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POLICIES AND PROCEDURES

IMPORTANT NOTE

This course is corequisite with both Aural Skills I (Mus 134) and Keyboard Skills I (Mus 137). If you are a music major, you may not take any of these courses without being concurrently enrolled in the other two. (Music minors are not required to take Keyboard Skills.)If you are not enrolled in all three courses simultaneously, you must either drop this course or you will automatically receive a grade of "F".

1. GRADING

You will be evaluated in this course in the following ways:

FALL QUARTER

a. Traditional homework assignments. [35%]
b. Short, timed quizzes, each of which tests some skill that you must acquire. Passing a quiz on the first attempt earns an "A," on the second a "B," etc. Passing a quiz on the fourth or greater attempt earns a "D,"[35%]
c. Your timely completion of the assigned "tunes." [10%]
d. Your lab instructor's subjective impressions of how well you are dealing with the materials of this course, your attendance, and your participation in classroom discussion [20%]

WINTER QUARTER

a. Traditional homework assignments. [40%]
b. Quizzes[40%]
c. Your lab instructor's subjective impressions of how well you are dealing with the materials of this course, your attendance, and your participation in classroom discussion [20%]

SPRING QUARTER

a. Traditional homework assignments. [40%]
b. Quizzes[15%]
c. Final Examination [30%]
d. Your lab instructor's subjective impressions of how well you are dealing with the materials of this course, your attendance, and your participation in classroom discussion [15%]

2. HOMEWORK

a. ~~ALL HOMEWORK MUST BE COMPLETED IN ORDER FOR YOU TO PASS THIS COURSE.~~
b. Each homework assignment will carry a due date.
c. Assignments will be collected 5 minutes after each class begins. After that they are late.
d. Assignments submitted late are acceptable only when you have an excused absence. All unacceptable assignments receive a zero.
e. ~~Even when a late assignment earns a zero~~ **it must be turned in** ~~or you will not pass the course.~~
f. If you are unable to turn in an assignment because of illness, **you must call Prof. Hurwitz at 346-3792 or email him at rhu@oregon and let him know you are ill *on or before the day the assignment is due***. If you do this, the lateness will be excused without penalty, so long as it does not become a regular pattern.
g. For any exceptions to these rules, you must receive clearance from Prof. Hurwitz.

3. QUIZZES

a. Short quizzes will be given on a regular basis. New quizzes will generally be given on Thursdays.
b. ALL SKILLS QUIZZES MUST BE COMPLETED IN ORDER FOR YOU TO RECEIVE A GRADE IN THIS COURSE. NON-SKILLS QUIZZES CAN BE RETAKEN ONCE FOR A 10% PENALTY.

c. Passing a quiz the first time gives you a grade in the "A" category [e.g., if a particular quiz has a passing score of 8 out of 10, a score of 10 would earn an A+, 9 would earn an A, and 8 would earn an A-]. Passing the second time would earn a grade in the "B" category, etc.
d. Passing a quiz on the fourth or subsequent attempt earns a "D."
e. Missing a quiz is the equivalent to not passing it, unless you are ill, in which case **you must call Prof. Hurwitz at 346-3792 or email him at** rhu@oregon.uoregon.edu **and let him know you are ill *on the day of your illness***.
f. NOTE. There will be a few quizzes which are given only once, for a percentage grade. These will be announced in advance.

4. KEEPING UP
   a. **AT NO TIME MAY YOU BE MORE THAN THREE ITEMS (ANY COMBINATION OF QUIZZES, HOMEWORKS AND TUNES [see below]) BEHIND OR YOU WILL RECEIVE AN F IN THE COURSE**.
   b. If you are in danger, you must seek extra help, taking advantage of your instructors' office hours and working with peer tutors.
   c. The number of times you may attempt each quiz *outside of class time* during any single term is limited to five. (Each quiz will be repeated in class until 60% of the class has passed it.)

DEFINITION OF WHAT IS "BEHIND"

a. (Tune assignments, that are described on page v, will begin several weeks into the Fall term.) A **tune** is *behind* if:
   a) it has not been turned in on the due date;
   b) it has not been returned following grading, on the next due date, and an excused absence for that date has not been granted.
b. **Homework** is *behind* if it has not been turned in on the due date, and an excused absence for that date has not been granted.
c. A **quiz** is *behind* if it has not yet been passed when 60% of the class has passed it. (In other words, it is behind from the class period after it has been given in class for the last time.)

5. ATTENDANCE is extremely important and roll will be taken regularly. A poor attendance record will have an adverse effect on your ability to do well in this course. Attendance is not, however, involved in the calculation of your grade.

6. KEEPING RECORDS Keep all your written work. Progress reports will be issued periodically, and if there is any discrepancy between your records and those of your instructors, copies of your work will set the record straight.

7. INCOMPLETES.
   a. The university defines the incomplete as a mark given when a small, but significant, portion of the term's work is left to be completed, with the completed work of passing quality.
   b. Anyone who, by the end of the term, has a maximum of 3 items (quizzes, tunes and homework combined) left to be completed will be given an "I" (Incomplete).
   c. Students with incompletes must finish all work before the last day to add the course for the following term (Friday of the second week of the term).
   d. Those who cannot remove their incomplete by the above time limit will be required to drop the next term's course. They will then have up to three terms to remove the incomplete, but they will have to wait until the next opportunity to enroll in the following course. (For many students, this would be the "trailer" section of Music Theory, which runs one term behind the regular section.

ALL OF THE ABOVE HAVE BEEN ESTABLISHED FOR ONE REASON ONLY: TO HELP YOU TO WORK CONSISTENTLY AND RESPONSIBLY WITH THE MATERIALS OF THIS COURSE.
ALTHOUGH THE POLICIES OUTLINED MAY AT FIRST SEEM RIGID,
THEIR SOLE PURPOSE IS TO PROMOTE YOUR SUCCESS.

PROCEDURES REGARDING THE TUNE ASSIGNMENTS

1. Tune assignments will be announced and described several weeks into the first term. Briefly, the assignment will be to spend fifteen minutes (minimum) per tune writing it out in musical notation *without consulting an instrument.*

2. Each tune you choose should offer you a challenge that is neither too great nor too small. Choose tunes you believe you can finish within that time period.

3. Be aware not only of correct pitches and rhythms, but also of correct orthography, paying special attention to durational spacing, stem directions, beaming, etc. It goes without saying that you should make your orthography as neat as possible.

4. Tunes will be due each Monday at the beginning of class. You may turn in tunes up to two class periods late, but they will be marked late. Lateness will affect your "tunes" grade. (See 1.c, p.iii, above.) You will earn an "A" in tunes if you turn in each tune when it is due. In addition, any tune which is entirely correct the first time it is turned in will receive a grade of A+. A tune that is turned in late will reduce your grade on that tune as follows: 1 class period late= B; 2= C; If a tune is turned in more than two class periods late, it earns an F. All tunes must be turned in to avoid an "incomplete."

5. When you receive a tune back, it will not have a grade written on it; instead, it will either have a solid check mark (√) on it, a "√+", or a dashed check mark. A "√+" indicates an entirely correct tune on the first try. A solid check indicates you have received credit for completing a tune. If you receive a dashed check, this indicates that some corrections will need to be made. You will then have up to two class days to turn it in again with corrections. This due date will be marked on your paper, next to the dashed check. Your paper will then be re-graded and returned to you, either with a solid check or another dashed one with a new due date. The process will continue until you receive a solid check.

6. You may note the word "Sing" written on your paper. This means either that your instructor does not know the tune you have written, or that s/he is uncertain about your version of that tune. When you receive a paper with Sing written on it, you should make arrangements to sing the tune to your instructor. (This usually can be done right after class.)

7. If you submit three tunes in a row that require no corrections (i.e., you receive three "√+s" in a row), you will be exempt from tune assignments for the remainder of the course.

8. Because this is a complicated process requiring lots of record keeping, it is necessary that every tune turned in be numbered. You should also always indicate the name of your small group instructor next to your own name. Any tune submitted without these pieces of information will automatically receive a dashed check and be returned to you without being evaluated.

9. This entire process can be a very useful one to you. Do your best to choose tunes that are appropriate to your skill level...and please don't hesitate to ask for our help and suggestions if they would be of use to you.

Tune List

A. Simple songs

America (My Country 'tis of Thee)
Blowin' in the Wind
Deck the Halls
For He's a Jolly Good Fellow
Frère Jacques
Go Tell Aunt Rhodie
Good King Wenceslas
Happy Birthday
Hark, The Herald Angels Sing
Here Comes the Bride
Hickory, Dickory, Dock
Hot Cross Buns
Jingle Bells
Joy to the World
Kumbayah
London Bridge is Falling Down
Mary Had a Little Lamb
Michael Row the Boat Ashore
O Come All Ye Faithful
Oh, Susanna
Pop Goes the Weasel
Row, Row, Row Your Boat
The First Noel
This Land is Your Land
Three Blind Mice
Twinkle, Twinkle, Little Star
We Three Kings of Orient Are
When the Saints go Marching In
Yankee Doodle
You are my Sunshine

B. Songs with leaps

Amazing Grace
Auld Lang Syne
Aura Lee (Love Me Tender)
Battle Hymn of the Republic
Camptown Races (Doo-dah)
Daisy, Daisy
Dixie
Down in the Valley
God Bless America
Hey, Jude!
Home on the Range
I've Been Working on the Railroad
Let it Be
Marine's Hymn
My Bonnie Lies Over The Ocean
O Christmas Tree
O My Darling Clementine
Oh Where...has my Little Dog Gone?
Old Folks At Home (Swanee River)
Old MacDonald Had a Farm
On Top of Old Smokey
Oregon Fight Song
Peter, Peter Pumpkin Eater
Puff, the Magic Dragon
Rock-a-bye Baby
Rudolph the Red-nosed Reindeer
Silent Night
Somewhere Over the Rainbow
Who's Afraid of the Big Bad Wolf?
Yellow Submarine
You Light Up my Life

C. Tunes with some accidentals

America the Beautiful
Get Me to the Church On Time
It Came Upon a Midnight Clear
Maria
Mexican Hat Dance
O Little Town of Bethlehem
Sweet Georgia Brown
Take Me Out to the Ball Game
The Star-Spangled Banner
White Christmas

D. Tunes with special problems

Doe, A Deer
Hard Day's Night
Here Comes the Sun
Joshua Fit de Battle of Jericho
La Marseillaise
Raindrops Keep Falling on my Head
Roll Out the Barrel
Somewhere (West Side Story)
Yesterday

E. Tunes in modes

Drunken Sailor
God Bless Ye Merry, Gentlemen
Greensleeves
Hava Nagila
Rock Around the Clock
Scarborough Fair
When Johnny Comes Marching Home

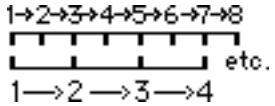
RHYTHM AND METER
DEFINITIONS

1. **Pulse**: one of a series of equally spaced, equivalent stimuli - like the clicking of an electronic metronome: "tick, tick, tick,...."not "tick, tock, tick, tock," which are unequal. Like a point in mathematics, pulses have position, but no duration.

. . . . . .

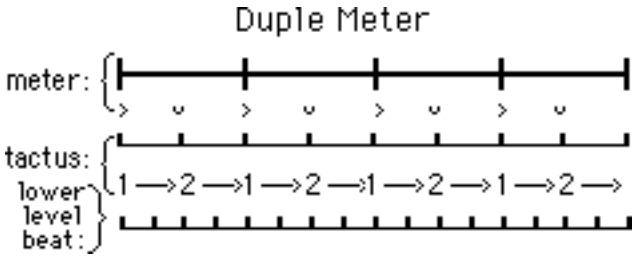
2. **Rate:** the number of pulses in a given amount of time (e.g. "60 pulses per minute").

3. **Beat:** includes a pulse, and the time span from the onset of that pulse to the onset of the next pulse. Beats occur on all *levels* of structure in most Western music, i.e., at all rates. The following chart displays two levels of beat:



4. **Tactus**: the rate of beat which is most comfortable to conduct. The tactus governs the naming of the meter by type.

5. **Meter**: the organization of the tactus into repeating patterns of accent[1] and unaccent. Patterns of two beats produce duple meter; patterns of three produce triple meter; patterns of four produce quadruple meter, etc. In the following example of duple meter, the tactus is organized into patterns of two by the alternations of strong and weak beats. (The impression of "strong" or "weak" can be achieved by several musical means: loudness, tone color, pitch relationships, etc. A beat does not have to be literally stronger than another to be considered a strong beat.)



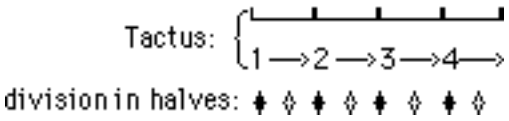
(> = accent; u = unaccent)

5. **Grouping and Division of the Tactus**: beats at the tactus level can be grouped into beats occurring at a slower rate and divided into beats occurring faster. The first division of the tactus is either into halves or thirds. Subsequent division into smaller units is called **subdivision**.

---

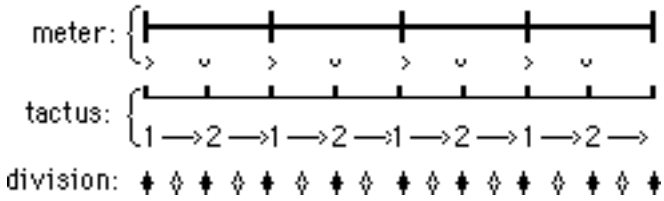
[1]Accent is here defined as a state of bodily or mental tension resulting from factors that tend to alter an existing equilibrium. This is very different from *dynamic accent,* which involves the dynamic intensification of a beat, whether metrically accented or not.

Division of the Tactus



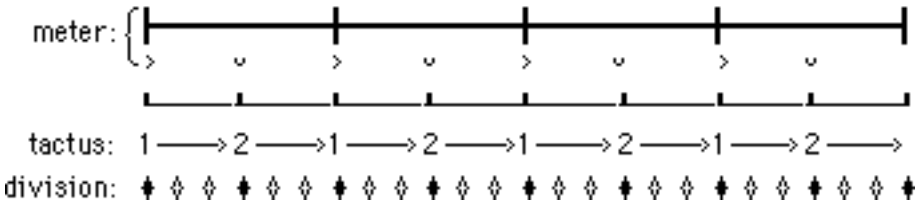
6. **Simple** division: division of the tactus into halves is called simple. The following chart defines simple duple meter as a meter in which the tactus-level beats are alternately strong and weak (the "duple" part) and the divisions of the tactus-level beats are into halves (the "simple" part).

Simple Duple Meter



7. **Compound** division: division into thirds is called compound. The following chart defines compound duple meter as a meter in which the tactus-level beats are alternately strong and weak (the "duple" part) and the divisions of the tactus-level beats are into thirds (the "compound" part).

Compound Duple Meter

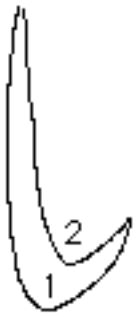


8. **Tempo**: the listener's perception of the speed with which music is going by. (This is not always correlated with the speed of the tactus.)

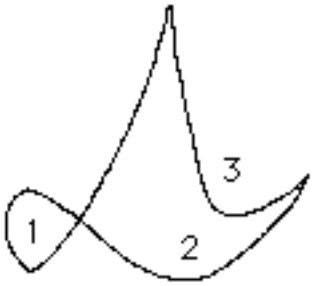
9. **Rhythm**: patterns created by the various durations present in a piece of music.

Diagrams of Conducting Patterns

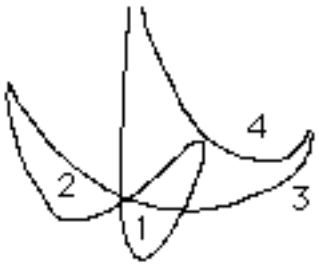
DUPLE



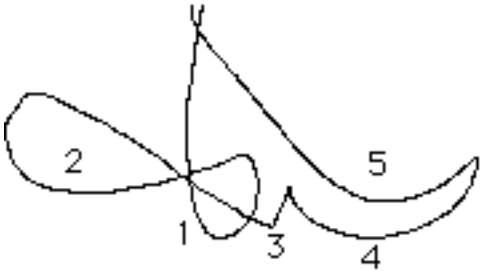
TRIPLE



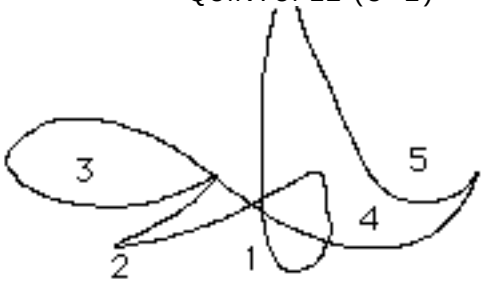
QUADRUPLE



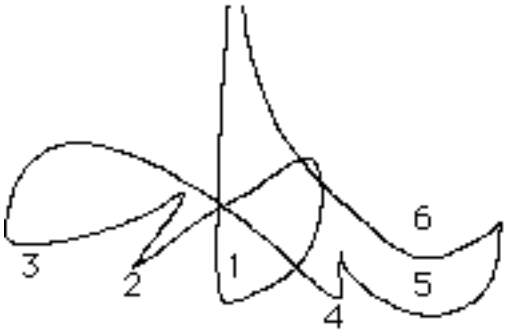
QUINTUPLE (2+3)



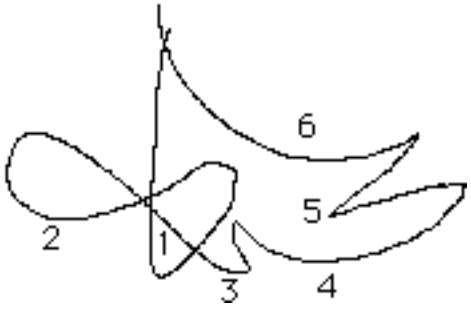
QUINTUPLE (3+2)



SEXTUPLE (3+3)



SEXTUPLE (2+2+2)



Strong Beats in Various Meters

The following chart indicates the location of strong beats for each meter.

Metrical Name	Location of Strong Beats
duple	1
triple	1
quadruple	1 and 3
quintuple (2+3)	1 and 3
quintuple (3+2)	1 and 4
sextuple (3+3)	1 and 4
sextuple (2+2+2)	1, 3, and 5

CONDUCTING MELODIES WITH APPROPRIATE BEAT PATTERNS

1. Sing the tune, e.g. *Baa, Baa, Black Sheep*, at a moderate tempo.

2. As you sing, wave your conducting hand at a regular rate, "in time" to the music.

3. Notice now that the text of the song has accented syllables and unaccented syllables:

Baa, baa, black sheep; have you a-ny wool?
> u > u > u >

4. "Conduct" the accented syllables at the same speed at which you waved your hand by moving your hand in a downward direction. Move your hand upwards for unaccented syllables. The following pattern will emerge, since accented and unaccented syllables alternate in this text:

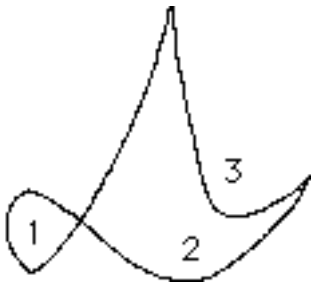
Your actual hand movements are likely to be more complicated than the simple diagram above, probably approximating the following pattern:

5. Your pattern now reflects several things. By the *speed* at which your hand is moving you are indicating **tactus-level beats**. By the *direction* in which your hand moves, you are showing both the natural accentuation of the text and the patterns of two beats into which the music seems to divide itself. In other words, you are showing the **meter**:

Baa, baa | black sheep | Have you a-ny | wool?
1 2 | 1 2 | 1 - 2 - | 1 (2)

Since your beats are grouped in pairs, the meter you are conducting is called **duple meter.**

6. Try conducting another tune now, *e.g.*, *Rock a bye, Baby.* Notice now that the text of the song has accented and unaccented syllables in a different arrangement from that shown by *Baa, baa black sheep* :




```
Rock   a bye,   |  Ba-------- by
 1     2   3    |   1     2    3
 >     u   u    |   >     u    u
```

Your conducting pattern will also be different, since accented beats will occur only every third time:

Since your beats are grouped in threes, the meter you are conducting is called **triple meter.**

7. Go back, now, to the first tune, *Baa, Baa, Black Sheep*, and conduct it again, this time paying attention not to the beats, but to the notes which move faster than the beats:

```
Baa,  baa   |  black sheep  |  Have you a-ny  |  wool?
 1     2    |   1     2     |   1   -  2  -   |  1   (2)
```

8. Now repeat the words “Have you any” over and over, without a pause. You will soon realize that there are two syllables (notes) for each beat. Beat 1 consists of “Have you,” and beat 2 of “a-ny.” Not only that, but the notes are all the same length: “Have” and “you” take the same amout of time, as do “a” and “ny.”

   When two notes occur within a single beat which are the same length as one another and which together occupy the entire beat, we can say that they divide the beat into half-beats. “Have” takes 1/2 beat and “you” takes the other 1/2 beat.

   A meter in which the regular (common, most often, most consistent) division is into halves is called **simple meter.**

   We have already determined that this tune is in duple meter, but now a more complete classification of its metric structure can be made. *Baa, Baa, Black Sheep* is in **simple duple meter.**

9. Now consider the tune *Pop, Goes the Weasel.* When you conduct it and try to beat time to it, you discover the following arrangement of beats:

```
All a-  round the | co-[hob]-bler's  bench
1         2       |  1                 2
>         u       |  >                 u
```

10. Consider the syllables *co-[hob]-bler's* now. When you repeat them over and over you can tell that they each take the same amount of time, and that together they fill up one beat. They thus divide the beat into thirds.

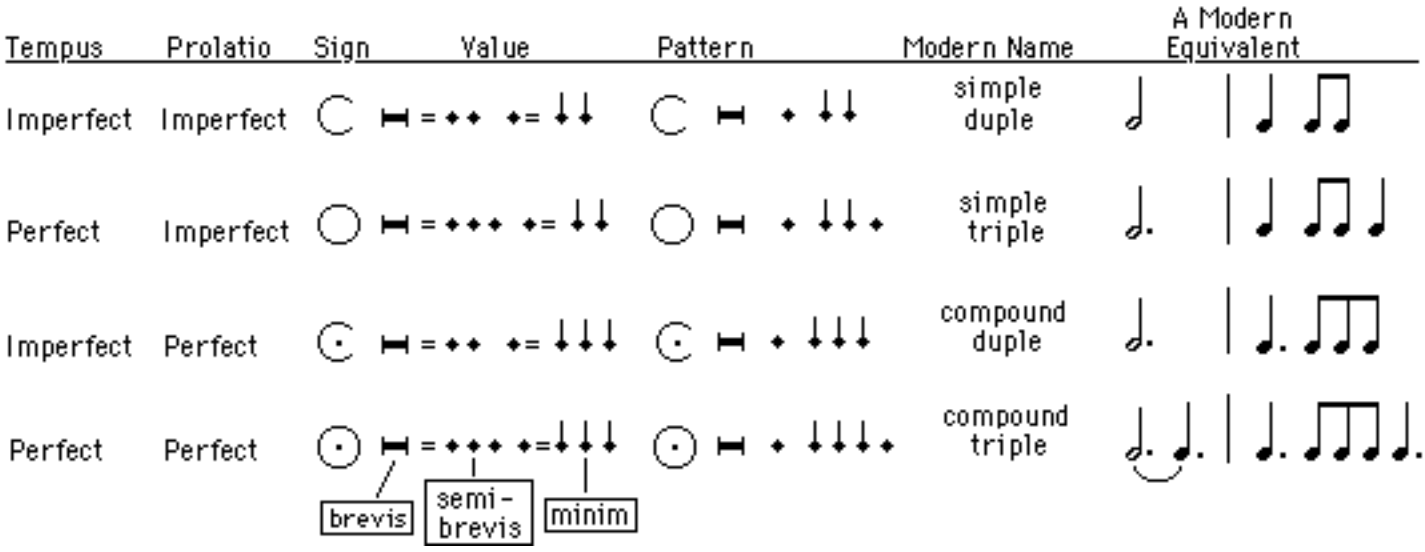
    A meter in which the regular (common, most often, most consistent) division is into thirds is called **compound meter.** *Pop, Goes the Weasel,* therefore, is in **compound duple meter.**

HISTORICAL BACKGROUND

NOTATION OF DURATION

Duration was incorporated into musical notation around the year 1250 by Franco of Cologne. His system showed not only different durational values, but also metric structure, and it proved to be well enough conceived to enjoy continuous use until the end of the 16th century. In this system, metric organization was shown at two levels, and involved three note values: the *modus* , or "mode" indicated the relationship between the *longa* and the *brevis* ; the *tempus* , or "time" indicated the relationship between the *brevis* and the *semibrevis* ; and the *prolatio* , or "prolation" indicated the relationship between the *semibrevis* and the *minima* , or "minim." When the relationship was "perfect" the note of lesser duration was worth 1/3 of the longer note; when it was "imperfect", the note of lesser duration was worth 1/2 of the longer note. The following table indicates two of these relationships, the *tempus* and the *prolatio,* their signs, or "signatures," and some modern equivalents:

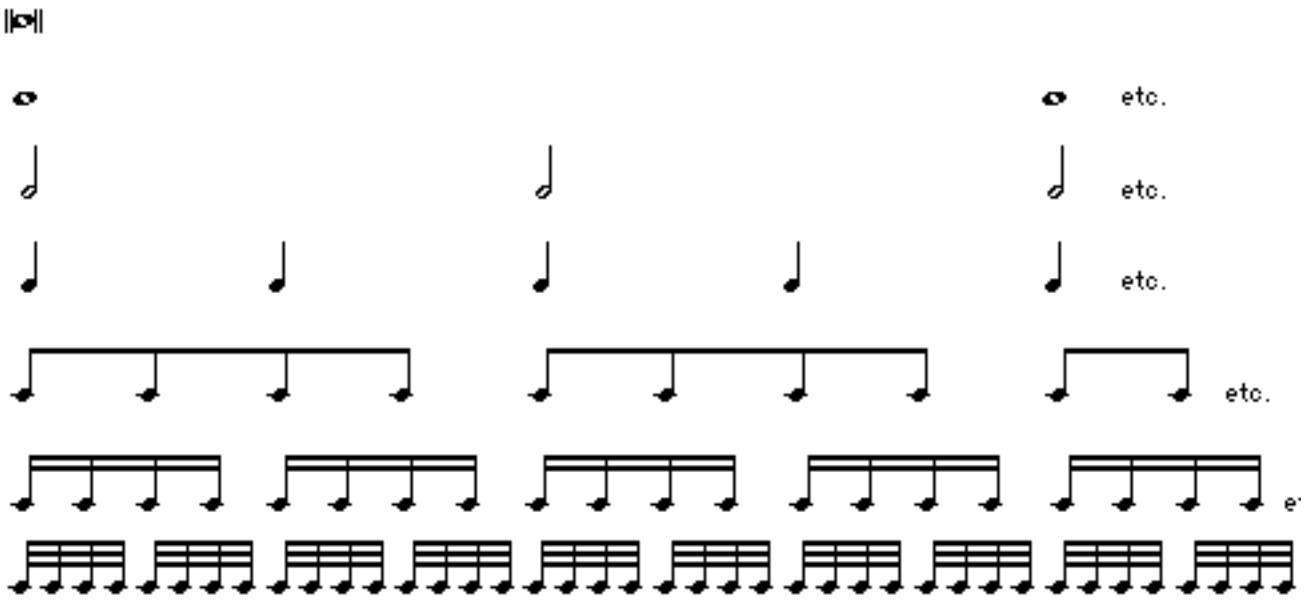
Mensural Notation



Modern Notation of Duration

Modern notation is based on a duple series, that is, a string of note values related by powers of two. This works very well for the notation of simple meters, since no matter which durational symbol is called the tactus, its division will be into halves.

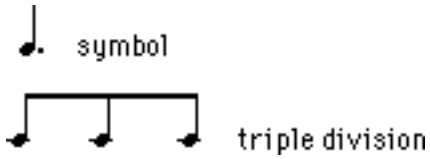
The Duple Series of Note Values



Any of the above note symbols can be assigned the value of the tactus, since none of them has an inherent duration. (The duration may be supplied by a tempo or metronome marking, e.g. *andante,* or ♩ = 120). At the tactus level, the note immediately beneath it is valued at "1/2 beat" and the note immediately above it at "2 beats."

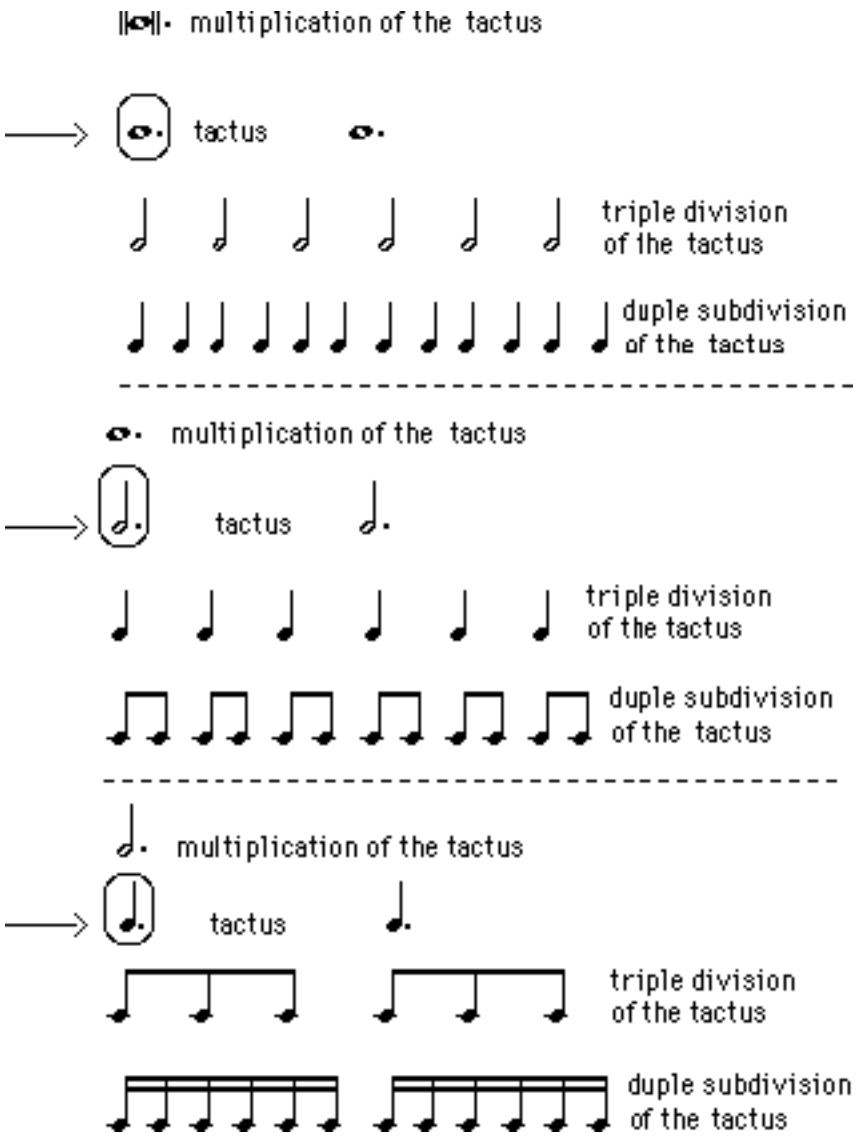
Triple Division

A dot adds half the value of the symbol immediately to the left of it to the total value of the note, and thus creates the possibility of notating triple division. E.g., if a dot is added to a quarter note, the symbol has an additional eighth note's value, for a total value of three eighth notes. This symbol, then, naturally divides into thirds



When a dotted note is chosen to represent the tactus, compound meter results. In compound meters, the division of the beat is into thirds, with subsequent subdivision (and sub-subdivision, etc.) into halves. In addition, the multiplication of the tactus is by two, and so on, so that the only triple relationship is at the level of the division of the tactus. Here are examples of systems that can be used to notate compound meter:

Incorporating Triple Division into the Duple Series



Modern Meter Signatures

In modern usage, the meter is indicated by a *meter signature* (also called a *time signature*) which usually consists of two numbers, one above the other. The lower number indicates the unit of measurement; the upper indicates the number of these units in each grouping (called a *measure,* or *bar*). Occasionally, meter signatures that use the old signs appear, especially 𝐂 for $\frac{4}{4}$ meter or 𝐂 for $\frac{2}{2}$ meter[2]. Note that the meter signature is NOT a fraction, and no line should be drawn between the numbers.

THEORETICAL BACKGROUND

CONFLICTS BETWEEN METRIC NOTATION AND PERCEIVED METER

The conflict between perceived meter and notated meter has been recognized by musicians for many years. Composers have often, while writing in one meter, experienced another.[3]

Since our basic orientation in the study of Music Theory is towards naming what we perceive rather than what we see, our discussion of meter signatures will deal primarily with how one can reconcile notated meter signatures with perceived meter. We have already experienced meter without having had recourse to notation, and have discovered that most meters in Western Music can be said to have two components: the number of beats in a group, and the manner in which those beats are regularly divided. We described the former using the terms duple, triple, quadruple, quintuple, sextuple, etc., and the latter by the terms simple and compound.

When music is written down (notated), it is most usual for a meter signature to appear at the very beginning of the notation. This signature consists of a pair of numbers with one placed beneath the other. Our task at this point is to interpret what such numbers mean with regard to the perceived meter of a composition.

Let us first of all deal with a musical parameter that affects our perception of meter. This is tempo.

The tempo of a piece of music can directly affect meter, because, as tempo increases, the tactus may change, requiring a new value to be assigned to the beat. For example, if a piece marked *allegro* is perceived as being in simple triple meter, a gradual increase in tempo might change the tactus to one that gives one beat for each pattern of 3. In addition, if a differentiation is felt between downbeat "measures" and upbeat "measures"

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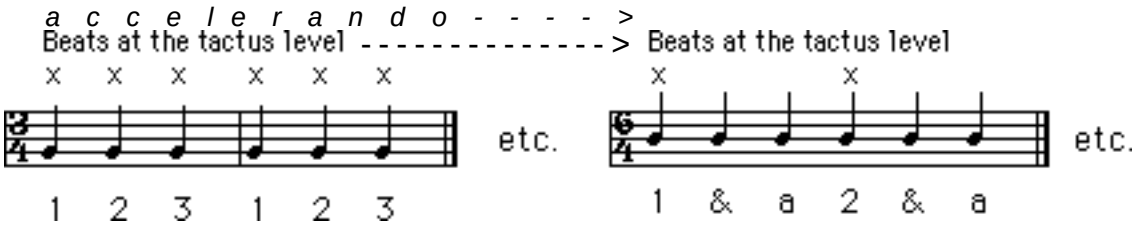
[2] In music of the Renaissance, the symbol 𝐂 denotes $\frac{4}{2}$ meter.

[3] Evidence of this can be seen in some of the works of Beethoven, for instance, where he writes *ritmo di tre battute* (rhythm of three measures..., by which he means "the perceived meter takes three notated measures as a single measure"), and in Schubert, who ends several of his pieces with three measures of rest in all the voices (because he is apparently perceiving hypermeasures made up of four notated ones, and the last full hypermeasure must be complete).

(which is likely at a faster tempo), the meter would have shifted from simple triple to compound duple, as in the example below:



Taking this quality of tempo into account, one arrives at the following description of an appropriate meter signature:

1. Given a moderate tempo, its top number indicates the number of beats in a group (measure).
2. Given a moderate tempo, its bottom number indicates the durational symbol that is assigned the value of one beat.

If we were to write meter signatures according to the above description, we would find that those for simple meters would resemble traditionally notated meter signatures, while those for compound meters would be different. Suppose, for example, that we were writing a meter signature for **simple duple**. Following the first part of the above description, we would write a "2" as our top number. Following the second part of the description, we would have to choose a durational symbol as our beat unit[4]. Let's choose, for the sake of this example, the quarter note, although any other value would do. Then our meter signature would look like this: $\frac{2}{4}$

The difficulty with compound meters is that their beats divide into three parts. Since our durational symbols are based on 2:1 relationships, the most convenient way one can show a regular division into three parts is by adopting a dotted note value as the beat unit. Given that, a traditional looking meter signature is impossible, as the following example demonstrates:

Suppose we're attempting to write a meter signature for **compound duple**. Following the first part of the above description, we would write a "2" as our top number. Following the second part of the description, we would have to choose a dotted note as our beat unit. Let's choose, for the sake of this example, the dotted quarter note, although any other dotted value would do. Then our meter signature would look like this: $\frac{2}{4.}$ (Note the augmentation dot which follows the "4.") This is hardly a traditional signature, although it indicates very well the meter we are attempting to describe.

RECONCILING NON-TRADITIONAL AND TRADITIONAL METER SIGNATURES

Since in the real world one must deal with traditional notation, it becomes necessary to be able to translate non-traditional meter signatures, like the $\frac{2}{4.}$ above, into traditional ones. In order to do this, we must first find out what traditional meter

[4] The "beat unit" is a durational symbol to which is assigned the value of one count. It represents the tactus-level beat.

signatures for compound meter actually do show. Since in traditional meter signatures no number may be dotted, and since in compound meters *the first non- dotted value available is the first division of the beat*, traditional meter signatures in fact *show that first division*, rather than the beat itself. The top number of the signature then shows *the number of first division durations present in a group*, or measure.

Let's take the above example of the compound duple meter that we have labeled $\frac{2}{4.}$. There are two beats in each measure, and the dotted quarter gets one beat. If we take the first division of that dotted quarter, we get three eighth notes, and since there are two dotted quarter notes in each measure, we would need a total of six eighths to fill out one measure. The traditional meter signature for a compound meter indicates the note value of the first division of the beat as the lower number, and the number of first division symbols that will fill up a measure as the top number. The compound duple meter we have been referring to as $\frac{2}{4.}$ would thus traditionally be called $\frac{6}{8}$ meter.

CHARACTERISTICS OF TRADITIONAL COMPOUND METER SIGNATURES

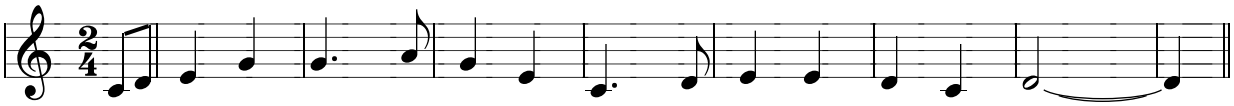
1. The top number is always an exact multiple of 3, except for 1 X 3. Duple meters have a top number of 2 X 3, or 6; triple meters have a top number of 3 X 3, or 9, etc.

2. The bottom number indicates the durational value of beats representing the first division of the tactus-level beat, rather than the tactus level itself.

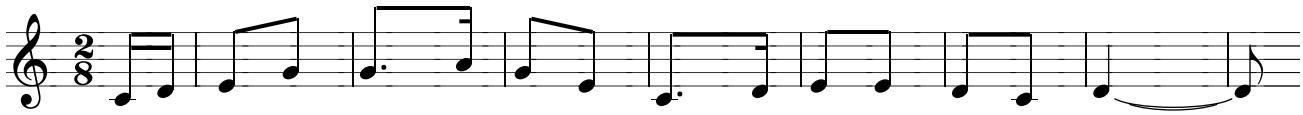
Remember that in all cases, we are considering moderate tempos. A slow $\frac{6}{8}$ meter, where we would conduct six beats rather than 2, would not be a compound duple meter at all, but a sextuple meter.

"O SUSANNA" NOTATED IN THREE DIFFERENT METERS
that Produce the Identical Sound

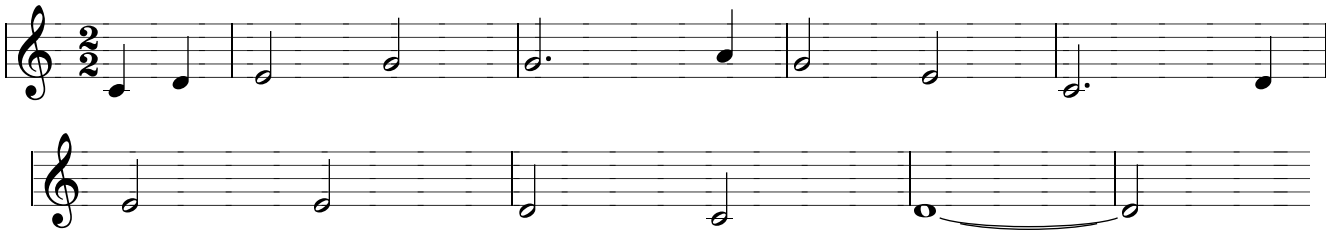
Quarter Note Gets The (Tactus-Level) Beat:



Eighth Note Gets The Beat:



Half Note Gets The Beat:



Note: Assuming the beat is given the same amount of time, e.g. m.m. = 60, these three versions will sound identical because they have the same verbal description (simple duple). This is shown by the fact that the upper number in the meter signature is the same for all versions.

Questions

1. How do the meter signatures of $\frac{2}{4}$ and $\frac{2}{4.}$ compare? (What do they have in common? How do they differ?)
2. How do the meter signatures of $\frac{3}{4.}$ and $\frac{9}{8}$ compare?
3. How do the meter signatures of $\frac{2}{4}$ and $\frac{4}{4}$ compare?
4. What is the verbal description of the following meters:

$\frac{4}{4.}$; $\frac{9}{8}$; $\frac{2}{2}$; $\frac{4}{8}$; $\frac{3}{8.}$; $\frac{3}{2.}$?

Which meter signatures will produce identical performances?

NOTATING RHYTHMS OF MELODIES

1. Meter signatures. Notating rhythms. The principles:

   a. experience a tune by thinking or performing it at a moderate tempo. [For example, *Row, Row, Row your Boat*]

   b. find a comfortable and proper conducting pattern for it.

      Example:

      ```
      >>    u    >        u      >>     u        >        u
      Row, row, row your boat,  Gently down the stream,        etc.
      ```

      works well in either duple or quadruple patterns. The accentuation shown above, with the use of both "$>>$" and "$>$" suggests quadruple meter.

   c. determine the normal beat division.
      Example:

      ```
      >>        u         >         u         ----> beat level
      > u  u    >  u u    >  u u    >  u u    ----> division level
      merrily, merrily, merrily, merrily
      ```

      suggests a division into thirds.

   d. give the meter a name. [in the case of this example, "compound quadruple"].

2. Choose a meter signature. To do this you must first choose a beat unit. [e.g., the dotted quarter note].

   Then you can write the meter signature by remembering the following: *the top number of the meter signature indicates the number of beats in the grouping (or measure, or bar) and the bottom number indicates the beat unit* [e.g., $\frac{4}{4}$.].

3. Work out the values of the notes in the duple series, given your choice of beat unit. For example, if you choose the half note as your beat unit, the quarter note would be worth 1/2 beat, the whole note 2 beats, the dotted quarter note 3/4 of a beat, etc.

4. Determine the lengths of the individual notes in the tune.

   a. conduct the beginning of the tune while singing it in order to measure the lengths of the individual notes.

      Example:

      ```
      1    2    3       4      ||  1       2        3       4
     Row, row, row your boat,       Gently down the stream
      ```

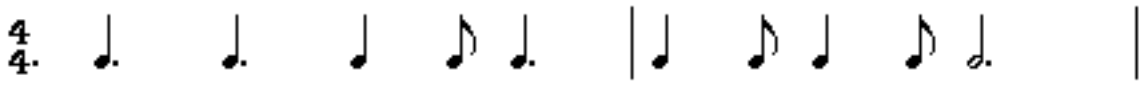
   b. determine the length of each note by measuring from where it begins to where the next note begins. [Ex. The first *row* begins on beat 1 and ends just before beat 2. Its length is therefore 2 minus 1, or one beat long.

c. Some notes will not begin <u>on</u> a beat; others will not end <u>on</u> a beat. In these cases you must subdivide until you find a grid which will accomodate all the rhythms you are trying to measure. Once you have, you will be able to determine the lengths of the various notes by counting 1/2 beats, 1/3 beats, or whatever other division you have found which works as a grid. [Ex. We have already determined that division into thirds works for *Row, row, row your boat.* When we get to *row your,* the grid will look like this:

> u u
row *your*

row thus takes 2/3 of a beat, and *your* 1/3 of a beat.]

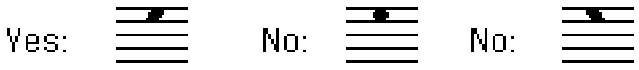
5. Translate the note values into notated rhythms. [Ex.: Since you have determined that the meter of *Row, row, row your boat* is compound quadruple, since you have chosen a meter signature of $\frac{4}{4.}$, and have come up with values of 1 - 1 - $\frac{2}{3}$ - $\frac{1}{3}$ - 1 in your first group, these would translate into the following:



If you had chosen a meter signature of $\frac{4}{2.}$, your notation would have been as follows:

Elements of Notation: Orthography of Rhythm and Meter

1. *Noteheads* should be drawn in a slightly oval shape, that tilts southwest-northeast about 30°.



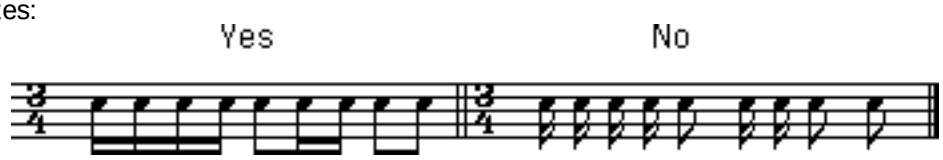
2. *Stems* are drawn vertically (never slanted), and should be approximately three spaces in length. Generally, stem direction is determined by the principal of keeping as much of the note on the staff as possible. A note whose head is on the middle line may have its stem drawn in either direction.

3. *Barlines* are also drawn vertically.

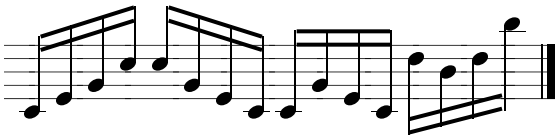
4. The terminal (final) barline consists of two parallel, vertical lines, with the one farthest to the right being of double thickness. (When writing with pen or pencil, two lines of equal thickness are acceptable.)

5. *Flags* should be drawn consistently from the ends of the stems, and be curved somewhat like a lengthened-out "S."

6. *Beams* are thick lines used in place of flags where a group of two or more notes forms a metrical unit. A beamed group is easier to read than a cluster of flagged notes:

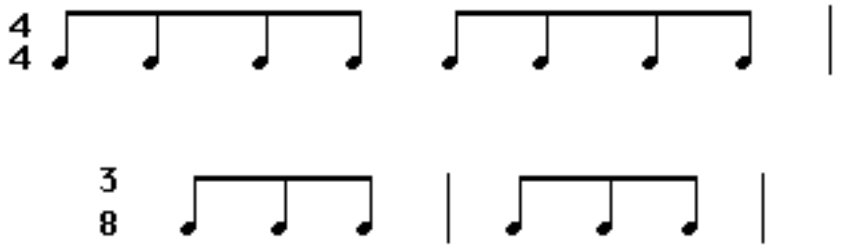


7. The distance between two beams of a sixteenth-note pattern is not quite as wide as the space between two lines of the staff. The slant of the beams depends on the position of the outer notes of the group.



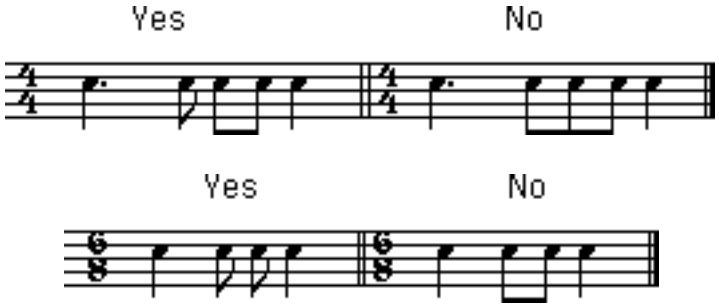
Stems must go through the secondary beam(s) and reach the primary beam in all groupings of sixteenth notes or smaller values.

8. A beam may incorporate more than one beat[5] so long as the first note in that beam is on a beat.

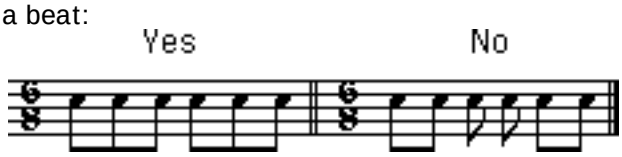


9. Do not beam beats together if the middle of an even-beat measure is not clearly shown.

10. Do not use beams if the beats of the prevailing meter are obscured.



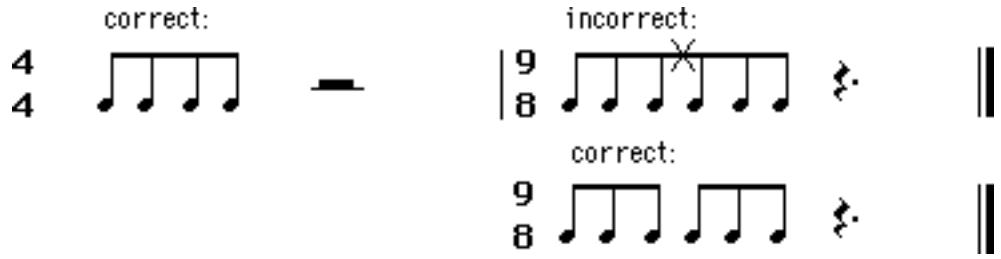
The second part of each of the above examples is incorrect because the beam begins in the middle of a beat:



In the above example, the second part is incorrect because the first beat's eighth notes are not all beamed together.

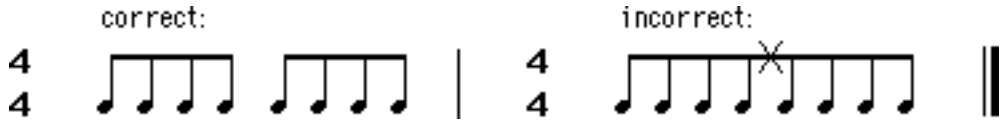
[5] For notational purposes, a tactus-level beat is defined as that occuring at a moderate tempo regardless of the actual tempo of the music. E.g., a very slow $\frac{4}{4}$ meter that might be conducted in eighth notes would still be notated as though the quarter note were the tactus.

11. Do not beam between beats in a compound meter.



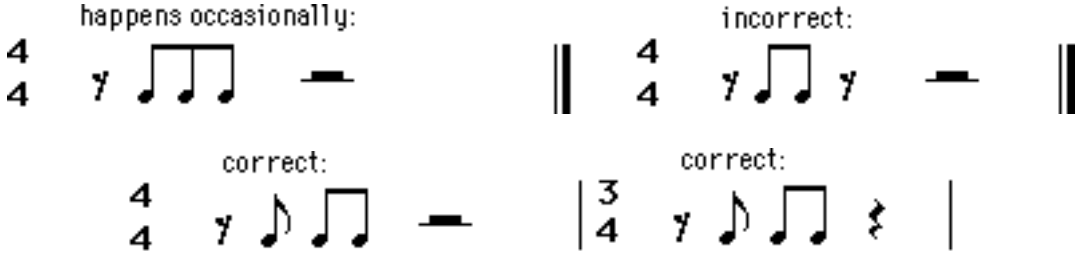
12. Do not beam together notes from different beats if they are of different durations unless the beat unit is smaller than a quarter note (when it is permissable at times).

13. Do not beam together more than three beats (as defined by the meter signature)



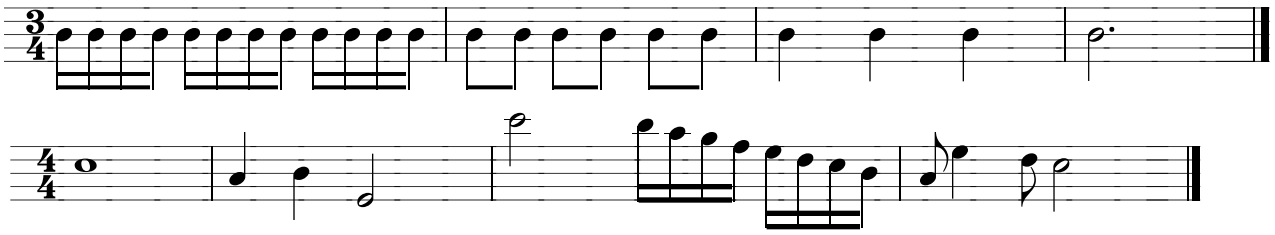
except in meters whose beat units are small enough to be beamed (e.g. $\frac{4}{8}$, where an entire measure may be beamed).

14. Do not beam together an incomplete part of one beat with an incomplete part of another. (Beaming together an incomplete part of one beat with a complete part of another does happen occasionally.)

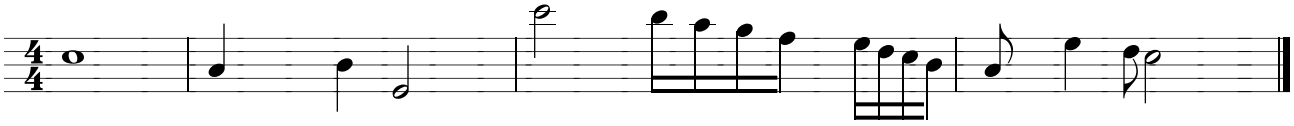


15. Good spacing of notes within a line of music ensures that the performer will be able to perceive the different durations of the notes with ease. This does not require precise mathematical proportions, and adjacent measures need not have the same physical length. Notation that conveys the impression of proportion is completely acceptable.

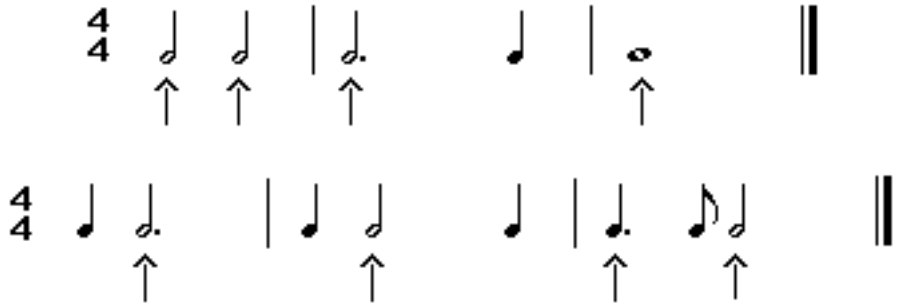
Good Spacing:



Poor Spacing:

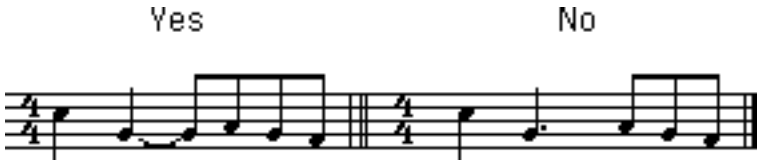


16. Notes that begin on a beat may last more than one beat.

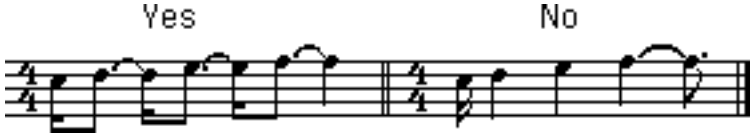


17. Notes that begin in between beats may complete more than one beat, unless they create difficulties in finding the metric position of subsequent notes. The following example, although unusual, is correct:

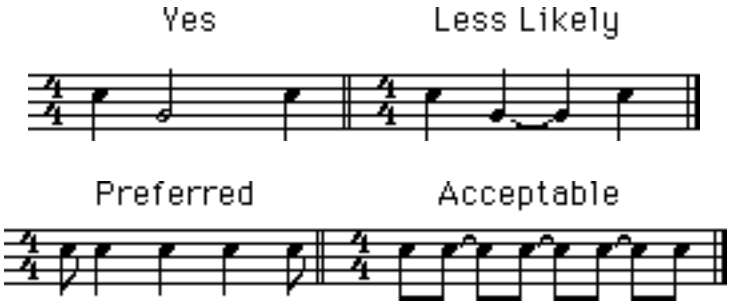
18. The notation of rhythm should never obscure the meter. This rule is especially relevant to the notation of syncopated[6] patterns:



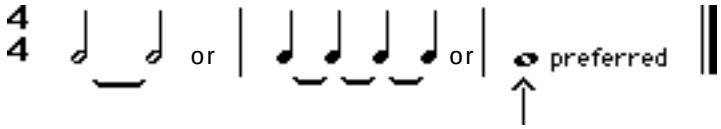
The "no" part of the above example is incorrect because the eighth-note beam gives the impression of beginning a beat, which is not the case in this meter.



19. One exception to the above involves syncopated patterns in which a note is followed by one or more notes that are twice its duration, when the final note is equal in value to the first note in the pattern. These patterns are easy for the eye to grasp:



20. When the above principles are not compromised, preference is given to the alternative that involves the fewest notes.



[6] Syncopation contradicts the prevailing order of strong and weak beats in a meter by shifting the emphasis in such a way as to suggest that strong beats are weak and weak beats strong. This is often accomplished by placing short notes on strong beats and long notes on weak beats, although there are many other ways to accomplish syncopation.

DIATONICISM

Question:

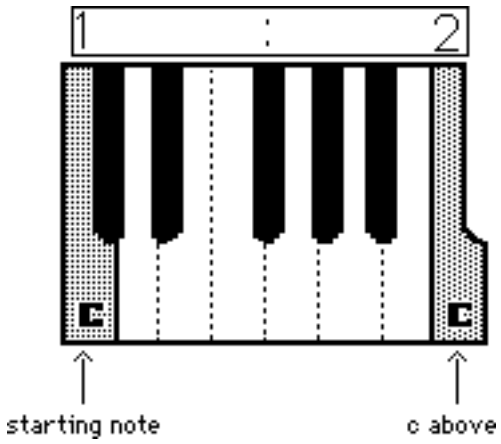
Given the infinite number of pitches within the audible range, why did Western musicians narrow the spectrum down to a set of pitch relationships known as diatonicism?

A Speculative answer:

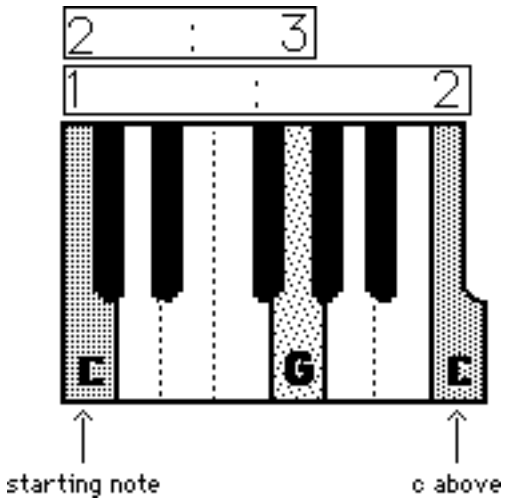
1. The ancient Greeks were much concerned with writing about the structure of their music. From their writings, which are some of the earliest we have dealing with music, it becomes clear that they considered music to be a branch of mathematics.

2. To the Greeks, stable, or consonant, relationships were produced by the ratios of simple, whole numbers, an idea first put forward by the philosopher Pythagoras around 530 B.C.E. They accepted only the ratios of (1:2), (2:3) and (3:4) as consonances. These ratios were measured in string lengths. For example, a single string and another half as long would create the ratio 1:2.

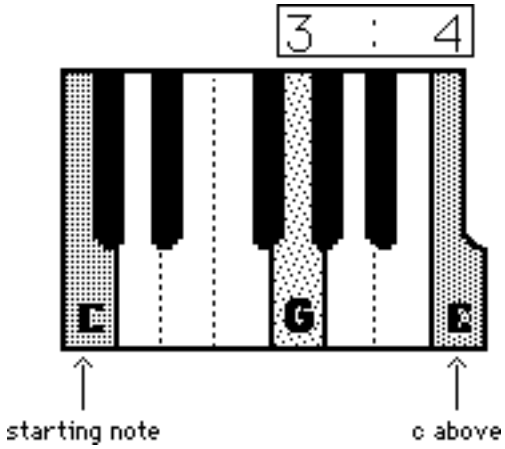
3. Governed by these consonances, the Greeks created pitch sets, or families of pitches, that included them. Given a starting note (e.g., C), they would include in a typical set the note that created a 1:2 relationship with the starting note (which turns out ot be the C above)



and also the one that created a 2:3 relationship with it (G).

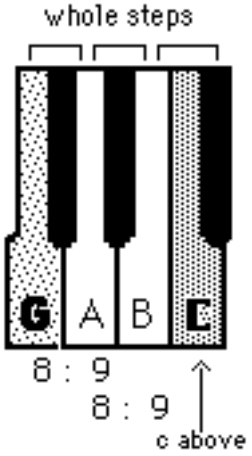


(The 3:4 relationship was represented by the notes G and the higher of the two C's.)

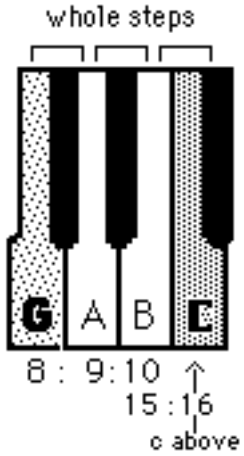


Next they filled in the distance (or *interval*) between the two closest tones, (G and the C above it) and produced what they called a tetrachord, (*i.e.*, made up of four sounds). They did this by adding new tones that fit within the space, thus creating smaller intervals.

How did they choose the size of the smaller intervals? One way they did this was by using the intervals they already had. They discovered that they could produce a new interval by adding two intervals with 2:3 ratios together and then lowering the resultant pitch an octave by dividing by 2. Starting on G, they could move up to D, then again from D move up to A. Bringing this A down an octave gave them a new interval, one that we call the *whole step.* Once they had G-A, they could perform the operation again and arrive at a whole step above the A, or B.

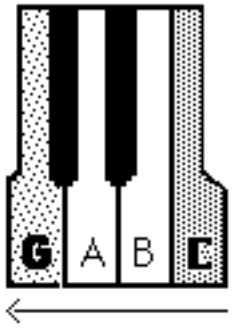


4. In addition to the whole step, the Greeks had to employ a smaller interval, called a half step. Why a half step? Whole steps cannot by themselves fill in an interval whose ratio is 3:4. Two whole steps do not yet reach it (G - A - B) and three whole steps go beyond it (G - A - B - C#). In order for the 3:4 interval to emerge, one interval must be smaller than a whole step. The half step is the interval that emerged in the process. Unfortunately, the ratio of this half step was very complicated....243:256! Nevertheless, the Greeks needed this interval, and used it regularly. Later theorists modified the size of the second whole step to produce simpler ratios (9:10 [the small whole step], 15:16 [the half step]), as can be seen in the chart at the right.

