Elements of Jazz

by
Leigh Jackson

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Abstract

This thesis examines the unique musical and cultural elements particular to jazz improvisation. The topics of scales, melody, voicings, harmony and rhythm are examined in separate chapters with over two hundred notated musical examples used to demonstrate the materials in their context. This thesis also seeks to explain the relationships between these elements and presents the material in a form applicable to improvisation.

In its relatively short history jazz has developed many unique musical and cultural elements. The fact that most of these musical elements have been developed in an improvised environment means that the complexity of the harmonic, melodic and rhythmic material presents more than an academic challenge for the student of this music. To play jazz requires a deep understanding of the complex relationships that exist between melody, harmony and rhythm. This must go beyond an academic understanding because the practical application of this knowledge ultimately determines whether the elements can be used spontaneously in improvisation.

To explain the theoretical material that underlies jazz improvisation, various types of musical shorthand and complex techniques of cross-referencing have evolved. Until more recently most of these techniques have been kept within the profession and were shrouded in mystery, with most information being passed directly from master to student. The relative lack of literature on the theoretical components of jazz, and the fact that most of its finest examples only exist in recorded form, have exacerbated this situation. In the last decade or so several books have been written in an attempt to decipher jazz. The best of these works contain a large academic component with an emphasis on using the material in the context of improvisation. The theoretical complexity of jazz rivals any other western or non-western form of music, but the way in which it has been taught is based on the African tradition of aural learning through imitation. As jazz has grown in complexity, the tradition of learning improvisation solely by imitation has proven to be inadequate. The modern trend towards the blending of theoretical, practical and intuitive learning, has created a need to find new ways of organising the ever increasing material. This thesis seeks to examine the elements of jazz and categorise and organise the information in a more efficient way.

The thesis is divided into chapters exploring scales, melody, voicings, harmony and rhythm.

The subject of scales is explored with reference to traditional and extended structures and their particular relationship to harmony. To describe the relationships between scales and chords several charts and diagrams are employed, with parallel and derived approaches as a basis. Jazz contains many unique ways of generating and structuring voicings, with 4-way close, drop 2, slash chords, ambichords, pentatonic derivatives, upper structures and quintal structures forming the basis of this study. The similarities and differences between European classical harmony and extended jazz harmony are explored, with an emphasis on the techniques found in jazz. To explore this connection many written examples show the gradual introduction of harmonic density, from simple four-part writing through to the use of upper structure, alteration, substitution, superimposition and polyphonic elaboration. Basic reharmonisation and techniques of variation in chord progressions are explored, with a comprehensive study of chord substitution. Transcribed examples from the jazz repertoire are used to trace melodic and harmonic chromaticism, with reference to the parallel developments in rhythm. The use of polyrhythm, displacement, rhythmic grouping and metric modulation are examined, with an emphasis on the parallel developments in harmony and melody. This thesis also contains several essays that examine the relationship between jazz and 20th-Century music, the evolution of chromaticism in jazz, and the unique culture of jazz improvisation.

Acknowledgments

Thanks to my wife Kirsten Mackenzie for her support and encouragement, and for lecture notes taken at the Guildhall and ABRSM in London, Dr.Donald Maurice for his enormous help with structure and his eye for detail, Colin Hemmingsen for pioneering jazz education in New Zealand, Roger Sellers and Paul Dyne for the practical experience they have given me over the years, Julie Coulson for proof reading the musical examples, Peter Churchill in London for putting many disparate elements in perspective, thanks to all of my students over the years for helping me to look for new ways of explaining ideas, and lastly thanks to my numerous teachers who have inspired me and given me the energy to complete this work.

Contents

Introduction

Elements Examined :

The unique melodic and harmonic elements found in jazz with analysis of their use and structure.

The evolution of melodic and harmonic chromaticism in jazz and the parallel relationship with rhythm.

The connections between traditional classical harmony and the modern innovations in jazz harmony.

The difference in culture between jazz and classical music and the relationship with 20th-Century music.

The culture of jazz improvisation and the elements fundamental to producing spontaneous music.

Sources and Methodology

Transcription of musical material

One essential problem with researching jazz is that most of its important examples are still only available as recordings and don't yet exist in written form. To analyse the structure of the music it must first be notated, so a large degree of transcription was required to complete this thesis. The methods used to transcribe the musical examples are outlined in Appendix 1. Unless indicated by a footnote, all transcriptions were done by this author. The methods used to analyse the resulting material are all based in traditional theory. Extended Roman numerals are used to define chord function within a key, chord symbols used to define a chord structure, the 'drop' system is used to define spacing within a voicing. The connection between chords and scales is constantly used as a way of explaining harmonic and melodic relationships.

Compositions

To demonstrate the application of some material it was necessary to compose a number of melody lines, chord progressions and some full pieces. In addition to this it was necessary to compose several harmonisations to demonstrate various concepts.

Informal discussion, Private consultation (lessons), Master classes, Conferences and Concerts

A proportion of the information here was gathered through private consultation with experts in the field over a number of years. A source of material and inspiration has been the I.A.J.E conferences (Chicago 1997 and New Orleans 2000) which provide exposure to the latest developments in thinking and include numerous performances by top practitioners. It also provides the opportunity to attend specialised lectures and talk informally with high level practitioners. Much of the information on the connections between jazz and classical harmony came from studies undertaken in the UK over a 3 month period in the year 2000. This and other information came primarily from my own studies with Peter Churchill, and lecture notes taken by Kirsten MacKenzie (recipient of ABRSM centennial scholarship) from classes with Nicky Iles, Peter Churchill, Danilo Perez and Simon Purcell. The work done in London helped to put the harmonic material in perspective by relating many disparate elements together. Some of the material comes from classes attended in the USA and New Zealand with John Scofield, Hal Galper, Mulgrew Miller, David Baker, Dave Liebman, Donny Nolan, Paul Wertico and Jim McNeely, also from private lessons with Mark Levine, Steve Erquiaga, Bill Cunliffe and Bruce Foreman.

Academic Literature

In an attempt to convey a fresh perspective it was essential to become familiar with current theories and culture, therefore, a large amount of reading was undertaken. Although jazz theory is relatively new many authors have tackled various areas. I have undoubtedly been influenced by the current literature that is available, but have tried to find better relationships and more efficient ways of explaining the material. There are references to external sources in the form of books, journals, interviews, videos, internet archives, musical scores, published transcriptions and lecture notes.

Performance and Teaching

To identify issues relevant to improvisation it is necessary to have a practical involvement in the subject. Associating and playing with numerous high level practitioners over 18 years has helped me to formulate practical theories of jazz and be immersed in its culture. The practical nature of improvisation dictated that many ideas in this thesis should be oriented toward a practical application. Some of the findings are due to a constant involvement in the teaching of jazz. To teach jazz effectively requires the formulation of clear concepts and explanations that can be applied directly to a performance situation.

Equipment

The graphical layout was produced solely by the author on a Macintosh 7100/80 using a combination of Encore 4.1 and ClarisWorks 4.

Glossary

A
Alteration - chords can have extension notes that are outside of the functional key
Atonal - Without a discernible key
Ambichords - 3 or 4 note chords based on combinations of 2nds and 4ths that have an ambiguous function because of the abundance of root note possibilities
Augmentation - extending the duration of notes in the repetition of a melody
Avoid Note - a particularly dissonant note of a scale often the 4th of a major scale

B
Backdoor Changes - typically a bVII chord functioning as a plagal minor or V7b9 substitute in a cadence
Bebop - a style of music from the 1940s associated with Charlie Parker and Dizzy Gillespie, the name bebop was despised by Charlie Parker, despite that it became the current name associated with this era
BIAB - Band-in-a-Box, software program for producing rhythm section backings
Bi-Tonal - in two keys at the same time

C
Cadence - resolving harmonic movement
CESH - contrapuntal elaboration of static harmony
Cadenza - an improvised ending to a composition often rubato
Changes - chord progression or harmonic basis
Chart - sheet music, manuscript or lead sheet
Chops - technique
Chorus - the complete song form once through
Chromaticism - the use of chromatic or out of key notes to enhance a melodic or harmonic passage
Close Position - a voicing that has several notes within a small interval sometimes called a cluster
Consonant - a term subjective describing the a lack of tension contained within a harmonic structure
Comping - the chordal accompaniment behind a soloist
Cross Rhythm - uneven rhythmic groupings often used in Metric Modulation

D
Deceptive Cadence - the V chord moves to a relative of the I chord
Delayed Resolution - a cadence that involves the tonic or resolving chord occurring later than expected. Often associated with chord I diminished substitution
Degree - a specific step within a scale
Diatonic - within a scale or key
Diatonic Cycle - a cycle that occurs within the constraints of a scale
Displacement - a rhythmic shift of a musical idea making it occur earlier or later than the original
Dissonant - a subjective term used to describe the amount of tension present in a harmonic structure
Dixieland - a style of jazz that originated in New Orleans around 1910
Double Diminished - A chord containing most of the notes from two adjacent diminished triads
Double Time - the changing of a tempo to twice the speed of the original, the harmonic rhythm often remains
Drop 2 - voicing with the 2nd note from the top dropped down in pitch by one octave
Drone notes - another term for Pedal point

E
Enclosure - a group of notes, usually upper and lower neighbour tones, that precede a melody note
Exotic scale - a scale with one or more minor 3rds, or an unusual construction of intervals
Extension - a note or group of notes that are non chord tones
Extemporisation - another term for improvisation, usually applied to classical music

F
Fake Book - a book of jazz standards usually just the melody and chords
Fragrant Chords - chords that have been specifically broken down and reassembled using a tonic register layout
Feel - a common term used by jazz musicians to describe the intricacies of the overall rhythm
Figure - a rhythmic motif found in the head often used as a unifying element in solos
4-Way Close - a term used to describe a four-note voicing that occurs within an interval smaller than an octave
Free Jazz - a term used to describe a type of jazz playing that developed from around 1960. Although not regarded as a style it has become more idiomatic in recent times. Linked to the avant-garde

G
Gig - a performance
Groove - An abstract term describing the main pulse or synchronisation of elements
Guide Tones - notes of a melody or chord that guide the harmony. Often 3rds and 7ths

H
Harmonic Rhythm - the duration that chords receive in a metric cycle
Harmonisation - the chordal accompaniment used to support a melody
Head - The melody
Horn - a generic term used by jazz musicians to describe a musical instrument. Even a piano can be referred to as a horn
Hybrid Upper Structure - a term describing a chord that has a 3 or 4 -note voicing combined with a bass note

I
Idiomatic - pertaining to a particular style
Improvisation - The art of using musical elements to spontaneously create music of the moment
Intervallic - the constant use of intervals larger than a 3rd in melodic lines
Inversion - a term describing the position of the notes of a chord

J
Jam Session - an informal gathering of jazz musicians, sometimes competitive in nature

L
Lead Sheet - sheet music for a standard often just melody and chords
Lick - a small musical phrase, often a cliche used in a solo
Line - melody or improvised series of notes

M
Melodic Minor Substitution - a technique of substitution based on the melodic minor scale
Metric Modulation - the changing of one tempo to another by using related cross rhythms
Metronome - a tool used by musicians to mark out perfect time
Modal - music with melodies and harmonies based on a mode
Mode - a scale that is based on a degree of a parent scale
Middle Eight - the bridge section of a song structure

N
Neighbouring Tone - a note that lies a semitone above or below a main melody note

O
Open Position - a chord that has intervals large than a 3rd giving it a larger degree of spacing between notes
Ostinato - a repeated rhythmic bass line that is used as a foundation for melodies and harmonies

P
Parallel Movement - the use of an identical chord structure at a different pitch
Parent Scale - a scale that has many other scales (modes) that can be built from each note
Passing-Tone - a note used to link two important pitches
Pedal Point - a series of chords or harmonies underpinned by a single bass note
Pentatonic Chords - chords constructed exclusively from the notes of a pentatonic scale
Plagal Minor Substitution - a type of substitution based on the use of chord IV as a minor chord
Play-Along - a music minus one recording usually a rhythm section used as an aid to practicing improvisation
Polychord - two or more chords combined in the same structure
Polyrhythm - a rhythm that cannot be divided evenly against the main pulse

Q
Quartal-Movement in fourths
Quintal Voicing - a chord constructed primarily from intervals of a 5th
Quintuplet - the rhythmic subdivision of a phrase into five equal parts, often used in polyrhythmic approaches

R
Rhythm Changes - A chord sequence associated with the Gershwin composition " I Got Rhythm", used frequently as a background for fast improvisation
Rhythm Section - The group of musicians associated with keeping the pulse and the form. Usually piano, bass, guitar and drums (tuba and banjo in Dixieland). Sometimes horn players mistakenly think they are part of the rhythm section when playing backgrounds

Ride Cymbal - the cymbal used by a drummer principally to keep the time
Riff - a repeated melodic phrase or bass-line
Root Note - the naming note of a scale or chord, the tonic
Rubato - an expressive term referring to the lack of a steady pulse used in intro's and endings

S
Secondary Dominant Chord - a chord that functions as a temporary chord V in diatonic harmony
Serial Composition - a way of composing based on the use of a tone row or mathematical formula
Side Slipping - the temporary modulation of a melodic or harmonic passage up or down a semitone often used to create temporary dissonance
Slash Chord - a chord that occurs over a bass note giving it a different function
Songsheet - a concise notation of lyrics, chords and melody used to convey a jazz standard
So What Chord - a voicing originally used on *Kind of Blue* album, based on the pentatonic minor scale. Series of voicings derived from the pentatonic minor scale
Subdivision - the division of a metric pulse into smaller units
Substitution - A replacement chord that functions in a similar way to the original
Superimposition- A chord or melody placed in a foreign harmonic environment effectively creating bi-tonality
Swing (1) - An abstract term used to describe the subtlety and mystery of jazz rhythm
Swing (2) - A term describing the 12/8 nature of a bar in 4. Referred to as a swing feel as opposed to a straight eighth feel
Swing (3) - The era of jazz that occurred in the 1930s associated with Benny Goodman
Symmetrical Scales - a scale that has a reoccurring pattern of intervals
Syncopation - a stressing of offbeats rather than main beats
Synthetic Scale - a scale comprised of notes from two keys

T
Target Tone - a pivotal note in the construction of a line, a note where several elements resolve
Time Feel - the subtle aspects of rhythmic placement. Sometimes used as a term to describe the rhythmic idiom of a composition
Trading - the consecutive sharing of ideas between two musicians, often between the drummer and melody instrument
Tritone substitution - a term used to describe the replacement of chord V^7 with a bII^7 chord in a cadence
Turnaround - a harmonic pattern that is often used at the end of a song form to link back to the start of the form

U
Upper Neighbour Tone - a note that lies a semitone above a main melody note
Upper Structure - a recognisable structure (often major or minor) that occurs in the upper part of a chord that contains extensions

T
Tonic Gravity - the pull exerted on a functional chord by the tonic key
Tone Row - a series of notes used to generate a musical composition
Transcribing - The act of writing down music that is available only in recorded form. The main method by which a jazz musician learns to improvise.

