
Tagg's Harmony Handout

or “Definitions of terms to do with tonal polyphony”
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Terminology

Harmony is today virtually synonymous with tonal polyphony (see p.2 ff.). In ancient Greece, however, where the term originates, ἁρμονία (*harmonía*) literally meant combination or union. Applied to music in Hellenic times, the word referred to the joining together of sounds into concords or sequences, not just the simultaneous combination of notes. Classical Latin's *harmonia* also meant an agreement of *sounds*, concord or melody. In medieval Europe, harmony initially meant the simultaneous sounding of two notes only (dyads), in much the same way as a backing vocalist in popular music may be described as 'singing harmonies', even though harmony, in the general sense of the term, is more likely to be provided by accompanying instruments. European theorists of the Renaissance extended the notion of harmony to the simultaneous sounding of three notes, thus accommodating the 'common triad', with its third as well as the fifth.

Since the seventeenth century harmony has, in its musical sense, largely been associated with the chordal practices of music in the Central European art music tradition and with styles of popular music relating to that tradition. More recently, the notion of harmony has been popularly applied to any music which sounds in any way chordal to the Western ear, even, for example, to the vocal polyphony of certain African and Eastern European traditions, or to the polyphonic instrumental practices of some Central and South-East Asian music cultures. In short, whereas popular English-language parlance may qualify as 'harmony' such phenomena as a melody plus drone or two voices singing in parallel homophony see (p.3 ff.), conventional musicology would tend to reserve the term for chordal practices relating to the Central European classical tradition of tertial harmony. However, since popular music encompasses a wider range of tonal polyphonic practices than those conventionally covered by musicology, it is appropriate to qualify any type of tonal polyphony as harmony. This wider meaning of the term makes it possible to speak of a variety of harmonic practices and thus to treat harmonic idiom as one important set of traits distinguishing one style of music from another.

Polyphony

Polyphony, from Greek *poly* [πολύ] (= 'many') and *fone* [φωνή] (= 'sound'), denotes: 1. music in which at least two sounds of clearly differing pitch, timbre or mode of articulation occur at the same time (general definition); 2. music in which at least two sounds of clearly differing fundamental pitch occur simultaneously (tonal definition); 3. a particular type of contrapuntal tonal polyphony used by certain European composers between c.1400 and c.1600. This latter usage of the term, widespread in historical musicology, is incongruous since the polyphony alluded to is contrasted with homophony, itself another type of polyphony. Most popular music is, however, polyphonic according to definitions 1 and 2.

According to the first definition it is possible to qualify as polyphonic music which features the simultaneous occurrence of sounds for which no fundamental pitch is discernible, especially when such 'unpitched' sounds are produced by different instruments or voices articulating different rhythmic patterns. The notion of a polyphonic synthesiser rhymes well with this general definition since such instruments

allow for the simultaneous occurrence of several different ‘unpitched’ as well as pitched sounds, whereas monophonic synthesisers cater only for one pitch and/or timbre at a time. In short, a broad definition of the term permits such phenomena as drumkit patterns, or single vocal line plus hand clap/foot stamp (e.g. Joplin 1971), or fife and drum music (e.g. Band of the Royal Welsh Fusiliers), all to be qualified as polyphonic, while the tonal definition would not. According to the second (tonal) definition of polyphony, all unison playing or singing not accompanied by ‘pitched’ instruments is regarded as monophonic while homophonic singing in parallel intervals is understood as polyphony. Single or unison melodic line accompanied by drone (single-pitch or multi-pitched) is, however, at least strictly speaking, polyphonic according to both definitions 1 and 2, as are all forms of heterophony, homophony and counterpoint.

The degree to which music can be regarded as polyphonic is determined by the cultural habitat of that music's producers and users. For example, the consecutively articulated notes of guitar or piano accompaniment to popular songs are usually both intended and perceived as harmony or as chords (and thereby polyphonic), not least because the strings of the accompanying instruments are left to sound simultaneously and/or because of reverberation created within the instrument itself or by electroacoustic means, as, for example, in the introduction to *House of the Rising Sun* (Animals, 1964) or *Your Song* (Elton John, 1969). On the other hand, the fast descending scalar pattern played on sitar or vina at the end of a raga performance (e.g. Shankar 1970) may for similar reasons of reverberation sound like a chord to Western ears but it is by no means certain that such a cascade of notes is in its original context intended to be heard as a chord or cluster.

Chord¹

A chord is the simultaneous sounding of two or more different pitched notes by any polyphonic instrument or by any combination of instrument(s) and/or voice(s). The simultaneous sounding of notes of the same name, i.e. pitches separated by octave intervals, does not qualify as a chord. ‘Chord’ derives from Greek's *chorde* [χορδή], via Latin's *chorda* and simply meant the string of musical instrument. In sixteenth-century Europe ‘chord’ came to denote the sounding together of different notes played on several instruments of the same family, especially strings. Since then the word gradually acquired its current meaning.

Chords need not be heard as such by members of a musical tradition whose polyphony emphasises the interplay of independent melodic lines much more strongly than music in the Western post-Renaissance tradition of melody and accompaniment. In most types of popular music chords are generally regarded as belonging to the accompaniment part of that dualism.

Homophony

Homophony, from Greek *homófonos* [ομόφωνος] (= sounding in unison or at the same time) denotes the type of polyphony in which the various instruments and/or voices move in the same rhythm at the same time, i.e. the polyphonic antithesis of

1. See also under “Chords (2)”, p.22, ff.

counterpoint. In historical musicology, homophony is sometimes opposed to polyphony, the latter in the restricted sense of imitative contrapuntal polyphony, and can also therefore denote music in which one voice or instrumental part leads melodically while others provide chordal accompaniment. However, since chordal accompaniment in many influential types of popular music is characterised by riffs (bass, lead guitar, backing vocals, etc.) and thereby to a significant extent contrapuntal, it is misleading to call such music homophonic.

Music can be considered homophonic (or contrapuntal) only in relative terms. For example, although example 1, taken from one of the most popular hymn tunes in nonconformist Christianity, fulfils all the criteria of homophony, it is less homophonic than example 2 because: (i) each voice has a clearly melodic character, sometimes proceeding in contrary motion to the tune (soprano); (ii) the excerpt ends with a small contrapuntal intervention in the alto and bass parts.

Ex. 1 *Cwm Rhondda* (refrain) (John Hughes, 1873-1932)

Ex. 2 *Old 100th* (French Psalter, 1551)

Example 3 illustrates both homophonic and contrapuntal characteristics: while lead singer and backing vocalists sing homophonically, their combined melodic gesture is counterpointed by bass line and *flauto dolce* ostinato doubled by strings.

Ex. 3 Abba: *Fernando* (1976).

REPEAT and FADE niente at end of bar 114
(03:55/04:02)
(107/111) (108/112) (109/113) (110/114) (04:02) (04:11)

fl. (s)
syn.
gt. E7 E7 A
dr.
vln. mf *legatiss.*
voc. Yes, if I had to do the same a - gain, I would my friend Fer - nan - do. If I had to do the
pf. A E7 E7 A
ac. gt.
bs.

Counterpoint

'Counterpoint' comes from the Latin *contrapunctus*, an abbreviation of *punctus contra punctum*, meaning note against note. It refers to polyphony whose instrumental or vocal lines clearly differ in melodic profile.

Counterpoint is often understood as the horizontal aspect of polyphony, harmony as its vertical aspect. The problem with this popular distinction is that since chords, the building blocks of harmony, are usually sounded in sequence and since each constituent note of each chord can often be heard as horizontally related to a note in the next one, harmony frequently gives rise to internal melodies, some of which may 'clearly differ in melodic profile' and thereby have a contrapuntal character. Conversely, the simultaneous sounding of lines with differing melodic profile (counterpoint) entails by definition consideration of the music's vertical aspect, i.e. its harmony. Therefore, since melodic profile is as much a matter of distinct rhythm as of pitch, it is more accurate to consider homophony (see p.3 ff.) as the polyphonic antithesis to counterpoint. Even so, polyphonic music can be considered contrapuntal or homophonic only by degree, never in absolute terms. For example, the final chorus in most trad jazz band performances of almost any number (many instrumentalists improvising different rhythmic and tonal lines around the same tune and its chords, e.g. King Oliver, 1923) is more contrapuntal than the preceding solos (one melodic line, a bass line and chordal rhythm), much more so than conventional hymn singing (voices moving to different notes in the same rhythm) and infinitely more so than doubling a vocal line at the third or sixth (following the same pitch profile in the same rhythm). In short, the more differences there are between concurrent parts in terms of melodic rhythm and pitch profile, the more contrapuntal the music.

Imitative counterpoint of the type taught to composition students is uncommon in popular music, even though a few well-known canons (*Frère Jacques*, *Three Blind Mice*, *London's Burning*, for example) must be among the most frequently sung songs in the world. Indeed, despite the fact that canonic singing is also widespread in some parts of Africa (e.g. the Ekonda of Zaire, the Shona of Zimbabwe, the Jabo of Liberia) (Nketia, 1974: 144-5), the most common forms of counterpoint in popular music are: (i) the simultaneous occurrence of different melodies in the overlap between call and response (see example 4); (ii) the contrapuntal interplay between (a) melodic line, (b) accompanying or lead instrument, (c) bass line (see ex. 5).

Ex. 4 Overlapping call and response in *Please Mr. Postman* (Marvelettes, 1961).

The musical score for 'Please Mr. Postman' (Marvelettes, 1961) is presented in two staves. The top staff is the vocal line, and the bottom staff is the instrumental line. The key signature is one flat (B-flat), and the time signature is common time (C). The vocal line features a call-and-response structure with lyrics: 'Woe, yeah', 'Please, Please Mr. Po-wo-wo-st-man'. The instrumental line provides a rhythmic accompaniment with lyrics: 'Please Mr. Postman, look and see Is there a letter in your bag for me? I've been waiting here a mighty long time'. Chord symbols E^b, C^m, and A^b are indicated above the vocal line.

Ex. 5 Melody, lead instrument and bass in *Satisfaction* (Rolling Stones, 1965)

The musical score for 'Satisfaction' (Rolling Stones, 1965) is presented in three staves. The top staff is the melody line, the middle staff is the lead instrument (labeled 'ld. gt. (dist.)'), and the bottom staff is the bass line (labeled 'bs.'). The key signature is one sharp (F-sharp), and the time signature is 4/4. The lyrics are: 'but he can't be a man 'cause he doesn't smoke the same ci-ga-rettes as me'. Chord symbols E, A, E, and A are indicated above the melody line.

Heterophony

Heterophony, from Greek *héteros* [ἕτερος] ('other') and *fóne* [φωνή] ('sound'), means polyphony resulting from differences of pitch produced when two or more people sing or play the same melodic line at the same time. Heterophony can denote everything from the unintentional polyphonic effect of slightly unsynchronised unison singing to the intentional discrepancies between vocal line and its instrumental embellishment which are characteristic of much music from Greece, Turkey and the Arab world (ex. 6).

Ex. 6 Heterophonic cadential formulae in Greek *Tsamiko* music (in Chianis, 1967).

Heterophony is also at the heart of most forms of Indonesian gamelan music. Several layers of heterophony can combine to produce a distinctly chordal effect (ex. 7).

Ex. 7 Gamelan gong kebyar: multiple heterophony (transcr. in Hood, 1980).

Another type of heterophony is found in traditional music from the Hebrides where each florid pentatonic improvisation on the same psalm tune is thought to present each individual's 'relation to God on a personal basis' (Knudsen, 1968, ex. 8).

Ex. 8 Hebridean home worship - Martyrdom (*Musique des Îles Hébrides*, 1968, transcr. Knudsen)

Harmony

Two main types of harmony practice are currently used in popular music: classical (p.7) and modal (p.14), the latter divisible into the general subcategories tertial and quartal. Since most writing on harmony deals with procedure inside only one of these categories or subcategories (e.g. classical harmony, chorale harmony, bebop jazz harmony, modal harmony), cardinal problems arise when terms conventionally used with reference to one category of harmony — usually the classical — are applied to a much wider range of practices. Two conceptual areas are in particular need of clarification: [1] classical harmony, [2] triads and tertial harmony.

Classical harmony

Classical harmony is so called because it denotes the most common practices of tonal polyphony found in the globally influential body of European classical music of the eighteenth and nineteenth centuries. Such harmony is also commonly referred to as ‘triadic’, ‘diatonic’, ‘functional’, ‘tonal’ etc., but these qualifiers are misleading since they can each be applied to harmonic practices diverging significantly from those of the European art-music canon, its immediate precursors and successors. For example, all modal harmony using three-note chords is by definition triadic. It is also diatonic if, as is often the case, its tonal material can be derived from a standard heptatonic scale containing two semitone intervals. Moreover, with the possible exception of ‘atonal’ underscores in horror films, all harmonic idioms in popular music are tonal and none is without function. In short, although many *popular* music styles throughout the world may follow the basic harmonic principles of the European art music tradition, ‘classical harmony’ is probably the least inadequate available descriptor of those principles.

