BASIC MUSIC

NAVEDTRA 10244

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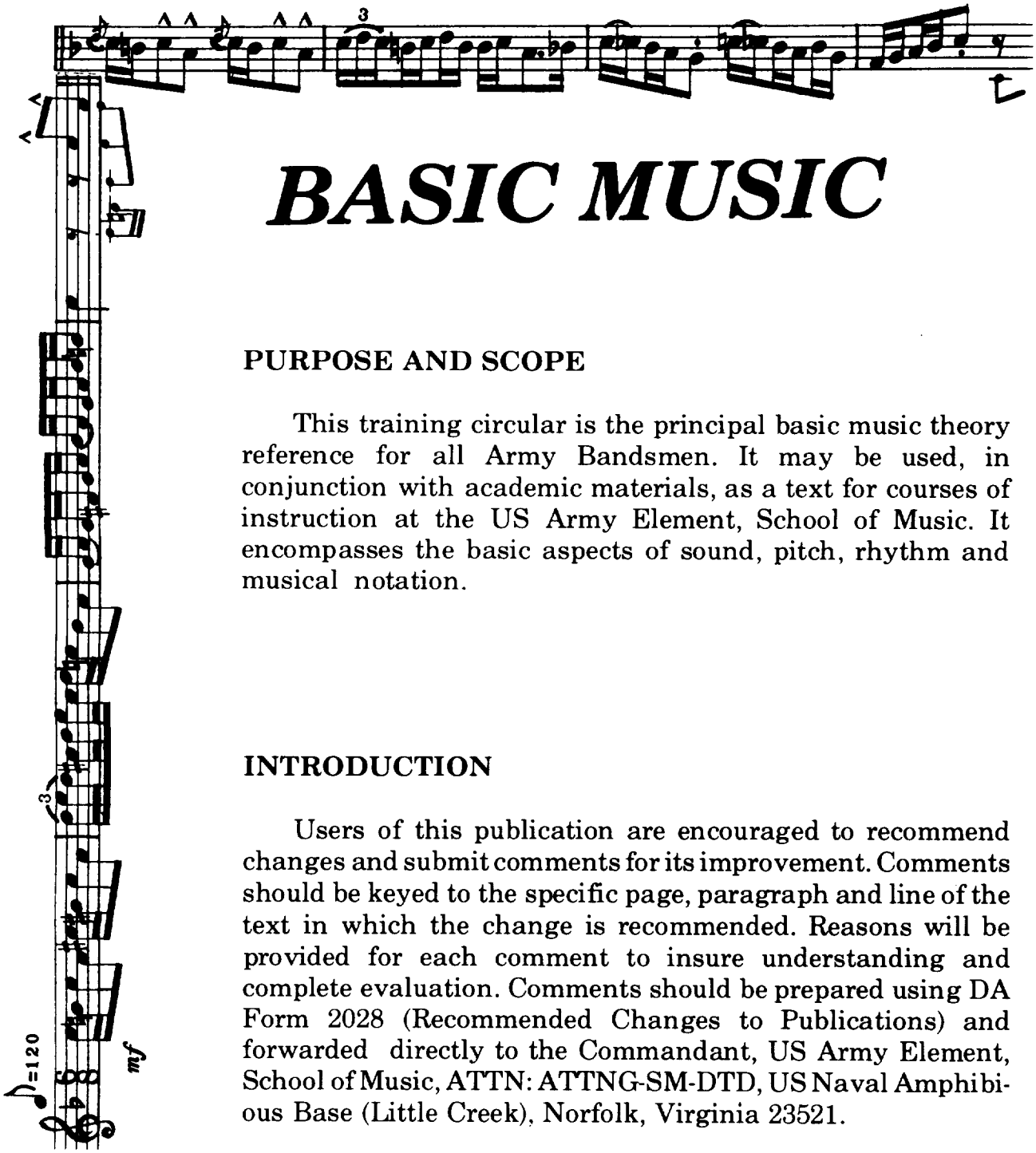


BASIC MUSIC

PURPOSE AND SCOPE

This training circular is the principal basic music theory reference for all Army Bandsmen. It may be used, in conjunction with academic materials, as a text for courses of instruction at the US Army Element, School of Music. It encompasses the basic aspects of sound, pitch, rhythm and musical notation.

INTRODUCTION

Users of this publication are encouraged to recommend changes and submit comments for its improvement. Comments should be keyed to the specific page, paragraph and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded directly to the Commandant, US Army Element, School of Music, ATTN: ATTNG-SM-DTD, US Naval Amphibious Base (Little Creek), Norfolk, Virginia 23521.

CHAPTER 1

NATURE OF SOUND

Sound is produced by vibration; there is no sound without a sound source in the physical state of vibration. The vibrating sound source transfers vibrational energy to the medium of transmission (gas, liquid, or solid) forcing it to vibrate. The medium, in turn, transfers vibrational energy to the ear, forcing the ear drum to vibrate. The human body's nervous system processes the vibration from the ear to the brain where the vibration is interpreted as sound.

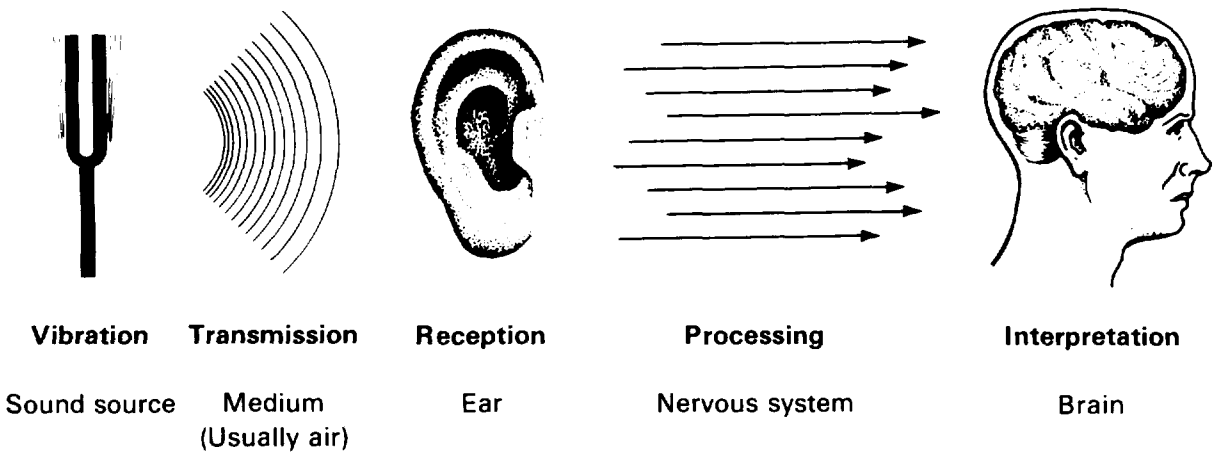


Figure 1.1: Nature of Sound.

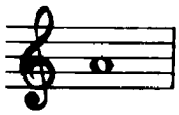
CHARACTERISTICS OF A MUSICAL SOUND

Pitch

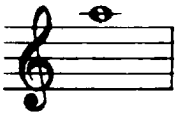
The number of sound waves per second produced by a sounding body is called *frequency*. Frequency is often expressed as the number of cycles per second (CPS) referred to as hertz (Hz). High frequencies are expressed in kilocycles or kilohertz (1 kHz = 1000 Hz).

When frequency of vibration is regular, it is called *pitch*. The pitch is higher when frequency is greater. When frequency of vibration is irregular, it is a sound source but is not pitched.

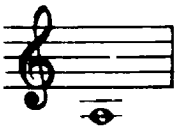
A regular vibration at 440 Hz (440 CPS) produces the pitch *A*.



Doubling the frequency (880 Hz) produces *A* an octave higher.



Halving the frequency (220 Hz) produces *A* an octave lower.



The approximate range of human hearing capacity is from 20 Hz to 16 kHz.

Intensity

The magnitude of force or energy of regular or irregular vibration is known as *intensity*. Intensity, musically referred to as volume, is determined by the amplitude of the vibration of the sound source. The sound is louder when amplitude is greater.

Frequency and amplitude (pitch and volume) may be graphically represented by a simple wave form.

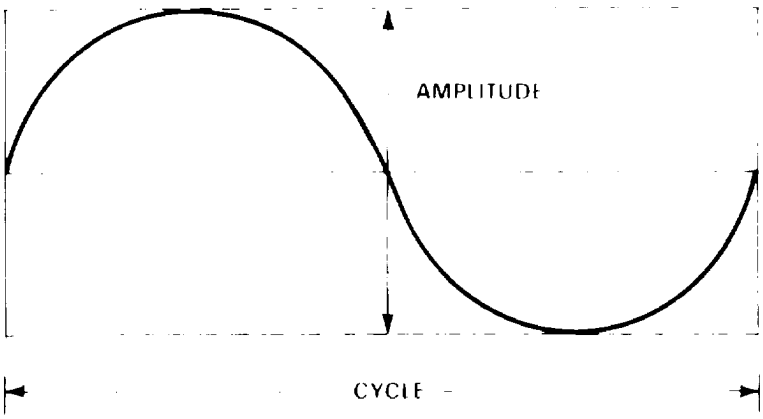
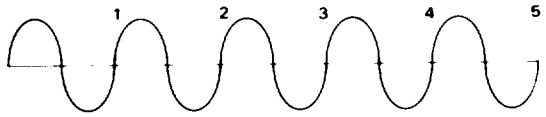
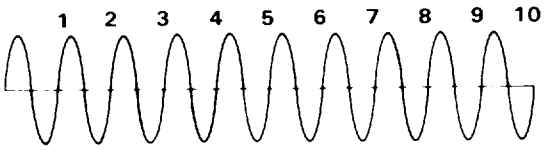


Figure 1.2: Single Cycle Wave Form.

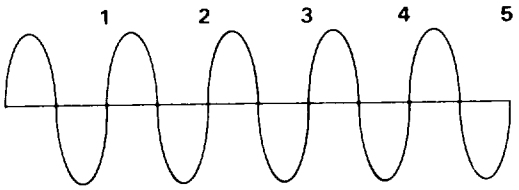
Frequency, the number of complete cycles within a given period of time, is represented horizontally. Amplitude is the displacement from center of the wave form and is represented vertically. Greater frequency indicates higher pitch; greater amplitude indicates greater volume.



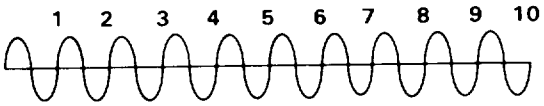
Basic Wave Form



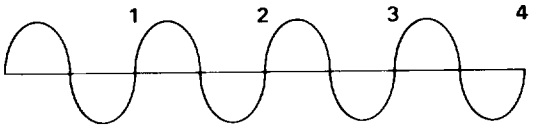
Greater Frequency
(higher pitch)
Same Amplitude
(same volume)



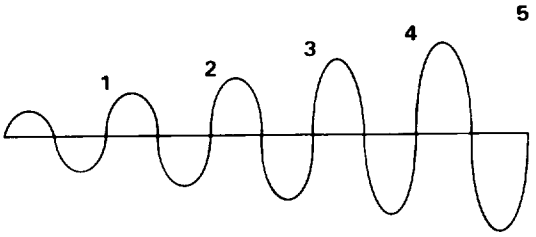
Same Frequency
(same pitch)
Greater Amplitude
(greater volume)



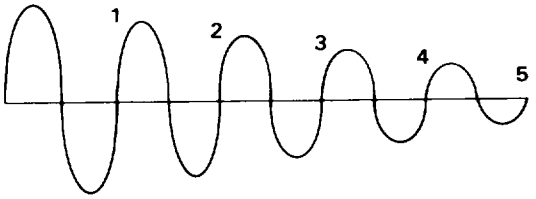
Greater Frequency
(higher pitch)
Lesser Amplitude
(less volume)



Lesser Frequency
(lower pitch)
Same Amplitude
(same volume)



Same Frequency
(same pitch)
Increasing Amplitude
(crescendo)



Same Frequency
(same pitch)
Decreasing Amplitude
(decrescendo)

Figure 1.3: Wave Form Representation of Frequency and Amplitude.

Duration

The length of time of vibration is called *duration.* Duration is the length of sound.

Timbre (ˈtam-bər or ˈtim-bər)

The distinctive tone or quality of a singing voice or a musical instrument is known as *timbre.* Sounds identical in pitch, intensity, and duration produced by different types of instruments are dissimilar and reveal a difference in timbre or tone quality.

Timbre is affected by:

method of sound production (bowed, blown, plucked, or struck)

physical nature of instrument (relative strength of overtones)

condition of instrument

individual performance characteristics

SUMMARY

Pitch _____ highness or lowness of the sound.

Intensity _____ volume of the sound.

Duration _____ length of the sound.

Timbre _____ quality of the sound.

CHAPTER 2
FUNDAMENTAL NOTATION

NOTATION OF PITCH

Pitch Nomenclature

Each line and space of the great staff (Figure 2.1) has a letter-name. In ascending order, the lines and spaces are named from *A* through *G*. After *G*, the seven-letter series repeats. A note placed on the staff takes the name of the line or space on which it is placed.

The *great staff* is a theoretical construction consisting of eleven lines and ten spaces with middle *C* as the middle or sixth line.

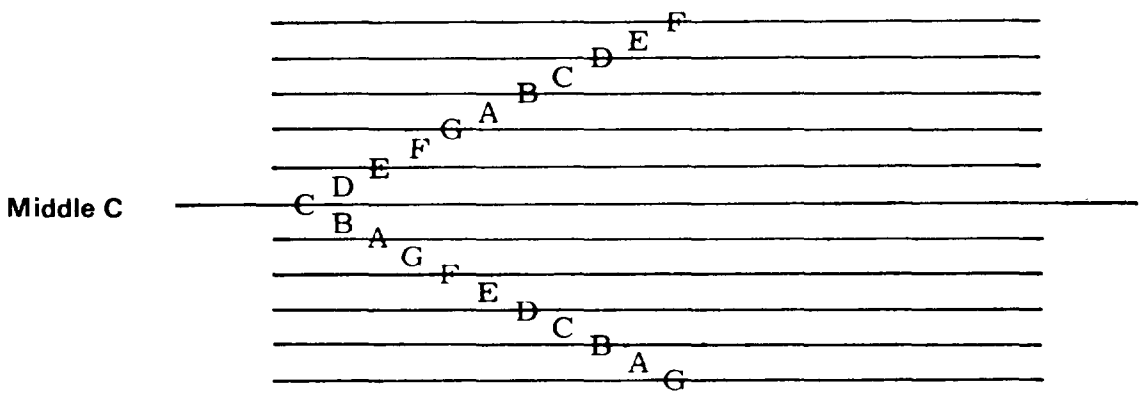


Figure 2.1: Great Staff.

The great staff is not used for the notation of music. Instead, a five-line staff is used. A symbol (clef sign) must be used to indicate which five lines of the great staff are to be used for the notation of pitch.

G, C, *and* F *Clefs*

The lower loop of the **G** clef sign encircles *G* above middle *C*.

Converging arms of the **C** clef sign designate middle *C*.

The two dots of the **F** clef sign designate the line passing between them as *F* below middle *C*.

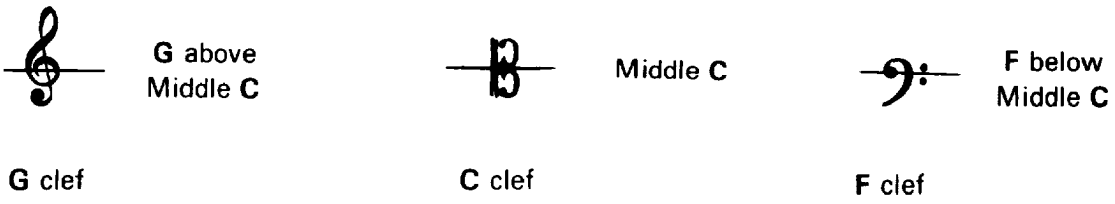


Figure 2.2: G, C, *and* F *Clefs.*

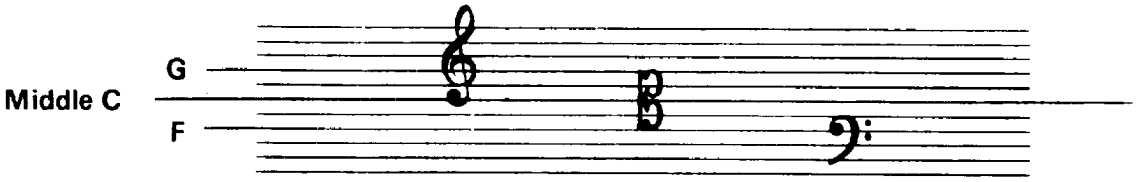


Figure 2.3: G, C, *and* F *Clefs on the Great Staff.*

Grand Staff/Treble and Bass Clefs

G clef is most commonly used to place *G* on the second line of a five-line staff. This clef is known as *treble clef.*

Figure 2.4: Treble Clef.

F clef is most commonly used to place *F* on the fourth line of a five-line staff. This clef is known as *bass clef.*

Figure 2.5: Bass Clef.

The treble and bass clefs, joined together, form the *grand staff* which is commonly used in keyboard music and scoring.

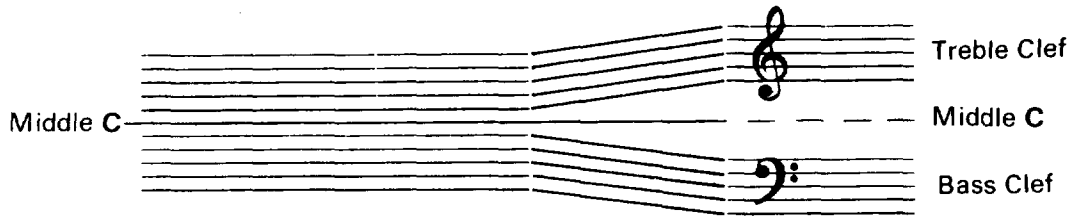


Figure 2.6: The Relationship between the Great Staff and Grand Staff.

Leger Lines

It is frequently necessary to write pitches above or below a five-line or grand staff. These temporary extensions above or below the staff are *leger lines.*

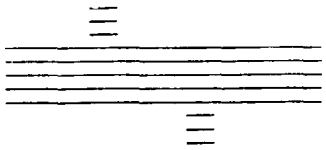


Figure 2.7: Leger Lines.

Keyboard

The keyboard may be used as a visual demonstrator for pitch relationships. Keyboard pitch nomenclature is similar to staff pitch nomenclature (Figure 2.8).

Note that the *black keys* are found in groups of two and three. Immediately to the left of each group of two black keys is found the pitch *C*. When ascending on the keyboard, the pitch names *A* through *G* are used, beginning again with the letter name *A* at the completion of the series.

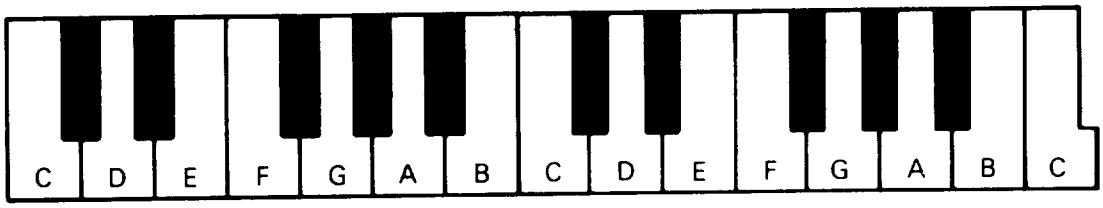


Figure 2.8: Keyboard.

Chromatic Signs

Pitches occurring 'between' letter names cannot be represented by letter names alone. Additional symbols are required for proper identification. These symbols, known as *chromatic signs,* are five in number.

Sharp	♯	Raises the pitch of the letter name a half step
Flat	♭	Lowers the pitch of the letter name a half step.
Double sharp	𝄪	Raises the pitch of the letter name two half steps.
Double Flat	𝄫	Lowers the pitch of the letter name two half steps.
Natural	♮	Cancels a previously used chromatic sign (including 𝄪 and 𝄫).

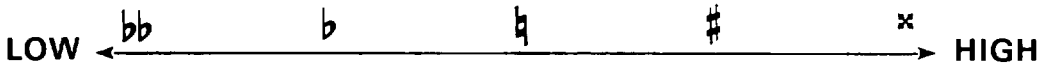
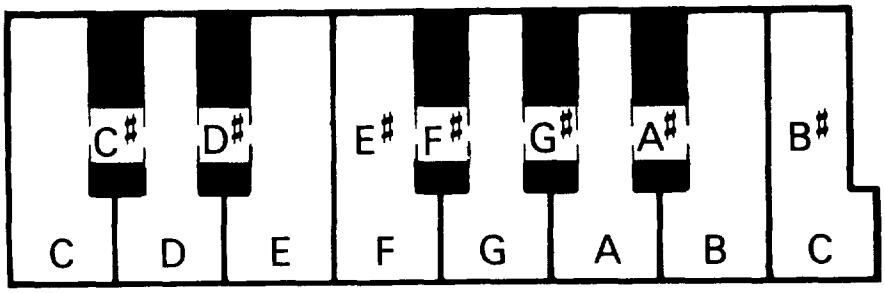
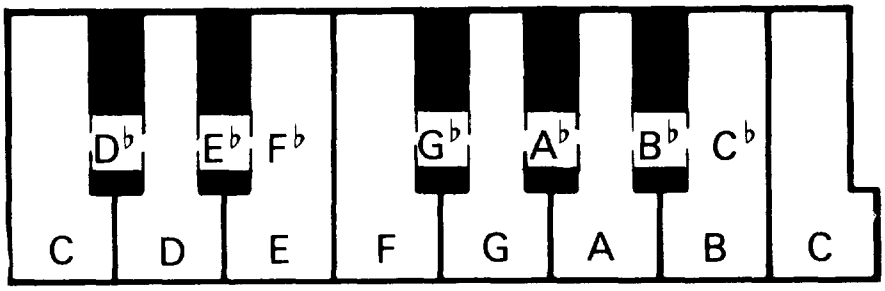


Figure 2.9: Chromatic Signs.

Any two adjacent keys on the keyboard sound a *half step* or *semitone* apart. When expressing the pitches occurring 'between' the letter names as sharps or flats, the pitches are expressed as *chromatic alterations* of the letter names.



Sharp Alterations



Flat Alterations

Figure 2.10: Chromatic Pitch Names.

Enharmonic Pitches

A single pitch may have more than one name. Pitches that have different names but sound the same are *enharmonic pitches.*

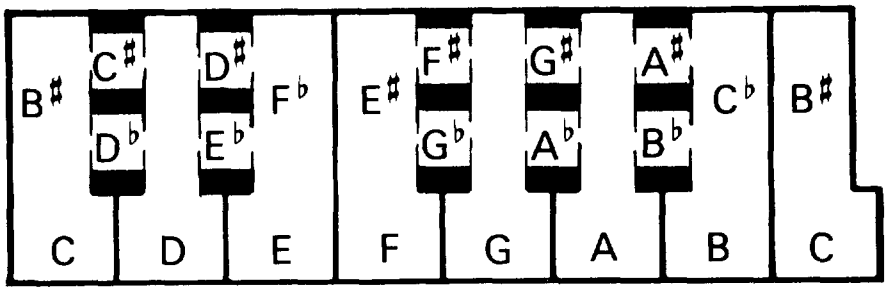


Figure 2.11: Enharmonic Pitches.

Adding double sharps and double flats increases the number of enharmonic pitches.

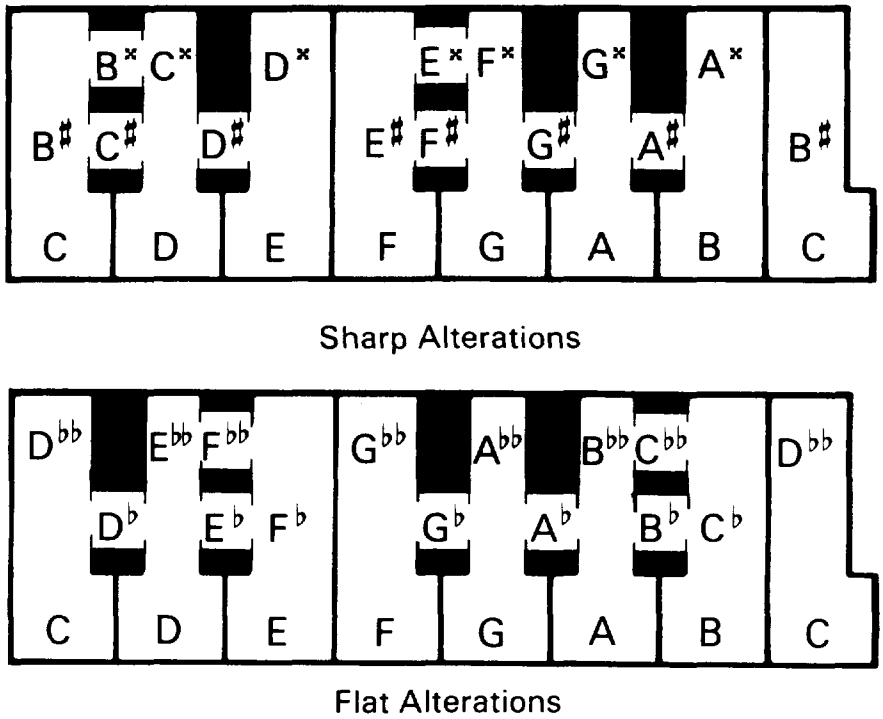


Figure 2.12: Enharmonic Pitches with Double Sharps and Double Flats.

Pitch Nomenclature in the Great Staff

Octave designators must be used to distinguish between identical pitch names in different octaves. This is one way a pitch may be represented precisely without staff notation or reference to the keyboard. Middle *C is* $\mathbf{c}^1$, the center line of the great staff and the imaginary line between treble and bass clefs in the grand staff. Middle *C* or $\mathbf{c}^1$ is the *C* closest to the center of the standard piano keyboard.

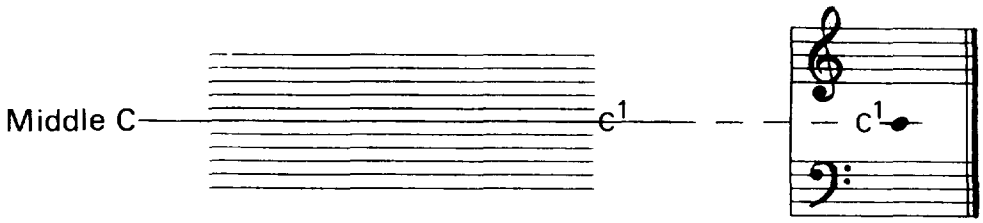


Figure 2.13: $\mathbf{c}^1$ *in Great and Grand Staves.*

From C^{bb} immediately below c^1 to B^{x} above c^1, all pitches spelled within the octave are designated *first octave* and are identified by lower case letters and the number 1.

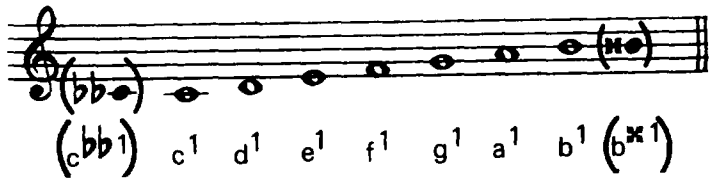


Figure 2.14: First Octave.

The octave immediately above the first octave is designated *second octave* and is identified by lower case letters and the number 2.

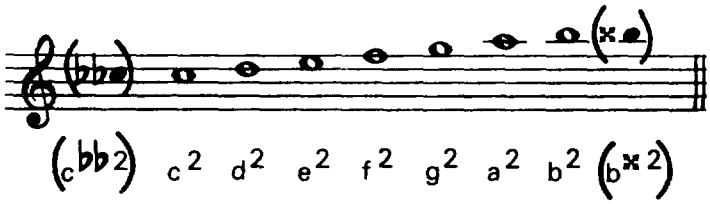


Figure 2.15: Second Octave.

The octaves are numbered consecutively in higher octaves including a *third octave* and *fourth octave.* The highest pitch on the piano keyboard is c^5.

The octave immediately below the first octave is designated *small octave* and is identified by lower case letters.

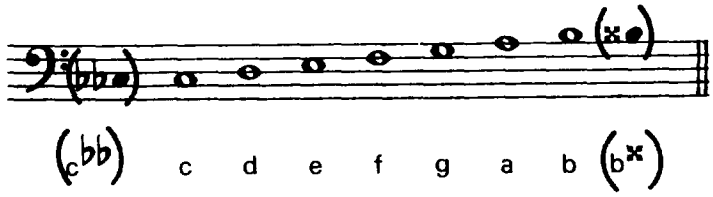


Figure 2.16: Small Octave.

The octave immediately below the small octave is designated *Great Octave* and is identified by capital letters. Below the Great Octave is the *Contra Octave* where pitches are identified by two capital letters (**BB♭** or **AA♯**) **and the** *Subcontra Octave* where pitches are identified by three capital letters (**BBB♭**). The lowest note on the piano keyboard is Subcontra *A* (**AAA**).

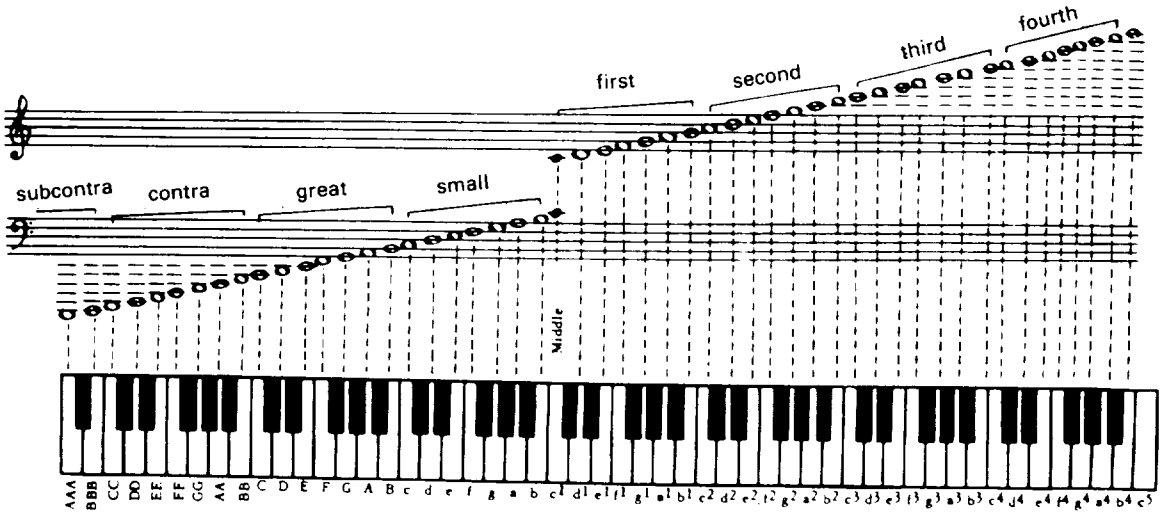


Figure 2.17: Grand Staff and Keyboard Pitch Nomenclature.

Single-Staff Clefs

Treble and bass clefs are used more frequently than any other five-line clefs, but other clefs are used. Their ranges have developed from the need to bring a specific range within the compass of the staff.

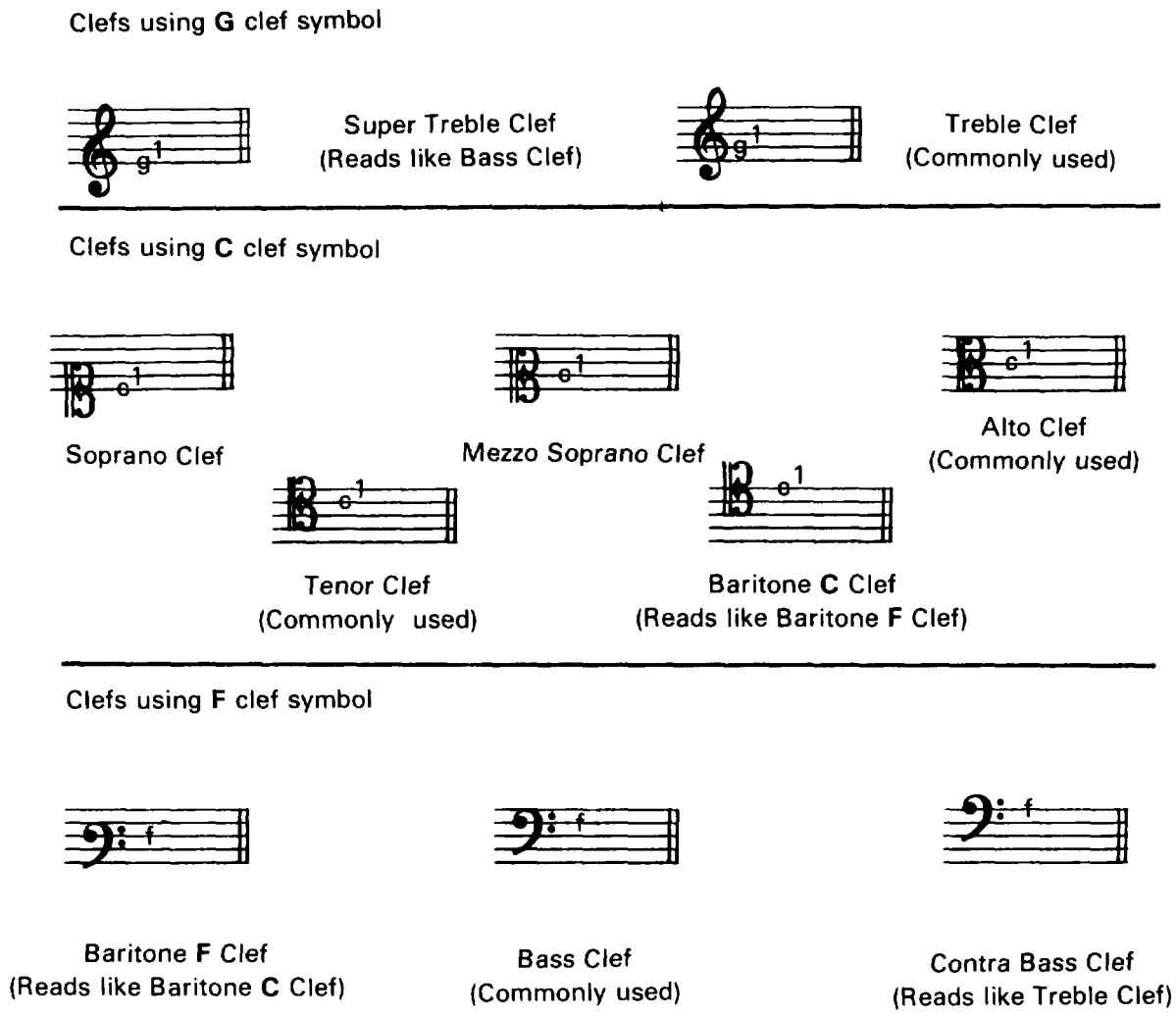


Figure 2.18: Single-Staff Clefs.

NOTATION OF DURATION

Note and Rest Values

Duration of sound is the building block for the creation of rhythm. Rhythm is composed of two elements: *sound* and *silence*. Notational symbols for sounds are called *notes*. Notational symbols for silences are called *rests*. Each note value and symbol has a corresponding rest value and symbol. These values are expressed arithmetically as fractions. The symbols have characteristics in common and are generally a single notational alteration from an adjacent value.

NOTES (sound)	**VALUE/NAME**	**RESTS** (silence)
	$\frac{1}{1}$ /Whole	*
	$\frac{1}{2}$ /Half	**
	$\frac{1}{4}$ /Quarter	or or
	$\frac{1}{8}$ /Eighth	
	$\frac{1}{16}$ /Sixteenth	
	$\frac{1}{32}$ /Thirty-second	
	$\frac{1}{64}$ /Sixty-fourth	

Less Frequently Used:

	$\frac{2}{1}$ /Double whole	***

*Hangs from fourth line.

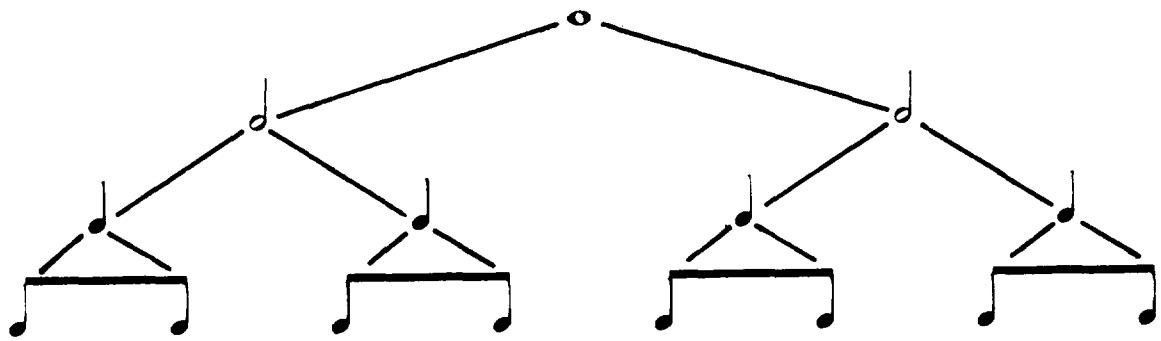
**Sits on third line.

***Fills space between third and fourth lines.

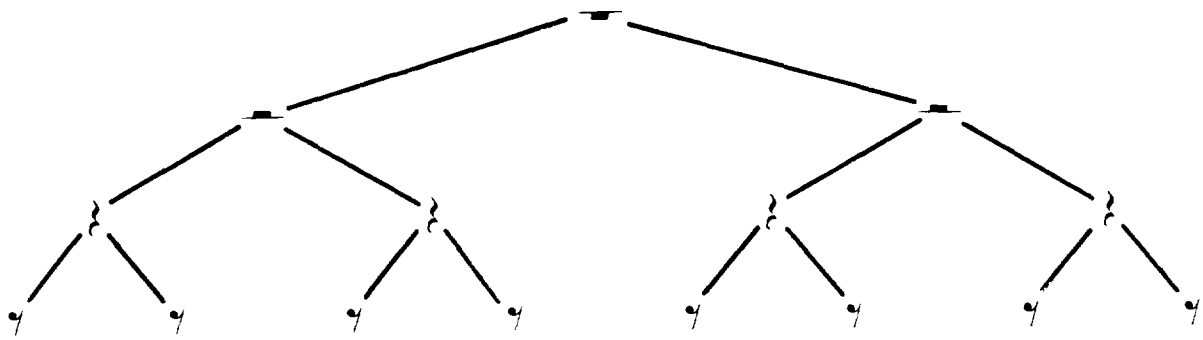
Figure 2.19: Note and Rest Values and Symbols.

Notes and rests indicate the creation of sound and silence to form rhythm. When specific pitches are desired, they are placed in a given clef to indicate the pitch.

Note and rest symbols do not indicate actual duration of time until tempo and metric grouping are indicated. They do indicate relative duration as expressed by fractional names. A given note or rest value is equal in duration to two notes or rests of the next smaller value.



Note Equivalents



Rest Equivalents

Figure 2.20: Note and Rest Equivalents.

Tied Notes

Since only multiples of two are possible with basic note and rest symbols, devices are used to extend duration. One symbol used to extend the duration of a note is the tie. A *tie* is a curved line joining two or more successive notes of

identical pitch. Tied notes sound as one note. Ties are not used with rests because rest values are cumulative.

Figure 2.21: Tied Notes.

Dotted Notes and Rests

Another symbol used to extend the duration of a note or rest is the dot. A *dot* placed after a note or rest increases duration by one half the original value. A dotted note or rest has a value equal to three of the next smaller value.

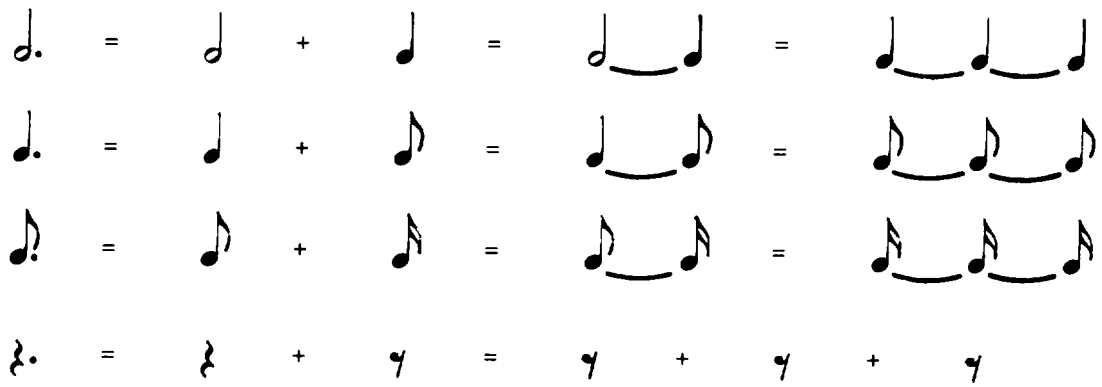


Figure 2.22: Dotted Notes and Rests.

Note and rest duration may be further increased by additional dots placed after the original dot. Each additional dot increases the duration of the note or rest by one half the value of the previous dot.

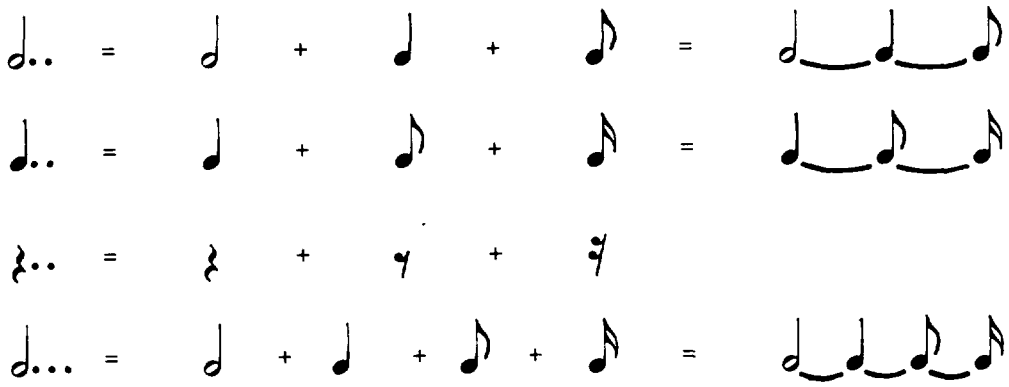


Figure 2.23: Multiple Dotted Notes.

CHAPTER 3

METER

Music exists in time. Sounds, interspersed with silence, occur with specific duration and are replaced by more sound or silence of the same or different duration. These durations of sound and silence must be measured before it is possible to notate them.

THE BEAT

The standard of measurement in most musical time is the beat. Regularly recurring pulsations in music are known as *beats*. Beats in music are not of fixed duration; they are of longer or shorter duration as determined by the character of the music. The slower the music, the longer the duration of the beat; the faster the music, the shorter the duration of the beat.

Tempo refers to the rate of progression of beats and beat combinations. Slow tempi are comprised of beats of long duration; fast tempi are comprised of beats of short duration.

Beat Groupings

In most music, certain beats tend to assume more relative importance than others. These stronger, more accented beats may recur with regularity, establishing groups of two, three, or four beats. This recurring pattern of accented and unaccented pulsations is known as *meter.*

The term *metrical stress* describes these beat groupings. If the meter establishes groups of two, the metrical stress is *duple;* if three, *triple;* and if four, *quadruple.*

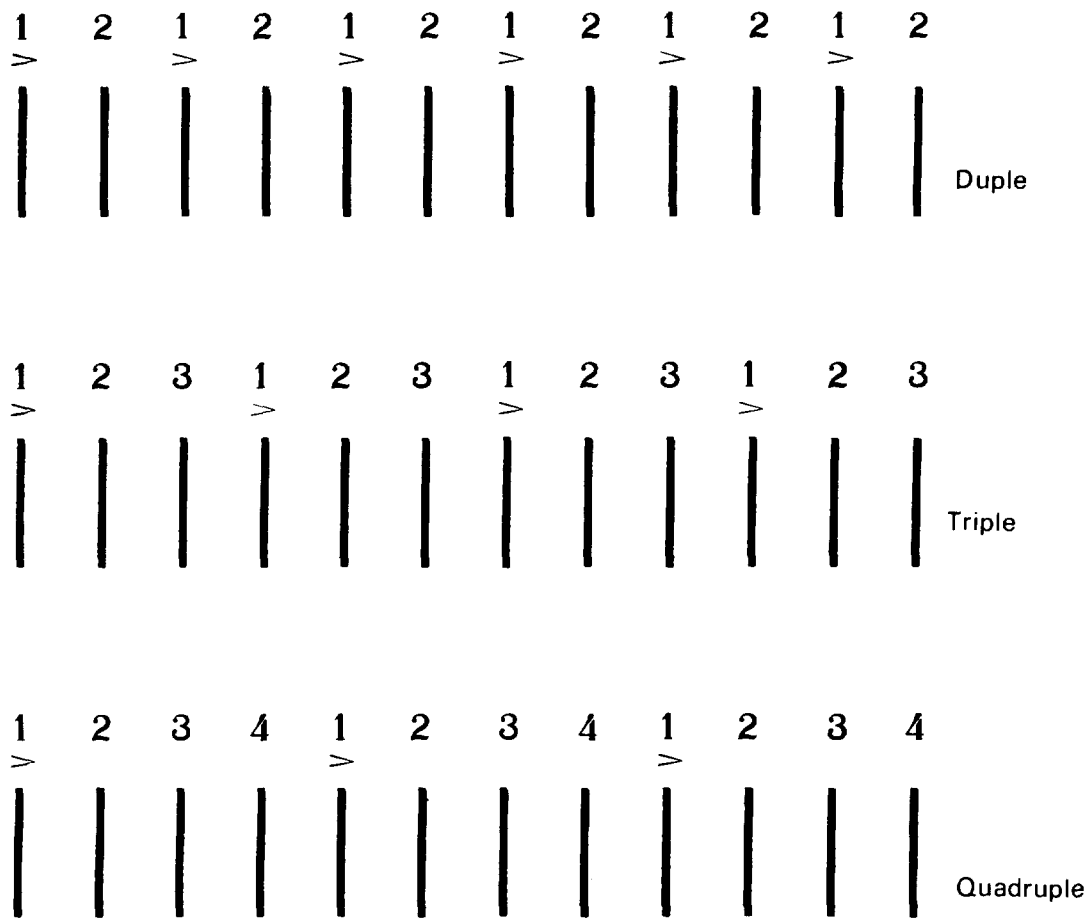


Figure 3.1: Beat Groupings.

Divided Beats

In addition to grouping of beats, most music has beats regularly divisible by two or three. *Metrical stress* also describes the division of the beat. When the beat is normally divisible by two, the metrical stress is *simple*. When the beat is normally divisible by three, the metrical stress is *compound*.

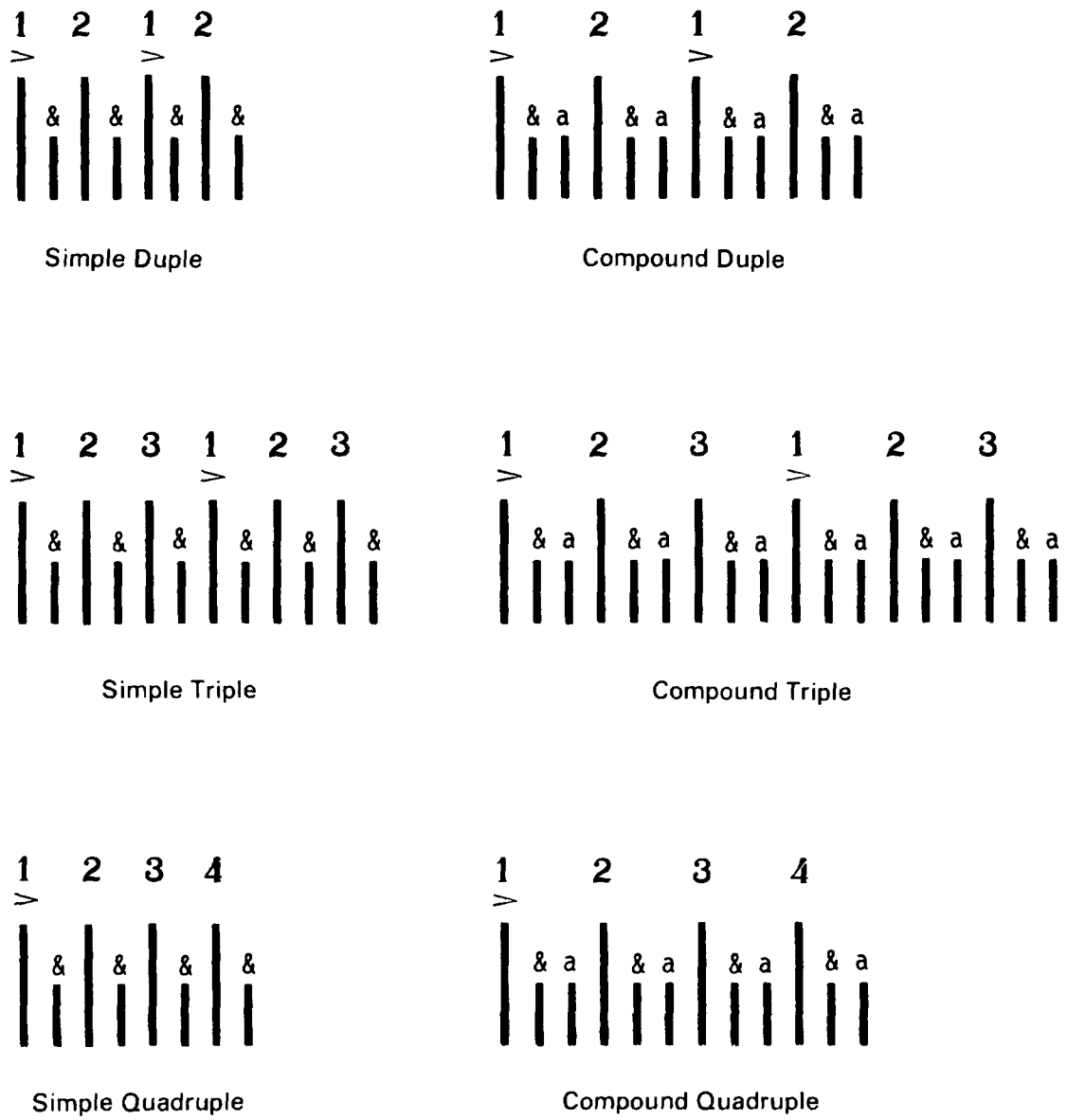


Figure 3.2: Division of Beat.

METER OR TIME SIGNATURE

The *meter or time signature* is a musical symbol which indicates metrical stress (meter) and unit of beat (notation). The unit of beat is the value that gets one beat. The meter or time signature is represented by two arabic numerals arranged vertically at the beginning of a staff or rhythm line (single line used for notating rhythm). The upper numeral indicates the metrical stress; the lower numeral indicates the unit of beat or division of beat.

In notation, the stronger, more accented beat in a beat grouping is indicated by placing a *bar line* vertically on a staff or through a rhythm line. The bar line precedes the note that begins the beat group. The space between any two adjacent bar lines is known as a *measure.* The word *bar* is commonly used to mean measure.

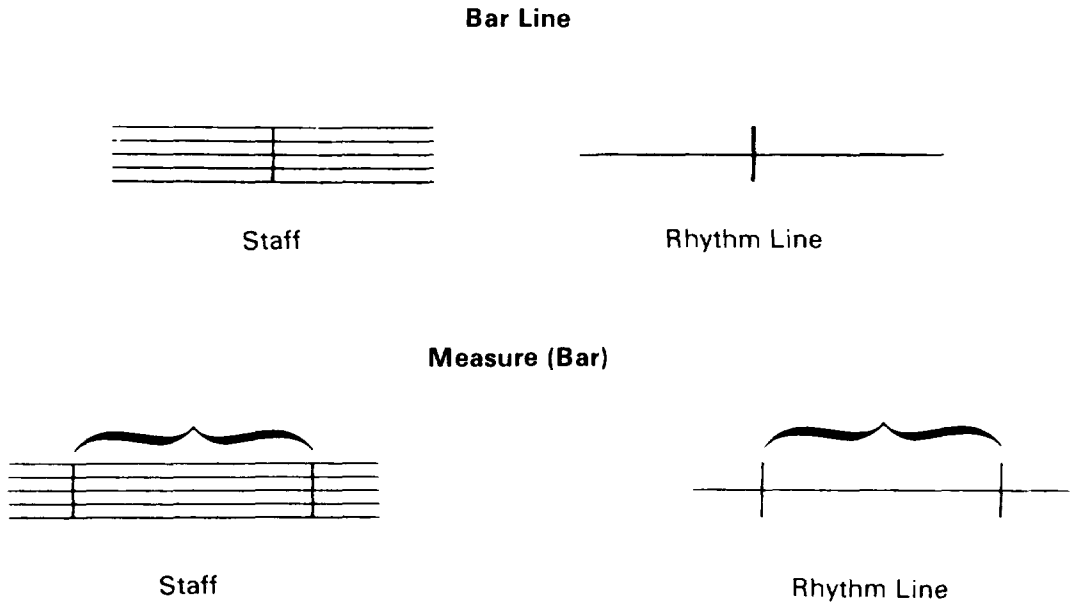


Figure 3.3: Bar Lines and Measures.

Simple Time Signatures

Any note divisible by two may be used as the unit of beat in *simple time.* Since unaltered note and rest values are normally divisible by two, any undotted note, except the sixty-fourth, may be used as the unit of beat (dividing the sixty-fourth is impractical). The lower numeral in a time signature is always 1, 2, 4, 8, 16 or 32, corresponding to the note value/name, and specifies the unit of beat. The most commonly used numerals, in order of frequency, are: 4, 2, 8, and 16. Duple, triple, or quadruple simple metrical stress is indicated by an upper numeral in a time signature of 2, 3, or 4 respectively.

Unit of Beat	Divided Beat	Duple	Triple	Quadruple
𝅝	𝅗𝅥 𝅗𝅥	2/1	3/1	4/1
𝅗𝅥	𝅘𝅥 𝅘𝅥	2/2 (¢)	3/2	4/2
𝅘𝅥	𝅘𝅥𝅮 𝅘𝅥𝅮	2/4	3/4	4/4 (C)
𝅘𝅥𝅮	𝅘𝅥𝅯 𝅘𝅥𝅮	2/8	3/8	4/8
𝅘𝅥𝅯	𝅘𝅥𝅰 𝅘𝅥𝅮	2/16	3/16	4/16
𝅘𝅥𝅰	𝅘𝅥𝅱 𝅘𝅥𝅮	2/32	3/32	4/32

Figure 3.4: Simple Time Signatures.

Note that figure 3.4 lists two symbols (C and ¢) as abbreviations for simple time signatures. The symbol C, called *common time,* functions as 4/4. The symbol ¢, called *cut time* or *alla breve* (according to the breve or half note), functions as 2/2.

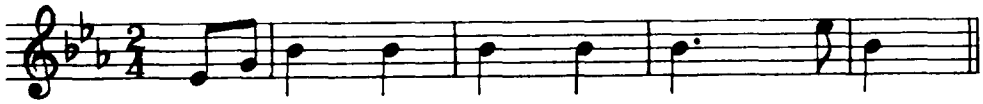


Figure 3.5: Simple Time Example.

In figure 3.5, the 2 indicates that the music is in simple duple time with each beat divisible by two. The 4 indicates that the quarter note is the unit of beat with the division of beat represented by eighth notes.

Compound Time Signatures

Any note divisible by three may be used as the unit of beat in *compound time.* Since dotted note and rest values are normally divisible by three, any dotted note, except the dotted sixty-fourth, may be used as the unit of beat (dividing the dotted sixty-fourth is impractical). In compound time, the lower numeral of a time signature will always be 2, 4, 8, 16, 32 or 64, corresponding to the note value/name. These numerals usually specify the division of beat. The unit of beat is derived by finding the dotted note value that is equal to three of the notes indicated by the lower numeral. The most commonly used numerals, in order of frequency, are: 8, 4, 2, and 16. Duple, triple or quadruple metrical stress is indicated by an upper numeral in a time signature of 6 (2 x 3 divisions of beat), 9 (3 x 3 divisions of beat), or 12 (4 x 3 divisions of beat) respectively.

Unit of Beat	Divided Beat	Duple	Triple	Quadruple
𝅝.	𝅗𝅥 𝅗𝅥 𝅗𝅥	6 2	9 2	12 2
𝅗𝅥.	♩ ♩ ♩	6 4	9 4	12 4
♩.	♩ ♩ ♩	6 8	9 8	12 8
♩𝅘𝅥𝅯	♩ ♩ ♩	6 16	9 16	12 16
♩𝅘𝅥𝅰	♩ ♩ ♩	6 32	9 32	12 32
♩𝅘𝅥𝅱	♩ ♩ ♩	6 64	9 64	12 64

Figure 3.6: Compound Time Signatures.

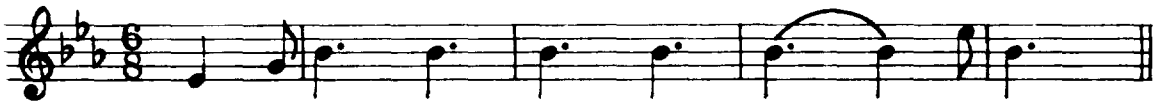


Figure 3.7: Compound Time Example.

In figure 3.7, the 6 indicates that the music is in compound duple time with each beat divisible into three parts. The 8 indicates that the eighth note is the division of beat with the unit of beat represented by the dotted quarter.

Some contemporary composers indicate compound time signatures with the actual number of beats as the upper numeral and a note value below.

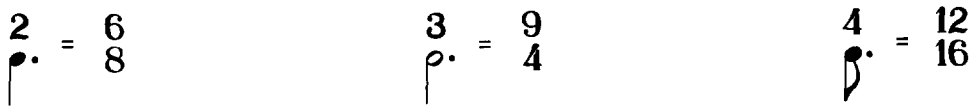


Figure 3.8: Contemporary Compound Examples.

COMPOSITE METER

When music is composed of beats of unequal beat lengths, the metrical stress is *composite* or *complex*. The beats in composite meters will be divisible by two or three with the divided beats having the same duration.

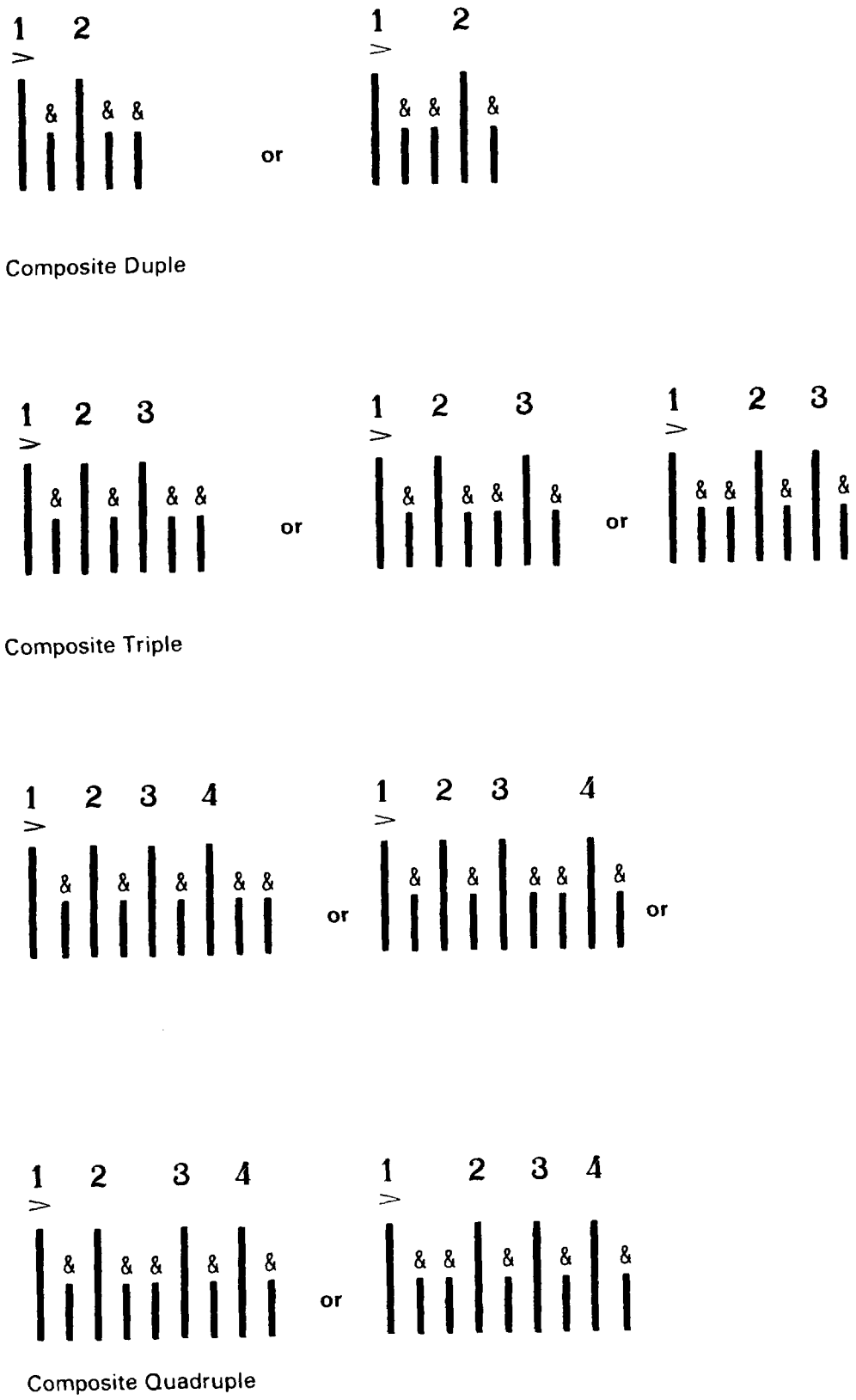


Figure 3.9: Composite Division of Beat.

Composite Time Signatures

Notes divisible by two and three are required for the representation of the beat in *composite time.* The unit of beat will be represented by undotted and dotted notes of the same value. Composite time signatures may be notated in three ways:

the lower numeral as the divided beat and the upper numeral as the sum of divided beats in the measure, **or**

the lower numeral as the unit of beat and the upper numeral as a mixed numeral, **or**

the lower numeral as the divided beat and the upper numerals as the beat composites.

Meter Signatures	Unit of Beat	Divided Beat	Metrical Stress
$\frac{5}{4}$ $\frac{2\frac{1}{2}}{2}$ $\frac{2+3}{4}$ $\frac{3+2}{4}$	𝅗𝅥 & 𝅗𝅥.	♩♩ & ♩♩♩	Composite Duple
$\frac{7}{8}$ $\frac{3\frac{1}{2}}{4}$ $\frac{2+2+3}{8}$ $\frac{2+3+2}{8}$ $\frac{3+2+2}{8}$	♩ & ♩.	♫ & ♫♪	Composite Triple
$\frac{9}{8}$ $\frac{4\frac{1}{2}}{4}$ $\frac{2+2+2+3}{8}$ $\frac{2+2+3+2}{8}$ $\frac{3+2+2+2}{8}$ $\frac{2+3+2+2}{8}$	♩ & ♩.	♫ & ♫♪	Composite Quadruple

Figure 3.10: Composite Time Signatures.

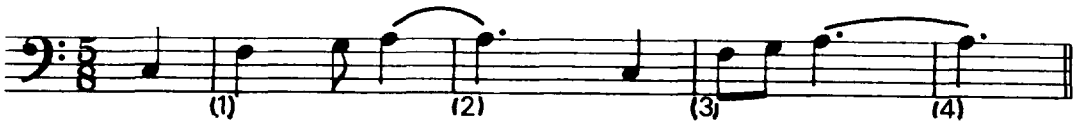


Figure 3.11: Composite Time Example.