V
Vagrant Chords - A term used by Schoenberg to describe symmetrical chords that are ambiguous in function, or have no function.
Voicing - the spacing and layout of a harmonic structure producing a characteristic sonority
Voice Leading - the connection of voices from one harmonic structure to another

W
Walking Bass - a steady quarter-note line employed by a bass player to underpin a swing feel
Wood-Shedding - intensive practice over a period of time

1. Exploring Scales

A scale can simply be described as a series of notes, ranging from the simplest of structures to the most complex. The inclusive nature of jazz means that an enormous number of scale structures are in common use in both improvisation and composition. Jazz has drawn from many non-western sources for its harmonic, melodic and rhythmic materials.

Most beginning jazz musicians start learning improvisation with reference to a scale structure in which the notes are rearranged to form melodies. This scale is usually the blues scale, as it has a degree of tension already built in and clearly defines a key centre. The most basic level of melodic improvisation usually involves running the scale up and down, assessing the quality of each note in relation to the surrounding harmony. This is usually done with reference to a background rhythm section sustaining a progression of chords or a play-along record. With very little practice most musicians seem to be able to improvise within a single scale, resting on chord tones and using passing notes in appropriate places to convey a feeling of tonality.

The relationship between scales and chords is essential in understanding the fundamentals of dissonance in jazz. Although every person probably has his or her own level of acceptable dissonance, some scales have a very dissonant note which is regarded as an avoid tone. This is a tone that stands out as being particularly unsuitable as a sustained note against a background chord. For instance, if a C major scale is played over a C major chord all the scale tones can be sustained, except the F or 4th degree. The F has to be resolved as it creates a feeling of instability that would be unacceptable to most people. The default scale for a major chord in modern jazz is the Lydian mode that has the raised 4th degree which replaces the avoid tone on the 4th degree. For a jazz musician it is essential to know the relative degrees of dissonance in scale-chord relationships, not so these notes can be avoided, but so they can appropriately be used to create the desired amount of tension required at any moment in a solo or composition. To examine these principles it becomes necessary to look at scales in detail.

(a) Parallel and Derived Scale Comparisons

Many scales that exist in music are modes of another. If a C major scale is played from the 2nd degree, a Dorian mode is the result. Although it shares the same notes as a C scale, the fundamental gravity is changed and the D becomes the tonic. This is nothing new to music, as the church modes have existed for centuries, but the way these are used in jazz is unique. In the analysis of scales there are fundamentally two useful ways of describing them, the parallel and the derived approach. The derived-scale approach deals with what scale can be built from each of the scale notes. In the case of C major a C major can be built from the root, a D minor from the 2nd, an E Phrygian from the 3rd, an F Lydian from the 4th and so on. The parallel approach outlines the structure in relation to a major scale. For example, a Dorian scale is 1, 2, b3, 4, 5, 6,b7 in structure, and a Phrygian scale is 1, b2, b3, 4, 5, b6, b7.

The following charts[1] show the scale seen in parallel relationship with all modes starting on C. Included is the functional chord symbol, the extensions and the modal chord symbol.

The functional symbol represents the tonal function within a key. If the chord is C7 then the function is dominant, and it is likely to be chord V of the key.

The extensions refer to the three non-chord tones that make up the upper structure, usually the 9th, 11th and 13th.

The modal symbol refers to a slash chord which defines the sound of the scale. Often this modal chord is made from extension tones.

1 The parallel scale charts are based on hand written layouts by Peter Churchill who has used elements from *The Lydian Chromatic Concept of Tonal Organisation* by George Russell

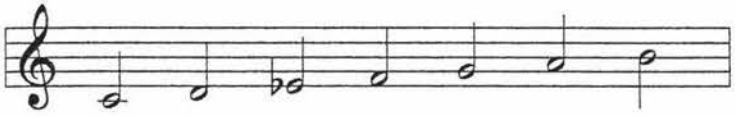
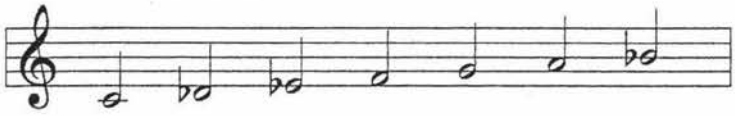
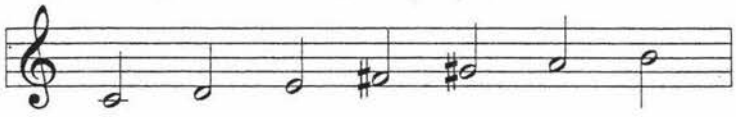
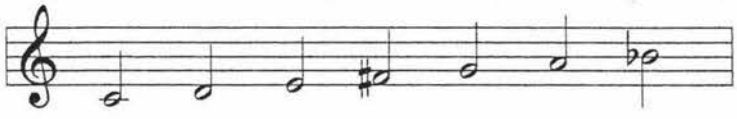
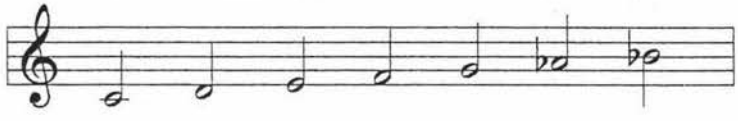
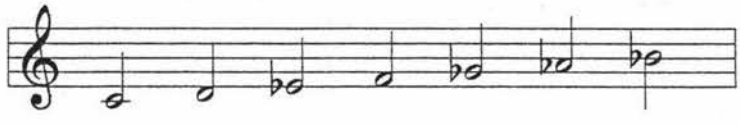
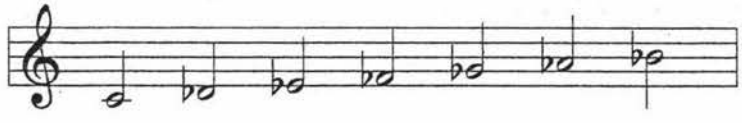
Major Modes (Parallel)

	Functional Chord Symbol	Extensions	Modal Chord Symbol
Lydian (4th degree G maj)	C^{Δ}	13 #11 9	C/C D/C
Ionian (1st degree C maj)	C^{Δ}	13 11 9	F/C G/C
Mixolydian (5th degree of F maj)	C^{7}	13 11 9	Bb/C
Dorian (2nd degree Bb maj)	$Cm7$	13 11 9	Eb/C
Aeolian (6th degree Eb maj)	$Cm7$	b13 11 9	Ab/C
Phrygian (3rd degree Ab maj)	C^{7}	b13 11 b9	Db/C
Locrian (7th degree Db maj)	$C^{\emptyset}$	b13 11 b9	Gb/C

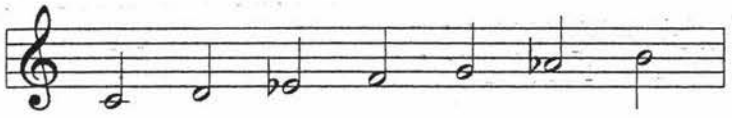
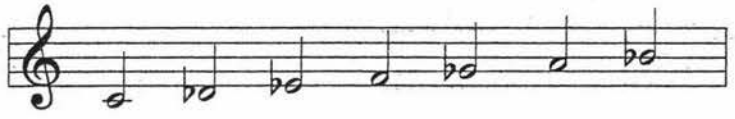
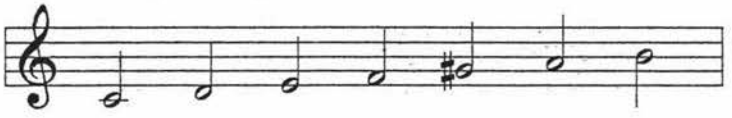
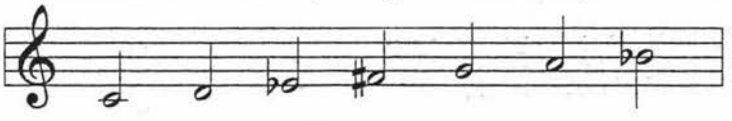
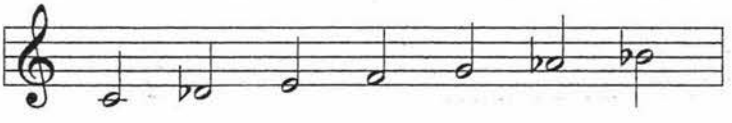
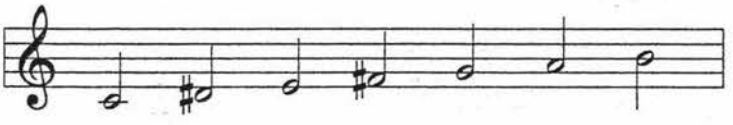
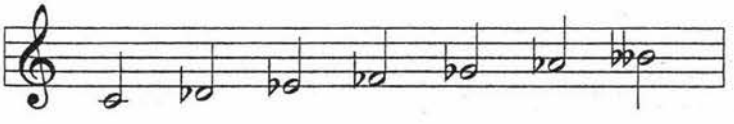
If this note is dropped then the result is a B Lydian scale

↓ The arrow represents the note that is lowered each time to create the following mode

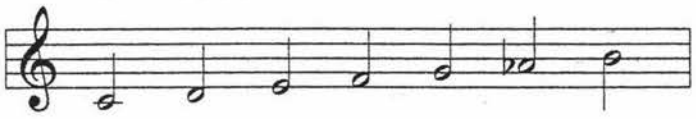
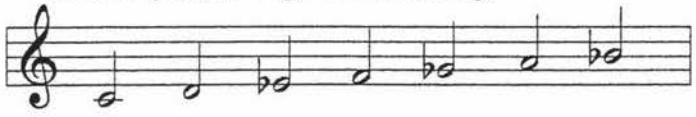
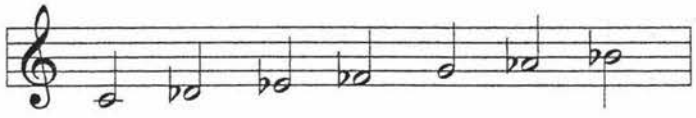
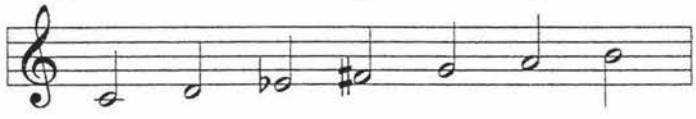
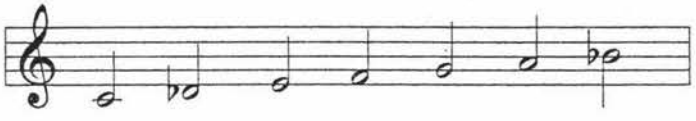
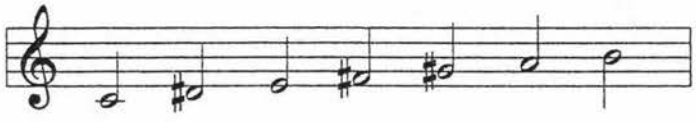
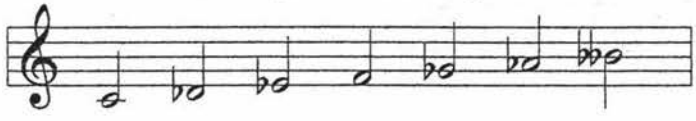
Melodic Minor Modes (Parallel)

	Functional Chord Symbol	Extensions	Modal Symbol
Melodic Minor Ascending 	$C^{m\Delta}$	13 11 9	Eb+ C
Dorian b9 (2nd degree Bb mel min) 	C^{m7}	13 11 b9	Db+ C
Lydian Augmented (3rd degree A mel min) 	$C^{\Delta+}$	13 #11 9	E C
Lydian Dominant (4th degree G mel min) 	C^{7}	13 #11 9	D C
Mixolydian b13 (5th degree F mel min) 	C^{7}	b13 11 9	Bb C
Locrian ♮9 (6th degree Eb mel min) 	$C^{\emptyset}$	b13 11 b9	Ebm C
Altered (7th degree Db mel min) 	C^{7}	b13 #9 b9	Gb C

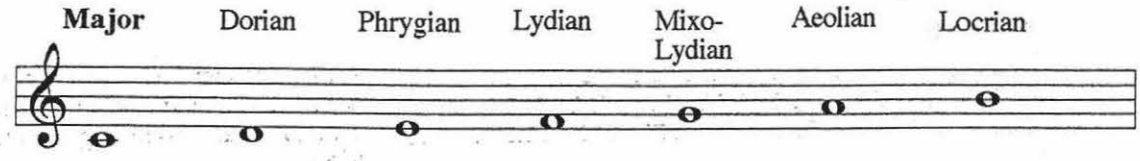
Harmonic Minor Modes (Parallel)

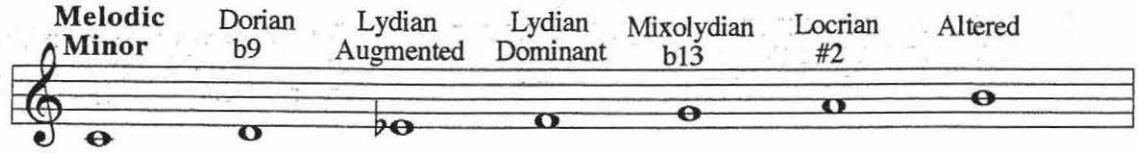
	Functional Chord Symbol	Extensions	Modal Symbol
Harmonic Minor 	$C^{m\Delta}$	b13 11 9	Eb+ C
Locrian ♮13 (2nd degree Bb harm min) 	$C^{\emptyset}$	13 11 b9	F C
Ionian Augmented (3rd degree A harm min) 	$C^{\Delta+}$	13 11 9	E C
Romanian, Dorian #11 (4th degree G harm min) 	C^{m7}	13 #11 9	D C
Spanish, Jewish (5th degree F harm min) 	C^{7}	b13 11 b9	Db C
Lydian #9 (6th degree E harm min) 	C^{Δ}	13 #11 #9	B C
Ultra Locrian (7th degree Db harm min) 	C^{o}	b13 11 b9	Gbm C

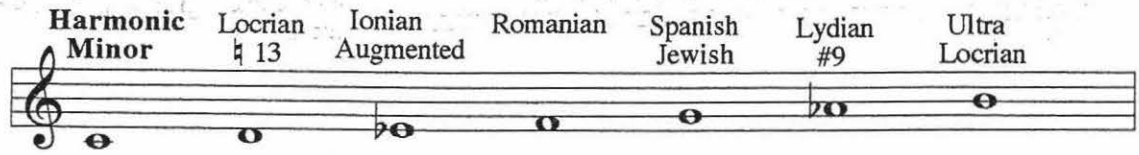
Harmonic Major Modes (Parallel)