Triads and tertial harmony

Due to the importance of harmonic narrative in European art music of the eighteenth and nineteenth centuries (), harmonic theory has been overwhelmingly dominated by terms suited to the description of that particular type of polyphonic practice (compare, for example, the incongruity of the ‘suspended fourth’ in reference to quartal harmony). Similarly, terms applicable to any type of tonal polyphony (e.g. ‘triad’) have become so identified with phenomena peculiar to classical harmony and to its direct successors as to require redefinition when other harmonic idioms are discussed. Moreover, terms from pre-classical music theory have had to be resurrected and redefined to denote modern modal practices, and a few new concepts have been added to the arsenal to denote phenomena for which harmonic theory previously had no name. One such term is ‘quartal harmony’ (p.17), so called because from the viewpoint of European art music theory its most distinctive trait appears to be chords built on fourths rather than thirds, this latter trait requiring no accurate descriptor as long as it is considered the norm from which all other practices are seen to diverge. Such a viewpoint is clearly untenable when discussing the variety of harmonic idioms used in popular music and a general structural descriptor for harmony based on thirds becomes essential. Therefore, if harmony characterised by the use of fourths is called quartal, ***harmony characterised by the use of thirds should be called tertial.***

The historical legacy of European classical music theory is so strong that such a common phenomenon as the triad is so named as if no triads existed in modal or quartal harmony. The problem is that if 'dyad' (from Greek's *δύο*/*dyo*, meaning 'two') means, when applied to music, any chord containing two different notes, then 'triad' should mean any chord containing three different notes, 'tetrad' four different notes, 'pentad' five, and so on; however, as the expression 'common triad' indicates, triads built on the superimposition of two adjoining thirds are literally so common in classical harmony that 'triadic' has come to qualify not so much chords containing three different notes as chords built on the superimposition of adjoining thirds. When discussing several harmonic idioms, including those associated with European art music of the classical period, it is necessary to use 'triad' and 'triadic' only in their original sense. Harmony based on superimposed thirds will therefore be called 'tertial', not 'triadic', and 'triad' will mean any chord, tertial or not, containing three different notes.

History

The tonal polyphony of European art music is generally regarded as having gradually developed into a form which by the end of the seventeenth century crystallised into a set of practices qualifiable in today's terms as classical harmony. Its establishment is associated with the transition from contrapuntal to more homophonic types of tonal polyphony in late sixteenth and early seventeenth century Central Europe, and with the adoption of the melody-accompaniment dualism as a basic compositional device in which harmony is generally associated with instrumental or vocal accompaniment ('background harmony', 'backing vocals', etc.). Practically all European art music of the seventeenth, eighteenth and nineteenth centuries uses harmonic practices which also form the basis of tonal polyphony in such common types of popular music as operetta, parlour song, music hall, waltzes, marches, hymns, community songs, national anthems, romantic ballads, Schlager, evergreens, jazz standards, swing, bebop, etc. This broad tradition of harmony also pervades much Country music and film music.

Structural traits

Syntax, narrative, 'function'

Classical harmony is generally thought to encompass the sequential (horizontal, linear, 'contrapuntal') as well as simultaneous (vertical, homophonic) aspects of chords. It is in other words not just a matter of instantaneous sonority or of short, repeated chord sequences. On the contrary, one of its most salient features is the implication of tonal *direction* of notes within chords (shown as ↗, ↘, → in ex. 9-16), such horizontal linearity being instrumental in elemental processes of *musical narrative* (opening, continuation, change, return, closure, etc.). The importance of narrative function in the European art music tradition led influential musicologists like Riemann (1893) to qualify its harmony as 'functional'. Although this nomenclature is misleading because it falsely implies that other harmonic practices have no function, its insistence on *syntactic function* underlines important differences of expression and narrative organisation between European classical harmony and other types of tonal polyphony.

Voice leading, the ionian mode and modulation

Ex. 9 (a) (b)



In classical harmony dissonances are in principle prepared to act as suspensions (notes held over from a previous consonance) which resolve into consonances (e.g. C^{sus4} → C or C^m, see ex. 9b), while closure is generally assumed to be effectuated by perfect

cadence (V-I, e.g. G7 → C in C). In such basic chord progressions the concept of *voice leading* is paramount in that the perfect fourth in relation to the keynote (e.g. the *f* of G7 in relation to C, as in ex. 9) usually descends to the third (*e* in relation to *c*) and the major seventh (e.g. the *b♭* of the G or G7 chord in relation to C, as in ex. 9) usually ascends to the keynote. These rules of voice leading are not arbitrary: they derive from the fact that the most popular array of notes within an octave during the rise and hegemony of the bourgeoisie in Europe was the *ionian mode* (the standard major scale, e.g. *c* to *c* on the white notes of the piano).

The ionian is the only heptatonic diatonic mode to feature at the same time:

- major triads on all perfect intervals of the scale (tonic, fourth and fifth, e.g. C, F and G in C major, see table 1);
- a dominant seventh chord, containing a tritone, on the fifth degree (e.g. G7, containing *f♯* and *b♭*, in C);
- semitone intervals, one ascending and one descending, which adjoin two of the tonic triad's three constituent notes, i.e. leading note to tonic (*♯7* ↗ 8, or *b♭* ↗ *c* in C) and subdominant to mediant (4 ↘ 3, or *f* ↘ *e* in C).

In simple terms, the ionian mode's fourth is felt to be pulled down to the major third a semitone below, while its major seventh or leading note is so called because it is heard as leading up to the keynote one semitone above. This simple principle of voice leading endows the ionian mode with its unique qualities of tonal directionality.

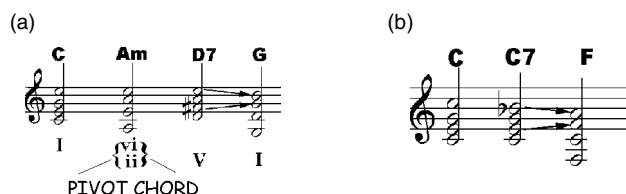
Ex. 10 (a) (b)



Although this directionality is that of the V-I cadence anticlockwise round the circle of fifths (e.g. G7 → C, see p.36 ff.), the ionian mode's semitones can also exert a pull in the opposite direction (ex. 10) because the third degree can rise as leading note to the fourth (e.g. *e* ↗ *f* in C) while degree one (or eight) can descend to degree seven

(e.g. *c* ↘ *b♭*), which also happens to be major third in a simple triad on the dominant. In the first instance (degree 3 ↗ 4) harmonic direction remains subdominant in that the mediant of the tonic acts as leading note to the subdominant (*e* ↗ *f*, ex. 10a); but in the second instance the tonic acts as fourth descending to the mediant of the dominant (*c* ↘ *b♭*, ex. 10b).

Ex. 11



Dominantal direction (clockwise round the circle of fifths, e.g. from C to G) is usually enhanced by raising the tonic's fourth by one semitone (e.g. *f* to *f♯* in the D7 chord of ex. 11a), such alteration making for a clearer direction towards the dominant by introducing a second, rising semitone (*f♯* ↗ *g*) to complement the falling

semitone already mentioned ($c \searrow b\sharp$, ex. 10b, 11a). Raising the fourth by a semitone (e.g. f to $f\sharp$) moves the tonic of the ionian mode to the dominant, from I to V (e.g. $C \rightarrow G$), and constitutes a change of key or modulation, especially if a pivot chord is included in the progression (ex. 11a). Conversely, lowering the leading note by half a tone (e.g. from $b\sharp$ to b in the C7 chord of ex. 11b) will introduce a descending semitone ($b\sharp \searrow a\sharp$) to underline the subdominant direction of semitone rising to the keynote of the new ionian mode (e.g. $e\sharp \nearrow f$, see ex. 10a, 11b). The introduction of accidentals providing ascending or descending leading notes for V-I cadences in other keys than the tonic is an essential characteristic of classical ionian-mode harmony because such chromaticism is a precondition for the type of modulation without which the basic narrative of most European art music would be unthinkable.

Dissolution of classical harmony

It is generally agreed that the harmonic idiom of influential European composers of art music in the late nineteenth and early twentieth centuries (e.g. Wagner) became increasingly chromatic and modulatory to the extent that tonality, in the sense of a home key for a particular piece of new music, was no longer considered by figures like Schönberg and Webern as a valid strategy for composition (Perle and Lansky, 1995). The subsequent development of dodecaphonic and other types of 'atonal' music contributed to a widening of the gap between popular and art genres. Jazz harmony underwent a similar process of chromaticisation in the forties with bebop's increasing use of chords containing two tritones, the rising augmented fourth ($\sharp 4$) or falling flat fifth ($b5$) providing yet another leading note to tertial harmony's ascending major seventh and descending fourth (see $7b5$, $9b5$, etc. Table 6, p. 29; and "Voice leading, the ionian mode and modulation", p.9, ff.).

'Tonal' art music reactions to late Romantic chromaticism came from impressionism (e.g. Debussy, ex.29), neo-classicism (e.g. Hindemith), and influences from folk music (e.g. Bartók). Impressionism often uses chords as sonorities *per se* without the constituent notes of each chord requiring voice leading into those of the next one, while music influenced by neo-classicism and interest in folk music outside Central Europe show clear traits of modality, often using quartal harmony (see p.17, ff.) which abandons the leading-note fixation of classical tertial harmony in favour of chords based on the fourth and fifth. Similar developments are found in jazz with the change from bebop into modal and 'free' jazz forms. All these currents have been influential on some postwar popular music styles.

Classical harmony in popular music

Main characteristics

Tertial harmony of the type used in operetta, parlour song, marches, musicals and in traditional church hymns, etc. largely follows the voice-leading practices of European art music: flat sevenths descend, sharp sevenths rise, voices may move in parallel thirds or sixths but never in parallel octaves or fifths. Dominant modulation (changing key one step clockwise round the circle of fifths), V-I cadences and inversions of tertial triads and seventh chords are other common features in these types of popular music.

Examples 12 and 13 (p.11), taken from two highly popular parlour songs, start by establishing the home key (tonic, I) by means of an ionian shuttle ($I \leftrightarrow V$, bars 1-2 $E\flat \leftrightarrow B\flat$ in ex. 12; 1-4 $F \leftrightarrow C$ in ex. 13), whence they both modulate to the dominant, ex. 12 directly, using an F7 in second inversion (bar 4), ex. 13 via an initial V-I in D minor (bars 5-6), which then acts as pivot for the double dominant (G7) and a V-I

cadence in C (bars 7-8). Note also the frequency of dominant seventh chords containing the ionian mode's two leading notes a tritone apart and how the major third in those chords ascends to the next chord's tonic (♯ in ex. 12-13), while the flat seventh descends to the next chord's third (♭). These traits, including sometimes use of tertial chords in their inversions, form the harmonic core of a global idiom of popular music which flourished during the late nineteenth century and the first half of the twentieth century. They can be found, in varying proportions in such popular tunes as *Adeste Fideles*, *Cocorocó*, *La cucaracha*, *The Blue Danube*, *Le déserteur*, *Giãi phóng miền nam*, *Jingle Bells*, the German national anthem, *L'hirondelle du faubourg*, the *Internationale*, the song of the International Brigade, *Liberty Bell*, *Light Cavalry*, the *Marseillaise*, *Onward Christian Soldiers*, Rubinstein's *Melody in F*, *Cielito Lindo*, *Sous le ciel de Paris*, *Sancta Lucia*, *The Star-Spangled Banner*, *Waltzing Matilda* (chorus), *We Shall Overcome*, *When The Saints*, *Where Have All the Flowers Gone*, *Workers of the World Awaken!*

Ex. 12 Mendelssohn: *Oh! For the Wings of a Dove*.

Ex. 13 James L Molloy: *Love's Old Sweet Song* (1882).

Voice leading the dominant seventh chord's minor seventh and major third, dominant modulation, subdominant V-I directionality, the frequent occurrence of inversions etc. have in fact become so indicative of European art music that they can be inserted as genre synecdoches in a context of non-classical harmony (e.g. pop and rock) to connote, seriously or humorously, 'high art' rather than 'low-brow entertainment', 'deep feelings' and the 'transcendent' rather than the 'superficial' and 'ephemeral' (ex. 14-16).

Together with dance styles like bossa nova, Jazz has relied heavily on a sense of harmonic direction similar to that of the European classical tradition. Long and sometimes quite complex chord sequences, an increasing amount of chromaticism, and the use of modulation are all key factors in many types of jazz. The popularity of the thirty-two bar standard as basis for improvisation bears witness to the essential role of harmonic narrative in jazz. Put simply, no jazz performance will work if musicians do not know or cannot follow the changes.

Ex. 14 Tonic second inversion as second chord: a 'classical' move: outline keyboard arpeggiation structure. (a) J S Bach: Prelude in C major from *Wohltemperiertes Klavier*, Band I (1722); (b) Elton John: *Your Song* (1970, transposed to C).

Example 14 shows two musical excerpts illustrating the tonic second inversion as a second chord. (a) J S Bach: Prelude in C major from *Wohltemperiertes Klavier*, Band I (1722). The notation shows three measures of arpeggiated chords: C (x 2), F⁶/_b (x 2), and G/_b (x 2). (b) Elton John: *Your Song* (1970, transposed to C). The notation shows three measures of arpeggiated chords: C, F/_c, and G/_c.

Ex. 15 Inversions through descending bass in major key: (a) J S Bach: Air from Orchestral Suite in D Major (c. 1730, transposed to C); (b) Procol Harum: *A Whiter Shade of Pale* (1967); (c) bass common to both (a) and (b).

Example 15 shows three musical excerpts illustrating inversions through descending bass in major key. (a) J S Bach: Air from Orchestral Suite in D Major (c. 1730, transposed to C). The notation shows four measures of chords: C, C^{maj7}/_b, A^m, C/_g, and F. (b) Procol Harum: *A Whiter Shade of Pale* (1967). The notation shows four measures of chords: C, C^{maj7}/_b, A^m, C/_g, and F. (c) Bass common to both (a) and (b). The notation shows four measures of bass notes: C, C, A, G, and F.

Ex. 16 Altered supertonic seventh chord in fourth inversion: (a) Mozart: *Ave verum corpus*, K618 (1791); (b) Procol Harum: *Homburg* (1967); Abba: *Waterloo* (1974).

Example 16 shows three musical excerpts illustrating the altered supertonic seventh chord in fourth inversion. (a) Mozart: *Ave verum corpus*, K618 (1791). The notation shows four measures of chords: D, D, E⁷/_d, and E⁷/_d. (b) Procol Harum: *Homburg* (1967). The notation shows four measures of chords: D, D, E⁷/_d, and E⁷/_d. (c) Abba: *Waterloo* (1974). The notation shows four measures of chords: D, D, E⁷/_d, and E⁷/_d.