In figure 3.11, the 5 indicates that the music is in composite duple time with one beat divisible into two parts and the other divisible into three parts (2+3 in bar 3 and 3+2 in bars 1 & 2). The 8 indicates the eighth note is the division of beat with unit of beat represented by the quarter and dotted quarter.

METRICAL STRESS EXCEPTIONS

If tempo is fast, a time signature with an upper numeral of 3 may call for a count of one beat per measure, which may require compound interpretation. This metrical stress is referred to as *compound single.*

If tempo is slow, a time signature with an upper numeral of 6, 9, or 12 may call for a count of 6, 9, or 12 beats per measure, and may require simple interpretation.

If tempo is slow, a time signature with an upper numeral of 2, 3, or 4 may call for a count of 4, 6, or 8 beats per measure.

A time signature with an upper numeral of 7, 10, 14, 15, 21, etc. may require simple or compound interpretation.

A time signature with an upper numeral of 2, 3, 4, 6, 8, 9, or 12 may require composite interpretation.

CHAPTER 4

RHYTHM

Rhythm is the occurrence of varying lengths of sound and silence. *Meter* is the pattern of beat groupings and the nature of the divided beat. Rhythm does not always coincide with meter. The two must not be confused.

The sum of note and rest values in each measure equals the number of beats indicated by the time signature. Relationships between rhythm and meter can be shown in two categories: *regular* rhythm and *irregular* rhythm.

REGULAR RHYTHM

Regular rhythm occurs:

when long notes coincide with strong beats and shorter notes (when present) occur as non-syncopated divisions of weak beats; **or**

when repeating non-syncopated divisions occur on all beats.

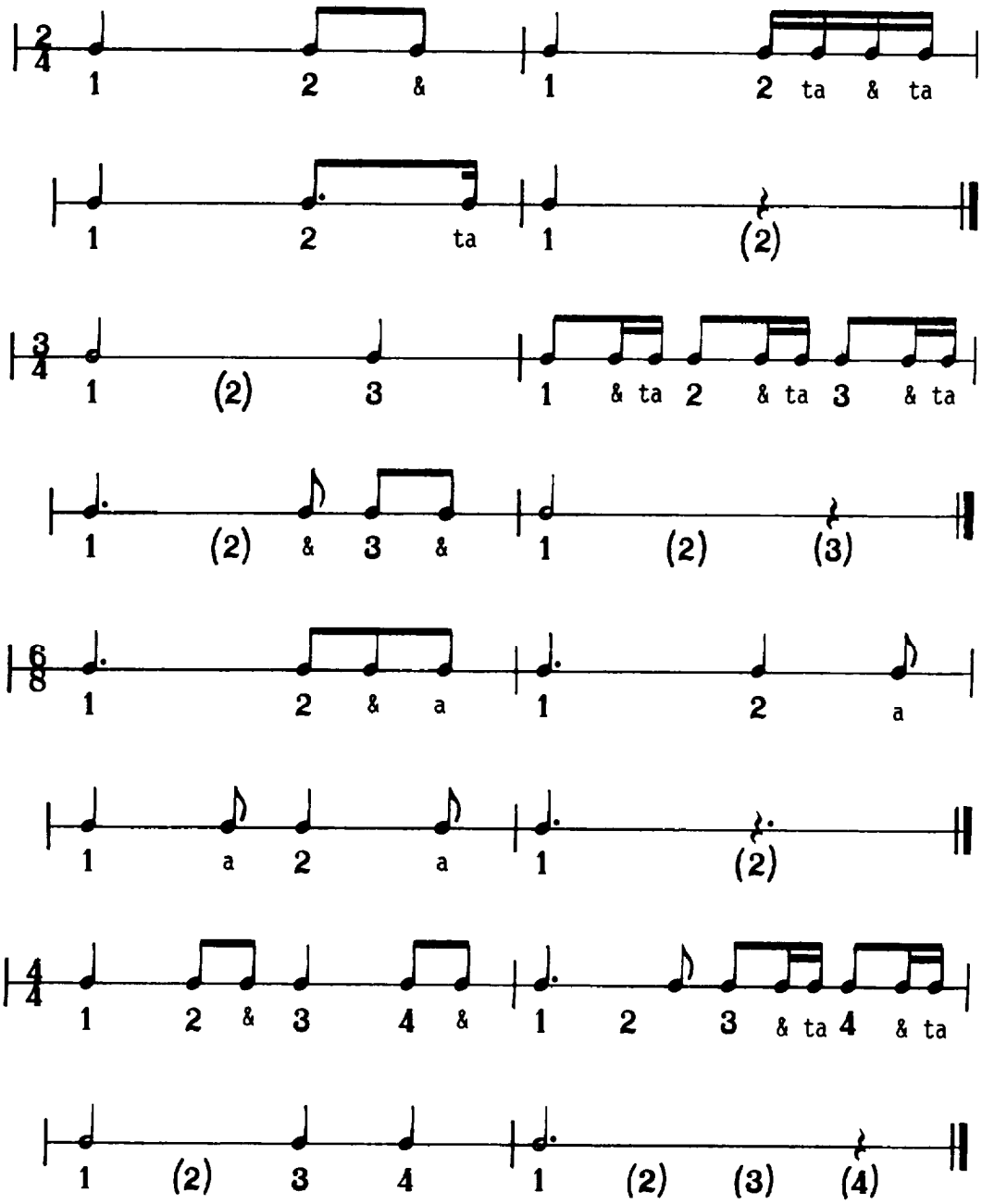


Figure 4.1: Regular Rhythm.

Uniform rhythm is regular rhythm that occurs:

when the measure is filled by one note; **or**

when the measure is filled by two equal notes in quadruple meter; **or**

when the measure is divided equally into units of beats; **or**

when the measure is divided into equal divisions of the unit of beat.

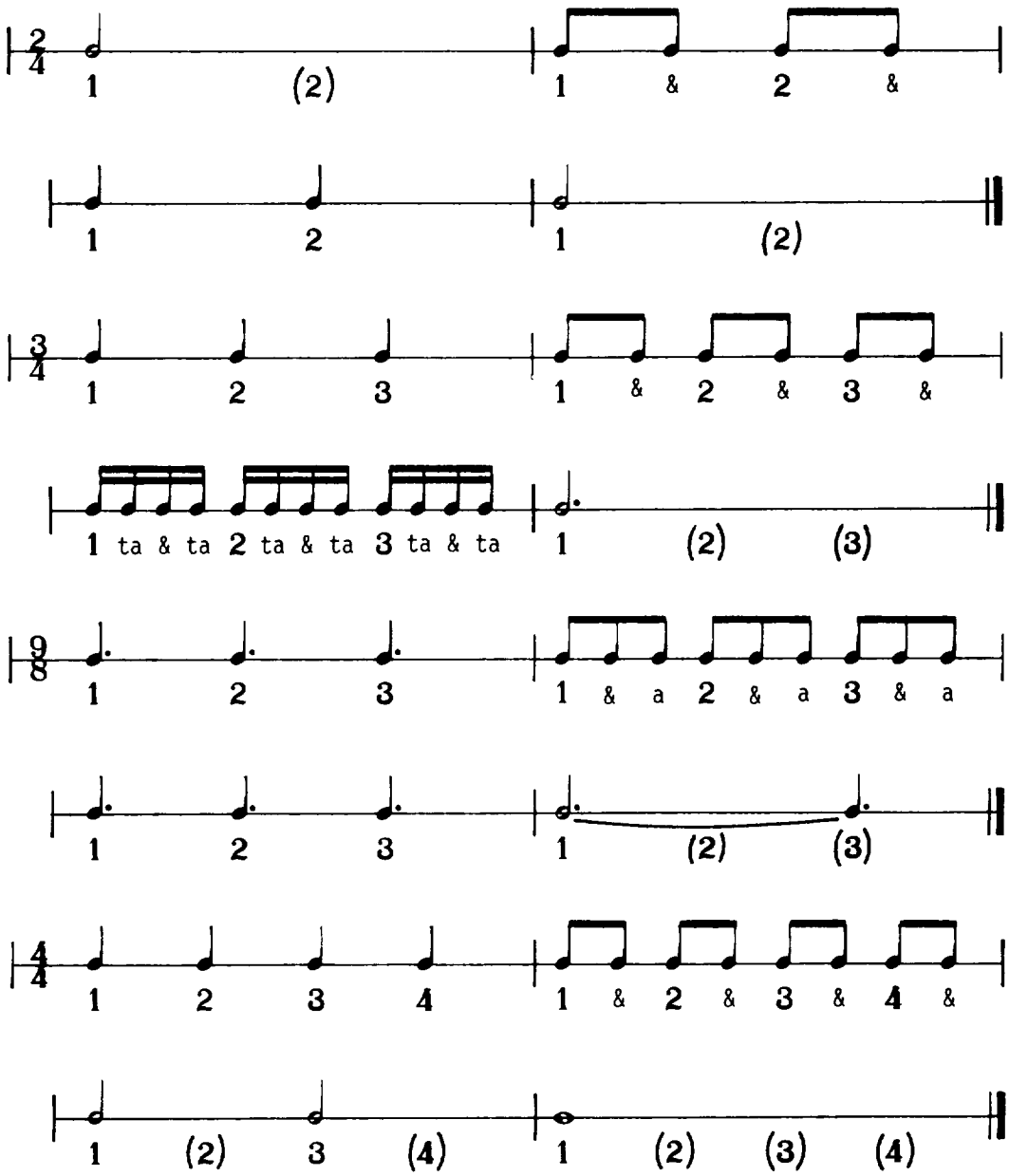


Figure 4.2: Uniform Rhythm.

All uniform rhythms are regular but not all regular rhythms are uniform.

IRREGULAR RHYTHM

Irregular rhythm occurs:

when long notes coincide with weak beats or weak parts of beats; **or**

when the rhythm has been syncopated.

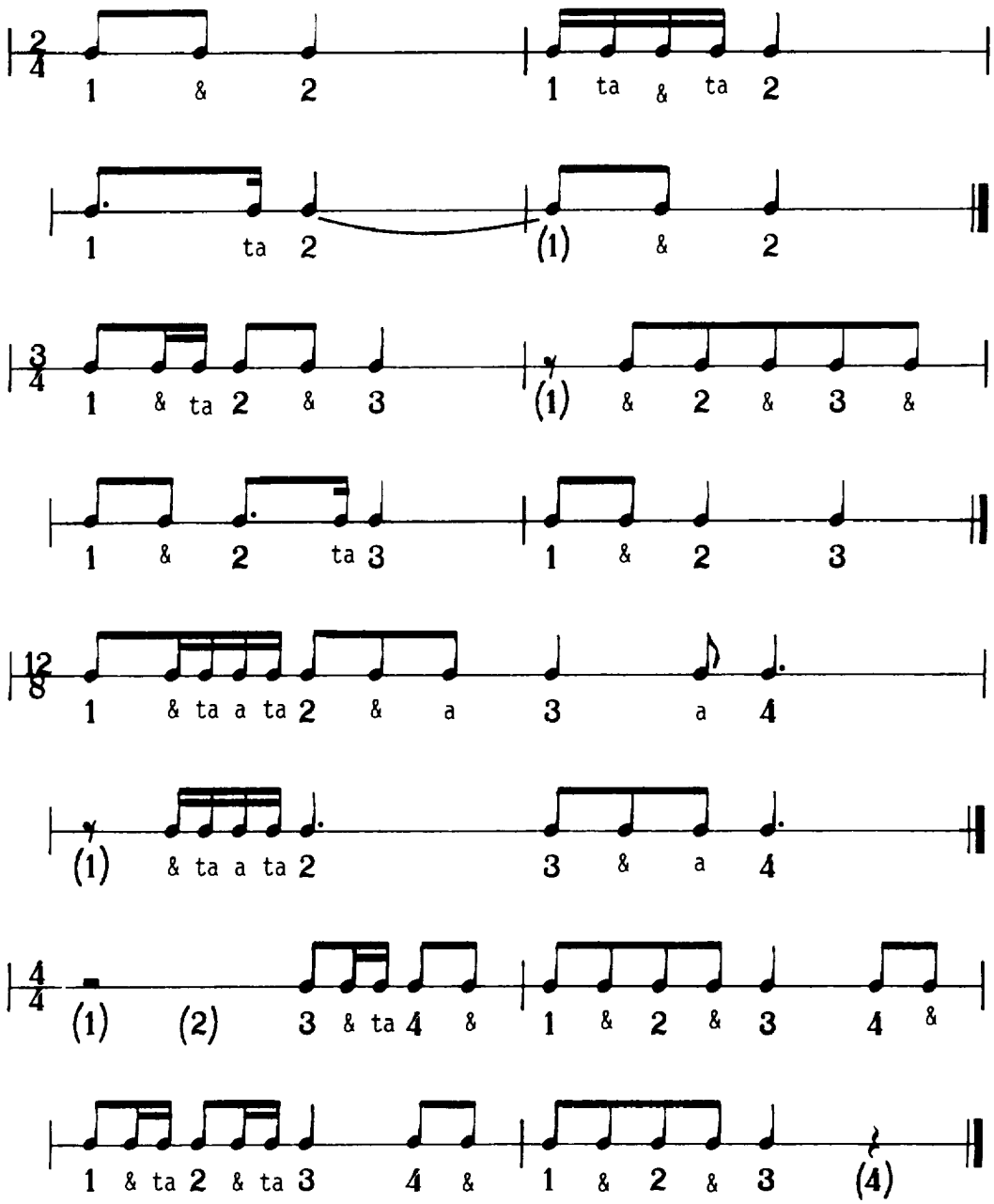


Figure 4.3: Irregular Rhythm.

Syncopated rhythm occurs when notes alter the normal or expected pattern of rhythm, accent, or meter by appearing on weak beats or weak parts of beats. Syncopation may be created:

when a weak beat or weak part of a beat is accented; **or**

when a weak beat or weak part of a beat is tied to the strong beat which follows it; **or**

when a rest occurs on a beat after a note on a weak beat or when a rest occurs on any beat after a weak part of a beat.

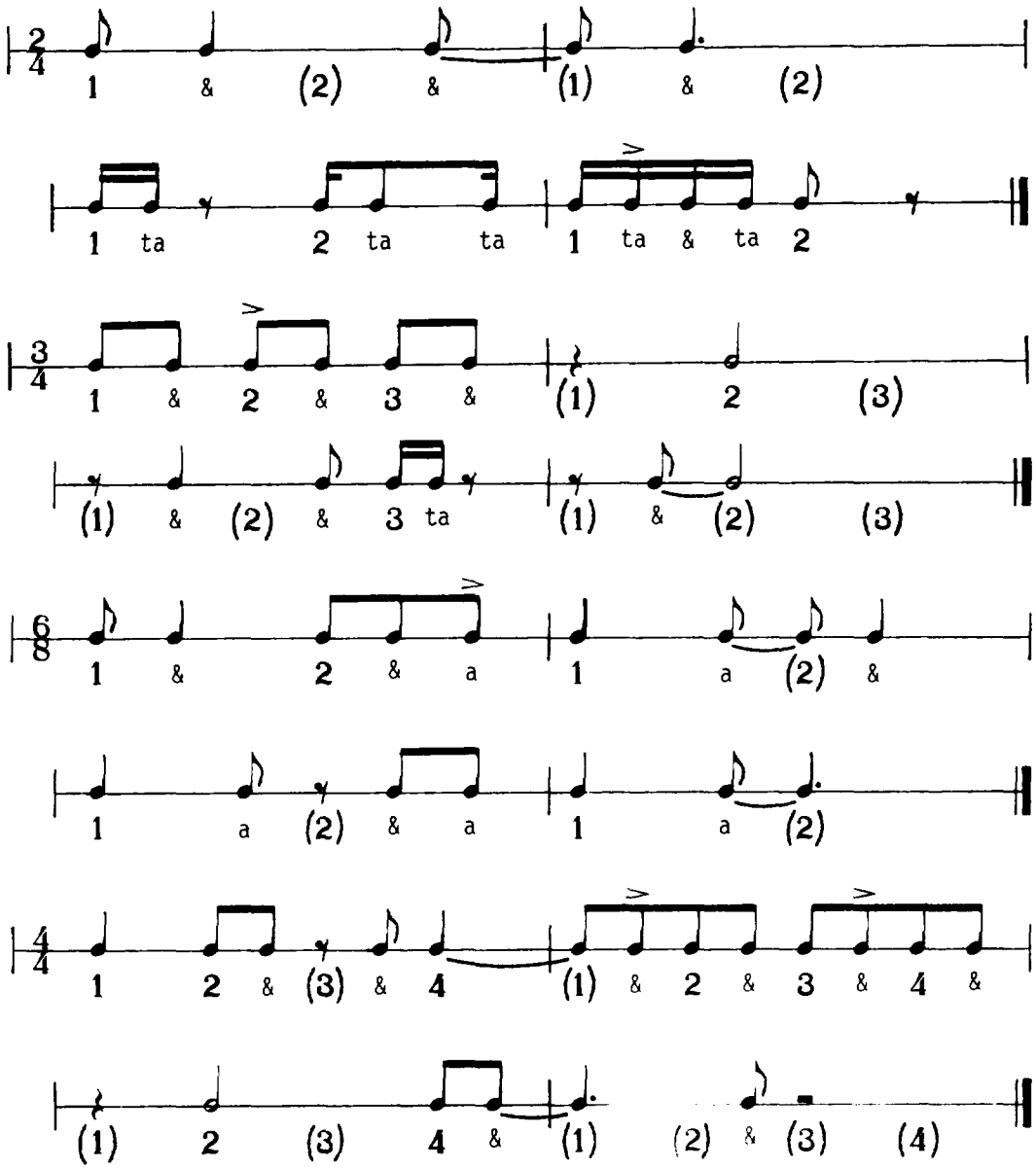


Figure 4.4: Syncopated Rhythm.

All syncopated rhythms are irregular, but not all irregular rhythms are syncopated.

RHYTHMIC PHRASE INITIATION AND COMPLETION

The first beat in a measure is called the *thesis.* A phrase (a short musical thought, normally two to four measures long) that begins on the first beat has a *thetic* beginning; the phrase is said to begin *thetically.* The thesis is also called the *down-beat.* Down-beat derives its name from the downward stroke of a conductor indicating the principally accented note of the measure.

An unaccented beat in a measure is called an *arsis.* An *anacrusis,* also called *upbeat* or *pick-up,* consists of one or more notes that precede the first down-beat of a musical phrase. Normally, when a composition begins with an anacrusis, the last measure contains only the rhythmic values that will complete the first measure. However, some composers and arrangers end their compositions with a complete measure regardless of the material contained in the first (incomplete) measure.

When the last attack of a phrase coincides with the thesis, the ending is called a *masculine ending.* If the last attack does not coincide with the thesis, the ending is called a *feminine ending.*

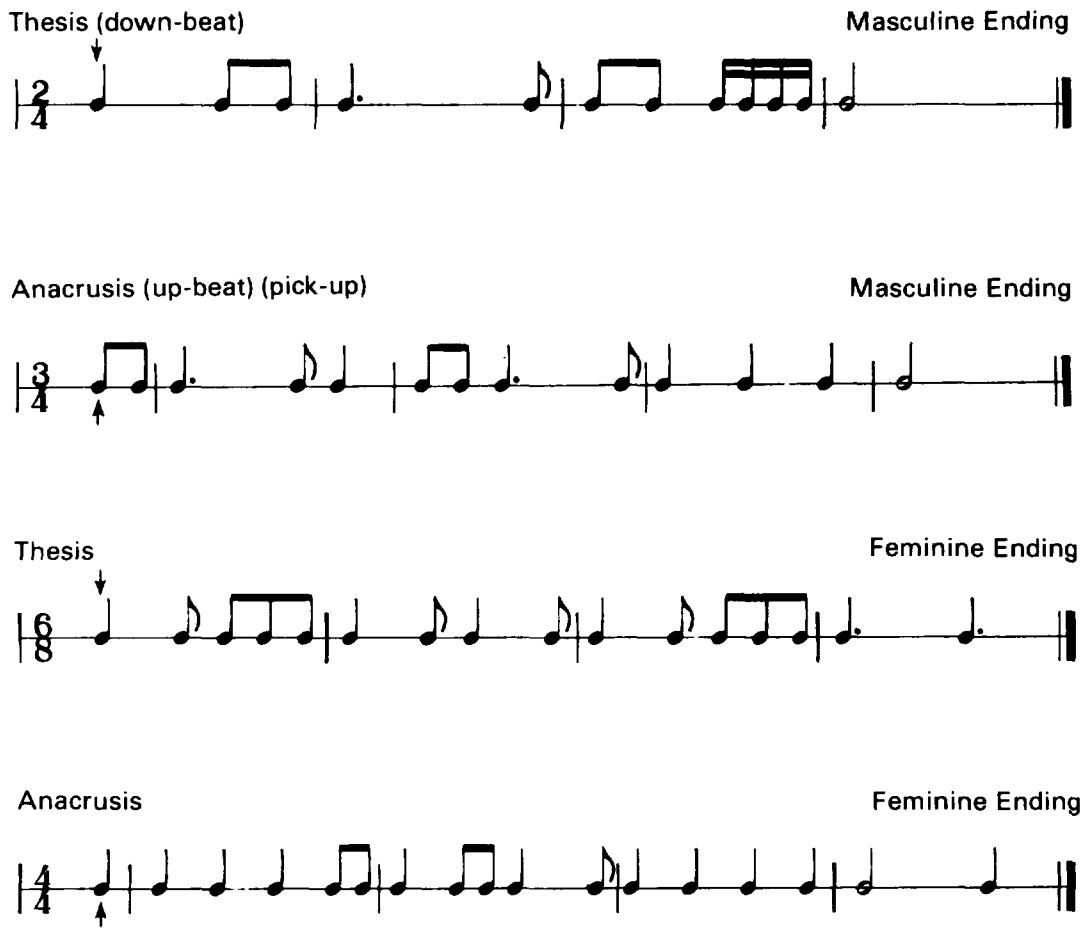


Figure 4.5: Rhythmic Phrase Initiation and Completion.

RELATED METERS

Related meters have the same metrical stress but a different unit of beat. In related meters, the upper time signature numeral is the same but the lower time signature numeral is different. Therefore, it is possible to notate the same rhythm in more than one time signature; the notation, which differs, reflects a choice of the unit of beat.

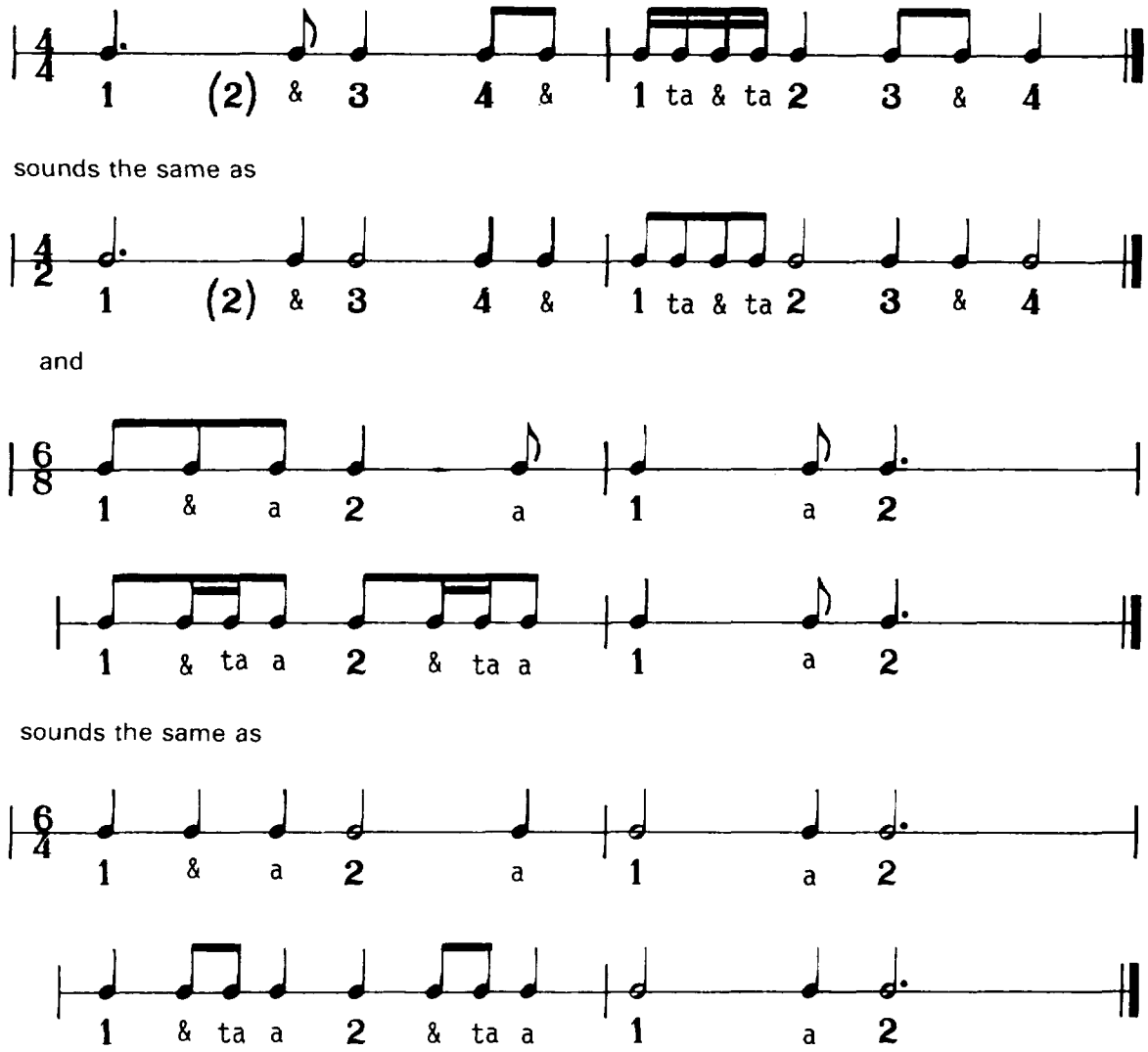


Figure 4.6: Related Meters (rhythmic transcription).

EQUIVALENT METERS

Equivalent meters are two different meters, one simple and one compound, that have the same beat grouping and the same note to represent the divided beat. The unit of beat in simple time is an undotted note and in compound time is a dotted note.

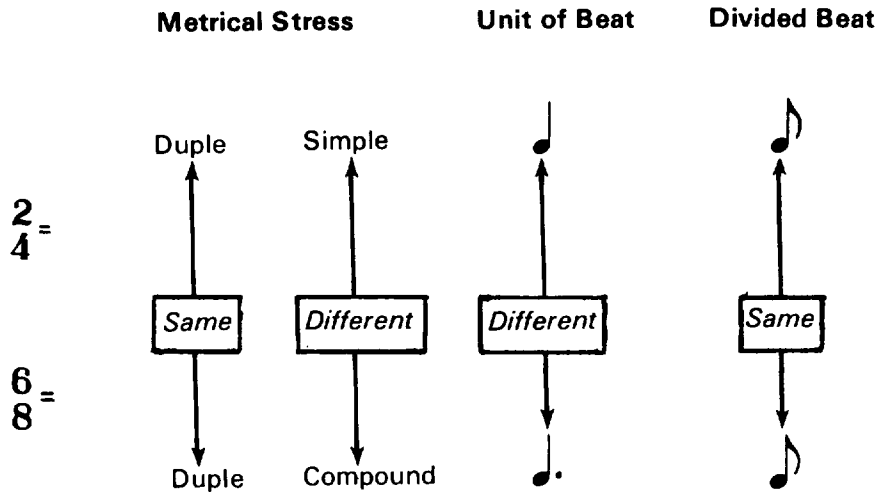


Figure 4.7: Equivalent Meters.

By making use of equivalent meters, it is possible to use the compound division of beat in simple time and the simple division of beat in compound time. These borrowed divisions of the beat are notated as the *triplet* in simple meter and the *duplet* in compound meter.

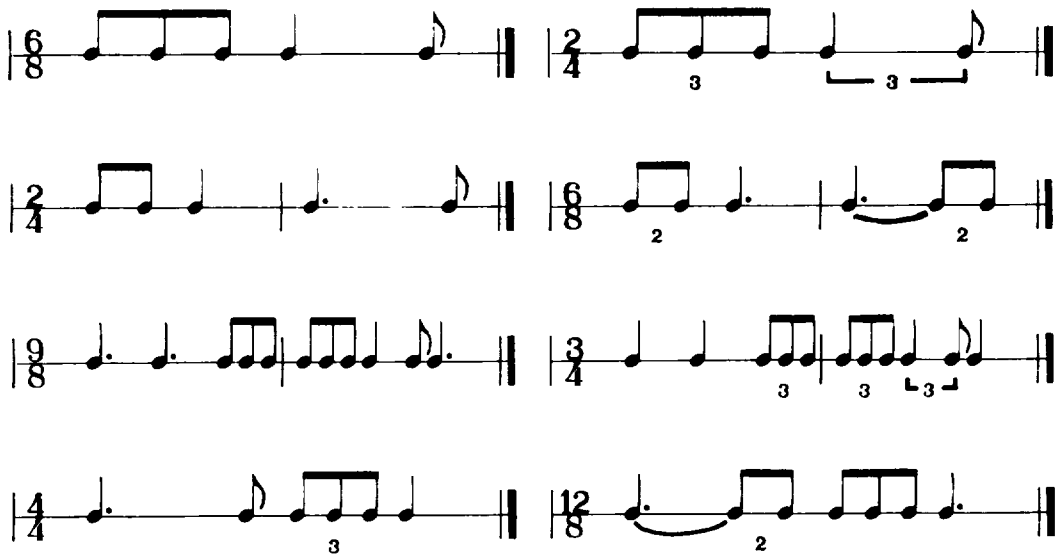


Figure 4.8: Equivalent Meters (metric conversion): duplets and triplets.

CHAPTER 5

SCALES AND TETRACHORDS

SCALES

A scale (from the Latin *scala* - ladder or staircase) is a graduated series of musical tones ascending or descending in order of pitch according to a specified interval scheme. An *interval* is the difference in pitch between tones. Music depends on the succession of pitches and certain measurable patterns of intervals used with regularity. These patterns may be extracted from musical examples, arranged in order, and expressed as scales.

The basic intervals used for scale analysis are the half step *(semitone)* and whole step *(whole tone)*. Any two adjacent keys on the keyboard sound a half step. The interval of two half steps sounds a whole step. A whole step (two half steps) occurs between *C* and *D*, *D* and *E*, *F* and *G*, *G* and *A*, and *A* and *B*. Observe that there are no keys between *E* and *F*, and *B* and *C*; these intervals are half steps.

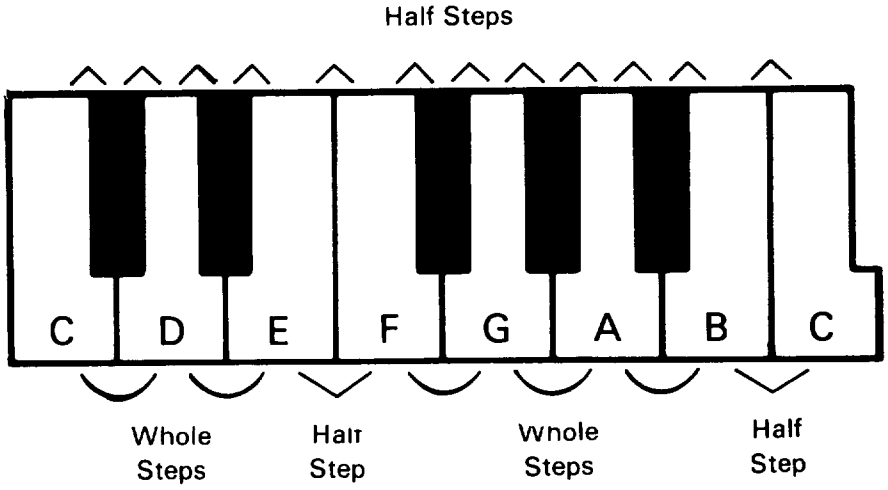


Figure 5.1: Keyboard Half Steps and Whole Steps.

The note a whole step above *E* is *F*♯, not *F*. The note a whole step above *B* is *C*♯, not *C*. *E*♭ and *B*♭ are both whole steps below *F* and *C* respectively.

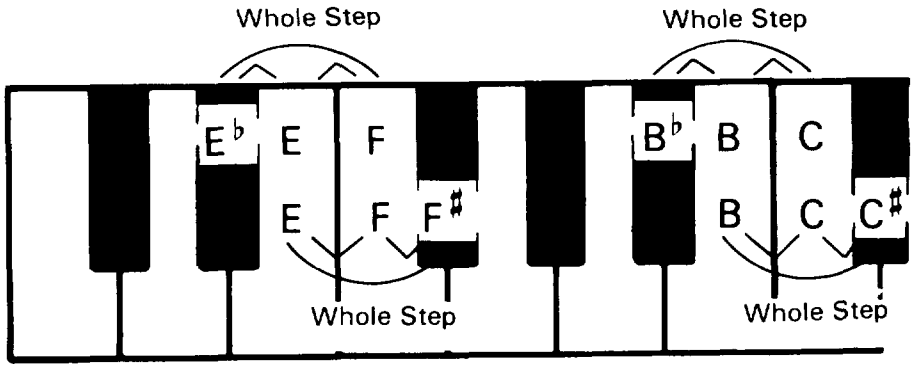


Figure 5.2: Whole Steps.

TETRACHORDS

The tetrachord is a device used in the construction and analysis of scales. A *tetrachord* is a series of four tones on successive degrees of the staff with an interval of five half steps between the first and last tones. Tetrachords used are the major (**M**), minor (**m**), natural (**N**), and harmonic (**H**). Any tetrachord may be constructed on any pitch and will retain the interval relationship of the tetrachord.

Major Tetrachord (M)

The *major tetrachord* is composed of two half steps, two half steps, and one half step ascending on four successive staff degrees.

(M - 221)

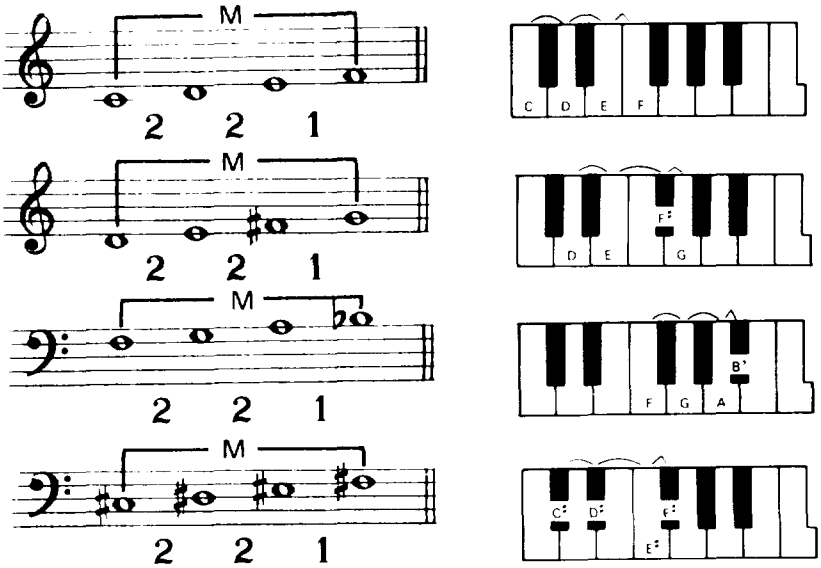


Figure 5.3: Major Tetrachords.

Minor Tetrachords (m)

The *minor tetrachord* is composed of two half steps, one half step, and two half steps ascending on four successive staff degrees.

(m - 212)

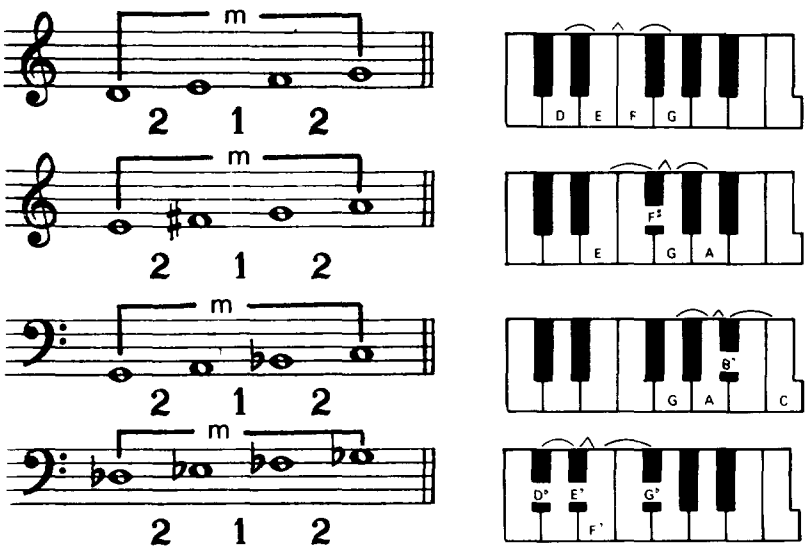


Figure 5.4: Minor Tetrachords.

Natural Tetrachord (N)

The *natural tetrachord* is composed of one half step, two half steps, and two half steps ascending on four successive staff degrees.

(N - 122)

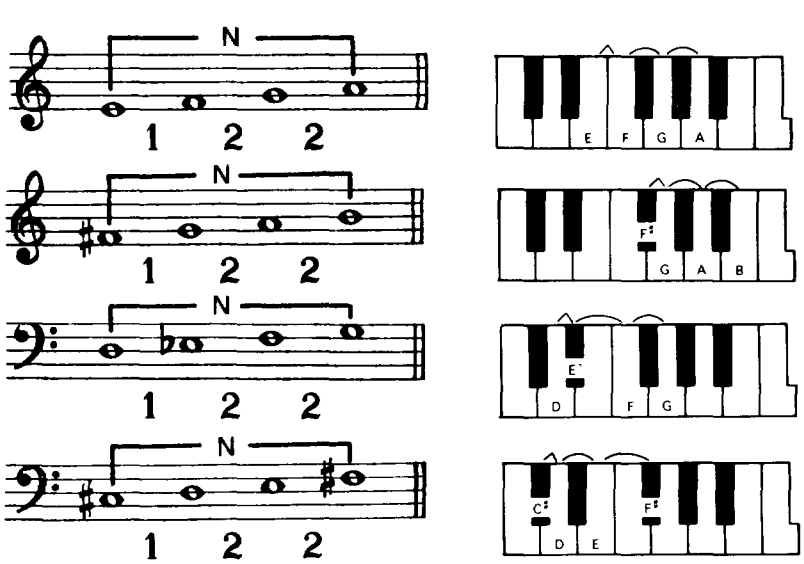


Figure 5.5: Natural Tetrachords.

Harmonic Tetrachord (H)

The *harmonic tetrachord* is composed of one half step, three half steps, and one half step ascending on four successive staff degrees.

(H - 131)

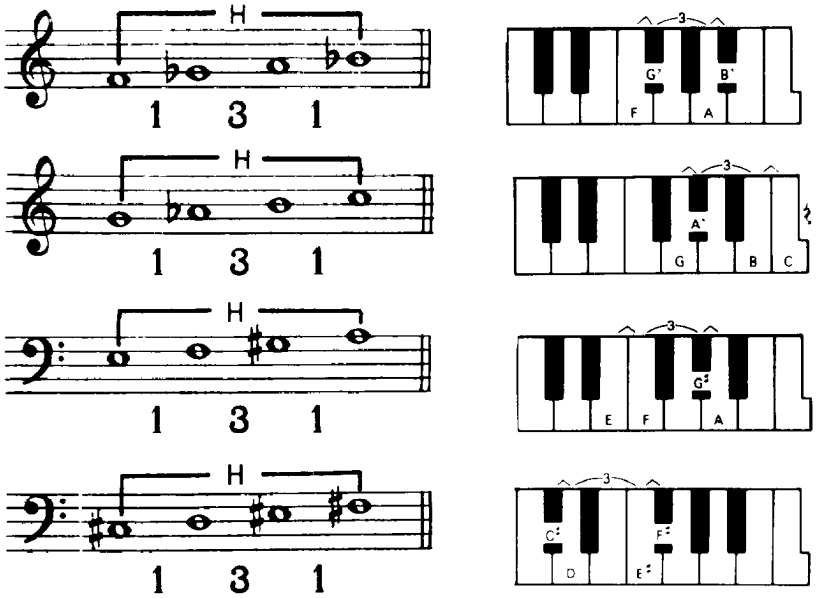


Figure 5.6: Harmonic Tetrachords.

SCALE CONSTRUCTION USING TETRACHORDS

Scales constructed with tetrachords combine two tetrachords and a link (abbreviated **L**). The link is always composed of two half steps (a whole step) on adjacent staff degrees. The link may be placed at the bottom, in the middle, or at the top of the scale. The combination of two tetrachords and a link form a scale that encompasses an octave. An *octave* is an interval containing twelve half steps. It is the distance from any pitch of a given letter name to the next higher or lower pitch with the same letter name.

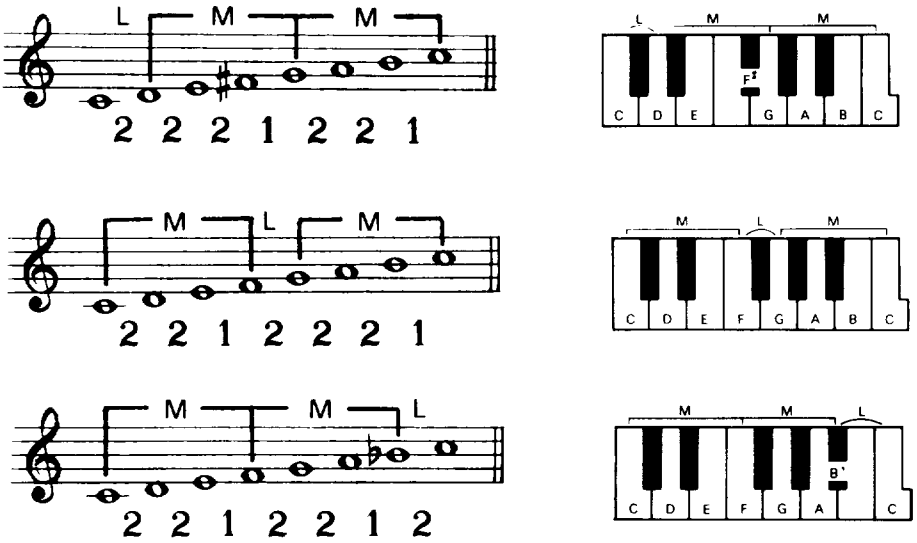


Figure 5.7: Tetrachords and Link in Scale Construction.

CHAPTER 6
MAJOR SCALES

The formula for the major scale is **MLM.**

The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *C* to *C*.

Scale Formula: **MLM**

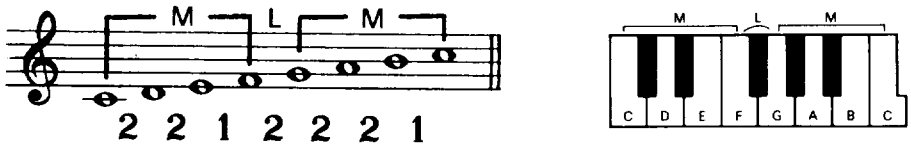


Figure 6.1: C *Major Scale.*

SHARP SCALES

To construct a scale other than *C* major, chromatic signs must be used to maintain the scale formula. The addition of chromatic signs in major scales follows specific, recognizable patterns. When a major scale is constructed on the fifth scale degree ascending in the *C* major scale, the scale formed is a *G major scale* and has one sharp: *F*♯.

Scale Formula: **MLM**

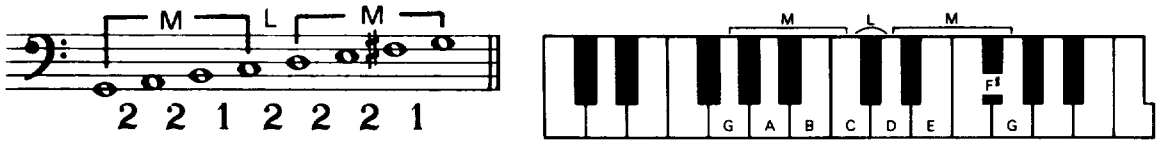


Figure 6.2: G *Major Scale.*

When a major scale is constructed on the fifth scale degree in the *G* major scale, the scale formed is a *D major scale* and has two sharps: *F*♯ and *C*♯.

Scale Formula: **MLM**

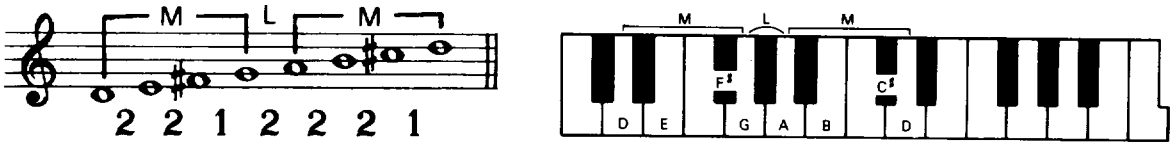


Figure 6.3: D *Major Scale.*

When a major scale is constructed on the fifth scale degree in the *D* major scale, the scale formed is an *A major scale* and has three sharps: *F*♯, *C*♯, and *G*♯.

Scale Formula: **MLM**

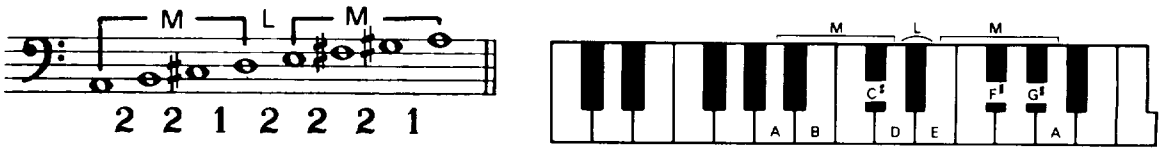


Figure 6.4: A *Major Scale.*

The pattern continues through the

E major scale with four sharps:
F♯, *C*♯, *G*♯, and *D*♯.

B major scale with five sharps:
F♯, *C*♯, *G*♯, *D*♯, and *A*♯.

F♯ *major scale* with six sharps:
F♯, *C*♯, *G*♯, *D*♯, *A*♯, and *E*♯.

C♯ major scale with all seven pitch names sharped:
F♯, *C♯*, *G♯*, *D♯*, *A♯*, *E♯*, and *B♯*.

Scale Formula: **MLM**

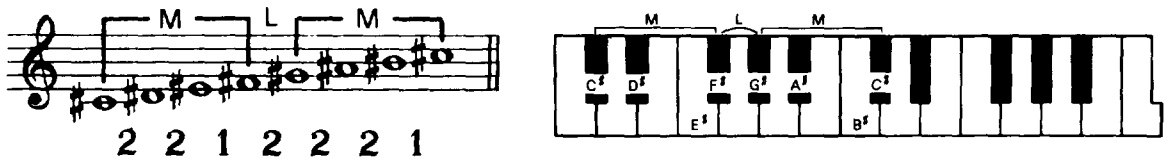


Figure 6.5: C♯ *Major Scale.*

Although a *G♯* major scale (fifth degree ascending in *C♯* major) is possible, the scale requires a double sharp and is considered a theoretical scale. Therefore, *C♯* major (seven sharps) is the last practical sharp scale to be considered, making a total of seven major scales with sharps.

FLAT SCALES

When a major scale is contructed on the fifth scale degree descending (the fourth degree ascending is the same note) of the *C* major scale, the scale formed is an *F major scale* and has one flat: *B♭*.

Scale Formula: **MLM**

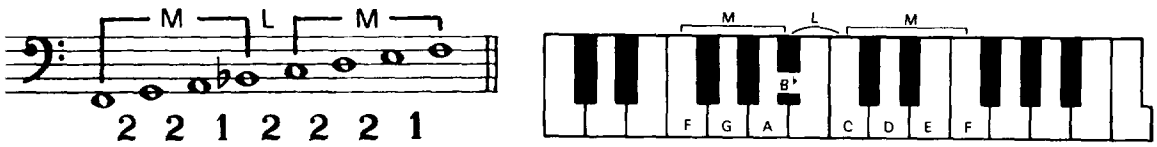


Figure 6.6: F *Major Scale.*

When a major scale is constructed on the fifth degree descending (fourth degree ascending) of the *F* major scale, the scale formed is a *B♭ major scale* and has two flats: *B♭* and *E♭*.

Scale Formula: **MLM**

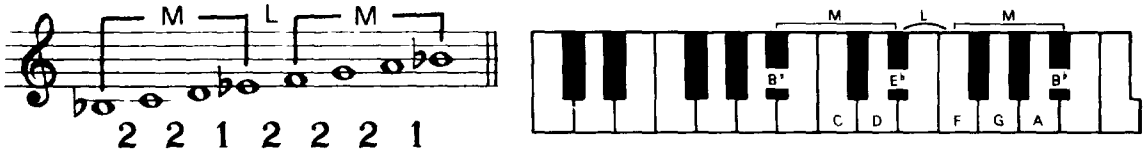


Figure 6.7: B♭ *Major Scale.*

The pattern continues through the

E♭ major scale with three flats:
B♭, *E♭*, and *A♭*.

A♭ major scale with four flats:
B♭, *E♭*, *A♭*, and *D♭*.

D♭ major scale with five flats:
B♭, *E♭*, *A♭*, *D♭*, and *G♭*.

G♭ major scale with six flats:
B♭, *E♭*, *A♭*, *D♭*, *G♭*, and *C♭*.

C♭ major scale with all seven pitch names flatted:
B♭, *E♭*, *A♭*, *D♭*, *G♭*, *C♭*, and *F♭*.

Scale Formula: **MLM**

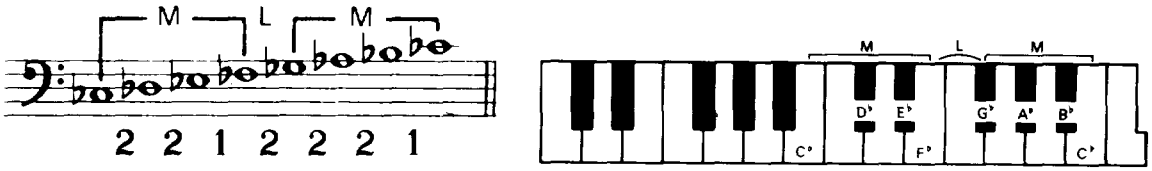


Figure 6.8: C♭ *Major Scale.*

Although an *F♭* major scale (fifth degree descending in *C♭* major) is possible, the scale requires a double flat and is considered a theoretical scale. Therefore, *C♭* major (seven flats) is the last practical flat scale, making a total of seven major scales with flats.

KEYS AND MAJOR KEY SIGNATURES

In most music, one pitch becomes more important than any of the other pitches in motion around it. This primary pitch to which the other pitches relate is known as the *tonic. Key* is the term which refers to interval relationships within a piece of music which establish one pitch as the tonic. A key involves a network of relationships, while a scale is an arranged list of the pitches of a key.

In most music, rather than notating the chromatic signs for each pitch, the chromatic signs are extracted from the scale and placed after a clef sign to indicate the key. This arrangement of chromatic signs is a *key signature.*

The scale of *E* major contains four sharps: *F*♯, *C*♯, *G*♯, and *D*♯ in order of their addition to sharp scales. Arranged as a key signature it is notated:

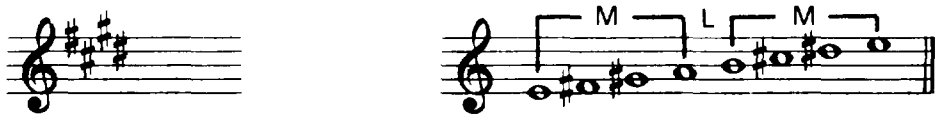


Figure 6.9: Key Signature.

A chromatic sign in a key signature affects all notes of that letter name in all octaves throughout the duration of the key signature unless cancelled within a measure by a different chromatic sign. The key signature is always in effect after a bar line except for a note tied from an altered note in the previous measure.

ORDER OF SHARP MAJOR KEYS:

G	D	A	E	B	F♯	C♯
1♯	2♯s	3♯s	4♯s	5♯s	6♯s	7♯s

ORDER OF SHARPS:

F♯ C♯ G♯ D♯ A♯ E♯ B♯

SHARP MAJOR KEY SIGNATURES IN TREBLE AND BASS CLEFS:

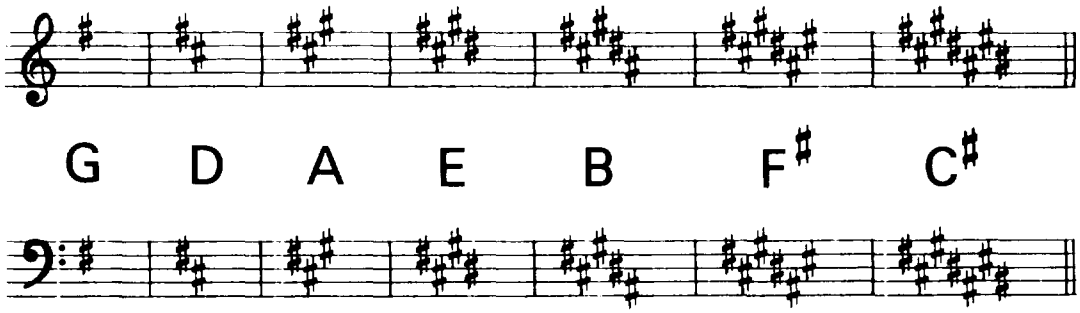


Figure 6.10: Sharp Major Key Signatures.

ORDER OF FLAT MAJOR KEYS:

F	B♭	E♭	A♭	D♭	G♭	C♭
1♭	2 ♭s	3 ♭s	4 ♭s	5 ♭s	6 ♭s	7 ♭s

ORDER OF FLATS:

B♭ E♭ A♭ D♭ G♭ C♭ F♭

FLAT MAJOR KEY SIGNATURES IN TREBLE AND BASS CLEFS:

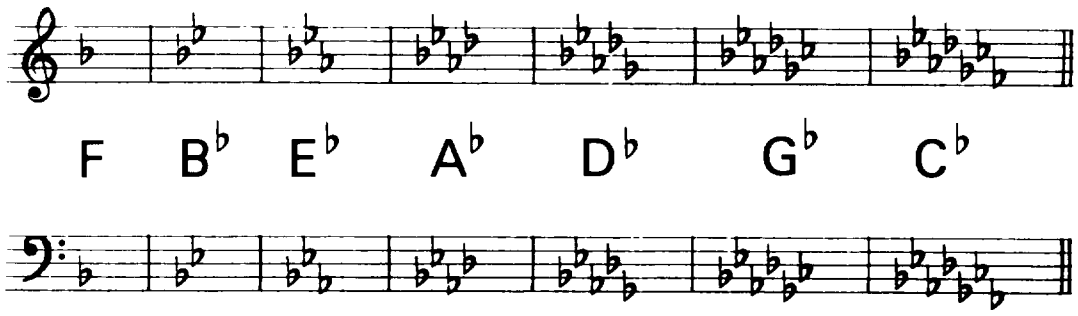


Figure 6.11: Flat Major Key Signatures.

CIRCLE OF MAJOR KEYS

Major keys arranged in a circle starting with *C* and progressing through the sharp keys clockwise and the flat keys counterclockwise, form the *circle of major keys* or the *circle of fifths.*

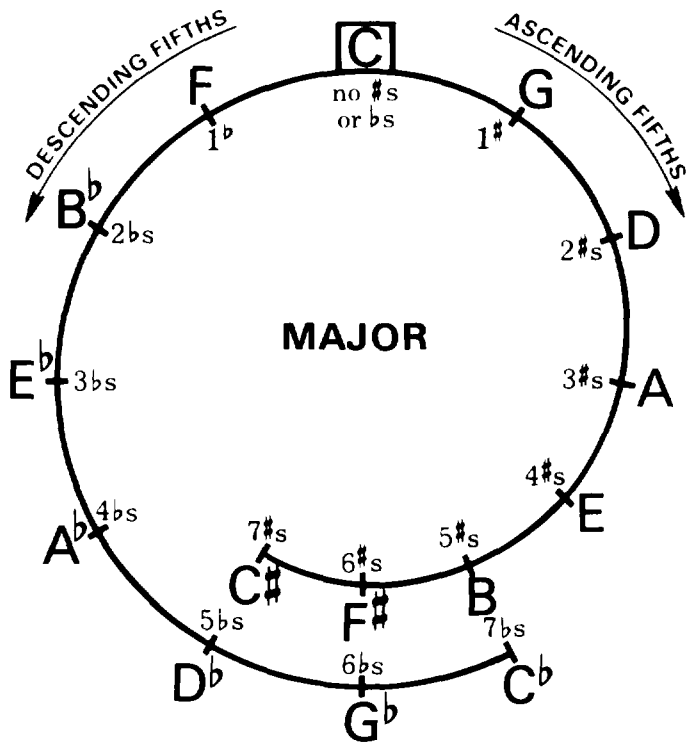


Figure 6.12: Circle of Major Keys.

ENHARMONIC KEYS

Keys that have different names but sound the same are *enharmonic keys*. The enharmonic major keys are

B major (5♯s) and *C*♭ major (7♭s)

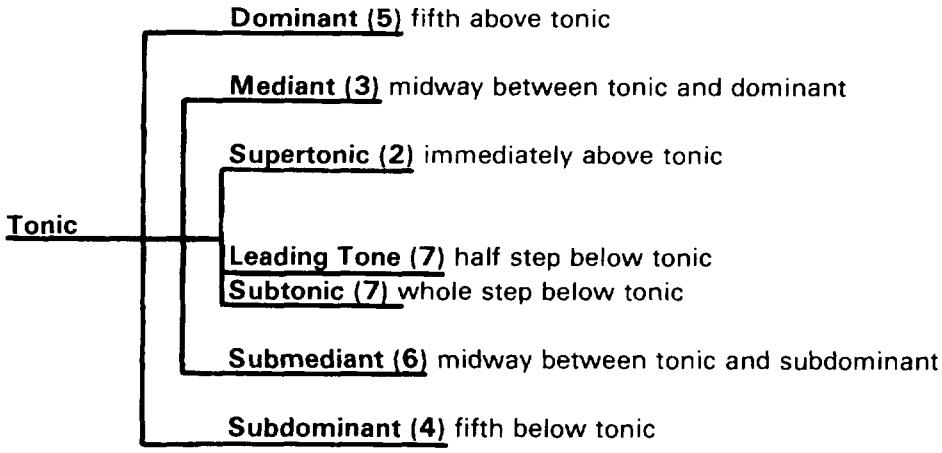
F♯ major (6♯s) and *G*♭ major (6♭s)

C♯ major (7♯s) and *D*♭ major (5♭s)

It is possible to start on *C* major and travel around the circle of fifths in either direction and return to *C* major by using one of the enharmonic keys to continue around the circle.

NAMES OF SCALE DEGREES

Traditional names are used for identification when reference is made to specific scale degrees. The *tonic* is the first scale degree. The pitch a fifth above the tonic is called the *dominant* and is the fifth scale degree. The pitch a fifth below the tonic is called the *subdominant* (meaning the dominant below the tonic) and is the fourth scale degree. The pitch midway between the tonic and the dominant is called the *mediant* (occurring in the middle) and is the third scale degree. The pitch midway between the tonic and the subdominant is called the *submediant* and is the sixth scale degree. The pitch immediately above the tonic is called the *supertonic* and is the second scale degree. The seventh scale degree is called a *leading tone* or *subtonic* depending on whether it is one half step or two half steps (a whole step) below the tonic.



Name:	Tonic	Supertonic	Mediant	Subdominant	Dominant	Submediant	Leading Tone or Subtonic	Tonic
Scale Degree	1st	2nd	3rd	4th	5th	6th	7th	8th (1st)

Figure 6.13: Names of Scale Degrees.

SCALE DEGREE ACTIVITY IN MAJOR

Some scale degrees serve as points of stability or rest; others are more active, ranging from a restless sound to a tendency to move to a specific pitch.

Stable Tones show a tendency towards being at rest.

Active Tones want to move.

Tendency Tones are active tones that exhibit a strong pull toward a specific pitch.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Leading Tone
	Tendency
	Subdominant (pulls to Mediant)
	Leading Tone (pulls to Tonic)

Figure 6.14: Scale Degree Activity in Major.

Normally, in major keys, the active tones will move to one of the two adjacent notes in the scale. That is, the supertonic will move to the tonic or mediant; the submediant will move to the dominant or leading tone. This does not mean active tones always move in this manner but tend to do so regularly.

Tendency tones tend to move a half step to an adjacent scale degree. The leading tone will most often move to the tonic unless it is part of scalewise motion in the opposite direction. Similarly, the subdominant will most often move to the mediant unless it is part of scalewise motion in the opposite direction. Note that tendency tones pull to stable scale degrees.

CHAPTER 7
MINOR SCALES

Three commonly used forms of minor scales are: *natural* (also called pure), *harmonic,* and *melodic* minor scales. The harmonic and melodic minor scales derive from the natural minor scale.

NATURAL MINOR SCALE

The formula for the natural minor scale is **mLN.** The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *A* to *A*.

Scale Formula: **mLN**

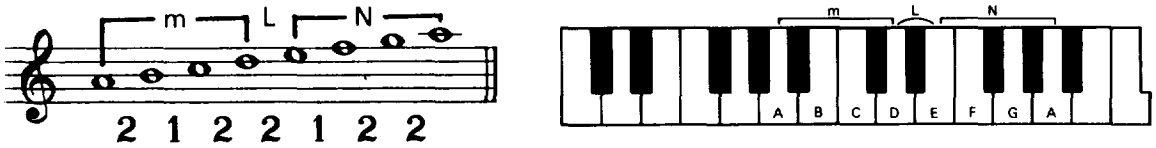


Figure 7.1: The a *Natural Minor Scale.*

Natural Minor Sharp Scales and Keys

When a natural minor scale is constructed on the fifth scale degree ascending in the *a* natural minor scale, the scale formed is an *e natural minor scale* and has one sharp: *F*♯.

Scale Formula: **mLN**

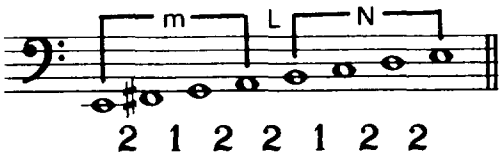


Figure 7.2: e *Natural Minor Scale.*

When a natural minor scale is constructed on the fifth scale degree ascending in the *e* natural minor scale, the scale formed is a *b natural minor scale* and has two sharps: *F*♯ and *C*♯.

Scale Formula: **mLN**

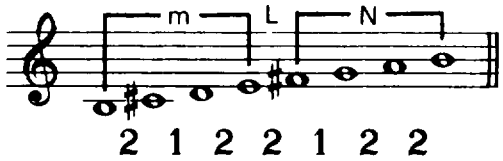


Figure 7.3: b *Natural Minor Scale.*

This pattern continues through the

f♯ *natural minor scale* with three sharps:
F♯, *C*♯, and *G*♯.

c♯ *natural minor scale* with four sharps:
F♯, *C*♯, *G*♯, and *D*♯.

g♯ *natural minor scale* with five sharps:
F♯, *C*♯, *G*♯, *D*♯, and *A*♯.

d♯ *natural minor scale* with six sharps:
F♯, *C*♯, *G*♯, *D*♯, *A*♯, and *E*♯.

a♯ *natural minor scale* with all seven pitch names sharped:
F♯, *C*♯, *G*♯, *D*♯, *A*♯, *E*♯, and *B*♯.

If the pattern is continued, double sharps will result. Therefore, *a*♯ natural minor (seven sharps) is the last practical sharp scale, making a total of seven natural minor scales with sharps. Although the tonics in natural minor differ from major, the order of sharps remains the same.