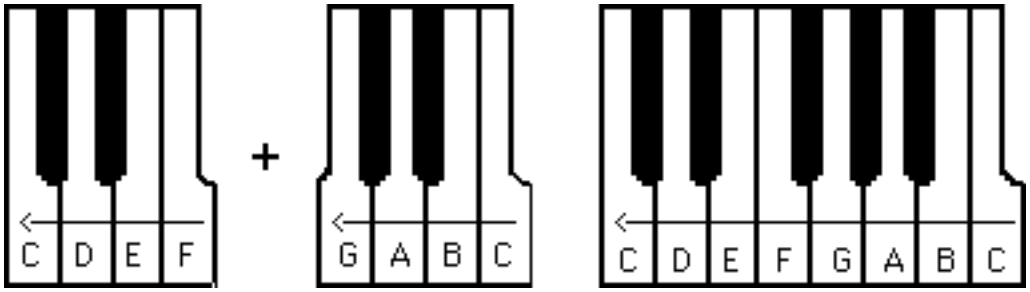


5. The Greeks referred to the tetrachord created of two whole steps and a half step as the diatonic tetrachord, and constructed pitch sets made with this tetrachord as their basis, by adding tetrachords together.[7] They arranged these sets in descending order, like a ladder. (The Latin word for 'ladder' is scala, from which we get our word scale.) These, then, were the diatonic scales.[8]

The Diatonic Tetrachord



Two diatonic tetrachords combined = a diatonic scale



6. In Medieval times, musicians became fascinated with Greek music theory, and adopted many of the Greek diatonic scales for their own music, and this tradition has been handed down to us today. (Medieval theorists constructed their scales from the lowest note to the highest, as we do today.)

A Modern Derivation of Diatonicism

A modern explanation of diatonicism must be based in major part on the knowledge of the existence of the overtone series, something neither the Greeks nor the Medieval theorists knew anything about. The Greeks' mathematics of consonance is actually present in the sounding of single tones, in which the ratios of simple whole numbers produce overtones. Given that fact, the following explanation of the basis of diatonicism can be made.

---

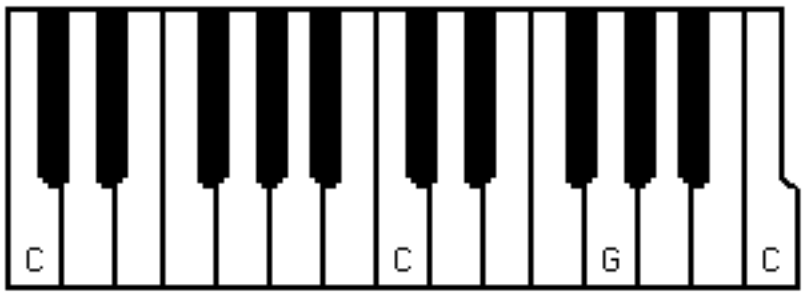
[7] The Greeks also produced other tetrachords that were more complex, called the chromatic and enharmonic tetrachords, but these tetrachords, and the scales constructed from them, were not subsequently employed by Western musicians.

[8] Since we have virtually no Greek music, only writings about it, it is difficult to know whether the Greeks “invented” their scales and then wrote music to accommodate them, or whether their discussions concerning scale structure resulted from an analysis of their music. In all subsequent musical styles, the music clearly has preceded the codification of scale forms. Scales, therefore, are abstractions created by theorists, not the generators of music.

Harmonic Component

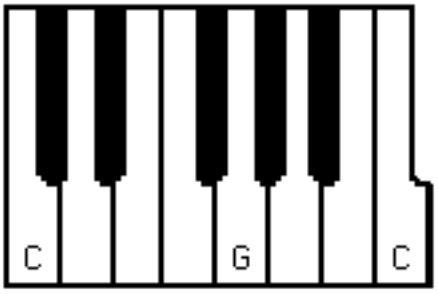
A. The strongest overtones must be included in the set. This requires the first four partials (i.e., the fundamental and the first three overtones), at least.

The Fundamental and First Three Overtones:



B. Since the octave repeats in the above system, the pitches and intervals present can all be shown if the system is reduced to a single octave:

Reduced to a Single Octave



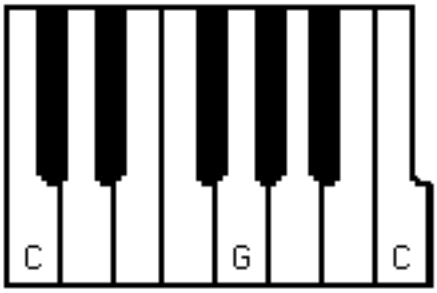
Melodic Component

C. Given these overtones as guideposts in the set, and the need for more pitches in the musical vocabulary, a goal is to fill in the gaps with as many whole steps (with more consonant ratios) and as few half steps (with less consonant ratios) as possible.

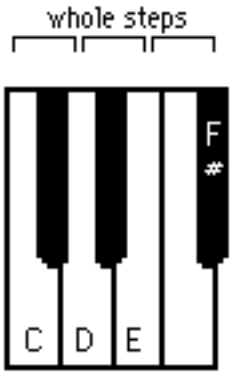
D. A second goal is to minimize the effect of the half steps by placing them as far apart from one another as possible, in both directions (higher and lower).[9] It turns out, given the above conditions, that the half steps must be separated by **two whole steps in one direction, and three whole steps in the other.**

[9] It is interesting to note that in some music the question of how to deal with half steps is avoided by reducing the number of pitches in the collection. At the point where a half step would be created, the note creating that half step is simply not used. In this music, which is called pentatonic (5 tones), no half steps appear at all.

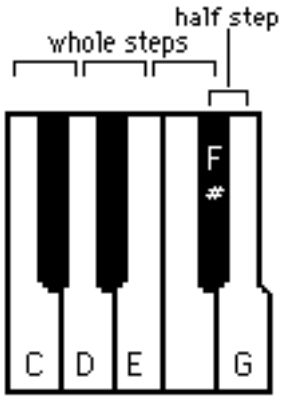
8. Here is an example of how a diatonic scale might be constructed, given the above criteria. Given C as the starting tone, we must then include the G and C above from the overtones of C.



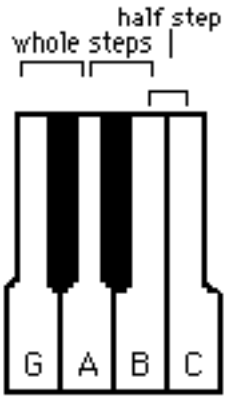
Next, we must fill in the gap between C and G and between G and C. Let's choose, in this example, to use as many whole steps in a row as we can, putting in the half step only when there is no other choice (C - D - E - F#).



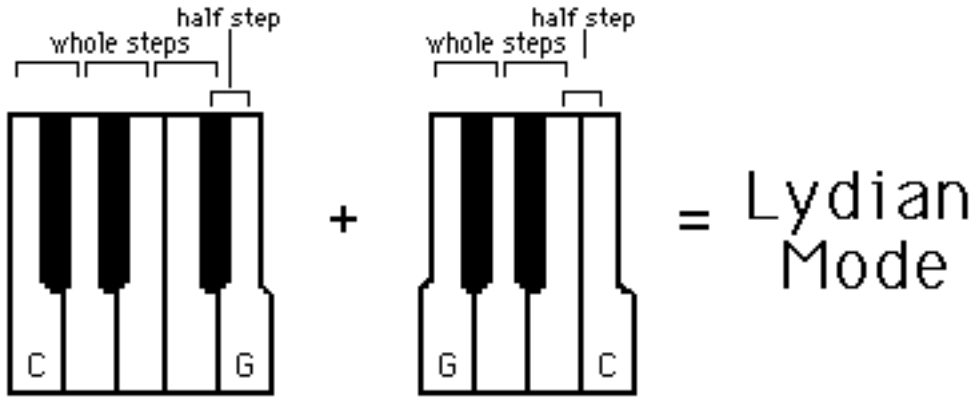
The half step is now necessary in order not to bypass the G.



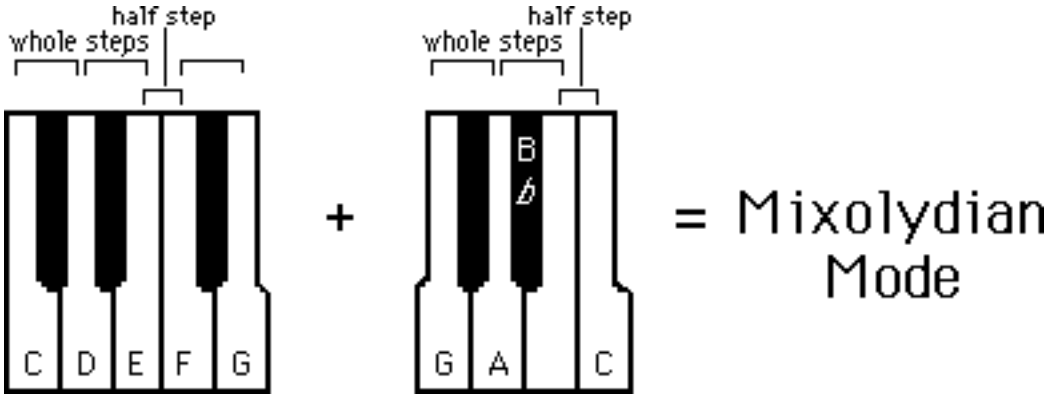
Following the G, we can include the whole steps A and B, but then another half step is required in order not to bypass the upper C.



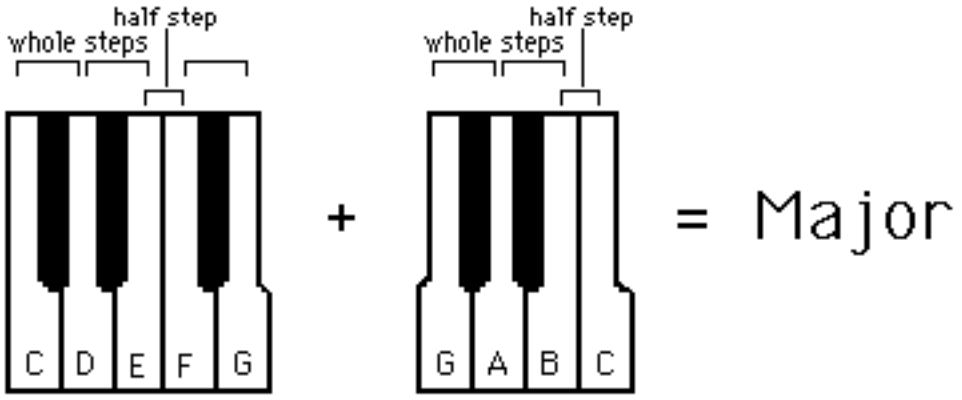
This half step is two whole steps above the F#-G half step, and is also, given a repetition of the pattern, three whole steps below the next F#-G half step. Thus we have formed a diatonic scale. This scale is known as the Lydian mode.



Here is another example. Beginning with C, let's include two whole steps and then use the half step. This gives us C - D - E - F. A whole step is now required in order to arrive at the G. Now, given the required separation of half steps, we must have at least one more whole step before another half can be used. This adds an A. We may either place the half step next (B flat) or include one more whole step (B) before the mandatory half step (C). In the first case the diatonic scale formed is called the Mixolydian mode:



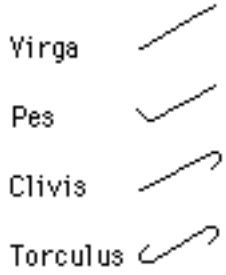
In the second case the scale, which was called by the old name Ionian Mode, is now called Major. The pattern of whole and half steps in major is, then, W W H W W W H.



NOTATION OF PITCH

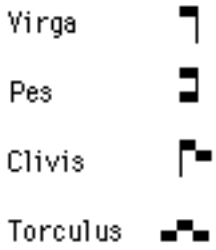
THEORETICAL BACKGROUND

Modern musical notation developed from what are called *staffless neumes*. Generally employed until the 11th century, they were capable of indicating only the general pitch contour of the notes they represented. Some of them looked like this:



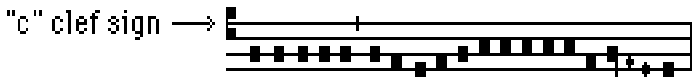
(St. Gall, 10th century)

The above eventually became standardized, and still appear in what is called "modern Gregorian" notation. Their pitch contour is more easily discernible:



(Modern Gregorian notation)

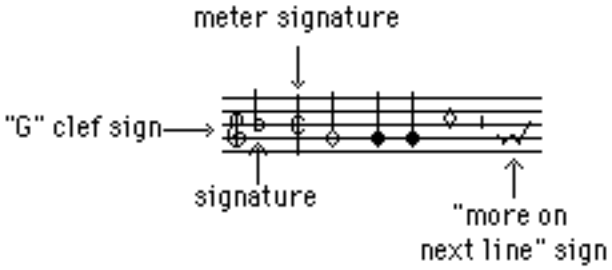
In the 11th Century Aquitinian neumes employed a single horizontal line to help in the precise measurement of pitches. This later developed into a "staff" of several lines, one of which was named by a letter placed "on" it. This is the "clef" sign:



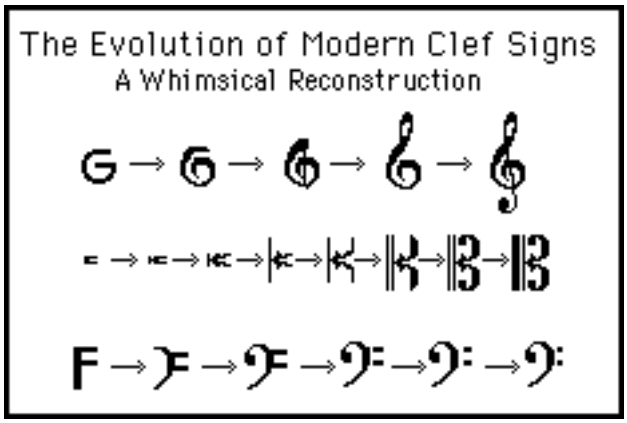
Modern Gregorian Notation

Around 1250 *mensural notation* was invented, as has been discussed earlier. This notation was able to convey information about both pitch and duration. With the basic elements of modern notation now in place, a gradual development continued for hundreds of years. An important milestone was the standardization of the 5-line staff, that began to be employed in a regular fashion in the 15th century. Here is an example from the 16th century, that includes a clef sign, a pitch- or key-signature (here simply called "signature," and meter signature. The sign at the end of the line informed the reader that there was more music to come:

White Mensural Notation, 1538



As the range of music increased, the five-line staff was used with three different clef signs, representing the notes "C", "G" and "F." In time, these clef signs developed from simple letters into highly embellished symbols. Here is an overly-simplified diagram to show these elaborations:

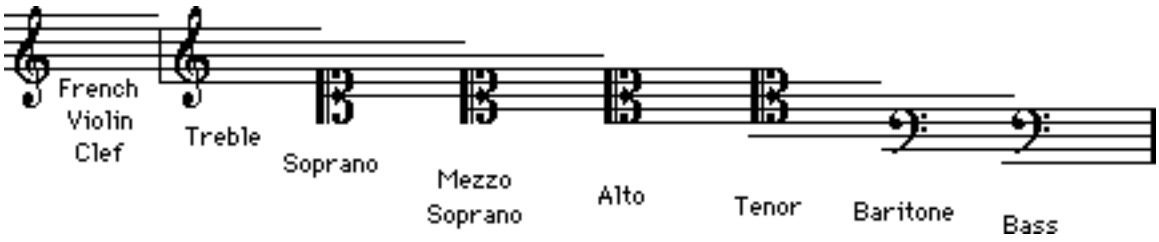


Later the 5-line staff was often found to be inadequate for the wide range of pitches requiring representation, and the *grand staff* was invented. This is essentially an eleven-line staff, with the middle line left out (for ease of reading). Here is a grand staff, with three clef signs on it:

The Grand Staff

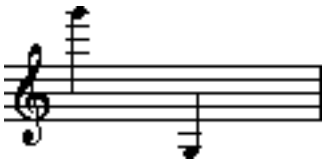
Clef signs that appear with a particular selection of five lines (taken from the grand staff) create **clefs**. Four clefs remain in modern use (treble, alto, tenor and bass), but there were originally many more. Below are shown eight clefs that were at one time all in common use. They are named by the ranges they represent:

Clefs:



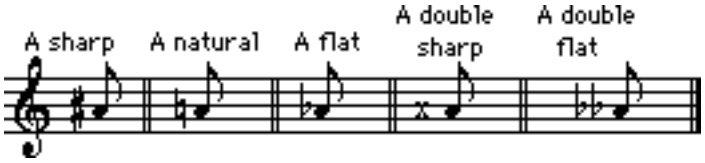
When the range of an instrument or voice exceeds the normal range of the staff, **ledger lines** (also spelled "leger") are employed. These are simply little bits of additional lines from within the grand staff or beyond it. Here are two examples:

Ledger Lines:



When notes are called for that are not included in the prevailing signature, or are needed to cancel other notes appearing earlier in a measure, **accidentals** are employed:

Accidentals:

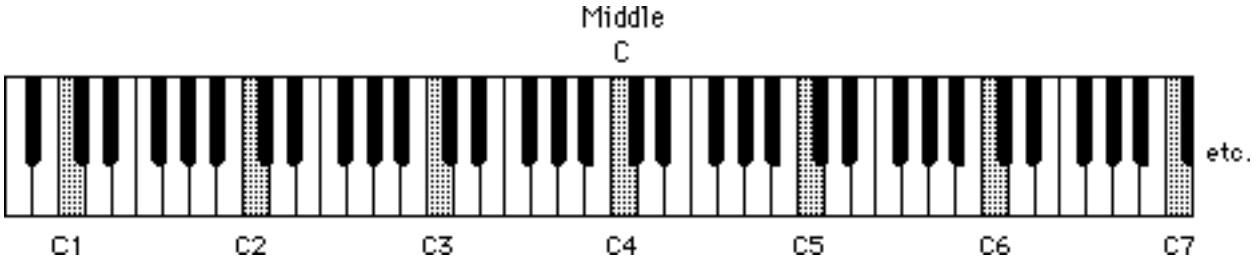


Standard Pitch Names

Pitches can be named in a number of ways. One is by **pitch class** (e.g. all the A's on the piano are in pitch class A, etc.)[10]; another is by location in a precise octave. There are several accepted systems that are employed to denote the precise pitch of a note. The one adopted for use in this text is as follows:

1. Middle C is indicated by the symbol C4.
2. All the pitch classes up to the next C (C5) are in Octave 4. (E.g., D4, E4, F#4, etc.)
3. The C below middle C is indicated by the symbol C3, etc.

The following illustration should make this system clear:



TRANSPOSITION OF THE DIATONIC CIRCLE

Close examination of a visual representation of diatonicism, the diatonic circle (see charts, below) will reveal the very precise order of relationships found in the diatonic system. The arrangement of whole and half steps fulfills each of the three requisites for diatonicism, namely:

a) The ratios of 2:1. 3:2 and 4:3 are included.
b) Only two half steps are included.
c) The half steps are as far apart from one another as possible.

The question arises, "Are there any ways in which a diatonic system can be modified without destroying the diatonicism?" The answer to this question is "yes." Two operations of modification can be performed on a diatonic system that will maintain the diatonicism. These are as follows:

a) Change the half step occurring after two whole steps (when going clockwise around the diatonic circle) to a whole step by raising the upper tone of the half step. (See figure 10 b.)

b) Change the half step occurring after the three whole steps to a whole step by lowering the lower tone of the half step. (See figure 10 c.)

---

[10]When dealing with pitch classes, enharmonics (e.g. A# and B^b)are considered to be equivalent. For this reason, there are said to be only twelve pitch classes.

Either of these two operations maintains the starting note of the system (the note in the "12 o'clock" position) while modifying the order of whole and half steps. Another way of saying this is that each operation changes the *mode.*

Change of Mode

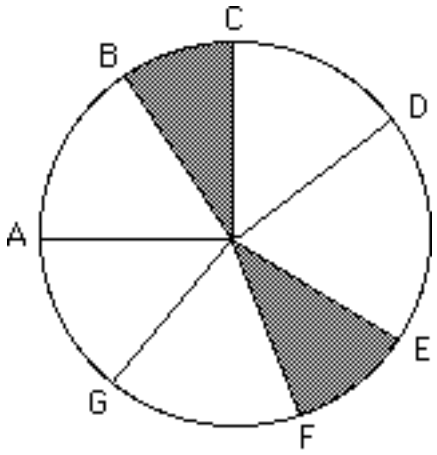


Figure 10a

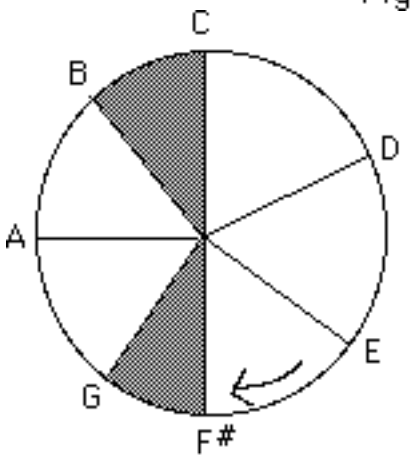


Figure 10b

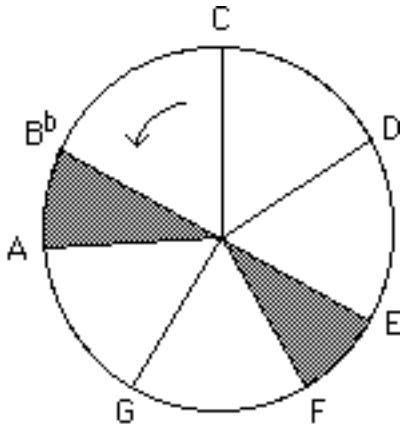


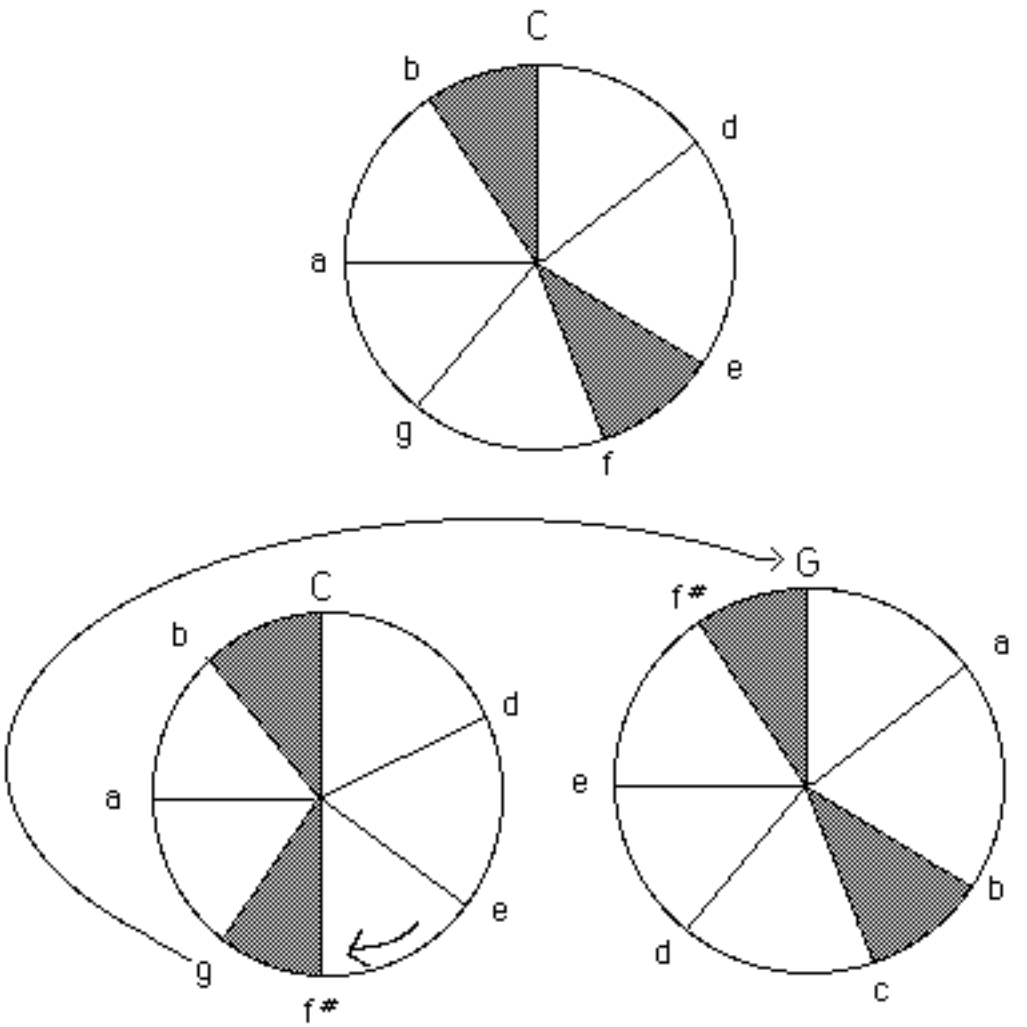
Figure 10c

Notice also that in each of these cases, a simple rotation of the circle produces the same pattern of whole and half steps that was originally present (in figure 10 a), i.e., the Major mode. That is, if you rotate figure 10b so that G is at the 12 o'clock position, it will look just like figure 10a. The same will happen if you rotate figure 10c so that F is on the top. Through these two operations, then, the mode has been maintained, but the starting note has been moved to another pitch. The system has thus been *transposed*.

Transposition

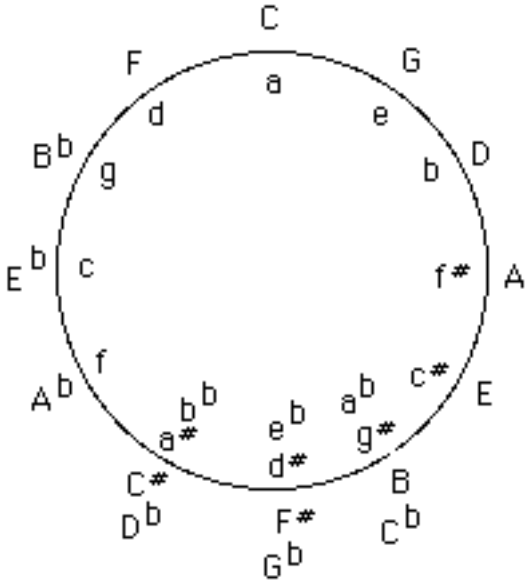
Here is a specific example of a transposition operation. The first procedure, that of increasing the size of the interval between the third and fourth degrees of the scale to a whole step, produces a change of mode without a change of tonic, in this case from C Major to C Lydian. The subsequent rotation returns to major, and produces the G major scale:

Transposition from C Major to G Major



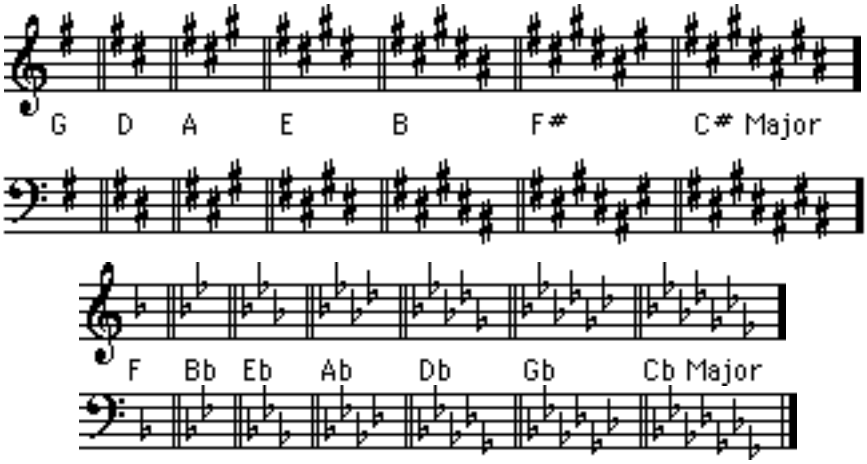
TRANSPOSITION OF MAJOR SCALES

When viewed from the perspective of the major mode, systematic transposition creates noticeable patterns. Raising the fourth note of the scale one half step and rotating the circle, raises the key five notes (or a 5th); repeating the process raises the key another 5th; lowering the seventh degree of the major scale one half step and rotating the circle, lowers the key five notes; repeating the process lowers the key another 5th. From this transposition process comes the *circle of 5ths*, an example of which appears below. (The tonics of the major scales appear on the outside of the circle; those inside the circle denote minor keys):

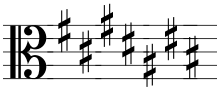
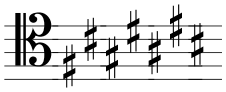


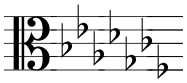
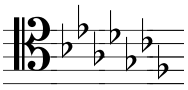
SIGNATURES

The following are the diatonic signatures obtained by the operations described above as they are properly written in treble and bass clefs. The first set, or sharp signatures, are arrived at by raising the fourth degree of each successive system. [E.g., beginning with no sharps or flats, or C Major, raise the fourth degree from F to F#, and rotate the circle. This produces G major, with a signature of one sharp.] The second set, or flat signatures are arrived at by lowering the seventh degree one half step. [E.g., beginning with no sharps or flats, or C Major, lower the seventh degree from B to B♭, and rotate the circle. This produces F Major, with a signature of one flat.]



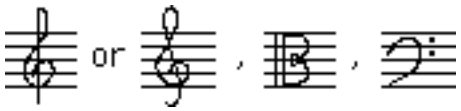
Here are the seven sharps and seven flats in alto and tenor clefs:

alto:  tenor: 

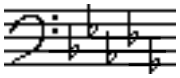
 

ELEMENTS OF NOTATION: ORTHOGRAPHY OF PITCH

1. Clef signs should be drawn consistently, and should appear at the beginning of every line of music.

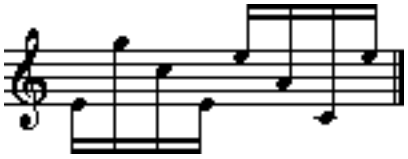


2. The *signature* precedes the meter signature, and is **written on every line**. Accidentals in the signature should be written consistently, and in the appropriate pattern. Here is an appropriately-written example (done by hand):



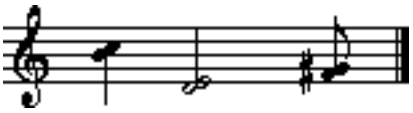
3. The *Meter Signature* follows the (pitch) signature, but **appears only on the first line**, unless a change of meter occurs. Each number making up the meter signature should fill two spaces of the five-line staff. *Since a meter signature is not a fraction, no line is drawn between the numbers.*

4. When planning beams, the stem lengths should be adjusted so that the shortest stem will be approximately an octave in length.

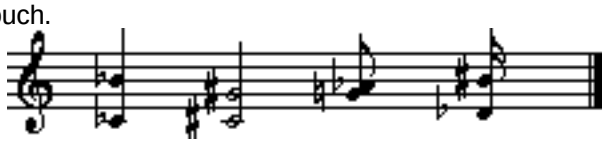


5. Stem direction for a group of beamed notes is determined by the note farthest away from the middle line of the staff.

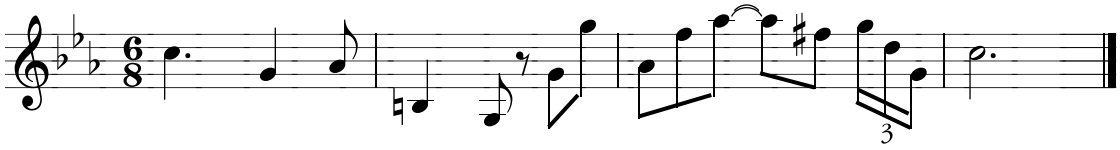
6. When two adjacent notes with different letter names appear on a single stem , the lower of the two notes is placed on the left side of the stem.



7. If an interval or chord is written on a single five-line staff, and that interval or chord contains two accidentals, those accidentals are placed in normal position if the notes are a seventh or more apart. If the noteheads are less than a seventh apart, the lower of the two accidentals must be placed to the left of the upper accidental so the two do not touch.

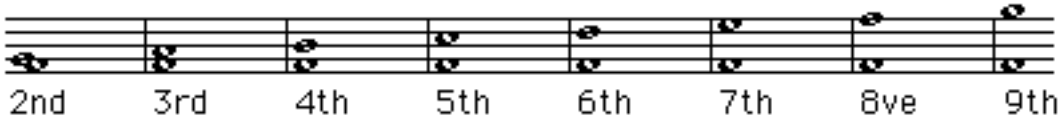


8. Here is an example of correct musical orthography:



Intervals

The distance between two pitches is called an "interval." Interval names commonly include two components, a numerical value and a "quality" designation. The numerical value of any interval can be determined by either of two methods: a) counting the number of letter names involved in going from one note of the interval to the other [e.g., the interval from a to d is a 4th, since the letters a, b, c and d are involved] or b) counting the number of lines and spaces dividing the notes of an interval. The following notation indicates how intervals of different numerical sizes appear on a five line staff. Without a clef sign it is impossible to determine either the letter names of the notes, or the quality of the intervals, but their numerical value is clearly shown.



THREE BEGINNING METHODS FOR READING INTERVALS

Method 1

(Scale method. [This one is the most common method.])

1. Determine the number of letter names (also called letter classes[11]) or the number of staff steps involved in the interval. (Be sure to include the notes of the interval itself in your calculation.) This procedure yields the number size of the interval (e.g. 3, 4, 8).

2. Assume the lower note of the interval is *do* of a major scale, and determine what version of the upper note would be in that same scale.

3. Identify the interval you have just found as follows:

---

[11]All notes employing the same letter designation are in the same letter class. Therefore, for example, all A's, A#s and A^{b}s are in letter class A.

a) If the number size of the interval is 1, 4, 5 or 8,
THE INTERVAL IS **Perfect**.

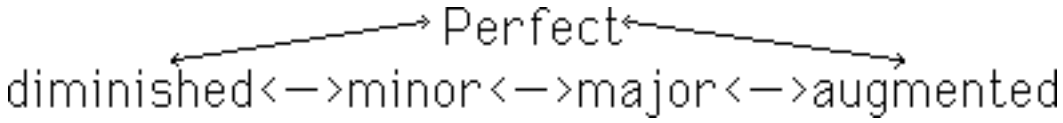
b) If the number size of the interval is 2, 3, 6, or 7,
THE INTERVAL IS **Major**.

4. Compare the interval you have just named with the given (original) interval.

a) If the intervals are identical, you are finished.

b) If the intervals are different, decide how the given interval has been modified (either by expansion or contraction) from the interval you have already identified.

5. Name the new interval according to the following chart. Each double-pointed arrow denotes of change in size of one half-step:



Method 2

1. Determine the number of letter classes or the number of lines and spaces (if notated on a staff) involved in the interval. (Be sure to include the notes of the interval itself in your calculation.)

2. Use the following table to determine the size of the interval:

Number of letter classes in the interval	Number of half steps in the interval	Name of the interval	Example measured from C
1	0	perfect unison (prime)	c-c
1	1	augmented unison	c-c#
2	0	diminished second	c-d^{bb}
2	1	minor second	c-d^{b}
2	2	major second	c-d
2	3	augmented second	c-d#
3	2	diminished third	c-e^{bb}
3	3	minor third	c-e^{b}
3	4	major third	c-e
3	5	augmented third	c-e#
4	4	diminished fourth	c-f^{b}
4	5	perfect fourth	c-f
4	6	augmented fourth	c-f#
5	6	diminished fifth	c-g^{b}
5	7	perfect fifth	c-g
5	8	augmented fifth	c-g#
6	7	diminished sixth	c-a^{bb}
6	8	minor sixth	c-a^{b}
6	9	major sixth	c-a
6	10	augmented sixth	c-a#
7	9	diminished seventh	c-b^{bb}
7	10	minor seventh	c-b^{b}
7	11	major seventh	c-b
7	12	augmented seventh	c-b#
8	11	diminished octave	c-c^{b}
8	12	perfect octave	c-c
8	13	augmented octave	c-c#

Method 3

(Keyboard method)

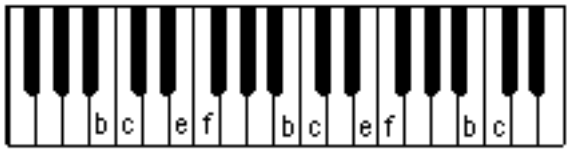
(This method works well for all intervals occurring within the white-note diatonic system, for which the keyboard provides an excellent representation. If it is mastered, the identification of more complex intervals will prove to be an easy next step.)

1. Determine the number of letter classes or the number of lines and spaces (if notated on a staff) involved in the interval. (Be sure to include the notes of the interval itself in your calculation.) This procedure yields the number size of the interval.

2. Given an interval to identify, ignore, for the time being, any accidentals involved. The interval will thus appear to be within the white-note diatonic system, or on the white notes of the keyboard.

3. Principles involved in the determination of interval quality:

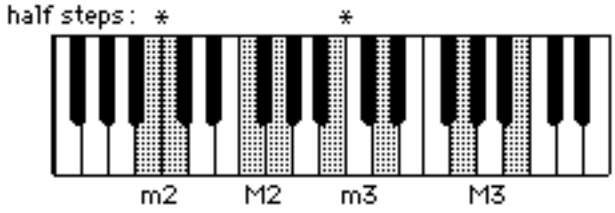
   a. There are two natural half steps in the white note diatonic system: e-f and b-c. On the keyboard, these white notes have no black notes between them:



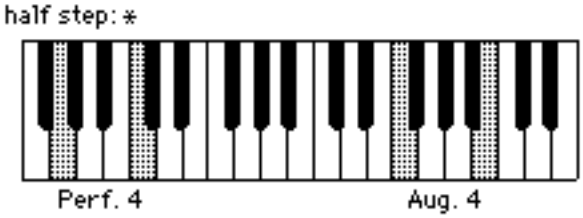
   b. In white note diatonicism the following qualities of intervals are the only ones that can arise:

unison, or prime:	perfect or augmented
2nds:	minor or major
3rds:	minor or major
4ths:	perfect or augmented
5ths:	perfect or diminished
6ths:	minor or major
7ths:	minor or major
8ves:	perfect

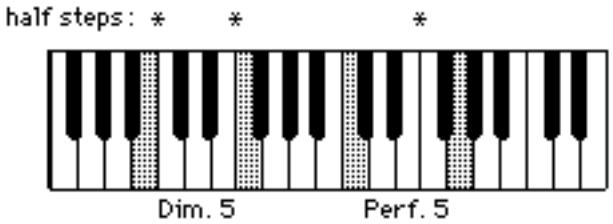
   c. 2nds and 3rds are Minor if they contain a white-note half step and Major if they do not.



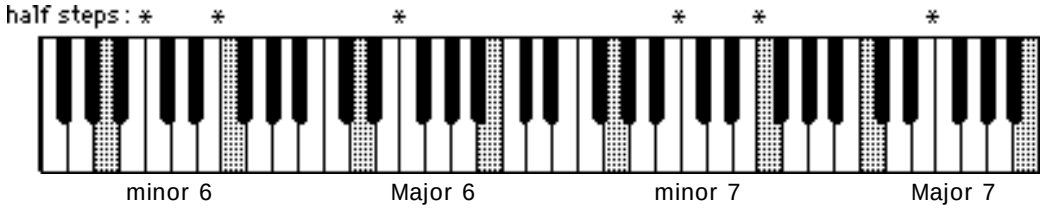
4ths are Perfect if they contain a white-note half step, and Augmented if they do not.



5ths are Diminished if they contain both white-note half steps, and Perfect if they contain only one white-note half step.



6ths and 7ths are Minor if they contain both white-note half steps, and Major if they contain only one white-note half step.

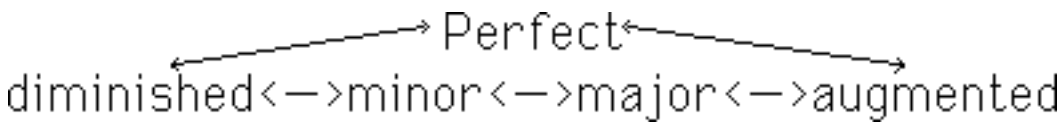


4. Once you have determined the quality of the white-note interval, compare it with the given (original) interval.

   a) If the intervals are identical, you are finished.

   b) If the intervals are different, decide how the given interval has been modified (either by expansion or contraction) from the interval you have already identified.

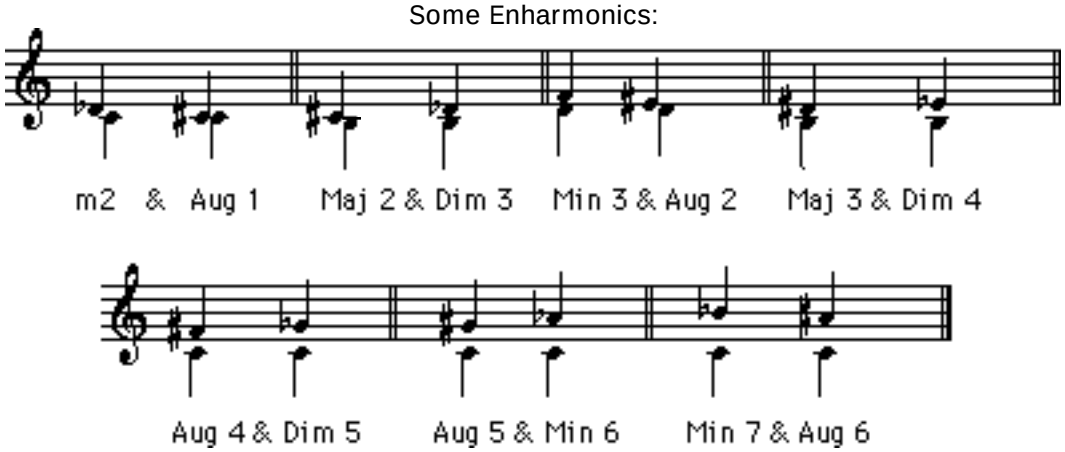
5. Name the new interval according to the following chart. Each double-pointed arrow denotes a change in size of one half-step:



ENHARMONICS

Enharmonic equivalents are intervals that sound the same, but which are spelled differently and have different functions within a key. (Actually, they sound the same only on instruments that are tuned to *equal temperament*. In other systems of tuning, their pitch may actually be a little different.) It is important to remember that enharmonics are in fact more different than they are the same, and that the spelling of an interval determines its number size and its quality. Enharmonics are thus *not really equivalent*.

Some Enharmonics:

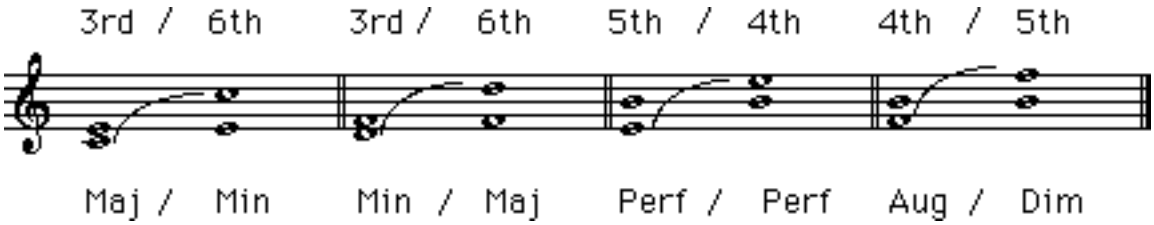


Mod 12 Intervals

Enharmonically equivalent intervals are also named by a system known as "modulo 12," which is usually abbreviated "mod 12." In this terminology, the number of half steps between the two notes of the interval identify it. For example, a minor second (or an augmented unison) is called a "1." A perfect fifth is a "7."

INVERSION OF INTERVALS

It is often useful to think of intervals in pairs, in which either note of the interval can assume the top or the bottom position. Interval pairs can be created by beginning with any interval (e.g., C4-A4), then transposing the lower member up an octave so that it becomes the higher member (A4-C5). Below are pairs of intervals:



Notice that these pairs of intervals exhibit the following relationships:

a) The number sizes of an interval pair, when added together, always totals 9.

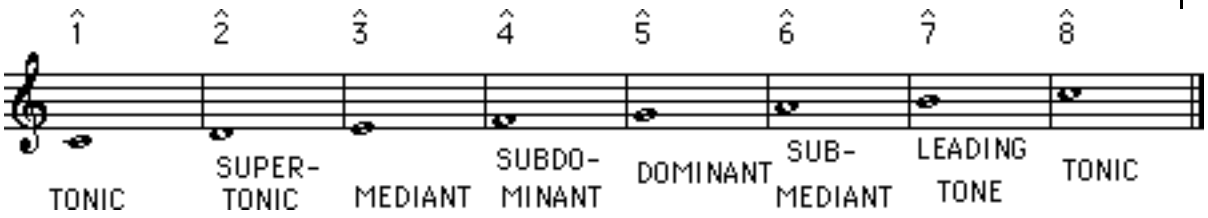
b) Major intervals invert to minor intervals (and minor to major); perfect intervals invert to perfect intervals; augmented intervals invert to diminished intervals (and diminished to augmented).

TONALITY

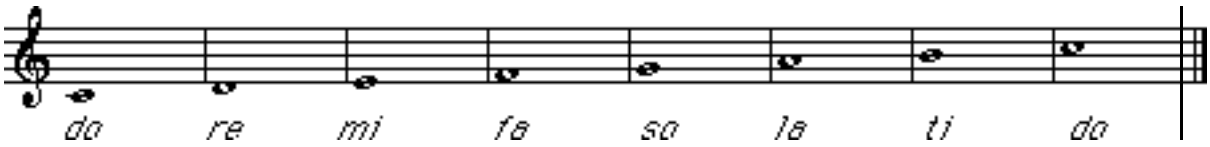
The complex system of pitch relationships in a diatonic system (e.g., the white notes of the keyboard) provides an example of *tonality*. Music that exhibits tonality is based on the relationships of pitches to a *tonal center* or *tonic.* (The tonal center has, up to now, been described as the "starting tone.") Any music in which a pitch is perceived to be a tonic is called *tonal music.*[12]

Degrees and Syllables

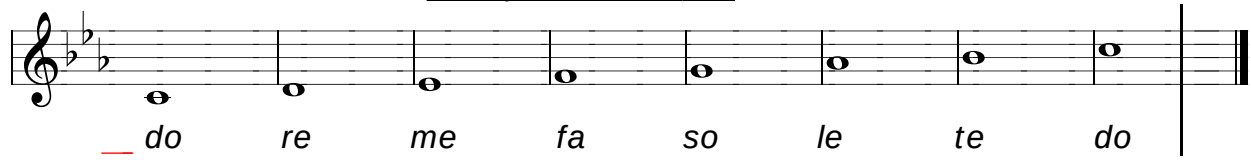
The Names of the Scale Degrees, beginning with *do*



The Syllables for Major

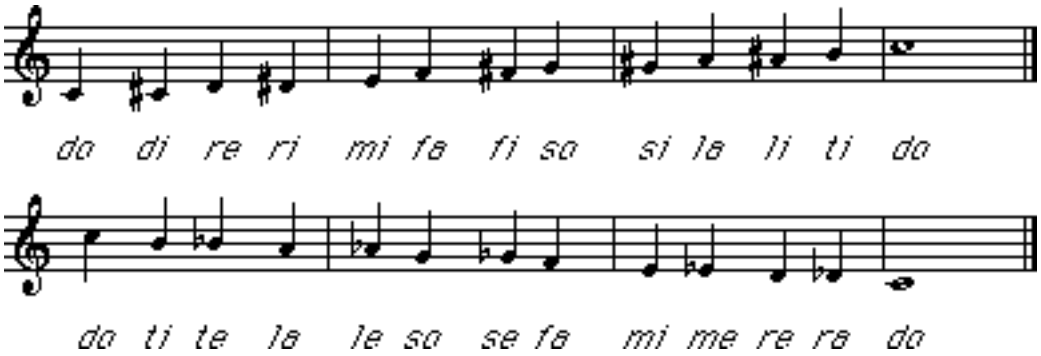


The Syllables for Minor



The Syllables for the Chromatic Scale, ascending and descending

[12]This is a broad definition of tonality. A more restrictive definition includes only music in major and minor keys.


do di re ri mi fa fi so si la li ti do
do ti te la le so se fa mi me re ra do

OF MODES AND THE RELATIONSHIPS AMONG THEM

Now that we have discovered the underlying structure of diatonicism, and have examined in detail a manifestation of that structure, namely the structure we call the major scale, we can extend our examination to other sets of relationships that occur within a diatonic framework. The major scale gives us two bits of information necessary for the formation of a *key*: a pitch set, and one note of that set that is designated to be the tonic, or *do*.

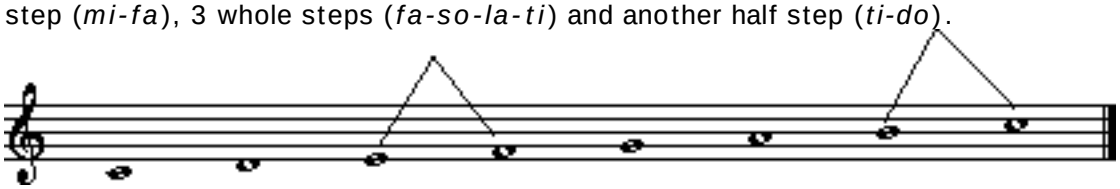
KEY = *DO* + PITCH SET

The Relative System

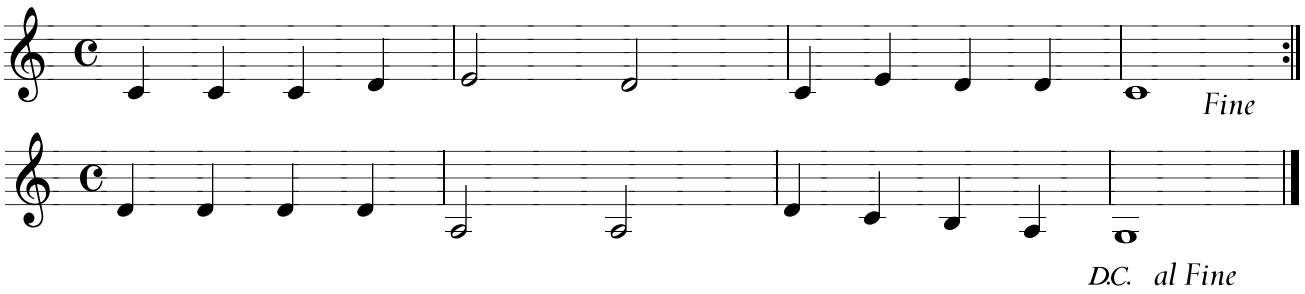
We are now ready to examine other diatonic structures that share the same pitch set, but designate a different note as the tonic. ALL KEYS THAT SHARE THE SAME PITCH SET ARE SAID TO BE RELATIVES OF ONE ANOTHER.

In order to simplify our discussion, we will first consider the diatonic system that is easiest to comprehend, namely the one represented by the white notes of the keyboard.

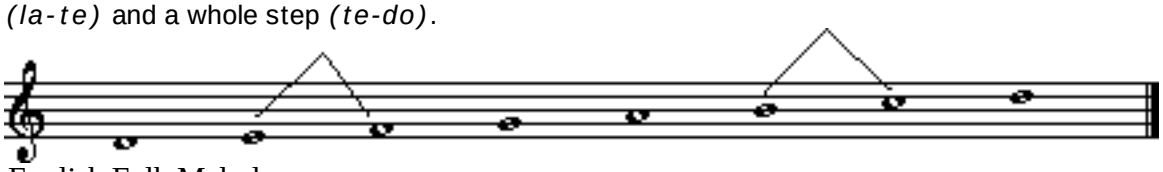
The key that uses only white notes and has C as *do* is called Major. (An older name for this key is Ionian mode.) Its structure is as follows: 2 whole steps (*do-re-mi*), a half step (*mi-fa*), 3 whole steps (*fa-so-la-ti*) and another half step (*ti-do*).



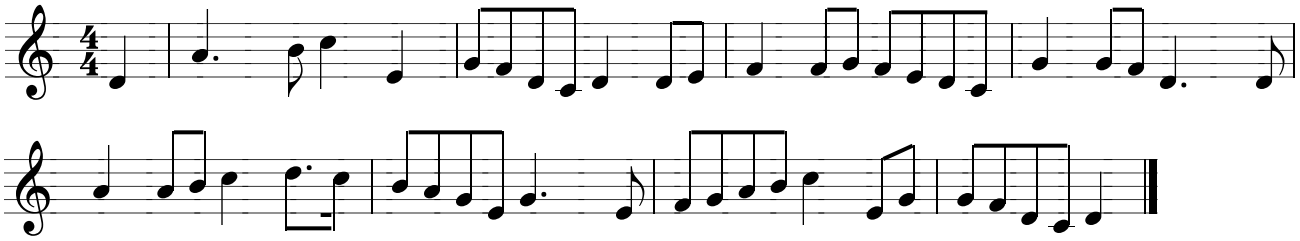
Au Clair de la Lune



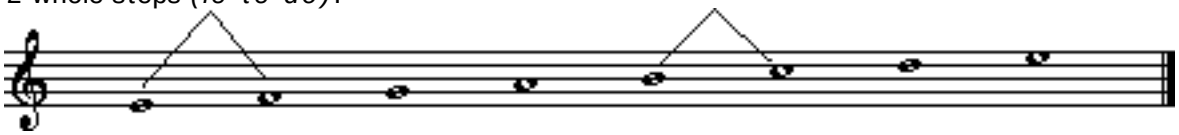
The key that uses only white notes and has D as *do* is called Dorian mode. Its structure is 1 whole step *(do-re)*, a half step (*re-me*), 3 whole steps *(me-fa-so-la)*, a half step *(la-te)* and a whole step *(te-do)*.



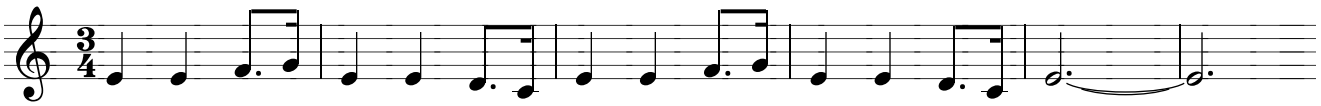
English Folk Melody:



The key that uses only white notes and has E as *do* is called Phrygian mode. Its structure is 1 half step *(do-ra)*, 3 whole steps *(ra-me-fa-so)*, 1 half step *(so-le)* and 2 whole steps *(le-te-do)*.

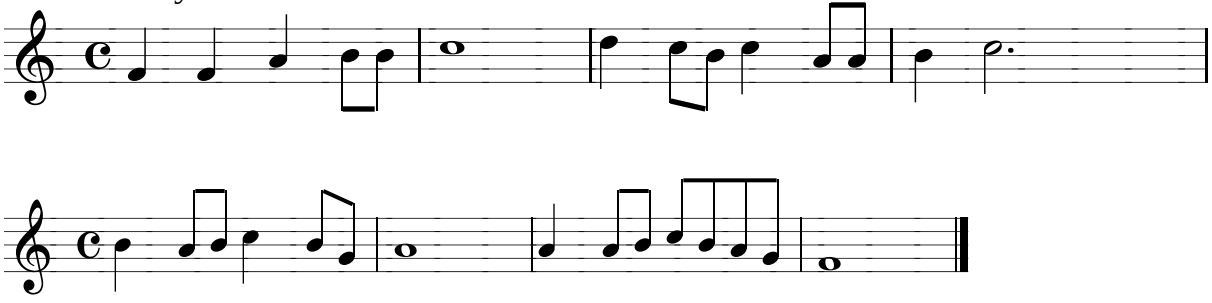


Brahms: Symphony No. 4

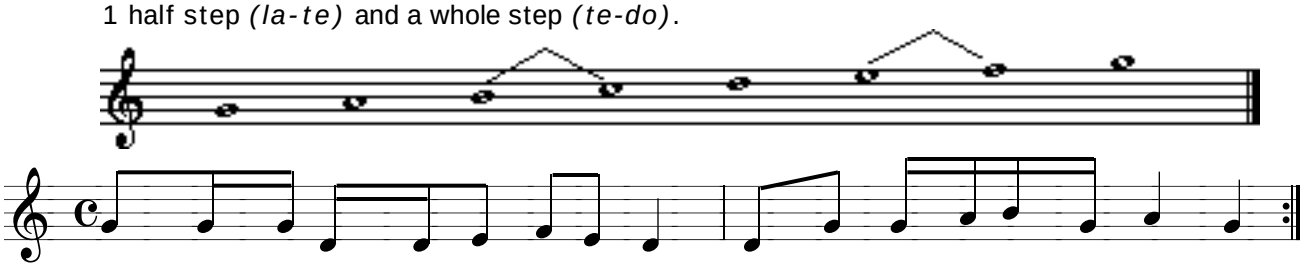


The key that uses only white notes and has F as *do* is called Lydian mode. Its structure is 3 whole steps *(do-re-mi-fi)*, 1 half step *(fi-so)*, 2 whole steps *(so-la-ti)* and a half step *(ti-do)*.

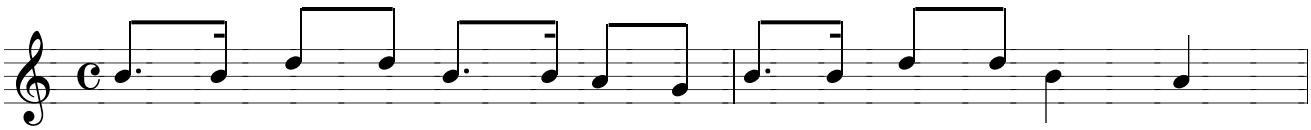
Folk Melody



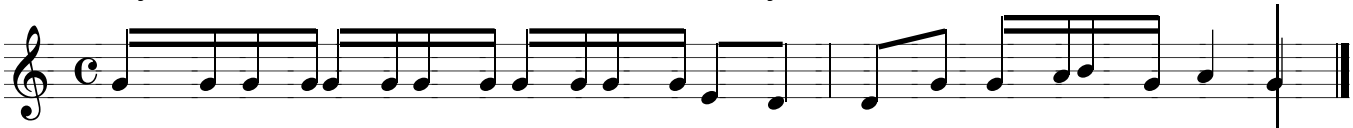
The key that uses only white notes and has G as *do* is called Mixolydian mode. Its structure is 2 whole steps *(do-re-mi)*, 1 half step *(mi-fa)*, 2 whole steps *(fa-so-la)*, 1 half step *(la-te)* and a whole step *(te-do)*.



Frog went a- court- ing and he did ride; Ring tum bol- ly min- chy cam- bo
Sword and pis- tol by his side; Ring- tum bol- ly min- chy cam- bo



Kye m'- dear- o down to Cai- ro Kye m'- dear- o Cai- ro.

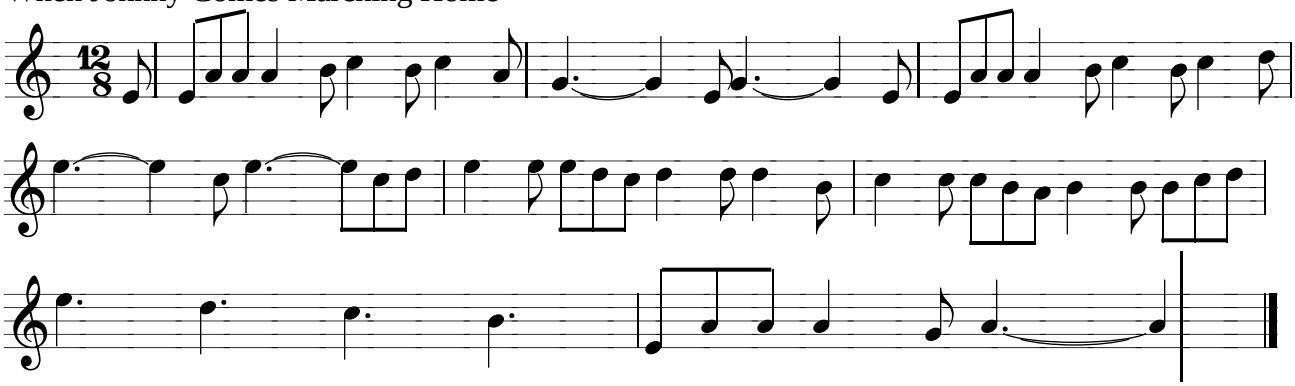


Strud- a- lud- a lud- a bub- a- lud- a bub- a- ling- tum ring- tum boll- y min- chy cam- bo.

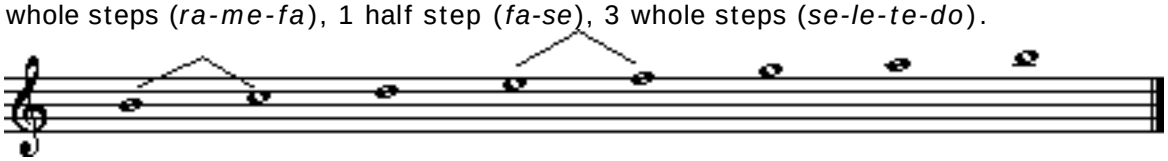
The key that uses only white notes and has A as *do* is called Minor. (An older name for this key is Aeolian mode.) Its structure is 1 whole step *(do-re)*, 1 half step *(re-me)*, 2 whole steps *(me-fa-so)*, 1 half step *(so-le)* and 2 whole steps *(le-te-do).*

~~*do).*~~

When Johnny Comes Marching Home



The potential key that uses only white notes and has B as *do* has not been used until the twentieth century. This is because it is the only diatonic scale that does not include a Perfect 5th from do to the fifth degree. (The fifth degree of this scale is a diminished 5th above *do*). Because the dominant is so important to the establishment of tonality, this mode (called Locrian) was not used until our own century, a time when clear tonality was no longer an ideal for many composers. Its structure is 1 half step (*do-ra*), 2 whole steps (*ra-me-fa*), 1 half step (*fa-se*), 3 whole steps (*se-le-te-do*).



The intervallic relationships between the tonics of the above relative keys can be summed up by the following mnemonic device:

I	Don't	Particularly	Like	Modes	Anyway
o	o	h	y	i	e
n	r	r	d	x	o
i	i	y	i	o	l
a	a	g	a	l	i
n	n	i	n	y	a
		a		d	n
		n		i	
				a	
				n	

The above relationships exist not only in the white note diatonic system, but in all diatonic systems. All keys are relative to one another that share the same diatonic system (which is the same as saying they share the same pitch set or the same signature). The syllables for each of the above scales remain the same regardless of transposition.

The Cotonic System

All keys that share the same *do*, e.g. C Major, C Minor, C Dorian, C Mixolydian, etc., are in a **Cotonic** relationship with one another. (The traditional term for this relationship is **Parallel**.) Since we are considering different keys that have the same *do*, the pitch set of each must be different from all the others. (C Major and C Dorian have different pitch sets.)