Jazz harmony can be divided into four main historical idioms: [1] trad. jazz; [2] swing; [3] bebop; [4] non-tertial (p.17). With the exception of [4], all jazz harmony follows the underlying principles of European art music: flat sevenths fall, sharp sevenths rise, accidentals (alterations) are used for chromatic effect or for modulation, there is strict adherence to falling, subdominant (V-I) progressions anti-clockwise round the circle of fifths. Trad. jazz harmony tends to use real circle-of-fifths progressions, adding sixths or sevenths to basic triads. Swing era harmony tends to favour virtual circle-of-fifths progressions with sixths, sevenths and ninths added to basic triads. Bebop harmony can be regarded as a radical expansion of swing harmony: it features chromatic alteration, typically through tritone substi-

tution which includes the flat fifth as an extra (voice) leading note, and chords of the eleventh and thirteenth. Basic differences between these jazz harmony idioms are illustrated in simplified form in example 17 which shows varying treatment of the (I-) VI - II - V - I vamp sequence.

Ex. 17 Renditions in C of VI-II-V-I sequence in main tertial idioms of jazz harmony.

(a) trad. jazz.

(b) swing era: [1] standard,
[2] chromatic.

(c) bebop: [1] standard,
[2] tritone substitution

(a)

(b1)

(b2)

(c1)

(c2)

Non-classical harmony

Non-directional tertial harmony

Ionian mode and barré

Although sequences of common triads in the ionian mode occur frequently in many postwar popular music styles (for example, in cúmbia, son, high life and kwela, as well in pop, rock and soul music) such harmonic practices cannot be qualified as classical because they rarely, if ever, follow the directional conventions of European art music's voice-leading and modulation. For example, the tertial, ionian-mode *La Bamba* matrix (I-IV-V, see table 2 (p.16)) does not modulate, contains no inversions, and usually closes IV→V, not V→I (e.g. *Guantanamera*). Moreover, barré chord progressions, so common in guitar-based popular music, automatically involve sequences of parallel fifths or octaves, forbidden in classical harmony, for example between the triads on IV and V of the *La Bamba* matrix. Similarly, bottleneck performance relies entirely on chords strung together in parallel motion. By including such parallel motion and by excluding modulation and inversion, such tertial matrices, which rarely involve more than four chords, function in a radically different way to progressions in the idiom of classical harmony. Although such matrices may vary from one (section of a) song to another, their function is neither to provide long-term harmonic direction nor to construct musical narrative but rather to pro-

vide a fitting tonal dimension to underlying patterns of rhythm, metre and periodicity and to generate an immediate sense of ongoing tonal movement.

Tertial modal harmony

By modal harmony is generally meant the use of chords that follow the tonal vocabulary of any church mode except the ionian and locrian (the latter excluded because its tonic triad is diminished, rather than, as in all other cases, either major or minor). It is the five remaining modes — dorian, phrygian, lydian, mixolydian and aeolian (see tables 1 and 2) — that give rise to modal harmony in the popular sense of the term.

Characteristic differences in tertial modal harmony derive to a large extent from the unique tonal relationship between the keynote and major triads of each mode. Table 1 shows that each mode contains three major triads (C, F, G on the white notes of the piano). It also shows that the minor modes (dorian, phrygian, aeolian) all have a major triad on the flat third degree (♭III), that the phrygian is alone with a major triad on the flat supertonic (♭II), that a major triad on the unaltered supertonic (II) is unique to the lydian mode, that the mixolydian is the only major mode with a major triad on the flat seventh (♭VII), that the dorian is the only minor mode with a major triad on the fourth (IV), etc.

Table 1 Major triad positions in church modes

	I	♭II	II	♭III	IV	V	♭VI	♭VII
ionian	✓				✓	✓		
dorian				✓	✓			✓
phrygian		✓		✓			✓	
lydian	✓		✓			✓		
mixolydian	✓				✓			✓
aeolian				✓			✓	✓

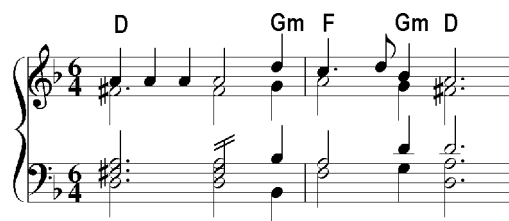
The basic principles of tertial modal harmony can be simply grasped using only the white notes of a piano keyboard instrument. Playing the major triads of F, G and C, as well as the relevant tonic triad (if it is not based on *f, g* or *c*), while at the same time holding down the keynote of the relevant mode in the bass (*c* for ionian, *d* for dorian, *e* for phrygian and so on) will produce familiar but distinctive patterns of modal harmony. This procedure can then be transposed to any of the octave's black or white notes.

It should be noted that the most common alteration in tertial modal harmony is to raise the third of tonic triads in minor modes. Such alteration can be understood in terms of a *tierce de Picardie* used consistently throughout a piece of music as substitute for the tonic minor triad, not just as alteration of the final chord. This major triad substitution practice was commonly used in the modal harmony of Elizabethan popular song and dance (ex. 18, 20; see also *Farnaby's Dreame*, Dowland's *King of Denmark's Galliard*, etc.).

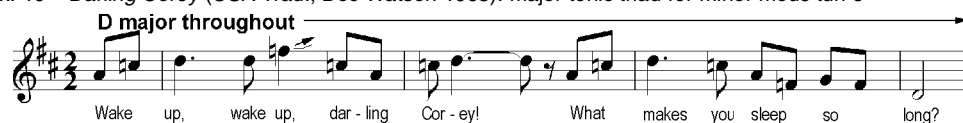
Major third substitution in the tonic triad is widespread in blues and in some Country music where minor or blues thirds are executed to the accompaniment of major

triads (ex.19), or when barré techniques are used to progress between I \flat III and IV, as in the dorian-mode riffs of *Green Onions* or *Smoke On The Water*. Dorian harmonies are in other words suited to the accompaniment of minor pentatonic melody (1 \flat 3 4 5 \flat 7) because, with alteration of the tonic, major triads occur on four of five pitches (I \flat III IV \flat VII).

Ex. 18 Farnaby: *Loth to Depart* (c.1610): aeolian triads with major tonic triad (I \flat III iv \flat VI \flat VII)



Ex. 19 *Darling Corey* (USA Trad., Doc Watson 1963): major tonic triad for minor mode tune



Ex. 20 Weelkes: *Hark, All Ye Lovely Saints* (c.1610).



The fifth degree triad of minor modes was also often altered to major in European polyphonic music during the ascendancy of the ionian mode, typically to introduce V-I cadences containing dominant sevenths and their double leading notes (see p.9). Example 20 (bars 1-2) shows a dorian (I IV \flat III) and (bars 4-5) a mixolydian progression (I IV \flat VII), each followed by the standard V7-I ionian cadence of classical harmony.

Alteration of minor dominant also occurs in blues-related styles, especially when barré, slide and bottleneck techniques are used on guitar. In these cases, however, such alteration relates to tuning and playing practices, not to any predilection for the ionian mode or perfect cadences, as is evident from the absence of V-I changes (B \rightarrow E) in example 21.

Ex. 21 Slide guitar chords (opening tuning E) for *Vigilante Man* (Guthrie), adapted from Cooder (1971).

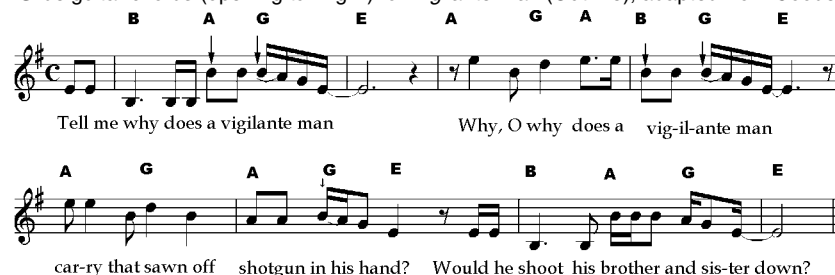


Table 2 shows the major triads, including, where applicable, the altered tonic (in square brackets), of each mode. (The lydian and locrian modes are excluded because they are uncommon in most forms of popular music.) Table 2 also presents each mode's major triads as they would occur 'in C' (no sharps, no flats) and 'in E' (four sharps), along with references to examples of popular music in which each relevant modal tertial harmony can be heard.

The tertial harmony of each mode is often related to the frequency with which it is (assumed to be) used in particular types of music. Hence, dorian harmony is a trait of some blues-based styles (ex.21), while phrygian chord changes are often regarded, at least by non-Hispanics, as distinctive of Hispanic popular music styles (ex.22). Tertial phrygian harmony is also used extensively in popular music from Greece, Turkey, the Balkans and the Near East, mostly in accompaniment to melody in the *Hijaz* mode (e.g. *Misirlou*, a.k.a. the theme from *Pulp Fiction*).

Ex. 22 Phrygian harmony: (a) Malagueña figure; (b) Puebla *Hasta siempre*

(a)

(b)

Mixolydian harmonies are often linked with British and Irish or Anglo-American folk music (ex. 28, p. 19), with some forms of rock and Country, and with music for Western adventures (ex. 23, p. 17). One particular trait of mixolydian harmony, the 'cowboy half cadence', from $bVII$ to an altered major triad on V, is familiar enough to have become an object of both pastiche (ex. 24a, p.17) and parody (ex. 24b).

Aeolian harmony seems to have acquired two main functions in pop and rock music: [i] connoting, by means of the 'aeolian pendulum', notions of the ominous, fateful or implacable (Björnberg 1984); [ii] substituting standard IV-I or V-I cadences with the more colourful and dramatic bVI - $bVII$ -I aeolian cadence, easily performed as barré chords on guitar.

Table 2 Major triads in tertial modal harmony

	relative positions	on white notes	with 4 sharps	examples
ionian	I IV V	C F G	E A B	<i>La bamba</i> , <i>Twist and Shout</i> [D-G-A in D]; <i>Guan-tanamera</i> [F-B \flat -C in F]; <i>Pata Pata</i> [F-B \flat -F-C].
dorian	[II] $bIII$ IV $bVII$	[D] F G C	[E] G A D	<i>Green Onions</i> , <i>Smoke on the Water</i> [E-G-A in E]; ex. 18, 20-21
phrygian	[II] bII $bIII$ $bVII$	[E] F C G	[E] F C G	See ex. 22, verse of <i>E viva España</i> , start of Rodrigo's <i>Concierto de Aranjuez</i> . <i>Misirlou</i> .
mixo-lydian	I IV $bVII$	G C F	E A D	<i>Sweet Home Alabama</i> [D-C-G in D]; <i>Hey Jude</i> [G-F-C-G]; <i>The Magnificent Seven</i> [E \flat -A \flat -E \flat -D \flat in E \flat]; ex. 23-28
aeolian	[II] $bIII$ bVI $bVII$	[A] C F G	[E] G C D	<i>All Along the Watchtower</i> [A-G-F-G in A], <i>Flash-dance</i> [G-F-E \flat -F in G]. Cadences in <i>Lady Madonna</i> [F-G-A], <i>PS I Love You</i> [B \flat -C-D], <i>SOS</i> [D \flat -E \flat -F], <i>Brown Sugar</i> [A \flat -B \flat -C].

Ex. 23 Mixolydian shuttles: (a) Tiomkin: *Duel in the Sun* (1947); (b) Mancini: *Cade's County* (1971).

(a) $\text{♩} = 80$ D G D G C G D

trpts. *f*
brass, timp. *f*
8va, 1 5a bassa

(b) $\text{♩} = 144$ E \flat D \flat

Ex. 24 Cowboy half cadences: (a) The Shadows: *Dakota* (1963); (b) Brooks: *Blazing Saddles* (1974).

Mixolydian shuttle

= 156 C B \flat C B \flat G C B \flat G C B

rh. gt. *mf* *sim. al fine* harmonica

(b) $\text{♩} = 132$ E \flat A \flat E \flat D \flat B \flat

He rode a blaz-ing sad-dle, he wore a flam-ing star

Quartal harmony

Structural definition

Quartal harmony is so called because it is based on the fourth and on its octave complement, the fifth. Unlike its tertial counterpart, quartal harmony it is not based on thirds, nor on the ionian mode, nor do its basic chords contain tritones whose constituent notes demand voice leading by semitone steps. The structural elements of quartal harmony are set out in example 25.

The first line (a) of example 25 shows: (1) *c* at the centre of a pile of fourths (*d g c f b b*); (2) the pentatonic scale resulting from that pile of fourths (1-2-4-5- \flat 7 or *c d f g b b*); (3) *c* at the centre of a pile of fifths containing exactly the same tonal material as ex. 25 (a1) and (a2): whether the notes be piled in fourths or fifths, they still constitute a run of five consecutive positions round the circle of fifths. Lines (b) and (c) in ex. 25 show (2) the resultant pentatonic scales when *c* is shifted subdominantly to position 2 or, dominantly, to position 4 in the pile of fourths (b1, c1), and to position 2 or 4 respectively in the equivalent pile of fifths (b3, c3). Note [i] that the quartal notes of C in central position (ex. 25a) are the same

Ex. 25 Basis of quartal harmony in C

(a1) (a2) (a3)

(b1) (b2) (b3)

(c1) (c2) (c3)

as those of the G minor or B \flat major anhemitonic pentatonic modes; [ii] that those of C in dominant position (ex. 25b) tally with the pentatonic scales of D minor and F major; [iii] that those of C in subdominant position (ex. 25c) coincide with C minor and E \flat major pentatonic scales. Simple triads and tetrads resulting from C in central quartal position (ex. 25a) are presented in example 26 and are transposable to any of the chromatic scale's eleven other pitches.

