

AUDITIVE GESTALTUNG

Rhythm, Beat and Drum Pattern

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1 Rhythm

Rhythm (from Greek ρυθμός – *rhythmos*, "any regular recurring motion, symmetry") is defined by the Oxford English Dictionary as a "movement marked by the regulated succession of strong and weak elements, or of opposite or different conditions."

Rhythm is the timing of musical sounds and silences, as well as speech syllables. While rhythm most commonly applies to sound, such as music and spoken language, it may also refer to visual presentation, as "timed movement through space", such as in dance, video or film arts.

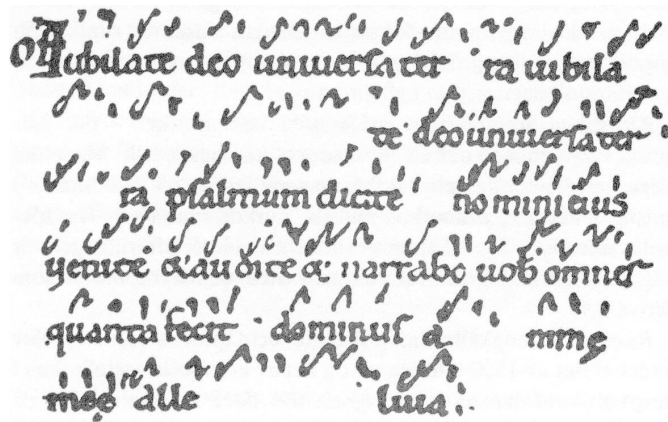
1.1 Origins

At the most basic level, rhythm relates to our body: how we walk, our heartbeat, our breathing. Our urge to move in rhythm (dance) is probably designed to boost our energy level to prepare for a chase, a fight or a flight. Perceiving rhythm is the ability to master the 4th invisible dimension: time, and appears to be a unique trait in humans (animals show no similar appreciation of rhythm).

1.2 Early Notation

In Western music, notation specifying longer and shorter note values evolved from the "Neume" notation type, prior to the invention of five-line staff. The earliest neumes were inflective marks which originally indicated the general shape and duration, but not necessarily the exact notes or rhythms to be sung.

The earliest notation for Western plainchant appears in the 9th century (Metz, northeast France). These early staffless neumes, called cheironomic or "in campo aperto", appeared as freeform wavy lines above the text. A single neume could represent a single pitch, or a series of pitches all sung on the same syllable.



Psalm "Iubilate deo uniuersa terra" - cheironomic neumes

In the early 11th century, Beneventian neumes (from the churches of Benevento, southern Italy) were written at varying distances from the text to indicate the overall shape of the melody. Such neumes are called "heightened" or "diastematic". Short after, one to four staff lines clarified the exact relationship between pitches. One line was marked as representing a particular pitch, usually C or F. It is believed that this innovation was introduced by **Guido d'Arezzo**, an Italian Benedictine monk who lived from 995–1050.

Guido D'Arezzo's achievements paved the way for the modern form of written music, music books, and the modern concept of a composer.

He named musical notes based on an ancient hymn dedicated to Saint John the Baptist, called *Ut queant Laxis*, written by the lombard historian **Paul the deacon**. The first stanza is:

1. **Ut** queant laxis
2. **re**sonare fibris,
3. **Mi**ra gestorum
4. **fa**muli tuorum,
5. **So**lue polluti
6. **la**bii reatum,
7. **San**cte **I**ohannes.

Guido used the first letters of each verse to name the Solfège syllables: Ut, Re, Mi Fa, Sol, La, and Si (the exception being Si, which has the S of Sancte and the I of Iohannes)

In the 13th century, "Sarum" chant was notated using square noteheads, a practice which later spread throughout Europe. By the 13th century, the neumes of Gregorian chant were usually written in *square notation* on a staff with four lines and three spaces, and a "clef" marker.

Square Notation

In square notation, small groups of ascending or descending notes are written with diamonds read from left to right.



"Gaudeamus omnes," from the Graduale Aboense - square notation.

