# Rhythm

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# 1 Rhythmic devices: time signatures, barlines and polyrhythms

THIS CHAPTER OPENS by introducing some elements of music theory in order to illustrate the connections between rhythm and mathematics.[1] It then goes on to explore various rhythmic devices with examples of their application in Western classical music, notably polyrhythms, and quintuple and septuple rhythms. This is followed by a discussion of the use of barlines, the restrictions they can impose and how eventually some composers broke away from what has been described as the 'tyranny of the barline', notably Stravinsky in his ballet *The Rite of Spring*. The final section discusses some of the rhythmic devices found in popular music and jazz including the use of unusual time signatures, four-on-the-floor, and the rhythmic construction of electronic dance music.

## Introduction

The word 'rhythm' describes the way that sounds are grouped together in different patterns over time. These patterns are produced by notes (sounds) and rests (silences) of different lengths.

1 For further information about music theory please see either *Rock & Pop Theory. The Essential Guide (London: Faber Music and Peters Edition, 2014) or Music Theory. The Essential Guide (London: Faber Music and Peters Edition, 2014).*

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**Table 1- Duration of notes**

| British name | American name |
|---|---|
| Semibreve | Whole note |
| Minim | Half note |
| Crotchet | Quarter note |
| Quaver | Eighth note |
| Semiquaver | Sixteenth note |
| Demi-semiquaver | Thirty-second note |

The pulse of a piece of music is the basic beat, to which we clap along or dance. The word metre (or meter) refers to the organisation of regular pulses into patterns of strong and weak beats. Western notation is largely a divisive rhythm system where a regularly repeated unit (the bar) is divided into smaller parts (usually two, three or four beats). In contrast, an additive rhythm is one which is formed by combining small metrical units. It moves from one note (*x t*ime units long) to another note (*y t*ime units long) where the sum of *x* plus *y* forms the metrical pattern such as 2 + 3 + 4 beats. As such, the bars of additive rhythms cannot be divided in the same way.

The metre is shown by the time signature. A time signature is placed at the beginning of a composition. It denotes how many beats there are in a bar. The top number of a time signature tells us the number of beats per bar and the bottom number tells us what type of beat. Of course across the world much music is not notated, or is notated differently, and here time signatures do not exist. Most Western classical music has either two, three or four beats in a bar – duple, triple or quadruple time. The same can be said for pop music where the very large majority of songs (of whatever genre) has four beats in a bar. For this reason 4/4 is often referred to as common time and is denoted by the sign C at the beginning of a piece. Across both classical music and pop, there is a tendency to accent the first beat of the bar, and bars are usually grouped into phrases in multiples of four.

As can be seen, rhythm deals with numbers and is thus linked to several basic mathematical concepts. The time signature, for example, looks like a fraction where the top number could be denoted as the numerator and the

bottom number the denominator. The duration of time is plotted along the x axis, and the rising and falling of pitch is plotted on the y axis. The sequence of the duration of notes (see Table 1 above) forms a mathematical pattern where each successive note is half the length of the previous note as is clear from the American note names – whole note, half note, quarter note and so on. This could be said to form a geometric sequence with a ratio of $r = 1/2$.

Note values and rests can be lengthened by adding dots to them. A single dot after a note adds half of its original value. So, for example, when a dot is added to a quarter note (or crotchet) it has the duration of a quarter note (crotchet) plus an eighth note (or quaver).

$$a + a/2 = b$$

Similarly, when two dots are added after a note, it has the duration of the note (a) plus half the value of a (b) plus half the value of (b).

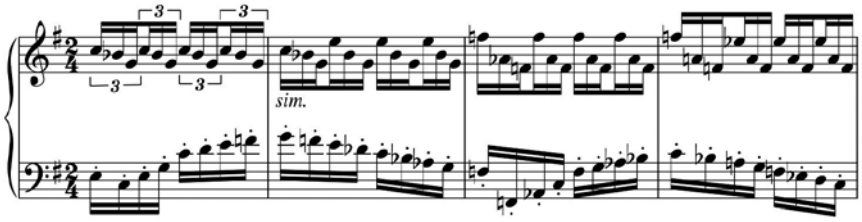
$$a + b + b/2 = c$$

So if a double dot is added to a quarter note (or crotchet), it has the duration of a quarter note (crotchet) plus an eighth note (or quaver) plus a sixteenth note (or semiquaver).

