MUSIC



MUSIC THEORY

Transposition Chart

0	С	C#	D	D#	Ε	F	F#	G	G#	Α	A#	B
1	C#	D	D#	Ε	F	F#	G	G#	Α	A#	В	С
2	D	D#	Ε	F	F#	G	G#	Α	A#	B	С	C#
3	D#	Ε	F	F#	G	G#	Α	A #	В	С	C#	D
4	Ε	F	F#	G	G#	Α	A#	B	С	C#	D	D#
5	F	F#	G	G#	Α	A#	В	С	C#	D	D#	Ε
6	F#	G	G#	Α	A#	B	С	C#	D	D#	Ε	F
7	G	G#	Α	A#	B	С	C#	D	D#	Ε	F	F#
8	G#	Α	A #	В	С	C#	D	D#	Ε	F	F#	G
9	Α	A#	B	С	C#	D	D#	Ε	F	F#	G	G#
10	A#	В	С	C#	D	D#	Ε	F	F#	G	G#	Α
11	В	С	C#	D	D#	Ε	F	F#	G	G#	Α	A #
12	С	C#	D	D#	Ε	F	F#	G	G#	Α	A#	В

Key Signatures

C – No flats or sharps	E – 4 sharps	C – No flats or sharps	Ab – 4 flats
G – 1 sharp	B – 5 sharps	F – 1 flat	Db – 5 flats
D – 2 sharps	F# - 6 sharps	Bb – 2 flats	G <i>b</i> - 6 flats
A – 3 sharps	C# - 7 sharps	Eb – 3 flats	Cb – 7 flats

Enharmonic Equivalents

B is the same as Cb

F# is the same as Gb

C# is the same as Db

Notes On The Staffs

Treble Clef:	Note how the pattern repeats. For example if we were to continue the spaces on the treble clef, the E in FACE is the beginning of the line pattern. So it would be:			
The spaces are:				
FACE				
The lines are:	FACEGBDFACEGBDF			
EGBDF	And the line pattern would be:			
Bass Clef:	EGBDFACEGBDFACE			
The spaces are:				
ACEG	It's not hard to see the pattern. What makes it even easier for			
The lines are:	English speakers is the fact that part of it spells the word "Face". All you need to remember is the other three letters			
GBDFA	that follow FACE in the repeating pattern which are "G B D"			
Alto or C Clef:	Often a music teacher will use the following acronym to help			
The spaces are:	students memorize the line notes on the treble clef:			
GBDF	Every Good Boy Does Fine.			
The lines are:				
FACEG				
Alto or C Clef:				
The spaces are:				
EGBD				
The lines are:				
DFACE				

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Overview

The purpose of this is for general reference. The information on this subject can be pretty detailed. The knowledge in this book is from music theory classes I took years ago as well as personal observations and from research that I've done online. The recording section is geared towards a single musician recording rather than a band.

Terms

Term	Description
Accelerando	Accelerating; gradually increasing the tempo.
Accidentals	Sharps, flats or natural signs used to raise, lower or return a note to its normal pitch within a scale.
Adagio	At ease. A slow tempo falling between largo (slower) and andante (faster)
al coda	To the coda.
al fine	To the end.
Allegro	Cheerful, a lively fast tempo.
al segno	Return to the sign.
Alto	The lowest female singing voice and the highest male singing voice.
Andante	Going, a moderate graceful tempo between adagietto and moderato
Arpeggio	The notes of a chord played in succession. played like a harp (i.e. the notes of the chords are to be played quickly one after another instead of simultaneously); in music for piano, this is sometimes a solution in playing a wide-ranging chord whose notes cannot be played otherwise; arpeggios are frequently used as an accompaniment; see also broken chord.

2	TERMS
Baritone	A low range singing voice between tenor and bass. An instrument tuned lower than normal.
Bend	Jazz term referring either to establishing a pitch, sliding down half a step and returning to the original pitch or sliding up half a step from the original note.
Broken Chord	A chord in which the notes are not all played at once, but in some more or less consistent sequence. They may follow singly one after the other, or two notes may be immediately followed by another two, for example. See also arpeggio, which as an accompaniment pattern may be seen as a kind of broken chord; see Alberti bass.
Caesura	A sudden silencing of the sound. A pause or break. A comma.
Cadence	A melodic or harmonic configuration that creates a sense of resolution.
Chromatic	Moving by half steps. A chromatic scale has twelve notes. Every note from root to root.
Coda	A section at the end of a piece which brings the piece to a close. Φ A coda symbol:
Crescendo	Gradually growing louder.
da capo	From the head. Indicates to return to the beginning of a piece.
da capo al coda	Indicates to return to the beginning of a piece and play it to the coda symbol, then jump to the coda section. Sometimes written D.C. al coda.
da capo al fine	Indicates to return to the beginning of a piece and play it to the fine symbol, Sometimes written D.C. al fine.
dal segno	From the sign. Indicates to return to the segno sign: $\%$
dal segno al capo	Indicates to return to the D.S. sign and play to the "to coda" indication, then skip to the coda. Sometimes written: D.S. al Capo
dal segno al fine	Indicates to return to the D.S. sign and play to the "fine" sign.

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Decelerando	Slowing down; decelerating; opposite of accelerando (same as ritardando or rallentando).
Decrescendo	Gradually growing softer. Gradually decreasing volume (same as diminuendo)
Diminuendo, dim.	Dwindling (i.e. with gradually decreasing volume) (same as decrescendo).
divisi (div.)	Divided (i.e. in a part in which several musicians normally play exactly the same notes they are instead to split the playing of the written simultaneous notes among themselves); it is most often used for string instruments, since with them another means of execution is often possible (the return from divisi is marked unisono)
Dolce	Sweet; con dolcezza: with sweetness. Dolcemente - Sweetly. Dolcissimo - Very sweet.
Double Stop	The technique of playing two notes simultaneously on a bowed string instrument.
Doit	Jazz term referring to a note that slides to an indefinite pitch chromatically upwards.
Downbeat	The first beat.
Drop	Jazz term referring to a note that slides to an indefinite pitch chromatically downwards.
D.S.	Dal Segno
Enharmonic Equivalent	An enharmonic equivalent is when a key has more than one name. For example $C^{#}$ is equal to D^{b} , $D^{#}$ is equal to E^{b} , $F^{#}$ is equal to G^{b} , $G^{#}$ is equal to A^{b} , $A^{#}$ is equal to B^{b} , B is equal to C^{b} , $B^{#}$ is equal to C, $E^{#}$ is equal to F, F^{b} is equal to E
Fall	Jazz term describing a note of definite pitch sliding downwards to another note of definite pitch.

Fermata	Stop (i.e. a rest or note to be held for a duration that is at the discretion of the performer or conductor) (sometimes called bird's eye); a fermata at the end of a first or intermediate movement or section is usually moderately prolonged, but the final fermata of a symphony may be prolonged for longer than the note's value, typically twice its printed length or more for dramatic effect.
Forte (f)	Strong (i.e. to be played or sung loudly).
forte-piano (fp)	Strong-gentle (i.e. loud, then immediately soft; see dynamics)
Fugue	Literally "flight"; hence a complex and highly regimented contrapuntal form in music; a short theme (the subject) is introduced in one voice (or part) alone, then in others, with imitation and characteristic development as the piece progresses.
glissando	A continuous sliding from one pitch to another (a true glissando), or an incidental scale executed while moving from one melodic note to another (an effective glissando). See glissando for further information; and compare portamento.
grace note	An extra note added as an embellishment and not essential to the harmony or melody.
Half Tone or Half Step	Space between to directly adjacent notes. C to C# is a half step, E to F is a half step.
Harmonics	An extra quality to the sound beyond the frequency of the note(s) generated by an instrument.
lament, lamento	A mournful piece.
largo	Slow and broad.
legato	Smooth. Joined (i.e. smoothly, in a connected manner) (see also articulation)
Lento	Slow. Lent (Fr.) - Slow. Lentando - Gradual slowing and softer. Lentissimo - Very slow.
Marcato, marc.	Marked (i.e. with accentuation, execute every note as if it were to be accented).

TERMS

Mezzo	Half; used in combinations like mezzo forte (mf), meaning moderately loud.
Multitimbral	Primarily referring to polyphonic synthesizers that can produce multiple sound patches of different timbre at the same time.
Overture	An orchestral composition forming the prelude or introduction to an opera, oratorio, etc.
Pad	Slang. A part of an arrangement that produces a soft, sustained background. Can be a single note or chords. Modern – synth pad patches. Early – soft strings. Classic – Hammond organ.
Pedale or ped	In piano scores, this instructs the player to press the damper pedal to sustain the note or chord being played. The player may be instructed to release the pedal with an asterisk marking (*). In organ scores, it tells the organist that a section is to be performed on the bass pedalboard with the feet.
Pizzicato	Pinched, plucked (i.e. in music for bowed strings, plucked with the fingers as opposed to played with the bow; compare arco, which is inserted to cancel a pizzicato instruction; in music for guitar, to mute the strings by resting the palm on the bridge, simulating the sound of pizz. of the bowed string instruments).
Polyphony	More than one note at a time. Early synthesizers were monophonic, meaning they could only play one note at a time.
Polyrhythm	Contrasting rhythms played simultaneously. In some African music, the rhythm played would be a mix of 4/4 and 3/4 or some more complex rhythmic combination. This type of polyrhythm is a polymetric.
Portamento	To slide continuously from one note to another. This is something that can be done on a fretless string instrument, with a slide on a fretted guitar or with a keyboard that includes a portamento setting.
ritardando, ritard., rit.	Slowing down; decelerating; opposite of accelerando

ritenuto, riten., rit.	Suddenly slower, held back (usually more so but more temporarily than a ritardando, and it may, unlike ritardando, apply to a single note); opposite of accelerato.
Rondo	A musical form in which a certain section returns repeatedly, interspersed with other sections: ABACA is a typical structure or ABACABA.
SAB	Soprano, Alto, Baritone
SATB	Soprano, Alto, Tenor, Bass
Segno	The segno symbol: %
Segue	Follows
Semitone	A half-tone, half-step. eg: C to C#, Eb to D, E to F
Solfege, Solfeggio	A way of ear training of the notes in the scales. Do, Re, Mi, Fa, So, La, Ti, Do
Tablature	A type of notation developed for fretted string instruments in the 16 th century. Lines indicate strings and numbers indicate frets.
Timbre	Pronounced (Tam-bur) The character or quality of a musical sound or voice as distinct from its pitch and intensity. Many instruments including the human voice can play the same pitch note, but they don't sound the same. This difference is the timbre. For example a middle C played on a piano sounds different than a middle C played on a guitar or a brass horn.
Tritone	The interval of an augmented fourth or a diminished fifth. Three whole tones.
Whole Tone or Whole Step	Equals two half steps. The space between two half tones. C to D is a whole step, C# to D# is a whole step, D to E is a whole step, E to F# is a whole step.

MUSIC THEORY

Note Values

Note	British Name Large (Latin: Maxima)	American Name Octuple Whole Note	Rest
	Long	Quadruple Whole Note	
	Breve	Double Whole Note	
0	Semibreve	Whole Note	
0	Minim	Half Note	
•	Crotchet	Quarter Note	or y
	Quaver	Eighth Note	Ч
	Semiquaver	Sixteenth note	Ý
8	Demisemiquaver	Thirty-second note	, y

Staffs

Staff/Stave
The staff is the fundamental latticework of music notation, on which symbols are
placed. The five staff lines and four intervening spaces correspond to pitches of
the diatonic scale; which pitch is meant by a given line or space is defined by the
clef. In British usage, the word "stave" is often used.

Ledger or ledger lines

These extend the staff to pitches that fall above or below it. Such ledger lines are placed behind the note heads, and extend a small distance to each side. Multiple ledger lines can be used when necessary to notate pitches even farther above or below the staff.

Bar line

These separate measures (see time signatures below for an explanation of measures). Also used for changes in time signature. Bar lines are extended to connect multiple staves in certain types of music, such as for keyboard or harp, and in conductor scores, but such extensions are not used for other types of music, such as vocal scores.



Double bar line, Double barline

These separate two sections of music, or are placed before a change in key signature and/or time signature.



Bold double bar line, Bold double barline

These indicate the conclusion of a movement or an entire composition. Music-dottedbar.svg Dotted bar line, Dotted barline Subdivides long measures of complex meter into shorter segments for ease of reading, usually according to natural rhythmic subdivisions.



Bracket

Connects two or more lines of music that sound simultaneously. In general contemporary usage the bracket usually connects the staves of separate instruments (e.g., flute and clarinet; two trumpets; etc.) or multiple vocal parts in a choir or ensemble, whereas the brace connects multiple parts for a single instrument (e.g., the right-hand and left-hand staves of a piano or harp part).

Brace

Connects two or more lines of music that are played simultaneously in piano, keyboard, harp, or some pitched percussion music.[1] Depending on the instruments playing, the brace (occasionally called an accolade in some old texts) varies in design and style.

Note Relationships



Beamed Notes

Beams connect eighth notes (quavers) and notes of shorter value and are equivalent in value to flags. In metered music, beams reflect the rhythmic grouping of notes. They may also group short phrases of notes of the same value, regardless of the meter; this is more common in ametrical passages. In older printings of vocal music, beams are often only used when several notes are to be sung on one syllable of the text – melismatic singing; modern notation encourages the use of beaming in a consistent manner with instrumental engraving, and the presence of beams or flags no longer informs the singer about the lyrics. Today, due to the body of music in which traditional metric states are not always assumed, beaming is at the discretion of composers and arrangers, who often use irregular beams to emphasize a particular rhythmic pattern.

Dotted Note



Placing a dot to the right of a note head lengthens the note's duration by one-half. Additional dots lengthen the previous dot instead of the original note, thus a note with one dot is one and one half its original value, a note with two dots is one and three quarters, a note with three dots is one and seven eighths, and so on. Rests can be dotted in the same manner as notes. In other words, n dots lengthen the note's or rest's original duration d to d \times (2 – 2–n).



Multi-Measure Rest

Indicates the number of measures in a resting part without a change in meter to conserve space and to simplify notation. Also called gathered rest or multi-bar rest.

Tie



Indicates that the two (or more) notes joined together are to be played as one note with the time values added together. To be a tie, the notes must be identical – that is, they must be on the same line or the same space. Otherwise, it is a slur (see below).



Indicates to play two or more notes in one physical stroke, one uninterrupted breath, or (on instruments with neither breath nor bow) connected into a phrase as if played in a single breath. In certain contexts, a slur may only indicate to play the notes legato. In this case, rearticulation is permitted.



Slurs and ties are similar in appearance. A tie is distinguishable because it always joins two immediately adjacent notes of the same pitch, whereas a slur may join any number of notes of varying pitches. In vocal music a slur normally indicates that notes grouped together by the slur should be sung to a single syllable. A phrase mark (or less commonly, ligature) is a mark that is visually identical to a slur, but connects a passage of music over several measures. A phrase mark indicates a musical phrase and may not necessarily require that the music be slurred.

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Glissando or Portamento

A continuous, unbroken glide from one note to the next that includes the pitches between. Some instruments, such as the trombone, timpani, non-fretted string instruments, electronic instruments, and the human voice can make this glide continuously (portamento), while other instruments such as the piano or mallet instruments blur the discrete pitches between the start and end notes to mimic a continuous slide (glissando).



Tuplet

A number of notes of irregular duration are performed within the duration of a given number of notes of regular time value; e.g., five notes played in the normal duration of four notes; seven notes played in the normal duration of two; three notes played in the normal duration of four. Tuplets are named according to the number of irregular notes; e.g., duplets, triplets, quadruplets, etc.

Arpeggiated Chord



A chord with notes played in rapid succession, usually ascending, each note being sustained as the others are played. It is also called a "broken chord" or "rolled chord".

Articulation Marks

Articulations (or accents) specify how to perform individual notes within a phrase or passage. They can be fine-tuned by combining more than one such symbol over or under a note. They may also appear in conjunction with phrasing marks listed above.



Staccatissimo or Spiccato

Indicates a longer silence after the note (as described above), making the note very short. Usually applied to quarter notes or shorter. (In the past, this marking's meaning was more ambiguous: it sometimes was used interchangeably with staccato, and sometimes indicated an accent and not staccato. These usages are now almost defunct, but still appear in some scores.) In string instruments this indicates a bowing technique in which the bow bounces lightly upon the string.



Staccato

This indicates the musician should play the note shorter than notated, usually half the value; the rest of the metric value is then silent. Staccato marks may appear on notes of any value, shortening their performed duration without speeding the music itself.



Tenuto

indicate a degree of emphasis, especially when combined with dynamic markings to indicate a change in loudness, or combined with a staccato dot to indicate a slight detachment (portato or mezzo staccato).

Fermata (Pause)

A note, chord, or rest sustained longer than its customary value. Usually appears over all parts at the same metrical location in a piece, to show a halt in tempo. It can be placed above or below the note. The fermata is held for as long as the performer or conductor desires, but is often set as twice the original value of the designated notes.

This symbol indicates play the note at its full value, or slightly longer. It can also



Accent

Play the note louder, or with a harder attack than surrounding unaccented notes. May appear on notes of any duration.



Marcato

Play the note somewhat louder or more forcefully than a note with a regular accent mark (open horizontal wedge). In organ notation, this means play a pedal note with the toe. Above the note, use the right foot; below the note, use the left foot.

Ornaments

Ornaments modify the pitch pattern of individual notes.



Trill

A rapid alternation between the specified note and the next higher note (according to key signature) within its duration, also called a "shake". When followed by a wavy horizontal line, this symbol indicates an extended, or running, trill. In modern music the trill begins on the main note and ends with the lower auxiliary note then the main note, which requires a triplet immediately before the turn. In music up to the time of Haydn or Mozart the trill begins on the upper auxiliary note and there is no triplet. In percussion notation, a trill is sometimes used to indicate a tremolo. In French baroque notation, the trill, or tremblement, was notated as a small cross above or beside the note.



Upper Mordent

Rapidly play the principal note, the next higher note (according to key signature) then return to the principal note for the remaining duration. In most music, the mordent begins on the auxiliary note, and the alternation between the two notes may be extended. In handbells, this symbol is a "shake" and indicates the rapid shaking of the bells for the duration of the note.



Lower mordent (inverted)

Rapidly play the principal note, the note below it, then return to the principal note for the remaining duration. In much music, the mordent begins on the auxiliary note, and the alternation between the two notes may be extended.



Appoggiatura

The first half of the principal note's duration has the pitch of the grace note (the first two-thirds if the principal note is a dotted note).



Acciaccatura

The acciaccatura is of very brief duration, as though brushed on the way to the principal note, which receives virtually all of its notated duration. In percussion notation, the acciaccatura symbol denotes the flam rudiment, the miniature note still positioned behind the main note but on the same line or space of the staff. The flam note is usually played just before the natural durational subdivision the main note is played on, with the timing and duration of the main note remaining unchanged. Also known by the English translation of the Italian term, crushed note, and in German as Zusammenschlag (simultaneous stroke).



Ottava

8va (pronounced ottava alta) is placed above the staff (as shown) to tell the musician to play the passage one octave higher. When this sign (or in recent notation practice, an 8vb – both signs reading ottava bassa) is placed below the staff, it indicates to play the passage one octave lower.



Quindicesima

The 15ma sign is placed above the staff (as shown) to mean play the passage two octaves higher. A 15ma sign below the staff indicates play the passage two octaves lower. 8va and 15ma are sometimes abbreviated further to 8 and 15. When they appear below the staff, the word bassa is sometimes added.



Tremolo

A rapidly repeated note. If the tremolo is between two notes, then they are played in rapid alternation. The number of slashes through the stem (or number of diagonal bars between two notes) indicates the frequency to repeat (or alternate) the note. As shown here, the note is to be repeated at a demisemiquaver (thirtysecond note) rate, but it is a common convention for three slashes to be interpreted as "as fast as possible", or at any rate at a speed to be left to the player's judgment.



Counting Beats

Counting with eighth notes say the first beat as the number of beat in the measure, the following note is designated as "and". For sixteenth notes it's broken down into 1-E-And-A.



Repeats

In music, a repeat sign is a sign (two dots) that indicates a section should be repeated. If the piece has one repeat sign alone, then that means to repeat from the beginning, and then continue on (or stop, if the sign appears at the end of the piece). A corresponding sign facing the other way indicates where the repeat is to begin. These are similar to the instructions da capo and dal segno. The following shows how to indicate a repetitive piece with different endings. In this piece you'd play measures one and two three times, then play measure one and three.



Sheet Music Navigation

Segno (The Sign)	%
Coda (CODA)	•
Dal Segno (D.S.)	Go to the sign
Da Capo (D.C.)	Go back to the beginning
D.S. al Coda	Go to the sign, then follow "To Coda" marking
D.C. al Coda	Go to the beginning, then follow "To Coda" marking
D.S. al fine	Go to the sign, then play to the end
D.C. al fine	Go to the beginning, then play to the end
Da Coda (TO CODA)	Go to the CODA

In this example, the piece is played through until you reach the D.S. al Coda, you return to the beginning and play until you reach the Segno, then jump to the Coda sign and play until the end.





Clef Examples



Scales

Major Scale Pattern: W = Whole Step, 1/2 = Half Step



Natural Minor Scale Pattern:



Harmonic Minor Scale Pattern: Same as the Natural Minor, but without the flattened seventh.



Melodic Minor Scale Pattern Ascending and Descending: The Ascending Melodic Minor scale is basically the major scale with a flattened third. The Descending Melodic Minor scale is simply the Natural Minor scale.



Scales - Latin Note Names: (Example C Major)

Deg	Note	Name	Mode	Mode	Meaning	Note In	Semitones
			Major	Minor		Minor	
1	С	Tonic	Ionian	Aeolian	Tonal center, note of	С	0
					final resolution.		
2	D	Supertonic	Dorian	Locrian	One whole step	D	2
					above the tonic.		
3	Е	Mediant	Phrygian	Ionian	Midway between	Eb	4-3
					tonic and dominant.		
4	F	Subdominant	Lydian	Dorian	Lower dominant,	F	5
					same interval below		
					tonic as dominant is		
					above tonic.		
5	G	Dominant	Mixolydian	Phrygian	Second in	G	7
					importance to the		
					tonic.		
6	А	Submediant	Aeolian	Lydian	Lower mediant,	Ab	9-8
					midway between		
					tonic and		
					subdominant, (in		
					major key) root of		
					relative minor key.		
b7		Subtonic		Mixolydian	One whole step	Bb	10
					below tonic in		
					natural minor scale.		
7	В	Leading Tone	Locrian		One half step below		11
					tonic. Melodically		
					strong affinity for		
					and leads to tonic.		
1	С	Octave	Ionian	Aeolian	Tonal center, note of	С	12
					final resolution		

Solfège

In music, solfège, also called sol-fa, solfa, solfeo, among many names, is a music education method used to teach aural skills, pitch and sight-reading of Western music. Solfège is a form of solmization, though the two terms are sometimes used interchangeably.

Syllables are assigned to the notes of the scale and enable the musician to audiate, or mentally hear, the pitches of a piece of music being seen for the first time and then to sing them aloud. Through the Renaissance (and much later in some shapenote publications) various interlocking 4, 5 and 6-note systems were employed to cover the octave. The tonic sol-fa method popularized the seven syllables commonly used in English-speaking countries: do (or doh in tonic sol-fa), re, mi, fa, so(I), Ia, and ti (or si).

There are two current ways of applying solfège:

- 1. fixed do, where the syllables are always tied to specific pitches (e.g. "do" is always "C-natural")
- 2. movable do, where the syllables are assigned to scale degrees, with "do" always the first degree of the major scale.

Solfege Major	Note Minor	Solfege Minor
Do	А	La
Re	В	Ti
Mi	С	Do
So	D	Re
Fa	E	Mi
La	F	So
Ti	G	Fa
	Solfege Major Do Re Mi So Fa La Ti	Solfege Major Note Minor Do A Re B Mi C So D Fa E La F Ti G

Major Scale Degree	Note	Solfège	Half Steps From Do
1	С	Do	0
	C# Db	Di	1
2	D	Re	2
	D# Eb	Ri	3
3	E	Mi	4
4	F	So	5
	F# Gb	Si	6
5	G	Fa	7
	G# Ab	Fi	8
6	А	La	9
	A# Bb	Li	10
7	В	Ті	11

Chromatic Solfège

Consonance And Dissonance

In music, consonance and dissonance are categorizations of simultaneous or successive sounds. Within the Western tradition, some listeners associate consonance with sweetness, pleasantness, and acceptability, and dissonance with harshness, unpleasantness, or unacceptability, although there is broad acknowledgement that this depends also on familiarity and musical expertise.

Consonances may include:

Perfect Consonances:	Imperfect Consonances:
Unisons	Major Seconds
Octaves	Minor Sevenths
Perfect Fourths	Major Thirds
Perfect Fifths	Minor Sixths
	Minor Thirds
	Major Sixths

Dissonances May Include:

Perfect Dissonances:

Tritones Minor Seconds Major Sevenths

Pentatonic Scales

A pentatonic scale is a five note scale.