ORDER OF SHARP NATURAL MINOR KEYS:

e	b	f♯	c♯	g♯	d♯	a♯
1♯	2♯s	3♯s	4♯s	5♯s	6♯s	7♯s

ORDER OF SHARPS:

F♯ C♯ G♯ D♯ A♯ E♯ B♯

SHARP NATURAL MINOR KEY SIGNATURES IN TREBLE AND BASS CLEFS:

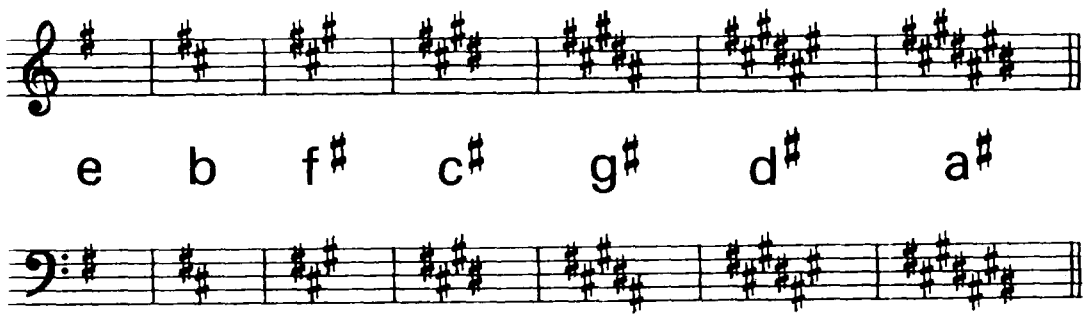


Figure 7.4: Sharp Natural Minor Key Signatures.

Natural Minor Flat Scales and Keys

When a natural minor scale is constructed on the fifth scale degree descending (fourth degree ascending) of the *a* natural minor scale, the scale formed is a *d natural minor scale* and has one flat: *B♭*.

Scale Formula: **mLN**

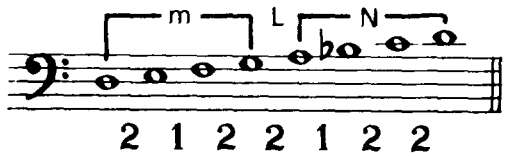


Figure 7.5: d *Natural Minor Scale.*

When a natural minor scale is constructed on the fifth degree descending (fourth degree ascending) of the *d* natural minor scale, the scale formed is a *g natural minor scale* and has two flats: *B*♭ and *E*♭ .

Scale Formula: **mLN**

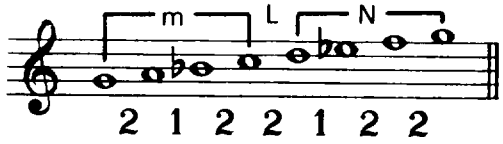


Figure 7.6: g *Natural Minor Scale.*

This pattern continues through the

c natural minor scale with three flats:
B♭ , *E*♭ , and *A*♭ .

f natural minor scale with four flats:
B♭ , *E*♭ , *A*♭ , and *D*♭ .

b♭ *natural minor scale* with five flats:
B♭, *E*♭, *A*♭, *D*♭, and *G*♭.

e♭ *natural minor scale* with six flats:
B♭, *E*♭, *A*♭, *D*♭, *G*♭, and *C*♭.

a♭ *natural minor scale* with all seven pitch names flatted:
B♭, *E*♭, *A*♭, *D*♭, *G*♭, *C*♭, and *F*♭.

If the pattern is continued, double flats will result. Therefore, *a*♭ natural minor (seven flats) is the last practical flat scale, making a total of seven natural minor scales with flats. Again, although the tonics in natural minor differ from major, the order of flats remains the same.

ORDER OF FLAT NATURAL MINOR KEYS:

d	g	c	f	b♭	e♭	a♭
1 ♭	2 ♭s	3 ♭s	4 ♭s	5 ♭s	6 ♭s	7 ♭s

ORDER OF FLATS:

B♭ E♭ A♭ D♭ G♭ C♭ F♭

FLAT NATURAL MINOR KEY SIGNATURES IN TREBLE AND BASS CLEFS:

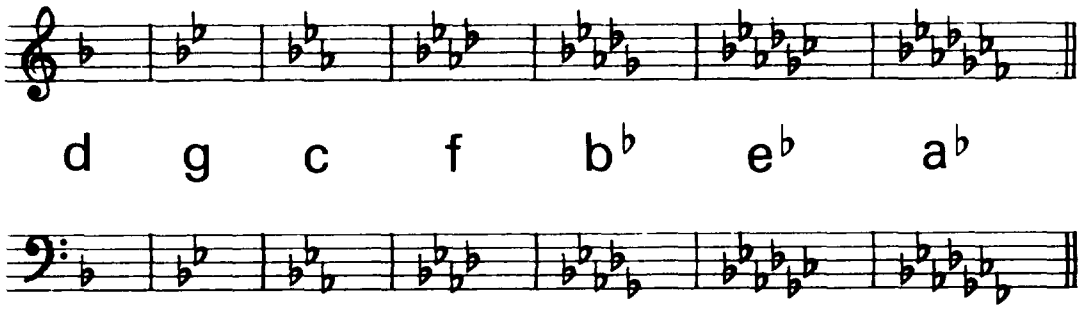


Figure 7.7: Flat Natural Minor Key Signatures.

Scale Degree Activity in Natural Minor

The natural minor scale has a lowered mediant, lowered submediant, and a subtonic when compared to the major scale constructed on the same tonic.

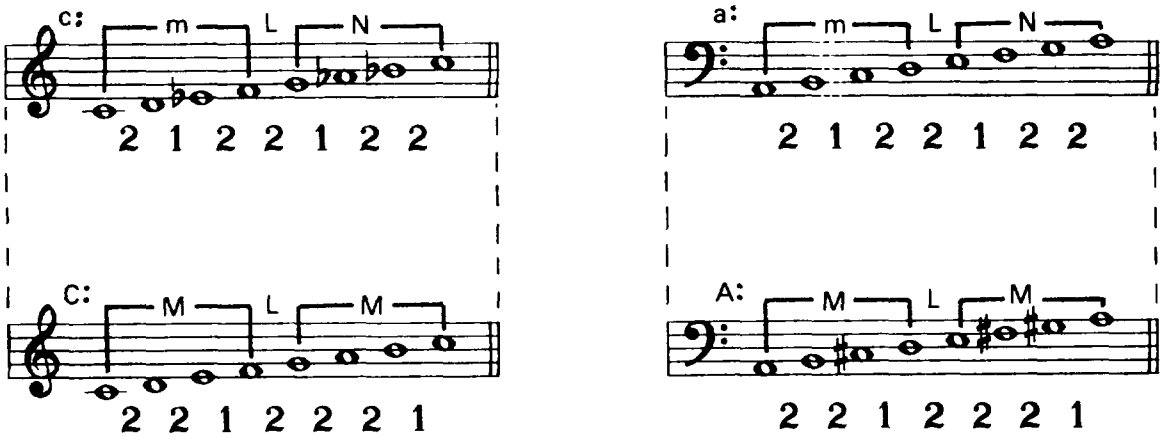


Figure 7.8: Comparison of Major and Natural Minor.

Since the scale degree relationships in natural minor are different from major, the activity of scale degrees is also different.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Subtonic

TENDENCY

Submediant (pulls to Dominant)

Figure 7.9: Scale Degree Activity in Natural Minor.

HARMONIC MINOR SCALES AND KEYS

The formula for the harmonic minor scale is **mLH.** The scale's half step/whole step interval relationship does not correspond to any *white key* scale.

Scale Formula: **mLH**

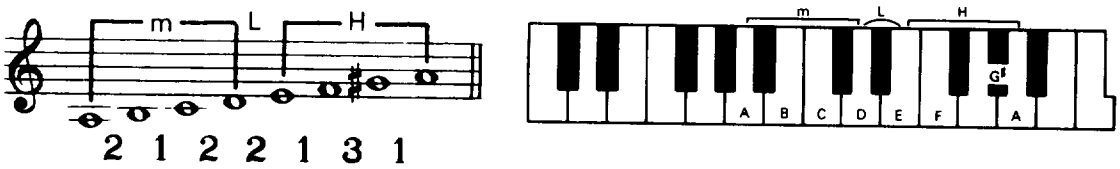


Figure 7.10: The a *Harmonic Minor Scale.*

Harmonic minor scales derive from natural minor scales. When constructed on the same tonic, the natural minor scale has a subtonic while the harmonic minor scale has a leading tone.

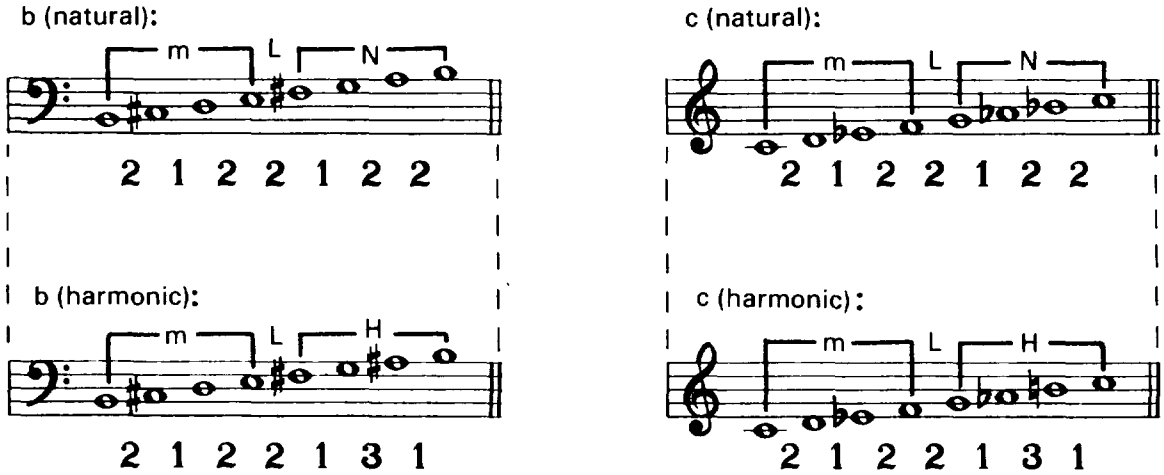


Figure 7.11: Comparison of Natural and Harmonic Minor.

Harmonic minor scales share the key signatures of natural minor scales. They are formed by a chromatic alteration of the subtonic upward to a leading tone. Chromatic signs used outside the key signature are called *accidentals.*

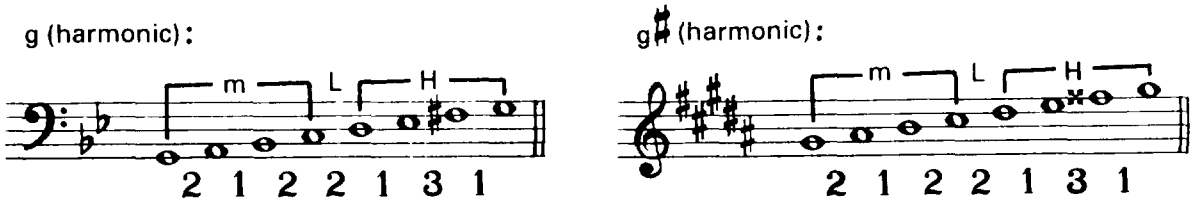


Figure 7.12: Harmonic Minor Scales with Key Signature.

Scale Degree Activity in Harmonic Minor

The harmonic minor scale evolved because of the relative lack of tendency tones in the natural minor. Using the harmonic form of the scale develops a better balance of tendency tones in minor keys.

STABLE	**ACTIVE**
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Leading Tone
	TENDENCY
	Submediant (pulls to dominant)
	Leading Tone (pulls to Tonic)

Figure 7.13: Scale Degree Activity in Harmonic Minor.

Although the harmonic form of the scale has desirable harmonic features, the three-half-step interval on two successive staff degrees (augmented second) has been found to be melodically objectionable. Therefore, a third form of the scale has been developed to avoid the effect of this interval.

MELODIC MINOR SCALES AND KEYS

The melodic minor scale has two formulas, one ascending and one descending. The formula for the *ascending* melodic minor scale is **mLM.** The formula for the *descending* melodic minor scale is **NLm,** which is the same as the natural minor scale.

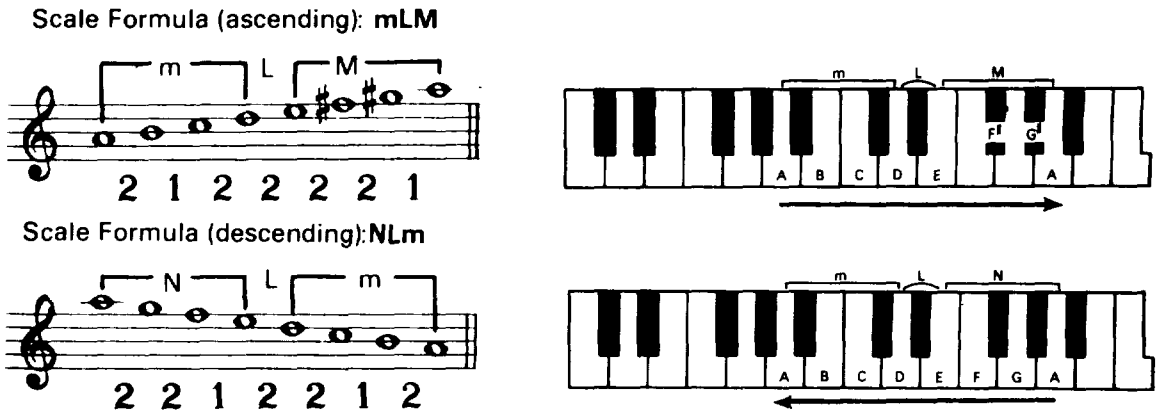


Figure 7.14: The a *Melodic Minor Scale.*

Melodic minor scales derive from natural minor scales. The ascending melodic minor scale has a raised submediant and leading tone (which eliminates the objectionable melodic interval) that return to a subtonic and lowered submediant when descending to achieve a more minor sound.

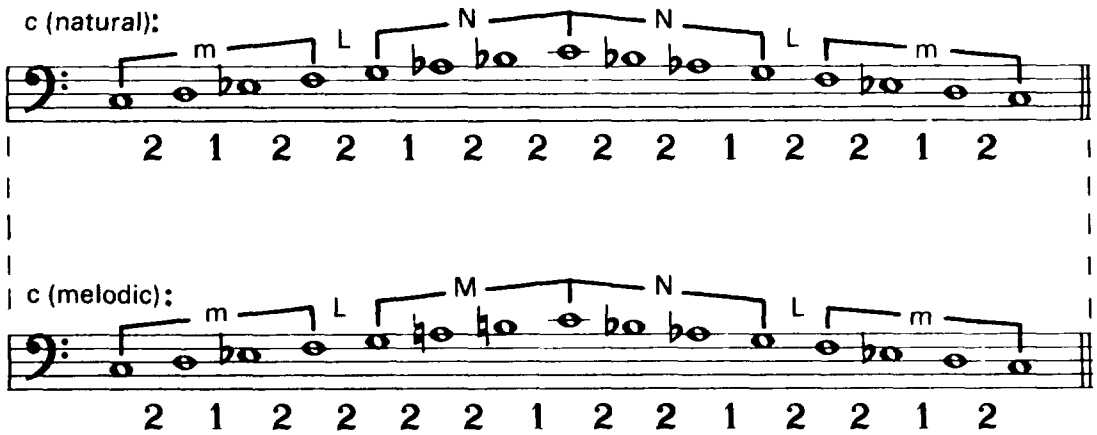


Figure 7.15: Comparison of Natural and Melodic Minor.

Melodic minor scales share the key signatures of natural minor scales. They are formed by chromatic alterations of the submediant upwards a half step and the subtonic upward to a leading tone.

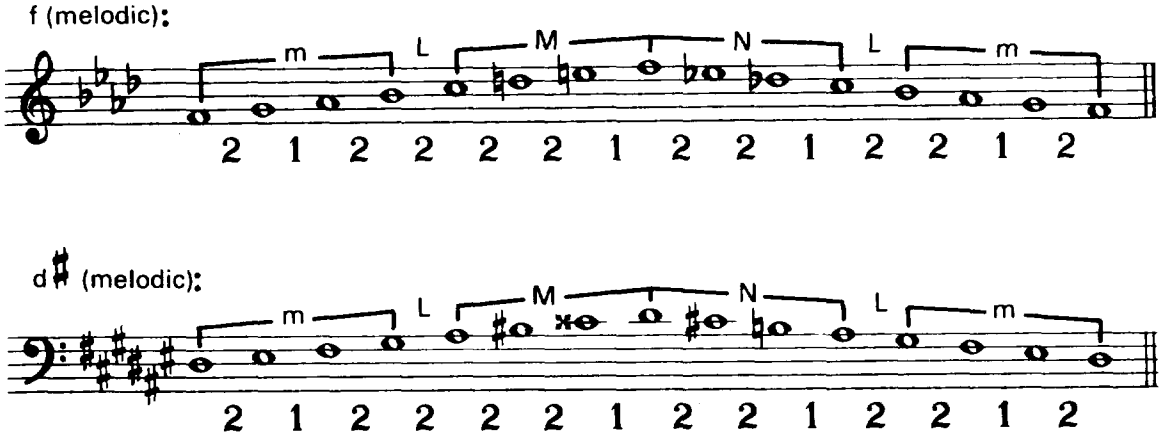


Figure 7.16: Melodic Minor Scales with Key Signatures.

Scale Degree Activity in Melodic Minor

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Raised Submediant (passes to Leading Tone)
	Subtonic (passes downward to lowered Submediant)
	TENDENCY
	Lowered Submediant (pulls to Dominant)
	Leading Tone (pulls to Tonic)

Figure 7.17: Scale Degree Activity in Melodic Minor.

CIRCLE OF MINOR KEYS

Since the natural, harmonic, and melodic minor scales share the same group of key signatures, it is possible to construct one circle of fifths for all three forms of the scale.

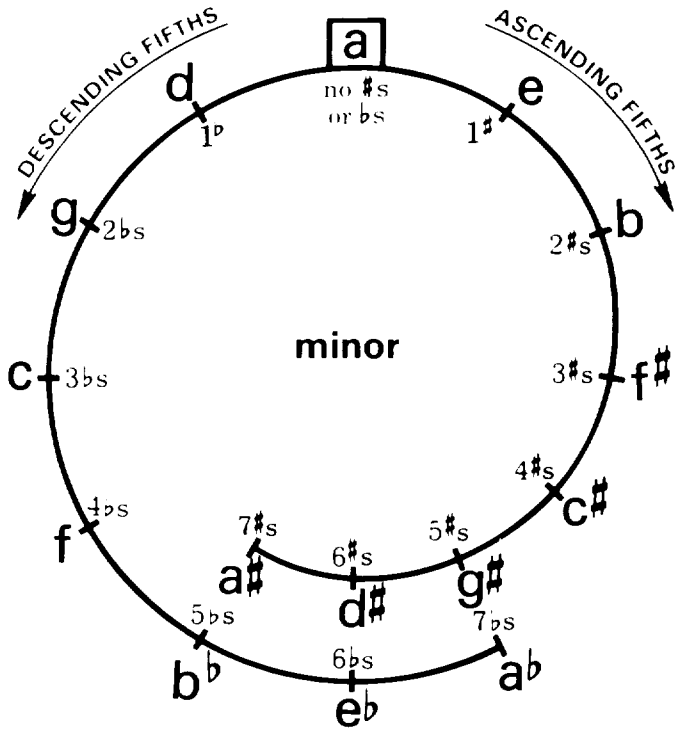


Figure 7.18: Circle of Minor Keys.

The enharmonic minor keys are

g♯ minor (5 ♯s) and *a*♭ minor (7♭s)

d♯ minor (6 ♯s) and *e*♭ minor (6♭s)

a♯ minor (7 ♯s) and *b*♭ minor (5♭s).

It is possible to start on *a* minor and travel around the circle of fifths in either direction and return to *a* minor by using one of the enharmonic keys to continue around the circle.

RELATIVE AND PARALLEL KEYS

Relative Keys

Keys having the same key signature are called *relative.* Relative keys will not have the same tonic. The keys of *a* minor and *C* major have no sharps or flats. Therefore, the relative major of *a* minor is *C* major, and the relative minor of *C* major is *a* minor.

To find the relative minor of any major key, descend three half steps on three successive staff degrees, or determine the sixth degree (submediant) of the major scale.

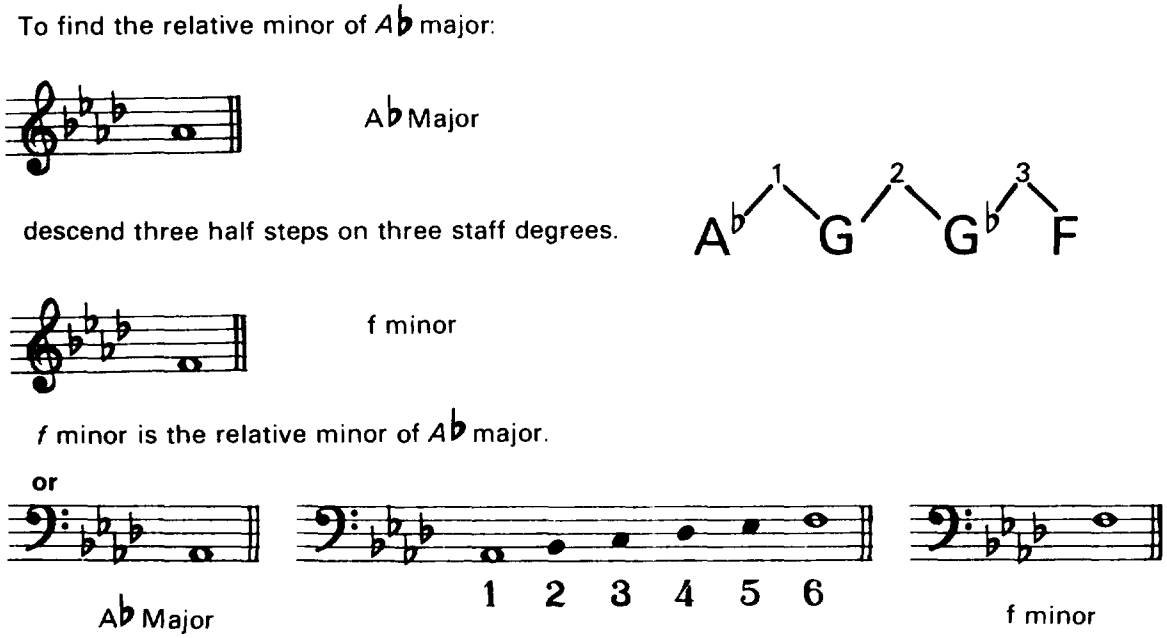


Figure 7.19: Relative Minor From Major.

To find the relative major from any minor key, ascend three half steps on three successive staff degrees, or determine the third degree (mediant) of the minor scale.

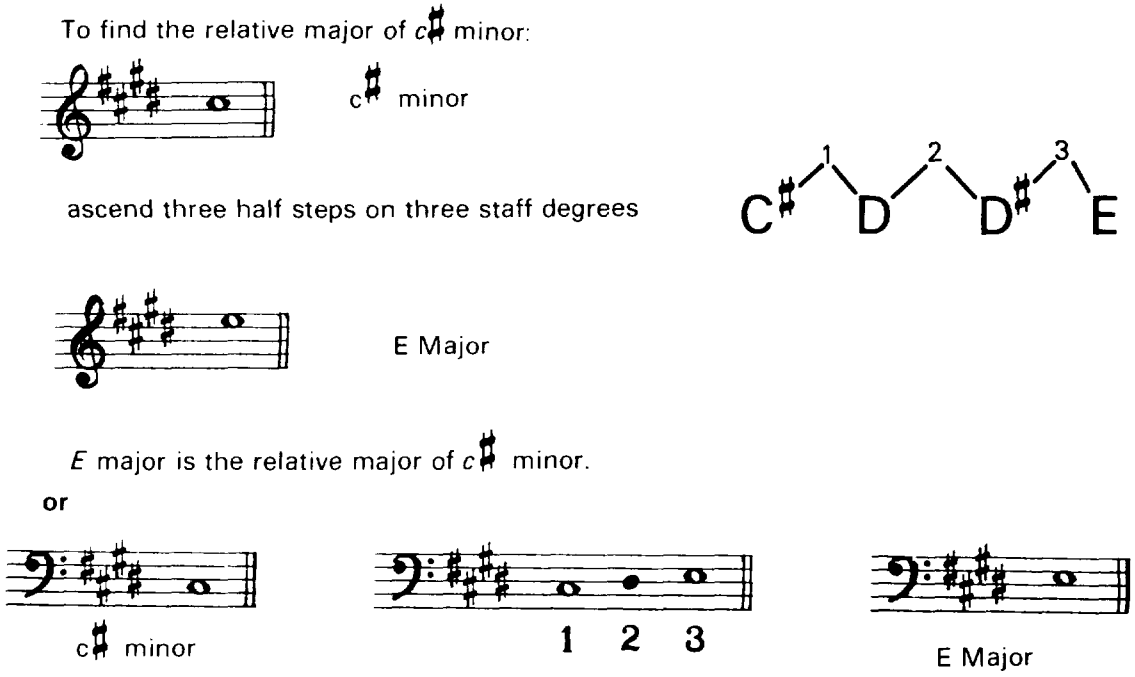


Figure 7.20: Relative Major From Minor.

PARALLEL KEYS

Keys having the same tonic are *parallel.* Parallel keys do not have the same key signature. The keys of *C* major and *c* minor have the same tonic: *C.* Therefore, the parallel major of *c* minor is *C* major, and the parallel minor (or tonic minor) of *C* major is *c* minor. Note that their key signatures differ (no ♯s or ♭s and 3 ♭s).

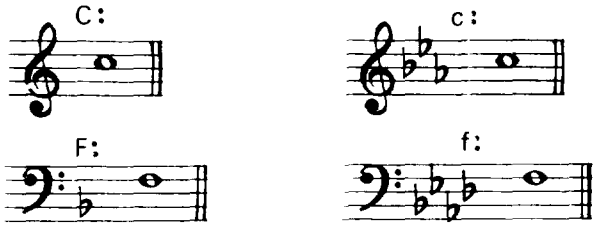


Figure 7.21: Parallel Keys.

CHAPTER 8
MODAL SCALES

Scales of eight tones containing half steps and whole steps in specified positions are called *modes* or *modal scales*. Historically, the modes have been used in many periods and styles of music. They are also called *church modes, ecclesiastical modes,* and *medieval modes*. Although the techniques for their use have changed, they retain their interval patterns and their traditional Greek names.

Most modes can be classified generally as major or minor. The modes with a predominantly major sound are

lydian

ionian

mixolydian

The modes with a predominantly minor sound are

dorian

aeolian

phrygian

The *locrian* mode sounds neither major nor minor; it *tends* toward minor and will be discussed with minor modes.

MAJOR MODES

LYDIAN

The formula for the *lydian mode* (scale) is **LMM.** The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *F* to *F*. The link (**L**) occurs at the beginning of this scale.

Scale Formula: **LMM**

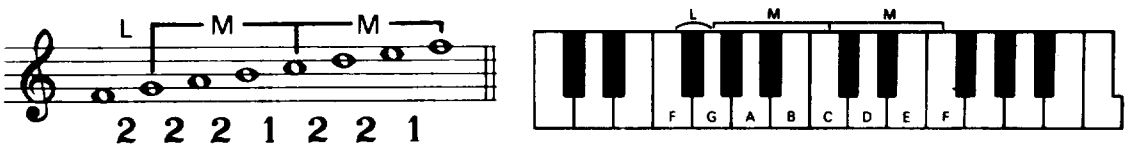


Figure 8.1: F *Lydian Scale.*

The remaining lydian scales are constructed on fifth scale degrees ascending and *lowered* fifth scale degrees descending from *F* lydian through seven sharps and flats. This creates fifteen lydian keys that can be represented in a circle of lydian keys (circle of fifths). Although lydian tonics differ from major and minor, the order of sharps and flats remains the same.

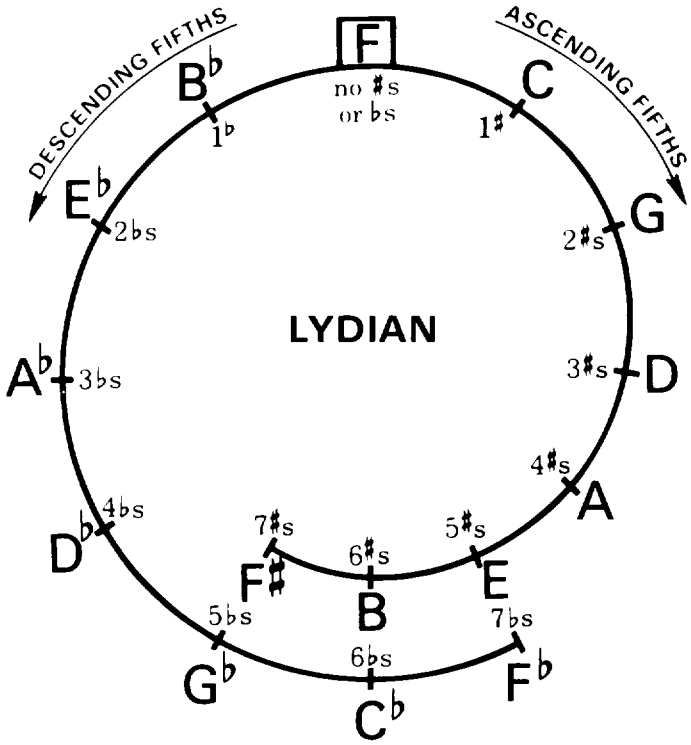


Figure 8.2: Circle of Lydian Keys.

C major and *F* lydian are relative keys. Likewise, *C* lydian and *G* major; *B*♭ lydian and *F* major; *A* lydian and *E* major; and *D*♭ lydian and *A*♭ major are examples of relative keys. The relative lydian tonic is the fourth scale degree (subdominant) of the major scale.

Scale Degree Activity in Lydian

The lydian scale has a raised subdominant (♯4) when compared to its parallel (same tonic) major scale.

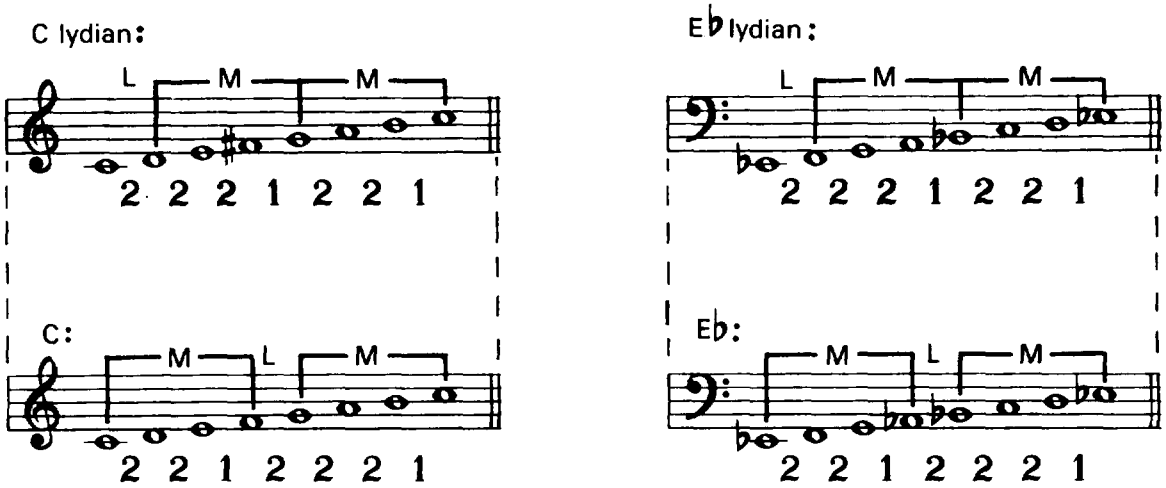


Figure 8.3: Parallel Major and Lydian.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Leading Tone

TENDENCY

Subdominant (pulls to Dominant)
Leading Tone (pulls to Tonic)

Figure 8.4: Scale Degree Activity in Lydian.

IONIAN

The formula for the *ionian mode* is **MLM**, making the ionian mode identical to major scales.

MIXOLYDIAN

The formulas for the *mixolydian mode* are **MML** or **MLm.** The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *G* to *G*.

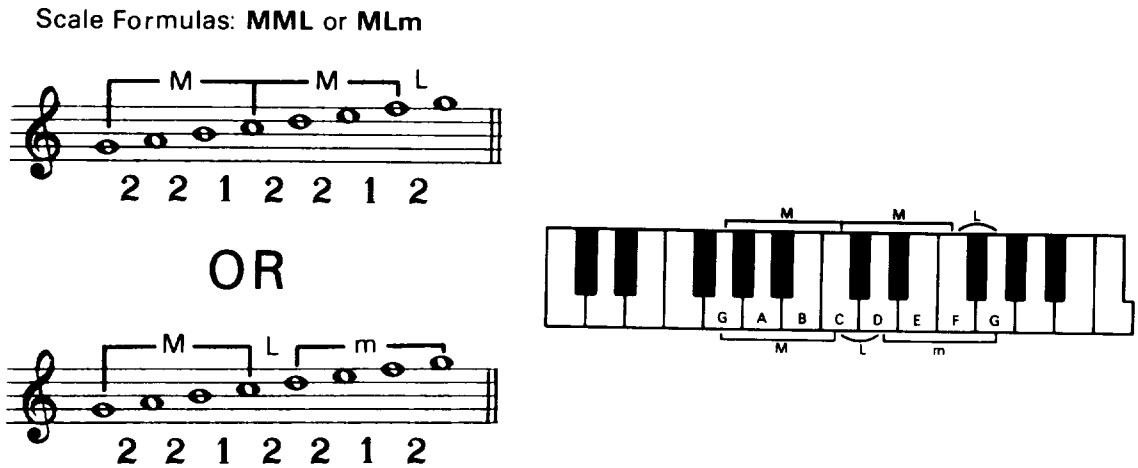


Figure 8.5: G *Mixolydian Scale.*

The remaining mixolydian scales are constructed on fifth scale degrees ascending and descending from *G* mixolydian through seven sharps and flats. This creates fifteen mixolydian keys that can be represented in a circle of mixolydian keys (circle of fifths). The order of sharps and flats remains the same as in previous key signatures.

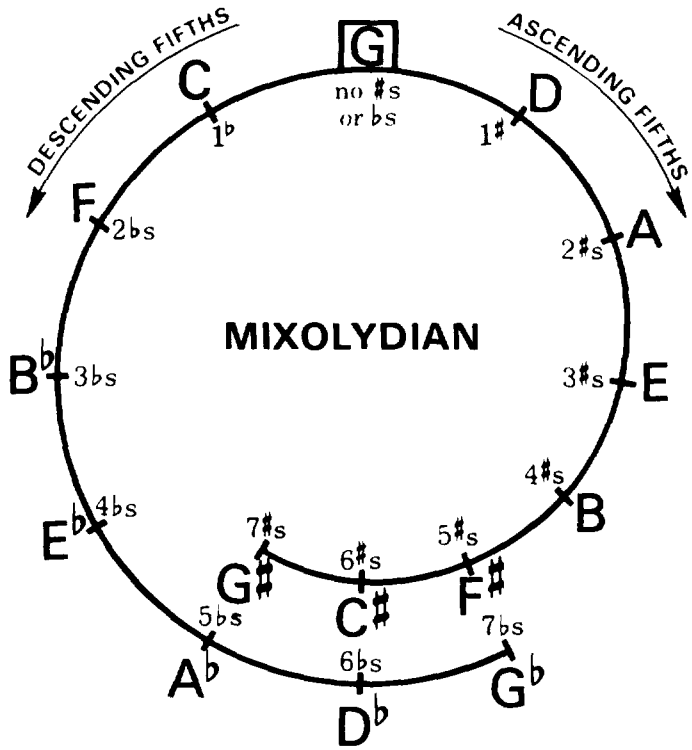


Figure 8.6: Circle of Mixolydian Keys.

C major and *G* mixolydian are relative keys. The relative mixolydian tonic is the fifth degree (dominant) of the major scale.

Scale Degree Activity in Mixolydian

The mixolydian scale has a subtonic (♭7) when compared to its parallel major scale.

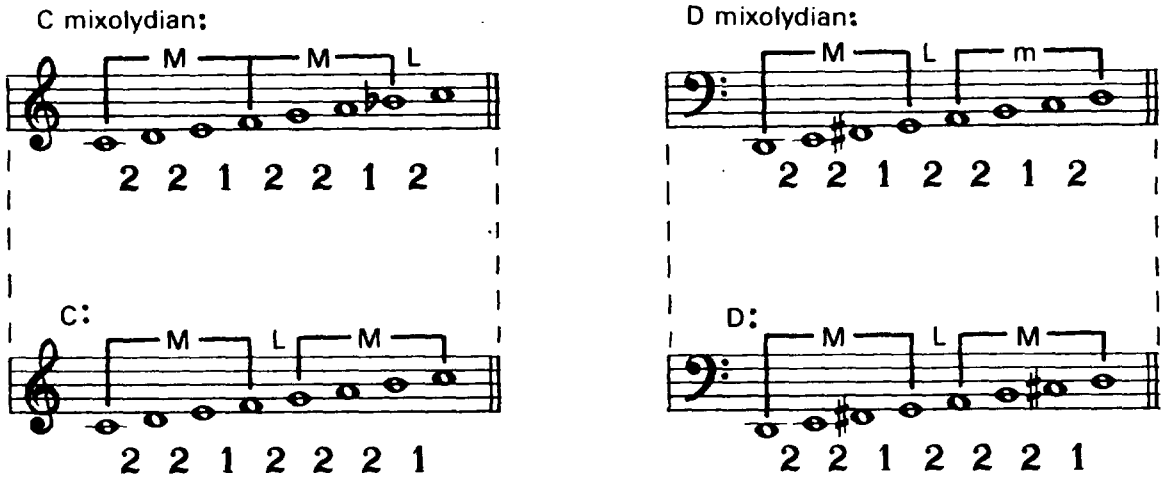


Figure 8.7: Parallel Major and Mixolydian.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Subtonic

TENDENCY

Subdominant (pulls to Mediant)
Mediant (can pull to Subdominant)
Subtonic (pulls to Submediant

Figure 8.8: Scale Degree Activity in Mixolydian.

MINOR MODES

DORIAN

The formula for the *dorian mode* is **mLm.** The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *D* to *D*.

Scale Formula: **mLm**

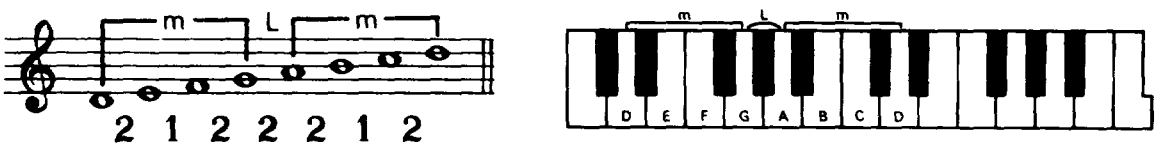


Figure 8.9: d *Dorian Scale.*

The remaining dorian scales are constructed on fifth scale degrees ascending and descending from *d* dorian through seven sharps and flats. This creates fifteen dorian keys that can be represented in a circle of dorian keys (circle of fifths). The order of sharps and flats remains the same as in previous key signatures.

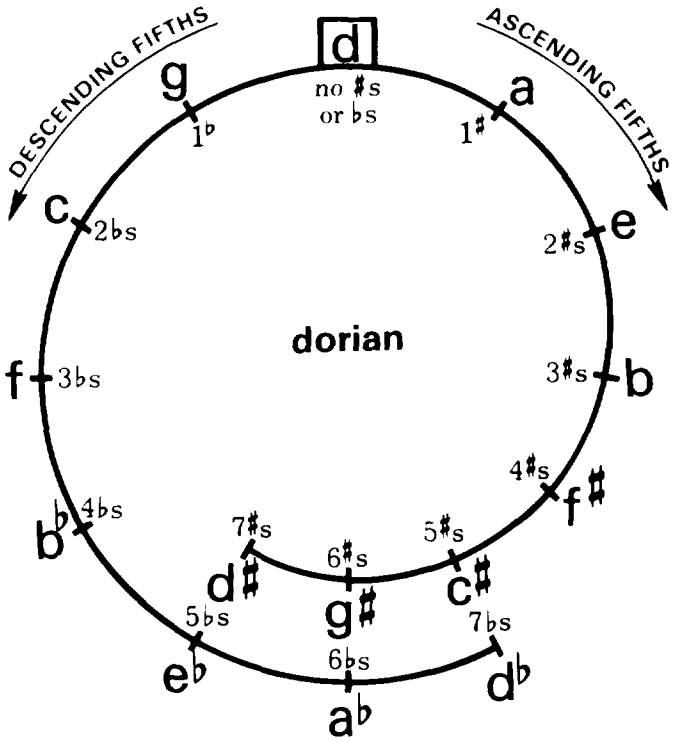


Figure 8.10: Circle of Dorian Keys.

C major and *d* dorian are relative keys. The relative dorian tonic is the second scale degree (supertonic) of the major scale.

Scale Degree Activity in Dorian

The dorian scale has a lowered mediant (♭3) and a subtonic (♭7) when compared to its parallel major scale. When compared to its parallel natural minor scale, the dorian scale has a raised submediant (♯6).

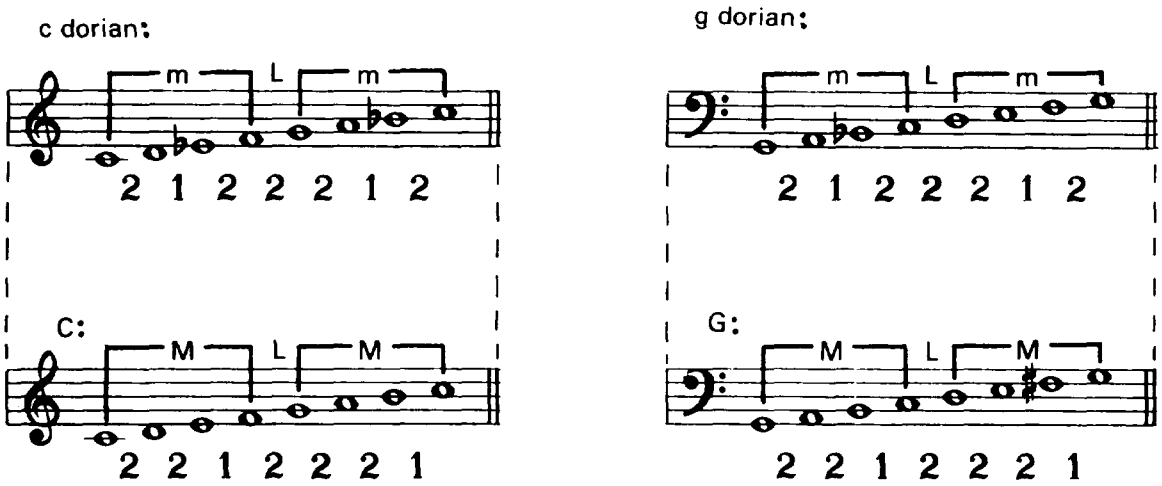


Figure 8.11: Parallel Major and Dorian.

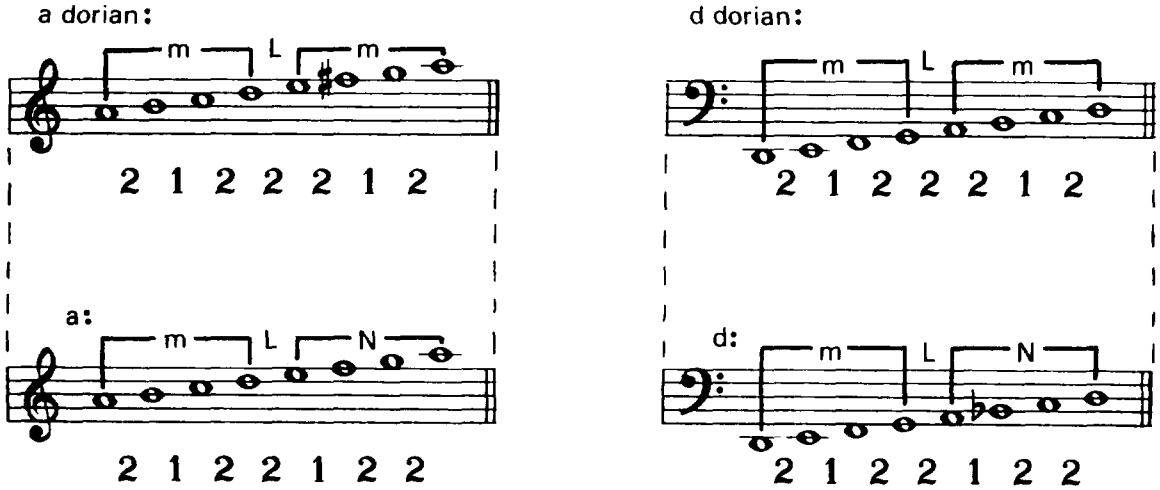


Figure 8.12: Parallel Minor and Dorian.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Subtonic

TENDENCY

Submediant (pulls to Subtonic)

Figure 8.13: Scale Degree Activity in Dorian.

AEOLIAN

The formula for the *aeolian mode* is **mLN**, making the aeolian mode identical to natural minor scales.

PHRYGIAN

The formula for the *phrygian mode* is **NLN.** The scale's half step/whole step interval relationship corresponds, on a keyboard, to a *white key* scale from *E* to *E*.

Scale Formula: **NLN**

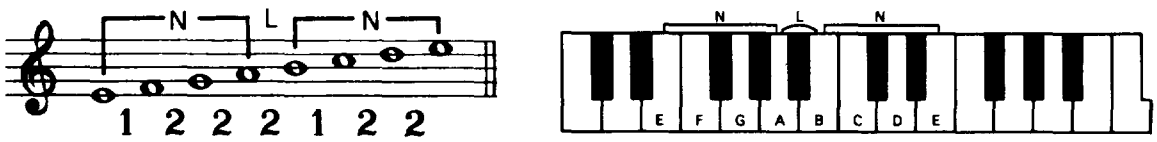


Figure 8.14: e *Phrygian Scale.*

The remaining phrygian scales are constructed on fifth scale degrees ascending and descending from *e* phrygian through seven sharps and flats. This creates fifteen phrygian keys that can be represented in a circle of phrygian keys (circle of fifths). The order of sharps and flats remains the same as in previous key signatures.

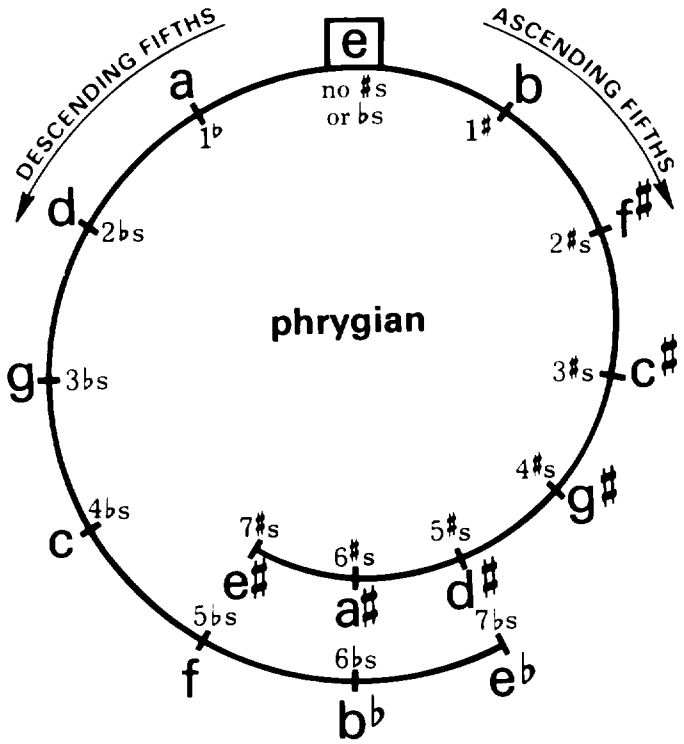


Figure 8.15: Circle of Phrygian Keys.

C major and *e* phrygian are relative keys. The relative phrygian tonic is the third scale degree (mediant) of the major scale.

Scale Degree Activity in Phrygian

The phrygian scale has a lowered supertonic (♭2), lowered mediant (♭3), lowered submediant (♭6), and subtonic (♭7) when compared to its parallel major. When compared to its parallel natural minor scale, the phrygian scale has a lowered supertonic (♭2).

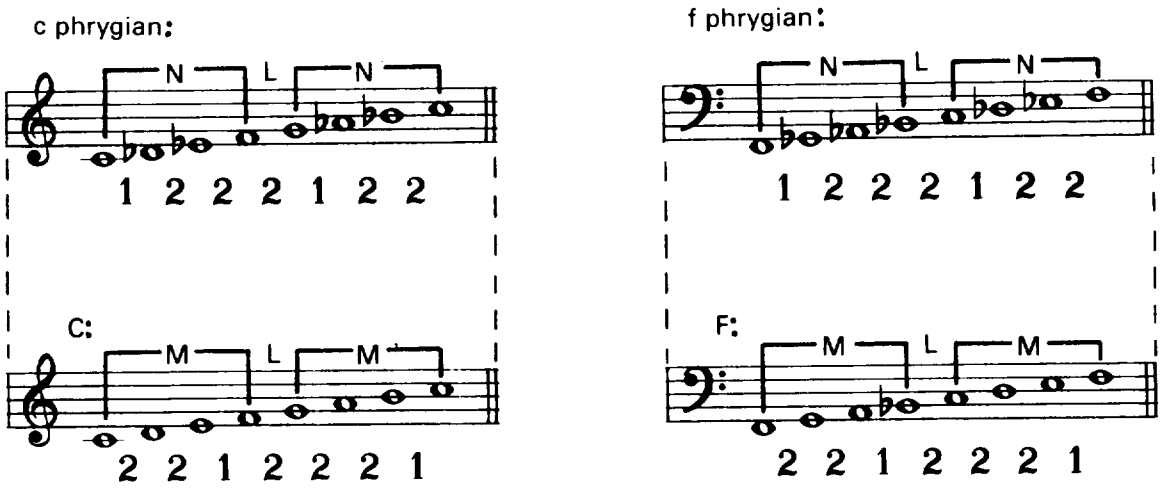


Figure 8.16: Parallel Major and Phrygian.

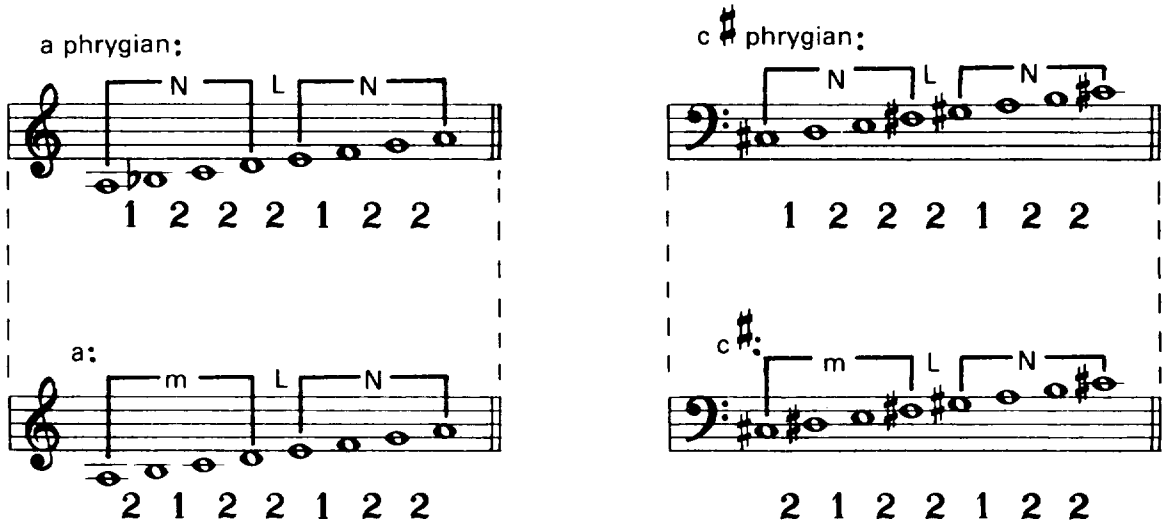


Figure 8.17: Parallel Minor and Phrygian.

STABLE	ACTIVE
Tonic	Supertonic
Mediant	Subdominant
Dominant	Submediant
	Subtonic
	TENDENCY
	Supertonic
	Submediant

Figure 8.18: Scale Degree Activity in Phrygian.

LOCRIAN

The formula for the *locrian mode* is **NNL.** The scale's half step/whole step interval relationship corresponds on a keyboard, to a *white key* scale,from *B* to *B*. The link (**L**) occurs at the end of this scale.

Scale Formula: **NNL**

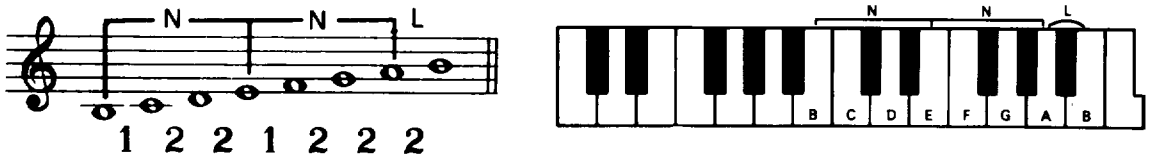


Figure 8.19: b *Locrian Scale.*

The remaining locrian scales are constructed on *raised* fifth scale degrees ascending and fifth scale degrees descending from *b* locrian through seven sharps and flats. This creates fifteen locrian keys that can be represented in circle of locrian keys (circle of fifths). The order of sharps and flats remain the same as in previous key signatures.

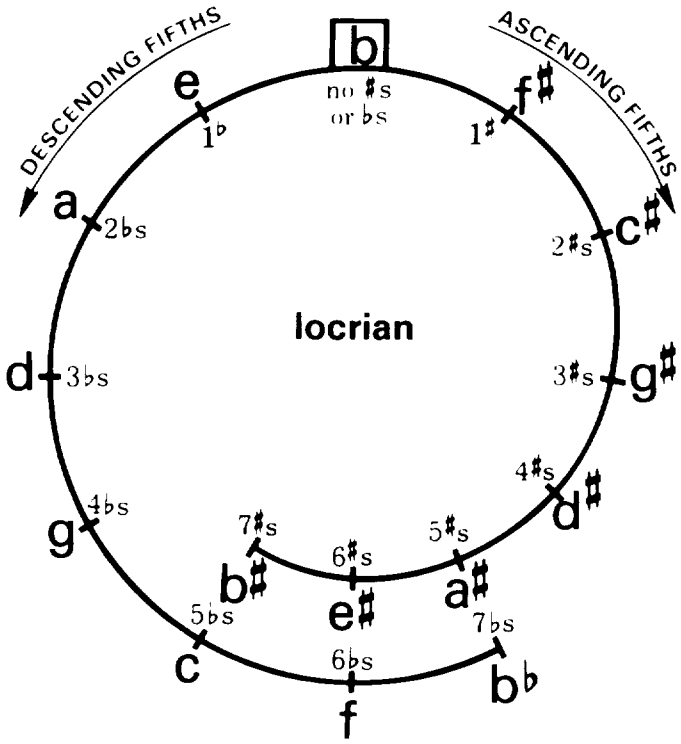


Figure 8.20: Circle of Locrian Keys.

C major and *b* locrian are relative keys. The relative locrian tonic is the leading tone of the major scale.

Parallel Analysis of Major and Locrian

The locrian has a lowered supertonic (♭2), lowered mediant (♭3), lowered dominant (♭5), lowered submediant (♭6), and subtonic (♭7) when compared to its parallel major scale. Only the subdominant remains unaltered when compared to the parallel major scale.

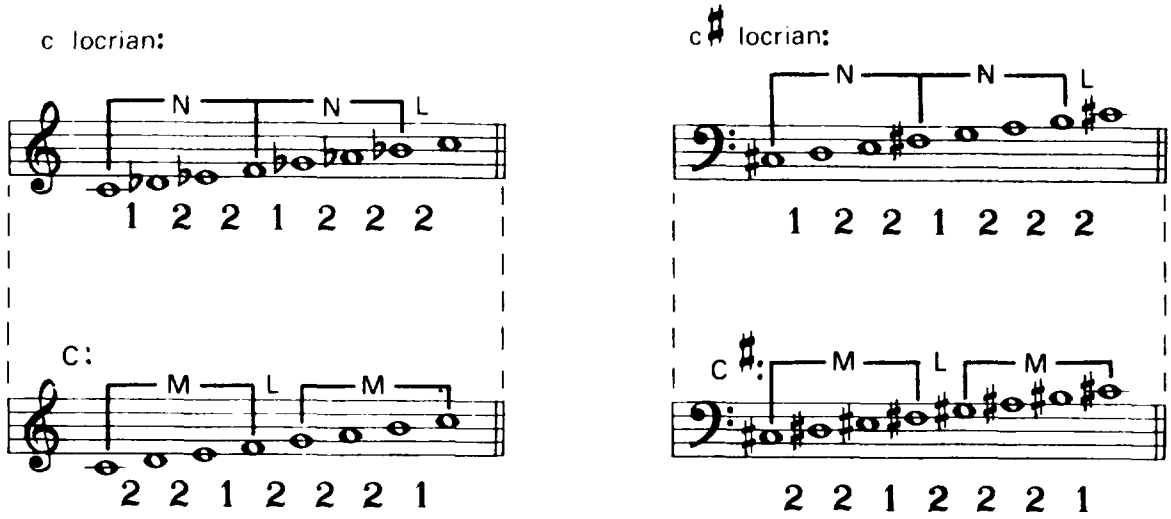


Figure 8.21: Parallel Major and Locrian.

As a scale, the locrian mode is unstable. It exhibits strong tendencies for movement. Scale degree activity in locrian mode is not easily analyzed. The mode is used primarily as a performance tool.

COMPARISON OF MODAL SCALE DEGREES TO MAJOR SCALE DEGREES

Charting the seven modes through their alterations as they relate to the same tonic (parallel) shows their scale degree relationships to the major scale.

	Tonic	Supertonic	Mediant	Subdominant	Dominant	Submediant	Leading Tone or Subtonic
Lydian	1	2	3	♯4	5	6	7
Ionian (Major)	1	2	3	4	5	6	7
Mixolydian	1	2	3	4	5	6	♭7
Dorian	1	2	♭3	4	5	6	♭7
Aeolian (Natural minor)	1	2	♭3	4	5	♭6	♭7
Phrygian	1	♭2	♭3	4	5	♭6	♭7
Locrian	1	♭2	♭3	4	♭5	♭6	♭7

Figure 8.22: Comparison of Modal Scale Degrees to Major Scale Degrees.

CHAPTER 9
CHROMATIC, WHOLE TONE, AND PENTATONIC SCALES

Chromatic, whole tone, and pentatonic scales cannot be analyzed using tetrachords. These scales do not form regular keys; therefore, none have regular key signatures. Chromatic and whole tone scales require accidentals when they are used with key signatures.

CHROMATIC SCALE

The *chromatic scale* consists entirely of half steps. There are twelve half steps (thirteen pitches) in an octave. If all thirteen pitches (twelve half steps) within an octave are represented in an ascending or descending order, the result is a chromatic scale. The name of the chromatic scale is the first note of the scale regardless of the key signature.

When notating chromatic scales, any pitch requiring an accidental is written as a chromatic alteration of the *previous* pitch.

D chromatic scale with a key signature of 2 flats

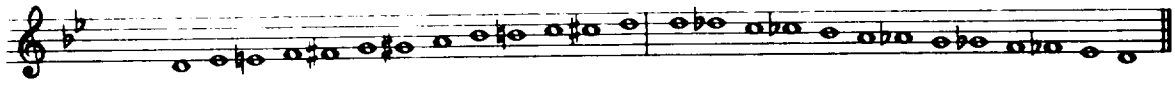
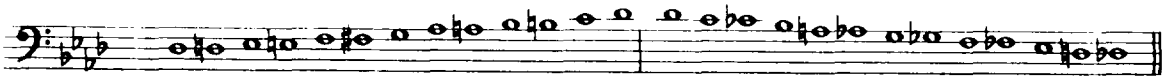


Figure 9.1: Chromatic Scale.

Double sharps and double flats should be avoided when notating chromatic scales. Therefore, natural signs on adjacent staff degrees are used to avoid double sharps and double flats.

D♭ chromatic scale with a key signature of 4 flats



A chromatic scale with a key signature of 3 sharps

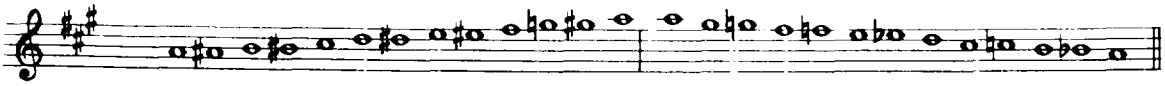
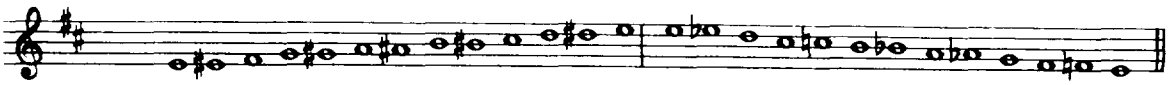


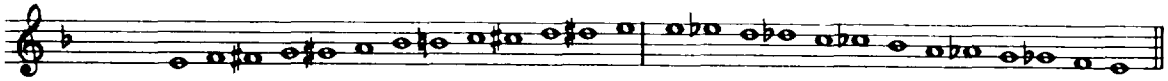
Figure 9.2: D♭ *and* A *Chromatic Scales.*

The same chromatic scale can be notated several ways. The key signature determines the notation of the chromatic scale.

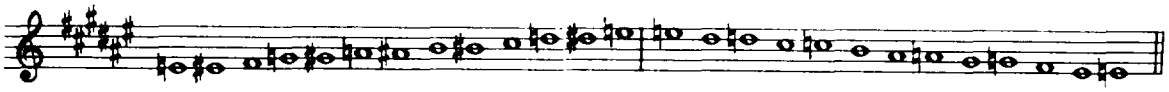
E chromatic scale with a key signature of 2 sharps



E chromatic scale with a key signature of 1 flat



E chromatic scale with a key signature of 6 sharps



E chromatic scale with a key signature of 5 flats

Figure 9.3: E *Chromatic Scales.*

WHOLE TONE SCALE

The *whole tone scale,* as its name implies, is a scale arranged to sound in whole steps. The whole tone scale is notated using accidentals to create whole steps.

The same whole tone scale can be notated several ways. The key signature often determines the notation of the whole tone scale.

Since the whole tone scale consists of seven pitches instead of eight (including the octave), one of the staff degrees within the scale will not contain a note. The whole step that is indicated by non-adjacent staff degrees may occur anywhere in the scale.