The relationships between the pitch sets used by the various cotonic keys can be summed up by the following mnemonic device:

```
{4#- 3#- 2#-  1#- -  +1#}
{4b+ 3b+ 2b+  1b+ -  -1b}
 P   A   D   M   I   L
ra+ le+ me+ te+  -  fi
<----------------    --->
```

The above chart may be read as follows:

1. The capital letters represent the various modes, which, read from left to right, are **P**hrygian, **A**eolian, **D**orian, **M**ixolydian, **I**onian, **L**ydian.
2. Using Ionian as our standard, we can see that Lydian substitutes fi for Ionian's fa. Its signature has one more sharp[13] than the signature of its cotonic major (Ionian).
3. Mixolydian substitutes te for Ionian's ti. Its signature has one more flat[14] than the signature of its cotonic major.
4. Dorian, in addition to te, includes me, rather than Ionian's mi. Its signature has two more flats (or two fewer sharps) than its cotonic major.
5. Aeolian, in addition to te and me, includes le, rather than Ionian's la. Its signature has three more flats (or three fewer sharps) than its cotonic major.
6. Phrygian, in addition to te, me and le, includes ra, rather than Ionian's re. Its signature has four more flats (or four fewer sharps) than its cotonic major.

If one is very familiar with the structure and the sound of diatonic (or "natural") minor, the following related mnemonic device can prove quite useful:

```
 Minor-ish      Major-ish
1#-  -  +1#    1#-  -  +1#
1b+  -  -1b    1b+  -  -1b
 P   A   D      M   I   L
ra   -   la     te   -   fi
<---    --->   <---    --->
```

The above chart may be read as follows:

1. There is only one difference between the Ionian (major) scale and its cotonic Lydian; Lydian has *fi* instead of *fa*.
2. There is only one difference between the Ionian scale and its cotonic Mixolydian; Mixolydian has *te* instead of *ti*.

---

[13]Depending upon the particular signature of a key, the phrase “one more sharp” might need to be read “one less flat.” C Lydian has “one more sharp” than C Major; $B^{\flat}$ Lydian has “one less flat” than $B^{\flat}$ Major.

[14]Depending upon the particular signature of a key, the phrase “one more flat” might need to be read “one less sharp”.

3. There is only one difference between the Aeolian scale and its cotonic Dorian; Dorian has *la* instead of *le*.
4. There is only one difference between the Aeolian scale and its cotonic Phrygian; Phrygian has *ra* instead of *re*.

Calculating Signatures of the Various Modes

One can calculate the signature of any mode (given as a key, i.e. with the tonic designated) using either the relative system or the cotonic system. Here is an example of each method.

PROBLEM: What is the signature of C Dorian?

RELATIVE METHOD:

1. Find *do* of the relative major. (This is located down a whole step from the *do* of the Dorian.) Answer: B Flat Major.
2. Since the signature of relative keys is the same, the signature of C Dorian is the same as that for B Flat Major, namely 2 flats, Bb and Eb.

COTONIC METHOD:

1. Find the cotonic major key of C Dorian. This is C Major.
2. We know the signature of C Major is no sharps or flats. Using the PAD MIL chart above, proceed to the left from C Ionian until you get to C Dorian, adding one flat for every move. (C Major = 0 flats; C Mixolydian = 1 flat; C Dorian = 2 Flats). Therefore, C Dorian has two flats in its signature, Bb and Eb.

HOW TO FIGURE OUT PROBLEMS CONCERNING THE INTERRELATIONSHIP OF TONIC, MODE, AND SIGNATURE

There are two kinds of relationships between keys, the so-called relative and cotonic (also called *parallel*)relationships. Both of these can be put to use in solving problems concerning tonic, mode and signature. Let us examine the three kinds of problems, and the way in which they can be solved using both of these relationships. We will begin with the Relative relationship.

RELATIVE RELATIONSHIP

Problem Type I (Given the tonic and mode, to determine the signature):

Example: Tonic = D; Mode = Dorian; Signature = ?

1. Write the modes in relative order, i.e. I D P L M A.

2. Place the given information on the chart; place the "D" tonic over the "D" for Dorian:

```
      D
I     D     P     L     M     A
```

3. Find the relative major by moving to the left from D:

```
C<---D
I     D     P     L     M     A
```

This tells you that the relative major of D Dorian is C Major.

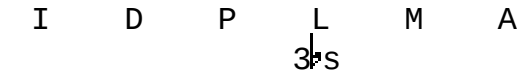
4. Name the signature of C Major (no sharps or flats). Since D Dorian is relative to C Major, it must have the same signature. Therefore the signature of D Dorian is no sharps or flats.

Problem Type II (Given the signature and mode, to determine the tonic):

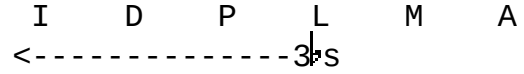
Example: Signature = 3 flats; Mode = Lydian; Tonic = ?

1. Write the modes in relative order, i.e. I D P L M A.

2. Place the given information on the chart:

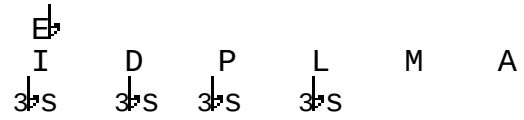


3. Find the relative major by moving down to the left:

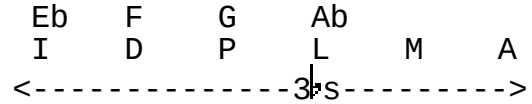


This tells you that the relative major of the Lydian mode with 3 flats also has 3 flats. (That's what relative means.)

Now you know the tonic of the relative major. It's E♭; write it in on the chart.



4. Go up the Eb Major scale until you reach "L" for Lydian. This will tell you the tonic of the Lydian scale that is relative to Eb Major:



The tonic of the Lydian mode with 3 flats is thus A♭.

Problem Type III (Given the tonic and signature, to determine the mode):

Example: Tonic = F#; Signature = 2#s; Mode = ?

1. Write the modes in relative order, i.e. I D P L M A.

2. Since you do not yet know where to place the tonic, place the signature below the chart:

```
 I    D    P    L    M    A
2#s---------------------->
```

3. Determine the tonic of the relative major and place it on the chart:

```
 D
 I    D    P    L    M    A
2#s---------------------->
```

This tells you that the relative major of the mode you're looking for is D Major.

4. Go up the D Major scale until you reach the note "F#. This will tell you the mode that has F# as its tonic:

```
 D    E    F#
 I    D    P    L    M    A
2#s---------------------->
```

The mode with 2#s in its signature that has a tonic of F# is Phrygian.

Solving Problems Concerning Modal Relationships at the keyboard

Because the intervals between the tonics of relative modes are fixed, the relationships among them can be easily discovered. If you learn to perform major scales in 5-finger position with your right (or left) hand playing from *do* up to *so* , and learn to extend your little finger (or thumb) to encompass the sixth degree of the scale as well, you will have “under your fingers” all the tonics of the relative modes, as is shown in the illustration.

Left Handed Method

Right Handed Method

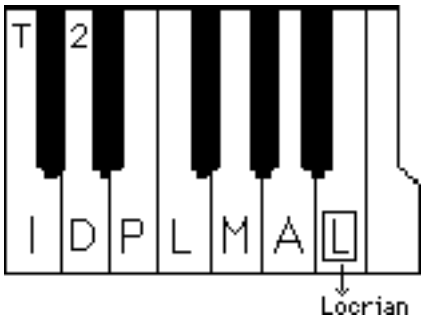
Below are the three types of problems associated with modal relationships. In each case, two items of information are given and a third is to be discovered. Once you have grasped the principles involved, give yourself problems to solve, and use your knowledge of the keyboard to help you find the answers quickly and securely:

Problem Type I (Given the tonic and mode, to determine the signature):

Example: Tonic = D; Mode = Dorian; Signature = ?

METHOD

Since the tonic is D and the mode is Dorian, place your "Dorian [or index] finger on D. Your thumb will fall on the relative major, or C. The signature of C Major = the signature of D Dorian.

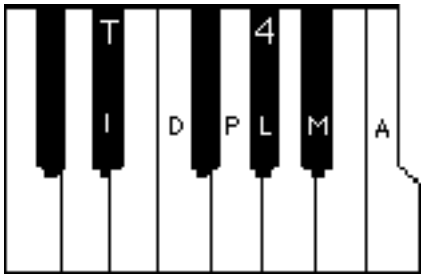


Problem Type II (Given the signature and mode, to determine the tonic):

Example: Signature = 3 flats; Mode = Lydian; Tonic = ?

METHOD

Given the signature of 3 flats, you know the major key that has that signature. Place your thumb on E flat, the tonic of the major scale with 3 flats. Then find the note on which your "Lydian [or fourth] Finger" rests [A flat]. This is the tonic you seek.

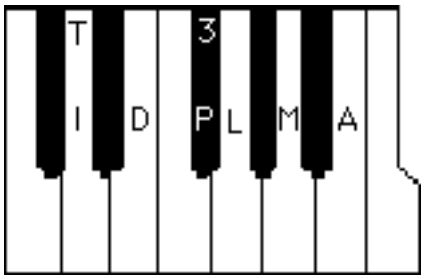


Problem Type III (Given the tonic and signature, to determine the mode):

Example: Tonic = F#; Signature = 2#s; Mode = ?

METHOD

Given the signature of 2 sharps, place your thumb on the tonic of the major scale that has that signature [D]. The F# would now be played by your middle [Phrygian] finger, so the mode you seek is Phrygian.



COTONIC RELATIONSHIP

Problem Type I (Given the tonic and mode, to determine the signature):

Example: Tonic = D; Mode = Dorian; Signature = ?

1. Write the modes in cotonic order, i.e. P A D M I L.

2. Given a D tonic, all the tonics will be D:

```
D------------------------>
P    A    D    M    I    L
```

3. You know the signature of D Ionian [Major], so write it in:

```
D------------------------>
P    A    D    M    I    L
                     2#s
```

4. Move to the left on the chart until you reach Dorian, removing one sharp with each move:

```
D------------------------>
P    A    D    M    I    L
          0#s  1#   2#s
```

5. D Dorian has no sharps (or flats).

Problem Type II (Given the signature and mode, to determine the tonic):

Example: Signature = 3 flats; Mode = Lydian; Tonic = ?

1. Write the modes in cotonic order, i.e. P A D M I L.
2. Write the given information on the chart:

```
P    A    D    M    I    L
                         3♭s
```

3. Move to the left on the chart until you find the cotonic major, remembering to add flats as you go:

```
P    A    D    M    I    L
                    4♭s<-3♭s
```

4. You know the tonic of the major key with four flats, so write it in:

```
                        Ab
P    A    D    M    I    L
                    4♭s<-3♭s
```

5. Since this is a cotonic chart, the tonic remains the same for all the modes. The answer is thus A♭.

```
  <------------------Ab---->
P    A    D    M    I    L
                    4♭s<-3♭s
```

Problem Type III (Given the tonic and signature, to determine the mode):

Example: Tonic = F#; Signature = 2#s; Mode = ?

1. Write the modes in cotonic order, i.e. P A D M I L.
2. Write the tonic on the chart (You cannot yet write the 2#s on the chart, because you don't know yet where it belongs):

```
F#---------------------->
P    A    D    M    I    L
```

3. You know the signature of F# Major, so write it in:

```
F#---------------------->
P    A    D    M    I    L
                     6#s
```

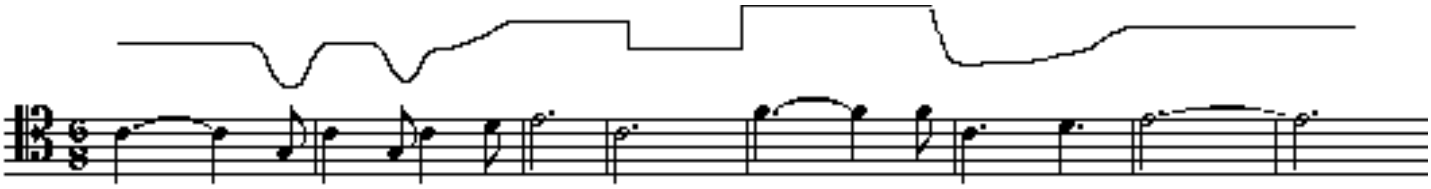
4. Now, move to the left until you get to a signature of 2#s:

```
F#---------------------->
P    A    D    M    I    L
2#s<-3#s<-4#s<-5#s<-6#s
```

5. The answer is thus Phrygian.

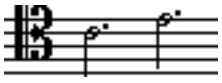
Terms Describing Melody

Contour: the shape of a melody, as created by the manner in which it moves up and down, either smoothly or by sudden, large leaps, etc.



Range: the distance from the lowest to the highest notes in a melody. Some melodies have extremely wide ranges; others are very narrow in range.

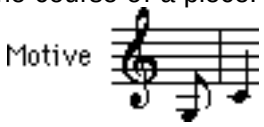
Tessitura:that portion of the range in which most of the melody is set.



Conjunct: stepwise motion.

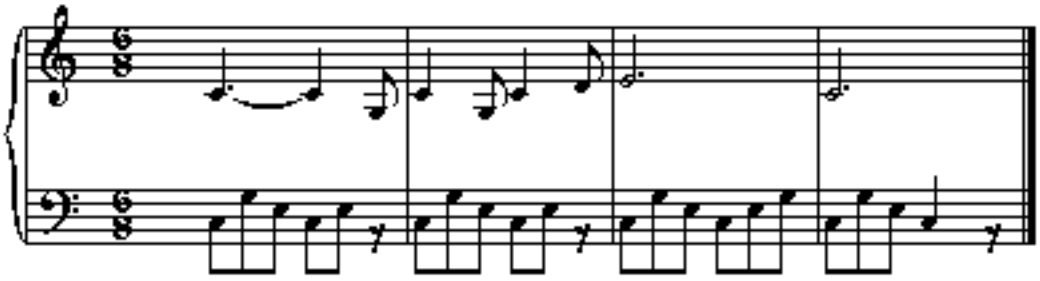
Disjunct: skipwise motion.

Motive: the smallest musical unit (either melodic or rhythmic) that undergoes development during the course of a piece.



Term Describing Accompaniment

Figure: a small musical unit that serves a primarily background or accompanimental function, and that is not significantly changed during the course of a piece.[15]

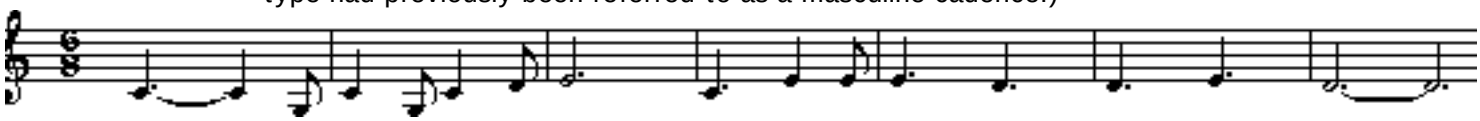


[15] This use of the term "figure" has no connection with the use of the term in painting, where "figure-ground" relationships mean something quite different.

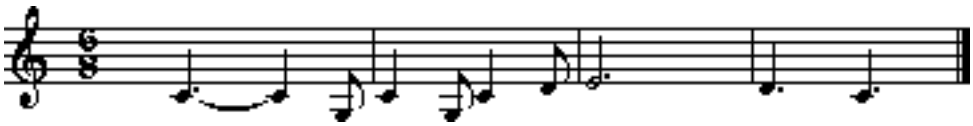
CADENCE

General definition: a point in the musical flow that provides a pause, or signals some sort of conclusion strong enough to end a phrase (see below).

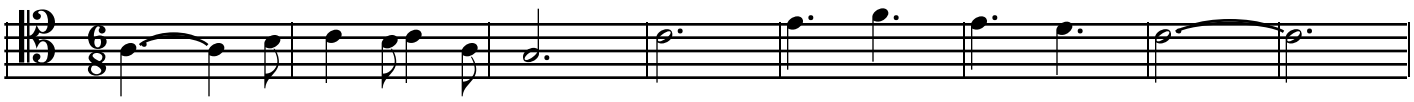
Accented Cadencestrong-beat): a cadence that ends on a metrically strong beat. (This type had previously been referred to as a masculine cadence.)



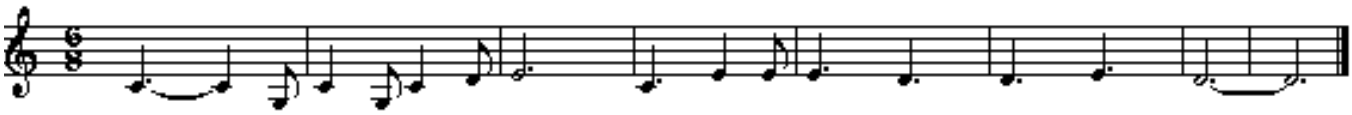
Unaccented Cadence (weak-beat): a cadence that ends on a metrically weak beat. (This type had previously been referred to as a feminine cadence.)



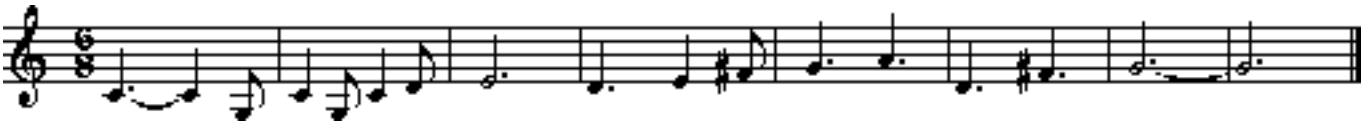
Conclusive Cadence: a cadence that denotes a partial or total cessation of activity, ending either on the tonic (a rest tone) or, at times, on the third or fifth degrees of the scale (tones often referred to as being associated rest tones). Cadences to associated rest tones are usually more weakly conclusive than those to the tonic. Cadences in which the tonic is not in the bass are less conclusive than those in which the tonic is the bass note.



Inconclusive Cadence: a cadence that suggests the necessity for continuation, although a momentary pause has been achieved. It rarely ends on the tonic, which most often signals at least a weak conclusion, but may end on any other scale degree, especially those degrees that exhibit activity (e.g. the 2nd, 4th, 6th and 7th degrees). Some cadences are more inconclusive than others.

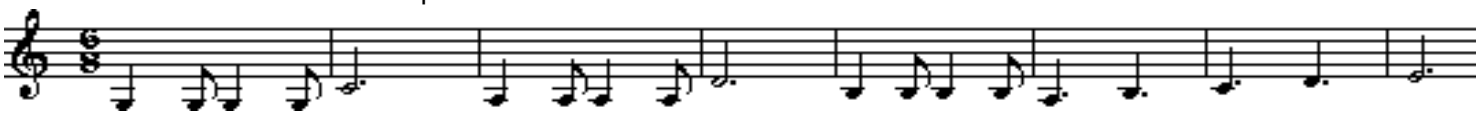


Regional Cadence: either a cadence that is of the conclusive type, that involves a chromatic leading tone to a final pitch that is not the tonic, OR a cadence of any type that is functioning in the orbit of a degree other than the tonic. (This definition will be expanded and modified later on, when greater exposure and experience allow for a more complete definition.) The following is an example of a conclusive, regional cadence:

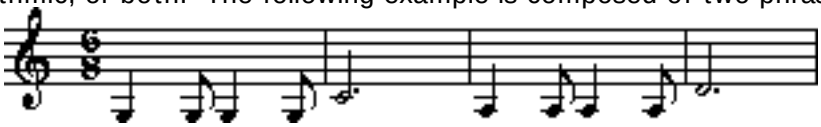


PHRASE

General definition: a comparatively complete musical thought that terminates in a feeling of relative repose at a cadence.

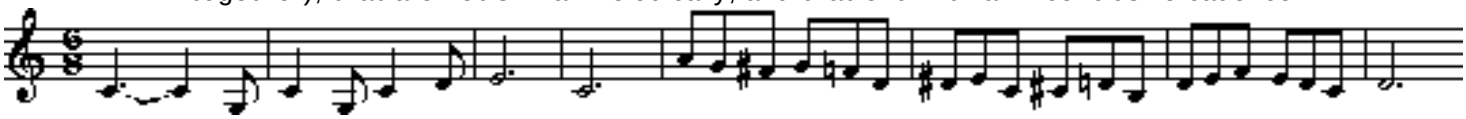


Phrase member: a portion of a phrase that comes to a point of relative repose that, however, does not carry the force of a cadence. This point of repose may be tonal, rhythmic, or both. The following example is composed of two phrase members:



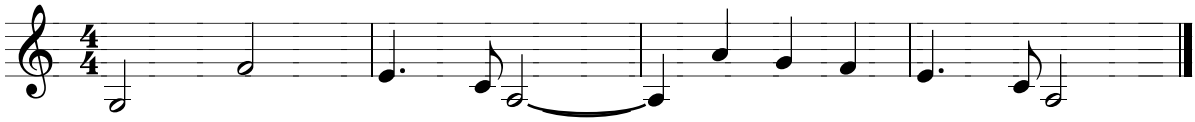
Larger Units

Phrase Chain: two or more phrases that form a contextual unit (i.e., they seem to go together), that are not similar melodically, and that end with an inconclusive cadence.

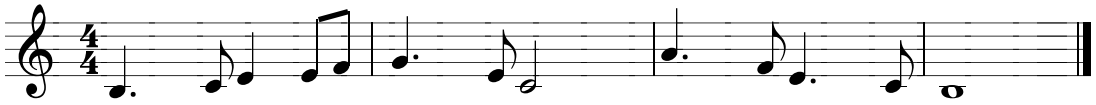


Phrase Group: two or more phrases that form a contextual unit, that are similar melodically, and that end with an inconclusive cadence.

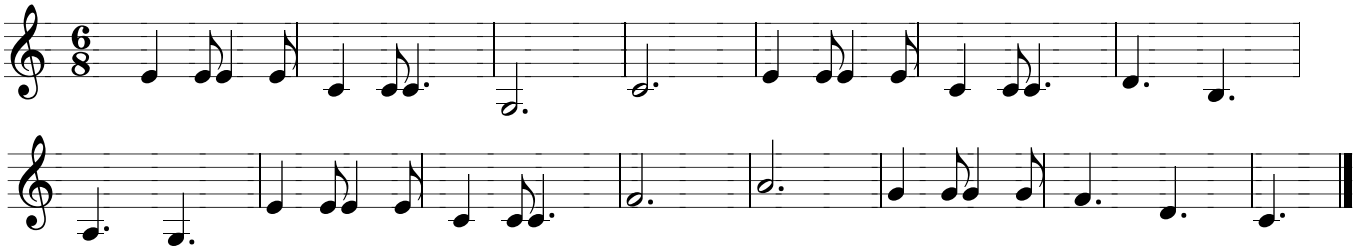
PHRASE 1



PHRASE 2



Period: two or more phrases that form a contextual unit, that may or may not be similar melodically, in which the last phrase ends with a conclusive cadence of greater force than any other cadence in the unit.



STRUCTURAL AND COMPLEMENTARY TONES IN MELODY

STRUCTURAL TONES are melodic pitches that serve as building blocks for melodies. They can be compared to some degree with structural components of a building, since they have similar functions. The supporting beams, foundation, wall studs, bearing walls, etc. of a building help to keep it from falling down. In much the same way, structural tones support the structure of a melody.

There are, of course, some elements of a successful building that are not structural. Their function is to enhance the esthetic qualities of the building. Painted walls, decorative columns, wall hangings, crystal chandeliers, etc. serve this purpose in architecture. **COMPLEMENTARY TONES** serve this purpose in melody.

Some of the contextual conditions contributing to the creation of Structural tones appear below, listed in order of importance and significance. When faced with the task of identifying Structural tones, each of the items below needs to be taken into account. The process is something like putting weights on a balance. The analyst decides on a "chunk" of music to consider [for now, we will mostly be using the measure as our unit], and determines how well each of the tones in that chunk fulfills each of the requirements show below. A tone gets weight for each of the conditions it fulfills, but a tone fulfilling condition 1 below gets more weight than a tone fulfilling condition 2, etc. Here are the conditions to be considered:

1. **METRIC POSITION**: Pitches occurring on metrically strong beats *are more apt to be* structural than are those occurring on weak beats.

2. **Agogic Accent**: Pitches having greater duration than their neighbors *are more likely to be* structural than are the others.

The following should be considered if the above do not lead to a conclusive identification of a structural tone:

3. **Melodic Terminal Points**: The last note of any phrase, and the first main note (excluding upbeats), *have a greater tendency to be* structural than the other pitches in the immediate proximity.

4. **Analogy and Expectation**: When, by analogy with previous experienced relationships, a particular tone bears the expectation of being a structural tone, *it is likely to be* perceived as one.

5. **Melodic Contour**: Peaks and valleys in the melodic line *may* point to pitches that have a greater tendency to be structural, but this is not a strong consideration if other factors contributing to the creation of Structural tones are present.

The following should be considered only if all of the above fail to identify a structural tone:

6. **Tonal Position**: If all of the above produce inconclusive results, the positions of the tones in the prevailing tonality may be considered. *This, however, is a last resort.*

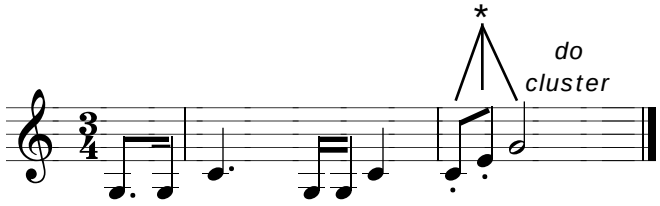
The "Cluster" -- Once a single structural tone has been found, all tones in the same "chunk" with it that are consonant form a **CLUSTER**. A Cluster is a group of two or more structural tones that have a stable or consonant relationship with each other. [The word "consonant" means "with the sound," and denotes tones that "sound good together." Consonant pitches can be imagined as sounding simultaneously; even if you hear them one at a time as you would in a melody, you can imagine them sounding at the same time and "going" together.]

Each tone in the cluster must be consonant with all the other members of the cluster. **For current purposes, we will consider melodic tones related by the following intervals to be consonant with one another: M & m 3rds, P 4ths & 5ths, and M & m 6ths.**(E.g., the tones C, E, and E flat do not form a cluster, even though the C is consonant with both the E and the E flat, because the E flat is not consonant with the E.) Tones in a Cluster need not be adjacent (e.g., the "chunk" C, D, E, G contains the cluster C-E-G).

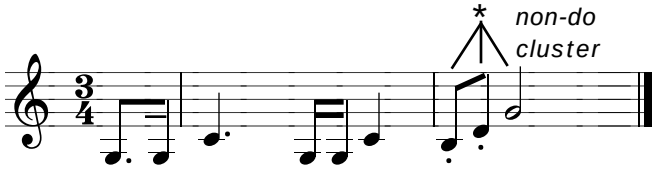
The Effect of Cluster Membership on Cadences

Tones associated with the tonic pitch can often create conclusive cadences. This is true because these tones appear, in the context of particular melodies, in a "do cluster".

In the following example, *so* is weakly conclusive:



In the following example, *so* is inconclusive:



COMPLEMENTARY TONES are Melodic pitches that enhance and embellish structural tones. Complementary tones are thus "non-structural." These tones group themselves into a number of classes, based on how each of them is approached and left. The following table lists all of them:

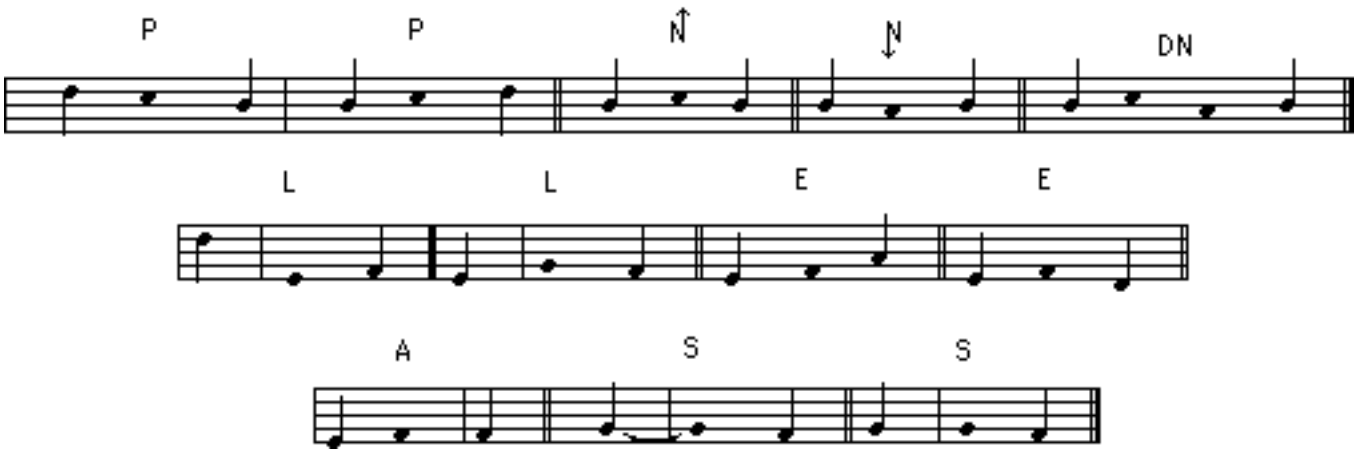
TYPES OF COMPLEMENTARY TONES

NAME	PITCH MOTION approached—left	CHARACTERISTICS	METRIC CHARACTER
Passing tone (P)	step* - step	approached and left by stepwise motion with no change in direction.	accented or unaccented
Neighbor Tone (N ⇧ or ⇩ N)	step - step	approached and left by stepwise motion from and to the same pitch.	accented or unaccented
Leaning Tone (appoggiatura) (L)	skip** - step		usually accented
Escape Tone (echappée) (E)	step - skip		usually unaccented
Neighbor Group or Double Neighbor (DN)	step - skip - step	two different neighbor tones surrounding a single structural tone.	accented or unaccented
Anticipation (A)	step - re-articulation or skip - re-articulation	appears between two different notes, the last of which must be a structural tone.	unaccented
Suspension (S)	tie or re-articulation - step down	usually apparent only when more than one voice sounds simultaneously; the tied, or rearticulated tone is the suspension that moves down to a structural tone. (A suspended tone that moves by step up rather than down is called an inverted suspension, or, more traditionally, a retardation.)	accented

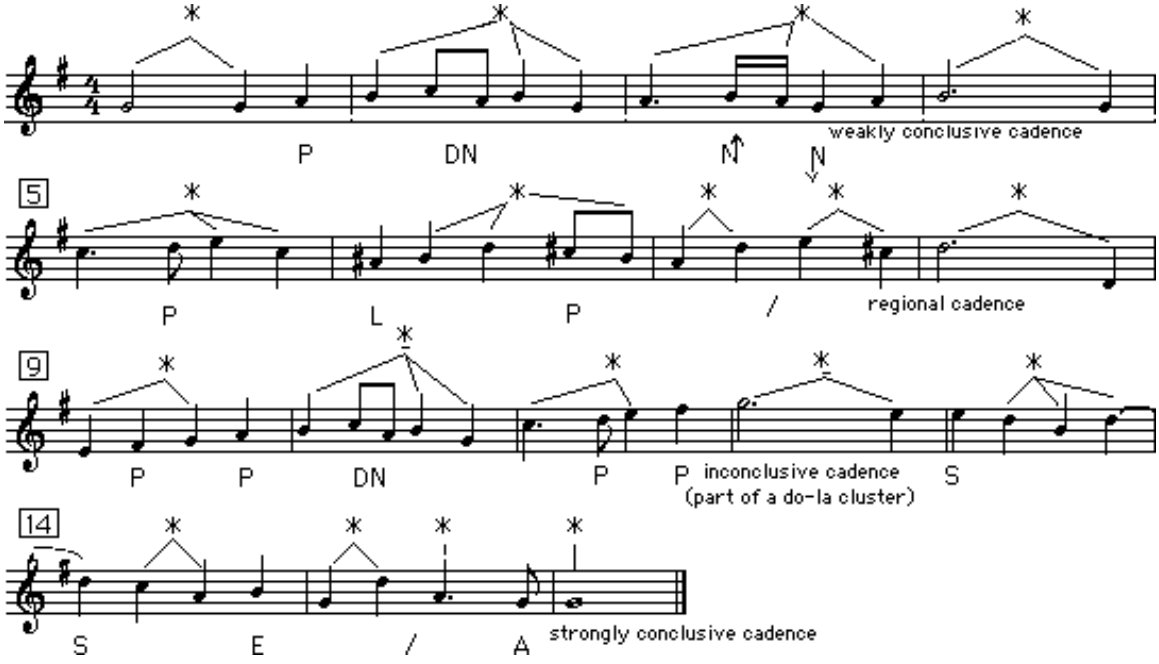
*No larger than a whole step ** Anything larger than a M 2nd

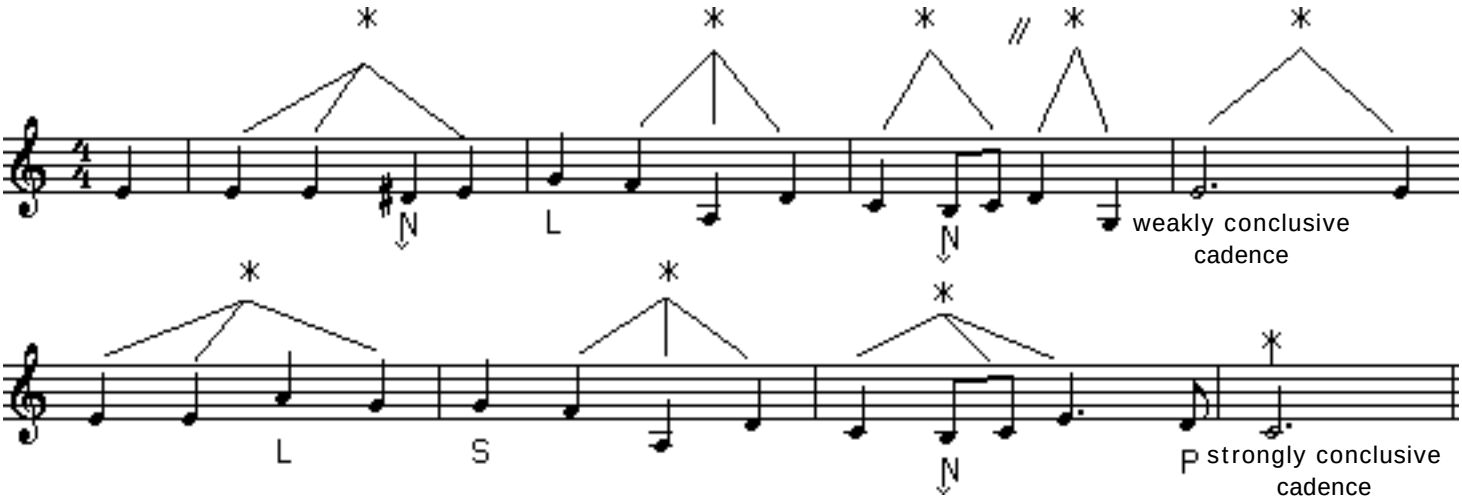
NOTE: Some complementary tones appear in metrically strong positions. The problem of determining when an accented note is structural and when it is complementary is a complex one. In general, however, you should consider the possibility that an accented note is complementary when it does not join a structural tone or cluster occupying more time in the measure than the accented tone itself occupies.

COMPLEMENTARY TONES



Here are two examples of the ways in which tones can be analyzed by function. The first melody is composed to demonstrate all types of complementary tones; the second is the carol "O Little Town of Bethlehem:"





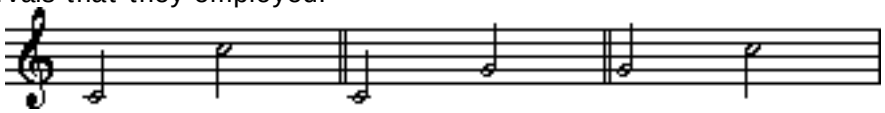
STEPS FOR MELODIC ANALYSIS

1. Isolate structural tones, using the criteria (1-6) given above.
2. Find and mark any clusters created by the Structural tones.
3. Name each of the Complementary Tones

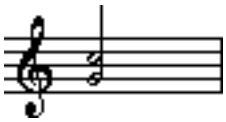
STABLE AND UNSTABLE INTERVALS

In all styles of tonal music, from the music of the ancient Greeks through music of our own day, certain musical intervals have been treated as stable, and others have been treated as unstable. Stable intervals (or **consonance**s) are allowed greater freedom of movement, while unstable intervals (or **dissonance**s) are restricted in their movement.

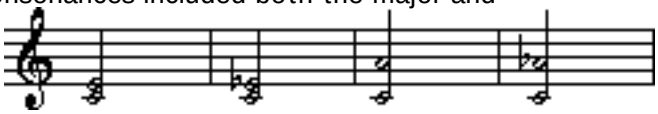
The Greeks considered that there were only three stable intervals: the perfect octave, the perfect 5th and the perfect 4th. Unfortunately for us, only a fragment of their music has survived, so it is difficult for us to imagine how they restricted the movement of the other intervals that they employed.



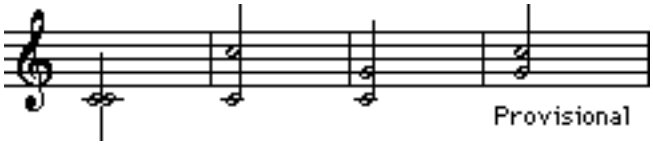
In medieval times, the consonances of the Greeks were first adopted, then modified, and then, very gradually, other intervals were included in the list of consonances. The first important change that was made was in the status of the perfect 4th. Our medieval ancestors must have realized that there was something unusual about the sound of this interval when they heard both of its tones sounding simultaneously. It appeared to be upside down. That is, the tone of focus, the one on which the interval seems to be based, was on top, rather than on the bottom. For this reason, they restricted the use of the perfect 4th, and it became a provisional consonance. [See the section entitled Provisionally Stable Intervals, below, to find out how it came to be used.]

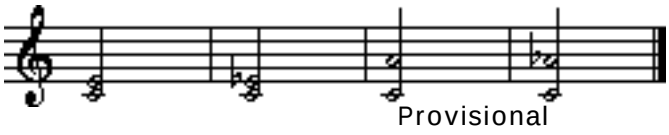


The intervals that were added to the list of consonances included both the major and minor 3rds, with the major 3rd being treated as the more stable of the two, and then the 6ths, which were also admitted on a provisional basis. [See Provisionally Stable Intervals, below.]



By the time of the late Renaissance and early Baroque (c. 1600), a fairly large number of intervals were considered to be full consonances. These were divided into two groups, the perfect consonances and the imperfect consonances. In the first category were the perfect unison, the perfect octave, the perfect 5th and, if it met certain provisions, the perfect 4th.
In the second category were the major and minor 3rds, and, if they met certain provisions, the major and minor 6ths.





Later on in the history of music, other intervals were added to the list of consonant intervals. A trend towards inclusion of more and more intervals in the consonant category throughout the nineteenth century resulted, at the beginning of the twentieth, in the proclamation by Arnold Schoenberg of the "emancipation of the dissonance." In his music, which is called *atonal* or *post-tonal*, there are no restrictions on the treatment of dissonances; in fact, one might properly say dissonances have ceased to exist.

Most of the music we will be dealing with in this course falls into a category known as common practice style. In this style, that began in the late Renaissance and is still being used today, the consonant intervals remained the same for a very long period of time.

PROVISIONALLY STABLE INTERVALS

In most styles, certain configurations are stable under some conditions and unstable under others. It becomes a matter of great importance, then, to determine the contexts in which these structures are stable, and those in which they are not.

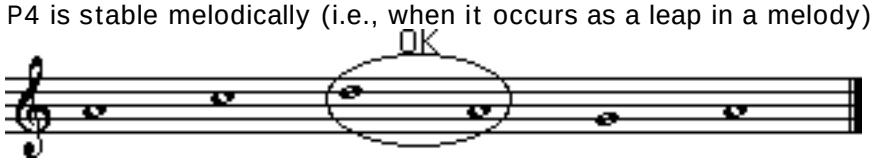
In the styles with which we are dealing, two classes of intervals fall under the provisionally stable category: the Perfect 4ths and the Major and Minor 6ths.

It is important to bear in mind that these intervals, although in a category labeled provisionally stable, are ALWAYS either stable or unstable in a particular context. To give an example, the P4 as a class is provisionally stable, but a P4 in context "x" is unstable, while another P4 in context "y" is stable.

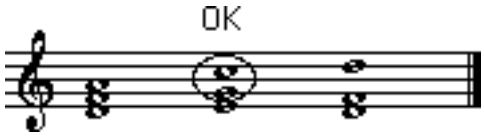
Following are the conditions necessary for the stability of the two provisionally stable intervals under current consideration:

A. The Perfect 4th

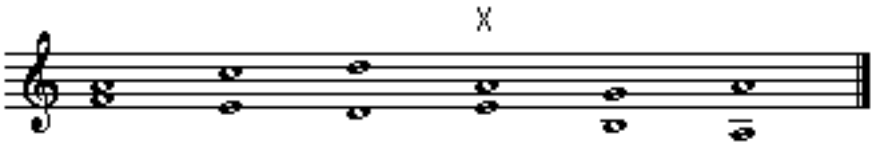
1. The P4 is stable melodically (i.e., when it occurs as a leap in a melody).



2. The P4 is stable harmonically (i.e., when it occurs between voices in a polyphonic [more-than-one-voice] composition), if **not** made with the bass voice. (The bass is defined as the lowest sounding voice, not necessarily in the bass range.) When it is thus made with upper voices the P4 is said to be "supported." (This can occur only when there are more than two voices sounding at the same time.)



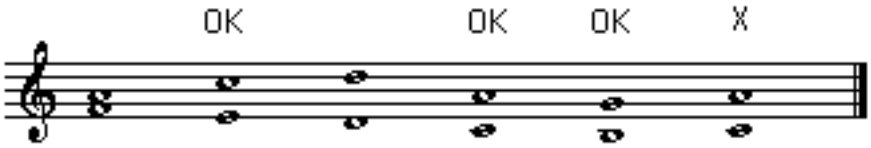
3. The P4 is unstable when it is made with the bass voice. It is therefore always harmonically unstable in two-voice textures.



B. The Major and Minor 6ths

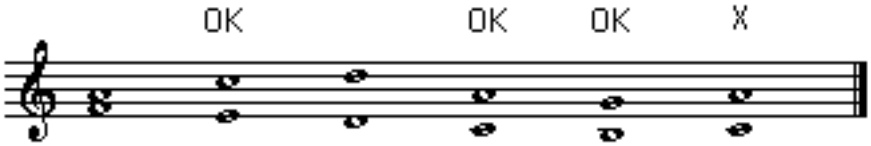
1. The M6 and m6 are stable melodically. Nevertheless, there are some restrictions placed on their use in counterpoint (these will be discussed shortly).

2. The M6 and m6 made with the bass are harmonically unstable at the ends of phrases, sections, and complete compositions, and should be avoided in those places.

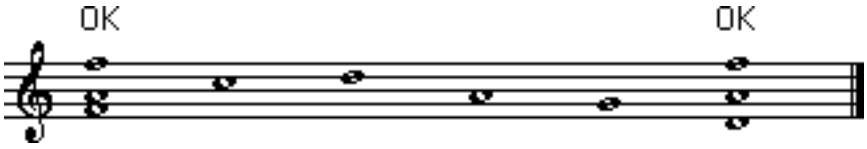


3. The M6 and m6 made with the bass are harmonically weak at the beginnings of phrases and sections and should be avoided in those places as well, although 6ths may begin internal phrases in a multi-phrase composition.

4. The M6 and m6 made with the bass are (completely) stable in all other places.



5. M or m6ths created between upper voices (i.e., "supported") are (completely) stable at all times. This can occur only in contexts where three or more voices are sounding simultaneously



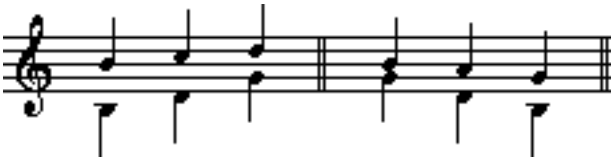
Summary Chart on Provisionally Stable Intervals

Interval Name(s)	Stable when	Unstable when
Perfect 4th	used in a single voice or between voices if properly supported.	appearing between the bass and an upper voice
Major & Minor 6ths	used between voices except at the beginning or end of a piece used between voices at the beginning or end of a piece if properly supported. Vertical sixths are also stable at the beginnings of interior phrases.	used as a leap in a single voice or between the bass and an upper voice at the beginning or end of a piece. A vertical 6th should not begin or end a section, but may begin interior phrases of a piece

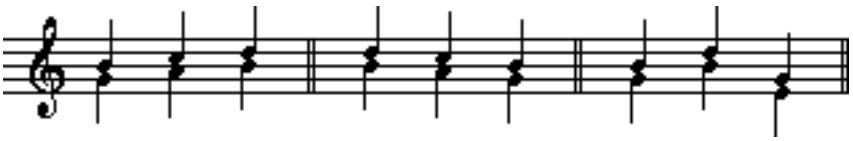
TYPES OF MOTION OCCURRING BETWEEN VOICES

(Asterisked items are most important)

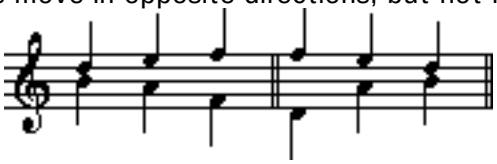
***Similar motion**: both voices move in the same direction, but not necessarily by the same interval.



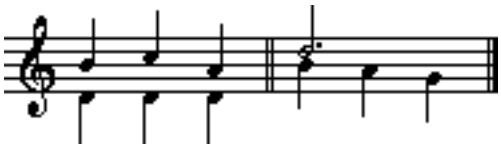
***Parallel motion:** both voices move in the same direction by the same interval. (Note that this interval need not be precisely the same quality, so long as it has the same numerical size. The following examples, that show parallel 3rds, includes both Major and Minor 3rds.)



***Contrary motion:** the voices move in opposite directions, but not necessarily by the same interval.

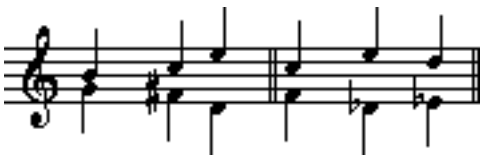


***Oblique motion:** one of the voices moves in either direction, while the other does not move.

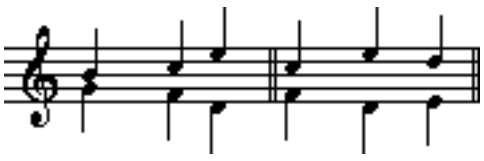


The following types are special types of contrary motion:

Mirror image: the voices move in opposite directions by precisely the same interval.



Modified Mirror image: the voices move in opposite directions by the same number sized intervals, but not necessarily by the same qualities.



Introduction to Counterpoint

1. In studying music in two parts, we will be working in a style which had its heyday at the end of the Renaissance (second half of the 16th century), especially in the music of Palestrina, Lasso, Victoria, and others.

2. Whenever we emulate a particular style, we need to discover the kinds of things the composers allowed themselves to do, and those things they did not allow themselves to do. We can discover these things by going on a kind of investigative examination of the music, like detectives looking for clues.

3. A German theorist named Johann Fux devised a famous instructional method in the 1720s to teach this style of writing to students of music.

Johann Josef Fux, Father of Species Counterpoint

Fux wrote a textbook on the subject in dialogue form, like a play with two characters, teacher and student. In the book the student asks questions and the teacher answers them. The student supplies exercises and the teacher corrects them. Fux's approach was to break the style down into a series of levels with clearly outlined rules. We'll attempt to devise a set of rules in the same way Fux did, by looking at the music and seeing what Lasso actually did.

4. One of the things Fux did was to examine the music in a way that considered how notes in one part related to notes in the other part when both moved along using the same note values. We call this musical relationship "note against note." In Latin, this is called "punct contra punct", which is also translated "point counter-point". Fux called note against note music "counterpoint in the First Species".

   Let's see how Lasso treated First Species counterpoint in this piece. What we're going to do is to examine all the places where notes of the same value begin together. Sometimes the notes will both be quarter notes and sometimes half notes. At one spot, the notes will be double whole notes. In the spirit of Fux, I'll ask questions, and you try to answer them. Here are the questions. The answers are in the footnotes:

   - What intervals are created vertically between the notes in First Species?[16]
   - What kinds of motion does Lasso allow between the parts? [17]

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[16] 3rds, 5ths, 6ths, 8ves. These are all consonances. Some of them are perfect consonances (8 and 5) and the others are imperfect consonances (3 and 6).

- Is there a difference in the way Lasso treats the perfect intervals and the imperfect ones? [18]
- Cadences occur in this music when both parts stop on long notes. How many cadences are there in this piece?[19]
- What intervals are used at cadences?[20]
- What is different about the notes used to approach cadences compared to the notes found in any other places in the piece? [21]
- How would you describe the melodic motion in this piece? Is it conjunct? disjunct? [22]
- What's the greatest number of leaps Lasso uses in a row?[23]
- What happens most often after a leap?[24]
- What intervals are allowed in melodic leaps?[25]
- Does the upper voice ever go below the lower or the lower one above the upper?[26]
- What's the largest interval between the voices?[27]

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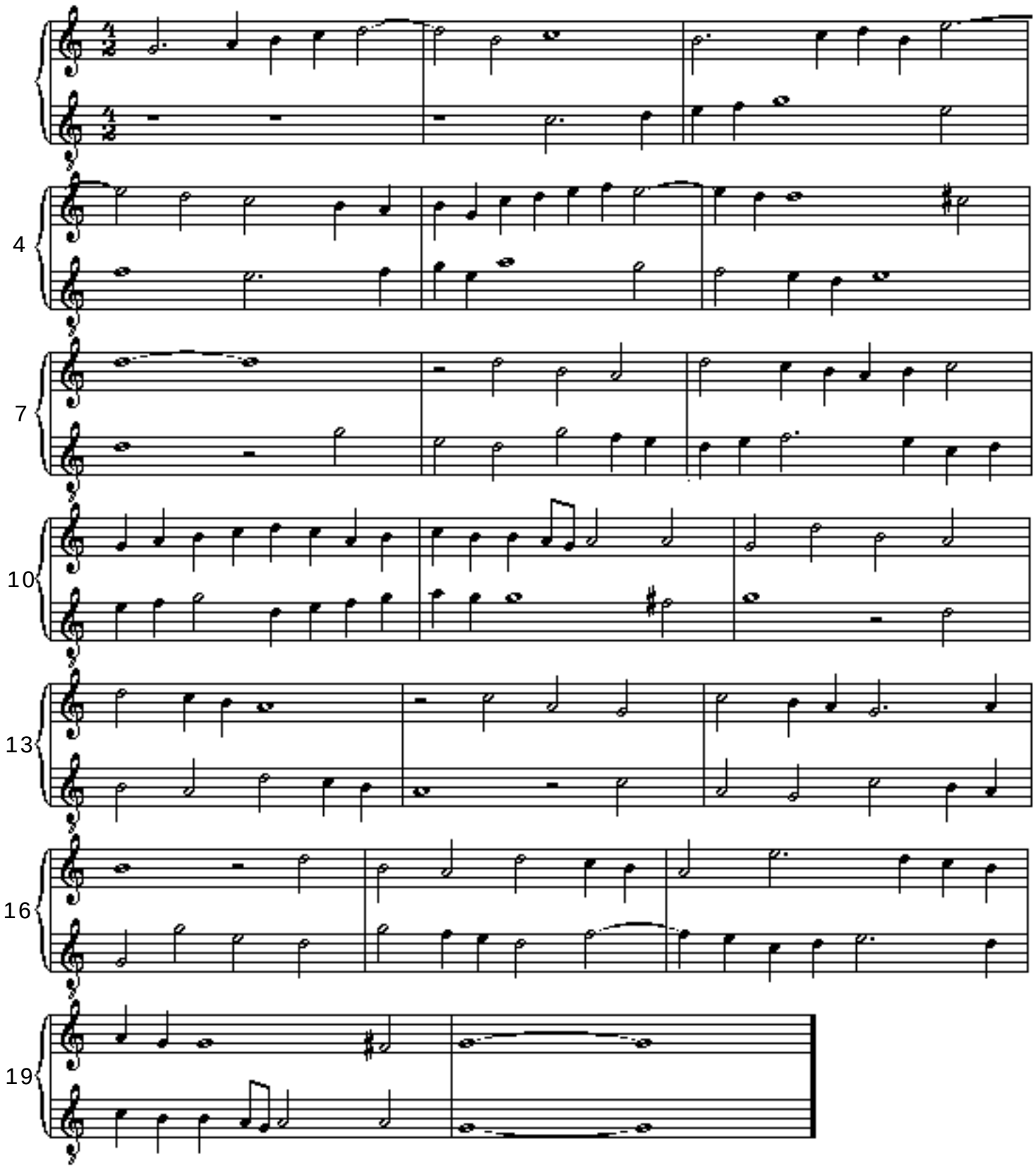
[17] Parallel and contrary only.
[18] The perfect ones are approached either by one part resting, or by contrary motion.
[19] Three
[20] Octaves
[21] Accidentals are used
[22] Mostly conjunct, but with some disjunct motion.
[23] Two
[24] Conjunct motion, often with a change of direction.
[25] 3rds, 4ths, 5ths, 8ves.
[26] No
[27] There are tenths in measures15 and 18.

Benedictus
Orlando di Lasso



FIRST SPECIES COUNTERPOINT

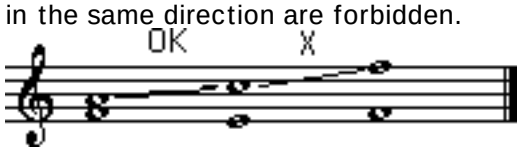
Description

In the version of First Species counterpoint we will be learning, each note of the counterpoint is set against a note of the *cantus firmus*. These are written as whole notes in both parts. No bar lines are employed.

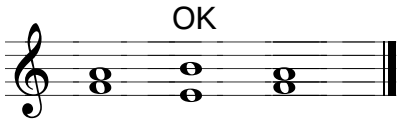
HORIZONTAL CONSIDERATIONS (Relationships within a single voice)

1. Leaps of a 6th or 7th are not allowed[28]; neither are leaps greater than an octave. However, leaps of an octave are permissible.

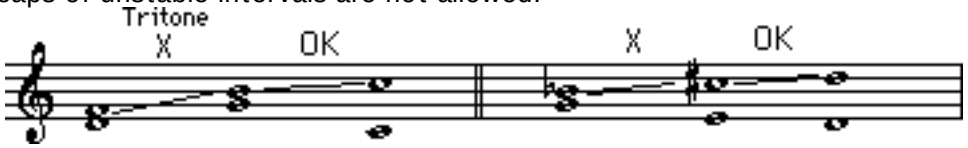
2. Consecutive leaps in the same direction are forbidden.



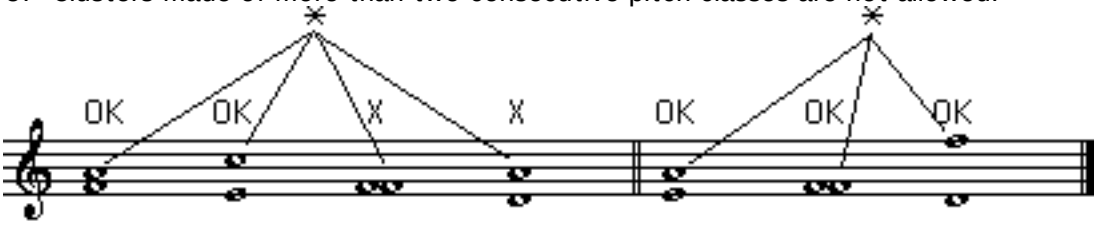
3. It is not permissible to leap away from a pitch and immediately back to it; however, it is permissible to *step* away from a pitch and immediately back.



4. Leaps of unstable intervals are not allowed.[29]



5. Clusters made of more than two consecutive pitch classes are not allowed.



three-pitch-class cluster of four notes (The f in the melody creates a cluster with the previous a and c, and the final a adds to that cluster.)

two-pitch-class cluster of three notes (The three melody notes create only a two-pitch-class cluster, which is allowed.)

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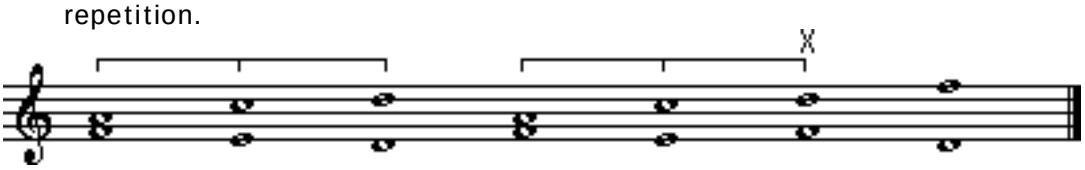
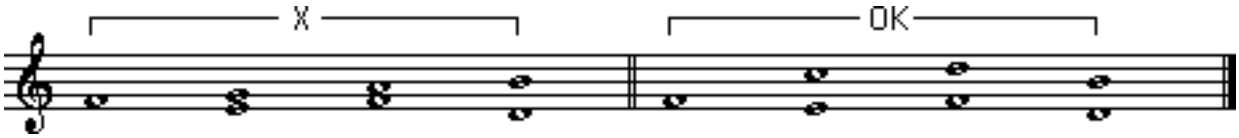
[28] Leaps of a seventh are disallowed because they are unstable; leaps of a sixth are disallowed not because they are unstable, but because they are awkward to sing.

[29] A leap is defined as any interval greater than a major second. The leaps in this example involve the unstable intervals of an Augmented Fourth (tritone) and an Augmented Second. Melodic leaps of a Perfect Fourth are stable, and therefore are allowed.

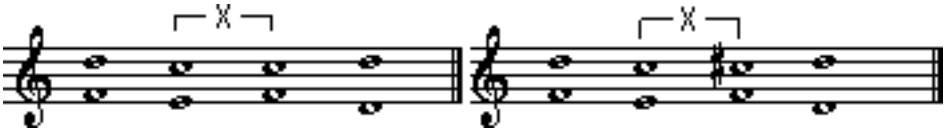
6. No melody may contain a tautology, i.e., a series of pitches with immediate repetition.



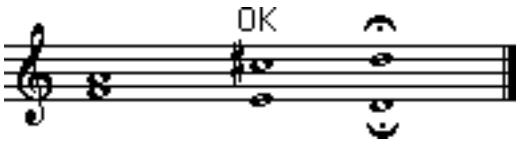
7. The tritone (A4 or d5) may not be exposed. Exposure occurs when the pitches of a tritone are both stated **before** the melody has gone outside the range of that tritone.



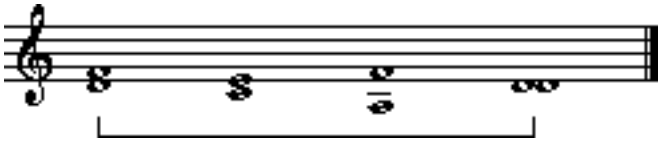
8. No immediate repetitions of pitches are allowed in the melody. (Two different versions of the same letter name are also not allowed, e.g. C followed by C#.)



9. No accidentals may be added to the counterpoint, with the exception of the leading tone, which may be introduced at a cadence.



10. When writing a counterpoint in the bass, the first and last notes of the composition must be the tonic.

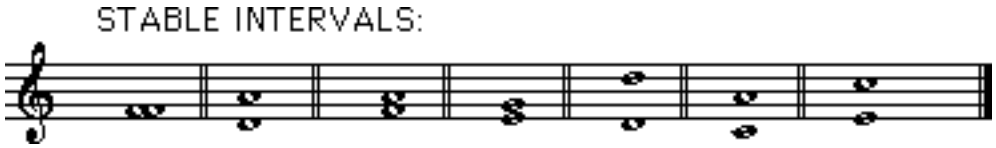


RECOMMENDATIONS

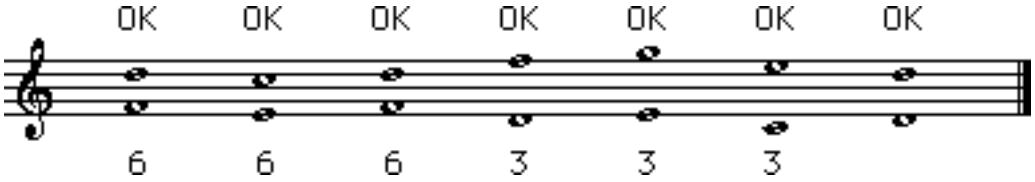
1. Follow the principles of good melodic construction by including a preponderance of conjunct (stepwise) motion, while allowing a few, well-placed leaps, most of which continue on with conjunct motion in the opposite direction.
2. Maintain independence between the voices by providing a variety of three types of motion: similar, parallel and contrary.
3. The strongest cadences are effected through contrary motion, especially with 7-8 in the top voice.
4. It is best to end on a perfect octave. Second best is a perfect fifth. End on a third only as a last resort.
5 . Make an attempt to produce the best compromise between ideal horizontal and ideal vertical organization.

Vertical Considerations (Relationships between voices)

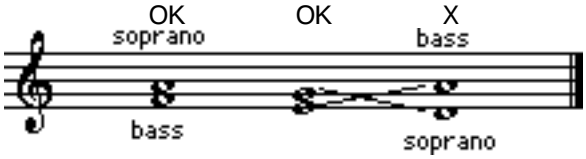
1. All vertical intervals must be stable. Fully stable intervals include the following: P1, P5, P8, M3, m3. Provisionally stable intervals are the M6 and m6. All vertical 2nds, 4ths, 7ths, and all augmented and diminished intervals are unstable.



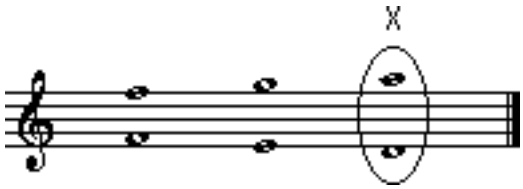
2. The maximum number of 3rds (tenths) or 6ths allowed in succession is three.



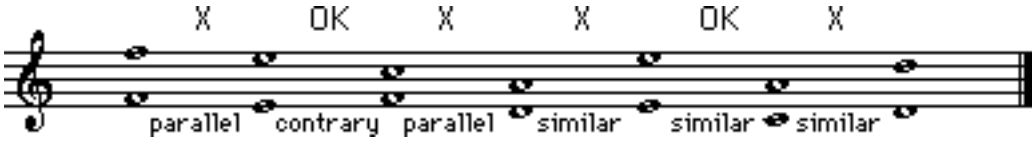
3. Crossing of voices is to be avoided. Voices are crossed when the upper part is given a lower note than the lower part.[30]



4. No vertical intervals larger than a tenth may be employed.[31]



5. Perfect intervals may not be approached in similar or parallel motion.[32]



[30] This rule holds for all species.
[31] This rule holds for all species.
[32] This rule holds for all species.

