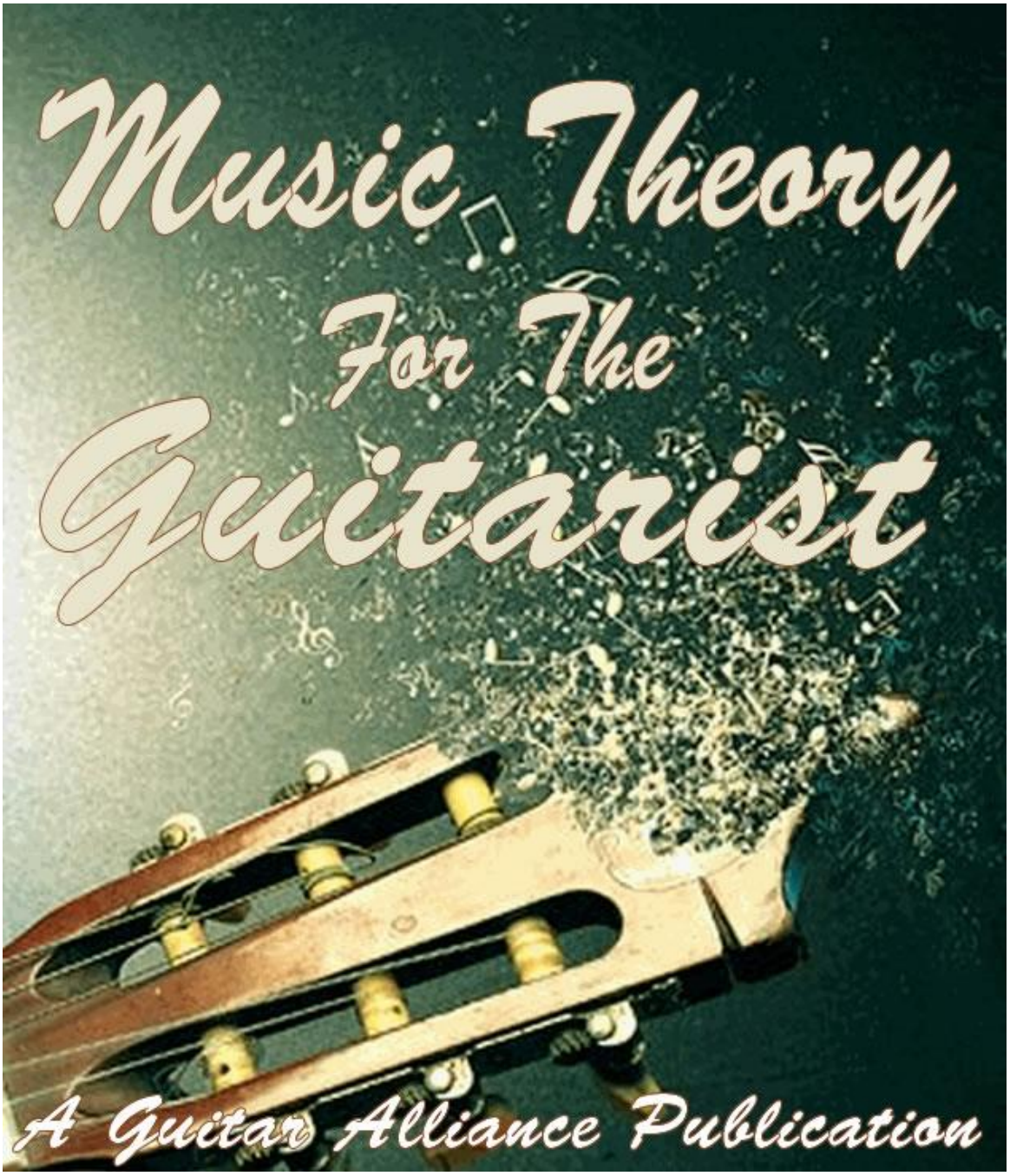
Music Theory
For The
Guitarist
A Guitar Alliance Publication

Music Theory For The Guitarist

Chapter 1: Music Notation

Time And Pitch

Music is basically a temporal art. Unlike some other arts such as traditional painting, the performance and perception of a piece of music takes place during the passage of time.

Music can be defined as 'organized pitches occuring in time.' Notation must account two dimensions:

1. Pitch
2. Time

These are represented in graphic format on manuscript, music writing, paper by a set of template-based symbols using two axes:

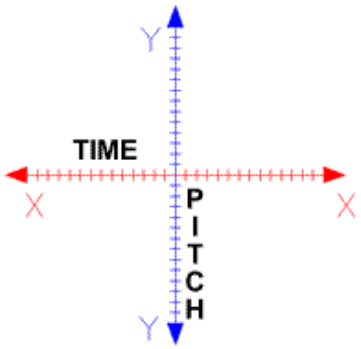

Fig. 1

The ***passage of time*** shows on the ***horizontal axis from left to right***.

The relative ***position of pitches*** is noted on the ***vertical axis moving up and down***.

Note Values And Rests

Rhythm is concerned with the duration or length in time of individual sounds. The relative lengths are indicated by a set of symbols called *notes*. Silence is similarly shown by symbols called *rests*.

The names given to the notes and rests refer to the fractional parts of a measure of *common time*. We'll discuss common time in a moment. For now, take a look at the following notes and rests. Note particularly the way they look.

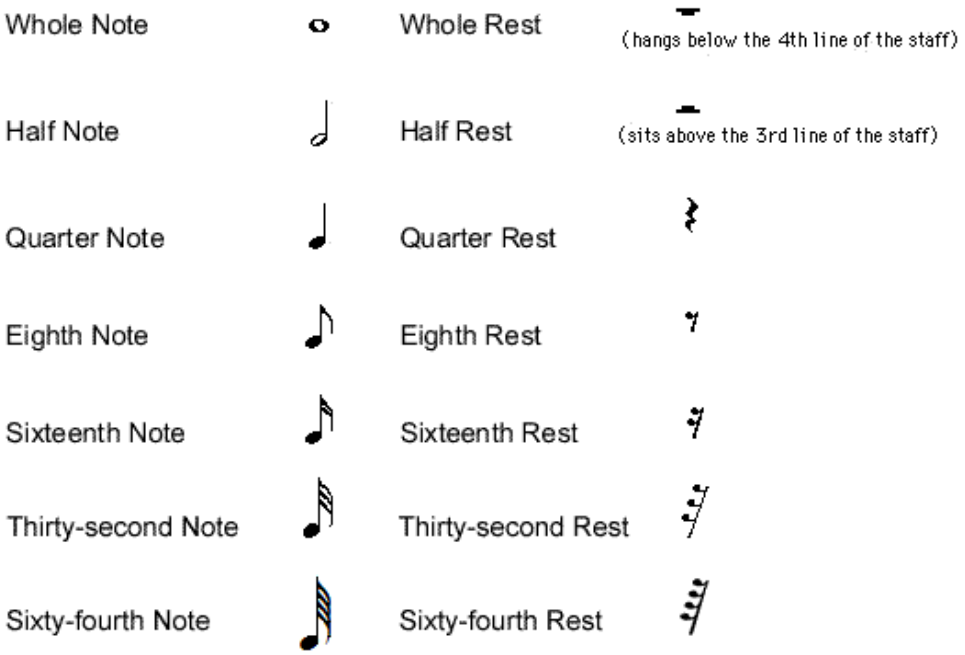

Fig. 2

Occasionally in older music a double whole note is found, but is rarely seen in today's music. It will look like this:

Each note value or rest is equal to two of the next smallest value, or one half the preceding value, like this:

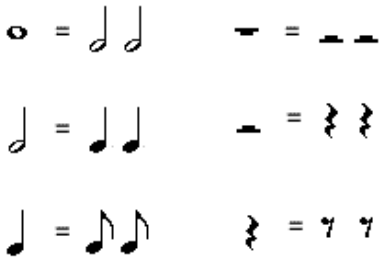

Fig. 3

Eighth notes and smaller values may be written separately, with individual flags, or they may be grouped together under *ligatures* or *beams*. (More on this under 'manuscript writing').

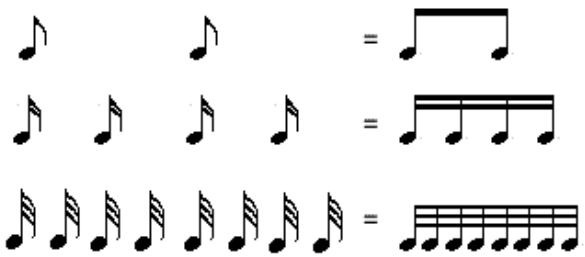

Fig. 4

Rests of corresponding values are always written separately, meaning they are *not* connected by beams (ligatures).

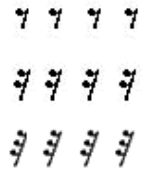

Fig. 5

However, in practice several small rests seldom occur so their total value will usually be shown by a larger rest.

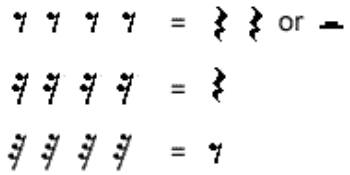

Fig. 6

Dots And Ties

A dot placed after a note or rest increases its value by one half.

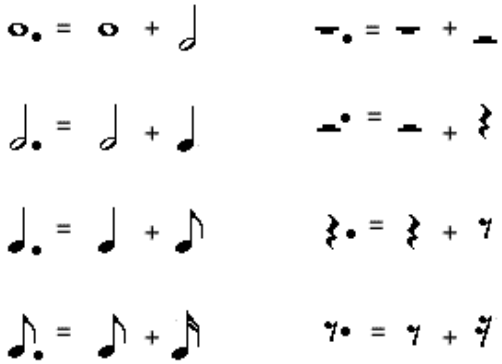

Fig. 7

Each dotted note (or rest) is equal to two of the next smallest dotted notes, or three of the next smallest notes without dots.

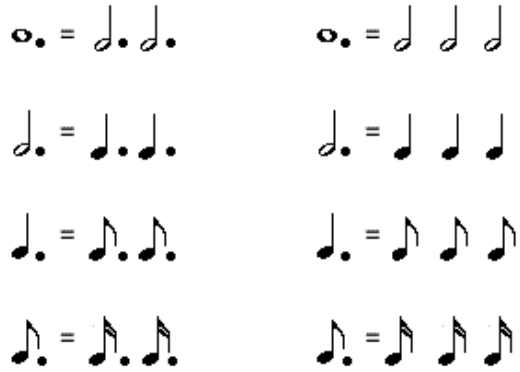

Fig. 8

Although less frequently used, a second dot adds half the value of the first dot.

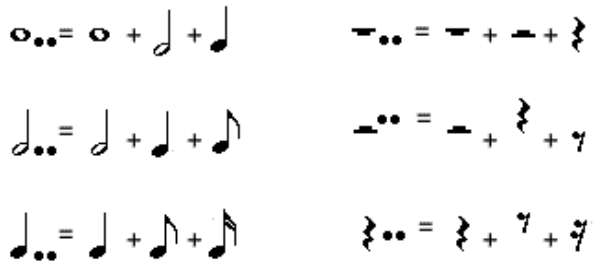

Fig. 9

The length of notes may also be increased by the use of a *tie*. This is a curved line that connects notes of the same pitch, and these are performed as one note with the total value of the notes tied. Ties are **not used to connect rests**.

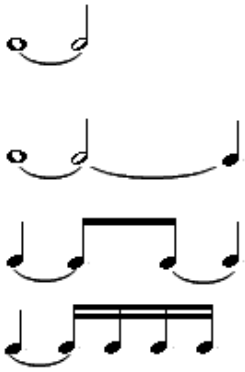

Fig. 10

To indicate rests of a duration longer than a measure, needed at times for orchestral parts, the following symbols may also be found in older publications.

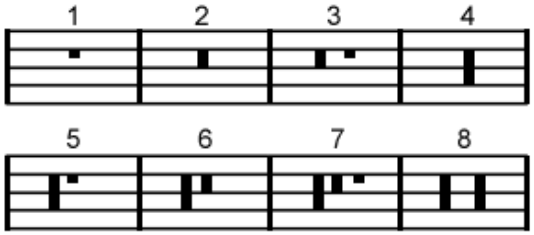

Fig. 11

Today these symbols are seldom found because the preferred way is to use a thick bar with the number of measures of rest written above it. This is seen very frequently in common 'tablature' for guitar.

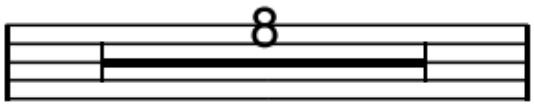

Fig. 12

Meter, Beat, And Tempo

Meter is concerned with measure; rhythm refers to the length or duration of tones. These relative lengths, expressed by note symbols, must be measured accurately, one against another. In order to know the exact length of a tone, you must establish regular

pulsation. This is called the *beat*, against which lengths can be measured.

The basic beat is what we express when we tap our foot, march, or dance to music. This background pulsation can be fast or slow, but it must be regular so that it measures off equal increments of time. It is somewhat related to the increments of distance on a ruler or yardstick.

Slow: . . . . . .

Fast: . . . . . .

The speed in which we beat time is called the *tempo*, which is variable from fast to slow.

In order to fully understand a succession of regular beats, they are arranged in small groups, called *measures*. They are set off by *bar lines*. The first beat in each measure is accented; and the remaining beats are unaccented. The number of beats within a measure is not arbitrary, but is chosen to best fit the rhythmic lengths and patterns of music.

Theoretically there may be from one to twelve beats within a measure, but in practice there are usually only two, three, four, or six pulsations.

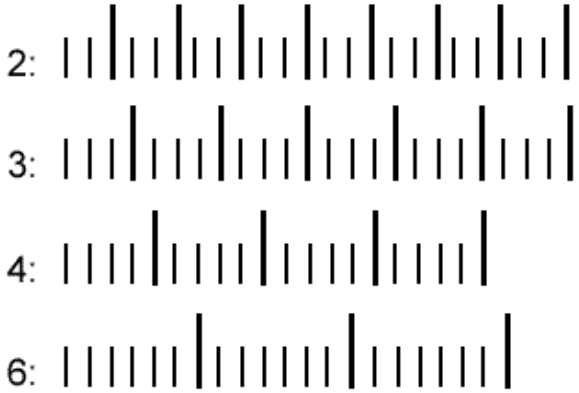

Fig. 13

The recurrent groups of pulsations are called meters; for example - duple meter, triple meter, and quadruple meter. The beats within the measures are counted and accented as:

2: **one**, two | **one**, two |
3: **one**, two, three | **one**, two, three |
4: **one**, two, **three**, four | **one**, two, **three**, four |
6: **one**, two, three, **four**, five, six |

The tempo or actual speed is indicated by a metronomic notation, which shows the number of beats per minute (bpm). You'll also find descriptive terms shown at the beginning of a piece, such as:

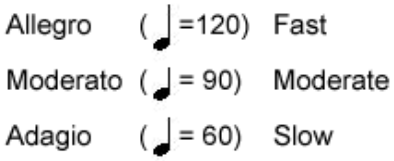

Fig. 14

The following tempo figures are those that are usually found on a metronome:

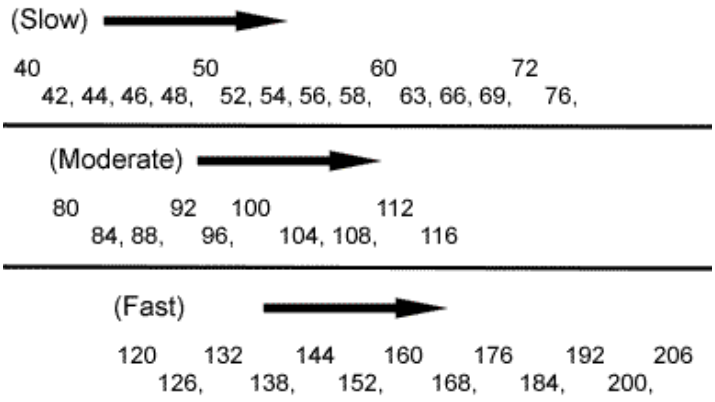

Fig. 15

Italian terms are frequently used to indicate approximate *tempi*, while other Italian terms indicate a general style of performance, dynamic interlude, or changes found in the tempi and dynamics. We'll get into the most useful terms along with their meanings a little later on.

Time Signatures: Simple And Compound Time

To represent the basic beat or pulsation we choose one of the note values, represented by numbers.

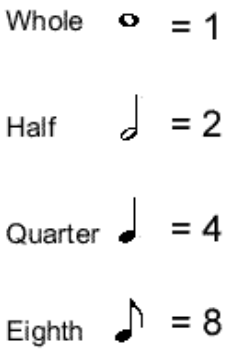

Fig. 16

The number of beats in each measure and the kind of note chosen to represent the beat are placed together as a fraction at the beginning of a composition or passage. This is called the *time signature*.

For example:

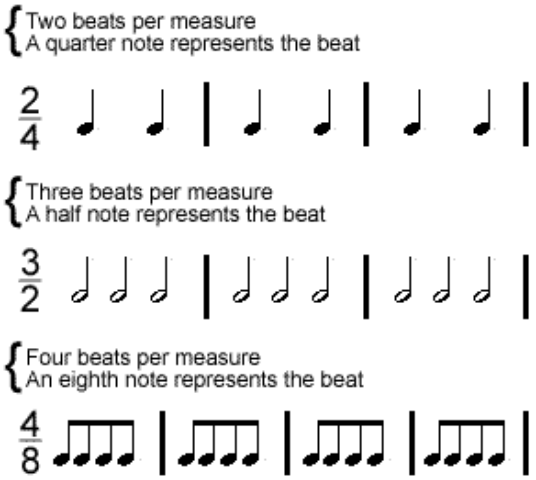

Fig. 17

Time signatures represent *simple time* or *compound time*, depending on how the basic beat is divided.

- In simple time, the beat is divisible into ***two*** of the next smallest note values.
- In compound time it is divisible into ***three*** of the next smallest value.

Simple Time - Time signatures such as simple time may show any number from 1 to 12 as the *upper figure*, and the *lower figure* will *always* show numbers where the beat is divisible by 2. Common simple time signatures are:

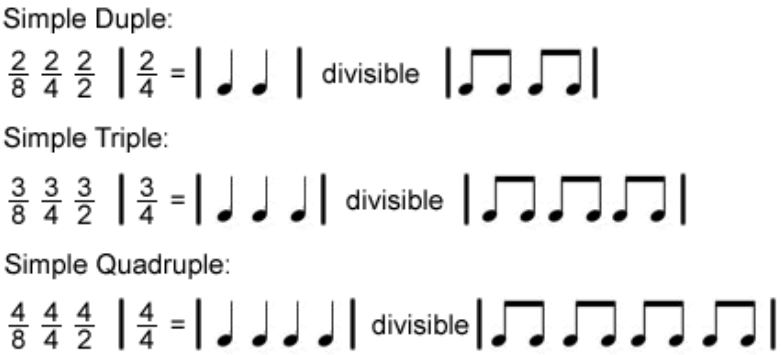

Fig. 18

Unusual signatures will be 1, 5, or 7 as the upper figure, with one of the basic note values as the lower figure.

Compound Time - *When the basic beat is naturally divisible by three*, the music is in compound time.

The upper figure will normally be 6, 9, or 12 and the lower figure will represent a basic note value (usually 2, 4, 8, or 16). To show the groupings by three, *dotted* note values represent the beat in compound time. Common compound time signatures are:

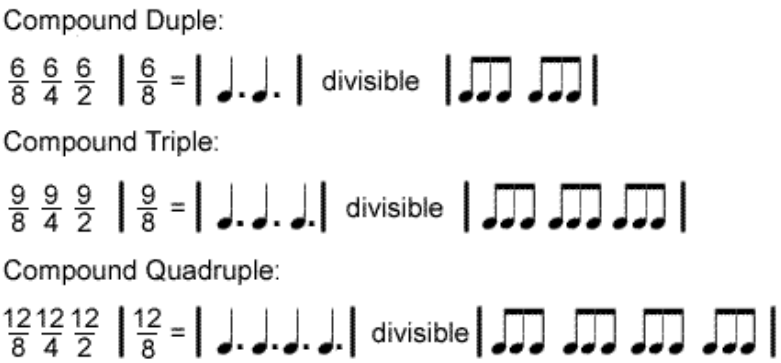

Fig. 19

There are some time signatures that can be treated either as simple or as compound time. For example, 3/8 is simple time when played three beats to the measure. However, it is considered compound time if taken in one beat per measure. Some music will appear to be a combination or a mixture of simple (2) and compound (3) groupings.

In the case with 5/8 time: If played two beats to the measure, it is two plus three or three plus two:

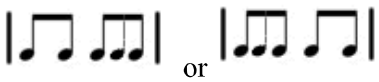

Fig. 20

In this case however, the beats are not of equal length, but the value of the eighth note remains the same.

In older music the same time signature was usually kept for the whole composition, or at least for a section of a piece. In contemporary music it is now common to find meter changes within a section or phrase of music. When the meter changes it is necessary to know whether the length of time for each *beat* remains the same, or whether the *note value* stays the same.

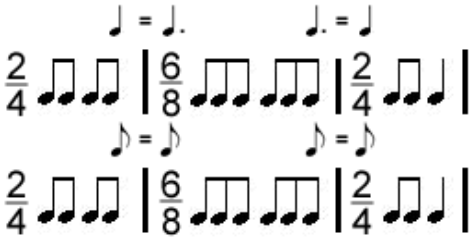

Fig. 21

Finally, two cases in evidence of an earlier notation system is found as time signatures today.

These are:

 - usually called common time

 - usually called *alla breve*.

Fig. 22

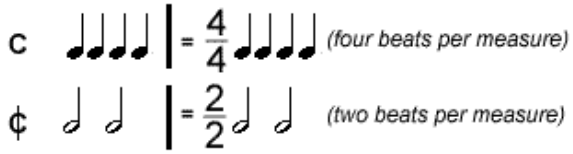

Fig. 23

Artificial Division and Syncopation

The natural divisions in both simple and compound time may be altered to produce other note groupings. The general rule for the notation is to use the note value of the nearest natural division and to place the appropriate number above or below the group and under a slur or bracket.

For example:

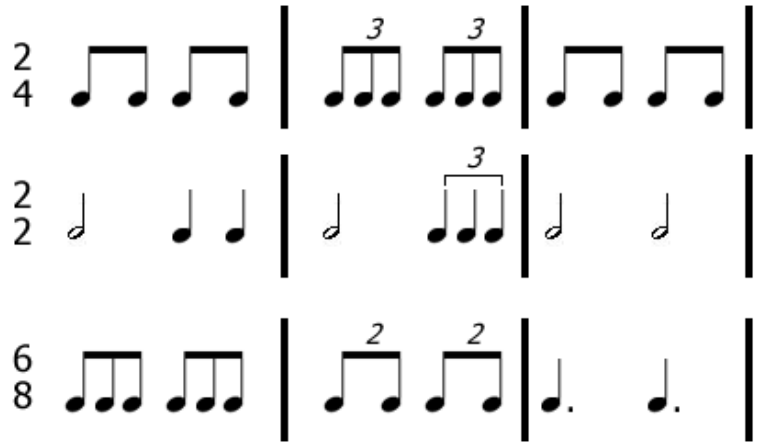

Fig. 24

These are called *triplets, duplets*, and so on, and indicate that three notes are to be played in the time of two, or vice versa. Rarely, the duplet in compound time will be shown by a dot.

Fig. 25

When short notes, ties, or rests are used to misplace the natural accents in music the effect is called *syncopation*. This is based upon an implied premise that long notes naturally occur on accented beats, or on the accented downbeat, while short notes naturally occur at unaccented places. For example:

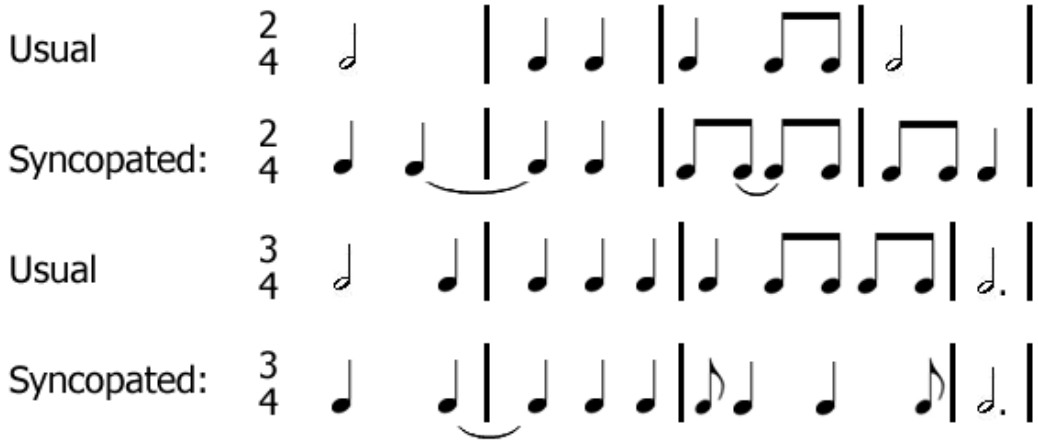

Fig. 26

Staff, Clef and Ledger Lines

The earliest attempts at pitch notation consisted of accent marks placed over the words of vocal music to remind the singer of the contour of an already-known melodic line. These staffless *neumes* only gave general direction to the line, and no precision in indicating pitch relations was possible until the staff was devised.

Staff - This was a scale (Italian, *scala*: ladder) consisting of parallel horizontal lines by which changes in pitch could be accurately measured.

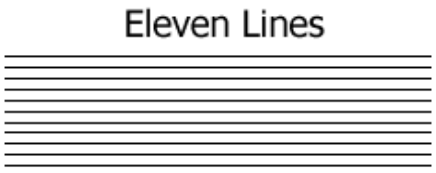

Fig. 27

Pitches were then indicated by placing the proper note value upon a line or space of this staff. The so-called *great staff* of eleven lines encompasses approximately the entire range of men's voices. However, since most early vocal melodies were of limited compass, a smaller section (four or five lines) was sufficient for most music.

The key to which four or five lines were being used was given by the placement of a letter (G, C, or F) on a line to be used as a point of reference.

Clef - These letters were called *clefs* (French, *clef*: key) and they have changed with time to become our modern forms of clefs.

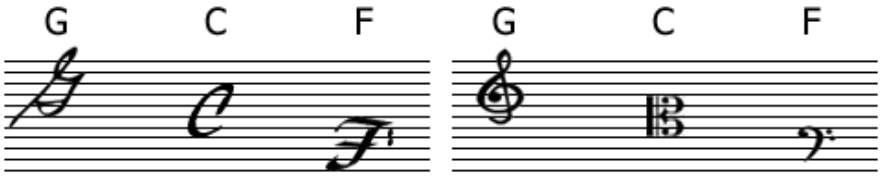

Fig. 28

The G clef is usually called the *treble* clef. The F clef is called the *bass* clef, and the C, or movable clef, usually is called in modern scores the *alto* or *tenor* clef.

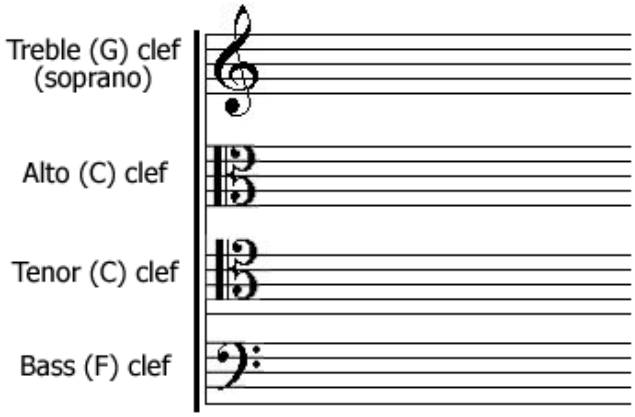

Fig. 29

Older music, particularly vocal music, used the C clef in other positions, so that the *middle* C occured on each of the five lines; the common names of these clefs were:

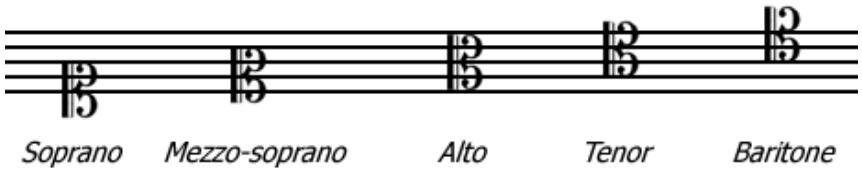

Fig. 30

The G and F clefs also occured on other lines, but these have no use today. In present-day vocal music, when the tenor part is written on a separate staff it is frequently notated in the G clef with an 8 below it to show that the part sounds an octave lower.

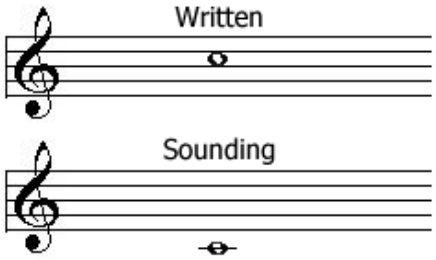

Fig. 31

The compass of each staff may be increased by the use of additional short lines called *ledger* lines.