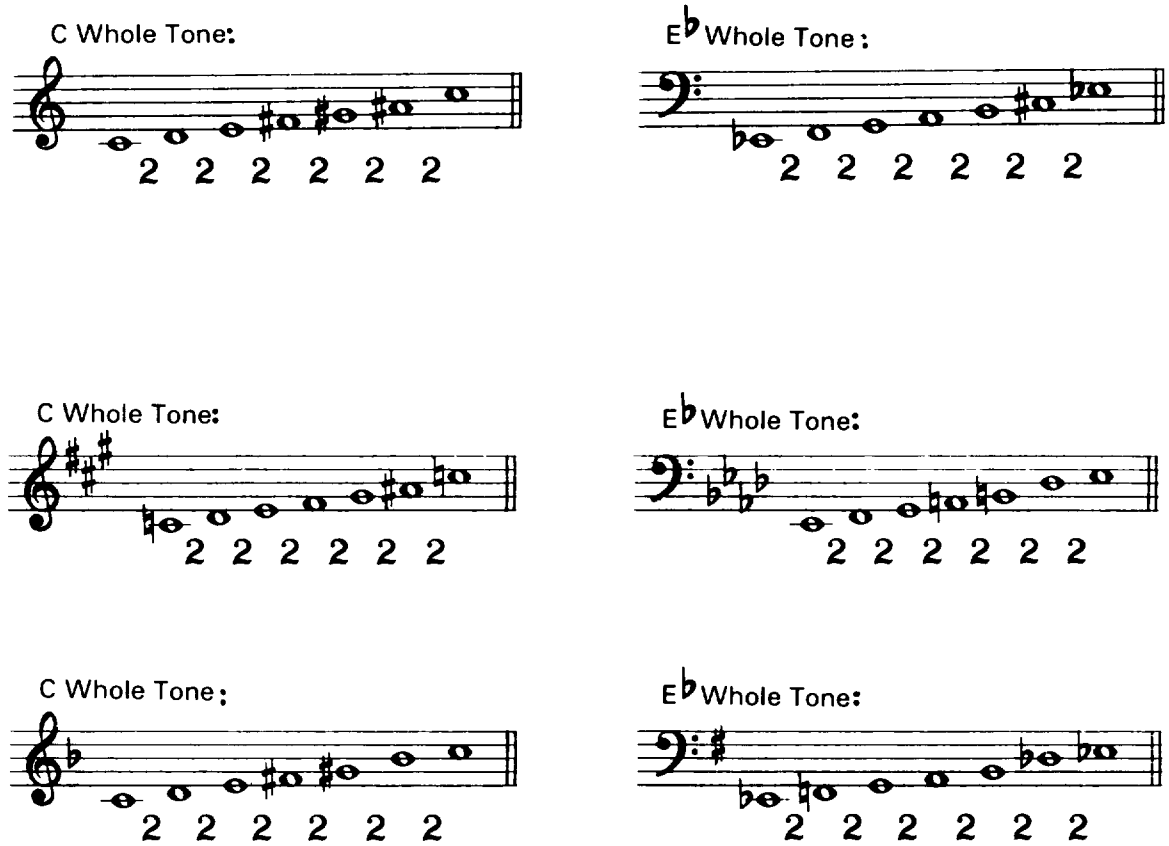


Figure 9.4: C *and* E♭ *Whole Tone Scales.*

PENTATONIC SCALES

A *pentatonic scale* consists of five tones (six pitches including the octave). Two common pentatonic scales are the pentatonic major and the pentatonic minor. No half steps occur in either of these scales.

Pentatonic Major

When constructed on the first degree of a major scale, a *pentatonic major scale* contains the tonic, supertonic, mediant, dominant, and submediant of that scale. The pentatonic major scale corresponds, on a keyboard, to a *black key* scale from *G♭* to *G♭*.

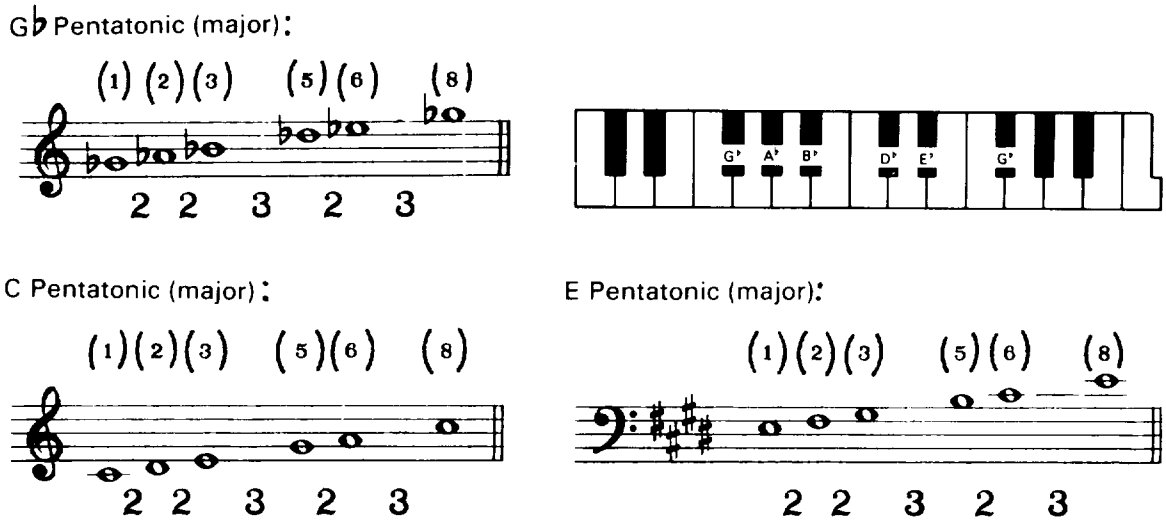


Figure 9.5: Pentatonic Major Scales.

The tones omitted are the tendency tones in major: the subdominant and leading tone.

Pentatonic Minor

When constructed on the first degree of a natural minor scale, a *pentatonic minor scale* contains the tonic, mediant, subdominant, dominant, and subtonic of that minor scale. This corresponds to the first, lowered third, fourth, fifth, and lowered seventh scale degrees (1, ♭3, 4, 5, ♭7) of the parallel major scale. The pentatonic minor scale corresponds, on a keyboard, to a *black key* scale from *E♭ to E♭* .

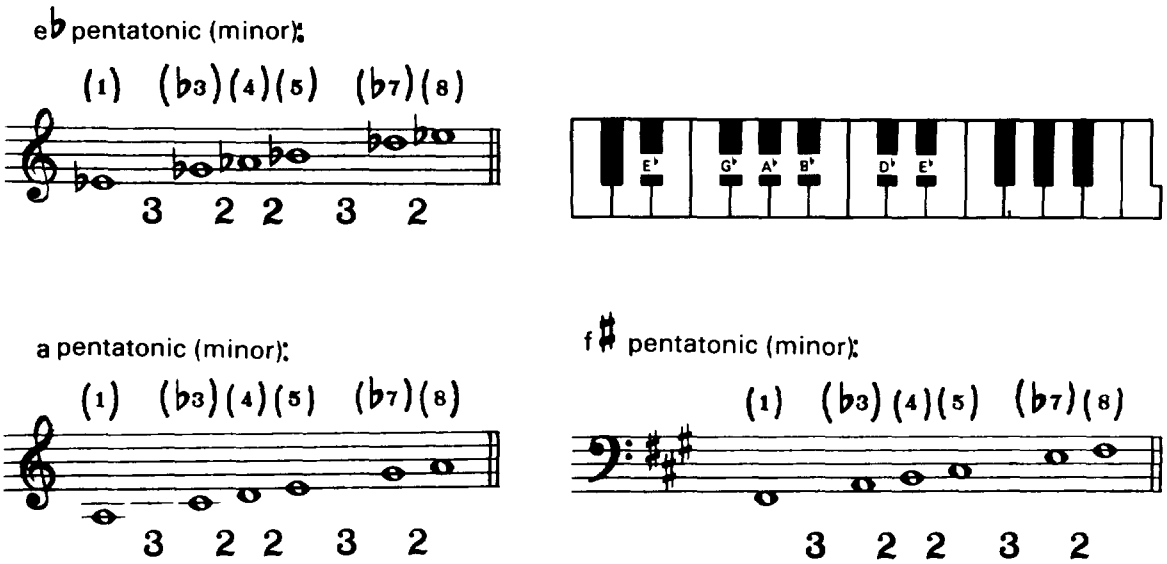


Figure 9.6: Pentatonic Minor Scales.

The tones omitted are the active tone and the tendency tone which form half steps in natural minor: the supertonic and submediant.

CHAPTER 10
INTERVALS

An *interval* is the difference in pitch between two tones. Intervals are named according to the number of letter names, or the number of successive staff degrees, encompassed by the interval.

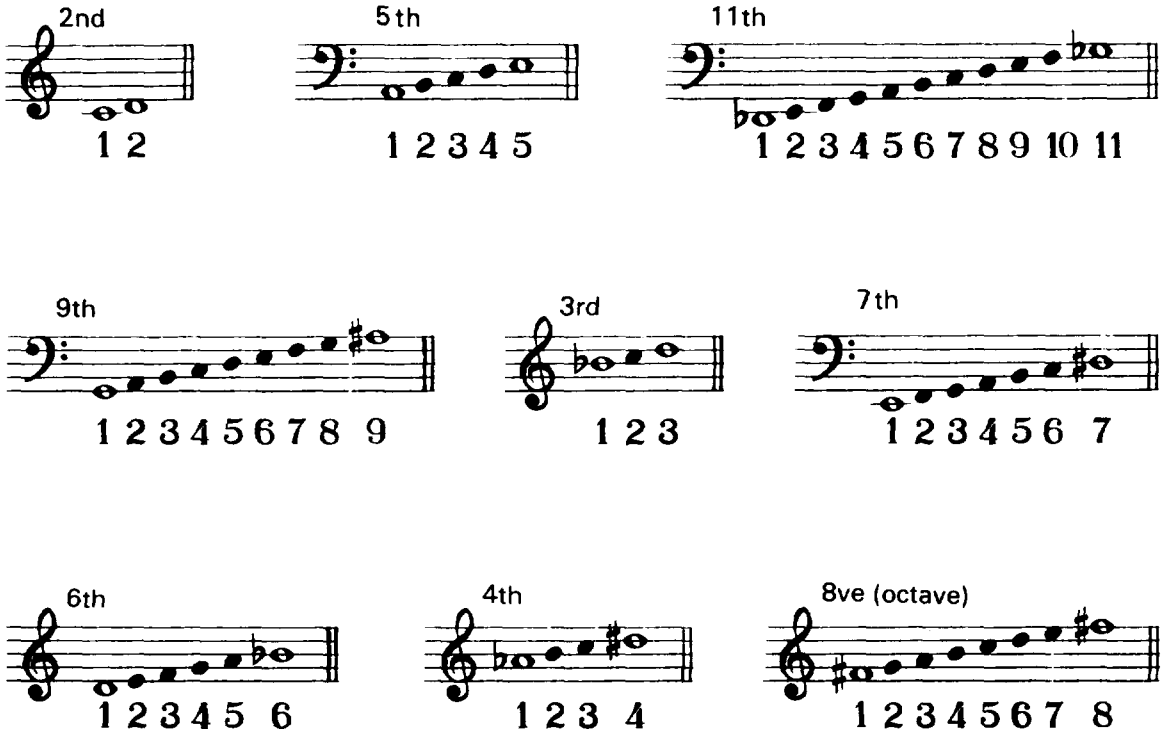


Figure 10.1: Names of Intervals.

When interval tones sound simultaneously, the interval is a *harmonic interval.* When interval tones sound in succession, the interval is a *melodic interval.*

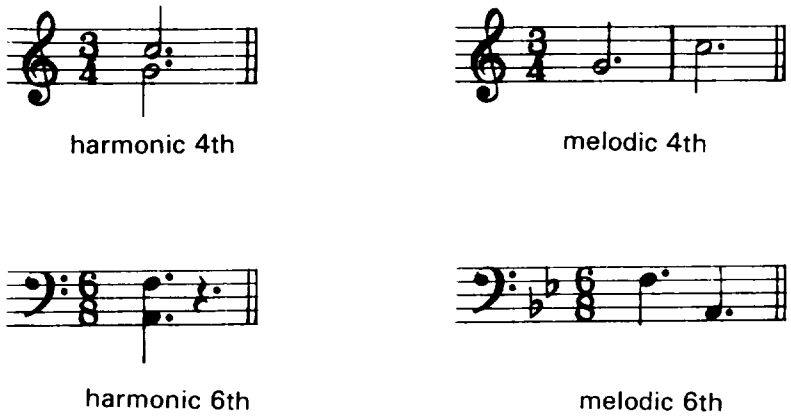


Figure 10.2: Harmonic and Melodic Intervals.

When interval tones encompass an octave or less, the interval is a *simple interval.* When interval tones encompass a ninth or more, the interval is a *compound interval.*

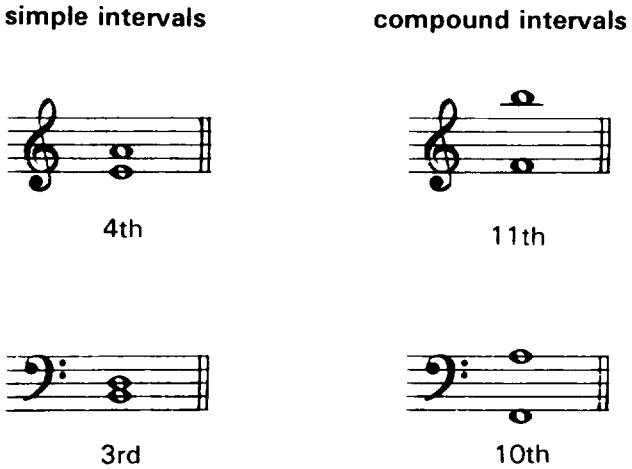


Figure 10.3: Simple and Compound Intervals.

QUALITIES OF INTERVALS

To identify a specific interval both its name and quality must be stated. The quality of an interval may be described by one of five terms: *perfect, major, minor, augmented, or diminished.*

Perfect Intervals

A *perfect prime* (P1) consists of two notes of the same pitch on the same staff degree. A *perfect fourth* (P4), a *perfect fifth* (P5), and a *perfect octave* (P8) consist of the intervals formed between the tonic and the subdominant, dominant, and octave of a major or minor scale.

The perfect prime contains no half steps; the perfect fourth contains five half steps; the perfect fifth contains seven half steps; and the perfect octave contains twelve half steps.

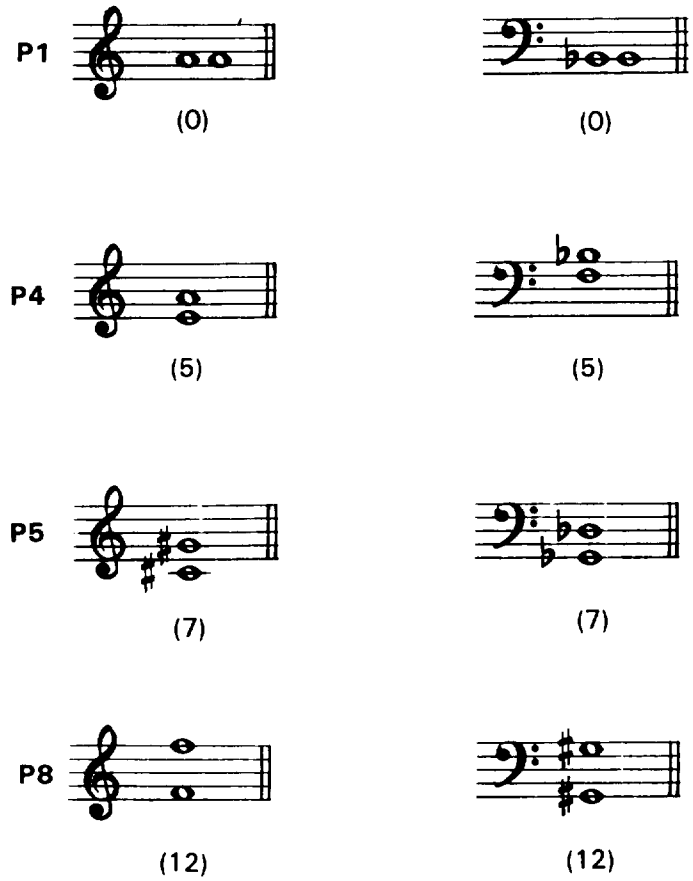


Figure 10.4: Perfect Intervals.

Major Intervals

A *major second* (Maj 2), *major third* (Maj 3), *major sixth* (Maj 6), and *major seventh* (Maj 7) consist of the intervals formed between the tonic and supertonic, mediant, submediant, and leading tone of a major scale.

The major second contains two half steps; the major third contains four half steps; the major sixth contains nine half steps; and the major seventh contains eleven half steps.

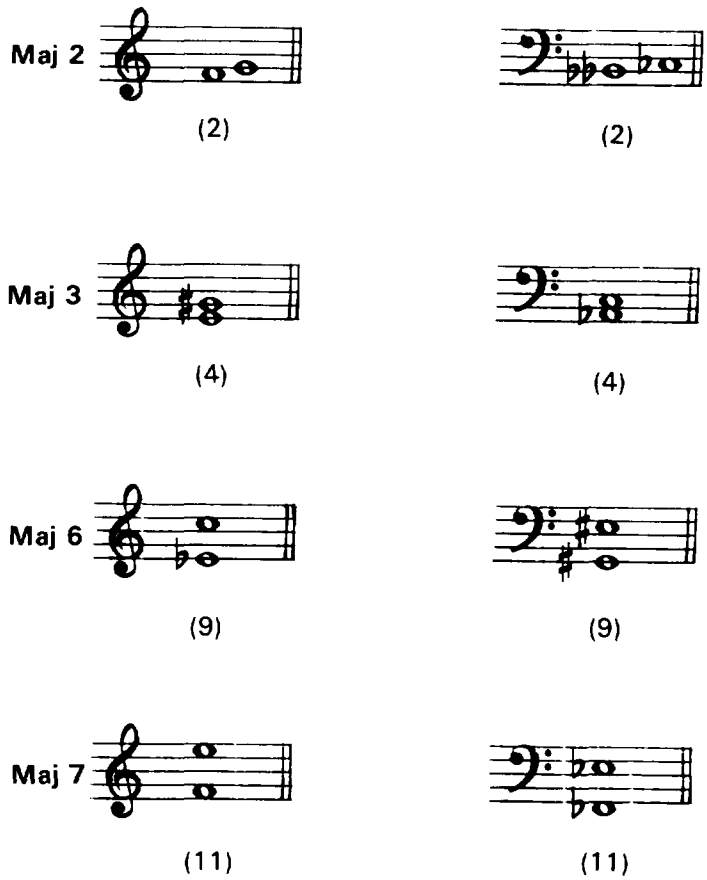


Figure 10.5: Major Intervals.

Minor Intervals

A major interval made smaller by a half step becomes minor. A *minor 2nd* (min 2), *minor 3rd* (min 3), *minor 6th* (min 6), and *minor 7th* (min 7) consist of the intervals formed between the tonic and lowered supertonic (♭2), mediant (♭3), and submediant (♭6) of a major scale, and between the tonic and subtonic (♭7).

The minor second contains one half step; the minor third contains three half steps; the minor sixth contains eight half steps; and the minor seventh contains ten half steps.

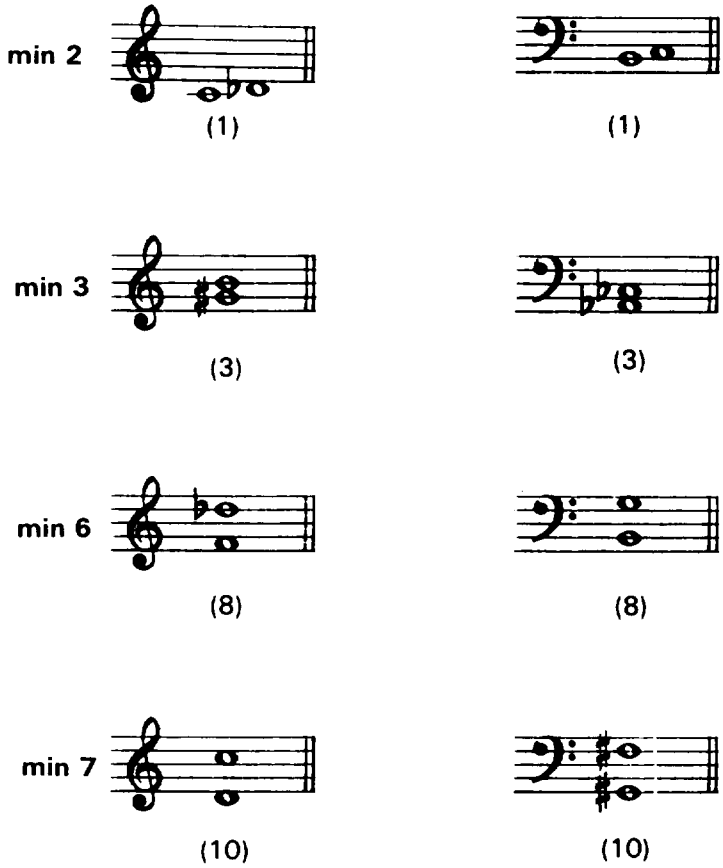


Figure 10.6: Minor Intervals.

Augmenting Perfect Intervals

A perfect interval made greater by a half step becomes augmented. The *augmented prime* (Aug 1) contains one half step; the *augmented fourth* (Aug 4) contains six half steps; the *augmented fifth* (Aug 5) contains eight half steps; and the *augmented octave* (Aug 8) contains thirteen half steps.

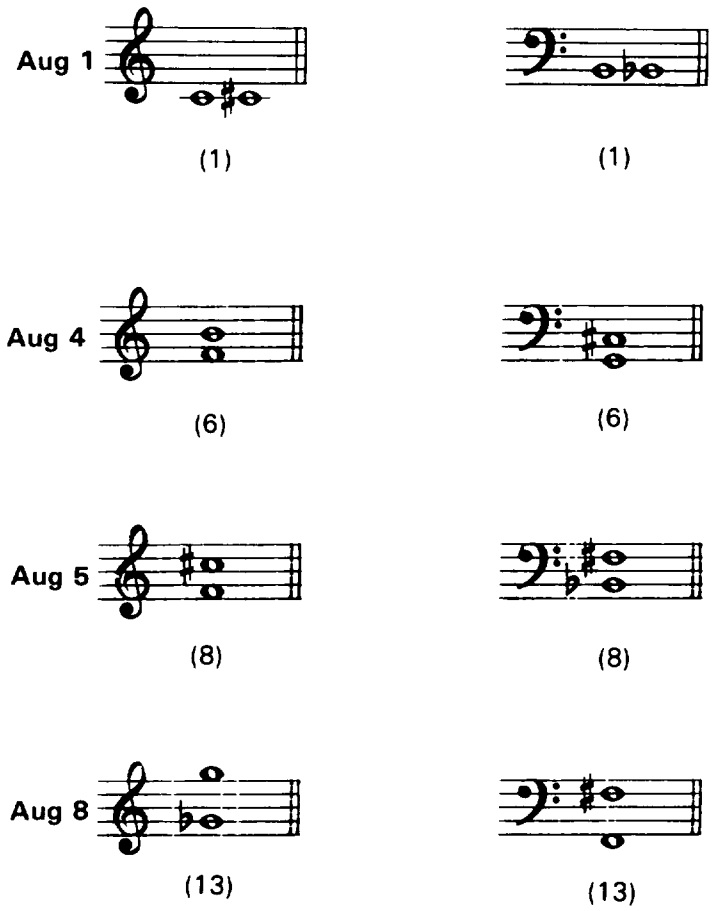


Figure 10.7: Augmented Intervals from Perfect Intervals.

Diminishing Perfect Intervals

A perfect interval made smaller by a half step becomes diminished. The *diminished fourth* (dim 4) contains four half steps; the *diminished fifth* (dim 5) contains six half steps; and the *diminished octave* (dim 8) contains eleven half steps. There is no diminished prime because it is impossible to make a prime smaller.

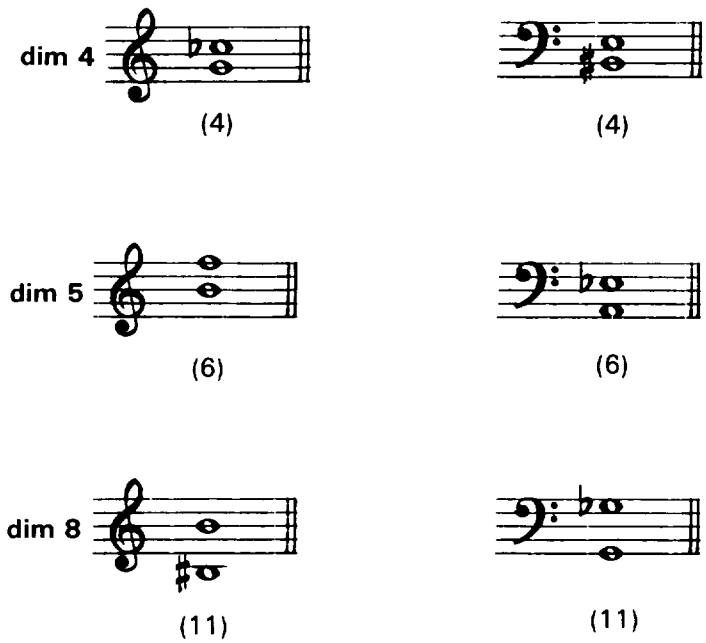


Figure 10.8: Diminished Intervals from Perfect Intervals.

Augmenting Major Intervals

A major interval made greater by a half step becomes augmented. The *augmented second* (Aug 2) contains three half steps; the *augmented third* (Aug 3) contains five half steps; the *augmented sixth* (Aug 6) contains ten half steps; and the *augmented seventh* (Aug 7) contains twelve half steps.

Minor intervals made greater by a half step become major; major intervals made greater by a half step become augmented; therefore, a minor interval made greater by a whole step becomes augmented.

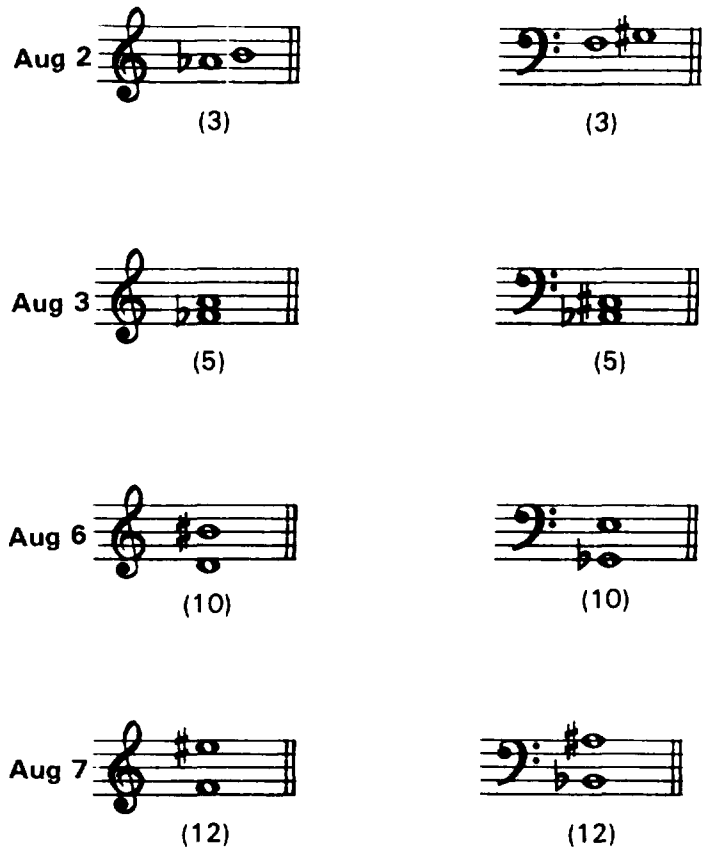


Figure 10.9: Augmented Intervals from Major Intervals.

Diminishing Minor Intervals

A minor interval made smaller by a half step becomes diminished. The *diminished second* (dim 2) contains no half steps because the two pitches sound the same; the *diminished third* (dim 3) contains two half steps; the *diminished sixth* (dim 6) contains seven half steps; and the *diminished seventh* (dim 7) contains nine half steps.

Major intervals made smaller by a half step become minor; minor intervals made smaller by a half step become diminished; therefore, a major interval made smaller by a whole step becomes diminished.

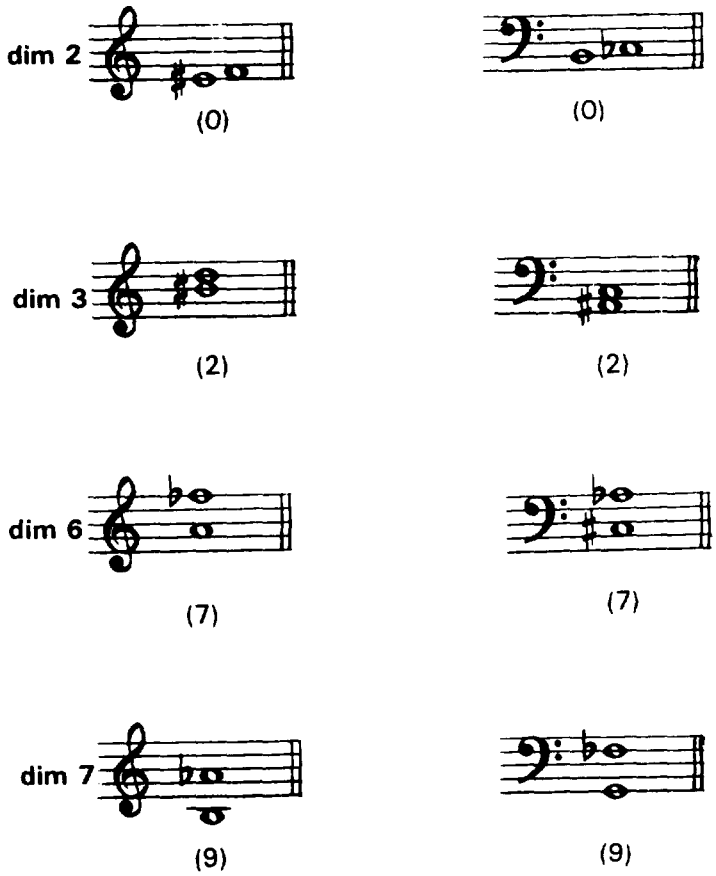


Figure 10.10: Diminished Intervals from Minor Intervals.

INTERVAL QUALITY RELATIONSHIPS

The following diagram illustrates the relationships of various intervals when moved by half steps.

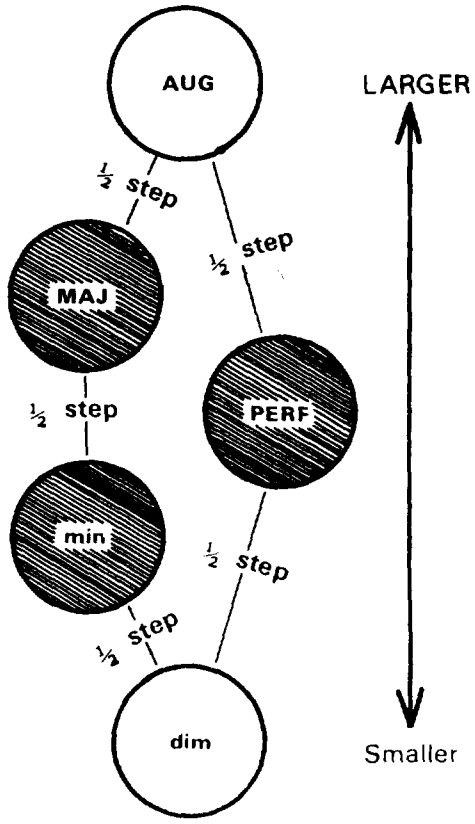


Figure 10.11: Interval Quality Relationships.

ENHARMONIC INTERVALS

Intervals that have different names but sound the same are *enharmonic intervals*. Enharmonic intervals will always have the same number of half steps but different notation. For example, the Aug 5 and min 6 shown in Fig. 10.12 are enharmonic intervals. Both intervals contain eight half steps.

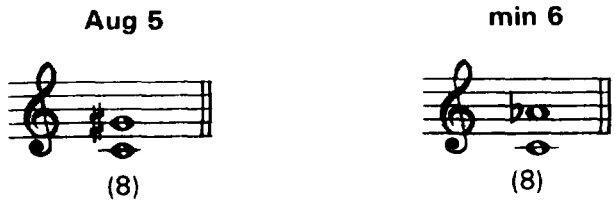


Figure 10.12: Enharmonic Intervals.

INVERSION OF SIMPLE INTERVALS

Inversion is a change in the relative position of the notes in a simple interval. When the upper note in a simple interval becomes the lower note, or the lower note becomes the upper note, the interval has been inverted. Inversion is accomplished by moving the lower note up an octave or the upper note down an octave.

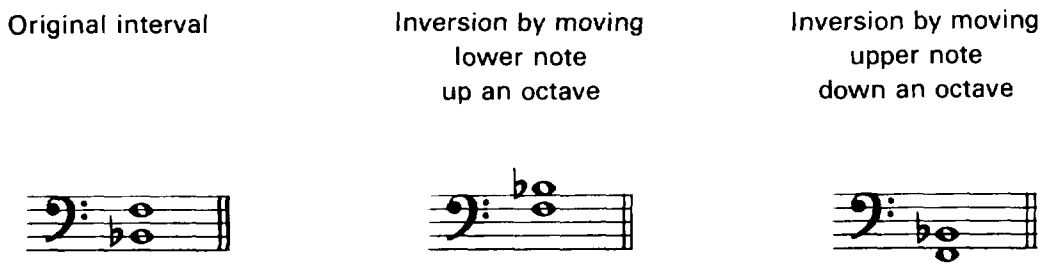


Figure 10.13: Inversion of Simple Interval (P5).

Three simple intervals do not invert: the perfect prime, perfect octave, and augmented octave.

The perfect prime will not invert because there is no upper or lower note.

The perfect octave will not invert because this would create a perfect prime, which has no upper or lower note.

The augmented octave will not invert because the upper note would remain the upper note and the lower note would remain the lower note.

The names of inverted simple intervals are predictable. The sum of a simple interval and it's inversion is always ***NINE:***

1 becomes 8 (when invertable)

2 becomes 7

3 becomes 6

4 becomes 5

5 becomes 4

6 becomes 3

7 becomes 2

8 becomes 1 (when invertable)

The qualities of inverted simple intervals are also predictable:

perfect remains perfect (when invertable)

major becomes minor

minor becomes major

augmented becomes diminished

diminished becomes augmented

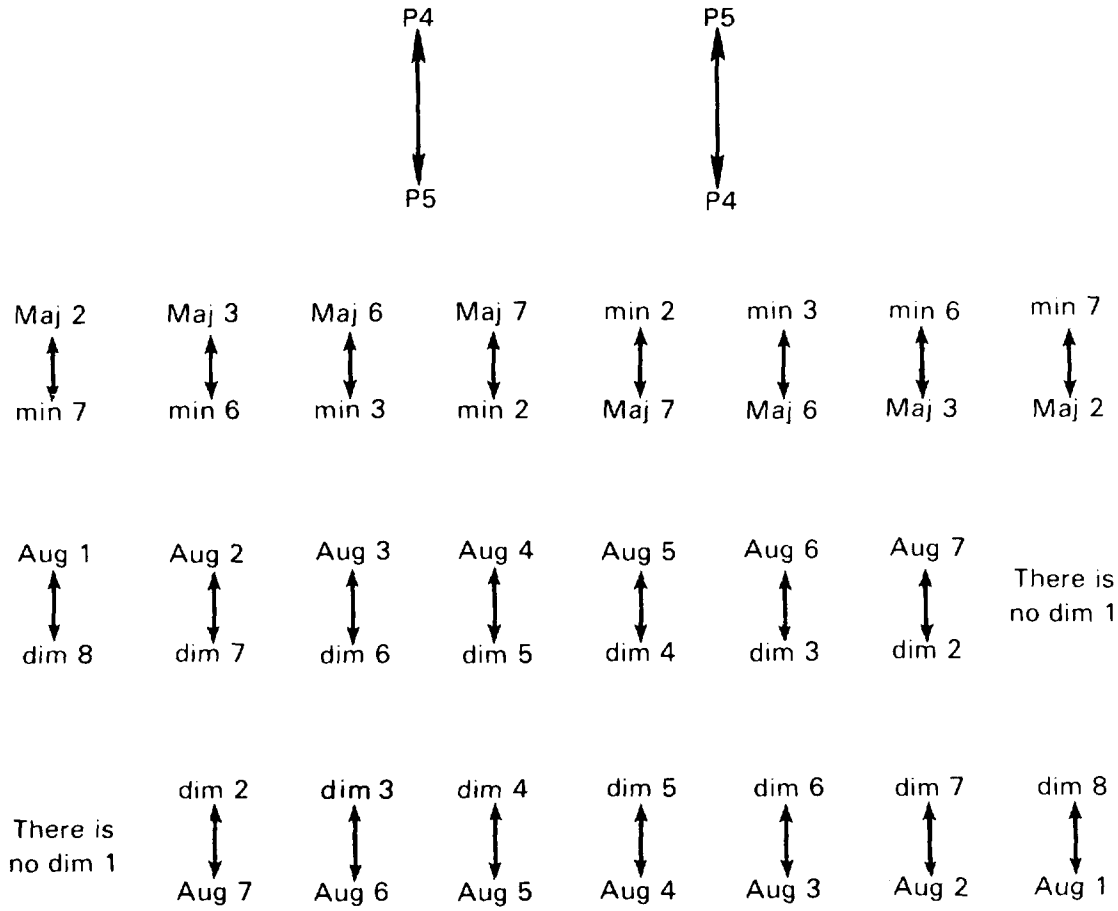


Figure 10.14: Simple Interval Inversions.

COMPOUNDING AND REDUCING INTERVALS

Compounding and *reducing* intervals are other methods of changing the relative position of the notes in an interval. Compounding a simple interval is accomplished by moving the upper note up an octave or the lower note down an octave. Moving the upper note down an octave or the lower note up an octave reduces a compound interval. Compounding intervals may continue indefinitely, but reduction can continue only until the interval becomes simple, then inversion rules control further movement. When compounding or reducing intervals, the name of the interval changes while the quality remains the same.

Compounding Intervals

When compounding a simple or compound interval, the number ***SEVEN*** is *added* to the name of the interval for each octave displacement. The quality of the interval remains the same.

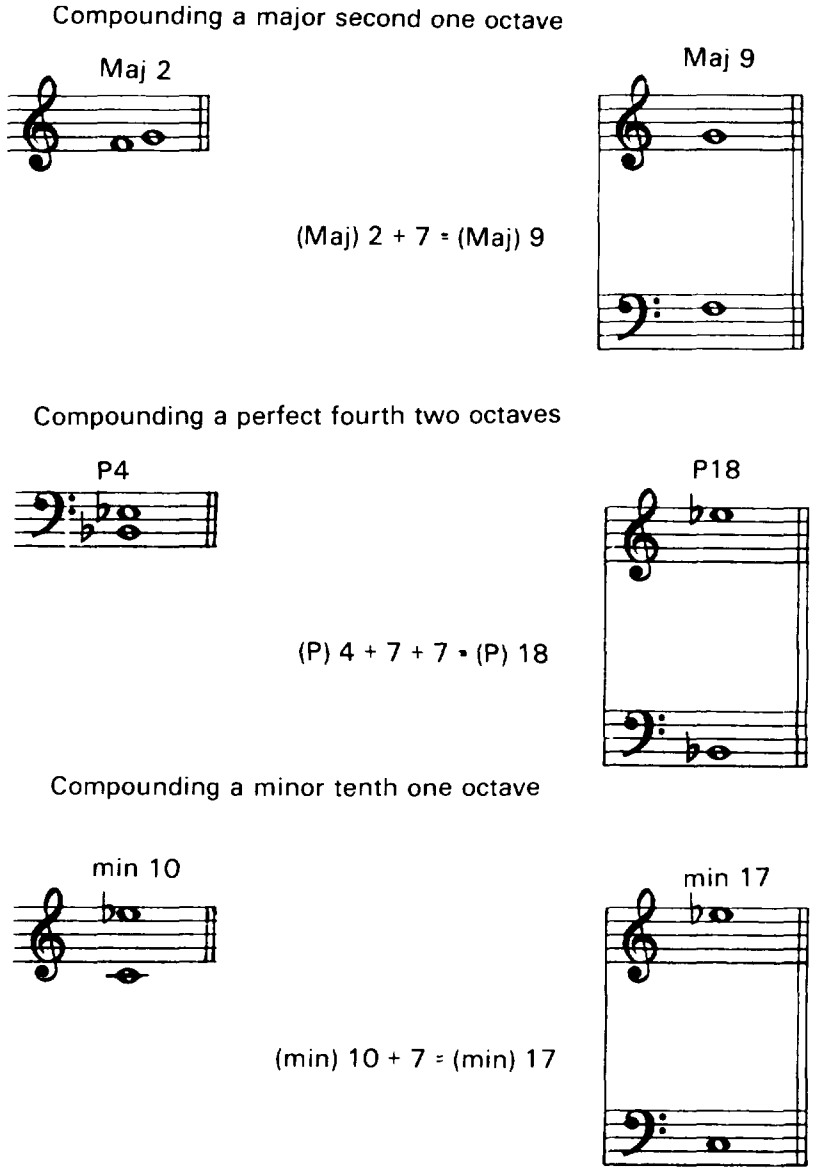


Figure 10.15: Compounding Intervals.

The perfect prime, which is not inverted, may be compounded. The perfect prime compounds to a perfect octave (P1+7 equals P8).

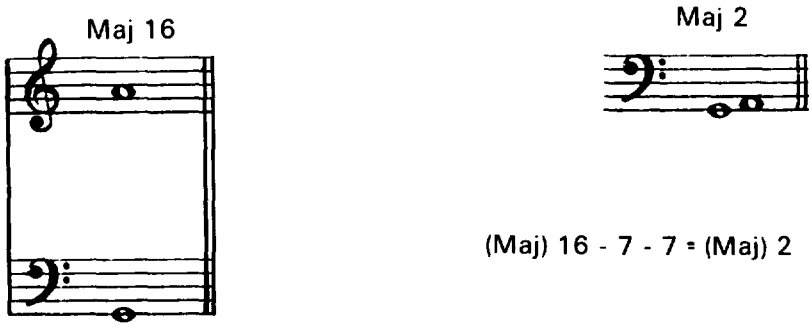
Reducing Intervals

When reducing a compound interval, the number ***SEVEN*** is *subtracted* from the name of the interval for each octave displacement. The quality of the interval remains the same.

Reducing an augmented twelfth by one octave

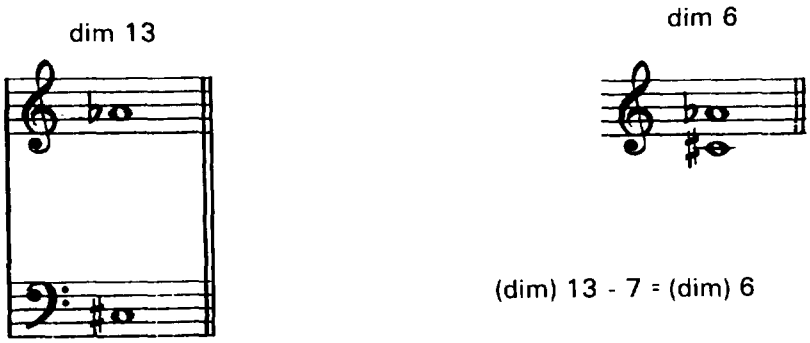
(Aug) 12 - 7 = (Aug) 5

Reducing a major sixteenth by two octaves



(Maj) 16 - 7 - 7 = (Maj) 2

Reducing a diminished thirteenth by one octave



(dim) 13 - 7 = (dim) 6

Figure 10.16: Reducing Intervals.

Two simple intervals may be reduced. The augmented octave reduces to an augmented prime (Aug 8 - 7 equals Aug 1) and the perfect octave reduces to a perfect prime (P8 - 7 equals P1).

CONSONANT AND DISSONANT INTERVALS

The basic sound of intervals may be generally described as *consonant* or *dissonant*. Consonant intervals tend to remain stable. Dissonant intervals tend to be unstable, requiring movement to a consonance. Perfect primes, thirds, perfect fifths, sixths, and perfect octaves are generally consonant intervals. Seconds, perfect fourths, sevenths, augmented, and diminished intervals are generally dissonant intervals.

Consonant Intervals	Dissonant Intervals
P1, P5, P8,	P4,
Maj 3, Maj 6	Maj 2, Maj 7
min 3, min 6	min 2, min 7
	All augmented intervals
	All diminished intervals

Figure 10.17: Consonant and Dissonant Intervals.

Although the minor third (3 half steps) and the augmented second (3 half steps) are enharmonic, one is classified as a consonance, the other as a dissonance. This is true of several enharmonic intervals (Maj 3 and dim 4, dim 2 and P1, dim 6 and P5, Aug 5 and min 6, etc.). The musical context determines consonance and dissonance when the intervals are enharmonic.

The diminished fifth (dim 5) and augmented fourth (Aug 4) contain six half steps, are dissonant, and are enharmonic. Since both these intervals contain three whole steps, both are commonly referred to as the *tritone* (abbreviated TT).

DIATONIC AND CHROMATIC INTERVALS

Pitches that belong to a scale or key are called *diatonic*. Pitches foreign to a scale or key are called *chromatic*. The pitch *C* is diatonic to the keys of *C* major (tonic), *e*♭ melodic minor ascending (raised submediant), and *b*♭ minor (supertonic). However, the pitch *C* is chromatic (not diatonic) to the keys of *D* major (subtonic), *G* lydian (lowered subdominant), and *a*♭ minor (raised mediant).

Intervals are diatonic when both the upper and lower notes of the interval are found in the key. Intervals are chromatic when one or both notes of the interval are foreign to the key. The simple interval formed by the pitches *G* up to *B♭* is a diatonic interval in *B♭* Major, *E♭* mixolydian, and *c* natural minor, but it is a chromatic interval in *G♭* major, *e* minor, and *D* lydian.

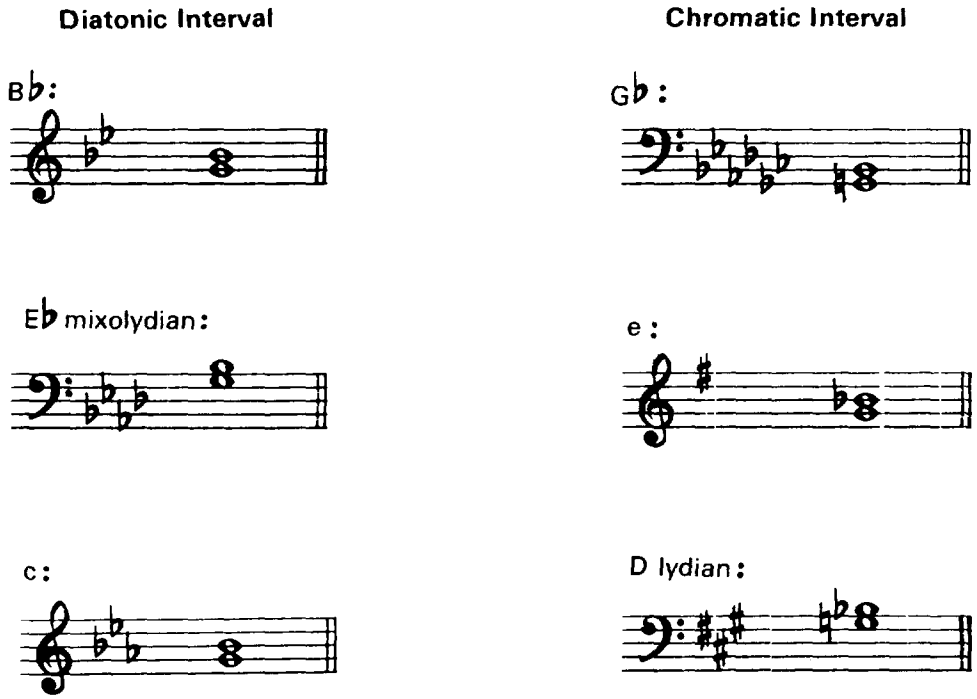


Figure 10.18: Diatonic and Chromatic Intervals.

CHAPTER 11
TRIADIC CHORDS

A *chord* is a combination of three or more different tones sounded simultaneously or in succession *(broken chord)*. Chords in music are often spelled in thirds.

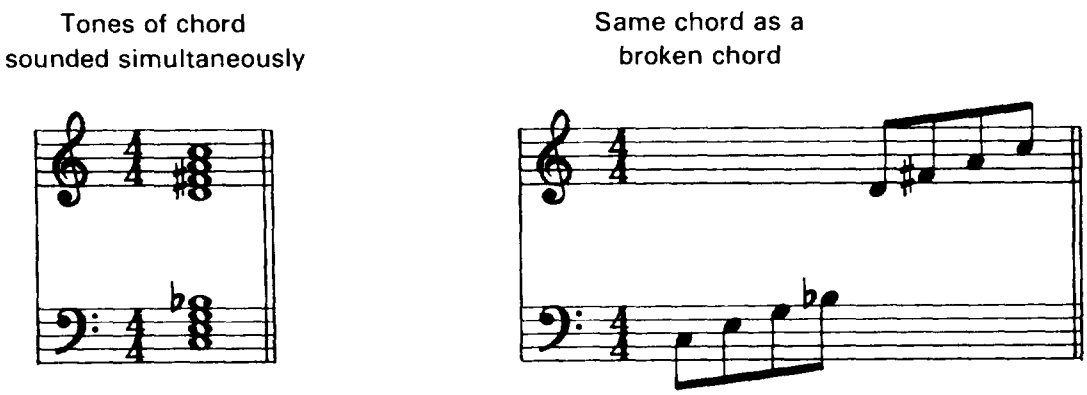


Figure 11.1: Chord.

A *triad* is a chord of three tones spelled in thirds. It may be constructed of any combination of two superimposed major and minor thirds. The lowest of these tones is called the *root* of the triad. The middle tone is called the *third* of the triad because it is a third above the root of the triad. The highest of the three tones is called the *fifth* of the triad because it is a fifth above the root of the triad.

The written triad uses alternate staff degrees in its notation. That is, the triad is notated on adjacent lines or spaces, depending on whether the root is on a line or a space.

Four combinations of major and minor thirds are possible in the construction of triads:

a major third as the lower interval with a minor third as the upper interval,

a minor third as the lower interval with a major third as the upper interval,

major thirds as both upper and lower intervals,

minor thirds as both upper and lower intervals.

Triads have the following qualities:

Major (Maj)

minor (min)

Augmented (Aug)

diminished (dim)

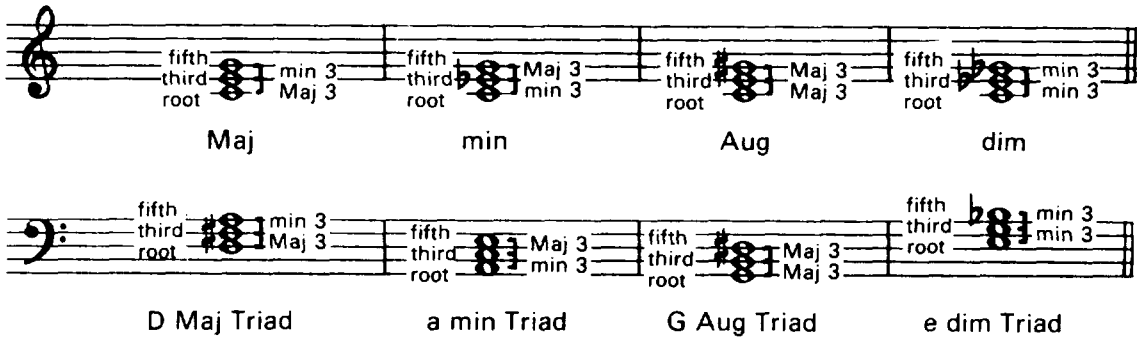


Figure 11.2: Triad qualities.

MAJOR TRIAD

The *major triad* has three tones on alternate staff degrees with a major third (4 half steps) as the lower interval and a minor third (3 half steps) as the upper interval. The interval between the root and fifth is a perfect fifth (7 half steps). When constructed on the first degree of a major scale, a major triad contains the tonic, mediant, and dominant of that scale. This corresponds to the first, third, and fifth (1, 3, and 5) scale degrees of that major scale.

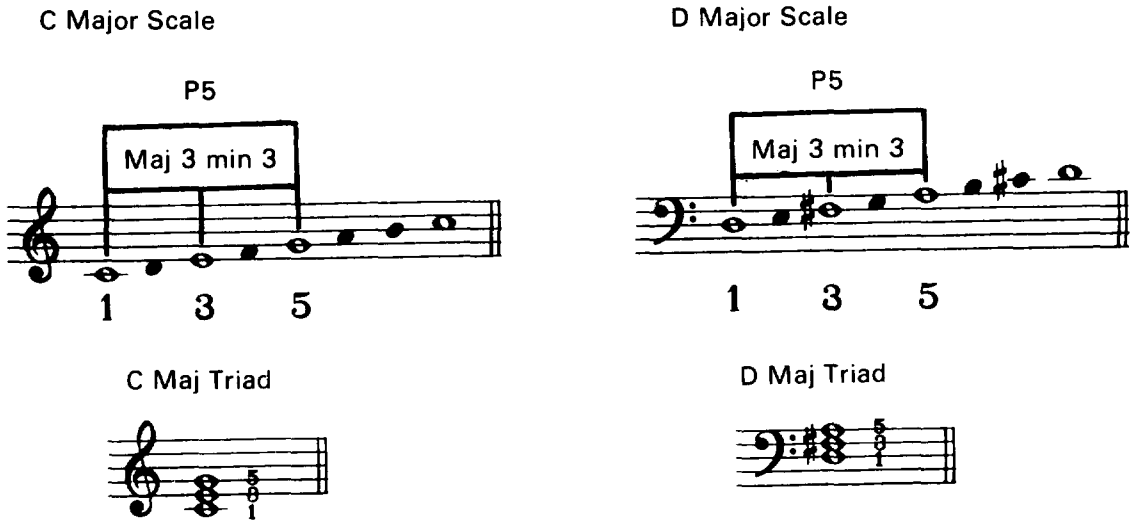


Figure 11.3: Major triads.

MINOR TRIAD

The minor triad has three tones on alternate staff degrees with a minor third (3 half steps) as the lower interval and a major third (4 half steps) as the upper interval. The interval between the root and fifth is a perfect fifth (7 half steps). When constructed on the first degree of a minor scale, a minor triad contains the tonic, mediant, and dominant of that minor scale. This corresponds to the first, lowered third, and fifth (1, ♭3, and 5) scale degrees of the parallel major scale.

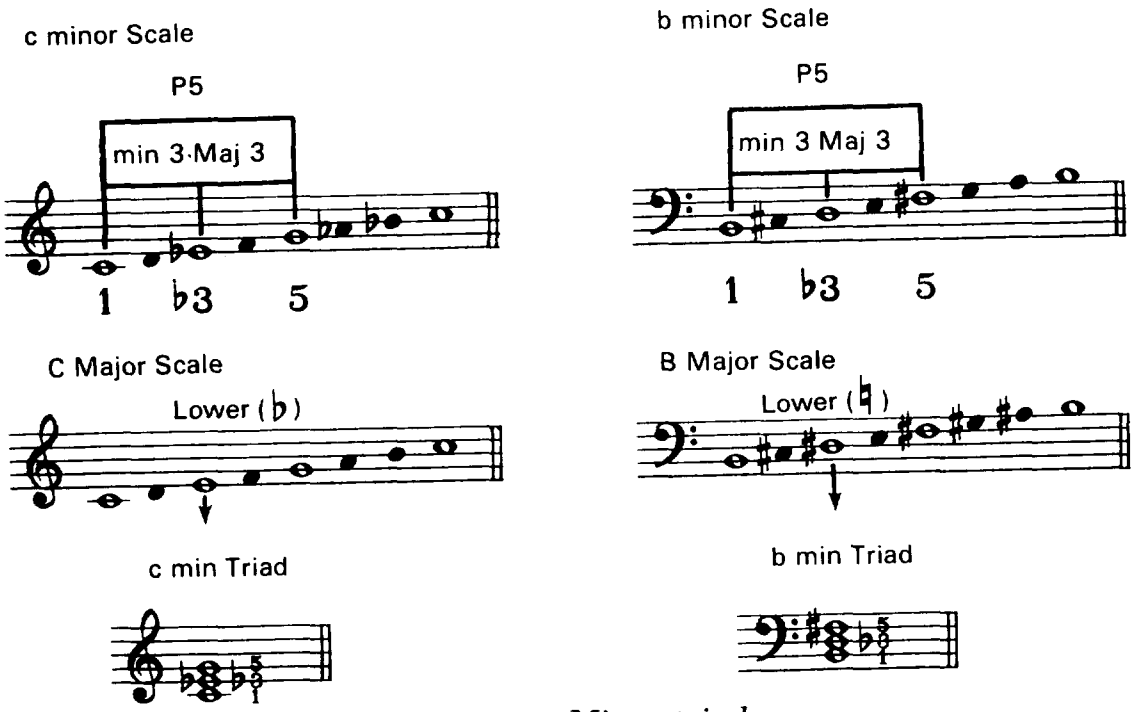


Figure 11.4: Minor triads.

AUGMENTED TRIAD

The *augmented triad* has three tones on alternate staff degrees with two major thirds (4 half steps) for the upper and lower intervals. The interval between the root and fifth is an augmented fifth (8 half steps). When constructed on the first degree of a whole tone scale whose fifth is raised, the augmented triad contains the tonic, mediant, and dominant of that whole tone scale. This corresponds to the first, third, and raised fifth (1, 3, and ♯5) scale degrees of the parallel major scale.

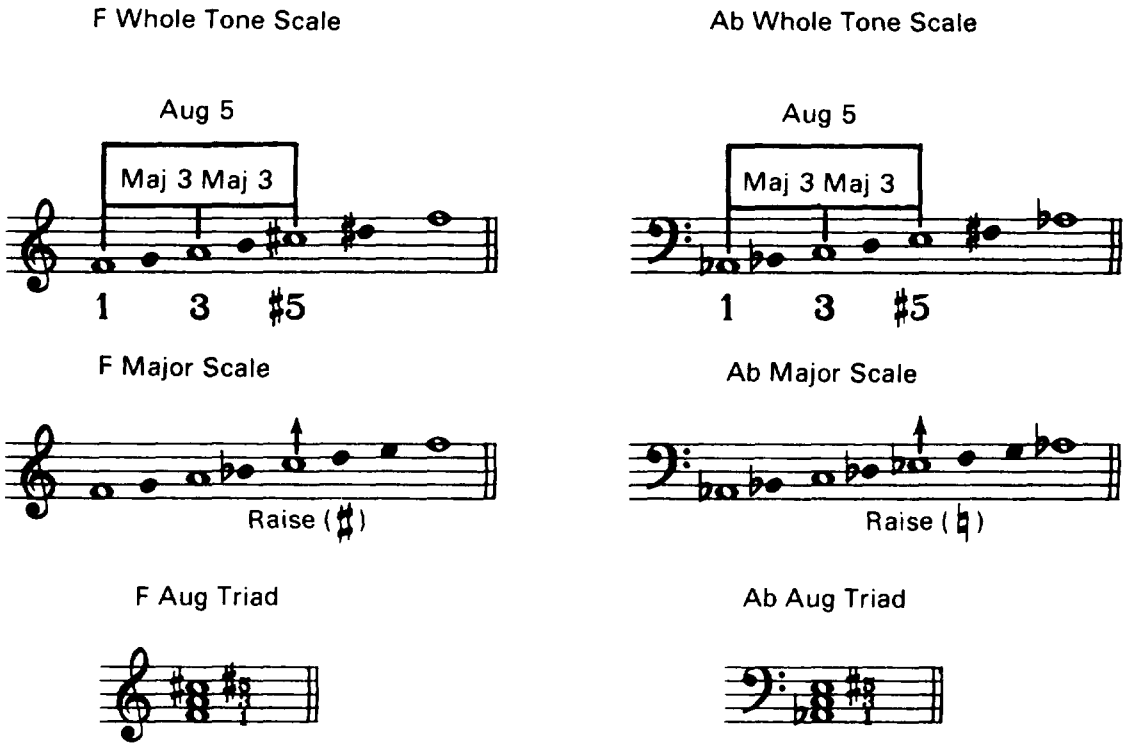


Figure 11.5: Augmented triads.

DIMINISHED TRIAD

The *diminished triad* has three tones on alternate staff degrees with two minor thirds (3 half steps) for the upper and lower interval. The interval between the root and fifth is a diminished fifth (6 half steps). When constructed on the first degree of a locrian scale, the diminished triad contains the tonic mediant, and dominant of that locrian scale. This corresponds to the first, lowered third, and lowered fifth (1, ♭3, and ♭5) scale degrees of the parallel major scale.

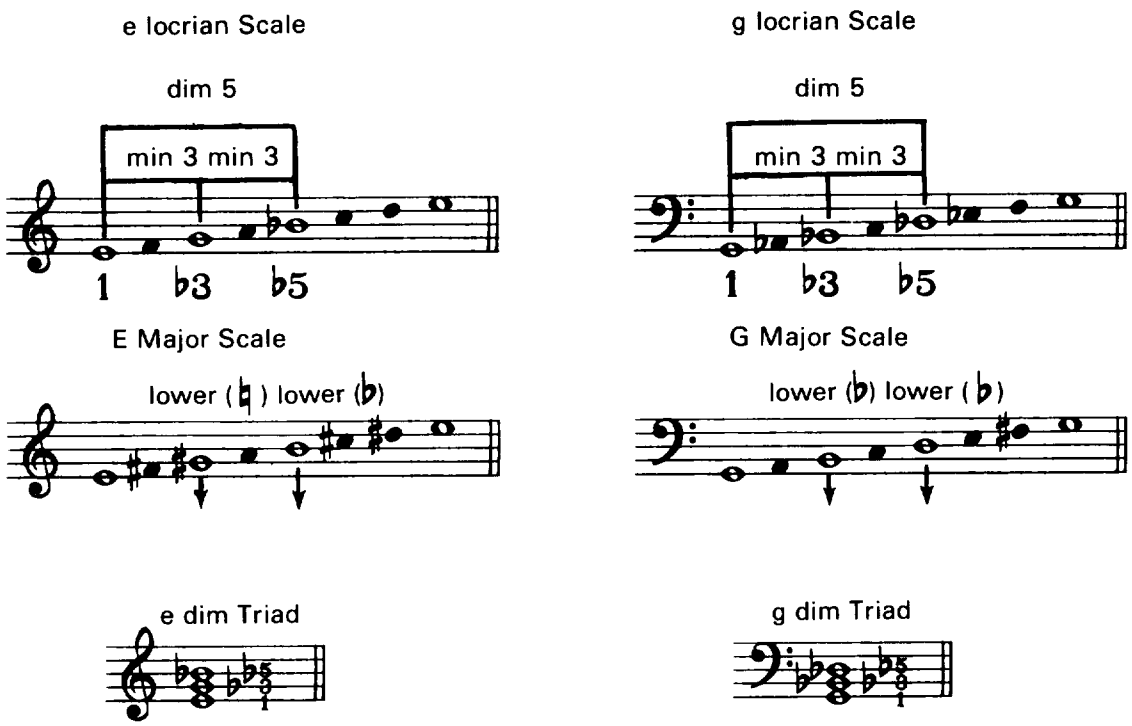


Figure 11.6: Diminished triads.

CONSONANT AND DISSONANT TRIADS

The basic sound of triads may be generally described as consonant or dissonant. Consonant triads tend to remain stable. Dissonant triads tend to be unstable requiring movement to a consonant triad. Major and minor triads are generally consonant triads. Augmented and diminished triads are generally dissonant triads.

Consonant Triads	Dissonant Triads
Maj	Aug
min	dim

Figure 11.7: Consonant and Dissonant Triads.

The quality of the fifth affects consonance and dissonance more than the quality of the third. When the fifth is augmented or diminished, dissonance usually occurs.

INVERSION OF TRIADS

When the root of a triad is its lowest note, the chord is in *root position. Inversion* is a change in the relative position of the notes from root position. When the third of a triad is the lowest note, the triad is in *first inversion* regardless of the placement of the root and fifth above it. When the fifth of a triad is the lowest note, the triad is in *second inversion* regardless of the placement of the root and third above it. The root of the triad remains the root regardless of its position. The same is true of the third and fifth.

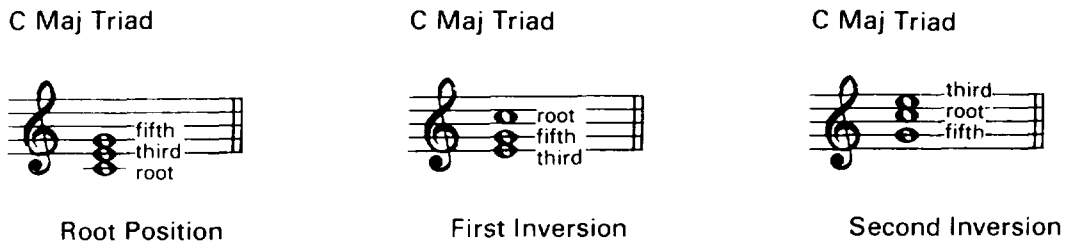


Figure 11.8: Inversions of C Major Triad.

