

Chapter 1

Fundamentals

1.1 Pitch

Definition 1 (Pitch) *Pitch is the property of the sound which allows a relative ordering of perceived sounds on a frequency-related scale.*

On a keyboard, pitch goes up to the right of the keyboard, while it goes down on the left.

Pitches are expressed through **notes**. There are 7 note names¹, which are repeated in **octave registers**, identified by the bottom number.

$$\cdots A_3 B_3 \underbrace{C_4 D_4 E_4 F_4 G_4 A_4 B_4}_{\text{Octave register 4}} C_5 D_5 \cdots$$

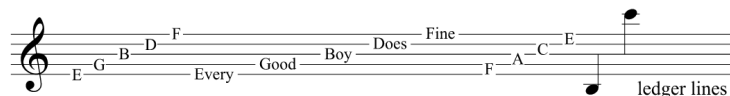


Figure 1.1: Treble clef

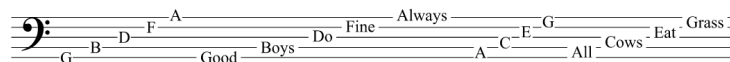


Figure 1.2: Bass clef

Definition 2 (Octave) *The distance / interval between two notes with the same name.*

¹C-B in anglophone countries, C-H in Germany and Do-Si for the rest of Europe.

Figure 1.3: The Grand Staff (a specific stave *system*)

Definition 3 (Middle C) The C_4 pitch, usually located in the middle of a keyboard (on the instrument) and always annotated in the middle of the grand staff, shared by the two staves.

Definition 4 (Accidental) A symbol placed before a note to raise / lower its pitch by a given amount.

An accidental is effective only for a measure. They affect the entire piece if they are placed before the clef in a **key signature**.

\flat	Flat	−1 half step
\sharp	Sharp	+1 half step
$\flat\flat$	Double flat	−2 half steps / −1 whole step
$\sharp\sharp$	Double sharp	+2 half steps / +1 whole step
\natural	Natural	Cancels preceding accidentals

There exists also **half-accidentals**, whose altered notes cannot be played on a keyboard.

Definition 5 (Half step) On the keyboard, the distance / interval between one key (either black or white) and the next (either black or white).

Definition 6 (Whole step) The interval made up of two half steps.

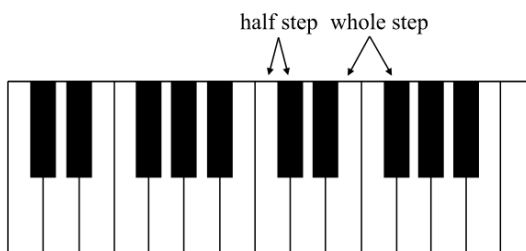


Figure 1.4: Half steps and whole steps

Definition 7 (Enharmonic) Which has the same sound, but different name.

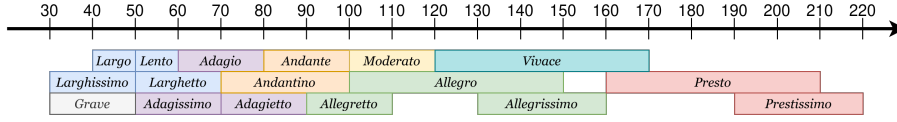


Figure 1.5: Common Italian metronome markings

1.2 Rhythm

Definition 8 (Beat / pulse) *The basic pulse underlying measured music and thus the unit by which musical time is reckoned.*

Definition 9 (Tempo) *Speed of the beat.*

The tempo is usually expressed through metronome markings in **BPM / Beats Per Minute**.

1.2.1 Time signatures

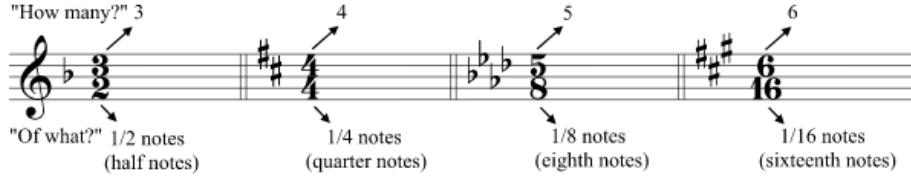


Figure 1.6: Meaning of the time signatures

1.2.2 Note / rests durations

Both notes and rests last for certain duration, which is always a 2^n number of beats, where $n \in \mathbb{Z}$. Common values for 2^n are the following ones:

$$\left\{ 4, 2, 1, \frac{1}{2}, \frac{1}{4} \right\} \text{ beats}$$

Values different from these ones can be gathered through **ties** and **dots**. A dot adds $\frac{1}{2}$ the value of the note dotted, while a double dot adds $\frac{1}{2} + \frac{1}{4}$ the original value.