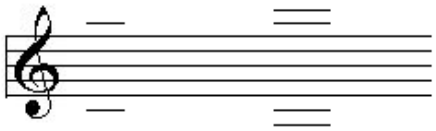

Fig. 32

Letter Names

Pitches are indicated by placing the different note values shown previously on the proper line or space of the staff. In other words, the clefs indicate reference points. Frequently music is written on a pair of staves using the treble and bass clefs.

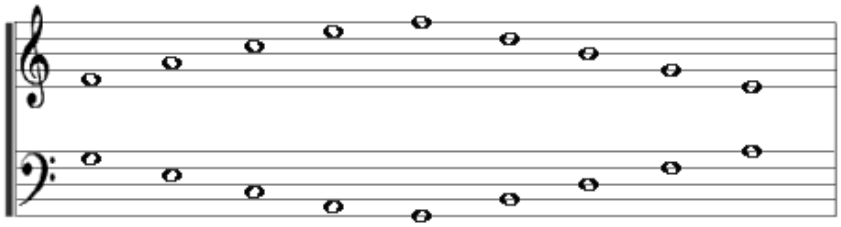

Fig. 33

Today we use a system of tempered tuning that arranges the entire pitch spectrum into smaller segments called *octaves*. Each octave is divided into twelve equal parts called *half steps*. Two half steps may be combined to produce a *whole step*.

Since early vocal music used scales that generally had seven tones to each octave, we have a system of naming pitches with seven letters or *solfege* (singing) syllables.

letters*	**A**	**B**	**C**	**D**	**E**	**F**	**G**
solfege+	**la**	**si (ti)**	**do**	**re**	**mi**	**fa**	**sol**

Fig. 34

* refers to the letters in German, English, American
+ refers to the syllables: Italian, French

The piano keyboard is a good graphic representation of the pitches found in the modern twelve-tone tempered scale system.

The space between two of the same letter names such as C to C is called an octave, that is, eight letter names. The white keys represent the arrangements of the early modal scales or our present seven-tone scales.

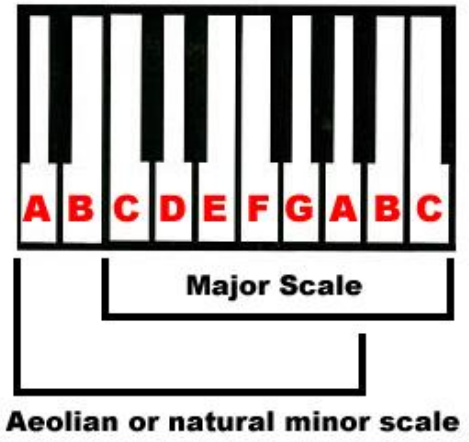

Fig. 35

These seven-tone *scales* or *modes* are made up of different arrangements of whole and half steps and are called *diatonic* scales. The white keys on the piano are represented by the lines and spaces of the staff. The letter names for these are:

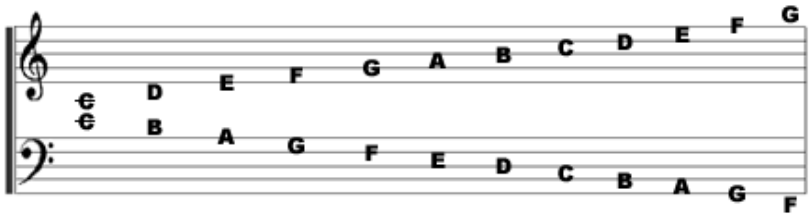

Fig. 36

The notes in between these white keys are represented by the black keys on the piano. On the staff they are represented by raising one of the natural letter names one half steps, with a symbol called a *sharp* (#), or lowering it one half step, with a symbol called a *flat* (b). A sign called a natural (♮) cancels a previous *accidental* (a raised or lowered letter name) and returns that note to its unaltered form.

Accidentals are placed on the staff immediately *before* the note they affect. They obtain for that note only for the duration of that particular measure, unless cancelled.

In speaking, we designate pitches by having the accidental *follow* the letter name, as: C# (C sharp) or Db (D flat).

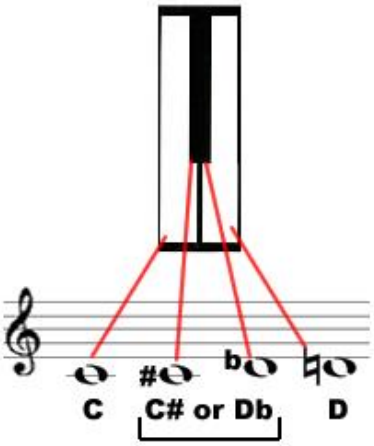

Fig. 37

The scale that uses all of the half steps is called a *chromatic* scale. Ascending scales are usually notated using sharps and descending scales using flats. The same sound or pitch written two different ways is said to be written *enharmonically*.

Chromatic scale:

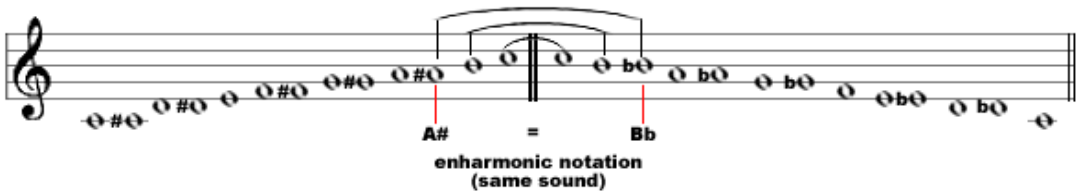

Fig. 38

Occasionally a double sharp (x) or a double flat (bb) is used to indicate that a natural scale step has been raised or lowered two half steps. That is...one whole step.

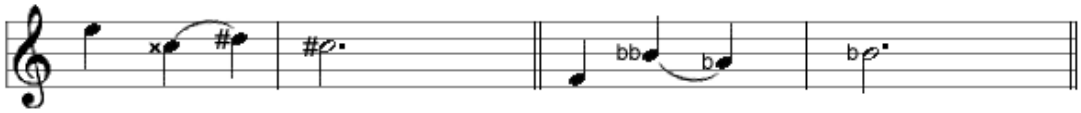

Fig. 39

Double sharps and double flats are sometimes found in music of the romantic period but today are much less used. Composers now try to notate music in the simplest way, such as this example:

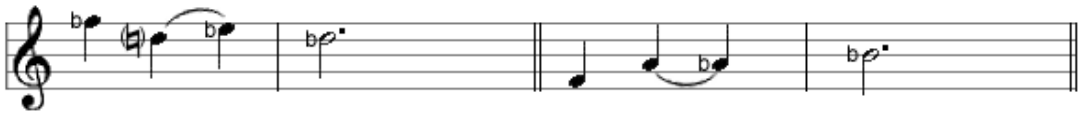

Fig. 40

An accidental placed in parenthesis (as in the first measure previously shown) is usually intended as a *precautionary* accidental. An accidental is also used immediately across a bar line when this would clarify the composer's intention, such as this:

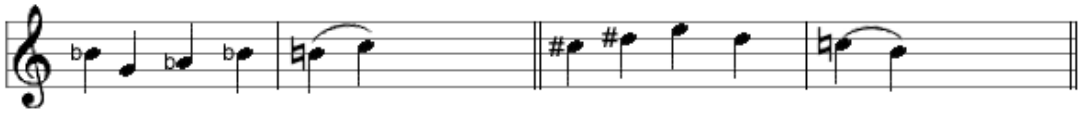

Fig. 41

Octave Designations

The range of pitches that can be heard by the human ear is quite large, roughly from 20 v.p.s. (vibrations per second) to 20,000 v.p.s. Music makes use of only a part of this possible range. For practical purposes the range of the piano is still all that we need to be concerned with.

The total range of orchestral instruments, from the piccolo to the violin to the contra-bassoon and string bass, is slightly less than the piano. Our system of tuning is based upon octave equivalence. In other words, this means the entire range of modern keyboard is divided up into those smaller segments called octaves, which have the same pattern of steps and half steps and the same letter names. The white keys are assigned letter names and the black keys are designated as accidentals.

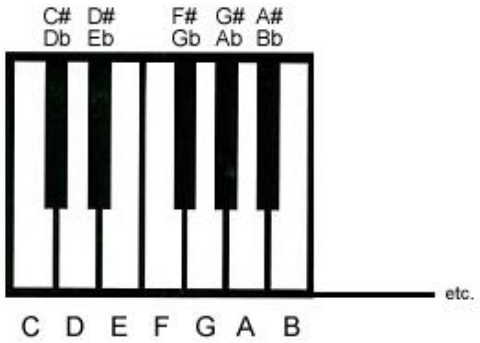

Fig. 42

Since this pattern is represented throughout the entire range of the piano - a little more than seven octaves - it is necessary to have a system to designate particular octaves when these are not shown by staff notation.

Each octave is considered to begin with the letter C and extends up to the letter B. The next octave begins with C, and so on.

The standard piano keyboard, however, begins with A and extends through seven octaves ending with C. The most commonly found system of identifying various octaves appears here:

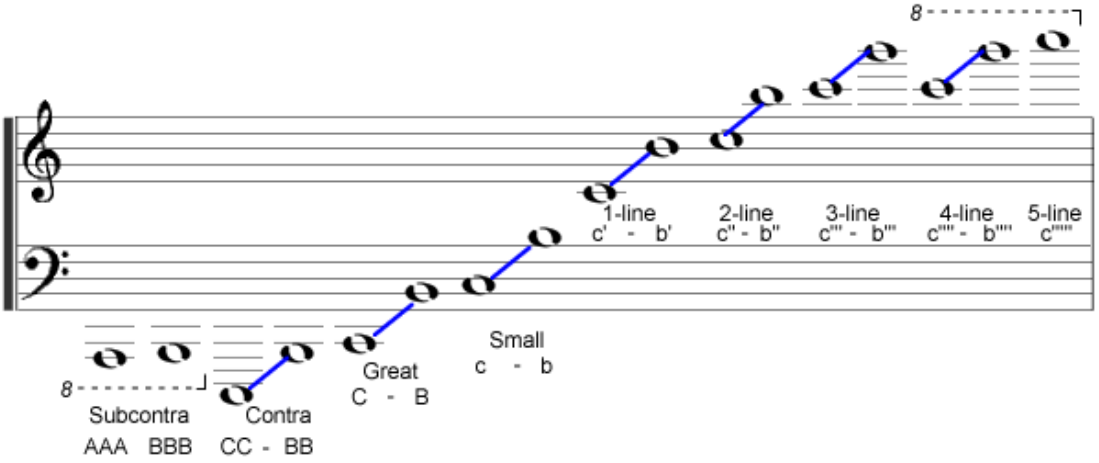

Fig. 43

Manuscript Writing And Additinal Symbols

There are some conventions of notation that you should know about and practice in manuscript writing. On all notes smaller than a whole note, a stem is attached.

Stems may extend up or down. Ascending stems are placed to the right of the note head. Descending stems are placed to the left.

Flags are always to the right of the stems.

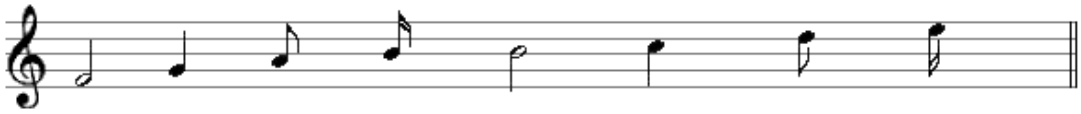

Fig. 44

Measures are marked off by *bar lines*. At the end of a section a double bar line is used. At the end of a composition a thicker double bar may occur.

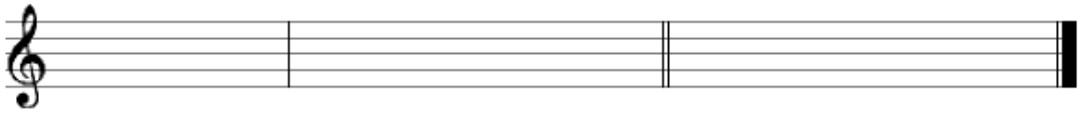

Fig. 45

When two dots are used with the double bar, this means to repeat the section of music, either from the beginning or from the previous repeat sign.

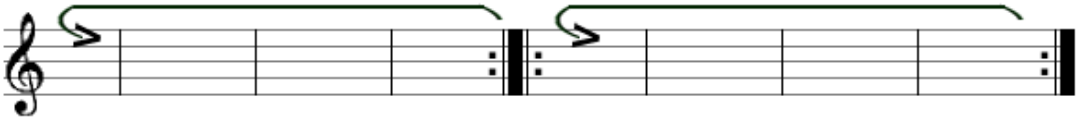

Fig. 46

D.C. is an abbreviation for *da capo* (from the beginning), and D.S. is an abbreviation for *dal sego* (from the sign). These mean to repeat the music from the beginning or from this sign:

Fig. 47

When this sign is found, it usually means to go from the coda (Italian: tail) or the closing section of music.

Fig. 48

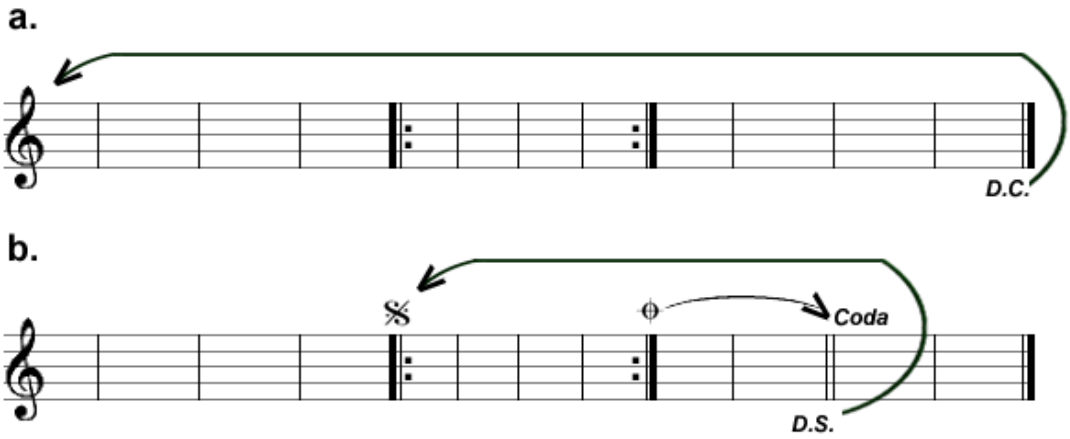

Fig. 49

In making D.C. and D.S. returns, repeat marks within the section are ignored the second time.

Although all measures within a composition must be complete, it is not uncommon to find a piece that begins with a partial measure. The note (or notes) in a beginning partial measure is called an *anacrusis*, or "pick-up" note. It is customary to leave out the final measure as much as the first partial bar contained, so that together they will add up to a complete measure.

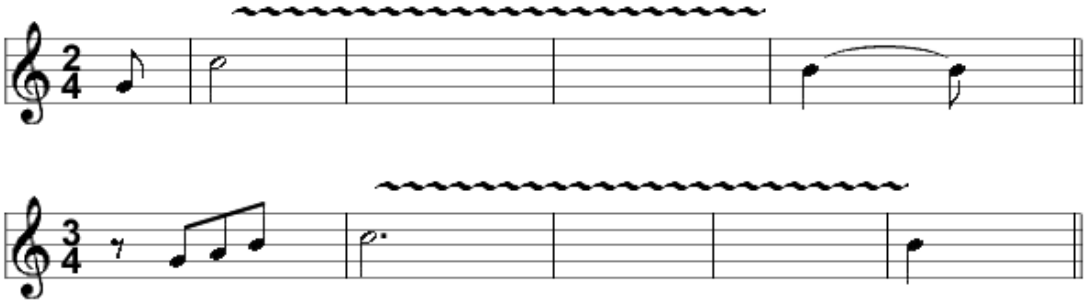

Fig. 50

In counting measures, the first *complete* measure is counted as number one. When a single part is written on one staff, the stems for the notes above the middle line all go down; the stems for the notes below the middle line all go up; the stems for the notes on the middle line may go either way.

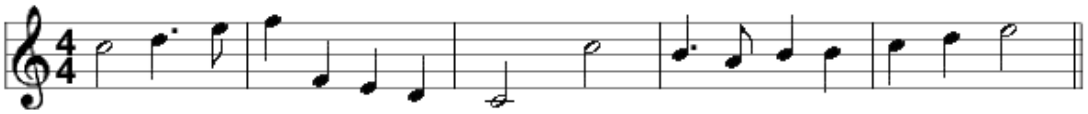

Fig. 51

When two parts share the same staff the stems for the upper part all go up, the stems for the lower part all go down, regardless of the position on the staff:

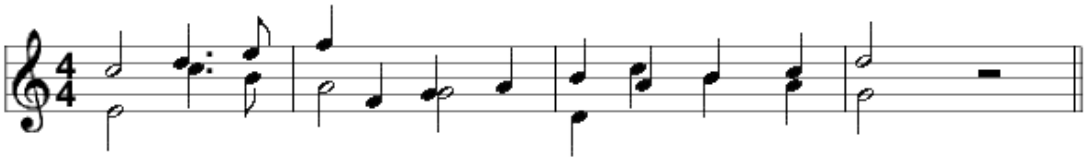

Fig. 52

In vocal music that has a text, it was formerly custom to write the small (eighth and sixteenth) notes with seperate flags when these notes were sung to separate syllables; small notes sung to the same syllable were connected by beams or ligatures.

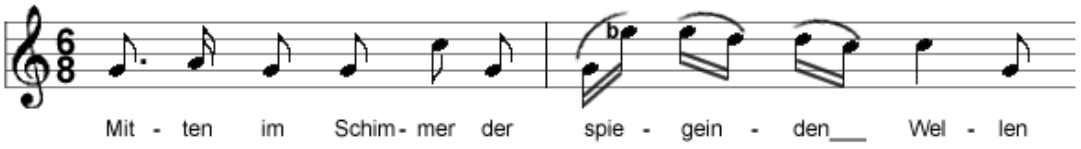

Fig. 53

Today, when rhythmic problems are often more difficult, many composers have adopted the policy of writing vocal music in the same way that instrumental music is written. In other words, small notes are grouped together by beats so that the rhythm is more easily seen.

Figure 54 shows the same fragment of Figure 53 in modern notation:

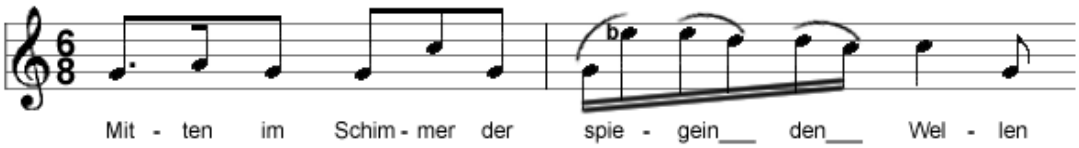

Fig. 54

When a part is to be performed an octave higher or lower, this is indicated by 8 or 8va with a dotted line extending above or below the part. This designation is often used to avoid writing ledger lines.

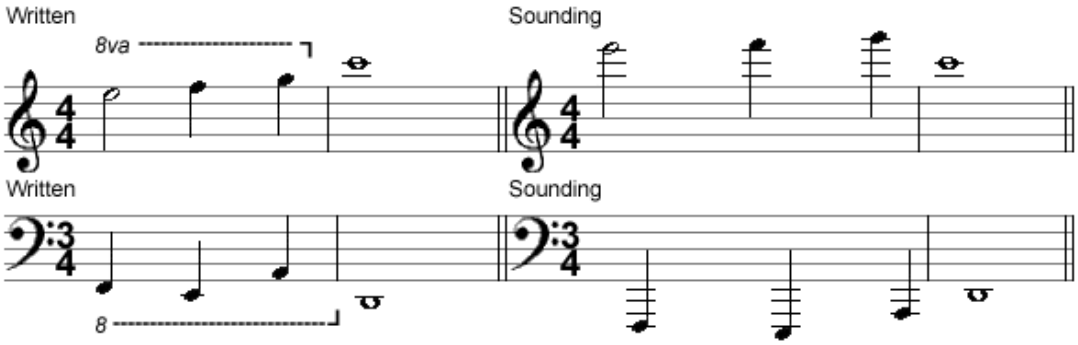

Fig. 55

Later, there will be other conventions to be seen in writing chords and keyboard music and in indicating phrasing and articulation in instrumental parts.

Before continuing with more material, we need to review this information by showing some examples of how all of these concepts learned thus far are combined into a piece of music.

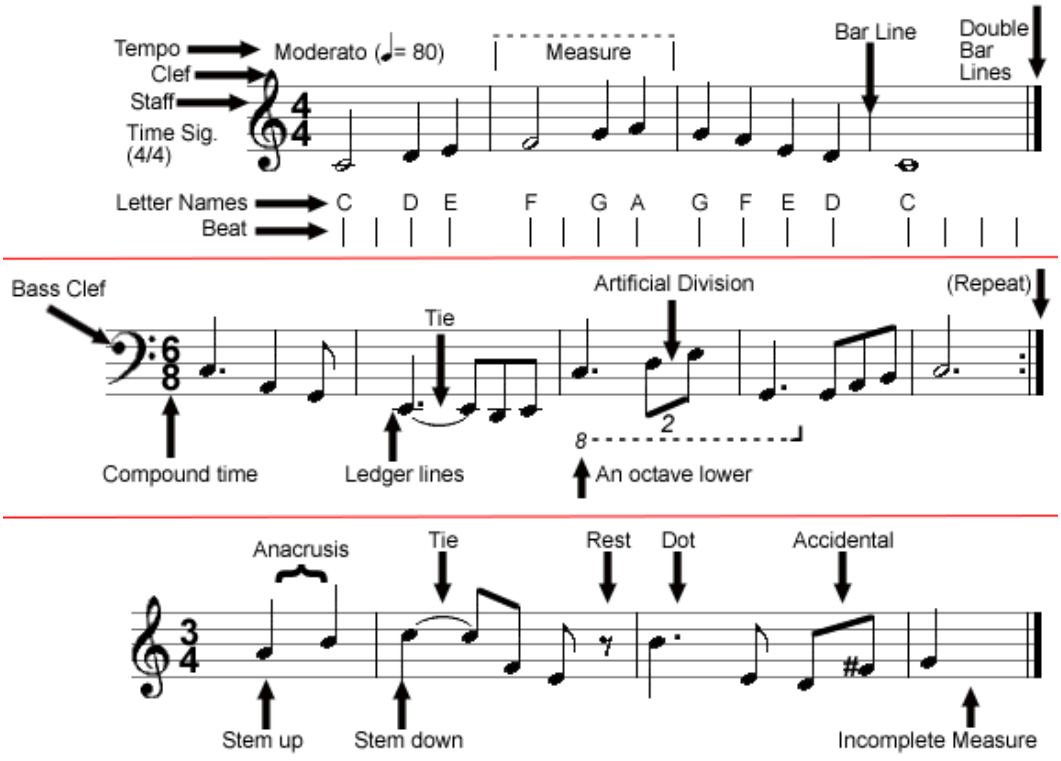

Fig. 56

Chapter 2: Intervals and Scales

Basic Intervals: Half and Whole Steps - The distance between two tones is termed an *interval*. The smallest intervals are those of half and whole steps. These occur between adjacent letter names on the staff. On the white keys of the piano there is a half step between E-F and B-C. Between all of the other letters there is a whole step. It really is that simple.

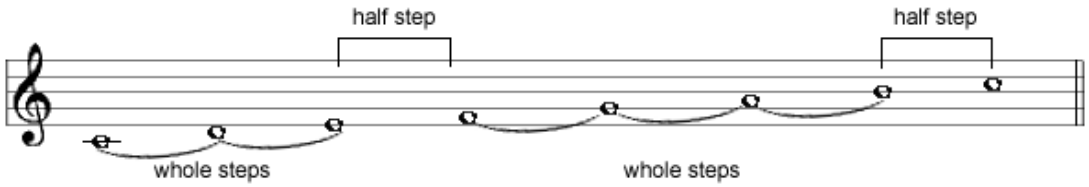

Fig. 57

The whole steps may be divided into half steps by the use of sharps and flats.

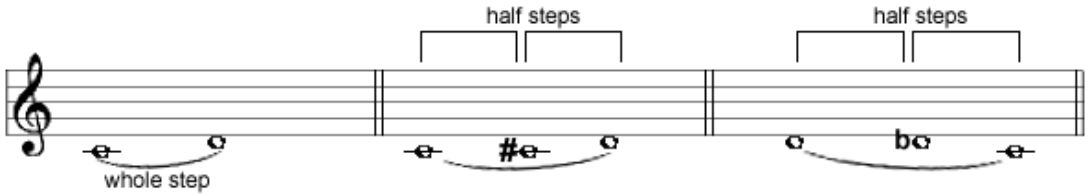

Fig. 58

If the two tones comprising an interval occur together in time the interval is *harmonic*. If they occur one after the other then the interval is *melodic*. In order to name intervals accurately, it is necessary to have two terms.

1. **Quantitative -** This represents the number of letter involved, including the first and last.
2. **Qualitative -** This requires an additional modifying term.

   For example: C to D is called a *major second* (a whole step), while the E to F is a *minor second* (half step). While it is possible to describe larger intervals in terms of the number of half steps each contains, this is usually not done because larger intervals are described by relating them to the normal occurences in the major scale.

Scales: Chromatic, Major, and Minor - From the earliest of times, theorists have abstracted the tones used in a musical composition and placed them on a staff in order to study them. The tones are arranged in ascending stepwise order from the keynote; the patterns, or orders of tones, are called *scales*.

We will begin with the three most useful types of scales: chromatic, major, and minor, since these have the greatest use in 18th, 19th, and 20th century music. Later we'll discuss the medieval modal scales and some others, such as whole-tone, pentatonic, and symmetrical scales.

The nonselective scale, which contains all the possible tones in equal temperament, is called the *chromatic* scale (or sometimes the *twelve-tone* or *duodecuple scale*).

Today it is usually notated in sharps ascending and in flats descending.

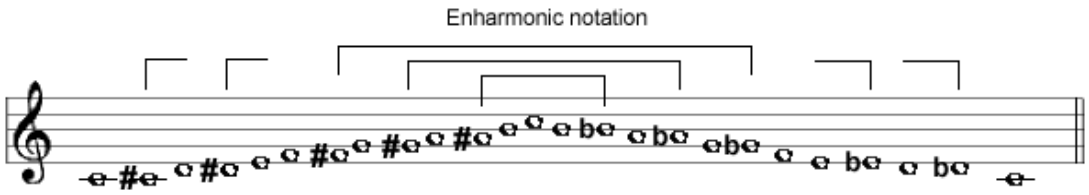

Fig. 59

The most used selective scale for music of the last three hundred years is called the *major scale.*

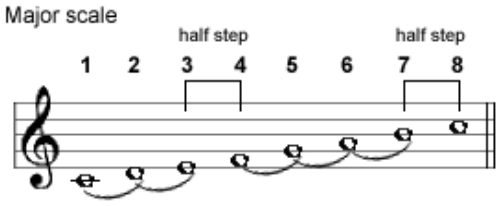

Fig. 60

In this scale, half steps occur between the third and fourth and between the seventh and eighth degrees. Between all other degrees is a whole step.

The next most useful scale, the *minor* scale, has three forms, meaning a basic pattern of whole and half steps, plus two variations of this pattern.

The *natural minor* scale was derived from the Aeolian mode (discussed more in a bit). In it, half steps occur between the second and third and between the fifth and sixth degrees.

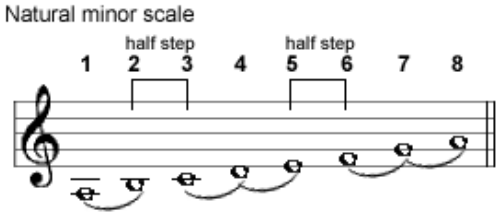

Fig. 61

In practical composition it was customary to raise the seventh degree of this scale to strengthen cadential points. This produced the *harmonic* form of the minor scale. In it, half steps occur between the second and third, the fifth and sixth, and the seventh and eighth steps. One and a half steps (*augmented second*) occur between the sixth and seventh degrees.

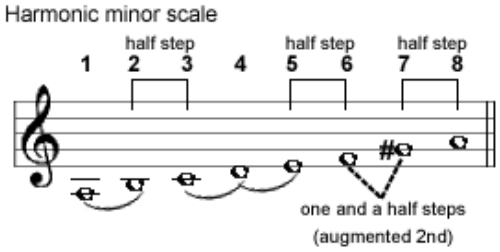

Fig. 62

In order to avoid the awkward interval between the sixth and seventh degrees of this scale, another adjustment was often made, particularly in vocal music. The *melodic minor* scale raises both the sixth and seventh degrees in its ascending form. The descending form of the melodic minor scale reverts to the form of the natural minor. In it, half steps occur between the second and third and between the seventh and eighth degrees ascending, and it reverts to the natural minor scale descending.