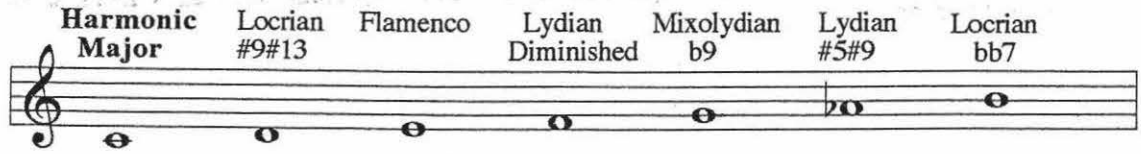
	Functional Chord Symbol	Extensions	Modal symbol
Harmonic Major 	C^{Δ}	b13 11 9	E C
Locrian ♮13 (2nd degree Bb harm maj) 	$C^{\emptyset 7}$	b13 11 9	Ebm C
Flamenco (3rd degree Ab harm maj) 	C^{m7}	b13 b11 b9	Dbm C
Lydian Diminished (4th degree G harm maj) 	$C^{m\Delta}$	13 #11 9	D C
Mixolydian b9 (5th degree F harm maj) 	C^{7}	13 11 b9	A C
Lydian #9 #5 (6th degree E harm maj) 	$C^{\Delta +}$	13 #11 #9	B C
Locrian bb7 (7th degree Db harm maj) 	C^{o7}	b13 11 b9	Gbm C

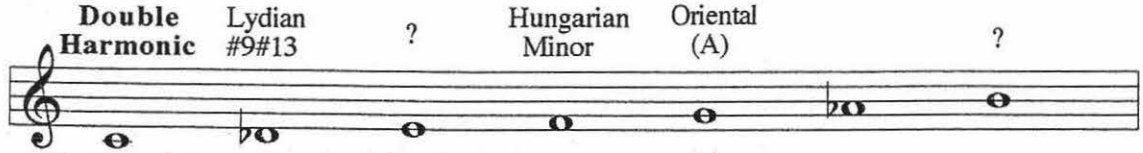
(b) Derived Scale Modes

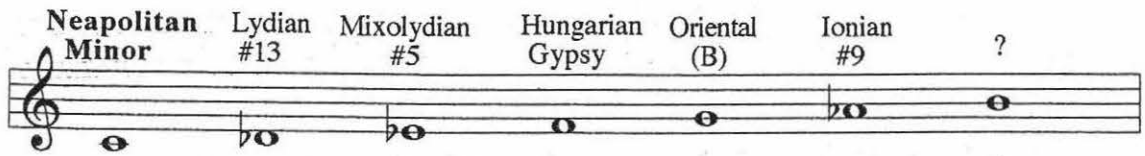










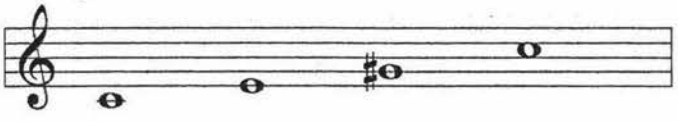


(c) Symmetrical Scales

Symmetrical scales and chords are common in jazz and functionally they are very versatile. Their lack of tonality means these structures are totally dependent on their context. Schoenberg referred to them as "vagrant chords". Example 1 shows the equal division of the octave into 3, 4 and 6 respectively

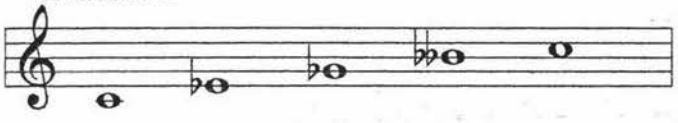
Ex 1

Augmented



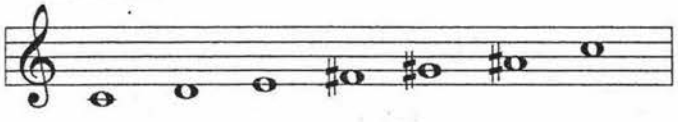
An octave can be divided into 3 equal parts, each interval being 4 semitones or a major 3rd, producing an augmented triad.

Diminished



The octave can also be divided into 4 equal parts of 3 semitones or a minor 3rd, producing a diminished chord.

Wholetone

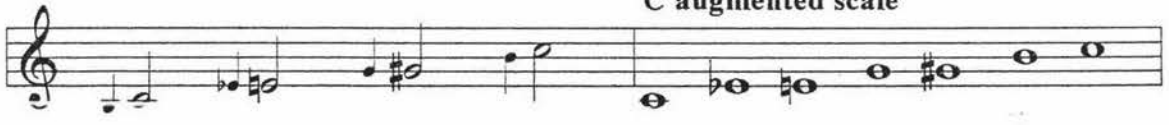


The octave can be divide into 6 equal wholetones, giving us the wholetone scale.

Example 2 shows the relationship between symmetrical arpeggios and scales. If the notes of an augmented chord are each preceded by a semitone the result is an augmented scale. This particular construction only exists on four notes. After four semitones it reoccurs, so there are only four different augmented scales. The augmented scale is made up from two augmented triads that are a semitone apart.

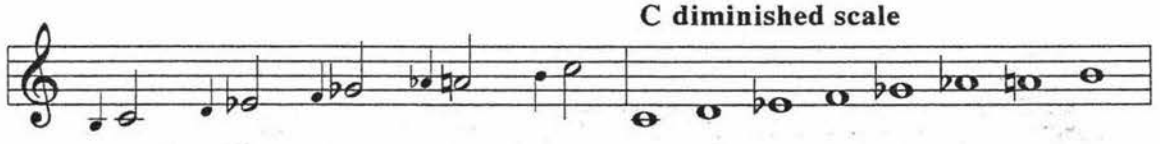
Ex 2

C augmented scale



The diminished arpeggio and scale reoccur after three semitones, so only three different diminished scales exist. If each arpeggio note is preceded by a semitone the result is a diminished scale. The diminished scale is made up from two diminished chords a semitone apart.

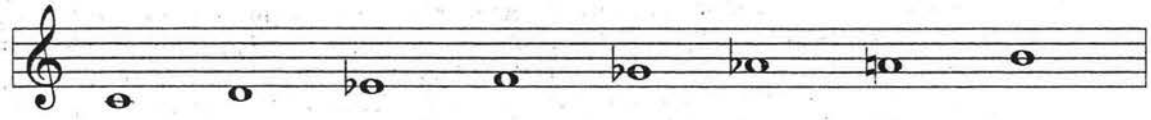
C diminished scale



If the same procedure is performed with the notes from C wholetone the result is a chromatic scale. The wholetone repeats again after a wholetone so only two scales exist, they are mutually exclusive.

The nature of the symmetrical diminished scale and chord means they are transposable at the minor 3rd. So the C diminished scale (example 3) contains the same notes as Eb, Gb and A diminished scales. This scale is often referred to as the whole-half diminished scale as it is constructed from wholetones and semitones alternately. A lot of confusion exists between the relationship of this scale and its counterpart, the half-whole diminished scale. The simplest explanation is to do with the function of the diminished chord in harmony. The diminished chord is essentially chord VII of a major or minor key. For example B diminished is chord VII in the key of C and often functions as a dominant chord in 1st inversion. If a B diminished chord is placed above a G, which is chord V in the key of C, then the overall sound is G7b9. If a B diminished scale is used against a G7b9 the result is the same scale.

Ex 3 C Diminished

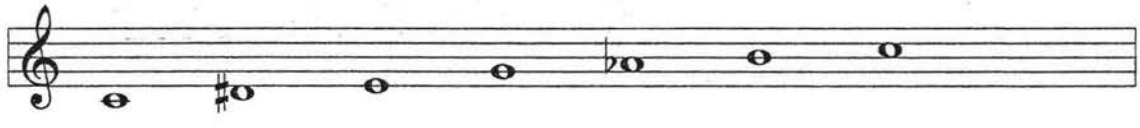


	Diminished	Dominant
VII dim	C dim Ebdim Gbdim Adim	Ab7b9 B7b9 D7b9 F7b9
VII / I	Ab B D F A C Eb Gb	bV / I: Ab B D F D F Ab B
II / I	Ab B D F Gb A C Eb	bVm / I: Abm Bm Dm Fm D F Ab B

This single C diminished scale contains all of these chords. The purpose here is simply to tie up the relationship between the scale and the chord. The harmonic uses of the scale and chords is covered in detail in chapter 4 on page 76.

The so called augmented or "Magic Scale" (example 4) is transposable at the major 3rd interval. So the C augmented contains the same notes as the E and Ab augmented scales. This scale works with the various chords notated below.

Ex 4 C augmented



	Major	Minor	Dominant
I maj7+5	Cmaj7+5 Emaj7+5 Abmaj7+5	Im(maj7) Cm(maj7) Em(maj7) Abm(maj7)	VI / I: C E Ab D# G B
III / I	E Ab C C E Ab	bIIm / I: Cm Em Abm B D# G	
bII / I	C E Ab B D# G	bVIm / I: Cm Em Abm E Ab C	

(d) Pentatonic Structures

A pentatonic scale is simply a five-note scale. Pentatonic scales are very common in folk music with the major pentatonic being the most common. In Indian, Japanese and Chinese music an abundance of pentatonic structures exists, many of which are also used in jazz. Once such scale is the insen scale used in many works by John Coltrane. There are many examples of pentatonic structures in jazz that do not conform to the standard major or minor forms.

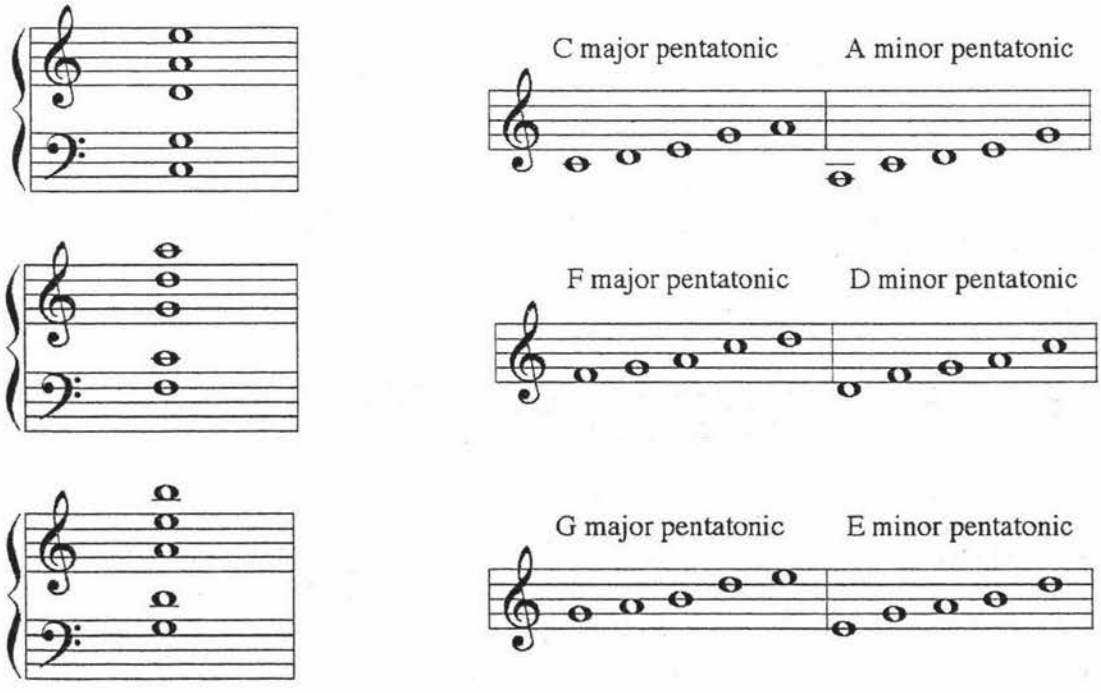
The book *Pentatonics* by Jerry Bergonzi, is dedicated to the use of some of these structures over standard chord sequences. He has given his own names for some of these structures, that would presume that it is new material, but further study reveals that some of these scales have existed in non-western music for centuries. For scales that have no western name traditional names have been used. The pentatonic scales have been part of the culture for centuries in many countries, giving an insight into the popularity and longevity of some of these forms. The major pentatonic has many names associated with it, Mongolian, Gong, Ryosen, Raga Bhopali (Bhup), Mohana, Deskar, Bilahari, Peruvian pentatonic and Ghana pentatonic. The minor pentatonic is known as Raga Dhani, Abheri, Udhayaravi Chandrika, Yu (China), Pyongjo-Kyemyonjo (Korea) and Minyo (Japan). This gives some idea how abundant these structures are.

Major pentatonic relationships

If a series of perfect 5ths is stacked up from C the resulting notes are C, G, D, A and E which can be put in series to form a C major pentatonic scale. If two more 5ths are added, the notes for a C Lydian scale are present, the brightest and most consonant of scales.

Example 1 shows that it is possible to stack perfect 5ths on the three major key centres of C, F and G. In other words, there are three major pentatonics associated with a major scale. The major pentatonic contains the same notes as the minor pentatonic based on the relative minor. This means that three minor pentatonics also exist in the key of C. They are A minor, D minor and E minor. In example 1 the 5ths are stacked up as a chord, then the same notes are laid out in a scale with the equivalent relative minor.

Ex 1



This is important, particularly when determining the relationship between pentatonic scales and chords. This relationship is also important in the construction and cross-referencing of minor pentatonic chords (So Whats), this is covered in detail in chapter 3.

Pentatonic Scales Chart

The following chart of scales represents a collection of the most common structures that exist in jazz and world music. Many different names are used for these structures, particularly in Indian, Chinese and Japanese music, where an abundance of pentatonic scales can be found. The western name for the scale has been used where possible, and some non-western names for more exotic structures. In this chart each scale is related back to the major, for example the minor pentatonic contains C, Eb, F, G and Bb which are 1, b3, 4, 5 and b7. In relating the modes to each other the degrees of the pentatonic scale have been numbered. To avoid confusion the notes in the scale are numbered from 1 to 5 despite what actual interval is present. For example the minor pentatonic is built on the 5th, or last note of the major pentatonic, although the interval is a major 6th, so the minor pentatonic is the 5th mode of the major pentatonic. By relating these scales together material is significantly reduced because of cross-referencing. To relate these scales together a method was devised. There is an abundance of material on these scales both on the internet, [2] and in books [3], but very little on how they relate to each other. To find patterns of intervals that would indicate a similarity in structure a method was devised. All the pentatonic scales, numbering about forty, were translated into an intervallic system based on 1-semitone, 2-wholetone, 3-minor 3rd. The major scale for example would read 2, 2, 1, 2, 2, 2, 1 and the Dorian mode built on the second degree would be 2, 1, 2, 2, 2, 1, 2. These strings of numbers make it easier to see similar patterns, enabling the recognition of similar intervallic structures. The following chart was generated from the findings.