1.2.3 Meters

Definition 10 (Meter) *Describes the number of beats in a measure / bar and how they are divided.*

Simple meters break the beat into 2 parts, while **compound meters** break it into 3 parts.

They can be **double** (2 beats / bar), **triple** (3 beats / bar) or **quadruple** (4 beats / bar).

Simple or Compound?	Duple, Triple, Quadruple?	Beat Grouping	Beat Division	Example Time Signatures
Simple	Duple	2	2	$\frac{2}{4}$ $\frac{2}{8}$ $\frac{2}{2}$ $\frac{2}{16}$
Simple	Triple	3	2	$\frac{3}{4}$ $\frac{3}{8}$ $\frac{3}{2}$ $\frac{3}{16}$
Simple	Quadruple	4	2	$\frac{4}{4}$ $\frac{4}{8}$ $\frac{4}{2}$ $\frac{4}{16}$
Compound	Duple	2	3	$\frac{6}{8}$ $\frac{6}{4}$ $\frac{6}{16}$
Compound	Triple	3	3	$\frac{9}{8}$ $\frac{9}{4}$ $\frac{9}{16}$
Compound	Quadruple	4	3	$\frac{12}{8}$ $\frac{12}{4}$ $\frac{12}{16}$

Figure 1.7: Meters

The meter is traditionally identified by the time signature.

When a piece shifts between time signatures / meters often the composers employ a **metric modulation**.

Definition 11 (Metric modulation) *A change in tempo or subdivision, suggested by a change of meter.*

1.2.4 Triplets

Definition 12 (Triplet) *Rhythmic grouping of notes which would typically not occur in the specified meter.*

Definition 13 (Duplet / Triplet / Quadruplet / Quintuplet) *Common triplet instances.*

Definition 14 (Drag triplet) *A common type of triplet, made up of quarter notes. They are called in this fashion because the rhythm seems to drag.*

A drag triplet is also a common example of **hemiola**.

Definition 15 (Hemiola (rhythm)) *In rhythm, playing a pattern of 3 against a pattern of 2 (e.g. a drag triplet against 2 quarter notes).*

1.2.5 Accents and syncopation

A certain meter / time signature usually implies a certain beat hierarchy. That is, some beats are played with stronger / weaker emphases:

• 4/4: • • • •

- 12/8: $\bullet \cdot \circ \cdot$ (es. *Nightmare King*)
- 2/4: $\bullet \cdot$
- 6/8: $\bullet \cdot$ (es. *White Palace, Tarantella Napoletana*)
- 3/4: $\bullet \cdot \cdot$ (es. *Valse di Fantastica*)
- 9/8: $\bullet \cdot \cdot$
- 3/8: \bullet (feels like 1 beat per measure)
- 2/2: $\bullet \bullet$

This should also explain why some pieces are better written as 2/4 over 4/4: because the beat hierarchy in the measures is different.

Definition 16 (Downbeat) *The first beat in a measure. Usually it is played with a very strong emphasis.*

Through **accents**, **ties** and **rests** it is possible to alter this rhythmic framework, obtaining **syncopation** in the process.

Definition 17 (Syncopation) *Playing music with a stronger emphasis on the weak beats and / or a weaker emphasis on the strong beats.*

Through syncopation some notes can also be played on the *offbeats*.

Definition 18 (Offbeat) *Which is not a beat.*

1.2.6 Irregular meters

These meters can be explained by thinking of normal meters with an uneven beat duration. That is, every measure has a fixed number of beats, but with different beat durations.

- 5/4: 5 uneven beats (es. *Mars, Bringer of War, Cinco de Chocobo*)
 - $3 + 2 : \bullet \cdot \cdot \circ \cdot$
 - $2 + 3 : \circ \cdot \bullet \cdot \cdot$
- 7/8: 3 uneven beats (3-2-2, 2-2-3).
- 13/8: 5 uneven beats (3-3-2-2-3, etc.).

1.2.7 Swing

Swing can be conceptualized as a way to write 6/8 in 4/4. The metronome text usually shows whether the 8th or 16th notes should be swung.

The opposite of a swing rhythm is called **straight** rhythm.