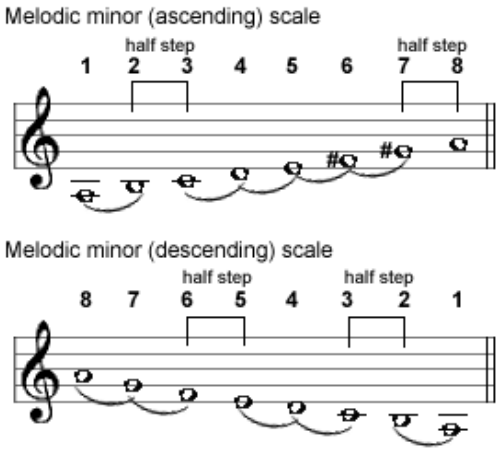

Fig. 63

Key Signatures and Circle of Fifths- The patterns for the major and natural minor scales must be constructed upon each of the possible twelve chromatic pitches. You'll need to do this by taking each tone systematically as the first note. You must keep in mind the whole- and half-step arrangement of the unaltered (white-key) letter names and create the correct pattern for the scale using the necessary accidentals. Only one kind of accidental (that is, sharps or flats) should be used in any single major or natural minor scale.

For example: If we begin to construct a major scale on A we need the following three sharps.

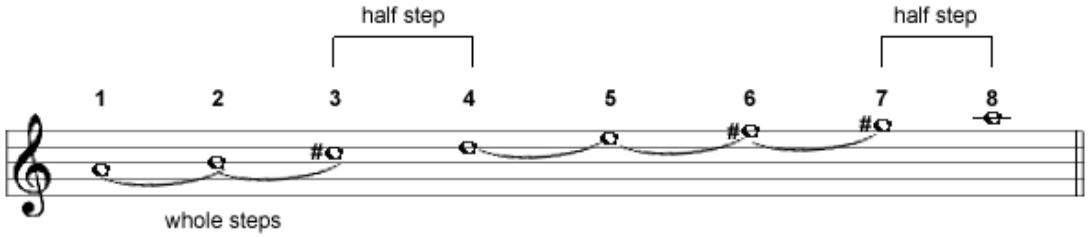

Fig. 64

If we construct a natural minor scale on C we require three flats.

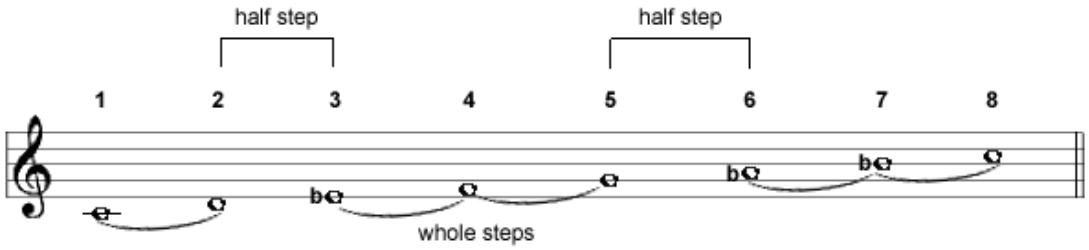

Fig. 65

For the sake of convenience, these accidentals are collected and arranged at the beginning of a musical composition and are termed its *key signature*. This key signature applies until it is canceled by naturals or until another key signature displaces it. One major and one minor key will share the same signature.

These two keys are said to be *related*, or one is the *relative minor* or *relative major* of the other. By common agreement the pattern of the accidentals assembled in the key signatures always follows the designs that are about to be presented. These signatures of the major and minor scales, with their respective keynotes, must be memorized, and you should practice writing these on the staff.

Key Signatures: major and relative minor

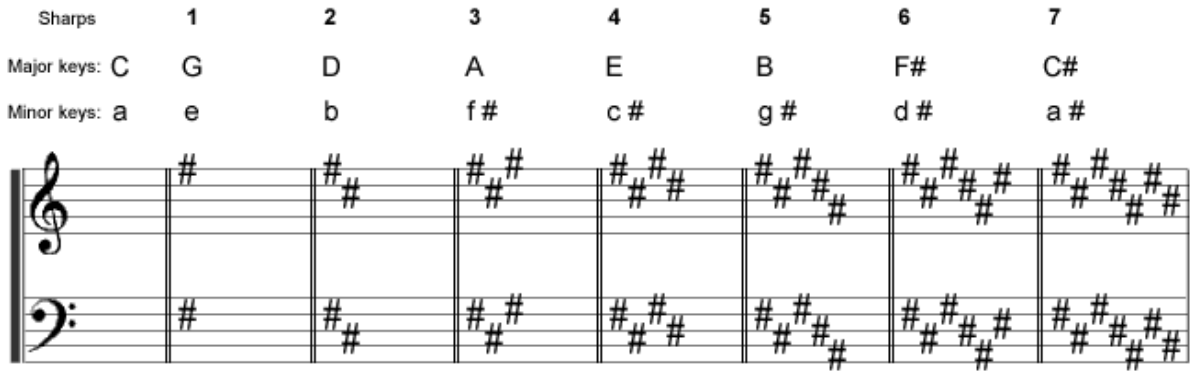

Fig. 66a

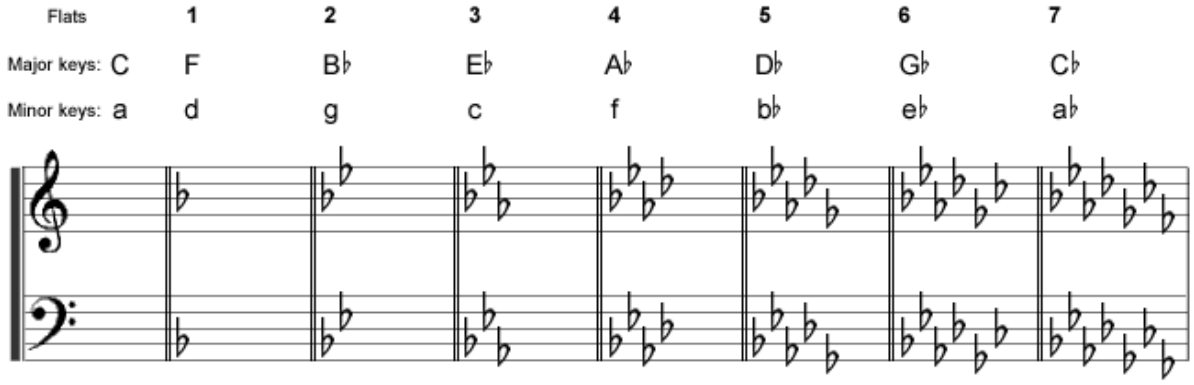

Fig. 66b

You'll notice that, beginning with the letter C, the sharp keys make an ascending progression in fifths, and the flat keys a descending progression in fifths (that is, every fifth letter name).

This is often described as the *circle of fifths,* the sharp keys occurring clockwise and the flat keys occuring counter-clockwise. The three overlapping keys are said to be *enharmonic*, the choice between one of each pair simply a matter of convenience.

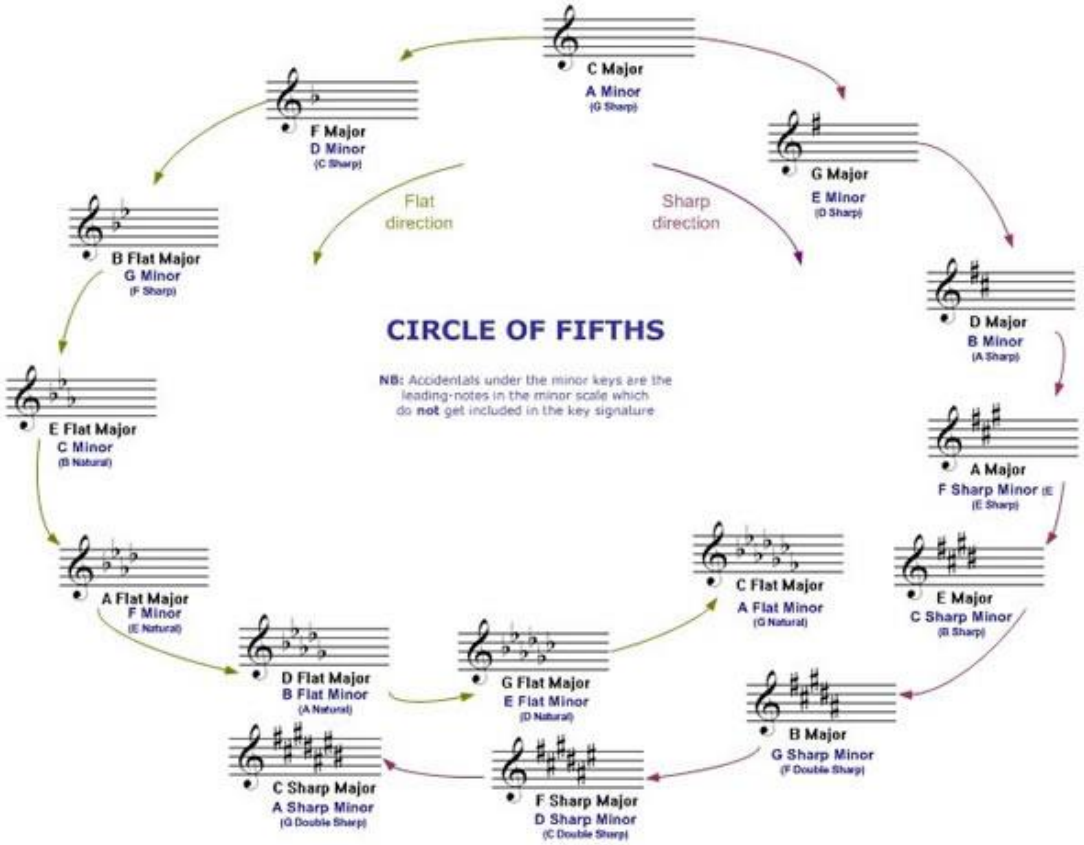

Fig. 67

Intervals - The *quantitative* name of an interval is determined by counting the number of letter names it contains, including the first and last. This number, which describes the size of an interval in terms of the scale steps it encompasses, is preceded by a *qualitative* term. We found that scales were constructed of *major seconds*, which contain two half steps, or *minor seconds* which contain one half step. While it is possible to define the larger intervals in terms of the number of half steps it contains, it is more convenient to describe them as they relate to the keynote, or *tonic*, of a major scale.

The diatonic intervals as they normally occur up from the tonic of the major scale are called either *major* or *perfect*. Some numerical intervals have *three* possible qualifying descriptive terms, and some have *four*. These must be memorized according to the following chart:

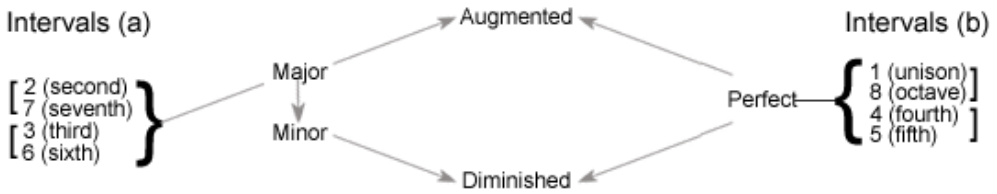

Fig. 68

(a) Intervals (left column) that are normally *major* become *augmented* if the distance between the notes is increased one half step. If it is decreased one half step the interval becomes *minor*. If it is further decreased one half step it becomes *diminished.*

(b) Intervals (right column) that are normally *perfect* become *augmented* if the distance between the notes is increased one half step. If it is decreased one half step the interval becomes *diminished*.

Intervals can become *doubly augmented* or *doubly diminished*.

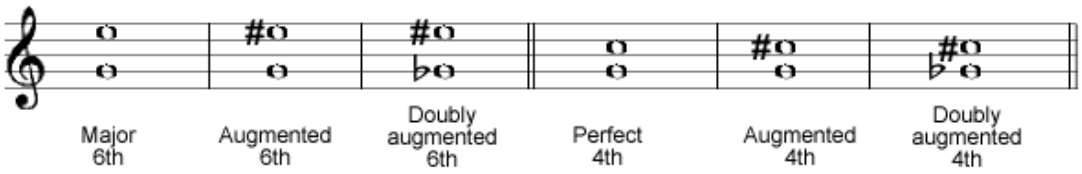

Fig. 69

The names of the basic white-key intervals as they occur from the tonic of the C major scale must be memorized.

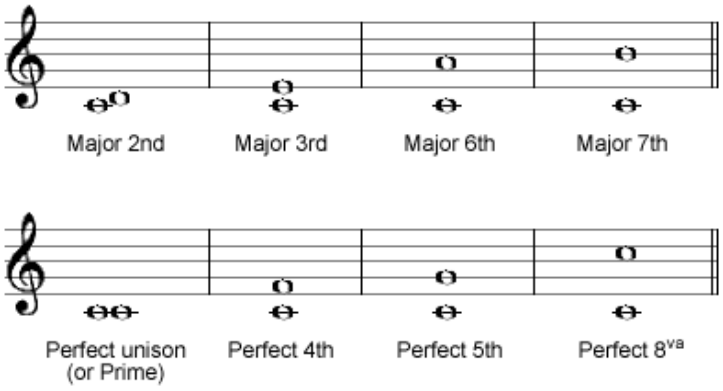

Fig. 70

Practice altering these basic intervals by the addition of accidentals according to the patterns shown in Figure 68.

For example, name the following intervals:

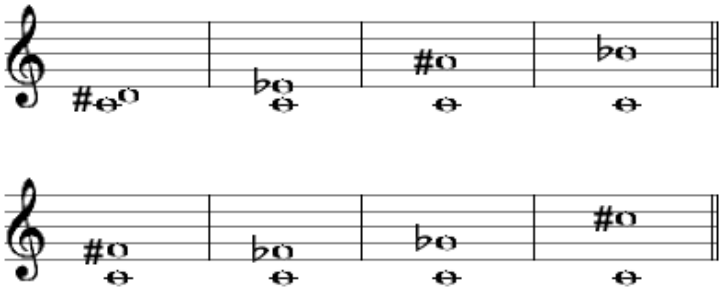

Fig. 71

From this point on you may use the following abbreviations for the qualifying terms of intervals:

- M = major
- m = minor
- A = augmented
- d = diminished
- P = perfect

To correctly name the intervals larger than a second, you first count the letters to find the quantitative name. The qualitative name is then found according to one of the following methods:

1. Memorize the correct names of the white-key intervals given for the key of C major (Fig. 70). These may be altered, meaning, made larger or smaller by the use of accidentals, according to Figure 68.

For example: perfect intervals may be altered as follows:

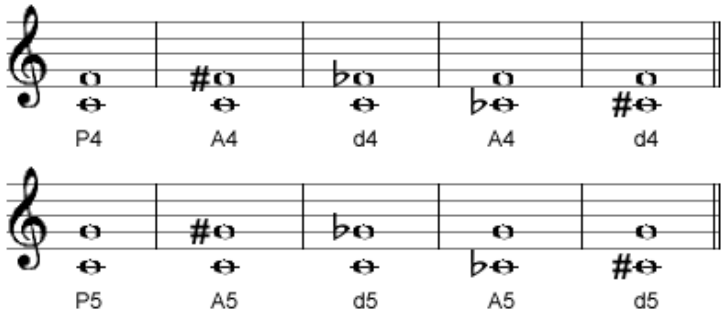

Fig. 72

Imperfect intervals may be altered:

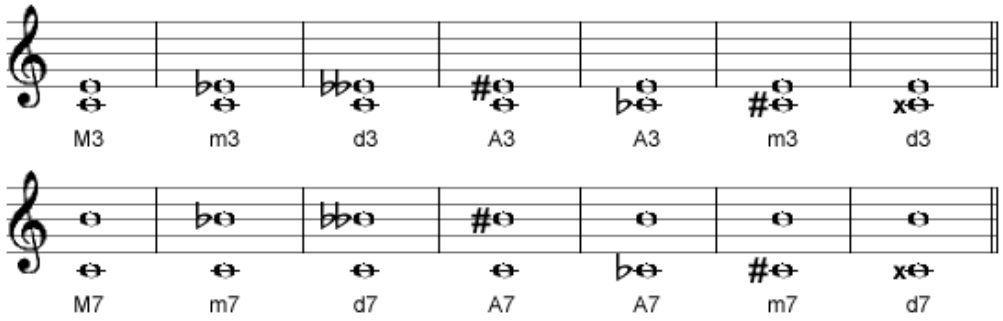

Fig. 73

2. When the lower note of an interval is not C, the key signature of the major scale of the lower note must be *imagined*.

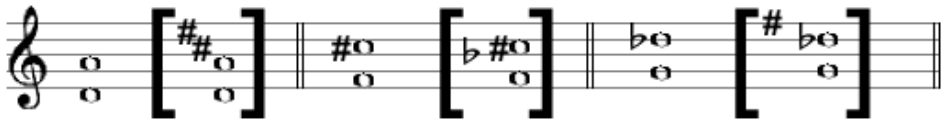

Fig. 74

If the upper note then occurs as a normal scale degree in the major scale of the lower note, then the interval will be either major or perfect, according to which of the two groups of intervals given in Figure 68 it belongs to. If the note is larger or smaller than would normally occur, then the quality of the interval will be determined by the accidental used.

Sometimes it is helpful to check the quality of large intervals by imagining the quality of the complementary small intervals that are more easily seen.

For example: The quality of sixths and sevenths will be the opposite of the complementary thirds and seconds.

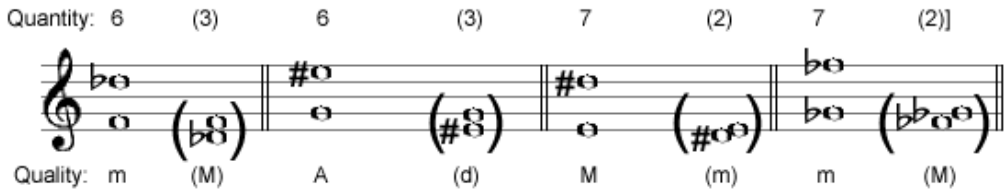

Fig. 75

To determine the quality of compound intervals, it is convenient to disregard the octave and to imagine the simple intervals.

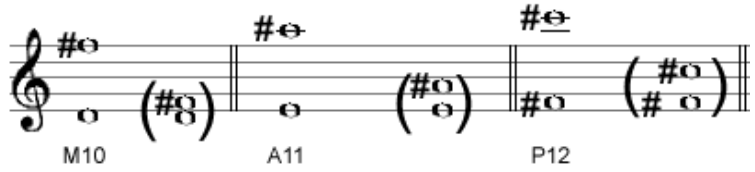

Fig. 76

Finally, if the interval utilizes unusual combinations of accidentals, especially double sharps or double flats, it is sometimes convenient to determine the quality of the unaltered notes (letter names) and then make the necessary adjustments.

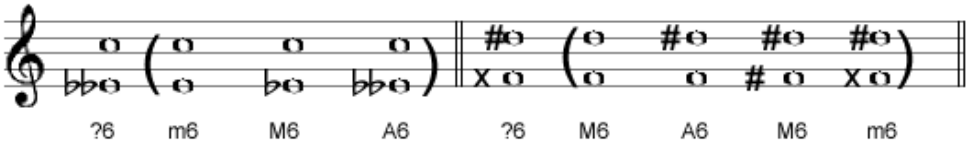

Fig. 77

Inversion of Intervals - If the lower tone of an interval is placed an octave higher, or if the upper tone of an interval is placed an octave lower, the interval is said to have been *inverted*.

Thus, seconds become sevenths, thirds become sixths, and fourths become fifths. (The original interval and its complementary one add up to the number nine).

As for the quality of the interval, perfect remains perfect when inverted, major becomes minor, minor becomes major, augmented becomes diminished, and diminished becomes augmented.

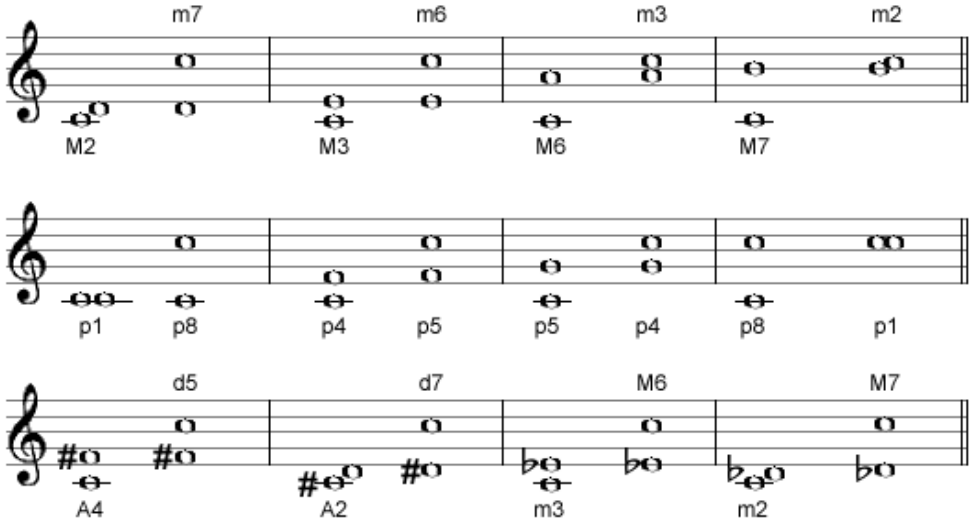

Fig. 78

Intervals no larger than an octave are called *simple* intervals. Those greater than an octave are called *compound* intervals. Thus any simple interval is made compound by the addition of an octave. (The numerical name of the simple interval is added to the number seven to produce the name of the compound interval.)

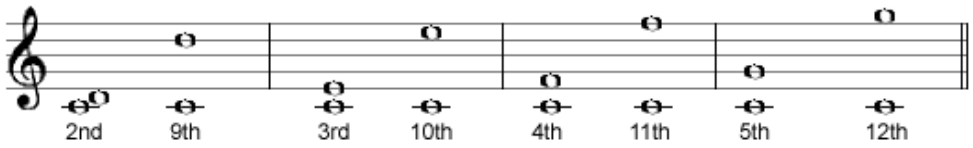

Fig. 79

Relative, Parallel, and Closely Related Keys - Theorists have given names to certain key relationships that are in common use. These will be defined here, but will become much more important later with the discussion of modulation (the process of changing from one key to another).

Relative Major and Minor Keys - As just explained, the major and minor keys that share a common key signature are termed *relative* (major or minor) keys.

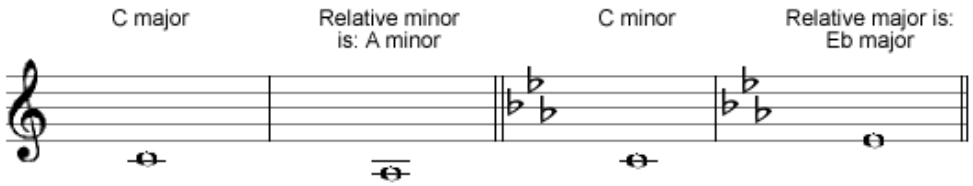

Fig. 80

Parallel or Tonic Major (or Minor) Keys - The major and minor keys that share a common keynote or tonic (but NOT the same key signature) are termed *parallel major* (or *minor)* keys.

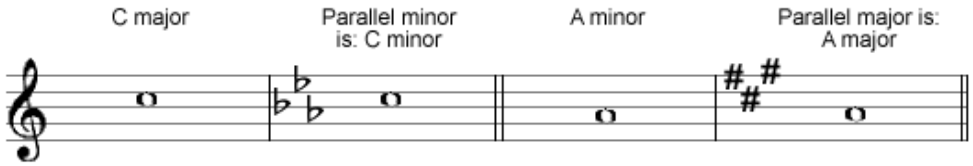

Fig. 81

Closely Related Keys - The seven-tone major or natural minor scale was expanded (by composers seeking greater tonal variety) by treating each consonant (ex. major or minor) triad as the keynote of another major or minor key. The diminished triad was eliminated since it could not function as a tonic triad. These six keys were said to be *closely related.*

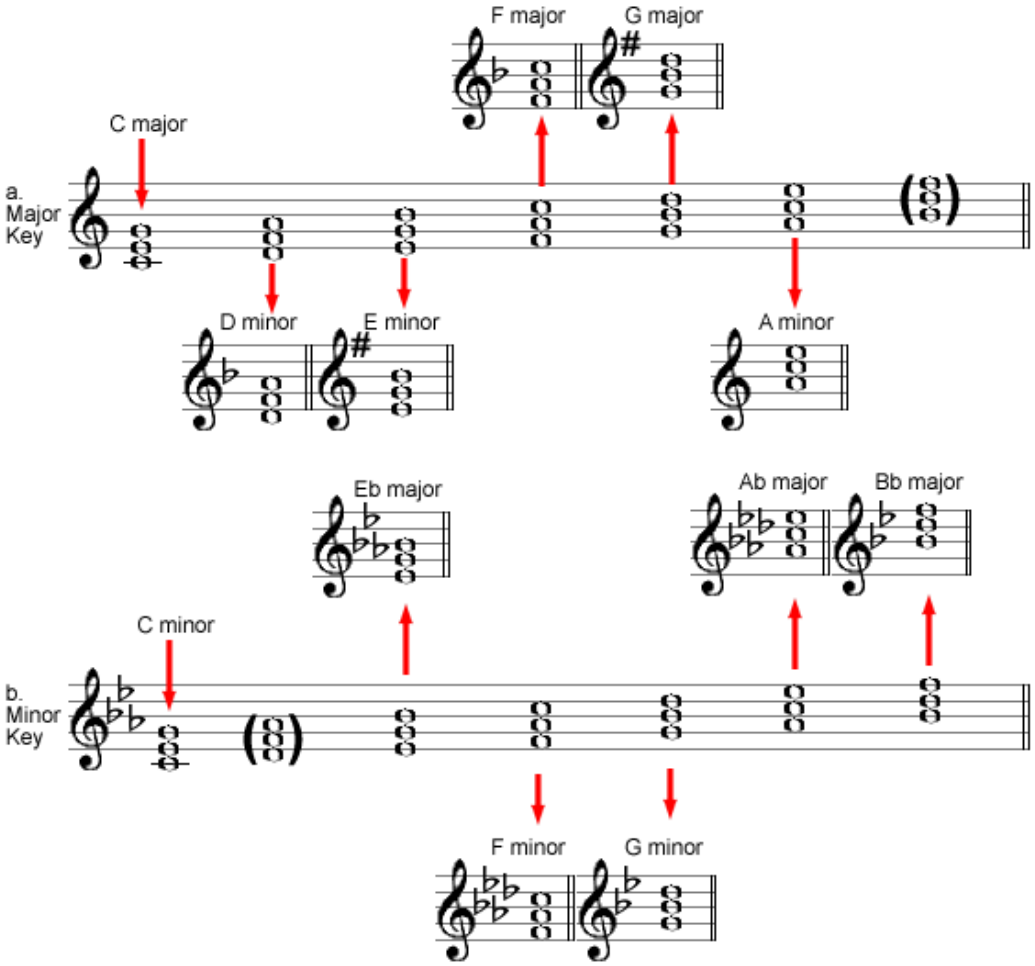

Fig. 82

The same set of closely related keys can be defined in two other ways:

1. Closely related keys are those which have one more, or one less, accidental in the key signature.

2. Closely related keys are those of the tonic, subdominant, and dominant (the primary scale degrees) and their relatives.

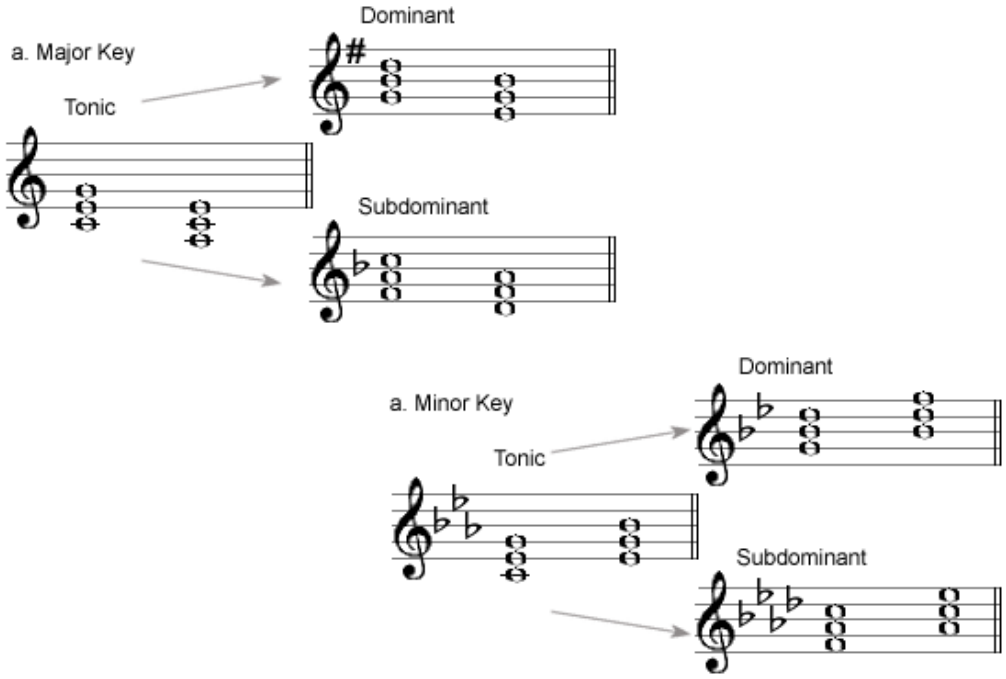

Fig. 83

Medieval Church Modes

In the Middle Ages music was often composed in arrangements of steps and half steps other than those of the major and minor scales. These early scalic patterns were called *modes*. By the 16th Century this Greater Modal System included seven principle modes (called *authentic*) and seven secondary forms (called *plagal* or *hypo modes*).