[2] From the website of Yala Abdullah at http://www.freeyellow.com/members2/tyala/t4scales.htm, some scales were from exotic-scales text by aesager@acs4.acs.ucalgary.ca (Alexander Sager)

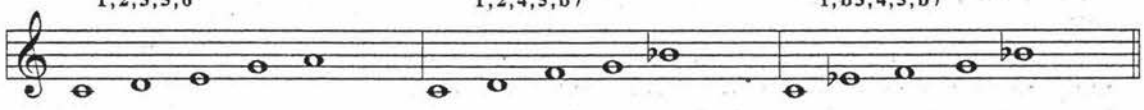
[3] *Pentatonics* by Jerry Bergonzi

Pentatonic Scale Chart

Major Pentatonic
1,2,3,5,6

Suspended Pentatonic
(2nd mode Major pent)
1,2,4,5,b7

Minor Pentatonic
(5th mode Major pent)
1,b3,4,5,b7

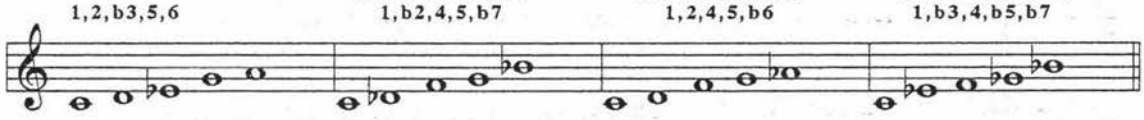


Dorian Pentatonic
1,2,b3,5,6

Insen mode
(2nd mode dorian pent)
1,b2,4,5,b7

Japanese(B) han-Kumoi
(4th mode dorian pent)
1,2,4,5,b6

Minor7 b5 Pentatonic
(5th mode dorian pent)
1,b3,4,b5,b7

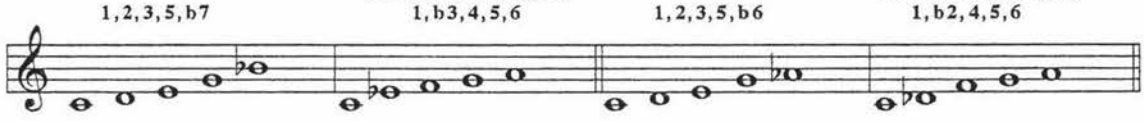


Dominant Pentatonic
1,2,3,5,b7

Minor 6th Pentatonic
(4th mode Dominant pent)
1,b3,4,5,6

Major b6 Pentatonic
1,2,3,5,b6

Altered Pentatonic
(4th mode Major b6 pent)
1,b2,4,5,6

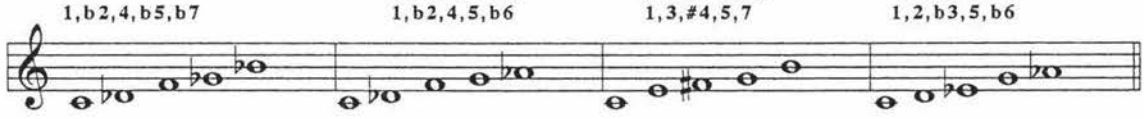


Iwato
1,b2,4,b5,b7

Japanese(A) hon-kumoi
(3rd mode Iwato)
1,b2,4,5,b6

Chinese(2)
(4th mode Iwato)
1,3,#4,5,7

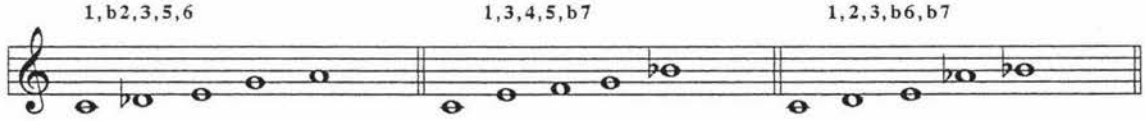
Hiro-joshi
(5th mode Iwato)
1,2,b3,5,b6



Scriabin mode
1,b2,3,5,6

Mixolydian Pentatonic
1,3,4,5,b7

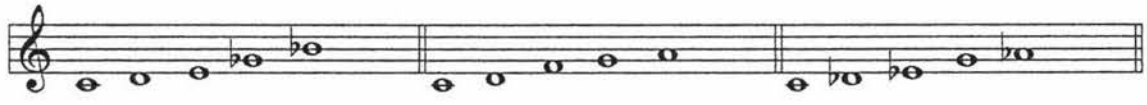
Wholetone Pentatonic
1,2,3,b6,b7



Prometheus Mode
1,2,3,b5,b7

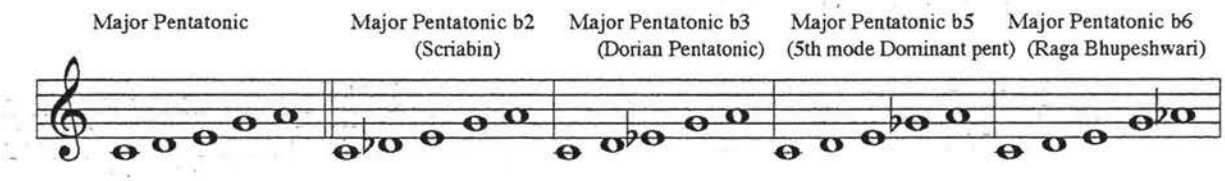
Scottish Pentatonic
(4th mode maj pent)
1,2,4,5,6

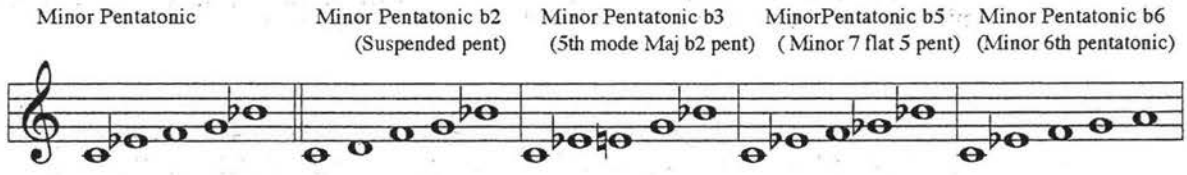
Balinese Pelog
1,b2,b3,5,b6

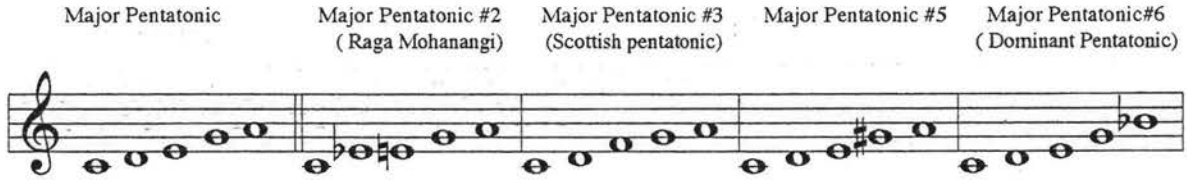


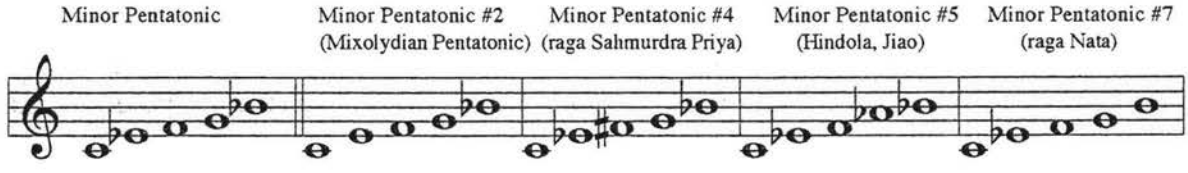
Altered Pentatonic Scales Chart

This chart takes the common major and minor pentatonics and shows new modes that can be generated by raising or lowering, in turn, each note in the scale. In most cases these modes already have existing names. This procedure of altering the basic scales is particularly useful when the construction of complex pentatonic chords is examined in Chapter 3.[4] In this chapter these scales are used to make vertical structures. Once the basic minor pentatonic or 'So What' chords are learnt, other structures can be found by raising and lowering different notes in the chord.









[4] The principle of generating voicings from a pentatonic scale is examined on pages 47-51

(e) Exotic Scales

After a thorough study of traditional jazz scales, it becomes clear that some musicians use more complex structures in improvisation and composition. An example of this is in the pedal sections, intros and tags played by Keith Jarrett on several of his trio albums. On closer listening it becomes apparent that he is using many lowered 2nds and lowered 6ths creating a middle-eastern sound that has a lot of tension and mystery.

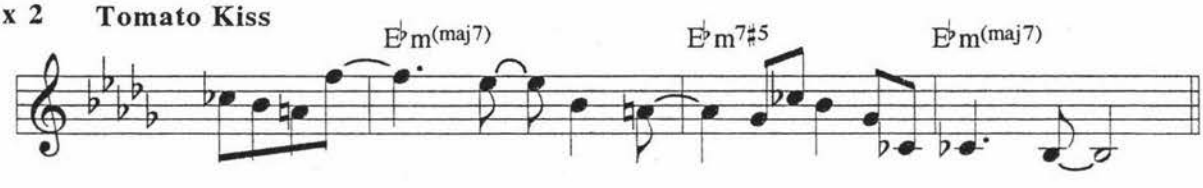
Example 1 shows the opening melody of "Impromptu"[5] by jazz pianist Danilo Perez. In examining the scale used here it appears to have two minor 3rd intervals and three consecutive semitones. This makes it a very unusual scale construction. The lowered 2nd and 6th give it a dark quality. This construction is known as the double harmonic or Byzantine scale. In Karnatic music it is known as the Mayamalavagaula

Ex 1 Impromptu (Conversations)

Transcribing similar melodies led to the discovery of another interesting scale which contained two lots of minor 3rds in its structure. The scale in C is made up of C, D, Eb, F#, G, Ab and B, which, on closer examination, conforms to the structure of the Hungarian minor.

In example 2 the first few bars of "Tomato Kiss" by Larry Schneider, has an interesting use of this scale. If applied to the harmonic background the resulting scale is Eb, F, Gb, A, Bb, Cb and D which on first glance appears to be a harmonic minor with a raised 4th. This gives it two minor 3rd intervals between the Gb and A, and Cb and D, producing the Hungarian minor.

Ex 2 Tomato Kiss



Exotic Scales Chart

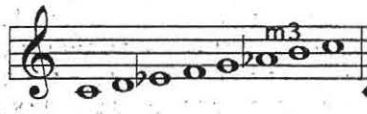
The following chart shows the relationship between exotic scales. It is debatable as to whether the harmonic major and harmonic minor modes should be classified as exotic scales, they are included here due to their use of the minor 3rd interval.

[5] From a transcription by Kirsten MacKenzie

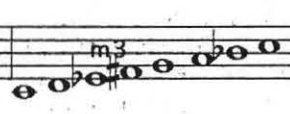
Exotic Scale Chart

The occurrence of the minor 3rd interval is indicated by m3

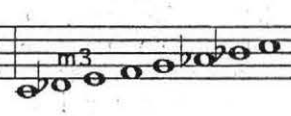
Harmonic Minor
(Major b3,b6)



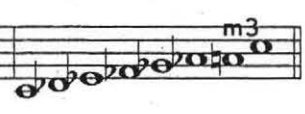
Romanian
(4th mode Harmonic Minor)



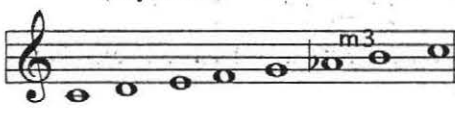
Spanish
(5th mode Harmonic Minor)



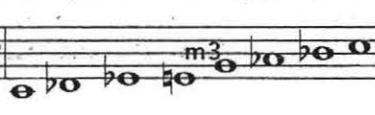
Ultra Locrian
(7th mode Harmonic Minor)



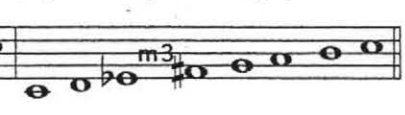
Harmonic Major
(Maj with b6)



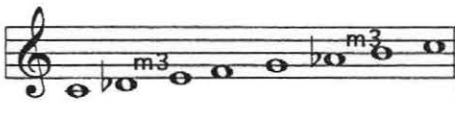
Flamenco
(3rd mode Harmonic Major)



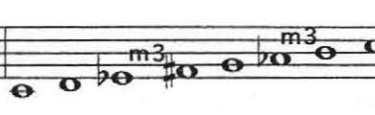
Lydian Diminished
(4th mode Harmonic Major)



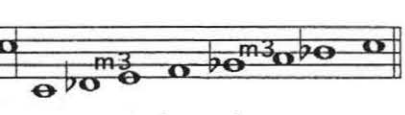
Double Harmonic
(Harmonic maj b2, Gypsy, Byzantine)



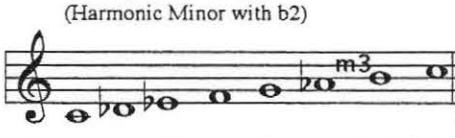
Hungarian Minor
(4th mode Double Harmonic)



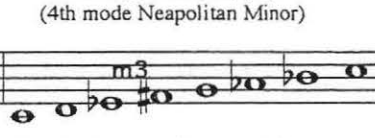
Oriental (A)
(5th mode Double Harmonic)



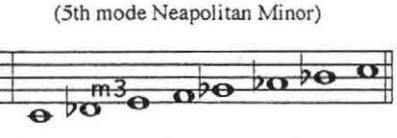
Neapolitan Minor
(Harmonic Minor with b2)



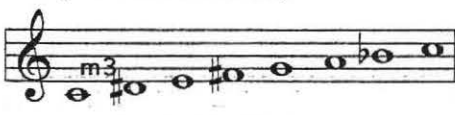
Hungarian Gypsy
(4th mode Neapolitan Minor)



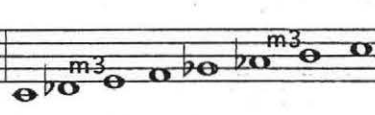
Oriental (B)
(5th mode Neapolitan Minor)



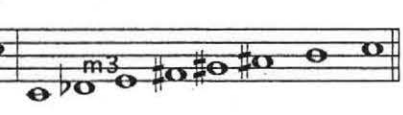
Hungarian Major
(Dom Diminished no 2nd)



Persian



Enigmatic

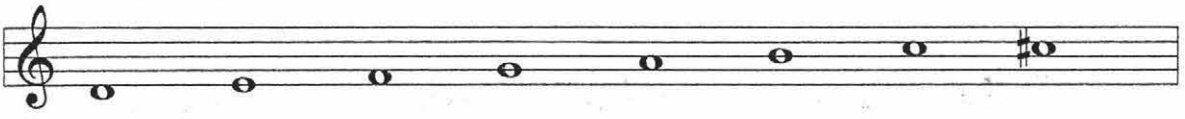


(f) Bebop Scales

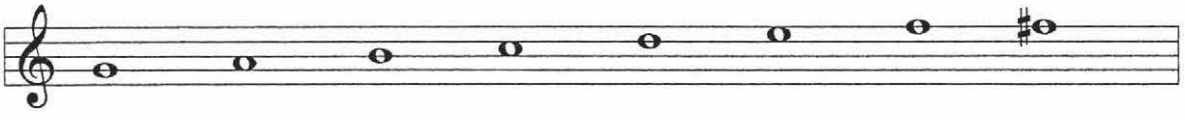
In the section on writing lines and melodies over chord progressions, the harmonic strength of the line is determined by where the chord tones fall in the bar. Most scale structures have an uneven number of notes, putting chord tones in a different metrical place in an even time signature. In scale practice this is resolved by either going up to the 9th or repeating the top note to make sure the scale starts on the first beat of each bar in common time. Eight-note scales work well in common time as the chord tones fall in the same metric place each time. The idea of putting a passing note in a seven-note scale became popular in the bebop jazz of the 1940s. Even though bebop scales appeared frequently in solos, the technique of using passing tones to keep the chord tones on strong beats became much more important than running scales. The study of bebop scales is very important in learning how to manage passing tones as it leads to a stronger sense of harmonic movement in lines.