Solesmes Notation

Various manuscripts and printed editions of Gregorian chant, using varying styles of square-note neumes, circulated throughout the Catholic Church for centuries. Some editions added rhythmic patterns, or meter, to the chants. In the 19th century the monks of the Benedictine abbey of Solesmes, particularly Dom Joseph Pothier (1835–1923) and Dom André Mocquereau (1849–1930) collected facsimiles of the earliest manuscripts and published them in a book called **Paléographie musicale**. They also assembled definitive versions of many of the chants, and developed a standardized form of the square-note notation which was adopted by the Catholic Church and is still in use in publications such as the **Liber Usualis** (although there are also published editions of this book in modern notation).

Rhythmic Interpretation

Common modern practice, following the Solesmes interpretation, is to perform Gregorian chant with no beat or regular metric accent, in which time is free, allowing the text to determine the accent and the melodic contour to determine phrasing. By the 13th century, with the widespread use of square notation, it is believed that most chant was sung with each note getting approximately an equal value, although Jerome of Moravia cites exceptions in which certain notes, such as the final notes of a chant, are lengthened.

1.3 Metrical Foot (Versfuß)

In verse, many meters use a **foot** as the basic unit in their description of the underlying rhythm of a poem. Both the *quantitative meter* of classical poetry and the *accentual-syllabic meter* of most poetry in English use the foot as the fundamental building block.

A foot consists of a certain number of syllables forming part of a line of verse. A foot is described by the character and number of syllables it contains: in English, feet are named for the combination of *accented* and *unaccented* syllables; in other languages such as Latin and Greek, the *duration* of the syllable (*long* or *short*) is measured.

When scanning a line of verse, a poet looks at feet as the basic rhythmic unit rather than words. A foot can consist of multiple words and a single word can contain many feet; furthermore, a foot can bridge multiple words, containing, for example, the last two syllables of one word and the first of the next.

The poetic feet in classical meter

The feet are classified first by the number of syllables in the foot (disyllables have two, trisyllables three, and tetrasyllables four) and secondarily by the pattern of vowel lengths (in classical languages) or syllable stresses (in English poetry) which they comprise.

The following lists describe the feet in terms of vowel length (as in classical languages). Translated into syllable stresses (as in English poetry), 'long' becomes 'stressed' ('accented'), and 'short' becomes 'unstressed' ('unaccented'). For example, an iamb, which is short-long in classical meter, becomes unstressed-stressed, as in the English word "betray."

The most common poetic feet are the **iamb**, the **trochee**, the **dactyl**, and the **anapest**.

Disyllables

∪ ∪ pyrrhus, dibrach
 ∪ — **iamb**
 — ∪ **trochee**, choree (or choreus)
 — — spondee

Trisyllables

∪ ∪ ∪ tribrach
 — ∪ ∪ **dactyl**
 ∪ — ∪ amphibrach
 ∪ ∪ — **anapest**, antidactylus
 ∪ — — bacchius
 — — ∪ antibacchius
 — ∪ — cretic, amphimacer
 — — — molossus

Tetrasyllables ...

1.4 Modern Notation

Modern music notation originated in European classical music and is now used by musicians of many different genres throughout the world.

The system uses a five-line staff. Pitch is shown by placement of notes on the staff (sometimes modified by accidentals), and duration is shown with different note values and additional symbols such as dots and ties. Notation is read from left to right, which makes setting music for right-to-left scripts difficult.

A **staff** (or **stave**, in British English) of written music generally begins with a **clef**, which indicates the position of one particular note on the staff. The *treble* or *G clef* was originally a letter G and it identifies the second line up on the five line staff as the note G above middle C. The *bass* or *F clef* shows the position of the note F below middle C.

Following the clef, the **key signature** on a staff indicates the key of the piece by specifying certain notes to be *flat* or *sharp* throughout the piece, unless otherwise indicated.

Following the key signature is the **time signature**. Measures (**bars**) divide the piece into groups of **beats**, and the time signatures specify those groupings.

Directions to the player regarding matters such as tempo and dynamics are added above or below the staff. For vocal music, lyrics are written. For short pauses (breaths), retakes (looks like ') are added.

In music for ensembles, a "score" shows music for all players together, while "parts" contain only the music played by an individual musician. A score can be constructed from a complete set of parts and vice versa. The process can be laborious but computer software offers a more convenient and flexible method.