Name	Base Mode	Degrees	In C	Steps
Major Pentatonic	Ionian	1-2-3-5-6	C-D-E-G-A	W-W-WH-W
Egyptian Sus	Dorian	1-2-4-5- <i>b</i> 7	C-D-F-G-Bb	W-WH-W-WH
Blues Minor	Phrygian	1- <i>b</i> 3-4- <i>b</i> 6- <i>b</i> 7	C-Eb-F-Ab-Bb	WH-W-WH-W
Blues Major	Mixolydian	1-2-4-5-6	C-D-F-G-A	W-WH-W-W
Minor Pentatonic	Aeolian	1- <i>b</i> 3-4-5- <i>b</i> 7	C-Eb-F-G-Bb	WH-W-W-WH

Modes: Scales Derived From The Major Scale

Mode	1	2	3	4	5	6	7
Ionian	С	D	Е	F	G	А	В
Dorian	D	Е	F	G	А	В	С
Phrygian	Е	F	G	А	В	С	D
Lydian	F	G	А	В	С	D	Е
Mixolydian	G	А	В	С	D	Е	F
Aeolian	А	В	С	D	Е	F	G
Locrian	В	С	D	E	F	G	А

Intervals

Intervals are the space between two notes on the keyboard. The intervals are classified by their tonal quality with relation to the tonic note.



Note to Note	Туре	Interval	Semitones
C to C	Perfect	Unison	0
C to Db	Minor	2nd	1
C to D	Major	2nd	2
C to Eb	Minor	3rd	3
C to E	Major	3rd	4
C to F	Perfect	4th	5
C to F#	Augmented	4th	6
C to Gb	Diminished	5th	6
C to G	Perfect	5th	7
C to Ab	Augmented	5th	8
C to A	Minor	6th	9
C to A	Diminished	7th	9
C to Bb	Minor	7th	10
C to B	Major	7th	11
C to C	Perfect	8 (Octave)	12

Note: In a major scale an augmented 4th is the tonal equivalent of a diminished 5th. A diminished 7th is the tonal equivalent of a minor 6th.

	H	H	μt	开生。	H 12.	H tt. 14	H tt. 14
	<u> </u>	194	1010	1011.1	<u> </u>	<u> PUP </u>	
		│ ∤ॉ	╎┝┦	┤╺┝╀╴╀╵			
<u>s</u>						<u> †'</u>	
[∎] C Major	G Major	D Major	A Major	E Major	B Major	F# Major	C# Major
6 3-							
<u>⊢`/`</u>	<u> </u>	1111	11111	1000	<u> </u>		<u> </u>
		│ ∤ॉ	╎┝┦	┤╺┟╀╴╀╵		╢╶┟┦╶╹┥╏╵	╫╫╨╫╖┨
						F 1	

Key Signatures

	Щр					
1 /20 /20	#P	11 12 h	112 h			 0 _1 _1
		l ^c	н н ^с			
■ F Major	Bb Major	Eb Major	Ab Major	Db Major	Gb Major	Cb Major
():						
	115 ¹²			<u> </u>	<u> _ ' P_ b</u>	116 ⁴ 1 Pr b. 1
- V	111			1 V V D	1 2 b	
					· •	

The key of E Flat Major has three flat notes in it. The root note, E flat, and the notes A flat and B flat. When a piece of sheet music has a key signature of E Flat, the notes on the staff for E, A and B are to be played E flat, A flat and B flat unless otherwise notated. If any of these notes have a "natural" symbol in front of them, then they are not to flattened.

С	None	F	Bb
G	F#	Bb	Bb, Eb
D	F#, C#	Eb	Bb, Eb, Ab
Α	F#, C#, G#	Ab	Bb, Eb, Ab, Db
E	F#, C#, G#, D#	Db	Bb, Eb, Ab, Db, Gb
В	F#, C#, G#, D#, A#	Gb	Bb, Eb, Ab, Db, Gb, Cb
F#	F#, C#, G#, D#, A#, E#	Cb	Bb, Eb, Ab, Db, Gb, Cb, Fb
C#	F#, C#, G#, D#, A#, E#, B#		

Major Scales Piano:



To figure out the **Natural Minor** scales, look at the 6th note of the major scale. For C it's A, for F it's D, for Bb it's G and so ion.



This is known as the Caged System. It is a means that teachers use to teach students the fretboard of the guitar. You can see in the diagram how the pattern repeats.



Guitar Fretboard Notes with sharps:

Guitar Fretboard Notes with flats:



Guitar Fretboard with C Major notes highlighted:



0	1	2	3	4	5	6	7	8	9	10	11	12	13
E) (F)	F#	G	G#	A	A#	B	C	C#		D#	E	Ē
B		C#	D	D#	E	F	(F#)	G	G#	A	(A#)	B	C
G	G#	A	(A#)	B	C	C#	D	D#	E	F	(F#)	G	G#)
	D#	E	F	(F#)	G	G#	(\mathbf{A})	(A#)	B	C	C#	D	D#
A	A#	B	C	C#	D	D#	E	F	(F#)	G	G#	A	A#
E	VF	F#	G	G#	(\mathbf{A})	A#	B	\bigcirc	C#	D	D#	E	E
Guita	ar Fre	tboar	'd wit	th a r	un in	GM	inor:						
0	1	2	3	4	5	6	7	8	9	10	11	12	13
E	(F)	F#	G	G#	A	A#	B	C	C#		D#	E	E
B		C#	D	D#	E	F	(F#)	G	G#	A	(A#)	B	C
G	G#	A	(A#)	B	C	C#	D	D#	E	E	(F#)	G	G#)
	D#	E	F	(F#)	G	G#	A	A#	B	C	C#	D	D#
A	A#	B	C	C#	D	D#	E	F	(F#)	G	G#)	A	(A#)
E	F	F#	G	G#	(\mathbf{A})	A#	B	\bigcirc	C#	D	D#	E	E
Ukule	ele Fr	etboa	ard:										

Guitar Fretboard with a run in C Major:



0	1	2	3	4	5	6	7	8	9	10	11	12	13
(\mathbf{A})	A#	B	C	C#		D#	E	F	F#	G	G#	A	A#
E	F	(F#)	G	G#	A	(A#)	B	C	C#	D	D#	E	F
C	C#	D	D#	E	F	(F#)	G	G#)	A	(A#)	B	C	C#
G	G#	(\mathbf{A})	A#	B	C	C#	D	D#	E	F	F#	G	G#

Chords

Chords are a group of two or more notes generally built from the notes in a scale. One of the most common types of chords is called a **triad**. A triad as its name implies is built with three notes.

Chord Notation

Chords are notated by their root note and the flavor or type of chord. There are many types of chords and different notations for them.

Major Triads

Major triads are always notated by the root note. If it has a note other than the root in its base, it'll be notated with a slash and the bass note.

Diminished Chords

dim	Cdim
° (Degree Symbol)	C°

Major Sevenths

Major sevenths can me notated in a variety of ways

Мај	СМај7
maj	Cmaj7
М	CM7

 Δ C Δ 7 (using a delta symbol)

Minor Triads & 7th

mi	Cmi Cmi7
min	Cmin Cmin7
m	Cm Cm7
-	C- C-7 (using minus)
(Minus are often	used in Jazz Charts)

Suspended Chords

sus	Csus Csus2 Csus4
S	Cs Cs2 Cs4

Half Diminished Chords

A full diminished seventh chord lowers its 3^{rd} and 5^{th} by a half step and 7^{th} by a whole-step. A half diminished seventh chord lowers its 3^{rd} , 5^{th} and 7^{th} by a half step.

m7 [⊅] 5	Cm7 ^⁵ 5
min7 [⊳] 5	Cmin7 [⊳] 5
mi7 [⊅] 5	Cmi7⁵5
-7 [⊳] 5	C- 7⁵5
Ø	C ^ø or C ^ø 7

Augmented Chords

Augmented chords raise their $\mathbf{5}^{\text{th}}$ note by a half step

aug	Caug Caug7
+	C+ C+7

Triads in a Major Key

If you use the key of C major and you construct chords of three notes with one note in between each note you will end up with the following triad chords:



Because of the asymmetry of the major scale, i.e. the interval between keys is not symmetrical in that not every interval is the same, there are **whole tone** and **half tone** steps, this causes the flavor of the triads in the key to alternate between **major**, **minor** and a **diminished** chord. Diminished chords are often designated with a small degree symbol. **Roman numerals** are used because they can show both the degree and flavor of the chord. Every major key has three major chords and three minor chords and one diminished chord.

Roman Numeral	Chord Name	Root	Third	Fifth
Ι	C Major	С	E	G
ii	D Minor	D	F	А
iii	E Minor	E	G	В
IV	F Major	F	А	С
V	G Major	G	В	D
vi	A Minor	A	С	Е
vii°	B Diminished	В	D	F

The Chords Above:

Often musicians will refer to a song's chord progression by the chords position in the scale. So for example someone might say it's a simple **1 - 4 - 5 progression** in the key of **C major**. This means the chord progression is **C - F - G**. If it was a **1 - 4 - 5** in the key of **A major** the progression would be **A - D - E**. Once you understand that everything is in patterns, everything becomes a lot clearer. It just becomes a process of shifting the pattern up and down the keyboard to the different keys.





Triad Types: The following are a list of different types of triad chords:

Major Triad: Built with a major third and a perfect fifth. For the C major triad the notes are C, E and G.

Minor Triad: Built with a minor third and a perfect fifth. For the C minor triad the notes are C, E flat and G.



C Major



C Diminished

C Minor

Diminished Triad: Built with a minor third and a diminished fifth. For the C diminished triad the notes are C, E flat and G flat.





C Augmented

Augmented Triad: Built with a major third and an augmented fifth. For the C augmented triad the notes are C, E and G sharp.

C Sus



C Sus4

Suspended Fourth Triad: Built with a perfect fourth and a perfect fifth. For the C suspended triad the notes are C, F and G.


Suspended Second: This is not actually a triad, although it is often played as one by eliminating the third. The notes for the C2 chord are C, D, E (Optional) and G.

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Chords in Scales with Roman Numbering

Notice the changes in the chord flavors for the different scales.



Seventh Chords

Seventh chords are used a lot in blues and jazz. The seventh chord comes in six basic flavors, the most common are the **dominant seventh**, the **major seventh** and the **minor seventh**. More often than not a dominant seventh is just referred to as a seventh. So if I write C7, it is implied to be a Dominant 7th. If it is a major 7th it will be written CM7 with a capital "M" or it might be written Cmaj7 or CMaj7 or it could be written with a **delta sign** " Δ " as such: C Δ 7, just be aware that these all designate a major seventh.





C Major 7th

Major Seventh: Built with a major third, a perfect fifth and a major seventh. For the C major seventh chord the notes are C, E, G and B.





C Dominant 7th

Dominant Seventh: Built with a major third, a perfect fifth and a minor seventh. For the C dominant seventh chord the notes are C, E, G and B-flat.





C Minor 7th

Minor Seventh: Built with a minor third, a perfect fifth and a minor seventh. For the C minor seventh chord the notes are C, Eflat, G and B-flat.





C Minor 7th Flattened 5th

Minor Seventh Flattened Fifth: Built with a minor third, a diminished fifth and a minor seventh. For the C minor seventh flattened fifth chord the notes are C, E-flat, G-flat and B-flat.



C Diminished 7th

Diminished Seventh: Built with a minor third, a diminished fifth and a diminished seventh. For the C diminished seventh chord the notes are C, E-flat, G-flat and A. (Note: $A = B^{bb}$)





C Minor / Major 7th

Minor With Major Seventh: Built with a minor third, a perfect fifth and a major seventh. For the C minor with major seventh chord the notes are C, E-flat, G and B.

7th Chords in the key of C major



Root Note	7th Notated	Name	Notes
С	CM7	C Major Seventh	C - E - G - B
D	Dm7	D Minor Seventh	D - F - A - C
E	Em7	E Minor Seventh	E - G - B - D
F	FM7	F Major Seventh	F - A - C - E
G	G7	G Dominant Seventh or just G Seventh	G - B - D - F
А	Am7	A Minor Seventh	A - C - E - G
В	Bm7b5	B Minor Seventh Flat Fifth	B - D - F - A

MUSIC THEORY

Extended Chords

Extended chords, with the exception of a sixth, are built upon a dominant seventh or a major seventh. If it is not specified as being a major chord, it is assumed to be a dominant seventh. So for example if the chord is listed as a D9, it's built upon a D dominant seventh, if it's listed as DM9, it's built upon a D major seventh. Something else to note is the chords beyond the 9th, may also include the 9th note. So for example a D11 may or may not include the ninth. Note that as we move through a scale beyond an octave that certain notes are skipped over. This is because they already exist in the base chord. For example 8 is the same as the root, 10 is the same as the third, 12 is the same as the 5th and 14 is the same as the 7th. So that leaves us with 9, 11 and 13. The following are the most common extended chords. With each added note, the number of potential variations increase. For example a major triad has at least ten variations besides itself with two modifiable notes, the third and the fifth. The variations, including itself, being: major, minor, sus2, sus4, dim 5th, augmented, diminished, minor augmented, sus2 diminished 5th, sus4 diminished 5th. So for each of the chords below, there may be many options beyond the base chord. An example might be C9+ where the fifth is raised by a half-step. The note of the chord being **C, E, Ab, Bb, D**

Sixth

A 6th is a triad that has an added note that is a sixth above the root. In the case of **C6** the added note is A. So the chord is: **C**, **E**, **G**, **A**. The chord **Cm6** is **C**, **Eb**, **G**, **A**.

Ninth

A 9th is a triad that has an added note that is a ninth above the root. In the case of C9 the added note is D. So the chord is: **C**, **E**, **G**, **Bb**, **D**

Eleventh

An eleventh is a dominant seventh with an added eleventh. In the case of C11 the added note is F. So the chord is: C, E, G, Bb, F. There may also be a 9th, as in C, E, G, Bb, D, F

Thirteenth

A thirteenth is a dominant seventh with an added thirteenth. In the case of C13 the added note is A. So the chord is: **C**, **E**, **G**, **Bb**, **A**. There may also be a 9th and or an 11th included in the chord. **C**, **E**, **G**, **Bb**, **A** or **C**, **E**, **G**, **Bb**, **D**, **A** or **C**, **E**, **G**, **Bb**, **F**, **A** or **C**, **E**, **G**, **Bb**, **D**, **F**, **A**

Secondary Chord

A secondary chord is an analytical label for a specific harmonic device that is prevalent in the tonal idiom of Western music beginning in the common practice period: the use of diatonic functions for tonicization.

Secondary chords are a type of altered or borrowed chord, chords that are not part of the music piece's key. They are the most common sort of altered chord in tonal music. Secondary chords are referred to by the function they have and the key or chord in which they function. Conventionally, they are written with the notation "**function/key**". Thus, the most common secondary chord, the dominant of the dominant, is written "V/V" and read as "five of five" or "the dominant of the dominant". The major or minor triad on any diatonic scale degree may have any secondary function applied to it; secondary functions may even be applied to diminished triads in some special circumstances.

Secondary chords were not used until the Baroque period and are found more frequently and freely in the Classical period, even more so in the Romantic period. Composers began to use them less frequently with the breakdown of conventional harmony in modern classical music—but secondary dominants are a cornerstone of popular music and jazz in the 20th century.

Secondary Dominant

The term secondary dominant (also applied dominant, artificial dominant, or borrowed dominant) refers to a major triad or dominant seventh chord built and set to resolve to a scale degree other than the tonic, with the dominant of the dominant (written as V/V or V of V) being the most frequently encountered. The chord that the secondary dominant is the dominant of is said to be a temporarily tonicized chord. The secondary dominant is normally, though not always, followed by the tonicized chord. Tonicizations that last longer than a phrase are generally regarded as modulations to a new key (or new tonic).

According to music theorists David Beach and Ryan C. McClelland, "the purpose of the secondary dominant is to place emphasis on a chord within the diatonic progression." The secondary-dominant terminology is still usually applied even if the chord resolution is nonfunctional. For example, the V/ii label is still used even if the V/ii chord is not followed by ii.

Definition

The major scale contains seven basic chords, which are named with Roman numeral analysis in ascending order. Because tonic triads are either major or minor, one would not expect to find diminished chords (either the viio in major or the iio in minor) tonicized by a secondary dominant. It would also not make sense for the tonic of the key itself to be tonicized.

In the key of C major, the five remaining chords are:

ii	iii	IV	V	vi
Dm	Em	F	G	Am

Of these chords, the V chord (G major) is said to be the dominant of C major. However, each of the chords from ii to vi also has its own dominant. For example, V (G major) has a D major triad as its dominant. These extra dominant chords are not part of the key of C major as such because they include notes that are not part of the C major scale. Instead, they are secondary dominants.

The notation below shows the secondary-dominant chords for C major. Each chord is accompanied by its standard number in harmonic notation. In this notation, a secondary dominant is usually labeled with the formula "V of ..." (dominant chord of); thus "V of ii" stands for the dominant of the ii chord, "V of iii" for the dominant of iii, and so on. A shorter notation, used below, is "V/ii", "V/iii", etc.

ii	iii	IV	V	vi
Dm	Em	F	G	Am
V/ii	V/iii	V/VI	V/V	V/vi
A	В	С	D	Е

I	D	E	F	G	Α
ii	Em	F#m	Gm	Am	Bm
=	F#m	G#m	Am	Bm	C#m
IV	G	А	Bb	С	D
V	Α	В	С	D	E
vi	Bm	C#m	Dm	Em	F#m

In Jazz And Popular Music

In jazz harmony, a secondary dominant is any dominant seventh chord on a weak beat and resolves downward by a perfect fifth. Thus, a chord is a secondary dominant when it functions as the dominant of some harmonic element other than the key's tonic and resolves to that element. This is slightly different from the traditional use of the term, where a secondary dominant does not have to be a seventh chord, occur on a weak beat, or resolve downward. If a non-diatonic dominant chord is used on a strong beat, it is considered an extended dominant. If it doesn't resolve downward, it may be a borrowed chord.

Bebob Cliche Arpeggio

Upwards from the third to the ninth of A7b9, which is the secondary dominant of D minor, the ii chord in the key of C (V/ii). The ii note in C is D. The V note of D is A.

Key Deg	jree	I			ii		iii			IV		V		vi
Key of C	:	С			D		Е			F		G		А
Key of D):	D			Е		F#			G		А		В
	1	3	5		7	b9								
A7b9	A	C#	E		G	Bb								
D in Ch	5			7		5		3	5	7	b9		1	
D in C	3	4		5	4	3	2		3	5			6	
Arp	Е	F	F#	G	F	Е	D	C#	Е	G	Bb		А	
Notes	Q	Е	Е	Е	Е	Е	Е	Е	Е	Е	Е	Er	Q	

Chord Progression: I'd Like To Teach The World To Sing. The V chord in F is C. The V chord of C is G.

I .	V/V	V	IV	V
F	G7	С	Bb	С

Secondary dominants are used in jazz harmony in the bebop blues and other blues progression variations, as are substitute dominants and turnarounds. In some jazz tunes, all or almost all of the chords that are used are dominant chords. For example, in the standard jazz chord progression ii–V–I, which would normally be Dm–G7–C in the key of C major, some tunes will use D7–G7–C7. Since jazz tunes are often based on the circle of fifths, this creates long sequences of secondary dominants.

Secondary dominants are also used in popular music. Examples include II7 (V7/V) in Bob Dylan's "Don't Think Twice, It's All Right" and III7 (V7/vi) in Betty Everett's "The Shoop Shoop Song (It's in His Kiss)". "Five Foot Two, Eyes of Blue" features chains of secondary dominants. "Sweet Georgia Brown" opens with V/V/V–V/V–V–I.

Extended Dominant

An extended dominant chord is a secondary dominant seventh chord that resolves down by a fifth to another dominant seventh chord. A series of extended dominant chords continues to resolve downwards by the circle of fifths until it reaches the tonic chord. The most common extended dominant chord is the tertiary dominant, which resolves to a secondary dominant. For example, V/V/V (in C major, A(7)) resolves to V/V (D(7)), which resolves to V (G(7)), which resolves to I. Note that V/V/V is the same chord as V/ii, but differs in its resolution to a major dominant rather than a minor chord.

Quaternary dominants are rarer, but an example is the bridge section of the rhythm changes, which starts from V/V/V/V (in C major, E(7)). The example below from Chopin's Polonaises, Op. 26, No. 1 (1835) has a quaternary dominant in the second beat (V/ii = V/V/V, V/vi = V/V/V/V).

Secondary Leading-Tone

In music theory, a secondary leading-tone chord or secondary diminished seventh (as in seventh scale degree or leading-tone, not necessarily seventh chord) is a secondary chord that is the leading-tone triad or seventh chord of the tonicized chord, rather than its dominant. In contrast to secondary dominant chords, these chords resolve up a half step. Fully diminished seventh chords are more common than half-diminished seventh chords and one may also find diminished triads (without sevenths).

Secondary leading-tone chords may resolve to either a major or minor diatonic triad:

In major keys	ii	iii	IV	V	vi
In minor keys		III	iv	V	VI

The type of diminished seventh chord is typically related to the type of tonicized triad:

If the tonicized triad is minor, the leading-tone chord is fully diminished seventh chord.

If it is major, the leading-tone chord may be either half-diminished or fully diminished, though fully diminished chords are used more often.

Especially in four-part writing, the seventh should resolve downwards by step and if possible the lower tritone should resolve appropriately, inwards if a diminished fifth and outwards if an augmented fourth, as the example below shows.

Some Progressions

Key of F:

IM7	viio7/ii	ii7	viio7/iii	iii7
FM7	F#dim7	Gm7	G#07	Am7

Inversions:

If you take a chord and instead of playing it's root note in the bass, you play one of the chord's other notes. For example with a C triad chord which consists of the three notes C, E and G, there is the root position and two inversions. The root position has the C in the bass. The first inversion has the E in the bass and the second inversion has the G in the bass.





C Major 1st Inversion







C Major Triad Root Position



C Major Triad 1st Inversion E in Bass



C Major Triad 2nd Inversion G in Bass

Root Position

The root note is in the bass.

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1st Inversion

The 3rd note of the chord is in the bass and the root note is at the top.

2nd Inversion

The 5th note of the chord is in the bass and the 3rd is at the top.

Roman Inversion Notation is done with roman numerals that indicate the chord position in the scale. Capital letters represent major chords, lowercase are for minor chords. Diminished are lowercase with a degree sign. Augmented are uppercase with a plus sign next to them. A number six by itself represents a 1st inversion. A six with a four below represents a 2nd inversion.

Learn Inversions

You should learn all the inversions for every chord and you should be able to smoothly go from one to the other. A good way to get good at this is to start out with a simple song and work your way through all the inversions with each chord change.

Dominant Seventh Chord Inversions











C7 - Root Position



C7 - 1st Inversion Position



C7 - 2nd Inversion Position

G as bass note

B^b as bass note

E as bass note





C7 - 3rd Inversion Position

What Inversions Are Good For

Moving Chord : Inversions are great to make music feel much fuller by working your way through different inversions.

Moving Towards Non-Adjacent Chord: They can be used to lead into a chord that is not relatively adjacent to the current chord. The inversion may be much closer to where you need to go.

Leading Chord Change: They are also great for leading into chord changes. They can be great for a chord change where the next chord is a note in the current chord. By changing the chord to an inversion that moves the next key into the bass position can make for a smooth transition.

Melodic Harmonization: They can be used to harmonize with melodic notes that fall within the chord but are not the root note.

Figured Bass

Figured bass, also called thoroughbass, is a kind of musical notation in which numerals and symbols (often accidentals) indicate intervals, chords, and non-chord tones that a musician playing piano, harpsichord, organ, or lute (or other instruments capable of playing chords) plays in relation to the bass note that these numbers and symbols appear above or below. Figured bass is closely associated with basso continuo, a historically improvised accompaniment used in almost all genres of music in the Baroque period of Classical music (c. 1600–1750), though rarely in modern music.

Other systems for denoting or representing chords include plain staff notation, used in classical music; Roman numerals, commonly used in harmonic analysis; chord letters, sometimes used in modern musicology; the Nashville Number System; and various chord names and symbols used in jazz and popular music (e.g., C Major or simply C; D minor, Dm, or D–; G7, etc.).

Figured Bass Notation

A part notated with figured bass consists of a bass line notated with notes on a musical staff plus added numbers and accidentals (or in some cases (back)slashes added to a number) beneath the staff to indicate what intervals above the bass notes should be played, and therefore which inversions of which chords are to be played.

The phrase tasto solo indicates that only the bass line (without any upper chords) is to be played for a short period, usually until the next figure is encountered. This instructs the chord-playing instrumentalist not to play any improvised chords for a period. The reason tasto solo had to be specified was because it was an accepted convention that if no figures were present in a section of otherwise figured bass line, the chord-playing performer would either assume that it was a root-position triad, or deduce from the harmonic motion that another figure was implied. For example, if a continuo part in the key of C begins with a C bass note in the first measure, which descends to a B(natural) in the second measure, even if there were no figures, the chord-playing instrumentalist would deduce that this was most likely a first inversion dominant chord (spelled B–D–G, from bottom note of the chord to the top).

Composers were inconsistent in the usages described below. Especially in the 17th century, the numbers were omitted whenever the composer thought the chord was obvious. Early composers such as Claudio Monteverdi often specified the octave by the use of compound intervals such as 10, 11, and 15.

Numbers

The numbers indicate the number of scale steps above the given bass-line that a note should be played. For example:

Note In Staff	С	Bass note	6 Above Bass	А
	6	Third note is 6 above bass note	4 Above Bass	F
	4	Second note is 4 above bass.	Bass	С

Here, the bass note is a C, and the numbers 4 and 6 indicate that notes a fourth and a sixth above it should be played, that is an F and an A. In other words, the second inversion of an F major chord. In cases where the numbers 3 or 5 would normally be understood, these are usually left out. For example:



although the performer may choose which octave to play the notes in and will often elaborate them in some way, such as by playing them as arpeggios rather than as block chords, or by adding improvised ornaments, depending on the tempo and texture of the music. Sometimes, other numbers are omitted: a 2 on its own or $\begin{array}{c} 4 \\ 2 \end{array}$ indicates $\begin{array}{c} 6 \\ 4 \\ 2 \end{array}$ for example. 2

From the figured bass-writer's perspective, this bass note is obviously a third inversion seventh chord, so the sixth interval is viewed as an interval that the player should automatically infer. In many cases entire figures can be left out, usually where the chord is obvious from the progression or the melody.