It is possible that any seven-note scale can have a passing note where a wholetone occurs between scale notes, but in practice a set of rules[6] is usually applied.
-On all major and major 6th type scales the passing tone should occur between the 5th and 6th
-On all scales with a flat 7th the passing tone occurs between the lowered 7th and the root.
The Dorian scale is often used with a passing tone added between the flat 3rd and 4th as an alternative.

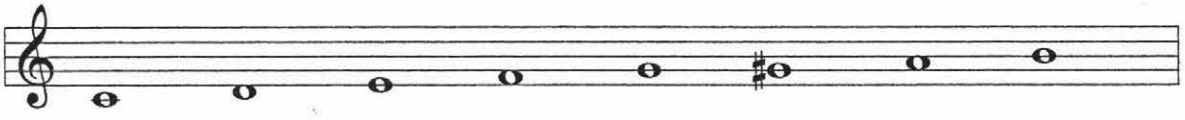
D Dorian (passing tone before 7th)



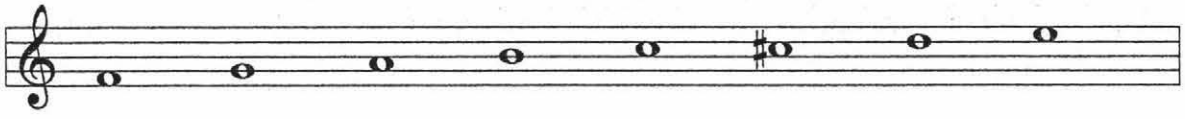
G Mixolydian (passing tone between 7th and root)



C major (passing tone between 5th and 6th)



F Lydian (passing note between the 5th and 6th)



[6] Although formulated in the early 1940s, Hal Galper has these set of rules on his website at http://www.upbeat.com/galper/13_arti/melembelshexcersises.htm

(g) Scale Opposites

One particular feature of jazz is the way in which improvisers experiment with playing scales 'inside' and 'outside' of the key to create extra tension in their solos. The most common way to do this is called side-slipping where a scale a semitone above or below the original is used to create the dissonance. Rather than using these 'outside' notes in passing, whole passages are played in this alternative tonality. The most effective way of using this idea is to choose a tonality that is as remote as possible from the main tonality. If the outside key that is used is not remote enough, it can give the impression of just sounding wrong rather than creating the desired dissonance.

If the notes of a C major scale are examined it becomes apparent that the notes needed to form a chromatic scale are Db, Eb, Gb, Ab and Bb. These notes form an Eb pentatonic minor or Gb major pentatonic constituting a scale opposite to C major. These outside notes, used over a C major chord, are quite dissonant and are used primarily to create tension. Most people regard them as 'out' or notes that their ears would only accept in passing. In modern jazz the amount of dissonance used is an essential feature when relating to chord progressions. Many modern improvisers use what is termed non-tonal chromaticism in their lines, the success of this technique relies on being able to stay away from the key centre. The procedure of finding these scale opposites is not as extensive a task as it might seem.

Summary of scale opposites.

- The opposite of a major scale is a major pentatonic built on the flat 5th
- The opposite of a jazz minor (ascending melodic minor) is the minor 6th pentatonic built from the flattened 2nd
- The opposite of a wholetone scale is the other wholetone.
- The opposite of a diminished scale is a 4-note diminished chord.
- The opposite of C harmonic minor is C#, E, F#, A, and Bb and is essentially a major b2 pentatonic from the A, commonly known as the Scriabin scale.

A C scale has its opposite as Gb major pentatonic, this means that the other modes, namely D Dorian, E Phrygian, F Lydian, G Mixolydian, A Aeolian and B Locrian also have the same scale as their opposite. The application of this concept is discussed further in Chapter 2.

(h) Scale Overview

This page shows how the scales mentioned in this chapter can be sorted into their corresponding chord types. The process of relating scales to chords is essential for an improviser in a jazz context, although it is unlikely that any musician utilises all of these scales.

Major 7th

Ionian, Lydian (4th mode Ionian), Lydian #5#9 (6th mode harmonic major), Lydian augmented (3rd mode melodic minor), Ionian augmented (3rd mode harmonic minor), harmonic major, double harmonic, Lydian #9#13 (2nd mode of double harmonic), Lydian#13 (2nd mode Neapolitan minor), Lydian #9 (6th mode harmonic minor), Ionian #9 (6th mode Neapolitan minor), augmented, major pentatonic, Chinese (2) pentatonic, Scriabin pentatonic, major b6 pentatonic.

Minor 7th

Dorian (2nd mode Ionian), Phrygian (Dorian b9,b13), Aeolian (6th mode Ionian), Dorian b9 (2nd degree melodic minor), flamenco (3rd mode harmonic major), Hungarian gypsy (4th mode Neapolitan minor), Romanian (4th mode harmonic major), minor pentatonic, suspended pentatonic, Dorian pentatonic, minor 6th pentatonic, blues.

Dominant 7th

Mixolydian (5th mode Ionian), Lydian dominant (4th mode melodic minor), Mixolydian b9 (5th mode harmonic major), 8-note diminished dominant (half-step, whole-step), Oriental A (5th mode double harmonic), altered (7th mode melodic minor), Spanish/Jewish (5th mode harmonic minor), Oriental B (5th mode Neapolitan minor), blues, wholetone, suspended pentatonic, dominant pentatonic, altered pentatonic, Mixolydian pentatonic, wholetone pentatonic, Prometheus mode.

Minor-Major 7th

Melodic minor, harmonic minor, Lydian diminished (4th mode harmonic major), Neapolitan minor, Hungarian minor (4th mode double harmonic), Dorian pentatonic, minor 6th pentatonic.

Half Diminished

Locrian (7th mode Ionian), Locrian #2 (6th mode melodic minor), Locrian bb7 (7th mode harmonic major), ultra Locrian (7th mode harmonic minor), Locrian 13 (2nd mode harmonic minor), minor 7th b5 pentatonic.

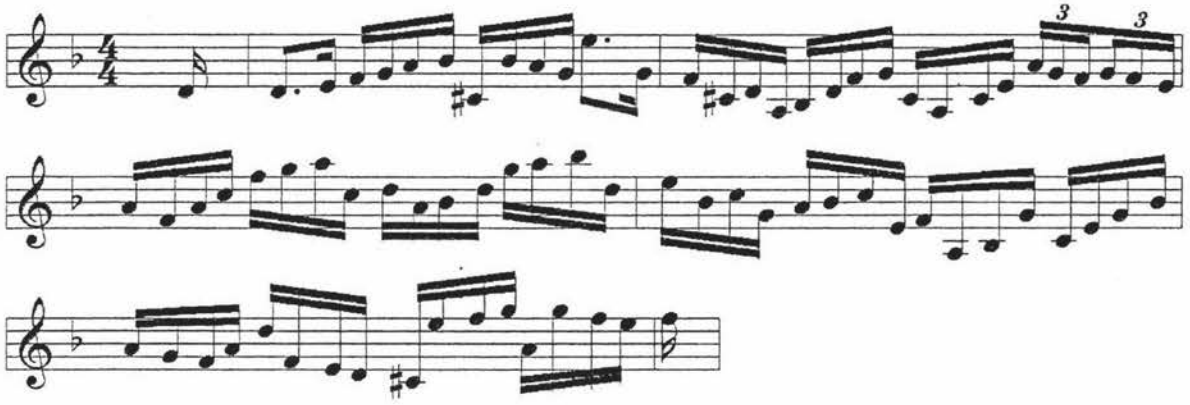
Diminished

8-note diminished (whole-step, half-step), ultra Locrian (7th harmonic minor), Locrian bb7 (7th mode harmonic major), Locrian ♮13, Romanian (4th mode harmonic minor), Lydian #9 (6th mode harmonic minor), Locrian #9#13 (2nd mode harmonic major), Lydian diminished (4th mode harmonic major), Lydian #5#9 (6th mode harmonic major).

2. Exploring Melody

Melody is an essential component in our appreciation of music, it is often the thing that stands out in the listener's memory of a piece of music. We rarely remember a piece for its chords or rhythm. A strong melody contains harmonic and rhythmic implications. Historically, melody has formed the basis of western music, with single melodic strands evolving into many strands giving way to modern counterpoint and harmony.

Ex 1



Example 1 is an excerpt of the first few bars of the Allemande from the Partita no 2 by for solo violin by Bach[1]. When played it gives the listener a strong impression of harmonic and rhythmic movement, even though the line is monophonic. The unaccompanied Partitas Sonatas and Suites for violin and cello are a profound example of music that creates its own harmonic background through the way the melodic lines are constructed. One interesting feature of Bach's melody writing is the way that almost every line could stand on its own, with the harmony being implied by the clarity of the lines. Taking into account Bach's phenomenal ability to make music of the moment, many of his pieces probably started life as improvisations based on preconceived chord progressions, or as harmonisations of existing melodies. At a time when only manuscript paper could be used to record music, there were many more pieces being played than were ever written down. Many of Bach's spontaneous improvisations were notated, and no doubt edited, enabling even an average musician to approximate his skill. The harmonic basis of many of Bach's compositions is strikingly similar, leading one to believe that the harmonic background was almost certainly conceived prior to an improvisation. This gave his melodies a strong harmonic foundation and consistency, making them stand out from those of his contemporaries. It is important to note that most music at this time was polyphonic, and harmonic relationships were based on the inter-relationship of separate strands and not on homophonic movement. Although each of these strands took a separate direction, each line was strongly based on the implied harmony and followed strict rules of counterpoint.

In Bach's harmonisation of chorales for organ the background harmony would contain a level of complexity not implied by the original melody. In the hands of an average organist the chorale could be supported by a minimum of homophonic chords, but Bach expanded these backgrounds into complex structures containing many temporary modulations and harmonic innovations.

[1] From a facsimile of the autograph manuscript by J.S.Bach published by International Edition

The simpler a melody is, the more possible harmonies can be used to accompany it[2]. As a melody increases in complexity the tonality and harmonic direction are contained more within the notes, restricting the possible choices in the harmonic accompaniment. The simplicity of melodies in church hymns presented Bach with the flexibility of being able to use complex chromatic harmony to enhance traditional repertoire.

In a similar way to Bach's treatment of chorales, Bill Evans would take a lead sheet of a popular melody and reharmonise it by using substitute chords, giving the melody a depth that hadn't been heard before. Although the original melodies of most of these popular songs were very simple, they were still strong enough to imply a harmonic foundation. The simplicity of these melodies meant that many harmonisations were possible, each presenting a different mood. The element of reharmonisation became an essential tool for jazz composers and improvisers to create their own unique versions. Many melodies were not considered jazz standards before Miles Davis and Bill Evans had tapped their harmonic potential and recorded their own versions. This is true of countless others who realised the potential of a simple show tune, or pop melody, and turned it into a jazz standard.

Charlie Parker was one of the first to tap the potential of harmonic melody in jazz. Although many before him composed and improvised very strong melodies, the harmonic content was much less. Parker composed and improvised melodies so strong in harmonic content, that they changed the way chord sequences were conceived. As jazz was moving out of the swing era and into bebop, the whole harmonic and melodic language was changing. It became apparent that Parker's lines were outlining a more complex harmonic sequence than was being used in the accompaniment. In the early recordings Parker's rhythm section was working from fairly fundamental chord structures, so the altered notes he was using in his melodies and solos were in effect superimpositions or harmonic clashes.

As the rhythm sections evolved, the backings became more harmonically interesting with the introduction of substitution and altered or extended chords. Until this time the main superimpositions came from the blues scale in the form of the flattened 5th and flattened 3rd. These were not used as extensions to chords but were more like harmonic clashes which were used quite blatantly in the swing era both by soloists and arrangers. The flattened 3rd became the raised 9th and the raised 5th became the sharp 11th, extensions became commonplace in the melodies and chord voicings of the bebop era. The conclusion chapter of this thesis contains an essay on the evolution of chromaticism in jazz and its main innovators. Almost all the significant harmonic changes were brought about by musicians who were primarily melody players.

For a jazz musician the process leading to the creation of strong melodies is an essential area of study. After initial explorations of the blues scale most beginning jazz improvisers go on to learn that a major scale is common to a II-V-I chord progression in a particular key, and can be used to improvise melodies. The early stages of the learning process involve the improvisation of melodies against a backing track, or piano chords. Most improvisers are able to achieve a satisfactory result, as all the chords are diatonic to the scale key and can be negotiated with a single scale. Even after a period of experimentation, this approach can be quite unsatisfactory, as the melodies seem to be isolated from the background chords. If the accompanying chords are removed, the improvised melody gives little or no indication what the background chords might be. Without this fundamental harmonic component the melodies are perceived as being weak and direction less. One of the challenges for the jazz improviser is to convey these background chords to the listener through the melodic note choices. This is known in the field as 'chord spelling' or 'change running', and is an essential step for anyone wanting to improvise in any bebop or post-bop style. Once the basics of this skill have been learned, a myriad of techniques can be used to enhance the interest of a melodic line. Passing-tone chromaticism, upper structures, superimposition, alteration, substitution, cell development and non-diatonic chromaticism are devices that will be examined in this chapter. These principles are by no means limited to jazz but are unique in the sense they are used in an improvised context.