Percussion Notation

Percussion notation conventions are varied because of the wide range of percussion instruments. Percussion instruments are generally grouped into two categories: *pitched* and *non-pitched*. The notation of non-pitched percussion instruments is the more problematic and less standardized.

Here some examples of percussion notation:

The image displays three examples of percussion notation on a five-line staff. Each example uses a different clef (C-clef, F-clef, and C-clef) and various note values and symbols to represent different percussion instruments. The first example shows notes for Bass drum, Snare, Tom 1, Tom 2, Tom 3, Hi-Hat, and Ride. The second example shows notes for Pedal hi-hat, Bass drum 1, Acoustic bass drum, Low floor tom-tom, High floor tom-tom, Low tom-tom, Tambourine, Acoustic snare, Electric snare, and Low wood block. The third example shows notes for Side stick, Low-mid tom-tom, High wood block, High-mid tom-tom, Cowbell, High tom-tom, Ride cymbal 1, Closed hi-hat, Open hi-hat, Crash cymbal 1, and Open triangle.

The image displays three musical staves illustrating drum notation. The first staff shows notes for Bass drum, Snare, Floor tom, Middle tom, and High tom. The second staff shows notes for Hi-hat with foot, Hi-hat struck, Ride cymbal, Bell of ride, Crash cymbal, and China cymbal/Splash cymbal. The third staff shows notes for Light (tenuto), Medium, and Heavy (marcato).

1.5 Time signature (meter), bars, beat and tempo

In Western music, rhythms are usually arranged with respect to a **time signature**, partially signifying a **meter** (or **metre**): the organization of music into regularly recurring measures or **bars** of stressed and unstressed **beats**.

The grouping of the underlying pulse is called the **beat**. The **tempo** is a measure of how quickly the beat flows. The tempo is usually measured in 'beats per minute' (bpm); 60 bpm means a speed of one beat per second.

The **meter** (usually corresponding with *measure* or *bar length*) is usually grouped into either two or three beats, which are called *duple meter* and *triple meter*, respectively. If the beats are in consistently even or odd groups of two, three, or four, it is *simple meter*, if by admixtures of two and three it is *compound meter*.

Simple Meter – Simple Time Signatures

Simple time signatures consist of two numerals, one stacked above the other:

- the lower numeral indicates the note value which represents one beat (the "beat unit");
- the upper numeral indicates how many such beats there are in a bar.

For instance, 2/4 means two quarter-note beats; 3/8 means three eighth-note beats. The most common simple time signatures are 2/4, 3/4, 3/8 and 4/4.

Compound Meter – Compound Time Signatures

In compound meter, subdivisions of the main beat (the upper number) are split into three, not two, equal parts, so that a dotted note (1.5 times longer) becomes the beat unit. Compound time signatures are named as if they were simple time signatures in which the one-third part of the beat unit is the beat, so the top number is commonly 6, 9 or 12 (multiples of 3). The lower number is most commonly an 8 (an eighth-note): as in 9/8 or 12/8.

Example:

3/4: A simple time signature, comprising three quarter notes. It has a basic feel of:

one *two three* (as in a waltz)

Each quarter note might comprise two eighth-notes (quavers) giving a total of six such notes, but it still retains that three-in-a-bar "feel":

one and *two and three and*

6/8: A *compound time signature*. Theoretically, this can be thought of as the same as the six-quaver form of 3/4 above with the only difference being that the eighth note is selected as the one-beat unit. But whereas the six quavers in 3/4 had been in three groups of two, 6/8 is practically understood to mean that they are in two groups of three, with a two-in-a-bar feel:

one and a, *two and a*

Beat and time

Time signatures indicating two beats per bar (whether it is simple or compound) are called *duple time*; those with three beats to the bar are *triple time*. To the ear, a bar may seem like one singular beat. For example, a fast waltz, notated in 3/4 time, may be described as being "one in a bar". Terms such as *quadruple* (4), *quintuple* (5), and so on are also occasionally used.

Stress and meter

For all meters, the first beat (the *downbeat*, ignoring any *anacrusis*) is usually stressed (though not always, for example in reggae where the offbeats are stressed); in time signatures with four groups in the bar (such as 4/4 and 12/8), the third beat is often also stressed, though to a lesser degree. This gives a regular pattern of stressed and unstressed beats, although notes on the "stressed" beats are not necessarily louder or more important.