Checking Counterpoint Exercises in First Species

1. Melodic lines:

Item	Correct	Incorrect
Leaps	3rd, 4th, 5th, 8ve	6th or 7th, unstable intervals and intervals greater than an 8ve
		away from and back to the same note
		two in the same direction in a row
		cluster of 3 or more pitch classes
Lines		tautologies, including immediate repetitions or chromatic repetitions, like c-c#
		tritone exposures
Accidentals	leading tone accidental at cadence if tritone not exposed	accidentals, except for ti at cadence
Counterpoint in the Bass	for counterpoint in bass: *do* at beginning and end	for counterpoint in bass: other than *do* at beginning and end

2. Relationships between the lines:

Item	Correct	Incorrect
Intervals	P1, M&m3, P5, P8, M&m10 anywhere M&m6ths internally	2nds, 4ths, 7ths, 9ths, 11ths, and all augmented and diminished intervals. M&m 6ths at beginning or end of first phrase or end of last phrase
	up to three 3rds or three 6ths in a row	more than three 3rds or three 6ths in a row
		intervals larger than a 10th
Voice Placement		crossed voices
Perfect Intervals	approached by contrary motion	approached by similar or parallel motion

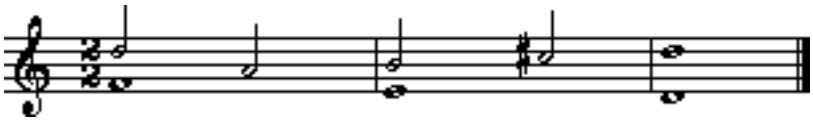
Note: When writing multi-phrase exercises, it is permissible to begin internal phrases with a sixth. Parallel perfect intervals, tautologies, etc. occurring between phrases are allowed. The last measure of each phrase must be in First Species.

SECOND SPECIES COUNTERPOINT

Description

A. In Second Species counterpoint, two notes of the counterpoint are set against one note of the cantus firmus. These are generally written as whole notes in the c.f. and half notes in the counterpoint. Bar lines are employed, with a meter signature of $\frac{2}{2}$

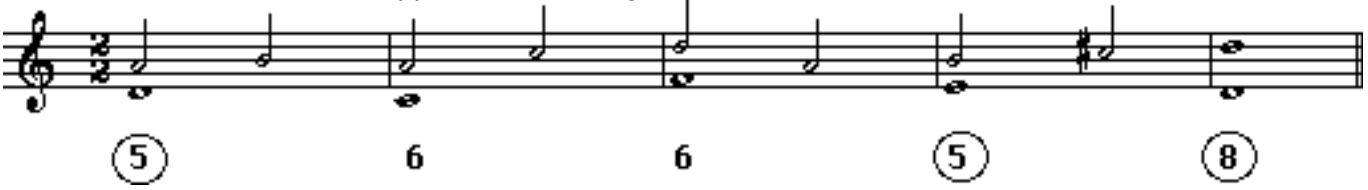
B. The last measure of each phrase has whole notes in both parts. (In other words, it is in First Species.)



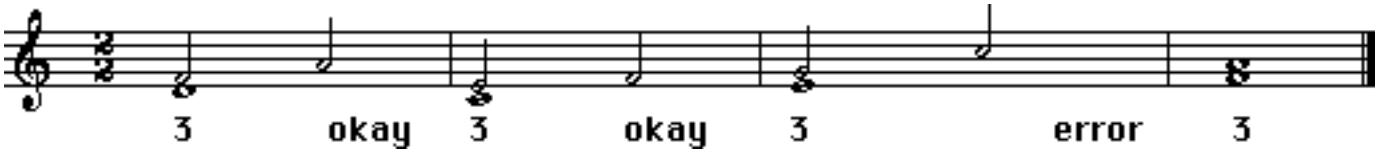
Vertical Considerations

[Horizontal considerations are the same as for First Species]:

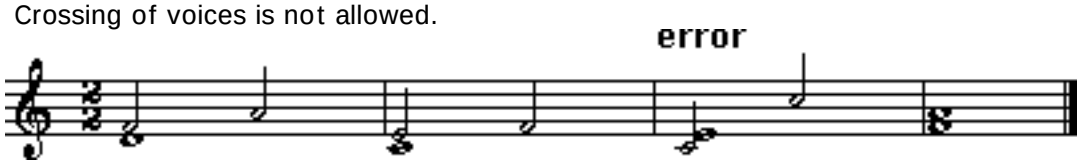
2. Stable intervals must appear on all strong beats.



2. The maximum number of 3rds or 6ths allowed on successive downbeats is three.

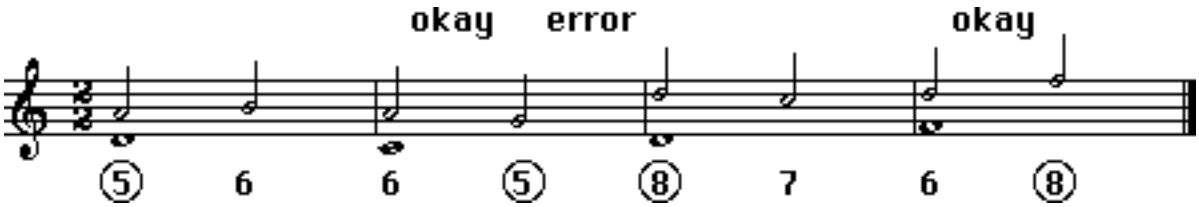


3. Crossing of voices is not allowed.

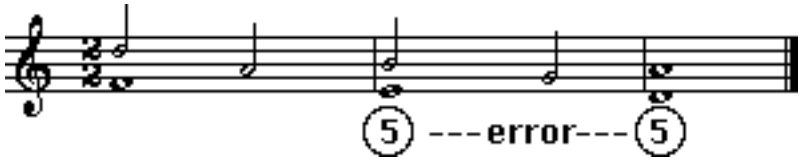


4. No vertical intervals larger than a tenth may be employed.

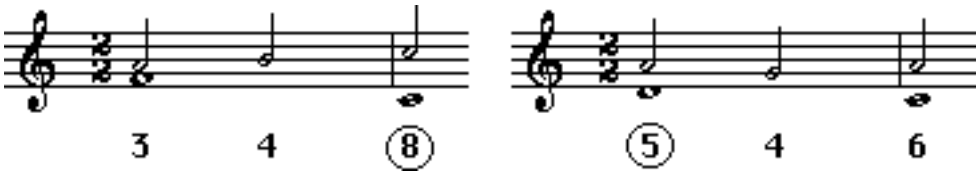
5. Similar and parallel approaches to perfect intervals are not permitted. Oblique and contrary approaches to perfect intervals are allowed.



6. Stable perfect intervals of the same size must be separated by more than one half note.



7. Both stable and unstable intervals may appear on weak beats, but unstable intervals must be both approached and left by step, creating either passing or neighbor tones.



Checking Counterpoint Exercises in Second Species

1. Melodic lines:

Item	Correct	Incorrect
Leaps	3rd, 4th, 5th, 8ve	6th or 7th, or unstable intervals
		away from and back to the same note
		two in the same direction in a row
		cluster of 3 or more pitch classes
Lines		tautologies, including immediate repetitions
		tritone exposures
	leading tone accidental at cadence if tritone not exposed	accidentals, except for ti at cadence
	for counterpoint in bass: *do* at beginning and end	for counterpoint in bass: other than *do* at beginning and end

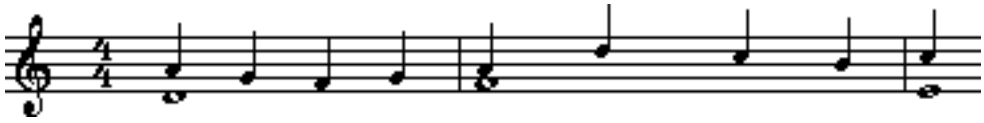
2. Relationships between the lines:

Item	Correct	Incorrect
Intervals	P1, M&m3, P5, P8, M&m10 anywhere M&m6ths internally	2nds, 4ths, 7ths, 9ths, 11ths, and all augmented & diminished intervals, on downbeats. M&m 6ths at beginning or end of first phrase or end of last phrase
	up to three 3rds or three 6ths on successive downbeats	more than three 3rds or three 6ths on successive downbeats
	unstable intervals on weak beats, if approached and left by step	unstable intervals on strong beats
		unstable intervals on weak beats if not approached AND left by step
		intervals larger than a 10th
Voice Placement		crossed voices
Perfect Intervals	approached by oblique or contrary motion	approached by similar or parallel motion
	pairs of unisons, 5ths or 8ves separated by more than one half note	pairs of perfect unisons, 5ths or 8ves separated by only one half note

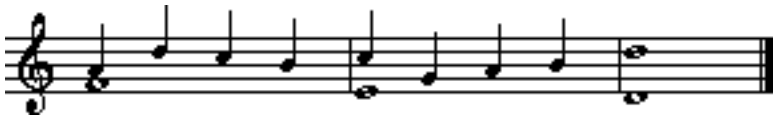
THIRD SPECIES COUNTERPOINT

Description

A. In Third Species counterpoint, four notes of the counterpoint are set against one note of the cantus firmus. These are generally written as whole notes in the c.f. and quarter notes in the counterpoint. Bar lines are employed, with a meter signature of $\frac{4}{4}$.



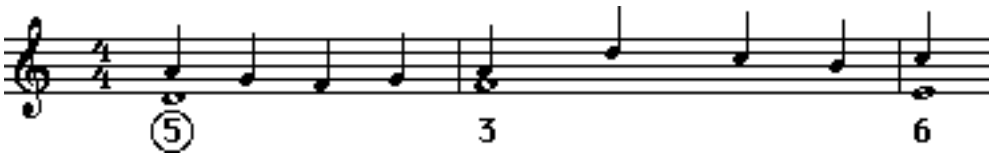
B. The last measure of each phrase has whole notes in both parts.



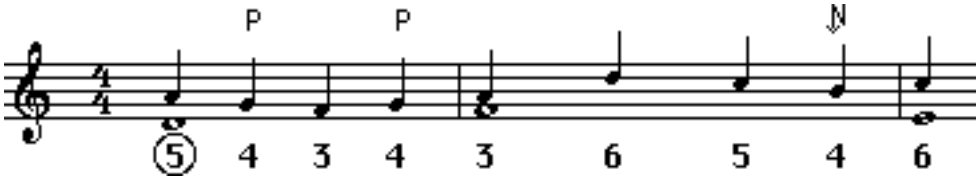
Vertical Considerations

[Horizontal considerations are the same as for First Species]:

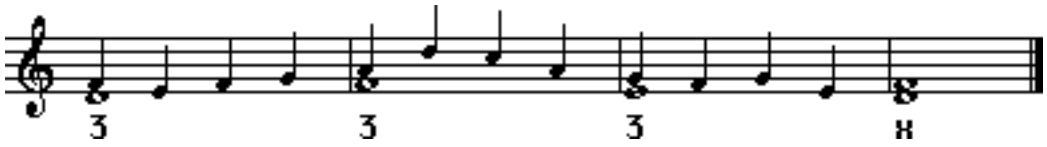
1. Stable intervals must appear on all downbeats.



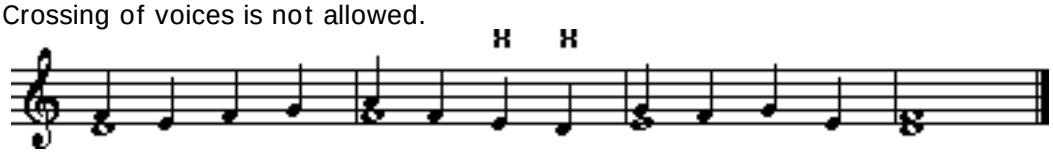
Both stable and unstable intervals may appear on beats 2, 3 and 4, but unstable intervals must be both approached and left by step.



2. The maximum number of 3rds or 6ths allowed on successive downbeats is three.

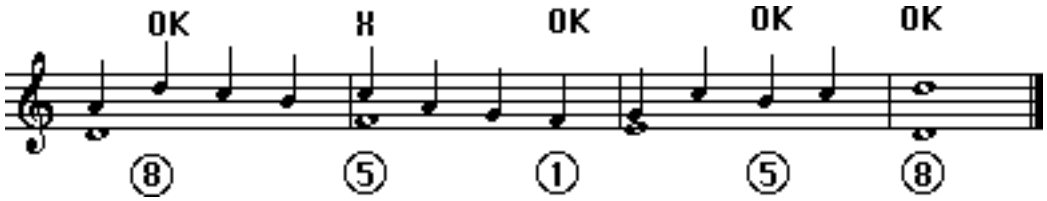


3. Crossing of voices is not allowed.

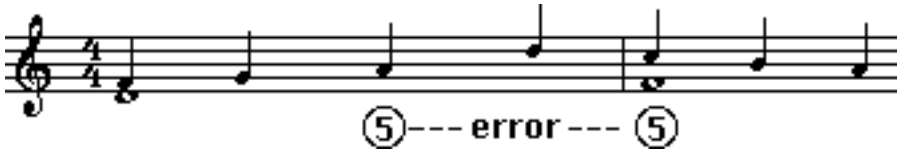


4. No vertical intervals larger than a tenth may be employed.

5. Perfect intervals must be approached either by oblique or contrary motion.



6. Stable perfect intervals of the same size *that are made of different pitch classes* must have four or more quarter notes between them.



Checking Counterpoint Exercises in Third Species

1. Melodic lines:

Item	Correct	Incorrect
Leaps	3rd, 4th, 5th, 8ve	6th or 7th, or unstable intervals
		away from and back to the same note
		two in the same direction in a row
		cluster of 3 or more pitch classes
Lines		tautologies, including immediate repetitions
		tritone exposures
	leading tone accidental at cadence if tritone not exposed	accidentals, except for ti at cadence
	for counterpoint in bass: *do* at beginning and end	for counterpoint in bass: other than *do* at beginning and end

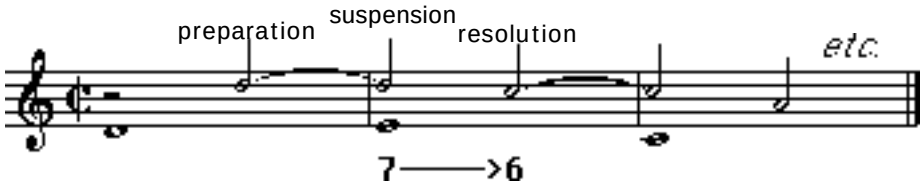
2. Relationships between the lines:

Item	Correct	Incorrect
Intervals	P1, M&m3, P5, P8, M&m10 anywhere M&m6ths internally	2nds, 4ths, 7ths, 9ths, and all augmented & diminished intervals, on downbeats. M&m 6ths at beginning or end of first phrase or end of last phrase
	up to three 3rds or three 6ths on successive downbeats	more than three 3rds or three 6ths on successive downbeats
	unstable intervals on beats 2,3, and 4, if approached and left by step	unstable intervals on downbeats
		unstable intervals on weak beats if not approached AND left by step
		intervals larger than a 10th
Voice Placement		crossed voices
Perfect Intervals	approached by oblique or contrary motion	approached by similar or parallel motion
	pairs of unisons, 5ths or 8ves separated by at least four quarter notes	pairs of different perfect unisons, 5ths or 8ves separated by fewer than four quarter notes

FOURTH SPECIES COUNTERPOINT

Description

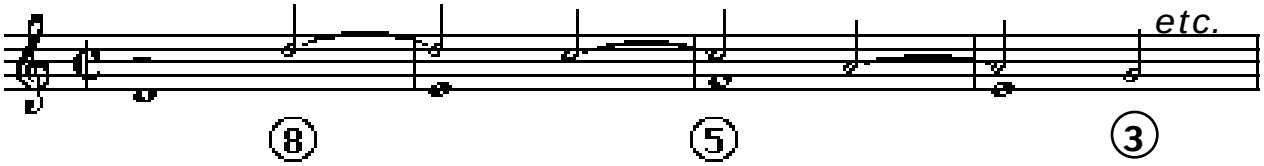
A. The added voice in Fourth Species consists of tied half notes, with the cantus firmus in whole notes.
B. The species begins with a half rest in the added voice. This is followed by half notes tied over the bar lines.
C. A feature of the species is the inclusion of dissonant suspensions on strong beats. A suspension is a complementary dissonance that is prepared by a consonance, is approached by either by a repetition or tie, and resolved by stepwise motion down to a consonance, as in the following example:



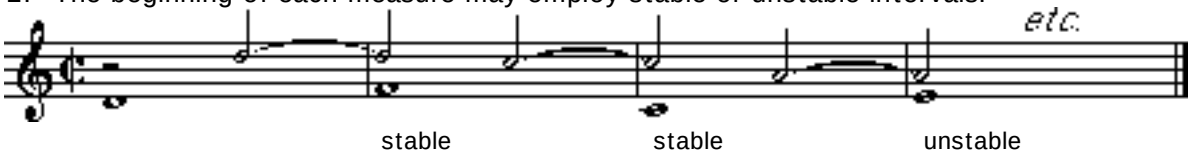
D. In the penultimate measure, the second half note is not tied over.
E. The final measure is in First Species (whole notes in each part).

Vertical Considerations
[Horizontal considerations are the same as for First Species]:

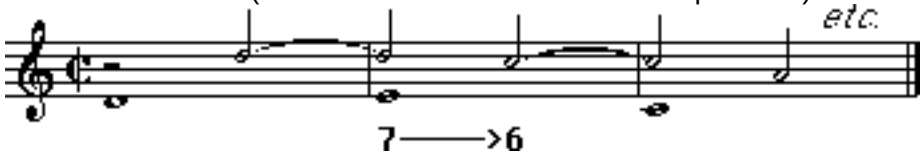
1. Stable intervals must occur on the second half of each measure.



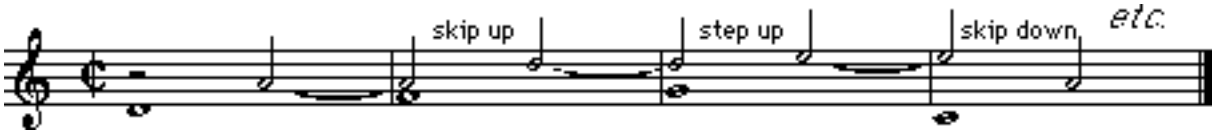
2. The beginning of each measure may employ stable or unstable intervals.



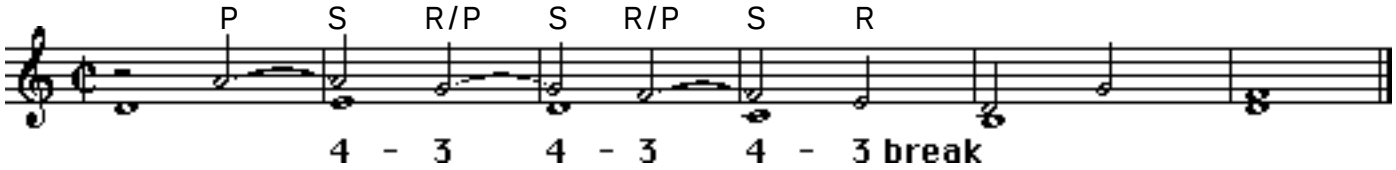
3. If the interval on the strong beat is unstable (dissonant), it must be resolved by stepwise motion down. (This is the classic form of the suspension.)



4. Consonant suspension figures (in which the tied-over note creates a stable interval on the downbeat) do not require subsequent motion downward by step. Upward motion by step, or motion by skip in either direction, are also allowed in this instance.



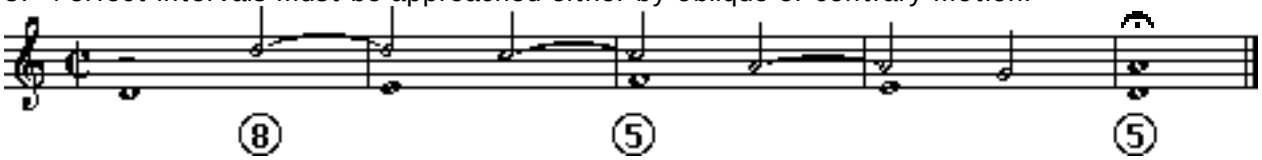
5. A “chain of suspensions” is a series of suspensions in which the resolution of the first is, simultaneously, the preparation for the next. When numerically identical suspensions occur in a chain, that chain must be limited to no more than three statements. The chain is broken by “breaking species” (see 10. below).



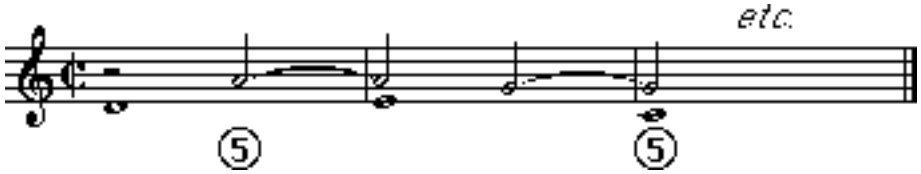
6. Voices must not cross.

7. No vertical intervals larger than a tenth may be employed.

8. Perfect intervals must be approached either by oblique or contrary motion.

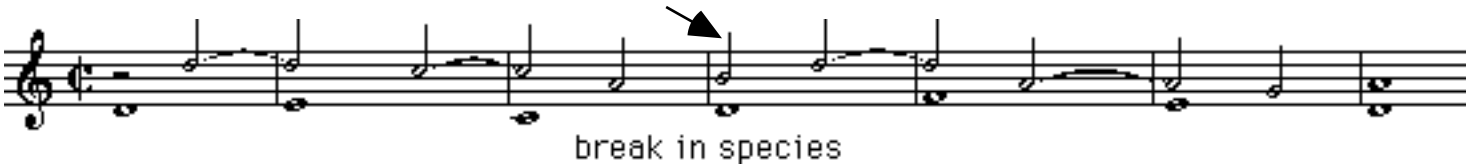


9. Perfect intervals of the same size but different pitch classes must be separated by more than one half note's duration.



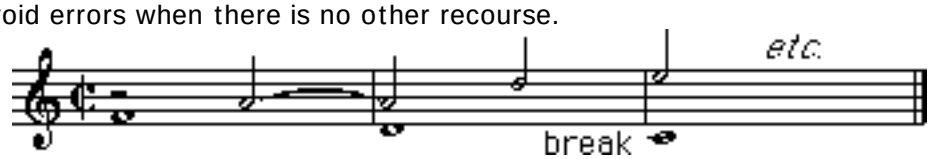
10. A “break” in species occurs when a consonant weak beat is NOT tied over to the next strong beat. (The break begins on a downbeat.) The species should be “broken” occasionally in order to:

a. improve the melody



b. curtail a chain of numerically identical suspensions to no more than three statements.

c. avoid errors when there is no other recourse.

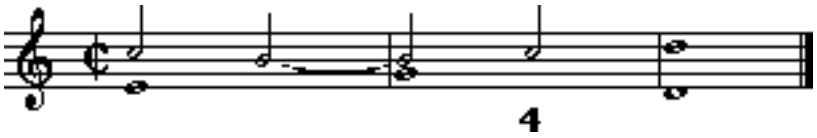


11. When the species is broken, all vertical intervals must be stable until the species is resumed.

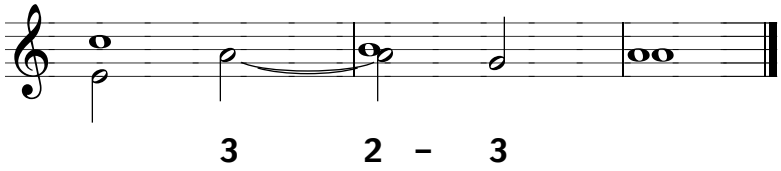
12. The species may not be broken at the very beginning of a phrase, or for more than one measure at a time, except for the end of the phrase, where the penultimate measure may be broken. (A break is mandated for the final measure, since that measure must be in First Species.) [See Example 5.]

13. The species should not be broken at the very first opportunity (i.e., in the second measure).

14. The penultimate measure may include a dissonance on the weak beat, so long as the downbeat is consonant.



15. When counterpoint is written in the bass, suspension figures still resolve by stepwise motion down:



Checking Counterpoint Exercises in Fourth Species

1. Melodic lines:

Item	Correct	Incorrect
Leaps	3rd, 4th, 5th, 8ve	6th or 7th, or unstable intervals
		away from and back to the same note
		two in the same direction in a row
		cluster of 3 or more pitch classes
Lines		tautologies, including immediate repetitions
		tritone exposures
	leading tone accidental at cadence if tritone not exposed	accidentals, except for *ti* at cadence
	for counterpoint in bass: *do* at beginning and end	for counterpoint in bass: other than *do* at beginning and end

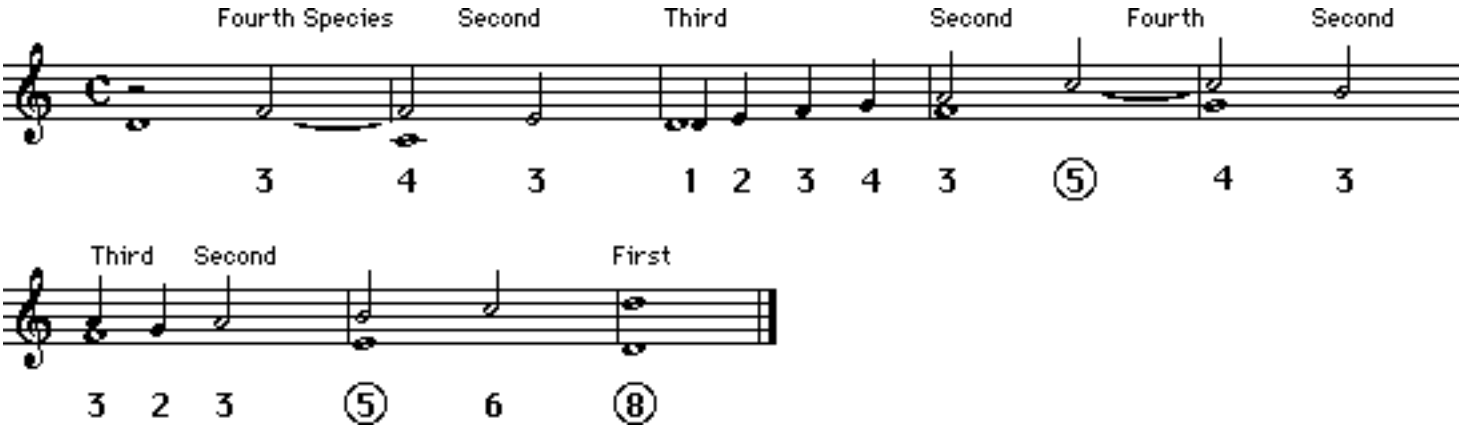
2. Relationships between the lines:

Item	Correct	Incorrect
Intervals	P1, M&m3, P5, P8, M&m10 anywhere M&m6ths internally Dissonant suspensions on downbeats	intervals larger than a 10th
	a chain of suspensions of up to three members	a chain of suspensions of more than three members
	unstable intervals on strong beats if treated as suspensions	unstable intervals on strong beats if not treated as suspensions
		unstable intervals on weak beats except in the penultimate measure, which can be in Second Species
Voice Placement		crossed voices
Perfect Intervals	approached by oblique or contrary motion	approached by similar or parallel motion
	pairs of unisons, 5ths or 8ves separated by two or more half notes	pairs of different perfect unisons, 5ths or 8ves separated by fewer than two half notes
Breaking Species	not more than one measure at a time	more than one measure at a time
	stable intervals exclusively, except for the penultimate measure, which can be in Second Species	any unstable intervals except for the penultimate measure, which can be in Second Species
		break at beginning of second measure of a phrase

FIFTH SPECIES COUNTERPOINT

Fifth Species consists of a combination of Species 1-4. It is also known as "free counterpoint." In fifth species, all of the temporal relationships of the other species may appear, in any order and to the extent desired by the composer (except that First Species is reserved for the ends of phrases). Whenever the durational ratio between the cantus firmus and the counterpoint is 1:1 the rules for First Species apply; when that ratio is 2:1 the rules of Second Species apply, etc.

Here is an example of Fifth Species counterpoint against the *Victimae Paschali* cantus firmus:



The *Benedictus* by Orlando di Lasso (C.1530-1594) shown earlier is an example of free, imitative counterpoint from the literature. It is called "imitative" because rather than employing a cantus firmus in slow note values, the lower line imitates the gestures of the upper line. How many of the rules of fifth species counterpoint seem to apply to this music?

Regulations Governing the Construction of

THREE-VOICE COUNTERPOINT IN FIRST SPECIES

A. VERTICAL CONSIDERATIONS

1. All vertical intervals made *with the bass* must be stable.

2. 2nds, 7ths or their compounds, occurring between upper voices are not allowed even if all intervals made with the bass are stable.

3. The perfect 4th or the tritone *between upper voices* is allowed if both tones create stable intervals with the bass. (When this occurs, the these intervals are said to be *supported.*)

4. The maximum number of 3rds or 6ths allowed in a row *in the same pair of voices* is three.

5. Crossing of voices is not allowed.

6. The outer voices should not generally lie farther apart than two octaves. Upper voices (top and middle voices) should generally lie within the compass of a single octave. There is no restriction on the spacing of the two lower voices (middle and bottom voices).

7. Parallel perfect 5ths or octaves are not allowed. These are defined as "different perfect 5ths or octaves *occurring in the same pair of voices.*"

8. Similar approach to perfect 5ths or octaves is allowed *except between outer voices.*

9. Supported perfect 4ths and supported major or minor 6ths are stable in all places, including the final sonority of a phrase or composition.

B. HORIZONTAL CONSIDERATIONS

1. No melody may contain a tautology, *except for immediately repeated tones*.

2. It is not permissible to leap by any *exact* interval twice in succession in the same direction.

3. Leaps of a 7th, or of unstable intervals, are not allowed.

4. No accidentals may be added, with the exception of the leading tone, which may be introduced at a cadence.

5. When writing counterpoint in the bass, the first and last notes must be the tonic.

C. RECOMMENDATIONS

1. Follow the principles of good melodic construction.

2. Maintain independence between and among the voices by providing a variety of types of motion.

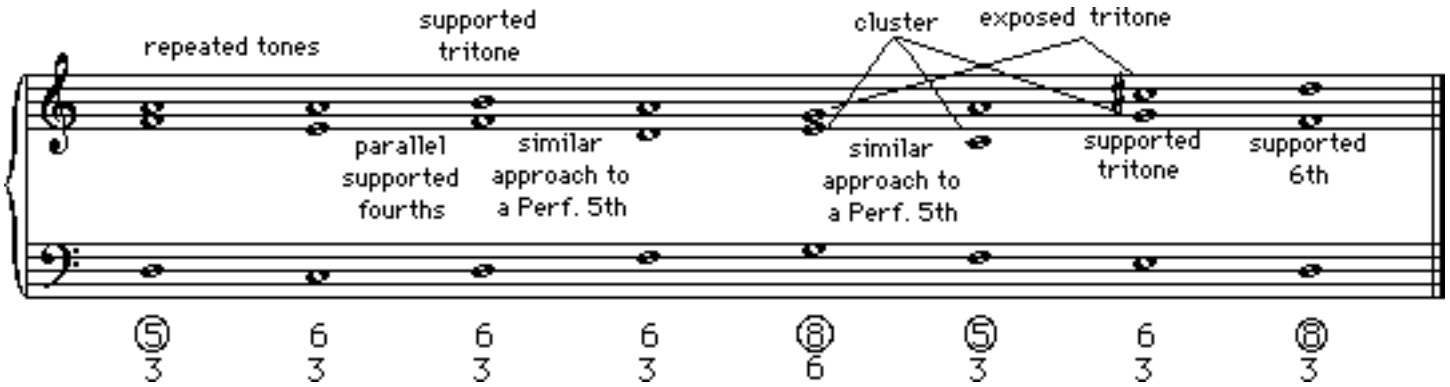
3. It is generally preferable to make use of three different pitch classes for each vertical sonority. However, the occasional inclusion of sonorities composed of fewer pitch classes is acceptable.

4. Attempt to produce the best compromise between ideal horizontal and ideal vertical organization.

D. CHANGES FROM THE RULES OF 2-VOICE COUNTERPOINT:

The tritone is now allowed *so long as it is supported* harmonically.
The tritone may now be exposed.
Consecutive leaps in the same direction are now allowed.
Leaping from a note and back to it is now allowed.
Clusters of three or more consecutive melodic tones are now allowed.
A leap of a 6th is now allowed, but leaps of a 7th and of augmented or diminished Intervals are still forbidden.
Immediate repetition of tones is now allowed.

The following is a "correct" construction of 3-voice counterpoint in First Species:



N.B. When indicating the intervals made with the bass, the tradition is to do the following:

a. Reduce all numbers larger than 8 to their simple equivalents.[33]
b. Place the larger of the resulting numbers on top, regardless of the voice in which it appears.

This procedure is followed in the above example. Notice that in the $\begin{matrix}5\\3\end{matrix}$ beneath the first bass note, the 5th is taken by the soprano, the 3rd by the alto, whereas in the $\begin{matrix}5\\3\end{matrix}$ above the 6th bass note, the 3rd is taken by the soprano, the 5th by the alto.

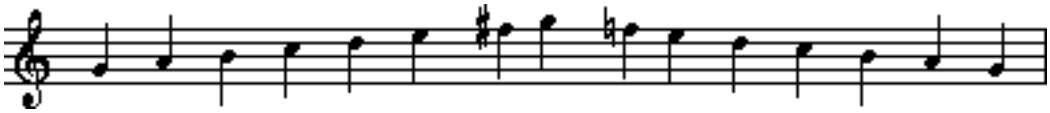
[33] The number 9 is sometimes used to show 9-8 suspensions, but we will not do that at this stage.

THE ADVENT OF HARMONIC THINKING

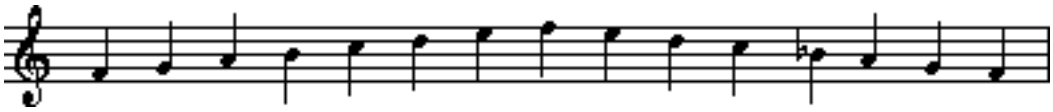
The musical styles we have been concerned with so far were constructed from the point of view that we call horizontal. That is, simultaneous tones were viewed as resulting from the combination of quasi-independent melodies. This manner of thinking about polyphony (the technical term for music in which two or more tones sound simultaneously) existed from the time of the ancient Greeks until somewhere in the sixteenth century. As is most often the case in history with regard to new ideas, new thoughts about the organization of polyphony did not take hold immediately, but were first looked upon as heretical, then merely as *avant garde* (the formal word for "way out") and finally as new norms of style.

One of the antecedents of the new style, which emerged around the beginning of the sixteenth century, was the ancient practice of *musica ficta,* the vocal application of accidentals in melodic lines where none were indicated. This natural vocal tendency served to emphasize melodic points of arrival by pressing into them with small intervals. An example of this practice has been included in our rules for writing counterpoint, where we have allowed the application of a leading tone at a cadence, even when that tone was not a part of the mode. The leading tone, in an ascending passage, presses more powerfully into the tonic than does the subtonic note, thus creating a more forceful cadence.

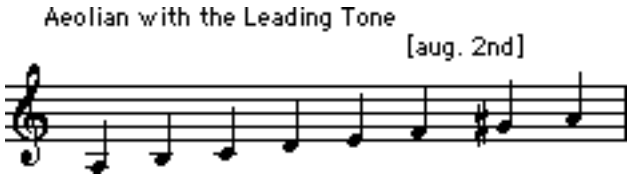
In the middle of the sixteenth century, the old modal system began to break down, due in part to the increased use of *musica ficta.* When *ficta* is applied to the various modes with regularity, it produces pitch vocabularies (scales) that resemble each other more closely than the uninflected modes do. For example, applying the leading tone to a melody in Mixolydian mode (thus creating a scale, which can be called "melodic Mixolydian") produces a pitch vocabulary, which is identical to the Ionian. Melodic Mixolydian employs the leading tone when ascending to the upper tonic, but not when descending, since the goal on the way down is not the upper tonic:



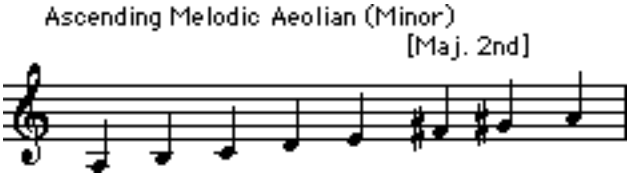
In the same way, "melodic Lydian" lowers the half step from *fi* to *so* when descending, since the push to the dominant is not needed. It, too, then resembles the Ionian:



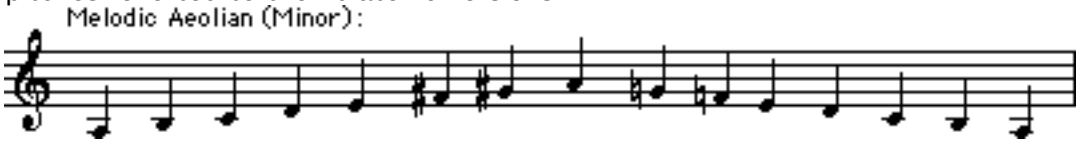
The same process took place in the “PAD” modes. In Aeolian, the push up to the tonic produced an additional difficulty, the creation of an augmented second:



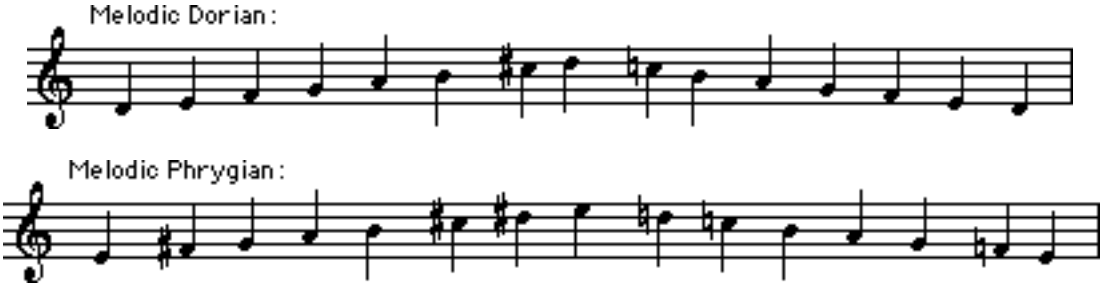
Since the augmented second was not considered to be a usual interval in Western European music, singers not only raised the subtonic to the leading tone, but also raised the sixth degree, thus eliminating the problematic interval:



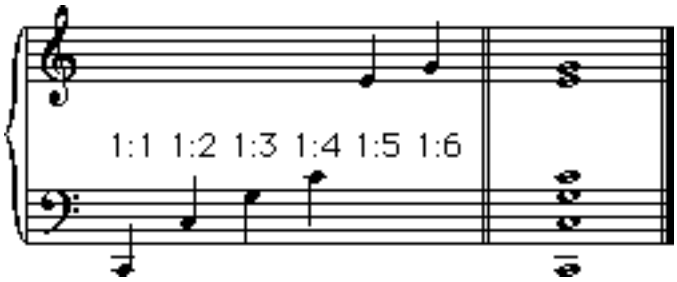
In descending melodies, the raised sixth and seventh degrees were not required, so the pitches reverted to their diatonic versions:



Melodic forms of the other modes began also to resemble this pattern. Here are examples of Melodic Dorian and Melodic Phrygian. Note that in both cases, the ascending form is identical to that of Melodic Aeolian (minor):



With the processes of *musica ficta* in place, a significant shift in musical style began early in the 16th century. Since the modes were beginning to sound more and more alike, vertical structures began to show signs of regularity as well. This caused some music theorists to consider for the first time the possibility of viewing vertical constructions as "entities” rather than as the result of the juxtaposition of melodies and the combination of intervals. Gradually the idea took hold that at least one sonority, the one that was composed of a whole string and its first five divisions (i.e., the ratios of 1:1, 1:2, 1:3, 1:4, 1:5 and 1:6) was somehow special. The intervals that made it up were so consonant that the sonority sounded not like a combination of intervals, but like a single thing.



In the mid-16th century an important Italian theorist by the name of Zarlino named this special sonority the *armonia perfetta*, or perfect harmony. It is what we now call the Major Triad.

Following the discovery of the perfect harmony, the shift in perception to the vertical structure of music became established. Accompanying this shift was a gradual breakdown of the old, modal system, accomplished in large part by the liberal application of *musica ficta,* the technique of altering certain degrees of the scale to increase their tendencies to resolve. The combination of the breakdown of the modes and the new awareness of vertical structure allowed for a new style to be born in the early 17th century. This style, in a sense invented by a group of musicians, poets and philosophers in Florence, Italy (the group was called the *Camerata*), dispensed with the contrapuntal technique of the previous century, with its multiple strands of music and simultaneous texts, and substituted for it a music that allowed a single line of words to be understood clearly. The style was called monody.

FIGURED BASS

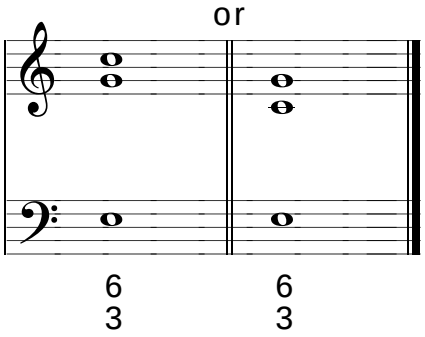
Monodic style involved a kind of musical shorthand we call *figured bass* (the British call it *thoroughbass*). Pieces in this style were written with both the vocal line and the bass line fully written out, but with the inner parts of the accompaniment appearing not in traditional musical notation, but in a kind of shorthand. A set of numerical figures written in Arabic[34] numerals was included below the bass line. These figures represented the intervals that were to be played above the bass line by the keyboard player, who was essential to this style. (Other instruments, like the viol, lute, etc. also played the bass line. Together, these players were referred to as the *basso continuo*, or continuous bass.)

At first, each set of figures used in the bass part indicated the precise octave in which the inner voices were to be played; numbers ranging up to 18 were employed at this early stage. Soon afterwards, however, the concern for precise indication of the inner parts decreased, and composers began employing figured basses that generally showed only the simple equivalents of compound intervals, leaving the keyboard player free to decide the octave in which to place the "realized parts."

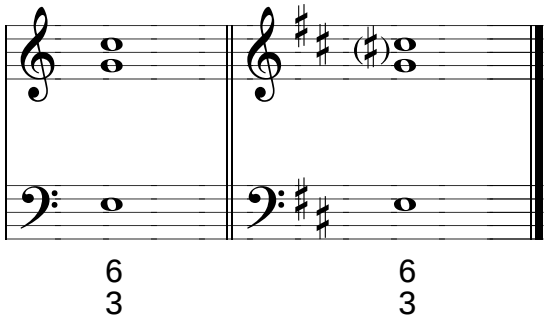
The figures presented below the bass line of a **figured bass** are in a kind of short hand. They indicate the number size of intervals that are to be placed above the bass line.

[34] Arabic numerals are the numerals we commonly use, e.g., 1,2,3, etc. They were invented by the Arabs.

Octaves are not specified (e.g. 5 could mean a 5th or a 12th above the bass). The figures are traditionally written with the higher numbers placed above the lower numbers, but the order of the numbers is not necessarily mirrored by the upper parts. E.g., given the figure $\begin{matrix}6\\3\end{matrix}$, the 6th above the bass could be placed in either the soprano or the alto voice:

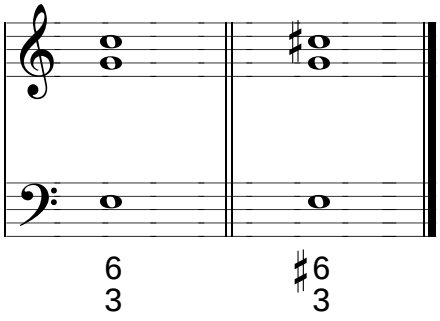


Figures in a figured bass indicate only the number sizes of the intervals to be placed above the bass line. The signature determines the qualities of the various intervals:

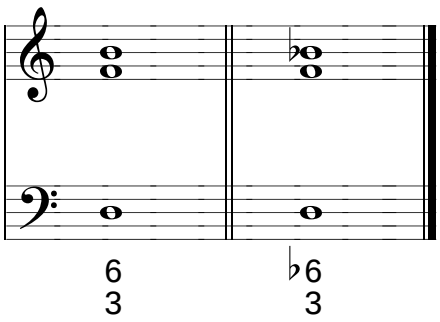


Qualities can be modified from those governed by the signature by modifying the figures in various ways.

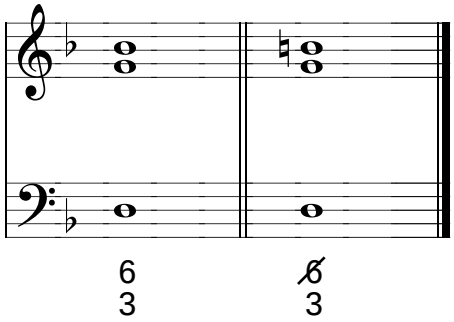
a. a "#" placed in front of a figure indicates that the pitch controlled by that figure should be raised a half step from what is indicated by the signature.



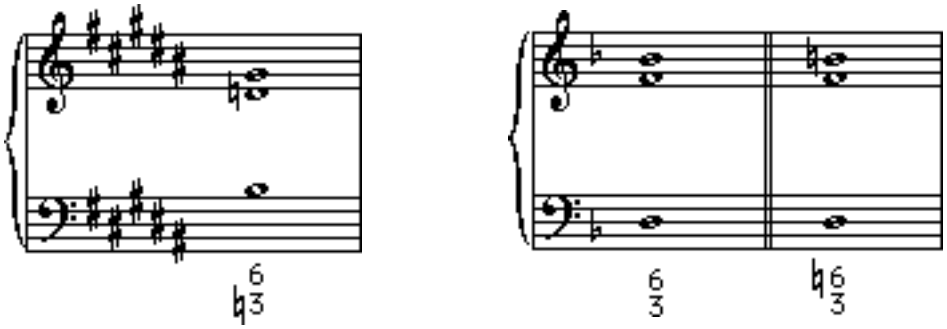
b. a "♭"placed in front of a figure indicates that the pitch controlled by that figure will be lowered a half step from what is indicated by the signature.



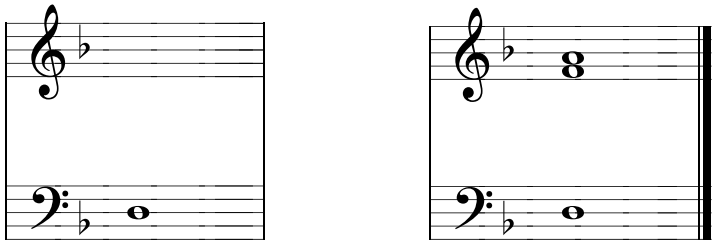
c. a "/" drawn through a figure is equivalent to raising the note a chromatic half step (i.e., without a change in letter name) from what is indicated by the signature.



d. a "♮" placed in front of a figure indicates that the pitch controlled by that figure will be raised or lowered a chromatic half step from what is indicated by the signature.

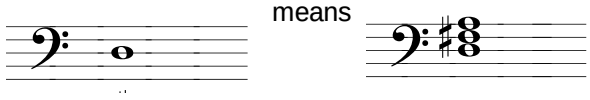


e. a bass note that has no figures beneath it is most often interpreted as meaning that a 5th and 3rd should be placed above it.

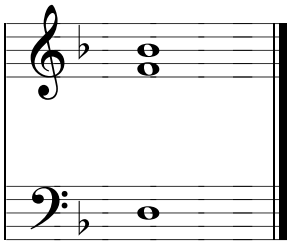


This is true except when the bass note is a complementary tone, in which case it usually does not support any harmony.

f. an accidental appearing beneath the bass line without any figures means that the chord is a $\begin{matrix}5\\3\end{matrix}$ and that the 3rd is either raised or lowered by a half step from what the signature indicates, depending on which accidental is used.



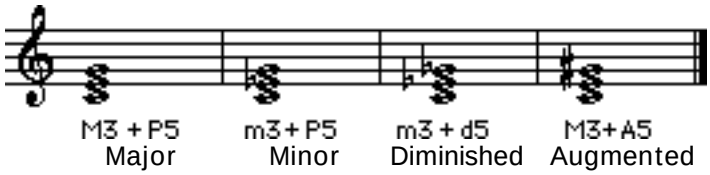
g. the figure 6 is an abbreviation of the figure $\begin{matrix}6\\3\end{matrix}$.



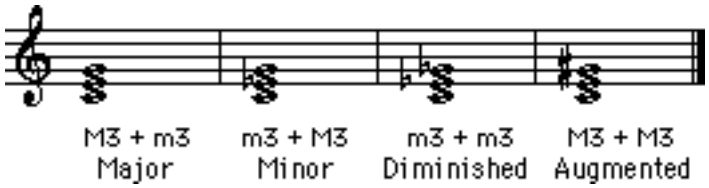
6

TRIADS

A. Triads (i.e., chords made up of three pitch classes) are composed of two intervals above a bass note. In its most stable form, a triad contains a 3rd and a 5th above the bass note. Although the number sizes of these intervals are constant, their qualities vary to produce different qualities of triad. The following chart gives the four common qualities of triad and the intervals that create them.



B. Since the distance between the 3rd of the triad and the 5th of the triad is also a 3rd, many theorists have viewed triads (and larger chords as well) as being built up from stacks of 3rds. They thus refer to these chords as **tertian** sonorities,[35] and the harmony they produce, tertian harmony. When viewed in this way, one can differentiate the various qualities of the triads by examining the stacks of 3rds of which they are composed:



C. We will call the lowest note of a triad that has a 3rd and 5th above it the "tertian root" of the triad.[36] The note forming the interval of a 3rd with the tertian root is referred to as the "tertian 3rd" of the triad, while the note forming a 5th with the root is referred to as the "tertian 5th" of the triad.

D. Triads in which the tertian root is placed at the bottom ("in the bass") are said to be in "$\frac{5}{3}$ position."[37] Triads in which the tertian 3rd is in the bass are said to be in $\frac{6}{3}$ or 6 position[38], since the intervals created between the bass note and the upper notes are a 3rd and a 6th (or their compounds). Similarly, triads with the

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[35] In actuality, the stack of thirds is merely coincidental to the structure of the triad. Nevertheless, it is often convenient to think of triads as tertian in structure. When we deal with triads in this manner, we will be involved with what can be called "musical grammar." In all our discussions concerning harmony, it will be extremely important to maintain a distinction between grammatical terminology, which reflects musical notation, and *functional* terminology, which reflects how music is perceived and understood.

[36] The traditional term for this is "root". The term "tertian" is added to distinguish the tertian root from acoustical and functional roots (see below).

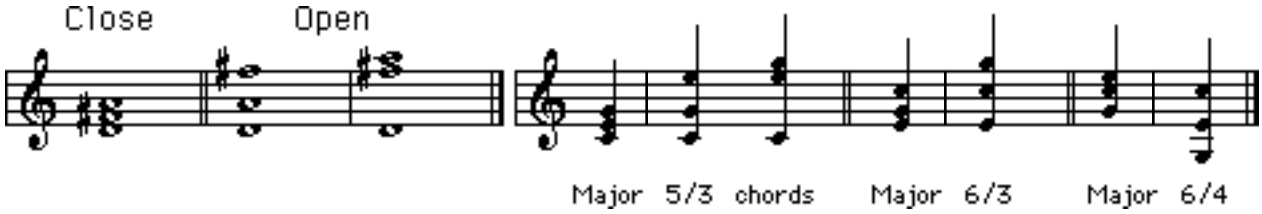
[37] We will also call this **tertian root position**.

[38] This is traditionally called **first inversion**.

tertian 5th in the bass are said to be in $\begin{matrix}6\\4\end{matrix}$ position[39]. This is true whether or not the construction of the chord is open or close.

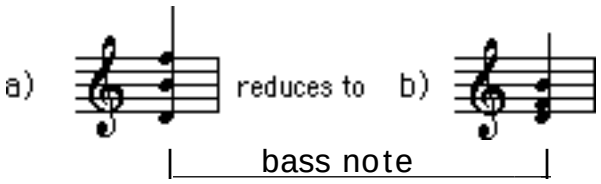
Construction

E. Construction is a term that describes the way in which the various parts are apportioned on the staff or staves. It is sometimes also called *voicing* or *scoring.* Although there are many varieties of construction, two types are named specifically: **open construction** and **close construction**. Construction is called "close" when there is literally no room between the tones of a chord where other tones of the chord could have been placed. In other words, the tones are packed as closely together as possible. Construction is called "open" when other chord tones could have been placed in between the particular tones in the construction. Below are some examples:



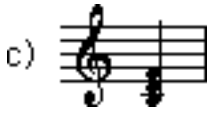
F. The tertian root, quality and position of any triad can be determined by the following method:

1. reduce the pitches to close construction (if the chord is in open construction), making certain that you keep the bass note as the lowest note of the chord.



2. name the position of the chord by figuring the intervals above the bass in chord version b above. In the case of the present example, the intervals above the bass are a 6th and a 3rd. The chord is thus in $\begin{matrix}6\\3\end{matrix}$ or ^{6} position. The original chord, or version a, is in the same position, since its bass note is the same.

3. stack the tones in 3rds (so the pitches are written either all on lines or all on spaces).



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[39] This is traditionally called **second inversion**. This position creates a 4th between the bass and one of the upper tones, a condition we have thus far been avoiding. Proper use of the $\begin{matrix}6\\4\end{matrix}$ position is discussed below, in the section titled *Functional Harmony.*

4. the tertian root will now be in the bass (lowest note). [In the case of the present example, the tertian root of the triad, from version c), is **B**.]

5. name the quality of the chord, in version c), by considering the intervals made with the bass, or between the adjacent voices. (See items A. and B. above.) [In the case of the present example, the triad contains a minor 3rd and diminished 5th above the bass, or a minor 3rd between the root and 3rd and another minor 3rd between the 3rd and 5th. The triad is therefore a **diminished** triad.] Name the chord by root, then quality, then position. The complete label for the chord is, then, $\mathbf{B^{o}_{6}}$.]

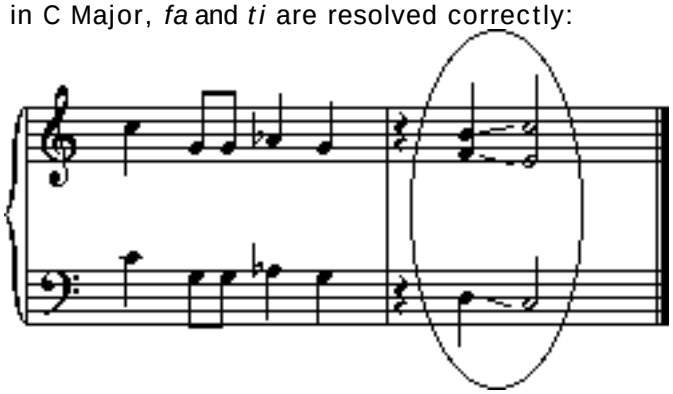
NOTES ON HARMONY

1. **Voice leading** is a term that describes how the parts are melodically connected. This is the horizontal component of harmony, to which we paid a great deal of attention in our counterpoint exercises.

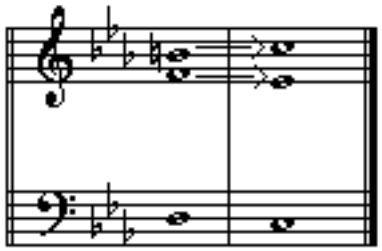
   A. **Closest Motion.** The norms of voice leading require voice leading by *closest motion in all parts but the bass,* repeating common tones whenever possible. (The bass is free to move by leaps, although leaps of a 6th or 7th are uncommon.) You should therefore prefer the option that allows for the least total movement of the parts. This will often produce some lackluster melodic lines, while enhancing the smoothness of chord connection. Be patient with this for the time being. Later on, we'll discover ways in which melodies can be made more interesting once again.

   Also, it is best to avoid melodic motion by augmented or diminished intervals.

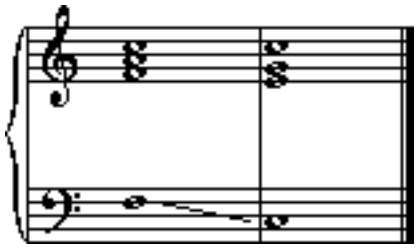
   B. **Active tones** are those tones in a key that are not part of a tonic cluster (do-mi-so), but that lie only a half step away from one of the tones of the tonic cluster. They include *fa* and *ti* in Major, and *ti* and *le* in Minor. At the ends of phrases it is mandatory for active tones to move (or resolve) by closest motion. It is also advisable to proceed by closest motion when an active tone appears in the highest voice, even in the midst of a phrase. In resolution, ***Fa*** is led to ***mi***; ***le*** is led to ***so*** (in minor); and ***ti*** is led to ***do***. In the following example, in C Major, *fa* and *ti* are resolved correctly:



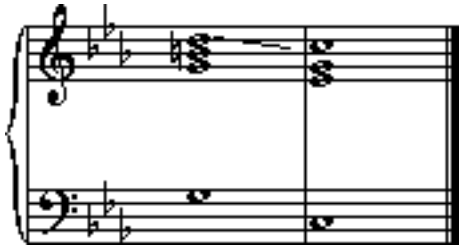
The fourth scale degree in minor borrows its voice-leading quality from the cotonic major, and is therefore considered to be active even though it lies a whole step from the third degree, rather than a half step. *Fa* therefore resolves to *me*:



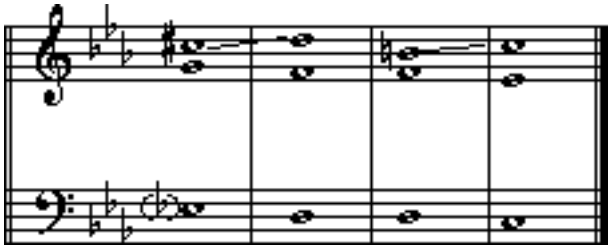
The fourth scale degree also serves as root of the subdominant chord. In this instance, *fa* is not an active tone, as can be seen in the following example of a typical "Amen"-type plagal progression:



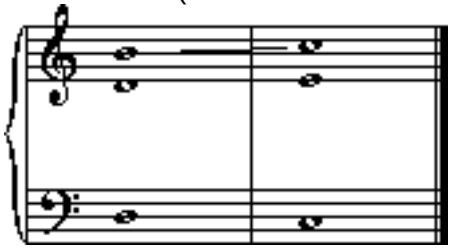
The second scale degree in minor borrows its voice-leading quality from the cotonic major. It is therefore *not* an active tone despite its half-step distance from the third degree, and often resolves by stepwise motion down, as in the following example, in c minor.



Chromatically modified tones are automatically active, and should be resolved by closest motion wherever they occur.



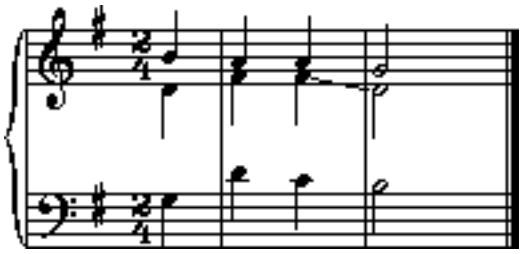
When realizing a figured bass, the resolution of active tones in outer voices takes priority over the precise figures indicated. One of the figures may have to be left out, and another doubled, in order to comply with the rule governing the resolution of active tones. (See 2 below for more on this.)



8 5
6 3 (8 instead of 5)

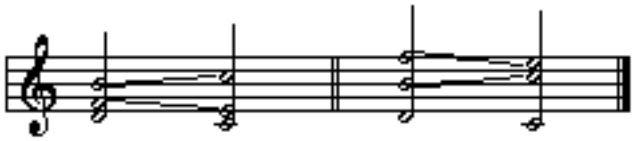
(5th left out, since ti must go to do)

An active tone occurring in an inner voice may resolve with greater freedom when another voice moves to the tone that the active tone would have ordinarily resolved to *in the same octave*. In this procedure, the resolution of the active tone is said to be "covered".



ti may move to *so* because *re* goes to *do*

C. **Augmented and Diminished Intervals.** Melodic motion by augmented or diminished intervals is unusual in this style. Augmented intervals occurring between two parts generally resolve by continued expansion, while diminished intervals generally resolve by continued contraction. *This is especially important when these intervals occur between outer voices.* The most common intervals of this type we will be encountering will be the natural tritones of the diatonic scale, that have already been defined as active tones. Simply following the rules of closest motion and resolution of active tones will avoid problems with the resolution of these intervals.



Aug. 4th expands Dim. 5th contracts

When other problems are created by this rule, and the notes involved are not both outer voices, compromises are acceptable.

D. **Contrapuntal Rules.** Many of the rules governing horizontal connections that were germane in our contrapuntal exercises are no longer applicable. The reason for this is that those rules were specific to the style in which we were writing. There are, however, global rules of counterpoint that remain in effect. These include the following:

1. parallel *perfect* unisons, 5ths, octaves and unsupported 4ths are still forbidden.
2. similar approach to perfect intervals is forbidden (but only in the outer voices when both voices approach the perfect interval by leaping). (But see C, above.)
3. Progressing from a diminished 5th to a perfect 5th should be avoided, if possible, but moving from a perfect 5th to a diminished 5th is always acceptable.

2. **Leaving out and doubling tones.** To avoid contrapuntal errors it is sometimes necessary to leave out one of the tones suggested by a figured bass and to double another of the tones in the chord:

For chords in $\frac{5}{3}$ position, the best chord member to leave out is the tertian 5th of the chord. To some extent at least, it will be supplied in the overtones of the root. The 3rd should NOT be left out, as it provides crucial information about the quality of the chord, and the overtone of the root which doubles the third is quite weak.

For chords not in $\frac{5}{3}$ position, it is best to have all tones present, even when this compromises the closest motion of parts. (In three-voice textures, chords in $\frac{6}{3}$ position occasionally appear with the 5th left out, but only when other factors require the elimination of one of the tones.)

Preferences in doubling will be discussed in detail later. The general order of preference in doubling is as follows: root as first preference, 5th as second preference, 3rd as least preferred.

DO NOT LEAVE OUT THE THIRD UNLESS THE FIGURES SPECIFICALLY REQUIRE IT, e.g. in the figure $\frac{8}{5}$.

3. **Spacing**. In general, upper parts should not be more widely spaced than an octave. Spacing between the bass and upper parts is not restricted.

4. **Leaps** up to a 6th are allowed, but should be used sparingly, and only when necessary. Avoid leaps of dissonant intervals with the exception of the diminished 5th, that may be used if a melody changes direction by step immediately afterwards. Closest motion remains the norm.

Summary Of the Rules For Voice Leading

1. Move by closest motion, resolving active tones properly, but avoiding parallel perfect octaves, perfect fifths, and similar-motion leaps to perfect intervals in outer voices.