The plagal forms of the modes, while having the same final , or keynote, as the authentic forms, utilized a different range. Since range is no longer a consideration in modern music, we will restrict our discussion to the authentic modes. These have some use in the romantic and contemporary periods, and the following patterns should be noted.

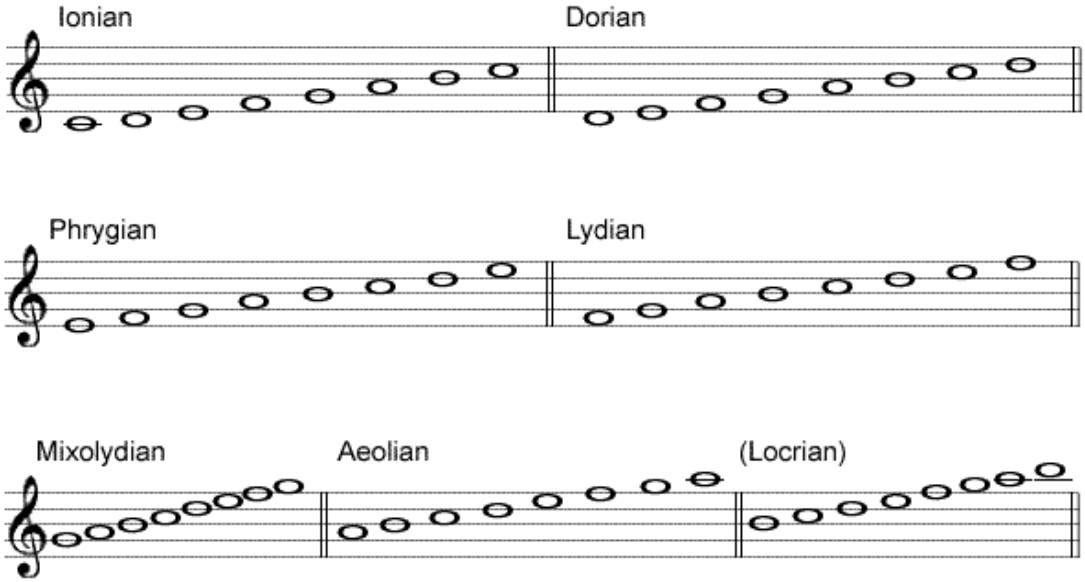

Fig. 84

The Ionian and Aeolian modes are like our present major and natural minor scales. The Locrian mode is seldom used because of the diminished tonic chord.

The same modes can be compared by constructing them on the same keynote. This clearly shows the difference in the patterns of steps and half steps. The basic six modes, all starting on C, would show the following patterns:

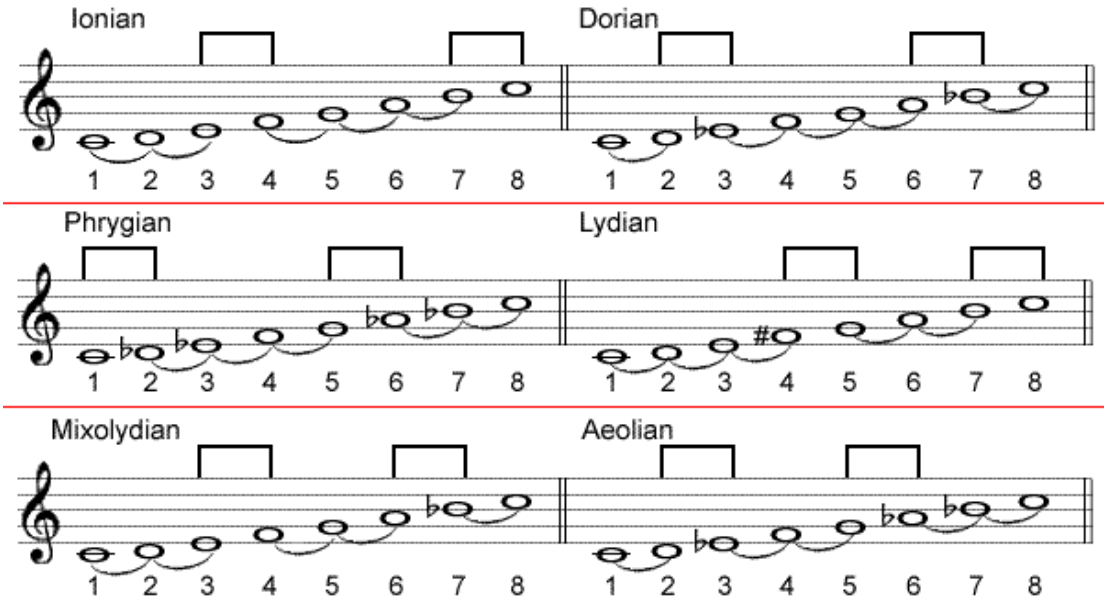

Fig. 85

If the accidentals used in the scales shown in Fig. 85 are assembled into key signatures, you will see that these differ from those of the conventional major and minor keys. While it would be possible to memorize the step-half step patterns of each of the modes, it is simpler to learn the following design in relation to the C major key signature:

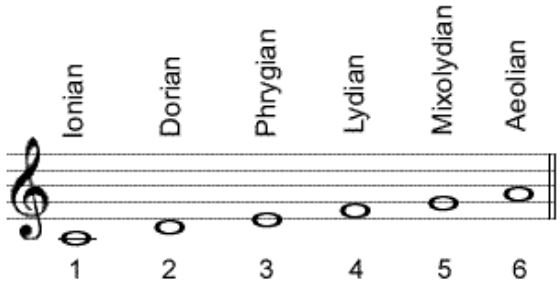

Fig. 86

In other words, if one begins upon the second degree of a major scale, this produces the pattern of the Dorian mode, the third degree gives the Phrygian mode, etc. In order to analyze modern modal music (frequently transposed), you must also be able to reverse the process.

For example, a composition in two sharps that ends on F sharp is in Phrygian mode. One in three flats that ends on A flat is in Lydian mode, and so on.

Whole-Tone Scales

In romantic and impressionistic music, *whole-tone scales* have some limited use. These are constructed out of six consecutive whole steps. The remaining six tones, of the possible twelve, form a complimentary whole-tone scale.

There are only two different whole-tone scales in sound, although these may, of course, be written in several ways.

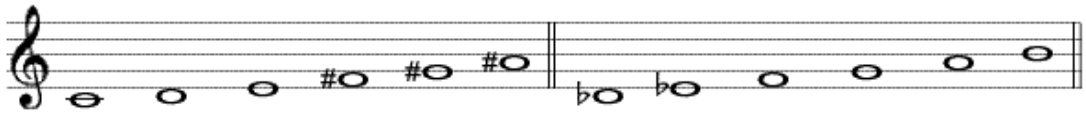

Fig. 87

Since the tones are all equidistant, they produce augmented triads and symmetrical four-note chords that are rootless and that quickly induce monotony because of the lack of variety in structure.

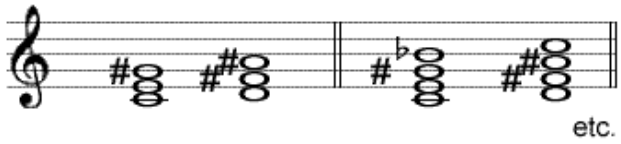

Fig. 88

Pentatonic Scales

The music of Eastern cultures sometimes makes use of pentatonic, or five-tone scales, which contains no half steps. These scales contain whole steps and minor thirds.

They may be constructed in several different ways, but the black keys of the piano show the pattern clearly.

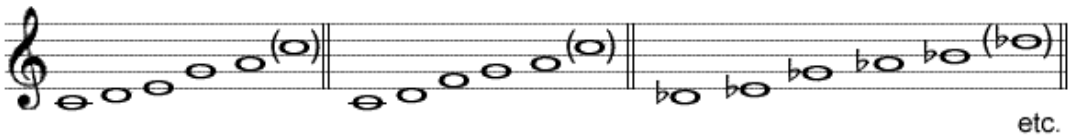

Fig.89

Other Scales

Composers have freely constructed synthetic scales, different from the more usual ones we have reviewed, and folk music sometimes uses peculiar or idiomatic scales. We have discussed the most common scales of five, six, seven, and twelve tones.

Synthetic scales may also be constructed to contain eight, nine, and ten tones. Mussorgsky, Debussy, Bartok, and many contemporary composers have consistently made use of unusual scalic combinations. Here are some possibilities:

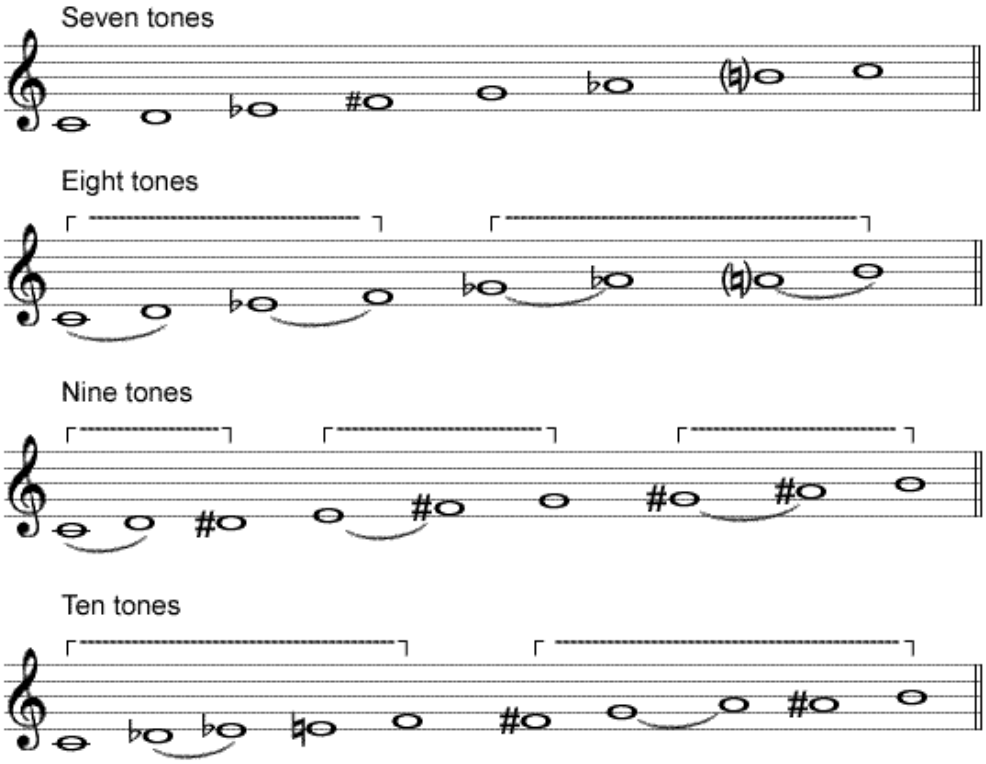

Fig.90

Tuning Systems and Temperament

At various times in the history of European music different systems have been advanced to calculate intervals and scales.

The most important have been:

1. Pythagorean scale
2. Just intonation
3. Mean-tone temperament
4. Equal temperament

Pythagorean Scale:

In the 6th century B.C. Pythagoras, a Greek mathematician, is thought to have made certain acoustic experiments with a vibrating string called the *monochord*. By using two monochords, Pythagoras performed an experiment in which the string of one monochord was successively shortened by by one half (raising the pitch an octave) and the string of the other was shortened each time by two thirds (raising the pitch a fifth).

After seven octaves and twelve fifths, Pythagoras discovered that B# from the second monochord was not exactly the same as the C produced by the first monochord, but was slightly higher: this small discrepancy is called the *Pythagorean comma*.

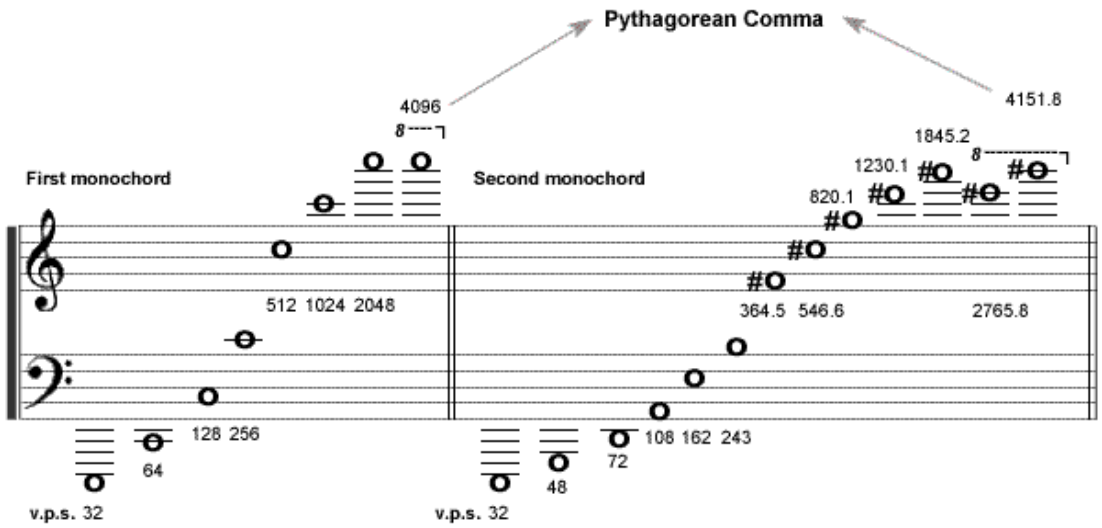

Fig.91

Since all Western European tuning systems are based upon octave equivalence, this small difference, about a ninth of a whole tone, has been a troublesome problem. The tuning systems differ in the manner in which this comma is handled. The so-called Pythagorean scale derives all tones from the interval of the pure fifth (3/2) as it occurs in the overtone series.

A diatonic scale can be calculated as a series of five successive upper fifths and one lower fifth, from a given starting point. Using the vibration number 64 to represent C, and calculating by 3/2 (or 2/3) we would have:

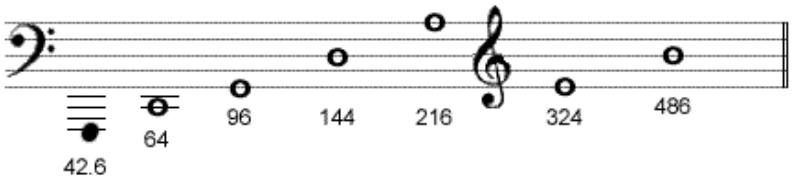

Fig. 92

This produces a third, which is considerably higher than the pure third in the overtone series, and makes the system unusable for contrapuntal music.

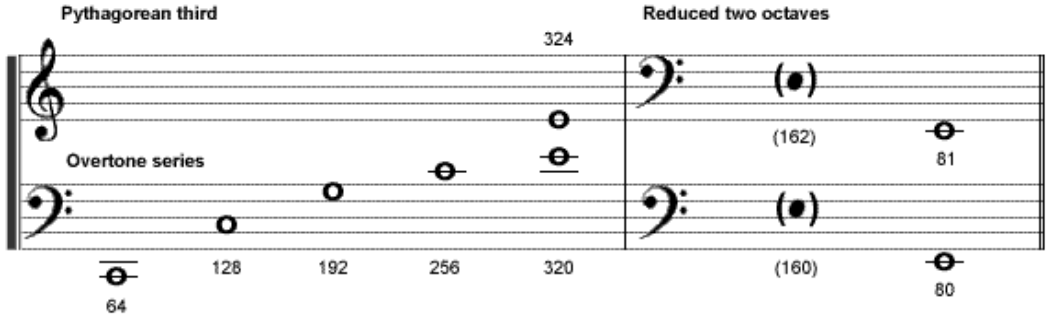

Fig. 93

Just Intonation:

This system attempts to imporve upon the deficiencies of the Pythagorean scale by basing the calculations on both pure fifths (3/2) and pure thirds (5/4).

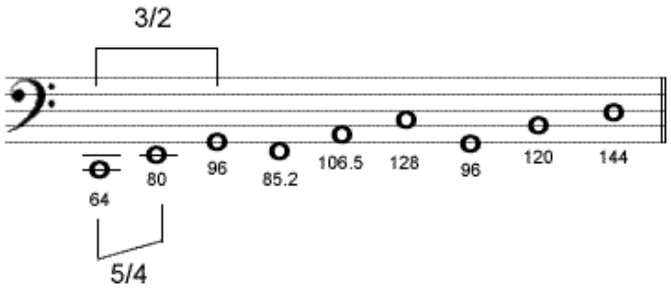

Fig. 94

The troublesome interval here is the fifth, D to A, the A being too low. If we reduce the tones calculated for the Pythagorean scale (Fig. 94) to the lower octave, we can compare these with those from the just intonation scale.

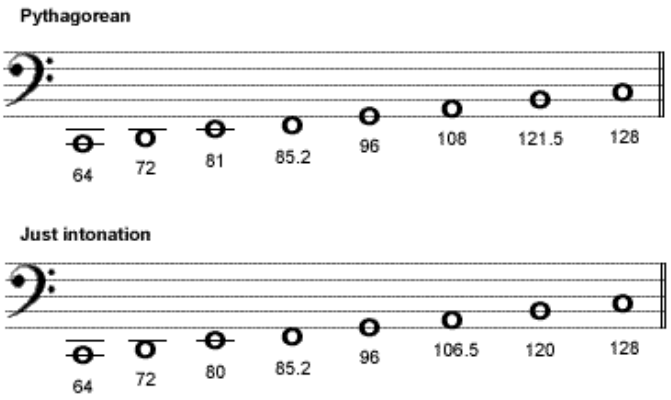

Fig. 95

The just intonation scale also multiplies its difficulties as soon as chromatic tones are introduced. String players often are said to be using just intonation when they play shars higher and flats lower than equal-tempered intervals, however, this is an erroneous conclusion since in just intonation, the sharps are actually LOWER in pitch than the flats.

These and other difficulties caused the pure tuning systems to be abandoned in favor of the tempered systems, where the comma could be divided up among several intervals to make it less noticeable.

Mean-Tone Temperament:

The mean-tone system of tuning was in use in the 16th century especially for keyboard instruments. It is based on the idea of tempering the third, arrived at by four super-imposed fifths, so that it agrees with the pure third from the overtone series.

The difference between these two tones - called the *syntonic comma* - is then distributed equally between the four 5ths, that is each fifth is lowered by one quarter of the syntonic comma. The whole tone is thus the mean of the major third.

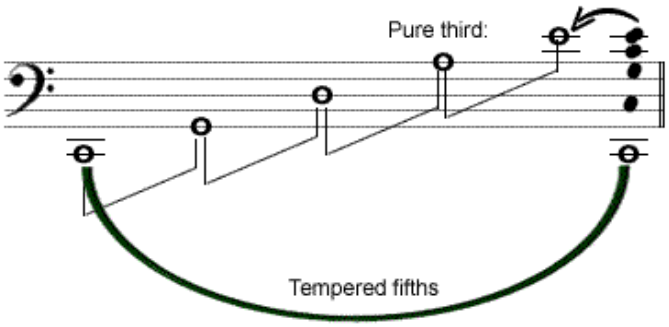

Fig. 96

This makes a very usable system of tuning with pure thirds and nearly pure fifths. It worked very well in the renaissance and early baroque periods for keyboard music that did not use key signatures of more than two flats or three sharp. Beyond these keys, the introduction of the third flat (Ab) or the fourth sharp (D#) created the problem of enharmonic tone (Ab-G#, Eb-D#, etc.)

Here the system was inadequate, since the enharmonic tones were nearly a quarter of a tone different. The increased use of more distant modulation in baroque music finally led to the abandonment of this system and the introduction of the equal temperament.

Equal Temperament:

The full development of tonality, from the seven- to the twelve-note scale, forced the choice of a tuning system that could accomodate unlimited modulation and equality of all the twelve pitches. This is made possible by dividing the octave into twelve equal semitones, each of which is slightly tempered.

The octave remains the only interval that is pure acoustically, that is, in agreement with the natural overtone series. The fifths are slightly smaller and the thirds somewhat larger than the natural intervals.

A system of measurement has been suggested that assigns 1,200 cents to the octave where each semitone equals 100 cents. For purposes of graphical comparison, it is possible to show the approximate relationships of the diatonic scale in earlier tuning systems in relation to a grid representing the twelve half steps of equal temperament:

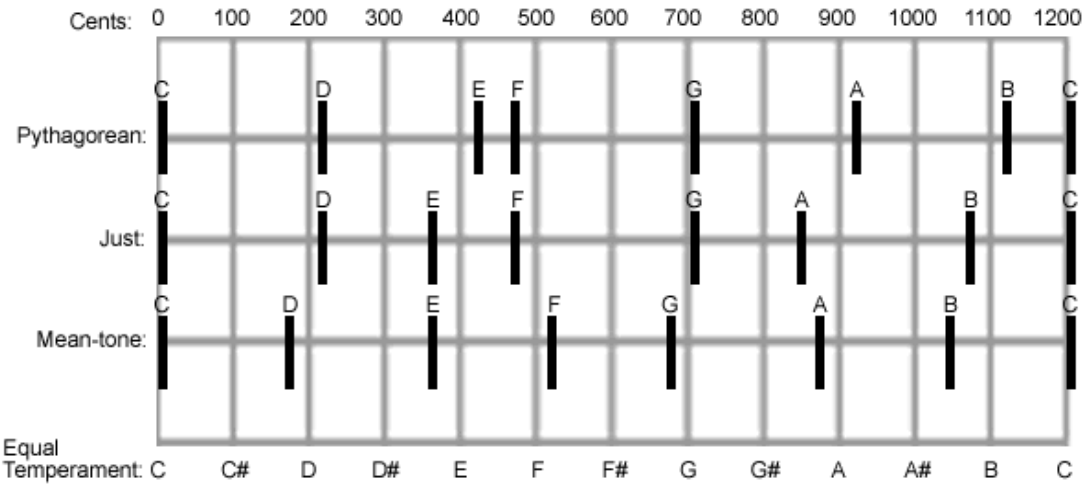

Fig.97

Chapter 3: Chords

Consonance and Dissonance

Western music uses sonorities of notes sounding together that are called *chords*. Two tones sounding together are usually termed an *interval*, while three or more tones are called a *chord*.

In the field of harmony the concepts of *consonance and dissonance* usually refer to the stability of the relationships between tones, that is, intervals or chords. This stability is often described as "smooth", "concordant," or "consonant" when the relationship is "pleasant" or "agreeable" or "rough, "discordant," or "dissonant" when the relationship appears to be "unpleasant" or "disagreeable."

It is clear that these are subjective judgements and that they vary with the individuals and also with cultures and periods.

Western European music, as distinct from that of some Eastern cultures, has generally based the concept of stability upon the norm

of the natural harmonic, or overtone series, which results from a vibrating string. This emphasis upon the harmonic aspect is not found to the same degree in certain Eastern cultures that are melodically oriented. Our sense of consonance, concordance, or agreement comes from the lowest six tones of the overtone series that produce a major third.

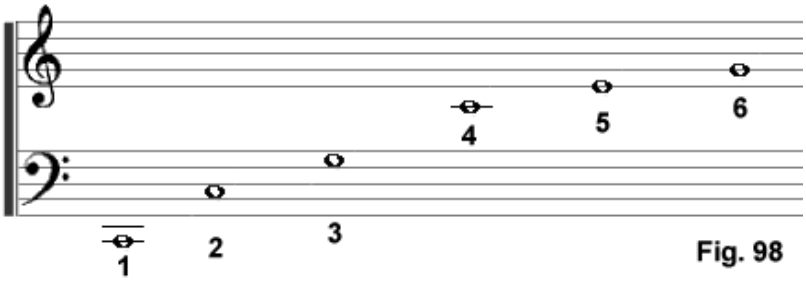

Fig. 98

These tones give us the intervals of the octave, perfect fifth, perfect fourth, and the major and minor thirds. Of course, if one continues with the overtone series, all tones and intervals would eventually appear (as well as some that are not in our tempered system) and this suggests that consonance and dissonance are simply relative terms, rather than absolutes.

This view is also borne out by history, since in the Middle Ages, when octaves, fourths, and fifths were "consonant," the third was considered "dissonant."

Later, after 1450, we developed a norm or tertian hamrony based upon the triad. The usual characterization of consonant and dissonant intervals in the "common-practice period" (1700-1900) is shown on this chart:

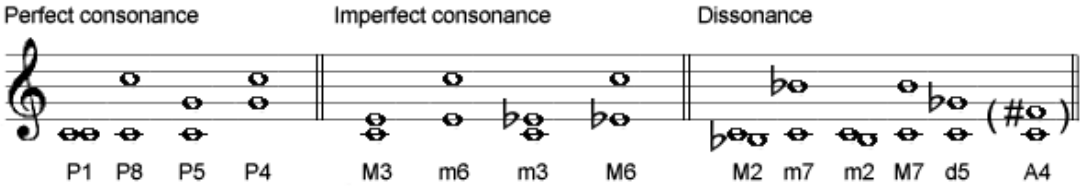

Fig. 99

However, it is more realistic today to say that consonance and dissonance are relative, rather than absolute terms; they are different degrees of the same thing.

Intervals are also said to have *roots*; the mind seeks a focal point for an interval or a complex chord. We seek the strongest, most important tone as the root of the interval or chord. While there are complex acoustic and stylistic reasons for choosing roots, the following chart shows the gradation of stability in two-part intervals and the generally accepted roots (---->).

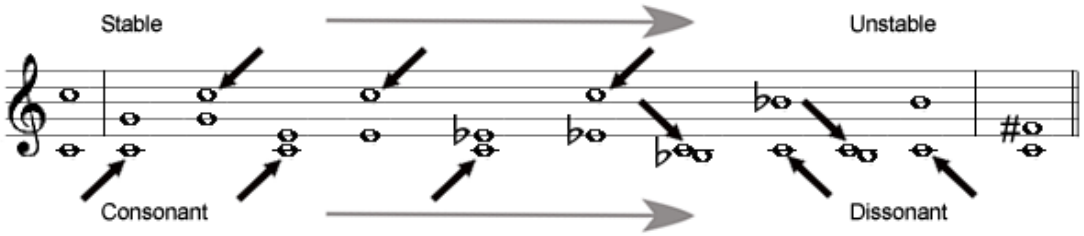

Fig. 100

The octave represents complete agreement, while the *tritone,* or augmented fourth, sets up two different overtone series that conflict with each other and therefore make the interval seem rootless.

Three intervals require special mention. During the period of triadic harmony, the interval of the perfect fourth *with the bass note,* or the lowest sounding note in a chord, was considered a dissonance. This "conceptual dissonance" was based upon the

disagreement that the fourth makes with the strong overtone and the major third from the lowest note.

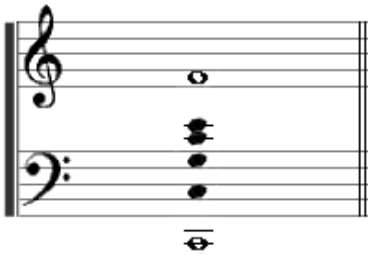

Fig. 101

This is the basis for treating the six-four (6/4) chord as a dissonant combination, requiring resolution to a five-three (5/3) chord during this period.

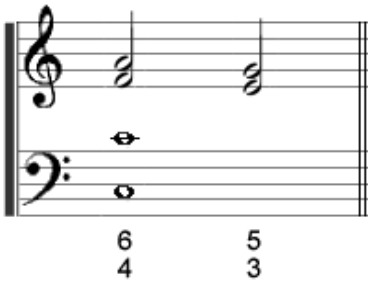

Fig. 102

Fourths between the *upper parts* were not considered dissonant and so required no resolution.

Augmented fifths were also considered to be dissonant. While this interval is acoustically the same as the minor sixths, when it is part of an augmented triad it is perceived as an altered tone. Early 19th century theorists considered this to be a "frozen" passing tone that ultimately required resolution.

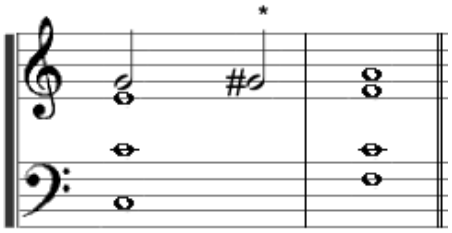

Fig. 103

During this period all *augmented* and *diminished* intervals were considered dissonant (A4, d5, A5, d8, A2, d7, etc.).

Finally there is the enigma of the minor third, which is treated as a "consonance." The minor third above a bass tone "disagrees" with the overtone series of the lower tone in the same way as that described for the perfect fourth. However, the minor third became an acceptable consonance which required no resolution.