Ex. 26 Basic quartal triads and tetrads in C (central position)

Ex. 26 displays basic quartal triads and tetrads in C (central position) across four systems (C, F, B \flat , D). Each system shows five numbered chords with their intervallic structures:

- C System:**
 - ① 1-2-5
 - ② 1-4-5
 - ③ 1-4- \flat 7
 - ④ 1-5- \flat 7
 - ⑤ 1-2-5- \flat 7
 - ⑥ 1-4-5- \flat 7
 - ⑦ 1-2-4-5- \flat 7
- F System:**
 - ① 1-2-5
 - ② 1-4-5
 - ③ 1-2-4-5
 - ④ 1-2-5-6
 - ⑤ Gm7/B \flat 6
- B \flat System:**
 - ① 1-2-5
 - ② 1-2-6
 - ③ B \flat
 - ④ B \flat 6
 - ⑤ 1-2-5-6
- D System:**
 - ① 1-4- \flat 7
 - ② B \flat
 - ③ 1- \flat 3-4
 - ④ B \flat 6
 - ⑤ 1- \flat 3-4- \flat 7

Each note of the pile of fourths (or fifths, or of the relevant pentatonic scale) can be used as bass for chords consisting of the same tonal vocabulary. Moreover, all of the chords tabulated can be sounded with any pitch from the relevant pentatonic material as bass note. This procedure occasionally produces tertial chords (in ex. 26 Gm and B \flat , marked in black) which, in a consistently quartal idiom, are usually supplied with a bass note foreign to the tertial chord in question. For example, with *c* in the bass, Gm(7) and B \flat (6) produce variants of C11, a chord which even in a tertial context contains a fourth and is sounded without third (see table 6, p.29, chords 4a-4d). Most of the chords in example 26 are, however, unequivocally quartal.

In jazz and pop circles quartal chords are sometimes referred to as suspensions. Chords C $\textcircled{6}$ and C $\textcircled{6}$ in ex. 26 might, for example, be called C sus^9 and C sus^4 respectively. However, it is apparent from examples 29-32 that quartal chords are consonances in their own right, not suspensions requiring resolution as in example 9b. Similarly, the chord marked 'C6/9' in the sheet music version of Sting's *Seven Days* (ex. 32, p. 20) is neither a C6 chord, nor a C9 nor a C9add6, nor C6/9 (see table 6, p.29-30), but a 1-2-5-6 quartal chord (C in dominant position, see ex. 25b2) that constitutes the main keynote sonority of the whole song.

History and usage

Open fourths and fifths, as well as quartal chords, start to appear in urban Western music in the folk-influenced work of composers living on the fringes of Europe.

Ex. 27 Borodin: (a) *Song of the Dark Forest* (1868); (b) *The Sleeping Princess* (1867).

Ex. 27 shows quartal harmony in two examples:

- (a) *Song of the Dark Forest* (1868): The bass line features quartal chords in 5/4 time, marked *f* and *col Sva bassa*.
- (b) *The Sleeping Princess* (1867): The bass line features quartal chords in 3/4 time, marked *pp*.

Russians like Mussorgsky and Borodin (ex. 27) are followed much later by composers of the Spanish school (ex. 28a, bar 2) but tertial modal harmony was for some

time the most common approach to the problem of harmonising music outside with the Central European classical idiom (e.g. Dvořák, Grieg, Rimsky-Korsakov, Vaughan Williams). However, the attitude of classically trained European musicians to music outside the canon did change during the nineteenth century. Whereas the Czech-German symphonist Carl Stamitz had in 1798 deemed Irish tunes incapable of bearing any harmony (Hamm 1979: 50), Herbert Hughes, in his preface to *Irish Country Songs* (vol. 1, London, 1909: iv), expressed the need for a radical and unacademic approach when dealing with such material, championing the work of 'M. Claude Debussy' who, he claimed, had set the trend 'to break the bonds of this old slave-driver' [classical tonality, etc.] 'and return to the freedom of primitive scales'. Indeed, Hughes's accompaniment to the mixolydian ballad *She Moved Through the Fair* (popularised by Simple Minds as *Belfast Child*) resolves its chains of open fifths and tertial triads into a final quartal chord (ex. 28b, p.19).

Ex. 28 (a) De Falla: Farruca from *El sombrero de tres picos* (1919).



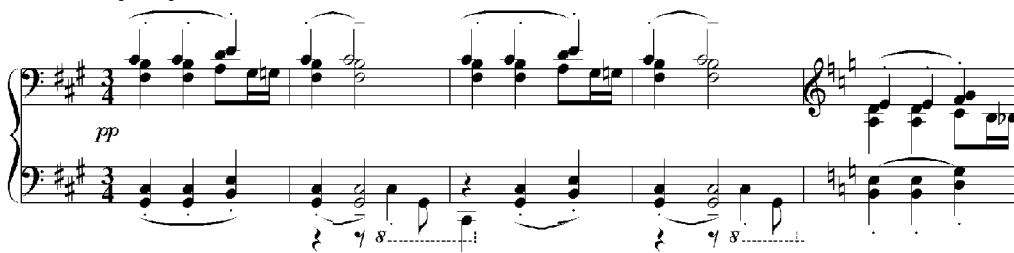
Ex. 28 (b) Irish Trad., arr. Hughes: *She Moved Through The Fair* (final chords in accompaniment, 1909).



Debussy is one of the first to use quartal harmony in modern Western music. Although whole sections of *La cathédrale engloutie* (1910), also as arranged by John Carpenter and Alan Howarth in *Escape from New York*, move in layered parallel fifths, Debussy's use of quartal chords is generally limited to short passages providing contrasting harmonic colour to other sonorities, such as the whole-tone scale and tertial chords of the sixth, seventh and ninth. Example 29 shows the first three bars of one such brief passage.

Ex. 29 Debussy: 'Sarabande' from *Pour le piano* (1901)

Avec une élégance grave et lente



The tertial aspects of Debussy's harmonic language were adopted by prewar US composers of popular song (e.g. Gershwin, Kern). However, the type of quartal harmony just cited, and practised more widely by Bartók or Hindemith, first found its way into the popular mainstream through composers associated with film or the stage, for example Copland (e.g. *Billy The Kid*, 1938; *Fanfare for the Common Man*, 1942, the latter used as title music for the Apollo-Soyuz broadcasts and in a General Motors commercial), Rózsa (e.g. scores for *The Jungle Book*, 1942; *Quo Vadis*, 1950), Leonard Bernstein (e.g. *On the Waterfront*, 1955), Elmer Bernstein (e.g. *The Carpetbaggers*, 1964).

Quartal harmony was slower to enter the world of jazz. The 1959 Miles Davis album *Kind of Blue* is often seen as a turning point when the tertial constraints of bebop

harmony were abandoned in favour of quartal chords (ex. 30). Among jazz musicians to follow in Davis's modal footsteps in the sixties and seventies were McCoy Tyner and Freddie Hubbard (ex. 31).

Ex. 30 Miles Davis: *So What* (1959)



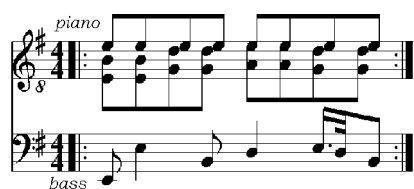
Ex. 31 Freddie Hubbard: *Red Clay* (1970), cited in Ingelf (1974).



Ex. 32 Sting: *Seven Days* (1993).



Ex. 33 Manfred Mann: *I'm Your Kingpin* (1964): bass and piano riff



Pentatonic improvisation and quartal chords became a cornerstone of jazz fusion harmony (e.g. John McLaughlin, Chick Corea, not to mention Davis's 1970 *Bitches Brew* album), surfacing also as music for TV (e.g. Goldenberg's *Kojak* theme) and later in recordings by jazz-influenced pop artists such as King Crimson and Sting (ex. 32).

In Anglo-US commercial music, early use of bare fourths and fifths resembling quartal chords can be found in *Nowhere To Run* (Martha and the Vandellas, 1965), in Carole King's *Road To Nowhere* (1966) and Manfred Mann's *I'm Your Kingpin* (1964, ex. 33). While the first two are both modal tunes, their thirdless

chords are attributable to word painting the emptiness of 'nowhere' rather than to consistent use of a new harmonic idiom. Mann, a jazz pianist, on the other hand, uses quartal harmony throughout *Kingpin* in conjunction with minor blues pentatonicism in both melody and bass. Quartal harmony in pop is in fact most often found together with tunes in the dorian, aeolian or minor pentatonic mode, for example in many a track by Steeleye Span or the Albion Country Band.

It is probable that the use of quartal harmony in pop and rock, including its occasional appearance in such Rolling Stones hits as *Jumpin' Jack Flash* and *Gimme Shelter* (1969), derives partly from old rural forms of polyphony (blues, folksong,

etc.). For example, Clarence Ashley's open-string banjo accompaniment to the minor pentatonic tune *Coo-Coo Bird* is entirely quartal and qualified by the Folkways liner notes (1963) as archaic. Similarly, the thirdless harmonies of minor-mode shape-note hymns like Hauser's *Wondrous Love* (1835) bear more resemblance to the polyphony of Heinrich Isaac (died 1517) than to their urbane contemporaries. Indeed, during tertial harmony's global hegemony (c.1650-c.1950), polyphony based on fourths or fifths was regarded as either archaic or primitive to the extent that Hollywood stereotypes for almost any place or time felt to be distant enough from 'our own' was provided with some kind of thirdless polyphony. Ancient Egypt, Greece and Rome, pre-Renaissance Europe, the Chinese, the Arabs and Native Americans were often harmonically indistinguishable.

From this perspective it might seem as if modal and quartal harmony constitute no more than a return to pre-classical polyphony. There is, however, little doubt that classical harmony will survive as just one polyphonic idiom among several. It has also left an indelible impression worldwide on practices of tonal polyphony. Its imprint on quartal harmony can be seen in the need to develop means of 'changing key' inside a tonal idiom which in earlier times contained no modulation. Quartal key changes occur in examples 29 (from $C\sharp^{4-5-b7}$ to E^{4-5-b7}), 30 (from Dm^{11} to Ebm^{11}) and 31 (a riff whose two poles are [i] Dm^{11} and A^{4-5-b7} and [ii] Cm^{11} , Ebm^{11} , Gb/f). Moreover, the *Kojak* theme changes between Cm^{11} and Ebm^{11} , and much of the dynamic in Bartók's harmonic language derives from tension between quartal chords a tritone apart (Lendvai 1971). In short, it is possible to change quartal key by introducing a chord whose constituent notes are as different as possible to those in the previous one. The most usual key changes from a quartal sonority in central position (1-2-4-5-b7, see ex. 25, p. 17) are therefore those to a quartal chord situated a minor third above or below, or to a quartal chord at a tritone's interval, or to a quartal chord on either degree IV or V in relation to those three other pitches, i.e. to any other note in the quartal tonic's diminished seventh chord, or to either IV or V in relation to those other three pitches. For example a quartal key change from C can move to Eb , $F\sharp/Gb$ or $A\flat$, or to [i] Ab (IV in relation to Eb), [ii] or B or $C\sharp/Db$ (IV or V in relation to $F\sharp/Gb$), or [iii] E (V in relation to A). Put simply, a 1-4-5 chord can only 'change key' to a 1-4-5 triad on a note at least three positions away in the circle of fifths (C to Eb , Ab , Db , $Gb/F\sharp$, B, E, A: see p.36, ff.) but it cannot 'change key' to Bb , F, G or D because these notes are already contained within its own tonal vocabulary (1-2-4-5-b7, see ex. 25).

It is impossible to tell if developments in tonal polyphony during the twentieth century will survive as long as those of the classical tradition, or whether the tonal constraints of quartal and modal tonality will end up in the same sort of cul-de-sac as tertial chromaticism. It is more likely that harmony might be superseded, not least for technological reasons, by another compositional dynamic: that of sampling, MIDI-looping and the juxtaposition of pre-existent musical and paramusical sounds. Whatever the future holds, it is clear that harmony, and whatever, if anything, supersedes it is just as much an ideological as technical or theoretical matter.

Chords (2)

Tertial chords

Tertial chords are based on common triads (see below) and can be regarded as the fundamental harmonic building blocks in most forms of jazz, popular music and European classical music.

Tertial triads

A *triad* is any chord containing three notes (cf. German *Dreiklang*). The *common triad* is constructed as two simultaneously sounding thirds, one superimposed on the other. For example *c-e* (a major third) together with *e-g* (minor third) constitute a C major triad, while *d-f* (minor third) with *f-a* (major third) makes for a D minor triad (ex.34).

Ex. 34 Tertial triads on each degree of C major / A minor scale

C major I Dm ii Em iii F IV G V Am vi B° vii
A minor III iv v VI VII i ii

There are four types of tertial triad: major, minor, diminished and augmented (see table 3). The first three of these triad types can be generated from the seven key-specific notes of any standard major or melodic minor scale (the ionian and aeolian modes). As shown in ex.34, major triads derive from degrees 1, 4 and 5 of the major and from degrees 3, 6 and 7 of the minor scale (e.g. C, F, G in C major / A minor), while minor triads are found at degrees 2, 3 and 6 of the major and at degrees 4, 5 and 1 of the minor scale (Dm, Em, Am). The major scale's degree 7 and the minor scale's degree 2 each produce a diminished triad. All four types of triad are set out, with C as their root, in table 3.