1.3 Dynamics

Dynamics hint at the volume of a given music segment. Often they range between *ppp* and *fff*. The intermediate dynamic *mf* is often used as a standard base volume.

n stands for *niente*, and it is usually used at the end of a decrescendo.

fp means to play the note as *f*, but then quickly fade to *p*.

sfz and *rfz* instead indicate to play a single note stronger than the surrounding ones.

1.4 Control structures

In a concert score setting often some parts do not need to play for a long number of measures. This situation is notated through a **multirest**.

1.4.1 Repeats

Repeats are sometimes highlighted with wings-like decorations, with the only purpose of making them stand out more.

Definition 19 (Segno) *Used as a landmark in a **D.S.** marking. **D.S.** means to play from the segno.*

Definition 20 (Coda) *Used as a landmark in a **Al coda** marking. **Al coda** means to play till the coda, then to continue playing the separate coda.*

Note that during a **D.C** or **D.S.** notation, repeats are *not* performed for a second time.

1.5 Articulations

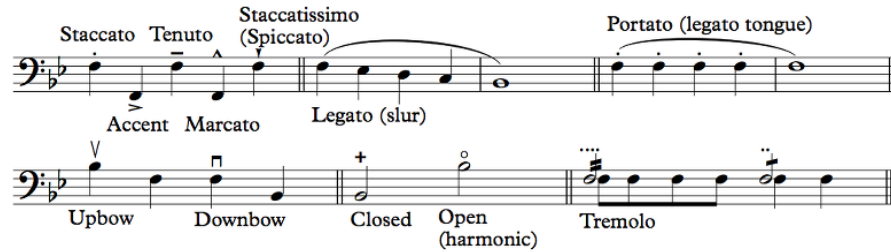


Figure 1.8: Articulations

There a variety of articulations used to tell the player how to produce the sounds. The meaning of these often varies from instrument to instrument:

Definition 21 (Staccato) *Play the note short, lightly and briefly detached from the next and the previous ones.*

Definition 22 (Accent) *Emphasize the note, with a quick attack and a gentle decay / release.*

Definition 23 (Marcato) *Emphasize the note with a strong attack and a quick release / decay.*

Definition 24 (Tenuto) *The player should be careful as to keep the note for its whole duration.*

Definition 25 (Staccatissimo) *A stronger staccato.*

Definition 26 (Spiccato) *Exclusively used in string instruments. Means to lightly bounce the bow upon the strings.*

Definition 27 (Portato) *A legato-staccato. Usually means to play the notes with a light disconnection between them.*

Definition 28 (Upbow & Downbow) *Indicates a corresponding motion of the bow on string instruments. The downbow is usually stronger.*

Definition 29 (Closed / Mute & Open) *Usually used on percussion and brasses. These indicate whether the sound should be muted (through the sordino, the hand, etc.) or left open to ring.*

Definition 30 (Tremolo (single-note)) *Repeat the note 2^n times, where n is the number of strips on the stem.*

Definition 31 (Tremolo (two-note)) *Quickly alternate between the notated pitches. The actual speed of the tremolo is usually derived from context (usually: one strip \Rightarrow 8th notes).*

Definition 32 (Arpeggio) *Play a series of notes in a quick sequence, but not simultaneously.*

Definition 33 (Glissando) *A quick run through all the notes between the notated ones. On piano, usually only the white notes are played.*

Often a glissando may be actually notated note per note, in which case it is called a **run**. Notes in a run should not be played too carefully; instead, the player should focus on the whole sequence speed.

A glissando is a *discrete* change of pitch, but some instruments are able to produce a *continuous* change of pitch (e.g. trombone, timpani, strings, voice).

Definition 34 (Portamento) *A continuous glissando.*

Definition 35 (Vibrato) *Periodic variation of a sound pitch. It is not notated.*

Definition 36 (Scoop / Doit / Plop / Fall) *Jazz articulations. A note is started a little² lower / higher or is terminated a little lower / higher.*

²Subjective.