Dots therefore follow the mathematical concept of iteration where the same process is applied repeatedly.

## Polyrhythms

The word polyrhythm refers to the simultaneous use of two (or more) independent rhythms built around the same pulse. One of the most common polyrhythms to be found in Western classical music is that of two against three frequently found in, for example, the piano sonatas of Haydn, Mozart and Beethoven amongst many others. The example below is taken from the first movement of Beethoven's *Piano Sonata, Op. 14, No 2 in* G (bars 89 – 92) where the right hand plays triplet semiquavers (in groups of three) against the semiquavers grouped in twos in the left hand.




Right hand 1 2 3 1 2 3 1 2 3 1 2 3
Left hand 1 2 1 2 1 2 1 2

The table below shows the precise location of where the notes are placed. This device is based on the mathematical concept of the least common multiple (LCM). The LCM of two positive integers is the smallest integer that each number divides into evenly. Polyrhythms are always based on numbers that are relatively prime. In the example above, the integers two and three, are divided into the LCM of six showing where the first notes of the groups are heard together.

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 2 | | 3 | | 1 | | 2 | | 3 | | 1 | | 2 | | 3 | | 1 | | 2 | | 3 | |
| 1 | | | 2 | | | 1 | | | 2 | | | 1 | | | 2 | | | 1 | | | 2 | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

More complex polyrhythms are used in the piano music of Frederic Chopin (1810-1849). His Nocturnes are characterised by their use of florid melodic lines in the right hand with the left hand providing a steady harmonic accompaniment. Chopin often uses not only two against three, and five against three, but also rarer examples of polyrhythms such as eleven against four and thirteen against four as in the example below from bars 60 and 61 of his *Nocturne in C# minor.*

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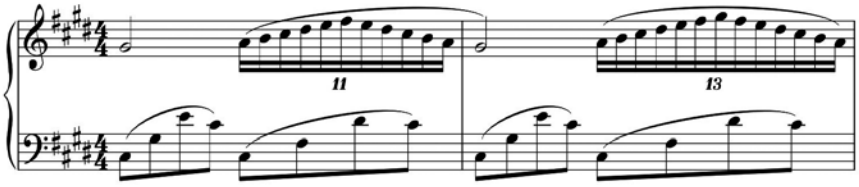



Here the LCM in bar 59 is 44 so to find the precise location of each note would involve dividing the second half of the bar into 44 micro-beats. Nevertheless, as is discussed in a later chapter, even such seemingly complex rhythms are relatively straightforward in comparison with those used outside Western classical music, as in, for example, West African drumming (see pages 41-5). To Western classical players, such rhythms are quite demanding to perform, but in the words of the American composer Aaron Copland '…by comparison with the intricate rhythms used by African drummers or Chinese or Hindu percussionists, we are mere neophytes.'[2] As the musicologist A M Jones wrote, 'If from childhood you are brought up to regard beating 3 against 2 as being just as normal as beating in synchrony, then you develop a two-dimensional attitude to rhythm'.[3]

## Quintuple and septuple rhythms

Duple and triple rhythms are relatively common in Western classical music and pop music, but examples of music with quintuple or septuple music rhythms are rare. However rhythms based on a five-beat or seven-beat structures can be traced as far back as to the metre of ancient Greek songs and such irregular rhythms can be found in traditional music across much of Europe, Asia and Africa. The musicologist and mathematician Andrew Gustar argues that the 'scarcity of septuple time in Western music is largely attributable to the development of the time signature' which lends itself to

2 Aaron Copland. *What to Listen for in Music (Philadelphia, Signet, 1953): 35.*

3 A M Jones. *Studies in African Music*. (London: Oxford University Press, 1959): 102.

multiples and divisions of two and three.[4] Both quintuple and septuple times are almost always additive: for example, a unit of three beats plus a unit of four beats, with this pattern being repeated. In quintuple time the five beats are subdivided into either 2+3 or 3+2; and in septuple time the seven beats can be grouped into various combinations of two, three and four e.g. 2+3 +2, or 3+2+2, or 4+3. As Gustar writes of septuple rhythms: 'the notation is messy; the rhythm is uncomfortable for those brought up on twos, threes and fours; and it constrains the music in ways that do not support the broader aesthetic values'.[5] As a consequence music using quintuple and septuple time is almost absent from the Baroque and Classical periods. The American psychologist Leslie A Osborn notes that:

Conventional notation is at its best … dealing with the prime two and its multiples four, six, and eight. It is awkward with… the number three and its multiples, but manages with a complexity of dotted and tied notes. It is extremely difficult to use with higher prime numbers, so that the possibilities of quintuple and septuple time have been rarely exploited. [6]

Quintuple and septuple rhythms are based on the prime numbers five and seven. As Gustar points out, when we look at the next prime number in the series, eleven, it is 'virtually unknown as a musical metre in Western music before the twentieth century' and although there are Indian *tala* with eleven beats, these demand greater conscious effort on the part of both the listener and the performer, and they too are rare.[7]

Early examples of both quintuple and septuple metres can be found in the *Libro de tientos (*1626) of the Spanish composer Francisco Correa de Arauxo (1584 – 1654) where he experimented with irregular meters in the organ pieces No. 34 and No. 41. Near the end of No. 34 there is a shift to septuple time and in No. 41 there is a passage of quintuple metre. Examples from the eighteenth century are rare, although a few are to be found in Italian operas by composers such as Monteverdi, Cavalli and Handel where they are sometimes used to fit the changing rhythms of the words. At other times

4 Andrew James Gustar. 'The Closest Thing to Crazy: The Shocking Scarcity of Septuple Time in Western Music' *Journal of the Royal Musical Association, 2012, Vol. 137, No. 2 (2012): 351- 400.*

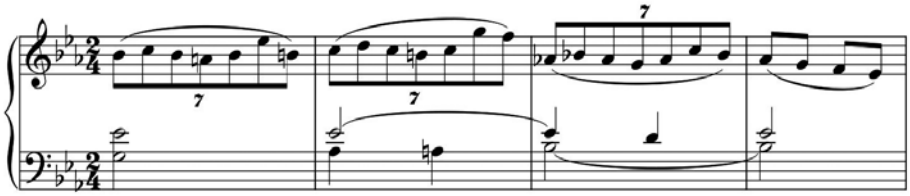
5 Gustar, 'Closest thing to crazy', 381-382.

6 Leslie A. Osborn, "Notation Should Be Metric and Representational', *Journal of Research in Music Education, 14* (1966), 67-83.

7 Gustar, ' Closest thing to crazy', 364-365.

they are there primarily for their disruptive effect. In his opera *Orlando* (1733), Handel included several bars in 5/8 in the middle of a 4/4 passage to represent his hero's madness when suffering from unrequited love. Similarly, Hector Berlioz used septuple metre for dramatic effect in his opera *Benvenutu Cellini* (1836) where two bars of seven time form part of the countdown in the duel scene of Act II.

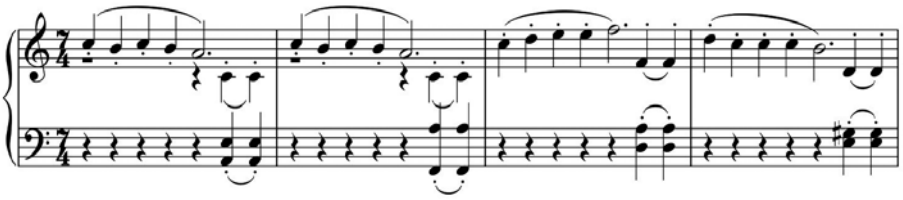
Robert Schumann (1810-1856) uses seven-time to create an atmosphere of dreamy vagueness in the slow movement 'Eusebius' of his piano work *Carnaval* (1833).[8] Although it is notated in duple metre, it is largely in a seven-over-two cross rhythm where there are seven equal parts in the right hand and two or four in the left. As a result it is difficult to hear a pulse or a pattern of strong and weak beats. Here are the opening bars of 'Eusebius'.