Table 3 Tertial triad type definition (in C)

type of triad	type of third	type of fifth	notes in chord	lead symbol	roman num.
major	major	perfect	c e g	C	I
minor	minor	perfect	c e \flat g	Cm	i
augmented	major	augmented	c e g \sharp /a \flat	Caug / C+	I+
diminished	minor	diminished	c e \flat g \flat /f \sharp	Cdim / C $^{\circ}$	i $^{\circ}$

Major triads comprise a minor third on top of a major third (*e-g* over *c-e* for C), minor triads a major third over a minor third (e.g. *e \flat -g* over *c-e \flat* for C minor), while augmented triads comprise two superimposed major thirds (e.g. *e-g \sharp* over *c-e*) and diminished triads two minor thirds (e.g. *e \flat -g \flat* over *c-e \flat*). All triadic chords contain the root (1) and, with very few exceptions, both third (3) and fifth (5) of one of the triad types defined in table 3Tertial chord symbols

Two types of shorthand are in common use so that musicians can quickly identify tertial chords: (1) *roman numerals* (e.g. I, vi, ii⁷, V⁷) and (2) *lead sheet chord symbols* (e.g. C, Am, Dm7, G7, see p.27 ff.).

Roman numerals

Ex. 35 I vi ii⁷ V⁷ sequence in C and D major

Roman numerals are used to denote chords and their relation to the tonic of any key. More specifically, single roman numerals denote tertial triads built on the scale degree they designate — the *root* — within any particular key, upper case denoting major and lower case minor triads (see ex.34 whose root notes are *c d e f g a b*). Bearing in mind that pitches extraneous to the tertial triad, most frequently the seventh, are expressed as superscripted arabic numerals, it is clear that « I vi ii⁷ V⁷ » designates the same chord progression in any major key, whereas « C Am Dm⁷ G⁷ » and « D Bm Em⁷ A⁷ » designate the same sequence in two keys only (C and D major respectively, see ex.35). Similarly, a repeated I ♭VII IV progression (C B♭ F in C) is found as D C G (in D) throughout Lynyrd Skynyrd's *Sweet Home Alabama*, as B A E (in B) repeatedly in The Rolling Stones' *Midnight Rambler*, and as G F C at the end of the Beatles' *Hey Jude* (in G). Note that tertial triads built on pitches foreign to the standard major or minor key of the piece must be preceded by the requisite accidental, for example « ♭VII » for a major triad built on ♭ in the key of C major but just « VII » for the same chord in C minor. Similarly, notes within a tertial chord that are extraneous to the current key of the piece must also be preceded by the requisite accidental, e.g. « ii⁷♭5 » for the second-degree chord in C major with d as root and containing also *f*, *a*♭ and *c*.

Inversions

In most popular music the lowest note in a chord is usually also its root. However, in choral settings and in music influenced by the European classical tradition, tertial chords are frequently *inverted*, i.e. the third, fifth or seventh is the lowest pitch. The first three chords of example 36 show a C major common triad [1] in its root position (with *c* in the bass), [2] in its *first inversion* (with its third, *e*, in the bass) and [3] in its *second inversion* (with its fifth, *g*, in the bass). The final chord of example 36 is a C major triad with the flat seventh (♭) in the bass, i.e. a C7 chord in its third inversion (with its seventh, ♭, as lowest note).

Ex. 36 Inversions of C major chord

European textbook harmony symbols, derived from figured bass techniques of the Baroque era (bottom line of symbols in ex. 36), are largely incompatible with the way in which chords are understood by musicians in the popular field. Therefore, when inversions need to be referred to they are most commonly denoted in the absolute terms of lead sheet chord symbols (top line in ex. 36, see also pp. 27-34), sometimes in the relative terms of roman numerals, as shown in the line of symbols between the two staves, i.e. as 'I₃' for the tonic triad with its third as bass note, 'I₅' for the same chord with its fifth in the bass, etc.

Recognition of tertial chords

Individual chords can be identified and named according to their constituent notes and harmonic functions. They can also be recognised phenomenologically. Table 4 lists some of the most common chords in popular music, together with striking occurrences of those chords in well-known pieces of popular music. It also shows, where applicable, in which musical styles or with what type of mood the chords are often associated.

Table 4 Familiar occurrences of tertial chords in popular music

chord short-hand	full chord description	Occurrences	style
	major triad	First and final chord of most national anthems, <i>White Christmas</i> (Crosby 1942), the <i>Internationale</i> (Degeyter 1871), the <i>Blue Danube</i> waltz (Strauss 1867). Both chords in chorus of <i>Yellow Submarine</i> (Beatles 1966). Final chord in <i>Happy Birthday</i> .	
m	minor triad	First long chord in Pink Floyd's <i>Shine On Crazy Diamond</i> (1975). First chord in <i>It Won't Be Long</i> , <i>She Loves You</i> and <i>I'll Be Back</i> (Beatles 1963, 1964). First and final chord in Chopin's Funeral March (1839).	
+	augmented triad	Gershwin's <i>Swanee</i> (1919) at "how I love you!". Second chord in <i>Being For The Benefit Of Mr Kite</i> and <i>Fixing A Hole</i> (Beatles, 1967)	
6	added sixth chord	First chord, at 'When whippervills call', in <i>My Blue Heaven</i> (Donaldson 1927). First and final chord in <i>Mack The Knife</i> (Weill, 1928); in chorus of <i>Alabama Song</i> , at 'Moon of Alabama' (Weill, 1927). Final 'Yeah' in <i>She Loves You</i> (Beatles, 1963).	jazz influences 1920-40s
m6	minor triad with added (major) sixth	First chord in verse of <i>Alabama Song</i> , at 'Show us the way to the next'... (Weill, 1927). First chord after fanfare in the Wedding March (Mendelssohn, 1843).	
7	(dominant) seventh chord	Penultimate chord in most hymns and national anthems. First chord in Beatles' <i>I Saw Her Standing There</i> (1963), <i>I Wanna Be Your Man</i> (1963), <i>She's A Woman</i> (1964), <i>Taxman</i> (1966), <i>Get Back</i> (1969).	
7+	seventh chord with augmented fifth	Cole Porter (1933): <i>You're Bad For Me</i> , upbeat to chorus. Miles Davis (1961): <i>Some Day My Prince Will Come</i> , second chord, at 'day'. Mary Hopkins (1968): <i>Those Were The Days</i> , at 'were the' in upbeat to chorus. Beatles (1969): <i>Oh! Darling</i> , just after 'broke down and died' as upbeat to reprise of hook.	
7b5	seventh chord with diminished fifth	Jobim (1963): <i>Garota da Ipanema</i> , penultimate chord; (1964): <i>Samba da una nota so</i> , 4th chord; (1969) <i>Desafinado</i> , 2nd chord.	bossa nova, bebop, jazz fusion

Table 4 Familiar occurrences of tertial chords in popular music

chord short-hand	full chord descrip- tion	Occurrences	style
maj7	major seventh chord	Cole Porter (1932): <i>Night And Day</i> , first chord of chorus. Erroll Garner (1960): <i>Misty</i> , first downbeat chord of main tune. Beatles (1963): <i>This Boy</i> , first chord. Tom Jones (1965): <i>It's Not Unusual</i> , first chord. Burt Bacharach (1968): <i>This Guy's In Love With You</i> , first three chords. Beatles (1969): <i>Something</i> , second chord. Bacharach (1970): <i>Raindrops</i> , second chord.	jazz stand- ards, pop 1960s-70s, bossa nova, Bacharach
m7	minor seventh chord	Youmans (1925): <i>Tea For Two</i> , first chord (on 'tea'). Bacharach (1964): <i>Walk On By</i> , first chord. Beatles (1965): <i>Michelle</i> , second chord; (1968): <i>Rocky Raccoon</i> , 1st chord in hook; (1969): <i>You Never Give Me Your Money</i> , first chord.	jazz stand- ards, pop 1960s-70s
mmaj7 / mmaj9	minor, major seventh/ninth	Hagen (1944): <i>Harlem Nocturne</i> (the 'Mike Hammer' theme), first downbeat chord of tune. Norman/Barry (1962): <i>James Bond Theme</i> , final chord.	detective and spy music
m7♭5	minor seven flat five or 'half diminished'	Addinsell (1940): <i>Warsaw Concerto</i> , 2nd chord. Miles Davis (1973): <i>Stella By Starlight</i> , 1st chord. Nat King Cole (1955): <i>Autumn Leaves</i> (Cosma), 1st chord of middle eight.	romantic pop 'classics', romantic bal- lads
dim	diminished seventh chord	Beatles (1963): <i>Till There Was You</i> , 2nd chord (at 'hill'); (1967): <i>Strawberry Fields</i> , at 'nothing is real'.	usual horror chord in silent movies.
9	(dominant) ninth chord	Beatles (1964): <i>Things We Said Today</i> , at 'dreaming' ('some day when we're dreaming'); (1968): <i>Because</i> , highlighted chord at 'round'/'high'/'blue'.	swing, bebop
+9	plus nine chord	Hendrix (1967): <i>Purple Haze</i> , 1st chord. Beatles (1968): <i>Come Together</i> , 1st chord. Blood Sweat & Tears (1969): <i>Spinning Wheel</i> , first chord.	rock c. 1970, jazz fusion
maj9	ninth chord with major seventh	Jobim (1963): <i>The Girl from Ipanema</i> , 1st chord.	bossa nova, 1960s
m9	minor nine chord	Warren (1938): <i>Jeepers Creepers</i> , 1st chord of chorus. Weill (1943): <i>Speak Low</i> , 1st chord in chorus. Raksin (1944): <i>Laura</i> , 1st chord in chorus.	jazz stand- ards
11	chord of the elev- enth	Righteous Brothers (1965): <i>You've Lost That Lovin' Feeling</i> , 1st chord. Beatles (1967): <i>She's Leaving Home</i> , at 'leaving the note', 'standing alone', 'quietly turning', 'stepping outside', 'meeting a man'; (1970): <i>Long And Winding Road</i> , at first occurrence of 'road'. Zawinul (1977): <i>Mercy Mercy</i> , 'Gospel' chord after unison runup just before minor key section. Abba (1977): <i>Name of the Game</i> , at repeated 'I want to know'.	gospel, soul, fusion, modal jazz
m11	minor eleven chord	Miles Davis (1959): <i>So What</i> , all chords. Goldenberg (1973): <i>Kojak Theme</i> , first two chords under melody.	modal jazz

Table 4 Familiar occurrences of tertial chords in popular music

chord short-hand	full chord descrip- tion	Occurrences	style
13	chord of the thirteenth	Degeyter (1871): <i>Internationale</i> , upbeat to chorus. Big Ben Banjo Band (1958): <i>Luxembourg Waltz</i> , 1st chord (upbeat). Beatles (1968): <i>Because</i> , just before ecstatic "Ah!" on D chord.	pre-jazz, swing, bebop
add9	major triad with added ninth	Bacharach (1970): <i>Close To You</i> , 1st chord (at 'why do birds suddenly appear?') Nilsson (1974): <i>Without You</i> , 1st chord.	pop ballads
madd9	minor triad with added ninth	Al Hirt (1966): <i>Music To Watch Girls By</i> , 1st chord. Lionel Richie (1983): <i>Hello</i> , 1st chord. Rota (1966): <i>Romeo and Juliet</i> , main theme, 1st chord.	wistful, sad or bitter-sweet ballads
/3	major triad in first inversion	Beach Boys (1966): <i>God Only Knows</i> , hook line at 'knows what I'd be'. Foundations (1967): <i>Baby, Now That I've Found You</i> , at 'let you go' and 'even so'. Procol Harum (1967): <i>Homburg</i> , 3rd and 4th chords in introduction.	'classical'
/5	major triad in second inversion	Beach Boys (1966): <i>God Only Knows</i> , 1st chord. Foundations (1967): <i>Baby, Now That I've Found You</i> , at 'love you so'. Procol Harum (1970): <i>Wreck of the Hesperus</i> , start of major key section.	'classical'
m/5	minor triad in second inversion	Simon & Garfunkel (1966): <i>Homeward Bound</i> , 2nd chord. Sinatra (1969): <i>My Way</i> , 2nd chord.	reflective ballads, 'classical'
7/7	seventh chord in third inversion	Beach Boys (1966): <i>God Only Knows</i> , at 'are stars above you'. Foundations (1967): <i>Baby, Now That I've Found You</i> , at 'now that I've found you'. Procol Harum (1967): <i>Homburg</i> , 2nd chord. Abba (1974): <i>Waterloo</i> , 2nd chord, on the of 'oo' of 'At Waterloo' in verse 1.	'classical'
maj7/7	major triad with major seventh in bass	Procol Harum (1967): <i>Whiter Shade Of Pale</i> , 2nd chord. Eric Clapton (1974): <i>Let It Grow</i> , 2nd chord.	'classical', reflective
sus4	susp. fourth chord / quartal chord	Beatles (1965): <i>You've Got To Hide Your Love Away</i> , at 'away'. Rolling Stones (1965): <i>Satisfaction</i> , 2nd of two chords in main riff. Marvin Gaye (1966): <i>Ain't No Mountain</i> , 1st chord in introduction.	pop 1960s-70s

Lead sheet

Definition and history

A lead sheet is a piece of paper displaying the basic information necessary for performance and interpretation of a piece of popular music. Elements usually featured on a lead sheet are: (i) melody, including its mensuration, in staff notation; (ii) *lead sheet chord shorthand*, usually placed above the melody; (iii) lyrics (if applicable). Such sheets are used extensively by musicians in the fields of jazz, cabaret, chanson

and most types of dance music, etc. Lead sheets consisting of lyrics and chord shorthand only are common among musicians in the rock, pop and Country music spheres.