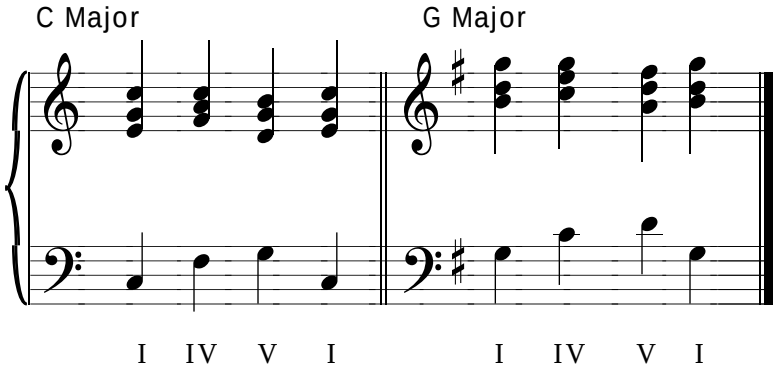
2. To avoid errors, leave out the fifth, but NOT the third, in $\frac{5}{3}$ chords; include all chord members when a chord is not in $\frac{5}{3}$ position.

ROMAN NUMERALS: DESCRIPTORS OF MUSICAL GRAMMAR

A. The Roman numeral[40] system was invented to enable musicians to represent harmonic events without the necessity of writing down a bass line and figures. It incorporates some characteristics of the figured bass system, while including a

[40] Roman numerals (I, IV, V) were invented by the Romans.

new element, the representation of various degrees of the scale by corresponding Roman numerals. The first degree of the scale carries the Roman numeral I, or i; the second degree is represented by II or ii, etc. Roman numerals are key independent. A chord on the first degree of the C major scale, and a chord on the first degree of the F major scale both carry the Roman numeral I. This system allows for direct comparisons between chord progressions, even when those progressions are in different keys:

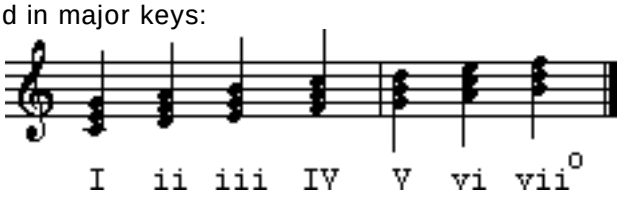


B. Roman numerals are employed in both upper and lower cases. Upper case numerals refer to chords in which the tertian 3rd is major (major and augmented triads, and several chords composed of more than three pitch classes), while lower case numerals represent chords in which the 3rd is minor (minor and diminished triads, and several chords composed of more than three pitch classes).

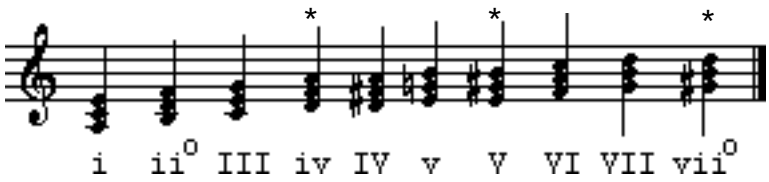
Upper case Roman numerals look like this: I, II, III, IV, V, VI, VII.
Lower case Roman numerals look like this: i, ii, iii, iv, v, vi, vii.

C. In order to distinguish an augmented triad from a major triad, the symbol "+" is included with the Roman numeral for the augmented triad. Similarly, the symbol "o" is included with the Roman numeral for the diminished triad.

D. Each Roman numeral indicates the tertian root of a chord, by showing the degree of the scale on which that root occurs. The following Roman numerals are the most commonly found in major keys:



The following Roman numerals are commonly found in minor keys (The asterisked chords are more common than their counterparts; e.g., iv is more usual than IV):

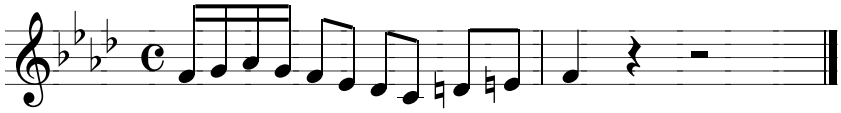


Note that there is a greater variety of "regular" chords in minor keys. This is to some extent due to the following:

a. One of the most powerful and influential functions in tonal harmony is that of the **dominant**. Dominant function is most potent when the chord includes the leading tone of the key. Since the diatonic minor mode lacks a leading tone, it does not have a natural dominant chord, and must "borrow" the dominant chord from its cotonic major. Minor often employs the leading tone as tertian root of a triad as well, as is the case in major. (See the final chord in the above example.) *These additions to the harmonic vocabulary produce a wider palette than that generally employed in major.*

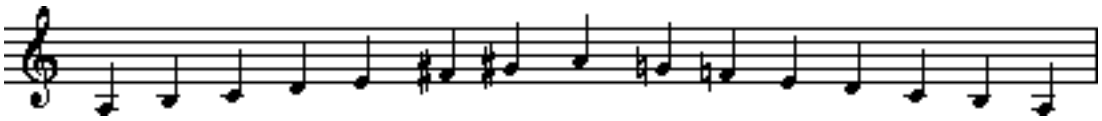
b. **Melodies in minor** are also influenced by the need for a leading tone. As has been discussed earlier, in ascending melodies the leading tone is often selected as a more convincing approach to the upper tonic than the subtonic note. In addition, in order to avoid the unusual interval (in Western music) of the augmented 2nd, the sixth degree of the scale is also raised. This produces two pitches not found in the diatonic minor: *la* and *ti.* In descending portions of melodies in minor the leading tone is not crucial, and most melodies therefore revert to the diatonic form, using *te* and *le*. The following example demonstrates first the descending form and then the ascending form that many melodies take in minor.

Beethoven: String Quartet in F Minor, op.95



MELODIC MINOR

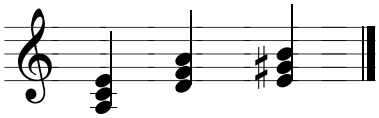
The combination produces the **Melodic Minor** scale.



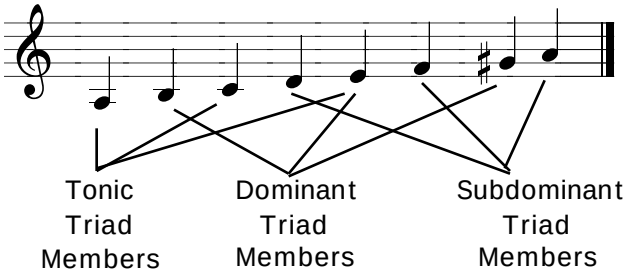
The melodic minor scale is an abstract, that shows us the most common pitches used in minor-mode *melodies*.

HARMONIC MINOR

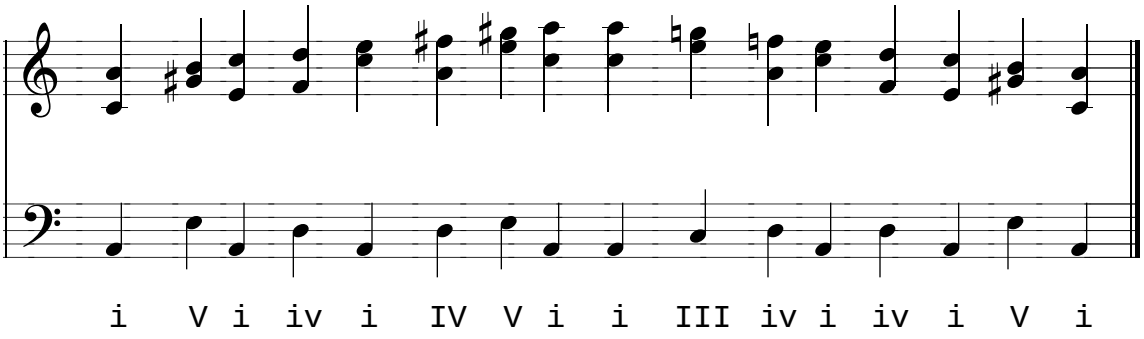
c. The most common chords used in ***harmonizing*** **minor-mode melodies** are the minor tonic and subdominant triads, and the major dominant triad:



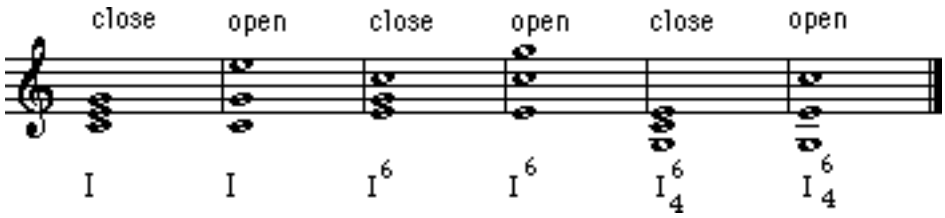
When these pitches are arranged in an abstract scale, they produce the set of pitches we call *Harmonic Minor* :



When the *variable* degrees of the melodic minor scale are harmonized, the raised sixth degree often is supported by a major chord on the subdominant, and the subtonic note by a mediant chord (shown in the following example) or by a minor chord on the dominant degree (not shown). Here is a typical harmonization in three voices:

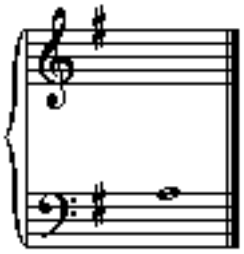


E. Figured bass numerals are attached to Roman numerals to give information about the *position* of a chord. When a Roman numeral appears without any figured bass numerals attached, the chord is in $\begin{smallmatrix}5\\3\end{smallmatrix}$ position (tertian root in the bass). When the figured bass numeral "6" appears with the Roman numeral, the chord is in $\begin{smallmatrix}6\\3\end{smallmatrix}$ position (tertian 3rd in the bass). When the figured bass numerals $\begin{smallmatrix}"6\\4"\end{smallmatrix}$ appear with the Roman numeral, the chord is in $\begin{smallmatrix}6\\4\end{smallmatrix}$ position (tertian 5th in the bass). Upper notes vary with particular constructions. Here are various possibilities in C Major:

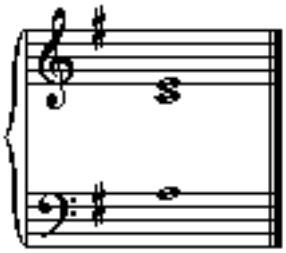


F. The process of converting Roman numerals to realized harmony, is as follows:

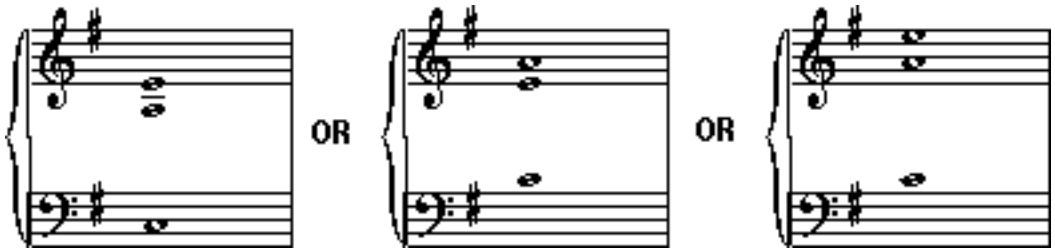
1. Read the Roman numeral itself. It will indicate the scale degree on which the tertian root of the chord is located. [For example, given ii^6 in G Major, read the Roman portion of the numeral, or ii; ii in G Major is A.]



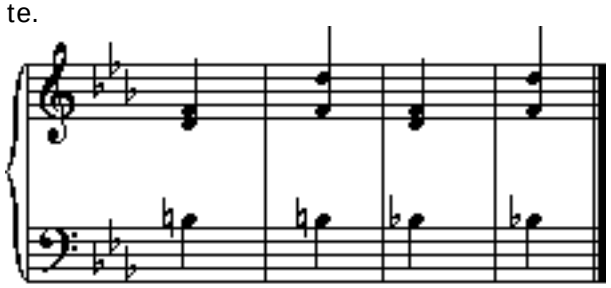
2. Build a chord by placing a 3rd and a 5th above the indicated tertian root. A $\begin{smallmatrix}5\\3\end{smallmatrix}$ position chord is thereby created.



3. Now consider the figured bass numerals appearing with the Roman numeral. (Remember that if there are none, the numbers $\begin{smallmatrix}5\\3\end{smallmatrix}$ are assumed, and that 6 stands for $\begin{smallmatrix}6\\3\end{smallmatrix}$. If the Roman numeral indicates a $\begin{smallmatrix}5\\3\end{smallmatrix}$ chord you have already produced it; if it indicates a chord in $\begin{smallmatrix}6\\3\end{smallmatrix}$ position, place the tertian 3rd in the bass; if it indicates a chord in $\begin{smallmatrix}6\\4\end{smallmatrix}$ position, place the tertian 5th in the bass.) [In the case of the present example, the Roman numeral ii^6 indicates, by the inclusion of the "6," that the chord is in $\begin{smallmatrix}6\\3\end{smallmatrix}$ position. The tertian 3rd of the chord, or "C," should therefore be placed in the bass. The upper tones may be in any number of constructions, as is illustrated by the musical notation that follows:]



G. The chord built on the seventh degree is minor is variable. In some situations its tertian root is the subtonic (te) and in others it is the leading tone (ti). Roman numeral symbols show this difference as follows: the vii^{o} version of the "seven chord" refers to a chord whose tertian root is ti; the VII version refers to chord whose root is te.



C Minor: vii^{o} vii^{o} VII VII

CHORD SYMBOLS IN LEAD SHEET NOTATION

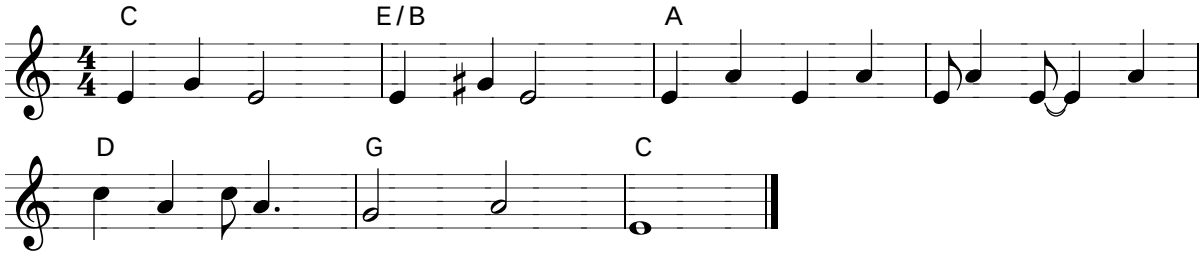
Yet another means of indicating chords in a kind of shorthand is one used a great deal in the notation of jazz and commercial music. In this system, chord symbols are usually written *above* the melody notes to which they refer. Chord symbols generally consist of two elements: the tertian root of the chord and the chord's quality, given in that order. For example, a C minor chord would be given as **Cmin.** or **Cm.**

As with the other systems of abbreviation, shortcuts are taken whenever possible. These include the following:

a. Major triads leave off the quality; it is simply assumed. Thus, a C major chord would be written as **C.**
b. Positions are not provided unless a particular position is specifically called for. In that case, a slash appears after the chord quality, followed by the *letter name of the bass note* . For example, a B diminished chord in 1position would be given the following symbol: **Bdim/D**

More complicated chords require more complex symbols. A compendium of chord symbols in lead sheet notation is included at the end of this volume.

Here is a simplified harmonization of the popular tune "Has Anybody Seen My Gal?" in lead sheet notation:



The Phenomenon of Rootedness

The term *root* has been defined in various ways during the course of the history of music theory. Some definitions have related primarily to musical notation, and others to the perception of music. The famous theorist and composer Jean-Philippe Rameau, created a number of theories (and definitions) of root, including the **tertian roots** we have discussed so far. He argued that, since harmonies could be understood as being created by stacking thirds one upon another, the fundamental (or root) of such a sonority would be the lowest of its notes. (He also argued that placing members of a chord in different configurations would not affect the status of the root, thus creating a theory of chordal inversion.)

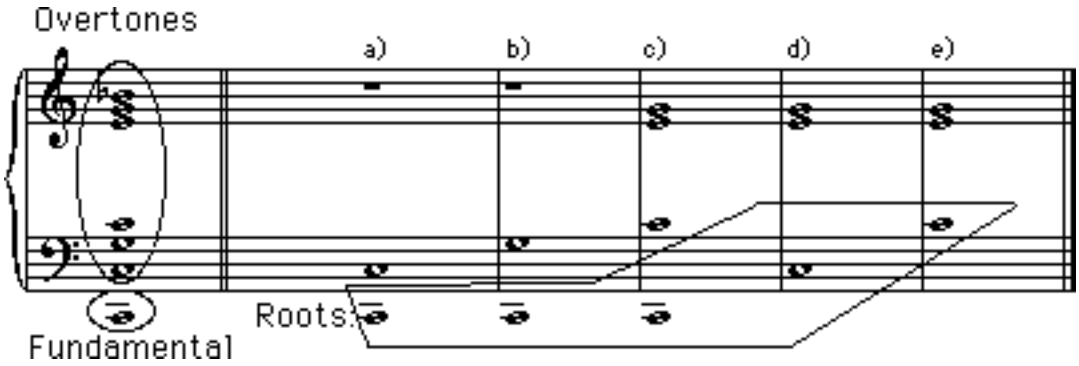
But Rameau was not completely satisfied with this account of the root phenomenon. He saw certain musical situations where his ear led him to the choice of a different note than the one dictated by tertian structure. Thus, in addition to defining the root as the lowest note in a stack of thirds, he argued that, in certain musical contexts, notes present in a chord were not to be considered part of its harmony, and were therefore to be excluded from the calculations of the root. Tertian structure might, in these cases, be ignored in favor of contextual analysis.

To be added to this is a completely acoustical definition of roots, as the fundamentals of the harmonic series in which the other notes are members. Rameau introduced this concept in his writings as well.

Tertian roots have already been discussed. What follows is a discussion of other types of roots, with an emphasis placed on the type which combines elements of acoustics and musical context to produce **functional roots.**

ACOUSTICAL ROOTS:

A. The root phenomenon sets up a hierarchy among tones that puts forward a single tone as the best representative of the entire sonority. This phenomenon is likely brought about by comparison with the natural order of the overtone series, where a fundamental, or root tone has harmonics, or overtones. Please refer to the example below. On the far left you see a fundamental tone (a low C) and its first six overtones. at a) you have the fundamental and its first overtone. Since the relationship between these two pitches occurs naturally, the lower C is the acoustical root of the interval. This is true as well for b) and c). In d) the fundamental of the series is absent, but three overtones are present. Strictly speaking, the acoustical root is still the low C, *even though it is not present as a sounding tone*, but since humans are generally tolerant of octave transpositions, we generally accept the tone an octave higher as being an adequate representative of the whole sonority, hence a kind of substitute acoustical root. The same situation holds in e), where the C is actually two octaves higher than the true acoustical root. In all of these examples, the acoustical root has the pitch class C.



B. Some intervals exhibit natural, or “acoustical,” roots. Consider how the first note of "Row, Row, Row your Boat" is indicated by the lower note of a Perfect 5th or Major 3rd sounded before the song is begun. There is something inherent in the sonority of the Perfect 5th or Major 3rd which “points” to the first note of the song...something not based on loudness or tone quality, but on the inherent qualities of the intervals themselves.

C. The acoustical root phenomenon exists even more strongly in some triads, since more tones, and therefore more intervals, are involved and the “pointing” signals are clearer.

The Major Triad

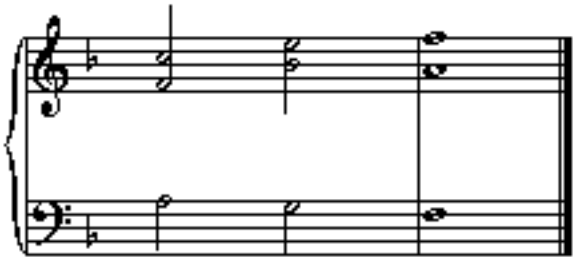
The major triad is a very special construction, since it exactly mirrors the 4th, 5th and 6th partials of the overtone series. In this regard, it must be considered the most "harmonic" triad, and its acoustical root is very clear. (In examples c, d, and e, above, the acoustical root is C.)

The Minor Triad

The minor triad is not as "harmonic" as the major. Although it, like the major triad, is "composed" of both a major 3rd and a minor 3rd, the order of these intervals is reversed from the order in which they appear in the overtone series. For this reason, the minor triad is less stable than the major, and its acoustical root is much less clear; it partakes of some of the same qualities as major primarily because the perfect 5th is present in both sonorities.

The Diminished Triad

When viewed harmonically, the diminished triad can be said to be composed of the 5th, 6th and 7th partials of the harmonic series. Its acoustical root, then, can be considered to be the fundamental of that same harmonic series, *even though that fundamental is not actually present in the sounding notes of the chord* .



The Augmented Triad

The augmented triad is hardly a harmonic triad, since it does not possess a perfect 5th, and contains a pitch which is not replicated in the lower members of the harmonic series, the pitch that creates the interval of the augmented fifth. It therefore possesses virtually no acoustical root.

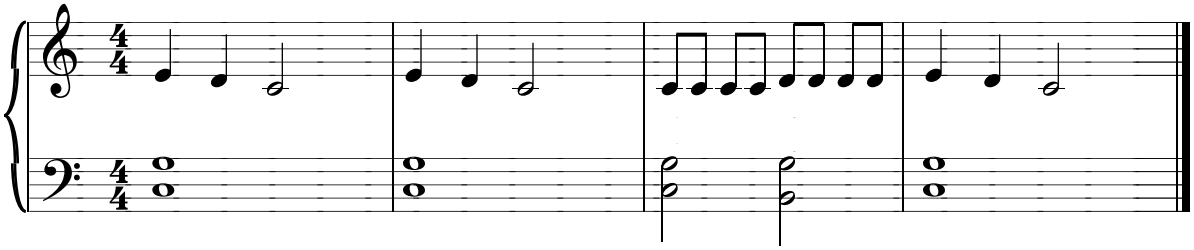
Complementary Tones and Harmony

Complementary tones are less ambiguous in polyphonic (i.e., more than one voice) musical contexts than they are in monophonic (single-voice) music. We have already seen how passing tones, neighbor tones and suspensions are employed in species counterpoint, where they are easily identifiable, since they create dissonances with the structural tones of the cantus firmus. Complementary tones are common in all styles of music, and have an important embellishing role to play in harmonic music. There are two categories of complementary tones in harmony:

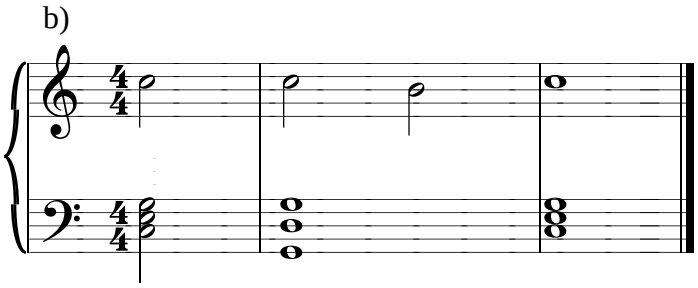
1. Non-chord tones. These tones create embellishing dissonances which require resolution. They are not members of the prevailing chord, and result either from a chord tone moving to a non-chord tone (the D4s in measures 1, 2 and 4 of Example a, below[41]) or from a chord tone being delayed by a non-chord tone (the C5 in the first full measure of Example b, which delays the arrival of the B4 chord tone).

[41] The D4 in measure 3 is a chord tone, and is therefore not complementary.

a)

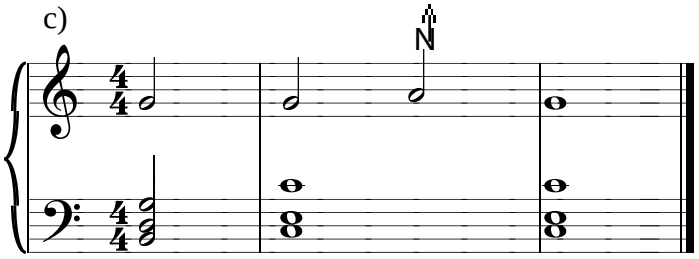


b)



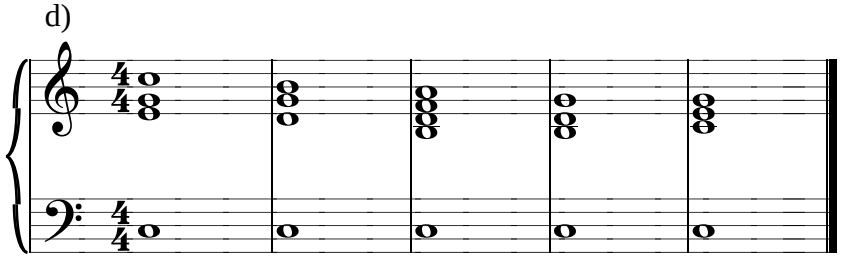
2. Tertian complementary tones. These tones, although complementary in function, happen to create tertian chords. The chords they create, however, function as embellishments of structural chords (see example c, where the A4 in the first full measure creates a fleeting a-c-e triad. The A4 is nevertheless perceived as an upper neighbor complement to the prevailing c-e-g chord established at the beginning of the measure).

c)



3. A new complementary tone, not previously defined, can now be discussed. It is made evident only in polyphony. It is the **pedal tone**. The pedal tone is a note most often found in the bass (or lowest sounding voice). It enters the musical texture as a structural tone, but remains while the chords above change. At times it may agree with the prevailing chord, and at times disagree with it. It leaves the musical texture as a chord tone. (In example d, the C3 pedal is a chord tone in measures 1 and 5, and a non-chord tone in measures 2,3, and 4). In some respects it is complementary, but it can also be considered to be structural, with some of the chords above it considered to be complementary. This depends on the context.

d)



One analysis of the above might consider each of the notes in the treble clef to be part of a chord, with a pedal tone C beneath; another analysis might give only the Roman numeral and an arrow: I ————————————————>, and consider the non-C Major “chords” above to be complementary.

FUNCTIONAL HARMONY

Many theorists have attempted to explain the logical succession of chords in tonal music by considering that each degree of the scale possesses a unique "function" within the tonality. These theorists accept as a fact the existence of tonic function (indicated by a number with a carat above it, e.g. $\hat{1}$), supertonic function, mediant function, etc., while stressing that the most important and powerful functions belong to the tonic, dominant, and subdominant. At least one important German theorist of the 19th century, Hugo Riemann, posited a theory in which only the latter three functions were accepted; all other degrees were considered to be substitutes for them. For example, Riemann viewed the $\hat{6}$ to be most often a tonic function and the $\hat{2}$ a subdominant function. In this text, we allow for the possibility of functions on all degrees except the leading tone (which, as we have seen, is acoustically an incomplete dominant: b-d-f in C major has the root G). Nevertheless, we will not automatically assign function solely on the basis of tertian structure or acoustics, but will consider musical context as well, as will become clear in the following section.

FUNCTIONAL ROOTS

The functional root of a sonority is the tone that best represents its function in tonality. The functional root is determined not only by the acoustical root a sonority might possess in isolation, but also by the placement of that sonority in a particular musical context. The environment in which the sonority is found can, in many cases, markedly affect its function. Context thus plays an often crucial role in the definition of the functional root (and therefore the function) of a sonority.

<u>The Major Triad</u>

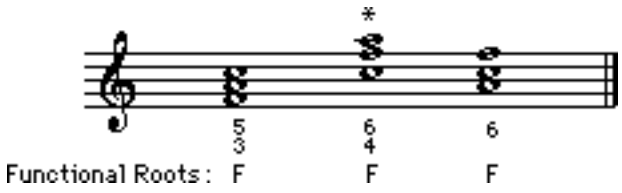
a. $\begin{matrix}5\\3\end{matrix}$ position: Of all chords, the major triad in its most "natural" position $\left(\begin{matrix}5\\3\end{matrix}\right)$ is the least susceptible to manipulation by context. It is safe to say that no matter what context in which the chord might be found, the functional root will be the same as its acoustical root (that is also the same as its tertian root).

b. $\begin{matrix}6\\3\end{matrix}$ position: Although the acoustical root of a major chord in $\begin{matrix}6\\3\end{matrix}$ position is less clear than is the acoustical root of a $\begin{matrix}5\\3\end{matrix}$ position major chord, it is still strong enough to control the functional root in most contexts.

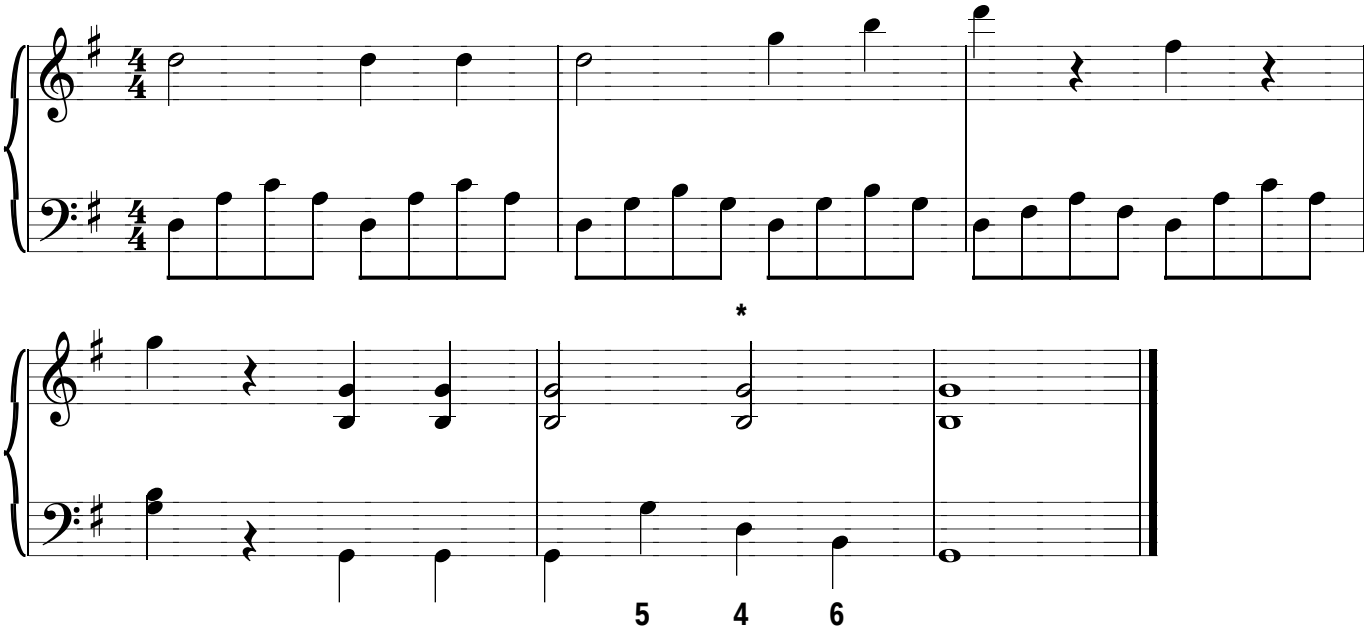
c. $\begin{matrix}6\\4\end{matrix}$ position: A major triad in this position can occur in several contexts, as outlined below:

Types of $\begin{matrix}6\\4\end{matrix}$ Chords

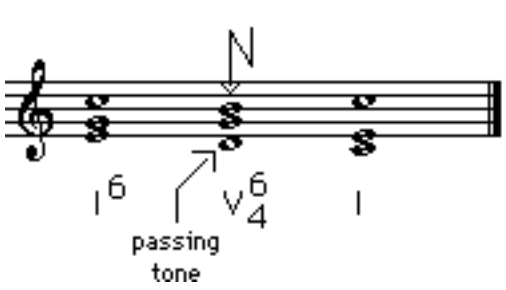
1. the ***arpeggiated*** $\begin{matrix}6\\4\end{matrix}$. Here, the $\begin{matrix}6\\4\end{matrix}$ occurs following between other positions of the same chord. The functional root is here the same as the tertian root.

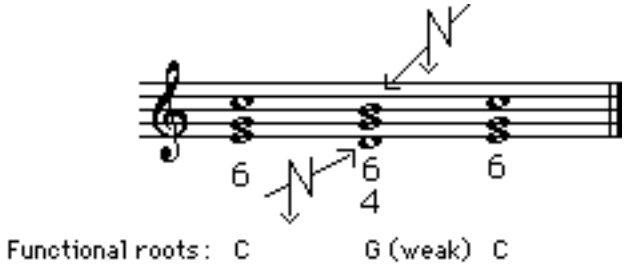


Beethoven: Sonatina in G

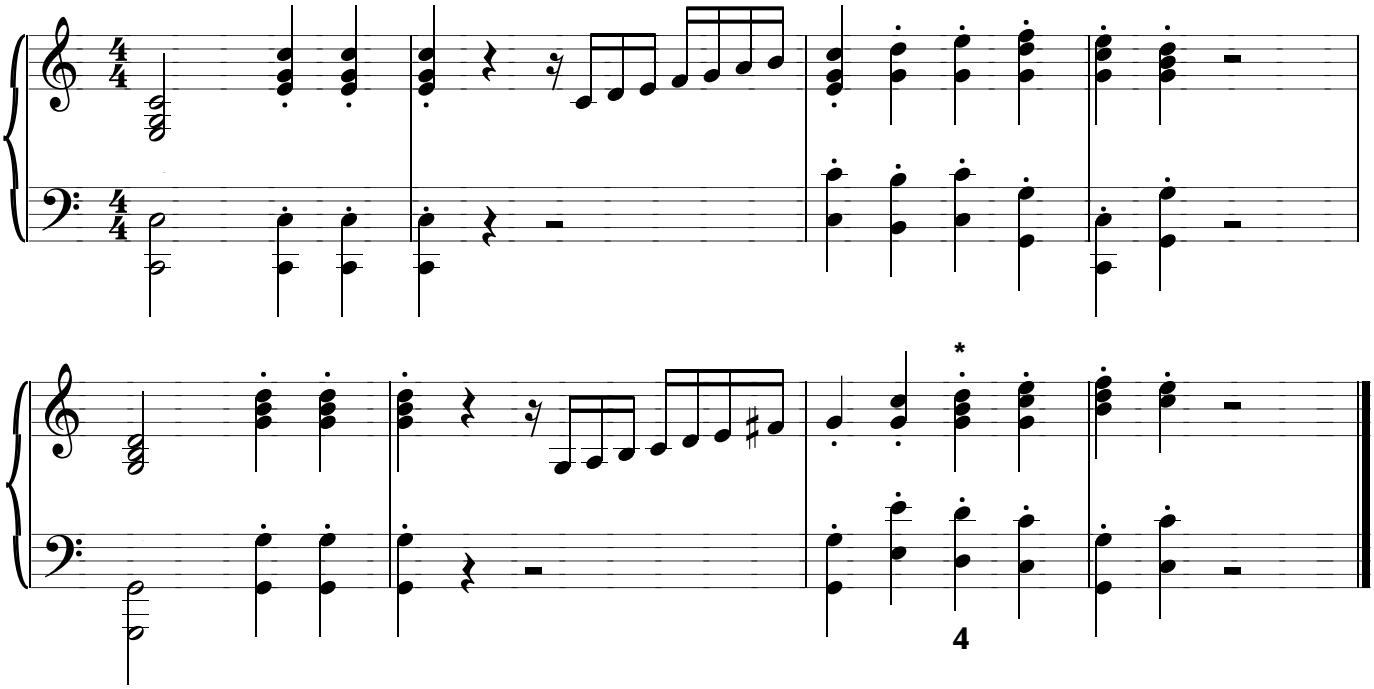


2. the ***passing*** $\frac{6}{4}$ or ***neighbor*** $\frac{6}{4}$: includes a set of complementary tones, one of which is the bass tone. In this environment, at least one chord member is complementary. Although the root phenomenon is greatly reduced in complementary chords, it still exists and is most commonly the same as the tertian root of the chord.

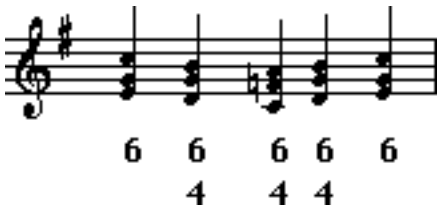




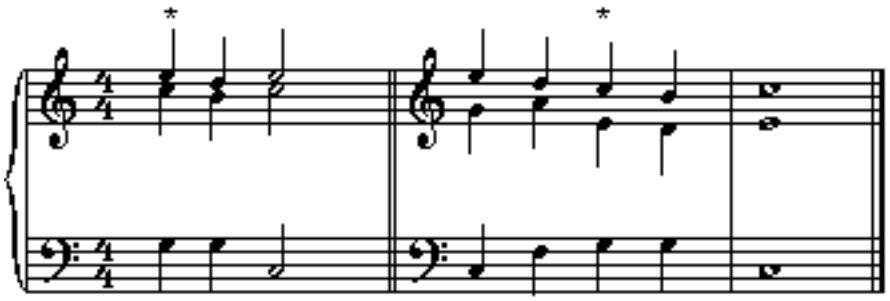
Beethoven: Piano Concerto No. 1



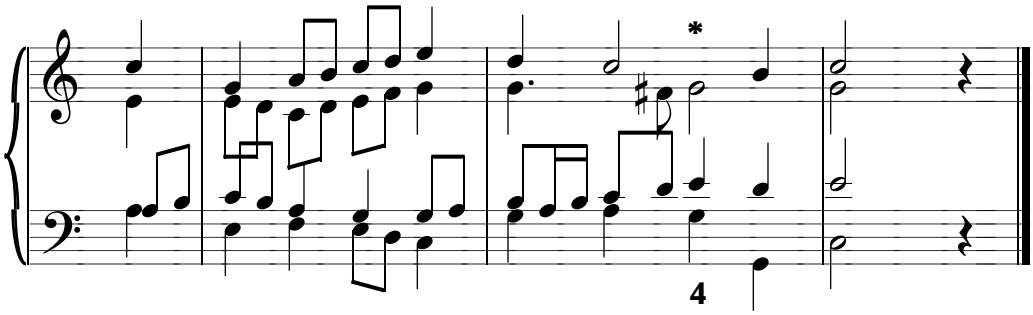
Passing 4s generally appear between different positions of the same chord, as in the above example. Passing 4s **do not** occur in a row. The following would not appear in "real" music:



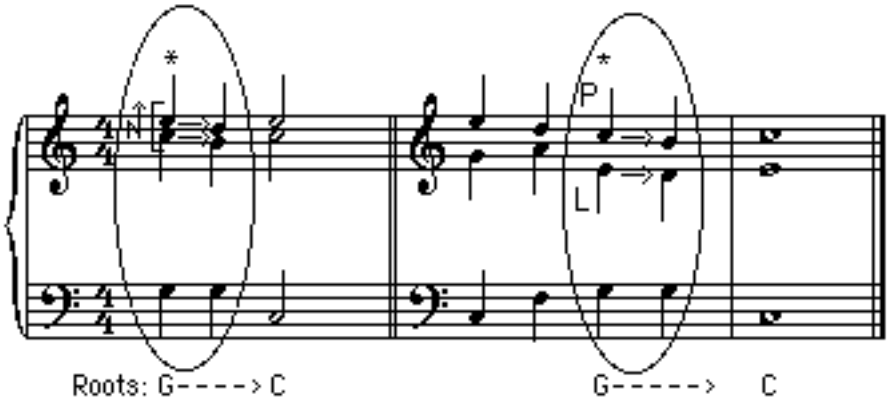
3. the ***cadential*** $\frac{6}{4}$: includes a set of complementary tones, NONE of which is the bass tone. This context places the $\frac{6}{4}$ major triad in an environment in which the sonority that follows it maintains the same bass note, while the upper tones move down by step to form a chord in $\frac{5}{3}$ position (see asterisked chords in the following example). This type most commonly appears as part of a cadence.



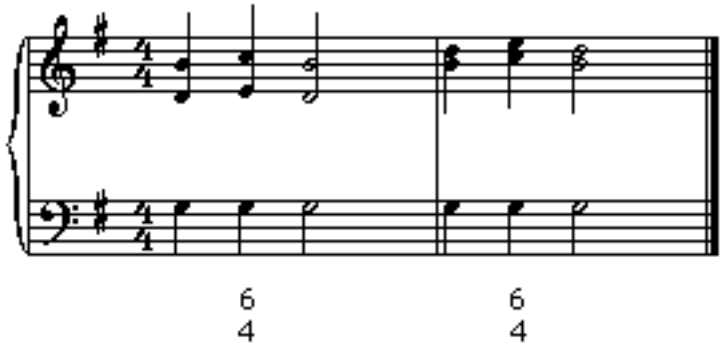
J.S. Bach: Allein zu dir

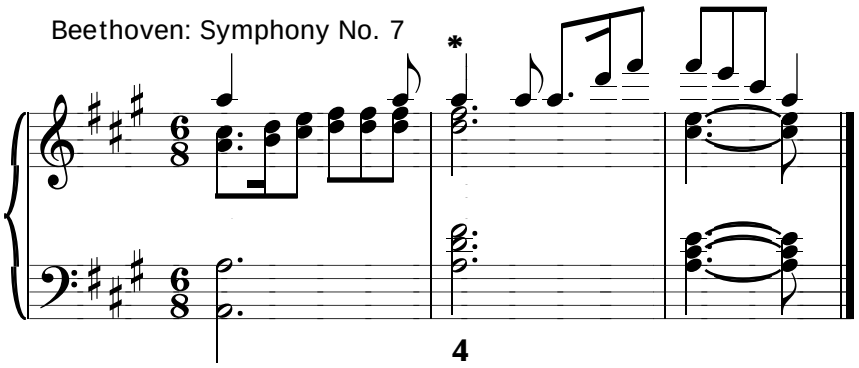


The "cadential $\frac{6}{4}$ " displays many qualities of a chord that contains complementary tones as substitutes for structural tones. The 4th and 6th above the bass in each of these chords seen above delay the appearance of the 3rd and 5th, and can thus be said to be complementary tones, rather than structural tones. The "real" chord has to wait until these complementary tones "resolve." Once all the structural tones are present, the functional root can be clearly determined; It is the bass note.



4. There are environments in which cadential-like $\frac{6}{4}$ chords can be found where they function more as embellishments of a structural chord or extensions of the final chord, following a cadence (like the "amen" at the end of a hymn). In these contexts, the chords are referred to as ***stationary***, or ***pedal*** $\frac{6}{4}$ chords, since the bass tone remains on the same pitch class. The $\frac{6}{4}$ chord is preceded and followed by a $\frac{5}{3}$ chord on the same bass note.



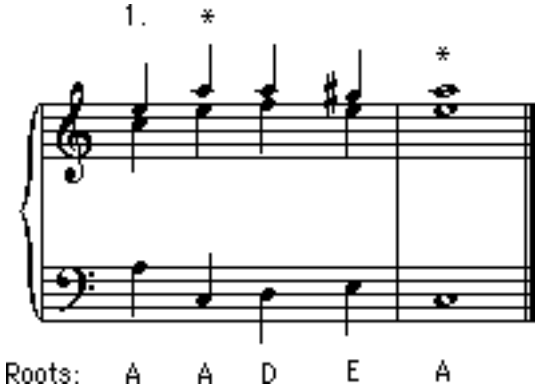


The Minor Triad

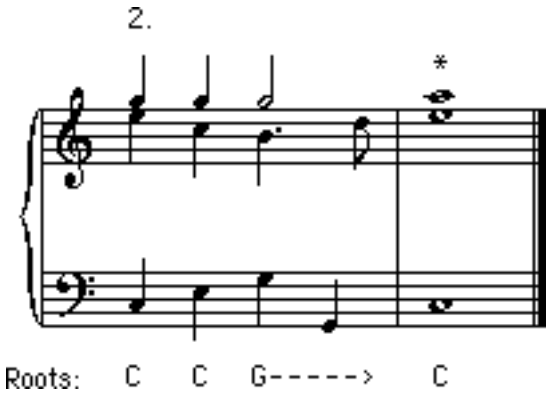
a. $\frac{5}{3}$ position: Although the minor triad is not as "harmonic" as the major, and its acoustical root is much less clear, it partakes of some of the same qualities as major primarily because the perfect 5th is present in both sonorities. Since the perfect 5th is apparent in the $\frac{5}{3}$ position, in this position the functional root is the same as the tertian root.

b. $\frac{6}{3}$ position: In the $\frac{6}{3}$ position of a minor triad a situation exists that is different from the one that occurs in the major triad. The intervals above the bass are a major 3rd and a major 6th (rather than the minor 3rd and minor 6th present in the $\frac{6}{3}$ position of a major triad). Especially due to the fact that the major 3rd is present, the major 3rd being a natural overtone, there is often a tendency for the

acoustical root to become ambiguous, thus affecting the functional root as well. In some contexts, the $\frac{6}{3}$ position of a minor triad has a functional root identical with its tertian root (see the asterisked chords below):

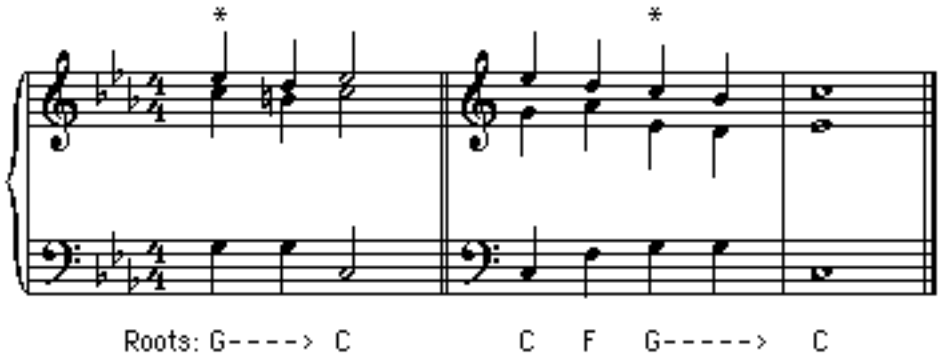


while in others its functional root is the same as its bass tone:



The conditions under which these alternatives are made clear will be discussed below.

c. $\frac{6}{4}$ position: A minor triad in this position can occur in the same three contexts in which a major triad can be found, and again, one of these contexts greatly affects its functional root. The cadential $\frac{6}{4}$ minor triad, like its major counterpart, has a functional root identical with its bass note:

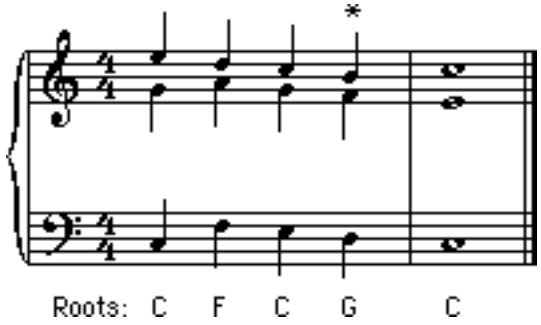


d. As in the major, the functional root of a $\frac{6}{4}$ minor triad in all other contexts is equivalent to its tertian root.

The Diminished Triad

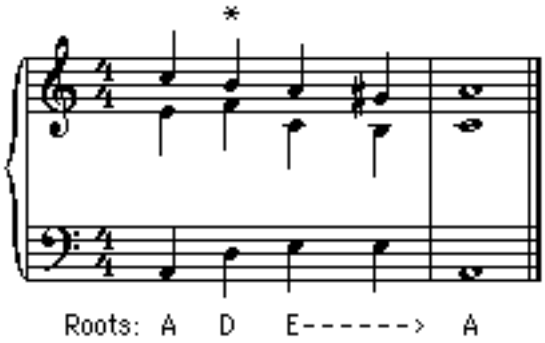
a. Since no major 3rd or perfect 5th appears in the diminished triad no matter what position the chord is placed in, all positions of the diminished triad are treated similarly when it comes determining functional roots.

b. Because the acoustical root of the diminished triad is weak (due to the fact that it is not actually a sounding member of the chord), the triad's functional root is susceptible to influence by context. Two different diatonic contexts normally influence the choice of a functional root for this chord. In one of these contexts the tertian root of the chord is the leading tone of the key in which the chord appears (ti). The following example is in the key of C Major, and the tertian root of the asterisked chord is B, *ti* in the C major scale.



In this case, the functional root lies a M3 below the tertian root of the chord (so), and is identical with its acoustical root.

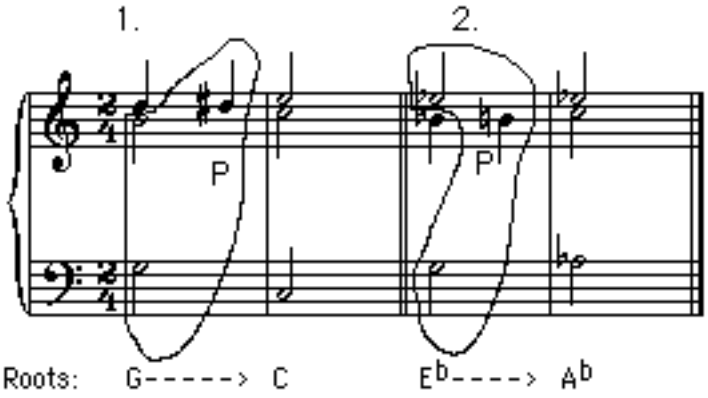
In the other of these contexts, the tertian root of the chord is the supertonic note (re) of the key in which the chord appears. The functional root is, in this context, identical with the tertian 3rd of the chord (fa). The following example is in the key of A minor, and the tertian root of the asterisked chord is B, *re* in the A minor scale.



The Augmented Triad

a. As was mentioned above, the augmented triad possesses no acoustical root. It is best viewed as a mixture of structural tones and melodic (or complementary) tones. Because complementary tones are determined by context, context has a powerful influence on the functional root of the augmented triad. In some contexts the triad can contain two structural tones and one complementary tone; in others, only one structural tone might be present. Precisely which tone(s) is (are) complementary is determined by the specific context in which the chord appears. A general rule of thumb is that if the chord is spelled correctly (i.e., the accidentals resolve by moving in the appropriate direction), the tertian root is the same as the functional root.

Here are two examples employing "enharmonically equivalent" augmented triads. In the first, the D# is complementary, its origin being in the D immediately preceding it. It is spelled as a D#, rather than as an E^b, because it resolves up to E. The functional root is G, which is also the tertian root. In the second example, the B is complementary, originating in the B^b immediately preceding it. It is spelled as a raised note, since it proceeds on to C. The functional root is therefore the same as the terian root, or E^b.



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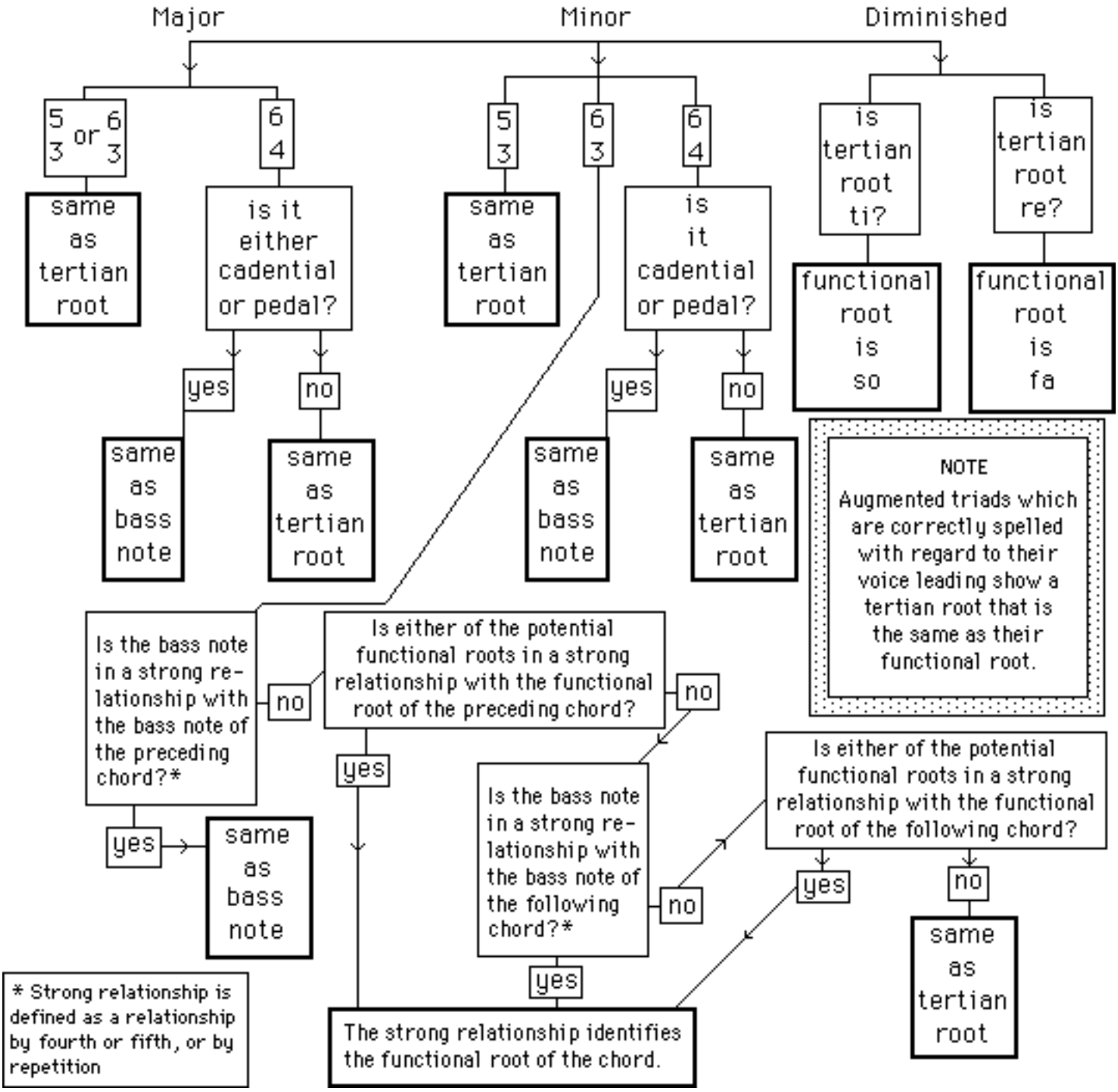
Other Chords

There are other chords for which the functional roots and tertian roots do not agree, including some expanded tertian chords, all of the Augmented 6th chords and the Neapolitan 6th. These chords will be discussed in detail later.

DETERMINING THE FUNCTIONAL ROOTS OF TRIADS

A Procedure and Flow Chart

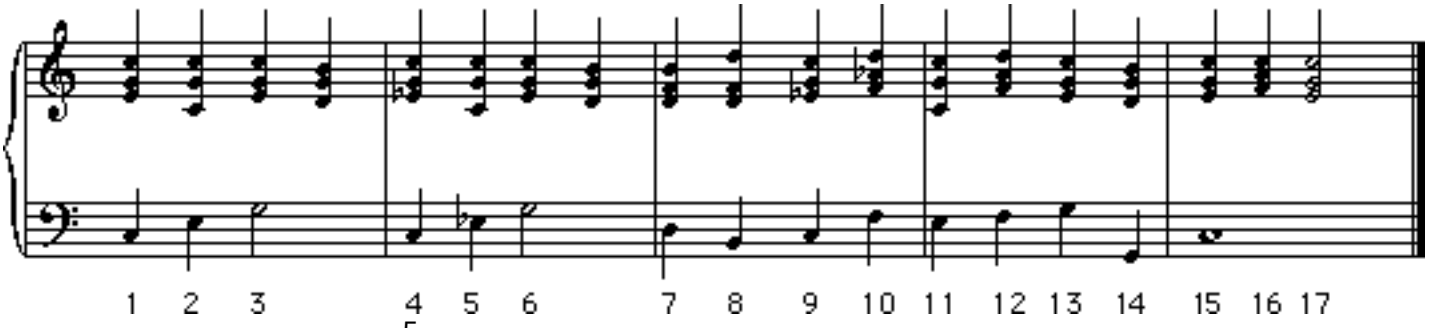
1. Stack the chord in thirds and determine its quality and position.
2. Procede with the appropriate branch of the following flow chart:



Summary of the Most Common Contextual Influences on Triads That Create **Functional Roots** that are different from their **Tertian Roots**

Traditional Chord Designation	Context	Functional Root
Major & Minor $\frac{6}{4}$	Cadential or Pedal	Bass note
Minor 6	Strong relationship esablished: bass note repetition or relationship of a P4 or P5, or potential root relationship of a 4th or 5th going into or out of the chord.	Bass note
Diminished (all positions)	a) tertian root is ***ti***	A Major 3rd below the tertian root (***so***)
	b) tertian root is ***re***	The tertian 3rd of the chord (***fa***)
Augmented (all positions)	One of the tones is complementary; the other two are structural.	Can be any one of three tones....varies with the context

Here is a musical example that demonstrates these principles:



1. Major triad in $\frac{5}{3}$ position. Functional root same as tertian root.
2. Major triad in $\frac{6}{3}$ position. Functional root same as tertian root.
3. Major triad in $\frac{6}{4}$ position. Bass note remains; other tones resolve down by step.
   This is a cadential $\frac{6}{4}$. Functional root same as bass note.
4. Minor triad in $\frac{5}{3}$ position. Functional root same as tertian root.

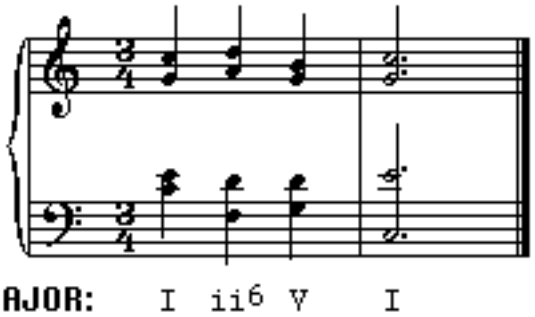
5. Minor triad in $\frac{6}{3}$ position. Arpeggiation from $\frac{5}{3}$ position. No bass or root motion by 4th or 5th. Functional root same as tertian root.
6. Minor triad in $\frac{6}{4}$ position. Bass note remains; other tones resolve down by step. This is a cadential $\frac{6}{4}$. Functional root same as bass note.
7. Diminished triad with tertian root *ti*. Functional root is *so,* or the dominant.
8. Diminished triad with tertian root *ti*. Functional root is *so,* or the dominant.
9. Minor triad in $\frac{5}{3}$ position. Functional root same as tertian root.
10. Diminished triad with tertian root *re.* Functional root is the tertian third of the chord, or *fa.*
11. Major triad in $\frac{6}{3}$ position. Functional root same as tertian root.
12. Minor triad in $\frac{6}{3}$ position. Bass note P4th away from functional root of previous chord. Functional root same as the bass note, or *fa.*
13. Major triad in $\frac{6}{4}$ position. Bass note remains; other tones resolve down by step. This is a cadential $\frac{6}{4}$ whose functional root is the same as the bass note.
14. Major triad in $\frac{5}{3}$ position. Functional root same as tertian root.
15. Major triad in $\frac{5}{3}$ position. Functional root same as tertian root.
16. Major triad in $\frac{6}{4}$ position. Bass note remains; other tones move up by step, then down by step. This is a pedal $\frac{6}{4}$, with functional root the same as the bass note.
17. Major triad in $\frac{5}{3}$ position. Functional root same as tertian root.

FUNCTIONAL ROMAN NUMERALS

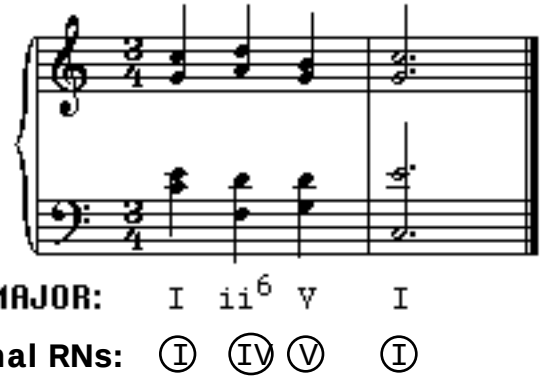
Roman numerals are primarily tertian descriptors. That is, they provide symbols that represent harmonic events within the tertian system. By reading any Roman numeral, the notes of the chord it represents can be constructed.

Additional information is needed, however, information which can show chord function by indicating the functional roots of chords. This is done by writing a separate line of *functional Roman numerals* beneath the line of Roman numerals.

Here is an example of this procedure. Below is a progression that is given with its Roman numerals beneath it, in the normal fashion. The second chord of this progression has a functional root that is different from its tertian root. (This is so because the tertian structure of the chord is a minor ^{6}, and the bass progression from the first chord is by the interval of a perfect 5th.)



Because tertian Roman numerals indicate tertian roots and not functional roots, a second tier of functional Roman numerals is added, as follows:



Each functional syllable indicates the functional root of the chord above it. Functional Roman numerals and tertian Roman numerals complement one another; neither replaces the other.

FUNCTIONAL INVERSION

A. A chord whose functional root is in the bass is said to be in **functional root position**. *Functional inversion* occurs when this bass note is replaced by another chord member without the functional root changing. This phenomenon occurs in many, but not all, chords.

B. In order to determine whether or not a chord is functionally inverted, it is first necessary to discover what the functional root is. Since this is in many cases controlled by context, the context must be considered before a determination of functional root, and consequently of functional inversion, is made.

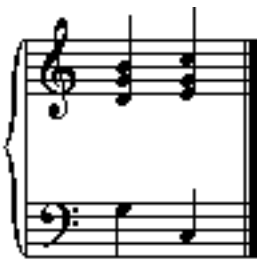
HARMONIC CADENCES

1. As was the case in melody alone (see index), cadences that include harmony serve the function of ending phrases. They fall into two broad categories indicating the degree to which they provide a sense of completion. These categories are Conclusive and Inconclusive.

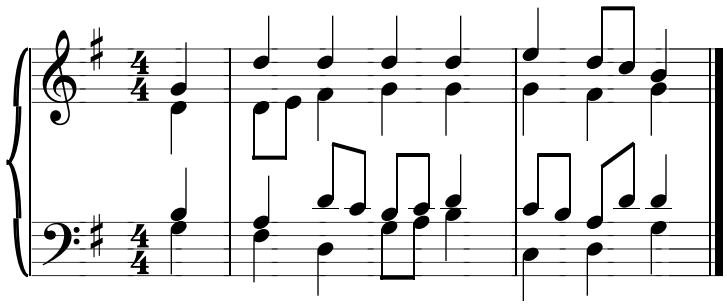
2. Because harmonic cadences provide for a greater variety of degrees of conclusion than simple, unaccompanied melodies do, specific terms have been employed to distinguish various types. There are names for common conclusive cadences as well as common inconclusive cadences.