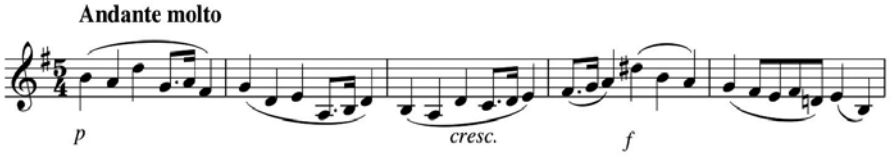

More examples can be found in music from the second half of the nineteenth century; Berlioz, Brahms and Liszt all used septuple time in the 1850s and in the second half of the nineteenth-century septuple rhythms were employed by Tchaikovsky, Janacek and Debussy amongst others. In 1849, the French composer Charles Alkan (1813-1888) composed his Op. 32 No. 2 for piano. This set of pieces includes three *'Airs à cinq temps'* along with an *'Air à sept temps'* (see below for the opening bars).[9]

8 Eusebius was Schumann's name for the dreamy, introspective side of his character contrasting with the passionate, outgoing Florestan whom he portrayed in *Carnaval in the 'Passionato' movement.*

9 Although today Alkan is a relatively little-known composer, in the early nineteenth century he had a burgeoning career as both a composer and concert pianist which flourished alongside those of Chopin and Liszt. His career did not thrive in the same way as theirs and his work gradually fell into obscurity. Since the 1960s, his work has attracted more attention with an enthusiastic following of aficionados.



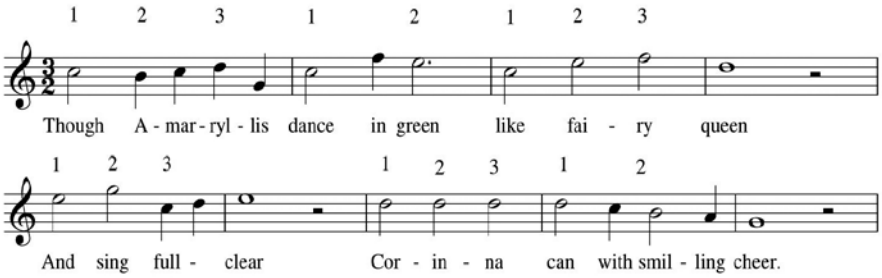
Samuel Coleridge-Taylor (1875-1912) composed his *Fantasiestucke Op. 5* for string quartet, a collection of five short character works for string quartet featuring cross rhythms and misplaced accents in 1895. It was described by *The Times* as a 'curious and most original work … showing the hand of a composer of real freshness [who] has something to say that is worth saying and he does so in a most original way'.[10] Here is the melody of the opening bars of the second movement, 'Serenade', which is in 5/4 time (see below).



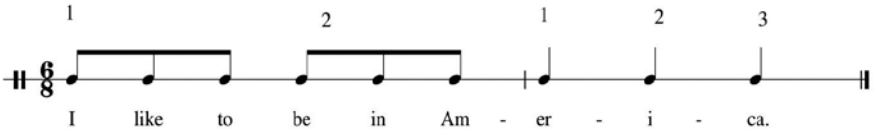

## Hemiolas

The word 'hemiola' is derived from the Greek word *'hemiolios'* which means 'half as much again'. It refers to any two quantities in the ratio 3: 2 (1½ to 1). The rhythmic device known as a hemiola is the pattern that occurs when three beats are performed in the time of two or two beats are performed in the time of three. William Byrd uses hemiola in his madrigal 'Though Amaryllis Dance in Green' (1588). The madrigal is mainly in triple time (three minim beats) but switches to duple time (two dotted minim beats) in bars 2 and 8 of the example.

10 *The Times*, March 14, 1895.




Hemiolas were frequently found in music up to and including the Baroque period, notably in lively dances such as the galliard and courante which included elements of 3: 2, usually alternated, but sometimes together. Hemiolas are relatively uncommon in Western art music after this period but a well-known example can be heard in the song 'America' from Bernstein's musical *West Side Story* where the first bar is divided into two main beats and the second bar is divided into three (see below).




In contrast, the hemiola is central to the rhythmic scheme in the music of sub-Saharan Africa.

## Folk music influence in twentieth–century classical music

In the twentieth century, composers began to draw more often from influences from outside the canon of Western classical music and both quintuple and septuple time, although still quite unusual, became more accepted as musical devices. Across the late nineteenth century and the early twentieth century there was a growing interest in national folk music. One of the first composers to use irregular rhythms was the Australian composer Percy Grainger (1882-1961) who was a pioneering folksong collector and

arranger, an avant-garde thinker and an experimentalist. He was also a linguist and a philologist, fluent in 11 languages including Icelandic and Russian. Describing his early use of irregular rhythms, Grainger referred to the 'Studies in the rhythms of prose speech that I undertook in 1899 led to such irregular barrings as those in bars 69-74 of 'Love Verses' from *The Song of Solomon*, composed 1899-1900, which (as far as I know) was the first use of irregular rhythms in modern times'.[11]