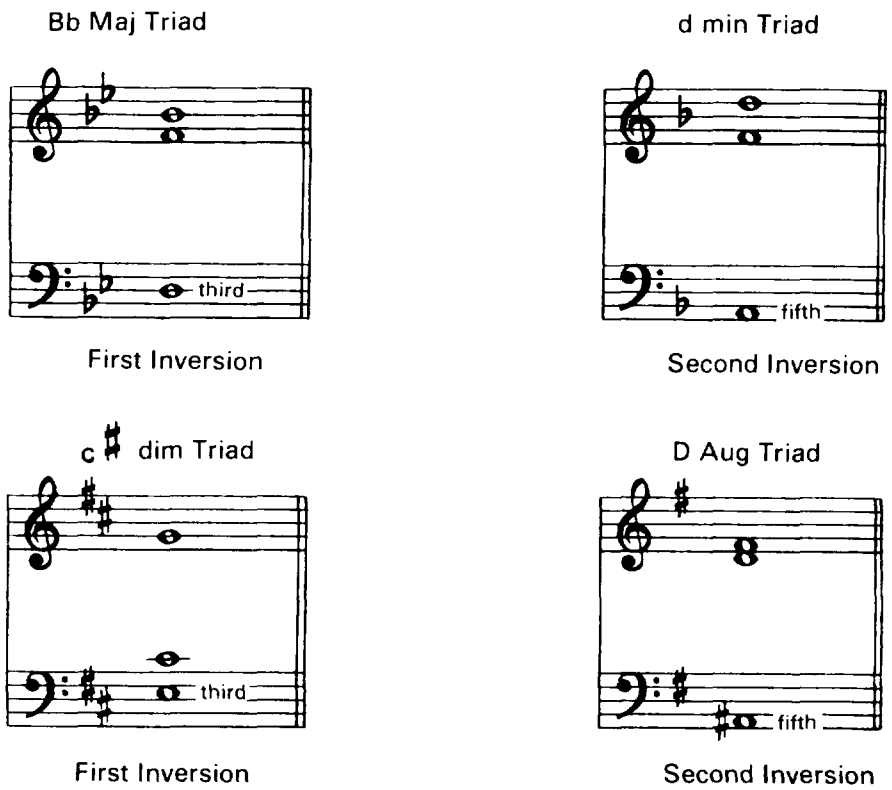


Figure 11.9: Inversion of the Four Types of Triads.

DIATONIC TRIADS IN MAJOR AND MINOR KEYS

Writing the diatonic third and fifth above each scale degree of a given scale will construct the triads diatonic to a particular scale or key.

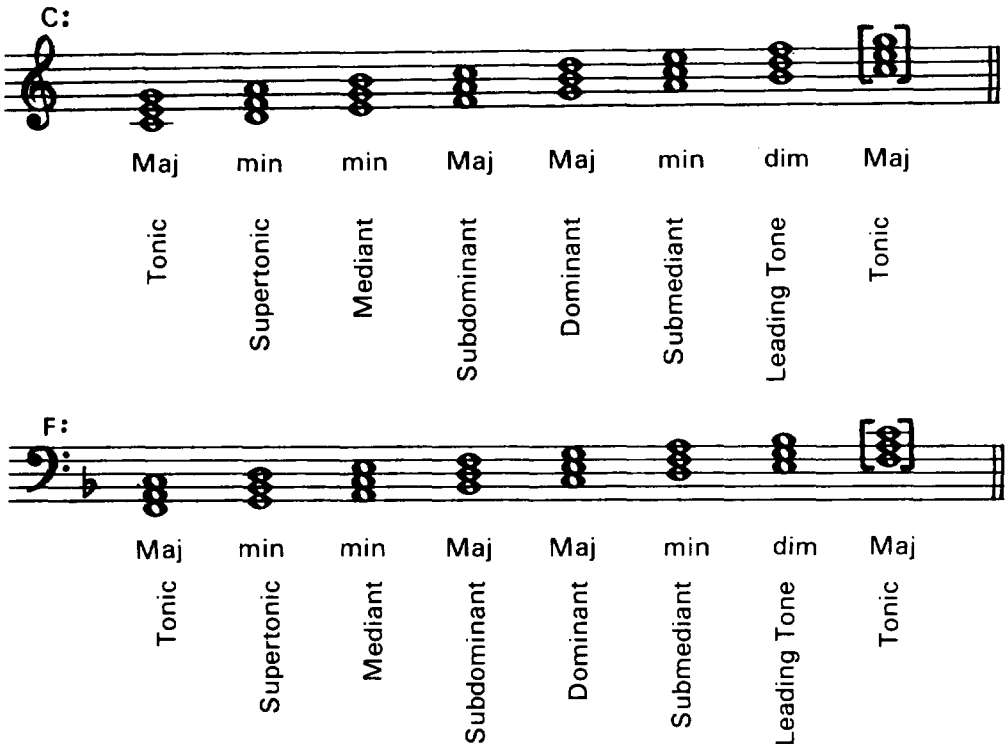
Diatonic Triads in Major

Constructing diatonic triads on major scale degrees produces:

major triads on the tonic, subdominant, and dominant

minor triads on the supertonic, mediant, and submediant

a diminished triad on the leading tone



Maj Triads	min Triads	dim Triad
Tonic	Supertonic	Leading Tone
Subdominant	Mediant	
Dominant	Submediant	

Figure 11.10: Diatonic Triads in Major.

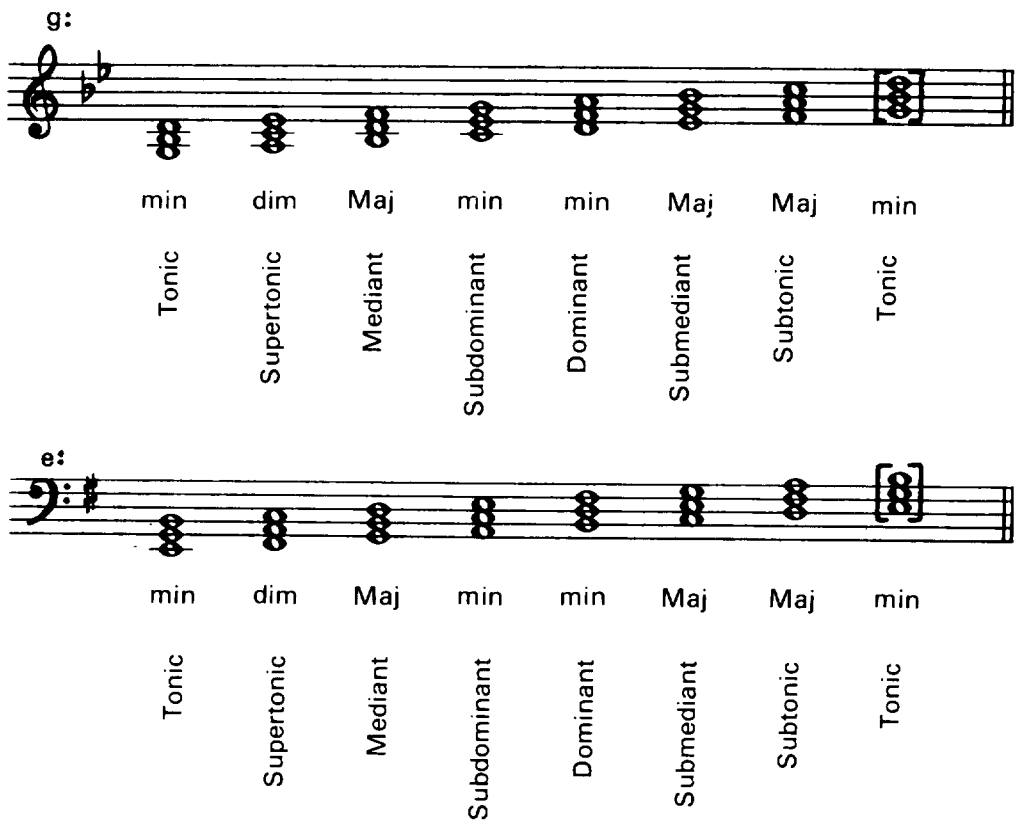
Diatonic Triads in Natural Minor

Constructing diatonic triads on natural minor scale degrees produces:

minor triads on the tonic, subdominant, and dominant

major triads on the mediant, submediant, and subtonic

a diminished triad on the supertonic



Maj Triads	**min Triads**	**dim Triad**
Mediant	Tonic	Supertonic
Submediant	Subdominant	
Subtonic	Dominant	

Figure 11.11: Diatonic Triads in Natural Minor.

Diatonic Triads in Harmonic Minor

Constructing diatonic triads on harmonic minor scale degrees produces:

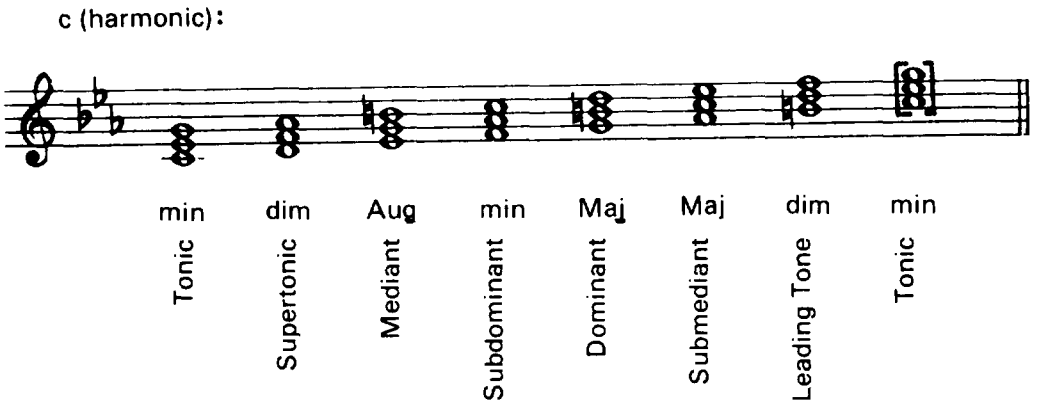
minor triads on the tonic and subdominant

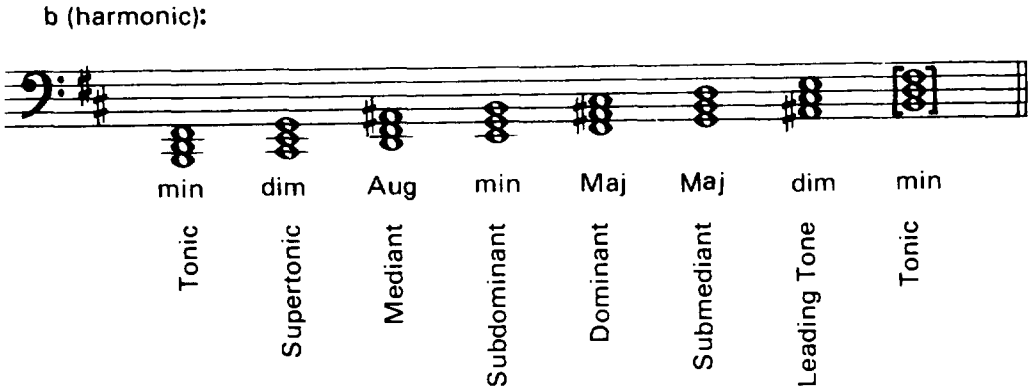
major triads on the dominant and submediant

diminished triads on the supertonic and leading tone

an augmented triad on the mediant

The harmonic use of the major quality dominant chord gives the harmonic minor scale its name. Altering the third of the dominant chord creates this scale. The third of the dominant chord is the leading tone of the minor key.





Maj Triads	**min Triads**	**Aug Triad**	**dim Triads**
Dominant	Tonic	Mediant	Supertonic
Submediant	Subdominant		Leading Tone

Figure 11.12: Diatonic Triads in Harmonic Minor.

Diatonic Triads in Melodic Minor

Constructing diatonic triads on ascending melodic minor scale degrees produces:

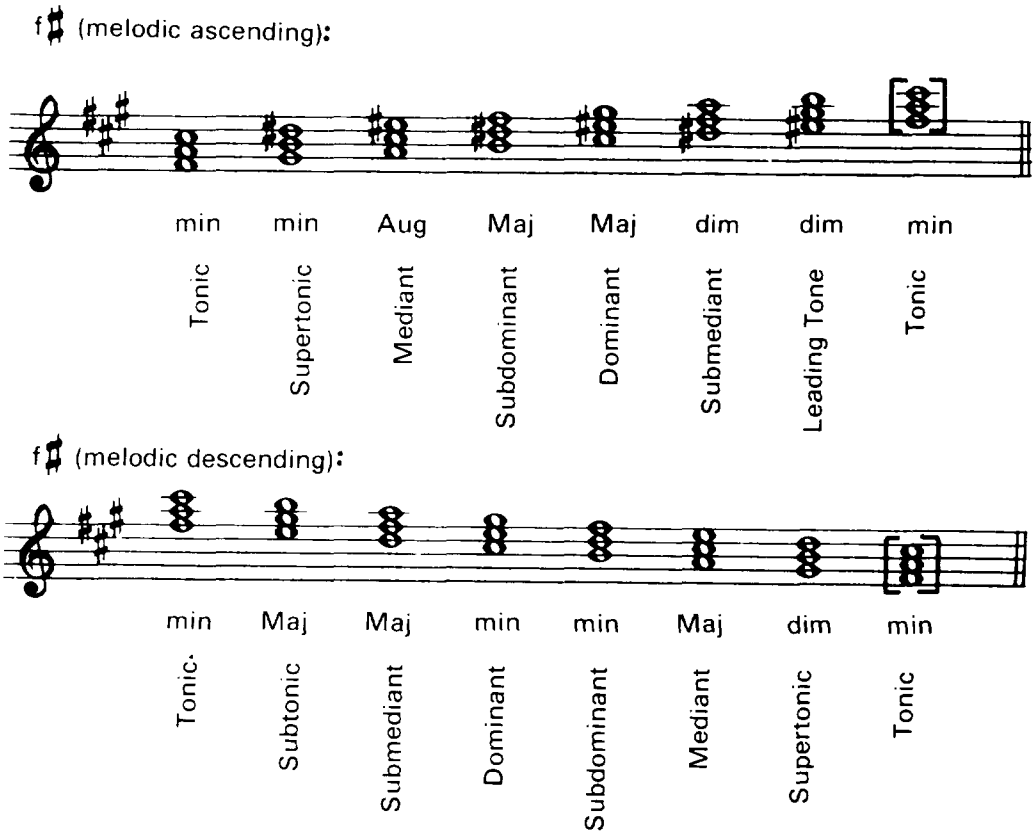
minor triads on the tonic and supertonic

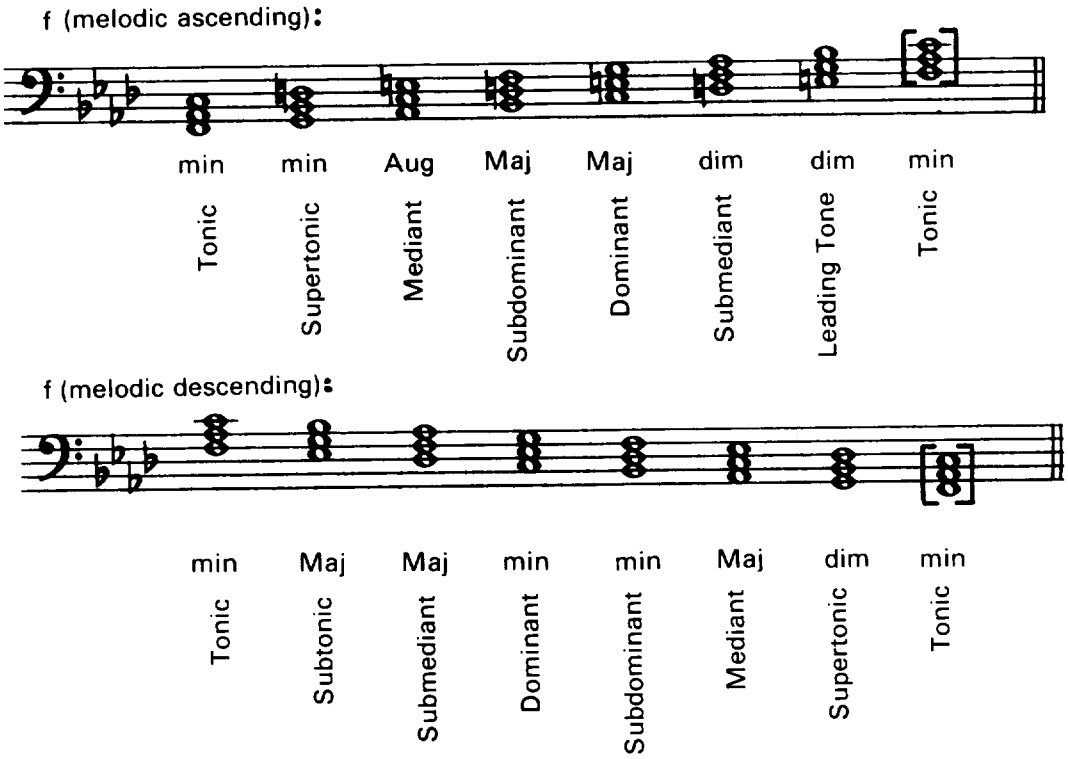
major triads on the subdominant and dominant

diminished triads on the submediant and leading tone

an augmented triad on the mediant

Constructing diatonic triads on descending melodic minor scale degrees produces triads identical to those of the natural minor scale. Eliminating the augmented second in the ascending form of the scales creates a major subdominant triad. Using the descending form of the scale creates a minor subdominant triad, resulting in a more minor sound.





ASCENDING MELODIC MINOR

Maj Triads	min Triads	Aug Triad	dim Triads
Subdominant	Tonic	Mediant	Submediant
Dominant	Supertonic		Leading Tone

DESCENDING MELODIC MINOR

Maj Triads	min Triads	dim Triad
Mediant	Tonic	Supertonic
Submediant	Subdominant	
Subtonic	Dominant	

Figure 11.13: Diatonic Triads in Melodic Minor.

CHAPTER 12
OVERTONE SERIES

A sound source vibrates as a whole unit, in halves, thirds, fourths, fifths, sixths, etc., continuing on indefinitely by fractions. The sounds these fractional vibrations produce are called *overtones* and are generally present in varying strengths.

The vibration of the whole unit produces the *generating tone* (because it generates overtones) and its pitch is called the *fundamental.* All the pitches produced are called *partials.* The fundamental is the first partial. It has the lowest frequency (pitch) and, commonly, the greatest amplitude (intensity). The partials above the fundamental are of greater frequency and vary in amplitude depending on the physical nature of the sound source.

CHARACTERISTICS OF A VIBRATING STRING

The characteristics of a vibrating string illustrate partials and their relationships. When a string tuned to Great C is set into motion it vibrates as a whole unit, producing the pitch Great C (fundamental - first partial). The string also vibrates in halves (second partial) producing small c; in thirds (third partial) producing small g; in fourths (fourth partial) producing c^1; in fifths (fifth partial) producing e^1; in sixths (sixth partial) producing g^1; and in smaller sections producing higher pitches. Lower partials have more amplitude, which decreases with the higher partials.

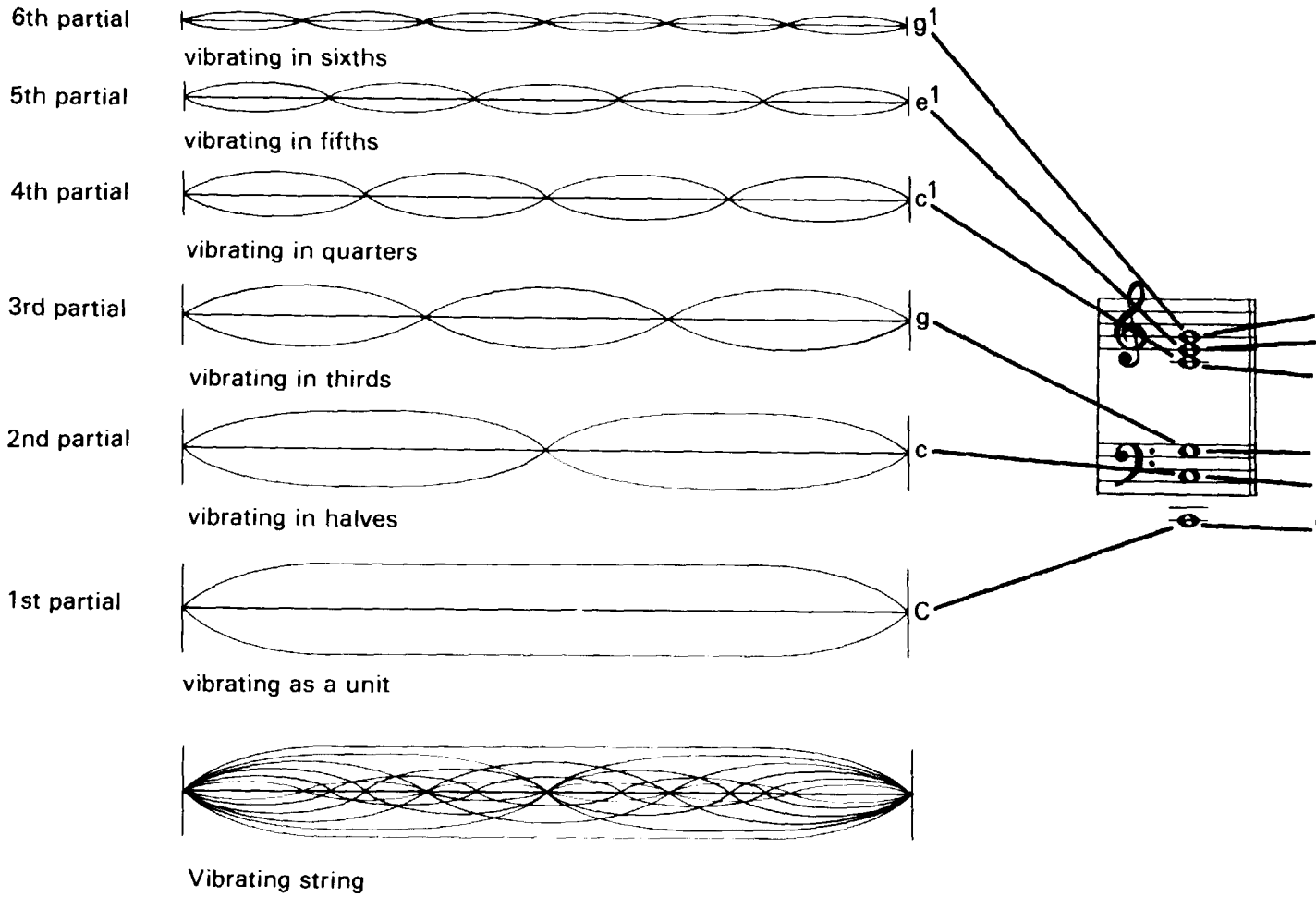
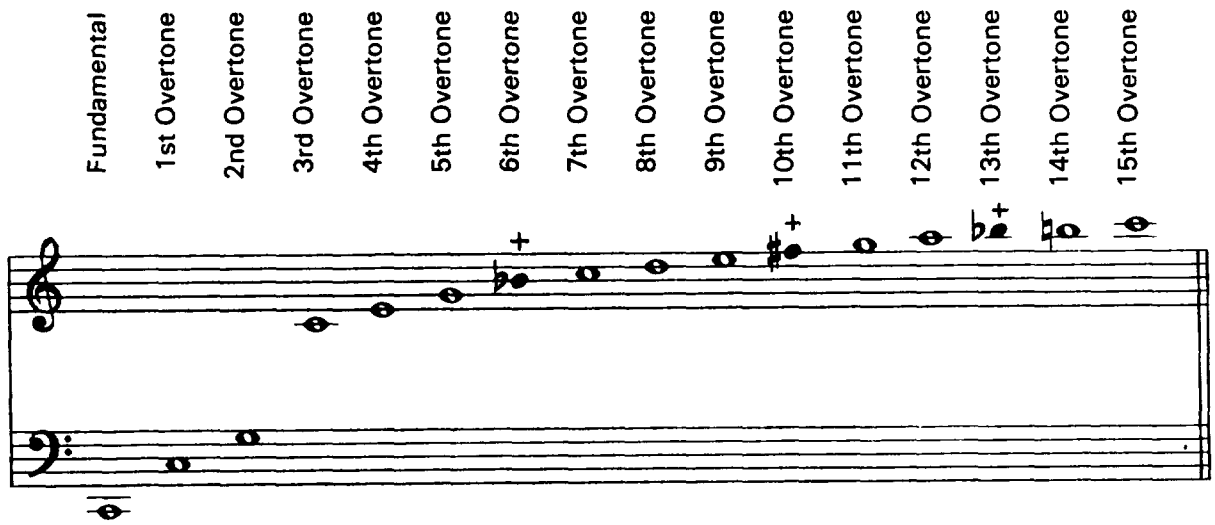


Figure 12.1: Characteristics of a Vibrating String.

THE OVERTONE SERIES

Although the overtone series continues with complex vibration indefinitely, it is necessary to put an upper limit on the series for practical purposes. The first sixteen partials are the ones most commonly used in music.

The relationship between partials and scale degrees is illustrated in figures 12.2 and 12.3. Understanding their relationship allows the formation of partial groupings, from which individual partials can be extracted for musical performance.



Tonic	Tonic	Dominant	Tonic	Mediant	Dominant	Subtonic	Tonic	Supertonic	Mediant	Raised Subdominant	Dominant	Submediant	Subtonic	Leading Tone	Tonic
1st Partial	2nd Partial	3rd Partial	4th Partial	5th Partial	6th Partial	7th Partial	8th Partial	9th Partial	10th Partial	11th Partial	12th Partial	13th Partial	14th Partial	15th Partial	16th Partial
Whole Unit $\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$	$\frac{1}{11}$	$\frac{1}{12}$	$\frac{1}{13}$	$\frac{1}{14}$	$\frac{1}{15}$	$\frac{1}{16}$	

+Out-of-Tune

Figure 12.2: C *Overtone Series.*

Scale Degree:	Tonic	Tonic	Dominant	Tonic	Mediant	Dominant	+Subtonic	Tonic	Supertonic	Mediant	+Raised Subdominant	Dominant	Submediant	+Subtonic	Leading Tone	Tonic
	1	1	5	1	3	5	♭7	1	2	3	♯4	5	6	♭7	7	1
Partial:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

+Out-of-Tune

Figure 12.3: Scale Degrees of Partials.

Tonic Partials

The first, second, fourth, eighth, and sixteenth partials are the tonic degrees in successive octaves. The tonic degrees are derived by doubling partial numbers starting with the first partial.

Dominant Partials

The third, sixth, and twelfth partials are the dominant degrees found in the second octave (3rd partial), third octave (6th partial), and fourth octave (12th partial) of a given series. The dominant degrees are derived by doubling the partial numbers starting with the third partial.

Mediant (Major) Partials

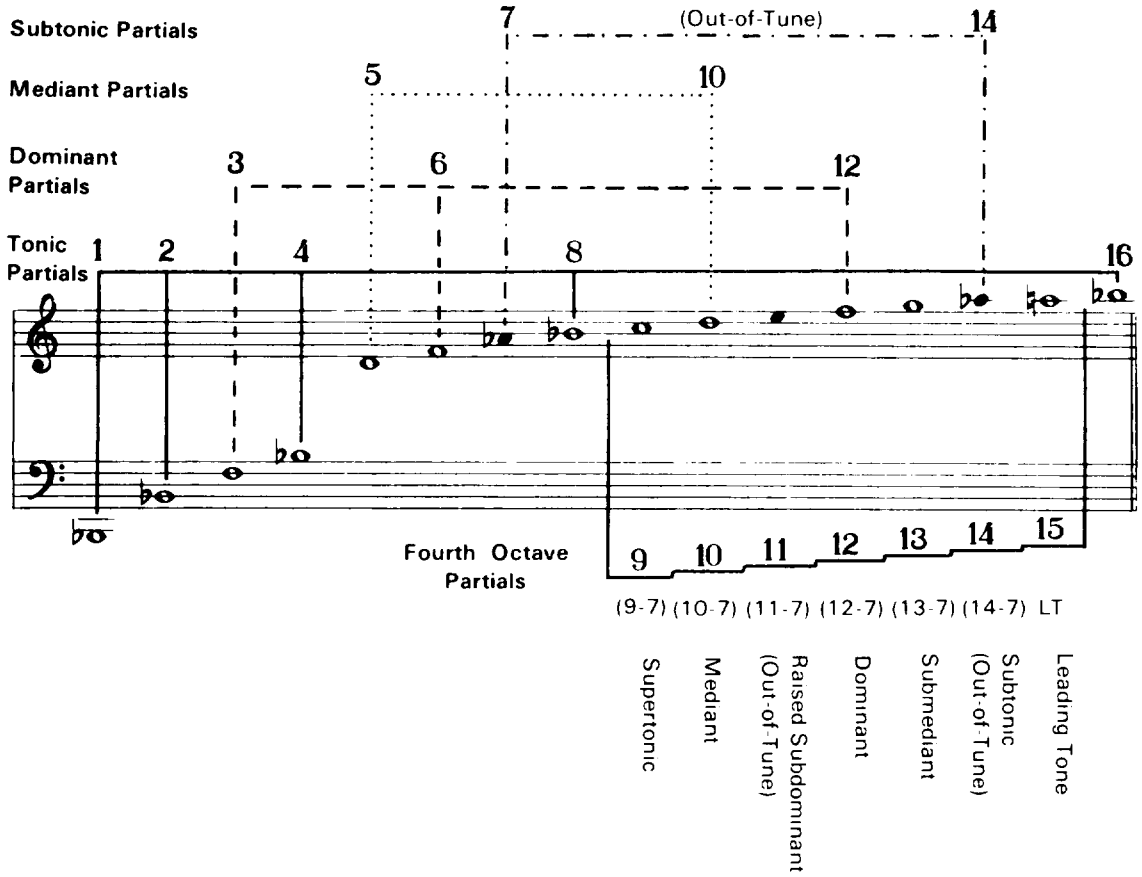
The fifth and tenth partials are the mediant (major) degrees found in the third octave (5th partial) and fourth octave (10th partial) of a given series. The upper partial is derived by doubling the lower partial.

Subtonic Partials

The seventh and fourteenth partials are the out-of-tune subtonic degrees found in the third octave (7th partial) and fourth octave (14th partial) of a given series. The upper partial is derived by doubling the lower. It may help to think of the seventh partial as a simple interval to remember its scale degree although it is actually a minor 21st from the fundamental.

The Fourth Octave Partials

If the ninth through fourteenth partials are thought of as intervals and then reduced to simple intervals, the scale degree numbers are produced. That is, the ninth partial (9 - 7 equals 2) is the supertonic; the tenth partial (10 - 7 equals 3) is the mediant; the eleventh partial (11 - 7 equals 4) is the out-of-tune raised subdominant (the only time the subdominant occurs it is raised and out of tune); the twelfth partial (12 - 7 equals 5) is the dominant; the thirteenth partial (13 - 7 equals 6) is the submediant (major); and the fourteenth partial (14 - 7 equals 7) is the out-of-tune subtonic. The fifteenth partial is not carried through the interval reduction process; it is considered the leading tone to the sixteenth partial (tonic).



Tonic Partials

1st, 2nd, 4th, 8th, 16th

Mediant Partials

5th, 10th

Dominant Partials

3rd, 6th, 12th

Subtonic Partials (out-of-tune)

7th, 14th

Fourth Octave Partials

9th	10th	11th	12th	13th	14th	15th
Supertonic	Mediant	Subdominant (out-of-tune)	Dominant	Submediant	Subtonic (out-of-tune)	Leading Tone Raised

Figure 12.4: Partial Relationships.

Converting Partials to Overtones and Overtones to Partials

Overtones do not include the fundamental as a numbered part of the series. Therefore, to convert from partials to overtones, subtract one to get the overtone number; from overtones to partials, add one to get the partial number. When comparing overtones and partials in an overtone series, the overtone number will always be one less than the partial number.

Harmonics

The term *harmonic* is often interpreted as being the same as partial. That is, the first partial is the first harmonic. However, string instrumentalists often use the term harmonic as being the same as overtone. That is, the first overtone is the first harmonic. Since the term harmonic may mean partial or overtone, its intended meaning must be specified.

THE OVERTONE SERIES AND TIMBRE

Because the physical nature of a musical instrument affects timbre, the relative prominence of overtones varies with different instruments and is a major factor in producing the timbre of a particular instrument. Usually, overtones are not heard as individual pitches but as variations in the tone quality of the most prominent pitch, the fundamental.

For example, the most prominent overtones on the saxophone are the first (2nd partial), third (4th partial), fifth (6th partial), etc. The most prominent overtones on the clarinet are the second (3rd partial), fourth (5th partial), sixth (7th partial), etc. These overtones decrease in intensity as they are further removed from the fundamental and alternate indefinitely.

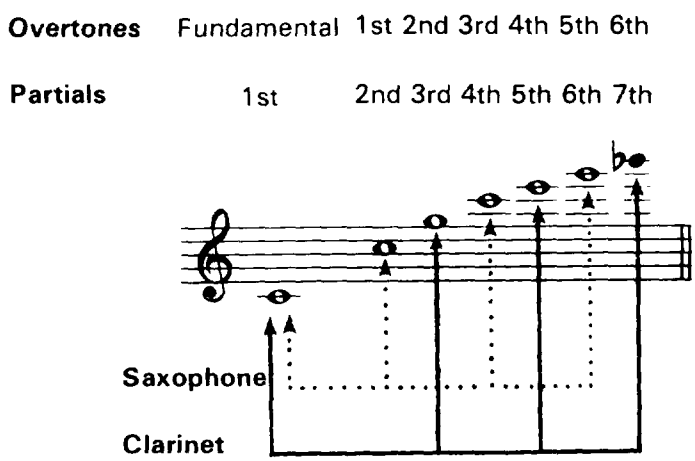


Figure 12.5: Overtone Prominence of Saxophone and Clarinet.

CHAPTER 13
TRANSPOSITION

Transposition is the process of moving a note or group of notes to a specific higher or lower pitch level. To *transpose* is to write or perform in a different key or at a different pitch level. Pitch relationships must remain intact during transposition.

TRANSPOSITION BY SCALE DEGREE

The most direct means of organizing pitch relationships for transposition is to identify the pattern of scale degrees in the original key, then to perform or write the pattern in a different key. Using numbers will help identify the scale degrees.

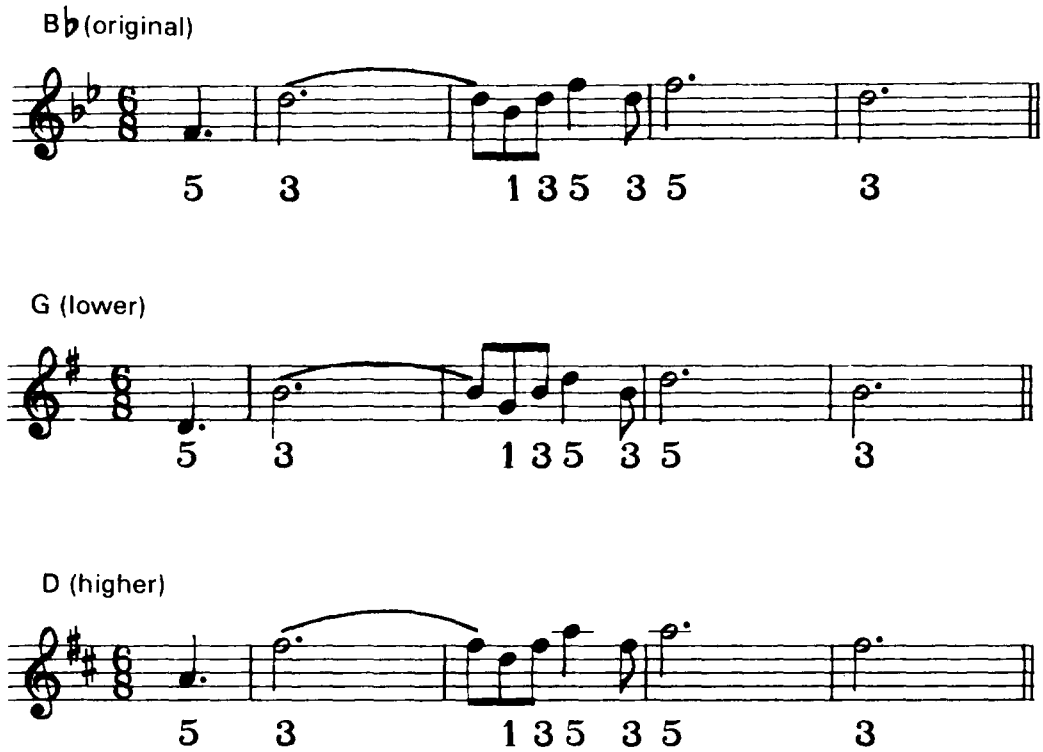


Figure 13.1: Scale Degree Transposition (diatonic major).

Transposition in minor keys that have accidentals may require chromatic signs that differ from the accidentals in the original music. The purpose is to keep the pitch relationships intact.

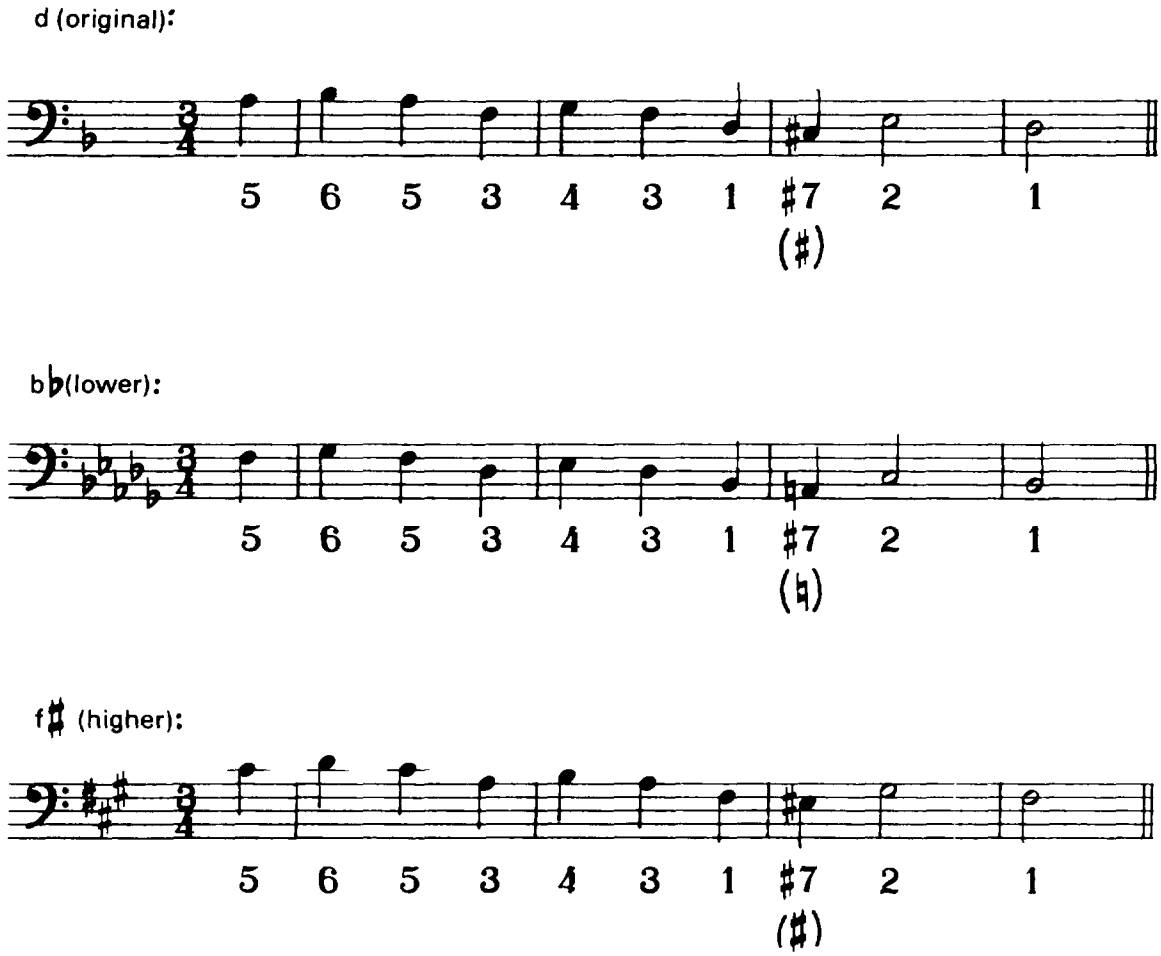


Figure 13.2: Scale Degree Transposition (harmonic minor).

Transposing diatonic melodies may be easier than transposing melodies with many accidentals because chromatic signs may be different after transposition. The pitch relationships must be kept intact.

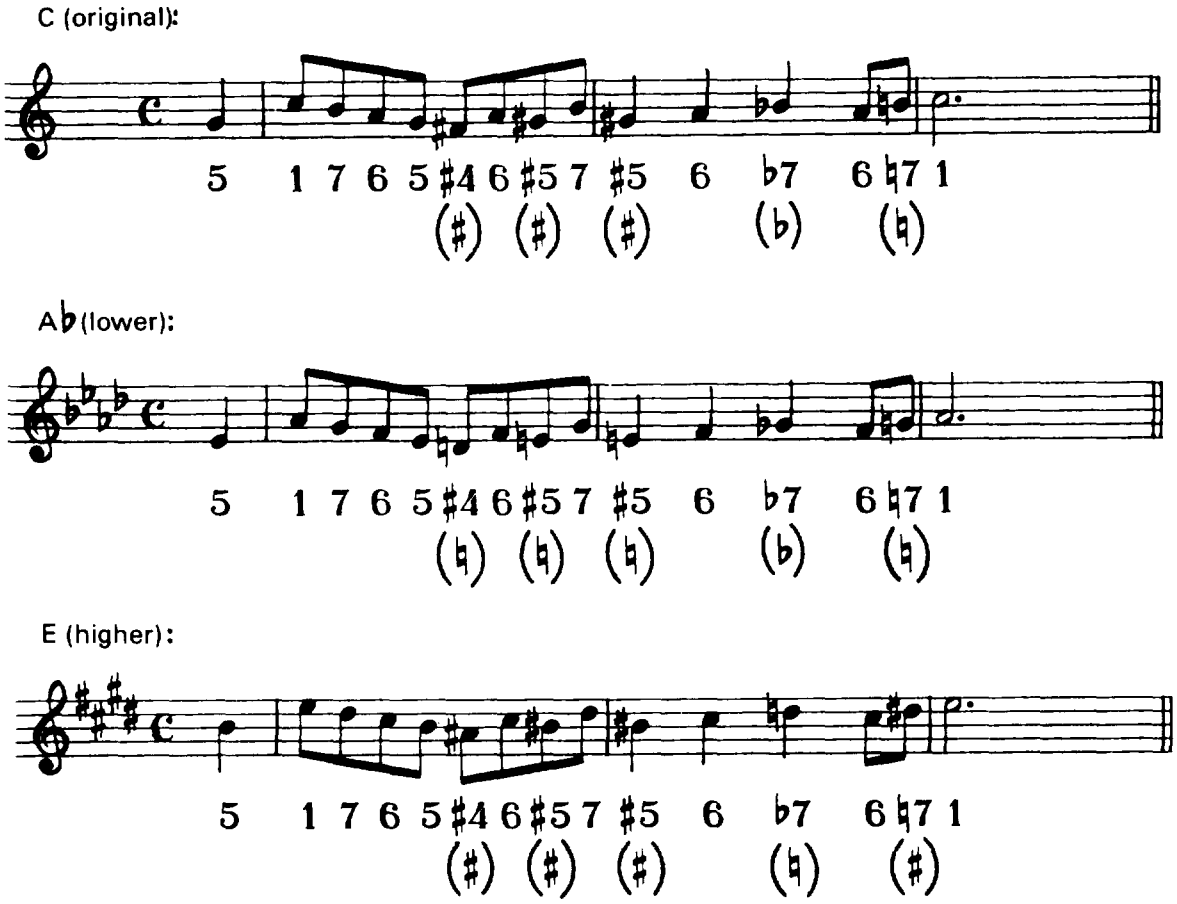


Figure 13.3: Scale Degree Transposition (chromatic).

TRANSPOSITION BY INTERVAL

Transposing by individual intervals may increase accuracy in music that has many accidentals, creates a complex key relationship, or has complex scale degree relationships. Interval transposition may also make a half step or whole step transposition easier. A transposition written or played the same exact interval above or below the original will keep the pitch relationships intact.

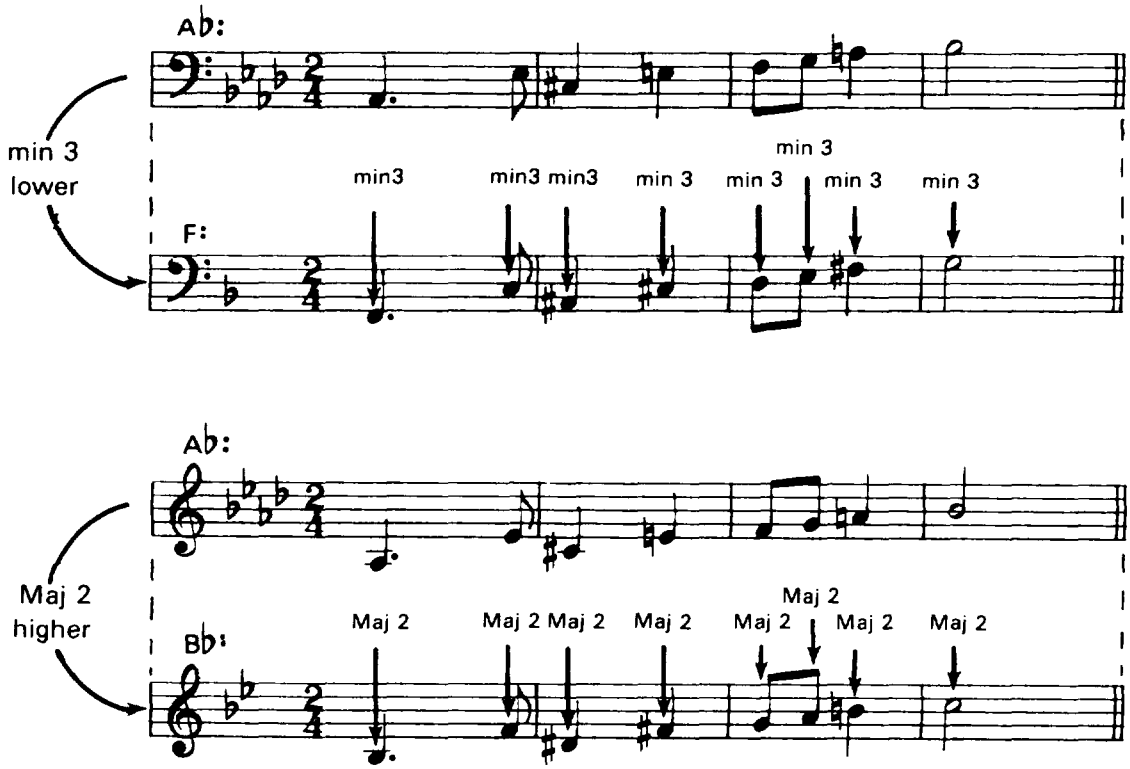


Figure 13.4: Interval Transposition (harmonic).

Melodic intervals in the transposed music will correspond to the same melodic intervals in the original key.

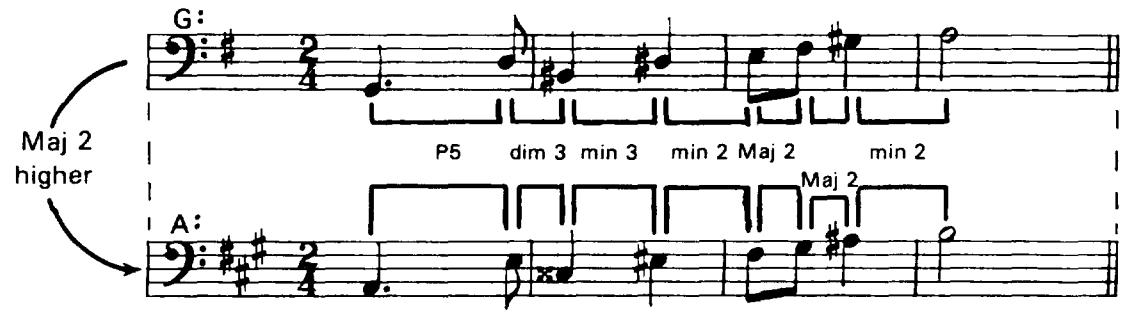


Figure 13.5: Interval Transposition (melodic).

TRANSPOSITION BY CHANGE OF KEY SIGNATURE

When a transposition desired is a half step higher or lower and the notes remain on the same staff degrees, transposition by key signature may be used.

This is accomplished by imagining the different key signature, reading the same staff degrees, and correcting accidentals to keep the pitch relationships intact. The same accidentals will not be used in the transposed key, so the effect of the accidental (raising or lowering) must be created by means of a different chromatic sign.

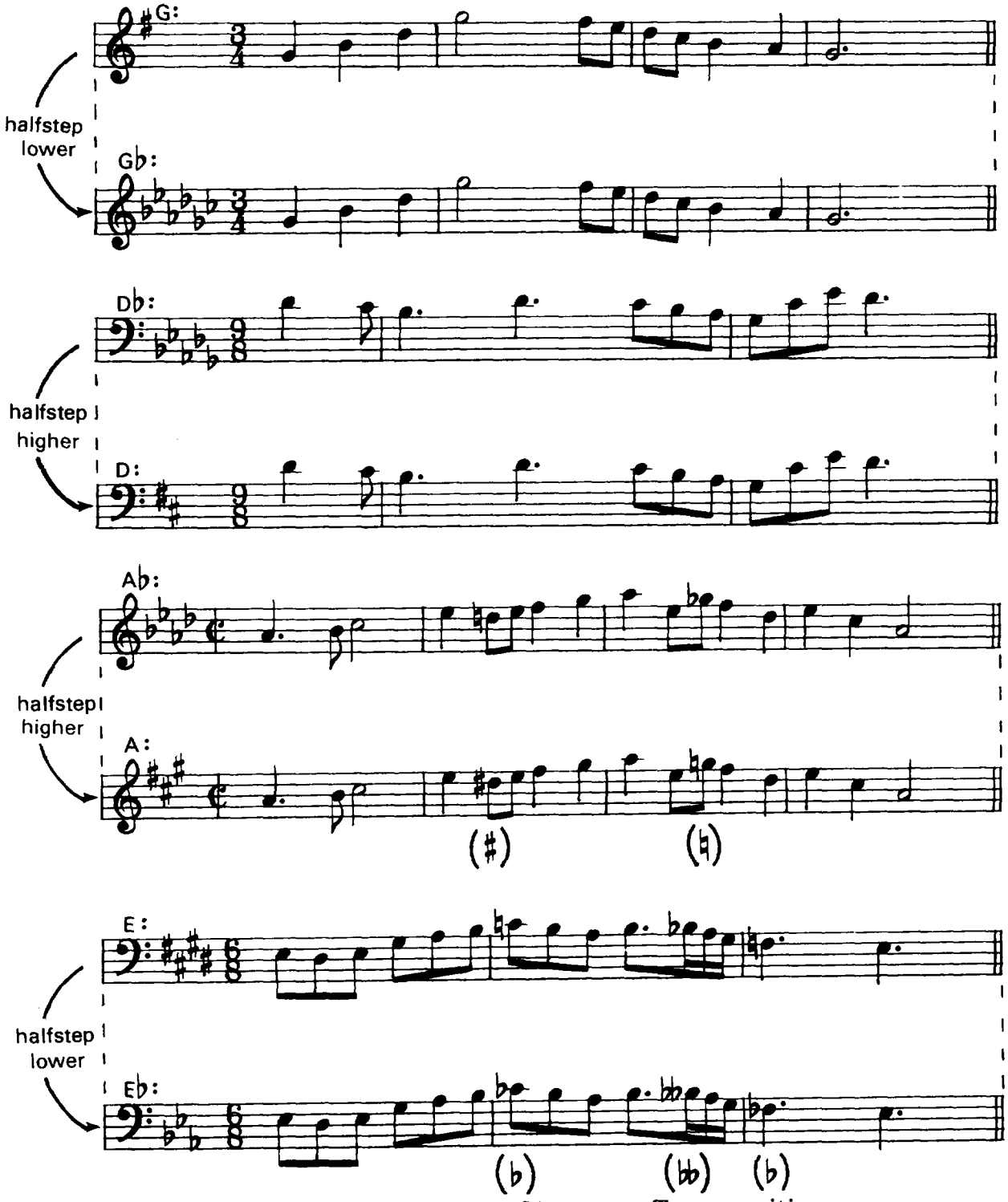


Figure 13.6: Key Signature Transposition.

CHAPTER 14
INSTRUMENTS

Copying instrumental parts requires that a copyist know the following:

clefs

keys and transpositions of instruments

written ranges

sounding ranges

While most instruments use a single clef, there are instruments that use more than one clef. For some instruments, music is written with pitches differing from actual sound; therefore, their parts must be transposed. Wind instrument ranges are determined as much by the instrumentalist's ability as by the instrument itself. Extreme ranges (particularly in upper registers) cannot be stated definitely; only minimum ranges for the qualified instrumentalist are presented. The sounding ranges for transposing instruments should be clearly visualized when copying from concert pitches.

Although a complete list of instrumental classification would be far longer, the most likely instruments to be encountered are:

woodwinds

brasswinds

percussion

keyboard

rhythm section strings

WOODWINDS

Woodwinds may be divided into *transverse, double reed,* and *single reed* woodwinds. Single reed woodwinds may be further divided into *clarinets* and *saxophones*. When a woodwind player plays written *C* on the instrument, the name of the instrument sounds: for example, B♭ instruments sound *B*♭, and E♭ instruments sound *E*♭. The interval between the written and sounded

pitches determines its transposition. Transposed woodwind parts allow the instrumentalist to use the same fingerings for more than one instrument. The following list gives:

Name of the instrument- Clef(s) normally used

Transposition relationship

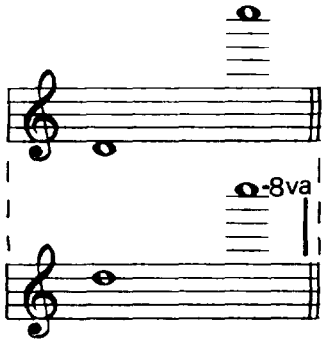
(Remarks about individual instrument)

Written and sounding range

TRANSVERSE WOODWINDS

C ***Piccolo*** - Treble Clef.

Sounds an 8ve higher than written.
Written an 8ve lower than it sounds.



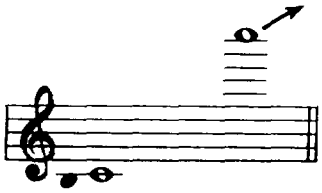
written
d^1 to c^4

sounds
d^2 to c^5

Flute (C) - Treble Clef.

Sounds as written.

(Some flutes have a low *B* extension).



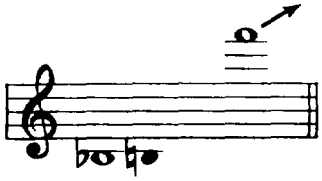
written
& sounds
c^1 to c^4

DOUBLE REED INSTRUMENTS

Oboe (C) - Treble Clef.

Sounds as written.

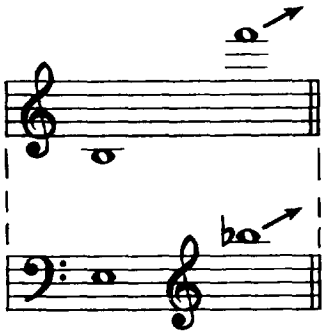
(Some oboes do not have low *B*♭ key).



written
& sounds
b♭ to f^3

F *English Horn* - Treble Clef.

Sounds a P5th lower than written.
Written a P5th higher than it sounds.



written
b to f^3

sounds
e to $b\flat^2$

***Bassoon* (C)** - Bass or Tenor Clef.

Sounds as written.

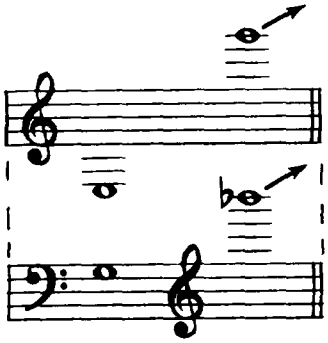
written
& sounds
$BB\flat$ to $b\flat^1$

SINGLE REED INSTRUMENTS

CLARINETS

E♭ *Clarinet* - Treble Clef.

Sounds a min 3rd higher than written.
Written a min 3rd lower than it sounds.

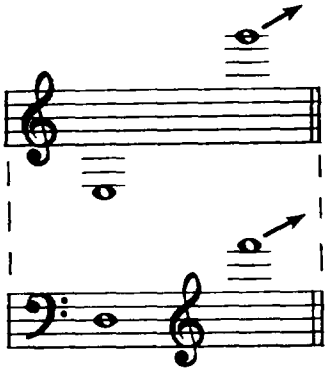


written
e to g^3

sounds
g to $b\flat^3$

B♭ *Clarinet* - Treble Clef.

Sounds a Maj 2nd lower than written.
Written a Maj 2nd higher than it sounds.



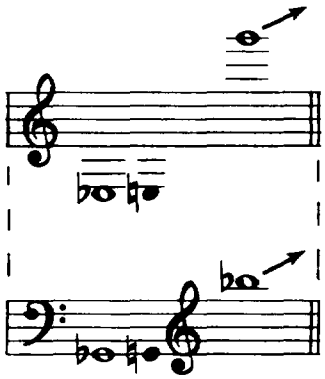
written
e to g^3

sounds
d to f^3

E♭ ***Alto Clarinet*** - Treble Clef.

Sounds a Maj 6th lower than written.
Written a Maj 6th higher than it sounds.

(Most alto clarinets have a low *E♭* key).



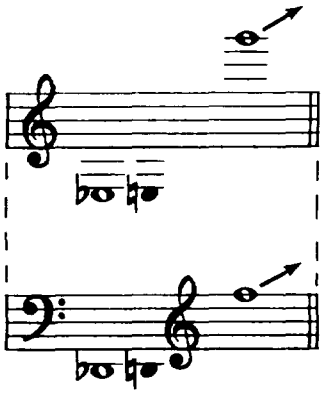
written
e♭ to g3

sounds
G♭ to b♭2

B♭ ***Bass Clarinet***

Sounds a Maj 9th lower than written.
Written a Maj 9th higher than it sounds.

(Most bass clarinets have a low *E♭* key).



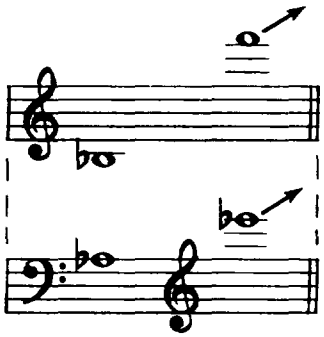
written
e♭ to g3

sounds
D♭ to f2

SAXOPHONES

B♭ ***Soprano Saxophone*** - Treble Clef.

Sounds a Maj 2nd lower than written.
Written Maj 2nd higher than it sounds.

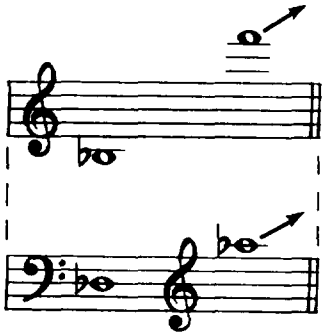


written
b♭ to f3

sounds
a♭ to e♭3

E♭ ***Alto Saxophone*** - Treble Clef.

Sounds a Maj 6th lower than written.
Written a Maj 6th higher than it sounds.

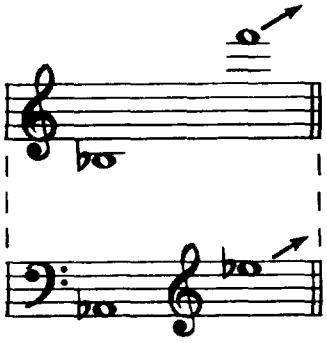


written
b♭ to f3

sounds
d♭ to a♭2

B♭ ***Tenor Saxophone*** - Treble Clef.

Sounds a Maj 9th lower than written.
Written a Maj 9th higher than it sounds.



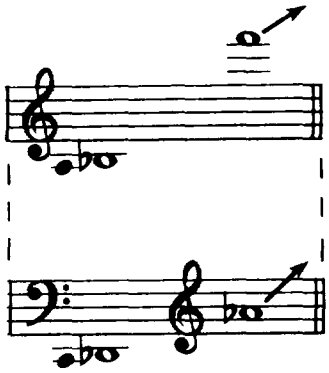
written
b♭ to f^3

sounds
A♭ to e♭^{2}

E♭ ***Baritone Saxophone*** - Treble Clef.

Sounds a Maj 13th lower than written.
Written a Maj 13th higher than it sounds.

(Some baritone saxophones do not have a low *A* key).



written
b♭ to f^3

sounds
D♭ to a♭^{1}

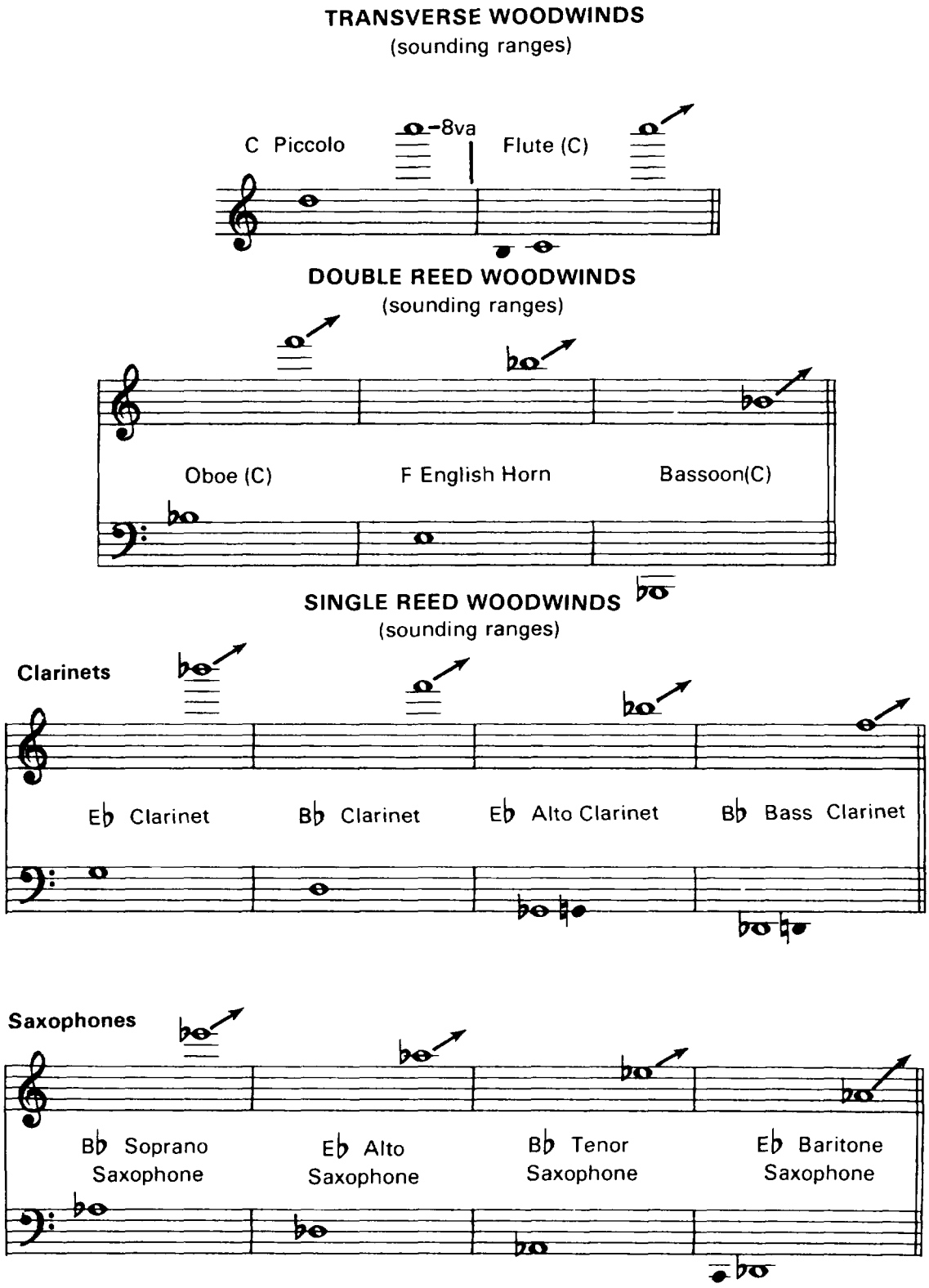


Figure 14.1: Woodwind Comparative Range Chart.