Figure 1.9: Scoop / Doit / Plop / Fall

1.6 Ornaments

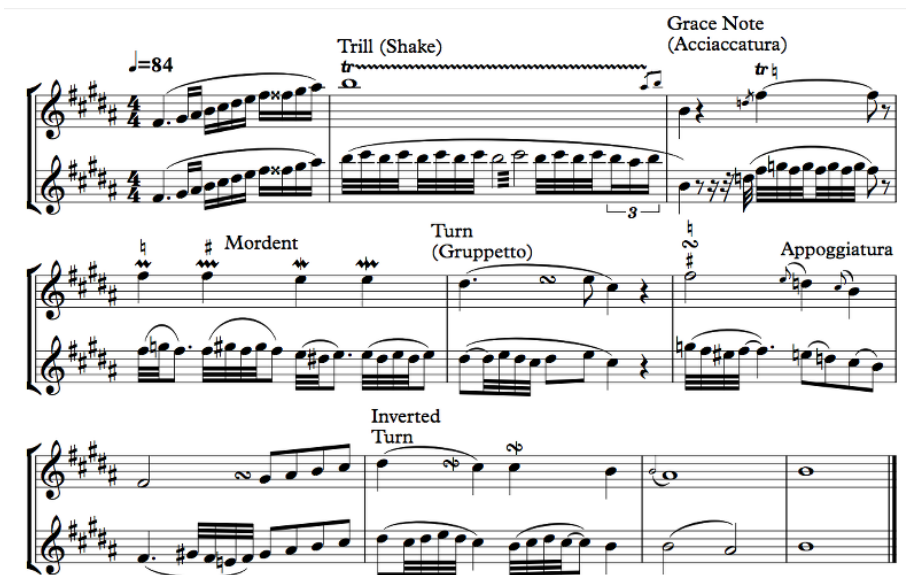


Figure 1.10: Ornaments

Ornaments differ from articulations in the sense that they are non-essential additions of notes used to make the melody prettier.

Definition 37 (Trill) *Play the note, then rapidly alternate between it and the note above it, in the key. The note above can be changed through an accidental above the trill marking.*

A wavy line on the trill allows for a clear definition of the trill extent / duration, but it is entirely optional.

Definition 38 (Grace note) *A little note that steals time from the surrounding notes.*

Definition 39 (Acciaccatura) *A grace note played very quickly before the attached note it is attached to.*

Definition 40 (Appoggiatura) *A grace note which takes time from the note which it is attached to.*

They are rarely used nowadays, as they can be expressed through conventional notation.

Definition 41 (Mordent) *Quickly goes up a note (in the key) then goes down (or viceversa, indicated by a line through).*

The actual note of the mordent can be changed through accidentals. A longer mordent instead can be used to hint a double duration.

Definition 42 (Turn / Gruppetto) *Goes up a note, then down to it, then down again, then up back at it.*

It is rarely used nowadays, as it can be expressed through conventional notes or grace notes.

A turn can be inverted (down, up, up, down) with a line through.

1.7 Stopping the time / tempo alterations

Definition 43 (Fermata / Corona) *Hold the note for as long as you want. In an ensemble, you have to look to your conductor.*

When on a rest, it just means to take a free pause.

As an heuristic, most of the times you just hold the note with a fermata for two times its duration.

Definition 44 (Breath mark) *In voice or wind instruments parts, used to mark suitable times for breathing.*

Definition 45 (Caesura) *An arbitrary time of silence.*

Definition 46 (Grand Pause) *A whole measure of silence.*

Compared to the caesura, the grand pause is a rest, but with a planned and well-defined time duration. It is seldom used to mark measures when the whole ensemble should stay silent.



Figure 1.11: Examples of tempo modifications

Chapter 2

Scales

2.1 Major scale

Definition 47 (Tetrachord) *A 4-note scale segment with the following steps: $W - W - H$.*

Definition 48 (Major scale) *A 8-note scale made up of 2 tetrachords, joined by a whole step.*

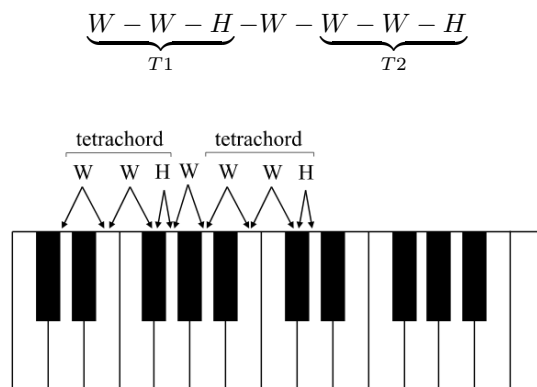


Figure 2.1: Tetrachords in a (D) major scale

A major scale uses all the 7 notes in order. No one is skipped and there are no duplicates.

2.1.1 Key signatures

There are 15 major key signatures:

- 1 with no accidentals: C Major.
- 7 with 1 to 7 flats.
- 7 with 1 to 7 sharps.



Figure 2.2: Major key signatures (sharps)



Figure 2.3: Major key signatures (flats)

A key signature can be quickly identified with the following mnemonic:

- With *sharps*: +1 half step from the last “sharped note”.
- With *flats*: the second to last flat is the key (along with the flat).