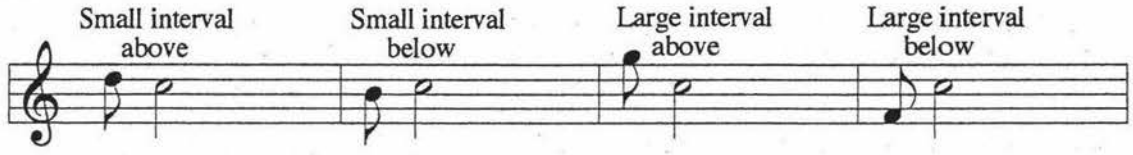
The next part of this chapter covers some of the elements that the author has deduced as being fundamental to constructing harmonic melody and how these elements are used to either deny or affirm the harmonic surroundings, and how the principles of tension and release can be applied.

[2] This principle of reharmonisation is covered in detail on page on 102.

(a) Basic Principles of Harmonic Melody

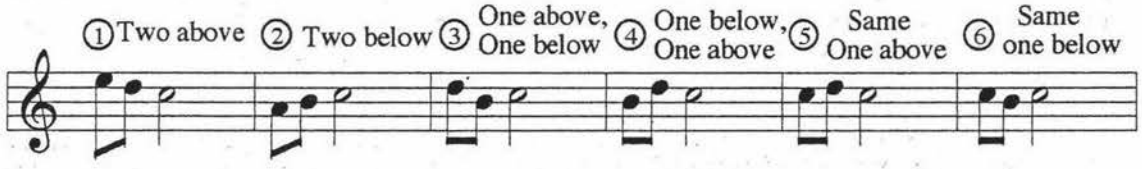
Example 1 shows the four ways that a single note can be used to precede a melody or target note.

Ex 1



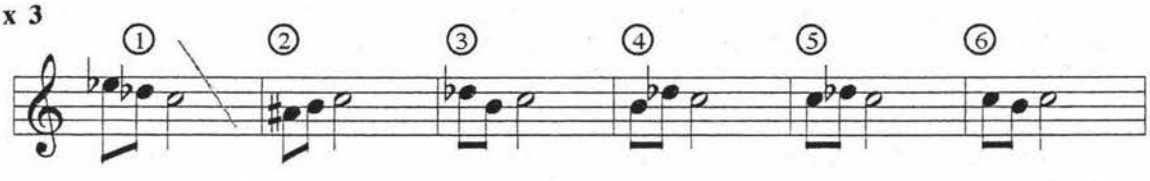
If the approach to a target note is limited to two notes, there are many ways this note can be led into. Example 2 shows six basic types of approach to a target note.

Ex 2



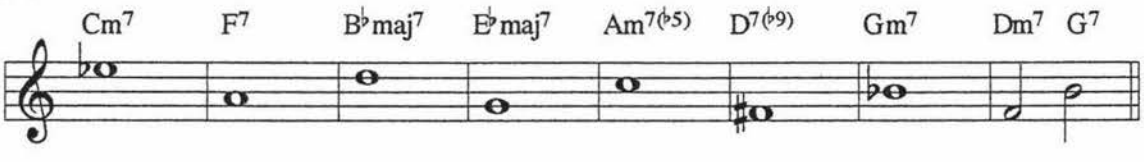
In example 3 chromatic alteration has occurred, with the two leading notes altered in the direction of the resolution. If the notes are below the melody note they are sharpened, if they are above they are flattened. In the case of number three and four in this example, enclosure is being used, where the melody note is sandwiched between the two notes a semitone either side. This use of chromatic alteration is very important in the way lines are constructed and is a feature of jazz writing in the 1940s.

Ex 3



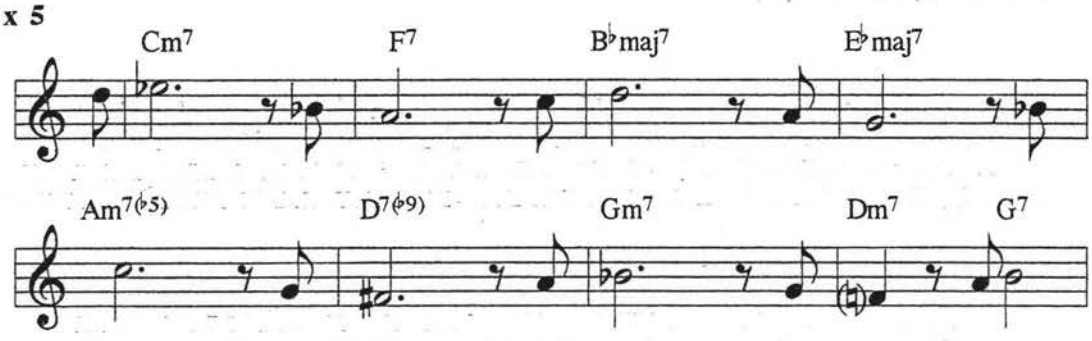
Example 4 shows a melody made up of 3rds of the chord. This is the first 8 bars of the chord progression of the jazz standard "Autumn Leaves". This chord sequence is logical to the ear making the principles easier to demonstrate.

Ex 4



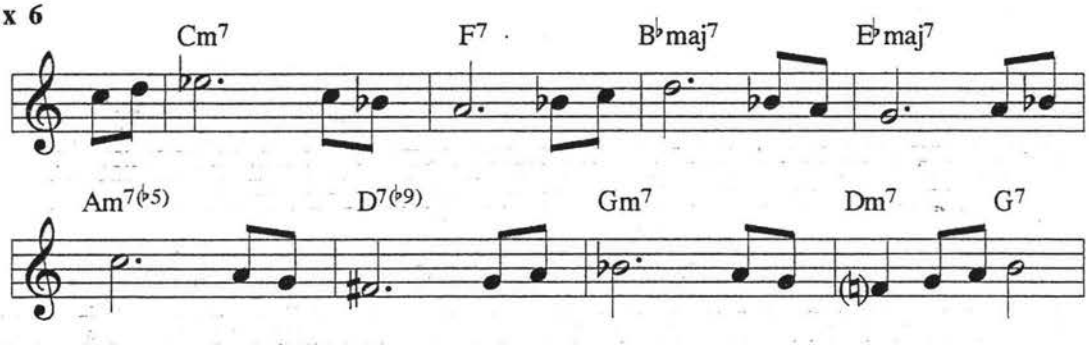
In example 5[3] the 3rds of the chords are approached by a single diatonic note alternating between above and below. Even with a small amount of melody the key and basic harmonic movement become apparent.

Ex 5



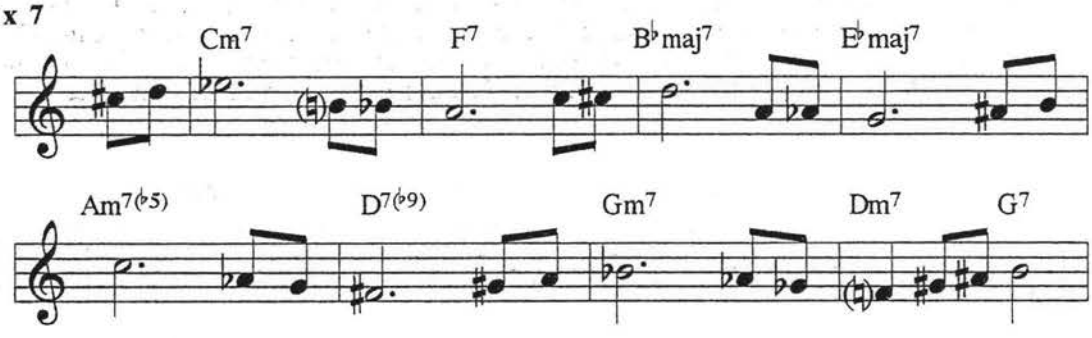
Example 6 has the same melody notes being approached from above or below by two preceding notes, giving an even stronger feeling of harmony.

Ex 6



In example 7 chromatic alteration of the passing notes toward the target notes is being used. Even though a large degree of out of key notes are present, the harmony is still clear.

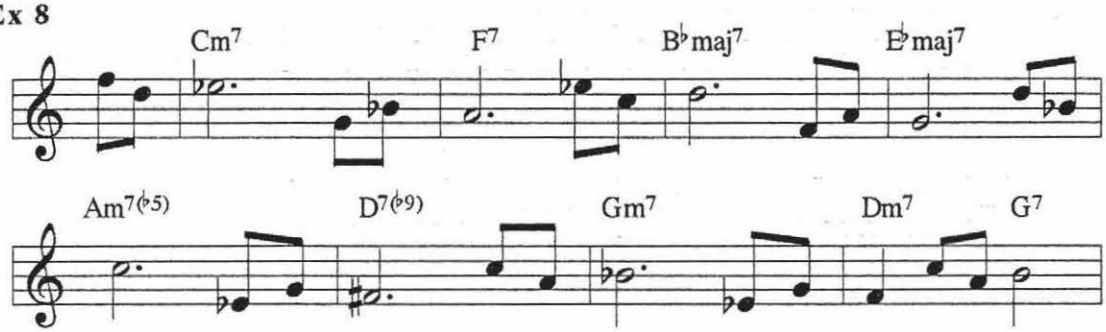
Ex 7



[3] Examples 5-11 are based on lecture notes from a Hal Galper class in 1982 and web site material at www.upbeat.com/ Galper.

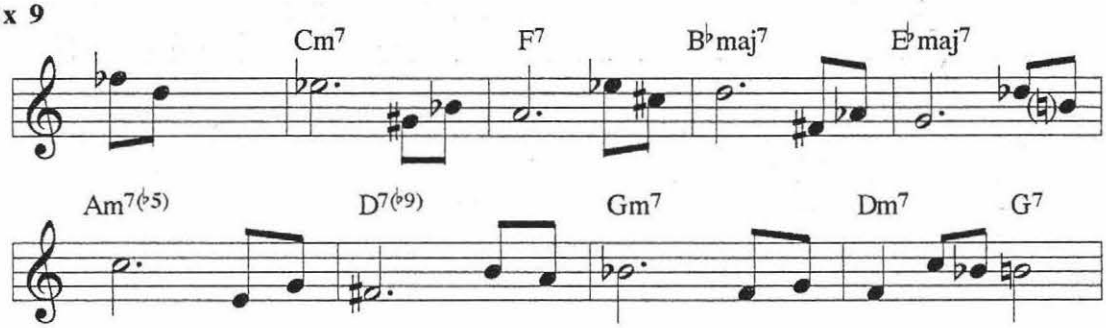
Diatonic enclosure is a feature of example 8, as each melody note is approached from above and below then vice-versa.

Ex 8



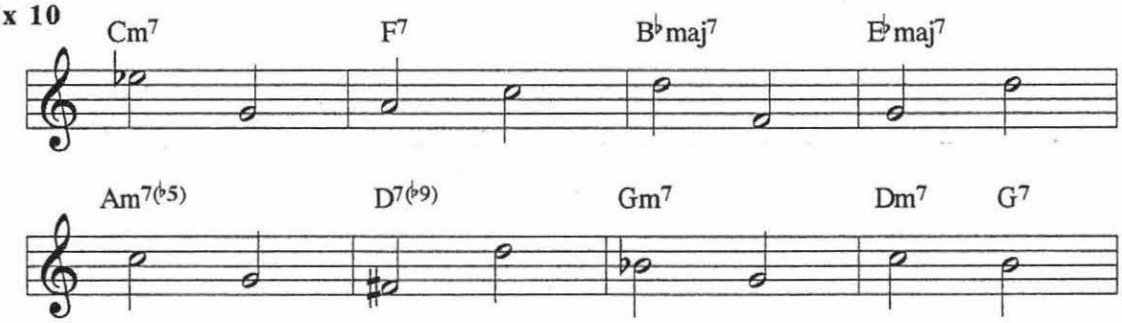
Example 9 shows how chromatic enclosure can be used. At this point it is clear that almost any notes can occur between the 3rds of the chords and the harmonic background would still be perceptible.

Ex 9



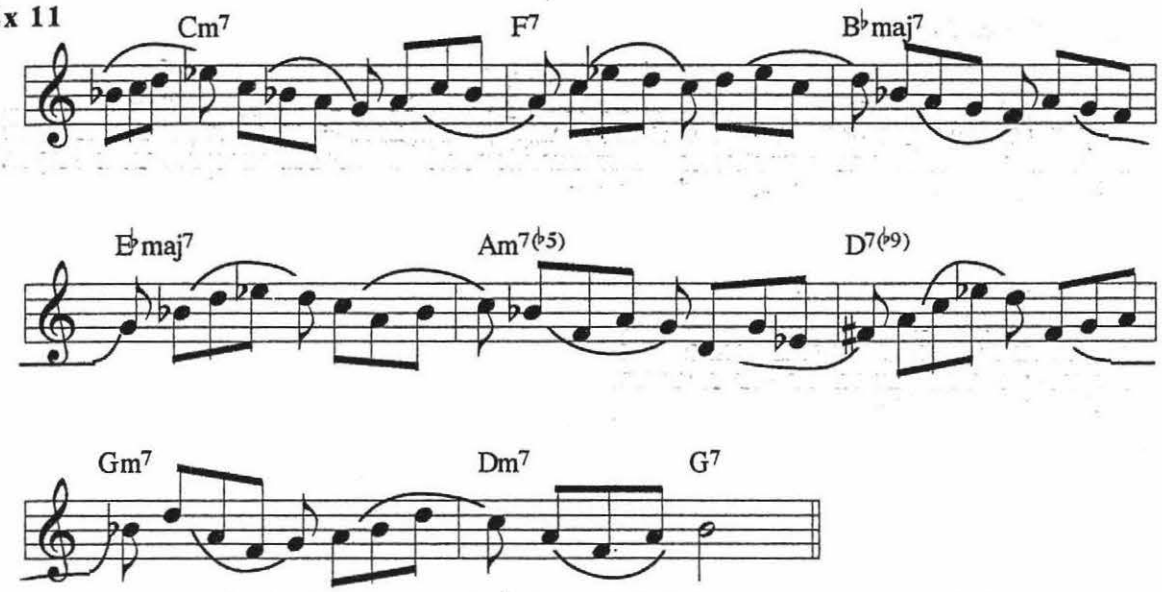
Previously the target-tones have been limited to the 3rds of the chords, if this principle is stretched to include other chord tones, namely roots, 5ths and 7ths, then the possibilities open up. Example 10 shows the use of these chord tones to provide the framework. The use of chromatic tones leading to the target-tone, changes the momentum of the line as the need for resolution is temporarily increased. If these target-tones are used on the first beat of each bar, it is possible to outline the chord progression clearly, even if more remote choices are used in between. So far there have been two approach notes before the target-note. This principle can be extended to use as many as seven notes to precede a target note in this time signature.