As a young man in England Grainger set out to collect and record folk songs with the Edison Phonograph, one of the first folk song collectors to do so. Grainger composed in a broad spectrum of styles from highly experimental works to popular pieces such as his wind band suite *Lincolnshire posy* that he described as a 'bunch of musical wildflowers'. The movement entitled 'Lord Melbourne' is based on a song which Grainger recorded and noted down in 1906. Some of the passages are marked 'Free Time'. At the top of the score Grainger explains that in these passages the 'bandleader should slightly vary his beat-lengths with that rhythmic elasticity so characteristic of many English folksingers – and especially characteristic of George Wray, the singer of this song'. Bars 38 and 40 even have a time signature of 2½/4. 2½ over 4 is different to 5/8 because it implies a certain stress pattern that the former does not; 2½ is two and a half crotchet beats rather than the 2+3 or 3+2 beats implied by a time signature of 5/8.[12] Grainger was not, however, the first to divide the top number of the time signature in this way. 'The Alcotts', the third movement of Charles Ives' *Concord Sonata* (1912) includes a bar with the time signature of 4½/4 – four and a half crotchet beats.

Music in five and seven time was found by folksong collectors in several countries, notably Bartók (1881-1945) in the music of Bulgaria. Bela Bartók's *Six Dances in Bulgarian Rhythm* (1926-1939), for example, use asymmetrical dance rhythms. The time signatures are written as the sum of smaller groups e.g. No. 1 has a time signature of 4 + 3/8 + 3. A characteristic of much of Bartók's music is its great rhythmical energy, and he often based passages

11 Grainger, Percy. "Percy Grainger's Remarks about His Hill-Song No. 1 by Percy Aldridge Grainger (5-page typescript dated September 1949) located in Number 4 – 1st Edition 1982 – 2nd Edition 1997 - *A Musical Genius from Australia – Selected Writings by and about Percy Grainger* – with commentary by Teresa Balough: 85.

12 https://percygrainger.org/blog/12712906

on alternating patterns, triple then duple, or groups of five alternating with groups of three.

The early twentieth century witnessed a growing avoidance of standard patterns and regular four-bar rhythms, which more innovative composers saw as too predictable and unadventurous, characteristics which are sometimes referred to under the term the 'tyranny of the barline'. In the late nineteenth century, the maverick French composer Erik Satie (1866-1925) composed his piano pieces *Gnossiennes* in free time where, at times, he dispensed with barlines and time signatures altogether.

Igor Stravinsky (1882-1971), like Bartók, played a major role in the revitalization of rhythm in Western classical music. Amongst his first musical successes were the ballets *Firebird* and *Petrushka*, where the music had a Russian folk-music influence. The music of both ballets features intricate rhythms, sometimes using units of seven, eleven or thirteen beats, and often shifting from one metre to another which dislocate the accents. One of the effects of building patterns from irregular accents is to subvert the barline. In 1913 Stravinsky launched what Ivan Hewett describes as a 'full frontal attack' on the tyranny of the barline in his ballet *The Rite of Spring*.[13] The work portrays pagan rituals of ancient Slavic tribes evoking the return of spring when a young girl is sacrificed by dancing herself to death. Audiences were shocked by what they heard as 'primitive' dissonant music, its 'barbaric' rhythmic energy accompanying the strange movements of the dancers which seemed to defy all the rules of ballet.

Above all it was the pounding rhythms with changing time signatures, polyrhythmic effects and frequent ostinati (repeated patterns) which sounded shockingly new. In most Western classical music from the Renaissance onwards, rhythm had been subservient to melody and harmony but in *The Rite of Spring*, the music is driven by the rhythm and there are innovative rhythmic devices in every movement. Stravinsky also makes use of additive rhythms by adding or subtracting beats from a pattern as it repeats. As Gillian Moore writes in her detailed study of the work, 'there is a clear connection with folk melodies, which often freely expand or contract by a beat to fit in words'.[14][15] *The Rite of Spring* opens with a Lithuanian wedding