3. **Conclusive cadences** that have specific names include the following:

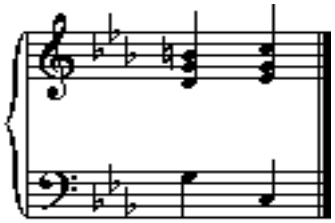
   A. The **authentic cadence**. This is defined as a cadence created by a chord of dominant function moving to one of tonic function.



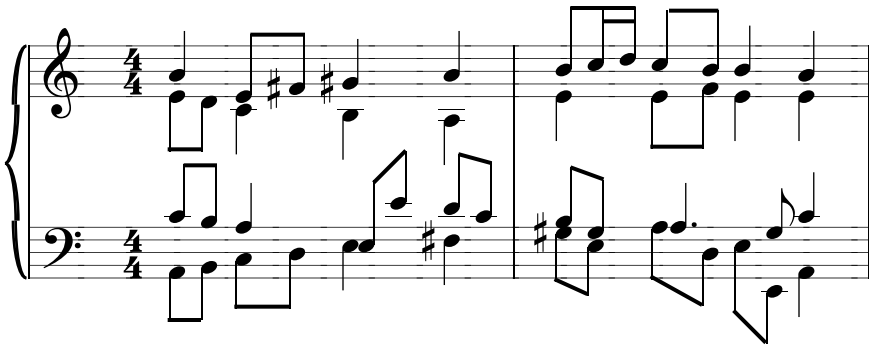
C Major: V – I



J.S. Bach: Lobt Gott, ihr Christen, allzugleich



C minor: V – i

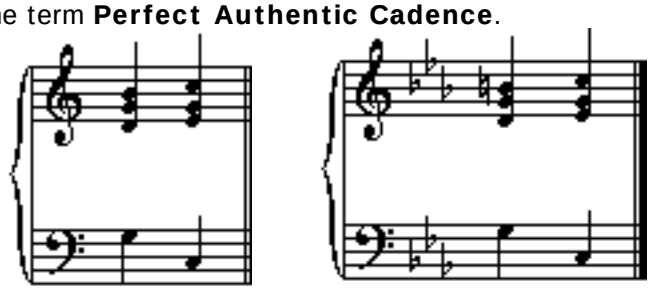


J.S. Bach: Herr, ich habe mißgehandelt

Authentic cadences are most conclusive when the following conditions are met:

a. the final chord has "do" in both the highest and lowest voices.
b. the penultimate (next-to-last) chord has "so" in the bass.

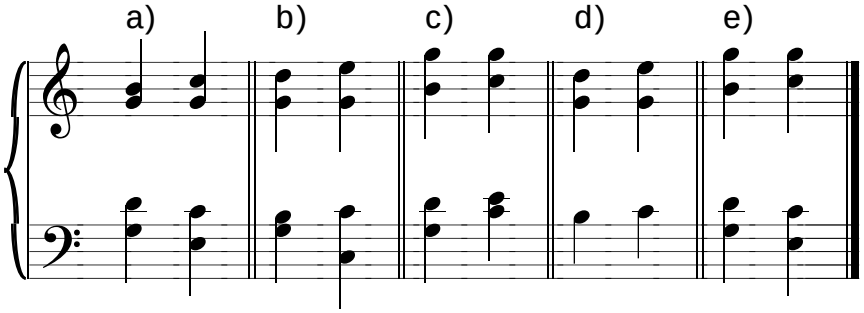
When an authentic cadence meets the above requirements, it is said to be perfect, hence the term **Perfect Authentic Cadence**.



C Major: V – I C minor: V – i

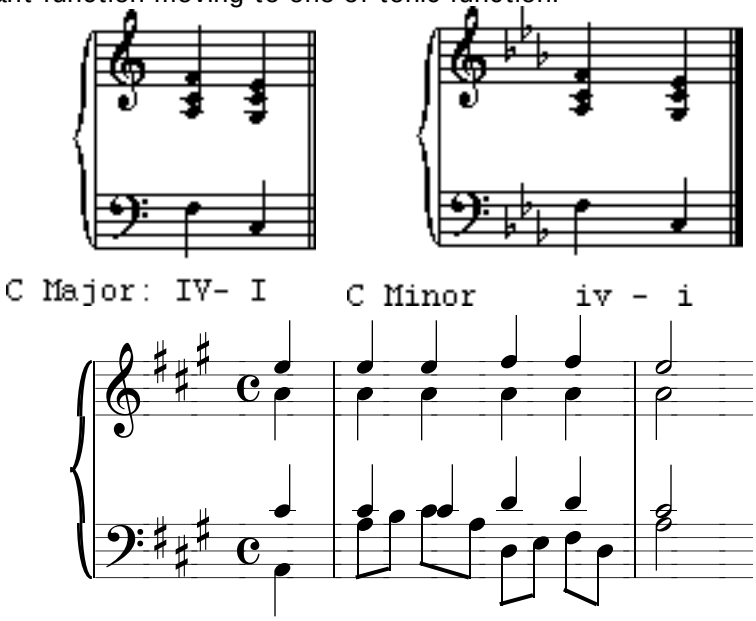
The cadence in the Bach chorale *Herr, ich habe mißgehandelt,* (above) is an example of a perfect authentic cadence.

Authentic cadences that are not perfect are called Imperfect. Here are some examples of **Imperfect Authentic Cadence**s in C major:



The chorale *Lobt Gott, ihr Christen* (above) concludes with an Imperfect Authentic cadence.

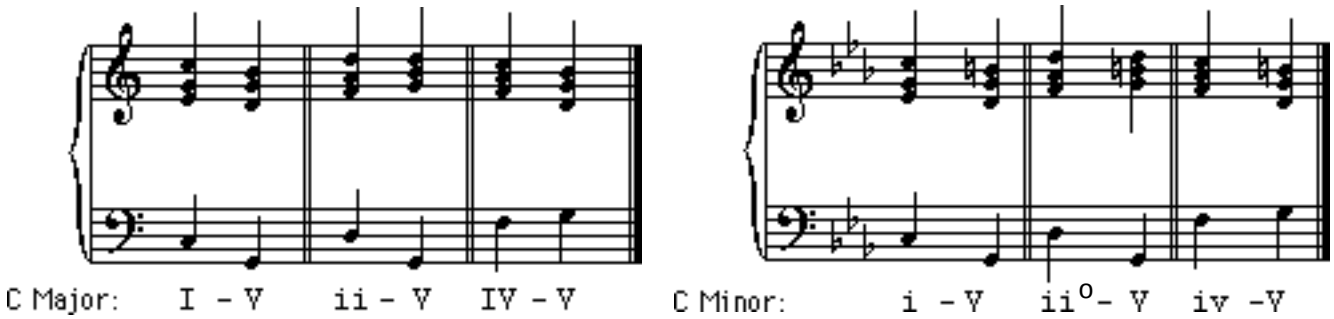
B. The **Plagal cadence**. This is defined as a cadence created by a chord of subdominant function moving to one of tonic function.

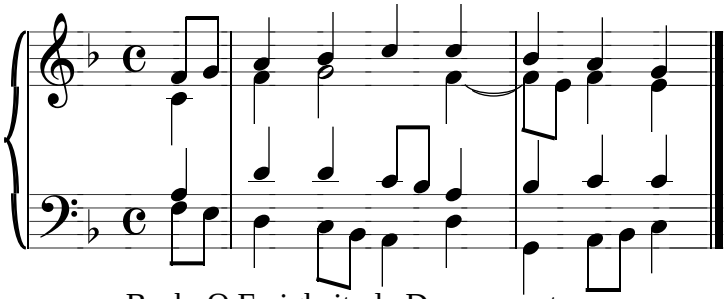


Bach: Nun danket alle Gott

4. **Inconclusive cadences** that have specific names include the following:

A. The **half cadence**. This is defined as a cadence ending on a chord of dominant function. Half cadences include, but are not limited to, I-V, ii-V, and IV-V.



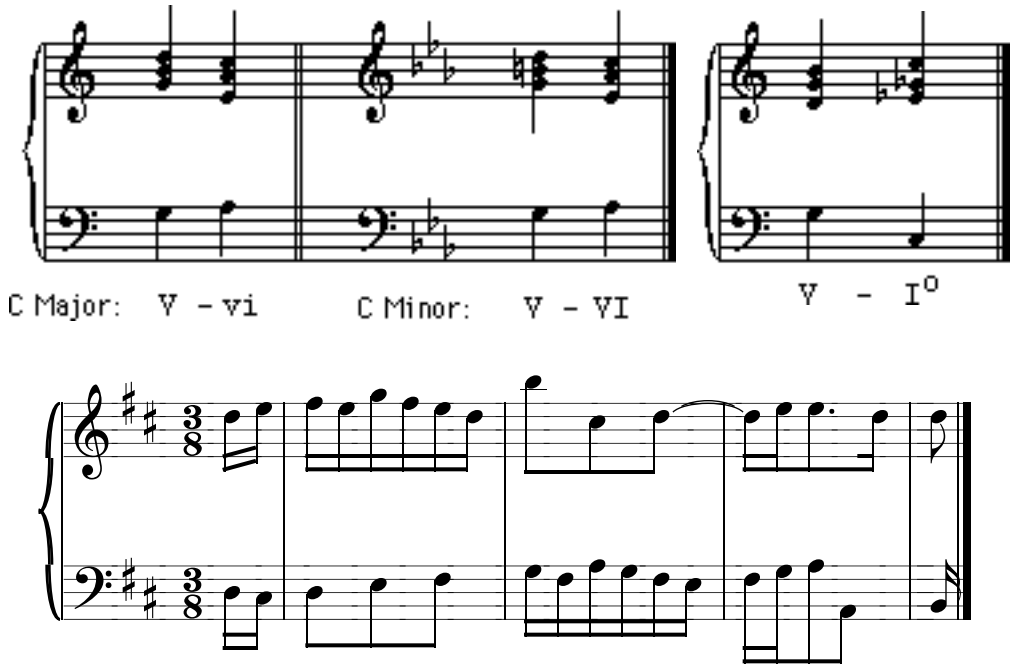


Bach: O Ewigkeit, du Donnerwort

B. The **deceptive cadence**. This is defined as a cadence moving from a chord of dominant function:

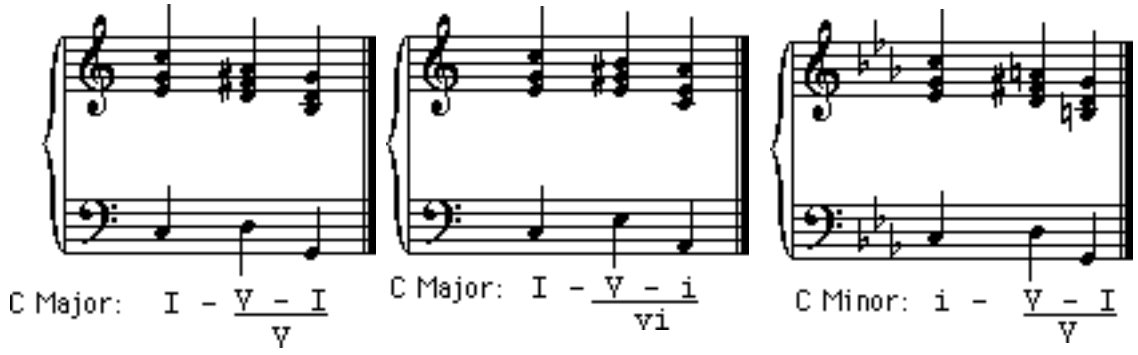
a) to a chord that contains the tonic note, but not as a functional root of the final chord. The most common types are V-vi in major keys, and V-VI in minor keys.

b) to an unstable chord with the tonic note as functional root (e.g. V-i$^{o)42}$.



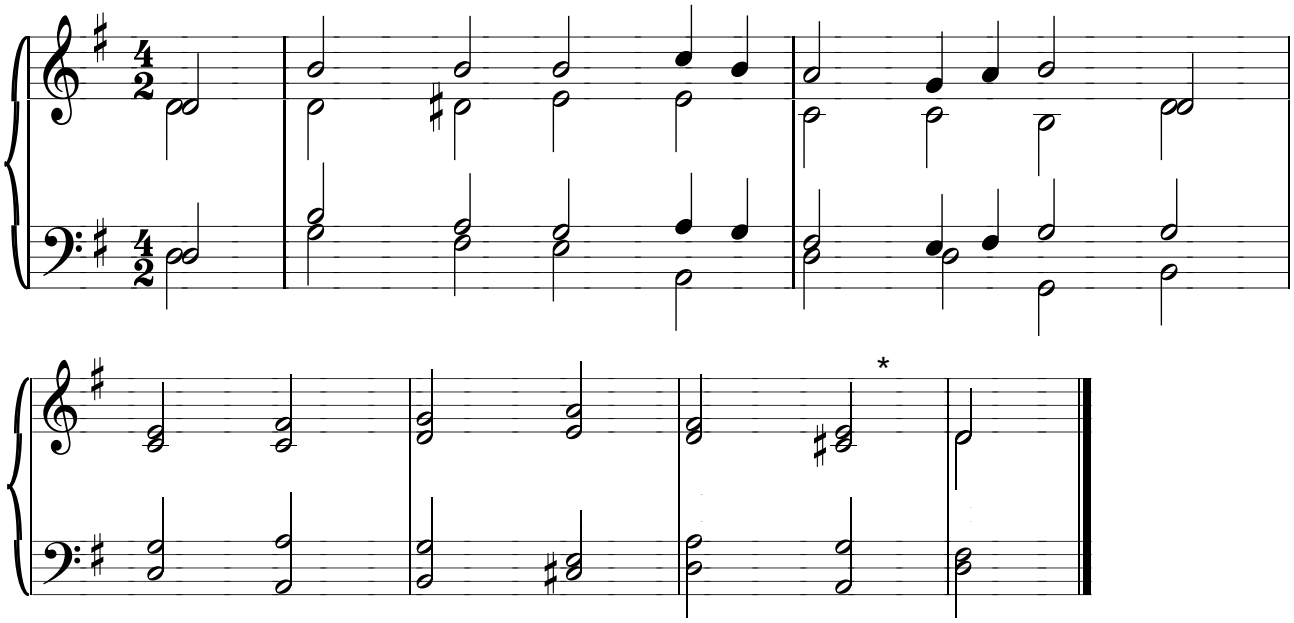
Bach: Two Part Invention No. 3

5. Cadences falling into a third category are referred to as **regional cadences**. They can take any of the above forms, but establish a new, and usually temporary *do* , most often through the inclusion of a new, chromatic leading tone introduced earlier in the phrase, and then again in the penultimate chord. There are *perfect authentic* regional cadences, *deceptive* regional cadences, etc. Here are three examples of a Perfect Authentic Regional Cadence:



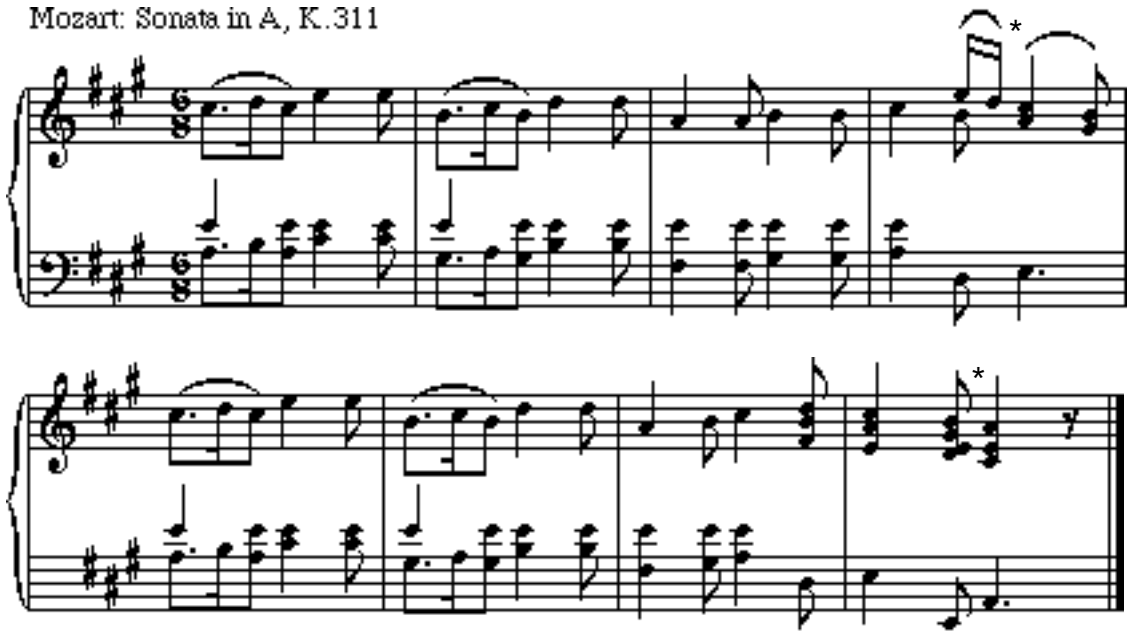
[42] In this diminished triad, the expectation set up by the preceding V chord points to the tertian root C as the functional root. This is unusual.

"Canterbury," Arranged by Robert Schumann

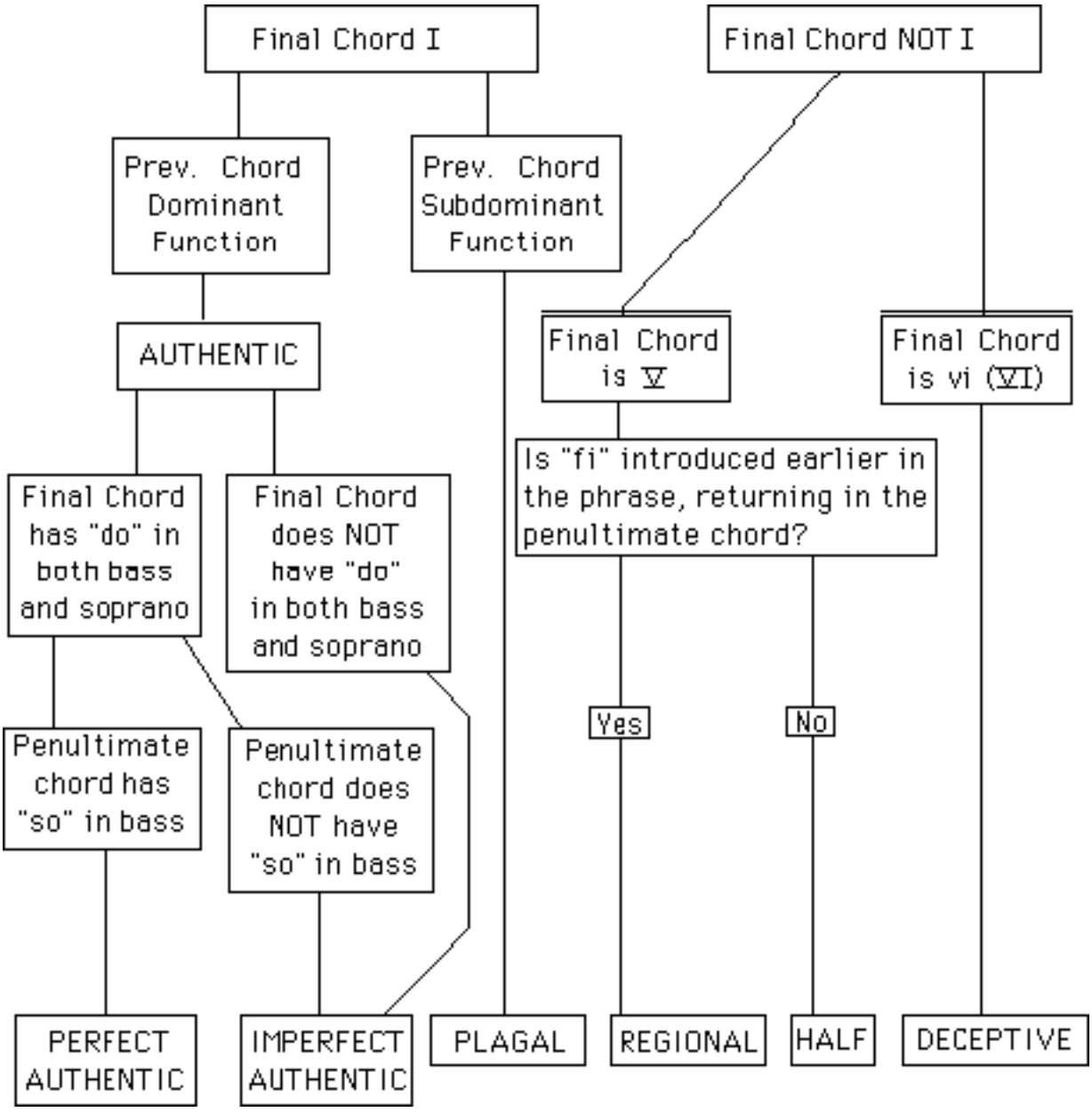


This type will be discussed in detail later.

6. The following example displays two phrases that demonstrate different harmonic cadences at the asterisks. Can you name these cadence types ?



FLOW CHART FOR THE IDENTIFICATION OF CADENCE TYPES



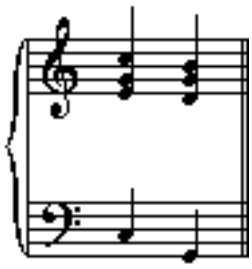
PRINCIPLES OF PART WRITING

With Emphasis on Four Parts

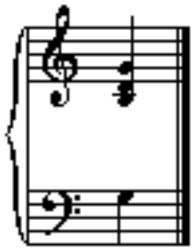
I VERTICAL CONSIDERATIONS

A. **Spacing**:

Like the natural spacing of the overtone series (i.e. with the widest spaces on the bottom). Adjacent upper voices (soprano /alto and alto/ tenor)are generally kept within the space of an octave:



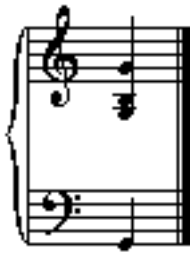
Some exceptions to this principle are allowable, when the lowest part is F3 or higher. Here, smaller intervals are allowable in lower voices. [43]



B. **Sonority**:

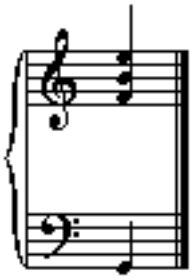
1. Have all tones present, if possible.
2. Leaving out tones: If there are more tones than voices, or if horizontal considerations dictate, leave out in the following order:

a) the fifth, for triads, seventh chords and ninth chords.[44]



b) the root, on the rare occasion when the context makes it clear.

c) for chords larger than the ninth, include the largest interval, as well as those two tones that, together with the downward resolution of the largest interval, would produce a complete major-minor seventh chord.



Thirteenth Chord

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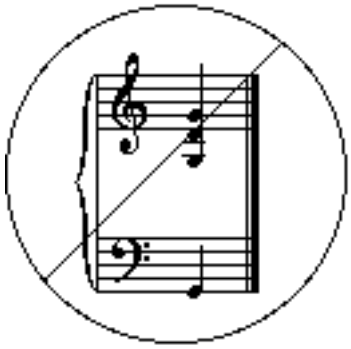
[43] This may be true because closely spaced tones in mid- or high range seem to be part of a harmonic series the fundamental of which is in audible range. In lower ranges, the projected fundamental would be inaudible. At any rate, closely spaced sonorities in lower ranges tend to sound muddy and indistinct, and should be avoided unless the special effect of muddiness is desired [as it is sometimes in the piano works of Beethoven].

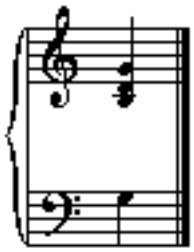
[44] These chords will be discussed later, but are included here because this section was designed to serve as a reference to be consulted at all stages of dealing with harmony.

d) DO NOT LEAVE OUT THE 3RD, as it is essential to identification of chord quality.

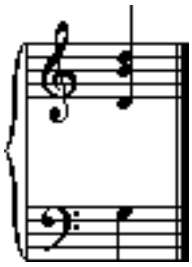


3. Doubling: If there are more voices than different tones, or if horizontal considerations dictate, generally double as follows:

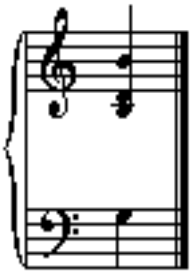
- a) the functional root of the chord:



b) the functional fifth of the chord:



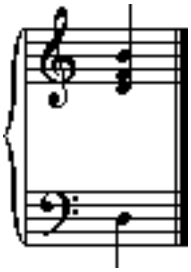
c) the functional third of the chord:



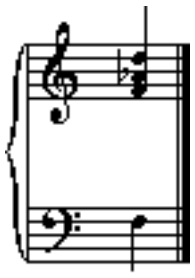
in the listed order of preference.

Special Cases

- In the diminished triad on *ti*, the functional root, *so,* is not present. The best choice for doubling is therefore the functional fifth, which is a fifth above the functional root:

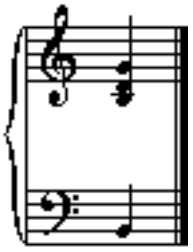


- In the diminished triad on re, the functional root is fa. It is the best choice for doubling:

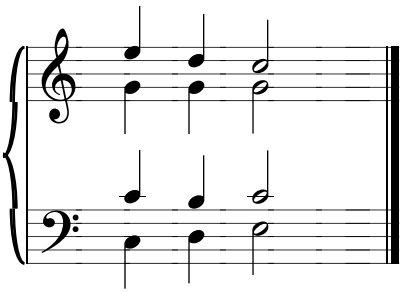


c minor

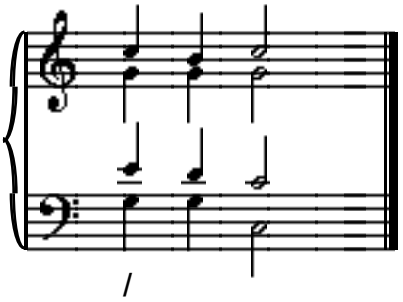
- (A doubled third that creates an octave or a unison between tenor and bass sounds good and may occur at any time.)



In the passing 4 the fourth above the bass, although it is a weak functional root, is dissonant. It therefore should not be doubled. Double the functional fifth in this chord (i.e., the bass note). This doubling also allows for the smoothest voice leading



In the cadential 4 the functional root is the bass note. Since the fourth and sixth above the bass are both complementary and must resolve down by step, it is not proper to double either of them. The bass note is the only appropriate note to double.



/

- (Active tones must ***not*** be doubled [this includes 7ths, 9ths, etc.].)

4. Scoring: for instruments and/or voices with proper ranges. **Vocal ranges** are as follows:

Soprano:	C4 - G5
Alto:	G3 - D5
Tenor:	C3 - G4
Bass:	E2 - C4

C. **Root**: Remember that a distinction needs to be made between the tertian root of a chord and its functional root. The following chords require special attention:

1. The cadential $\frac{6}{4}$, whether major or minor.

2. The minor $\begin{matrix}6\\3\end{matrix}$.

3. The diminished triad (all positions)..

IN ALL THE ABOVE CASES, IT IS THE FUNCTIONAL ROOT THAT IS TO BE CONSIDERED IN MATTERS OF DOUBLING, LEAVING OUT, ETC.

D. **Position**:

1. $\frac{5}{3}$: Used freely, with the exception of the diminished triad. (See the discussion under ROOT.)
2. $\frac{6}{3}$: May be used interchangeably with the $\frac{5}{3}$ position, but its melodic (and, at times, its harmonic) meaning is different.
3. $\frac{6}{4}$: This position contains an unstable interval (the perfect 4th with the bass) and must therefore be treated in special ways. The chord occurs in three distinct contexts, as the CADENTIAL OR PEDAL $\frac{6}{4}$, the COMPLEMENTARY $\frac{6}{4}$ and the ARPEGGIATED $\frac{6}{4}$.
    a) The cadential $\frac{6}{4}$,: In this instance the bass tone is structural and the upper tones complementary (upper neighbors or suspensions). The bass tone is the functional root of the sonority, the 4th above it the tertian root. A cadential $\frac{6}{4}$ chord occurs almost always on a metrically strong beat, and must proceed to a $\frac{5}{3}$ chord on a bass note of the same pitch class.
    b) The complementary $\frac{6}{4}$: In this instance the bass tone and the majority of the upper tones are complementary. (This type has traditionally been called a "passing $\frac{6}{4}$.") This chord generally occurs on weak beats, with the bass note acting as a passing or neighbor tone.
    c) The arpeggiated $\frac{6}{4}$: This type occurs in the context of arpeggiation of a chord, in which at times the tertian 5th of the chord is placed in the bass. Only if this momentary $\frac{6}{4}$ occurs on a metrically strong beat is the chord perceived as being a true $\frac{6}{4}$. In contexts in which it is thus perceived, it most often behaves like a cadential $\frac{6}{4}$. When the arpeggiated $\frac{6}{4}$ appears on weak beats, it is usually perceived as being a decoration of a $\frac{5}{3}$ chord made up of the same notes.
4. All positions of seventh chords may be used interchangeably, but each position conveys a specific voice-leading quality to the bass line.
5. Tertian sonorities greater than the seventh invariably occur in root position (i.e., with the tertian root in the bass) in music of the common practice.

II. HORIZONTAL CONSIDERATIONS

A. **Voice leading**:

1. Move by closest motion in each of the upper voices, holding over any common tones between chords.
2. The bass line is free to move both melodically (stepwise) and harmonically (by leaps, especially of 4ths and 5ths).
3. Follow the principles of good melodic construction.
4. Avoid parallel 5ths and octaves, as well as combinations that sound like parallel 5ths and octaves, e.g., some instances of similarly approached 5ths, etc., especially in the outer voices, where they are most likely to be noticed.
5. Active tones (*fa*, ti, and to a lesser extent *le* should resolve by closest motion. The tendency of active tones to move in this manner is modified by melodic lines going in the opposite direction at the beginnings of phrases (e.g. *mi-fa-so* or *do-ti-la-so*.)

B. **Chord Succession**:

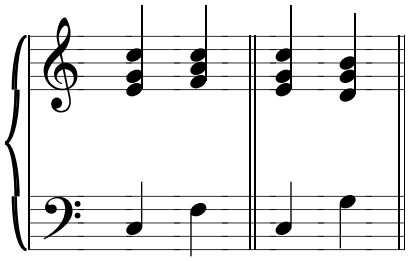
Two principles are at work in this area: **chord function** (as shown by the scale degree of the functional root) and **functional root relationships** (as determined by the interval between two functional roots).

Chord Function

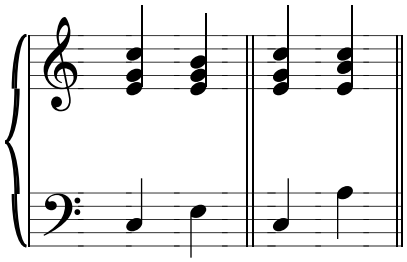
For music in common practice style (i.e., the majority of the western music written from the time of Corelli to the time of Brahms, with extensions beyond in both directions), scale degrees of functional roots emphasized the so-called "**tonal degrees**," which are degrees 1, 4 and 5. For this reason, chords whose functional roots lie on **modal degrees**, which are degrees 2,3,6, and subtonic 7, should be used sparingly, unless, of course, an unusual modal (non-major or minor) flavor is desired.

Functional Root Relationships

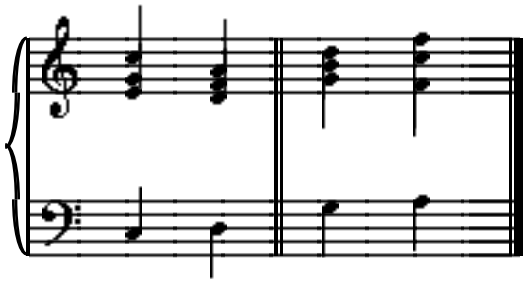
1. There are only three categories of functional root relationships:
   a) up or down a 4th or 5th



b) up or down a 3rd or 6th



c) up or down a 2nd or 7th.



2. Root relationships involving 4ths or 5ths are strong, and may be employed at any time. Root motion down a fifth (or up a fourth) is generally more convincing than root motion up a fifth (down a fourth).
3. Root relationships involving 2nds and 7ths are employed as follows:
   a) motion UP a 2nd (= down a 7th) is classified as moderate, and it is therefore usually employed only once before using a stronger root motion (e.g., of 4th or 5th). The strongest of the possible root relationship up a 2nd is motion from subdominant to dominant, which is extremely common.
   b) motion DOWN a 2nd (= up a 7th) is weak, and therefore uncommon, but it sometimes occurs in approaching the dominant degree, or, less frequently, the tonic degree.
4. Root relationships involving 3rds and 6ths are employed as follows:
   a) motion UP a 3rd (= down a 6th) is moderate, and is generally used only once before employing a stronger root motion.
   b) motion DOWN a 3rd (= up a 6th) is fairly strong, and is used frequently.

   The following chart summarizes the above information:

STRONG (most common)	**FAIRLY STRONG** (frequent)	**MODERATE** (occasional)	**WEAK** (less common)
5th (or 4th) up or down	3rd down (6th up)	2nd up (7th down)	2nd down (7th up)
unison (same root)		3rd up (6th down)	

5. Except for fourths and fifths, it is usually inadvisable to employ root motion up and down (or down and up) by the same interval in succession. E.g., root motion up a third, then down a third, or down a second, then up a second, etc., is uncommon.[45]

As was the case in the contrapuntal exercises, compromise between horizontal and vertical principles is a constant necessity.

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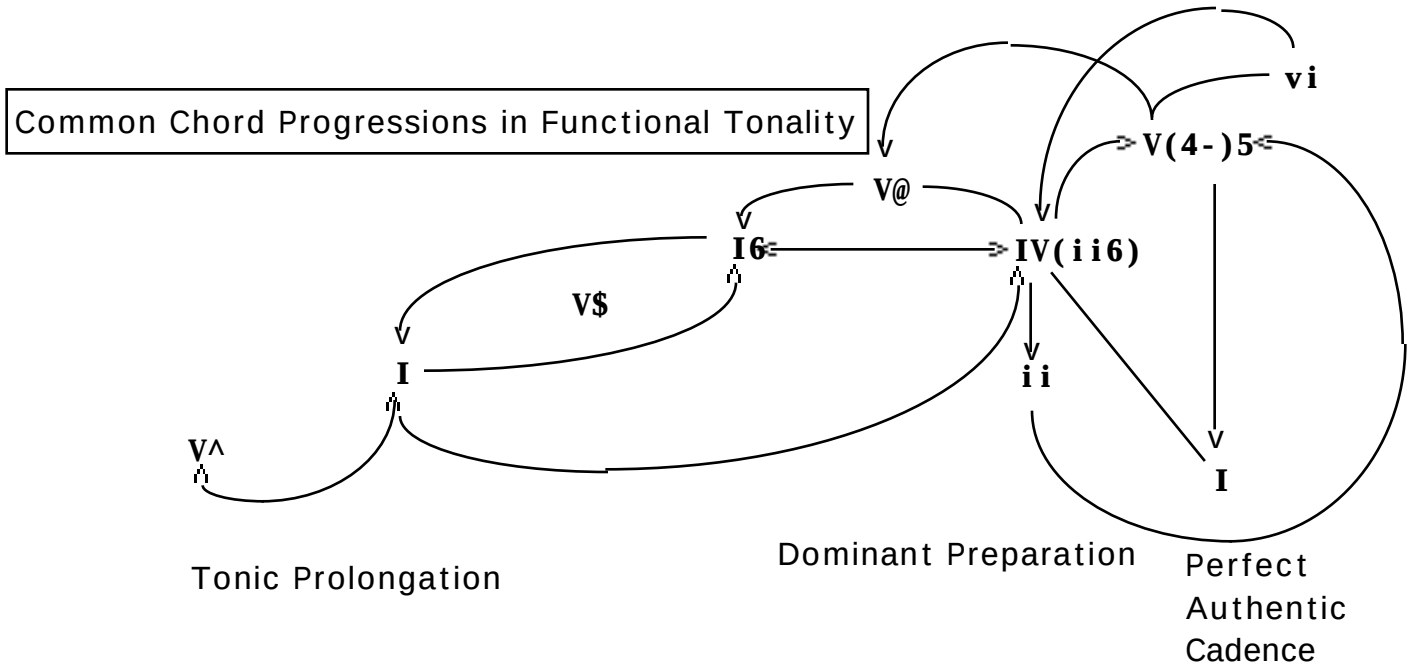
[45] An exception involves the dominant degree. Progressions like V-IV-V, and V-vi-V do occur on occasion. When weak progressions are employed, it is often possible to create bass line motion which is contrary to the movement of roots. E.g., V-IV^{6}-V. This mitigates the weakness, to some extent.



Check List for Part Writing

1. Notation of Individual Chords

- all chords must include pitches for all voices in each chord
- be sure the notes of each chord are correct
- include any required accidentals
- correctly space the upper parts
- utilize the best doublings

2. Voice Leading

- avoid parallel fifths and octaves between *any* voices
- resolve leading tones at cadences, and at other places, if possible
- avoid leaps in upper parts involving greater motion than necessary, especially those involving leaps of a tritone or leaps greater than a fifth
- avoid leaps in similar motion to a fifth or octave *in outer voices*
- avoid crossed voices
- connect parts with economy of motion
- hold over common tones when appropriate

Part-Writing Priorities

When doing part writing, consider the following :

- Spacing
- Doubling
- Voice leading
- Contrapuntal viability
- Chord succession

Take into account the following priorities:

1. Consider contrapuntal rules to be the top priority (no parallel fifths or octaves, leading tones in outer voices and other active tones (like fa in a dominant seventh chord) resolved at cadences and elsewhere, if possible.

2. Spacing is also a high priority, but only in the rigid sense of not allowing more than an octave between adjacent upper parts (tenor, alto, soprano).

3. Questions of doubling and close motion are next in order, and are more or less equal. In other words, if you choose a better doubling in expense of closest motion, you're okay. If you choose better voice leading at the expense of doubling, you're okay.

4. Chord succession is an area unto itself. Choosing convincing chord successions impacts several of the above, but does not make any of them so difficult that a successful solution cannot be found.

STEP-BY-STEP PROCESS FOR REALIZING A FIGURED BASS

in four Parts

1. Take note of the signature, since it will affect the notes to be realized.

2. Realize the first chord as follows:

   a. If the figures present are abbreviations, imagine the complete set of figures (nothing = $\begin{matrix}5\\3\end{matrix}$; 6 = $\begin{matrix}6\\3\end{matrix}$).

   b. remembering that the figures in a figured bass *always* refer to intervals above the bass, determine the notes of the chord, by naming the letter names, **making sure to include the accidentals governed by the signature or by modified figures:**
   a "#" next to a figure raises the indicated interval above the bass one half step ;
   a slash "/" through a figure raises the interval above the bass one half step;
   a "b" next to a figure lowers the interval above the bass one half step.

   c. stack the chord in 3rds, either mentally, if you can, or on scratch paper.

   d. determine the quality of the chord
   *a major 3rd and perfect 5th above the bass make a **major** triad;*
   *a minor 3rd and perfect 5th above the bass make a **minor** triad;*
   *a minor 3rd and diminished 5th above the bass make a **diminished** triad.*

   e. determine the functional root of the chord, keeping in mind the exceptions to tertian root structure:
   minor triad in $\begin{matrix}6\\3\end{matrix}$ position with strong motion in the bass may have bass note as the functional root;
   cadential $\begin{matrix}6\\4\end{matrix}$ chord (major or minor) has bass note as the functional root;
   diminished triad with tertian root "ti" has "so" as functional root;
   diminished triad with tertian root "re" has "fa" as functional root.

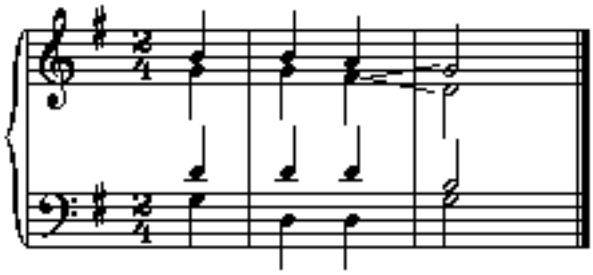
   f. determine the best choice for doubling.
   *best choice is to double the **functional root;***
   *next best choice is to double the **functional 5th;***
   *third best choice is to double the **functional 3rd.***

   g. notate the first chord, bearing in mind the rules for voicing:
   in general, have widest spaces between the lowest voices;
   do not separate upper parts (sop-alt or alt-ten) by more than an octave.

3. Repeat steps a through f in No. 2 above, but before notating chord 2, consider the principles of **voice leading:**

   a. hold over any common tones between voices;
   b. move voices by closest motion;
   c. active tones (especially *ti* and *fa*) **must** resolve by closest motion at cadences, and should move by closest motion at most other times, if possible. (But see "Principles of Harmonic Writing II.A.5.)

      An exception to this rule occurs when another voice moves to the tone to which the active tone "must" resolve *in the same octave*. In this case, the "covered" active tone may move elsewhere.



      In the above case, the desire to produce a Perfect Cadence by leading the soprano voice down to *do* necessitated the adjustments shown. The alto part is able to move down because the soprano is covering the resolution of the alto's *ti*. Since holding over the *so* in the tenor voice would result in a chord without a 3rd, the tenor moves down to fill out the chord.
   d. Parallel 5ths and octaves are not allowed.[46]
   e. Do not leap to a 5th or octave in similar motion in outer voices.

4. Repeat the above steps for each subsequent chord.

STEPS SIMILAR TO THE ABOVE MAY BE EMPLOYED IN THE REALIZATION OF HARMONY INDICATED BY ROMAN NUMERALS

[46] There is an exception to this rule, involving the resolution of a German Augmented Sixth chord, which will be discussed when the augmented sixth chords are introduced.

STEP-BY-STEP PROCESS OF HARMONIZING AN UNFIGURED BASS LINE

A. Determine the key of the bass line to be harmonized, and analyze the metrical accents.

B. Analyze the line for structural tones, clusters and complementary tones, allowing for alternate interpretations.

1. Make a decision concerning which pitches you will harmonize. [All structural tones must be harmonized.]

2. Choose a root for the first chord that will establish the key. (This will most likely be the tonic chord, but possibly the dominant chord, especially if the piece begins with an upbeat.)

3. For each pitch you plan to harmonize, determine the chords of which that pitch could be a member by considering the pitch first as root, then as 3rd, then as 5th (etc.) of tertian chords. [E.g., in C Major, the pitch "G" could be the (tertian) root of a G major chord, the 3rd of an e minor chord, and the 5th of a C major chord, etc.]

4. Choose a proper root movement from the first chord to the second, and so on, creating a pathway for the harmonization of the entire phrase. At the early stages of your work with harmonization it is wise to choose the strongest root movements. Remember to deal with functional roots and not tertian roots when planning root movement. Keep in mind that music in major and minor keys generally emphasizes chords with roots on the tonic, subdominant, and dominant degrees and makes less frequent use of chords whose roots lie on "modal" degrees. Plan for convincing harmonic movement at cadences.

5. Remember that when desirable, $\frac{6}{3}$ positions of chords can help to create variety. Be sure to treat $\frac{6}{4}$ positions appropriately. Remember that a $\frac{6}{4}$ chord must be either complementary, arpeggiated or cadential/pedal in order to be used properly. Plan cadences with care. (The strongest cadences involve both root and bass motion by 4th or 5th.)

6. Fill in the upper voice(s) in accordance with good voice-leading principles, as well as with an ear to the sonorities that are produced. A fundamental goal is to connect inner voices smoothly, without untoward disjunct motion.

7. Check for contrapuntal accuracy. Parallel 5ths and octaves are incompatible with this style.

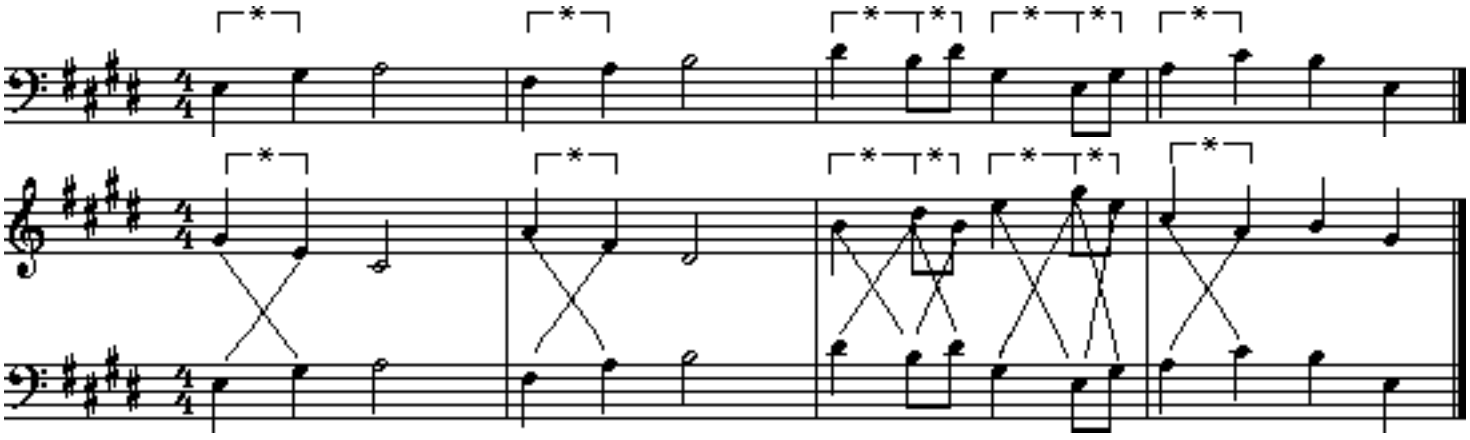
8. Check for proper spacing and doubling of each chord.

9. Repeat the above procedures (steps 3 through 7) for subsequent phrases.

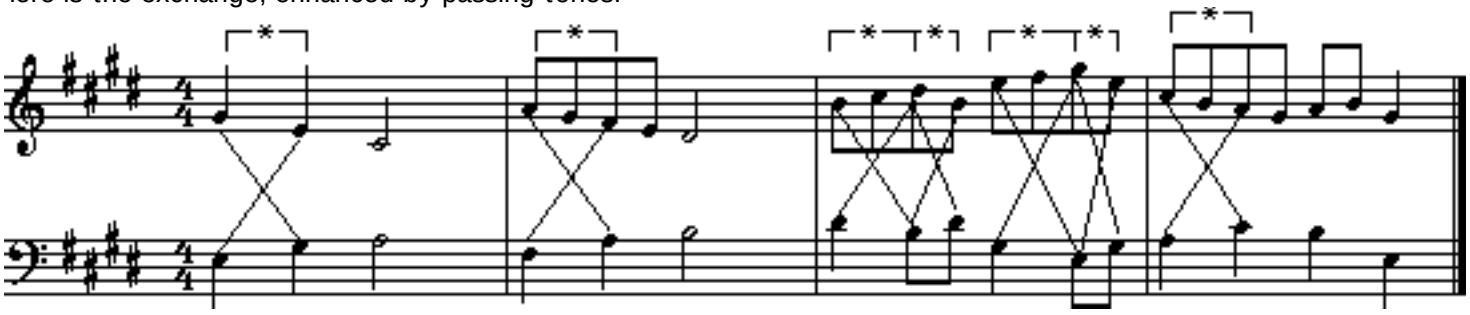
10. As a final bit of labelling, supply the appropriate Roman numeral for each of the chords you have written.

EXCHANGE OF VOICES

One of the ways to make a simple harmonization more interesting is to employ a technique called *exchange of voices*. What takes place in voice exchange is as follows: Two notes in a single part, most often harmonized by the same chord, exchange places with the same notes in another part, either immediately or following the insertion of a complementary tone or tones. The following example demonstrates the technique. The task is to write an upper part to the given bass line that exchanges voices with the notes indicated by asterisks.

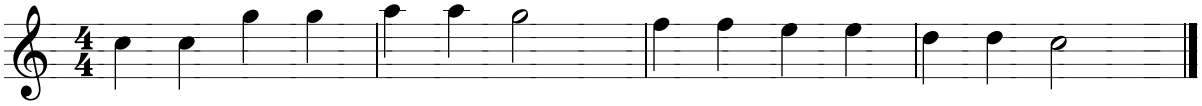


Here is the exchange, enhanced by passing tones:



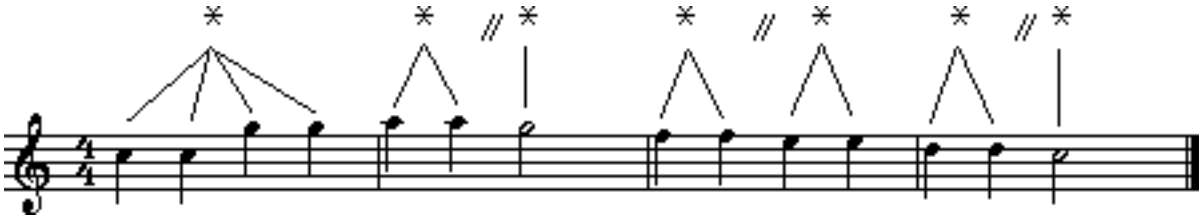
STEP-BY-STEP PROCESS OF HARMONIZING A GIVEN MELODY

(with the first two phrases of "Twinkle, Twinkle, Little Star" as an example)



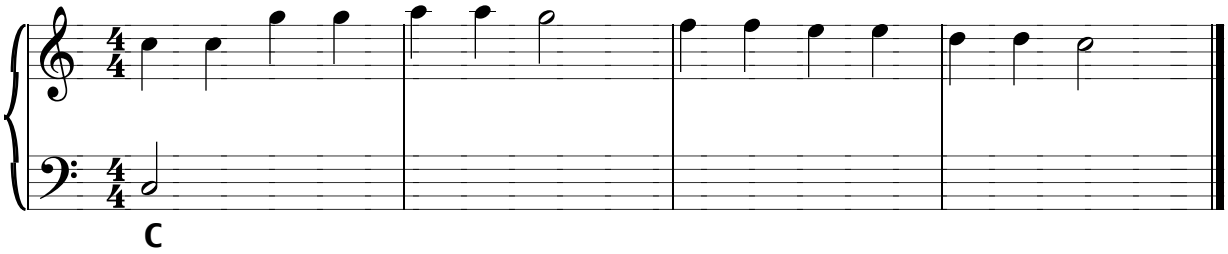
A. Determine the key of the melody to be harmonized, and analyze the metrical accents.
C Major, Simple Quadruple (strong beats on 1 and 3).

B. Analyze the melody for structural tones, clusters, and complementary tones, allowing for alternate interpretations.

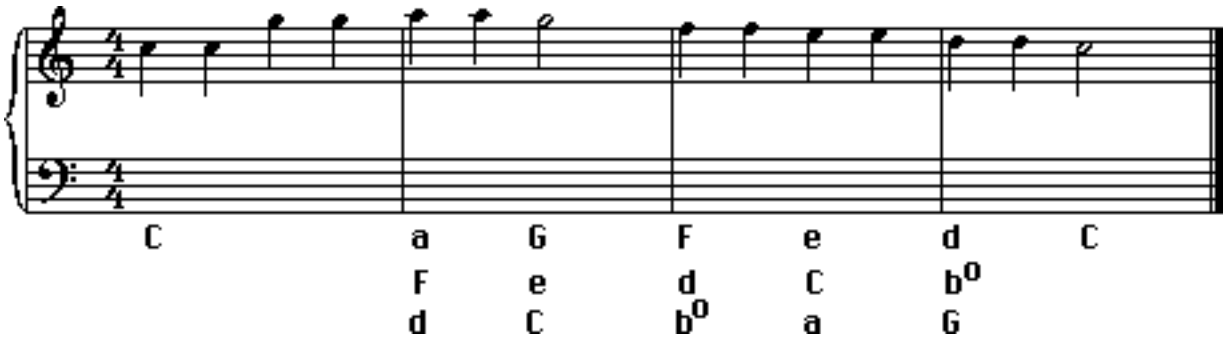


1. Make a decision concerning which pitches you will harmonize. [All structural tones must be harmonized.]
All tones in Twinkle, Twinkle should be harmonized, since there are no complementary tones present.

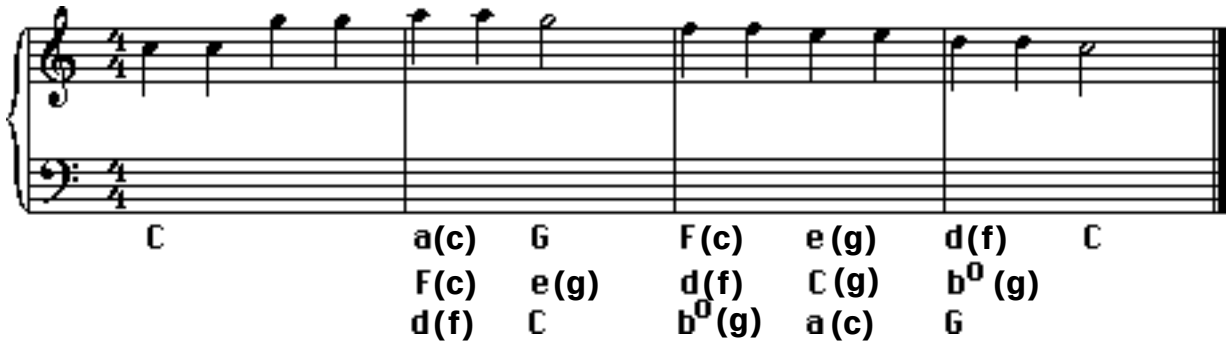
2. Choose a root for the first chord that will establish the key. (This will almost always be the tonic chord, or possibly the dominant chord, especially if the piece begins with an upbeat.)



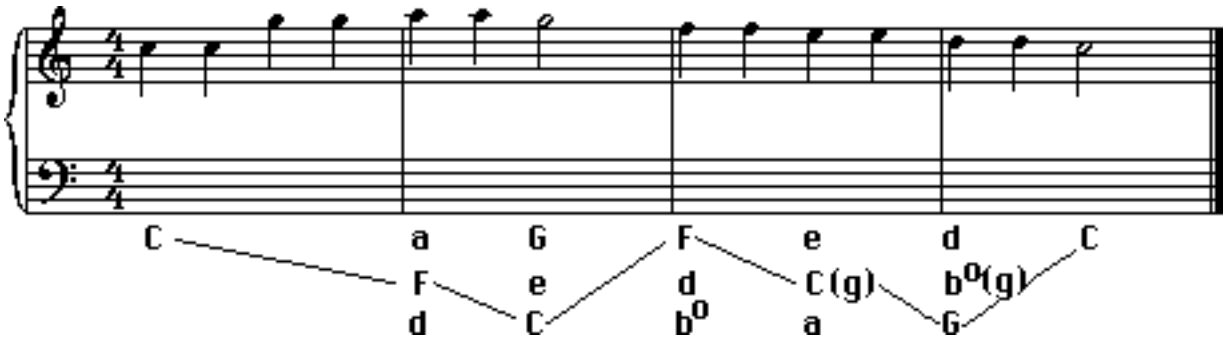
3. For each pitch you plan to harmonize, determine the chords of which that pitch could be a member by considering the pitch first as root, then as 3rd, then as 5th (etc.) of tertian chords. [E.g., in C Major, the pitch "G" could be the (tertian) root of a G major chord, the 3rd of an e minor chord, and the 5th of a C major chord, etc.]



4. In parentheses, next to the tertian roots you have written, indicate any possible functional roots that are different from tertian roots. Some functional roots are only possible if particular contexts are provided, e.g. minor chords in $\frac{6}{3}$ position.[47]

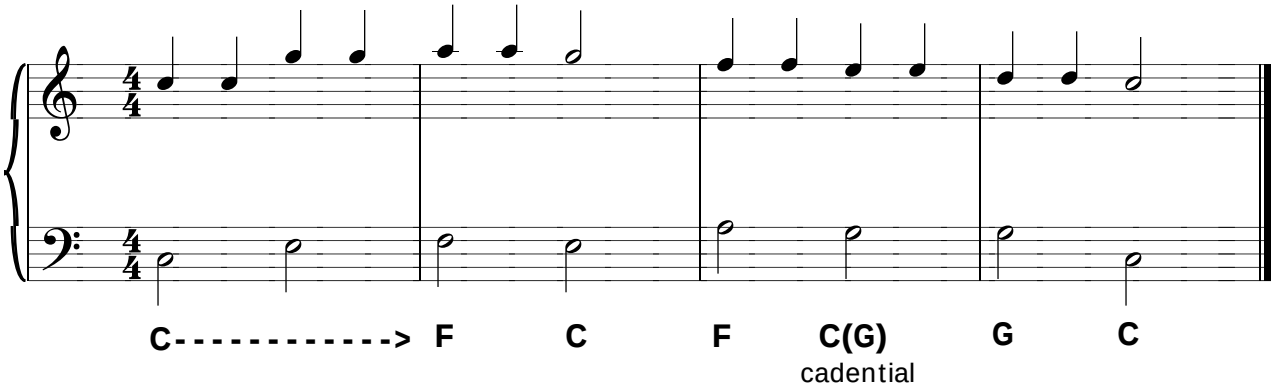


5. Choose a proper root movement from the first chord to the second, and so on, creating a pathway for the harmonization of the entire phrase. At the early stages of your work with harmonization it is wise to choose the strongest root movements. Remember to deal with functional roots and not tertian roots when planning root movement. Keep in mind that music in major and minor keys generally emphasizes chords with roots on the tonic, subdominant, and dominant degrees and makes less frequent use of chords whose roots lie on "modal" degrees. Plan for convincing harmonic movement at cadences.

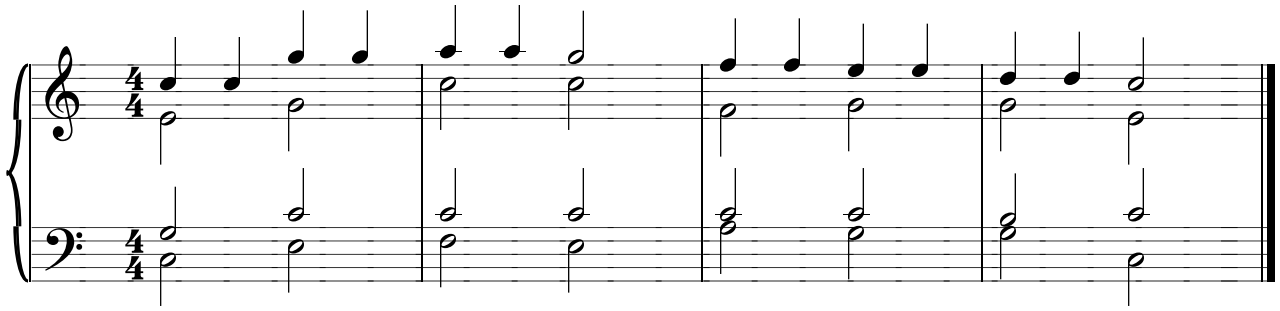


[47] On the beat chord in m.2, the A minor chord would have a functional root of C if it were placed in 6 position; the F major chord could be a cadential 6/4 if C were placed in the bass and thus carry a C root, and the D minor chord might have an F in the bass, thus creating an F root.

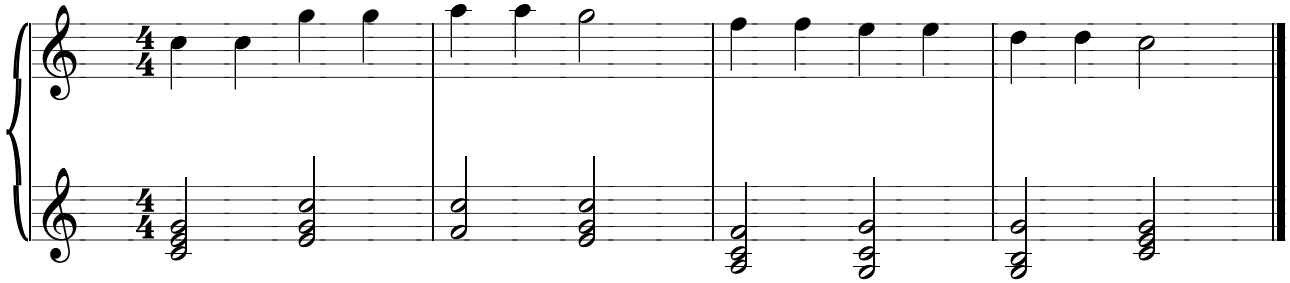
6. Write a bass line that takes into account both melodic and harmonic demands. Remember that the bass is free to move by either step or skip. Strong positions of chords often produce disjunct bass lines, but this is not objectionable. When desirable, $\frac{6}{3}$ positions of chords can help to create a more melodic bass. Be wary, however, of $\frac{6}{4}$ positions, and treat them appropriately. Remember that a $\frac{6}{4}$ chord must be either complementary, arpeggiated or cadential in order to be used properly. Plan cadences with care. (Strong cadences most often involve root motion and bass motion by 4th or 5th.)



7. Fill in the middle voice(s) in accordance with good voice-leading principles, as well as with an ear to the sonorities that are produced. A fundamental goal is to connect inner voices smoothly, without untoward disjunct motion.



Here is a version in keyboard accompaniment style:

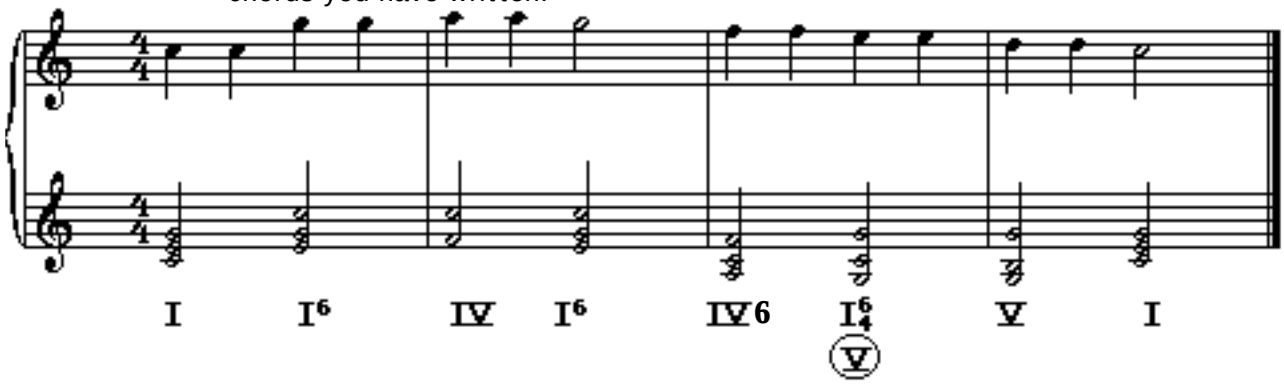


8. Check for contrapuntal accuracy. Parallel 5ths and octaves are incompatible with this style.

9. Check for proper spacing and doubling of each chord.

10. Repeat the above procedures (steps 3 through 7) for subsequent phrases.

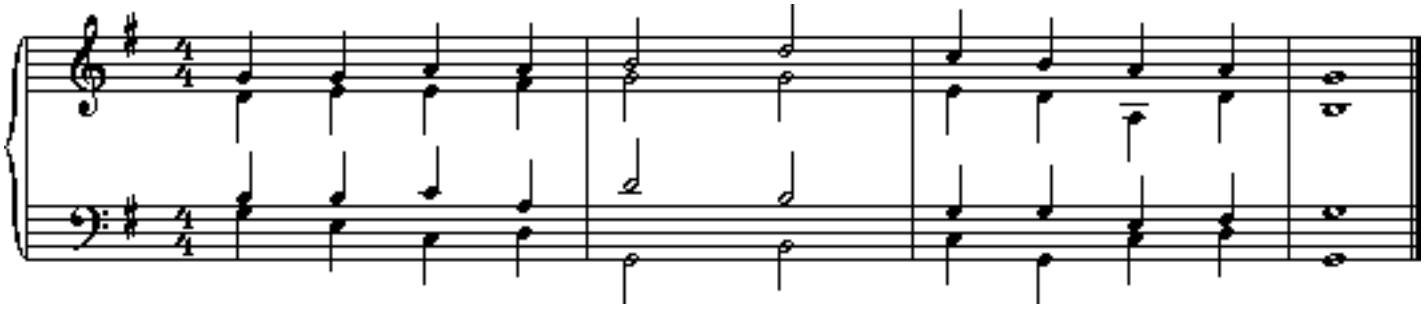
11. As a final bit of labelling, supply the appropriate Roman numeral for each of the chords you have written.