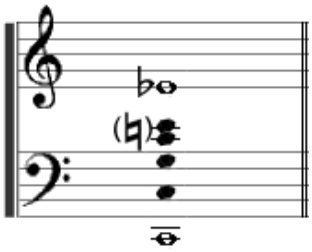

Fig. 104

During the 16th century conservative composers like Palestrina were reluctant to end a composition on this "dissonance." This probably accounts for the *tierce de Picardie* (Picardy third), the practice of ending a composition in a minor mode upon a major triad. Hindemith, among others, believes that we accept the minor third as consonance because we perceive it as a "darker" version of the natural overtone.

Triads: Root Position and Inversions

The first six notes of the natural overtone series produce a composite sound that we call the *major third.* This basic sonority became the pattern for the system of triadic harmony, that is, the construction of chords out of superimposed thirds.

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Sonorities that contain three different tones in superimposed thirds are called *triads*; those chords of four or more tones are named for the largest interval they contain.

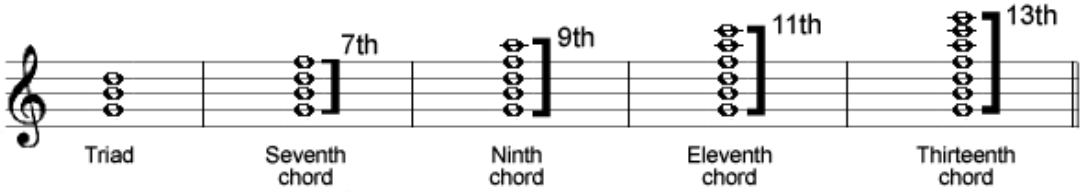


Fig. 105

Since the spaces between tones vary, constructing triads on different tones of the scale will produce thirds of different types.

Four basic triad types are generally recognized and have been given convenient labels: major, minor, diminished, and augmented.

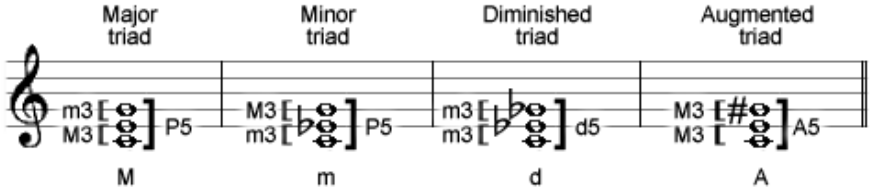


Fig. 106

The *major* and *minor* triads are consonant; they contain major and minor thirds and a perfect fifth. The *diminished* and *augmented* triads are dissonant, since they contain the intervals of diminished and augmented fifths, as well as thirds.

The members of the triads are named as follows:

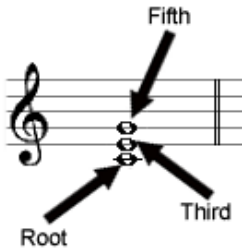


Fig. 107

You should practice constructing all of the triad types on different pitches. The triad is in *root position* when the root of the triad is the bass, or lowest-sounding tone. Triads may be *inverted* by placing the lowest-sounding tone an octave higher. The *first inversion*has the third of the chord as the bass, or lowest tone; the *second inversion* has the fifth as the bass.

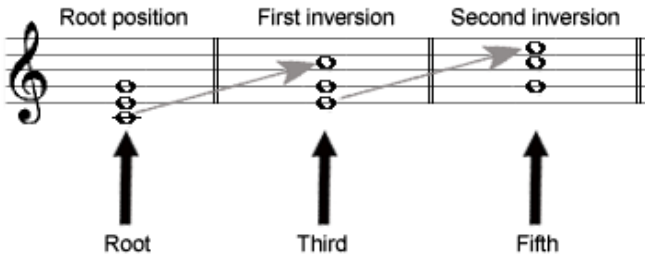


Fig. 108

Seventh Chords and Larger Structures

Early contrapuntal music used consonant triads as the basis for its harmonic material; these sonorities were elaborated by certain dissonant nonharmonic tones.

After 1600 some nonharmonic devices, such as passing tones and suspensions, began to be incorporated into the basic sonorities as chord members.

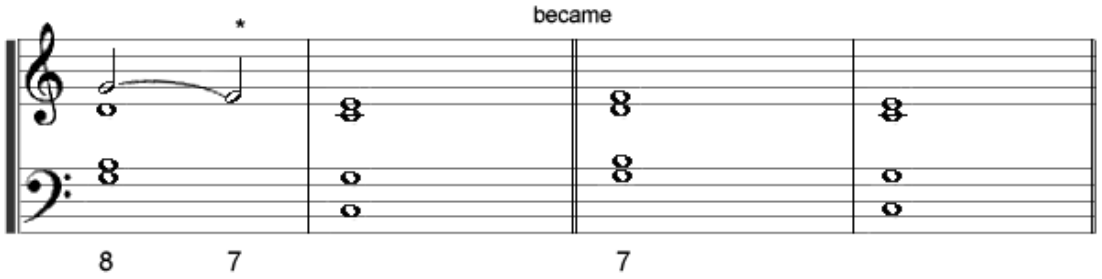


Fig. 109a

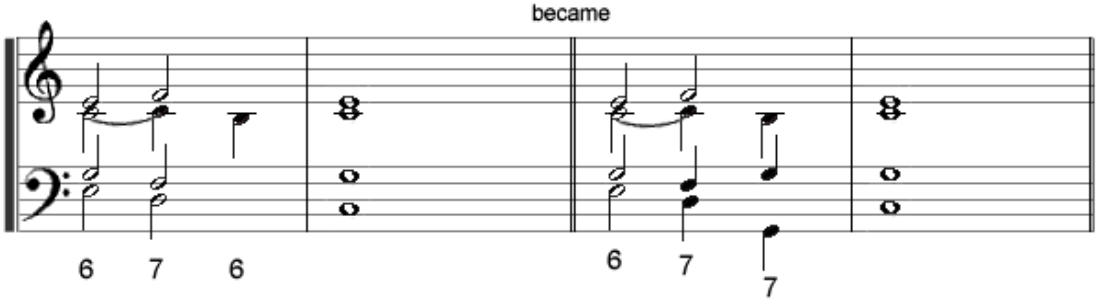


Fig. 109b

This resulted in the recognition of dissonant *seventh* (7th) chords, as independent harmonies, though still requiring resolution of the dissonant member. There are several different types of seventh chords, depending upon which scale degree is the root of the chord. These may be labeled or symbolized with two letters, the first indicating the type of triad, the second type indicating the type of seventh (see Chapter 4); if the two letters are the same, only one is used.

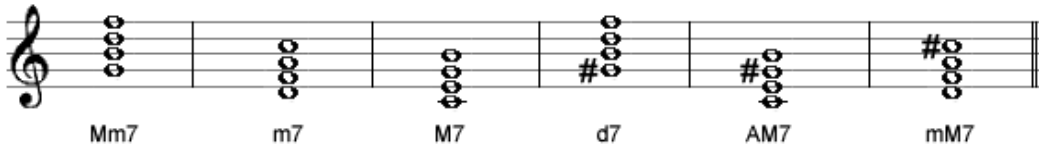


Fig. 110

The 19th century composers continued the process of superimposing thirds; this resulted in *ninth* chords and, late in the romantic period, *eleventh* and *thirteenth* chords. The names are derived from the largest interval in the chord and, like the seventh chords, several types are possible.

There is no universally accepted system for symbolizing all of the possible types, but those constructed on V, II, and I are the most used. It is, of course, possible to chromatically alter members of these chords.

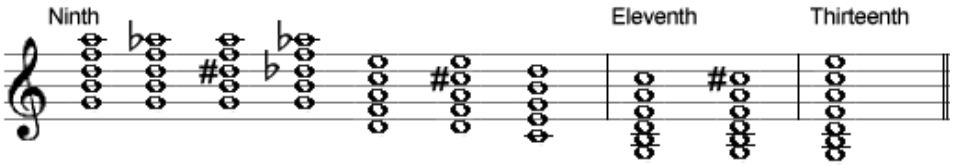


Fig. 111

When these larger chords are used in piano or orchestral music, it is possible to have them complete, but when they are used in four-part vocal texture certain less important tones have to be omitted. These larger chords are most common in root position; inversions occur less frequently. In four-voice texture the following are common distributions:

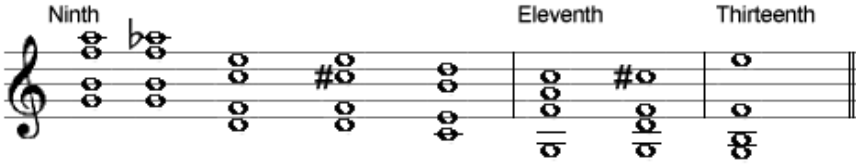


Fig. 112

Other Chord Structures

Late romantic and contemporary composers experimented with other kinds of chord structures, that is, harmonies were constructed by superimposing other intervals than thirds.

At the beginning of this century Scriabin used a *mystic chord* constructed from various kinds of fourths as the basis for his symphonic poem *Prometheus* and for other compositions.

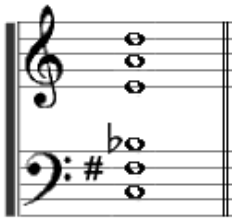


Fig. 113

It is clear from the sound that the notation in fourths (both augmented and diminished) is misleading; this chord sounds like one of the larger dominant chords with lowered fifth.

When the chord is constructed all of perfect fourths, the effect is quite different; fourth chords may contain from three to six or more tones.

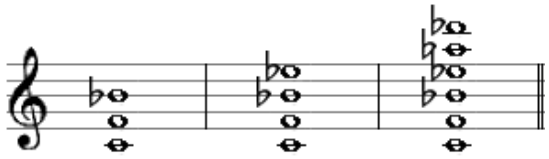


Fig. 114

Somewhat similar in sound are chords built in perfect fifths (the inversion of fourths).

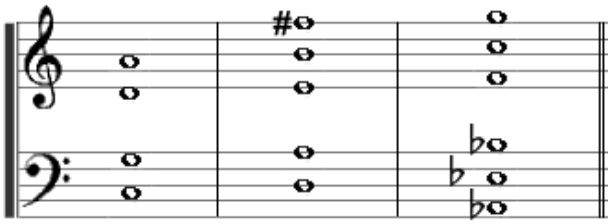


Fig. 115

Composers from Debussy to Hindemith have frequently made use of chords built of perfect fourths or fifths, usually intergrating them into a style that is still fundamentally triadic and tonal. These chords, like all other chords that are built of equal intervals (ex. augmented triads and diminished seventh chords) have a certain sameness of sonority that quickly leads to monotony unless they are used along with each other, less symmetrical chord types.

Since they are all built of equal intervals, they sound rootless; or to be more accurate, when the isolated chord does not have a strong acoustical root, the apparent root must be determined by the use in the musical context.

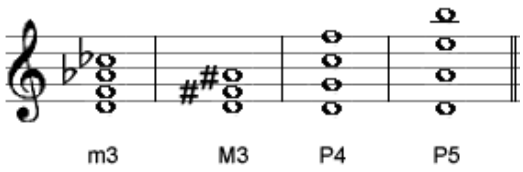


Fig. 116

The only interval left from which symmetrical chord structures might be built is the second. This produces what are generally called *tone clusters*. Henry Cowell, among others, has made tone clusters of different sizes a feature of his piano music. These are frequently notated with a bar connecting the extremes of the intended chord and are played with the fingers, hand, or arm.

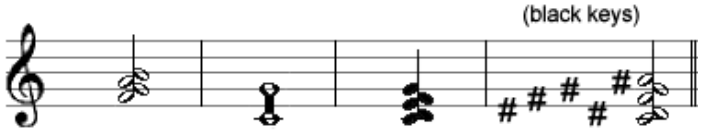


Fig. 117

On the piano, because of the construction of the keyboard, some seconds will be major and some minor, if just the white keys are

used; in the orchestra, tone clusters can be written using all major or all minor seconds.

In the history of music, far more often than the symmetrical chord types just discussed, composers have used sonorities built of a combination of different intervals. While any conceivable combination might occur, for purposes of categorization, it is convenient to relate sonorities, to some already designated type. This has led to a concept of *added tones,* that is, notes added to a conventional triad, seventh, or fourth chord.

Popular music and jazz use the added sixth to both the major and minor triads, without changing the basic chord function, and Debussy was fond of the added sixth and ninths.

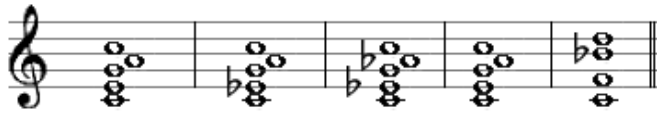


Fig. 118

The practice of adding tones has finally led to the superimposing of one chord upon another. Stravinsky and others have frequently opposed tonic and dominant formations.

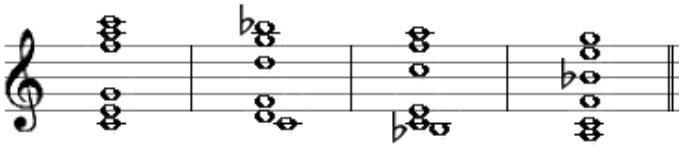


Fig. 119

These bichordal combinations have frequently led to what is called *bitonality,* that is, the suggestion of two keys. This term must be interpreted loosely to cover not only two "keys" but also the superimposing of various chord types.

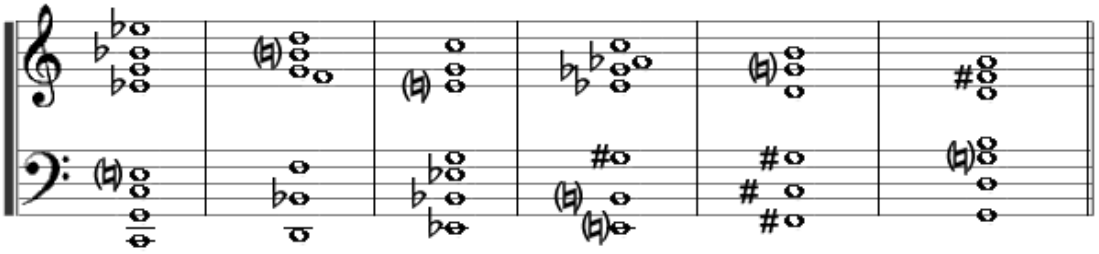


Fig. 120

You must study examples from musical literature to see how composers have used the various sonority types that have been shown here. To see how composers in different periods used these chords is to undertake a detailed study of musical style. However, as a very general principle, you could say that the more complex, colorful, and dissonant chords -seventh, ninth, fourth chords, added tones, etc. - have, throughout the tonal period, often been used as more intense substitutes for the simple, functional triads.

Chapter 4: Symbolization

Basic Symbols and Definitions

Music theory has developed a symbolization that is particularly useful in discussing, or analyzing, music in the absence of staff notation. While the details of this vary from one theory book to another, the following seem to be the most useful concepts that have the greatest agreement.

Letters are often used to symbolize the quality of intervals and chords.

- M - major
- m - minor
- A - augmented
- d - diminished
- P - perfect

These qualitative symbols may be combined with the quantitative numbers to indicate intervals: P5, A4, m6, M3, d5, and so on.

The first four letters (M, m, A, d) may also be used to abbreviate triad types.

To describe the sonority of seventh chords two terms are used; the first refers to the type of triad, the second to the kind of seventh. When two like letters occur they are combined.

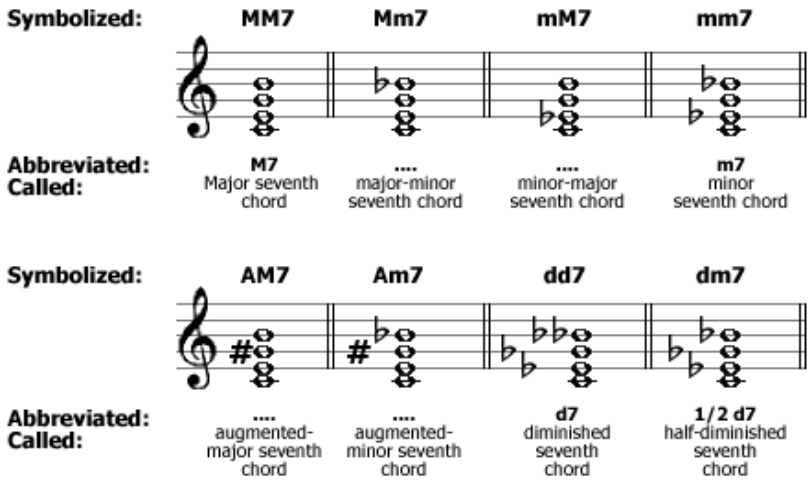


Fig. 121

Names of Scale Degrees and Chords

Scale degrees, and the chords constructed upon them, are frequently identified by names and numbers. Arabic numbers are used to identify scale degrees, which are the same in both major and minor, with the exception of those for the seventh degree; the unaltered seventh degree of the natural minor scale is sometimes called the *subtonic*, while the raised seventh degree is called the *leading tone*, as in the major scale.

Take a look at this:

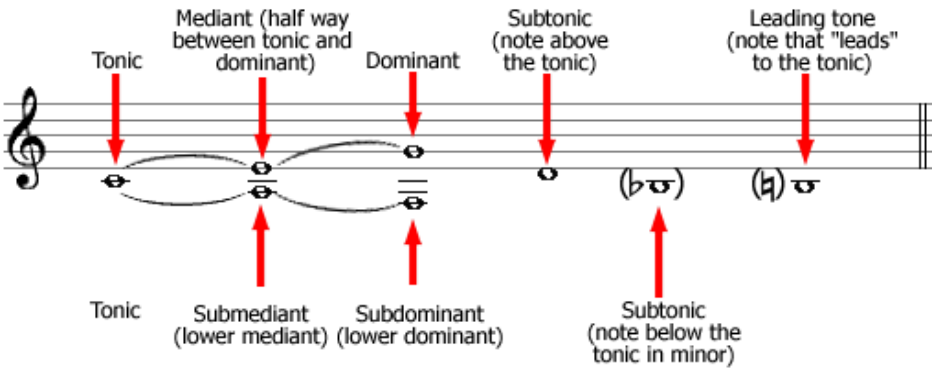


Fig. 122

These names also apply to the chords constructed upon these scale degrees. Roman numerals are used to symbolize these chords. We'll get deeper into this in a moment.

Figured Bass

In the early baroque period a system of musical shorthand was developed to make the writing of keyboard parts easier. The usual practice was to write out the bass line and to place, above or below it, arabic numerals indicating the harmonies.

The actual keyboard part, or *continuo* as it was called, was then improvised by the player from this guide. While practices have differed slightly in diferent periods, the general principles are clear and have become fairly well standardized. You should keep in mind that this type of symbolization is usually predicated upon the performer's seeing the bass note; the exception to this, where figured bass numerals are combined with the roman numeral chord symbol for the purpose of analysis, is discussed below.

In the practice of figured bass, arabic numerals show the intervals sounding above a given bass part. Simple, rather than compound, intervals are used, since there is no attempt to show in which voice a particular interval occurs nor the precise octave in which it sounds. Exceptions: 9-8 may be used instead of 2-1, and 7-8-9 rather than 7-1-2. For simultaneous sounding tones the figures are arranged vertically, with the largest figure at the top. Certain abbreviations have become well established; you should use these rather than the complete figuration, unless some ambiguity would result.

The customary abbreviations are these:

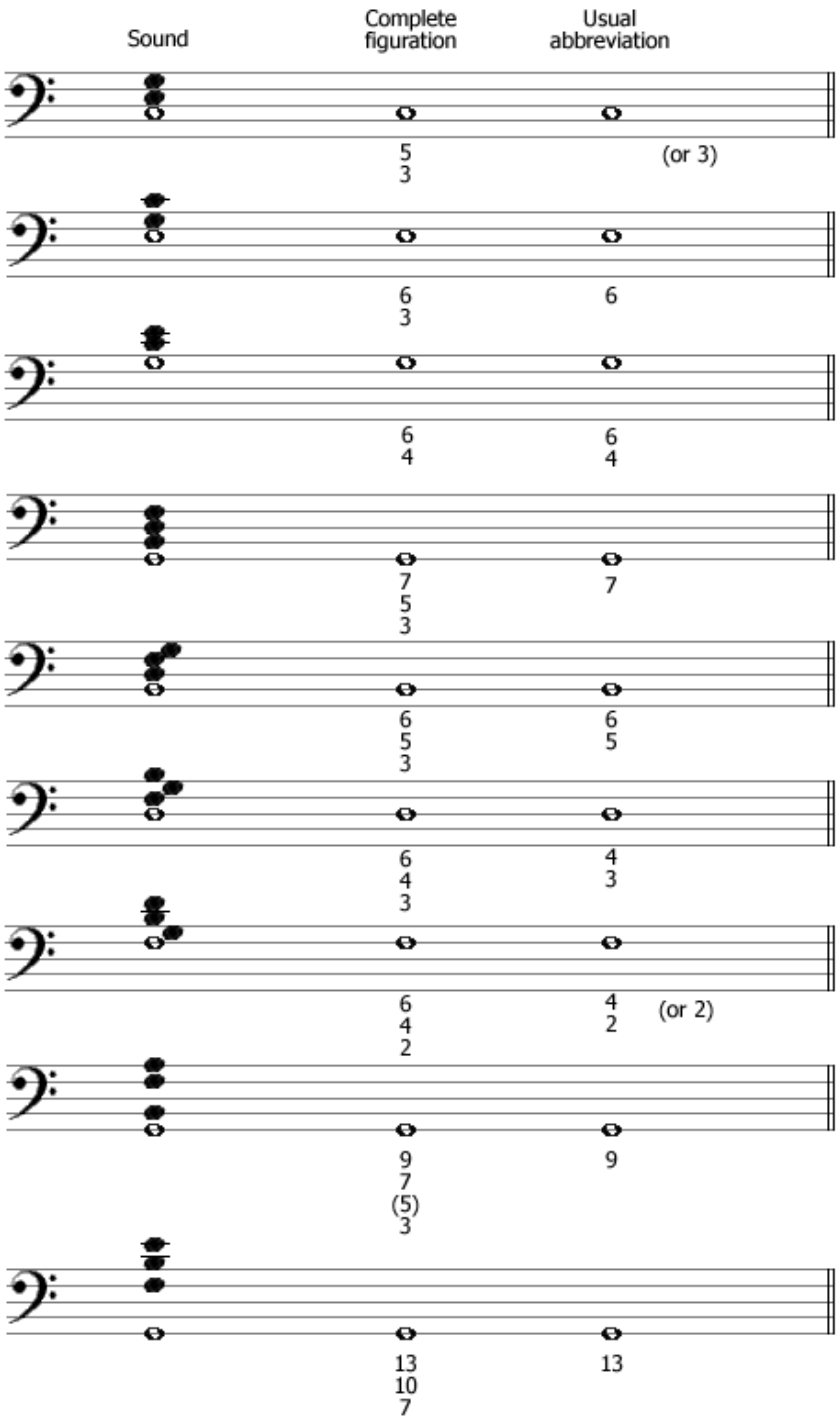


Fig. 123

Alterations from the printed key signature are indicated by placing the appropriate accidental before the arabic numeral.

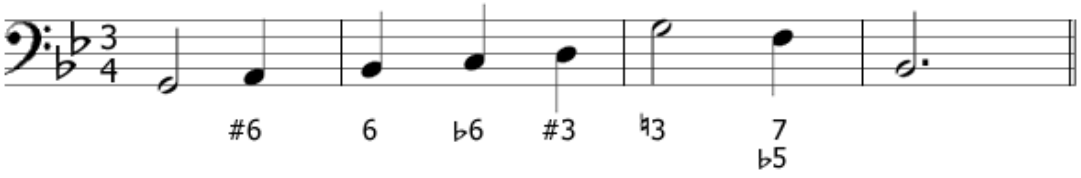


Fig. 124

Two abbreviations of this principle have been sanctioned by long usage. They are:

1. An accidental that is not followed by a figure refers to the third above the bass note. The previous example might also have been written:

(from Fig. 124)

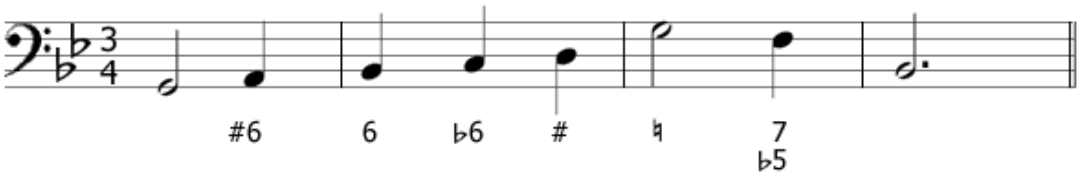


Fig. 125

2. A diagonal stroke placed through a figure, from upper right to lower left, may be used to indicate an intervals that is raised a chromatic half step. The previous example could also be written:

(from Fig. 125)

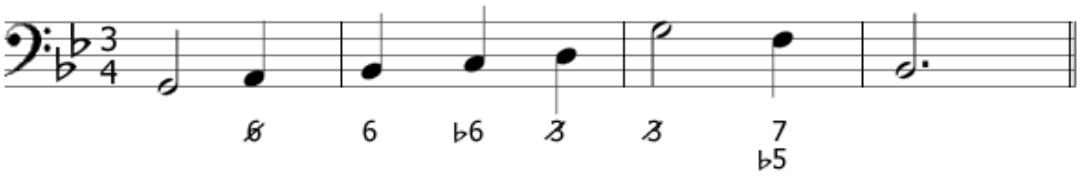


Fig. 126

Melodic motion in upper parts should be shown by the figures. While no attempt is made to show exact rhythmic values, the figures should show the relative position of the upper parts by spacing and vertical alignment.

A dash is used to show that a tone is held or repeated. For example:

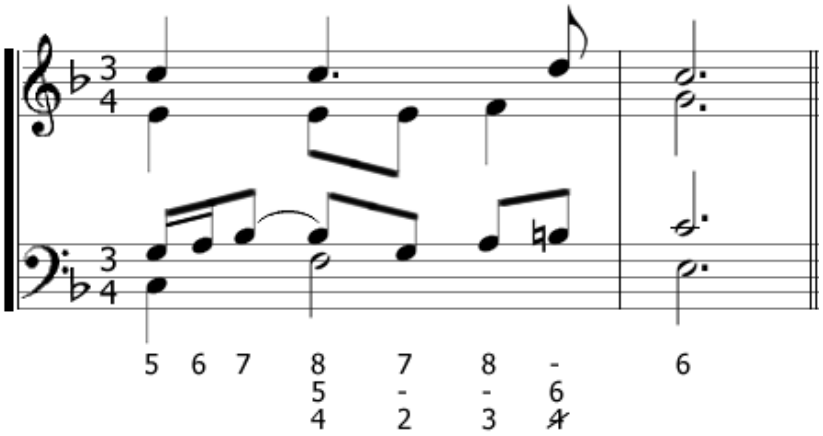


Fig. 127

To avoid confusion with a root-position chord, a nonharmonic tone that occurs in the bass voice should be figured, or the continuation of the previous chord indicated by dashes.

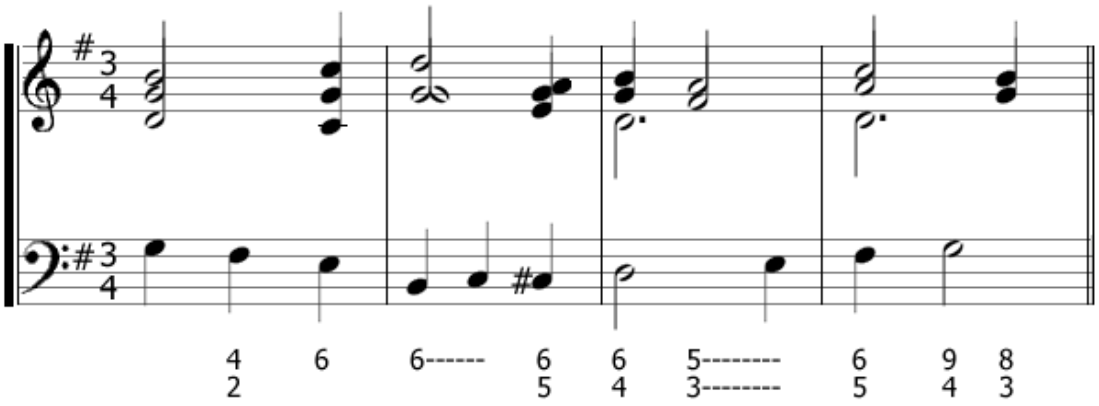


Fig. 128

Roman Numeral Chord Symbols: Functional Harmony

In the early nineteenth century, German theorists began to use roman numerals to symbolize functional harmony; that is, in conventional tonality, the function of a tonic or a dominant chord was symbolized by I or V.

Two kinds of systems developed. One utilized large roman numerals, representing the scale degree upon which the chord was built, for all triad types in both major and minor keys.