13 Ivan Hewett https://www.classical-music.com/features/articles/why-do-we-have-barlines/

14 Gillian Moore. *The Rite of Spring. The Music of Modernity* (London, Apollo, 2019): 138.

15 For more information about *The Rite of Spring* see Gillian Moore (2019).

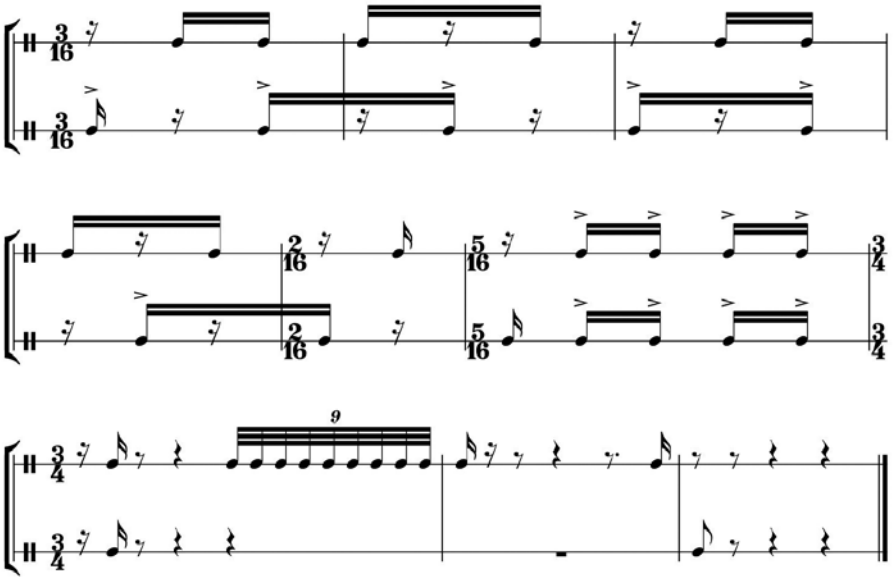
song played in the uppermost register of the bassoon, a sinuous winding solo whose time signature changes repeatedly for the first five bars. 4/4, 3/4, 4/4, 2/4, 3/4. The effect is one where any feeling of metre is removed. In other places relatively simple musical patterns of differing lengths are layered on top of each other creating an effect of rhythmic complexity. In the 'Ritual of Abduction', for example, a polyrhythmic effect is used at Fig. 41, where the violins, violas and cellos are playing in 9/8 at the same time as the double basses play in 4/8 + 5/8 (this time signature is written on the score). The two different pulses are heard together – the upper parts play in groups of three at the same time as the basses are playing in groups of four plus five.

**1** 2 3 **1** 2 3 **1** 2 3
**1** 2 3 4 **1** 2 3 4 5

The final section, the 'Sacrificial Dance', is constructed from cells of from 1 - 6 notes rather than phrases in the usual way. The cells are unequal in length meaning that frequent changes of time signature are needed. The overall effect is that time is no longer measured in bars but 'marked by the individual duration of crotchet and quaver'. [16] Below is the rhythm of the final bars.

As the musicologist Paul Griffiths writes 'The rhythmic newness of *The Rite of Spring* was recognized immediately, it could hardly be mistaken… Some condemned it as a barbaric annihilation of all that musical traditions stood for …others praised it on the same grounds'.[17] As Stravinsky wrote "Mild protests against the music could be heard from the beginning…Then when the curtain opened on the group of knock-kneed and long-braided Lolitas jumping up and down, the storm broke.' The music could hardly be heard for the cat calls and cries of *'Ta gueule' ('Shut up')* but the orchestra played on until the end. Since its notorious premiere in Paris 1913, the influence of *The Rite of Spring* has been felt by generations of composers.

16 Paul Griffiths. *Modern Music.* (London: Thames and Hudson, 1994): 42.
17 Griffiths, *Modern Music, 41.*





## Unusual time signatures and polyrhythms in popular music and jazz

Although most pop music has a straightforward four beats to the bar, there are some well-known examples which do otherwise. Pink Floyd's song 'Money' (1973) has a time signature of 7/4 and its famous bass riff follows a 3 + 4 pattern. The verses of the 1967 Beatles' song 'All you need is love' alternate bars with four beats with bars of three beats and Peter Gabriel's song 'Solsbury Hill', recorded ten years later, uses the same alternating-bars device to give a metre of seven.