Sometimes the chord changes but the bass note itself is held. In these cases the figures for the new chord are written wherever in the bar they are meant to occur.

Triads

Inversion	Interval Above Bass	Symbol
Root	5 3	None
1 st Inversion	6 3	6
2 nd Inversion	6 4	6 4

Example		
	-	
$\langle \bullet \rangle$	•	•
1 9:=		•
	+	
	6	6 4

Seventh

Root	7 5 3	7
1 st Inversion	6 5 3	6 5
2 nd Inversion	6 4 3	4 3
3 rd Inversion	6 4 2	4 2



Instruments - Guitar

Guitar Fretboard



Ukulele Fretboard



Baritone Guitar Fretboard

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	C	C#	Ð	D#	E	Æ	F#	G	G#	A	A#	B	C	C#	\square	D#	E	E
F#	G	G#	A	(A#)	B	C	C#	D	D#	E	E	F#	G	G#	A	(A#)	B	C
D	D#	E	E	F#	G	G#	A	A#	B	C	C#	D	D#	E	F	(F#)	G	G#)
A	(A#)	B	C	C#	D	D#	Œ	F	F#	G	G#)	A	(A#)	B	C	C#	D	D#
E	F	(F#)	G	G#)	A	A#	B	C	C#	D	D#	E	F	F#	G	G#	A	(A#)
B	C	C#	\bigcirc	D#	E	F	(F#)	G	G#	(\mathbf{A})	(A#)	B	\bigcirc	C#	\bigcirc	D#	E	F

Baritone Open Chords Compared To Standard Tuning

Baritone	С	D	E	F	G	Α	В	Bb	F#
Standard	G	Α	В	С	D	Е	F#	F	C#

So if I'm playing an open G chord on a Baritone guitar, I'm actually playing a D chord note-wise.

Triads Guitar

Triad chords on a guitar are three note moveable chords. They require a bit more precision to play than most chords. They are moveable chords making them very versatile. They are often seen in jazz tablature. There are many forms of triads. The best way to describe the different form is by grouping them by sets of strings used.

The first set of guitar triads are played on the **G B E** strings. Forms displayed in Yellow.

The second set are played on strings **D G B**. Forms displayed in Green.

The third set are played on strings **A D G**. Forms displayed in Orange.

The final set is played on strings **E A D**. Forms displayed in Dark Orange.







To use these chords, you just need to know all the forms and where all the root notes are located which is why I indicated the note degree to the right of each chord form.

TRIAD FORMS

50	1A		1A	1B	1C		2A	2B	2C
3		0	Е	С	А	0	С	G	Е
	1B	1	F	C#	A#	1	C#	G#	F
		2	F#	D	В	2	D	А	F#
		3	G	D#	С	3	D#	A#	G
5	1C	4	G#	Е	C#	4	Е	В	G#
		5	А	F	D	5	F	С	А
$\bigcirc \bigcirc$		6	A#	F#	D#	6	F#	C#	A#
		7	В	G	Е	7	G	D	В
B	2A	8	С	G#	F	8	G#	D#	С
		9	C#	А	F#	9	А	Е	C#
		10	D	A#	G	10	A#	F	D
	0 D	11	D#	В	G#	11	В	F#	D#
	2B	12	Е	С	А	12	С	G	Е
15/11/5/									
	2C		3A	3 B	3C				
	2C	0	3A G	3B D#	3C C	1 ^	10	10	
	2C	0 1	3A G G#	3B D# E	3C C C#	1A 0r	, 1B	, 1C	GRE
3 0	2C	0 1 2	3A G G# A	3B D# E F	3C C C# D	1A On	, 1B Stri	,1C ings	GBE
	2C	0 1 2 3	3A G G# A A#	3B D# E F F#	3C C C# D D#	1A On	, 1B Stri	,1C ings	G B E
	2C 3A	0 1 2 3 4	3A G G# A A# B	3B D# E F F# G	3C C C# D D# E	1A On 2A	, 1B Stri . 2B	,1C ings .2C	G B E
	2C 3A	0 1 2 3 4 5	3A G G# A A# B C	3B D# E F F# G G#	3C C# D D# E F	1A On 2A On	, 1B Stri , 2B	,1C ings ,2C ings	G B E D G B
	2C 3A	0 1 2 3 4 5 6	3A G G# A A# B C C#	3 B D# F F# G G# A	3C C# D D# E F	1A On 2A On	, 1B Stri , 2B Stri	,1C ings ,2C ings	g b e d g b
	2C 3A 3B	0 1 2 3 4 5 6 7	3A G G# A A# B C C# D	3B D# E F F# G G# A A#	3C C# D D# E F F# G	1A On 2A On	, 1B Stri , 2B Stri	,1C ings ,2C ings	g b e D g b
	2C 3A 3B	0 1 2 3 4 5 6 7 8	3A G G# A A# B C C# D D#	3B D# E F F# G G# A A# B	3C C# D D# E F F# G G#	1A On 2A On 3A	, 1B Stri , 2B Stri	, 1C ings , 2C ings , 3C	g b e d g b
	2C 3A 3B 3C	0 1 2 3 4 5 6 7 8 9	3A G G# A A# B C C# D D# E	3B D# E F F# G # A A # B C	3C C# D# E F F# G G# A	1A On 2A On 3A	, 1B Stri , 2B Stri , 3B	, 1C ings , 2C ings , 3C ings	g b e d g b a d g
	2C 3A 3B 3C	0 1 2 3 4 5 6 7 8 9 10	3A G G# A A# B C C# D D# E F	3B D# E F F# G # A A # B C C#	3C C# D# E F# G # A A#	1A On 2A On 3A	, 1B Stri , 2B Stri , 3B	, 1C ings , 2C ings , 3C ings	g b e d g b a d g
	2C 3A 3B 3C	0 1 2 3 4 5 6 7 8 9 10 11	3A G G A A B C B C B D D E F F F #	3B D# E F F# G # A A # B C C # D	3C C # D # E F F # G # A # B	1A On 2A On 3A	, 1B Stri , 2B Stri , 3B	, 1C ings , 2C ings , 3C ings	g b e d g b a d g

Piano Chord Forms

The following shows chord forms within the key of C. From these forms you should be able to extrapolate the chords to other keys.





Tempo Terms

From slowest to fastest:

Larghissimo	very, very slow (24 bpm and under)
Adagissimo	very slow (24-40 bpm)
Grave	very slow (25-45 bpm)
Largo	slow and broad (40-60 bpm)
Lento	slow (45-60 bpm)
Larghetto	rather slow and broad (60-66 bpm)
Adagio	slow with great expression[10] (66-76 bpm)
Adagietto	slower than andante (72-76 bpm) or slightly faster than adagio (70-80 bpm)
Andante	at a walking pace (76-108 bpm)
Andantino	slightly faster than andante (although, in some cases, it can be taken to mean
	slightly slower than andante) (80-108 bpm)
Marcia Moderato	moderately, in the manner of a march[11][12] (83-85 bpm)
Moderato	at a moderate speed (108-120 bpm)
Andante Moderato	between andante and moderato (thus the name) (92-112 bpm)
Allegretto	by the mid-19th century, moderately fast (112-120 bpm); see paragraph above
	for earlier usage
Allegro Moderato	close to, but not quite allegro (116-120 bpm)
Allegro	fast, quick, and bright (120-156 bpm) (molto allegro is slightly faster than
	allegro, but always in its range; 124-156 bpm)
Vivace	lively and fast (156-176 bpm)
Vivacissimo	very fast and lively (172-176 bpm)
Allegrissimo	very fast (172-176 bpm)
or Allegro Vivace	
Presto	very, very fast (168-200 bpm)
Prestissimo	even faster than presto (200 bpm and over)

Additional Tempo Terms

A Piacere	the performer may use their own discretion with regard to tempo and rhythm;
	literally "at pleasure"
Accelerando	gradually play faster
Assai	(very) much
A Tempo	resume previous tempo
Con Grazia	with grace, or gracefully
Con Moto	Italian for "with movement"; can be combined with a tempo indication, e.g.,
	Andante Con Moto
Lamentoso	sadly, plaintively
L'istesso,	at the same speed; L'istesso is used when the actual speed of the music has
L'istesso Tempo, or	not changed, despite apparent signals to the contrary, such as changes in time
Lo Stesso Tempo	signature or note length (half notes in $4/4$ could change to whole notes in $2/2$,
	and they would all have the same duration)
Ma Non Tanto	but not so much; used in the same way and has the same effect as Ma non
	troppo (see immediately below) but to a lesser degree
Ma Non Troppo	but not too much; used to modify a basic tempo to indicate that the basic
	tempo should be reined in to a degree; for example, Adagio ma non troppo to
	mean "Slow, but not too much", Allegro ma non troppo to mean "Fast, but not
	too much"
Maestoso	majestically, stately
Molto	very
Meno	less
Più	more
Росо	a little
Subito	suddenly
Tempo Comodo	at a comfortable speed
Tempo Di	the speed of a (such as Tempo di valzer (speed of a waltz, dotted quarter
	note. $pprox$ 60 bpm or quarter note $pprox$ 126 bpm), Tempo di marcia (speed of a
	march, quarter note \approx 120 bpm))
Tempo Giusto	at a consistent speed, at the 'right' speed, in strict tempo
Tempo Primo	resume the original (first) tempo

Tempo Semplicesimple, regular speed, plainly

Terms for change in tempo

Composers may use expressive marks to adjust the tempo:

Accelerando	speeding up (abbreviation: accel.) Opposite of Ritardando, it is an Italian term
	pronounced as [aht-che-le-rahn-daw] and is defined by gradually increasing
	the tempo until the next tempo mark is noted. It is either marked by a dashed
	line or simply its abbreviation.
Affrettando	speeding up with a suggestion of anxiety
Allargando	growing broader; decreasing tempo, usually near the end of a piece
Calando	going slower (and usually also softer)
Doppio Movimento,	double-speed
or Doppio Più Mosso	
Doppio Più Lento	half-speed
Lentando	gradually slowing, and softer
Meno Mosso	less movement; slower
Meno Moto	less motion
Più Mosso	more movement; faster
Mosso	movement, more lively; quicker, much like Più Mosso, but not as extreme
Precipitando	hurrying; going faster/forward
Rallentando	a gradual slowing down (abbreviation: rall.)
Ritardando	slowing down gradually; also see rallentando and ritenuto (abbreviations: rit.,
	ritard.) sometimes replaces allargando.
Ritenuto	slightly slower, but achieved more immediately than Rallentando or
	Ritardando; a sudden decrease in tempo; temporarily holding back. (Note that
	the abbreviation for Ritenuto can also be rit. Thus a more specific abbreviation
	is riten. Also, sometimes Ritenuto does not reflect a tempo change but rather a
	'character' change.)
Rubato	free adjustment of tempo for expressive purposes, literally "stolen"—so more
	strictly, to take time from one beat to slow another
Slargando	slowing down, literally "slowing down", "widening" or "stretching"

Stretto	in a faster tempo, often used near the conclusion of a section. (Note that in
	fugal compositions, the term stretto refers to the imitation of the subject in
	close succession, before the subject is completed, and as such, suitable for the
	close of the fugue.[24] Used in this context, the term is not necessarily related
	to tempo.)
Stringendo	pressing on faster, literally "tightening"
Tardando	slowing down gradually (same as ritardando)
Tempo Primo	resume the original tempo

Tritones

In music theory, the tritone is defined as a musical interval composed of three adjacent whole tones (six semitones). For instance, the interval from F up to the B above it (in short, F–B) is a tritone as it can be decomposed into the three adjacent whole tones F–G, G–A, and A–B. According to this definition, within a diatonic scale there is only one tritone for each octave. For instance, the above-mentioned interval F–B is the only tritone formed from the notes of the C major scale. A tritone is also commonly defined as an interval spanning six semitones. According to this definition, a diatonic scale contains two tritones for each octave. For instance, the above-mentioned C major scale contains the tritones F–B (from F to the B above it, also called augmented fourth) and B–F (from B to the F above it, also called diminished fifth, semidiapente, or semitritonus). In twelve-equal temperament, the tritone divides the octave exactly in half as 6 of 12 semitones or 600 of 1,200 cents.

In classical music, the tritone is a harmonic and melodic dissonance and is important in the study of musical harmony. The tritone can be used to avoid traditional tonality: "Any tendency for a tonality to emerge may be avoided by introducing a note three whole tones distant from the key note of that tonality." The tritone found in the dominant seventh chord can also drive the piece of music towards resolution with its tonic. These various uses exhibit the flexibility, ubiquity, and distinctness of the tritone in music.

The condition of having tritones is called tritonia; that of having no tritones is atritonia. A musical scale or chord containing tritones is called tritonic; one without tritones is atritonic.

Leading-Tone

In music theory, a leading-tone (also subsemitone, and called the leading-note in the UK) is a note or pitch which resolves or "leads" to a note one semitone higher or lower, being a lower and upper leading-tone, respectively. Typically, the leading tone refers to the seventh scale degree of a major scale (scale degree 7), a major seventh above the tonic. In the movable do solfège system, the leading-tone is sung as ti.

A leading-tone triad is a triad built on the seventh scale degree in a major key (viio in Roman numeral analysis), while a leading-tone seventh chord is a seventh chord built on the seventh scale degree (vii7b5).

Passing Chord

In music, a passing chord is a chord that connects, or passes between, the notes of two diatonic chords. "Any chord that moves between one diatonic chord and another one nearby may be loosely termed a passing chord. A diatonic passing chord may be inserted into a pre-existing progression that moves by a major or minor third in order to create more movement."] "Inbetween chords' that help you get from one chord to another are called passing chords."

For example, in the simple chord progression in the key of C Major, which goes from:

IM7	iii7	ii7	V7
Cmaj7	Em7	Dm7	G7

The diatonic (this means "from the scale of the tonic") passing chord (Dm7) may be inserted:

IM7	ii7	iii7	ii7	V7
Cmaj7	Dm7	Em7	Dm7	G7

Or the chromatic passing chord (Ebm7) may be inserted:

IM7	iii7	biii7	ii7	V7
Cmaj7	Em7	Ebm7	Dm7	G7

Or one or more secondary dominants may be inserted: In this example, the B7 is the secondary dominant of Em7 and the A7 is the secondary dominant of Dm7

IM7	V/iii	iii	V/ii	ii	V
Cmaj7	B7	Em7	A7	Dm7	G7

A chromatic passing chord is, "a chord that is not in the harmonized scale" For example, one or more diminished seventh chords may be inserted:

IM7	viio7/iii	iii	viio7/ii	ii7	V7
Cmaj7	D#dim7	Em7	C#dim7	Dm7	G7

In the previous example, the D# dim7 is the viio7 of Em7 and the C# dim7 is the viio7 of Dm7.

Passing chords may be consonant or dissonant and may include flat fifth substitution, scalewise substitution, dominant minor substitution, approach chords, and bass-line-directed substitution. Passing chords may be written into a lead sheet by a composer, songwriter, or arranger.

As well, particularly in smaller ensembles, such as the organ trio or jazz quartet, the comping (chord-playing) rhythm section instrumentalists (e.g., jazz guitar, jazz piano, Hammond organ) may improvise passing chords. With large ensembles, such as a big band, the comping players may have less freedom to improvise passing chords, because the composer/arranger may have already written in passing chords into the written horn parts, which might clash with improvised passing chords played by a comping musician. The freedom of comping musicians to improvise passing chords also depends on the tempo. In a very slow ballad, if a chord-playing musician adds in an improvised diminished chord for a half a bar, this may "clash" with the melody notes or chords played by other performers. On the other hand, in an extremely up-tempo (fast) bebop tune, a comping musician could add improvised passing chords with more freedom, because each bar goes by so fast.

Musical Counterpoint

In music, counterpoint is the relationship between two or more musical lines (or voices) which are harmonically interdependent yet independent in rhythm and melodic contour. It has been most commonly identified in the European classical tradition, strongly developing during the Renaissance and in much of the common practice period, especially in the Baroque period. The term originates from the Latin punctus contra punctum meaning "point against point", i.e. "note against note".

There are several different forms of counterpoint, including imitative counterpoint and free counterpoint. Imitative counterpoint involves the repetition of a main melodic idea across different vocal parts, with or without variation. Compositions written in free counterpoint often incorporate non-traditional harmonies and chords, chromaticism and dissonance.

General Principles of Counterpoint

The term "counterpoint" has been used to designate a voice or even an entire composition. Counterpoint focuses on melodic interaction—only secondarily on the harmonies produced by that interaction. In the words of John Rahn:

It is hard to write a beautiful song. It is harder to write several individually beautiful songs that, when sung simultaneously, sound as a more beautiful polyphonic whole. The internal structures that create each of the voices separately must contribute to the emergent structure of the polyphony, which in turn must reinforce and comment on the structures of the individual voices. The way that is accomplished in detail is ... 'counterpoint'.

Work initiated by Guerino Mazzola (born 1947) has given counterpoint theory a mathematical foundation. In particular, Mazzola's model gives a structural (and not psychological) foundation of forbidden parallels of fifths and the dissonant fourth. Octavio Agustin has extended the model to microtonal contexts.

In counterpoint, the functional independence of voices is the prime concern. The violation of this principle leads to special effects, which are avoided in counterpoint. In organ registers, certain interval combinations and chords are activated by a single key so that playing a melody results in parallel voice leading. These voices, losing independence, are fused into one and the parallel chords are perceived as single tones with a new timbre. This effect is also used in orchestral arrangements; for instance, in Ravel's Bolero #5 the parallel parts of flutes, horn and celesta resemble the sound of an electric organ. In counterpoint, parallel voices are prohibited because they violate the homogeneity of musical texture when independent voices occasionally disappear turning into a new timbre quality and vice versa.

Development of Counterpoint

Some examples of related compositional techniques include: the round (familiar in folk traditions), the canon, and perhaps the most complex contrapuntal convention: the fugue. All of these are examples of imitative counterpoint.

Species Counterpoint

Species counterpoint was developed as a pedagogical tool in which students progress through several "species" of increasing complexity, with a very simple part that remains constant known as the cantus firmus (Latin for "fixed melody"). Species counterpoint generally offers less freedom to the composer than other types of counterpoint and therefore is called a "strict" counterpoint. The student gradually attains the ability to write free counterpoint (that is, less rigorously constrained counterpoint, usually without a cantus firmus) according to the given rules at the time. The idea is at least as old as 1532, when Giovanni Maria Lanfranco described a similar concept in his Scintille di musica (Brescia, 1533). The 16th-century Venetian theorist Zarlino elaborated on the idea in his influential Le institutioni harmoniche, and it was first presented in a codified form in 1619 by Lodovico Zacconi in his Prattica di musica. Zacconi, unlike later theorists, included a few extra contrapuntal techniques, such as invertible counterpoint.

In 1725 Johann Joseph Fux published Gradus ad Parnassum (Steps to Parnassus), in which he described five species:

- 1. Note against note;
- 2. Two notes against one;
- 3. Four notes against one;
- 4. Notes offset against each other (as suspensions);
- 5. All the first four species together, as "florid" counterpoint.

A succession of later theorists quite closely imitated Fux's seminal work, often with some small and idiosyncratic modifications in the rules. Many of Fux's rules concerning the purely linear construction of melodies have their origin in solfeggi. Concerning the common practice era, alterations to the melodic rules were introduced to enable the function of certain harmonic forms. The combination of these melodies produced the basic harmonic structure, the figured bass.

Considerations For All Species

The following rules apply to melodic writing in each species, for each part:

- The final note must be approached by step. If the final is approached from below, then the leading tone must be raised in a minor key (Dorian, Hypodorian, Aeolian, Hypoaeolian), but not in Phrygian or Hypophrygian mode. Thus, in the Dorian mode on D, a C[‡] is necessary at the cadence.
- Permitted melodic intervals are the perfect unison, fourth, fifth, and octave, as well as the major and minor second, major and minor third, and ascending minor sixth. The ascending minor sixth must be immediately followed by motion downwards.

- 3. If writing two skips in the same direction—something that must be only rarely done—the second must be smaller than the first, and the interval between the first and the third note may not be dissonant. The three notes should be from the same triad; if this is impossible, they should not outline more than one octave. In general, do not write more than two skips in the same direction.
- 4. If writing a skip in one direction, it is best to proceed after the skip with step-wise motion in the other direction.
- 5. The interval of a tritone in three notes should be avoided (for example, an ascending melodic motion F–A–B) as is the interval of a seventh in three notes.
- 6. There must be a climax or high point in the line countering the cantus firmus. This usually occurs somewhere in the middle of exercise and must occur on a strong beat.
- 7. An outlining of a seventh is avoided within a single line moving in the same direction.

And, in all species, the following rules govern the combination of the parts:

- 1. The counterpoint must begin and end on a perfect consonance.
- 2. Contrary motion should dominate.
- 3. Perfect consonances must be approached by oblique or contrary motion.
- 4. Imperfect consonances may be approached by any type of motion.
- 5. The interval of a tenth should not be exceeded between two adjacent parts unless by necessity.
- 6. Build from the bass, upward.

First Species

In first species counterpoint, each note in every added part (parts being also referred to as lines or voices) sounds against one note in the cantus firmus. Notes in all parts are sounded simultaneously, and move against each other simultaneously. Since all notes in First species counterpoint are whole notes, rhythmic independence is not available.

In the present context, a "step" is a melodic interval of a half or whole step. A "skip" is an interval of a third or fourth. (See Steps and skips.) An interval of a fifth or larger is referred to as a "leap".

A few further rules given by Fux, by study of the Palestrina style, and usually given in the works of later counterpoint pedagogues, are as follows.

- 1. Begin and end on either the unison, octave, or fifth, unless the added part is underneath, in which case begin and end only on unison or octave.
- 2. Use no unisons except at the beginning or end.

- Avoid parallel fifths or octaves between any two parts; and avoid "hidden" parallel fifths or octaves: that is, movement by similar motion to a perfect fifth or octave, unless one part (sometimes restricted to the higher of the parts) moves by step.
- 4. Avoid moving in parallel fourths. (In practice Palestrina and others frequently allowed themselves such progressions, especially if they do not involve the lowest of the parts.)
- 5. Do not use an interval more than three times in a row.
- 6. Attempt to use up to three parallel thirds or sixths in a row.
- 7. Attempt to keep any two adjacent parts within a tenth of each other, unless an exceptionally pleasing line can be written by moving outside that range.
- 8. Avoid having any two parts move in the same direction by skip.
- 9. Attempt to have as much contrary motion as possible.
- 10. Avoid dissonant intervals between any two parts: major or minor second, major or minor seventh, any augmented or diminished interval, and perfect fourth (in many contexts).

In the adjacent example in two parts, the cantus firmus is the lower part. (The same cantus firmus is used for later examples also. Each is in the Dorian mode.)



First Species	D	А	В	D	C#	D
Cantus Firmus	D	F	G	F	E	D

Second Species

In second species counterpoint, two notes in each of the added parts work against each longer note in the given part. Additional considerations in second species counterpoint are as follows, and are in addition to the considerations for first species:

- 1. It is permissible to begin on an upbeat, leaving a half-rest in the added voice.
- 2. The accented beat must have only consonance (perfect or imperfect). The unaccented beat may have dissonance, but only as a passing tone, i.e. it must be approached and left by step in the same direction.
- 3. Avoid the interval of the unison except at the beginning or end of the example, except that it may occur on the unaccented portion of the bar.
- 4. Use caution with successive accented perfect fifths or octaves. They must not be used as part of a sequential pattern. The example show is weak due to similar motion in the second measure in

both voices. A good rule to follow: if one voice skips or jumps try to use step-wise motion in the other voice or at the very least contrary motion.



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- 1. It is permissible to begin on an upbeat, leaving a half-rest in the added voice.
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- 3. Avoid the interval of the unison except at the beginning or end of the example, except that it may occur on the unaccented portion of the bar.
- 4. Use caution with successive accented perfect fifths or octaves. They must not be used as part of a sequential pattern. The example show is weak due to similar motion in the second measure in both voices. A good rule to follow: if one voice skips or jumps try to use step-wise motion in the other voice or at the very least contrary motion.



Third Species

In third species counterpoint, four (or three, etc.) notes move against each longer note in the given part.

Three special figures are introduced into third species and later added to fifth species, and ultimately outside the restrictions of species writing. There are three figures to consider: The nota cambiata, double neighbor tones, and double passing tones.

Double neighbor tones: the figure is prolonged over four beats and allows special dissonances. The upper and lower tones are prepared on beat 1 and resolved on beat 4. The fifth note or downbeat of the next measure should move by step in the same direction as the last two notes of the double neighbor figure. Lastly a double passing tone allows two dissonant passing tones in a row. The figure would consist of 4 notes moving in the same direction by step. The two notes that allow dissonance would be beat 2 and 3 or 3 and 4. The dissonant interval of a fourth would proceed into a diminished fifth and the next note would resolve at the interval of a sixth.

Fourth Species

In fourth species counterpoint, some notes are sustained or suspended in an added part while notes move against them in the given part, often creating a dissonance on the beat, followed by the suspended note then changing (and "catching up") to create a subsequent consonance with the note in the given part as it continues to sound. As before, fourth species counterpoint is called expanded when the added-part notes vary in length among themselves. The technique requires chains of notes sustained across the boundaries determined by beat, and so creates syncopation. Also it is important to note that a dissonant interval is allowed on beat 1 because of the syncopation created by the suspension. While it is not incorrect to start with a half note, it is also common to start 4th species with a half rest.