Ex 10



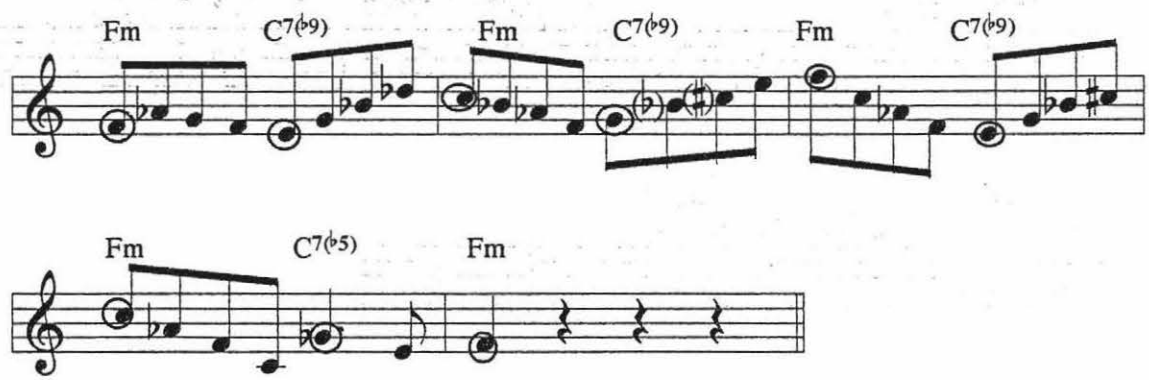
Example 11 is a line construction with chord tones that fall on beat 1 and 3, with three notes before each. The ties indicate the importance of the target-tone and the fact that the three notes are structurally connected to the target tones.

Ex 11



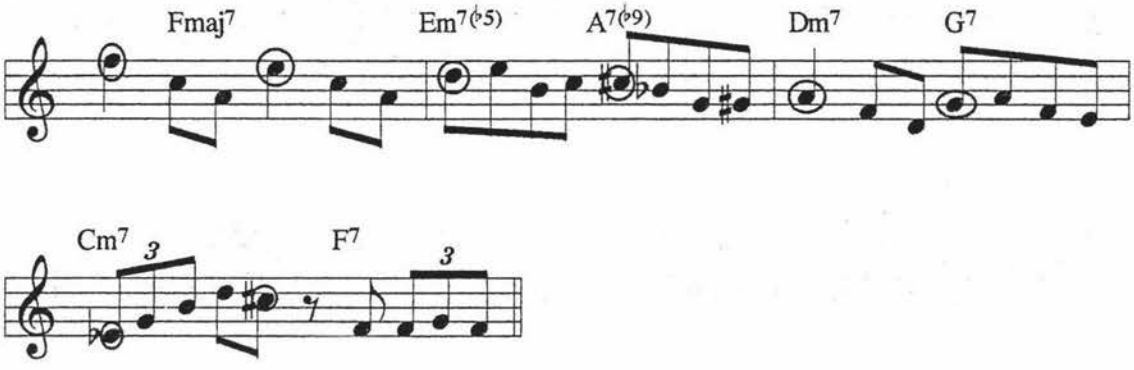
Example 12 comes from the introduction to 'Bebop' written by Dizzy Gillespie in the 1940s. It is very reminiscent of J.S. Bach, although the simple harmonic movement of I to V would probably have had a more sophisticated treatment in his hands. This line fits the pattern of having the chord tones fall on beats 1 and 3 with connecting material between. The harmonic movement of V-I in the minor key is perfectly spelled out by the line.

Ex 12 Bebop



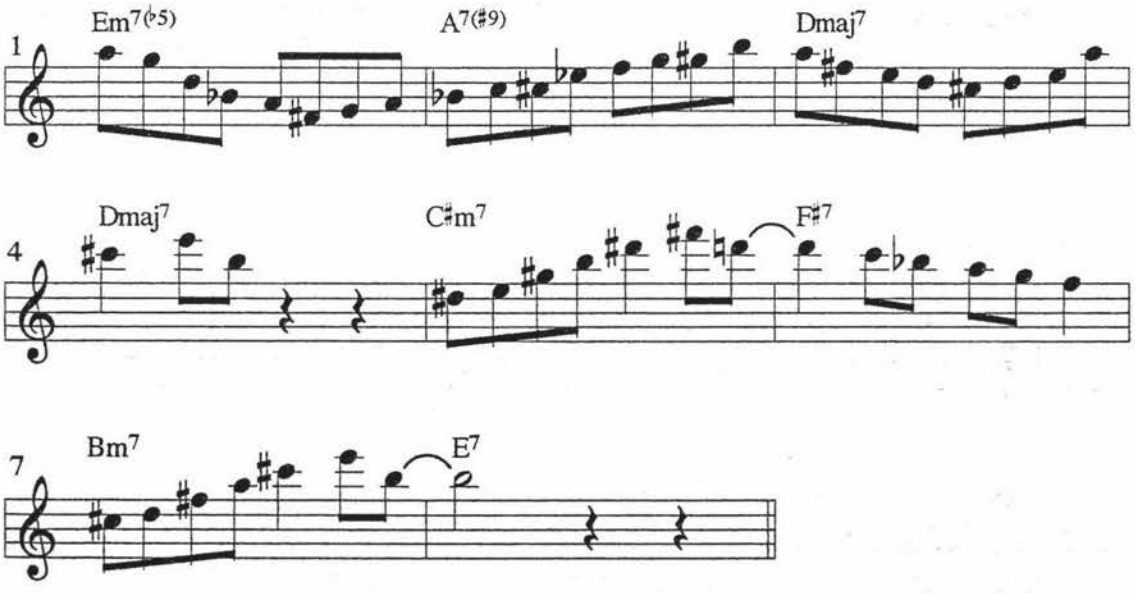
Example 13 shows an excerpt from 'Blues for Alice' by Charlie Parker, this melody adheres to the principle of having chord tones on the first and third beats of the bar. A notable exception occurs in the 4th bar in which the raised 5th of the F7 chord arrives an eighth note earlier. The raised 5th introduces another common feature of bebop melodies in which an extension occurs in a prominent place in the bar. This note falls on an anticipation of beat 3 giving the line more impetus. The use of this note is an example of an extension occuring as a target tone, producing melodies with a higher degree of tension.

Ex 13 Blues for Alice



Example 14 is from a composition called "Bottleneck"[4] originally recorded by the authors group in 1988. It features a bridge section with a smooth flowing line, designed to be played at high speed. The line starts with a common cliche in jazz known as the 'CMAR' lick from the standard 'Cry Me a River'. This line uses extensions on the first and third beats, creating a higher level of tension against the background chords. An interesting feature appears in the F#7 bar in which notes in the melody are derived from C minor, introducing a further element known as superimposition.

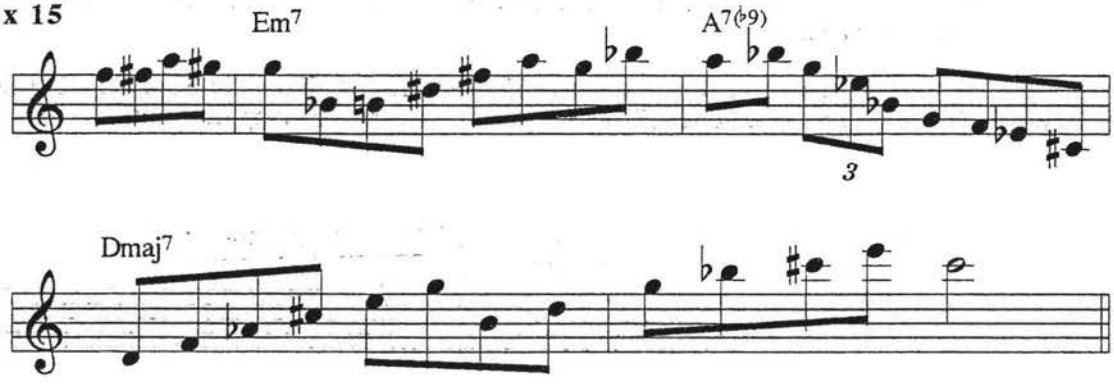
Ex 14 Bottleneck



[4] From the Kiwi Realbook volume 2

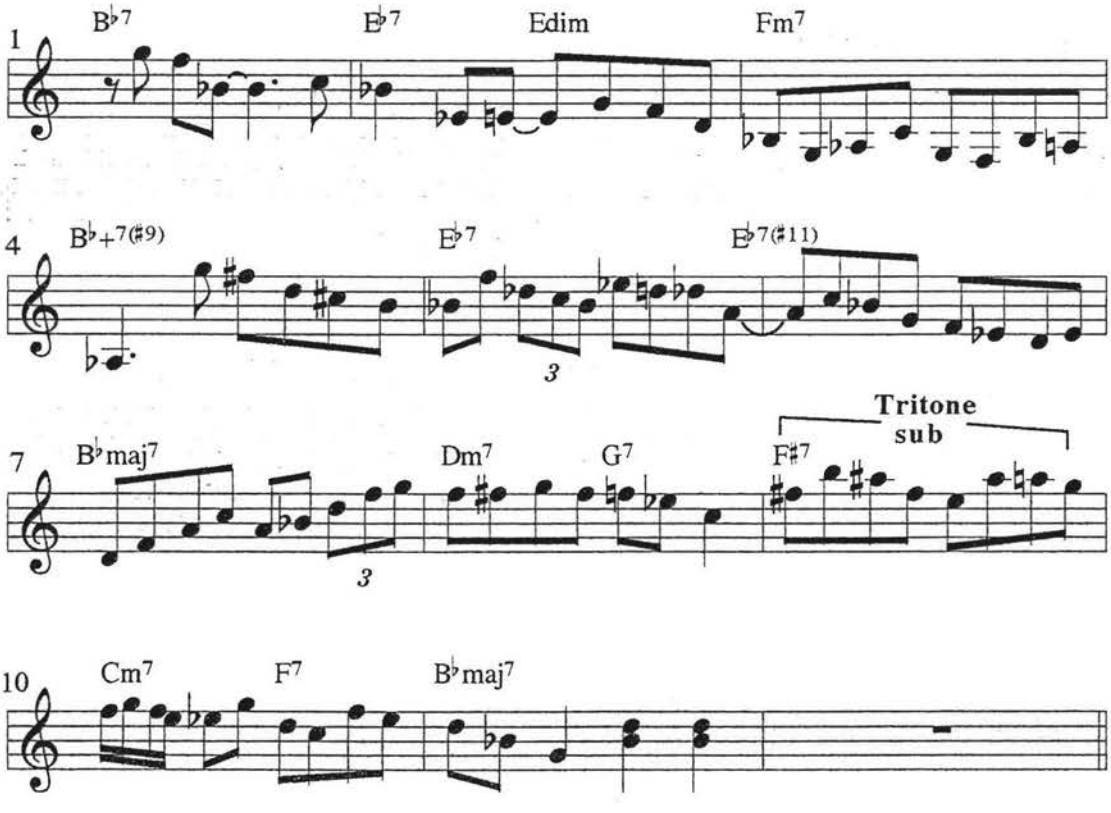
This original line, in example 15, demonstrates the use of superimposition, enclosure and delayed resolution. The line opens with a 4-note enclosure, landing on the 3rd of an Em7 chord, the line then goes through the dominant of Em with a B7 chord. In the A7b9 bar an Eb major triad is superimposed, giving the dominant chord a large degree of tension. In the D major bar, notes from a D diminshed scale are present giving no feeling of resolution until the last few notes. The technique of superimposition appears here in the form of delayed resolution.

Ex 15



The following line over a standard Bb blues was improvised by McCoy Tyner on the track "Blues for Gwen" from the album *Inception* . The line has a number of interesting features. In bar 2 the E natural indicates the use of a diminished chord. In bar 4 the line takes a turn into the Bb7 altered sound, or it could also be a tritone substitute of E7. The most interesting feature of the line occurs in bar 9 as the F#7 appears in place of what should be Cm or C7. This tritone substitute[5] stands out as an excellent example of superimposition.

Ex 16 **Blues for Gwen**



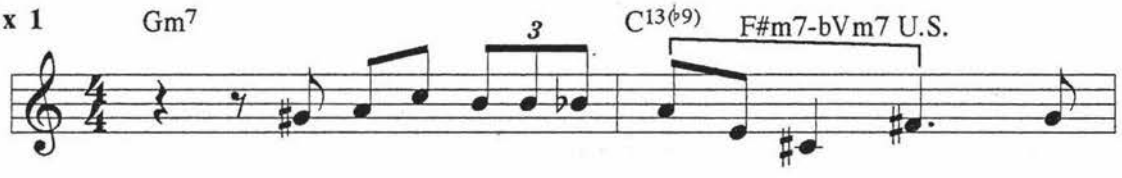
[5] The technique of tritone substitution is explained on page 76

(b) Upper Structure in Melody

An upper structure can be loosely defined as a chord comprised of non-chord tones or extensions, quite often a major or minor structure, that has been superimposed melodically or harmonically over a basic chord. If a D major triad is placed above a C7 chord, the notes D, F# and A become the 9th, raised 11th and 13th. If a line is constructed which has these notes falling on the strong beats it results in a higher degree of tension. Here are some lines that use this concept. Use of the upper structures in harmony is dealt with in detail in the chapter 3, and a chart of upper structure arpeggios appears on the next page.

Example 1 shows an excerpt from the melody 'Bud Powell' by Chick Corea. In the 2nd bar the chord of F#m7 is superimposed over C7b9 giving a b5th minor seventh upper structure.

Ex 1



In example 2 the bridge section of 'Hot House', written by Charlie Parker, has several interesting features .

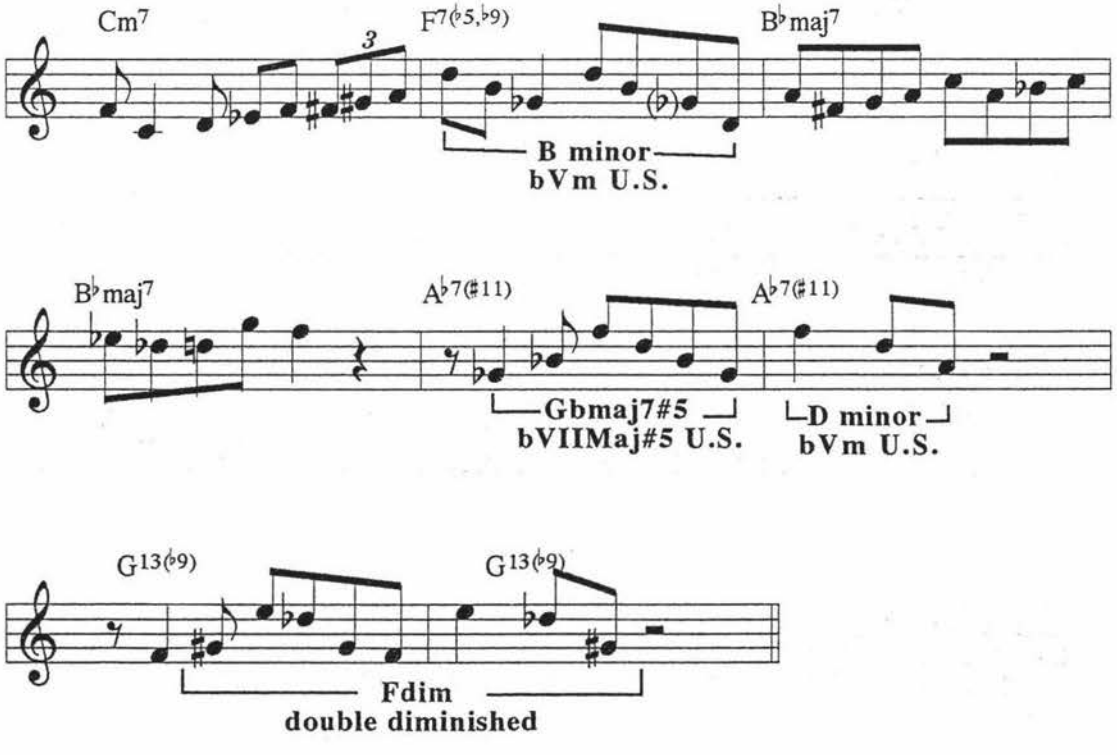
-In bar 2 a bV minor upper structure appears, which gives three tension tones, namely the 13th, #11 and b9. This superimposition relies on its juxtaposition against the original F7 chord. If a B minor chord was substituted in the accompaniment the effect of the tension would be lost.