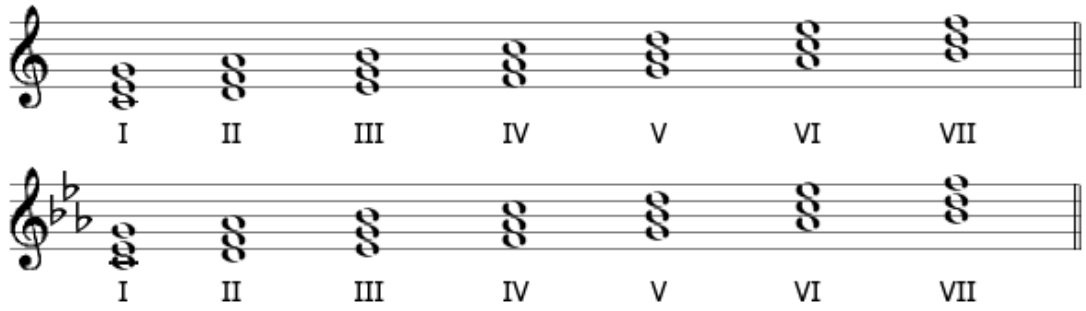


Fig. 129

The other system utilized separate symbols for each triad type. For example, the major, minor, diminished, and augmented triads were symbolized by large numerals, small numerals, small numerals with a circle, and large numerals with a cross, respectively.

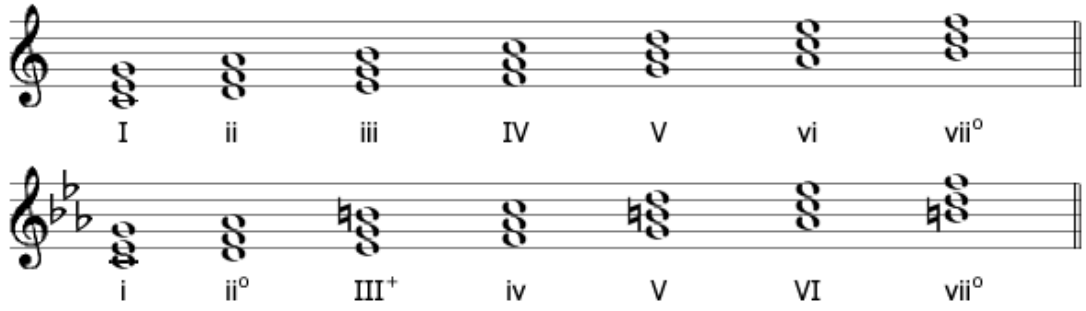


Fig. 130

While some theory books still use the latter system, it is not recommended, since no real advantage is afforded by using different symbols for the four triad types, and this system becomes unwieldy when it is extended to chromatically altered seventh and ninth chords.

Since scale degrees are numbered in relation to a tonic, this point of reference must first be established. Some theorists write out the

name of the major or minor key, but we will use the following symbols:

- capital letters will represent major keys
- lower-case letters will indicate minor keys

If the keynote is an altered tone, the accidental will follow the letter. A colon is placed after the key indication.

- C - Key of C major
- c - Key of C minor
- Bb - Key of B flat major
- f# - Key of F sharp minor

The addition of a 7 to the upper right of the roman numeral adds that diatonic interval to the diatonic triad. A similar symbolization may be used for ninth, eleventh, and thirteenth chords.

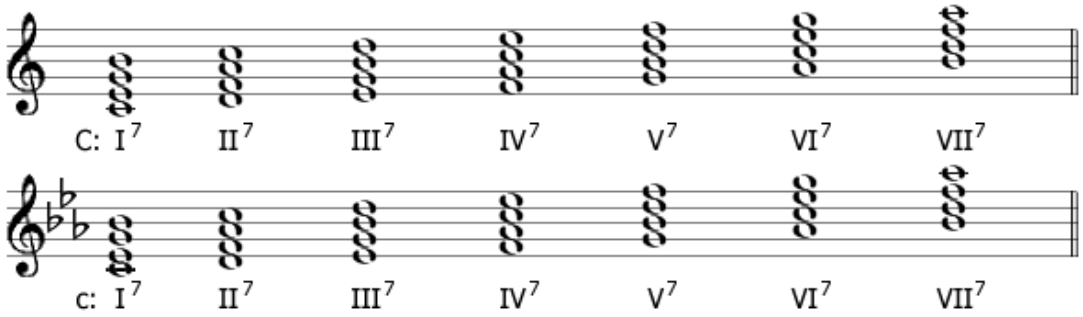


Fig. 131

Some theory books advocate called VII and VII^{7} "incomplete dominant seventh and ninth chords" (V^{0}_{7} and V^{0}_{9}), because these chords on the leading tone frequently resolve to the tonic, as the dominant chords do. Since this leads to unnecessary speculation about "missing" chord members, we will symbolize these with VII and VII^{7}, in the same manner as all other chords.

The exact inversion of a triad or seventh chord may be shown by combining the correct figures from figured bass with the roman numeral. These are placed to the right of the roman numeral, beginning with the largest figure at the upper right corner and continuing downward.

I^{6} II^{6}_{4} V^{4}_{3} $V^{6}_{4}_{2}$

Any alteration, different from the diatonic version of the chord, also can be shown by the chord symbol. While many special systems have been devised to show alterations, these systems are superfluous, since we already have the well-established system of figured bass (as learned earlier). Exactly the same accidentals and figures used in figured bass are combined with the roman numeral. However, to avoid any confusion, it is recommended that an accidental not be used alone, but should always be followed by the figure 3; the use of the diagonal stroke (/) is *not* recommended here. Alterations to the third, fifth, or seventh of a *root position* chord would be indicated:

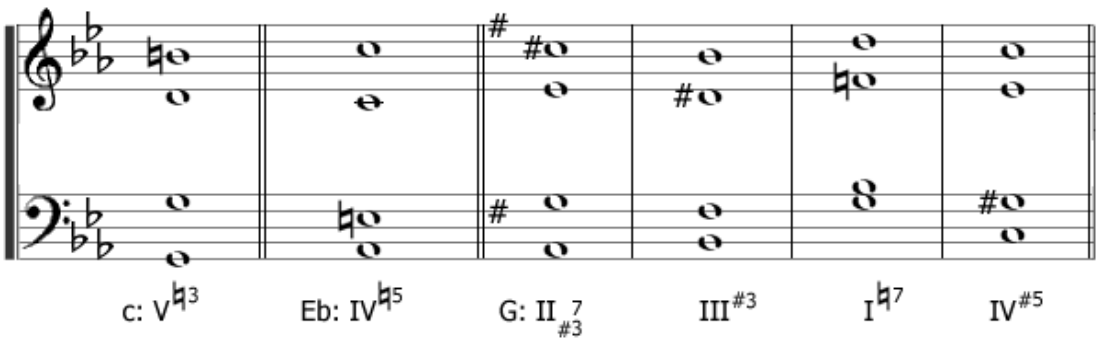


Fig. 132

If the root of a root position chord is altered, this is shown by placing the proper accidental *before* the roman numeral.

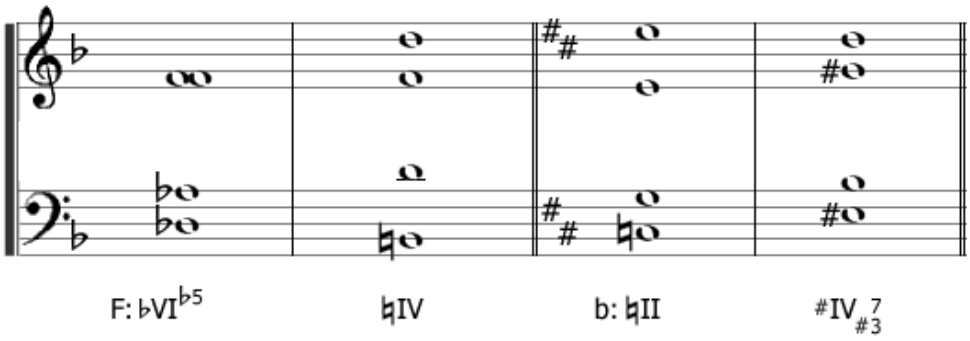


Fig. 133

If a chord occurs in an inversion, the same arabic figuration used for figured bass will be added to the roman numeral. Note the fourth chord below; if the root is altered but the chord is inverted, the accidental will not preced the roman numeral as in root position, but will precede the proper figure.

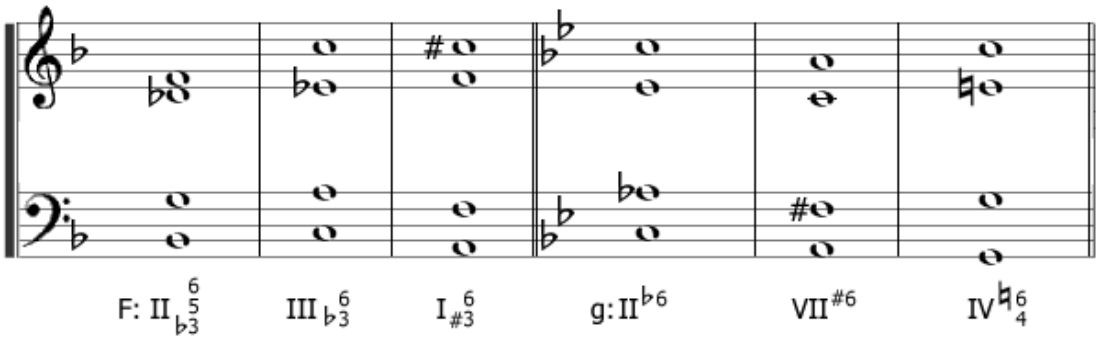


Fig. 134

When the bass note of an *inverted* chord is altered with an accidental this may be shown with the figure 1.

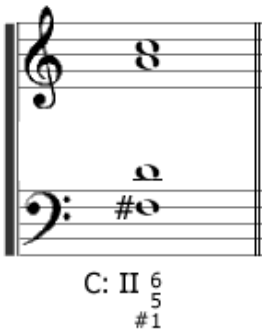


Fig. 135

This takes care of all of the usual alterations with a key; however, certain additional problems in harmonic symbolization occur when a "new key" is established - that is, when a *modulation* takes place. The concept of modulation, as the process of changing key, is discussed later. The actual *symbolization* is discussed here.

When a common-chord modulation takes place, the chord (or sometimes chords) that is common to both keys, called the *pivot* chord, is given a dual analysis; one shows how the chord is approached in the old key and the other how it is left in the new key.

The roman numeral symbols for the new key should be placed on a different level. A difficulty arises in symbolizing those tones in

the new key which are "diatonic" or unaltered, in that key, but which require accidentals because the old key signature is still in effect. For example:

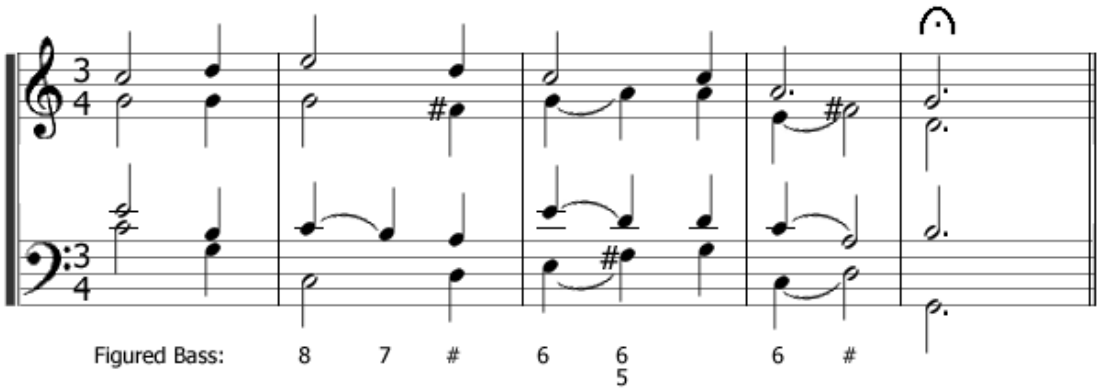


Fig. 136

Most theory books would analyze the above phrases as beginning in the key of C major, and modulating to the key of G major (the dominant). The roman numerals would be:

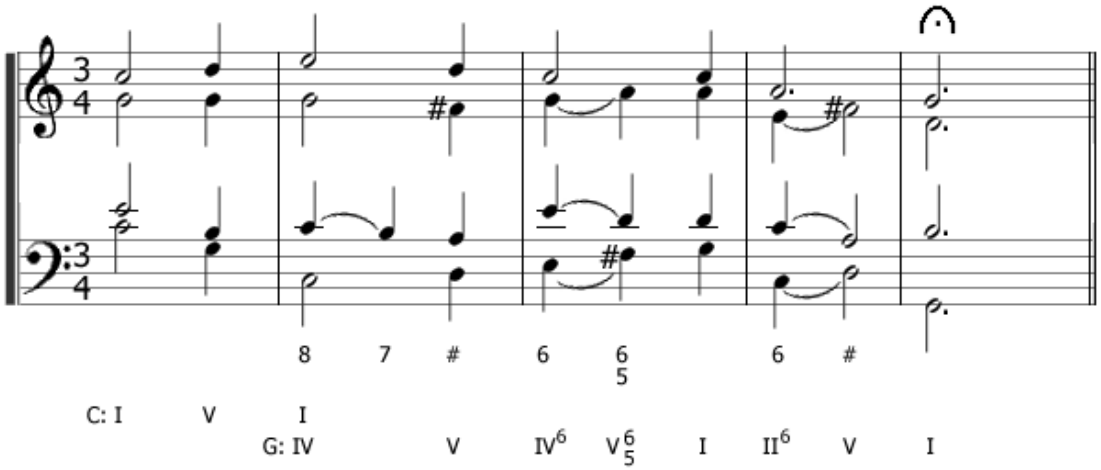


Fig. 137

In terms of these symbols the entire process looks "diatonic," that is, the symbols show no alteration. The figured bass symbols are more realistic; they show that, in relation tot he basic key, some alteration has taken place. Therefore, in keeping with our basic premise that the figures and accidentals from figured bass be combined with the roman numeral symbol in order to show the inversions and alterations, we recommend the following:

When a modulation takes place, the roman numeral symbol will show all alterations that occur in relation to the printed key signature. The phrase would then be analyzed as follows:

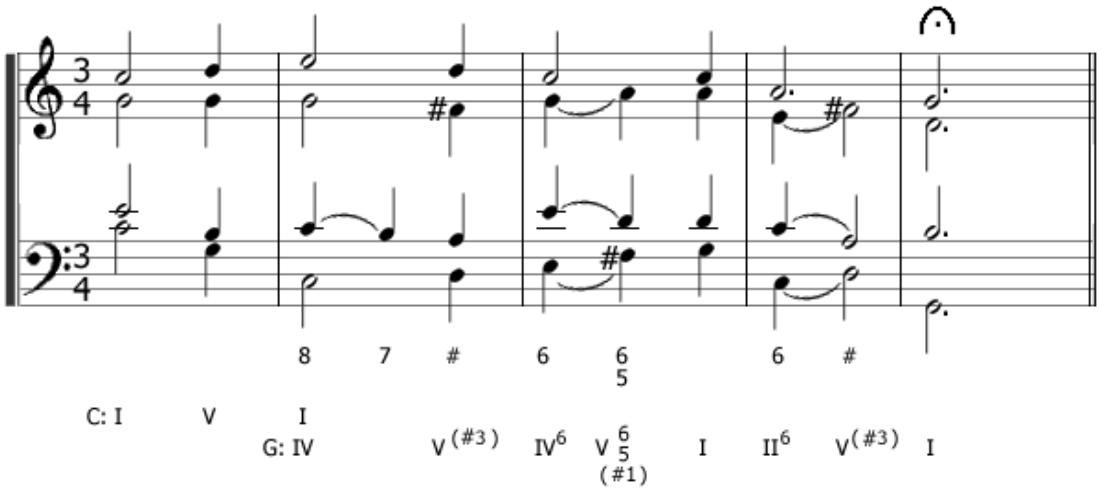


Fig. 138

For additional clarity, the chromatically altered tones that would be "diatonic" in the new key are placed in parentheses. This analysis keeps the focus upon the original key by enumerating those alterations which are necessary to emphasize the new, temporary tonal center.

In a chromatic or direct modulation, the symbolization of a pivot chord is often dispensed with in favor of going directly to the new key. While it is always possible to show a pivot-chord analysis in both keys, sometimes the connection is not strongly functional, or is obscure, and it is better to omit it. For example:

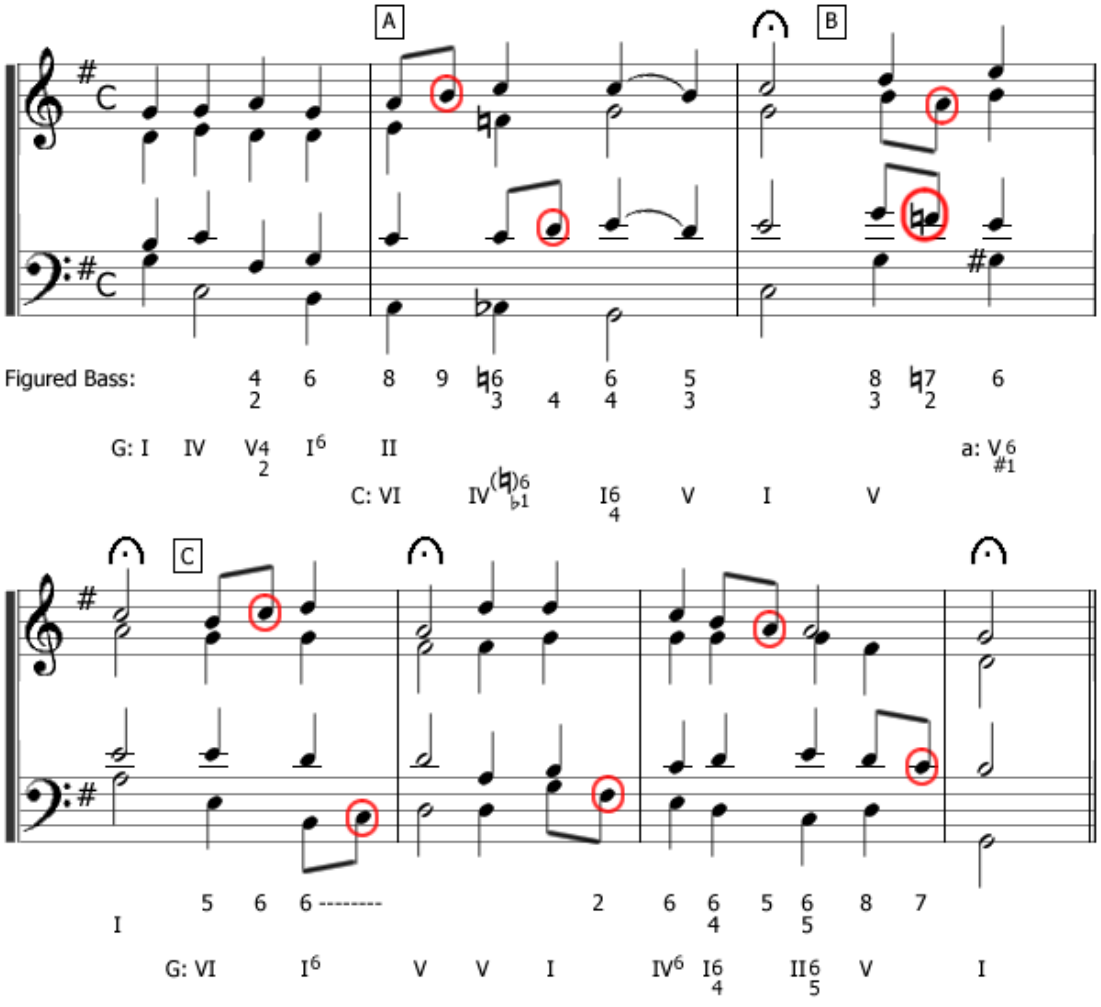


Fig. 139

At (A) the pivot chord is given a dual analysis, since II and VI are both functional, and the chromatic motion produces an altered chord (minor subdominant chord) in the new key of C major. For the chromatic modulation at (B) no common chord is shown, since the first chord still functions as V of C, while the second chord is the V with raised leading tone in A minor. The first chord could be called a natural VII in A minor, but this is not especially meaningful in the minor key. Also, in the direct modulation at (C) the dual symbolization of the first chord is dropped in favor of beginning the phrase directly in the new key of G major. The first chord at (C) could be called a natural V in A minor, but again, this is more theoretical than strongly functional.

The symbols derived from figured bass and the roman numerals are especially useful when, in the absence of the staff notation, one must analyze music or discuss musical concepts.

Chord Symbols In Popular Music and Jazz

Popular songs and jazz arrangements frequently supplement the staff notation by the addition of chord symbols placed over the melody; these are usually associated with the guitar or piano parts, or the sheet-music editions for voice and piano.

While there are small differences between particular publishers, the general principles of the symbolization are clear.

Letter names (followed by an accidental, where appropriate) signify a major triad built upon that root, regardless of any printed key signature. The notation is completely enharmonic, but for major triads flats are more common than sharps.

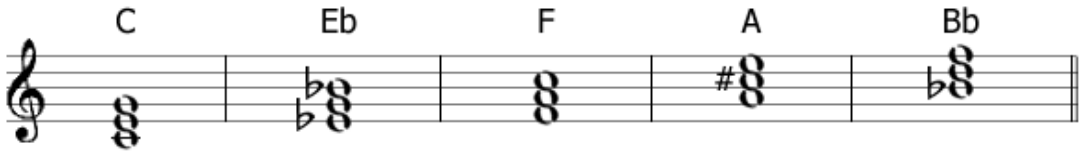


Fig. 140

Minor, augmented, and diminished chords are shown by the letter name of the chord root plus one of the following abbreviations:

- m, mi, or min - minor triad
- + or aug - augmented triad
- dim - diminished seventh chord (the diminished triad is not used)

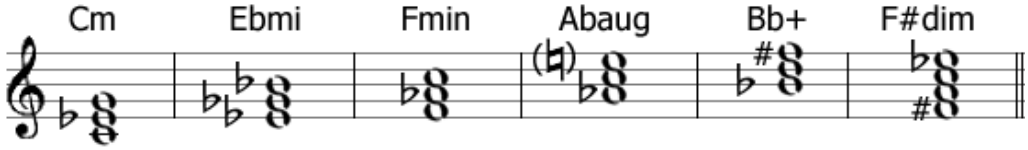


Fig. 141

Jazz harmony often is consistently four part, that is, in place of a triad the chord of the *added sixth* will be used. The major sixth is added to either the major or minor triad and symbolized by the addition of the figure 6.

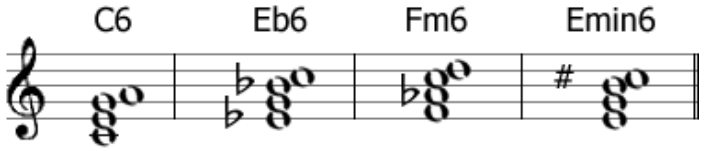


Fig. 142

The addition of the figure 7 adds a *minor seventh* to any of the symbols for triads.

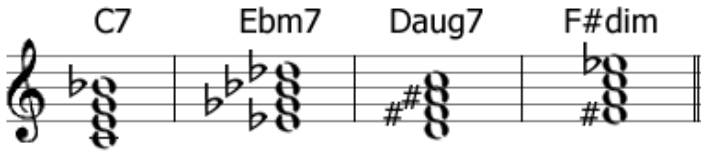


Fig. 143

The addition of the *major seventh* occurs only with the major triad and is symbolized:

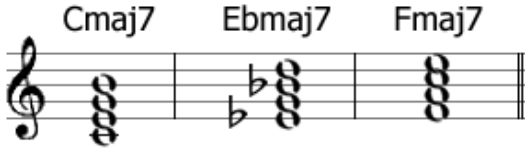


Fig. 144

The alteration of the fifth in the seventh chord is shown by a plus sign (+) for raised and a minus sign (-), or a flat (b) for lowered.

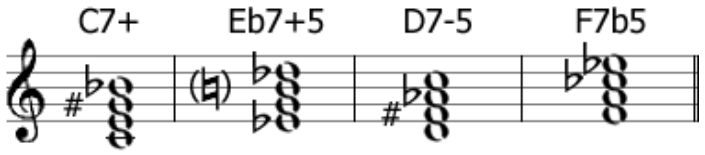


Fig. 145

Ninth chords are either of the dominant or tonic types, with the necessary alterations shown.

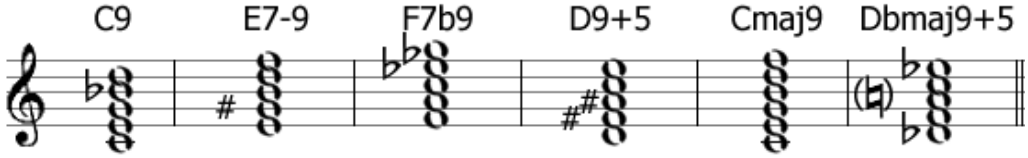


Fig. 146

Occasionally the eleventh or thirteenth is added to the dominant seventh chord, and this is shown by the appropriate figures. Other sonorities, which are not made from superimposed thirds, are shown as *added tones*. For example:

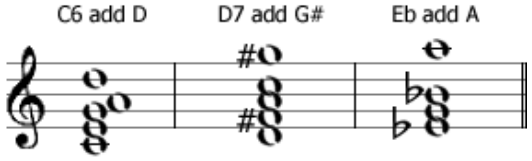


Fig. 147

Usually the bass note for any jazz chord is the root of the chord indicated; when this is not the case, that is, when an inversion is intended, that indication is added to the chord symbol.

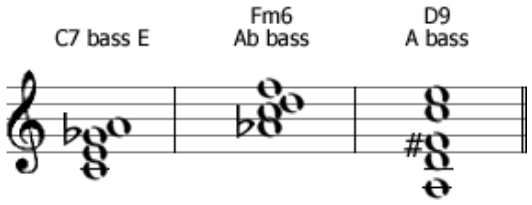


Fig. 148

In some schools an instrument called the autoharp is used to provide a chordal accompaniment for folk songs. Above the melody line for such printed songs, it is usual to indicated the chord for the autoharp; exactly the same chord symbols are used as those just described for jazz, but only simple triads and the dominant seventh chord are possible.

Chapter 5: Expression Marks/Foreign-Language Terms

Tempo

During the baroque period, Italian composers began the practice of using words to supplement staff notation. These words were like rubics, which gave additional clarification to the composer's intent. Since that time these Italian terms have been used in printed music of many countries and have generally been adopted as a kind of international vocabulary concerning music.

The most accurate way to show the *tempo*, or actual rate of speed, of the basic pulsation is to use the metronomic indication that we worked with in Chapter 1 (Meter, Beat, Tempo). These show the number of beats per minute for some basic note value (♩ = 60) means that the quarter note represents the beat and that there are 60 beats per minute (or 1 beat per second).

In addition, there is usually a term to indicate the approximate speed. The following are the most common, arranged from slow to fast.

- *Largo* = Very slow
- *Larghetto* = Not as slow as *largo*
- *Adagio* = Slow
- *Lento* = Slow
- *Moderato* = Moderate
- *Andante* = "Going"- with moderate motion
- *Andantino* = Faster than *andante*
- *Allegretto* = Less fast than *allegro*
- *Allegro* = Moderately fast
- *Vivace* = Vivacious, fast
- *Presto* = Fast
- *Prestissimo* = Very fast

The following terms, arranged alphabetically, represent *changes* in the basic tempo:

- *Accelerando (accel.)* = Accelerating
- *Allargando (allarg.)* = Broadening, slowing down
- *Fermata (𝄐)* = To hold (literally, "stopped")
- *Rallentando (rall.)* = Slowing down
- *Ritardando (ritard./rit.)* = Slowing, or holding back
- *Ritenuto (rit.)* = Held back
- *Rubato* = Freely (literally "robbed")
- *Stringendo (string.)* = Speeding up

Dynamics

Dynamics is not a technique in as much as it is a manner of providing variation and contrast in the sound of your playing. It can create a clear division between one part of the song from another and also provide a powerful punch of emotion. Using dynamics effectively can also help to articulate the importance of silence within music and the inevitable primal scream that often follows.

These terms refer to the dynamic level at which the music is to be played, and are arranged from soft to loud.

- *Pianissimo (pp)* = Very soft
- *Piano (p)* = Soft
- *Mezzo piano (mp)* = Moderately soft
- *Mezzo forte (mf)* = Moderately loud
- *Forte (f)* = Loud
- *Fortissimo (ff)* = Very loud

This scale will occasionally be extended from *ppp* to *fff. Changes* in the dynamic level are indicated by:

- Crescendo (cresc.) = Increasing in volume <
- Decrescendo (decresc.) = Decreasing in volume >
- Diminuendo (dim.) = Diminishing
- Rinforzando (rfz) = Reinforcing
- Sforzando (sfz) = Forcing

Style

The general manner or style in which the music is to be played is indicated by a rather large collection of terms.