BRASSWINDS

Most brasswinds use three or more valves in combination to produce more than one overtone series, allowing chromatic pitches. Trombones use slides for the same purpose.

Brasswinds may be grouped into *treble clef brass* and *bass clef brass.* When a treble clef brasswind player plays written *C* on the instrument, the pitch name of the instrument sounds. The interval between the written and sounded pitches of an instrument determines its transposition. Bass clef brasswinds sound as written. The pitch name of a bass clef brasswind is its open or first position sounding overtone series.

Brasswinds are constructed with various ratios of cylindrical and conical bores. *Cylindrical bore brasswinds* are more cylindrical than conical; *conical bore brasswinds* are more conical than cylindrical. The ratio of cylindrical to conical tubing affects the timbre of the instrument. The following list gives:

Name of the instrument (open/first position sounding series)

Transposition relationships

(Remarks about individual instrument)

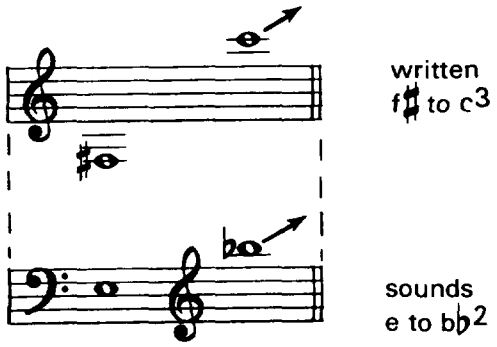
Written and sounding range

TREBLE CLEF BRASS

B♭ ***Trumpet, Cornet,*** *and* ***Flugelhorn.***

Sounds a Maj 2nd lower than written.
Written a Maj 2nd higher than it sounds.

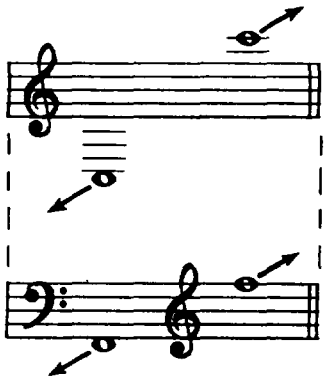
Trumpet - Cylindrical Bore (3 valves).
Cornet - Conical Bore (3 valves).
Flugelhorn - Conical Bore (3 valves).



***Horn* F/B♭** (called Double Horn).

Sounds a P5th lower than written.
Written a P5th higher than it sounds.

Conical Bore (3 valves).



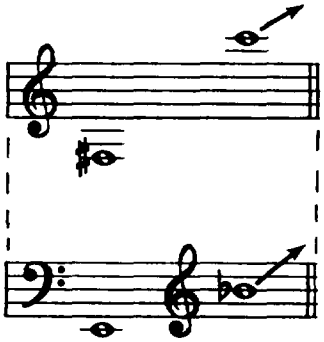
written
c to c^3

sounds
F to f^2

B♭ ***Baritone Horn.*** 𝄞

Sounds a Maj 9th lower than written.
Written a Maj 9th higher than it sounds.

Conical Bore (3 valves).



written
f♯ to c^3

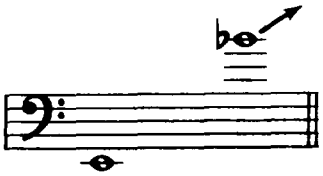
sounds
E to $b\flat^1$

BASS CLEF BRASS

B♭ ***Baritone Horn.*** 𝄢

Sounds as written (non-transposing).

Conical Bore (3 valves).

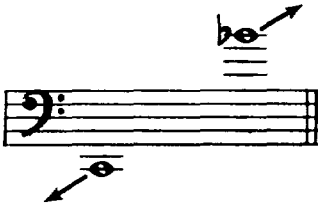


E to $b\flat^1$

B♭ ***Euphonium.***

Sounds as written (non-transposing).

Conical Bore (4 valves).



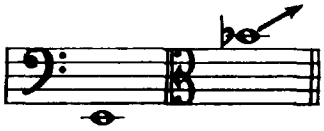
C to $b\flat^1$

B♭ *Tenor Trombone.*

Sound as written (non-transposing).

(Makes use of tenor and alto clefs).

Cylindrical Bore (Slide).



E to b♭^{1}

B♭ *Tenor Trombone*
with F Attachment.

Sounds as written (non-transposing).

(Makes use of tenor and alto clefs).

Cylindrical Bore (Slide).

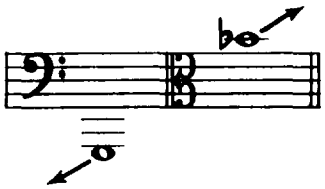
BB♭ to b♭^{1}

B♭ /F/D *Bass Trombone.*

Sounds as written (non-transposing).

(Makes use of tenor and alto clefs).
(high extreme of instrument
infrequently used).

Cylindrical Bore (slide).

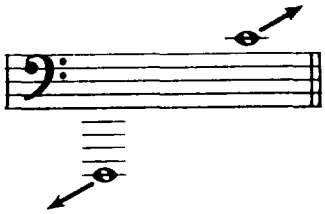


GG to b♭^{1}

C *Tuba.*

Sounds as written (non-transposing).

Conical Bore (4 valves).

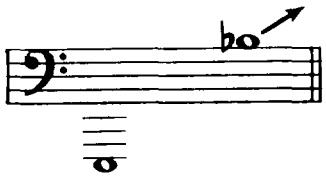


DD to c^1

BB♭ *Sousaphone.*

Sounds as written (non-transposing).

Conical Bore (3 valves).

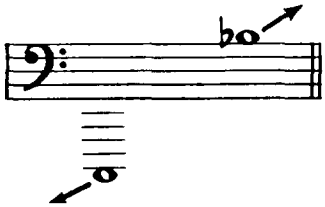


EE to b♭

BB♭ *Tuba.*

Sounds as written (non-transposing).

Conical Bore (4 valves).



CC to b♭

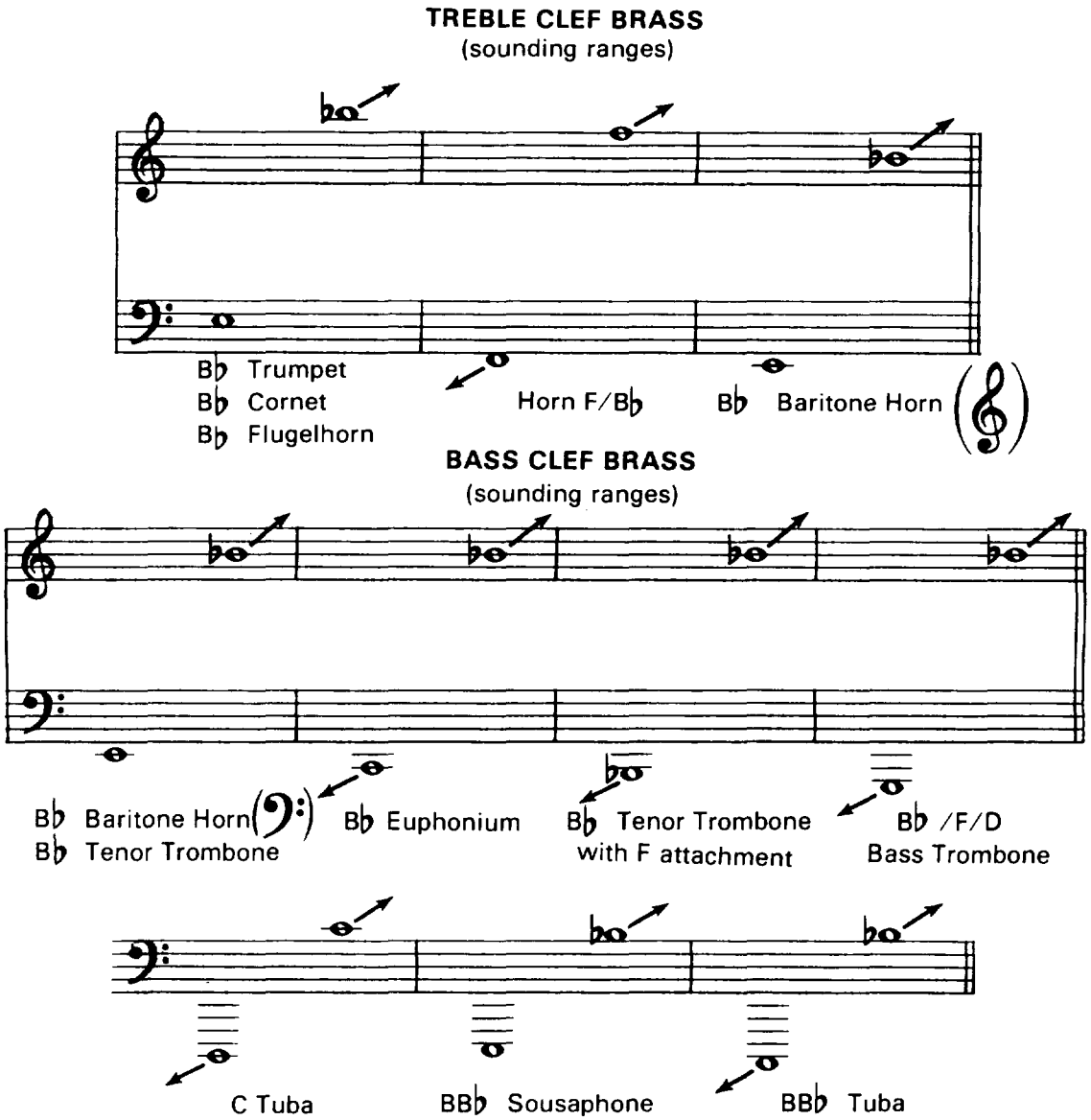


Figure 14.2: Brasswind Comparative Range Chart.

PERCUSSION

The percussion instruments may be divided into *indefinite pitch* and *definite pitch* percussion. Due to the large number of instruments in the indefinite pitch grouping, placement in notation is very irregular and will vary greatly. Definite pitch drums (timpani) are notated in bass clef. Mallet percussion (keyboard percussion) instruments are normally notated in treble clef.

INDEFINITE PITCH PERCUSSION

The following list of indefinite pitch percussion gives:

Name of the instrument symbol

Placement in notation

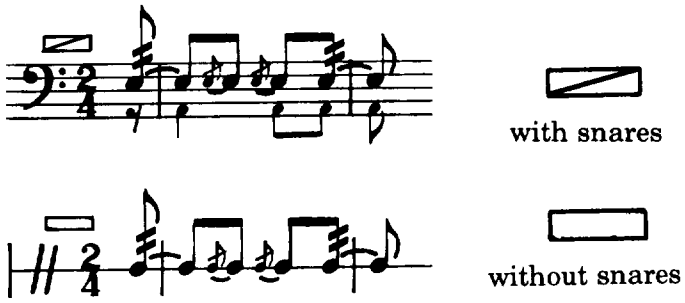
Tools used for performance

(Remarks about individual instrument)

Snare Drum.

3rd space bass clef,
Rhythm Line.

Sticks, mallets, brushes.

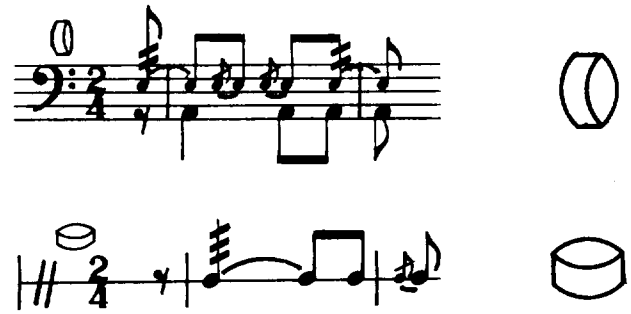


Bass Drum.

1st space bass clef,
Rhythm Line.

Sticks, mallets.

(May be played vertically or horizontally).

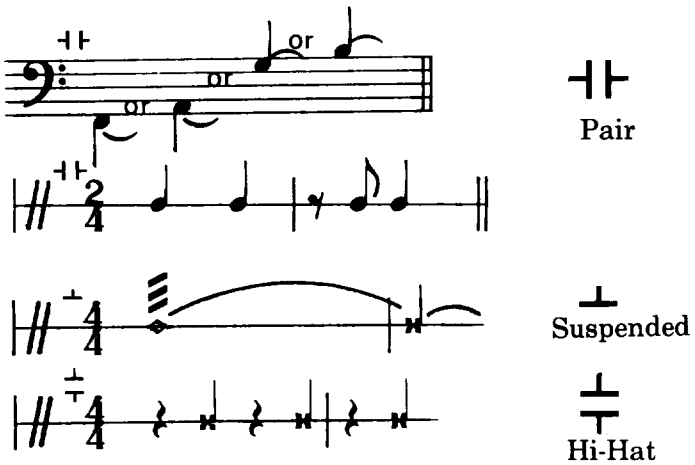


Cymbal(s).

Below, 1st space, 4th space, or
above bass clef
Rhythm Line.

Hands (in pairs), sticks, brushes,
mallets, etc.

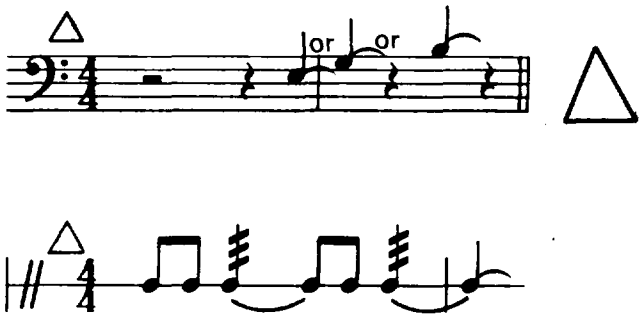
(Sometimes notated with diamond
or x head notes).



Triangle.

3rd space, 4th space, or above bass clef,
Rhythm Line.

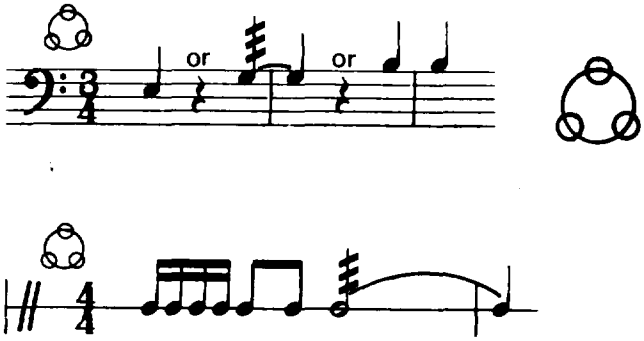
Triangle beater, stick.



Tambourine.

3rd space, 4th space, or above bass clef
Rhythm Line.

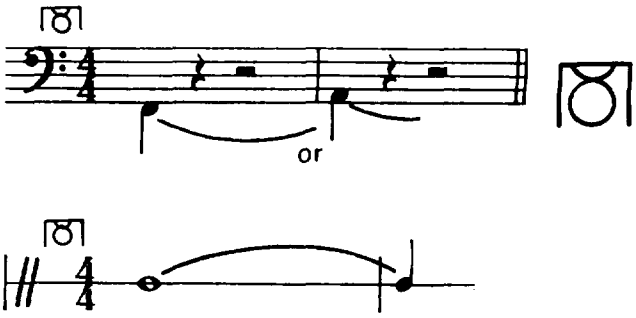
Hands, sticks, mallets, thumb.



***Tam-tam** (Gong).*

Below or 1st space bass clef,
Rhythm Line.

Gong beater



DEFINITE PITCH PERCUSSION

The following list of definite pitch percussion gives:

Name of the instrument (symbol) - clef

Transposition

Tools used for performance

(Remarks about individual instrument).

Written range
(Ranges of instruments may vary depending on the manufacturer.)

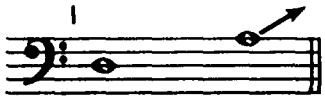
Timpani - Bass Clef.

(IV III II I)

Sounds as written.

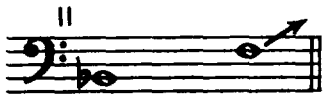
Mallets (felt, wool, wood).

23 inch Timpano (I)



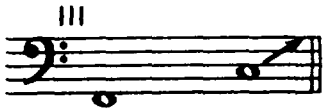
d to a

26 inch Timpano (II)



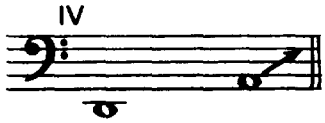
B♭ to f

29 inch Timpano (III)



F to c

30 inch Timpano (IV)



D to A

Timpani are fully chromatic and have a minimum range of a P5th; the upper range of a timpano depends on its condition.

Orchestra Bells (B) - Treble Clef.

Sounds a P15th higher than written.

Brass or hard mallets.

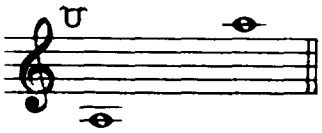
written
g to c^3

sounds
g^2 to c^5

Bell Lyre ( ) - Treble Clef.

Sounds a P15th higher than written.

Hard plastic mallets.



written
a to a^2

sounds
a^2 to a^4

Tubular Bells *(Chimes)* ( ) - Treble Clef.

Sounds as written.

Chime hammer of wood or rawhide.

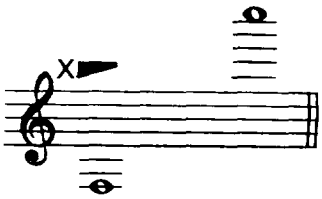
(Some instruments do not extend beyond f^2)

c^1 to g^2

Xylophone ( ) - Treble Clef.

Sounds a P8ve higher than written.

Wood, rubber, or plastic mallets.



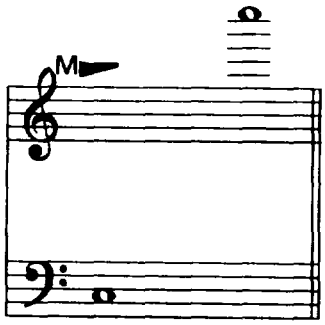
written
f to c^4

sounds
f^1 to c^5

Marimba ( ) - Treble and Bass Clefs.

Sounds as written.

Rubber, wood, plastic, yarn, or cord mallets.

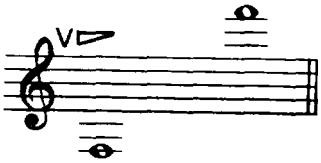


c to c^4

Vibraphone ( ) - Treble Clef.

Sounds as written.

Yarn or cord mallets.



f to f^3

KEYBOARD

With the exception of the standard piano, keyboard ranges vary widely depending on the manufacturer. Keyboard instruments make use of notation in treble and bass clefs. The following list of keyboard instruments gives:

Name of the instrument

Transposition

Method of sound production

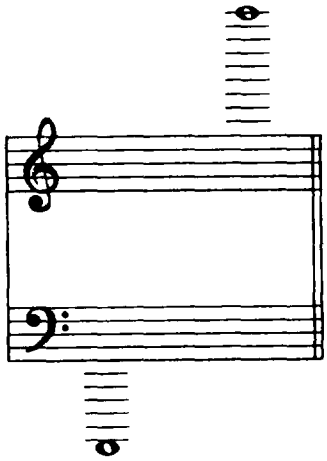
(Remarks about individual instrument)

Written range

Piano *(Pianoforte).*

Sounds as written.

Struck strings.



AAA to c^5

Electric Piano.

Sounds as written.

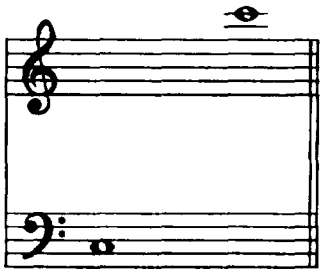
(Method of sound production varies depending on the manufacturer)

Range Varies Widely

Celeste.

Sounds a P8ve higher than written.

Struck metal bars.



written
c to c^3

sounds
c^1 to c^4

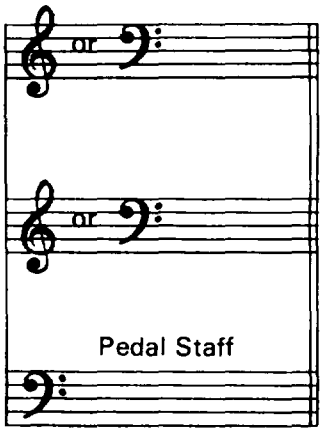
Organ.

Sounds as written

Compressed air through pipes or electronically generated.

The organ uses an extra staff for the pedal register as needed.

Range Varies Widely



Synthesizer.

Unlimited transposition.

Electronically generated.

Range and Layout
Depend on
Manufacturer

RHYTHM SECTION STRINGS

Rhythm section strings include *guitar, bass guitar,* and *string bass.* Normally, they are used in a rhythm section with piano and drums. All three instruments sound a perfect octave lower than written. The following list of rhythm section string instruments gives:

Name of the instrument - Clef normally used

Transposition

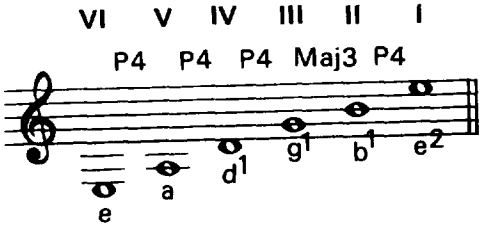
Remarks about individual instrument

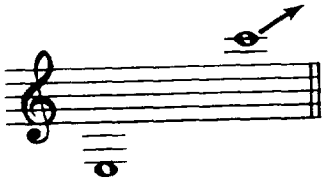
Open strings written range

Guitar - Treble Clef.

Sounds a P8ve lower than written

Tuned in P4ths except for II to III (Maj 3rd).





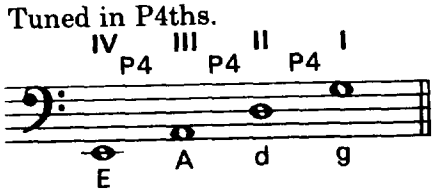
written e to c^3

sounds
E to c^2

Bass Guitar - Bass Clef.

Sounds a P8ve lower than written

Tuned in P4ths.



written
E to eb^1

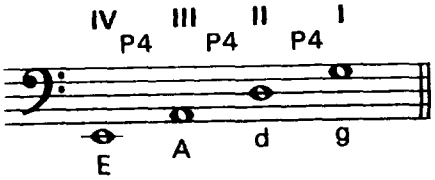
sounds
EE to eb

String Bass - Bass Clef.

Sounds a P8ve lower than written.

Tuned in P4ths.

The instument may be bowed (arco)
or plucked (pizzacato)



written
E to eb^1

sounds
EE to eb

CHAPTER 15
CHORD SYMBOLS

Vertical combinations of tones that create the harmonic framework of a piece may be indicated by chord symbols. Chord symbols are a shorthand expression for those combinations. Although a chord symbol indicates which tones are included in the combination, it does not indicate how the tones in the combination are used.

CHORD SYMBOL INTERPRETATION

The Root

The letter name of a chord symbol is the root of the chord.

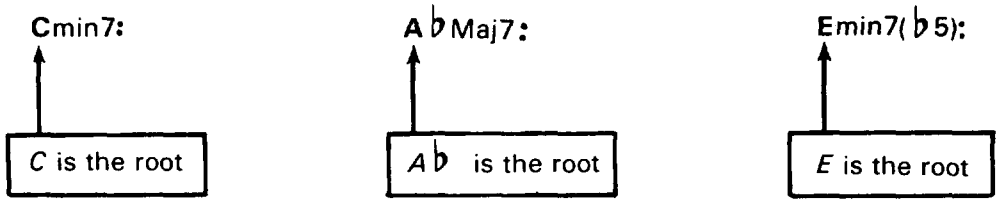


Figure 15.1: Determining the Root of a Chord from a Chord Symbol.

The Third

The chord includes the pitch a major third above the root of the chord unless the third is qualified by the chord symbol. Qualifiers that affect the third always lower it a half step (minor third). *Minor, diminished* and *half diminished* are the qualifiers that lower the third. The preferred abbreviations are *min* and *dim* but may be expressed in other ways.

Indicators for Minor _____ min, -, m, mi, minor

Indicators for Diminished _____ dim, °

Indicator for Half Diminished _____ ø

Figure 15.2: Indicators for Qualified Thirds.

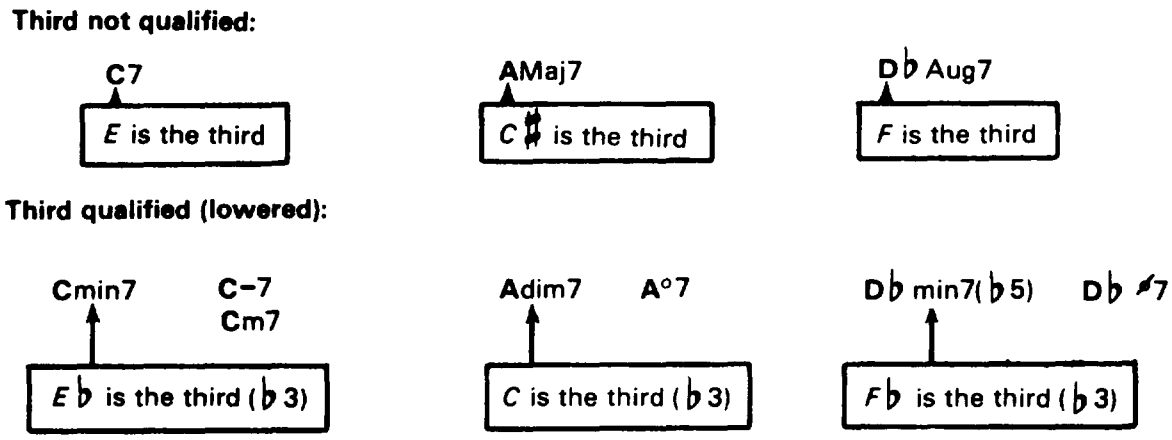


Figure 15.3: Determining the Third of a Chord from a Chord Symbol.

The Fifth

The chord includes the pitch a perfect fifth above the root of the chord unless the fifth is qualified by the chord symbol. Qualifiers that affect the fifth raise the fifth a half step (augmented fifth) or lower the fifth a half step (diminished fifth). *Augmented* is the qualifier that raises the fifth. *Diminished, half diminished* and *flat five* are qualifiers that lower the fifth. The preferred abbreviations are *(Aug, dim* and *♭5)* but may be expressed in other ways.

Indicators for Raised Fifth _____ Aug, +, (+5), (♯5)

Indicators for Lowered Fifth _____ dim, °, ø, (♭5) (-5)

Figure 15.4: Indicators for Qualified Fifths.

Fifth not qualified:

CMaj7 → *G* is the fifth

A♭ min7 → *E♭* is the fifth

E6 → *B* is the fifth

Fifth raised:

CAug7, C+7, C7(♯5) → *G♯* is the fifth (♯5)

A♭ Aug7 → *E* is the fifth (♯5)

EAug7 → *B♯* is the fifth (♯5)

Fifth lowered:

Cdim7, C°7 → *G♭* is the fifth (♭5)

A♭ min7(♭5), A♭ø7 → *E♭♭* is the fifth (♭5)

Emin7(♭5), Emin7(-5) → *B♭* is the fifth (♭5)

Figure 15.5: Determining the Fifth of a Chord from a Chord Symbol.

The Sixth

The chord includes the pitch a major sixth above the root of the chord when the numeral 6 is part of the chord symbol.

C6 → *A* is the sixth

G♭ min6, G♭ -6 → *E♭* is the sixth

B6 → *G♯* is the sixth

Figure 15.6: Determining the sixth of a Chord from a Chord Symbol.

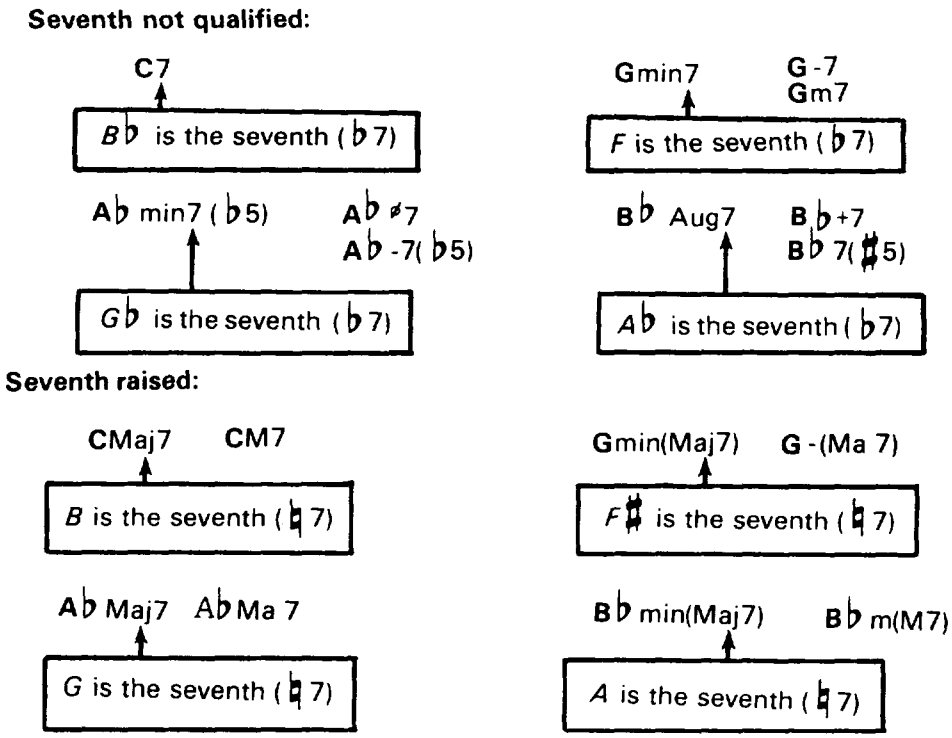
The Seventh

The chord includes the pitch a minor seventh above the root of the chord (subtonic) unless the seventh is qualified by the chord symbol. Qualifiers that affect the seventh raise the seventh a half step (major seventh) or lower the seventh a half step (diminished seventh or major sixth). *Major seven* is the qualifier that raises the seventh. *Diminished seven* is the qualifier that lowers the seventh and the tone may be spelled enharmonically as the sixth. Pitches of a diminished seventh chord may be spelled enharmonically. The preferred abbreviations are *Maj7* and *dim7* but may be expressed in other ways.

Indicators for Raised Seventh _____ Maj7, M7, Ma 7, (+7), (♯7)

Indicators for Lowered Seventh _____ dim7, °7

Figure 15.7: Indicators for Qualified Sevenths.



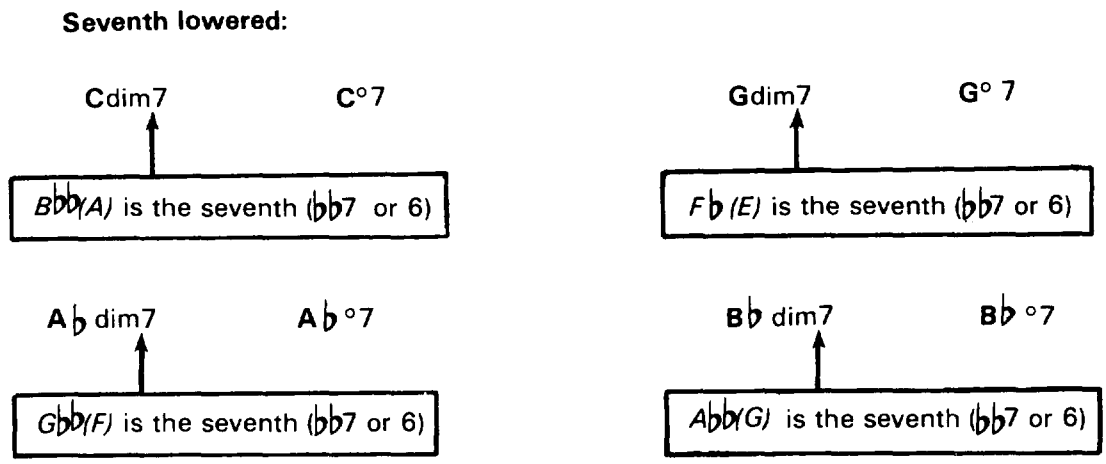


Figure 15.8: Determining the Seventh of a Chord from a Chord Symbol.

The Delta Sign

The Delta Sign (▵) was originally used to indicate the use of a triad. Its meaning has come to include chords of the sixth and major seventh.

CHORD STRUCTURES

In addition to *major, minor, augmented* and *diminished* triads, there are nine commonly used chord structures:

major sixth

major seventh

minor sixth

minor/major seventh

dominant seventh

minor seventh

minor seventh (flat five)

augmented seventh

diminished seventh

Major Sixth Chord

The chord formula for the major sixth chord is 1, 3, 5, 6 of a major scale. It is indicated by a root name and 6.

6 A	6 G	6 B
5 G	5 F	5 A
3 E	3 D	3 F♯
1 C	1 B♭	1 D
C6	B♭6	D6

Figure 15.9: Major Sixth Chords.

Major Seventh Chords

The chord formula for the major seventh chord is 1, 3, 5, 7 of a major scale. It is indicated by a root name and Maj 7.

7 B	7 D	7 G♯
5 G	5 B♭	5 E
3 E	3 G	3 C♯
1 C	1 E♭	1 A
CMaj7	E♭Maj7	AMaj7

Figure 15.10: Major Seventh Chords.

Minor Sixth Chord

The chord formula for the minor sixth chord is 1, ♭3, 5, 6 of a major scale. It is indicated by a root name, min, and 6.

6 A	6 F	6 C♯
5 G	5 E♭	5 B
♭3 E♭	♭3 C♭	♭3 G
1 C	1 A♭	1 E
Cmin6	A♭min6	Emin6

Figure 15.11: Minor Sixth Chords.

Minor/Major Seventh Chord

The chord formula for the minor/major seventh chord is 1, ♭3, 5, 7 of a major scale. It is indicated by a root name, min, and Maj 7.

7 B	7 C	7 A♯
5 G	5 A♭	5 F♯
♭3 E♭	♭3 F♭	♭3 D♯
1 C	1 D♭	1 B
C min(Maj7)	D♭ min(Maj7)	Bmin(Maj7)

Figure 15.12: Minor/Major Seventh Chords.

Dominant Seventh Chord

The chord formula for the dominant seventh chord is 1, 3, 5, ♭7 of a major scale. It is indicated by a root name and 7.

♭7 B♭	♭7 E♭	♭7 F
5 G	5 C	5 D
3 E	3 A	3 B
1 C	1 F	1 G
C7	F7	G7

Figure 15.13: Dominant Seventh Chords.

Minor Seventh Chord

The chord formula for the minor seventh chord is 1, ♭3, 5, ♭7 of a major scale. It is indicated by a root name, min, and 7.

♭7 B♭	♭7 C	♭7 A♭
5 G	5 A	5 F
♭3 E♭	♭3 F	♭3 D♭
1 C	1 D	1 B♭
Cmin7	Dmin7	B♭ min7

Figure 15.14: Minor Seventh Chords.

Minor Seventh (Flat Five) Chord

The chord formula for the minor seventh (flat five) chord is 1, ♭3, ♭5, ♭7 of a major scale. It is indicated by a root name, min, 7, and (♭5). This type of chord is also called a half diminished seventh chord (ϕ7).

♭7 B♭	♭7 G	♭7 F
♭5 G♭	♭5 E♭	♭5 D♭
♭3 E♭	♭3 C	♭3 B♭
1 C	1 A	1 G
Cmin7(♭5)	Amin7 (♭5)	Gmin7(♭5)

Figure 15.15: Minor Seventh (flat five) Chords.

Augmented Seventh Chord

The chord formula for the augmented seventh chord is 1, 3, ♯5, ♭7 of a major scale. It is indicated by a root name, Aug, and 7.

♭7 B♭	♭7 C	♭7 A♭
♯5 G♯	♯5 A♯	♯5 F♯
3 E	3 F♯	3 D
1 C	1 D	1 B♭
CAug7	DAug7	B♭Aug7

Figure 15.16: Augmented Seventh Chords.

Diminished Seventh Chord

The chord formula for the diminished seventh chord is 1, ♭3, ♭5, 6 (♭♭7) of a major scale. It is indicated by a root name, dim, and 7. Notes of diminished seventh chords are often spelled enharmonically for ease of identification

♭♭7 A♭	6 A	6 B♭
♭5 F	♭5 G♭	♭5 G*
♭3 D	♭3 E♭	♭3 E*
1 B	1 C	1 D♭
Bdim7	Cdim7	D♭dim7

*spelled enharmonically

Figure 15.17: Diminished Seventh Chords.

CHAPTER 16
CHORD SCALES

Chord symbols indicate the vertical or harmonic framework of a piece; however, their use may be expanded by using chord scales for horizontal or melodic application. A given chord symbol normally **implies** use of a particular scale.

MAJOR SIXTH AND MAJOR SEVENTH CHORD SCALES

The major or ionian scale (**MLM**) is used for tonic major sixth or major seventh chords. The lydian scale (**LMM**) is used for all other major sixth or major seventh chords.

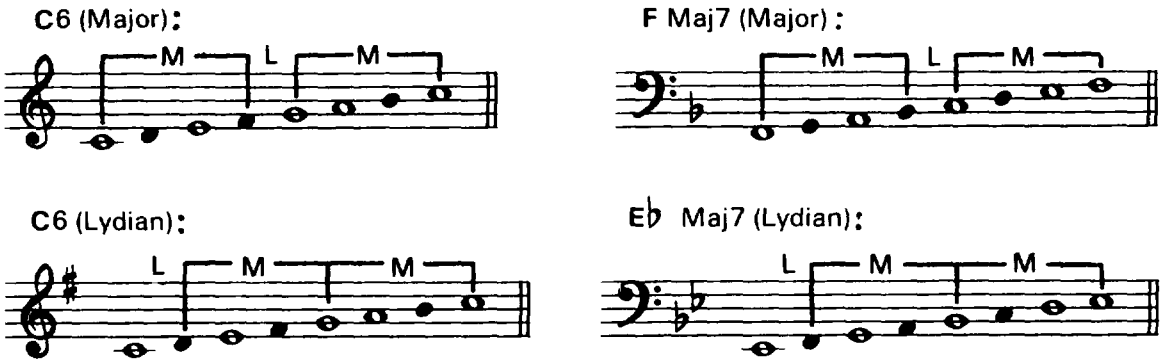


Figure 16.1: Major Sixth and Seventh Chord Scales.

MINOR SIXTH AND MINOR/MAJOR SEVENTH CHORD SCALES

The ascending melodic minor scale (**mLM**) is used both ascending and descending on minor sixth and minor/major seventh chords.

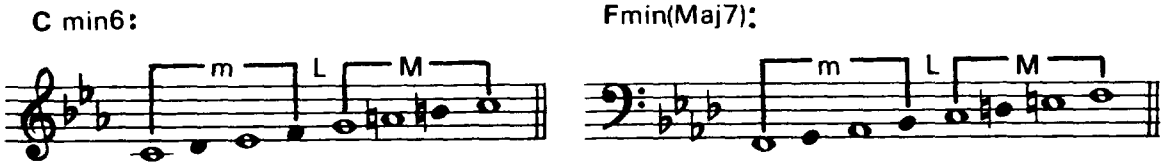


Figure 16.2: Minor Sixth and Minor/Major Seventh Chord Scales.

DOMINANT SEVENTH CHORD SCALES

The mixolydian scale (**MML** or **MLm**) is used for dominant seventh chords which move from dominant to tonic. The lydian seventh scale (**LMm**) is used for all other dominant seventh chords.

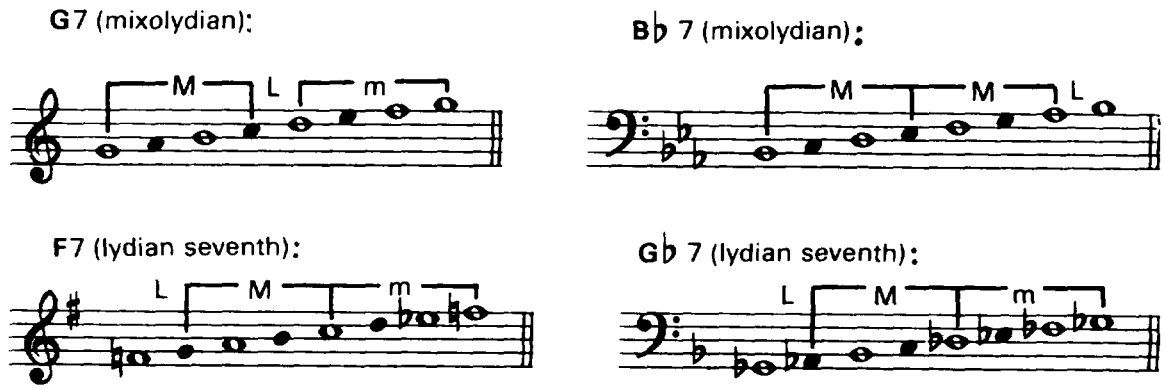


Figure 16.3: Dominant Seventh Chord Scales.

MINOR SEVENTH CHORD SCALES

The dorian scale (**mLm**) is used for minor seventh chords. Although some minor seventh chords should take other scales, the dorian scale will fit all minor seventh chords.

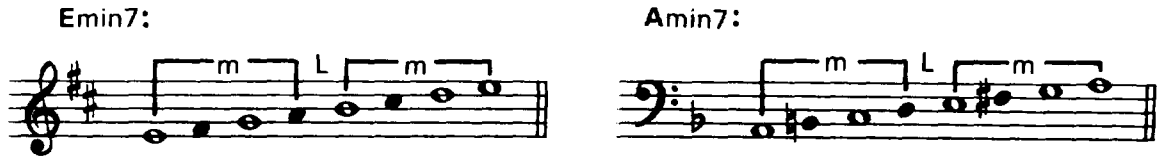


Figure 16.4: Minor Seventh Chord Scales.

MINOR SEVENTH (FLAT FIVE) CHORD SCALES

The locrian scale (NNL) is used for minor seventh (flat five) chords.

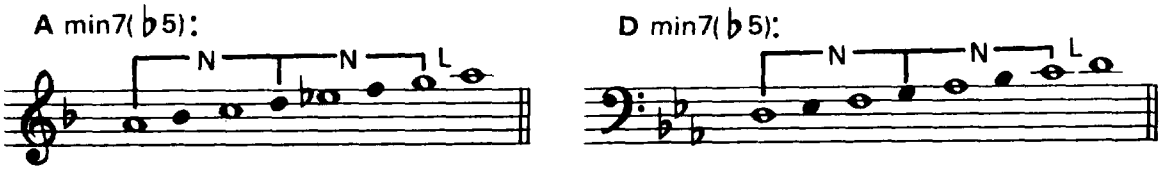


Figure 16.5: Minor Seventh (flat five) Chord Scales.

AUGMENTED SEVENTH CHORD SCALES

The whole tone scale (222222) is used for augmented seventh chords.

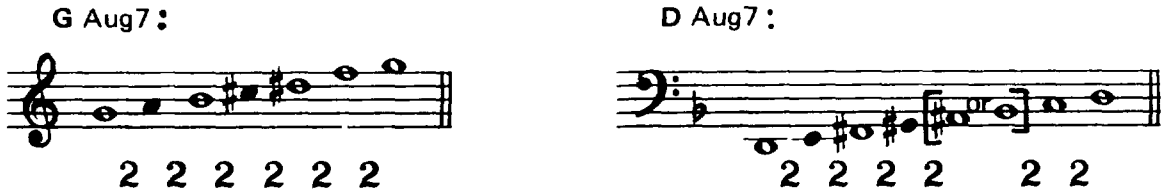


Figure 16.6: Augmented Seventh Chord Scales.

DIMINISHED SEVENTH CHORD SCALES

The diminished scale (21212121) is used for diminished seventh chords. A diminished scale may be thought of as two superimposed diminished seventh chords a whole step apart.

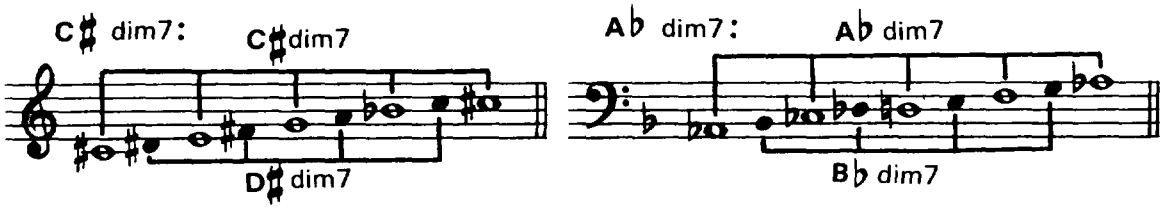


Figure 16.7: Diminished Seventh Chord Scales.

THE BLUES SCALE

The blues scale is a scale used primarily as a device while playing blues. It cannot be analyzed with tetrachords. The scale contains the tonic (1), subdominant (4), and dominant (5) plus the "blue notes" which are the lowered third (♭3), lowered fifth (♭5), and lowered seventh (♭7). Enharmonic spellings are frequently used.

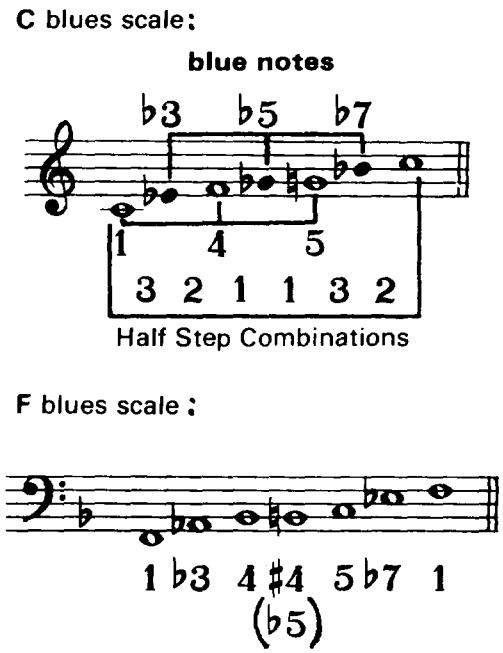


Figure16.8: The Blues Scale.

PENTATONIC SCALES

The pentatonic major scale may be used with major sixth, major seventh, and dominant seventh chords.

The pentatonic minor scale may be used with minor seventh chords or as a substitute for the blues scale.

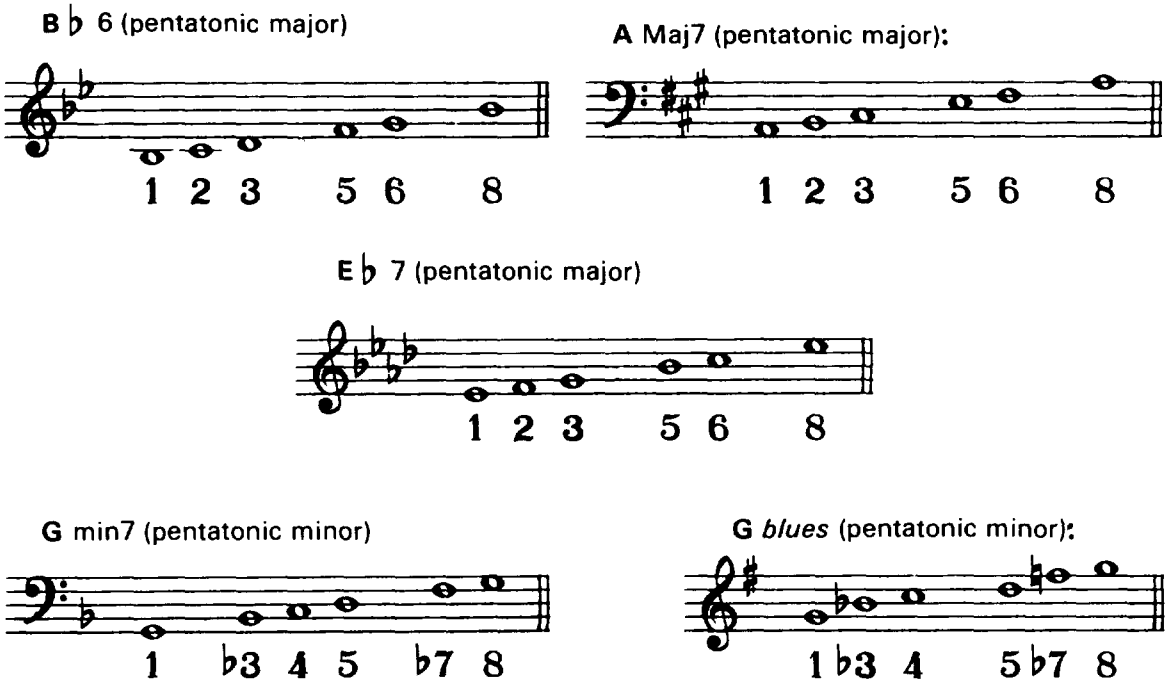


Figure 16.9: Pentatonic Scales.

CHORD TYPE	*COMMON CHORD SCALES USED*		
Major Sixth and Major Seventh	Major **(MLM)**	Lydian **(LMM)**	Pentatonic Major **(1 2 3 5 6)**
Minor Sixth and Minor/Major Seventh	Ascending Melodic Minor **(mLM)**		
Dominant Seventh	Mixolydian **(MML *or* MLm)**	Lydian Seventh **(LMm)**	Pentatonic Major **(1 2 3 5 6)**
Minor Seventh	Dorian **(mLm)**	Pentatonic Minor **(1 ♭3 4 5 ♭7)**	
Minor Seventh (Flat Five)	Locrian **(NNL)**		
Augmented	Whole Tone **(222222)**		
Diminished	Diminished **(21212121)**		
blues	*Blues* **(1 ♭3 4 ♭5 5 ♭7)**	Pentatonic Minor **(1 ♭3 4 5 ♭7)**	

Figure 16.10: Common Chord Scale Usage.

CHAPTER 17
SWING RHYTHM

ANTICIPATION

Anticipation occurs when a note normally on the beat is attacked a half beat early. The result is *melodic, harmonic,* and *rhythmic* syncopation (usually ♪, sometimes ♩).

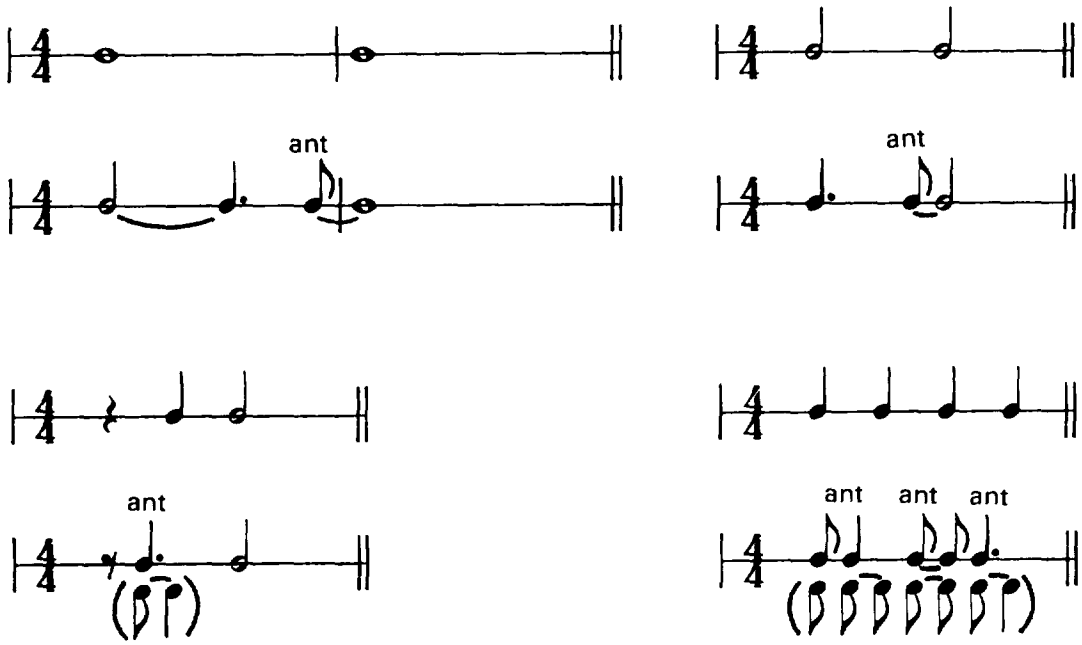


Figure 17.1: Anticipation.

An off-beat eighth note followed by a rest is a method of notating anticipation.

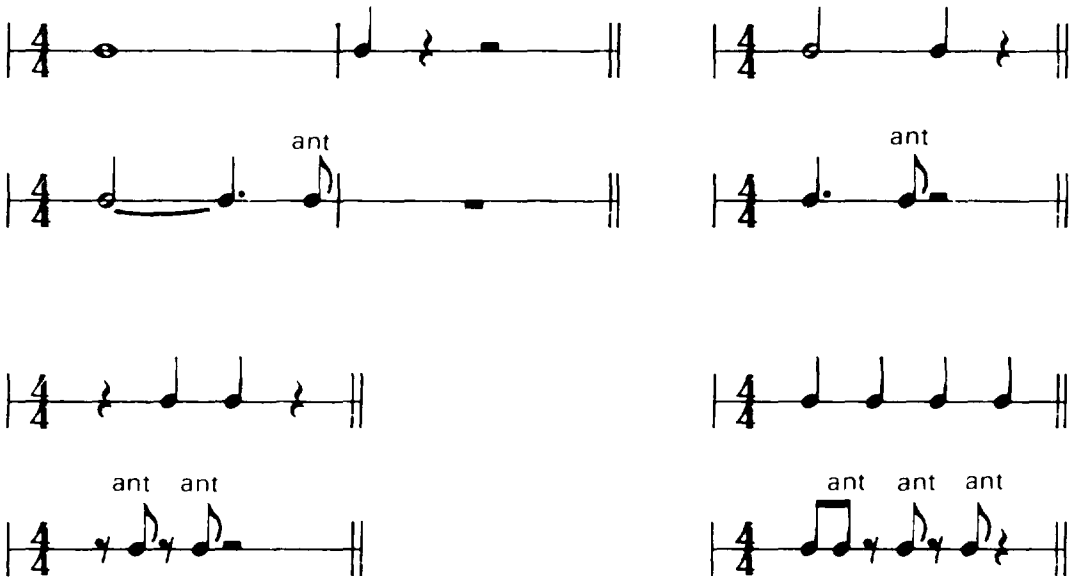
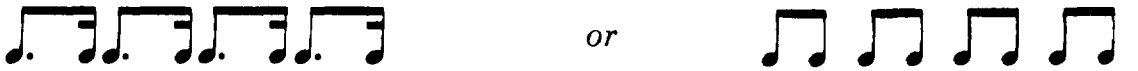


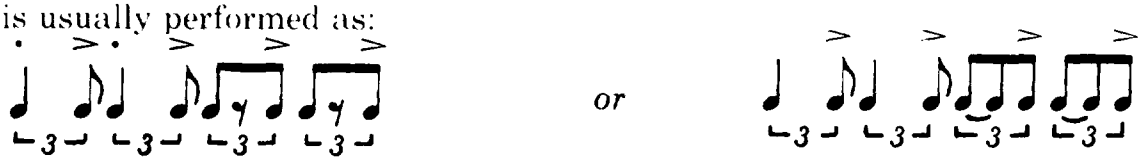
Figure 17.2: Anticipation Created by Rests.

DIVIDED BEAT IN SWING TIME

The divided beat in swing time is often interpreted differently from the way it is notated. The dotted eighth/sixteenth or eighth note pattern in notation:



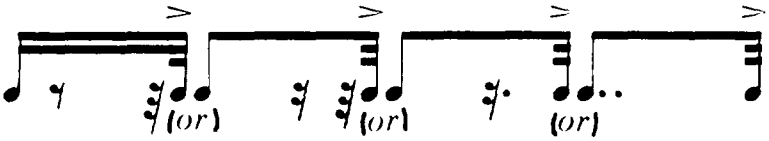
is usually performed as:



Tempo determines the interpretation of the divided beat in swing time.

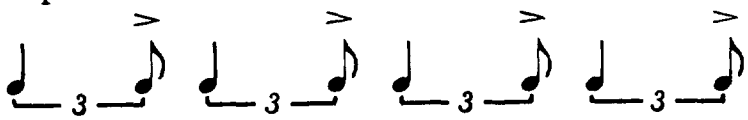
In extremely slow tempi, the notation:

is often performed as:



In double time, the same notation is often performed as:

In medium tempi, the second portion of the beat sounds earlier and requires compound interpretation. The notation is often performed as:



In extremely fast tempi, the second portion of the beat sounds earlier and requires simple interpretation. The notation is often performed as:

The following graph illustrates how the second portion of the divided beat moves.

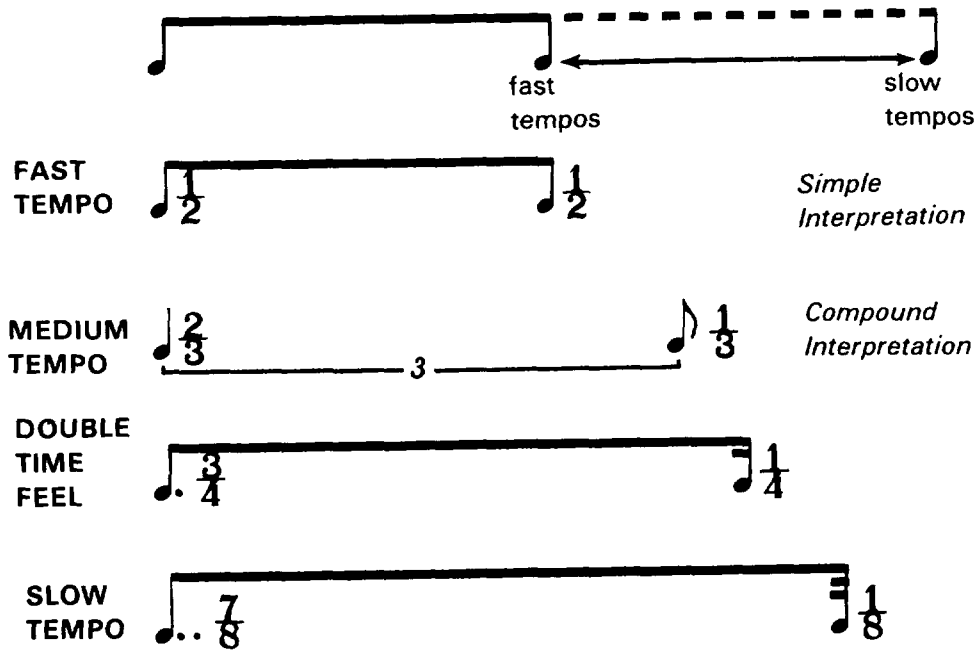


Figure 17.3: Divided Beat in Swing Time.

Normally, in rhythmic passages containing repeated regular divisions of the beat, there is a *breath accent* or *push* on off-beats.

SHORT PERCUSSIVE NOTE

Normally, in swing time, the quarter note or its tied equivalent (eighth tied to eighth) is a short percussive note. The duration of a short percussive note is determined by style and tempo.

A quarter note on the beat is a short percussive note unless marked long (usually with a legato mark—). It is performed with the duration of the first portion of the beat. A cap accent (^) is often used to indicate a short percussive note.

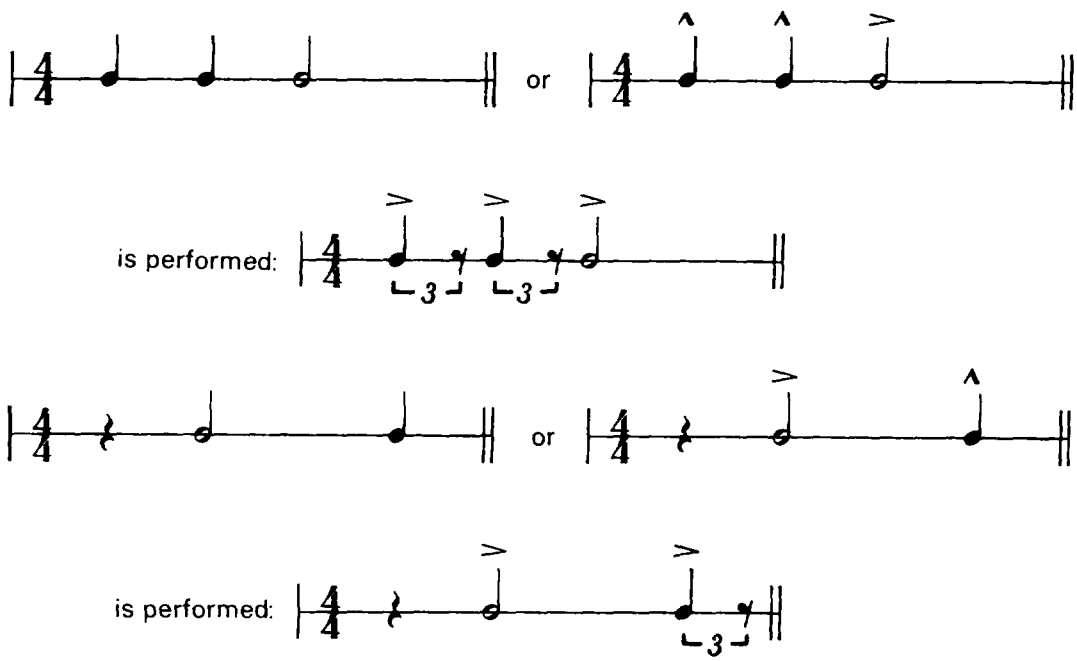


Figure 17.4: Short Percussive Notes on the Beat.

A quarter note (quarter note equivalent) off the beat is a short percussive note unless marked long. It is performed with the duration of the first portion of the beat.

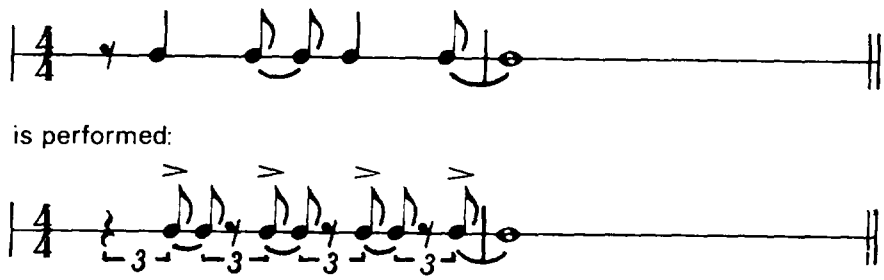


Figure 17.5: Short Percussive Notes off the Beat.

An anticipation that is an off-beat eighth note followed by a rest is usually a short percussive note. It is performed with the duration of the first portion of the beat.