Lead sheets originated for reasons of copyright. In the 1920s, the only way to protect authorship of an unpublished song in the USA was to deposit a written copy with the Copyright Division of the Library of Congress in Washington. For example, to protect a song recorded by early blues artists (e.g. Sippie Wallace, Bertha 'Chippie' Hill, Eva Taylor), musicians such as George Thomas, Richard M Jones and Clarence Williams provided the Library of Congress with a transcription of the melody's most salient features along with typewritten lyrics and basic elements of the song's accompaniment (Leib, 1981:56). Such a document was called a 'lead sheet', its function descriptive rather than prescriptive, not least because: (i) the most profitable popular music distribution commodity of the time was not the recording but three-stave sheet music in arrangement for voice and piano; (ii) most big band musicians read their parts from staff notation provided by the arranger. However, guitarists and bass players of the thirties usually played from a mensurated sequence of chord names (see p.26 ff.), i.e. from 'basic elements of the song's accompaniment' as written on a lead sheet in its original sense. With the decline of big bands and the rise of smaller combos in postwar years, with the increasing popularity of the electric guitar as main chordal instrument in such combos, and with the shift from sheet music to records as primary popular music commodity, lead sheets ousted staff notation as the most important scribal aide-memoire for musicians in the popular sphere. Other reasons for the subsequent ubiquity of lead sheets are that: (i) their interpretation demands no more than rudimentary notational skills; (ii) since they contain no more than the bare essentials of a song, an extensive repertoire can be easily maintained and transported to performance venues (a 'fake book').

Lead sheet chord shorthand

By 'lead sheet chord shorthand' is meant: (1) symbols used on a *lead sheet* ("Lead sheet", p.26) to represent, descriptively or prescriptively, the chords of a song or instrumental number; (2) the widespread system according to which popular music practitioners most frequently specify chords.

Since there are probably as many variants of lead sheet chord shorthand in current circulation as there are musicians, it is impossible to provide a definitive overview of the system. However, although a few of these variants diverge from the codification practices described below ("Flat, sharp, plus and minus", p.33), most variants follow by and large the principles expounded here. Table 6 (pp. 29-30) provides a selection of tertial chords and their lead sheet symbols, all with the note *c* as root. Table 7 (p.30) shows how the shorthand translates into the terms of spoken English used by musicians. (For a short guide to the phenomenological rather than structural identification of chords and for fuller structural description of common chords, "Recognition of tertial chords", p.24; for a complete song whose lyrics consist entirely of lead sheet names for the chords being played, see 10cc (1977)).

Basic rationale

Lead sheet chord shorthand has a tertial basis. Since the shorthand evolved during the heyday of tertial harmony in jazz-based popular music, its simplest symbols denote common triads built on the designated note (e.g. C for a C major triad). Moreover, characters placed after the triad name tend merely to qualify that tertial triad, either in terms of notes added to it or by denoting chromatic alteration of any degree within the chord except for the root and its third. Similarly, the numerals seen most frequently after the triad symbol (7, 9, 11, 13) represent pitches stacked in thirds above the two thirds already contained within the triad (1-3, 3-5) on which a more complex chord is based (e.g. C9 containing *b* and *d* – flat seventh and major ninth – in addition to *c-e-g*). The shorthand system also assumes that root and bass note are the same. Developed in style-specific contexts, lead sheet chord shorthand allows for the concise and efficient representation of chords in many types of popular music, for example jazz, pop, rock, country music, chanson, *Schlager* and most styles of dance music. The system is, however, cumbersome in its codification of inversions and of non-tertial harmony.

Symbol components

Lead sheet chord symbols are built from the following components placed in the following order: (i) note name of the chord's root, present in every symbol; (ii) triad type; (iii) type of seventh; (iv) thirteenth, eleventh and ninths, with or without alteration; (v) altered fifth; (vi) added or omitted notes and suspensions; (vii) inversions. Since components (ii) through (vii) are only included when necessary, chord symbols range from very simple (e.g. C, Cm, C⁷) to quite complex (e.g. F#m⁶add⁹, B^b-13+9, E omit G#). Table 5 (p.28) summarises the order of presentation for symbols most commonly used in connection with tertial chords containing neither added notes, nor suspensions nor inversions.

Table 5 Basic order of components in lead sheet chord shorthand

1: root note name:	A, B ^b , B, C, C#/D ^b , D, D#/E ^b , E, F, F#/G ^b , G, G#/A ^b				
chord/interval type:	perfect	major	minor	augmented	diminished
2: triad type			m (or min/mi)	aug or +(5)	[v. unusual]
3: type of seventh		maj(7) or Δ	7		dim(7) or °(7)
4a: thirteenth		13	-13		
b: eleventh	11			+11	
c: ninth		9	-9	+9	
5: fifth				+ or aug	-5 or ^b 5

Note name of the chord's root

Note names may be in English, as in tables 5 and 6, or are written according to Germanic or Latin language nomenclature. English root note names are always in upper-case.

Legend

The image shows musical notation for a lead sheet and piano accompaniment. The lead sheet (top) includes a treble clef, a key signature of one flat (B-flat), and a common time signature. It features four measures of music. The first measure is a whole note chord with notes G, B-flat, and D. The second measure is a whole note chord with notes G, B-flat, and D. The third measure is a whole note chord with notes G, B-flat, and D. The fourth measure is a whole note chord with notes G, B-flat, and D. The piano accompaniment (bottom) includes a grand staff with treble and bass clefs. It features four measures of music. The first measure is a whole note chord with notes G, B-flat, and D. The second measure is a whole note chord with notes G, B-flat, and D. The third measure is a whole note chord with notes G, B-flat, and D. The fourth measure is a whole note chord with notes G, B-flat, and D. The piano accompaniment also includes a 'loco' marking and a 'chord example number' (4d).

lead sheet
chord shorthand

triadic
stacking of
notes in
chord

note omitted
from chord

optional notes
notes omitted

alternative
enharmonic spelling

R.H.

viable
spacing of
chords on
piano

L.H.

loco

chord example number

TRIADS **SEVENTH CHORDS** **NINTH CHORDS**

The image displays musical notation for triads, seventh chords, and ninth chords. It is organized into three main sections: TRIADS, SEVENTH CHORDS, and NINTH CHORDS. Each section contains a series of chords, each represented by a symbol above a musical staff. The TRIADS section shows three chords: C (C major), C-5 (C minor), and C+ (C augmented). The SEVENTH CHORDS section shows eight chords: C7 (C dominant seventh), Cmaj7 (C major seventh), C7b5 (C half-diminished seventh), C7+ (C augmented seventh), C9 (C dominant ninth), Cmaj9 (C major ninth), C-9 (C minor ninth), and C9-5 (C minor ninth sharp five). The NINTH CHORDS section shows eight chords: C9b5 (C minor ninth flat five), C9aug (C augmented ninth), C-10 (C minor tenth), C-9b5 (C minor ninth flat five), C9+ (C augmented ninth sharp five), C#9 (C sharp ninth), C-9-5 (C minor ninth sharp five), and C9-5 (C minor ninth sharp five). Each chord is shown in two staves: a treble clef staff and a bass clef staff. The chords are labeled with letters (a, b, c, d, e, f, g, h) below them. The notation includes notes for each chord, with accidentals (sharps, flats, naturals) indicating the specific notes. The chords are arranged in a grid-like fashion, with each chord occupying a specific position in the sequence.

ELEVENTH CHORDS

$C\Delta+11$

C11 C+11 Cmaj+11 C+11+9 C13 C-13 C13-9 C-13-9 C13+9 C-13+9 C11+13 Cmaj11+13

4a 4b 4c 4d 5a 5b 5c 5d 5e 5f 5g 5h

THIRTEENTH CHORDS

$C13+11$ $C\Delta11+13$

5i 5j 5k 5l 5m 5n 5o 5p 5q 5r 5s 5t

MINOR AND DIMINISHED CHORDS							ADDED & SUSPENDED CHORDS								
TRIADS		SEVENTH CHORDS			NINTHS & ELEVENTHS		SIXTH CHORDS								
Cm	C ^o	Cm ⁷	Cm ^{Δ7} Cm ^{ma7}	Cm ^{7b5} Cm ⁷⁻⁵	C ^o (7) C ^{dim} (7)	Cm ⁹	Cm ^{Δ9} Cm ^{ma9}	Cm ¹¹	C ⁶	Cm ⁶	C ^{sus} (4)	C ^{7sus} (4)	C ^{sus} 9	C ^{add} 9	Cm ^{add} 9
6a	6b	7a	7b	7c	7d	8a	8b	8c	9a	9b	10a	10b	10c	10d	

Table 6, cont'd

INVERSIONS (examples)								DOUBLE SUSPENSIONS		OTHER CHORDS				
C _{1e}	C _{7b}	C ₅	C ₇	C ₉	C ₁₁	C ₁₃	C ₁₅	C ₇ ⁹	C ₇ ⁹ ₄	C ₅	C ₇ ⁹	C ₉ ⁹	C ₁₁ ⁹	C ₁₃ ⁹
11a	11b	11c	11d	11e	11f	11g	12a	12b	13a	13b	14a	14b	14c	14d

Table 7 Guide to pronunciation of lead sheet chord shorthand (examples)

chord shorthand	table 6	pronunciation
C+ or C _{aug}	1c	C plus, C augmented, C aug [o:g]
C ₇ , C ₉ , C ₁₁ , C ₁₃	2a, 3a, 4a, 5a	C seven, C nine, C eleven, C thirteen
C ₇ ⁹ , C ₉ ⁹	2b, 3b	C major seven, C major nine
C ₇ ⁻⁵ or C ₇ ^{b5}	2c	C seven minus five, C seven flat five
C ₇ ^{aug} , C ₇ ⁺	2d	C seven augmented, C seven plus
C ₉ ⁺ (C ₉ ^{aug5}), C ₉ ⁺	3f, 3g	C nine plus (C nine augmented), C plus 9
C ₁₃ ⁺ (C ₁₃ ^{aug11})	5g	C thirteen plus eleven (C eleven plus thirteen)
C _m ⁷ , C _m ⁹ , C _m ¹¹	7a, 8a, 8c	C minor seven, C minor nine, C minor eleven
C _m ⁷ ⁺ , C _m ⁹ ⁺	7b, 8b	C minor major seven, C minor major nine
C _m ⁷⁻⁵ or C _m ^{7b5} or C _o	7c	C minor seven minus five, C minor seven flat five, C half diminished
C _{dim} or C _{dim} ⁷	7d	C diminished, C dim, C diminished seventh
C ₆ , C _m ₆	9a, 9b	C six (C add[ed] sixth), C minor six
C _{sus} (4), C _{sus} ₉	10a, 10c	C sus (four) or C four suspension, C sus nine
C _{add} 9, C _m _{add} 9	10c, 10d	C add nine, C minor add nine
C ₇ ₃ , C ₇ _e	11g	C (with) third in bass, C (with) e bass, C first inversion

Tertial triad type

No symbol is necessary for chords using a major triad (e.g. C = C major triad), the qualifier 'major' applying exclusively to sevenths (see p.31 ff.). On the other hand, 'minor' applies to the third and to no other interval. Therefore, chords built as or on a minor triad must include the triad type qualifier m, mi or min, always lower-case, immediately after the chord root's note name (e.g. Cm = C minor triad; for different convention, see p.33 ff.). Augmented and diminished triads are represented similarly (e.g. C+ for an augmented triad on C, see tables 5, p. 28 table 6, p. 29: chords 1c, 6b; see also p.31). To avoid linguistic incongruity it may be preferable to write root name and triad type in normal typeface, subsequent symbols in a smaller typeface and/or as superscript, for example Cm^{maj7} or Cm^{add6} rather than Cmmaj7 or Cmadd6. It should be noted that while the diminished triad is highly uncommon on its own, the augmented triad (e.g. C+) occurs quite frequently in popular music.

Type of seventh

Since the minor (flat) seventh (e.g. $b\flat$ in relation to c) is more common than the key-specific major seventh (e.g. $b\natural$ in relation to c) in the jazz-related styles for which lead sheet symbols were originally developed, and since the qualifier 'minor' is applied exclusively to the third in tertial triads, a major triad with an added minor seventh requires no other qualification than the numeral 7 (table 6: 2a): flat seven is, so to speak, default seventh in the same way as default triads feature major thirds. On the other hand, tertial chords containing a key-specific major seventh need to be flagged by means of maj or Δ (table 6: 2b). Since maj and Δ are reserved as qualifiers of the seventh and no other degree, the 7 may be omitted in conjunction with these symbols (e.g. $C\text{maj}$ or $C\Delta = C\text{maj}7$). However, the 7 is always present to denote the any seventh chord whose 7 has the default value (flat/minor, see table 6: examples 2a, 2c, 2d, 7a, 7c; see also p.31).

Seventh chords containing an augmented fifth indicate such alteration by $7+$ or 7aug (table 6: 2d). Diminished fifths in seventh chords containing a major third appear as $7-5$ or $7\flat 5$ (table 6: 2c, 7c). Seventh chords containing minor third, diminished fifth and flat seventh are written as $m7-5$ or $m7\flat 5$, sometimes as \emptyset ('half diminished'). The 'dim' chord constitutes a special case, containing both diminished seventh and fifth, and is most frequently indicated by dim placed straight after the root note name, sometimes by $\text{dim}7$, occasionally by $^\circ$ or $^\circ 7$ (table 6: 7d).

Ninths, elevenths, thirteenth

Chords involving ninths, elevenths and thirteenth are assumed to include, at least theoretically, some kind of tertial triad and some kind of seventh (see pp.28-31). Chords containing elevenths presuppose the presence of a ninth, and thirteenth chords the presence of an eleventh as well as a ninth, all in addition to a seventh and the major or minor triad of the root note. To save space, shorthand denoting all such chords is usually presented in descending order of intervals requiring qualification — thirteenth, eleventh, ninth, fifth — once the root note name, the minor triad marker (if necessary) and the major seventh symbol (if necessary) have been included (table 6: 3a-5h, 8a-c). The only common exception to this practice is the chord containing major thirteenth and augmented eleventh (13+11) which is sometimes referred to in reverse order as 11+13 (table 6: 5g-h). Shorthand for chords of the thirteenth, eleventh and ninth include no mention of the eleventh, ninth or seventh below them unless any of those degrees deviate from their default values (perfect eleventh, major ninth, minor seventh). For example, the '11' in $C11$ assumes the presence of the default ninth and flat seventh (d and $b\flat$), whereas the '9' in $C+11+9$ is included on account of its alteration from d to $d\sharp/e\flat$ (table 6: 4d).