Perhaps more than anyone else, the jazz musician Dave Brubeck (1920 – 2012) has been instrumental in introducing quintuple and septuple metres to mainstream Western audiences. In 1958 the Dave Brubeck Quartet took part in a US State Department tour covering parts of Europe, the Middle East and the Indian subcontinent. Whilst on tour they played with local musicians and, according to Fred Hall (Brubeck's biographer), there were times in Afghanistan, Turkey and India, when Brubeck 'immersed himself

in the music of the East, that later influenced much of his composing'.18 In 1959 the Dave Brubeck Quartet released their album *Time Out* including several songs in unusual metres, the best-known is 'Take five' which is in 5/4; some bars using a 2+3 metre, others 3+2. Brubeck followed up the album with four more using non-standard time signatures. On three numbers, of which 'Unsquare dance' is the most familiar, he uses 7/4 time. Brubeck's musicians would improvise over these unusual time signatures and Brubeck observed in the liner notes to the album *Countdown: Time in Outer Space*, that '7/4 remains the most challenging for improvising, but I figure if a whole Greek culture can feel seven, we can too!'

## Polyrhythms in popular music

Polyrhythms are frequently found in boogie-woogie piano music, popular during the 1920s and 1930s played by Afro-American artists such as Albert Ammons, Lux Meade Lewis and Pine Top Smith. The essence of the style is the interplay between the left and right hands. The left hand plays a driving bass line, keeping the beat and providing the chords whilst the right hand provides an embellished melody often set up in polyrhythms against the left hand. Here are some typical figurations found in boogie-woogie (see below).

Polyrhythms, although frequently found in jazz, are fairly unusual in popular music post-1950 although there are notable exceptions such as Wham's chart-topping hit 'Wake me up before you go-go' (1984) where the horn section make exciting use of two against three at its climax. The songs of the metal band Metallica frequently use polyrhythms, change time signature and make much use of metric modulation ('Enter Sandman', 1991, is a good example).[19]

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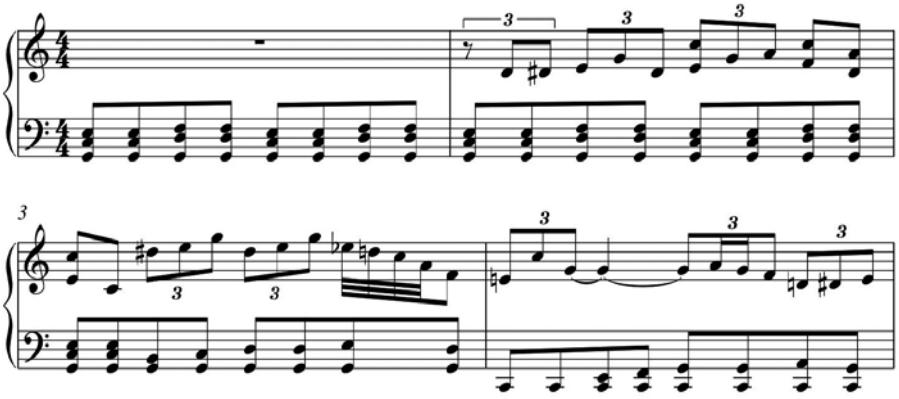
18 Hall, Fred. *It's About Time: The Dave Brubeck Story*. (Arkansas: The University of Arkansas Press, 1996): 74.

19 Metric modulation is where there is a change in pulse rate or time signature wherein a note value from the first section is made equivalent to a note value in the second section. For example, there could be a change of time signature from 2/2 (two minims to a bar) to 6/4 (two dotted minims per bar) where the pulse remains the same by means of the tempo of the minim beat becoming equivalent to the tempo of the dotted minim beat.



Captain Beefheart too was adventurous in his use of rhythm; many examples of polyrhythms and changing time signatures can be heard on his albums such as *Trout Mask Replica* (1969). Beefheart's friend and fellow musician Frank Zappa also experimented with complex polyrhythms such as 11:17. A very effective use of polyrhythm can be heard in the 2007 song by the America rock band The National in their song 'Fake Empire' which uses a four against three pattern throughout. The song opens with solo piano playing four beats in the right hand against three beats in the left hand. When the other instruments enter, some follow the three pattern and others follow the four pattern. Because this four against three polyrhythm is heard throughout, it could be argued that 'Fake Empire' uses two time signatures simultaneously.