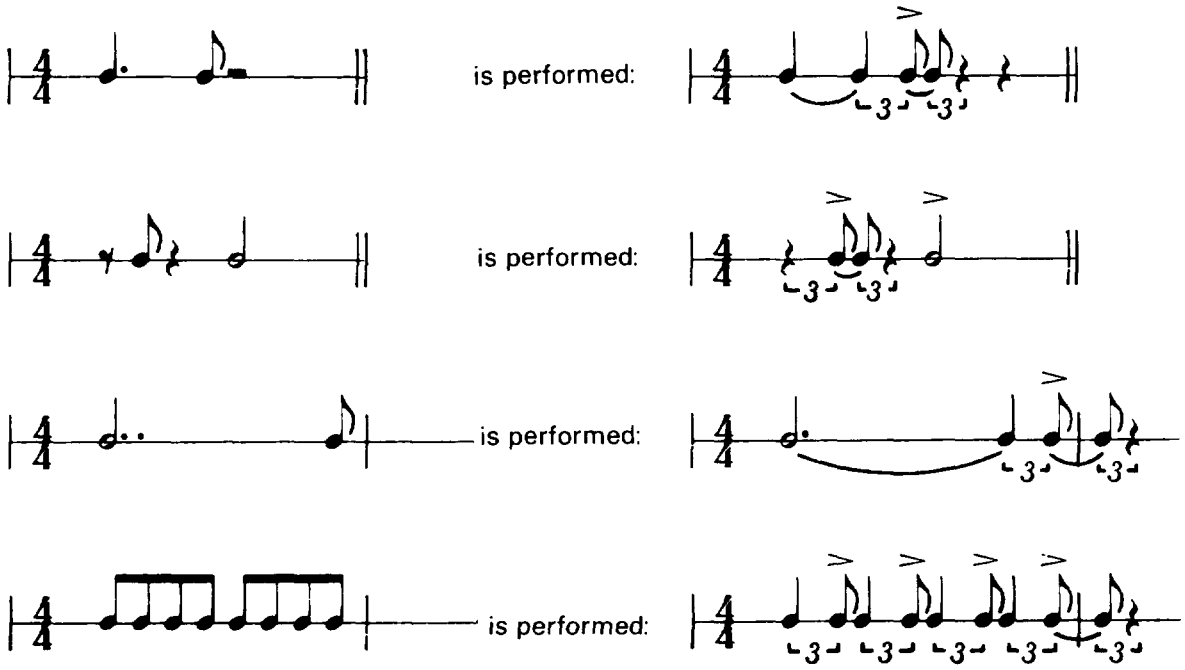


Figure 17.6: Short Percussive Notes as Anticipations.

LONG PERCUSSIVE NOTE

An anticipation that is not a short percussive note is normally a long percussive note in swing time. A long percussive note is often, but not always, marked with a horizontal accent (>). An anticipated long percussive note of two or more beats may be performed with its full value or it may be shortened by the duration of the second portion of the divided beat. The anticipation occurs on the second portion of the divided beat.

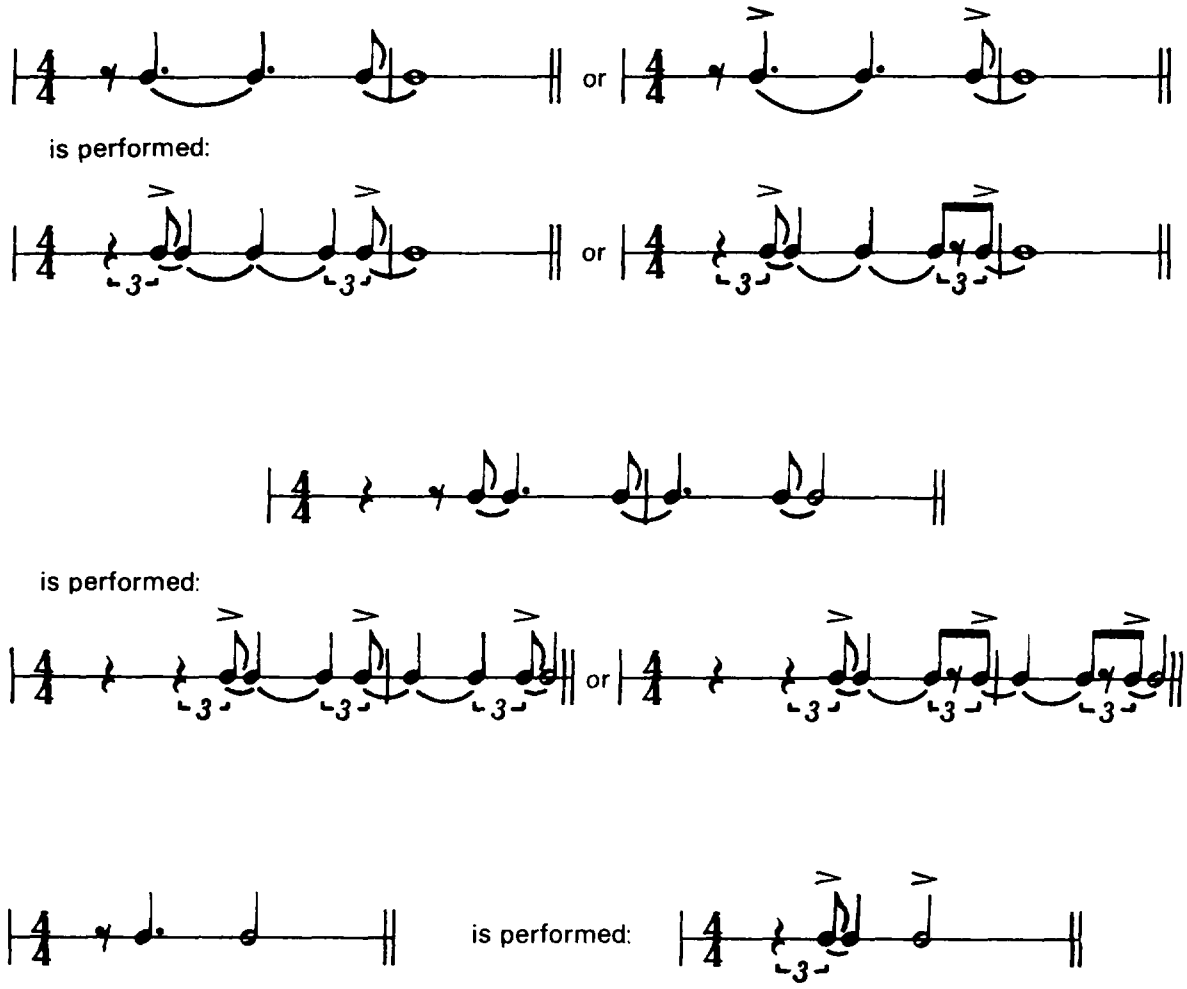


Figure 17.7: Long Percussive Notes as Anticipations.

A note that occurs beginning on the beat is often a long percussive note. A long percussive note that begins on the beat, and is of more than a beat's duration, may be performed with its full value or it may be shortened by the duration of the second portion of the divided beat.

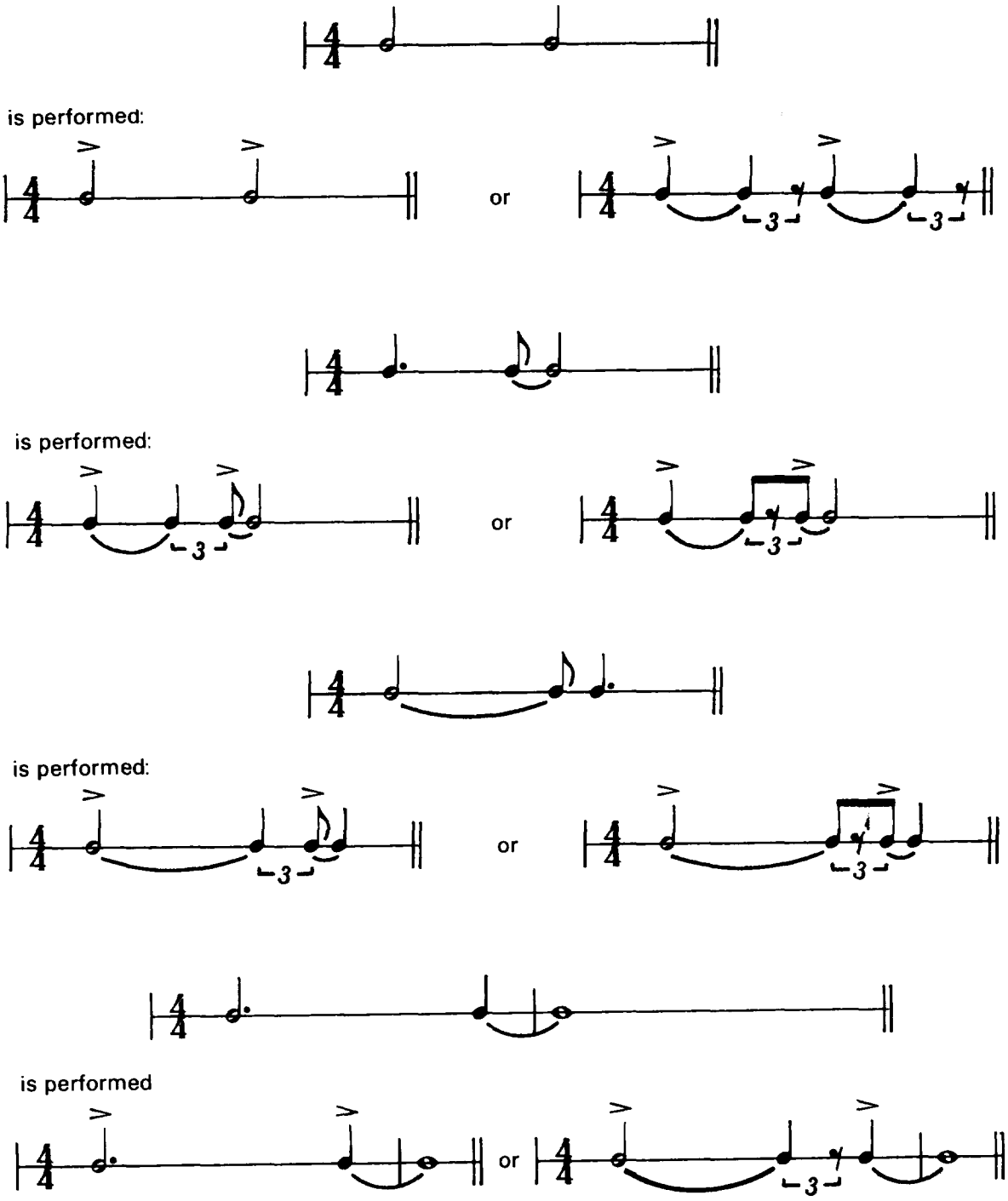


Figure 17.8: Long Percussive Notes on the Beat.

A quarter note (or equivalent) that is marked long is usually a long percussive note. It is performed with the duration of the full beat. An off the beat long percussive quarter note occurs on the second portion of the divided beat.

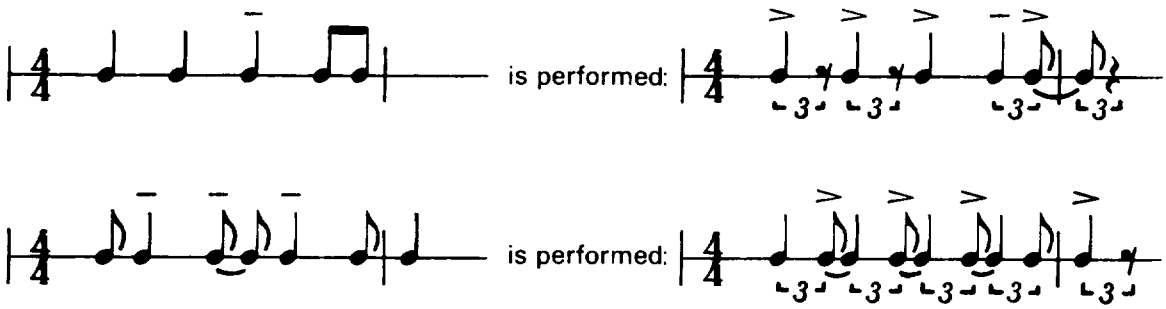


Figure 17.9: Quarter Notes as Long Percussive Notes.

CHAPTER 18
MELODY CONSTRUCTION

Pitches used to construct melodies may be chord tones or approach tones.

CHORD TONES

Many melodies are constructed primarily of chord tones. For example, *La Curcaracha* is composed of chord tones in all but the third and seventh bars.

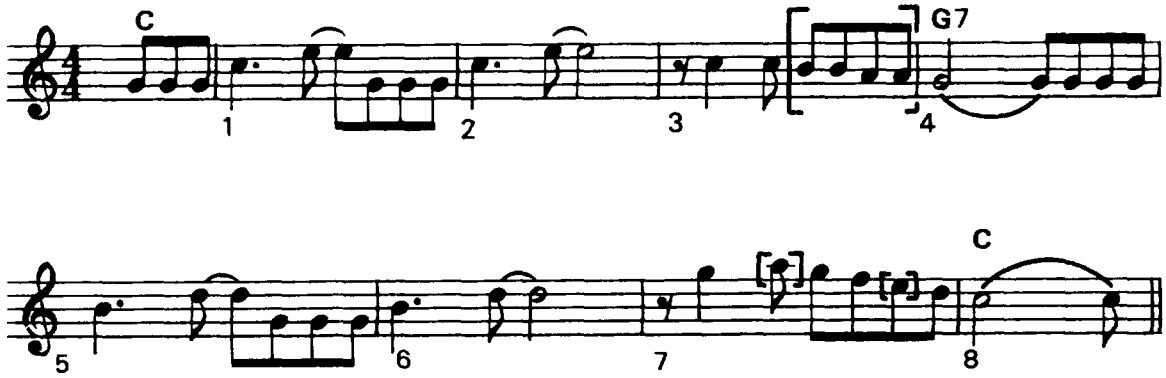


Figure 18.1: Chord Tones in La Cucaracha.

Chord tones of a given chord may be played in any order, in any octave and with any rhythm pattern against that chord. When the melody is anticipated, the harmony is also anticipated.

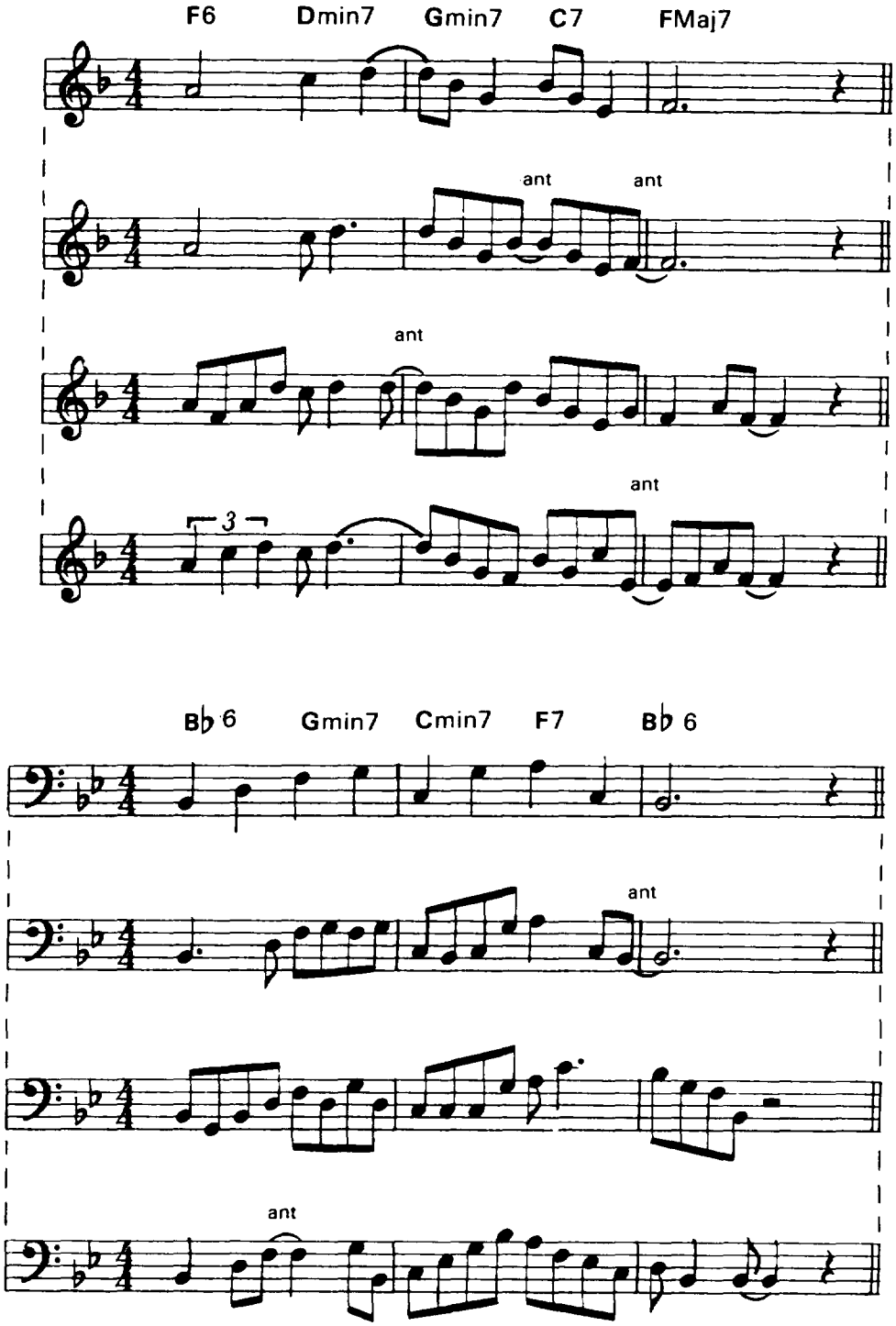


Figure 18.2: Chord Tone Melodies.

APPROACH TONES

Approach tones are tones that lead into chord tones by step. Approach tones are usually of half beat duration (usually ♪ , sometimes ♩). Two types of approach tones are scale approach tones and chromatic approach tones.

Scale Approach Tones

Scale approach tones are non-chord tones within a given chord scale that approach the chord tones of that chord by step.

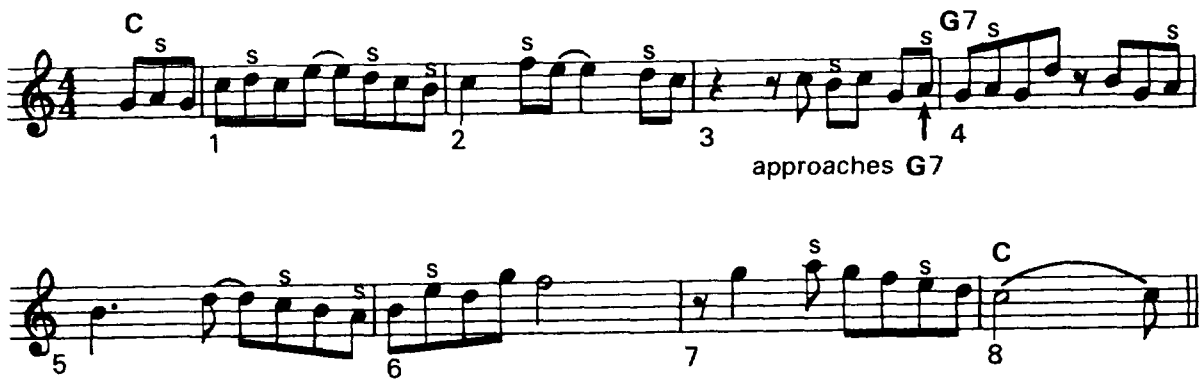


Figure 18.3: Scale Approach Tones in La Cucaracha.

Notation of the chord scale for a given chord will make the identification of scale approach tones easier.

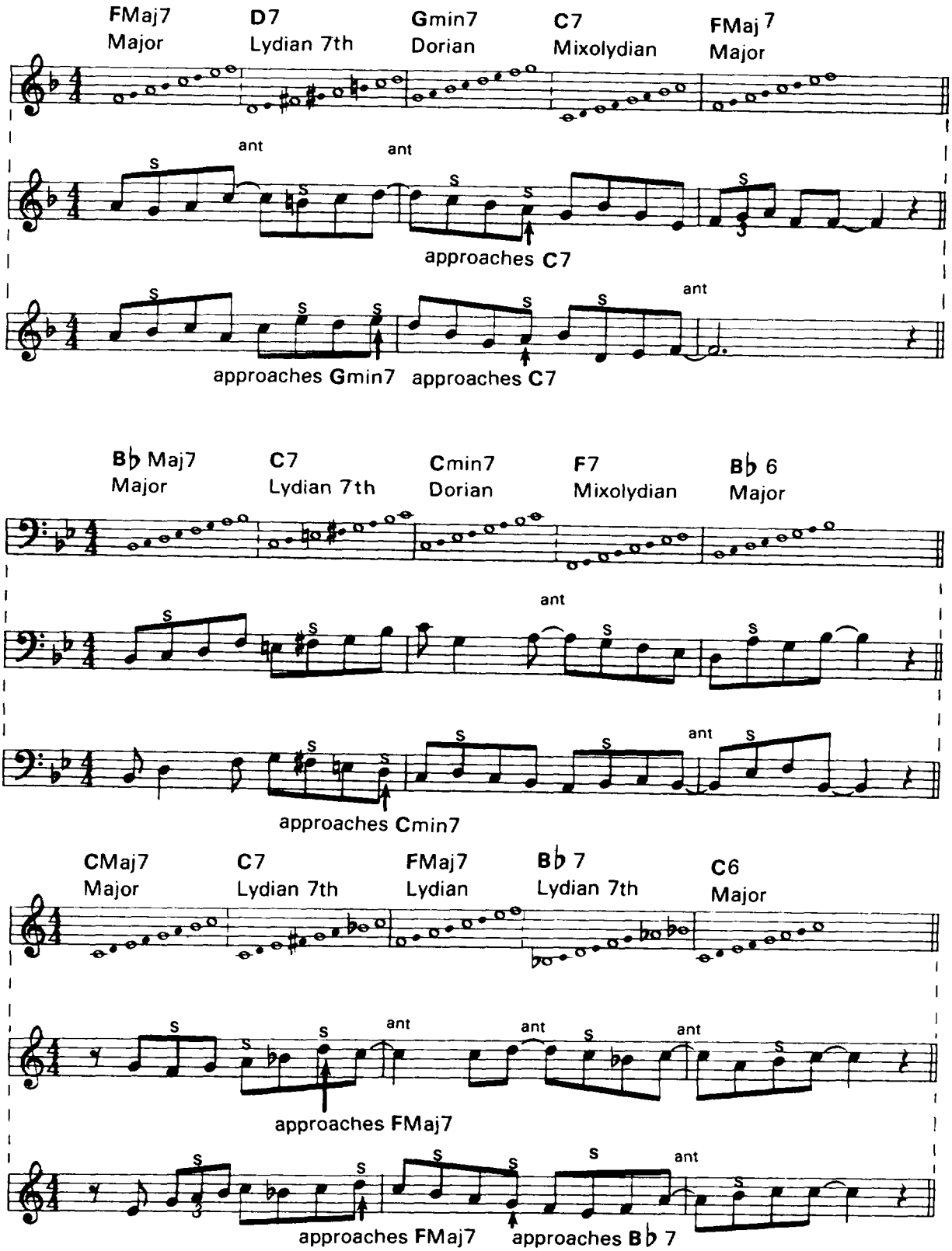


Figure 18.4: Scale Approach and Chord Tone Melodies.

Chromatic Approach Tones

Chromatic approach tones are non-chord tones that approach chord tones or scale approach tones by half steps.

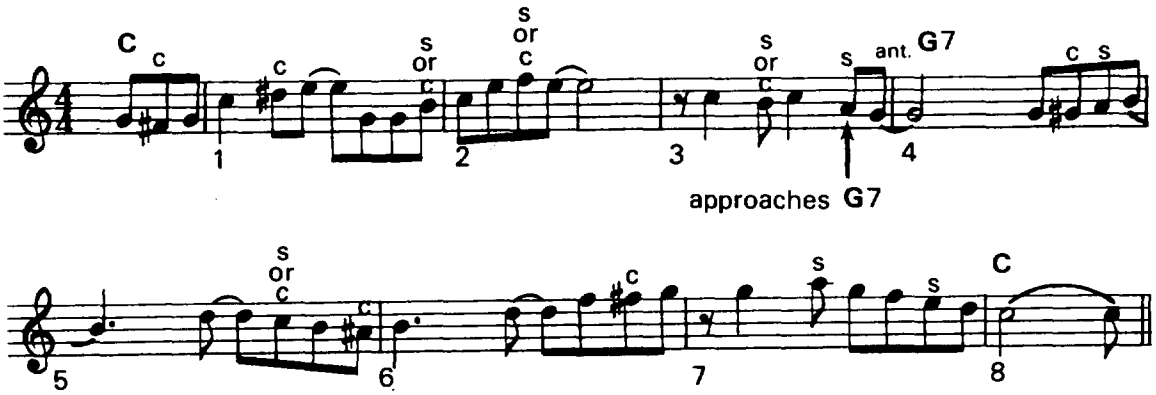


Figure 18.5: Chromatic Approach Tones in La Cucaracha.

A scale approach tone may move to a chromatic approach tone by half step if the chromatic approach tone goes immediately to a chord tone in the same direction.

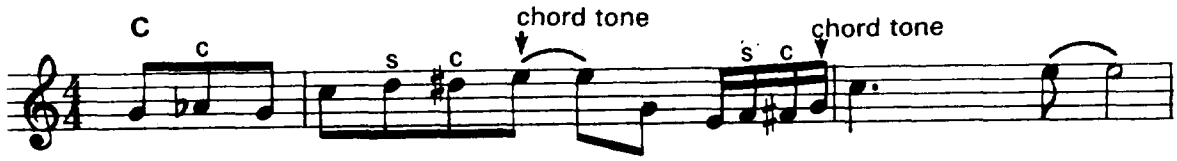


Figure 18.6: Scale Approach Tone to Chromatic Approach Tone.

Notation of the chromatic approach tones, with the chord scale of a given chord, will make their identification easier. The result will be a chromatic scale.

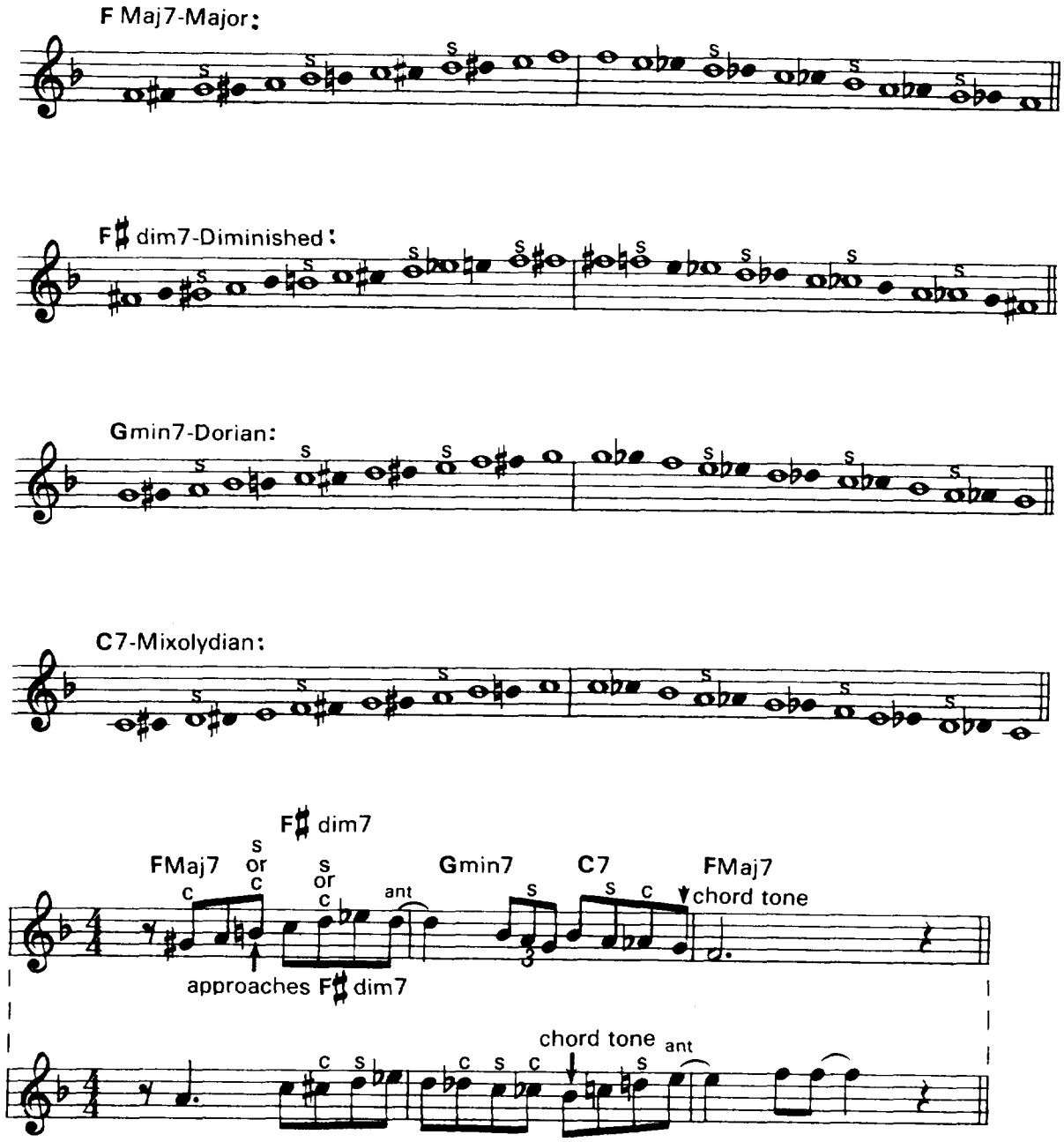


Figure 18.7: Chromatic Approach, Scale Approach, and Chord Tone Melodies.

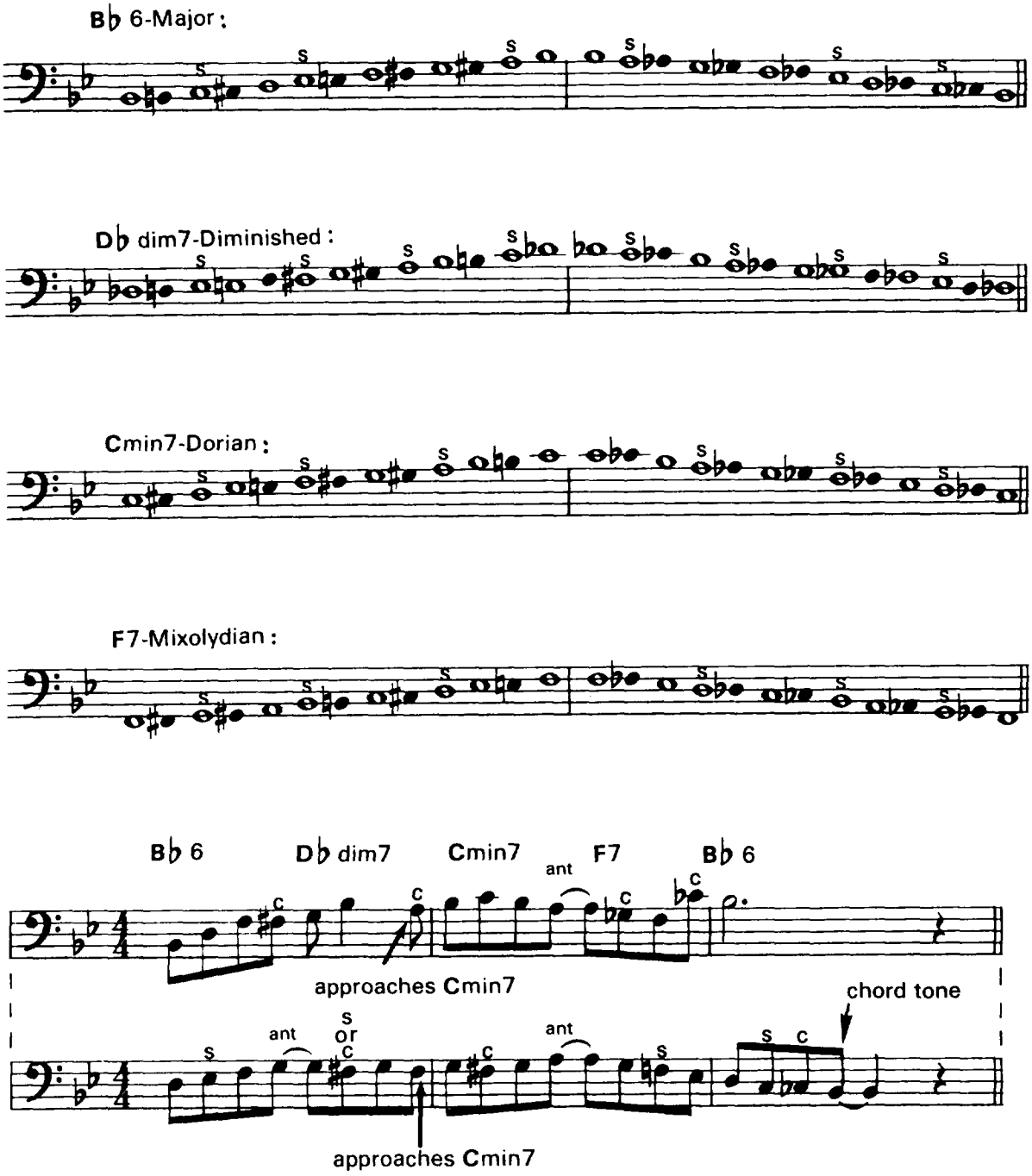


Figure 18.7: (continued).

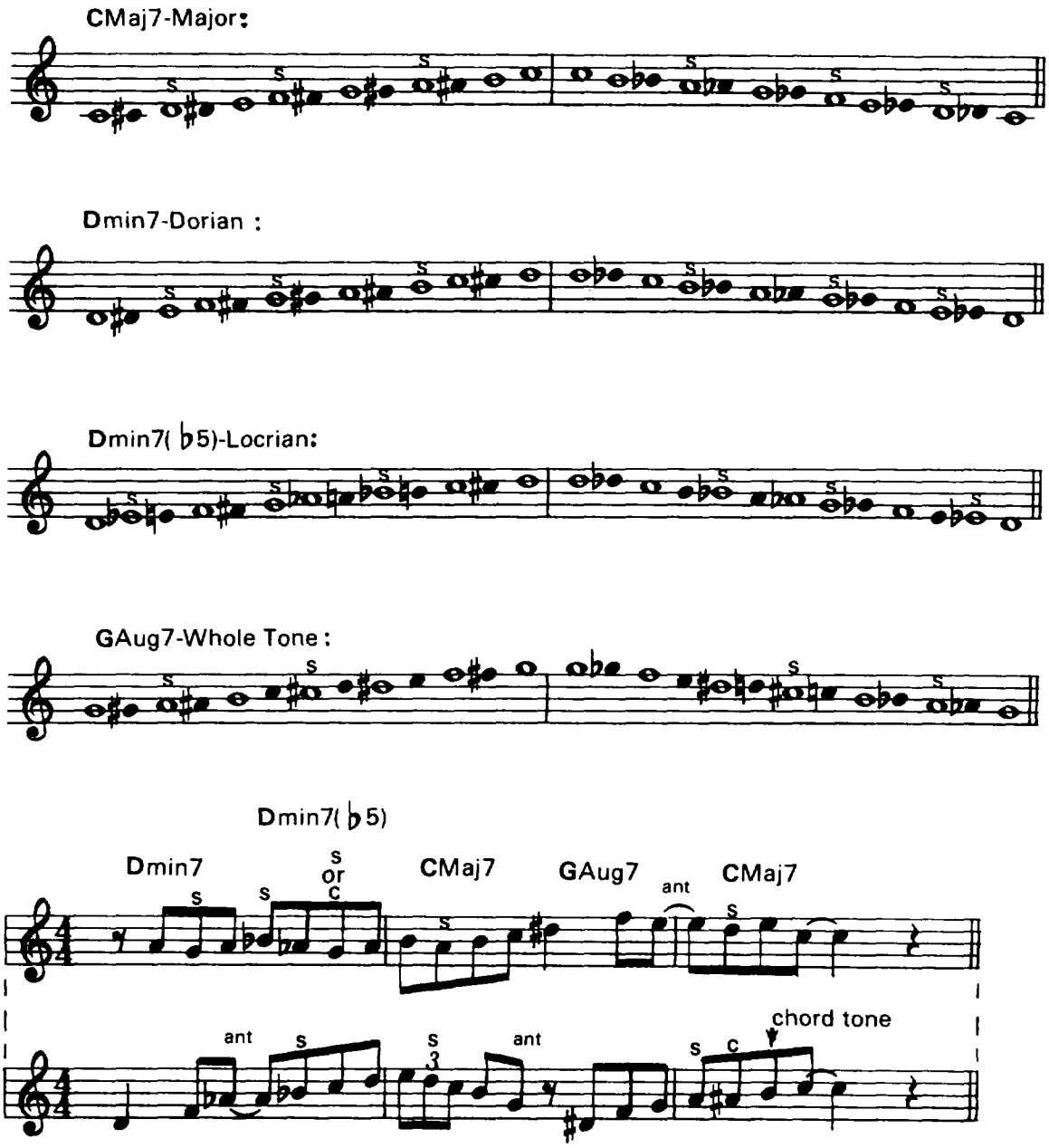


Figure 18.7: (continued).

CHAPTER 19
EXTENDED AND ALTERED CHORDS

A chord symbol often indicates pitches other than the first, third, fifth, sixth, and seventh. When additional pitches are required, the basic chord is extended in ascending thirds. These pitches are expressed as compound intervals from the root of the chord. The extensions are the ninth, eleventh, and thirteenth above a root.

Extended chords are created when the ninth, eleventh or thirteenth are present in the chord.

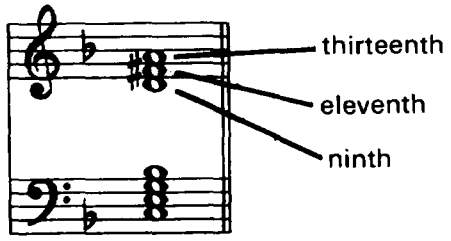


Figure 19.1: Extended Chord.

Altered chords are created when the fifth, ninth, eleventh, or thirteenth are chromatically altered.

THE NINTH

Natural Ninth

The chord includes the pitch a major ninth (major second) above the root of the chord when the numeral **9** is part of the chord symbol.

9 C	9 B♭	9 G
6 G	7 G	6 D
5 F	5 E♭	5 C
3 D	3 C	♭3 A♭
1 B♭	1 A♭	1 F
B♭(9/6)	A♭ Maj9	Fmin (9/6)
9 A	9 B	9 E
7 F♯	♭7 G	♭7 C
5 D	5 E	5 A
♭3 B♭	3 C♯	♭3 F
1 G	1 A	1 D
Gmin(Maj9)	A9	Dmin9
9 D	9 A	9 F♯
♭7 B♭	♭7 F	♭♭7 D♭
♭5 G♭	♯5 D♯	♭5 B♭
♭3 E♭	3 B	♭3 G
1 C	1 G	1 E
Cmin9(♭5)	GAug9	Edim9

Figure 19.2: Natural Ninth Chords.

Lowered Ninth

The chord includes the pitch a minor ninth (minor second) above the root of the chord when (**♭9**) is part of the chord symbol. The symbol (**♭9**) is the preferred indicator, but (**-9**) is also used. This alteration occurs on dominant seventh type chords.

♭9	D♭	♭9	E♭	♭9	B♭♭(A)
♭7	B♭	♭7	C	♭7	G♭
5	G	5	A	5	E♭
3	E	3	F♯	3	C
1	C	1	D	1	A♭
C7(♭9)		D7(♭9)		A♭7(♭9)	

Figure 19.3: Flat Nine Chords.

Raised Ninth

The chord includes the pitch an augmented ninth (augmented second, usually spelled enharmonically as a minor third) above the root of the chord when (♯**9**) is part of the chord symbol. The symbol (♯**9**) is the preferred indicator, but (+**9**) is also used. This alteration occurs on dominant seventh type chords.

♯9	E♭*	♯9	F*	♯9	B
♭7	B♭	♭7	C	♭7	G♭
5	G	5	A	5	E♭
3	E	3	F♯	3	C
1	C	1	D	1	A♭
C7(♯9)		D7(♯9)		A♭7(♯9)	

*spelled enharmonically as minor third.

Figure 19.4: Sharp Nine Chords.

THE ELEVENTH

Natural Eleventh

The chord includes the pitch a perfect eleventh (perfect fourth) above the root of the chord when the numeral **11** is part of the chord symbol. This

extension usually occurs on *minor ninth, minor ninth (♭5),* and *diminished ninth* chords.

11 F	11 G	11 D♭
9 D	9 E	9 B♭
♭7 B♭	6 B	♭7 G♭
5 G	♭5 A♭	♭5 E♭♭(D)
♭3 E♭	♭3 F	♭3 C♭
1 C	1 D	1 A♭
Cmin11	Ddim11	A♭min11(♭5)

Figure 19.5: Natural Eleven Chords.

Suspended Fourth *(Sus 4)*

The chord includes the pitch a perfect fourth above the root of the chord when **sus 4** is part of the chord symbol. The perfect fourth replaces the major third as a chord tone. This extension occurs on *dominant seventh* and *ninth, major sixth* and *major six/nine,* and *major seventh* and *ninth* chords.

♭7 B♭	6 F♯	7 D
5 G	5 E	5 B♭
sus 4 F	sus 4 D	sus 4 A♭
1 C	1 A	1 E♭
C7sus4	A6sus4	E♭Maj7sus4
9 D	9 B	9 F
♭7 B♭	6 F♯	7 D
5 G	5 E	5 B♭
sus 4 F	sus 4 D	sus 4 A♭
1 C	1 A	1 E♭
C9sus4	A9sus4 6	E♭Maj9sus4

Figure 19.6: sus 4 Chords.

If the symbol **sus** is present in a chord symbol, it is usually interpreted as a sus 4.

Raised Eleventh

The chord includes the pitch an augmented eleventh (augmented fourth) above the root of the chord when (**♯11**) is part of the chord symbol. The symbol

(♯**11**) is the preferred indicator, but (+**11**) is also used. This alteration usually occurs on *dominant ninth, augmented ninth, major six/nine,* and *major ninth* chords. The altered ninth and raised eleventh may be used on the dominant seventh type chord. Both the *altered ninth* and *(♯11)* are indicated in the chord symbol.

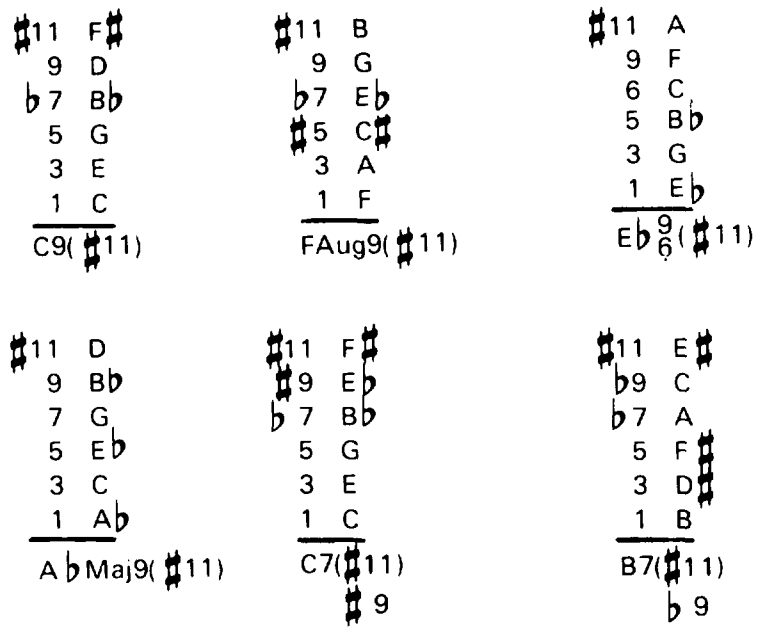


Figure 19.7: Sharp Eleven Chords.

THE THIRTEENTH

Natural Thirteenth.

The chord includes the pitch a major thirteenth (major sixth) above the root of the chord when the numeral **13** is part of the chord symbol. This extension usually occurs on *dominant ninth (♯11)* and *major ninth (♯11)* chords. The (♯11) should be indicated in the chord symbol. The lowered ninth may be included on the *dominant thirteenth (♯11)* but must be indicated with the (♯11) in the chord symbol.

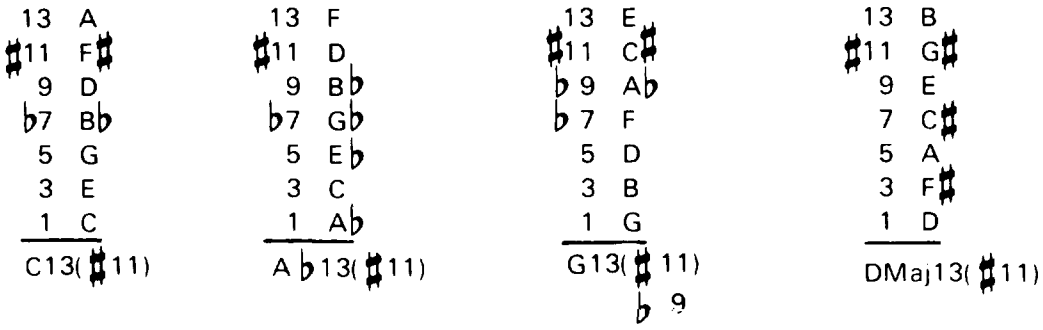


Figure 19.8: Natural Thirteen Chords.

Lowered Thirteenth

The chord includes the pitch a minor thirteenth (minor sixth) above the root of the chord when (♭**13**) is part of the chord symbol. The symbol (♭**13**) is the preferred indicator, but (**-13**) is also used. This alteration usually occurs on dominant seventh type chords with altered ninth and raised eleventh. It also occurs on *minor eleventh (♭5)* and *diminished eleventh* chords. The altered 9, (♯11), and (♭13) on dominant seventh type chords should be indicated in the chord symbol.

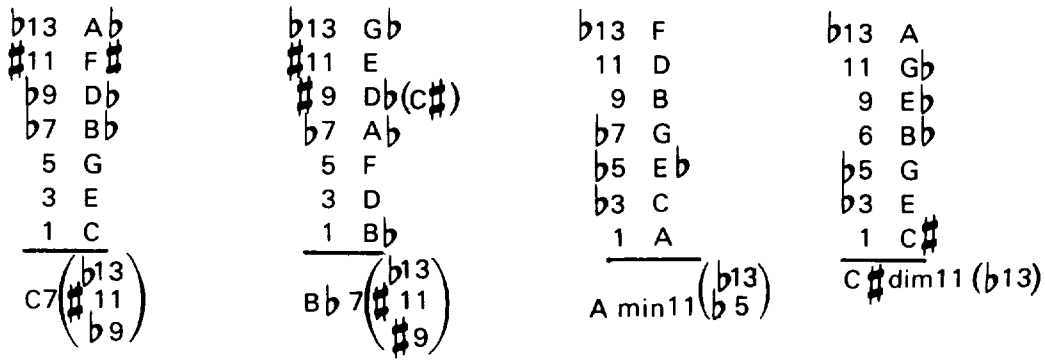


Figure 19.9: Flat Thirteenth Chords.

SPECIFIED BASS NOTE

A bass note which is not the root of the chord is often required in music. One way to notate this is to indicate the chord structure over the bass note.

chord structure / bass note

Gmin7 / C is: F D B♭ G / C

B♭ min(Maj7) / A is: A F D♭ B♭ / A

E♭ / B♭ is: B♭ G E♭ / B♭

Dmin7 / C is: C A F D / C

Figure 19.10: Specified Bass Note.

APPENDIX A
MANUSCRIPT TECHNIQUES

The importance of producing good manuscript cannot be overestimated. A fine, well-prepared score or part immediately receives more attention from the performer. No matter how objective a reader may try to be, a fine score or part is bound to make a better impression simply by being more attractive and easier to read. Composers and arrangers, professionals or students, who expect their manuscript to be performed should consider it mandatory, an act of professional courtesy, to supply the best manuscripts possible.

Every writer should strive for the greatest clarity and attractiveness compatible with a reasonable rate of copying speed. Like ordinary penmanship, manuscript can show personal characteristics of the writer while being technically correct and conveying the thought of the musical content.

For the student, pencils are recommended. Practice manuscript by drawing (freehand) straight vertical lines, straight horizontal lines, circles, ovals, clefs, accidentals, slurs, and other musical symbols.

CLEF SIGNS

Clef Signs have a definite purpose and are not inserted merely for decorative effect. Strive for consistent design and avoid over-embellished designs that confuse the reader. Clef signs should appear at the beginning of every line.

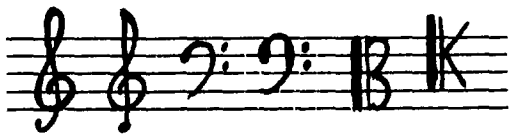


Figure A.1: Clef Signs.

KEY SIGNATURES

Key Signatures are placed after the clef sign. Sharps and flats are always written in an unchanging order.

Sharps: **F C G D A E B**

Flats: **B E A D G C F**

Key signatures are written at the beginning of every line.

Figure A.2: Key signatures.

TIME SIGNATURES

Time Signatures are placed within the limits of the outer staff lines following the key signature. A bar line is not placed between the time signature and the first note of the first measure. In addition to the beginning, time signatures are written when the meter changes.

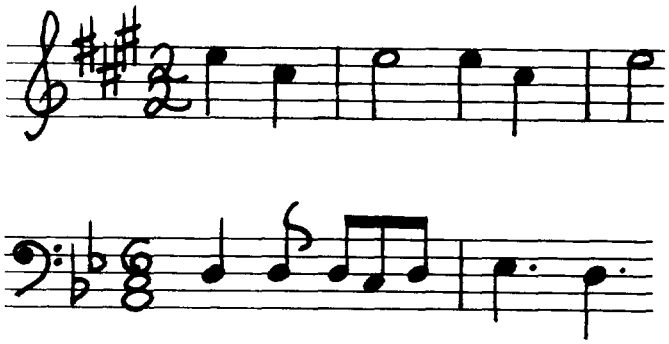


Figure A.3: Time Signatures.

LEGER LINES

The distance between leger lines must be the same as the distance between printed staff lines. A series of leger-lined notes inaccurately placed is difficult to read.

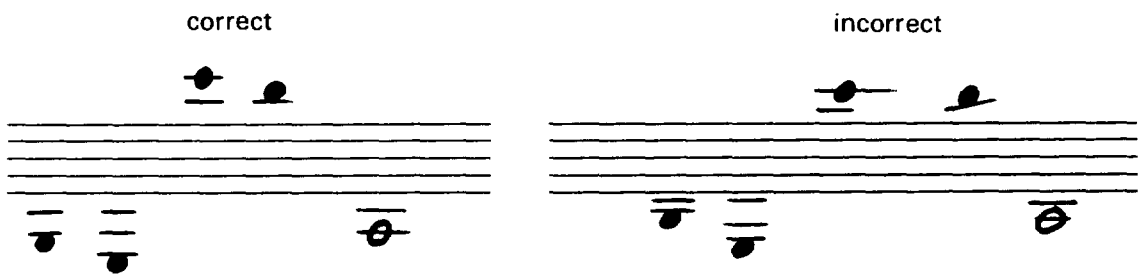


Figure A.4: Leger Lines.

NOTEHEADS

Noteheads are oval, slightly slanted, and clearly centered on the line or within the space. The size of the notehead is determined by the size of the staff. Noteheads should never be so large that they confuse the reader regarding their precise location, nor should they be so small that they look like cues rather than notes to be played. Strive for noteheads of uniform size. No "daylight" should be allowed in any notehead that should be solid.

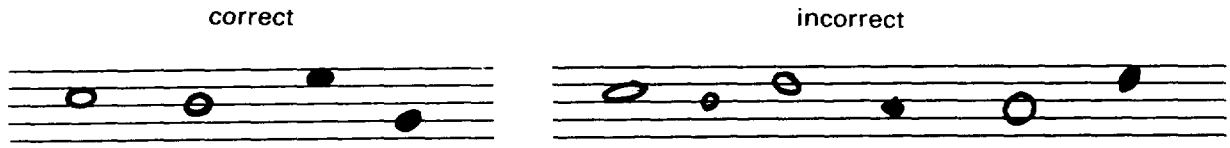


Figure A.5: Noteheads.

STEMS

Stems are always vertical, never slanting left or right. Stems are approximately one octave in length, and normally extend at least to the center line of the staff. For notes above the center line, stems go down and to the left of the notehead. For notes below the

center line, stems go up and to the right of the notehead. For notes on the center line, stems may go up or down depending on musical context. When stemming notes in a group to be beamed, stem direction is determined by the position of the majority in the group and distance from the center line.

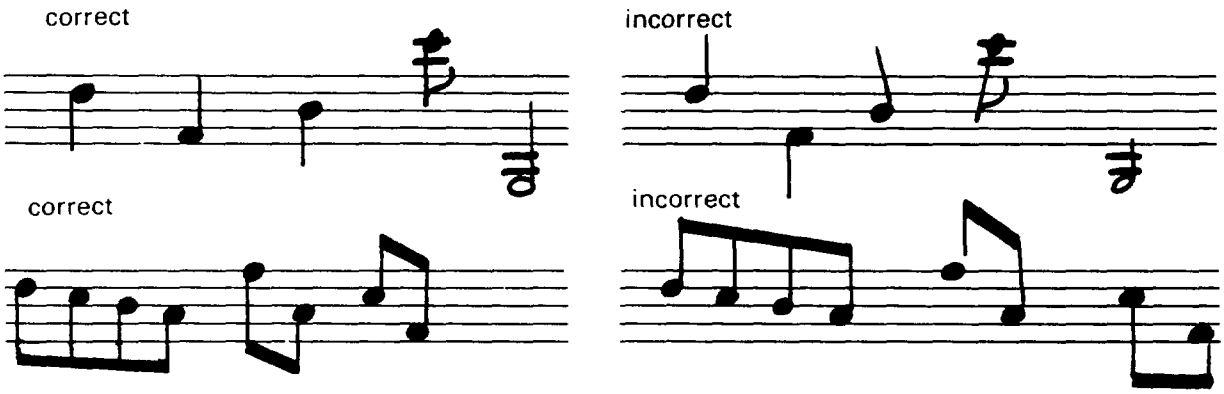


Figure A.6: Stems.

FLAGS

Flags always go to the right of the stem regardless of stem direction. Avoid embellished designs which can easily be confused with rests or other symbols. Flags are connected to the stem. Flags begin at the end of the stem with the end of the flag curving inward toward the notehead. The stem may be lengthened slightly to accommodate additional flags.

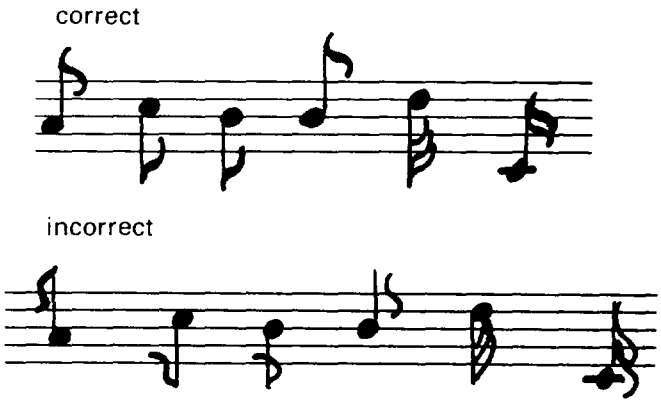
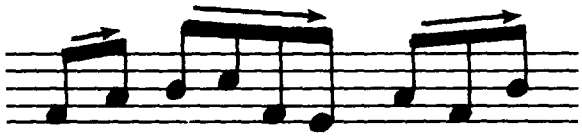


Figure A.7 : Flags.

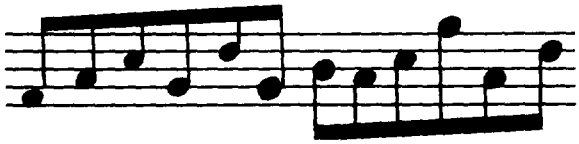
BEAMS

Beams link notes that normally use flags. Although many factors determine the "proper" beaming of a specific note group, beams that look good and are least confusing to the reader are best. Beams should be approximately one-half the width of the space between staff lines. Some general guidelines are shown in figure A.8.

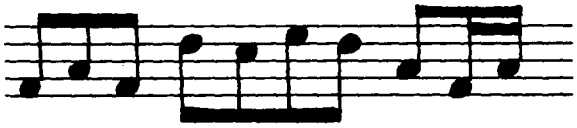
Beam direction is determined by the location of the first and last notes of the group to be beamed together.



Beam location, above or below the staff, is determined by the stem direction of the majority of notes affected.



Groups beginning and ending with the same pitches should have horizontal beams.



Normally, beams should not extend over barlines, or in quadruple meter, from the second to the third beat of a measure.

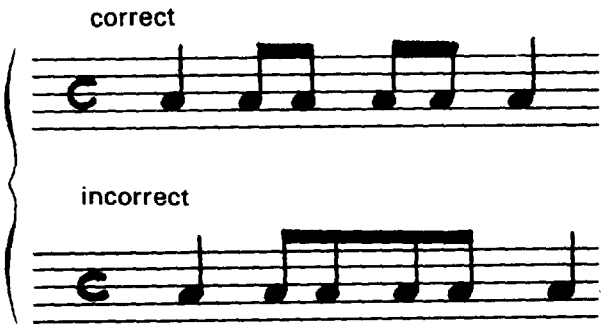


Figure A.8: Beams.

DOTS

Dots are placed to the right of the notehead affected and in the same space as the note. If the note is on a line, the dot is placed in the space immediately above and to the right. Double dots are placed in the same relative position as the single dot.

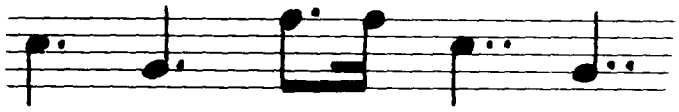


Figure A.9: Dots

SPACING

Spacing of notes is generally in proportion to their time values. Notes and rests must be placed in each measure on the beat to which they belong. This is accomplished by visually dividing each measure into equal imaginary segments (quadruple meter into four parts, triple meter into three parts, and duple meter into two parts). This division is made from beat 1 to beat 1 of the following measure, not from bar-line to bar-line. The first beat in each measure is positioned at least one notehead distance from the bar-line. Whole notes performed on beat 1 are written on beat one, and not in the center of a measure.

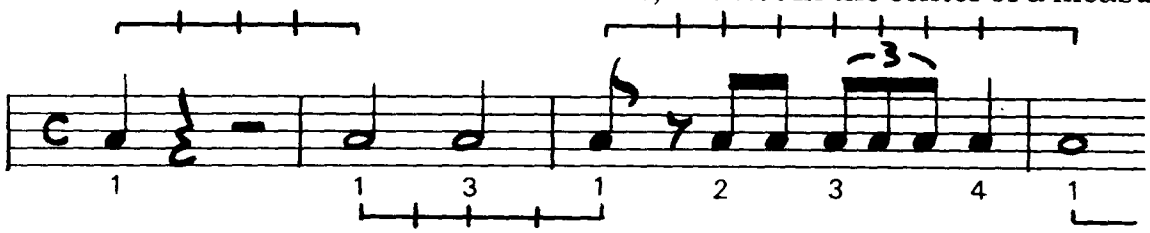


Figure A.10: Spacing.

On individual parts, measure length is determined by the amount of music to be written within it. Thus, a measure containing just a whole note should not be as long as another measure containing running sixteenth notes. A good average line will contain four measures. Avoid crowding. The wise copyist plots the length of each measure on a line, using as a basis the measure with the most notes. A certain amount of give-and-take has to be allowed, so that the last measure on each line ends at the end of the line, and that all measures are more-or-less proportionate in length. It is always better to allow too much room than not to allow enough.

TIES

Ties are usually placed on the notehead side of the notes affected. If there is a question as to position, the tie is inserted above the notehead. Ties extend from notehead to notehead.

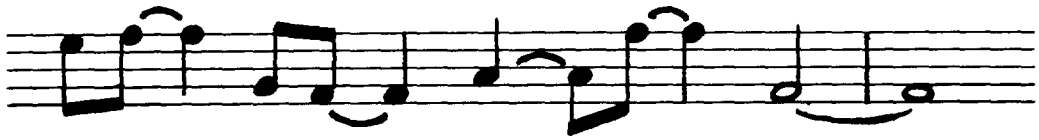


Figure A.11: Ties.

SLURS

Slurs are placed on the notehead side when all notes within the group to be slurred are stemmed in the same direction. If stemming is in both directions, slurs are placed above, regardless of the division of stem direction. It is not acceptable to stem a note incorrectly to justify slurring below the staff. Draw slurs from a specific note to a specific note so that each slur has a definite beginning and ending.

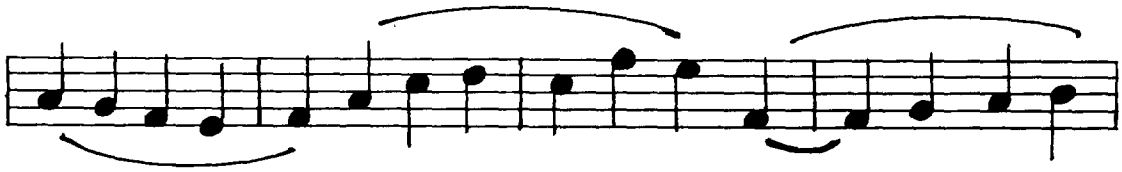


Figure A.12: Slurs.

RESTS

Rests have specific time values and must be given space within each measure proportionate to their value. Normally, whole rests hang from the fourth line of a staff, and half rests sit on the third or middle line.

Rests are not tied. A whole rest is positioned in the middle of a measure to indicate one whole measure of rest regardless of time signature. This is the only single symbol which is placed in the middle of a measure.

Normally, multiple rests within a measure are added together. In quadruple meter, rests are not combined from the second to the third beat of a measure.

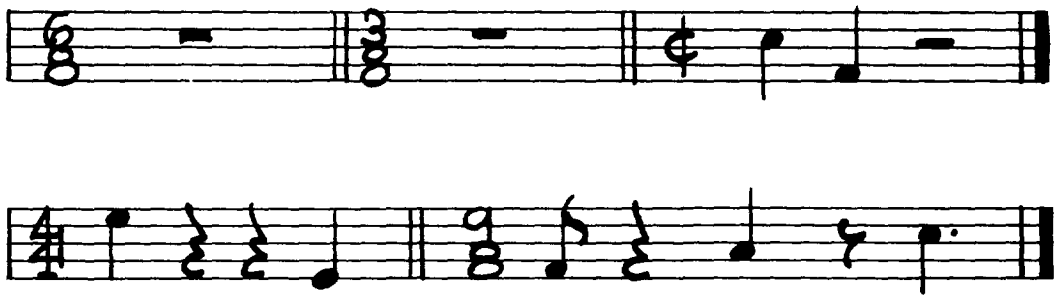


Figure A.13: Rests.

When it is necessary to indicate more than one whole measure of rest, the number of whole measures are combined as in figure A.14. All the measures combined must be of the same metric value.

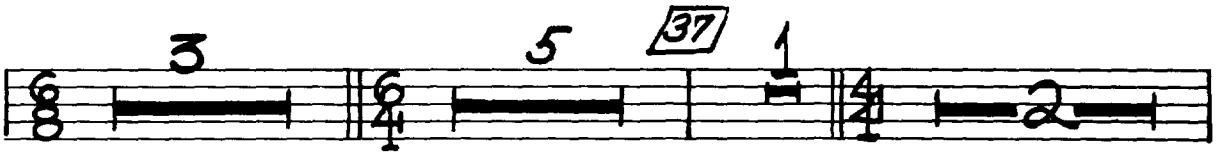


Figure A.14: Combined Measure Rests.