Altered fifths

Although simple augmented and diminished triads are encoded $+$ or aug and dim respectively, the symbol for altered fifths ($+$ and -5 or $\flat 5$) in chords of the seventh, ninth, eleventh and thirteenth is always placed last after all other relevant information (e.g. $C7\flat 5$ or $Cm7-5$, $Cm7\flat 5$ or $Cm7-5$, $C7+$ or $C7\text{aug}$; see table 6, chords 2c, 2d, 3e, 3h, 7c).

Additional symbols

Omitted notes

The more notes a chord theoretically contains, the more difficult it becomes to space those notes on the keyboard or guitar in a satisfactory manner. In some cases, the

principle of stacking thirds even leads to problems of unacceptable dissonance, usually involving an internal minor ninth, which cannot be resolved by the most ingenious techniques of chord spacing. For example, the major third is always absent from the 11 chord (table 6: 4a), and the unaltered eleventh is always left out of thirteenth chords based on the major triad (table 6: 5a-5f). Similarly, the perfect fifth is often omitted from thirteenth chords as well as from certain ninth chords (table 6: 5a-5h, 3a-3e, 3g). These omissions constitute standard practice and need not be indicated. However, one chord which does require indication of note omission is the 'bare' fifth, often used as the power chord of heavy metal and usually written (in E) E no 3 or E omit G# (see p.33).

Added ninths and sixths

Added chords are those consisting of a simple triad to which another single note has been added without inclusion of intervening odd-number degrees. For example, add9 and m^{add9} chords are triads to which the ninth has been added without including an intermediate seventh (table 6: 10c-d). Similarly, the two sixth chords shown in table 6 (9a, 9b) are qualifiable as added because both consist of a triad to which a major sixth has been added without intervening sevenths, ninths or elevenths making them into chords of the thirteenth. It should be noted that the 'm' in m6 refers to the minor third, not to the sixth which is always major (table 6: 9b). Unlike added ninths, added sixth chords are not indicated with the prefix 'add' before the '6'.

Suspended fourths and ninths

Suspensions are chords that can be resolved into a subsequent tertial consonance. The most common suspensions in popular music, sus4 and sus9, both resolve to common major or minor triads, the fourth of sus4 to a third, the ninth of sus9 to the octave (e.g. the *f* in Csus4 to the *e* of C or the *eb* of Cm, the *d* in Csus9 to the *c* of C or Cm, see table 6: 10a-d). The absence of any numeral after sus assumes that the suspension is held on a fourth. Although sus9 and add9 may be identical as individual chords, sus9 should typically resolve in the manner just described, while add9 need not.

Inversions

Since inversions in popular music mainly occur in passing-note patterns or anacrusis created by the bass player without reference to notation, no standard lead sheet codification exists for such practices. This lacuna in the system obstructs efficient indication of chord sequences for music in the classical vein. One way of indicating inversions is to write the relevant bass note by interval number or note name after the rest of the chord's symbols and a forward slash, for example C⁷/₃ or C⁷/_e for a C seven chord with its third, *e*, in the bass (see also table 6: 11a-g). Inversions audible in pop recordings are often absent from published lead sheets and tend only be indicated if they occur on an important downbeat or its syncopated anticipation.

Anomalies

Flat, sharp, plus and minus

Ex. 37 (a) E-9; (b) E♭9



Sharp and flat signs (# ♭) are mainly reserved as accidentals qualifying the root note name. Thus, the '♭' in E♭9 indicates that the E itself, not the ninth above it, is flat. In this way it is possible, as shown in example 37, to distinguish between an E flat nine chord (E♭9) and an E minus nine chord (E-9, i.e. E7 with a flat ninth). In any chord, all altered degrees except 3 and 7 (see p.31 ff.) are indicated by + (=♯) or – (=♭). The only exception to this rule is that a flat sign is often used as an alternative for 'minus' before the final 5 of a chord containing a diminished triad (e.g. C7♭5 instead of C7-5, see table 6: 2c, 3e, 3h, 7c). It should be noted that conflicting conventions concerning the use of these symbols are in operation. For example, some versions of the 'Real Book' (the most well-known 'Fake Book') use minus signs instead of m or min to denote minor triads, flat and sharp signs instead of + and – to signal chromatic alteration.

Enharmonic spelling

Lead sheet chord shorthand tends to disregard enharmonic orthography. For example, although the ♭II→I cadence in *The Girl from Ipanema* (Jobim, 1963) might appear as A♭9♭5 → Gmaj7 on a lead sheet in G, the same ♭II → I cadence would in E♭ almost certainly be spelt E9♭5 → E♭maj7 rather than F♭9♭5 → E♭maj7. Similarly, distinction is rarely made between chords containing a falling minor tenth and those including a rising augmented ninth: the implicit assumption is that since both -10 and +9 refer to the same equal-tone pitch, the difference between them is immaterial. Hence, +9 is much more commonly used than -10, even though the latter may more often be enharmonically correct.

Non-tertial chords

Since non-tertial chords do not derive from superimposed thirds, they are not easily expressible in lead sheet shorthand. Apart from power fifths, already mentioned, there are considerable problems in encoding harmonies used in modal and bitonal jazz as well as in some types of folk music and avant-garde rock. For example, standard consonances in quartal harmony are frequently indicated by sus(4) (e.g. C7sus, see table 6: 10b and 14d) even though harmonic suspension is neither intended nor perceived. Similarly, many musicians often conceptualise chords of the eleventh and thirteenth bitonally rather than in terms of stacked thirds, for example C13+11 as a D major triad on top of C7, or C11 as Gm7 with c in the bass. No satisfactory consensus exists as to how such sonorities might be more adequately encoded. One possible solution to part of the problem may be to refer to some of these chords in the way suggested in table 6, examples 13a-14d (see "Quartal harmony", p.17 ff.).

Turnaround

A 'turnaround' is, strictly speaking, a short chord progression played at the end of one section in a song or instrumental number and whose purpose is to facilitate re-capitulation of the complete harmonic sequence of that section. 'Turnaround' has also come to mean *any* short sequence of chords, usually three or four, recurring consecutively inside the same section of a single piece of music.

Example 38 (p.34) shows a typical turnaround (in its original sense) for a slow twelve-bar blues in F whose changes run, for example

| : F | B \flat | F | F7 | B \flat | B \flat | F | F | C | B \flat | F | F : | |.

To avoid harmonic stasis and to lead back into the initial F chord of bar 1, the final F chord of bars 11 and 12 can be replaced with a sequence such as the progression shown in example 38 (F F 7 / $_a$ B \flat Bdim | F/ $_c$ E \flat 9 C7). This turnaround first increases the rate of harmonic change in motion towards the final C chord (bar 12) which, in its turn, leads back to the F of bar 1, creating in the process a highlighted V→I cadence and an effect of continuity over the join between the two periods.

Ex. 38 Typical turnaround figure for a slow blues in F.

F F/ $_a$ B \flat Bdim F/ $_c$ D \flat 9 C7

half cadence back to bar 1

Performance of jazz standards in AABA form feature turnarounds before each recurrence of the A section. Table 8 shows the basic chord changes for the ten-bar 'A' section of the chorus of the World-War-II hit *A Nightingale Sang In Berkeley Square* (Sherwin).

Table 8 Basic changes for 'A' section of *A Nightingale Sang in Berkeley Square* (slow 4/4)

1	2	3	4	5
E \flat Δ Cm7	Gm7 E \flat 9	A \flat Δ G7	Cm7 D \flat 9	E \flat Δ A \flat Δ
6	7	8	9	10
E \flat Δ A \flat m7	E \flat Δ Cm7	F9 B \flat -9	E \flat 6 E \flat 6	E \flat 6 E \flat 6
VAMP turnaround for reprise →			Cm7	Fm7 B \flat 7
TRITONE SUBSTITUTION of VAMP turnaround for reprise			G \flat 13	Fm9 E9 \flat 5
1 →				

A harmonic rhythm of two chords to the bar is established in the first eight bars of this song. However, harmonic progression stops on E \flat in bars 9-10 and across the join to the reprise from bar 1. To avoid such harmonic stasis, the last two bars can be provided with a simple turnaround consisting of a standard I→vi→ii→V vamp figure, for example | | E \flat 6 → Cm7 → | Fm7 → B \flat 7 | | or a tritone substitution of those changes (E \flat 6 → G \flat 13 → | Fm9 → E9 \flat 5).

Since the purpose of a turnaround is, in the sense just described, to maintain harmonic rhythm and direction while at the same time effectuating a return to the first chord in a period, it is by its very nature circular. In fact, one of the most common turnarounds in popular song is the $I \rightarrow vi/IV \rightarrow ii \rightarrow V$ progression (*vamp*) which was often used as a consecutively repeated two or four bar accompanying figure to provide a sense of movement before the entry of a solo singer or instrumentalist between verses or periods, or at the start of a song ('vamp until ready'). Moreover, the consecutively repeated $I \rightarrow vi \rightarrow ii \rightarrow V$ vamp and its variant $I \rightarrow vi \rightarrow IV \rightarrow V$ constitute either all or most of the chord changes found in much English-language popular song (see Table 9, p.35 ff., row 2). With vamps providing the majority of changes for large parts of many pop songs, it is hardly surprising that 'turnaround' came also to denote, especially in pop and rock circles, *any* short, consecutively repeated sequence of chords.

In this transferred sense of the term, turnarounds usually consist of three or four chords covering a period of two or four bars. A sequence of only two chords constitutes a chord shuttle or pendulum, not a turnaround. Conversely, a harmonic progression occupying a complete period (section) of eight or more bars cannot be a turnaround in itself because a turnaround sequence must, in order to qualify as such, occur consecutively at least twice within one period or section. Turnarounds are extremely common in pop and rock music, often contributing importantly to the particular character and style specificity of individual songs and instrumental numbers. For example, most of the vamp turnaround songs mentioned in row 2 of table 9 were recorded in the USA around 1960. Similarly, most of the songs referenced in row 3 of table 9 are in the rock vein and sport lyrics circumscribing "a relatively uniform field of associations which might be characterised by such concepts as 'modernity', 'uncertainty', 'sadness', 'stasis'", etc. (Björnberg, 1984: 382).

Table 9 Some common pop turnarounds

Suggested Name	Progression	Examples of songs containing turnaround
'la Bamba'	$I \rightarrow IV \rightarrow V$	<i>La bamba</i> (Valens); <i>Do You Love Me</i> (B. Poole); <i>Guantanamera</i> (Martí); <i>Hang On Sloopy</i> (McCoys); chorus of <i>Name of the Game</i> (Abba); <i>Twist and Shout</i> (Isley Brothers, Beatles, Poole); <i>Wild Thing</i> (Troggs).
'vamp'	$I \rightarrow vii \rightarrow ii/IV \rightarrow V$	<i>Blue Moon</i> (Rodgers); <i>Diana</i> (Anka); <i>Donna</i> (Valens); <i>Ebb Tide</i> (Chacksfield); <i>Hey Paula</i> (Paul & Paula); <i>I Like It</i> (Gerry & the Pacemakers); <i>It's Only Make Believe</i> (Twitty); <i>Love Hurts</i> (Capaldi); <i>Oh Carol</i> , <i>Happy Birthday Sweet 16</i> , <i>Little Devil</i> (Sedaka); <i>Poetry In Motion</i> (Tillotson); verse of <i>Return to Sender</i> (Presley); <i>Runaway</i> (Shannon); <i>Stand By Me</i> (B.E. King); <i>Stay</i> (M. Williams, Hollies); <i>Teenager In Love</i> (Dion); <i>These Foolish Things</i> (Fields); <i>This Boy</i> (Beatles); <i>Unchained Melody</i> (Liberace); <i>Who Put The Bomp</i> (Mann); <i>Why Do Fools Fall In Love</i> (Lyman).
'aeolian shuttle'	$(I/i \rightarrow) \flat VI \rightarrow \flat VII (\rightarrow I/i)$	<i>All Along The Watchtower</i> (Dylan, Hendrix); chorus of <i>Flashdance</i> (Cara); <i>In the Air Tonight</i> (Collins); 'run away' in <i>Janie's Got A Gun</i> (Aerosmith); <i>Layla</i> (Derek & the Dominoes); end of <i>Stairway to Heaven</i> (Led Zeppelin); <i>Sultans of Swing</i> (Dire Straits); <i>Wall Street Shuffle</i> (10cc); <i>West End Girls</i> (Pet Shop Boys).
'mixolydian turnaround'	$I \rightarrow \flat VII \rightarrow IV \rightarrow (V)$	<i>Fortunate Son</i> (Credence Clearwater); end of <i>Hey Jude</i> (Beatles); <i>If I Were A Carpenter</i> (Darin, Four Tops); <i>Soul Finger</i> (Bar Kays); <i>Sweet Home Alabama</i> (Lynyrd Skynyrd); <i>Twentieth Century Man</i> (Kinks); <i>Midnight Rambler</i> (Rolling Stones).

Circle of fifths

The circle of fifths has been a central concept of tonality in Western music theory since the advent of equal tone tuning (c.1700). Its main functions are (i) to visualise the system of keys and key signatures used in much music of the Western world; (ii) to facilitate understanding of harmonic progressions found frequently in such music.