(Anacrusis: In music, it is the note or sequence of notes which precedes the first downbeat in a bar. In the latter sense an anacrusis is often called a pickup, pickup note, or pickup measure)

Frequent Time Signatures

(see table on next page)

Simple time signatures

4/4 (quadruple) *common time*: widely used in most forms of Western popular music. Most common time signature in rock, blues, country, funk, and pop; allemande, bourrée.



Simple quadruple drum pattern:
divides four beats into two

2/2 (duple) *alla breve, cut time*: used for marches and fast orchestral music; gavotte. Sometimes called "in 2", but may be notated in 4.



Simple duple drum pattern:
divides two beats into two

4/2 (quadruple) never found in early music (which did not use numeric time signatures), and rare since 1600, although Brahms and other composers used it occasionally.

2/4 (duple) used for polkas or marches



Simple duple drum pattern:
divides two beats into two

3/4 (triple) used for waltzes, minuets, scherzi; sarabande; country & western ballads, sometimes used in pop.



Simple triple drum pattern:
divides three beats into two

3/8 (triple) also used for the above, but usually suggests higher tempo or shorter hypermeter.

Compound time signatures

6/8 (duple) double jigs, polkas, fast obscure waltzes, tarantella, marches, barcarolles, loures, and some rock music.



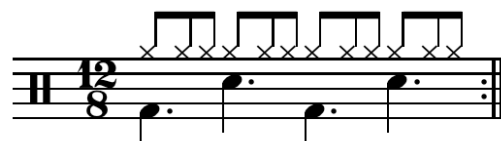
Compound duple drum pattern:
divides two beats into three

9/8 (triple) "compound triple time", used in triple ("slip") jigs, otherwise occurring rarely



Compound triple drum pattern:
divides three beats into three

12/8 (quadruple) baroque gigue (jig); common in slower blues (where it is known as *shuffle*) and doo-wop; also used more recently in rock music.



Compound quadruple drum pattern:
divides two beats into three

Changing meter

In twentieth century concert music, it became more common to switch meter—the end of Igor Stravinsky's *The Rite of Spring* is an example. A *metric modulation* is a modulation from one metric unit or meter to another. The use of asymmetrical rhythms also became more common: such meters include quintuple as well as more complex additive meters along the lines of 2+2+3 time, where each bar has two 2-beat units and a 3-beat unit with a stress at the beginning of each unit. Similar meters are used in various folk music as well as some music by Philip Glass. Additive meters may be conceived either as long, irregular meters or as constantly changing short meters.

Polymer and Polyrhythm

Although sometimes used synonymously, polymer is the use of two metric frameworks (time signatures) simultaneously, while polyrhythm refers to the simultaneous use of two or more different patterns, which may be in the same time-signature.

Research into the perception of polymer shows that listeners often either extract a composite pattern that is fitted to a metric framework, or focus on one rhythmic stream while treating others as "noise". This is consistent with the Gestalt psychology tenet that "the figure-ground dichotomy is fundamental to all perception" (Boring 1942, 253; London 2004, 49-50). In the music, the two meters will meet each other after a specific number of beats. For example, a 3/4 meter and 4/4 meter will meet up after 12 beats.

(*Gestalt psychology* or *gestaltism* (German: Gestalt - "essence or shape of an entity's complete form") of the Berlin School is a theory of mind and brain positing that the operational principle of the brain is holistic, parallel, and analog, with self-organizing tendencies)

(A *dichotomy* is any splitting of a whole into exactly two non-overlapping parts, meaning it is a procedure in which a whole is divided into two parts, or in half. It is a partition of a whole (or a set) into two parts (subsets) that are:

- jointly exhaustive: everything must belong to one part or the other, and
- mutually exclusive: nothing can belong simultaneously to both parts.

The two parts thus formed are complements. In logic, the partitions are opposites if there exists a proposition such that it holds over one and not the other.)

1.6 Beat

The beat is the basic time unit of music, the pulse of the mensural level, also known as the "beat level". However, since the term is in popular use, it often connotes the tempo of a piece or a particular sequence of individual beats, the meter, rhythm or groove.

In hip hop and R&B music, the term 'beat' commonly refers to the entire instrumental, non-vocal layer of the song, which is frequently based on a looped recording of a drum-rhythm. It may also refer to particular beats in the measure.