FOUR-PART ELABORATION

Simple four-part settings can be made more interesting through a number of means. One important technique is melodic embellishment through the introduction of complementary tones. In a harmonic context, complementary tones are usually not members of the prevailing chord. (In fact, they are traditionally referred to as *non-chord tones*.)

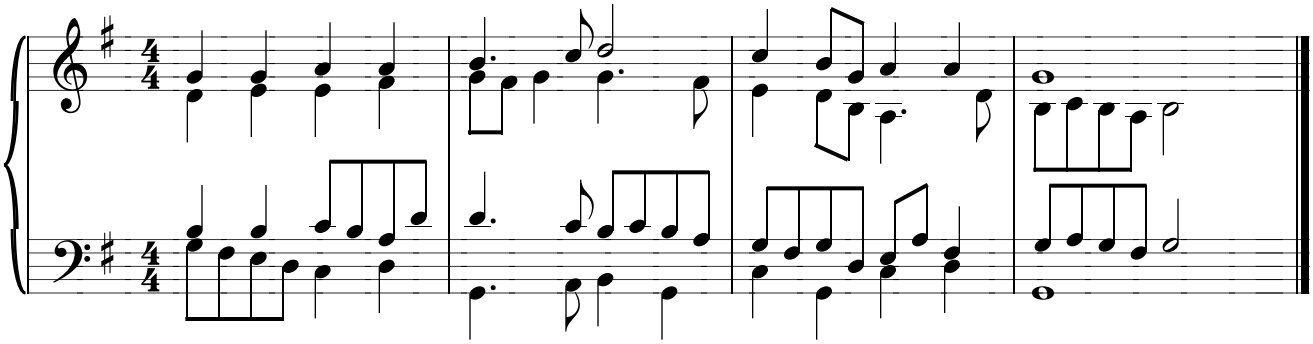
Here is a demonstration of the process of elaboration through the introduction of complementary tones. We begin with a simple, strict, 4-part setting:



Notice that closest motion between upper parts has been observed wherever possible. (Note also the voice exchange between tenor and soprano in m.2.)

The elaboration below was created by using the following techniques:

a. Filling in gaps of a 3rd with passing tones (*e.g.* the bass line in m.1, beats 1 and 2).
b. Embellishing repetitions with neighbor tones (*e.g.* the tenor line in m.3, beats 1 and 2).
c. Arpeggiating tones within the prevailing chord (*e.g.* the tenor line in m.1, beat 4).



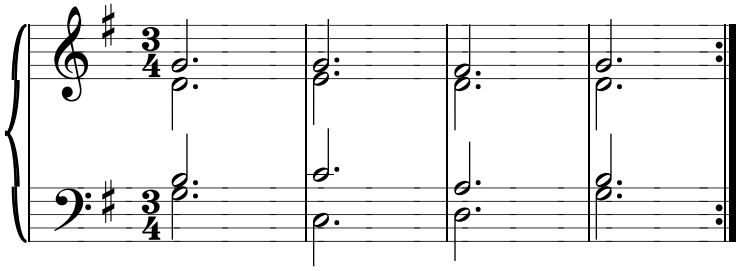
Notes:

1. When complementary tones occur simultaneously in more than one voice (*e.g.*, m.2, beat 2; m.2, beat 4) they are generally consonant *with each other*, even though they are not in the prevailing chord. It is unusual for simultaneous complementary tones to be dissonant with each other, but this does occur on occasion.

2. Notice the exchange of voices in m. 2, beats 1-3.

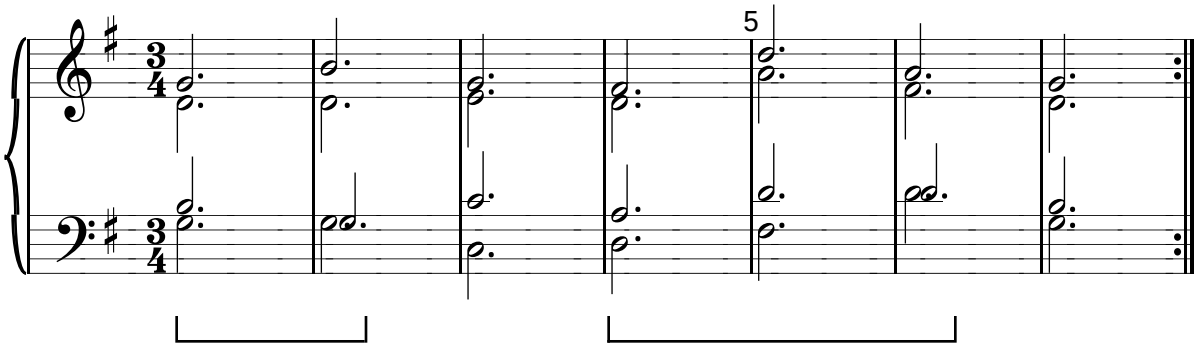
Progressive Embellishment

Version A



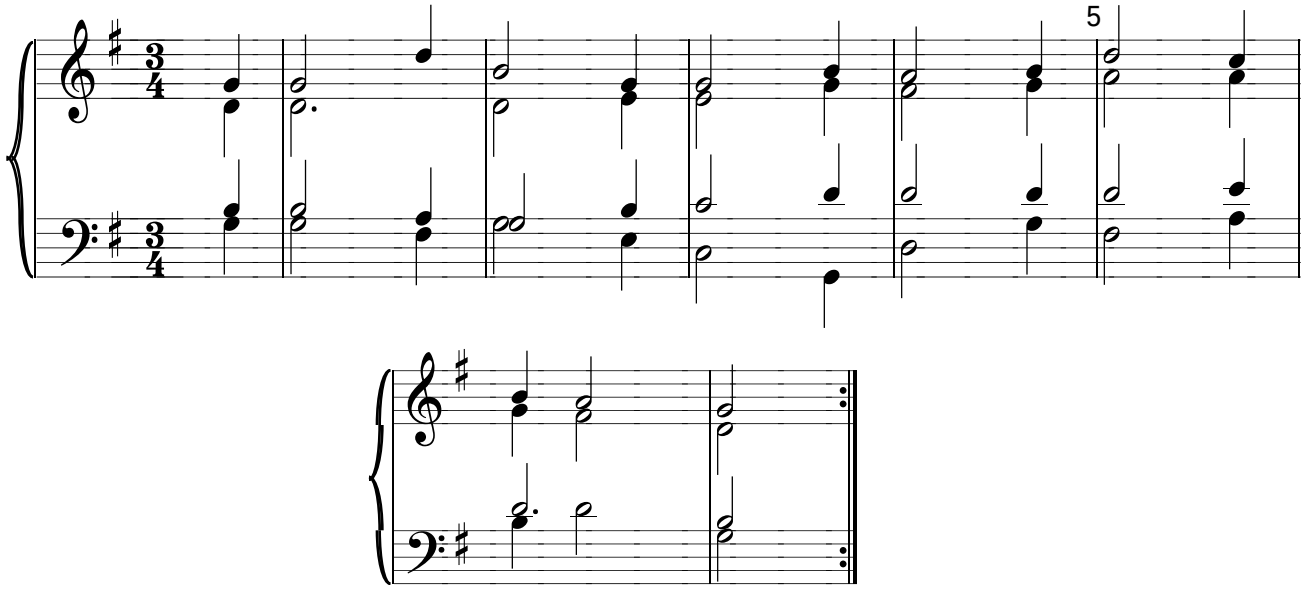
Version B

m.2 Arpeggiate the chord in a new measure (m.2).
mm.4-6 Arpeggiate the chord twice, in two new measures (mm.4-6).

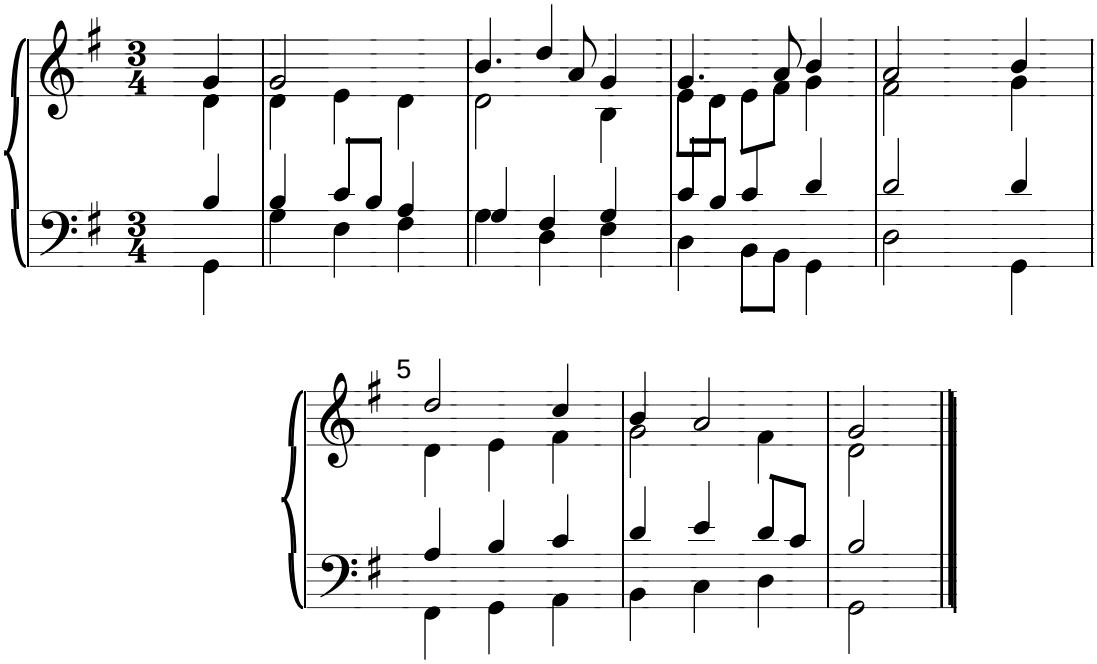


Version C

a. Add an upbeat chord.
m.1 Add a lower neighbor in the bass and harmonize it.
m.2 Add an arpeggiation of the melody and harmonize it.
m.3 Add an arpeggiation of the melody and harmonize it.
m.4 Rescore the connection to improve the voice leading from measure 3. Add a complementary tone to the melody, and harmonize it.
m.5 Add a passing tone to the melody, and harmonize it.
m.6 Add a passing tone to the melody, and harmonize it.
m.7 Change the dotted half note to a half note (to compensate for the upbeat).

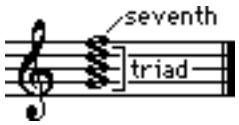


Version D (Bach)



SEVENTH CHORDS

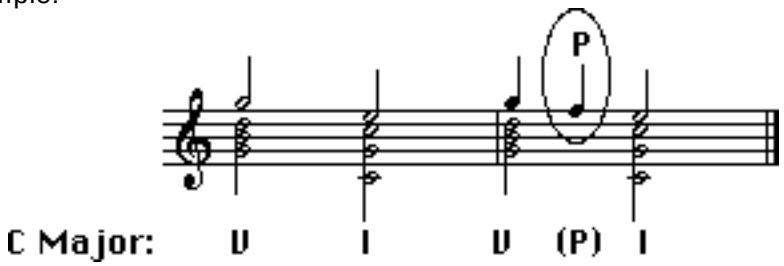
Seventh chords are so called because of their tertian structure. They appear to be chords that consist of a basic triad plus a superimposed 3rd, thus creating a 7th between the tertian root and the top of the stack of four tones:



THEORETICAL BACKGROUND

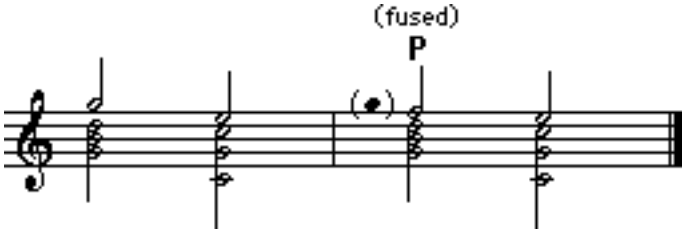
ORIGIN OF THE SEVENTH CHORDS

Historically, the origin of the seventh chord is in complementary motion, as in the following example:



The above includes a passing tone in a progression from a dominant chord to a tonic chord.

The next step in the creation of the seventh chord was to allow the complementary tone to "arrive" at the same time as the other tones. The 'f' in the above example can thus be said to have replaced the 'g'. Another way of saying this is that the complementary tone has been *fused* to the chord.



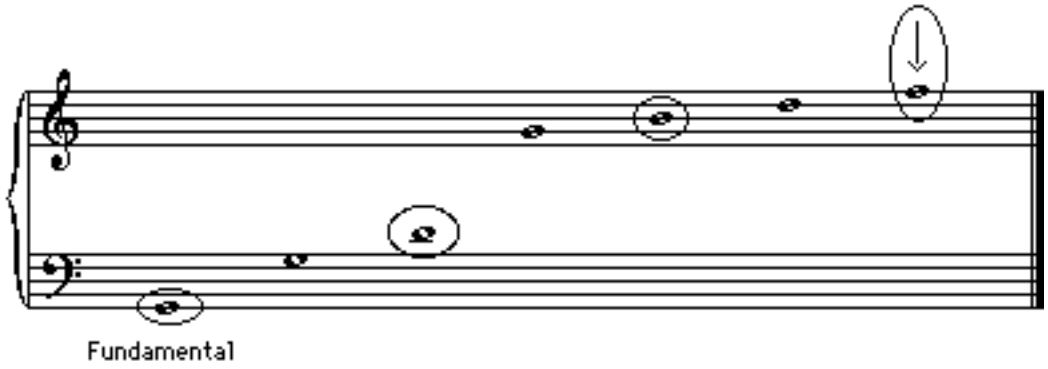
When does a set of simultaneous tones become a chord?

If, as was indicated above, the origin of the seventh chord was in melodic passing motion, why not simply label the above a passing tone, and refrain from referring to a chord at all? Why were theorists tempted to *name* the vertical structure produced by a triad plus a passing tone, calling it a chord? The answer lies first with the kind of seventh chord shown in the above example. This variety of seventh chord is composed of a major triad (in this case g-b-d) and a minor 7th added above the root of that triad (f, in this example). It is the earliest type of seventh chord to be accepted as a chord.

Our question then, can be asked more specifically. "Why did this *particular* combination of triad and complementary tone become a recognizable chord in its own right, while many other complementary embellishments were not understood to form new chords?" A likely reason takes note

of the construction of this chord, for there is some acoustical justification for this specific combination of tones to be thought of as harmonic.

An examination of this chord reveals that all of the tones above the root lie in the harmonic series of that root. (Taking 'g' as the fundamental of a harmonic series, the other tones are the 3rd, 5th, and 7th partials of that same series, or 'd', 'b', and 'f'.)



Although the higher up one goes in the overtone series the more remote become the relationships with the fundamental, the 7th partial (which produces a tone very close in pitch to the 7th of the chord under consideration) is not so far removed from the fundamental as to be considered foreign to it. Thus, a listener hearing this combination of tones is able to hear the conglomeration as a *harmony*. (It is for a similar reason that the functional root of the diminished triad on the leading tone was identified as the dominant degree. Adding the functional root to the leading-tone diminished triad produces a complete dominant seventh chord. In that sense, the leading-tone diminished triad is an incomplete dominant seventh chord. Most importantly, however, the chord should be viewed as a triad with a fused, passing seventh.

Composers began using this combination of a major triad and a minor seventh in the major mode, on the scale degree that could naturally carry its intervallic structure, $\overset{\Delta}{5}$.

Once the set of tones producing the above sonority became a familiar sound, composers started using the set without preparing the 7th by first sounding the tone above it (as in the first example in this section). In other words, the 7th, which could by that time be approached not only by step but also by a leap, arrived at the same time as the other chord members and did not resolve until all members of the chord had also moved on. When a situation like this exists, it becomes desirable to refer to the sonority in question as a chord.

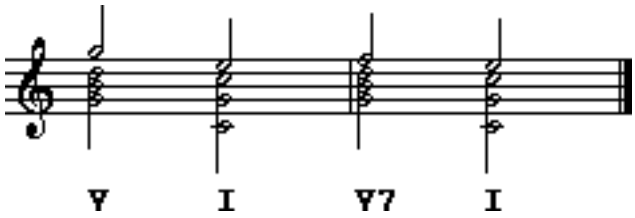
Although the *chord* under discussion can indeed be heard as a *harmony*, there remains a vestige of complementary function in it, and in every seventh chord. Since the origin of the 7th was in passing motion down, the 7th of all seventh chords is regularly resolved by stepwise motion down (which usually is the closest motion available anyway).

NAMING SEVENTH CHORDS

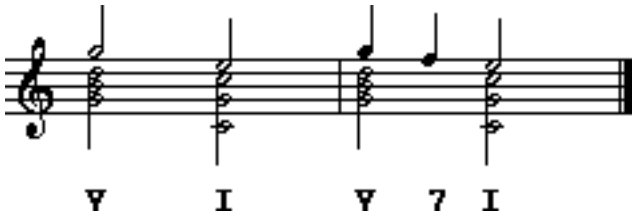
The above chord is formally referred to as a *major-minor seventh chord.* The name is obtained by following this procedure: First, name the quality of the triad part of the chord (*major*); second, name the quality of the interval created between the root and the 7th (*minor*). This name is abbreviated *Mm7*.

Roman Numeral Designation

Since the Mm7 is recognized as a chord in its own right, it is entitled to its own Roman numeral symbol. As is usual for Roman numerals, the Roman portion of the symbol indicates the scale degree of the root, given the key in which the chord is functioning, while its case (upper or lower) indicates the presence of a major or minor 3rd above the root. In the vast majority of cases, the root will be on the fifth degree. Because this is the "regular" degree on which a Mm7 can be found, the Mm7 is normally referred to as a **dominant seventh chord**. The Roman portion of the numeral is therefore represented as **V.** The Arabic portion of the numeral gives the intervals above the bass, in abbreviated form. In the case of our current example, the intervals made with the bass are a 7th, 5th, and 3rd. As in the triad, the 5 and 3 are omitted, and the Arabic numeral is simply '7'.

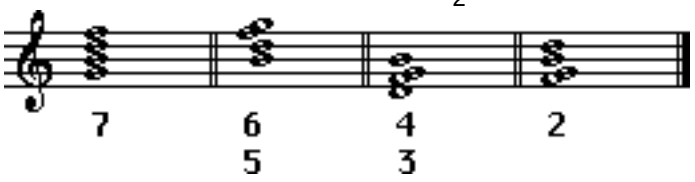


As soon as the sound of a Mm7 became familiar, listeners recognized it even when the 7th was clearly a passing tone. For this reason, it is often appropriate to call the Mm7s that result from passing motion *chords*. Their sound has simply become familiar enough for us to recognize their profile in a variety of contexts.



Figured Bass Abbreviations for Seventh Chords

1. The $\begin{matrix}7\\5\\3\end{matrix}$ position is abbreviated "7".
2. The $\begin{matrix}6\\5\\3\end{matrix}$ position is abbreviated "$\begin{matrix}6\\5\end{matrix}$ "
3. The $\begin{matrix}6\\4\\3\end{matrix}$ position is abbreviated "$\begin{matrix}4\\3\end{matrix}$ ".
4. The $\begin{matrix}6\\4\\2\end{matrix}$ position is abbreviated "$\begin{matrix}4\\2\end{matrix}$ ", or "2"..



Resolution of Major-Minor Seventh Chords

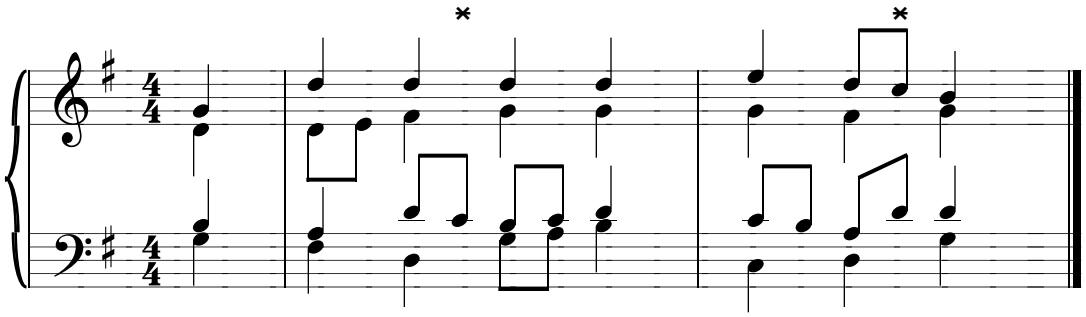
The following principles are to be observed in resolving dominant seventh chords:

1. Resolve the 7th (fa) by stepwise motion down.
5. Resolve the leading tone (ti) by stepwise motion up.
6. The fifth of the chord (re) may be resolved with greater freedom, since it lies a step away from both do and mi (or me, in minor). I usually goes to do, but sometimes to re, and occasionally, when a full resolution chord is desired, to so.
4. The bass is free to move by larger intervals, except when the tone in the bass is active, in which case the active tone (leading tone or 7th of the chord) must resolve according to 1 and 2 above. When the root of the dominant seventh is in the bass, the bass moves either down by fifth or up by fourth to resolve; **the common tone is NOT held in this case, as doing so would result in an unstable $\begin{matrix}6\\4\end{matrix}$ chord**.
5. Continue to proceed by closest motion *of upper parts* whenever feasible.

· General summary: fa-mi; ti-do; re-do; so-do (if so is in the bass) or so- ~~(~~so- do, if in ~~the bass); ti-do; re-do; fa-mi.~~an upper voice).

· If ti appears in an inner voice, its resolution can be covered, and it can move to so.

Here is an example from the literature. The basic harmonic structure is embellished by complementary tones:



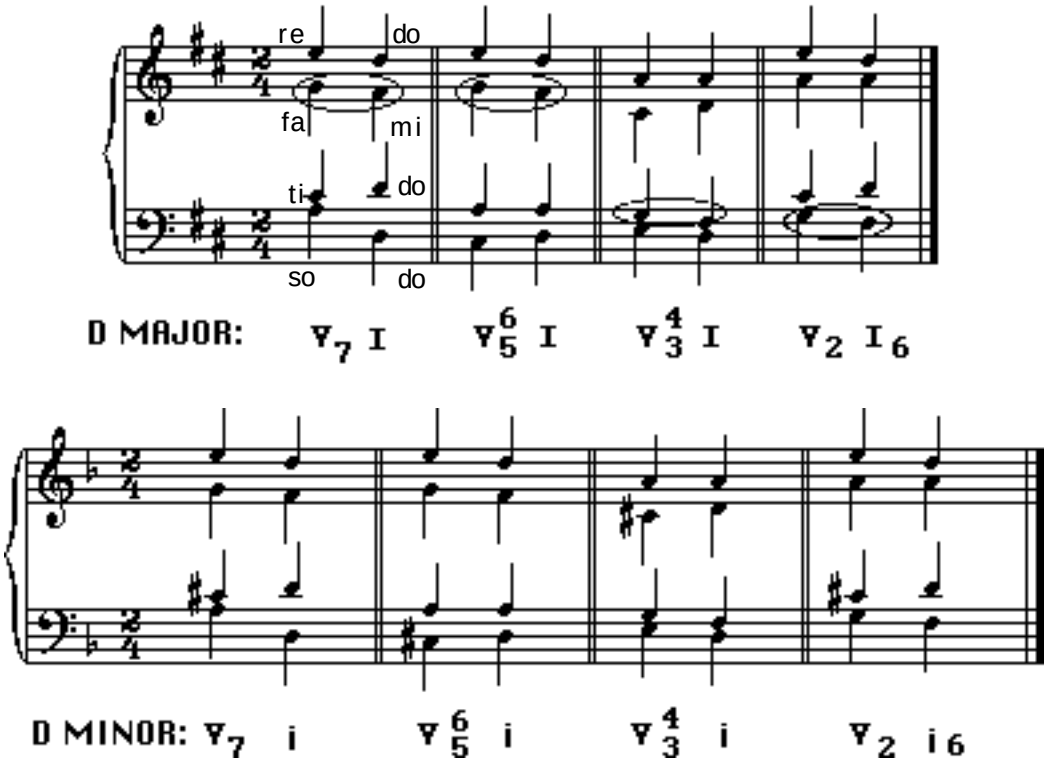
J.S. Bach: Lobt Gott, ihr Christen, allzugleich

Note that in this case, both of the dominant seventh chords are missing the fifth before they resolve. Because of voice leading concerns, a full dominant seventh does not resolve

to a full tonic triad. If the V7 is full, the triad will have a tripled root and third, no fifth. If the V7 is incomplete, it will usually have a doubled root and no fifth. This resolves to a full triad.

Here are several examples of the proper resolution of Mm seventh chords in various positions. The 7th of each seventh chord, and the note to which it resolves, are circled. Note that in the first case a full sonority cannot be achieved in the chord of resolution unless liberties are taken with the norm of close connection of chords.

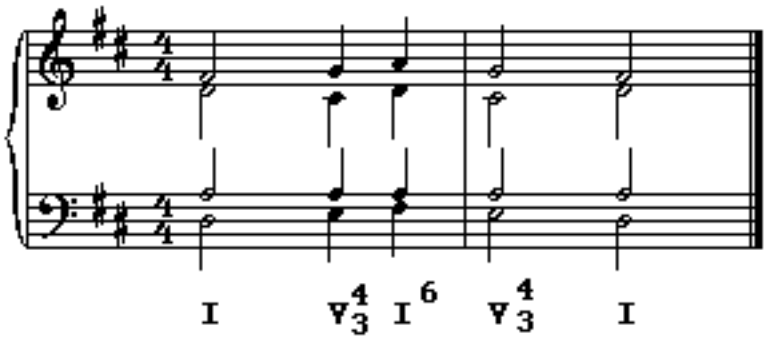
Regular Resolutions of Dominant Seventh Chords

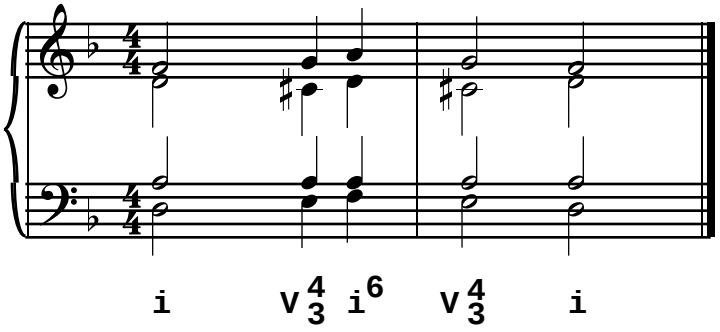


Note the leap in the bass in the first examples above. This motion creates the most stable and satisfying position and doubling for the tonic chord, even though the fifth of the chord is left out.

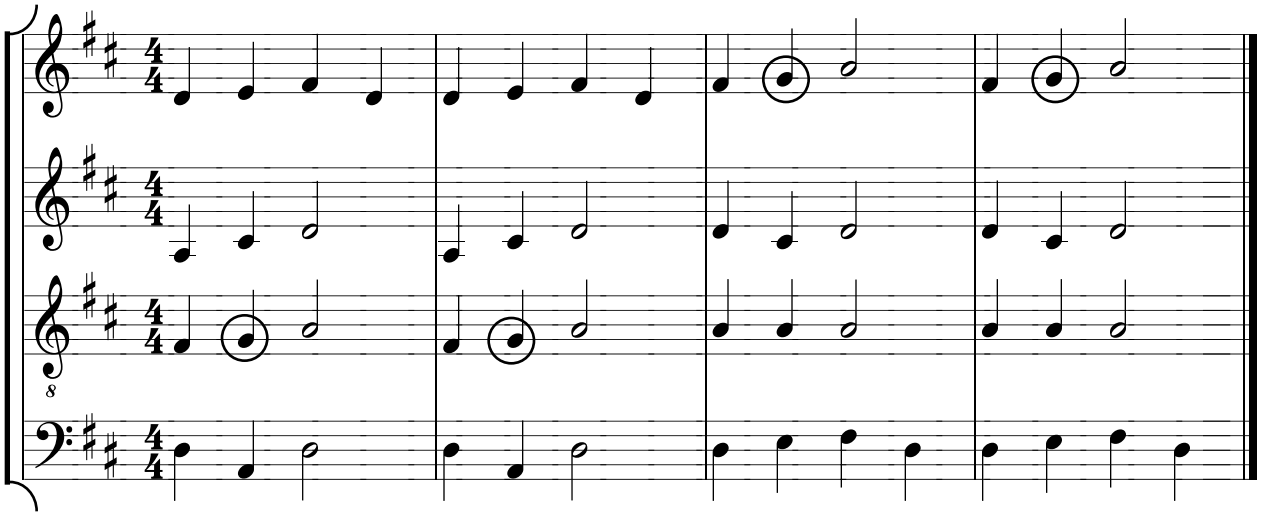
Exceptions

- At the beginnings of phrases, where active tones may sometimes move differently from usual, the 7th of a Mm seventh chord may proceed upwards. Note, however, that at the cadence (in measure 2) the regular resolution of the 7th does take place.

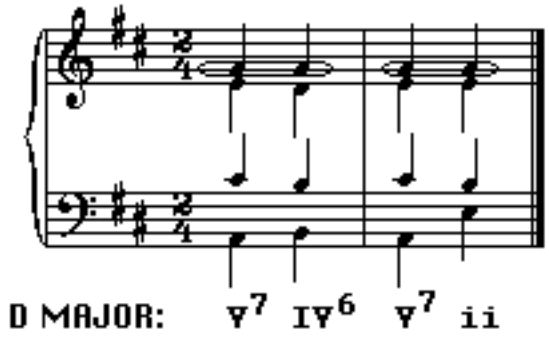




Frère Jacques



- In highly unusual circumstances, where uncommon connections occur between chords, it may not be possible to resolve the 7th down by step. This most often occurs when the 7th is a tone common to the following chord. In rare cases like this, the common tone should be maintained. Here are two examples:

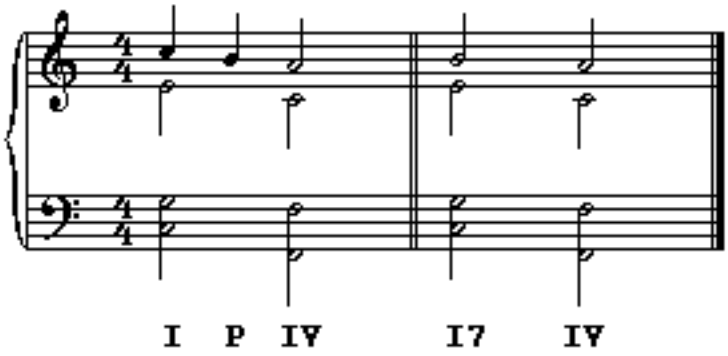


OTHER SEVENTH CHORDS

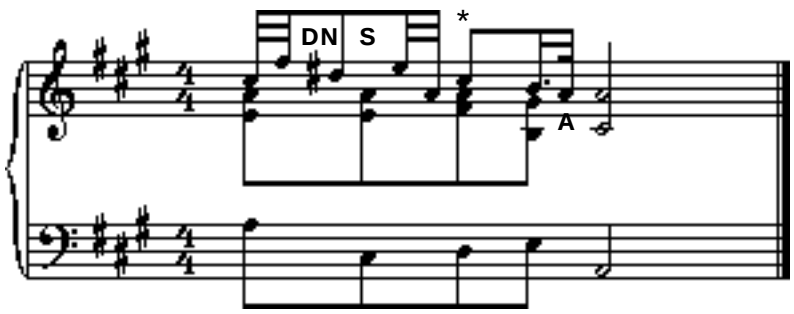
Once the Mm7 was established as a chord, listeners' tolerance for additions to the basic triad increased. Since one way of describing the structure of the Mm7 chord is to say that it consists of a triad with a *fused passing tone*, it becomes useful to view other types of seventh chords as manifestations of the "fused passing tone" phenomenon as well.

Here are the other seventh chords that have come into common usage. They are shown along with their origins and with their commonly used abbreviations:

major-major seventh: MM,
called *major seventh chord*

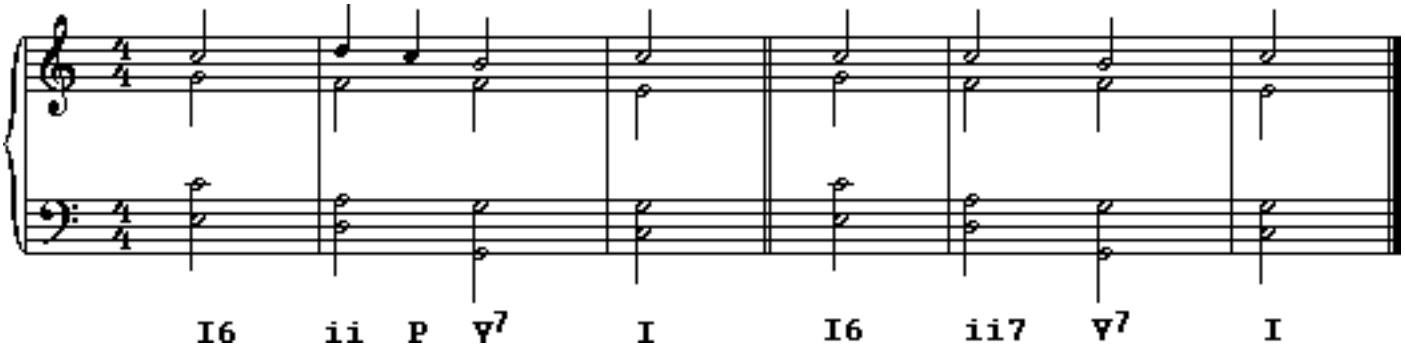


J.S. Bach: *Laudamus te,* from the B Minor Mass:



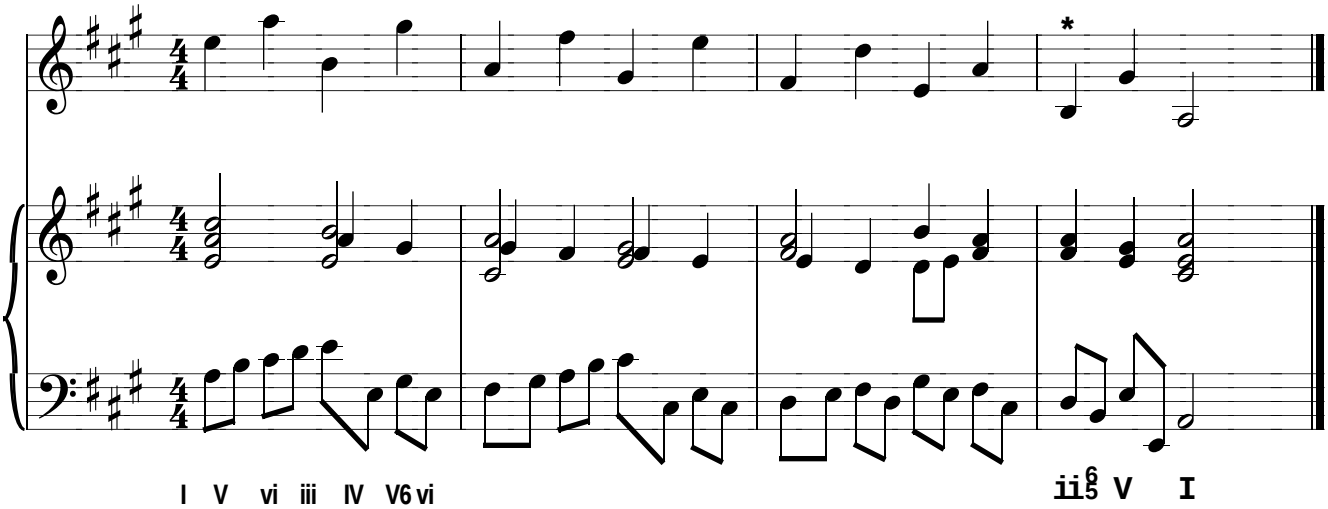
I I6 IV7 V I

minor-minor seventh: mm,
called *minor seventh chord*

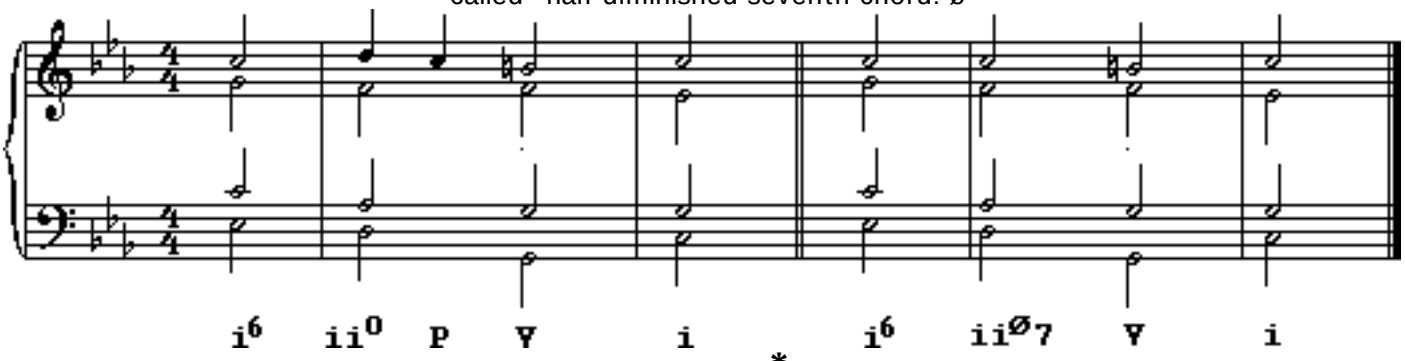


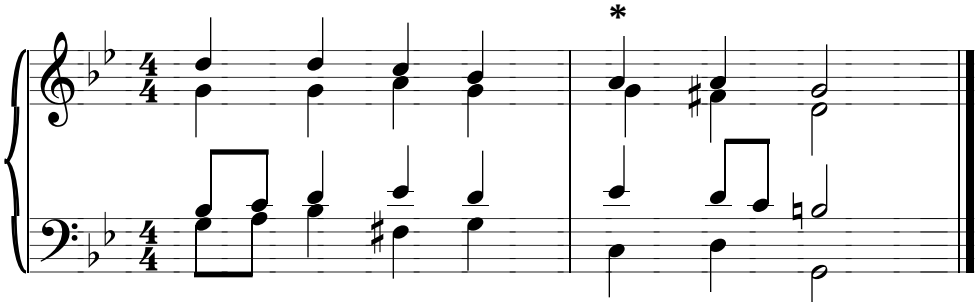
I6 ii P V7 I I6 ii7 V7 I

Corelli: Sonata IX for Violin and Continuo:



diminished-minor seventh: dm,
called "half diminished seventh chord: ø [48]

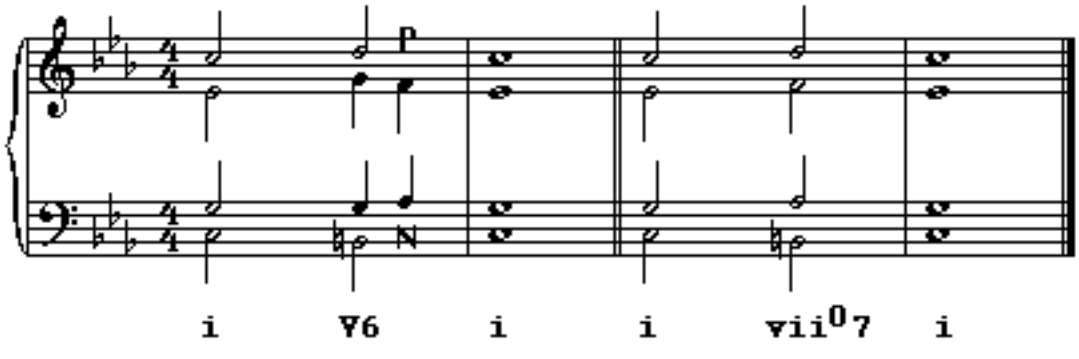


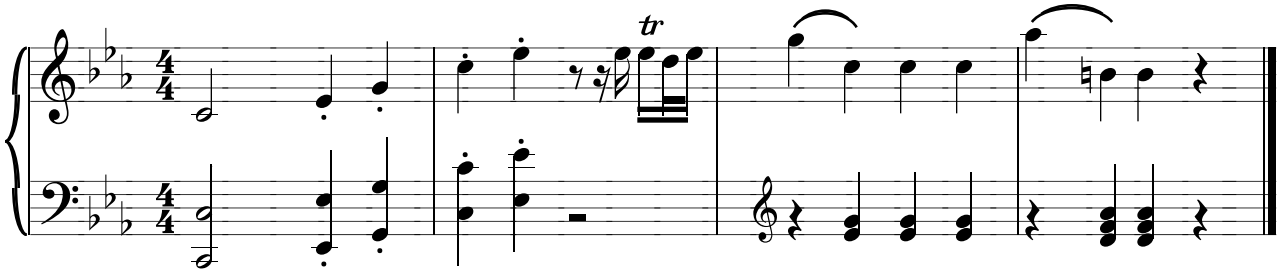


J.S. Bach: Jesu, der du meine Seele ii ø6 5 V 7 I

[48] In Roman numeral terminology for seventh chords, the circle refers both to the triad and to the seventh. Thus, the symbol "ø" reads: "the triad is diminished, but the seventh is not."

diminished-diminished seventh: dd,
called *fully diminished seventh chord* or *diminished seventh chord*: o [49]





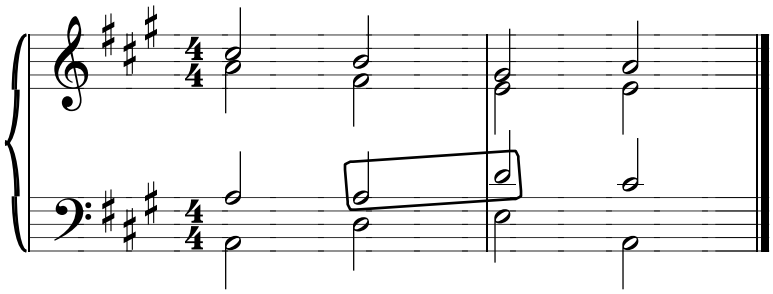
Mozart: Piano Sonata in C Minor, K. 457 **i6** **vii°6/5**

[49] The symbol "o" reads: "the triad is diminished and the seventh is also diminished."

RESOLUTIONS OF THE OTHER SEVENTH CHORDS

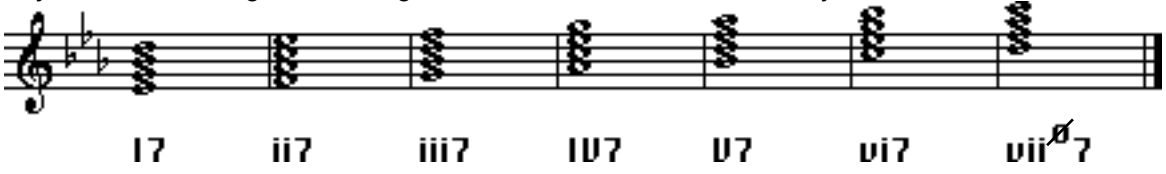
Seventh chords other than the Mm seventh are generally resolved in a similar manner to the resolution of the Mm seventh. The 7th normally resolves by stepwise motion down, and upper parts move by close motion. Regular resolutions of each of the seventh chords is demonstrated in the above examples.

There are exceptions to the *normal* resolution of 7ths in some seventh chords. If other parts move in the connection between a seventh chord and its resolution (e.g., the given melody), then the resolution of the 7th may have to be irregular in order to avoid improper doublings or voice leading problems. In the following example, involving a mm $\frac{6}{5}$, the 'a' in the tenor part cannot go to the 'g#' without doubling the leading tone (an active tone), since the given melody moves to that 'g#'. Neither can it go to 'b' because that would cause parallel 5ths with the bass. It is therefore forced to move by leap, in this case to the 7th of a Mm seventh chord (which then resolves 'regularly'), even though the normal resolution of a 7th in a mm $\frac{6}{5}$ is down by step.

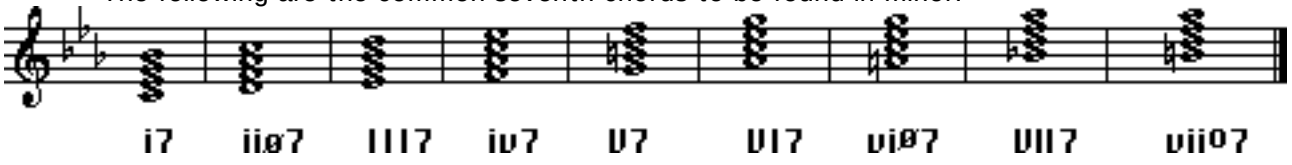


REGULAR LOCATIONS OF SEVENTH CHORDS IN MAJOR AND MINOR KEYS

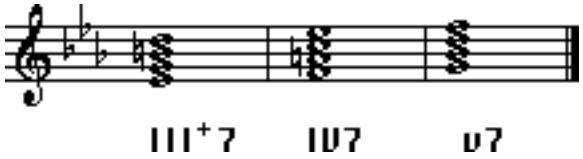
Seventh chords can be built on every degree of the scale, in both major and minor keys. The following are the regular sevenths to be found in major:



The following are the common seventh chords to be found in minor:



The following are less common, but do occur at times:

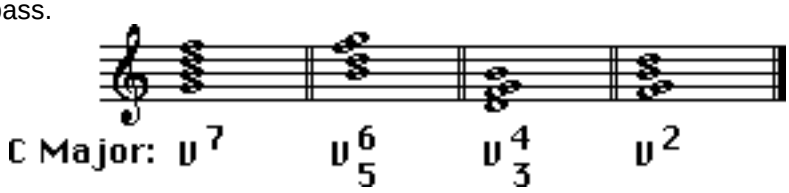


Summary of Common Seventh Chords, by Sonority types:

MM	I, IV in major; III, VI in minor
Mm	V in major; V, VII in minor
mm	ii, iii, vi in major; i, iv, v in minor
ø	vii in major; ii in minor
o	vii in major (with added “le”); vii in minor (with “ti”)

CONVERTING ROMAN NUMERALS INVOLVING SEVENTH CHORDS INTO WRITTEN NOTATION

When a Roman numeral for a seventh chord appears with only a “7” Arabic numeral, the chord is in $\begin{matrix}7\\5\\3\end{matrix}$ position (tertian root in the bass). When the figured bass numerals are $\begin{matrix}6\\5\end{matrix}$ the tertian 3rd is in the bass; when the figured bass numerals are $\begin{matrix}4\\3\end{matrix}$ the tertian 5th is in the bass; when the figured bass numerals are $\begin{matrix}4\\2\end{matrix}$ or 2 the tertian 7th is in the bass.



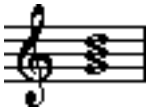
FUNCTIONAL ROOTS OF SEVENTH CHORDS

The functional roots of seventh chords are the same as they are for their base triads. Therefore, in order to determine the functional root of any seventh chord, remove the 7th and employ the same test for the remaining triad as we have done earlier.

The Dominant Seventh Chord

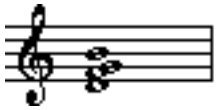
For example, to find the root of a Dominant Seventh chord in 7 position (V_7) in C major,

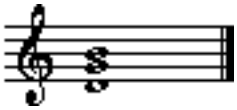
focus on the base triad, which is a major triad (V).



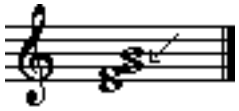
Since in major triads in $\begin{smallmatrix}5\\3\end{smallmatrix}$ position the functional root is the same as the tertian root, this is therefore also true for the Dominant Seventh chord.

In $\begin{smallmatrix}4\\3\end{smallmatrix}$ positions of Mm seventh chords, removing the 7th results in a chord in $\begin{smallmatrix}6\\4\end{smallmatrix}$ position.





This suggests the following question: Is there any context in which the functional root of the seventh chord is affected? The answer is "no." The presence of a 7th in the $\begin{smallmatrix}4\\3\end{smallmatrix}$ position prevents the chord from functioning in a cadential context similar to that of the cadential $\begin{smallmatrix}6\\4\end{smallmatrix}$. For this reason ***all positions of the Mm seventh chord have a functional root that is identical to the tertian root.***



The functional root
of the $\begin{smallmatrix}4\\3\end{smallmatrix}$ chord is the
same as its tertian root

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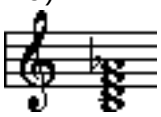
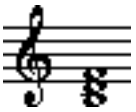
The Diminished Seventh Chord

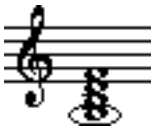
To find the functional root of a vii$^{o}_{7}$ (in C):



refer to the bass triad vii^{o}.

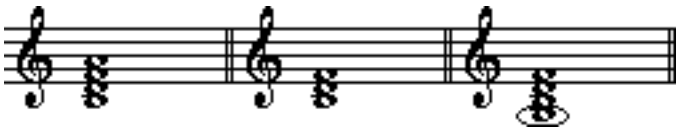


Its functional root is a major 3rd below the tertian root. The root of the vii$^{o}_{7}$ is therefore G:



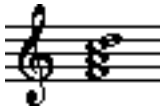
The Half-Diminished Seventh Chord

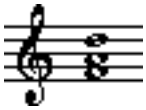
The same is therefore true of the vii$^{ø}_{7}$.



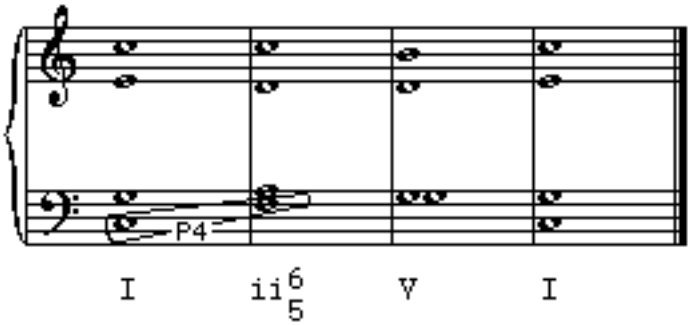
The Minor-Minor Seventh Chord

To find the functional root of a ii$^{6}_{5}$, refer to the base triad, ii^{6}.





Context plays an important role in the rootedness of this triad, and also in the seventh chord. (See the flow chart above.) In many cases, the bass note will serve as the functional root, as it does in the second chord of the following example:



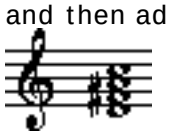
The Major-Major Seventh Chord

The functional root of a MM seventh chord is the same as its tertian root.

WRITING SEVENTH CHORDS FROM THE TERTIAN ROOT OR FROM THE BASS NOTE

1. Given the following kind of problem--Mm_2 with root D, here are the steps involved:

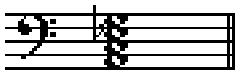
   a. Build a Mm_7 first. The root, D, will therefore be in the bass. First build a major triad on D--D F#A-- and then add the minor 7th--C.



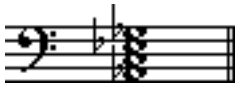
   b. Now invert the chord so that it's in $_2$ position. This places the 7th of the chord in the bass: C D F# A.

2. Given the following kind of problem--Mm^4_3 , bass note E^b, here are the steps involved:

   a. Begin by writing the E^b on a staff. Since the chord is in $^4_3$ position, you know the E^b is the fifth of the chord. Build a seventh chord in root position by placing two thirds below the E^b and one third above it. Do not yet include any accidentals



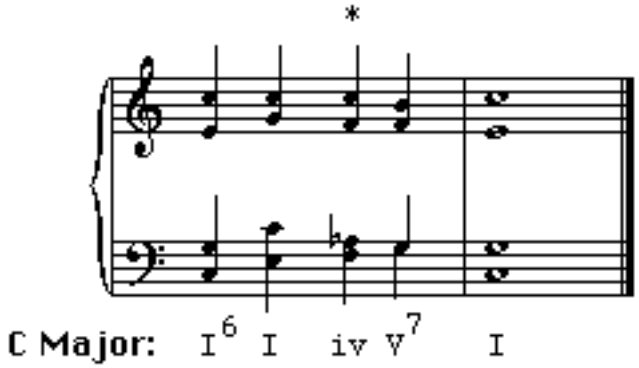
   b. Consider the quality of the seventh chord you need to build (in this case , a Mm_7), adjust any tones you have added ***leaving the given tone untouched.***

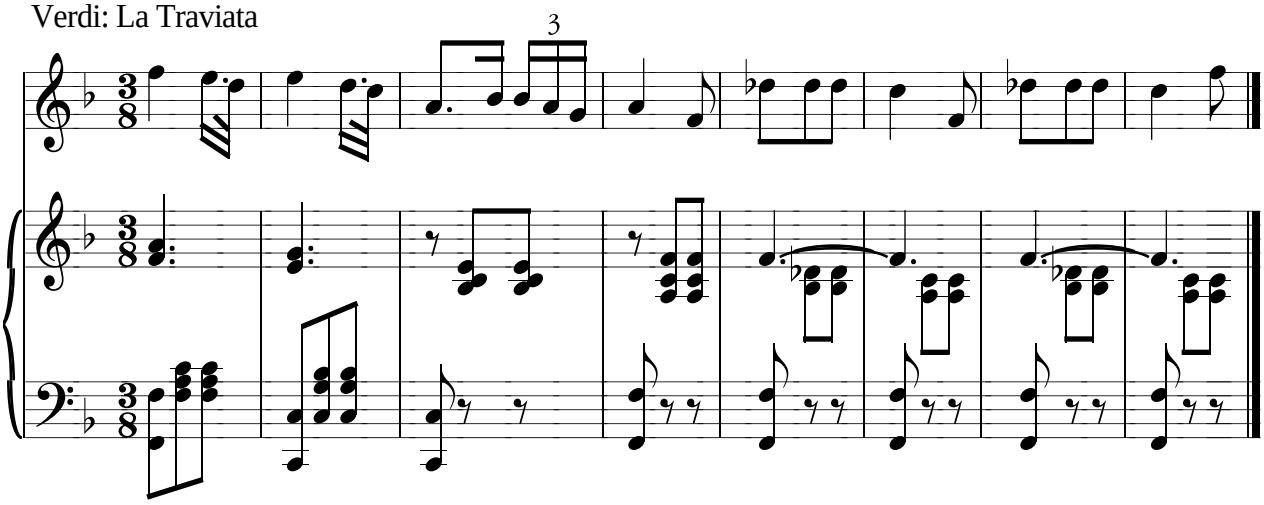


   c. Finally, return the chord to its original position, with the E^b in the bass:

CHROMATIC CHORDS

Chords that include tones not present in the scale of the prevailing key are called chromatic. There are various types of chromatic chords, and each type functions differently. One type creates simple variants of diatonic chords (chords whose pitches lie within the scale of the key) by altering one or more of the diatonic tones, thus effecting a change of quality but not of function. This type of chromatic change is referred to as mutation. (It is also commonly called modal borrowing.) Here is a chord progression that includes a mutated chord:

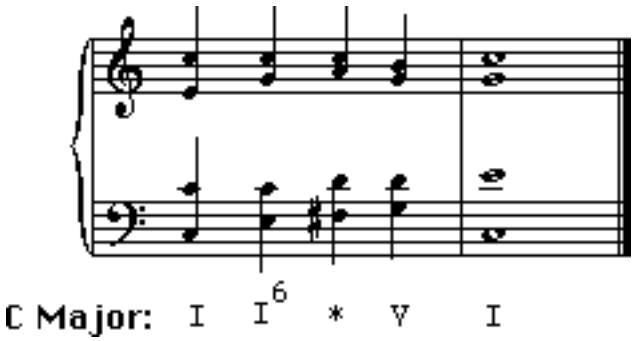




The iv is a mutated form of IV. Its quality has been changed, but its function (and its root) is identical to that of the IV. (In the case of the Verdi, the iv is actually a pedal $\frac{6}{4}$, so the functional root is the same as the bass note. This would have been true for the IV $\frac{6}{4}$ as well).

SECONDARY HARMONIC FUNCTIONS

Chromatic chords that are perceived to function within the orbit of a scale degree other than tonic, as if that scale degree were "do" are called *secondary chords*. Their function is secondary because their relationship to the real *do* is made clear through an intermediary, or "primary" function. Most secondary chords are produced by chromaticism of a very different type from mutation. Here is an example of one of the most common secondary functions:



In the above example, the third chord is chromatic. If one were to label it using tertian Roman numerals, the appropriate numeral would seem to be $\mathbf{II}^{6}_{5}$, with the capital **II** showing the addition of the F sharp, a note not in the scale of C major, to the seventh chord on the supertonic degree. But how is this chord actually functioning? We know that Major-Minor Seventh Chords (this is one in $^{6}_{5}$ position) most often behave as *dominants*. Is this chord behaving as a dominant? If so, we would expect it to resolve by root motion down a 5th. A glance at the following chord confirms this root motion. The chord is therefore perceived as functioning not as a supertonic chord, but as the dominant of G. A more appropriate Roman numeral for this chord is thus a ***secondary Roman numeral***, or V^{6}_{5} / V.[50]

Hard brackets: Another way of indicating a chord that has a secondary function is to place it in hard brackets. [V] means that the chord is V of the tertian root of the chord that follows. [V] - V means the same thing as V/V - V.

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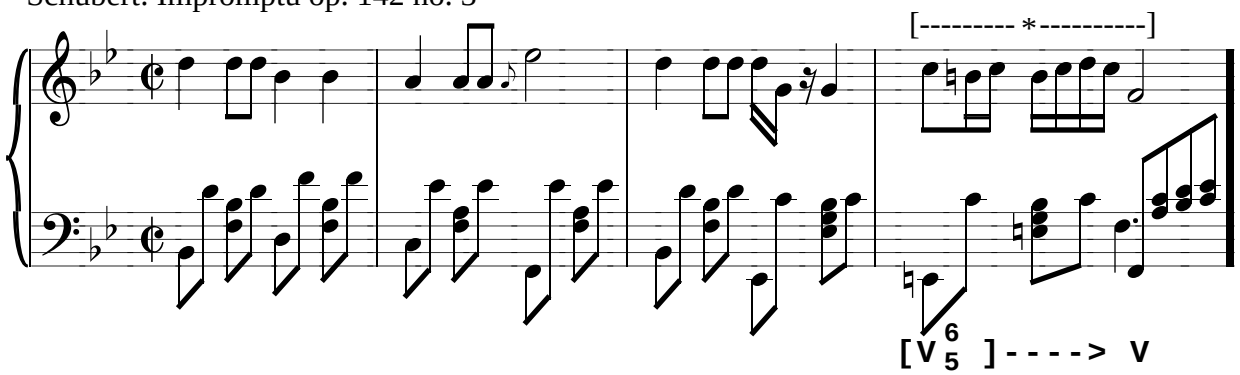
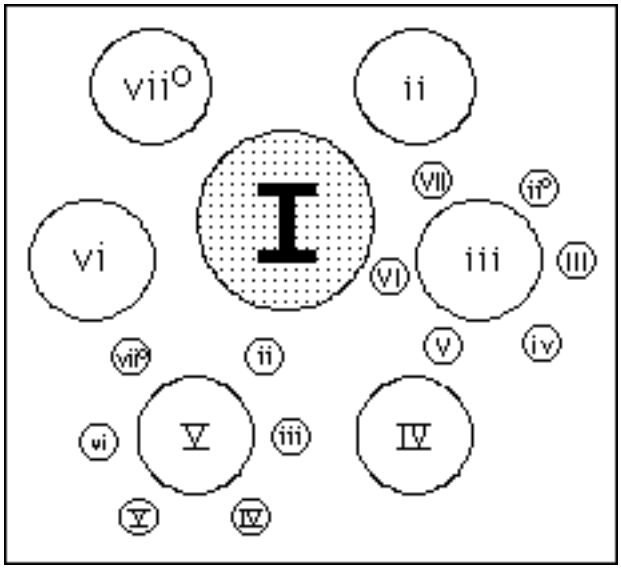
[50] The functional Roman numeral, the one that indicates the functional root relationship, is (V/V) .