Fifth Species (florid counterpoint)

In fifth species counterpoint, sometimes called florid counterpoint, the other four species of counterpoint are combined within the added parts. In the example, the first and second bars are second species, the third bar is third species, the fourth and fifth bars are third and embellished fourth species, and the final bar is first species. In florid counterpoint it is important that no one species dominates the composition.



Contrapuntal Derivations

Since the Renaissance period in European music, much contrapuntal music has been written in imitative counterpoint. In imitative counterpoint, two or more voices enter at different times, and (especially when entering) each voice repeats some version of the same melodic element. The fantasia, the ricercar, and later, the canon and fugue (the contrapuntal form par excellence) all feature imitative counterpoint, which also frequently appears in choral works such as motets and madrigals. Imitative counterpoint spawned a number of devices, including:

Melodic Inversion

The inverse of a given fragment of melody is the fragment turned upside down—so if the original fragment has a rising major third (see interval), the inverted fragment has a falling major (or perhaps minor) third, etc. (Compare, in twelve-tone technique, the inversion of the tone row, which is the so-called prime series turned upside down.) (Note: in invertible counterpoint, including double and triple counterpoint, the term inversion is used in a different sense altogether. At least one pair of parts is switched, so that the one that was higher becomes lower. See Inversion in counterpoint; it is not a kind of imitation, but a rearrangement of the parts.)

Retrograde

Whereby an imitative voice sounds the melody backwards in relation to the leading voice.

Retrograde Inversion

Where the imitative voice sounds the melody backwards and upside-down at once.

Augmentation

When in one of the parts in imitative counterpoint the note values are extended in duration compared to the rate at which they were sounded when introduced.

Diminution

When in one of the parts in imitative counterpoint the note values are reduced in duration compared to the rate at which they were sounded when introduced.

Free counterpoint

Broadly speaking, due to the development of harmony, from the Baroque period on, most contrapuntal compositions were written in the style of free counterpoint. This means that the general focus of the composer had shifted away from how the intervals of added melodies related to a cantus firmus, and more toward how they related to each other.

Nonetheless, according to Kent Kennan: "....actual teaching in that fashion (free counterpoint) did not become widespread until the late nineteenth century."[19] Young composers of the eighteenth and nineteenth centuries, such as Mozart, Beethoven, and Schumann, were still educated in the style of "strict" counterpoint, but in practice, they would look for ways to expand on the traditional concepts of the subject.

Main features of free counterpoint:

- 1. All forbidden chords, such as second-inversion, seventh, ninth etc., can be used freely in principle of harmony.
- 2. Chromaticism is allowed
- 3. The restrictions about rhythmic-placement of dissonance are removed. It is possible to use passing tones on the accented beat.
- 4. Appoggiatura is available: dissonance tones can be approached by leaps.

Linear counterpoint

Linear counterpoint is "a purely horizontal technique in which the integrity of the individual melodic lines is not sacrificed to harmonic considerations. "Its distinctive feature is rather the concept of melody, which served as the starting-point for the adherents of the 'new objectivity' when they set up linear counterpoint

as an anti-type to the Romantic harmony." The voice parts move freely, irrespective of the effects their combined motions may create." In other words, either "the domination of the horizontal (linear) aspects over the vertical" is featured or the "harmonic control of lines is rejected."

Associated with neoclassicism, the technique was first used in Igor Stravinsky's Octet (1923), inspired by J. S. Bach and Giovanni Palestrina. However, according to Knud Jeppesen: "Bach's and Palestrina's points of departure are antipodal. Palestrina starts out from lines and arrives at chords; Bach's music grows out of an ideally harmonic background, against which the voices develop with a bold independence that is often breath-taking."

According to Cunningham, linear harmony is "a frequent approach in the 20th century...[in which lines] are combined with almost careless abandon in the hopes that new 'chords' and 'progressions'...will result." It is possible with "any kind of line, diatonic or duodecuple".

Dissonant Counterpoint

Dissonant counterpoint was originally theorized by Charles Seeger as "at first purely a school-room discipline," consisting of species counterpoint but with all the traditional rules reversed. First species counterpoint must be all dissonances, establishing "dissonance, rather than consonance, as the rule," and consonances are "resolved" through a skip, not step. He wrote that "the effect of this discipline" was "one of purification". Other aspects of composition, such as rhythm, could be "dissonated" by applying the same principle.

Seeger was not the first to employ dissonant counterpoint, but was the first to theorize and promote it. Other composers who have used dissonant counterpoint, if not in the exact manner prescribed by Charles Seeger, include Johanna Beyer, John Cage, Ruth Crawford-Seeger, Vivian Fine, Carl Ruggles, Henry Cowell, Carlos Chávez, John J. Becker, Henry Brant, Lou Harrison, Wallingford Riegger, and Frank Wigglesworth.

Turnaround

In jazz, a turnaround is a passage at the end of a section which leads to the next section. This next section is most often the repetition of the previous section or the entire piece or song.

The turnaround may lead back to this section either harmonically, as a chord progression, or melodically.

Typical Examples

Typical turnarounds in jazz include:

I – vi – ii – V	(ii-V-I turnaround, circle progression)
I - VI - ii - V	
I – VI – II – V	(I–V/ii–V/V–V)
I – biiio – ii7 – V7	
l – vi – bVl7#11 – V	
V – IV – I	(blues turnaround)
I – bIII – bVI – bII7	(Tadd Dameron turnaround)
iii - VI - ii - V	

Turnarounds typically begin with the tonic (I) (or a tonic substitute such as iii) and end on the dominant (V7), the next section starting on the tonic (I). They may also end on blI7 (which is a dominant substitute). Thus when used in a twelve bar blues pattern, the twelfth bar may end on the dominant. All of the chords in a turnaround may be seventh chords, typically dominant seventh chords for major chords and minor seventh chords for minor chords (e.g., ii7).

Harmonic Alternatives

Sometimes, especially in blues music, musicians will take chords which are normally minor chords and make them major. The most popular example is the I - VI - ii - V - I progression; normally, the vi chord would be a minor chord (or **m7**, **m6**, **mb6** etc.) but here the major third makes it a secondary dominant leading to ii, i.e. V/ii. Take the example in **C major**: **C** - **A** - **Dm** - **G(7)**. The third of the **VI** chord (in this case, **C#**) allows for chromatic movement from **C** (the root of I) to **C#** (the third of **VI**) to **D** (the root of **ii**).

Similar chromaticism and harmonic interest can be achieved by the use of a secondary dominant of V, for example V7/V - V7 - I (that is, II7 - V7 - I), instead of ii - V - I. Another popular turnaround which may be considered as a secondary dominant analysis is ii - bV/V - I (i.e. ii - bII - I), which is a variation on the standard ii - V - I turnaround. In jazz parlance, use of the bII instead of the V is known as tritone substitution. Using bV/V instead of V allows for a smooth chromatic descent. Again, let us examine C major; the original turnaround would be Dm - G(7) - C, while the modified would be Dm - Db - C. The obvious chromatic movement is thorough; it is apparent in the roots (D - Db - C), thirds (F - F - E; F is often used as a**pedal tone**), and fifths <math>(A - Ab - G).

While in that particular example the **bV/V** can be considered a Neapolitan chord, the more typical functional analysis in the context of the jazz idiom is that it is not a secondary dominant (**bV7/V**) but **bII7**, a substitute dominant (**tritone substitution**). Harmonically, **bII7** functions exactly as **V7/I** does, because the two chords enharmonically contain the same tritone, which is the critical harmonic element in the
resolution from dominant to tonic. The half step downward motion of the roots of those chords, as seen in **ii – bll7 – l**, forms the familiar line cliché, arriving satisfyingly at the tonic.

Secondary dominant refers to the functional dominant of the key's dominant or another non-tonic chord, while substitute dominant refers to an alternative functional dominant of the key's tonic. The extending of dominants to secondaries (or beyond) is a practice which remains firmly inside the circle of fifths, while the substitution of dominants replaces that cycle with one of minor-second intervals.

I - vi - ii - V may be transformed through various chord substitutions. For example, the vi and ii chords may be substituted with dominant chords, giving I - VI7 - II7 - V or C - A7 - D7 - G, the ragtime progression. The tritone substitution may be applied to the vi and V chords, giving C - Eb7 - D7 - Db7, or to every chord but the I, giving C - Eb7 - AbM7 - Db7.

Articulations

Legato

In music performance and notation, legato, Italian for "tied together" indicates that musical notes are played or sung smoothly and connected. That is, the player makes a transition from note to note with no intervening silence. Legato technique is required for slurred performance, but unlike slurring (as that term is interpreted for some instruments), legato does not forbid re-articulation. Standard notation indicates legato either with the word legato, or by a slur (a curved line) under notes that form one legato group. Legato, like staccato, is a kind of articulation. There is an intermediate articulation called either mezzo staccato or non-legato (sometimes referred to as portato).

Staccato

The word Staccato derives from the Italian word Staccare, meaning to detach or separate. For bowed string instruments, it is best to use the term staccato to describe an on-the-string effect only. Staccato is indicated by placing a dot over or under the notehead and is most effectively performed at slow to moderate tempos. There are two ways to play staccato on a bowed instrument. One, with separate bow strokes and two, with a single bow stroke. The first is called Separate-Bow Staccato and the second is called Slurred Staccato and is indicated by slur lines.

Spiccato

Is a bowing technique for string instruments in which the bow appears to bounce lightly upon the string. The term comes from the past participle of the Italian verb spiccare, meaning "to separate". The terms martelé, saltando, and sautillé describe similar techniques.

Marcato

From the verb "To Hammer". In bowing it indicates a fast, well-articulated, heavy, separate stroke, resembling a sforzando. The bow does not leave the string, even though there is a stop between the notes and each new stroke is initiated with a heavy accent. It can be indicated like a staccato with a dot, or with and inverted solid triangle, a caret or a greater-than sign above or below the notehead. Like the regular accent, however, the marcato is often interpreted to suggest a sharp attack tapering to the original dynamic, an interpretation which applies only to instruments capable of altering the dynamic level of a single sustained pitch. According to author James Mark Jordan, "the marcato sound is characterised by a rhythmic thrust followed by a decay of the sound."

In jazz big-band scores, the marcato symbol usually indicates a note is to be shortened to approximately 2/3 its normal duration, and given a moderate accent. The instruction marcato or marcatissimo (extreme marcato), among various other instructions, symbols, and expression marks may prompt a string player to use martellato bowing, depending on the musical context.

Portato

Italian past participle of portare, "to carry"), also mezzo-staccato, in music denotes a smooth, pulsing articulation and is often notated by adding dots under slur markings. Portato is also known as articulated legato. Portato is a bowing technique for stringed instruments, in which successive notes are gently rearticulated while being joined under a single continuing bow stroke. It achieves a kind of pulsation or undulation, rather than separating the notes. Currently, portato is sometimes indicated in words, by "mezzo-staccato" or "non-legato"; or can be shown by three graphic forms:

- A slur that encompasses a phrase of staccato notes (the most common), or
- A tenuto above a staccato mark (very often), or
- A slur that encompasses a phrase of tenuto notes (less common).

Portato is defined by some authorities as "the same as portamento".

Vibrato

This is a technique that is common to all stringed instruments. Vibrato is accomplished by pressing the finger firmly on the string at the desired pitch while quickly rocking it back and forth on the string. Italian, from past participle of "vibrare", to vibrate, is a musical effect consisting of a regular, pulsating change of pitch. It is used to add expression to vocal and instrumental music. Vibrato is typically characterised in terms of two factors: the amount of pitch variation ("extent of vibrato") and the speed with which the pitch is varied ("rate of vibrato"). In singing it can occur spontaneously through variations in the larynx. The vibrato of a string instrument and wind instrument is an imitation of that vocal function.

Tremolo

In music, tremolo is a trembling effect. There are two types of tremolo.

The first type is a rapid reiteration of a single note, particularly used on bowed string instruments, by rapidly moving the bow back and forth by means of short, quick up and down bow strokes, this is known as **Bowed Tremelo**; plucked strings such as on a harp, where it is called bisbigliando or "whispering"; and tremolo picking, in which a single note is repeated extremely rapidly with a plectrum (or "pick") on traditionally plucked string instruments such as guitar (although a pick is not necessary to execute a tremolo), mandolin, etc. It's also the rapid reiteration between two notes or chords in alternation, an imitation (not to be confused with a trill) of the preceding that is more common on keyboard instruments. Mallet instruments such as the marimba are capable of either method. On stringed instruments it's called **Fingered Tremelo** and it involves an interval of a 2nd or larger is quickly repeated, somewhat like a trill.

A second type of tremolo is a variation in amplitude as produced on organs by tremulants or using electronic effects in guitar amplifiers and effects pedals which rapidly turn the volume of a signal up and down, creating a "shuddering" effect. It's also an imitation of the same by strings in which pulsations are taken in the same bow direction or a vocal technique involving a wide or slow vibrato, not to be confused with the trillo or "Monteverdi trill".

Note: Some electric guitars use a (misnamed) lever called a "tremolo arm" or "whammy bar" that allows a performer to lower or (usually, to some extent) raise the pitch of a note or chord, an effect properly termed vibrato or "pitch bend". This non-standard use of the term "tremolo" refers to pitch rather than amplitude. However, the term "trem" or "tremolo" is still used to refer to a bridge system built for a whammy bar, or the bar itself. True tremolo for an electric guitar, electronic organ, or any electronic signal would normally be produced by a simple amplitude modulation electronic circuit. Electronic tremolo effects were available on many early guitar amplifiers. Tremolo effects pedals are also widely used to achieve this effect. In acoustic instruments, for e.g. guitar, tremolo effect provides the sustenance of sound for a longer span.

Glissando

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In music, a glissando is a glide from one pitch to another. It is an Italianized musical term derived from the French glisser, "to glide". In some contexts, it is distinguished from the continuous portamento. Some colloquial equivalents are slide, sweep (referring to the "discrete glissando" effects on guitar and harp, respectively), bend, smear, rip (for a loud, violent gliss to the beginning of a note), lip (in jazz terminology, when executed by changing one's embouchure on a wind instrument), plop, or falling hail (a glissando on a harp using the back of the fingernails). This is another technique that is common to all stringed instruments. It is accomplished by sliding one finger on one string from one pitch to another.



The glissando is indicated by following the initial note with a line, sometimes wavy, in the desired direction, often accompanied by the abbreviation gliss. Occasionally, the desired notes are notated in the standard method (i.e. semiquavers) accompanied by the word 'glissando'.

Prescriptive attempts to distinguish the glissando from the portamento by limiting the former to the filling in of discrete intermediate pitches on instruments like the piano, harp, and fretted stringed instruments have run up against established usage of instruments like the trombone and timpani. The latter could thus be thought of as capable of either "glissando" or "portamento", depending on whether the drum was rolled or not. The clarinet gesture that opens Rhapsody in Blue could likewise be thought of either way: it was originally planned as a glissando (Gershwin's score labels each individual note) but is in practice played as a portamento though described as a glissando.

Portamento

Portamento is similar to Glissando, but it is more of a slide where there aren't stops on individual notes.

Trill

The trill (or shake, as it was known from the 16th until the early 20th century) is a musical ornament consisting of a rapid alternation between two adjacent notes, usually a semitone or tone apart, which can be identified with the context of the trill. It is sometimes referred to by the German Triller, the Italian trillo, the French trille or the Spanish trino. A cadential trill is a trill associated with each cadence. A trill provides rhythmic interest, melodic interest, and—through dissonance—harmonic interest. Sometimes it is expected that the trill will end with a turn (by sounding the note below rather than the note above the principal note, immediately before the last sounding of the principal note), or some other variation. Such variations are often marked with a few appoggiaturas following the note bearing the trill indication.

MUSIC THEORY

Trill Notation

In most modern musical notation, a trill is generally indicated with the letters tr (or sometimes simply t) above the trilled note. This has sometimes been followed by a wavy line, and sometimes, in the baroque and early classical periods, the wavy line was used on its own. In those times the symbol was known as a chevron. Both the "tr" and the wavy line are necessary for clarity when the trill is expected to be applied to more than one note (or to tied notes). Also, when attached to a single notehead in one part that corresponds to smaller note values in another part, it leaves no room for doubt if both the letter and line are used.

The usual way of executing a trill, known as a diatonic trill, is to rapidly alternate between the written note and the one directly above it in the given scale (unless the trill symbol is modified by an accidental, understood to apply to the added note above; this is a chromatic trill).

Mordent

In music, a mordent is an ornament indicating that the note is to be played with a single rapid alternation with the note above or below. Like trills, they can be chromatically modified by a small flat, sharp or natural accidental. The term entered English musical terminology at the beginning of the 19th century, from the German Mordent and its Italian etymon, mordente, both used in the 18th century to describe this musical figure. The word ultimately is derived from the Latin mordere (to bite).

The mordent is thought of as a rapid single alternation between an indicated note, the note above (the upper mordent) or below (the lower mordent) and the indicated note again.

The upper mordent is indicated by a short squiggle; the lower mordent is the same with a short vertical line through it:



As with the trill, the exact speed with which the mordent is performed will vary according to the tempo of the piece.

Turn

A turn is a short figure consisting of the note above the one indicated, the note itself, the note below the one indicated, and the note itself again. It is marked by a backwards S-shape lying on its side above the staff. The details of its execution depend partly on the exact placement of the turn mark. For instance, the turns below



The exact speed with which a turn is executed can vary, as can its rhythm. The question of how a turn is best executed is largely one of context, convention, and taste. The lower and upper added notes may or may not be chromatically raised.

An inverted turn (the note below the one indicated, the note itself, the note above it, and the note itself again) is usually indicated by putting a short vertical line through the normal turn sign, though sometimes the sign itself is turned upside down.

Appoggiatura

An appoggiatura is an added note that is important melodically (unlike an acciaccatura) and suspends the principal note by a portion of its time-value, often about half, but this may be considerably more or less depending on the context. The added note (the auxiliary note) is one degree higher or lower than the principal note, and may or may not be chromatically altered. Appoggiaturas are also usually on the strong or strongest beat of the resolution, are themselves emphasised, and are approached by a leap and left by a step in the opposite direction of the leap. An appoggiatura is often written as a grace note prefixed to a principal note and printed in small character, without the oblique stroke:

Appoggiatura Noted Appoggiatura Executed





Acciaccatura

The word acciaccatura comes from the Italian verb acciaccare, "to crush". In the 18th century, it was an ornament applied to any of the main notes of arpeggiated chords, either a tone or semitone below the chord tone, struck simultaneously with it and then immediately released. Hence the German translation Zusammenschlag (together-stroke).

In the 19th century, the acciaccatura (sometimes called short appoggiatura) came to be a shorter variant of the long appoggiatura, where the delay of the principal note is quick. It is written using a grace note (often a quaver, or eighth note), with an oblique stroke through the stem. In the Classical period, an acciaccatura is usually performed before the beat and the emphasis is on the main note, not the grace note. The appoggiatura long or short has the emphasis on the grace note.

The exact interpretation of this will vary according to the tempo of the piece, but the following is possible:



Whether the note should be played before or on the beat is largely a question of taste and performance practice. Exceptionally, the acciaccatura may be notated in the bar preceding the note to which it is attached, showing that it is to be played before the beat. The implication also varies with the composer and the period. For example, Mozart's and Haydn's long appoggiaturas are, to the eye, indistinguishable from Mussorgsky's and Prokofiev's before-the-beat acciaccaturas.

Ghost Note

In music, a ghost note is a musical note with a rhythmic value, but no discernible pitch when played. In musical notation, this is represented by an "X" for a note head instead of an oval, or parentheses around the note head. It should not be confused with the X-shaped notation that raises a note to a double sharp.

On stringed instruments, this is played by sounding a muted string. "Muted to the point where it is more percussive sounding than obvious and clear in pitch. There is a pitch, to be sure, but its musical value is more rhythmic than melodic or harmonic...they add momentum and drive to any bass line." Occurring in a rhythmic figure, they are purposely deemphasized, often to the point of near silence. In popular music drumming, ghost notes are ones played "very softly between the 'main' notes," (off the beat on the sixteenth notes) most often on the snare drum in a drum kit. Ghost notes are often used by electric bass players and double bass players in a range of popular music and traditional music styles. In vocal music, this style of notation represents words that are spoken in rhythm rather than sung.

Dynamics

Dynamics are one of the expressive elements of music. Used effectively, dynamics help musicians sustain variety and interest in a musical performance, and communicate a particular emotional state or feeling.

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Dynamic markings are always relative. p never indicates a precise level of loudness; it merely indicates that music in a passage so marked should be considerably quieter than f. There are many factors affecting the interpretation of a dynamic marking. For instance, the middle of a musical phrase will normally be played louder than the beginning or end, to ensure the phrase is properly shaped, even where a passage is marked p throughout. Similarly, in multi-part music, some voices will naturally be played louder than others, for instance, to emphasize the melody and the bass line, even if a whole passage is marked at one dynamic level. Some instruments are naturally louder than others, for instance, a tuba playing piano will likely be louder than a guitar playing fortissimo, while a high-pitched instrument like the piccolo playing in its upper register can usually sound loud even when its actual decibel level is lower than that of other instruments.

Dynamic Markings

The two basic dynamic indications in music are: **p** or **piano**, meaning "quiet". **f** or **forte**, meaning "loud or strong".

Name	Letters	Level
fortissimissimo	fff	Very, very loud
fortissimo	ff	Very loud
forte	f	Loud
mezzo-forte	mf	Average
mezzo-piano	mp	Average
piano	р	Quiet
pianissimo	рр	Very quiet
pianissimissimo	ррр	Ver, very quiet

More subtle degrees of loudness or softness are indicated by:

MIDI Dynamics Levels

Note this is an approximation. Different DAWs may have different values. This is for Logic Pro X

LPX	ррр	рр	р	тр	mf	f	ff	fff
	16	32	48	64	80	96	112	127

Changes

Three Italian words are used to show gradual changes in volume:

Crescendo

Abbreviated cresc. translates as "increasing" (literally "growing")

Decrescendo

Abbreviated to decresc. translates as "decreasing".

Diminuendo

Abbreviated dim. translates as "diminishing".

Signs sometimes referred to as "hairpins" are also used to stand for these words. If the angle lines open up, like an elongated less-than sign '<', then the indication is to get louder; if they close gradually, like an elongated greater-than sign '>', the indication is to get softer. Hairpins are usually written below the staff (or between the two staves in a grand staff), but are sometimes found above, especially in music for singers or in music with multiple melody lines being played by a single performer. They tend to be used for dynamic changes over a relatively short space of time (at most a few bars), while cresc., decresc. and dim. are generally used for changes over a longer period. Word directions can be extended with dashes to indicate over what time the event should occur, which may be as long as multiple pages. The word morendo ("dying") is also sometimes used for a gradual reduction in dynamics (and tempo).

For greater changes in dynamics, **cresc. molto** and **dim. molto** are often used, where the molto means "much". Similarly, for more gradual changes **poco cresc.** and **poco dim.** are used, where "poco" translates as a little, or alternatively with poco a poco meaning "little by little".

Sudden changes in dynamics may be notated by adding the word **subito** (meaning "suddenly") as a prefix or suffix to the new dynamic notation. **Subito Piano** (abbreviated **sub. p** or **sp**) ("suddenly soft") indicates that the dynamics quickly, almost abruptly, lower the volume to approximately the **p** range. It is often purposefully used to subvert the listener's expectation and will signify an intimate expression. Although it uses the piano **p** dynamic symbol, the performer has slight freedom in their interpretation, causing it to vary based on the preceding loudness or character of the piece. Likewise, **subito** can be used to mark suddenly louder changes, like **subito forte sf**, or **subito fortissimo sff**, however in these cases it's usually only used to add a particular amount of accent to one note or chord. If **subito** is used to note a sudden change to an entire louder passage, something like sub. **f** or sub. **ff** should be used to leave out any ambiguity.

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Accented notes is typically notated with the accent sign > above or below the note, giving it a general emphasis relative to the current dynamics. A harder and shorter emphasis is usually marked with the marcato mark ^ above the note instead. If a very particular emphasis is needed instead, it can be marked with a variation of **subito**, **forzando/forzato** or **fortepiano**.

forzando/forzato indicates a forceful accent and is abbreviated as **fz**. To emphasize the effect, it is most often preceded with **subito** as **sfz** (**subito forzato/forzando**, **sforzando/sforzato**). How these should be interpreted and played in the music is up to the judgement of the performer, but a rule of thumb is that a **forzato/forzando** can be considered as a variation on **marcato** while **subito forzando/forzato** can be considered as a variation on **marcato** while **subito forzando/forzato** can be considered as a variation.

The **fortepiano** notation **fp** indicates a **forte** followed immediately by **piano**. By contrast, **pf** is an abbreviation for **poco forte**, literally "a little loud" but (according to Brahms) meaning with the character of **forte**, but the sound of **piano**, though rarely used because of possible confusion with **pianoforte**.

Orchestra / Symphony Instruments

Most genres of modern music are played with a small band arrangement that consists of a collection of certain instruments, such as, a drum kit, an electric bass guitar, an electric guitar or two, and vocalists. There are sometimes other instruments that are used, such as, piano or electric keyboard, percussion instruments like tambourine and shakers, horns, etc... Some genres, such as Country Music, use instruments like fiddles (violins), mandolins, banjos, washboards and even sometimes accordions. Often producers will add orchestral instrument arrangements to enhance a track.