These terms to be played are indicated by the following:

- *Animato* = Animated
- *Cantabile* = In a singing style
- *Dolce* = Sweetly
- *Espressivo* = Expressive
- *Grazioso* = Graceful
- *Legato* = Smoothly, connected
- *Maestoso* = Majestic
- *Marcato* = Marked
- *Semplice* = Simply
- *Solo* = One, alone
- *Sostenuto* = Sustained
- *Staccato* = Short, detached
- *Tenuto* = Long, held for full value
- *Tutti* = All, together

The following terms may be used to modify, or further clarify, the basic terms (for example *Allegro assai* = very fast), or give additional directions for performance:

- *Ad libitum (ad lib.)* = At will
- *Assai* = Very
- *Con brio* = With brilliance
- *L'istesso tempo* = Same tempo
- *Meno mosso* = Slower (literally "less moved")
- *Molto* = Very or much
- *Non tanto* = Not so much

- *Non troppo* = Not too much
- *Piu mosso* = Faster (literally "more moved")
- *Poco* = Little
- *Poco a poco* = Little by little
- *Quasi* = Almost or as if
- *Seque* = Follows
- *Sempre* = Always
- *Simile* = Similarly
- *Sotto voice* = Subdued voice
- *Subito* = Suddenly
- *Volta subito* = Turn over quickly

Phrasings and Articulations

Melodies may be performed in different ways, that is, they may be played *legato* (smoothly), *marcato* (marked), *staccato* (detached), and so on. In addition to general terms, there are specific signs used in conjunction with notation to indicate phrasings and articulation. Unfortunately, there is no universal agreement among instrumentalists as to the exact meaning of these signs; a sign may mean something slightly different when used for different instruments (that is, piano, string instruments, or wind instruments). More particular treatment concerned with bowing, tonguing, and so on, must be left to the study of orchestration.

Slurs: Different from a tie, which connects notes of the same pitch, the *slur* is a curved line, placed above or below notes, to indicate they are to be played in a smooth, connected way.

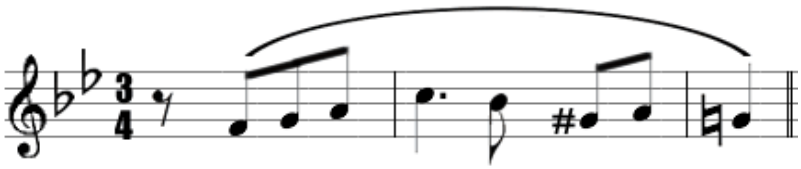


Fig. 149

While such a slur frequently is intended to show a musical phrase, slurs may also be used to show more detailed articulation.

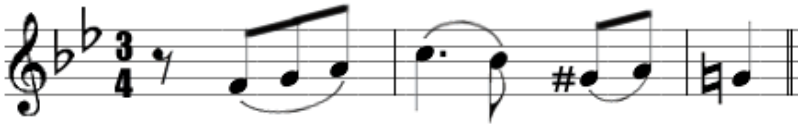


Fig. 150

Dots: A *dot* placed above or below the note head means that the note is to be played short.

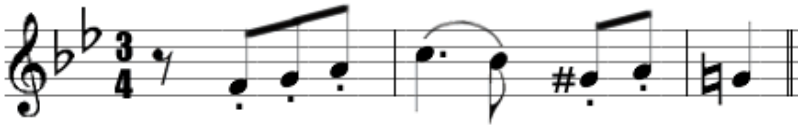


Fig. 151

Dashes: *Dashes* (tenuto marks) indicate that notes are to be played long, that is, they are to be articulated but held for the full value.

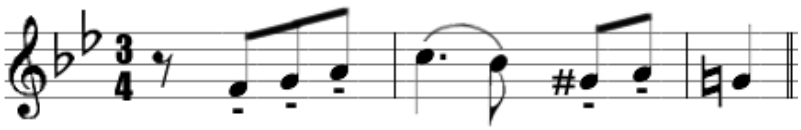


Fig. 152

Accents: Dynamic *accents* are usually indicated by placing the following signs over or under the notes:

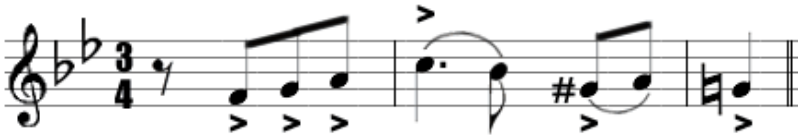


Fig. 153

Wedges: The *wedge* that points up (^) usually indicates a note that is both accented and short. This is customarily not used with a note of long value.

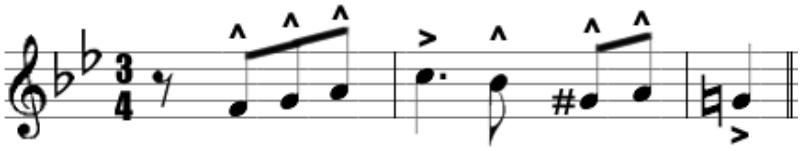


Fig. 154

Combinations: When slurs are found under a slur, the longer slur indicates a musical phrase, while the smaller slurs show the articulation.

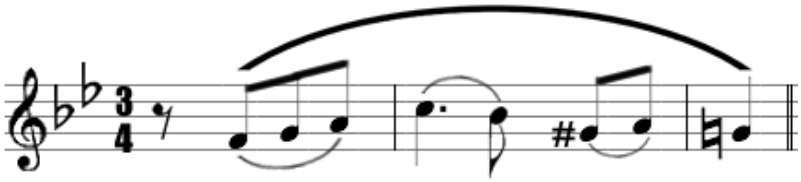


Fig. 155

When dots and dashes are placed under a slur there is less general agreement as to what this means, but usually it indicates a detached or semi-legato style.

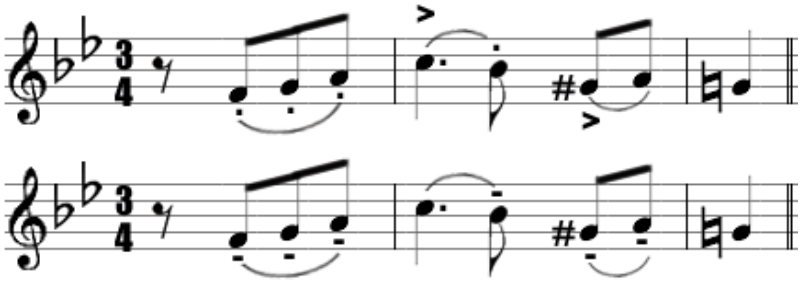


Fig. 156

D.C. and D.S. Abbreviations

D.C. is an abbreviation for *da capo* (from the beginning) and D.S. is an abbreviation for *dal segno* (from the sign), which mean to

repeat the music from the beginning or from this sign: 𝄋 . When the sign 𝄌 is found, it usually means to go to the *coda*, or the closing section of the music.

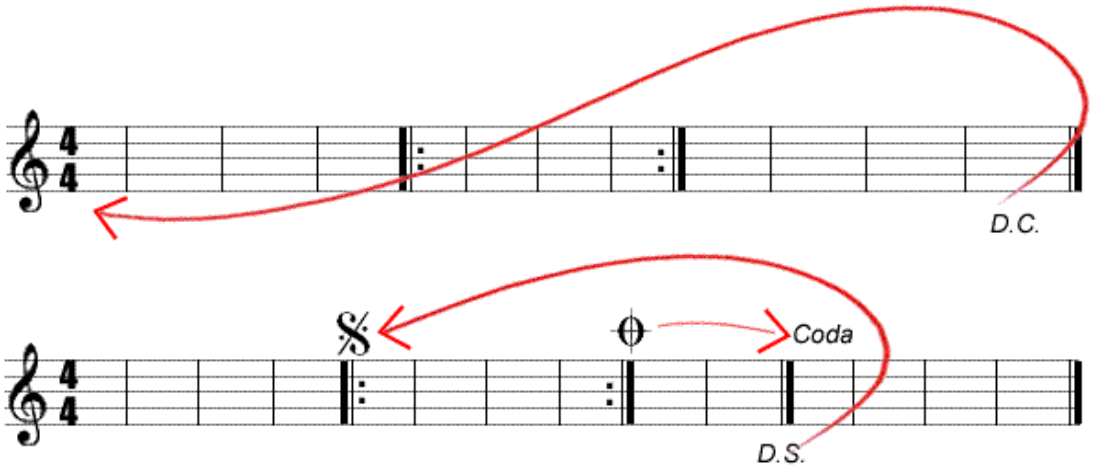


Fig. 157

In making D.C. and D.S. returns, repeat marks within the section are ignored the second time. A repeated measure is shown by this sign:

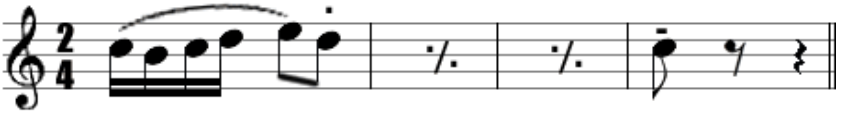


Fig. 158

The repetition of two measures may be indicated:

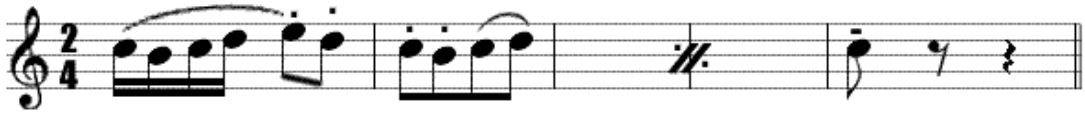


Fig. 159

Repeated figures within the bar may be shown by diagonal slashes, the number of strokes equaling the number of note beams.

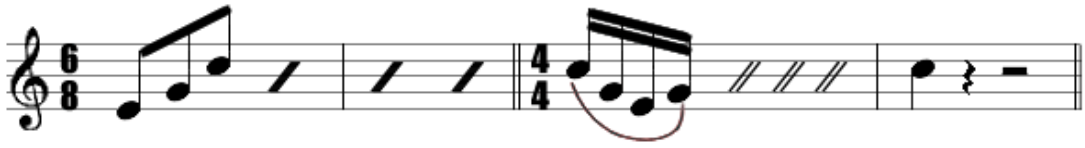


Fig. 160

A long note value may be broken up into eighth, sixteenth or thirty-second notes by the proper number of slashes above the note or through the stem; the value of the longer note is played in eighths and sixteenths, and so on.

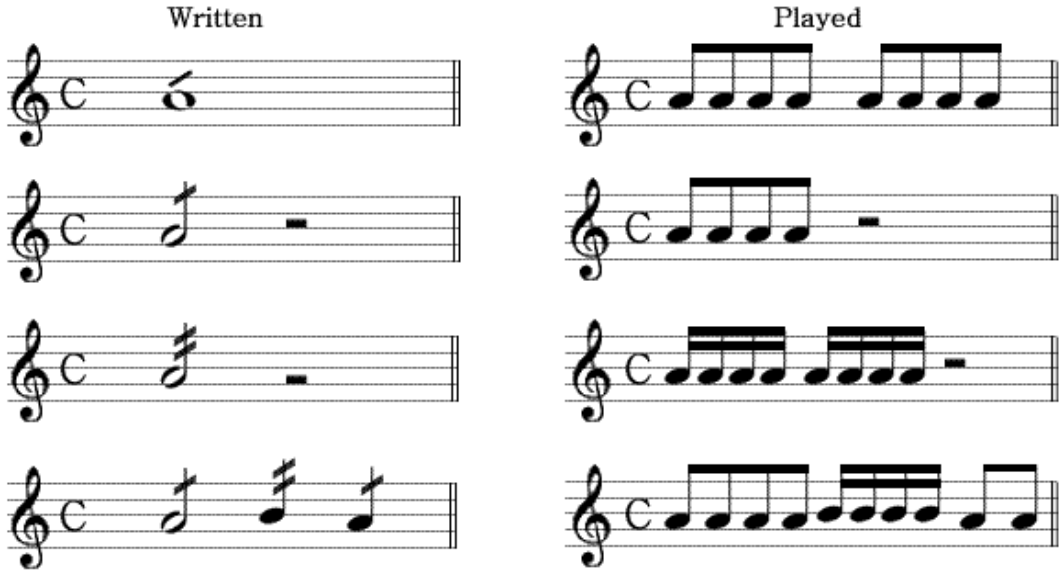


Fig. 161

If an unmeasured tremolo is desired, four slashes should be used:

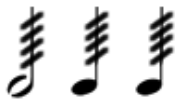


Fig. 162

An unmeasured legato tremolo or trill between two pitches may be indicated similarly, but notice that each pitch is written with the whole value of its group.

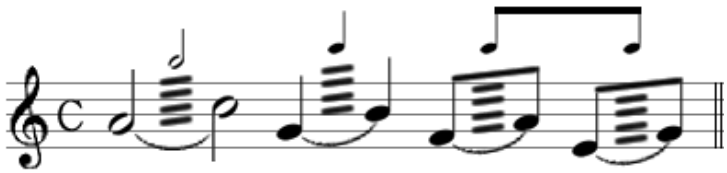


Fig. 163

Foreign Names For Scale Degrees and Keys

In foreign publications of music, scale degrees and keys often appear, particularly in titles of compositions, in the language of the country.

English		Italian	French	German
C	(C)	do	ut	C
C sharp	(C#)	do diesis	ut dièse	Cis
D flat	(Db)	re bemolle	ré bémol	Des
D	(D)	re	ré	D
D sharp	(D#)	re diesis	ré dièse	Dis
E flat	(Eb)	mi bemolle	mi bémol	Es
E	(E)	mi	mi	E
E sharp	(E#)	mi diesis	mi dièse	Eis
F flat	(Fb)	fa bemolle	fa bémol	Fes
F	(F)	fa	fa	F
F sharp	(F#)	fa diesis	fa dièse	Fis
G flat	(Gb)	sol bemolle	sol bémol	Ges
G	(G)	sol	sol	G
G sharp	(G#)	sol diesis	sol dièse	Gis
A flat	(Ab)	la bemolle	la bémol	As
A	(A)	la	la	A
A sharp	(A#)	la diesis	la dièse	Ais
B flat	(Bb)	si bemolle	si bémol	B
B	(B)	si	si	H
B sharp	(B#)	si diesis	si dièse	His
C flat	(Cb)	do bemolle	ut bémol	Ces

Fig. 164

Names Of Keys

English: major | Italian: maggiore | French: majeur | German: dur
English: minor | Italian: minore | French: mineur | German: moll

Fig. 165

Chapter 6: Tonality

Tonality and Key Feeling

The term *tonality* has two generally accepted definitions: (1) in its most general use it simply means music which has a tonic, that is, music which exhibits an organizational affinity for an all-important center, or *keynote;* (2) in its more specific and narrow sense it means a tonal organization synonymous with the major-minor key system of the eighteenth and nineteenth centures.

We will discuss the more general use of the term first, since all music, whatever its period or style, has a tonic, with the possible exception of some recent atonal music, which purposely attempts to avoid this.

Tonality

In order to abstract meaning out of complexity, the human mind seeks some form of simplification. The history of Western music shows several instances in which the mind chooses a single a tone to represent a *klang,* or collection, of many different sounds. The *root* of an interval, or complex chord, the *finalis* of a mode, the *tonic* of a key, or the *fundamental* of the natural overtone series, these all exhibit the same hierarchical principle in which we seek to single out one all-important element to represent several others.

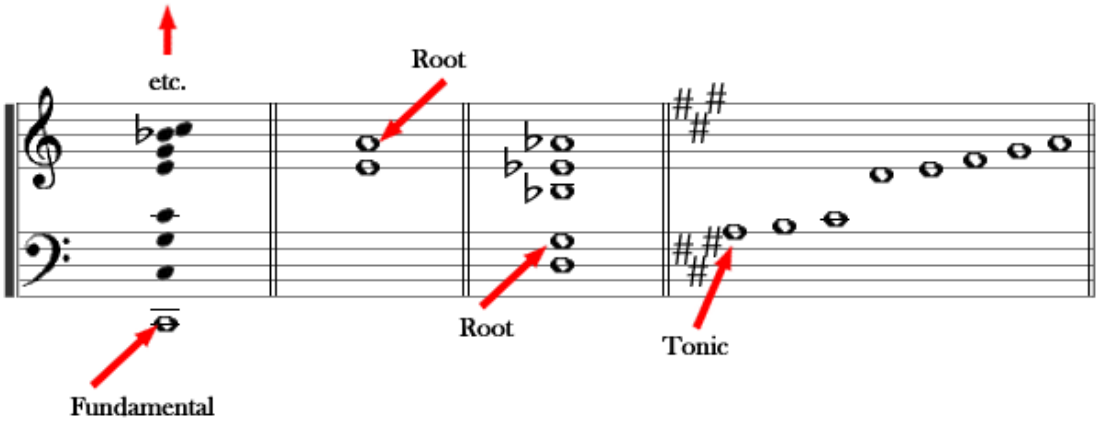


Fig. 166

In all of these cases, where two or more different tones occur, we tend to focus our attention upon the most important tone. In the case of an interval or chord, we say the important tone is the *root;* where more tones are associated, as in the scale or key, we say that the center is the *tonic.*

The basic question then becomes: what prompts us to choose one tone, rather than another, as the root, tonic, or tonal center? Hindemith assigns roots to intervals or chords largely on the basis of acoustical phenomenon, that is, by deciding which tone is best supported by the overtone structure. However, in the case of a key or tonal area, other factors must be considered, particularly the one of *emphasis.* The tonal organization must emphasize, or focus our attention upon, the tonic of the composition.

This emphasis is accomplished by different means in different periods. In monophonic music the tonal center is established by melodic means. This is done largely by circling around a particular tone (neighbor-note motion), that is, the tonic or finalis is reached by a stepwise motion. These formulas of conclusion are called *cadences.*

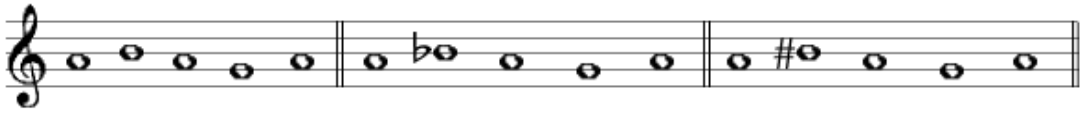


Fig. 167

In early contrapuntal music, each voice reached its goal by melodic means, while the vertical combinations laid the foundation for harmony.

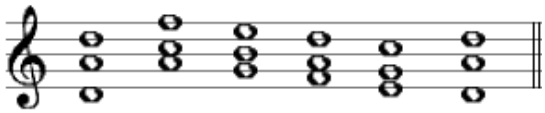


Fig. 168

In the thirteenth and fourteenth centuries this cadential action was intensified by the use of accidentals *(musica ficta*), which made the *leading tone* closer to the note it resolved to. Sometimes the inner part also use an *auxiliary leading tone.*

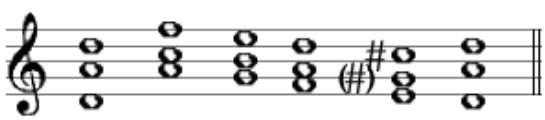


Fig. 169

In a typical 15th century cadence, the crossing of the inner part produces a sonority like the later "dominant" function, while still allowing the two more important outer parts to approach the final by step.

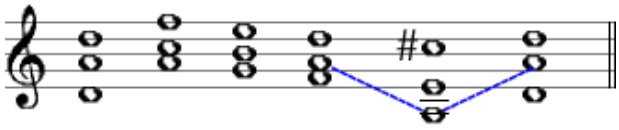


Fig. 170

The reaching of the final note by stepwise motion in both parts is still called *clausula vera (*true cadence) in the 16th century.

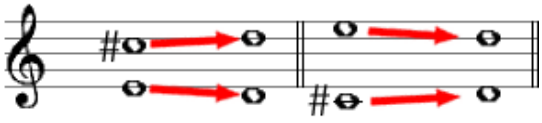


Fig. 171

In certain scalic patterns (the Phrygian mode, for example) the leading tone principle is inverted, that is, one part moves by the interval of a half step down, instead of up.

Fig. 172

With the increase in the number of parts, from two or three to four or more, the individuality of the many separate lines had to be subordinated to the overall harmonic progression. When the chord progression constains sonorities of three or four different tones, we seek the roots of those chords as a guide to the overall organization. In the 18th century, Rameau advocated writing out, on a separate staff below the music, the roots of the chords, which he called the *fundamental bass.*

In examining this root movement, we may disregard interval inversion and reduce the harmonic progression of roots to those a fifth, third, or second apart, or to repeated chords.

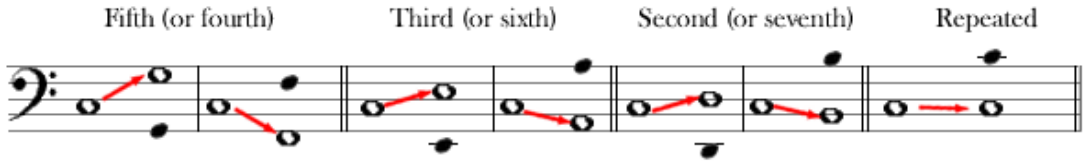


Fig. 173

Roots a fifth apart produce the strongest sense of harmonic progression. Contrary to melodic cadential patterns, which emphazise the strong melodic interval of a second, the strongest harmonic cadences, the *authentic* or *full,* and the *plagal* cadence, use root movements of the fifth, or its inversion, the fourth. If we examine the authentic cadence, we can see that this produces the strongest cadential effort because it combines the strong melodic movement of the *clausual vera* with the strong root movement of a fifth.

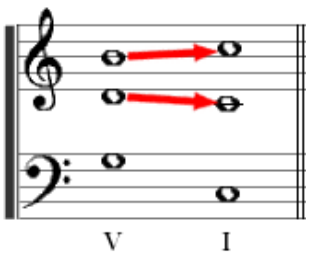


Fig. 174

The plagal cadence is a less dynamic final cadence. It combines the stepwise motion with the root movement of the fourth, but the common tone softens the cadential effect.

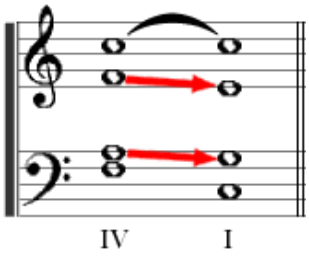
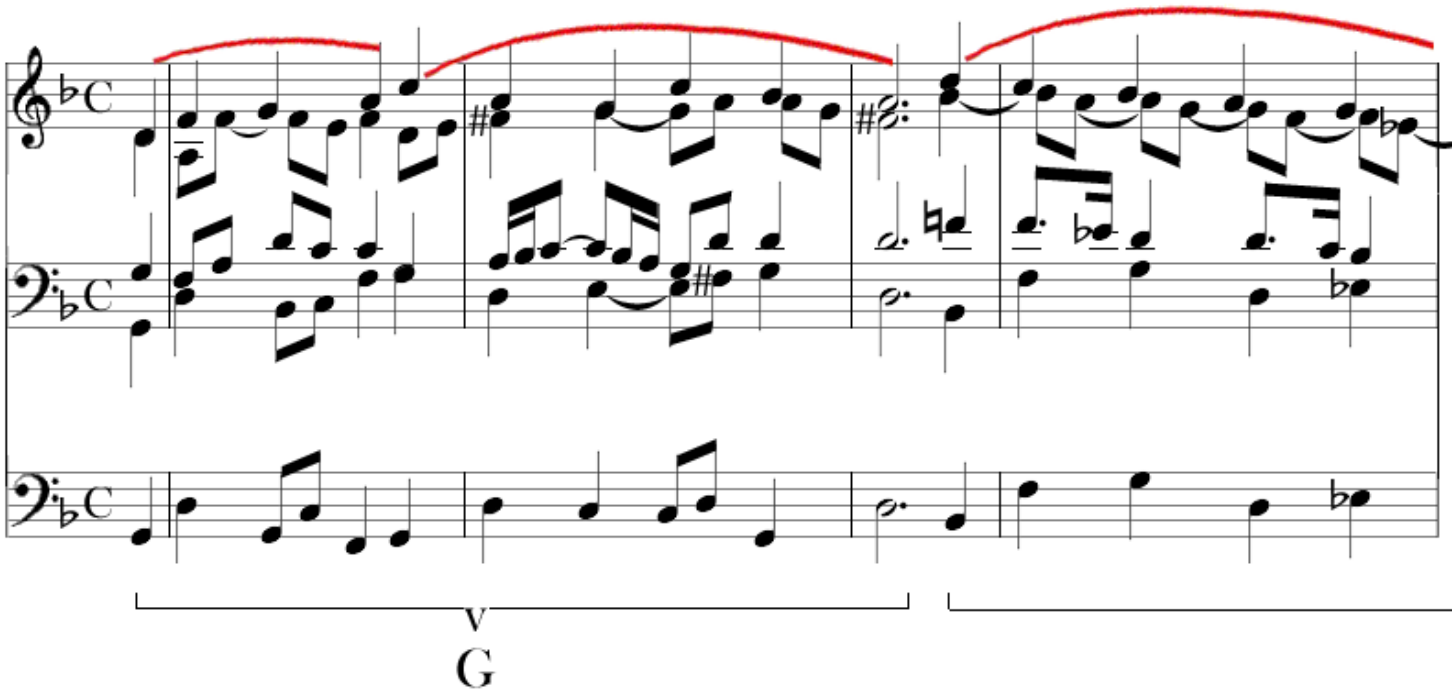


Fig. 175

Here is a Bach chorale with the abstracted roots of the vertical harmonies. This fundamental bass will tell us something about the tonality, or how the music is organized.



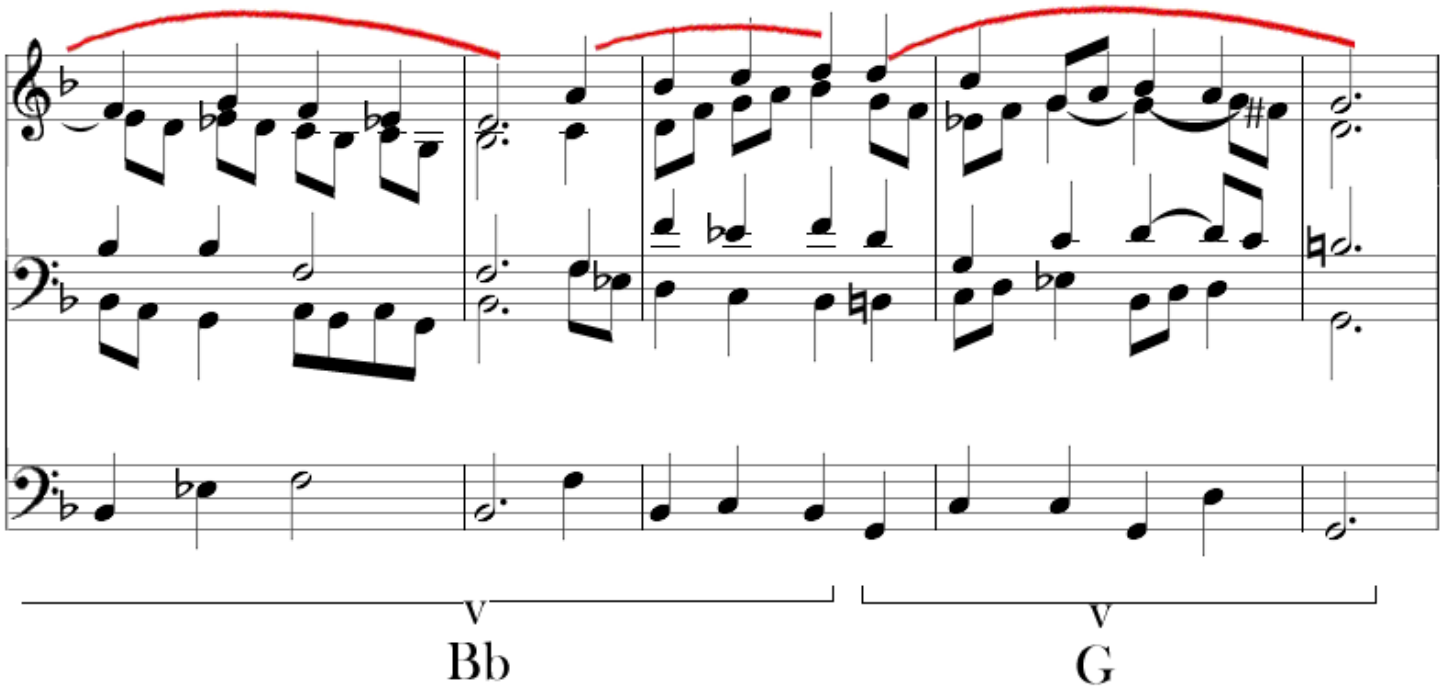


Fig. 176

The roots of the chords for this chorale tell us that G is the tonic; the chorale begins on G, it modulates to the relative major, B flat - Heinrich Schenker would say that the third of the tonic chord is emphasized - and it returns to G. We understand this tonal organization from the root movement, not from the key signature nor the content of the scale. To be more precise about stylisitic details, we could say that this is an ancient modal melody (transposed Dorian mode, if one believes the key signature, or transposed Aeolian, if one counts the E flat) harmonized by Bach in the 18th century style of a minor key, and ending with a Picardy third. The tabulation of the root movement would be:

Chords a 5th apart: 18
Chords a 2nd apart: 8
Chords a 3rd apart: 2
Repeated chords: 2

In addition to the strong harmonic focus upon G at the beginning and the end of the chorale, we can also see that the melody itself is an elaboration of the notes in the tonic chord.