NUMERALS

Numerals that indicate artificial divisions (e. g. duplets, triplets, quadruplets) are enclosed in brackets on either side of the notes affected. Their location depends upon space limitations and readability. Groups normally beamed together need not be grouped together again with a bracket, except when slurred. Curved lines are sometimes substituted for brackets. The curved line may indicate articulation as well as artificial division.

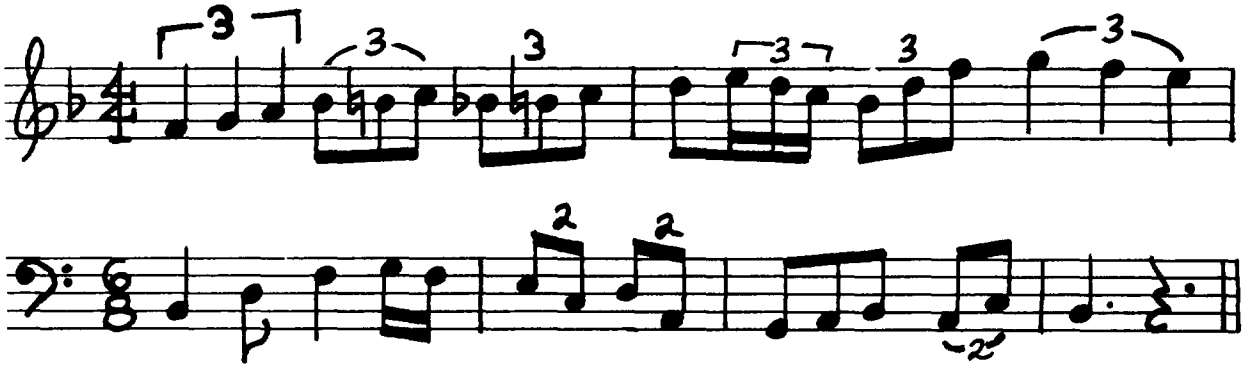


Figure A.15: Numerals.

REPEAT SIGNS

Repeated measures should be numbered, with the notated measure being measure 1. If the measure is to be repeated on the subsequent line, the notated measure must be written at the beginning of the new line.

Figure A.16: Single Measure Repeats.

If the repetition of a two measure repeat occurs more than once, the repeats should be numbered.

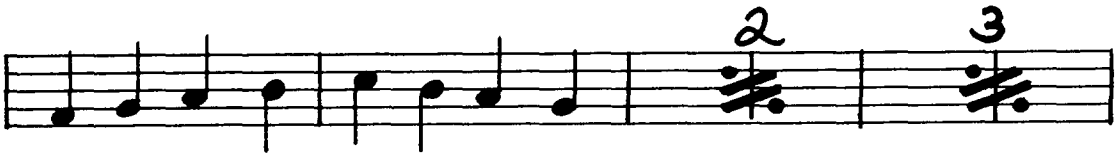


Figure A.17: Two Measure Repeats.

Signs indicating repetition of a complete section are made with a double bar line with dots placed in the second and third spaces of the staff. Normally, when

the repeat is to be made from the beginning of a composition, the first repeat sign is not needed. If the repeated section is to be repeated more than once (played more than twice), the number of times the section is to be played, rather than the number of times it is to be repeated, must be indicated.

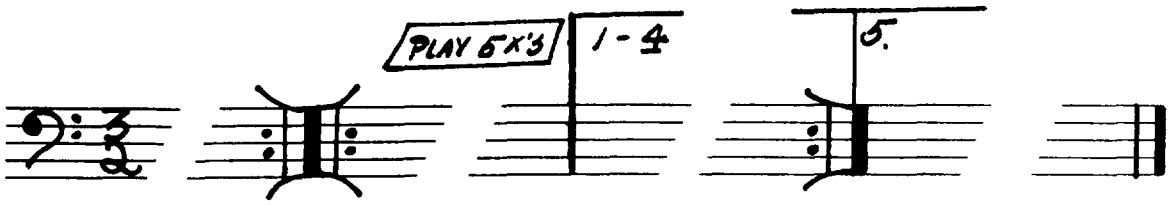


Figure A.18: Section Repeats.

Abbreviations of Da Capo (D.C.) and Dal Segno are placed below the staff at the end of the measure in which they take effect. The signs for Dal Segno (𝄋) and Coda (𝄌) are placed above the staff at the beginning of the measure in which they take effect.

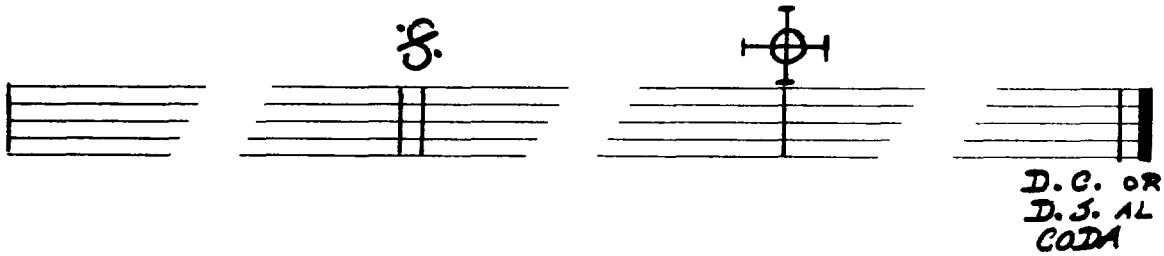


Figure A.19: Da Capo, Dal Segno and Coda.

ACCIDENTALS

Accidentals appear before the note on the same line or space as the note which they alter. The open portion of an accidental should either be bisected by line or be entirely within the space. To avoid confusion it is sometimes advisable to remind the performer of an accidental's cancellation in the following measure parenthetically.

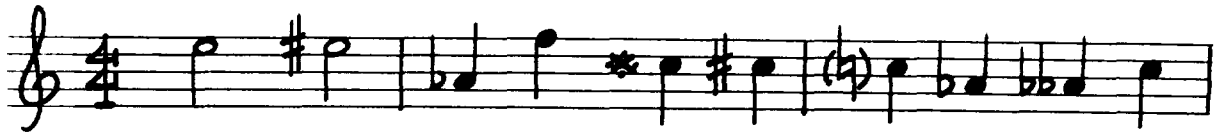


Figure A.20: Accidentals.

DIRECTIONS FOR PERFORMANCE

Directions for performance are placed above, below, or within a staff system, depending on the intent of the direction:

Tempo Indications such as Allegro, Bouncy 4, Grave, etc., are located above the staff on score and parts.

Metronome Marks used to supplement tempo indications immediately follow such directions above the staff.

Ornament Signs such as those for a mordent or turn go above the staff. It has become customary to write out ornament figures to avoid confusion as to interpretation.

Articulations are inserted on the notehead side of a note directly over or under the note they affect. Heavy accent directions such as sforzando (*sf*), sforzato (*sfz*) and forte piano (*fp*) are placed below the staff on instrumental parts or between the staves of keyboard music.

Fermatas are placed above the staff regardless of stem direction.

Dynamic Marks are placed below the staff on instrumental parts and between the staves of keyboard music. The signs should be carefully placed below the first note of the passage affected. If crescendo and diminuendo directions, whether written out verbally or by the sign, < >, do not show an exact terminal volume level, one level change is understood.

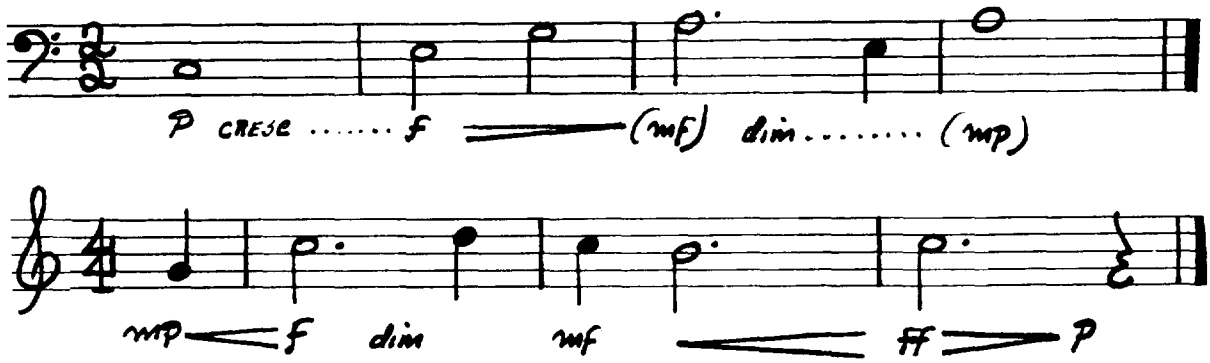


Figure A.21: Dynamic Marks.

REHEARSAL SIGNS

Rehearsal signs (letters or numbers) may be placed every eight measures. These signs are written in boxes or circles above the staff and directly over the bar-line affected. The numbering of every measure for rehearsal purposes is sometimes necessary. Often, it is better to place rehearsal signs according to musical phrases rather than arbitrarily at eight-measure intervals. It is advisable to place rehearsal signs at points within the arrangement that might require special attention in rehearsal.

PROOFREADING

Proofreading is an absolute necessity. All manuscript work of any kind must be carefully checked before it is submitted for performance. Often a copyist will proofread a part and overlook certain errors simply because the musical mind reads what should be there rather than what is actually seen by the eye.

Proofread for omitted or incorrect

Accidentals	Rest measures
Key signatures	Beams, flags, stems or dots
Time signatures	Articulations
Rehearsal signs	Chord symbols
Repeat signs	Directions for performance
Dynamics	

Also check for

Transposition errors

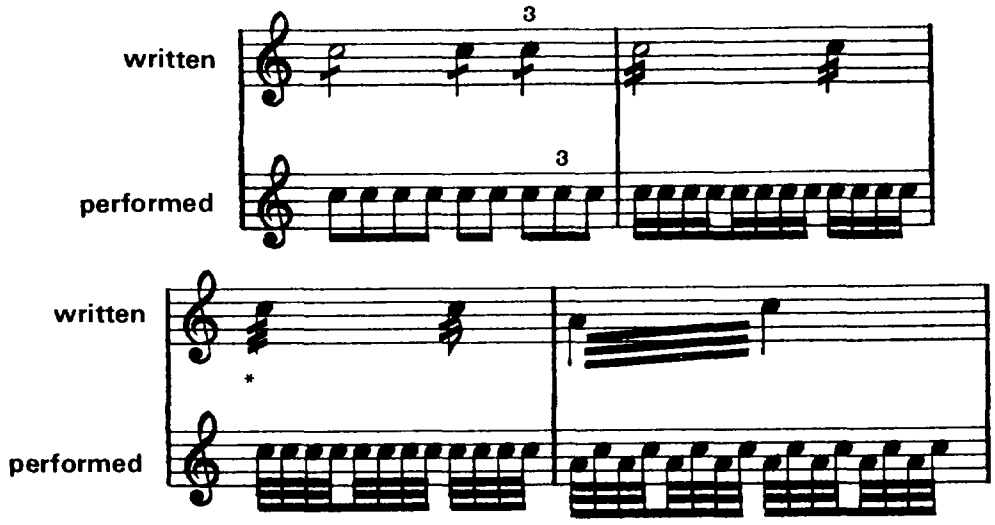
Measures omitted

Beats within measures omitted

APPENDIX B
DIRECTIONS FOR PERFORMANCE

MUSICAL ABBREVIATIONS

Divided Notes. A *stroke* through the stem of a note is used to divide that note into equal lesser values on the pitch or pitches given.



*The *tremolo* is played as fast as possible when the tempo is too rapid to play it as written. In writing for percussion instruments, this is sometimes called a *roll*.

Figure B.1: Divided Notes.

Repeated Beats. *Cross-strokes* indicate repeated beats within a measure.

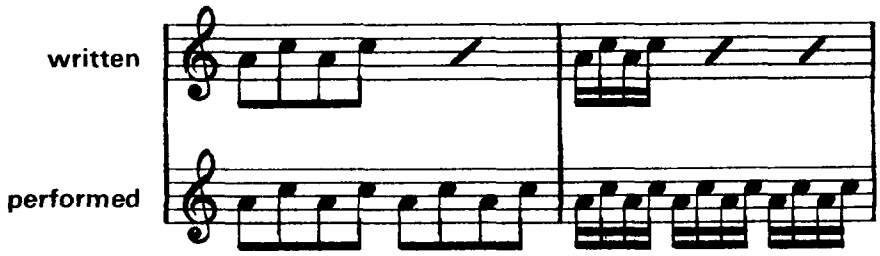


Figure B.2: Repeated Beats.

Repeated Measures. *Single* - and *double - measure repeat signs* indicate repeated measures.

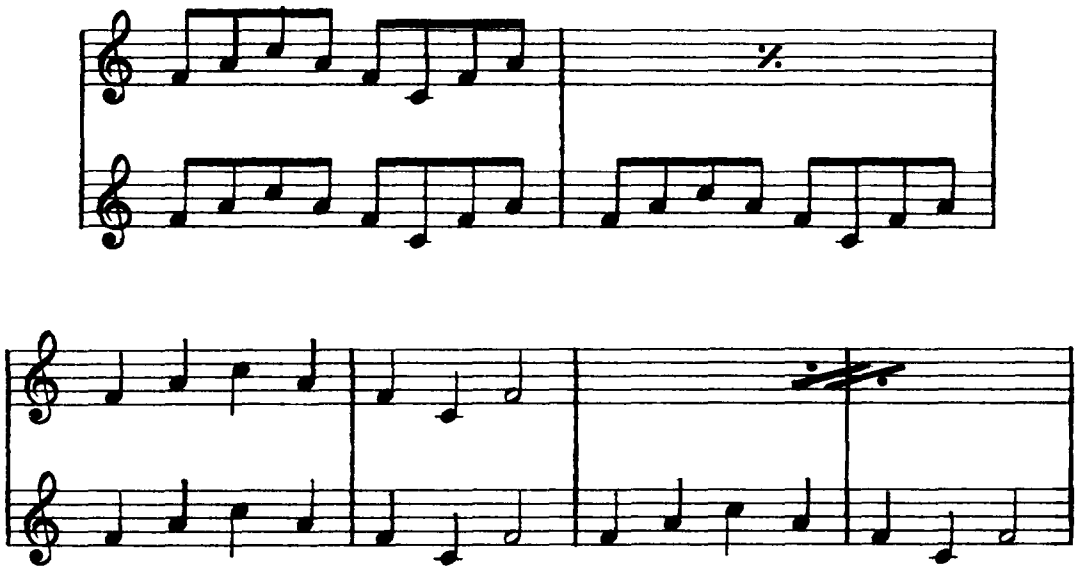


Figure B.3: Repeated Measures.

Repeated Sections

Da Capo al Fine (D.C. al Fine) means to repeat from the beginning (from the head) and play to the end (fine), usually indicated by a double bar with one heavy line.

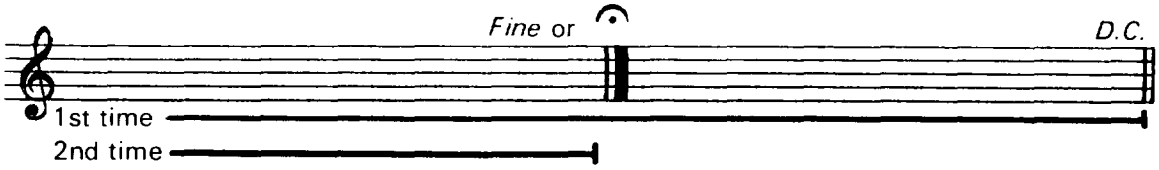


Figure B.4: Da Capo - Performed.

Dal Segno (D.S.) means to repeat from the sign.

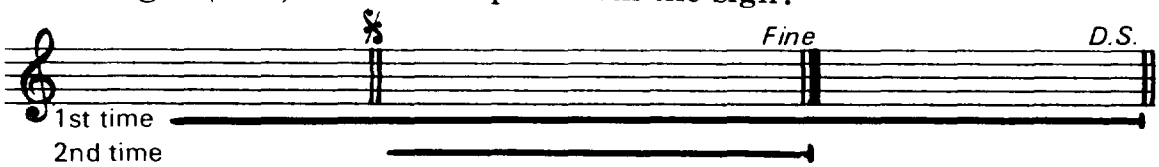


Figure B.5: Dal Segno - Performed.

NOTE: Whether the directions are *D.C. al Fine, D.S. al Fine, D.C. al Coda, D.S. al Coda,* etc., or simply *D.C.* or *D.S.;* the meaning is still to go to the end or to the coda.

The *coda* sign (⊕) is used in conjunction with the directions, *D.C.* and *D.S.*, to indicate a skip to a different ending. One is put at the point where the skip is to be made to the coda (tail), and another is put at the coda.

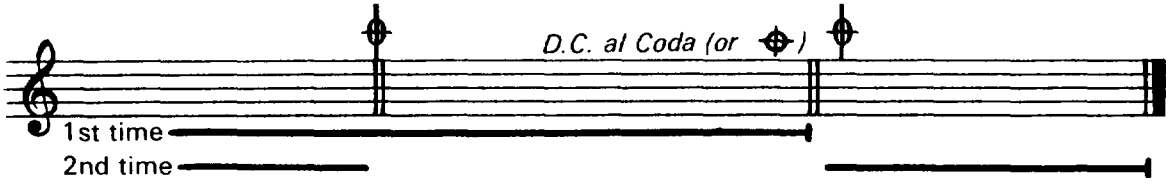


Figure B.6: Coda - Performed.

Repeat signs are used to indicate repeated phrases and strains. Unless otherwise indicated, the repeated sections are played twice (repeated once).

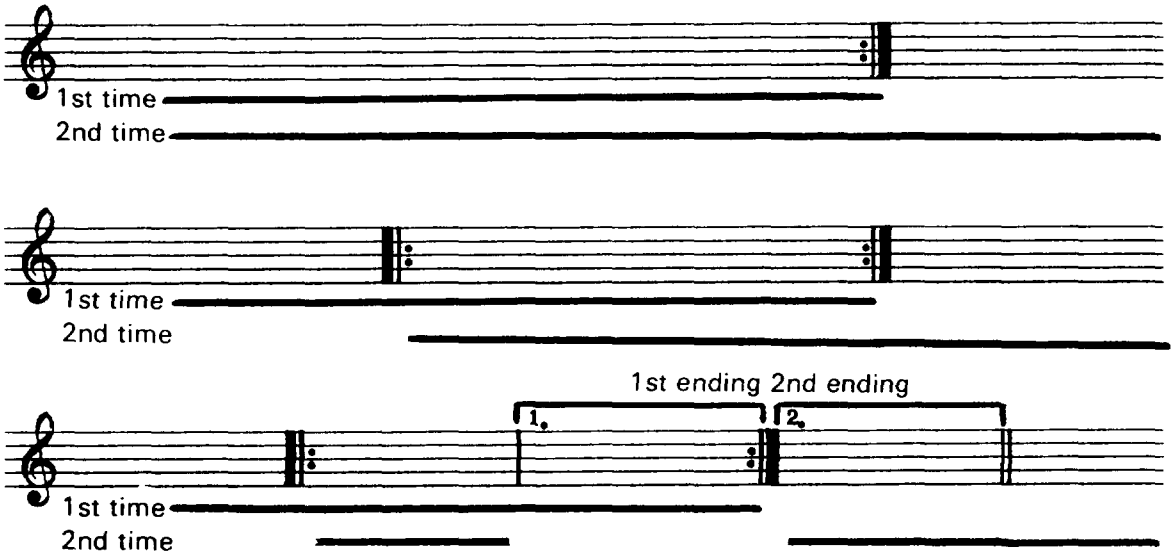


Figure B.7: Repeat Signs - Performed.

Octave Signs. Octave signs are used to indicate that a part is to be played an octave higher, an octave lower, or with the upper or lower octave.

8va, 8ve, 8, ottava ..... octave

8va bassa ..... octave lower

8va alta ..... octave higher

con *8va* ..... with octave

loco ..... where written

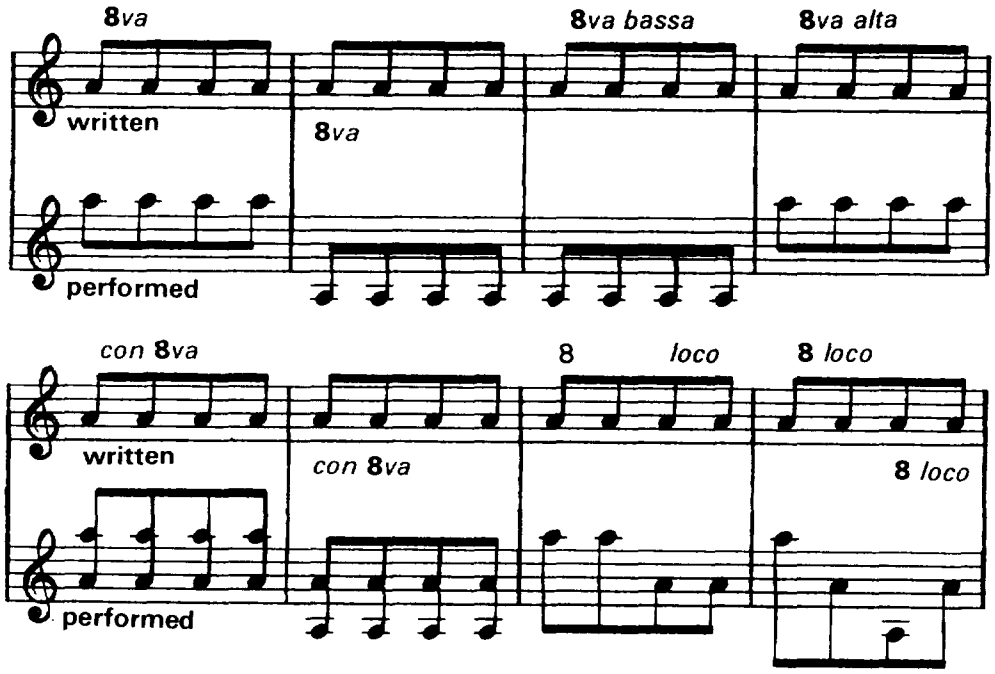


Figure B.8: Octave Designations - Performed.

MELODIC ORNAMENTS

Acciaccatura or ***Grace Note.*** This is an eighth note in small type with a slash through it. Its time value is not counted in the rhythm of the measure, but must be subtracted from one of the adjacent notes. It is usually performed *before* the beat, taking its time value from the *preceding* note and is very short *(Figure B.9a).* As used in music of the Baroque and Classic periods (Haydn, Mozart, Handel, etc.), this grace note usually occurs *on* the beat, taking its time value from the *succeeding* note and is very short *(Figure B.9b).*

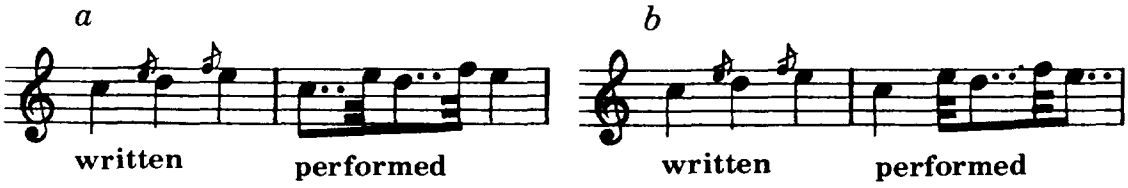


Figure B.9: Acciaccatura - Performed.

Appoggiatura. A note in small type whose time value is not counted in the rhythm of the measure. It *always occurs on the beat* and takes its time value from the *succeeding* note as follows:

> If the appoggiatura precedes a note whose time value is divisible by *two,* it receives *one-half* of the time value *(Figure B.10a).*
>
> If the appoggiatura precedes a note whose time value is divisible by *three,* it receives *two-thirds* of the time value *(Figure B.10b).*

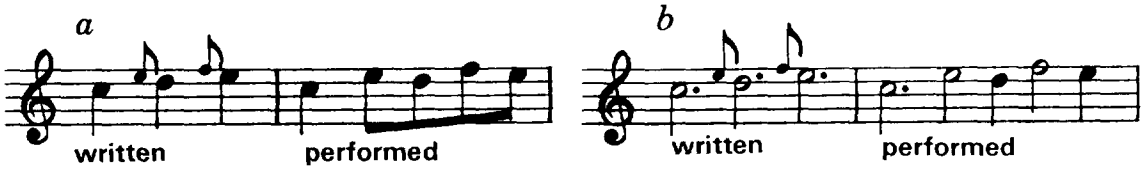


Figure B.10: Appoggiatura - Performed.

Double Grace Note *(Disjunct).* Two notes (usually one above and one below the principal note) which may be performed either *on* the beat or *before* the beat, depending on the character of the music. The usual practice is to perform them *before* the beat.

Figure B.11: Double Grace Note - Performed.

Multiple Grace Note *(Conjunct).* A scalewise series of two or more small notes usually performed *before* the beat; although, they are sometimes performed *on* the beat, depending on the character of the music.

Figure B.12: Multiple Grace Note - Performed.

Mordent. A single or double alternation of the principal note with its lower neighbor, or with its upper neighbor when inverted. When an accidental applies, it is written above or below the sign.

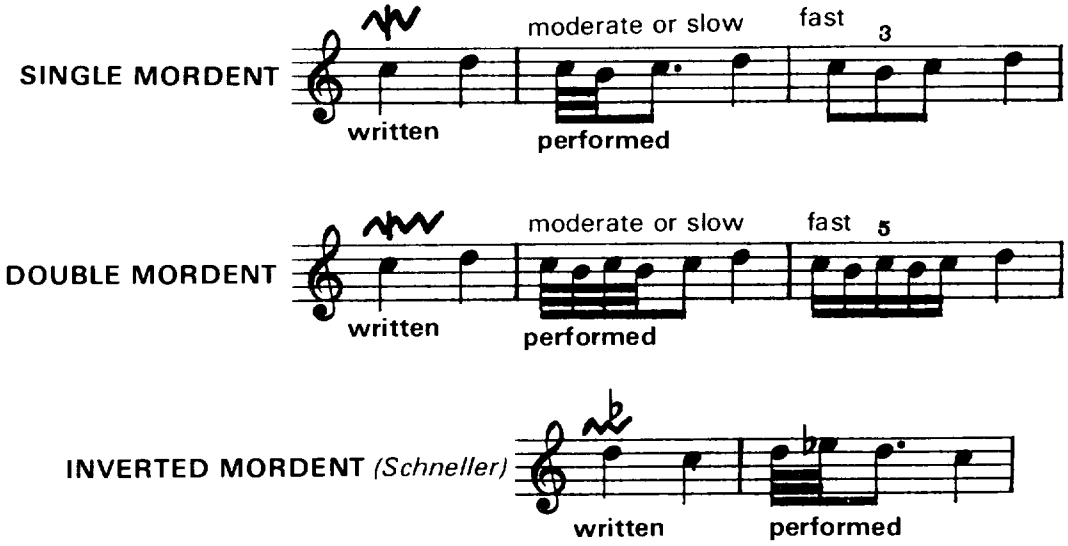


Figure B.13: Mordent - performed.

Turn or ***Gruppetto.*** An alternation of the principal note with its upper *and* lower neighbor, consisting of four notes. When accidentals apply, they are written above and/or below the sign.

If the sign is placed over the principal note, the turn begins on the upper neighbor and takes its time value from the *first* part of the principal note *(Figure B.14a).*

If the sign is placed between two notes of different pitch, the turn is performed on the *last* part of the first (principal) note *(Figure B.14b).*

If the sign is placed between two notes of the same pitch, the first three notes of the turn are performed on the *last* part of the principal note; the second same pitch becomes the fourth note of the turn *(Figure B.14c).*

If the sign is placed after a dotted note, it is performed the same as if it were between two notes of the same pitch since the dot is simply another way of writing a second similar note *(Figure B.14d).*

If the turn is *inverted,* the upper and lower neighbors change places (Figure B.14e). With this exception, the inverted turn is performed the same as the regular turn.

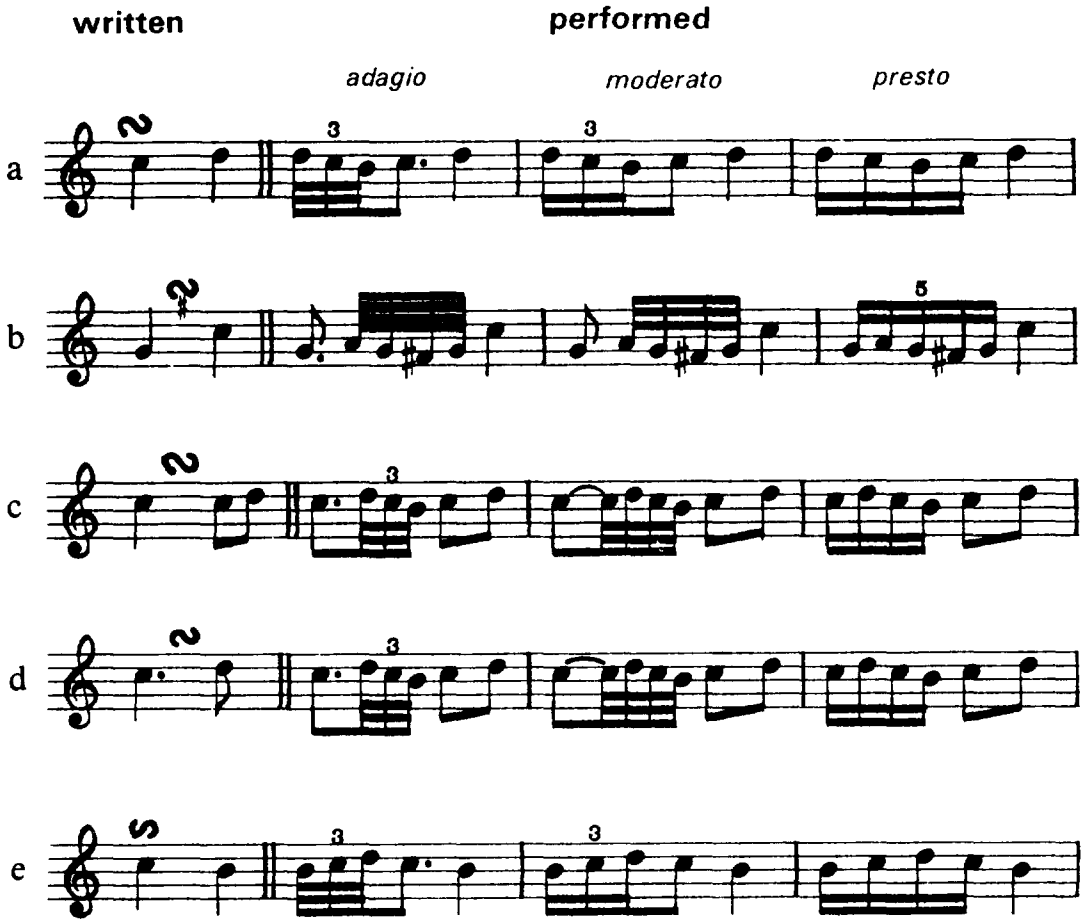


Figure B.14: Gruppetto/Turn - Performed.

Trill. A rapid, even alternation of the principal note with its upper neighbor which lasts for the entire duration of the principal note or continues to the end of the waved line, if used. When an accidental applies, it is written above the trill sign.

Often a trill is followed by one or more short notes or grace notes leading to the next long tone as a completion to the trill. If these notes are not present, a single alternation with the lower neighbor should still be played, in most cases, as an after-turn to complete the trill. All trills must close with the principal tone; therefore, trills

beginning on the principal tone will require a return to the principal tone by means of a triplet prior to, or a quintuplet in conjunction with the after-turn *(Figure B.15a).*

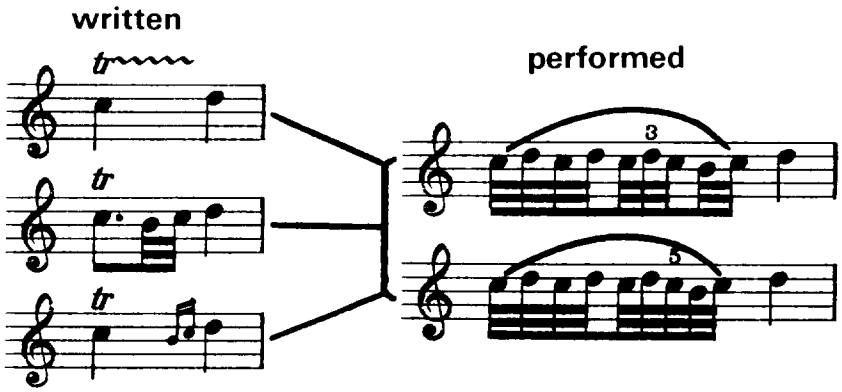


Figure B.15a: Trill - Performed.

An incomplete trill has no after-turn. It is simply an alternation with the upper neighbor. The incomplete trill may be used when followed by an unaccented note, or in rapid passages or chains of trills *(Figure.15b).*

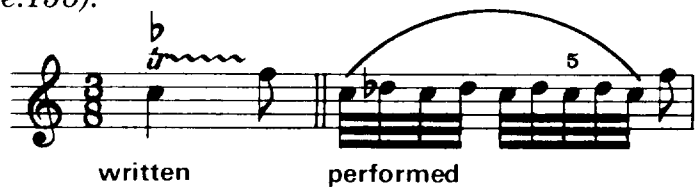


Figure B.15b: Trill - Performed.

The trilled note may be tied to a second note of the same pitch. If a waved line continues over the second note, it is performed as part of the trill; if not, the trill stops at the second note *(Figure B.15c).*

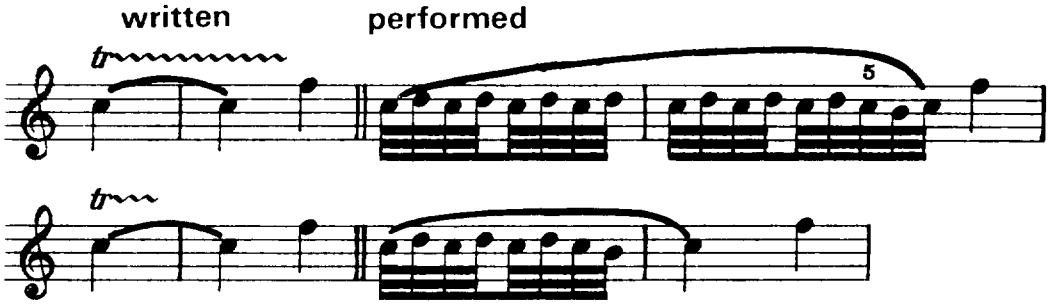


Figure B.15c: Trill - Performed.

The number of notes in a trill varies with the tempo of the music and the length of the note being trilled *(Figure B.15d).*

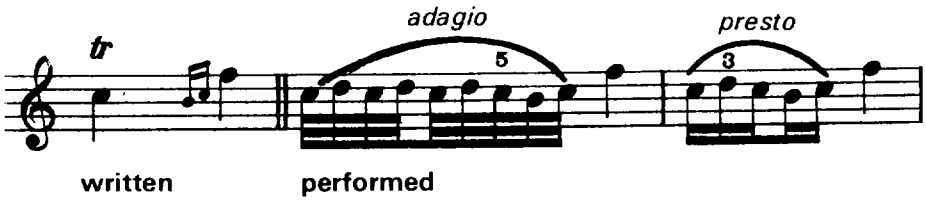


Figure B.15d: Trill - Performed.

Sometimes, in solos, a trill begins slowly and accelerates. Its performance is a matter of interpretation and there is no special notation for such a trill *(Figure B.15e).*

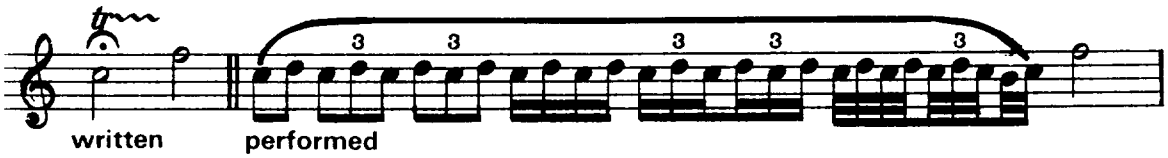


Figure B.15e: Trill - Performed.

An *inverted trill* begins with the upper neighbor instead of the principal tone and completes itself without triplet before the afterturn *(Figure B.15f).* This was the trill interpretation most generally used in music prior to Beethoven (1770). It may be used in certain strictly classic readings of Haydn, Mozart, Handel, etc., and music written prior to their time. In more recent music, however, the inverted trill should only be used when the upper neighbor is written as a grace note preceding the trill note.

Figure B.15f: Inverted Trill - Performed.

ARTICULATIONS AND ACCENTS

When the composer or arranger intends that specific emphasis be applied to the performance of his music, he uses a group of special signs. There is much controversy over the particular interpretation of many of these signs, due in large part to the indiscriminate use of them by some composers/arrangers and to contrasting views among performers.

In any case, the style and character of the music must be regarded as the essential determinants of performance, and any symbols or interpretation markings simply as reminders or suggestions for performance.

In music for wind instruments in general and for the military band in particular, certain standards and practices have been adopted and show a rather universal acceptance.

Several common articulation markings and accents follow along with suggestions as to their performance. Sometimes articulation symbols are used in combination with accents to give a more precise indication.

Legato - Slurred. Maximum duration. To be performed without interruption between notes. Only the first note is attacked.

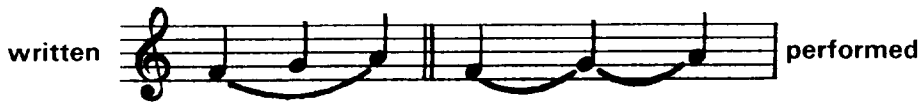


Figure B.16a: Articulation - Performed.

Tenuto - Non Legato - Leggiero. Held full value. To be performed with only a very slight break between notes to allow for the attack.

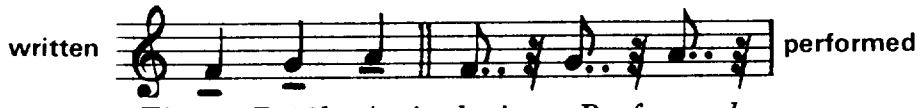


Figure B.16b: Articulation - Performed.

Portato *(Mezzo - Staccato).* Duration slightly more than half. To be performed with a slight break between the notes.

Figure B.16c: Articulation - Performed.

Staccato. Duration about half. Performance varies from short to very short with the character and tempo of the music.

Figure B.16d: Articulation - Performed.

Staccatissimo. Usually performed as short as possible, with a slight emphasis.

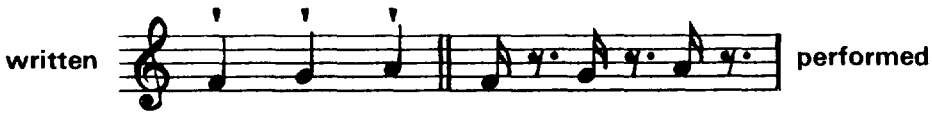


Figure B.16e Articulation - Performed.

Horizontal Accent. Attacked with force, usually followed by a slight decrescendo. Performed louder than surrounding dynamic level. Has no effect on duration.

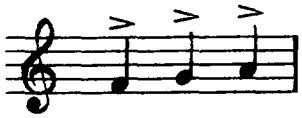


Figure B.17a: Accents - Performed.

Vertical Accent. Attacked with force, usually followed by a retention of dynamic level. Performed louder than surrounding dynamic level. Occasionally performed with a slight lessening of duration.

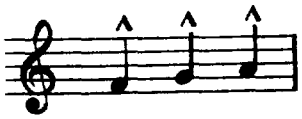


Figure B.17b: Accents - Performed.

JAZZ EXPRESSIVE DEVICES

Scoop. A short glissando from below to a note of any value. Its time value is taken from the previous note or rest. The symbol or is normally used.

Saxophone: Lip up or finger lower grace note.

Trumpet: Lip up, finger lower grace note or half valve.

Trombone: Lip or short slide movement.

Rip *or* ***Flare.*** A glissando that usually starts a fourth or fifth below a note of any value. Its time value is taken from the previous note or rest. The symbol or is normally used.

Saxophone: Lip up with chromatic or diatonic scale.

Trumpet: Half valve or overtone series lip slur.

Trombone: Longer slide movement or overtone series lip slur.

Sometimes ( ) or ( ) is used at the beginning of a rip or flare to indicate where the effect begins. Although it is notated at a particular place on the staff, it does not indicate a definite pitch.

Plop. A glissando which usually starts a fourth or fifth above a note of any value. Its time value is taken from the previous note or rest. The symbol or is normally used.

Saxophone: Lip down with chromatic or diatonic.

Trumpet: Half valve or overtone series lip slur.

Trombone: Slide movement or overtone series lip slur.

Sometimes ( ) or ( ) is used at the beginning of a plop to indicate where the effect begins. No definite pitch is intended.

A glissando is often required *between* two notes. Its time value is taken from the first of the two connected notes. The symbol or is normally used.

Saxophone: Chromatic or diatonic scale.

Trumpet: Chromatic or diatonic scale or half value.

Trombone: Slide or scale.

Drop *or* ***Fall.*** A descending glissando that begins on the second half of a note of any value. The symbol or is normally used.

Saxophone: Chromatic or diatonic scale.

Trumpet: Half valve or overtone series slur.

Trombone: Slide movement or overtone series

Sometimes ( ) or ( ) is used at the end of a drop to indicate where the effect ends. No definite pitch is intended.

Doit, Doik, *or* ***Doink.*** An ascending glissando that begins on the second half of a note of any value. The symbol is normally used.

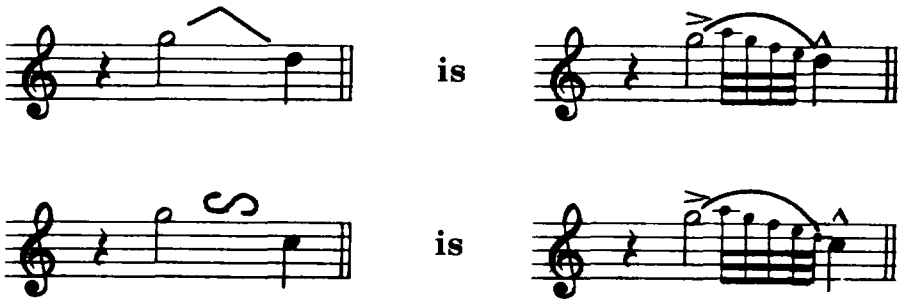
Saxophone: Chromatic or diatonic scale.

Trumpet: Half valve or overtone series lip slur.

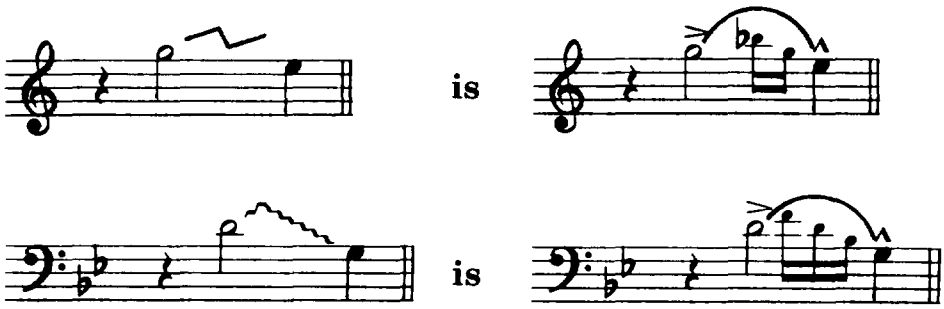
Trombone: Slide movement or overtone series lip slur.

Flip** or **Turn. A variation of the classical turn or gruppetto. The effect occurs between a note and a lower note that follows it. The symbol ∽, ⌒, ⌒, or ⌒ is usually used when the effect is notated.

Saxophone: Perform the principal note, slur to the note above the principle note, and glissando to the second written note.



Trumpet and *Trombone:* Perform the principal note, slur to the first available overtone above the principal note, and lip slur the overtone series to the second written note.



Bend. An effect produced by attacking the note in the normal manner, lowering the pitch by relaxing the embouchure, and bringing the note back up to pitch by tightening the embouchure. The symbol is normally used.

Smear. An effect produced by attacking the note below normal pitch by using a relaxed embouchure and bringing the note up to pitch by tightening the embouchure. Its time value is not taken from the previous note or rest. The symbol is normally used.

Shake. A lip trill from the note marked up to an overtone above. It is primarily a brass effect. The shake is normally measured.The width and speed of the shake is normally determined by the section leader or bandleader. Saxophone instrumentalists simulate the shake with a keyed trill instead of the lip trill. The symbol is normally used.

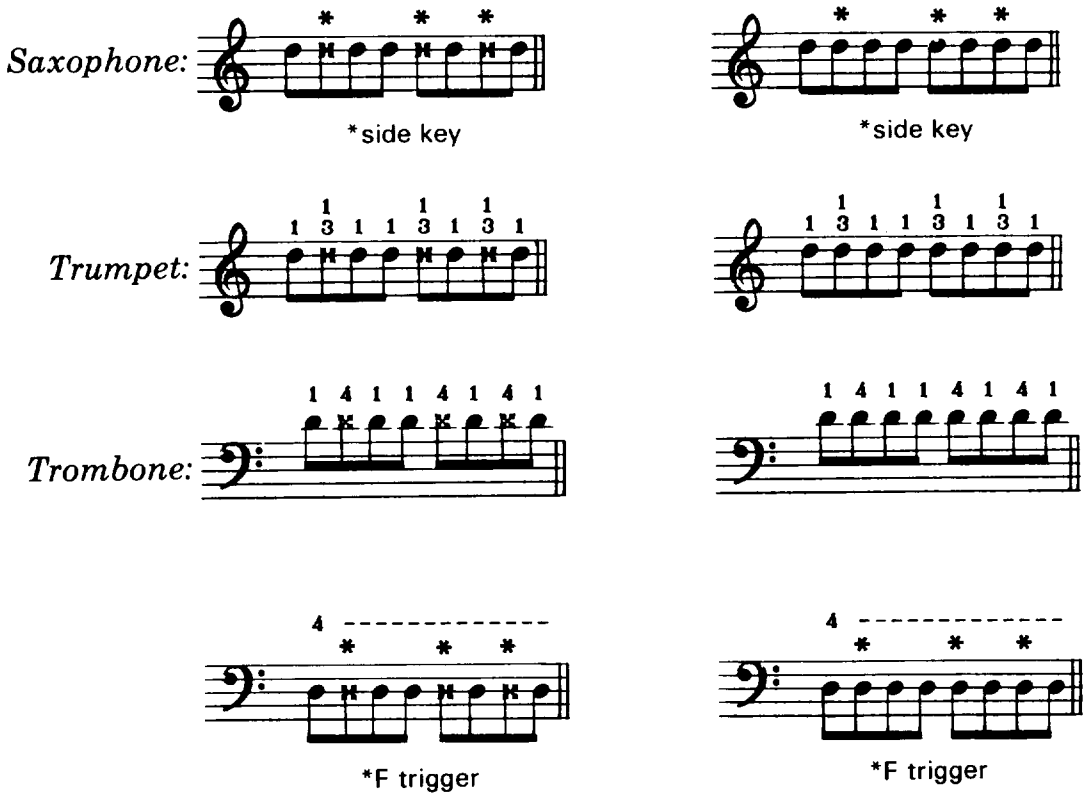
Subtone. A saxophone effect that consists of a soft, airy sound produced by relaxing the embouchure. It is usually marked *subtone.*

Muting. Brasswind sound is altered by the following mute effects:

Straight	Hat
Cup	In stand
Harmon	Bucket
Plunger	H. O. B. (hand over bell)

When using harmon, plunger, hat, or H. O. B., the instrumentalist may be required to alternate between closed (+) and open (o) sound produced by the hand.

False Fingerings. Used to change the timbre of a note. The alternate fingering or slide position is marked above the note or the symbol ✱ .



Swallowed Notes. Used to change the timbre of a note. They are performed at a lower dynamic level than surrounding notes. They are produced by fingering the note and decreasing the air stream. Parentheses around the notes are usually used to indicate the effect.

Straight Eighths. In swing time, the straight eighth effect often replaces swing eighth notes. They are indicated with the traditional tenuto sign or marked *straight eighths.*

TEMPO INDICATIONS

Slower Tempi

Largo	Slow, Broad
Lento	Slow, Dragging
Adagio	Slow

Medium Tempi

Andante	Going, Walking
Moderato	Moderate

Faster Tempi

Allegro	Cheerful, Quick
Vivace	Lively
Presto	Fast

Momentary Changes in Tempo

Tenuto (Ten.)	**held** - sustained
Rubato	**robbed, stolen** - deliberate unsteadiness of tempo, a slackening and quickening of tempo for the sake of expression
Fermata (𝄐)	**stay, stop** - unmeasured pause or hold
General Pause (G.P.)	a rest for the entire band, sometimes called *Grand Pause*

Lunga Pausa	**long pause** - a long pause
Cut Off (𝄼)	an abrupt, short pause

Increasing Tempo

Accelerando	accelerating
Incalzando	hastening, pressing forward
Stringendo	suddenly accelerating
Piu Mosso	more moved

Decreasing Tempo

Allargando	becoming broader, slower
Calando	slowing and decreasing in loudness
Rallentando (rall.)	gradually slower
Ritardando (rit.)	gradually slower
Ritenuto	suddenly slower
Meno Mosso	less moved
Morendo	slowing and decreasing in loudness
Smorzando	slowing and decreasing in loudness

Returning to Previous Tempi

A Tempo	in (original) tempo
Primo Tempo	first tempo
Tempo I	first tempo

No Change in Tempo

L'istesso Tempo	same tempo
Lo Stesso Tempo	same tempo
Stesso Tempo	same tempo

Metronome Markings. Tempo may be indicated in terms of beat units per minute (metronome markings). For example:

𝅗𝅥 = 120 indicates 120 half notes per minute

♩ = 90 indicates 90 quarter notes per minute

♩. = 60 indicates 60 dotted quarter notes per minute

Special Tempo Markings. When the meter changes but the tempo remains constant, the indication is made with special signs (Figure B.18). The first note represents the beat unit in the first meter and the second note, the beat unit in the second meter.

a 𝅗𝅥 = ♩ , ♩. = ♩ , ♩ = ♪, 𝅗𝅥. = ♩. , ♪ = ♩

b 𝅗𝅥 = 𝅗𝅥 , ♩. = ♩. , ♩ = ♩ , ♪ = ♪

Figure B.18: Special Tempo Markings.

The examples at *Figure B.18a* might be encountered when the beat value changes (2/4 to 6/8, 6/8 to 3/4, etc.). For example, assume that a change is made from 4/4 to 6/8:

if, in the first meter, $\frac{4}{4}$ ♩ = 120, and ♩ = ♩. is indicated,

then, in the second meter, $\frac{6}{8}$ ♩. = 120.

The examples at *Figure B.18b* would be used when the beat value remains the same (4/4 to 3/4, 6/8 to 9/8, etc.). For example, assume that a change is made from 4/4 to 3/4:

if, in the first meter, $\frac{4}{4}$ ♩ = 90, and ♩ = ♩ is indicated,

then, in the second meter, $\frac{3}{4}$ ♩ = 90.

DYNAMIC INDICATIONS

Those terms and signs which deal with intensity or loudness are called *dynamic indications.* The most common of these follows.

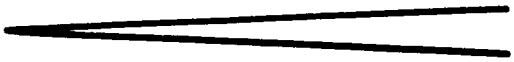
Term	Symbol	Translation
Soft		
Pianissimo	*pp*	very soft
Piano	*p*	soft
Mezzo Piano	*mp*	medium soft
Loud		
Mezzo Forte	*mf*	medium strong (loud)
Forte	*f*	strong (loud)
Fortissimo	*ff*	very strong (loud)

Term	Abbreviation	Translation
Increasing the Dynamic Level		
Crescendo	*cresc.*	gradually increasing loudness
Forzando, Forzato	*fz*	forced, strongly accented
Sforzando, Sforzato	*sfz*	forced, strongly accented
Rinforzando	*rfz, rinf.*	sudden stress or emphasis
Decreasing the Dynamic Level		
Calando	*cal.*	decreasing loudness, slowing
Decrescendo	*decresc., dec.*	gradually decreasing loudness
Diminuendo	*dim.*	gradually decreasing loudness
Morendo	*mor.*	decreasing loudness, slowing
Smorzando	*smorz.*	decreasing loudness, slowing

Dynamics Signs

The dynamic level may also be changed by the use of signs as follows:

increase loudness for the length of the sign.



decrease loudness for the length of the sign.

ITALIAN TERMS, PART 1

a. To, at, for, by, in, etc.
Alla. According to.
Assai. Very.
Ben. Well.
Con. With.
Da, di. Of, from.
Doppio. Double.
e. And.
Il. The.
Ma. But.
Meno. Less.
Mezzo. Half.
Molto. Much.
Mosso. Moved.
Moto. Motion.
Non. Not.
Piu. More.
Poco. Little.
Primo. First.
Quasi. Like, as.
Secco. Dry.
Sempre. Always.
Senza. Without.
Sotto. Under.
Stesso. Same.
Tanto. As much, so much.
Troppo. Too (much)
un, uno, una. A, an, one.
Voce. Voice.

ITALIAN TERMS, PART 2

Attacca Subito. Attack suddenly.
Div a 2(3). Divide in two (three)
Colla Parte. With the part.
Segue. Follows.
Sordino (i). Mute (s).
Volta subito (V. S.). Turn (page) immediately.
Solo. Alone, performed by a single performer.
Soli. Plural of solo, more than one player plays the solo parts.
Tutti. All together.
Ensemble (Ens). Full band.

ITALIAN TERMS, PART 3

Agitato. Agitated.
Animato. Spirited.
Bravura. Bravery.
Brilliante. Brillant.
Brio. Brilliance.
Cantabile. Singing.
Cantando. As if sung.
Deciso. Decisive.
Dolce. Sweet.
Dolcemente. Sweetly.
Dolore. Grief.
Doloroso. Pained.
Dolente. Grieving.
Energico. Energetic.
Espressivo (Expressivo). Expressive.
Forza. Force.
Fuoco. Fire.
Giusto. Just, strict, precise.
Grave. Heavy.
Lacrimoso. Tearful.
Maestoso. Majestic.
Marcato. Marked.
Marcia. March.
Marziale. Martial.
Passionato, Appassionato. Impassioned.
Pesante. Heavy.
Piacere, a piacere. At pleasure.
Pomposo. Pompous.
Ponderoso. Ponderous.
Religioso. Religious.
Scherzando. Playful, joking.
Sostenuto. Sustained.
Strepitoso. Loud, noisy.
Vigoroso. Vigorously.

APPENDIX C
ITALIAN TERMS

A large portion of the music for band is inherited from the orchestral literature of the 18th and 19th centuries. Most of this music is of European origin and reflects the traditional practice of expressing directions for performance in Italian. In order to understand these words or phrases, the performer must be able to translate them into English.

An Italian word may have different endings which change the form of the word, but do not change the basic indication or level of intensity. The following list shows some of the more common suffixes and their normal or usual English equivalents.

-abile ..... -able

-ando ..... -ing, -ful
-endo ..... -ing, -ful

-ato ..... -ed
-uto ..... -ed

-amente ..... -y, -ly
-mente ..... -y, -ly

-atamente ..... -edly
-utamente ..... -edly

-enza ..... -ence

-evole ..... -ing, -ful

-ezza ..... -ity, -ness

-mento ..... -ment, -tion, -ness

-oso ..... with ___, -ous, -ful, -ate, -y

Examples:

accentuare means *to accentuate;* therefore, *accent-**ato*** means *accent-**ed.***

giusto means *strict;* therefore, *giust-**amente*** means *strict-**ly.***

grandezza means *grandeur;* therefore, *grandi-**oso*** means ***with** grandeur.*

affano means *anxiety;* therefore, *affann-**oso*** means ***with** anxiety,* or *anxi-**ous.***

Some suffixes **do** change the level of intensity of the basic indication:

-issimo. Superlative suffix. Increases the intensity of the basic indication.

-ino, -etto. Diminutive suffixes. Lessen the intensity of the basic indication.

Examples:

piano means *soft;* therefore *pian-**issimo*** means ***very** soft,* or ***extremely** soft.*

largo means *large, broad, slow;* therefore, *largh-**etto*** means ***less** slow.*

In the section which follows, the words found most often in the band repertoire have been selected and their translations given.

a. to, at, for, by, in, etc.
a-2. two on the part.
accarezzevole. caressing.
accentato. accented.
acciacato. crushed, jammed together, performed violently.
adagietto. less slow.
adagissimo. extremely slow.
addolorato. grieved, melancholy. (form of *dolore*).
adirato. angered, irritated.
affannoso. anxious, distressed, restless.
affetto. affection.

affettuoso. affectionate.
affettuosamente. affectionately.
afflizione. affliction, sorrow.
afflitto. afflicted, sorrowful.
affrettando. hurrying.
affrettato. hurried.
agevole. easy, light.
agevolmente. easily, lightly.
aggiustatamente. strictly (in time).
agiatamente. easily.
agilita. agility.
agitamento. agitation, excitement.
agitatamente. agitatedly, hurriedly, excitedly.
agitato. agitated, hurried, excited.
agitazione. agitation.
alla. according to.
allegretto. less cheerful, quick.
allegrezza. liveliness.
allegria. liveliness.
allegrissimamente. very lively, fast.
allegrissimo. very lively, fast.
allentamento. slowness.
allentando. retarding, slowing.
allentato. retarded.
altra, altro. another.
altra volta. another time (*encore*).
amabile. sweet, tender.
amabilita. sweetness, tenderness.
amarevole. bitter.
amarezza. bitterness, grief.
amaro. bitter, grieved.
amorevole. loving.
amoroso. amorous, loving.
ancora. again, yet, still (*encore*).
andantino. less walking, faster than andante.
andare diritto. go straight on.
angoscia. anguish.
anima. animation.
animato. animated, spirited, lively.
appassionato. impassioned.
appenato. distressed.
ardente. ardent.
arioso. in a singing manner.
articolazione. articulation.
asprezza. harshness.
assai. very.
assoluto. absolute.
attacca subito. begin the next section immediately.
audace. audacious, bold.
ballabile. dancingly.
ballo. dance.
battuta. beat.
battatura, a. with the beat, in strict time.
bellezza. beauty.
ben. well.
bimmolle. the flat sign.
biquadro. the natural sign.
bis. again, a second time.
biscanto. a duet.
bissare. to repeat, play a second time.
bravura. bravery, boldness.
brillante. brilliant.
brio. brilliance.
brioso. with brilliance, spirit.
calcando. pressing, hastening.
cantabile. singable, songlike.
cantando. as if sung.
capriccioso. capricious, free.
col. parte, colla parte. with the part, indicates to accompaniment parts to yield to and not overshadow the soloist.
comodo. accommodating, comfortable.
compiacevole. pleasing.
con. with.
consolante. consoling.
corrente. running.

cupo. dark, obscure, reserved.
da. of, from.
dal. of the, from the.
deciso. decisive.
delicatezza. delicacy.
delicato. delicate.
delirio. delirium, frenzy, excitement.
desto. brisk, sprightly.
devozione. devotion.
di. of, from.
diluendo. fading away.
disaccentato. unaccented.
disinvolto. easily.
distinto. distinct.
divisi. divided, two parts on the same staff are to be played by separate instruments.
divozione. devotion.
dolce. sweet, soft.
dolcemente. sweetly, softly.
dolente. grieving.
dolore. grief.
doloroso. painful, pathetic.
doppio. double.
dopo. after.
due. two.
e. and.
energico. energetic.
enfasi. emphasis.
entrata. introduction.
entusiasmo. enthusiasm.
esecuzione. execution.
espirando. expiring, dying away.
espressivo. expressive.
estinto. hushed, all but silent.
facilmente. easily, with facility.
fantastico. fantastic, whimsical.
fastoso. proud, stately.
feroce. fierce.
fine. end.
finito. finished, concluded.
forza. force.
forzando, forzato. forced, emphasized.
franchezza. freedom, boldness.
fretta. haste.
fuoco. fire.
fuocoso. firey.
gaio. gay.
giocoso. playful, merry.
gioioso. joyous.
giustamente. strictly, with precision.
giusto. just, strict, precise.
grave. heavy, somber, solemn.
grazia. grace.
grazioso. graceful.
il. the.
indeciso. undecided.
inquieto. restless, uneasy.
intrepidezza. intrepidity, boldness.
lacrimoso. tearful.
largamente. broadly, slowly.
larghetto. less broad.
larghezza. largeness, broadness.
largissimo. extremely broad.
leggiero. light.
lentando. increasing slowness, slowed.
l'istesso. the same.
lo stesso. the same.
lusingando. coaxing, seductive.
ma. but.
maestoso. majestic.
mancando. dying away.
marcato. marked.
marcia funebre. funeral march.
martellato. hammered.
marziale. martial.
medesimo. same.
melodioso. melodious.
meno. less.
mezzo. half.
militarmente. militarily.

misterioso. mysterious.
misurato. measured, in strict time.
mobile. movable.
modo. mode, manner.
mollemente. softly, gently.
molto. much, very.
morendo. gradually slower, dying away.
mormorando. murmuring.
mosso. moved.
moto. motion.
muta. change (instruments, etc.).
nobile. noble.
non. not.
ordinario. ordinary, common.
partitura. full score.
pastorale. pastoral, rural.
paventoso. fearful, timid.
per. for.
perdendosi. disappearing.
perpetuo. perpetual.
pesante. heavy, heavily marked.
piacere, a. at pleasure.
piacevole. pleasing, smooth.
piena. full.
piu. more.
placido. placid.
pochettino. very little.
pochetto. very little.
pochissimo. very little.
poco. little.
pomposo. pompous.
ponderoso. ponderous, vigorously impressive.
preciso. precise, exact.
prestamente. rapidly.
prestissimo. as fast as possible.
prima, primo. first.
prima volta. first time.
puntato. pointed, detached.
quasi. like, as.
rabbia. rage, fury.
rapidamente. rapidly.
religiosamente. religiously.
religioso. religious.
replicato. repeated.
rigoroso. rigorous, exact time.
rilasciando. relaxing (the time).
ripieno. fill-in or supplementary part.
risoluto. resolute.
risonante. resonant, resounding, ringing.
romanza. romance.
rotondo. round or full (tone).
rustico. rustic, rural.
scemando. diminishing in volume.
scherzando. playful, joking.
schietto. simple, plain, neat.
scordato. out of tune.
secco. dry, plain, without ornament.
segue. follows.
semplice. simple.
sempre. always.
senza. without.
sereno. serene, tranquil.
sforzato, sforzando. forced, emphasized.
silenzio. silence, a rest.
soave. suave, soft.
solito, al. as usual.
soli. plural of *solo,* more than one performer plays the solo parts.
solo. alone, performed by a single performer.
sonabile. sounding, resonant.
sonare. to sound, play upon.
sono. sound, play.
sorda. muffle, veil.
sordino. mute.
sostenuto. sustained.

sotto. under.
spianato. smooth, level, even, without passion.
spiccato. separated, detached (*staccato*).
stabile. stable, firm, steady.
staccato. separated, detached.
stentato. forced, emphasized.
stesso. same.
strepitoso. very loud, noisy.
stretto. drawn together, hurried.
strisciando. gliding, smooth. The correct term for what is commonly called a *smooth glissando.*
suave. soft, sweet.
sul. on.
svegliato. animated.
tace, taci, tacit. be silent.
tanto. as much, so much.
tempestosamente. tempestuously, stormily, passionately.
teneramente. tenderly.
tenuto. held full value.
tremolo. trembling, reiteration with great speed.
troppo. too (much).
tutti. all, together, full band or section, usually follows when solo or soli ends.
uguale. equal.
un, una, uno. a, an, one.
variamente. variedly, freely.
vigoroso. vigorous.
vivacissimo. extremely fast.
voce. voice.
volti subito. turn (page) immediately.

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29 SEPTEMBER 1978

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