Orchestral Arrangements on Beatles Songs

George Martin, the primary producer for The Beatles was a classically trained musician and arranger. He's often referred to as the fifth Beatle because of his contribution to their songs. He is credited with playing piano and creating orchestral arrangements for many Beatles songs. Here are just a few that included George's addition:

Strings

Yesterday Eleanor Rigby Being For The Benefit Of Mr. Kite A Day In The Life Hey Jude Golden Slumbers Carry That Weight The End Here Comes The Sun Something Martha My Dear

Horns

Got To Get You Into My Life Good Morning Good Morning A Day In The Life Being For The Benefit Of Mr. Kite All You Need Is Love Penny Lane Martha My Dear

The following section is to acquaint you with the instruments used in a symphony. For each instrument we'll look at several factors, such as the following:

- The tuning of the instrument.
- The range of the instrument.
- The sweet spot of the range.
- Any articulations that the instrument can make.
- Any other relevant details about the particular instrument.

Modern symphony orchestra is usually divided into four sections or choirs. Here is a partial list of the different instruments in these groups:

Strings	Woodwinds	Brass	Percussion
Violin	Piccolo	French Horn	Xylophone
Viola	Flute	Trumpet	Marimba
Cello	Oboe	Trombone	Vibraphone
Double Bass	Bassoon	Tuba	Glockenspiel
	Clarinet		Chimes
	English Horn		Cymbals
	Saxophone		Drums

Ordering of Instruments and Sections in an Orchestral Score

As a general rule, the instruments in each section are listed in the score from highest to lowest in pitch, top to bottom. Notice the different placement of percussion in orchestra and band scores.

Orchestral Score Order	Band Score Order	Brass Quintet
Woodwinds	Flutes (Fl or Fls)	Trumpet I
Flutes (Fl or Fls)	Oboes (Ob or Obs)	Trumpet II
Oboes (Ob or Obs)	Bassoons (Bsn or Bsns)	Horn
English Horn	Clarinets (Cl or Cls)	Trombone
Clarinets (Cl or Cls)	Saxophones (AS, or TS, or BS)	Tuba
Bassoons (Bsn or Bsns)	Cornets (Cor)	
Brass	Trumpets (Tpt or Tpts)	Woodwind Quintet
Horns (Hn or Hns)	Horns (Hn or Hns)	Flute
Trumpets (Tpt or Tpts)	Trombones (Trb or Trbs)	Oboe
Trombones (Trb or Trbs)	Euphoniums (Euph)	Clarinet
Tuba (Tuba)	Tubas (Tubas)	Horn
Timpani (Timp)	Timpani (Timp)	Bassoon
Percussion (Perc)	Percussion (Perc)	
Other Instruments		
Strings		
Violins I (VIns)		
Violins II		
Viola (Vla)		
Violoncellos (Vcl)		
Double Bass (DB)		

Note Names On Staff

Before defining the range of the instruments, it's important to note the names of each note in the context of where it sits on the common notation staffs. This is often illustrated with a full range piano keyboard and using an illustration of the grand staff. A full size 88 key piano keyboard ranges from A0 to C8. C4 is middle C. The numbers change on the note C. For example the first four notes of the grand piano are A^0 , $A\#^0/Bb^0$, B^0 and C^1 .



Bowed String Instruments

Bowed instruments are instruments that are played primarily with a bow. Although they are primarily bowed, many of them can be plucked as well.

The Bow

The bow used in bowed instruments has two ends, the Tip, the part that is away from the hand holding the bow, and the Frog, the part where the hand grips the bow.

Violin

The violin is the soprano instrument of the string section.

Tuning: $G^3 D^4 A^4 E^5$

Range: G^3 to E^7

0	G ³	D^4	A ⁴	E⁵
1	G# ³ /Ab ³	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F⁵
2	A ³	E ⁴	B^4	F#⁵/Gb⁵
3	A# ³ /Bb ³	F^4	C ₅	G⁵
4	B ³	F# ⁴ /Gb ⁴	C#⁵/Db⁵	G# ⁵ /Ab ⁵
5	C ⁴	G ⁴	D⁵	A ⁵
6	C# ⁴ /Db ⁴	G# ⁴ /Ab ⁴	D# ⁵ /Eb ⁵	A# ⁵ /Bb ⁵
7	D^4	A ⁴	E ⁵	B⁵
8	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F⁵	C ⁶
9	E ⁴	B ⁴	F#⁵/Gb⁵	C# ⁶ /Db ⁶
10	F ⁴	C ⁵	G⁵	D^6
11	F# ⁴ /Gb ⁴	C#⁵/Db⁵	G#⁵/Ab⁵	D# ⁶ /Eb ⁶
12	G ⁴	D⁵	A ⁵	E ⁶
13	G# ⁴ /Ab ⁴	D# ⁵ /Eb ⁵	A# ⁵ /Bb ⁵	F ⁶
14	A ⁴	E⁵	B⁵	F# ⁶ /Gb ⁶
15	A# ⁴ /Bb ⁴	F⁵	Ce	G°
16	B^4	F#⁵/Gb⁵	C# ⁶ /Db ⁶	G# ⁶ /Ab ⁶
17	C ⁵	G⁵	D ⁶	A ⁶
18	C# ⁵ /Db ⁵	G#⁵/Ab⁵	D# ⁶ /Eb ⁶	A# ⁶ /Bb ⁶
19	D ⁵	A ⁵	E ⁶	B ⁶
20	D#⁵/Eb⁵	A# ⁵ /Bb ⁵	F ⁶	C ⁷

Stops: Playing more than one note on a stringed instrument are called stops. Two notes are called double stops, three notes are called triple stops and four notes are called quadruple stops.

Bowed Instrument Articulations

Slurred Bowing

Whenever a passage is slurred, all notes within that slur are performed on one bow, meaning that all are played in one bow stroke. Normally this produces smooth or legato playing. Legato means "bound together".

Non-Slurred Bowing

In a passage with no notated slurs, each pitch is normally performed by changing the direction of the bow, detaching each note from the next.

Loure

This essentially legato bowing is accomplished by slightly separating notes while the bow is being drawn across the string. It can produce a very expressive effect and is used often in accompaniments. This bowing is indicated by dashes under or over each of the noteheads, with slurs to designate the bow changes.

Off-The-String Bowings

Spiccato

There are three distinct ways of performing spiccato bowings. All depend upon the speed and the dynamics of the passage.

Conscious Spiccato

In a slow or moderate tempo, the player makes a conscious effort to make the bow bounce.

Spontaneous Spiccato (Saltando)

At fast tempo the player does not have to make a conscious effort to lift the bow; rather, the short, quick up-down motion controlled by the wrist alone makes the bow bounce spontaneously off the string with every stroke.

Slurred Spiccato

Performing spiccato in a single bowing.

Arpeggiando

A slightly different kind of spiccato. This bowing may begin with a simple on-the-string slurring of an arpeggio played over three or four strings at a moderate tempo, but at a fast tempo, the bow will spontaneously bounce off the strings because of the motion of the wrist.

Trills

The trill is extensively used in all string instruments. Trills are executed by holding down the string of the pitch printed in the score with the appropriate finger and playing and releasing the next higher note with the adjacent upper finger as rapidly as possible for the entire value of the printed note.

Pizzicato

This is a technique that is performed without the bow. The string is plucked. It can be done with a single string or multiple strings.

Viola

The viola is the alto instrument of the string section and it's playing technique is similar to that of the violin. The notation of the viola is usually notated with the Alto Clef. The viola's four strings are normally tuned in fifths: the lowest string is C^3 (an octave below middle C), with G^3 , D^4 , and A^4 above it. This tuning is exactly one fifth below the violin, so that they have three strings in common G, D, and A and is one octave above the cello.

Tuning: $C^3 G^3 D^4 A^4$ **Range:** C^3 to E^6

0	C ³	G ³	D ⁴	A ⁴
1	C# ³ /Db ³	G# ³ /Ab ³	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴
2	D^3	A ³	E ⁴	B ⁴
3	D# ³ /Eb ³	A# ³ /Bb ³	F ⁴	C⁵
4	E ³	B ³	F# ⁴ /Gb ⁴	C# ⁵ /Db ⁵
5	F^3	C ⁴	G⁴	D^{5}
6	F# ³ /Gb ³	C# ⁴ /Db ⁴	G# ⁴ /Ab ⁴	D# ⁵ /Eb ⁵
7	G ³	D^4	A ⁴	E ⁵
8	G# ³ /Ab ³	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F ⁵
9	A ³	E ⁴	B ⁴	F#⁵/Gb⁵
10	A# ³ /Bb ³	F ⁴	C ⁵	G⁵
11	B ³	F# ⁴ /Gb ⁴	C# ⁵ /Db ⁵	G# ⁵ /Ab ⁵
12	C ⁴	G⁴	D^{5}	A ⁵
13	C# ⁴ /Db ⁴	G# ⁴ /Ab ⁴	D# ⁵ /Eb ⁵	A#⁵/Bb⁵
14	D^4	A ⁴	E ⁵	B⁵
15	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F⁵	C ⁶

Articulations

Same as the violin.

Cello

The Cello is both the tenor and the bass of the string section. The cello or violoncello is a bowed (sometimes plucked and occasionally hit) string instrument of the violin family. Its four strings are usually tuned in perfect fifths: from low to high, C^2 , G^2 , D^3 and A^3 . The viola's four strings are each an octave higher. Music for the cello is generally written in the bass clef, with tenor clef and treble clef used for higher-range passages.

Tuning: $C^2 G^2 D^3 A^3$ **Range:** C^2 to C^6

0	C ²	G ²	D ³	A ³
1	C# ² /Db ²	G# ² /Ab ²	D# ³ /Eb ³	A# ³ /Bb ³
2	D^2	A ²	E ³	B ³
3	D# ² /Eb ²	A# ² /Bb ²	F^3	C ⁴
4	E ²	B ²	F# ³ /Gb ³	C# ⁴ /Db ⁴
5	F ²	C ³	G ³	D^4
6	F# ² /Gb ²	C# ³ /Db ³	G# ³ /Ab ³	D# ⁴ /Eb ⁴
7	G ²	D^3	A ³	E ⁴
8	G# ² /Ab ²	D# ³ /Eb ³	A# ³ /Bb ³	F ⁴
9	A ²	E ³	B ³	F#⁴/Gb⁴
10	A# ² /Bb ²	F^3	C ⁴	G⁴
11	B ²	F# ³ /Gb ³	C# ⁴ /Db ⁴	G# ⁴ /Ab ⁴
12	C ³	G ³	D^4	A ⁴
13	C# ³ /Db ³	G# ³ /Ab ³	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴
14	D^3	A^3	E ⁴	B ⁴
15	D# ³ /Eb ³	A# ³ /Bb ³	F ⁴	C ⁵

Articulations

Same as the violin.

Double Bass

The double bass, also known simply as the bass (or by other names), is the largest and lowest-pitched bowed (or plucked) string instrument in the modern symphony orchestra (excluding unorthodox additions such as the octobass). Similar in structure to the cello, it has four, although occasionally five, strings. The double bass is generally tuned in fourths, in contrast to other members of the orchestral string family, which are tuned in fifths. The standard tuning (lowest-pitched to highest-pitched) for bass is E^1 , A^1 , D^2 , G^2 , starting from E below second low C (concert pitch). This is the same as the standard tuning of a bass guitar and is one octave lower than the four lowest-pitched strings of standard guitar tuning. The double bass is notated an octave higher than it actually sounds.

 $C^1 E^1 A^1 D^2 G^2$

4 String Double Bass 5 String Double Bass

Tuning: $E^1 A^1 D^2 G^2$ **Range:** E^1 or C^1 to Bb^3

0	C ¹	E ¹	A ¹	D ²	G ³
1	C# ¹ /Db ¹	F ¹	A# ¹ /Bb ¹	D# ² /Eb ²	G# ² /Ab ²
2	D ¹	F# ¹ /Gb ¹	B ¹	E ²	A ²
3	D# ¹ /Eb ¹	G ¹	C ²	F ²	A# ² /Bb ²
4	E ¹	G# ¹ /Ab ¹	C# ² /Db ²	F# ² /Gb ²	B ²
5	F ¹	A ¹	D ²	G ²	C ³
6	F# ¹ /Gb ¹	A# ¹ /Bb ¹	D# ² /Eb ²	G# ² /Ab ²	C# ³ /Db ³
7	G ¹	B ¹	E ²	A ²	D ³
8	G# ¹ /Ab ¹	C ²	F ²	A# ² /Bb ²	D# ³ /Eb ³
9	A ¹	C# ² /Db ²	F#²/Gb²	B ²	E ³
10	A# ¹ /Bb ¹	D ²	G ²	C ³	F ³
11	B ¹	D# ² /Eb ²	G# ² /Ab ²	C# ³ /Db ³	F# ³ /Gb ³
12	C ²	E ²	A ²	D ³	G ³
13	C# ² /Db ²	F ²	A# ² /Bb ²	D# ³ /Eb ³	G# ³ /Ab ³
14	D^2	F# ² /Gb ²	B ²	E ³	A ³
15	D# ² /Eb ²	G ²	C ³	F ³	A# ³ /Bb ³

Plucked String Instruments

Harp

The pedal harp (also known as the concert harp) is a large and technologically modern harp, designed primarily for use in art music. It may be played solo, as part of a chamber ensemble, or in an orchestra. It typically has 47 strings with seven strings per octave, giving a range of six and a half octaves.

In this type of harp the pedals alter the pitch of the strings, so that the pedal harp can easily play works written in any key. This is particularly important in the harmonically complex music of the Romantic period and later 20th-century classical music.

Guitar

(See page 31)

Mandolin

A mandolin is a stringed musical instrument in the lute family and is generally plucked with a plectrum. It most commonly has four courses of doubled metal strings tuned in unison, thus giving a total of 8 strings, although five (10 strings) and six (12 strings) course versions also exist. The courses are typically tuned in an interval of perfect fifths, with the same tuning as a violin (G^3 , D^4 , A^4 , E^5). Also, like the violin, it is the soprano member of a family that includes the mandola, octave mandolin, mandocello and mandobass.

Tuning: $G^3 D^4 A^4 E^5$ **Range:** G^3 to E^6

0	G ³	D^4	A ⁴	E⁵
1	G# ³ /Ab ³	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F ⁵
2	A^3	E⁴	B ⁴	F#⁵/Gb⁵
3	A# ³ /Bb ³	F^4	C ⁵	G⁵
4	B^3	F# ⁴ /Gb ⁴	C# ⁵ /Db ⁵	G#⁵/Ab⁵
5	C^4	G ⁴	D^{5}	A ⁵
6	C# ⁴ /Db ⁴	G#⁴/Ab⁴	D# ⁵ /Eb ⁵	A# ⁵ /Bb ⁵
7	D^4	A ⁴	E ⁵	B⁵
8	D# ⁴ /Eb ⁴	A# ⁴ /Bb ⁴	F⁵	C ⁶
9	E ⁴	B⁴	F# ⁵ /Gb ⁵	C# ⁶ /Db ⁶
10	F ⁴	C⁵	G⁵	D^6
11	F# ⁴ /Gb ⁴	C# ⁵ /Db ⁵	G#⁵/Ab⁵	D# ⁶ /Eb ⁶
12	G ⁴	D^{5}	A ⁵	E ⁶

Banjo

The banjo is a stringed instrument with a thin membrane stretched over a frame or cavity to form a resonator. The membrane is typically circular, and usually made of plastic, or occasionally animal skin. The banjo is frequently associated with folk and country music, and has also been used in some rock and pop. Several rock bands, such as the Eagles, Led Zeppelin, and The Allman Brothers, have used the five-string banjo in some of their songs.

Five-String Banjo

The modern five-string banjo is a variation on Sweeney's original design. The fifth string is usually the same gauge as the first, but starts from the fifth fret, three-quarters the length of the other strings. This lets the string be tuned to a higher open pitch than possible for the full-length strings. Because of the short fifth string, the five-string banjo uses a reentrant tuning – the string pitches do not proceed lowest to highest across the fingerboard. Instead, the fourth string is lowest, then third, second, first, and the fifth string is highest.

The short fifth string presents special problems for a capo. For small changes (going up or down one or two semitones, for example), retuning the fifth string simply is possible. Otherwise, various devices called "fifth-string capos" effectively shorten the vibrating part of the string. Many banjo players use model-railroad spikes or titanium spikes (usually installed at the seventh fret and sometimes at others), under which they hook the string to press it down on the fret.

Tuning

Five-string banjo players use many tunings. Probably the most common, particularly in bluegrass, is the **Open-G** tuning $G^4 D^3 G^3 B^3 D^4$. In earlier times, the tuning $G^4 C^3 G^3 B^3 D^4$ was commonly used instead, and this is still the preferred tuning for some types of folk music and for classic banjo. Other tunings found in old-time music include **Double C** ($G^4 C^3 G^3 C^4 D^4$), "**Sawmill**" ($G^4 D^3 G^3 C^4 D^4$) also called "**Mountain Modal**" and **Open-D** ($F\#^4 D^3 F\#^3 A^3 D^4$). These tunings are often taken up a tone, either by tuning up or using a capo. For example, "**Double-D**" tuning ($A^4 D^3 A^3 D^4 E^4$) – commonly reached by tuning up from Double C – is often played to accompany fiddle tunes in the key of D, and **Open-A** ($A^4 E^3 A^3 C\#^4 E^4$) is usually used for playing tunes in the key of A. Dozens of other banjo tunings are used, mostly in old-time music. These tunings are used to make playing specific tunes easier, usually fiddle tunes or groups of fiddle tunes.

Four-String Banjo

The four-string plectrum banjo is a standard banjo without the short drone string. It usually has 22 frets on the neck and a scale length of 26 to 28 inches, and was originally tuned $C^3 G^3 B^3 D^4$. It can also be tuned

like the top four strings of a guitar, which is known as "**Chicago Tuning**". As the name suggests, it is usually played with a guitar-style pick (that is, a single one held between thumb and forefinger), unlike the five-string banjo, which is either played with a thumbpick and two fingerpicks, or with bare fingers. The plectrum banjo evolved out of the five-string banjo, to cater to styles of music involving strummed chords. The plectrum is also featured in many early jazz recordings and arrangements.

Other Types of Banjos

There are also 6 and 7 stringed banjos.

Zither

Zither, from the Greek word cithara, is a class of stringed instruments. Historically, the name has been applied to any instrument of the psaltery family, or to an instrument consisting of many strings stretched across a thin, flat body. This article describes the latter variety.

Zithers are played by strumming or plucking the strings, either with the fingers or a plectrum, sounding the strings with a bow, or, with varieties of the instrument like the santur or cimbalom, by beating the strings with specially shaped hammers. Like an acoustic guitar or lute, a zither's body serves as a resonating chamber (sound box), but, unlike guitars and lutes, a zither lacks a distinctly separate neck assembly. The number of strings varies, from one to more than fifty.

In modern common usage the term "zither" refers to three specific instruments: the **Concert Zither**, its variant the **Alpine Zither** (both using a fretted fingerboard), and the **Chord Zither** (more recently described as a fretless zither or "guitar zither"). Concert and Alpine zithers are traditionally found in Slovenia, Austria, Hungary, France, north-western Croatia, the southern regions of Germany, Alpine Europe, Poland, the Czech Republic, Slovakia, Russia, Ukraine and Belarus. Emigration from these areas during the 19th century introduced the concert and Alpine zither to North and South America. Chord zithers similar to the instrument in the photograph also became popular in North America during the late 19th and early 20th centuries. These variants all use metal strings, similar to the cittern.

Woodwinds

Principals of Transposition

Something to note about woodwinds that is also common in some brass instruments. A transposing instrument produces pitches that sound different from what is notated in the score. It is up to the composer or orchestrator to transpose the part so that the player can simply read it off the page, fingering it naturally on the instrument but producing the pitches that the music demands. It is therefore important to distinguish between written pitch, the note one sees on a page, and the sounding or concert pitch, the resulting pitch emanating from a transposing instrument. The key in which the entire orchestra is playing is called the concert key. The reason this is done is to make it easier for the musician to switch between instruments without having to memorize what concert pitch each instruments sounds. The score may have different key signatures for each different transposing instrument to make them sound in tune with the rest of the orchestra.

In order for the following instruments to sound in the key of C Major, the key signature:

For an instrument in Bb must be D Major. For an instrument in A must be Eb Major. For an instrument in Eb must be A Major. For an instrument in D must be Eb Major. For an instrument in F must be G Major.

Common Woodwind Articulations

Vibrato

The tone of woodwinds like that of strings is enriched by the use of vibrato. On wind instruments, vibrato is produced by starting a rapid pulsation of the air column in one of four different ways.

- 1. By movement of the lips and jaw (normal for Clarinet and saxophone, seldom for oboe and bassoon)
- 2. By movement of the throat muscles (sometimes for flute)
- 3. By movement of the abdominal muscles (normal for oboe and bassoon)
- 4. By a combination of movements of the throat and abdominal muscles (normal for flute)

Tonguing and Phrasing

A tone on a woodwind instrument is initiated when the tongue touches the roof of the mouth and immediately pulls back, as if one were saying the syllable "tuh". The tone is stopped either by returning the tongue to it's original position, or by cutting off the supply of breath. Where no slurs are present, each

note is tongued or articulated separately. When slurs are present the player performs all of the pitches within the slur in one breath. This in one breath articulation is called legato playing. Note that a wind player can play more notes legato (in one breath) notes, than a string player can play in one bow, due to the limitations of the bow length.

Staccato

When a dot is placed above or below a notehead, the player will articulate a very short, staccato note, with natural separation between notes.

Soft Tonguing

In some instances, slurs are placed over repeated notes that have dots or dashes, calling for "soft tonguing". With dots over the notes under the slur, the articulation is slightly "harder" than when dashes separate the notes. The effect is similar to staccato and loure on strings, played on one bow stroke. Such slurred notes are performed in one breath.

Double and Triple Tonguing

In very fast passages, the player will double tongue or, especially in fast triplet passages, triple tongue. The syllables that are used to articulate double and triple tonguing are "te" and "ke" in various combinations.

Dynamic Envelopes

The usual way of releasing a tone on a woodwind instrument is to return the tongue to it's original position. There is also a way of using the tongue to create a special effect that, although not exclusive to the woodwinds, is one at which they excel. It consists of creating a strong attack, then immediately decreases volume, and in some cases, increasing again.

Flutter Tongue

This special effect is not unlike the unmeasured tremolo for strings in notation and purpose. Of course the sound is different, more like a whir. Flutter tonguing can be produced either by a rapid roll or fluttering of the tongue, or by a prolonged guttural "r" rolled in the throat. It is relatively easy to execute on all flutes, Clarinets and saxophones, but more difficult on oboes and bassoons, even though it is used in 20th and 21st century literature quite often. Flutter tonguing may be required on long notes, or an entire passage (fast or slow) may be played with flutter tonguing. The parts must be marked like an unmeasured string tremolo, with three slashes through the stems or above whole notes, or with the words "flutter tongue" (abbr: flt) written in the score above the passage.

Muting

None of the woodwind instruments have mutes, yet composers have asked for muted sounds. Wind players usually accommodate by lightly stuffing a cloth or handkerchief into the opening of the instrument, or by covering the open end of the bell with their hands. Obviously this is not possible to do on the flute.

Glissandi

Glissandi are most successful on the Clarinet and saxophone, but only in an upward direction; the downward glissando is effective only between neighboring pitches. Flutes, oboes, and bassoons, as well as Clarinets, can depress a pitch or raise it slightly by changing the embouchure; this sounds like a slight glissando, but should not be used between pitches greater than a 2nd.

Slap Tonguing

Slap tonguing, a special effect taken from jazz, produces a perky, snappy, over articulated attack. It is especially effective on single reed instruments: the player creates suction against the reed, suddenly releasing it to make a popping sound, which is amplified as it travels through the instrument. Flutists can approximate that sound by "popping" the tongue against the air hole. Oboes and bassoons are seldom if ever asked to use this type of tonguing.

Classification by family:

The Flute Family:

Piccolo, Flute, Alto Flute, Bass Flute

The Oboe Family:

Oboe, Oboe d'Amore, Bass Oboe, English Horn, Hecklephone, Bassoon, Contrabassoon

The Clarinet Family:

C Clarinet, D Clarinet, Eb Clarinet, Bb Clarinet, A Clarinet, Eb Alto Clarinet, Basset Horn, Bb Bass Clarinet, Bb Contrabass Clarinet

The Saxophone Family:

B*b* Soprano Saxophone, E*b* Alto Saxophone, B*b* Tenor Saxophone, E*b* Baritone Saxophone, B*b* Bass Saxophone

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The Flute Family

The flute is the only non-reed instrument in the woodwind choir, and though all the other woodwind instruments exhibit great agility and sensitivity, none can equal the flute in these attributes.

Range Of The Flute

Most professional flutes made in America have a B foot, meaning that they are able to play low B^3 . In the upper register, the modern flute goes beyond high C^7 to $C\#^7$ and D^7 . All pitches are more difficult to produce above A^6 .

Description Of Flute Ranges

 B^3 to G^4 – Weak, but luscious. A⁴ to G^5 – Sweet, but with little carrying power. A⁵ to G^6 – Clear and brilliant. A⁶ to D⁷ – A bit shrill.

Piccolo

This instrument in the flute family is used to produce pitches in the higher register. It's range is from D^4 to C^7

Description Of Piccolo Ranges

 D^4 to G^4 – Quiet, hauntingly hollow sound. A^4 to G^5 – Soft and mellow. A^5 to F^6 – Bright and clear. G^6 to C^7 – Shrill.

Alto Flute

The Alto Flute, the first extension of the flute family downward, came into prominence in the last decade of the 19th century and was made popular by the scores of Stravinsky and Ravel in particular. The Alto Flute is a transposing instrument; it's mechanism and fingering are the same as on the C Flute, but the Alto Flute is in G and therefore sounds a perfect 4th lower than written.