Much music is characterized by a repeating sequence of stressed and unstressed beats (often called "strong" and "weak") organized into measures and indicated by a *time signature* and *tempo indication*.

Downbeat

The downbeat is the impulse that occurs at the beginning of a bar in measured music. Its name derives from the downward stroke of the director or conductor's baton at the start of each measure. It frequently carries the strongest accent of the rhythmic cycle. However, in some cases, the downbeat may not be emphasized. Such departure from the normal stress pattern of a measure is a form of *syncopation*.

Upbeat

1. An unaccented beat or beats that occur before the first beat of the following measure. In other words, this is an impulse in a measured rhythm that immediately precedes, and hence anticipates, the downbeat. It can be the last beat in a bar where that bar precedes a new bar of music.
2. An anticipatory note or succession of notes occurring before the first barline of a piece, sometimes referred to as an 'upbeat figure', section or phrase. An alternative expression is "anacrusis" (from Greek. ana: "up towards" and krousis: "to strike").
3. The upward stroke made by a conductor to indicate the beat that leads into a new measure.

On-beat and off-beat

In music that progresses regularly in 4/4 time, counted as "1 2 3 4, 1 2 3 4, ...", the first beat of the bar (down-beat) is usually the strongest accent in the melody and the likeliest place for a chord change, the third is the next strongest: these are "on" beats.

The second and fourth are weaker - the "off-beats".

Subdivisions (like eighth notes) that fall between the pulse beats are even weaker and these, if used frequently in a rhythm, can also make it "off-beat".

Off-beat is a musical term commonly applied to *syncopation* that emphasizes the weak even beats of a bar, as opposed to the "normal" on-beat. This is a fundamental technique of African polyrhythm that transferred to popular western music.

According to Grove Music, the "Offbeat" is [often] where the downbeat is replaced by a rest or is tied over from the preceding bar".

The downbeat can rarely be the off-beat because it is the strongest beat in 4/4 time.

Certain genres in particular tend to emphasize the off-beat. This emphasis is a defining characteristic of rock'n'roll, Jazz and Ska music.

Backbeat

A backbeat is a syncopated accentuation on the "off" beat. In a simple 4/4 rhythm these are beats 2 and 4. Emphasized back beat, a feature of some African styles, defined rhythm and blues recordings in the late 1940s and so became one of the defining characteristics of rock and roll and much contemporary popular music.

Related concepts:

Afterbeat refers to a percussion style where a strong accent is sounded on the second, third and fourth beats of the bar, following the downbeat.

In Reggae music, the term **One Drop** reflects the complete de-emphasis (to the point of silence) of the first beat in the cycle.

James Brown's signature funk groove emphasized the downbeat – that is, with heavy emphasis "on the one" (the first beat of every measure) – to etch his distinctive sound, rather than the back beat (familiar to many R&B musicians) which places the emphasis on the second beat.

Break, Break beat and Breakbeat

1. **Break:** an interruption in the rhythmic flow, often introducing a new section. In popular music, a break is an instrumental or percussion section or interlude during a song derived from or related to stop-time – being a "break" from the main parts of the song or piece. A solo break in jazz occurs when the rhythm section stops playing behind a soloist for a brief period, usually two or four bars leading into the soloist's first chorus.
2. **Break beat:** the sampling of breaks as drum loops (beats), originally from soul tracks, and using them as the rhythmic basis for hip hop and rap songs. A particularly innovative style of street dance was created to accompany break beat-based music, and was hence referred to as "The Break", or break dancing.
3. **Breakbeat:** a collection of sub-genres of electronic music (*jungle, drum'n'bass, etc.*), usually characterized by the use of a non-straightened 4/4 drum pattern (as opposed to the steady beat of house). These rhythms may be characterized by their intensive use of syncopation and polyrhythms. Breakbeat as a genre did not appear in any commercial sense until well after the advent of inexpensive digital sampling equipment.

1.7 Groove

Groove is the sense of propulsive rhythmic "feel" or sense of "swing" created by the interaction of the music played by a band's rhythm section (drums, electric bass or double bass, guitar, and keyboards). Groove is a consideration in genres such as salsa, funk, rock music, fusion, and soul. The word is often used to describe the aspect of certain music that makes one want to move, dance, or 'groove'.