## Four-on-the-floor in disco

One of the most basic rhythms found in pop music is known as four-on-the-floor. It is a very simple pattern where the bass drum accents each of the four beats in a 4/4 bar (see below).

The term comes from the way that the drummer had to press the foot pedal four times per bar. A constant stream of four-on-the-floor beats was prevalent in 1970s disco, it can still be heard in electronic dance music and it is not unknown for it to be incorporated into jazz. Although the reggae beat is typically characterised by the bass drum playing on beats two and four, it

can also be found in some reggae songs; Carlton Barret, the drummer with Bob Marley and the Wailers, used four on the floor on songs such as 'Exodus' and 'Is this love'.

## Rhythm in electronic dance music (EDM)

Electronic dance music is technology-based with DJs playing an important role in mixing and presenting tracks. The emphasis is on rhythm and timbre rather than melody and harmony. It is characterized by extensive use of samples and loops producing a layered texture made up of repeating motifs, rhythms or samples. DJs use different ways to add their own creative element to a live set, selecting, combining and manipulating sounds. The loudest most resonant sound in the texture is usually the bass drum and its sound is often referred to as the beat, a sound which can be felt as well as heard. The fundamental structural units of EDM are loops, constantly repeated rhythmic passages which together create a layered texture. As such loops make use of cyclical repetition and EDM tracks are composed largely, sometimes entirely, of them. The loops are of different lengths varying from one note to sixteen bars.

EDM embraces several different styles and these are being added to all the time. The styles can be divided into two broad categories which can be defined by their metrical characteristics. The first category is distinguished by its use of the four-on-the-floor rhythm and includes, house, garage and techno with artists such as Basement Jaxx, Mis-Teeq, and DJ Misjah & DJ Tim. Typical drum patterns are as below where all the rhythms are evenly divided.

The second category features more complex rhythms and includes drum 'n' bass, hardcore and bigbeat with artists such as Andy C, DJ Trax and the Chemical Brothers. These genres also include breakbeats where drum breaks are sampled from old funk records and speeded up, the most common samples being taken from James Brown's 'Funky Drummer' (1970) and a recording of the gospel song 'Amen Corner' by The Winstons (1969).

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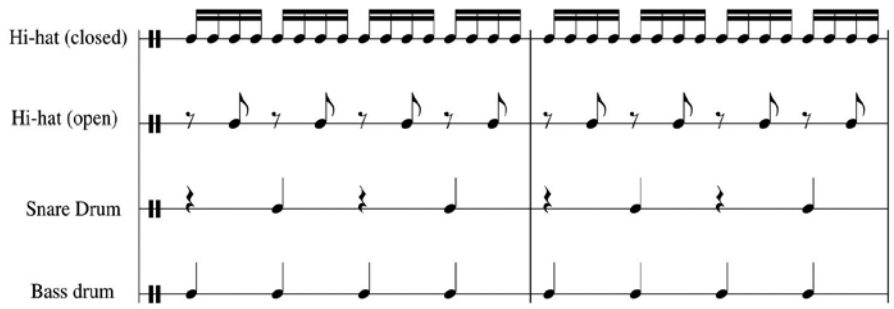
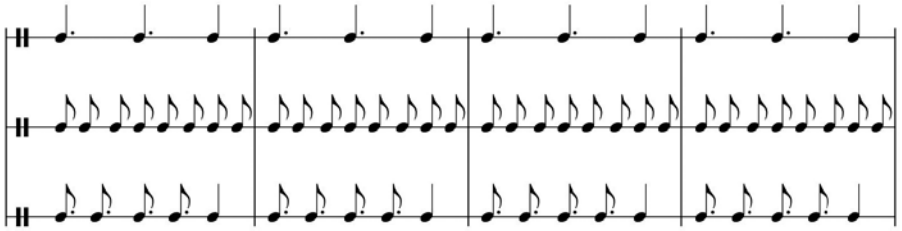



In breakbeat-driven genres such as drum 'n' bass, the rhythm is manipulated in various ways with other rhythmic techniques being used to add variety. These include asymmetrical divisions, some of the most common are shown below. The rhythm at the top of table is divided into 3 + 3 + 2 as is the rhythm below it where all the note values are halved (diminution).



It is interesting to note the similarity between the breakbeat rhythm above and some of the rhythms used in West African drumming (see pages 41-5).

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