Description Of Alto Flute Ranges

 C^4 to C^5 – Deep, rich and sonorous.

- C^5 to C^6 Full and quite effective.
- D^6 to C^7 Ordinary without the brilliance of the flute.

Bass Flute

the Bass Flute doesn't look anything like it's counterparts. Because of the physics involved in creating a flute that can produce pitches in the lower register, it had to be created with a bend that curves 180 degrees below the head joint, so that the main tube crosses the right side of the player's body. An adjustable bracket allows the player to balance the instrument on the right thigh when sitting down. This transposing instrument sounds an octave lower than written.

Bass Flute Range

 C^3 to C^6 .

The Oboe Family

This family of woodwinds consists of the Oboe, Oboe d'Amore, English Horn, Bass Oboe and the Heckelphone.

Oboe

The Oboe, basically a lyrical instrument, has possibly the most individual personality of all the woodwinds. Many people have described the double reed instrument as the prima donna of the woodwind choir. This is not due to its position in the section, but rather because it's such a temperamental instrument to play. Professional oboists develop an extraordinary ability to sustain notes for a long time or to play quite lengthy passages in one breath.

Range of the Oboe: F^6 to A^7

Description Of Oboe Ranges

 Bb^{3} to F^{4} – Thick and heavy. G^{4} to A^{5} – Warm, prominent, reedy, and poignant. B^{5} to E^{6} – Thin, but clear. F^{6} to A^{7} – Pinched and ineffective.

Oboe d'Amore

The Oboe d'Amore is the mezzo-soprano instrument of the Oboe family. This instrument was very popular during the Baroque period, but since a larger sound was needed for the larger orchestras and halls, it fell out of favor and was supplanted by both the Oboe and English Horn. The Oboe d'Amore is a transposing instrument, sounding a minor third lower than written. The sound of the Oboe d'Amore is much gentler than that of an Oboe, but since it has a bulblike bell like the English Horn, its lower notes are full, dark, and beautiful. The upper register is quite thin and almost useless. It's range is $G\#^3 - C\#^6$

English Horn

There are no standard instruments in the Oboe family that extend the range upward, but there are at least three that extend the range downward. The English Horn, the Alto instrument in the Oboe family, is the most popular and works on the same principal as the Oboe. It is an instrument with a conical tube and a double reed, with both the tube and the reed slightly longer than those of the Oboe. Added to the flared part of the oboe tube is a bulb shaped bell (d'Amore Bell), which gives the English Horn a more sonorous, melancholy sound.

Range of the English Horn: E^3 to C^6

Description Of English Horn Ranges

 E^3 to C^4 – Deep, rich and intense. D^4 to D^5 – Mellow, reedy and sonorous. E^5 to C^6 – Thin, pinched.

Baritone or Bass Oboe & Heckelphone

The Baritone Oboe, sometimes called the Bass Oboe, has the same range and transposition as the Heckelphone and a very similar sound; the difference is in appearance. The Heckelphone was made by a bassoon maker, hence the instrument resembles a bassoon, whereas the Baritone Oboe was manufactured by an Oboe maker and looks very much like an oversized English Horn, since it has a d'amore bell. The Heckelphone is named after it's inventor, Wilhelm Heckel, an instrument maker in Germany. It sounds an octave lower than the regular Oboe.

Range of the Bass Oboe and Heckelphone: C^1 to E^5

The Clarinet Family

This family of woodwinds consists of the E*b* Clarinet, B*b* Clarinet, A Clarinet, E*b* Alto Clarinet, Basset Horn, B*b* Bass Clarinet and B*b* Contrabass Clarinet.

The Clarinet consists of a cylindrical tube with an added bell, which flares slightly more than an Oboe. The mouthpiece with a single reed is the uppermost joint of the five sections that make up the instrument. This mouthpiece is sometimes referred to as the "beak". Since all Clarinets have the same fingering system, clarinetists are able to play all instruments in the family, regardless of their size or transposition. The modern Clarinet's size dictates its particular tuning.

Range and Registral Characteristics

All Clarinets have the same written range from E^3 to A^6 . The concert pitch depends upon the particular instrument used. For example the concert pitch range of a Bb Clarinet is D^3 to G^6 . The concert pitch range of an A Clarinet is $C\#^3$ to $F\#^6$.

The Piccolo Clarinet: Clarinet in D or Eb

The two small Clarinets that extend the range of the Clarinet family upward stand in the same pitch relationship to each other as the Bb and A instruments and were created for similar considerations of key. However, the Clarinet in D is seldom used today, and therefore we recommend that all piccolo Clarinet parts be written for the Eb Clarinet. The D and Eb Clarinets have the same mechanical and fingering systems, a factor that facilitates playing parts originally written for the D Clarinet on the Eb Clarinet; the player simply transposes all pitches down a half step.

Concert Pitch Range of the D Clarinet: $F#^3$ to B^5 Concert Pitch Range of the Eb Clarinet: G^3 to C^6

Bass Clarinet

The bass Clarinet is most commonly a Bb instrument, although composers in the past have asked for a bass Clarinet in A. For a long time E3 was the lowest note on the Bb bass Clarinet, but composers had long desired to expand its range downward, and finally an Eb was added to the instrument. Today one can reasonably expect every Bass Clarinet to have a low Eb.

Concert Pitch Range of the Bass Clarinet: C² to D⁵

Alto Clarinet in Eb

The alto Clarinet in Eb is seldom used in orchestra, but it has become a more or less regular member of the standard band and wind ensemble. It has the same fingering and mechanical system as the Bb and A Clarinets, but only the lowest two octaves of its range speak effectively.

Concert Pitch Range of the Alto Eb Clarinet: G² to G⁵

Basset Horn (in F)

The Basset Horn is sometimes described as the orchestral tenor Clarinet. Like the English Horn, it always transposes a perfect fifth down; it also is certainly not a horn, but is so called probably because of its sickle shape. The term basset may be interpreted as a diminutive form of bass.

Written Pitch Range of the Basset Horn: C^3 to G^6 Concert Pitch Range of the Basset Horn: F^2 to C^6

Contrabass Clarinet

This Clarinet, in Bb or Eb, has a range an octave lower than that of the Bass Clarinet. In contrast to the majority of Clarinets, which are made of wood (except for the Bass Clarinet and Alto Clarinet bells), the Contrabass Clarinet is made of metal and is folded in on itself, thereby looking like a diminutive contrabassoon.

Written Pitch Range of the Bb Contrabass Clarinet: D^3 to D^6 Concert Pitch Range of the Bb Contrabass Clarinet: C^2 to C^4 Written Pitch Range of the Eb Contrabass Clarinet: Eb^3 to D^6 Concert Pitch Range of the Eb Contrabass Clarinet: Gb^1 to F^4

The Saxophone Family

This family of woodwinds consists of the B*b* Soprano Saxophone, E*b* Alto Saxophone, B*b* Tenor Saxophone, E*b* Baritone Saxophone and the B*b* Bass Saxophone Though it is made of brass and having a conical pipe, the saxophones are included in the woodwinds family for several reasons.

- 1. Their tone is closer to the Clarinet family than any other.
- 2. They are played with a mouthpiece and a single reed very much like that of a clarinet.
- 3. Most clarinetists double on saxophones because the fingering and all other playing techniques are very similar to those of a clarinet.

The Saxophone was invented by Adolphe Sax in Paris around 1840. Today there are a great variety of saxophones, used extensively and in multiple numbers in band and jazz band literature, but in a limited way in standard orchestral repertoire. The saxophone family has never been fully accepted into the symphony orchestra. The sound of all saxes is quite distinctive, and tends to overpower other instruments of the symphony orchestra. In modern times, the saxophone has been used extensively in Jazz and in early rock and roll bands.

	Saxophone	Key		Sounds octave lower	Sounds octave higher
				than	than
1	Sopranissimo	Bb			Soprano
2	Sopranino	Eb	Minor 3 rd up		Alto
3	Soprano	Bb	Major 2 nd down	Sopranissimo	Tenor
4	Alto	Eb	Major 6 th down	Sopranino	Baritone
5	Tenor	Bb	Major 9 th down	Soprano	Bass
6	Baritone	Eb	Major 13 th down	Alto	Contrabass
7	Bass	Bb	2 octaves + major	Tenor	Subcontrabass
			2 nd down		
8	Contrabass	Eb		Baritone	
9	Subcontrabass	Bb		Bass	

Sopranissimo Saxophone

The sopranissimo saxophone (also known as the piccolo or soprillo saxophone) is the smallest member of the saxophone family. It is pitched in Bb, one octave above the soprano saxophone. The keywork only extends to a written Eb6 (sounding Db7), rather than F, F♯, or sometimes G, like most saxophones, and the upper octave key has to be placed on the mouthpiece. The extremely small mouthpiece requires a small and focused embouchure, making the soprillo difficult to play, particularly in its upper register. There is very little market demand for soprillos, reducing the economy of scale and making the soprillo more expensive than more common saxophones like the alto or tenor.

Playing range: Bb³ to Eb⁶

Sopranino Saxophone

The sopranino saxophone is one of the smallest members of the saxophone family. It is tuned in the key of Eb, and sounds an octave higher than the alto saxophone. The sopranino saxophone has a sweet sound and although it is one of the least common of the saxophones in regular use today. Due to their small size, sopraninos are not usually curved like other saxophones.

Playing range: Bb³ to F⁶

Soprano Saxophone

The soprano saxophone is a higher-register variety of the saxophone, a woodwind instrument invented in the 1840s. The soprano is the third-smallest member of the saxophone family, which consists (from

smallest to largest) of the soprillo, sopranino, soprano, alto, tenor, baritone, bass, contrabass saxophone and tuba. Soprano saxophones are the smallest and thus highest-pitched saxophone in common use. A transposing instrument pitched in the key of Bb, modern soprano saxophones with a high F# key have a range from concert Ab³ to E⁶ (written low Bb to high F#) and are therefore pitched one octave above the tenor saxophone.

Playing range: Ab³ to Eb⁶

Alto Saxophone

The alto saxophone, also referred to as the alto sax, is a member of the saxophone family of woodwind instruments. It is pitched in Eb, smaller than the tenor but larger than the soprano. It is the most common saxophone and is commonly used in popular music, concert bands, chamber music, solo repertoire, military bands, marching bands, and jazz (such as big bands, jazz combos, swing music).

In Eb: sounds a major sixth lower than written. Most modern alto saxophones can reach a high F# (or higher using altissimo fingerings).

Tenor Saxophone

The tenor saxophone is a medium-sized member of the saxophone family, a group of instruments invented by Adolphe Sax in the 1840s. The tenor and the alto are the two most commonly used saxophones. The tenor is pitched in the key of Bb (while the alto is pitched in the key of Eb), and written as a transposing instrument in the treble clef, sounding an octave and a major second lower than the written pitch. Modern tenor saxophones which have a high F
key have a range from Ab² to E⁵ (concert) and are therefore pitched one octave below the soprano saxophone. People who play the tenor saxophone are known as "tenor saxophonists", "tenor sax players", or "saxophonists".

The tenor saxophone uses a larger mouthpiece, reed and ligature than the alto and soprano saxophones. Visually, it is easily distinguished by the curve in its neck, or its crook, near the mouthpiece. The alto saxophone lacks this and its neck goes straight to the mouthpiece. The tenor saxophone is most recognized for its ability to blend well with the soprano, alto and baritone saxophones, with its "husky" yet "bright" tone.

Playing range: Ab² to Eb⁵

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Baritone Saxophone

The baritone saxophone is a member of the saxophone family of instruments, larger (and lower-pitched) than the tenor saxophone, but smaller (and higher-pitched) than the bass. It is the lowest-pitched saxophone in common use - the bass, contrabass and subcontrabass saxophones are relatively uncommon. Like all saxophones, it is a single-reed instrument. It is commonly used in concert bands, chamber music, military bands, big bands, and jazz combos. It can also be found in other ensembles such as rock bands and marching bands. Modern baritone saxophones are pitched in Eb.

In Eb: sounds one octave and a major sixth lower than written. (range is concert Db to Ab). Many models have a key for a (written) low A and/or a key for high $F\sharp$. With practice, there is an altissimo range on the saxophone leading up to D^8 .

Bass Saxophone

The bass saxophone is one of the largest members of the saxophone family, larger than the more commonly encountered baritone saxophone. The modern bass saxophone is a transposing instrument pitched in Bb, an octave below the tenor saxophone. The bass saxophone is not a commonly used instrument, but it is heard on some 1920s jazz recordings; in free jazz; in saxophone choirs; and occasionally in concert bands.

Although bass saxophones in C were made for orchestral use, modern instruments are in Bb. This puts them a perfect fourth below the baritone and an octave lower than the tenor. Music is written in treble clef, just as for the other saxophones, with the pitches sounding two octaves and a major second lower than written. As with most other members of the saxophone family, the lowest written note is the Bb below the staff - sounding as a concert Ab in the first octave (~ 51.9 Hz). German wind instrument maker Benedikt Eppelsheim has made bass saxophones to low A, similarly to the extension in the baritone saxophone. This sounds as a concert G in the first octave (~ 49 Hz).

Until the start of the 21st century, the largest existing member of the saxophone family was the rare contrabass, pitched in Eb, a perfect fifth lower than the bass. Inventor Adolphe Sax had a patent for a subcontrabass saxophone (or bourdon saxophone), but apparently never built a fully functioning instrument. In 1999, Benedikt Eppelsheim introduced the subcontrabass tubax, a modified saxophone pitched in Bb an octave below the bass saxophone.

In Bb: sounds two octaves and a major second lower than written

Contrabass Saxophone

The contrabass saxophone is the second-lowest-pitched extant member of the saxophone family proper. It is extremely large (twice the length of tubing of the baritone saxophone, with a bore twice as wide, standing 1.9 meters tall, or 6 feet 4 inches) and heavy (approximately 20 kilograms, or 45 pounds), and is pitched in the key of Eb, one octave below the baritone saxophone.

The contrabass saxophone was part of the original saxophone family as conceived by Adolphe Sax, and is included in his saxophone patent of 1846, as well as in Kastner's concurrently published Method for saxophone. By 1849, Sax was displaying contrabass through sopranino saxophones at exhibitions.

In Eb: sounds two octaves and a major sixth lower than written

The Bassoon Family

The Bassoon and Contrabassoon are double reed instruments and are the main bass voices of the wind section.

Bassoon

The Bassoon, a double reed instrument with a conical bore, is the main bass voice of the wind section. The reed is fitted onto a curved metal mouthpiece called the "crook" or "bocal". The pitch can be adjusted by pulling this mouthpiece out slightly, thus lengthening it, or pushing it in a bit to shorten it. Although the Bassoon, by virtue of it's double reed and conical shape, is related to the Oboe, its tone is less nasal. Like the Oboe, the Bassoon performs lyric melodies beautifully and produces attacks and staccato passages incisively.

Contrabassoon

The Contrabassoon, the lowest of the woodwinds, widens the Bassoon's range by an octave. It sounds an octave lower than notated.

Brass

The brass section in a band has great dynamic power. The brass section of the modern orchestra is usually made up of four horns, three trumpets, three trombones and a tuba. The brass choir, which is more homogeneous than the woodwinds section, is often divided into two groups:

- 1. The Horns
- 2. The Trumpets, Trombones and Tubas.

The division reflects the different use the horns have from other brass instruments; in addition to being part of the brass choir they have been employed as adjuncts to the woodwind section because of their unique ability to blend with and strengthen the woodwind sound.

We can also classify brass instruments in terms of transposition

- 1. Transposing Horns, Trumpets, and Cornets.
- 2. Non-transposing Trombones, All Tubas, and Euphoniums.

Brass Instruments and the Written Orchestral Score

The arrangement of the brass choir on the orchestral page has some historic peculiarities. The brass instruments are placed right below the woodwinds on the score page in the following order:

- 1. Four Horns
- 2. Three Trumpets
- 3. Three Trombones
- 4. Tuba

Overblowing and the Principle of the Harmonic Series

Up to the mid 19th century, trumpets and horns were not equipped with valves or pistons to play a variety of pitches as they are today. Instead, the performer executed different pitches on these "natural" instruments by overblowing the fundamental tone of that instrument, which produced upper partials of the fundamental's overtone series. Each natural brass instrument consisted of a hollow tube governed by a single fundamental pitch; the longer the tube, the lower the fundamental pitch of that brass instrument. By blowing comfortably through the tube (with an appropriate mouthpiece), the player produced the fundamental pitch of that instrument; by overblowing the instrument, the player produced the fundamental's overtones. An eight foot long tube, theoretically capable of sounding C2 as its fundamental, produces the following series of tones:

Harmonic Series on C²

 $C^{2},\,C^{3},\,G^{3},\,C^{4},\,E^{4},\,G^{4},\,Bb^{4},\,C^{5},\,D^{5},\,E^{5},\,F\#^{5},\,G^{5},\,A^{5},\,Bb^{5},\,B^{5},\,C^{6},\,C\#^{6},\,D^{6},\,Eb^{6},\,E^{6},\,F^{6}$

The skilled player of a natural brass instrument can isolate each of these pitches, or partials, by embouchure manipulation and breath control. The player must have a mental concept of what the pitch sounds like as well as how it feels in order to execute that pitch clearly.

You'll note that in the harmonic series, there are many missing notes from the chromatic scale. This is a limitation of the natural brass instrument. Another limitation is the amount a person can overblow. Although theoretically pitches up to the 21st partial in the harmonic series are possible, most player can't play more than the 16th partial.

Harmonic Series on C ²	Notes Not In Series Chromatically
C ² ,	$C\#^2$, D^2 , $D\#^2$, E^2 , F^2 , $F\#^2$, G^2 , $G\#^2$, A^2 , $A\#^2$, B^2
C ³ ,	C# ³ , D ³ , D# ³ , E ³ , F ³ , F# ³
G ³ ,	G# ³ , A ³ , A# ³ , B ³
C ⁴ ,	C# ⁴ , D ⁴ , D# ⁴
E ⁴ ,	F ⁴ , F# ⁴
G ⁴ ,	G# ⁴ , A ⁴
Bb ⁴ ,	B ⁴
C ⁵ ,	C# ⁵
D ⁵ ,	D# ⁵
E ⁵ ,	F⁵
F# ⁵ ,	
G ⁵ ,	G# ⁵
A ⁵ ,	
Bb⁵,	
B ⁵ ,	
C ⁶ ,	
C# ⁶ ,	
D ⁶ ,	
Eb ⁶ ,	
E ⁶ ,	
F ⁶	
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Crooks, Valves, and Slides

By the time of Haydn, a mechanism had been invented that allowed trumpets and horns to play notes outside a single harmonic series. We know that the pitch of the fundamental depends upon the length of tube; it was found that by adding extra tubing, a player could produce another harmonic series on the same instrument. This added pipe, called a "crook", was U-shaped and inserted at certain points along the length of the original tube. This allowed a musician to play the fundamental harmonic series for both the original tube as well as the series for the crook.

During the 18th century, both trumpets and horns remained transposing instruments, since it was much easier for the performer to read music is C and let the particular transposition of the instrument (and crook used) take care of transposing the passage to the required key.

The next important improvement, early in the 19th century, was the invention of valves (both rotary and piston), although it was not until the middle of that century that the system of valves was refined enough to gain acceptance by performers.

The valve system functions in this manner: three coiled tubes are permanently attached to the main tube inside the main loop. Each of the attached coils can be activated, or joined, to the main stream of air by a valve easily operable by the performer's left hand on French Horn and right hand on Trumpet and Tuba. Pressing the piston or lever opens up the extra tubing and thereby accomplishes instantly what the changing of crooks did previously. There are four valves on the Horn and three valves on the Trumpet.

The Use of the Slide on Trombones

The 15th century Trombone closely resembles its modern counterpart in the manner in which it is constructed and played. Both instruments are made of two U-shaped pieces of tubing, one of which slides into the other. The player changes pitches by sliding the two pieces together of apart. This slide mechanism enables the trombonist to change the total length of the tube with precision and perfect intonation, and play a full chromatic scale. The notes of the overtone series are still controlled by means of embouchure manipulation.

The Tenor Trombone has 7 positions of the slide, each of which produces its own fundamental pitch

Position	1	2	3	4	5	6	7
Fundamentals	Bb	A	Ab	G	Gb	F	Е

Trumpet/Horn Valves Depressed	Trombone Slide Position	Interval By Which Pitch Is Lowered
None	First	None
No. 2	Second	Half Step
No. 1	Third	Whole Step
No. 3 or Nos. 1 & 2	Fourth	Minor Third
Nos. 2 & 3	Fifth	Major Third
Nos. 1 & 3	Sixth	Perfect Fourth
Nos. 1, 2 & 3	Seventh	Augmented Fourth

Comparing Trumpet and Horn Valves with Trombone Positions

Tone Production, Articulation and Tonguing

Tonguing on a brass instrument is similar to tonguing on woodwind instruments. Like woodwind players, brass players can articulate with single, double and triple tonguing. A great variety of attacks are available on all brass instruments, although the particular constraints of each brass instrument make certain attacks and articulations problematic, especially on extremely low notes that require a loose embouchure. Conversely, in extremely high register, soft attacks and controlled articulations are quite difficult to execute because of the required firmness of lips and velocity of breath required to produce these effects.

Breathing and Phrasing

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Brass instruments require a great deal more breath than woodwinds do. Because playing these instruments is rather taxing, the composer or orchestrator should allow frequent intervals of rest so that the players can catch their breath and their lips can recuperate.

Phrasing is similar to woodwinds. All slurred phrases are performed in one breath, tonguing only the first note. If a passage is not slurred in the score it will be tongued by the player, each note articulated separately. In a loud passage in a slow tempo, you should not phrase too many notes in one breath, since it takes more breath to play loudly than softly.

Common Characteristics and Effects on all Brass Instruments

Attacks and Tonguing - Sforzando and the Forte-Piano Attack

Brass instruments can execute sforzando attacks better than winds or strings.

Light, Soft and Single Tonguing

This effect can be accomplished so it sounds very delicate and not brassy.

Double Tonguing

Double tonguing is executed using syllables "tuh-kuh" or "tuh-keh"

Triple Tonguing

Triple tonguing is executed using the syllables "tuh-kuh-tuh" or "tuh-tuh-kuh

Flutter Tonguing

Flutter tonguing is very effective and easy to produce on all brass instruments.

Glissandi

Horn and Trumpet players can produce a glissando by using a "lip slur". With normal lip pressure, this lip glissando will result in a high-speed rendering of that portion of the harmonic series that falls between the beginning and ending pitches played.

Trills and Tremolos

Most brass instruments can perform some tremolos successfully; all are able to play trills.

Mutes

All brass instruments can be muted. Muting can be a pianissimo that is incredibly soft; however, mutes do not simply make the instrument softer, they also changes the character or color of the sound.

Types of Mutes

Straight Mute, Cup Mute, Harmon or Wah-Wah Mute, Whispa Mute, Solotone Mute

Other Muting devices and Methods

Plunger Hat or Derby Putting the Hand of the Bell or in the Bell Playing Into The Stand 105

Horn or French Horn

It is a mystery why the term French Horn has persisted for this instrument in England and America, since most of the developments concerning its construction occurred in Germany. The unique status of the horn is apparent in its many different functions within ensembles. In chamber music composers have treated the horn sometimes as a woodwind instrument other times as a brass instrument.

Types of Horns

There are two distinct types of Horns

- 1. The Natural Horn sometimes called the Hand Horn.
- 2. The Valve Horn which is used in most orchestras today.

Transposition

It was the practice to use various crooks to change the fundamental and, with it, the entire harmonic series. Each crook produced a horn in a different transposition. These crooks were fitted to the ends of the tube near the horn's mouthpiece, or in later years, were slid into the tubing where the turning slide was usually placed. The following crooks were most popular during the 18th century and in the early part of the 19th century:

Horn In	Sounding Transposition
C Alto	Sounds as written.
Bb Alto	A major 2 nd lower than notated.
А	A minor 3 rd lower than notated
Ab	A major 3 rd lower than notated
G	A perfect 4 th lower than notated
F	A perfect 5 th lower than notated
Е	A minor 6 th lower than notated
Eb	A major 6 th lower than notated
D	A minor 7 th lower than notated
C Basso	An octave lower than notated
Bb Basso	A major 9 th lower than notated
A Basso	An octave and a minor 3 rd lower than notated

The Valve Horn

For a time both types of horns were used. Now the valve horn is the standard that is used.

The Trumpet Family

The trumpet is a brass instrument commonly used in classical and jazz ensembles. The trumpet group ranges from the piccolo trumpet with the highest register in the brass family, to the bass trumpet, which is pitched one octave below the standard Bb or C Trumpet. The Trumpet, the soprano member of the brass family, is the most agile of the brass instruments. It is often called upon to perform not only very high passages, both loudly and softly, but also passages that exploit its entire range at various dynamic levels. Trumpets are used in art music styles, for instance in orchestras, concert bands, and jazz ensembles, as well as in popular music. They are played by blowing air through nearly-closed lips (called the player's embouchure), producing a "buzzing" sound that starts a standing wave vibration in the air column inside the instrument.

There are many distinct types of trumpet, with the most common being pitched in Bb (a transposing instrument).

Piccolo Trumpet

The smallest of the trumpet family is the piccolo trumpet, pitched one octave higher than the standard Bb trumpet. Most piccolo trumpets are built to play in either Bb or A, using a separate leadpipe for each key. The tubing in the Bb piccolo trumpet is one-half the length of that in a standard Bb trumpet. Piccolo trumpets in G, F, and even high C are also manufactured, but are rarer.[citation needed]

The piccolo trumpet should not be confused with the pocket trumpet, which plays in the same pitch as the regular Bb trumpet. The piccolo trumpet in Bb is a transposing instrument, which sounds a minor seventh higher than written. It is, however, rarely written for specifically; it is often just used at the player's discretion to cover high material as appropriate.