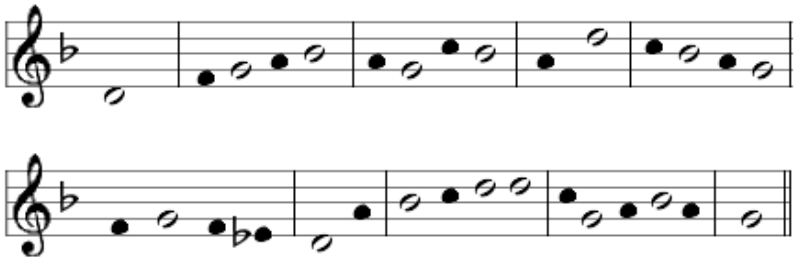


Fig. 177

Emphasis produced by cadential patterns, whether melodic or harmonic, is possibly the strongest factor in establishing a tonic. Less important is scalic content, as was shown by the chordal phrase in Fig. 177.

While there is strong tendency, in analyzing harmonic music from the last two hundred years, to assume that the key signature tells us the tonic, we know from past experience with modal scales that this may not be so. In other words, with any given key signature or

collection of pitches, the composer can choose any one of the several pitches and, by emphasis, make it the tonal center. The four authentic medieval church modes used the same pitches, but, by melodic emphasis, were able to achieve different finals.

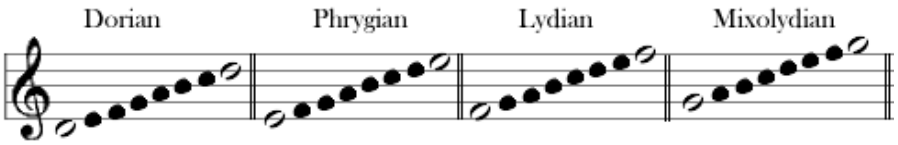


Fig. 178

Root movements of seconds and thirds produce less emphatic progressions, and these are normally used for interior progressions and cadences rather than final ones.

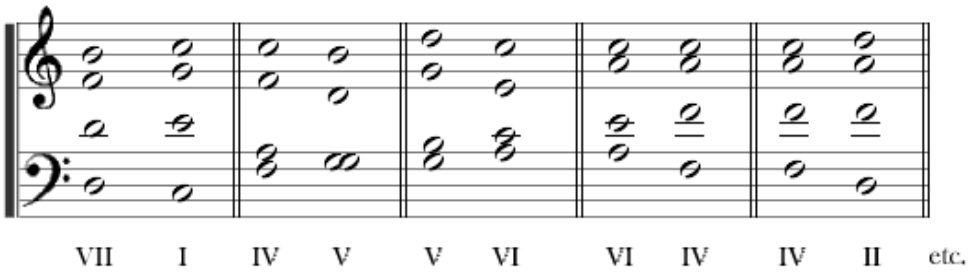


Fig. 179

For a fuller discussion of the different types of cadences, you can refer to Ch. 9 "Chord Choice". In addition to strength of the root movement and the emphasis of cadential formulas, the following factors may also affect the determination of a tonic: stress or accent, duration, the tone most frequently repeated or returned to, and the resolution of dissonance and consonance. Tension followed by relaxation is a characteristic of many types of cadences. We say that the concept of tonic represents a point of rest or repose, therefore the consonant triad, or the less dissonant chord, assumes the role of a tonic when it is preceded by a greater dissonance.

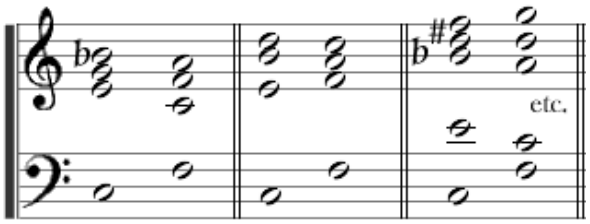


Fig. 180

Of the several factors mentioned before that aid in establishing a tonic, in a given situation one may conflict with another. Which of these factors takes precendence over the others can be decided only by the individual context, and this must be left to the analysis of a particular piece of music.

onality and Key Feeling - To many musicians, the *key feeling* of a major or minor scale is synonymous with the idea of tonality. While this is too narrow a concept of tonality, that is, nevertheless, the view that is valid for much music of the 18th and 19th century.

By the middle of the baroque period most of the vestiges of modality had disappeared in favor of a more standardized major or minor key. It would be more accurate to say that *musica ficta,* especially the raised leading tone in the cadence, had reduced the various modal scales to one of two patterns, depending upon the type of third in the final chord. The second tetrachord in all of the church modes became identical, except for the Phrygian mode.

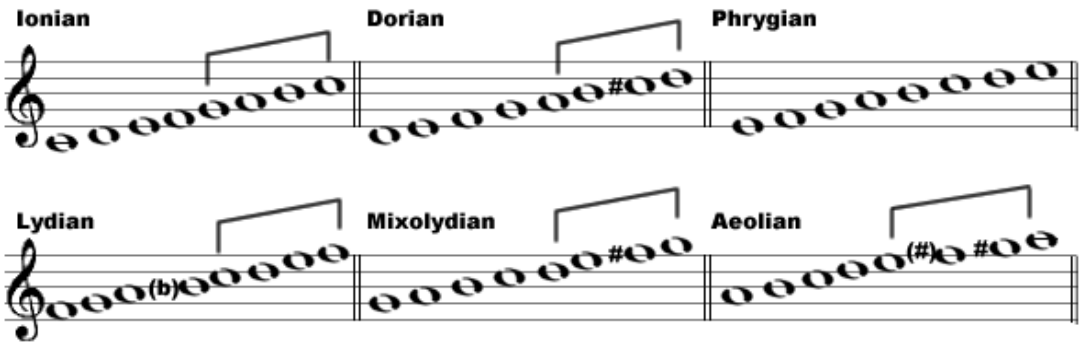


Fig. 181

The Phrygian mode did not conform to the pattern because of the interval of the half step between the first and second scale degrees. The seventh degree in this mode could not be raised in the traditional cadence without producing an augmented sixth, a dissonant interval.

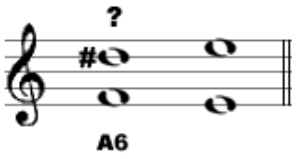


Fig. 182

The peculiarity made possible the so-called *Phrygian cadence*, popular in the 18th century, in which the bass voice progressed down a half step.

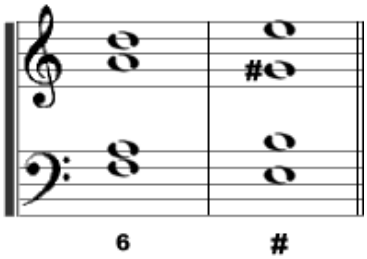


Fig. 183

The distinction between all of the other modes disappeared, and one spoke of only a major mode, or a minor mode, depending upon the type of tonic chord.

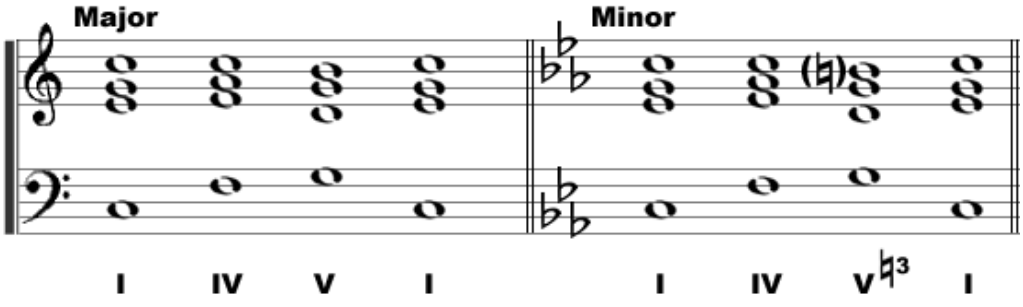


Fig. 184

The various forms of the minor scale - natural, harmonic, and melodic - and the use of the Picardy third in the final cadence, gave the minor key three variable scale degrees; the third, the sixth, and the seventh degrees were frequently raised.

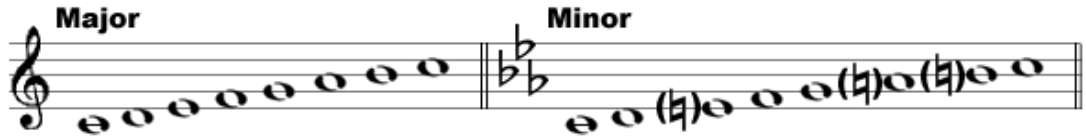


Fig. 185

By the beginning of the 19th century, this amalgamation had produced a composite that might be called the *major-minor scale.* This ten-tone scale was organized by a system of functional harmony in which the quality or color of the primary functions could be varied without disturbing the feeling for tonic.

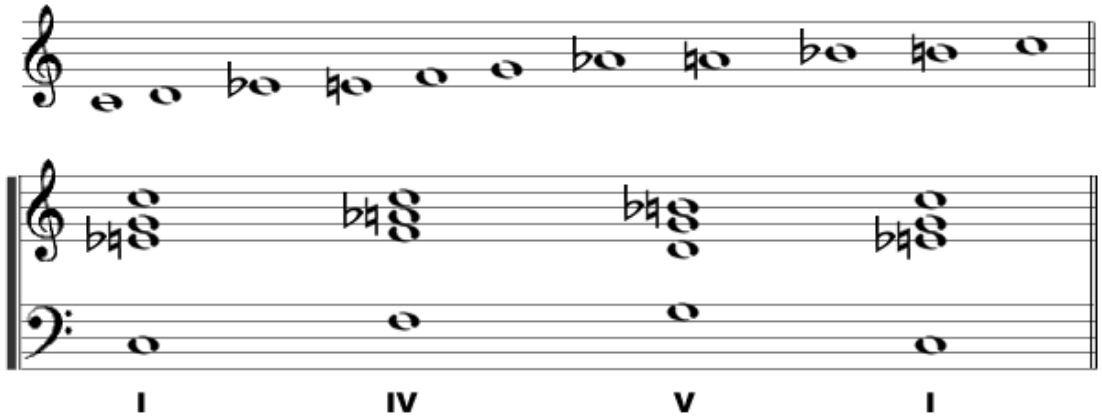


Fig. 186

The seven-tone modal scales, which since the medieval period had used seven letter-names or syllables for purposes of notation, now were expanded into a ten-tone major-minor key. This was only an intermediate step toward the twelve-tone scale, which was reached by the middle of the 19th century, and for which the seven-letter notation began to be clearly inadequate.

Tonality, or key-feeling, in this common-practice period comes from the root movement, which sets up a tonic, rather than from the color of the chords used. The seven-tone scale key signature was still used, but it was practically meaningless, since any number of tones from seven to twelve could be used without disturbing the basic key-feeling, so long as the root movement focused upon the tonic.

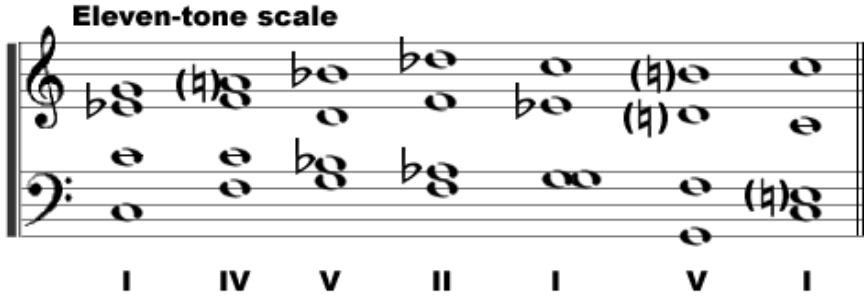


Fig. 187

The key of C major, for example, then became a tonal complex that, at least in the imagination of theorists, consisted of seven principal tones and five auxiliary alternates. To make matters more confusing, the five auxiliary tones, at least on paper, looked like alterations of the seven principal tones. Only recently has it become apparent that this was only an accident of notation; the problem stemmed from the attempt to represent twelve tones with a notation system based upon seven letter names.

Modulation, Secondary Dominants, and Altered Chords

The expansion of the seven-tone scale into the twelve-tone scale took place in music while theorists were still attempting to explain tonality in terms of the seven-tone key. This dilemma gave rise to several theories, which were invented to explain the new tones.

While all of the theories are in some ways inadequate, all of them have good points with which you must be familiar.

The oldest theory to explain the new tones that lay outside the seven-tone scale, and the most important from the historical standpoint, is the one of *modulation.* This theory says, in effect, that, when a new tone is introduced into the music, a new seven-tone scale with a new tonic has to be established. This theory works very well, especially in simple cases where the new "tonality" is confirmed by a stronger cadence. Modulation may then be defined as the process of changing the key or tonic; three types of modulation can be conveniently categorized; *common chord, chromatic,* and *direct*.

Common Chord Modulation

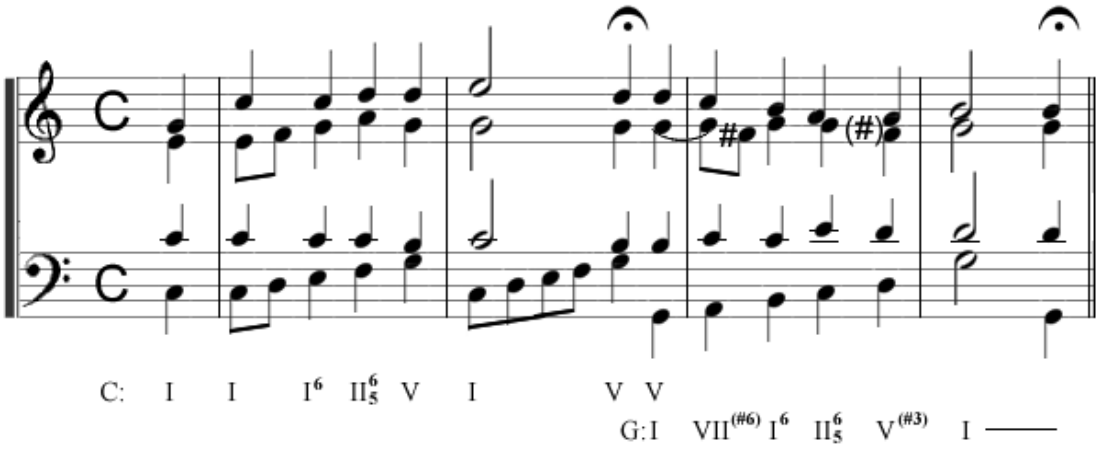


Fig. 188

A common chord modulation is one in which a *pivot chord,* common to both keys, is used as the means of leaving the old key and as the entry into the new key. In this example, the seven-tone scale of C major is established by the first phrase, which then ends in a half cadence on the dominant (V); this chord then becomes the tonic (I) of the new seven-tone scale of G major. In other words, the explanation for the new tone, F sharp, is that of a seven-tone scale, to which it belongs, has been established.

Chromatic Modulation

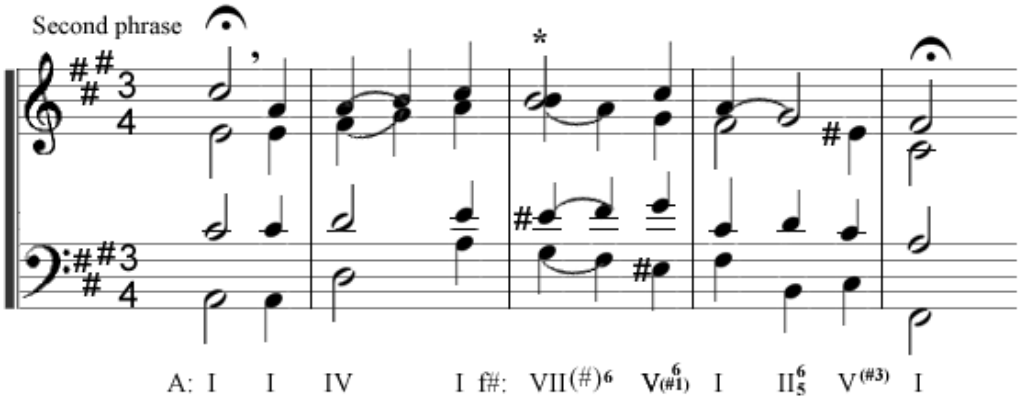


Fig. 189

A chromatic modulation dispenses with the common chord and utilizes a chromatic inflection to enter the new key. You must clearly differentiate here between a chromatic half step (which means the same letter name with a different accidental) and a diatonic half

step (which means two different letter names, whether an accidental occurs or not).

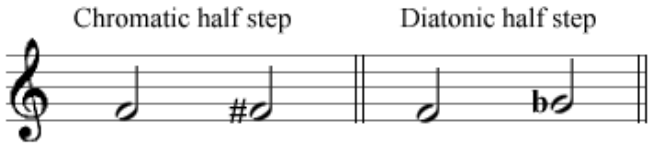


Fig. 190

Chorale no. 7 is in the key of A Major, the second phrase ending with a full cadence on the tonic. The next phrase begins in A and, at the asterisk, modulates to the F sharp minor, the tenor voice moving chromatically, E, E sharp, F sharp. This modulation is then confirmed by an authentic cadence in F sharp minor. The modulation is also considered a chromatic one, even in those cases where the chromatic inflection take place in a different voice. For example:

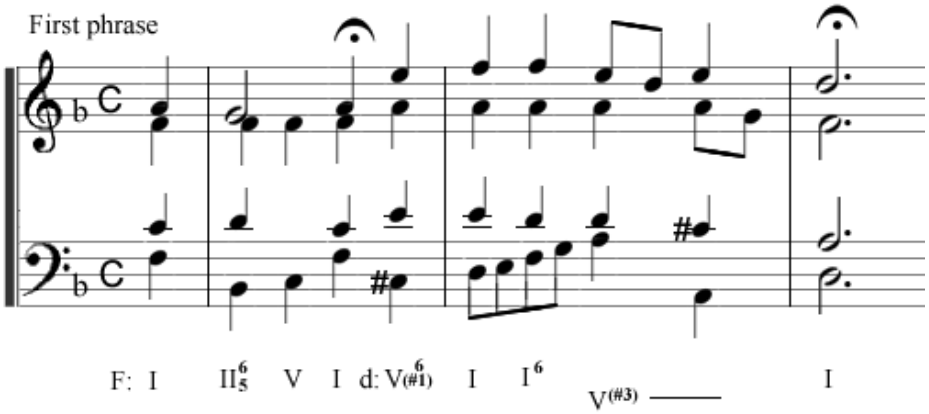


Fig. 191

The first phrase ends in F major, with the C in the tenor voice; the A major chord that begins the next phrase contains the chromatic inflection (C sharp) in the bass voice. This cross relation is somewhat softened by the separation between the two phrases. This example might also be considered....

Direct Modulation

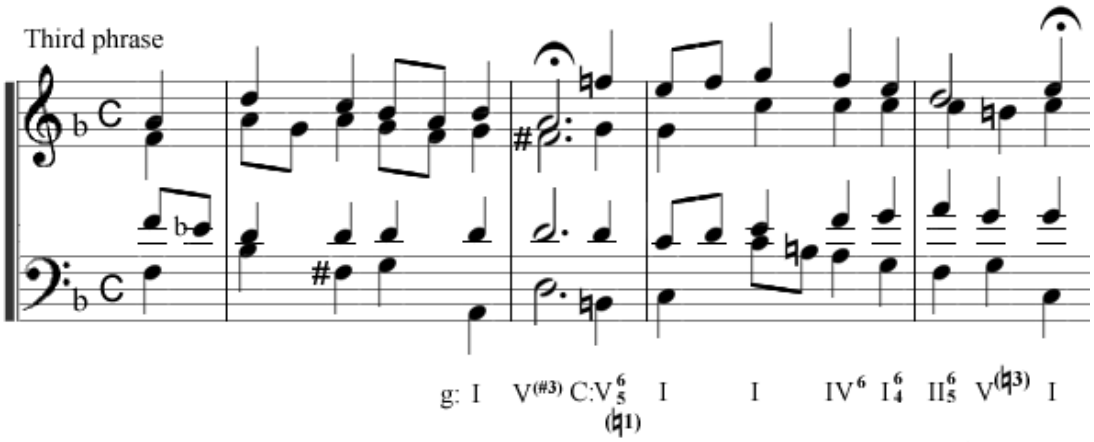


Fig. 192

A direct modulation takes place at the beginning of a new phrase by commencing directly in the new key. In the given example, the third phrase ends with a half cadence in the key of G minor; the new phrase begins directly in C major with the dominant six-five chord, and this, as in the previous example, also produces a cross relation.

The theory of modulation works less well in those cases where there is no strong confirmation of the new tonic. Frequently new

notes outside the original seven-tone scale will be introduced into the music, but no new tonal center will be evident, or several keys will be passed through quickly. In these cases the theory of modulation, in the sense of a new tonality is firmly established, seems to be a weak explanation for the introduction of the new notes. To explain some of these "transient modulations" the theory of secondary dominants was put forward.

Secondary Dominants

This theory says that any of the consonant triads in a major or minor key may be preceded by its own V, V_7, VII, or VII_7 chord, without producing a modulation. These secondary, or applied, dominants in effect embellish, or intesify, the following chord without really changing its function in the original key.

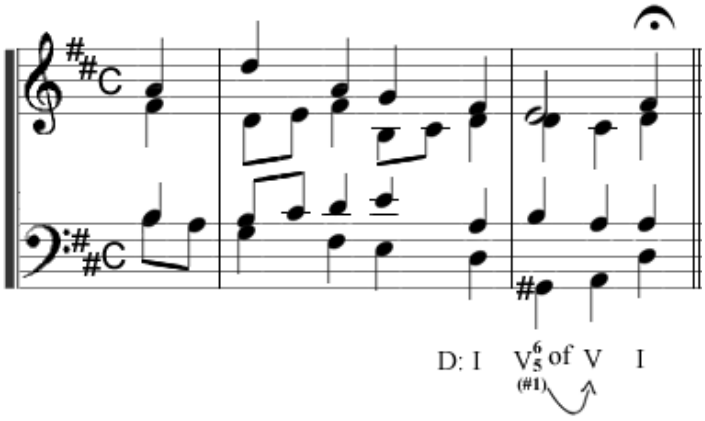


Fig. 193

In the key of D Major, the dominant chord in the cadence is preceded by its own dominant seventh chord. That is, the sonority is like the dominant seventh chord, as it would be in the key of A major; however, the A major chord does not have the function of I, but still functions as V in the original key.

The process can be extended back for several chords.

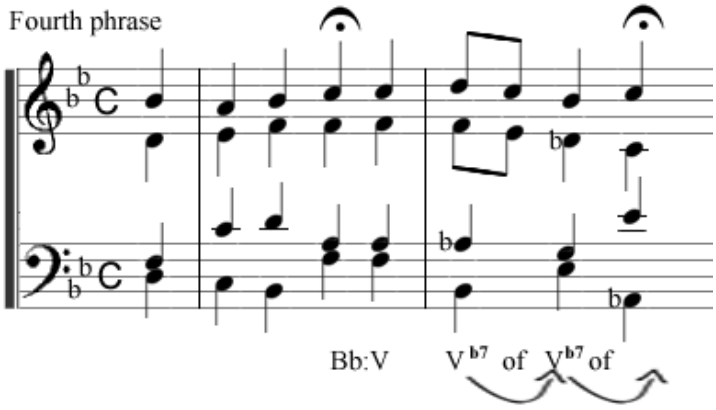


Fig. 194

The theory of secondary dominants is effective in explaining altered notes when these occur in the "dominant of the dominant" relationship; however, other altered tones do not fit this theory, and so these tones require some other explanation.

Altered Chords

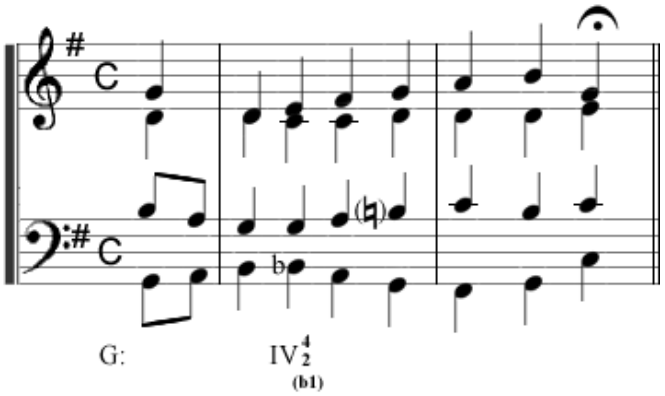


Fig. 195

The third chord in this example has the sonority of a "dominant seventh" but the key, of which it would be V, F, is not in the scale of G major. Hence, a more inclusive theory of altered chords has evolved to explain this and other possible alterations.

The B flat, in the bass of the example shown here, is a chromatic passing tone, altered to increase its drive down to A. It is absorbed into the chord that sounds above it, as the seventh, but the alteration in no way changes the function of the chord in the key; it is still a subdominant seventh chord in G major.

The theory of chromatic alteration goes back to the contrapuntal period, when the concept of *musica ficta* allowed the substitution of the raised leading tone for the seventh scale degree in modes in which that degree was one whole step below the tonic. The inverse of the leading tone principle may be found as far back as plainchat, in which the note B was frequently made B flat as a close upper neighbor to A.

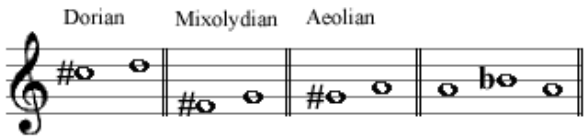


Fig. 196

The melodic pull, or tendency to resolve, of the altered note was intensified in the direction of the alteration. In later harmonic periods, this became a basic structural principle, where lines were bent in the direction of their goals.

The theory of alteration operates by producing chords of different color, or sonority, upon roots that still maintain their basic function in a key. Tonal unity is maintained by the root movement, while some variety is afforded by the difference in chord quality. However, it must be emphasized that this theory stems from a contrapuntal phenomenon and not a harmonic one, that is, the choice of the individual tone chosen for reasons of harmonic sonority.

There are a number of Bach chorales that illustrates this principle of alteration; indeed, there are a number of chorales that utilize all twelve chromatic pitches in the span of a few phrases (Numbers 3, 21, 89, and 94, to mention a few). By the following example, although it uses only ten of the possible twelve pitches, shows a clear example of an altered chord and also shows an example of modulation and the use of secondary dominants.

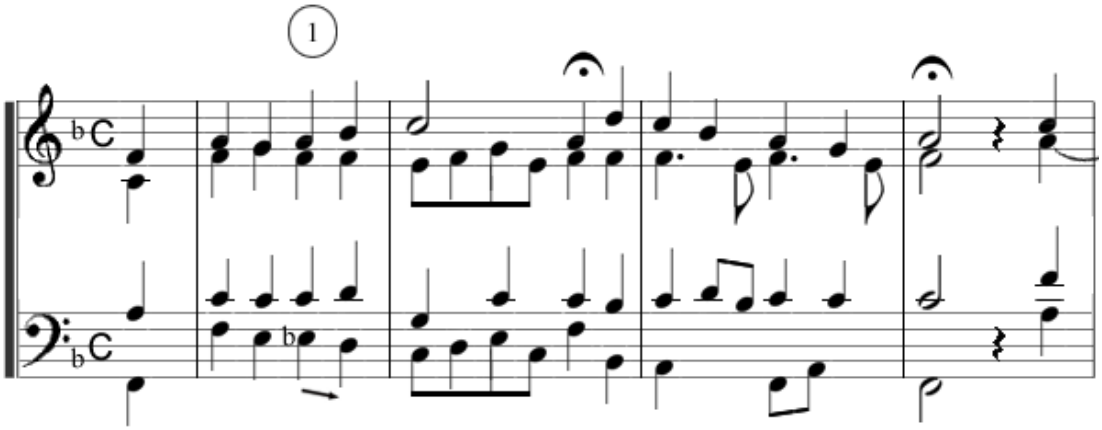


Fig. 197

This is in the key of F major, but also utilizes the tones B natural, E flat, and D flat. At (1), the chromatic passing tone, E flat, makes a V_7 of IV; at (2), the B natural is part of V_7 of V; the phrase then modulates to the key of the dominant; at (4), the D flat is used to pull the tenor line back to C.

At first, when the image of the seven-tone scale was strong, one could properly speak of these as altered tones, that is, one recognized the normal scale degree and was conscious of its being chromatically altered. *Chroma* means color; these alterations were in the nature of color changes that did not radically affect the chord functions within the key. At some point, however, in the evolution of the twelve-tone scale, the alterations became so numerous that the original concept of the seven-tone scale was no longer discernible. At that point the concept of tonality should have changed from that of a seven-tone scale to one of a multi-tone scale. However, our system of notation, based on seven letter names, made it very difficult to accept the twelve-tone chromatic scale as a tonal reality.

In the early years of the 20th century, the German theorist Heinrich Schenker, realizing that compositions from the classic and romantic periods were elaborations and prolongations of a single tonic triad, suggested that the theory of modulation was no longer valid. He believed that there was only one basic tonality for any composition and that, instead of using the term *modulation* - which implies changing the key - we should say that certain tones within the basic key were intensified by their close adjacent tones. This seems to be a matter of terminology; however, Schenker's basic point is clear. If our conception of tonality is not limited by the concept of the seven-tone scale, then we are under no obligation to explain other tones as belonging to other "keys;" rather we are obliged to explain how all tones function within the single, unified concept of tonality.