Musicologists and other scholars began to analyze the concept of "groove" in the 1990s. They have argued that a "groove" is an "understanding of rhythmic patterning" or "feel" and "an intuitive sense" of "a cycle in motion" that emerges from "carefully aligned concurrent rhythmic patterns" that sets in motion dancing or foot-tapping on the part of listeners.

Defintion

Like the term "swing", which is used to describe a cohesive rhythmic "feel" in a jazz context, the concept of "groove" can be hard to define. Indeed, some dictionaries use the terms as synonyms: "Groovy... denotes music that really swings." Marc Sabatella's article Establishing The Groove argues that "groove is a completely subjective thing." He claims that "one person may think a given drummer has a great feel, while another person may think the same drummer sounds too stiff, and another may think he is too loose." Similarly, a bass educator states that while "groove is an elusive thing" it can be defined as "what makes the music breathe" and the "sense of motion in the context of a song."

In a musical context, general dictionaries define a groove as "a pronounced, enjoyable rhythm" or the act of "creating, dancing to, or enjoying rhythmic music."

Steve Van Telejuice explains the "groove" as the point in this sense when he defines it as a point in a song or performance when "even the people who can't dance wanna feel like dancing..." due to the effect of the music.

Bernard Coquelet argues that the "groove is the way an experienced musician will play a rhythm compared with the way it is written (or would be written)" by playing slightly "before or after the beat." Coquelet claims that the "notion of groove actually has to do with aesthetics and style"; "groove is an artistic element, that is to say human,...and "it will evolve depending on the harmonic context, the place in the song, the sound of the musician's instrument, and, in interaction with the groove of the other musicians", which he calls "collective" groove." Minute rhythmic variations by the rhythm section members such as the bass player can dramatically change the feel as a band plays a song, even for a simple singer-songwriter groove.

See also: playing "on top", "laid back"

The term "groove" is especially used in musical genres such as: R & B, Hip Hop, Jazz, Reggae, etc.

1.8 Drum Pattern (Drum Beat)

Pattern means form, template, or model.

A drum beat or drum pattern is a rhythmic pattern, or repeated rhythm establishing the meter and groove through the pulse and subdivision, played on drum kits and other percussion instruments. As such a "beat" consists of multiple drum strokes occurring over multiple musical beats while the term "drum beat" may also refer to a single drum stroke which may occupy more or less time than the current pulse. Many drum beats define or are characteristic of specific music genres.

Typical settings

- time, signature (see chapter 1.5)
- tempo in BPM (beats per minute) = metronome speed
- swing factor, shuffle: the lengthening of the on-beats compared to the off-beats, usually defined in % - it can typically be applied to the 8th or the 16th)
- dynamics: level, or volume differences between the instrumental hits; can respond to controller (keyboard or drum pad) input "velocity"
- panorama: positioning of the instruments within the stereo field (between Left and Right)

Typical drum instruments

Generally used on the *downbeats* (in 4/4 time, the 1st and 3rd beat)

- bass drum (BD), kick drum

Generally used on the *off-beats* (in 4/4 time, the 2nd and 4th beat)

- snare drum (SD), rim shot, hand clap

Generally used to mark the *eighths* or *sixteenths*:

- hi-hat (HH), shaker, tambourine, triangle, etc.

Other instruments

- toms, claps, cowbell, etc.

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Wikipedia Links:

- Wikipedia EN (01.12.2010 09:00): Rhythm → <http://en.wikipedia.org/wiki/Rhythm>
- Wikipedia EN (01.12.2010 09:00): Time Signature → http://en.wikipedia.org/wiki/Time_signature
- Wikipedia EN (01.12.2010 09:00): Beat (music) → [http://en.wikipedia.org/wiki/Beat_\(music\)](http://en.wikipedia.org/wiki/Beat_(music))
- Wikipedia EN (01.12.2010 09:00): Groove (music) → [http://en.wikipedia.org/wiki/Groove_\(popular_music\)](http://en.wikipedia.org/wiki/Groove_(popular_music))
- Wikipedia EN (01.12.2010 09:00): Drum Beat → http://en.wikipedia.org/wiki/Drum_beat