2.2 Minor scales

In contrast to major scales, there are 3 different minor scales. They all follow the following formulas, while the melodic minor is only used as an *ascending* scale (the *descending* part is the same as the natural minor scale).

2.2.1 Key signatures

In respect to the major keys, minor keys can be derived by adding 3 flats (or subtracting sharps and adding flats if needed).

In doing so, the corresponding major scale will also have three of its scale degrees lowered, resulting in what is called a **parallel** minor scale.

Definition 49 (Parallel scale relationship) *Two major / minor scales with the same 1st scale degree.*

On the other hand, if it is the key signature to be shared, then we call it a **relative** minor key.

Definition 50 (Relative key relationship) *Two major / minor key signatures with the same key signature.*

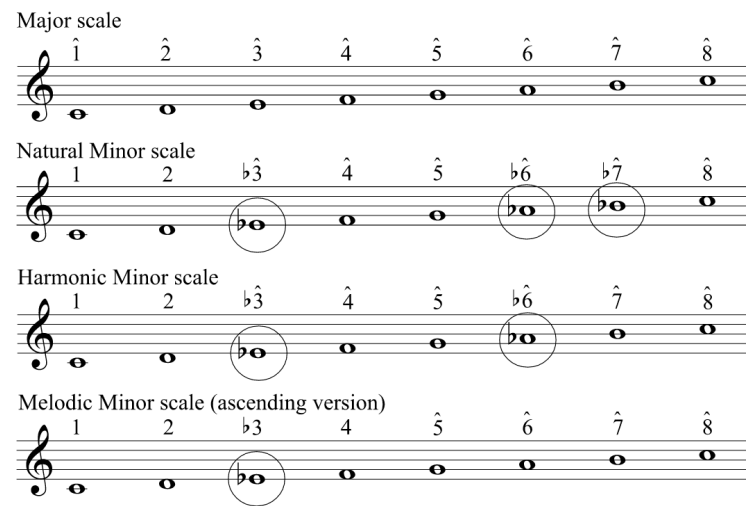


Figure 2.4: Minor scales

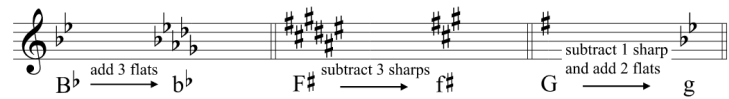


Figure 2.5: Parallel relationship

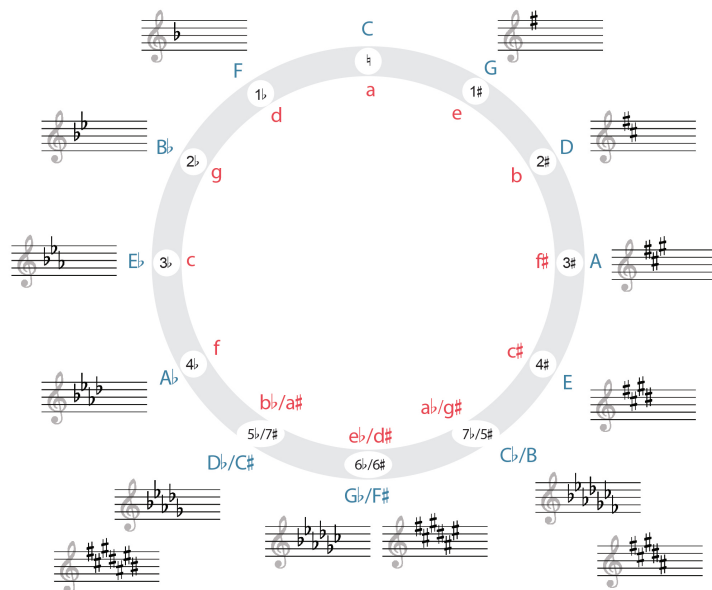


Figure 2.6: Circle of fifths

2.3 Circle of fifths

The circle of fifths is a convenient aid for the visualization of both minor and major keys and scales:

- To the right, we add sharps / remove flats and we go up a 5^{th} .
- To the left, we remove sharps / add flats and we go down a 5^{th} .

2.4 Key signature identification

Given a piece of sheet music we can devise its key signature as follows:

1. Through the number of flats / sharps we restrict ourselves to 2 key signatures: a major one and a minor one.
2. The tonic can help us do the final discrimination. Usually the tonic note is located at the beginning / end of the piece either in the lower or upper parts.