The soprano trumpet in D, also known as the Bach trumpet, was invented in about 1890 by the Belgian instrument maker Victor Mahillon to play the high trumpet parts in music by Bach and Handel.

The sound production technique is basically the same as that used on the larger Bb trumpet. Air pressure and tonguing are different, and players use a shallower mouthpiece for the piccolo trumpet. Almost all piccolo trumpets have four valves instead of three — the fourth valve usually lowers the pitch by a fourth. This extends the low range and provides alternate fingerings and improved intonation for some notes.

The piccolo trumpet solo in the Beatles' "**Penny Lane**", which introduced the instrument to pop music, was played by David Mason. Paul McCartney was dissatisfied with the initial attempts at the song's instrumental fill (one of which is released on Anthology 2), and was inspired to use the instrument after hearing Mason's performance in a BBC radio broadcast of the second Brandenburg Concerto and asking George Martin what the "tremendously high" trumpet was. Eventually Mason recorded the solo using a

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piccolo trumpet in A. The piccolo trumpet was also used to quote Bach's Invention no. 8 in F major (BWV 779) during the fade-out of "All You Need Is Love".

Use of the instrument is now commonplace in many musical genres.

Trumpets

The most common type is the Bb trumpet, but A, C, D, Eb, E, low F, and G trumpets are also available. The C trumpet is most common in American orchestral playing, where it is used alongside the Bb trumpet. Orchestral trumpet players are adept at transposing music at sight, frequently playing music written for the A, Bb, D, Eb, E, or F trumpet on the C trumpet or Bb trumpet.

Extended Technique

Contemporary music for the trumpet makes wide uses of extended trumpet techniques.

Flutter Tonguing: The trumpeter rolls the tip of the tongue (as if rolling an "R" in Spanish) to produce a 'growling like' tone. This technique is widely employed by composers like Berio and Stockhausen.

Growling: Simultaneously playing tone and using the back of the tongue to vibrate the uvula, creating a distinct sound. Most trumpet players will use a plunger with this technique to achieve a particular sound heard in a lot of Chicago Jazz of the 1950s.

Double Tonguing: The player articulates using the syllables ta-ka ta-ka ta-ka.

Triple Tonguing: The same as double tonguing, but with the syllables ta-ta-ka ta-ta-ka ta-ta-ka or ta-ka-ta ta ta-ka-ta.

Doodle Tongue: The trumpeter tongues as if saying the word doodle. This is a very faint tonguing similar in sound to a valve tremolo.

Glissando: Trumpeters can slide between notes by depressing the valves halfway and changing the lip tension. Modern repertoire makes extensive use of this technique.

Vibrato: It is often regulated in contemporary repertoire through specific notation. Composers can call for everything from fast, slow or no vibrato to actual rhythmic patterns played with vibrato.

Pedal Tone: Composers have written notes as low as two-and-a-half octaves below the low F♯ at the bottom of the standard range. Extreme low pedals are produced by slipping the lower lip out of the

mouthpiece. Claude Gordon assigned pedals as part of his trumpet practice routines, that were a systematic expansion on his lessons with Herbert L. Clarke. The technique was pioneered by Bohumir Kryl.

Microtones: Composers such as Scelsi and Stockhausen have made wide use of the trumpet's ability to play microtonally. Some instruments feature a fourth valve that provides a quarter-tone step between each note. The jazz musician Ibrahim Maalouf uses such a trumpet, invented by his father to make it possible to play Arab maqams.

Valve Tremolo: Many notes on the trumpet can be played in several different valve combinations. By alternating between valve combinations on the same note, a tremolo effect can be created. Berio makes extended use of this technique in his Sequenza X.

Noises: By hissing, clicking, or breathing through the instrument, the trumpet can be made to resonate in ways that do not sound at all like a trumpet. Noises may require amplification.

Preparation: Composers have called for trumpeters to play under water, or with certain slides removed. It is increasingly common for composers to specify all sorts of preparations for trumpet. Extreme preparations involve alternate constructions, such as double bells and extra valves.

Split Tone: Trumpeters can produce more than one tone simultaneously by vibrating the two lips at different speeds. The interval produced is usually an octave or a fifth.

Lip-Trill or Shake: Also known as "**Lip-Slurs**". By rapidly varying air speed, but not changing the depressed valves, the pitch can vary quickly between adjacent harmonic partials. Shakes and lip-trills can vary in speed, and in the distance between the partials. However, lip-trills and shakes usually involve the next partial up from the written note.

Multi-Phonics: Playing a note and "humming" a different note simultaneously. For example, sustaining a middle C and humming a major 3rd "E" at the same time.

Circular Breathing: A technique wind players use to produce uninterrupted tone, without pauses for breaths. The player puffs up the cheeks, storing air, then breathes in rapidly through the nose while using the cheeks to continue pushing air outwards.

Bass Trumpet

The bass trumpet is a type of low trumpet which was first developed during the 1820s in Germany. It is usually pitched in 8' C or 9' Bb today, but is sometimes built in Eb and is treated as a transposing instrument sounding either an octave, a sixth or a ninth lower than written, depending on the pitch of the instrument. Having valves and the same tubing length, the bass trumpet is quite similar to the valve trombone, although the bass trumpet has a harder, more metallic tone. Certain modern manufacturers offering 'valve trombones' and 'bass trumpets' use the same tubing, valves, and bell, in different configurations - in these cases the bass trumpet is virtually identical to the valve trombone.

Cornet

The cornet is a brass instrument similar to the trumpet but distinguished from it by its conical bore, more compact shape, and mellower tone quality. The most common cornet is a transposing instrument in Bb, though there is also a soprano cornet in Eb and cornets in A and C. All are unrelated to the Renaissance and early Baroque cornett.

Flugelhorn

The flugelhorn, also spelled fluegelhorn, flugel horn, or flügelhorn, is a brass instrument that resembles the trumpet and cornet but has a wider, more conical bore. Like trumpets and cornets, most flugelhorns are pitched in Bb (some are in C). It is a type of valved bugle, developed in Germany in the early 19th century from a traditional English valveless bugle.

The flugelhorn is generally pitched in Bb, like most trumpets and cornets. It usually has three piston valves and employs the same fingering system as other brass instruments, although four-valve versions and rotary-valve versions also exist. It can therefore be played by trumpet and cornet players although it has different playing characteristics. The flugelhorn mouthpiece is more deeply conical than either trumpet or cornet mouthpieces, but not as conical as a French horn mouthpiece. The shank of the flugelhorn mouthpiece is similar in size to a cornet mouthpiece shank.

Some modern flugelhorns feature a fourth valve that lowers the pitch a perfect fourth (similar to the fourth valve on some euphoniums, tubas, and piccolo trumpets, or the trigger on trombones). This adds a useful low range that, coupled with the flugelhorn's dark sound, extends the instrument's abilities. Players can also use the fourth valve in place of the first and third valve combination (which is somewhat sharp).

A compact version of the rotary valve Flugelhorn, is the oval shaped Kuhlohorn in Bb. It was developed for the German protestant trombone choirs.

A pair of bass flugelhorns in C, called fiscorns, are played in the Catalan cobla bands which provide music for sardana dancers.

Timbre

The tone is fatter and usually regarded as more mellow and dark than the trumpet or cornet. The sound of the flugelhorn has been described as halfway between a trumpet and a French horn, whereas the cornet's sound is halfway between a trumpet and a flugelhorn. The flugelhorn is as agile as the cornet but more difficult to control in the high register (from approximately written G5), where in general it locks onto notes less easily.

Trombone

The trombone is a musical instrument in the brass family. As with all brass instruments, sound is produced when the player's vibrating lips (embouchure) cause the air column inside the instrument to vibrate. Unlike most other brass instruments, which have valves that, when pressed, alter the pitch of the instrument, trombones instead have a telescoping slide mechanism that varies the length of the instrument to change the pitch. However, many modern trombone models also have a valve attachment which lowers the pitch of the instrument. Variants such as the valve trombone and superbone have three valves similar to those on the trumpet.

The word "trombone" derives from Italian Tromba (trumpet) and -one (a suffix meaning "large"), so the name means "large trumpet". The trombone has a predominantly cylindrical bore like its valved counterpart, the baritone, in contrast to its conical valved counterparts: the cornet, the euphonium, and the French horn. The most frequently encountered trombones are the tenor trombone and bass trombone. These are treated as non-transposing instruments and are pitched in Bb, an octave below the Bb trumpet and an octave above the pedal Bb tuba. The once common Eb alto trombone became less widely used as improvements in technique extended the upper range of the tenor, but it is now resurging due to its lighter sonority which is appreciated in many classical and early romantic works. Trombone music is usually written in concert pitch in either bass or tenor clef, although exceptions do occur, notably in British brass-band music where the tenor trombone is presented as a Bb transposing instrument, written in treble clef; and the alto trombone is written at concert pitch usually in alto clef.

Some varieties include: Alto Trombone, Tenor Trombone, Tenor Trombone with F Attachment Bass Trombone with F Attachment, Bass Trombone with F & E Attachment

Euphonium

The euphonium is a medium-sized, 3 or 4-valve, often compensating, conical-bore, tenor-voiced brass instrument that derives its name from the Ancient Greek word euphonos, meaning "well-sounding" or "sweet-voiced". The euphonium is a valved instrument. Nearly all current models have piston valves, though some models with rotary valves do exist.

The euphonium may be played in bass clef as a non-transposing instrument or in treble clef as a transposing instrument. In British brass bands, it is typically treated as a treble-clef instrument, while in American band music, parts may be written in either treble clef or bass clef, or both.

The euphonium is in the family of brass instruments, more particularly low-brass instruments with many relatives. It is extremely similar to a baritone horn. The difference is that the bore size of the baritone horn is typically smaller than that of the euphonium, and the baritone is a primarily cylindrical bore, whereas the euphonium is predominantly conical bore. It is controversial whether this is sufficient to make them two different instruments. In the trombone family large and small bore trombones are both called trombones, while the cylindrical trumpet and the conical flugelhorn are given different names. As with the trumpet and flugelhorn, the two instruments are easily doubled by one player, with some modification of breath and embouchure, since the two have identical range and essentially identical fingering. The cylindrical baritone offers a brighter sound and the conical euphonium offers a more mellow sound.

Tuba

The Tuba is the lowest-pitched musical instrument in the brass family. As with all brass instruments, the sound is produced by lip vibration – a buzz – into a mouthpiece. It first appeared in the mid-19th century, making it one of the newer instruments in the modern orchestra and concert band. The tuba largely replaced the ophicleide. Tuba is Latin for "trumpet".

Some varieties include: F Tuba, CC Tuba, BBb Tuba

Percussion

This part of the orchestra includes much more variety than any of the other parts.

Mallets, Beaters and Sticks

Mallets – Used for keyboard instruments Sticks – Used for all drums Beaters – Used for other instruments, such as the Tam-Tam and Gongs

Categorizing Persussion Instruments

There are several ways to categorize this large collection of instruments. They are first divided into two groups:

- Instruments of Definite Pitch
- Instruments of Indefinite Pitch

Then we will separate insttuments in each of these two groups by the way they produce sound:

Idiophones	Produce their sound by the vibration of their whole body.
Membranophones	Produce their sound by the vibration of a skin or membrane tightly stretched and fastened over a resonating shell or tube.
Chordophones	Produce their sound through the vibration of their strings.
Aerophones	Produce their sound through the vibration of an air column within an enclosed body.

Idiophone Instruments of Definite Pitch

Mallet Instruments - Xylophone, Marimba, Vibrphone, Glockenspiel, Chimes, Crotales, Steel Drums,...

Xylophone

The xylophone (from the Ancient Greek words for wood and sound, literally meaning "sound of wood") is a musical instrument in the percussion family that consists of wooden bars struck by mallets. Like the glockenspiel, the xylophone essentially consists of a set of tuned keys arranged in the fashion of the keyboard of a piano. Each bar is an idiophone tuned to a pitch of a musical scale, whether pentatonic or heptatonic in the case of many African and Asian instruments, diatonic in many western children's instruments, or chromatic for orchestral use.

The term xylophone may be used generally, to include all such instruments such as the marimba, balafon and even the semantron. However, in the orchestra, the term xylophone refers specifically to a chromatic instrument of somewhat higher pitch range and drier timbre than the marimba, and these two instruments should not be confused.

Marimba

The marimba is a percussion instrument consisting of a set of wooden bars struck with yarn wrapped or rubber mallets to produce musical tones. Resonators or pipes are suspended underneath the bars to amplify the sound of the wooden bars. The bars of a chromatic marimba are arranged like the keys of a piano, with the groups of two and three accidentals raised vertically, overlapping the natural bars to aid the performer both visually and physically. This instrument is a type of idiophone, but with a more resonant and lower-pitched tessitura than the xylophone.

Modern uses of the marimba include solo performances, woodwind and brass ensembles, marimba concertos, jazz ensembles, marching band (front ensembles), drum and bugle corps, indoor percussion ensembles, and orchestral compositions.

Vibraphone

The vibraphone is a musical instrument in the struck idiophone subfamily of the percussion family. It consists of tuned metal bars and is usually played by holding two or four soft mallets and striking the bars.

The vibraphone resembles the marimbaphone and steel marimba, which it superseded. One of the main differences between the vibraphone and other keyboard percussion instruments is that each bar suspends over a resonator tube with a motor-driven butterfly valve at the top. The valves connect together on a common axle, which produces a tremolo or vibrato effect while the motor rotates the axle. The vibraphone also has a sustain pedal similar to a piano. With the pedal up, the bars produce a muted sound. With the pedal down, the bars sustain for several seconds, or until muted with the pedal.

The vibraphone is commonly used in jazz music, in which it often plays a featured role and was a defining element of the sound of mid-20th-century "Tiki lounge" exotica, as popularized by Arthur Lyman. It is the second most popular solo keyboard percussion instrument in classical music, after the marimba, and it is part of the standard college-level percussion performance education. It is a standard instrument in the modern percussion section for orchestras, concert bands, and marching bands (as part of the front ensemble).

Glockenspiel

The glockenspiel is a percussion instrument. It consists of pitched aluminum or steel bars arranged in a keyboard layout. This makes the glockenspiel a type of metallophone, similar to the vibraphone.

The glockenspiel is played by striking the bars with mallets, often made of a hard material such as metal or plastic. Its clear, high-pitched tone is often heard in orchestras, wind ensembles, marching bands, and in popular music.

In German, a carillon is also called a glockenspiel, while in French, the glockenspiel is often called a carillon. In Italian, the term campanelli is often used to refer to the glockenspiel.

Chimes / Tubular Bells

Chimes also known as Tubular bells are musical instruments in the percussion family. Their sound resembles that of church bells, carillon, or a bell tower; the original tubular bells were made to duplicate the sound of church bells within an ensemble. Each bell is a metal tube tuned by altering its length. Its standard range is C^4 to F^5 , though many professional instruments reach G^5 . Tubular bells are often replaced by studio chimes, which are a smaller and usually less expensive instrument. Studio chimes are similar in appearance to tubular bells, but each bell has a smaller diameter than the corresponding bell on tubular bells.

Tubular bells are sometimes struck on the top edge of the tube with a rawhide- or plastic-headed hammer. Often, a sustain pedal will be attached to allow extended ringing of the bells. They can also be bowed at the bottom of the tube to produce a very loud, very high-pitched overtone. The tubes used provide a purer tone than solid cylindrical chimes, such as those on a mark tree. Chimes are often found in orchestral and concert band repertoire. It rarely plays melody, instead being used most often as a color to add to the ensemble sound. It does have solos occasionally, often depicting church bells.

Crotales

Crotales, sometimes called antique cymbals, are percussion instruments consisting of small, tuned bronze or brass disks. Each is about 10 cm (4 in) in diameter with a flat top surface and a nipple on the base. They are commonly played by being struck with hard mallets. However, they may also be played by striking two disks together in the same manner as finger cymbals, or by bowing. Their sound is rather like a small tuned bell, only with a much brighter sound and a much longer resonance. Similar to tuned finger cymbals, crotales are thicker and larger; they also have slight grooves in them. The name comes from the Greek crotalon, for a castanet or rattle.

Modern crotales are arranged chromatically and have a range of up to two octaves. They are typically available in sets (commonly one octave) but may also be purchased individually. Crotales are treated as transposing instruments; music for crotales is written two octaves lower than the sounding pitch to minimize ledger lines.

Steelpan aka Steel Drums

The steelpan (also known as a pan, steel drum, and sometimes, collectively with other musicians, as a steelband or steel orchestra) is a musical instrument originating from Trinidad and Tobago. Steelpan musicians are called pannists.

The modern pan is a chromatically pitched percussion instrument made from 55 gallon industrial drums.

Drum refers to the steel drum containers from which the pans are made; the steel drum is more correctly called a steel pan or pan as it falls into the idiophone family of instruments, and so is not a drum (which is a membranophone). Some steelpans are made to play in the Pythagorean musical cycle of fourths and fifths.

Pan is played using a pair of straight sticks tipped with rubber; the size and type of rubber tip varies according to the class of pan being played. Some musicians use four pansticks, holding two in each hand. This grew out of Trinidad and Tobago's early 20th-century Carnival percussion groups known as tamboo bamboo. Pan is the national instrument of Trinidad and Tobago and also appeared as the final logo of their former national airline, BWIA and on the tails of their aircraft.

Membranophone Instruments of Definite Pitch

Timpani

Timpani or kettledrums (also informally called timps) are musical instruments in the percussion family. A type of drum categorised as a hemispherical drum, they consist of a membrane called a head stretched over a large bowl traditionally made of copper. Thus timpani are an example of kettle drums, also known as vessel drums and semispherical drums, whose body is similar to a section of a sphere whose cut conforms the head. Most modern timpani are pedal timpani and can be tuned quickly and accurately to specific pitches by skilled players through the use of a movable foot-pedal. They are played by striking the head with a specialized drum stick called a timpani stick or timpani mallet. Timpani evolved from military drums to become a staple of the classical orchestra by the last third of the 18th century. Today, they are used in many types of ensembles, including concert bands, marching bands, orchestras, and even in some rock bands.

Timpani is an Italian plural, the singular of which is timpano. However, in English the term timpano is only widely in use by practitioners: several are more typically referred to collectively as kettledrums, timpani, temple drums, or timps. They are also often incorrectly termed timpanis.

Roto Toms

The Rototom is a drum developed by Al Payson, Robert Grass, and Michael Colgrass that has no shell and is tuned by rotating. A rototom consists of a single head in a die-cast zinc or aluminum frame. Unlike most other drums, this type has a variable definite pitch. Composers are known to write for them as tuned instruments, demanding specific pitches. Rototoms are often used to extend the tom range of a standard drum kit. They were commercialized by the drumhead company Remo Inc., of North Hollywood, California.

Rototoms can be tuned quickly by rotating the drumhead, which sits in a threaded metal ring. Rotation raises or lowers the tension hoop relative to the rim, which increases or decreases the pitch of the drum by increasing or decreasing the tension of the drumhead.

Sizes

Remo currently markets Rototoms in seven sizes — 6" (15.2 cm), 8" (20.3 cm), 10" (25.4 cm), 12" (30.5 cm), 14" (35.6 cm), 16" (40.6 cm) and 18" (45.7 cm) diameters, each tunable over an octave's range or more, although the company notes that "the practical range for fullness of sound is approximately a sixth interval." [4] Each size can produce various effects, depending upon the drum head and its tuning.

Chordophone Instruments of Definite Pitch

Cimbalom

The Cimbalom or Concert Cimbalom is a type of chordophone composed of a large, trapezoidal box on legs with metal strings stretched across its top and a dampening pedal underneath. It was designed and created by V. Josef Schunda in 1874 in Budapest, based on his modifications to the existing Hammered dulcimer instruments which were already present in Central and Eastern Europe.

Today the instrument is mainly played in Hungary, Slovakia, Moravia, Romania, Moldova, and Ukraine.

The cimbalom is typically played by striking two sticks, often with cotton-wound tips, against the strings which are on the top of the instrument. The steel treble strings are arranged in groups of 4 and are tuned in unison. The bass strings which are over-spun with copper, are arranged in groups of 3 and are also tuned in unison. The Hornbostel–Sachs musical instrument classification system registers the cimbalom with the number 314.122-4,5.

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Piano

The piano is an acoustic, keyboard, stringed percussion instrument in which the strings are struck by wooden hammers that are coated with a softer material (modern hammers are covered with dense wool felt; some early pianos used leather). It is played using a keyboard, which is a row of keys (small levers) that the performer presses down or strikes with the fingers and thumbs of both hands to cause the hammers to strike the strings. It was invented in Italy by Bartolomeo Cristofori around the year 1700.

The word "piano" is a shortened form of pianoforte, the Italian term for the early 1700s versions of the instrument, which in turn derives from clavicembalo col piano e forte (key cimbalom with quieter and louder) and fortepiano. The Italian musical terms piano and forte indicate "soft" and "loud" respectively, in this context referring to the variations in volume (i.e., loudness) produced in response to a pianist's touch or pressure on the keys: the greater the velocity of a key press, the greater the force of the hammer hitting the strings, and the louder the sound of the note produced and the stronger the attack. The name was created as a contrast to harpsichord, a musical instrument that does not allow variation in volume; compared to the harpsichord, the first fortepianos in the 1700s had a quieter sound and smaller dynamic range.

A piano usually has a protective wooden case surrounding the soundboard and metal strings, which are strung under great tension on a heavy metal frame. Pressing one or more keys on the piano's keyboard causes a wooden or plastic hammer (typically padded with firm felt) to strike the strings. The hammer rebounds from the strings, and the strings continue to vibrate at their resonant frequency. These vibrations are transmitted through a bridge to a soundboard that amplifies by more efficiently coupling the acoustic energy to the air. When the key is released, a damper stops the strings' vibration, ending the sound. Notes can be sustained, even when the keys are released by the fingers and thumbs, by the use of pedals at the base of the instrument. The sustain pedal enables pianists to play musical passages that would otherwise be impossible, such as sounding a 10-note chord in the lower register and then, while this chord is being continued with the sustain pedal, shifting both hands to the treble range to play a melody and arpeggios over the top of this sustained chord. Unlike the pipe organ and harpsichord, two major keyboard instruments widely used before the piano, the piano allows gradations of volume and tone according to how forcefully or softly a performer presses or strikes the keys.

Most modern pianos have a row of 88 black and white keys, 52 white keys for the notes of the C major scale (C, D, E, F, G, A and B) and 36 shorter black keys, which are raised above the white keys, and set further back on the keyboard. This means that the piano can play 88 different pitches (or "notes"), spanning a range of a bit over seven octaves. The black keys are for the "accidentals" (F#/G b, G#/Ab, A#/Bb, C#/Db, and D#/Eb), which are needed to play in all twelve keys. More rarely, some pianos have additional keys (which require additional strings), an example of which is the Bösendorfer Concert Grand

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290 Imperial, which has 97 keys. Most notes have three strings, except for the bass, which graduates from one to two. The strings are sounded when keys are pressed or struck, and silenced by dampers when the hands are lifted from the keyboard. Although an acoustic piano has strings, it is usually classified as a percussion instrument rather than as a stringed instrument, because the strings are struck rather than plucked (as with a harpsichord or spinet); in the Hornbostel–Sachs system of instrument classification, pianos are considered chordophones. There are two main types of piano: the grand piano and the upright piano. The grand piano has a better sound and gives the player a more precise control of the keys, and is therefore the preferred choice for every situation in which the available floor-space and the budget will allow, as well as often being considered a requirement in venues where skilled pianists will frequently give public performances. The upright piano, which necessarily involves some compromise in both tone and key action compared to a grand piano of equivalent quality, is nevertheless much more widely used, because it occupies less space (allowing it to fit comfortably in a room where a grand piano would be too large) and is significantly less expensive.

During the 1800s, influenced by the musical trends of the Romantic music era, innovations such as the cast iron frame (which allowed much greater string tensions) and aliguot stringing gave grand pianos a more powerful sound, with a longer sustain and richer tone. In the nineteenth century, a family's piano played the same role that a radio or phonograph played in the twentieth century; when a nineteenthcentury family wanted to hear a newly published musical piece or symphony, they could hear it by having a family member play a simplified version on the piano. During the nineteenth century, music publishers produced many types of musical works (symphonies, opera overtures, waltzes, etc.) in arrangements for piano, so that music lovers could play and hear the popular pieces of the day in their home. The piano is widely employed in classical, jazz, traditional and popular music for solo and ensemble performances, accompaniment, and for composing, songwriting and rehearsals. Although the piano is very heavy and thus not portable and is expensive (in comparison with other widely used accompaniment instruments, such as the acoustic guitar), its musical versatility (i.e., its wide pitch range, ability to play chords, louder or softer notes and two or more independent musical lines at the same time), the large number of musicians - both amateurs and professionals - trained in playing it, and its wide availability in performance venues, schools and rehearsal spaces have made it one of the Western world's most familiar musical instruments.

Celesta

The Celesta, also called a bell-piano, is a struck idiophone operated by a keyboard. It looks similar to an upright piano (four- or five-octave), albeit with smaller keys and a much smaller cabinet, or a large wooden music box (three-octave). The keys connect to hammers that strike a graduated set of metal (usually steel) plates or bars suspended over wooden resonators. Four- or five-octave models usually have a damper pedal that sustains or damps the sound. The three-octave instruments do not have a

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pedal because of their small "table-top" design. One of the best-known works that uses the celesta is Pyotr Ilyich Tchaikovsky's "Dance of the Sugar Plum Fairy" from The Nutcracker.