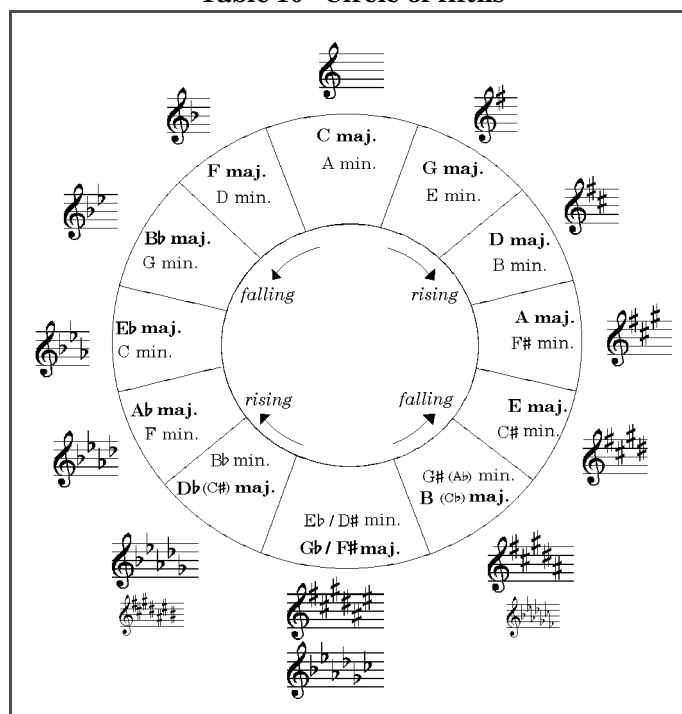
Since ancient times (China, Greece, etc.) it has been known that an interval of twelve fifths is, with a minimal margin of error (the Pythagorean comma or 0.24% of one semitone per octave), equal to an interval of eight octaves, i.e. that the frequencies of pitches one fifth apart are separated by a factor of 12:8 or 3:2 ($\times 1.5$) when ascending and of 2:3 ($\times 0.67$) when descending. The concept also assumes that the interval of a fourth (4:3 or $\times 1.33$ up and 3:4 or $\times 0.75$ down) is complementary to that of the fifth within an octave, so that ascending a fourth and then descending an octave (e.g. from c^3 to f^3 to f^2) will land on the same pitch as just descending a fifth (e.g. c^3 to f^2) and, conversely, that ascending a fifth and then descending an octave (e.g. c^3 to g^3 to g^2) will end up on the same pitch as just descending a fourth (e.g. c^3 to g^2). Hence, a series of alternately falling fifths and rising fourths, running anticlockwise round the complete circle of fifths (e.g. $c^3 \searrow f^2 \nearrow b\flat^3 \searrow e\flat^2 \nearrow a\flat^2 \searrow d\flat^2 \nearrow g\flat^2/f\sharp^2 \searrow b^2 \nearrow e^2 \searrow a^2 \nearrow d^2 \searrow g^1 \nearrow c^2$, see table 10) visits every note in the twelve-tone chromatic scale within a relatively restricted range. The same principle applies to a series of alternately rising fifths and falling fourths running clockwise (e.g. $c^2 \nearrow g^2 \searrow d^2 \nearrow a^3 \searrow e^2 \nearrow b^2 \searrow f\sharp^2/g\flat^2 \nearrow d\flat^3 \searrow a\flat^3 \nearrow e\flat^3 \searrow b\flat^3 \nearrow f^3 \searrow c^3$).

The fact that the circle of fifths also constitutes a 'circle of fourths' but is never referred to as such probably stems from the notion's development in the European classical tradition where chords constructed on the fifth degree of any scale (V) are understood and referred to as 'dominant', those on the fourth degree (IV) as 'sub-dominant'.

The circle of fifths is a tonal concept applied to harmony rather than to melody, not least because progressions based on fourths and fifths are much more common in the former than in the latter. It is of particular use in the theoretical and practical study of popular music in most jazz idioms as well as in other styles influenced by European traditions of tertial harmony.

Keys and their signatures are arranged as the twelve figures of an analogue clock with C major and its relative A minor (no sharps and no flats) on the hour, and F \sharp /G \flat major with their relative D \sharp /E \flat minor (six sharps or six flats) at half past. Moving clockwise, the number of sharps in each key signature increases (one for G major at five past, two for D major at ten past and so on) or the number of flats decreases (five for D \flat major at twenty-five to, four for A \flat major at twenty to, etc.). Since movement clockwise round the circle is by ascending fifths and since an increase in sharps or a decrease in flats implies upward movement, this tonal direction 'sharpwards' towards the dominant (from I to V, e.g. C to G) can be referred to as rising, while anticlockwise tonal movement 'flatwards' towards the subdominant (from V to I or from I to IV, e.g. from G to C or from C to F) can be referred to as falling.

Table 10 Circle of fifths



Harmonic progressions based on the circle of fifths are extremely common in popular music. Those running *anticlockwise* ('flatwards', falling, see table 10) are particularly common in styles using the tertial harmonic practices of jazz or classical music. Two basic types of such progression exist: (i) the *real* or *modulatory* circle of fifths; (ii) the *virtual* or *key-specific* circle of fifths. Both these types of anticlockwise progression involve the same two-stage $V \rightarrow I$ cadence (e.g. $G^7 \rightarrow C$) because all unaltered notes in the dominant seventh chord (V^7 , e.g. $g b d f$ in G^7) are contained in the major scale of the tonic (I , e.g. C major, containing $c d e f g a b$). However, as soon as an anticlockwise circle-of-fifths progression contains more than two stages it will become either *real/modulatory*, for example $VI^7 \rightarrow II^7 \rightarrow V^7 \rightarrow I$ ($A^7 \rightarrow D^7 \rightarrow G^7 \rightarrow C$ in C, see ex.39, p. 37), or *virtual/key-specific*, e.g. $vi^7 \rightarrow ii^7 \rightarrow V^7 \rightarrow I$ ($Am^7 \rightarrow Dm^7 \rightarrow G^7 \rightarrow C$ in C). The former constitutes a *real* circle of fifths because A^7 (VI – the chord on the sixth degree) is the real dominant seventh of D (II, on the second degree), D^7 (II) the real dominant seventh of G (V); it can also be termed *modulatory* because A^7 and D^7 both contain notes foreign to the tonic key of C major ($c\sharp$ and $f\sharp$ respectively). The virtual circle-of-fifths progression is *key-specific* because all notes in all chords belong to the same tonic key (e.g. C major, see example 39) and can be termed *virtual* because neither Am^7 (on the sixth degree) nor Dm^7 (second degree) are real dominant sevenths of subsequent chords in the progression.

Ex. 39 Real and virtual VI II V I progressions.

	A^7 D^7 G^7 C	
‘real’		‘virtual’
	Am^7 Dm^7 G^7 C	
	VI II V I	vi ii V I

Some predilection for real circles of fifths in US popular song from the nineteen tens and twenties was superseded by preference for more virtual variants in standards and evergreens of the thirties and forties (see table 11). The virtual or key-specific circle-of-fifths is moreover a distinctive trait of the Baroque style (Corelli, Vivaldi, J.S. Bach, etc.) and is also quite common in European popular song showing classical influences. Many well-known popular songs use a mixture of real and virtual circle-of-fifths progressions. Anticlockwise circle-of-fifth progressions are, as shown in example 39 and table 11, frequently constructed as a chain of seventh chords (sometimes also ninths, elevenths or thirteenth).

Table 11 Anticlockwise circle-of-fifth progression types in English-language songs

Song	type ⁱ	Chord progression
Sweet Georgia Brown	R	(B ⁷) E ⁷ E ⁷ A ⁷ A ⁷ D ⁷ D ⁷ G — (III)-VI-II-V-I in G
Charleston	R	[B ^b] D ⁷ G ⁷ G ⁷ C ⁷ F ⁷ B ^b G ⁷ C ⁷ F ⁷ — III-VI-II-V-I in B ^b
Has Anybody Seen My Gal	R	F A ⁷ D ⁷ D ⁷ G ⁷ C ⁷ F D ⁷ G ⁷ C ⁷ — III-VI-II-V-I in F
All The Things You Are (start)	K	Fm ⁷ B ^b m ⁷ E ^b ⁷ A ^b Δ ⁷ D ^b Δ ⁷ — vi-ii-V-I-IV in A ^b Cm ⁷ Fm ⁷ B ^b ⁷ E ^b Δ ⁷ A ^b Δ ⁷ — vi-ii-V-I-IV in E ^b
Blue Moon	K	: E ^b Cm ⁷ Fm ⁷ B ^b ⁷ : E ^b — (I)-vi-ii-V-I in E ^b
Jeepers Creepers	K/M	(a) Gm ⁹ C ⁹ FΔ ⁹ (b) Dm ⁷ Gm ⁷ C ⁹ F ⁶ Gm ⁹ C ⁹ (c) Am ⁷⁻⁵ D ⁹ Gm ⁷ C ⁹ F ⁶ — (a) ii V I (b) vi ii V I ii V (c) iii VI ii V I, all in F
Moonlight Serenade	K/M	Bm ⁷⁻⁵ E- ⁹ Am ⁷ D- ⁹ Gm ⁷ C- ⁹ F — +iv-VII-iii-VI-ii-V-I in F
Georgia (end of bridge)	K/M	Bm ⁷⁻⁵ E ⁷ Am ⁷ D- ⁹ Gm ⁷ C ⁷ F — +iv-VII-iii-VI-ii-V-I in F
Autumn Leaves	K	Gm ⁷ C ⁷ FΔ ⁷ BΔ ⁷ E ⁷⁻⁵ A ⁷ Dm — iv-VII-III-VI-ii-V-i in D minor.
Windmills of Your Mind	K	E ⁷ Am D ⁷ GΔ ⁷ CΔ ⁷ F#m ⁷⁻⁵ B ⁷ Em — I-iv-VII-III-VI-ii-V-I in E minor.
Bluesette	K	[B ^b] Am ⁷ D ⁷ Gm ⁷ C ⁷ F ⁷ B ^b ⁷ E ^b — vii-iii-vi-ii-V-I-IV in B ^b major
Yesterday	M	[F] Em ⁷ A ⁷ Dm B ^b (Gm ⁷) C ⁷ F — vii-III-VI-IV(ii)-V-I in F ⁱⁱ

i. R = real; K = key-specific; M =mixed.

ii. IV (here B^b) can often appear as an alternative to ii (Gm⁷) at this point in a circle-of-fifths progression.

Example 40 (p.39) illustrates one common way of playing such chains as key-specific circles in (i) C major, (ii) D \flat major, (iii) G \sharp minor. (This example assumes the presence of each chord's root in the bass part.) To effectuate any complete key-specific circle-of-fifths one step in the bass line will be a diminished fifth (between vii and IV in the major key, between ii and V in the minor, e.g. from F Δ^7 to Bm $^7\flat^5$ in C major or A minor), each of the remaining seven steps either falling by a perfect fifth or rising by a perfect fourth.

Playing anticlockwise circle-of-fifths progressions demands a minimum of physical effort because: (i) stringed bass instruments are tuned in fourths, facilitating leaps of the fourth, fifth and octave (see above); (ii) fifths, fourths and octaves are easy to pitch on brass instruments playing a bass line; (iii) the constituent notes of any two contiguous seventh chords in a circle-of-fifths progression are, with the exception of the root, either immediately adjacent or the same, this rendering them amenable to hand and finger positioning for keyboard players and guitarists.

Clockwise ('rising') circle-of-fifths progressions may be less common than their anticlockwise counterparts but do occur in pop/rock styles using certain types of modal harmony. For example, the mixolydian turnaround \flat VII IV I runs clockwise (e.g. B \flat F C), as do all progressions listed in table 12.

Ex. 40 Seventh chords in key-specific (virtual) sequence anti-clockwise round the circle of fifths: (i) C major; (ii) D \flat major; (iii) G \sharp minor.

(i) **Bm $^7\flat^5$ Em 7 Am 7 Dm 7 G 7 Cmaj 7 Fmaj 7 Bm $^7\flat^5$ Em 7 Am 7 Dm 7 G 7 C**

vii iii vi ii V I IV vii iii vi ii V I

(ii) **Cm $^7\flat^5$ Fm 7 Bbm 7 Ebm 7 Ab 7 Db Δ^7 Gb Δ^7 Cm $^7\flat^5$ Fm 7 Bbm 7 Ebm 7 Ab 7 Db**

vii iii vi ii V I IV vii iii vi ii V I

(iii) **F \sharp m 7 B Δ^7 E Δ^7 A \sharp m $^7\flat^5$ D \sharp m 7 G \sharp m 7 C \sharp m 7 F \sharp m 7 B Δ^7 E Δ^7 A \sharp m $^7\flat^5$ D \sharp 7 G \sharp m**

VII III VI ii v i iv VII III VI ii V i

Table 12 Clockwise circle-of-fifth progressions in English-language rock music

Artist: Song	Progression
Kinks: <i>Dead End Street</i> (verse)	C G Dm Am — III VII iv i in A minor
Rolling Stones: <i>Brown Sugar</i> (aeolian cadence in instrumental at end of chorus)	(D \flat)-A \flat E \flat -B \flat F-C— (bII-) \flat VI \flat III- \flat VII IV-I in C, see example 41.
Rolling Stones: <i>Jumping Jack Flash</i> ('It's alright')	D A E B — \flat III \flat VII IV I in B
Jimi Hendrix: <i>Hey Joe</i> (throughout)	C G D A E — \flat VI \flat III \flat VII IV I in E
Irene Cara: <i>Flashdance</i> (start of verse)	B \flat F Cm Gm — iii VII iv i in G minor

Ex. 41 Rolling Stones: *Brown Sugar* (1971). Clockwise circle-of-fifths progression through plagal ornamentation of aeolian cadence.

basic chords: Ab Bb C
 plagalised triads: Ab Db Ab Eb Bb F C

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