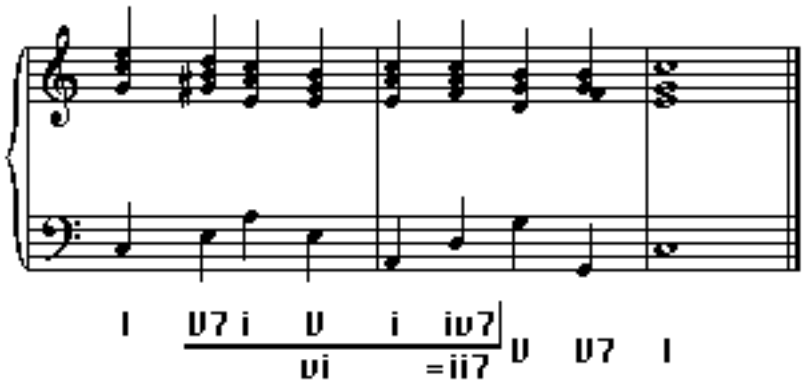
Schubert: Impromptu op. 142 no. 3



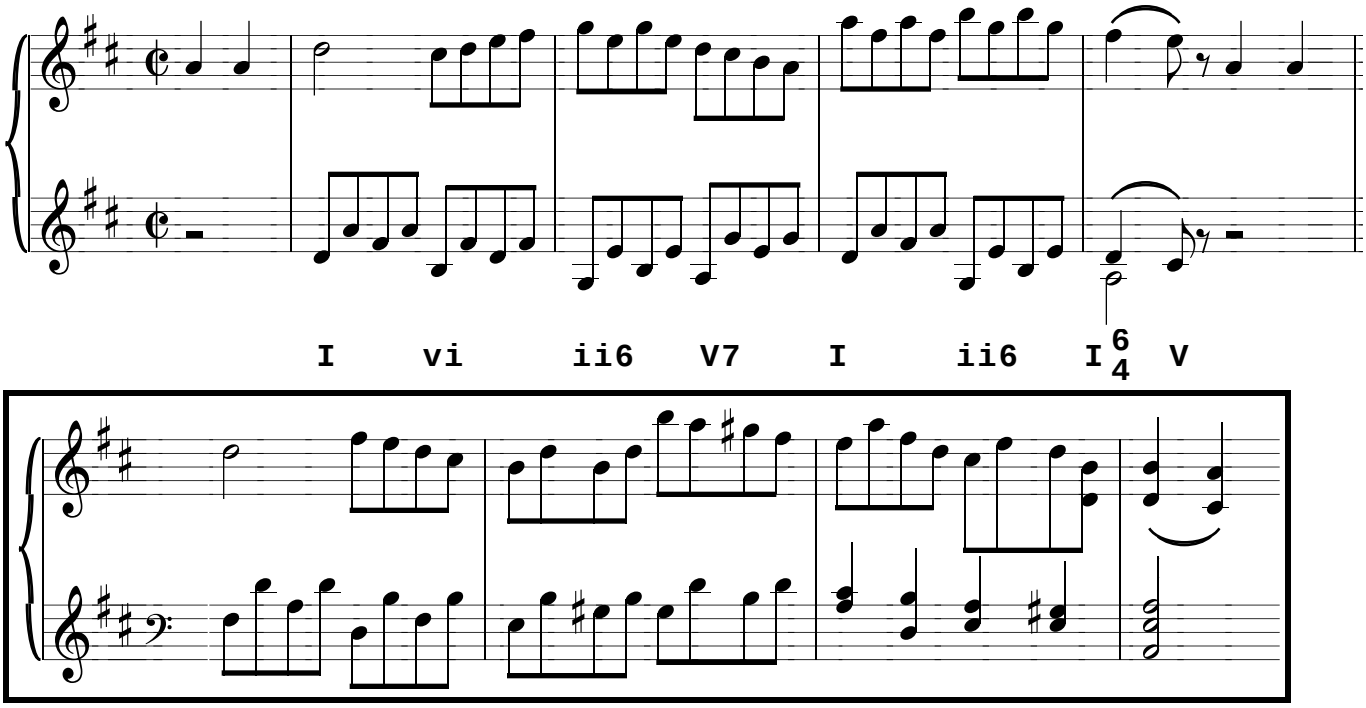
A useful way of looking at secondary relationships uses the planetary system as a model. In this analogy, the tonic, or key center, becomes the sun, with the degrees of the scale (and their triads) circling around it like planets. Secondary relationships are like moons, circling around the planets and relating to the planets as though they (the planets) were suns. The diagram below should make these relationships clear.



Secondary areas are usually defined by the introduction of a new chromatic tone that functions as a leading tone. (In the example on the previous page, the F sharp became a new leading tone to G.) Once a secondary area has been defined, the chords in its immediate vicinity will most likely be perceived as functioning in that area as well. Thus, a proper analysis of the following harmonic progression indicates a string of secondary chords, all related to vi as their pseudo-"do." This string is written as a fraction, above the pseudo-"do," using those Roman numerals which would be appropriate if the pseudo-"do" were actually the tonic. (In the analysis, the return to the real tonic is shown by reinterpreting the last chord relating to the pseudo-"do" and labelling it in relation to the true tonic. Thus iv^7/vi is reinterpreted as ii^7.



Here is an example of the establishment of a secondary area in "real" music, taken from the last movement of Mozart's Piano Sonata in D, K. 284.



Note that the g sharp, which is introduced in measure 6, is part of the harmony in that measure, and in subsequent measures, and that it ultimately resolves to the A of the final chord as leading tone —>"tonic." It is appropriate to use the "fraction method" of Roman numeral designation to describe how the harmony is working in this excerpt.

Secondary relationships that are fleeting, and return to diatonicism before even one cadence, are referred to as **allusions**. (In the C Major example above, *A minor* is alluded to in mm. 1 & 2.) When secondary areas are confirmed in at least one cadence, they are referred to as tonal regions, or simply as **regions**. (In the Mozart example above, A major is established as a region at the end of the second phrase.) Secondary

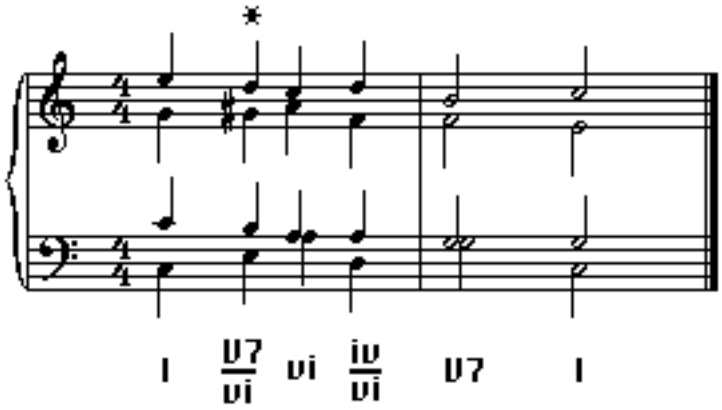
areas that last for a significant amount of time (in relation to the size of the entire piece), and that help to elucidate the form of the piece, are referred to as **modulations**.

RECOGNIZING SECONDARY FUNCTIONS IN NOTATION

How can one recognize a secondary function when one sees it? What are the clues?

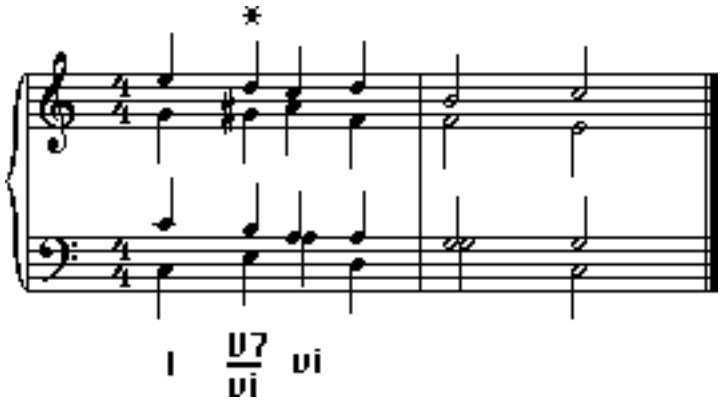
The first thing to look for is the presence of a new leading tone. This is most often noticed as a chromaticism (an accidental from outside the key).[51] If a chromaticism exists, it is important to determine if a new leading tone has been established. Look at the chord in question and see how it resolves. If one of the tones moves up a half step to the root of the next chord, a new leading tone has been established, and with it a secondary harmonic function. Since the leading tone indicates **dominant function**, secondary areas are first established through the use of *secondary dominant* functions. A secondary function is named not in relation to the primary key but in relation to the chord to which it directly relates, *as though that chord were the tonic chord.*

For example, study the following succession of chords:

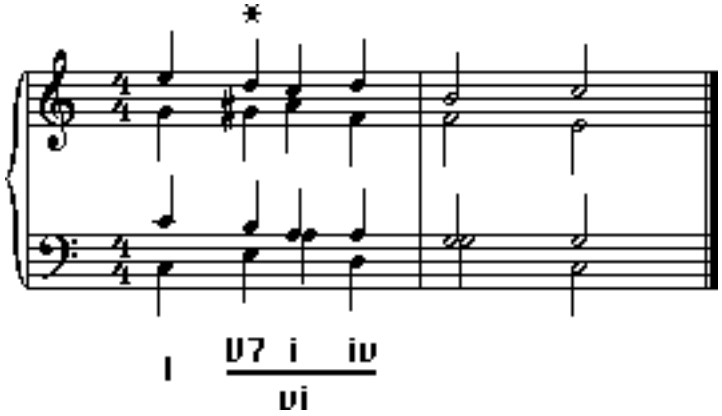


The second chord (*) is chromatic, and the g# does indeed behave like a leading tone, resolving to the root of the following chord. The chord is thus a secondary chord, and is specifically a secondary *dominant*. Because it is a secondary function, it is named in relation to the chord to which it resolves, as if that chord were a tonic chord. The chord to which it resolves is an *a minor* chord. The chord preceding it is thus V^7 of A minor. Since A minor is vi in the principal key of C major, the E^7 chord is called a V^7 / vi.

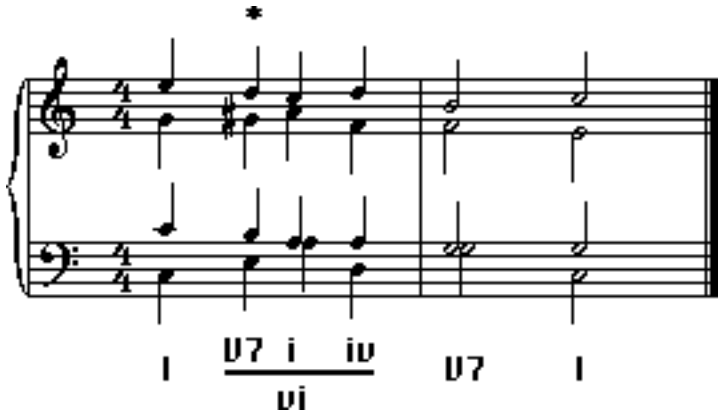
[51] It is possible to create a secondary function without chromaticism, although this is less common. Several secondary triads can create new leading tones without adding further accidentals (e.g. V/IV in major, V/III, V^7/III and V/VI in minor).



Once a secondary dominant has appeared, it establishes a new, if temporary, tonal area. All chords that follow it will likely be related to this new tonal area until a chord that clearly has a simpler relationship to the principal key (or to some other key) emerges. In the above example, the two chords following the V^7/vi seem also to function in the area of A minor.



The fifth chord in the succession, however, is a Mm seventh chord (with the 5th left out), that is clearly functioning as a dominant, and it turns out to be the dominant of the principal key. The secondary area of A minor has thus come to an end.



Writing Secondary Functions

When realizing a secondary roman numeral, follow this procedure:

1. Note the principal key.

2. Name the notes of the chord to which the secondary chord resolves. Since it serves as the "do" of that secondary chord, determine its signature.

3. Write the secondary chord in relation to its secondary "do," using the signature of that secondary "do" rather than the signature of the principal key.

Here is an example of the above procedure:

PROBLEM - WRITE THE FOLLOWING. C: V^7/ii

1. The principal key is C Major.

2. The chord to which the secondary chord relates is ii. The ii chord is a d-f-a, or d minor, and the signature of its tonal area is one flat.

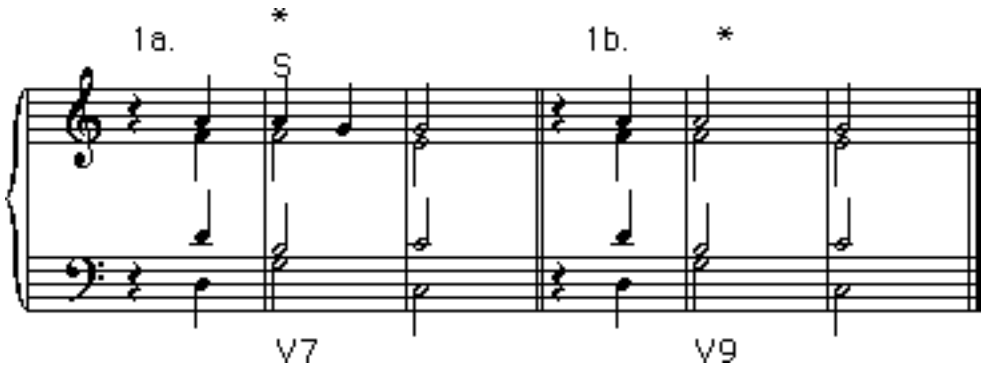
3. The V^7/ii in C is therefore the same as the V^7 chord in d minor. To build a V^7 in d minor, find the dominant note. This is A. Now build a dominant seventh chord on the A. The notes are A C# E and G.

EXTENDED SONORITIES

We have seen the origin of the seventh chords in melodic (passing) motion. In each case, a complementary tone has gradually gained enough familiarity to begin to be treated freely, approaching, but not matching, the freedom given to structural tones. When this complementary tone is introduced for a significant amount of time in the life of the chord and does not resolve until all other members of the chord move away, then it has almost achieved the status of a structural tone; in fact, one can call it a chord tone. [The distinction between a chord and a harmony is thus made; a harmony is made up exclusively of structural tones, while this is not necessarily the case for a chord. A chord that is not a harmony can stand for or represent a harmony.]

When complementary tones achieve chord-tone status, the chords of which they are members must be named. The first chord for which this was true was the major-minor seventh chord, that became common as a chord in the early Baroque period (although the concept of "chord" was quite complex at this time, and contemporary views of what constituted chords was very different from our present view). As soon as the 7th began to be treated as something more than a passing tone, it became necessary to name the chord in which that 7th appeared. Following the naming of the Mm7, the other seventh chords were named.

In the nineteenth century, other complementary tones achieved chordal status (again, by our modern definition; chords of this nature were described by figured bass theorists of the baroque period, but these chords were not used in the same way at that time.) They produced the so-called ninth, eleventh and thirteenth chords. As was the case with the seventh chords, these tones were first treated as complementary, then later became chord tones. Each of the new chords originated in the idea of suspension, where a complementary tone is held over beyond its normal time, and thus substitutes for the tone to which it ultimately resolves. Here is an example of this pattern:



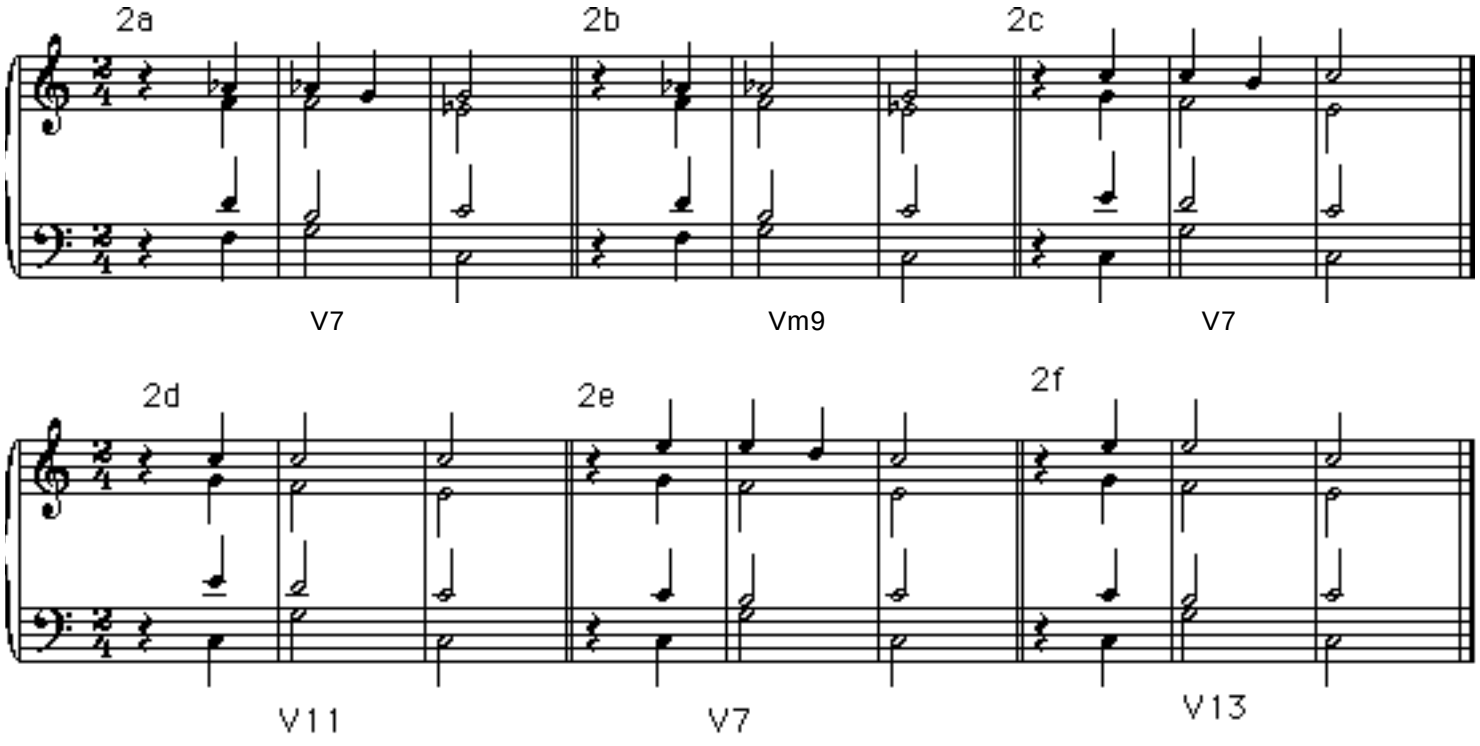
In example 1a above, the a on the downbeat is not a chord tone, since it moves to the g (thus creating a simpler sonority) before the other tones resolve. In example 1b, however, the a lasts as long as the other tones. It therefore can be said to have achieved chordal status, and the chord of which it is a member must be named.

Extended sonorities are given tertian names; i.e., they are named by stacking the notes in 3rds. Thus, the chord at the asterisk in example 1b would be called a ninth chord, (with the 5th left out). The tertian root is G, the 3rd is major, the 7th is minor and the ninth (an octave plus a 2nd) is major. The chord is therefore referred to as a G MmM 9, or as a G dominant ninth chord. (The word dominant is used, since the seventh chord portion is Mm.) The tertian Roman numeral for this chord is V 9, and the functional Roman numeral is V.

Below are some other common extended sonorities, shown first in a context that demonstrates their origin in complementary motion, and second in a chordal context. Notice that in each case the chord appears in four parts. This is done not only because a four-part texture is the norm for harmonic writing, but also because an extended sonority is not really tertian, but is a chord in which one of the tones functions as a substitute for a structural tone. With the exception of the ninth chords, in which the 5th can be said to have been left out in a four-part setting, tertian tones that appear to be missing are not really parts of the chord, and the chord is not incomplete.

Each of the extended sonorities presently under discussion is in essence a major-minor seventh chord, with one of the tones of that seventh chord replaced by a "fused" suspension. Each chord is preceded below by a context in which its origin is made clear. Each is also presented here in root position, since extended chords almost always appear in this way. It is important to note that, since each chord is based on the major-minor seventh chord, it has a dominant function. [Other extended sonorities appearing later in the history of music have non-dominant functions.]

When writing extended sonorities, it is useful to remember their origin in the Mm 7, and to replace one of the tones of that Mm 7 chord with its suspended upper neighbor. In this way, the proper tones will be included.

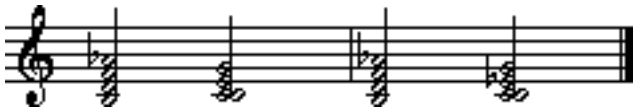


DIMINISHED SEVENTH CHORDS

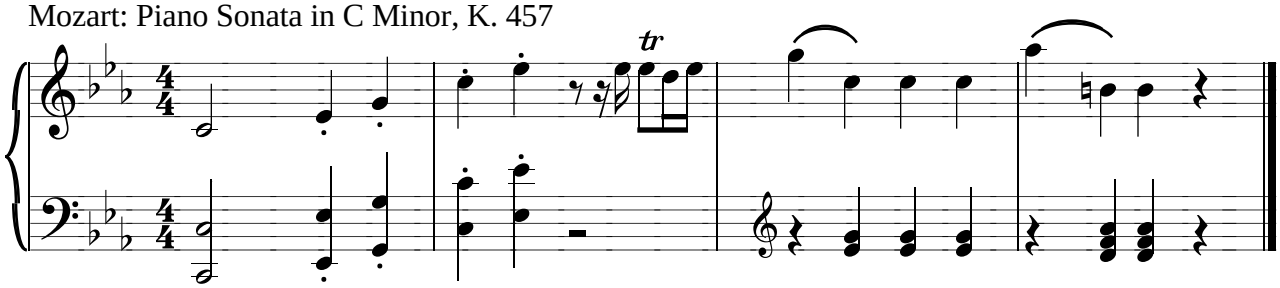
1. Diminished seventh chords are members of a class of sonorities that divide the octave into equal (enharmonic) portions. [Other members of this class are the tritone, the augmented triad, the whole-tone scale, and the chromatic scale.] Because of the equality of division, these sonorities are capable of multiple harmonic interpretation, i.e., their harmonic functions, or functional roots, are controlled by context.

2. There are three different ways in which a diminished seventh chord can function in a key:

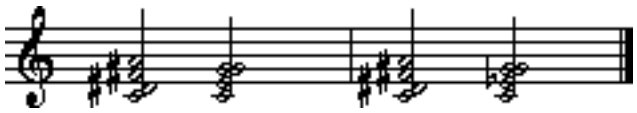
   a. as a ***normal*** $^{0}7$, built on the leading tone, with syllables ***ti-re-fa-le:***



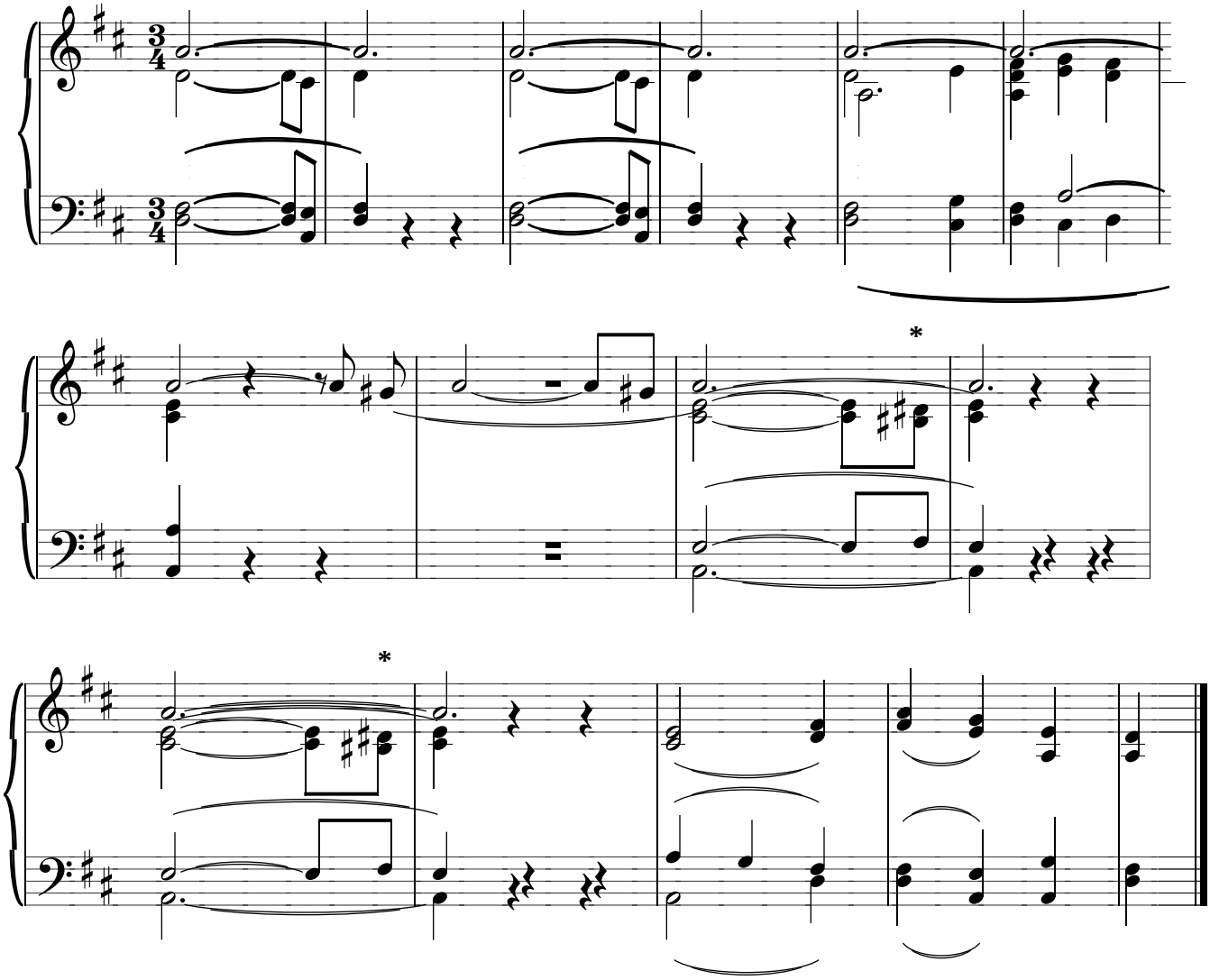
Mozart: Piano Sonata in C Minor, K. 457



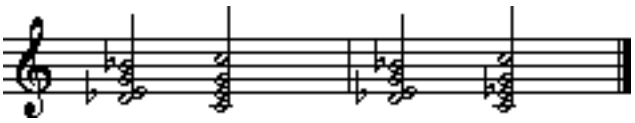
   b. as a ***deo-common tone*** $^{O}7$, in which is the tertian root of the resolving triad is also a member of the $^{0}7$ chord that precedes it:



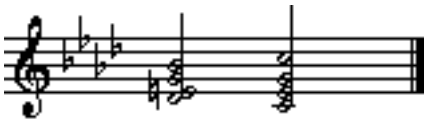
Beethoven: Symphony No. 7



c. as a ~~***double***~~ ***so-common tone*** $^{0}_{7}$, in which ~~two adjacent pitches~~the note ~~of~~ in the $^{O}_{7}$ chord ~~are~~ representing *so* is maintained in the resolution ~~to a major triad~~. [In resolution to a ~~minor~~ major triad, ~~only the fifth of that triad~~"mi" is also a common tone~~, but it is still considered to be of the "double-common-tone type.]~~.

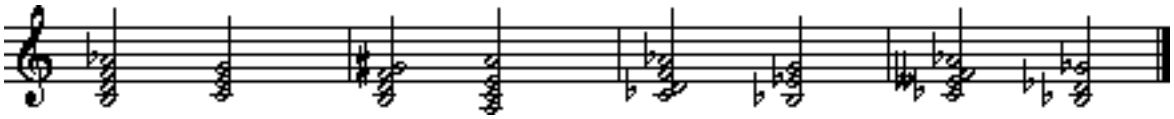


This last variety, which is rare, more often resolves to the dominant of the key, rather than the tonic, and the syllables thus are ***le-ti-re-fa***, resolving to ***so-ti-re-so:***

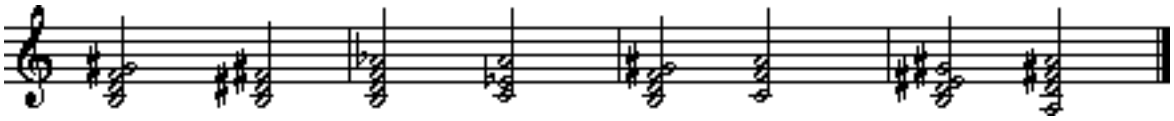


3. Connections involving *normal* $^{0}7$ chords should spell each member of that chord according to the direction of its resolution. For common-tone connections, unorthodox spelling is sometimes used by the great composers, especially when it eliminates complexities such as the use of double sharps or double flats. (For our own purposes in this course, however, we will be spelling connections of all of these $^{0}7$ chords in orthodox fashion.)

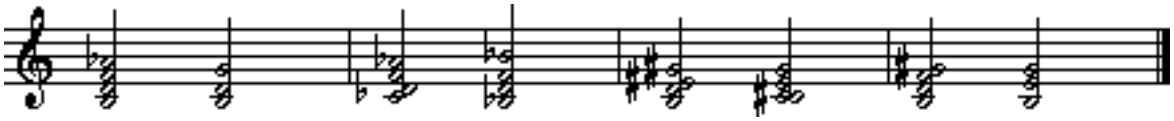
4. Since any single diminished seventh chord can be identified as to harmonic function only by the context in which it is placed, and since the tones divide the octave equally (enharmonically), each tone of an $^{O}7$ may function as "ti" in a "normal" connection, as "do" or “so” in the most usual common-tone connections, or "mi" or "so" in a ***so***-common-tone connection. There are four normal resolutions for any $^{0}7$ (only the spelling of individual notes changes, depending upon the direction in which they resolve).



There are also four common-tone resolutions:



and four *double-* common-tone resolutions:



for that same chord. Since each of these twelve resolutions is unique, any one diminished seventh chord can be connected to all major (or minor) triads by employing these three methods of connection.

Here are the steps to follow when you wish to resolve normal diminished seventh chords correctly:

1. Write down the chord of resolution (Chord B)
2. Write the notes of the normal diminished seventh chord (Chord A) so that closest motion is effected in all parts.

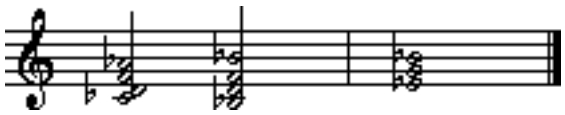
Here are the steps to follow when you wish to resolve common tone and *so*-common tone diminished seventh chords correctly:

1. Write down the chord of resolution. (Chord B)

2. Write down the common tone(s) to the left of Chord B.

3. Construct a diminished seventh chord (Chord A) by writing minor 3rds (or, in one case, the enharmonic equivalent of a minor 3rd [an augmented 2nd]) either above, below or both above and below any of the note(s) you have already written for Chord A. The spelling of each note you write should be dictated by how it will resolve (by closest motion) to a note in Chord B.

Rules of Spelling: Any note accidental to the key should resolve by closest motion, and be written as a raised note (i.e., either with a sharp or a natural sign), or a lowered note (i.e., either with a flat or a natural), depending on the direction of resolution. No accidental (except "fi") properly resolves to a note with the same letter name. It is also useful to remember that a so-common-tone resolution often sounds like a progression to the dominant, while normal and (single) common-tone resolutions sound like progressions to the tonic. Because of this difference, one of the tones of the so-common-tone diminished 7th (the one that will resolve by whole step) will at first seem to be an accidental tone. This tone is actually in the key, however.



THE AUGMENTED SIXTH CHORDS

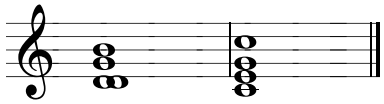
The so-called augmented sixth chords are sonorities that result from the replacement of structural tones with complementary substitutes, producing fused complementary tones. [This process was first described in relation to the creation of the dominant seventh chord.] The following discussion gives a theoretical derivation of these chords, all of which can be derived from the dominant seventh chord, that itself was derived from the dominant triad.

THEORETICAL BACKGROUND

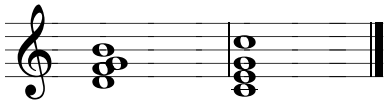
Theoretical Derivation

A. The dominant triad has both a harmonic and melodic tendency towards resolution. The harmonic component is the downward root motion of a 5th; the melodic component is the *ti-do* resolution of the leading tone.

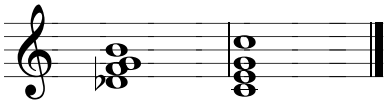
B. By placing the dominant triad in $\begin{smallmatrix}6\\4\end{smallmatrix}$ position, one gives it its most melodic form. Here the falling 5th root movement does not occur in any voice; voices need move by step or simply remain on a common tone to resolve the chord.



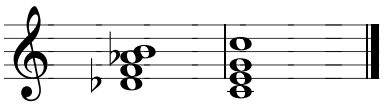
C. By adding a 7th to this dominant $\begin{smallmatrix}6\\4\end{smallmatrix}$ triad an additional active tone is produced, since this new tone will resolve by half step. It is, in some degree, another leading tone.



D. A third leading tone can be created by replacing the bass note of the chord with its lower neighbor. This produces a chord of the augmented sixth, traditionally known as the French $\begin{smallmatrix}4\\3\end{smallmatrix}$.

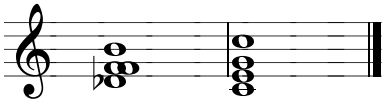


E. By raising the 4th of the above chord to a 5th, yet another leading tone is created, and the German $\frac{6}{5}$ chord is produced.



NOTE: The parallel 5ths created by the D^b and A^b moving to the C and G are acceptable in the resolution of the German $\frac{6}{5}$ chord.

F. By removing the 5th of the German 6th chord the Italian 6 is produced.

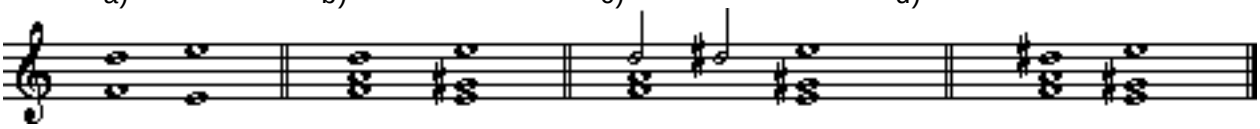


HISTORICAL BACKGROUND

Historical Derivation

The following staff shows the progress from a) the two-voice Phrygian Cadence to b) the Baroque Phrygian Cadence to c) the embellished Baroque Phrygian Cadence to d) the Italian 6 chord (that includes a fused passing tone). The German and French augmented sixth chords were added to the vocabulary almost immediately afterwards.

a) b) c) d)



Note: Historically, the augmented sixth chords were embellishments of the dominant degree. In the above example, the key is *a minor*. The most common augmented sixth chords are thus secondary chords, functioning as mutants of the dominant of the dominant.

Practical Aids to Remembering These Chords

A. The German sixth chord (G $\frac{6}{5}$) is a major triad + an augmented 6th. It is built on the ra of the chord to which it resolves.

B. The French sixth chord (F $\frac{4}{3}$ is like the German, but with the 5th replaced by the tone a minor 2nd lower (thus producing an augmented 4th).

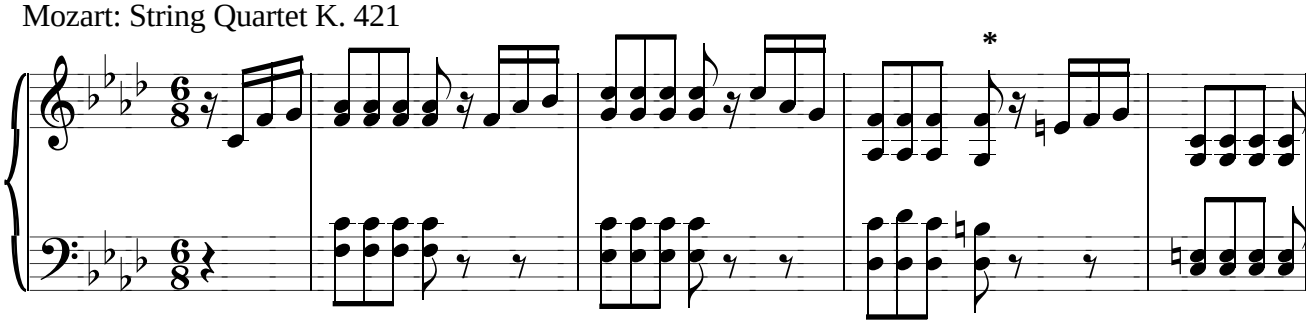
C. The Italian sixth chord (It 6) is like the German, but with the 5th removed.[52]

[52] N.B. The above are the most common positions of the augmented sixth chords. In less common positions, the augmented sixth is transformed into a diminished third.

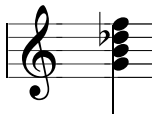
Identification of Augmented Sixth Chords from Notation

(With the following example from a work by Mozart)

Mozart: String Quartet K. 421

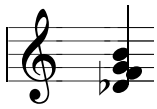


1. As with all other chords you want to identify, begin by stacking the chord tones in 3rds. *In the example above, we will stack the tones of the asterisked chord in thirds:*



2. The chord, as stacked in 3rds, will resemble a triad or a seventh chord, but if you try to name it, you will discover an interval that is never present in triads and seventh chords, namely the diminished 3rd. *In the above example, the diminished third occurs between B natural and D flat.* The presence of this interval should act like a RED FLAG, telling you that the chord is some sort of Augmented sixth chord.

3. Once you have encountered an Augmented Sixth Chord, the way to identify it by type is to place it in augmented sixth position. (This can be done by placing the upper tone of the diminished 3rd in the bass.) *In the above example, the chord would look like this:*



4. Now, read the figured bass, by measuring all the intervals above the bass tone.
   a. If the position is $\begin{matrix}6\\5\end{matrix}$, the chord is German.
   b. If the position is $\begin{matrix}4\\3\end{matrix}$, the chord is French.
   c. If the position is 6, the chord is Italian.

In the case of the above example, the figures are a sixth (D-flat to B), a fourth (D-flat to G) and a third (D -flat to F). The figured bass is, therefore, $\begin{matrix}6\\4\\3\end{matrix}$ *, or* $\begin{matrix}4\\3\end{matrix}$.

The chord is thus a French Augmented Sixth chord.

~~*.chord is thus a French Augmented Sixth chord.*~~

5. Finally, read the figured bass of the chord as it actually appears in the score. These chords appear most commonly with an augmented sixth interval made with the bass note. *This is the case with the present example.* Occasionally, however, the augmented sixth chords appear in other positions. Your final answer will include the name of the chord type, followed by the position numbers, e.g., German $\frac{6}{5}$, German 2, French $\frac{4}{3}$, French $\frac{6}{5}$, Italian 6, Italian $\frac{6}{4}$, etc. *In the present example, the chord is French* $\frac{4}{3}$.
6. Remember that most augmented sixth chords function in relationship to the dominant, and are thus secondary chords. Remember also that these chords all have a vestige of dominant function, and that the position numbers provide absolutely no information about their functional root.

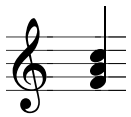
THE CHORD OF THE NEAPOLITAN SIXTH

1. The so-called Neapolitan Sixth (or N^6) chord is a chromatic chord consisting both of structural tones and of "fused" complementary tones.

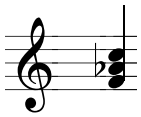
2. The subdominant triad is the ancestor of the Neapolitan chord.

3. Here are the steps in the evolution of the Neapolitan chord:

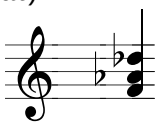
   a. Begin with a subdominant triad in $\begin{smallmatrix}5\\3\end{smallmatrix}$ position (e.g., F-A-C in C major):



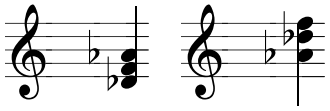
   b. Mutate the triad so as to create a half-step resolution downward by lowering the 3rd of the chord a chromatic half step (e.g., F-A flat-C):



   c. Create an additional half-step resolution by raising the 5th of the chord a diatonic half step (e.g., C to D flat):



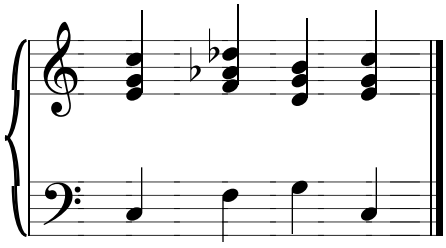
4. The Neapolitan sixth is a chord in $\begin{smallmatrix}6\\3\end{smallmatrix}$ position with a tertian root on "ra." The Neapolitan chord sometimes appears in positions other than 6. It is then referred to either as N ($\begin{smallmatrix}5\\3\end{smallmatrix}$) or N $\begin{smallmatrix}6\\4\end{smallmatrix}$:



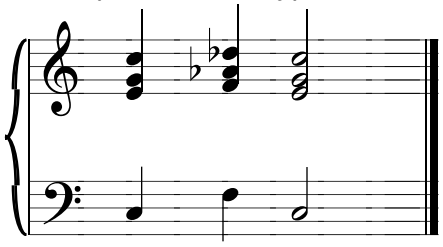
5. The functional root of the Neapolitan is the fourth degree (IV), or the subdominant.

6. The syllables for N 6 in any key are fa-le-ra.

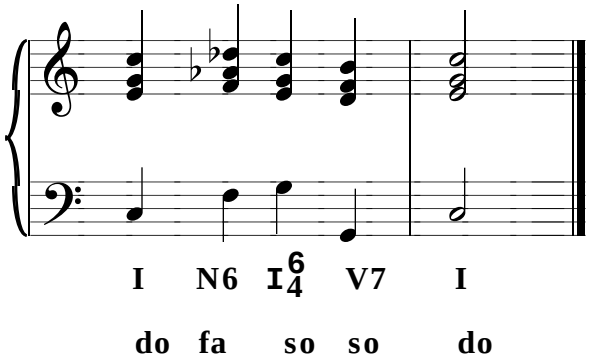
7. The Neapolitan chord most usually resolves to a dominant chord:



8. The Neapolitan chord can also (less commonly) resolve directly to the tonic:

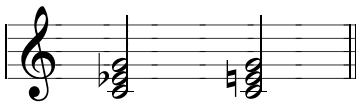
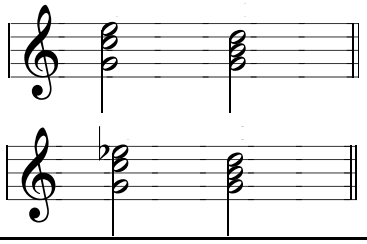
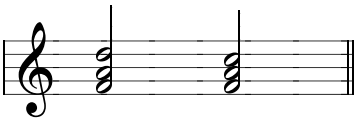
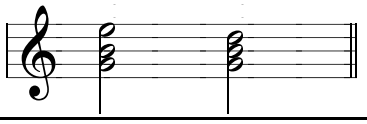
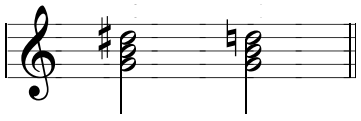
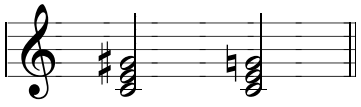


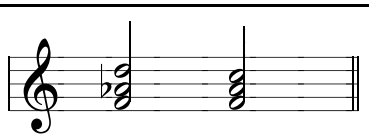
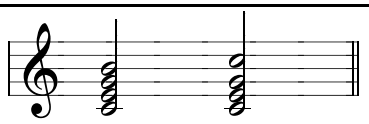
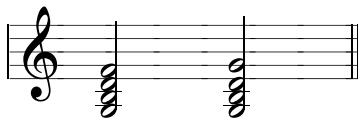
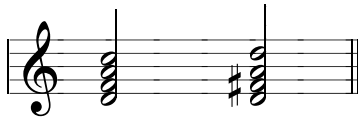
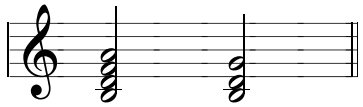
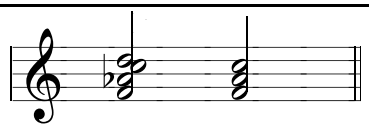
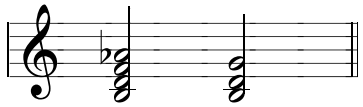
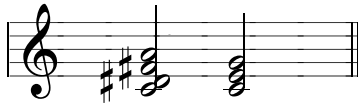
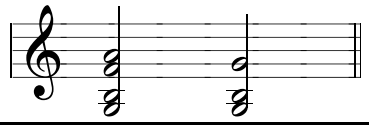
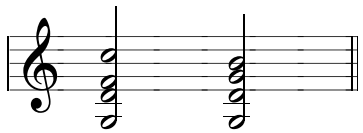
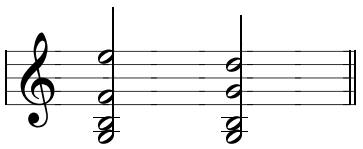
The common tertian progression I - N 6 - I^{6}_{4} - V^{7} - I is functionally a progression of I - IV - V - I.

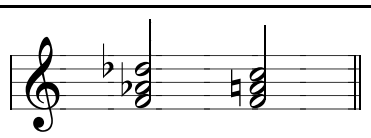
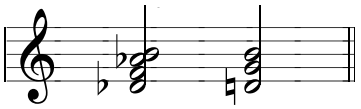
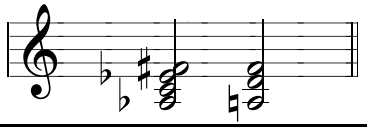
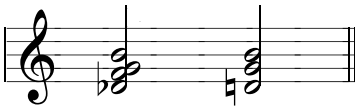
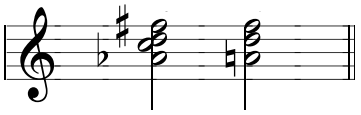
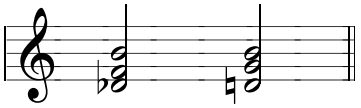
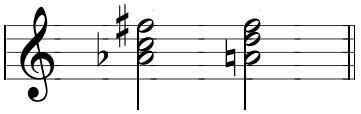


CHORDS CONTAINING COMPLEMENTARY TONES

In a sense, the only really structural chord is the major triad. If one takes this (admittedly extreme) approach to harmony, then all other chords must be said to contain complementary tones, i.e., tones that substitute for structural tones. The following chart demonstrates the implications of this position.

Chord	Tertian Root	Complementary Tone(s)	Functional Root	Notation
Minor $\frac{5}{3}$	do	me (replacing mi)	do	
Cadential $\frac{6}{4}$ (major or minor)	do	mi (me) & do replacing re & ti	so	
Complementary $\frac{6}{4}$	varies with the context	varies with the context	varied	
Minor $\frac{6}{3}$	re	re (replacing do)	fa	
Minor $\frac{6}{3}$	mi	mi (replacing re)	so	
Minor $\frac{6}{3}$	la	la (replacing so)	do	
Augmented triad	so	ri (replacing re)	so	
Augmented triad	do	si (replacing so)	do	
Diminished triad	ti	fa (replacing so)	so	

Diminished triad (especially in 6 position)	re	re (replacing do)	fa	
Major-major seventh chord	do	ti (replacing do)	do	
Major-minor seventh chord	so	fa (replacing so)	so	
Minor-minor seventh chord	re (or mi, or la)	do (replacing le) (etc.)	re	
Half diminished seventh chord	ti	fa & la (replacing so & so)	so	
Half diminished seventh chord (esp. in $\frac{6}{5}$ position	re	re (replacing do)	fa	
Diminished seventh chord	ti	fa & le (replacing so & so)	so	
Diminished seventh chord	do	re & fi & la (replacing mi & so & so)	do	
Diminished seventh chord	ra	ambiguous	ambiguous	
Dominant ninth chord	so	fa & la (or le) (replacing mi & so & so)	so	
Dominant eleventh chord	so	fa & do (replacing so & ti)	so	
Dominant thirteenth chord	so	fa & mi (replacing so & re)	so	

Neapolitan Sixth chord	r a	ra [& le] (replacing do [& la])	s o [or d o]	
German Augmented Sixth chord (primary)	t i	ra & fa & le (replacing re & so & so)	s o	
German Augmented Sixth chord (secondary)	f i	le & do & me (replacing la & re & re)	s o of s o	
French Augmented Sixth chord (primary)	t i	ra & fa (replacing re & so)	s o	
French Augmented Sixth chord (secondary)	f i	le & do (replacing la & re)	s o of s o	
Italian Augmented Sixth chord (primary)	t i	ra & fa (replacing re & so)	s o	
Italian Augmented Sixth chord (secondary)	f i	le & do (replacing la & re)	s o of s o	

It is important to remember that this view of harmony is merely one of many. However, what it says about musical structure is important.

Some Basic Concepts to be used in the Analysis of
PHRASE STRUCTURE

Phrase: A more of less complete musical thought that terminates in a feeling of relative repose at a cadence. Within a phrase other points of rest without the force of a cadence may be found; these may be called caesuras.

Cadences may be categorized by melodic-harmonic and by metrical character. The former class comprises authentic and plagal cadences, that are conclusive, half and deceptive cadences, that are inconclusive, and numerous others which do not have specific names. The second class comprises accented and unaccented cadences.

Phrase Connections - In order to avoid excessive discontinuity, phrases are often connected together by each of the following means:

a. continued rhythmic activity in the accompaniment after the cadence.

b. a melodic link after the cadence.

c. an elision of two phrases, in which the last note or chord of one phrase serves also as the first of the next phrase.

d. in contrapuntal textures, phrases in different voices may end at different times. This is called overlapping phrase structure.

Division of Phrases - Most phrases can be divided into smaller units; sometimes caesuras within a phrase accomplish this.

Motive - Phrases are frequently made up of motives, i.e., short melodic-rhythmic fragments that are recognizable in themselves, containing usually from two to six notes. Motives may be varied by ornamentation, interval change, inversion, retrogression, augmentation, or diminution. In an accompaniment or a contrapuntal texture, motives may appear in imitation among the several voices, possibly varied.

Development of Phrases - Phrases may be extended from their normal length by each of the following means:

a. Introduction - before the phrase proper begins, an introduction (of less extent than another complete phrase) may be provided by a number of means, among which are a few measures of accompaniment alone, a few chords, and a few melodic tones not clearly part of the phrase.

b. Interpolation - once a phrase has been stated, a restatement may be elongated by some insertion in the middle of a phrase, quite possibly a repetition or sequential restatement of some motive within the phrase. Note that most of the time an original form of the phrase is available for comparison to establish the fact of interpolation, but some phrases give clear indications of interpolation without prior examples.

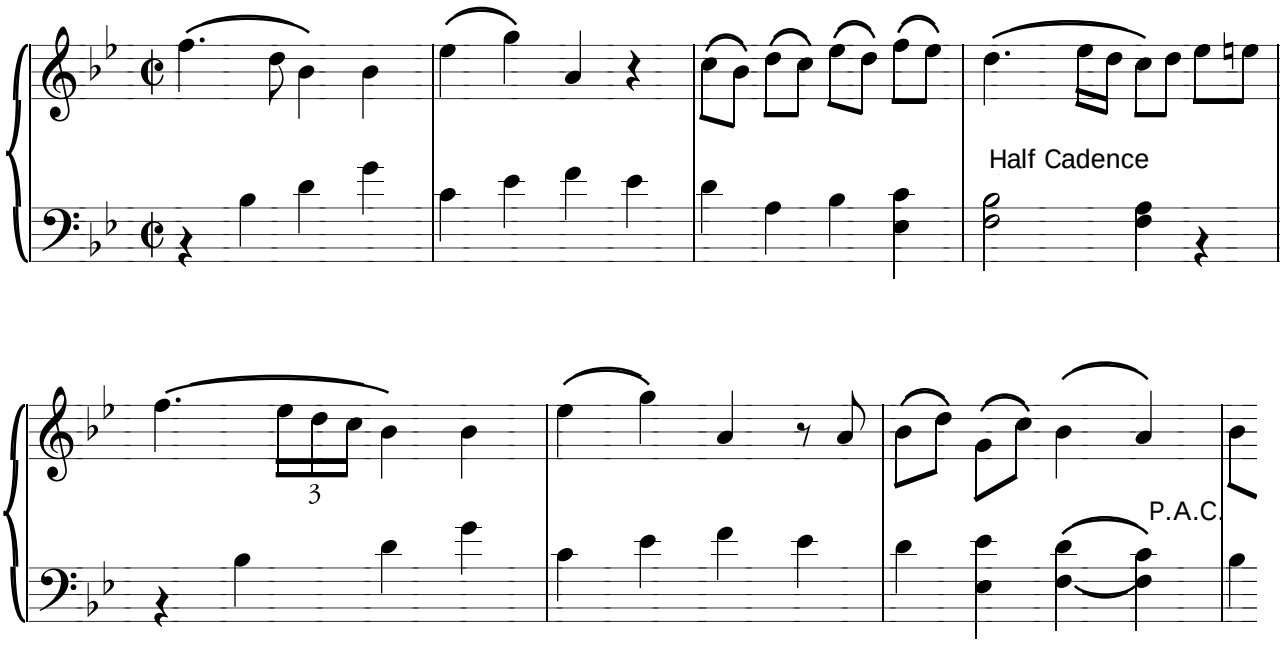
c. Extension - after what would be the end of the phrase is reached, an elongation may be accomplished by retaining the final chord for additional measures, repeating the closing portion of the phrase either literally or in sequence, or by evading the final cadence on the first approach, then making it on the second try.

Combination of Phrases - Units of two or more phrases may be formed. These include the following types:

a. Phrase Chain - two or more phrases that form a contextual unit, that are not similar melodically, and that end with an inconclusive cadence.

b. Phrase Group - two or more phrases that form a contextual unit, that are similar melodically, and that end with an inconclusive cadence.

c. Period - two or more phrases that form a contextual unit, that may or may not be similar melodically, in which the last phrase ends with a conclusive cadence of greater strength than any other cadence in the unit. Here is an example of a two-phrase period in Mozart, taken from the finale of the Piano Sonata in B♭ K. 333:



A Beginning Method for Dealing with

INSTRUMENTAL TRANSPOSITION

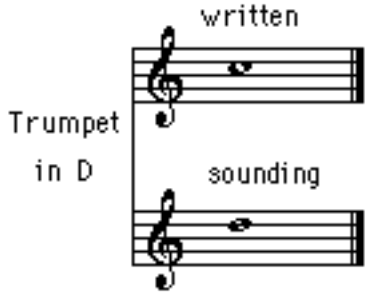
Transposing instruments read musical notation in one key and sound in another. It is therefore necessary to learn how to interpret the sound of a written, transposed part, and also how to write a transposed part for a particular instrument. Here are some guidelines:

1. The key in which the transposing instrument is pitched is usually given on a musical score. Examples include: Trumpet in Bb, Clarinet in A, Horn in F, Trumpet in D, etc.

2. In each case, the key in the instrument's description gives the following information: When the instrument in question reads the note C, the sound that it makes is the same as the key of the instrument. For example, when a Trumpet in B flat reads a C, the sound it makes is a B flat. (The sounding key is referred to as *concert pitch*.)

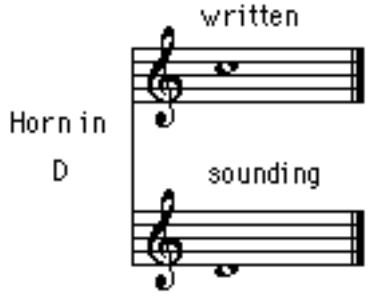
3. The direction of transposition from written to sounding pitch is variable. Some instruments sound higher than their written pitches, others lower. In most cases, the following rule applies:

The direction of transposition generally involves going the shortest distance (smallest interval) from written to sounding pitch. For example, consider the D Trumpet. Going from C the transposition might be up a M2 or down a m7. The M2 is closer; therefore the D Trumpet transposes up.

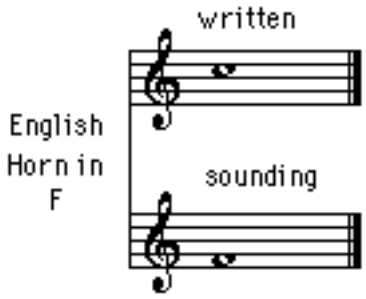


Exceptions

A. All French Horns transpose down, regardless of interval size. E.g., a Horn in D sounds a m7 below its written pitches.



B. Larger versions of standard instruments transpose down. E.g., the English Horn in F (a larger version of the oboe) transposes down a P5. Others in this category are alto flute & saxophones.



C. Most instruments normally reading bass clef play in concert pitch even if pitched in a different key, e.g. Eb tuba.

D. Contra instruments (string bass, contrabassoon, etc.) sound an octave lower than written.

E. The C piccolo sounds an octave higher than written.

Solving a Specific Transposition Problem

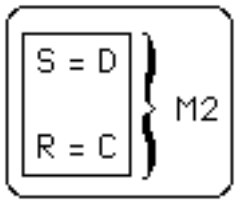
A Trumpet in D is reading E flat; what pitch is sounding?

Begin by making a transposition box as follows:

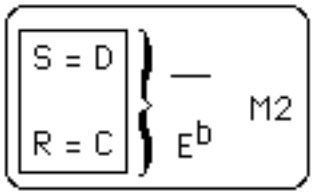
a. Write down R=C. [The meaning of this is "when the instrument (in this case a trumpet) reads C...]

b. Consider whether the instrument in question transposes up or down. Since the D Trumpet transposes up, write S=D above the R=C. [The meaning of this is "the instrument sounds the D above.] The box now says: "When the Trumpet in D reads C it sounds the D above."

c. Write in the interval of transposition. In the case of the Trumpet in D, this interval is a M2, and the transposition box would look like this:

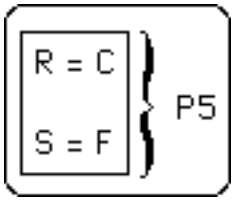


d. Now you're ready to solve the specific problem. The information given is that the trumpet is reading an Eb. Place the Eb on the R (read) line:



The blank space in the sounding line can now be filled in. The box says: "The sounding pitch is a M2 above Eb. The answer is F.

e. For a Horn in F, the transposition is down. The box should therefore look like this:



The box says: "When the Horn in F reads C, it sounds the F below.

TABLE OF TRANSPOSING AND NON-TRANSPOSING INSTRUMENTS

Non-Transposition Instruments

Instrument	Abbreviation	Pitched in	Interval of Transposition
flute	fl	C	none
oboe	ob	C	none
bassoon	bsn	C	none
trumpet	tr	C	none
trombone(s)	tb	C	none
tuba	tuba	various[53]	as written
violin	vn	C	none
viola	vla	C	none
violoncello	vlc	C	none

Octave Transposition

piccolo	picc	C	up an octave
contrabassoon	cbsn	C	down an octave
string bass	bass	C	down an octave

Transposition by Smallest Interval

clarinet	cl	B flat	down a major second
clarinet	cl	A	down a minor third
clarinet	cl	D	up a major second
clarinet	cl	E flat	up a minor third
trumpet	tr	B flat	down a major second
trumpet	tr	D	up a major second
piccolo trumpet	picc. tr	F	up a perfect fourth

Transposition Down

English horn	E.H.	F	down a fifth
bass clarinet	b.cl	B flat	down a major ninth (up a step when reading in bass clef)
horn[54]	hn	F	down a perfect fifth
horn	hn	B flat	down a major second
horn	hn	E flat	down a major sixth
horn	hn	D	down a minor seventh
euphonium	euph.	B flat	down a major ninth
soprano saxophone	sop. sax	B flat	down a major second
alto saxophone	alt. sax	E flat	down a major sixth

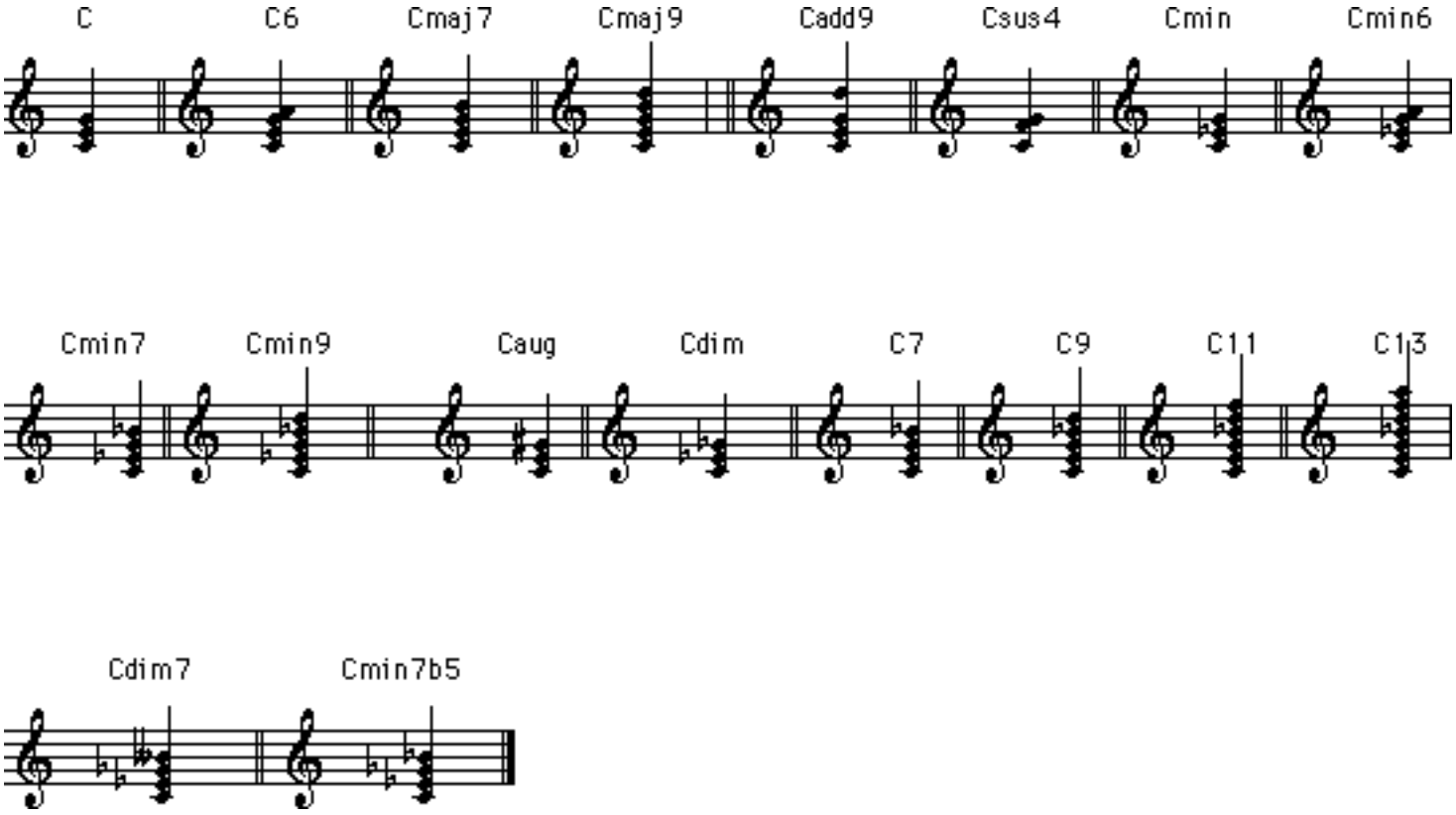
[53] Although tubas are naturally pitched in several keys, they are always written as though they were non-transposing instruments. Players must learn alternate fingerings for the various tubas.

[54] It has been traditional for horn parts to be written without a signature, even when they are playing in (written) keys other than c. Any required accidentals are added to the notes rather than appearing in the signature. In more recent times, some composers have included signatures in their horn parts.

tenor saxophone	ten. sax	B flat	down a major ninth
baritone saxophone		E flat	down a major thirteenth

COMPENDIUM OF CHORD SYMBOLS

in Lead Sheet Notation



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