The sound of the celesta is similar to that of the glockenspiel, but with a much softer and more subtle timbre. This quality gave the instrument its name, celeste, meaning "heavenly" in French. The celesta is often used to enhance a melody line played by another instrument or section. The delicate, bell-like sound is not loud enough to be used in full ensemble sections; as well, the celesta is rarely given standalone solos.

The celesta is a transposing instrument; it sounds one octave higher than the written pitch. Its four-octave sounding range is generally considered to be C4 to C8. The fundamental frequency of 4186 Hz makes this one of the highest pitches in common use. The original French instrument had a five-octave range, but because the lowest octave was considered somewhat unsatisfactory, it was omitted from later models. The standard French four-octave instrument is now gradually being replaced in symphony orchestras by a larger, five-octave German model. Although it is a member of the percussion family, in orchestral terms it is more properly considered a member of the keyboard section and usually played by a keyboardist. The celesta part is normally written on two braced staves, called a grand staff.

Harpsichord

A harpsichord is a musical instrument played by means of a keyboard. This activates a row of levers that turn a trigger mechanism that plucks one or more strings with a small plectrum made from quill or plastic. The strings are under tension on a soundboard, which is mounted in a wooden case; the soundboard amplifies the vibrations from the strings so that the listeners can hear it. Like a pipe organ, a harpsichord may have more than one keyboard manual, and even a pedal board. Harpsichords may also have stop buttons which add or remove additional octaves. Some harpsichords may have a buff stop, which brings a strip of buff leather or other material in contact with the strings, muting their sound to simulate the sound of a plucked lute.

The term denotes the whole family of similar plucked-keyboard instruments, including the smaller virginals, muselar, and spinet. The harpsichord was widely used in Renaissance and Baroque music, both as an accompaniment instrument and as a soloing instrument. During the Baroque era, the harpsichord was a standard part of the continuo group. The basso continuo part acted as the foundation for many musical pieces in this era. During the late 18th century, with the development of the fortepiano (and then the increasing use of the piano in the 19th century) the harpsichord gradually disappeared from the musical scene (except in opera, where it continued to be used to accompany recitative). In the 20th century, it made a resurgence, being used in historically informed performances of older music, in new compositions, and, in rare cases, in certain styles of popular music (e.g., Baroque pop).

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Around the year 1700 the first piano was built. The piano uses percussion, the strings being struck with muffled wooden hammers instead of being plucked. The piano is capable of a quieter sound, which is why it has the name it has. The piano also allows variation in volume, which the harpsichord did not. By the late 18th century the harpsichord was supplanted by the piano and almost disappeared from view for most of the 19th century: an exception was its continued use in opera for accompanying recitative, but the piano sometimes displaced it even there.

Harpsichords vary in size and shape, but all have the same basic mechanism. The player depresses a key that rocks over a pivot in the middle of its length. The other end of the key lifts a jack (a long strip of wood) that holds a small plectrum (a wedge-shaped piece of quill, often made of plastic in the 21st century), which plucks the string. When the player releases the key, the far end returns to its rest position, and the jack falls back; the plectrum, mounted on a tongue mechanism that can swivel backwards away from the string, passes the string without plucking it again. As the key reaches its rest position, a felt damper atop the jack stops the string's vibrations. These basic principles are explained in detail below.

Harmonium and Organ

The pump organ is a type of free-reed organ that generates sound as air flows past a vibrating piece of thin metal in a frame. The piece of metal is called a reed. Specific types of pump organ include the Reed Organ, Harmonium, and Melodeon. The idea for the free reed was imported from China through Russia after 1750, and the first Western free-reed instrument was made in 1780 in Denmark.

More portable than pipe organs, free-reed organs were widely used in smaller churches and in private homes in the 19th century, but their volume and tonal range were limited. They generally had one or sometimes two manuals, with pedal-boards being rare. The finer pump organs had a wider range of tones, and the cabinets of those intended for churches and affluent homes were often excellent pieces of furniture. Several million free-reed organs and melodeons were made in the US and Canada between the 1850s and the 1920s, some which were exported. During this time Estey Organ and Mason & Hamlin were popular manufacturers.

Alongside the furniture-sized instruments of the west, smaller designs exist. The portable, hand-pumped harmonium or samvadini is a major instrument on the Indian Subcontinent developed by Indians to meet local needs. The craftsmen created a harmonium that a single person could carry, with added microtones.

Harmoniums have been used in western popular music since at least the 1960s. John Lennon played a Mannborg harmonium on the Beatles' hit single "We Can Work It Out", released in December 1965, and the band used the instrument on other songs recorded during the sessions for their Rubber Soul album.

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They also used the instrument on the famous "final chord" of "A Day in the Life", and on the song "Being for the Benefit of Mr. Kite!", both released on the 1967 album Sgt. Pepper's Lonely Hearts Club Band. The group's hit single "Hello, Goodbye" and the track "Your Mother Should Know" were both written using a harmonium.

Many other artists soon employed the instrument in their music, including; Pink Floyd on the title song "Chapter 24" of their first album The Piper at the Gates of Dawn in 1967, Elton John on his 1973 album Don't Shoot Me I'm Only the Piano Player, 1976's Blue Moves, the 1978 album A Single Man, and 1995's Made in England. German singer Nico was closely associated with the harmonium, using it as her main instrument, during the late 60s and 70s, on albums such as The Marble Index, Desertshore and The End....

Aerophone Instruments of Definite Pitch

Aerophones produce sound by the vibration of an air column within an enclosed body. Woodwind and Brass instruments are all Aerophones; in the percussion section, all kinds of whistles, sirens and machines (like the wind machine) are included in this category. Although all have definite pitch, their pitch is not always specified, except perhaps for the whistles.

Whistles

Whistles of all kinds are used for various effects, especially in scores composed during the last few decades. The kind of whistle required should be carefully indicated in the score: bird whistle, police whistle, slide whistle, tin whistle, train whistle, and so on.

Percussion Instruments of Indefinite Pitch

Idiophone Instruments of Indefinite Pitch

Cymbals

A cymbal is a common percussion instrument. Often used in pairs, cymbals consist of thin, normally round plates of various alloys. The majority of cymbals are of indefinite pitch, although small disc-shaped cymbals based on ancient designs sound a definite note (such as crotales). Cymbals are used in many ensembles ranging from the orchestra, percussion ensembles, jazz bands, heavy metal bands, and marching groups. Drum kits usually incorporate at least a crash, ride, or crash/ride, and a pair of hi-hat cymbals.

Crash Cymbals or Clash Cymbals

Crash Cymbals in an orchestra are most often hand held cymbals that a musician strikes together to create sound. They can be clashed together forte and then held high over the player's head. If the stroke is fast, they can be clashed and immediately damped against the player's chest. One cymbal can be swished across the other to give a hissing effect. A roll can be created by rubbing the plates together with a fast rotary motion.

Suspended Cymbals

Suspended Cymbals are the kind you would see on a standard drum kit. They are most often struck with sticks to make sound. These generally fall into three categories:

Crash Cymbal - The crash cymbal has an edge, a bow and in the center, a cup. Striking these specific areas each create a different sound.

Ride Cymbal – The ride cymbal has an edge, a bow and in the center, a bell. Striking these specific areas each create a different sound.

Hi-Hat Cymbals – The hi-hat cymbals consist of two cymbals facing each other, mounted vertically on a metal rod and crashed together by a foot pedal.

Crash Cymbal

A crash cymbal is a type of cymbal that produces a loud, sharp "crash" and is used mainly for occasional accents, as opposed to a ride cymbal. It can be mounted on a stand and played with a drum stick, or by hand in pairs. One or two crash cymbals are a standard part of a drum kit. Suspended crash cymbals are also used in bands and orchestras, either played with a drumstick or rolled with a pair of mallets to produce a slower, swelling crash. Sometimes a drummer may hit two different crash cymbals in a kit at the same time to produce a very loud accent, usually in rock music.

Although crash cymbals range in thickness from paper-thin to very heavy, all crash cymbals have a fairly thin edge. They are typically 14 to 18 inches (36 to 46 cm) in diameter, but sizes down to 8 inches (20 cm) and up to 24 inches (61 cm) are manufactured. Custom crash cymbals up to 28 inches (71 cm) in diameter have been used by big bands. Different thicknesses are used for different kinds of music, and the alloy for each manufacturer's models varies. A thick cymbal is likely to be used by a metal or rock band, while thinner cymbals are generally used in lighter rock. Darker crashes are best used for jazz.

The sound of a crash is changed by its luster. A cleaner cymbal creates a crisper sound, whereas a cymbal showing signs of oxidation (called a 'raw' cymbal) creates a duller sound.

Ride Cymbal

The ride cymbal is a standard cymbal in most drum kits. It maintains a steady rhythmic pattern, sometimes called a ride pattern, rather than the accent of a crash. It is normally placed on the extreme right (or dominant hand) of a drum set, above the floor tom. The ride can fulfill any function or rhythm the hi-hat does, with the exception of an open and closed sound. The ride is played with a drumstick. Hitting the ride cymbal on its edge verses on the bow or bell can create a very different sound.

Hi-Hat Cymbals

A hi-hat is a combination of two cymbals and a pedal, all mounted on a metal stand. It is a part of the standard drum kit used by drummers in many styles of music including rock, pop, jazz, and blues. Hi-hats consist of a matching pair of small to medium-sized cymbals mounted on a stand, with the two cymbals facing each other. The bottom cymbal is fixed and the top is mounted on a rod which moves the top cymbal toward the bottom one when the pedal is depressed (a hi-hat that is in this position is said to be "closed" or "closed hi-hats").

The hi-hat evolved from a "sock cymbal", a pair of similar cymbals mounted at ground level on a hinged, spring-loaded foot apparatus. Drummers invented the first sock cymbals to enable one drummer to play multiple percussion instruments at the same time. Over time these became mounted on short stands— also known as "low-boys"—and activated by pedals similar to those used in modern hi-hats. When extended upward roughly 3' (76 cm) they were originally known as "high sock" cymbals, which evolved over time to the familiar "high-hat" term.

The cymbals may be played by closing them together with the pedal, which creates a "chck" sound or striking them with a stick, which may be done with them open, closed, open and then closed after striking to dampen the ring, or closed and then opened to create a shimmering effect at the end of the note. Depending on how hard a hi-hat is struck and whether it is "open" (i.e., pedal not pressed, so the two cymbals are not closed together), a hi-hat can produce a range of dynamics, from very quiet "chck" (or "chick") sounds, done with merely gently pressing the pedal; this is suitable for soft accompaniment during a ballad or the start of a guitar solo, to very loud (e.g. striking fully open hats hard with sticks, a technique used in loud heavy metal music songs).

While the term hi-hat normally refers to the entire setup (two cymbals, stand, pedal, rod mechanism), in some cases, drummers use it to refer exclusively to the two cymbals themselves.

Triangle

The triangle is an idiophone type of musical instrument in the percussion family. It is a bar of metal, usually steel but sometimes other metals such as beryllium copper, bent into a triangle shape. The instrument is usually held by a loop of some form of thread or wire at the top curve. While the triangle theoretically has a definite pitch, it is obscured by the overtones that are produced when struck.

Cowbell

The cowbell is an idiophone hand percussion instrument used in various styles of music, such as Latin and rock. It is named after the similar bell used by herdsmen to keep track of the whereabouts of cows.

Tam-Tam and other Gongs

Gongs can be divided into high, medium and low sounding instruments. A gong is a percussion instrument originating in East and Southeast Asia. Gongs are a flat, circular metal disc that is typically struck with a mallet. They can be small or large in size, and tuned or untuned.

Gongs broadly fall into one of three types: Suspended gongs are more or less flat, circular discs of metal suspended vertically by means of a cord passed through holes near to the top rim. Bossed or nipple gongs have a raised centre boss, or knob, and are often suspended and played horizontally. Bowl gongs are bowl-shaped and rest on cushions. The latter may be considered a member of the bell category. Gongs are made mainly from bronze or brass but there are many other alloys in use.

Wind Chimes

There are three kinds of wind chimes.

- 1. Bamboo Wind Chimes
- 2. Glass Wind Chimes
- 3. Metal Wind Chimes

Wood Blocks

Wood blocks, rectangular pieces of hard wood, come in sets of graduated sizes, from three to five each. When several wood blocks are called for, they are either mounted or placed in a set on a table or a stand. Even though they are considered non-pitched instruments, the different sized blocks produce a spectrum of indefinite pitches from low to high.

Claves

Claves are a percussion instrument consisting of a pair of short, wooden sticks about 20–25 centimeters (8–10 inches) long and about 2.5 centimeters (1 inch) in diameter. Although traditionally made out of wood (typically rosewood, ebony or grenadilla) many modern manufacturers offer claves made out of fiberglass or plastic.

When struck, claves produce a bright, penetrating clicking noise. This makes them useful when playing in large dance bands. Claves are sometimes hollow and carved in the middle to amplify the sound.

Claves have been very important in the development Afro-Cuban music, such as the son and guaguancó. They are often used to play an ostinato, or repeating rhythmic figure, throughout a piece known as the clave.

Castanets

Castanets, also known as clackers or palillos, are a percussion instrument (idiophone), used in Spanish, Kalo, Moorish, Ottoman, Italian, Sephardic, Swiss, and Portuguese music. In ancient Greece and ancient Rome there was a similar instrument called crotalum. The instrument consists of a pair of concave shells joined on one edge by a string. They are held in the hand and used to produce clicks for rhythmic accents or a ripping or rattling sound consisting of a rapid series of clicks. They are traditionally made of hardwood although fibreglass is becoming increasingly popular.

In practice, a player usually uses two pairs of castanets. One pair is held in each hand, with the string hooked over the thumb and the castanets resting on the palm with the fingers bent over to support the other side. Each pair will make a sound of a slightly different pitch.

Maracas

A maraca, sometimes called rumba shaker or chac-chac, is a rattle which appears in many genres of Caribbean and Latin music. It is shaken by a handle and usually played as part of a pair.

Shakers

The word shaker describes various percussive musical instruments used for creating rhythm in music.

They are called shakers because the method of creating the sound involves shaking them, moving them back and forth in the air rather than striking them. Most may also be struck for a greater accent on certain beats. Shakers are often used in rock and other popular styles to provide the ride pattern along with or substituting for the ride cymbal.

Types of Shakers

A shaker may comprise a container, partially full of small loose objects such as beans, which create the percussive sounds as they collide with each other, the inside surface, or other fixed objects inside the container, as in a Latin Shaker, Rainstick, Caxixi or Egg Shaker.

Vibraslap

The vibraslap is a percussion instrument consisting of a piece of stiff wire (bent into a U-shape) connecting a wooden ball to a hollow box of wood with metal "teeth" inside. The percussionist holds the metal wire in one hand and strikes the ball (usually against the palm of their other hand). The box acts as a resonating body for a metal mechanism placed inside with a number of loosely fastened pins or rivets that vibrate and rattle against the box. The instrument is a modern version of the jawbone.

Güiro

The güiro is a Latin American percussion instrument consisting of an open-ended, hollow gourd with parallel notches cut in one side. It is played by rubbing a stick or tines along the notches to produce a ratchet sound.

The güiro is commonly used in Puerto Rican, Cuban and other forms of Latin American music, and plays a key role in the typical rhythm section of important genres like son, trova and salsa. Playing the güiro usually requires both long and short sounds, made by scraping up and down in long or short strokes.

The güiro, like the maracas, is often played by a singer. It is closely related to the Cuban guayo, Dominican güira, and Haitian graj which are made of metal. Other instruments similar to the güiro are the Colombian guacharaca, the Brazilian reco-reco, the quijada (cow jawbone) and the frottoir (French) or fwotwa (French Creole) (washboard).

Cabasa

The cabasa, similar to the shekere, is a percussion instrument that is constructed with loops of steel ball chain wrapped around a wide cylinder. The cylinder is fixed to a long, narrow wooden or plastic handle.

The metal cabasa was created by Martin Cohen, founder of Latin Percussion. This company has built a more durable cabasa that they call an afuche-cabasa. It provides a metallic, rattling sound when shaken or twisted, similar to the sound of a rattlesnake. It is often used in Latin jazz, especially in bossa nova pieces. Precise rhythmic effects can be gained by the advanced player. The player places his non-dominant hand on the metal chain, to provide pressure, while holding the wooden handle with the other hand and twisting the instrument back and forth depending on the rhythmic pattern desired. In addition to Latin music, many band and orchestra pieces call for the cabasa.

The African original version of the cabasa is called agbe, and is constructed from dried oval or pearshaped gourds with beads strung on the outer surface. There are many versions of this instrument, particularly in Latin music. Cabaça is used in Latin American dance. The cabaça is a natural or synthetic round or pear-shaped gourd covered with a network of beads and finishing in a single handle. This is compared to the metal version used in Latin jazz.

Membranophone Instruments of Indefinite Pitch

Snare Drum

The snare drum or side drum is a percussion instrument that produces a sharp staccato sound when the head is struck with a drum stick, due to the use of a series of stiff wires held under tension against the lower skin. Snare drums are often used in orchestras, concert bands, marching bands, parades, drumlines, drum corps, and more. It is one of the central pieces in a drum set, a collection of percussion instruments designed to be played by a seated drummer and used in many genres of music.

Snare drums are usually played with drum sticks, but other beaters such as the brush or the rute can be used to achieve different tones. The snare drum is a versatile and expressive percussion instrument due to its sensitivity and responsiveness. The sensitivity of the snare drum allows it to respond audibly to the softest strokes, even with a wire brush; as well, it can be used for complex rhythmic patterns and engaging solos at moderate volumes. Its high dynamic range allows the player to produce powerful accents with vigorous strokes and a thundering crack when rimshot strokes are used.

The snare drum originates from the tabor, a drum first used to accompany the flute. The tabor evolved into more modern versions, such as the kit snare, marching snare, tarol snare, and piccolo snare. Each type presents a different style of percussion and size. The snare drum that one might see in a popular music concert is usually used in a backbeat style to create rhythm. In marching bands, it can do the same but is used mostly for a front beat.[citation needed] In comparison with the marching snare, the kit snare is generally smaller in length, while the piccolo is the smallest of the three. The snare drum is easily recognizable by its loud cracking sound when struck firmly with a drumstick or mallet. The depth of the sound varies from snare to snare because of the different techniques and construction qualities of the drum. Some of these qualities are head material and tension, dimensions, and rim and drum shell materials and construction.

The snare drum is constructed of two heads—both usually made of Mylar plastic in modern drums but historically made from calf or goat skin—along with a rattle of metal, plastic, nylon, or gut wires on the bottom head called the snares. The wires can also be placed on the top, as in the tarol snare, or both

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heads as in the case of the Highland snare drum. The top head is typically called the batter head because that is where that is where the drummer strikes it, while the bottom head is called the snare head because that is where the snares are located. The tension of each head is held constant by tension rods or ropes. Tension rod adjustment allows the pitch and tonal character of the drum to be customized by the player. The strainer is a lever that engages or disengages contact between the snares and the head, and allows snare tension adjustment. If the strainer is disengaged, the sound of the drum resembles a tom because the snares are inactive. The rim is the metal or wooden ring around the batter head that holds the head onto the drum and provides tension to the head, which can be used for a variety of things, although it is notably used to sound a piercing rimshot with the drumstick when the head and rim are struck together with a single stick.

Tenor Drum

The Tenor Drum is found most frequently in both bands and orchestras. It has a deep, resonant sound. It shares the same basic techniques as the snare drum, although it has no snares. Wooden sticks serve as beaters, though Timpani mallets and Marimba mallets can also be used effectively. Many of these drums have a head on the bottom as well as the top.

Bass Drum

The bass drum, or kick drum, is a large drum that produces a note of low definite or indefinite pitch. The instrument is typically cylindrical, with the drum's diameter much greater than the drum's depth, with a struck head at both ends of the cylinder. The heads may be made of calfskin or plastic and there is normally a means of adjusting the tension either by threaded taps or by strings. Bass drums are built in a variety of sizes, but size does not dictate the volume produced by the drum. The pitch and the sound can vary much with different sizes, but the size is also chosen based on convenience and aesthetics. Bass drums are percussion instruments and vary in size and are used in several musical genres. Three major types of bass drums can be distinguished.

The type usually seen or heard in orchestral, ensemble or concert band music is the orchestral, or concert bass drum. It is the largest drum of the orchestra.

The kick drum, a term for a bass drum associated with a drum kit, which is much smaller than the abovementioned bass drum. It is struck with a beater attached to a pedal, usually seen on drum kits.

The pitched bass drum, generally used in marching bands and drum corps, is tuned to a specific pitch and is usually played in a set of three to six drums.

In many forms of music, the bass drum is used to mark or keep time. The bass drum makes a low, boom sound when the mallet hits the drumhead. In marches, it is used to project tempo (marching bands historically march to the beat of the bass). A basic beat for rock and roll has the bass drum played on the first and third beats of bars in common time, with the snare drum on the second and fourth beats, called backbeats. In jazz, the bass drum can vary from almost entirely being a timekeeping medium to being a melodic voice in conjunction with the other parts of the set.

Tom-Toms

A tom drum is a cylindrical drum with no snares, named from the Anglo-Indian and Sinhala language. It was added to the drum kit in the early part of the 20th century. Most toms range in size between 6 and 20 inches in diameter, though floor toms can go as large as 24 inches. It is not to be confused with a tamtam, a gong. The Tom is popular and used by players worldwide.

Timbales

Timbales or pailas are shallow single-headed drums with metal casing. They are shallower than singleheaded tom-toms and usually tuned much higher, especially for their size. They were developed as an alternative to classical timpani in Cuba in the early 20th century and later spread across Latin America and the United States.

Timbales are struck with wooden sticks on the heads and shells, although bare hands are sometimes used. The player (called a timbalero) uses a variety of stick strokes, rim shots, and rolls to produce a wide range of percussive expression during solos and at transitional sections of music, and usually plays the shells (or auxiliary percussion such as a cowbell or cymbal) to keep time in other parts of the song. The shells and the typical pattern played on them are referred to as cáscara. Common stroke patterns include abanico, baqueteo (from danzón), mambo and chachachá.

Timbales have average diameters of 13 inches (macho drum) and 14 inches (hembra drum). Originally made of calfskin, the heads are most commonly made of plastic for increased volume and durability and mounted on a steel rim. The shells are usually made of metal, although wooden shells are also available. In general, the drums are mounted on a stand and played while standing. Smaller timbales called timbalitos are often incorporated into larger drum kits.

Bongos

Bongos are an Afro-Cuban percussion instrument consisting of a pair of small open bottomed hand drums of different sizes. They are struck with both hands, most commonly in an eight-stroke pattern called martillo (hammer). They are mainly employed in the rhythm section of son cubano and salsa ensembles, often alongside other drums such as the larger congas and the stick-struck timbales.

Bongo drummers (bongoseros) emerged as the only drummers of son cubano ensembles in eastern Cuba toward the end of the 19th century. The instrument remained important as son groups evolved into larger conjuntos and orchestras in Havana in the 1940s, at which point they began to share the stage with congas. Bongos later reached the United States, where they are commonly played in salsa, Afro-Cuban jazz, Latin rock and other genres.

Bongo drums are about 8 inches high and have diameters of approximately 8 inches and 10 inches (the smaller drum is called macho, male, and the larger drum, hembra, female). They are the smallest drums in Latin percussion, some models being only 6 inches in diameter. The shells of the drums and the bridge (the small block that joins them) are usually made of wood, although fiberglass is also common. The heads are typically made of calfskin and attached to the shells via steel hardware that enables their tuning. Originally, metal tacks were used, so tuning had to be done by heating the skins.

Conga

The conga, also known as tumbadora, is a tall, narrow, single-headed drum from Cuba. Congas are staved like barrels and classified into three types: quinto (lead drum, highest), tres dos or tres golpes (middle), and tumba or salidor (lowest). Congas were originally used in Afro-Cuban music genres such as conga (hence their name) and rumba, where each drummer would play a single drum. Following numerous innovations in conga drumming and construction during the mid-20th century, as well as its internationalization, it became increasingly common for drummers to play two or three drums. Congas have become a popular instrument in many forms of Latin music such as son (when played by conjuntos), descarga, Afro-Cuban jazz, salsa, songo, merengue and Latin rock.

Although the exact origins of the conga drum are unknown, researchers agree that it was developed by Cuban people of African descent during the late 19th century or early 20th century. Its direct ancestors are thought to be the yuka and makuta (of Bantu origin) and the bembé drums (of Yoruba origin). In Cuba and Latin America, congas are primarily played as hand drums. In Trinidadian calypso and soca, congas are sometimes struck with mallets, while in the Congos, they are often struck with one hand and one mallet.

Tambourine

The tambourine is a musical instrument in the percussion family consisting of a frame, often of wood or plastic, with pairs of small metal jingles, called "zills". Classically the term tambourine denotes an instrument with a drumhead, though some variants may not have a head. Tambourines are often used with regular percussion sets. They can be mounted, for example on a stand as part of a drum kit (and played with drum sticks), or they can be held in the hand and played by tapping or hitting the instrument.

Tambourines come in many shapes with the most common being circular. It is found in many forms of music: Turkish folk music, Greek folk music, Italian folk music, French folk music, classical music, Persian music, samba, gospel music, pop music, country music, and rock music.

Quica

The cuica is a Brazilian friction drum with a large pitch range, produced by changing tension on the head of the drum. Cuica is Portuguese for the gray four-eyed opossum (Philander opossum) which is known for its high-pitched cry. It is frequently used in carnivals, as well as often in samba music. The tone it produces has a high-pitched squeaky timbre. It has been called a 'laughing gourd' due to this sound. Many also liken its sound to that of a monkey.