-In the third and fourth bar, the 7th, 9th and 11th fall on strong beats, giving a feeling of release once the F note is reached. The enclosure that occurs in the fourth bar also helps the feeling of chromaticism.

-The upper structure in the fifth bar is just the extended arpeggio of Ab7#11, comprised of the 9th, #11 and 13th, which can be analysed as a bVII#5 major chord (Gbmaj7#5).

-In the last 2 bars of this example, a double diminished[6] arpeggio is used in the context of a dominant chord.

Ex 2 **Hot House**

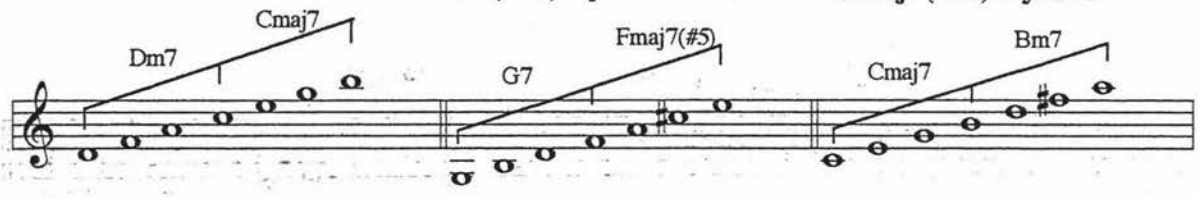


[6] Double diminished structures are explained on page 45.

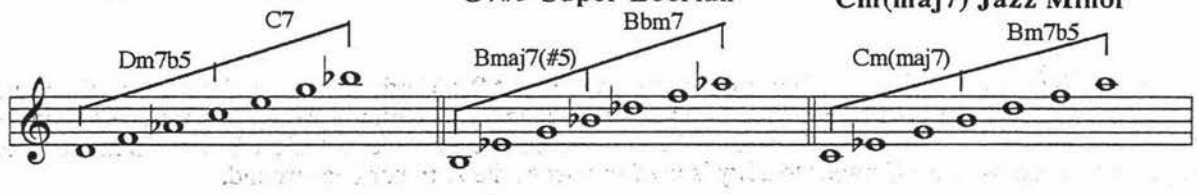
Chart of Upper Structure Extensions

This chart shows the upper structure extensions for most chord types. With the exception of the last two lines they are laid out to be applicable to a II-V-I in C major or minor. The principle of dividing arpeggios into lower structure and upper structure is demonstrated by the juxtaposition of two chords. The lower chord symbol represents the basic chord tones and the upper chord the extensions to the chord. The ability to be able to manage extensions in a harmonic environment is an essential skill for the jazz improviser.

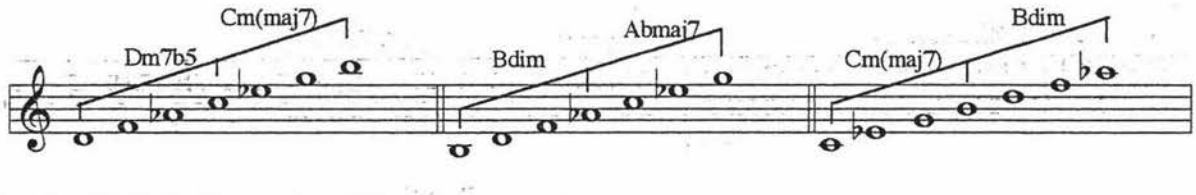
Dm7 Dorian **G7(#11) Lydian Dominant** **CMaj7(#11) Lydian**



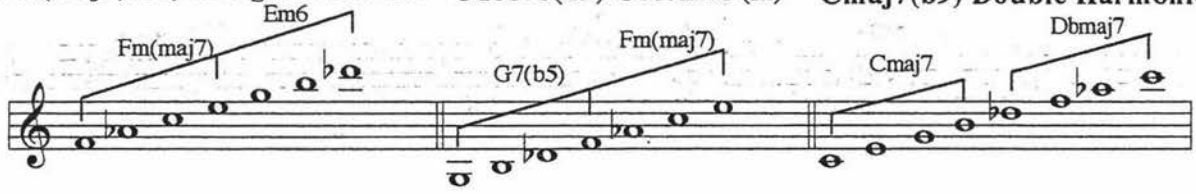
Dm9b5 Locrian #2 **G7#9 Super Locrian** **Cm(maj7) Jazz Minor**



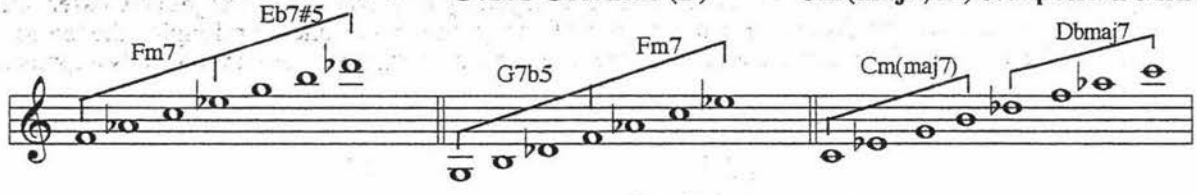
Dm7b5 2nd Mode Harmonic Minor **G7sus(b9) Spanish** **Cm(maj7) Harmonic Minor**



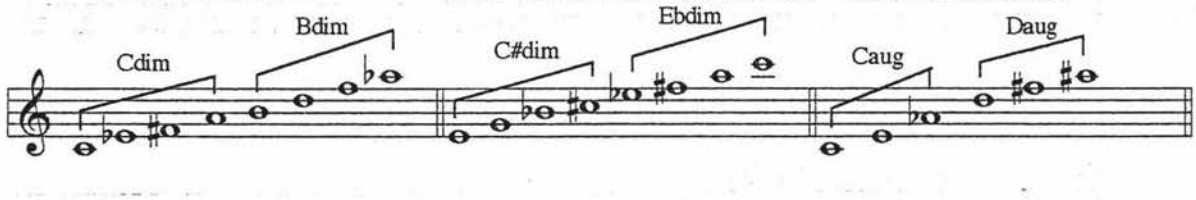
Fm(maj7,#11) Hungarian Minor **G13sus(b9) Oriental (A)** **Cmaj7(b9) Double Harmonic**



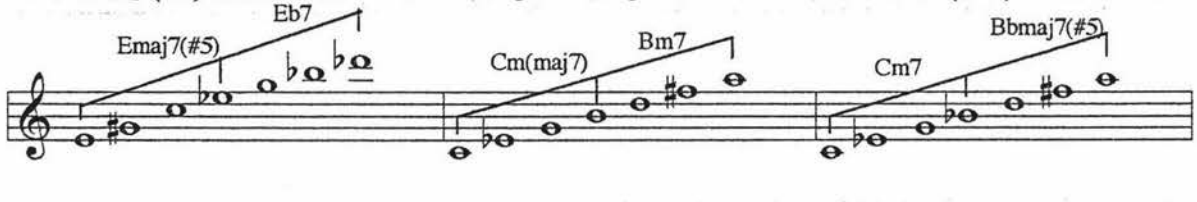
Fm7(#11) Hungarian Gypsy **G7sus Oriental (B)** **Cm(maj7,b9) Neapolitan Minor**



Cdim Diminished **C7b9 Diminished Dominant** **C7#5 Wholetone**



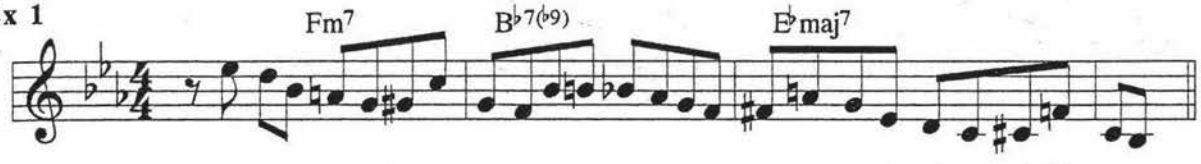
C7b9(#5) Flamenco **Cm(maj7#11) Lydian Diminished** **Cm7(#11) Romanian**



(c) Chromatic Lines

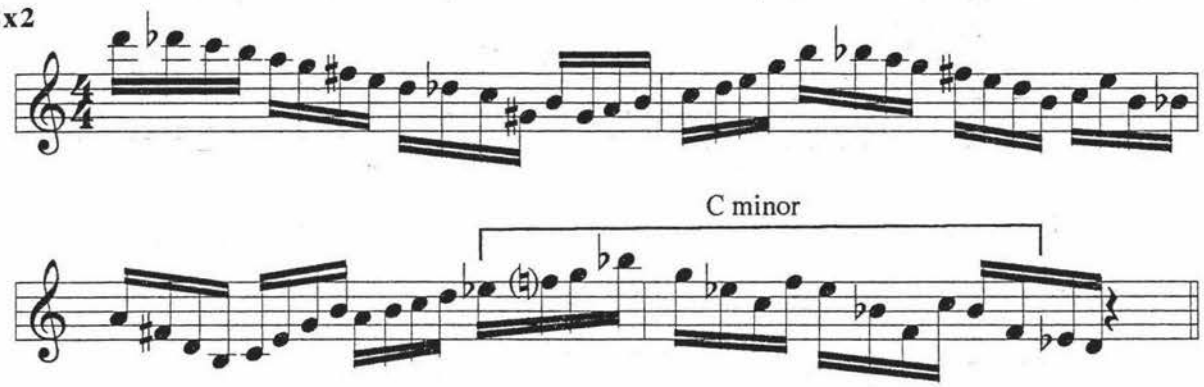
Example 1 shows a line improvised by McCoy Tyner on his composition " Blues for Gwen". It is over a standard II-V-I in Eb. Passing tones have been used on beat 1 and 3 along with chromaticism in the form of enclosure. The chromaticism here sounds fairly diatonic, as the tensions do not stay unresolved for long. This type of passing-tone chromaticism is common in the bebop era and is associated with the use of bebop scales.[7]

Ex 1



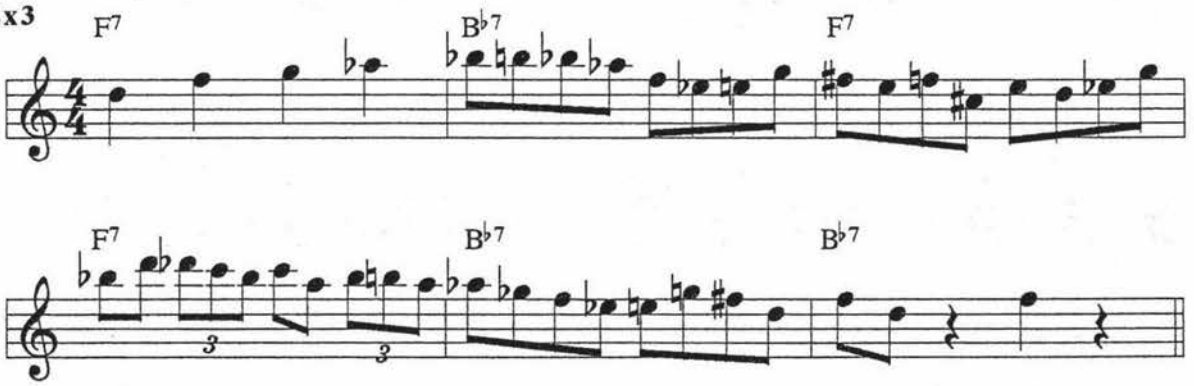
Example 2 is an excerpt from an improvised solo by guitarist Pat Martino from the album *Consciousness*. The harmony is A minor and the chromaticism appears in the form of passing notes that occur between the b3rd, 4th, 2nd and root note. Another form of chromaticism occurs at the end of the 3rd bar in the form of superimposition, where a C minor tonality is used to oppose the A minor background.

Ex2



Example 3 shows an excerpt from the 4th chorus of solo played by Bill Evans on "Straight no Chaser" on Jeremy Steig's album *What's New*. He makes use of many chromatic tones, prolonging the tension with extended enclosure. Extended enclosure is where several converging notes chromatically approach a target note.

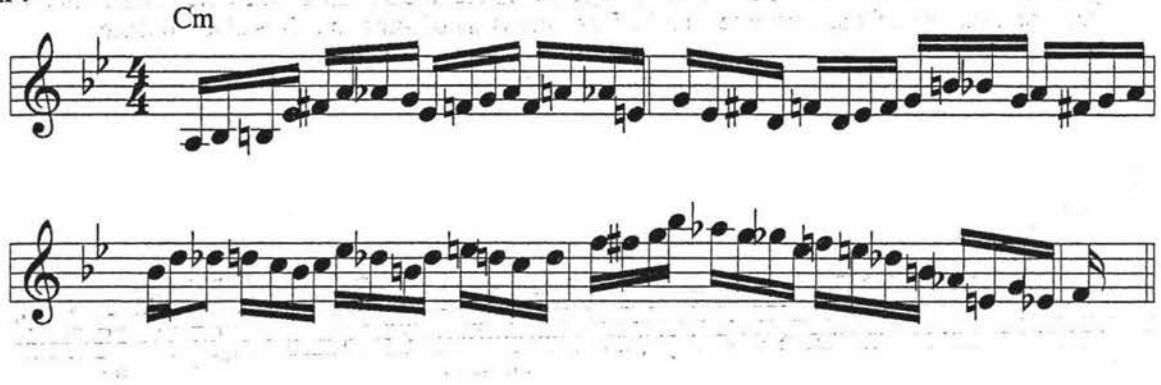
Ex3



[7] The construction and theory of bebop scales is outlined on page 15

Example 4 contains a line improvised by guitarist Pat Metheny on the track " Third Wind" from the album *First Circle.* The line was conceived over a C minor tonality although there are many out of key notes.

Ex4

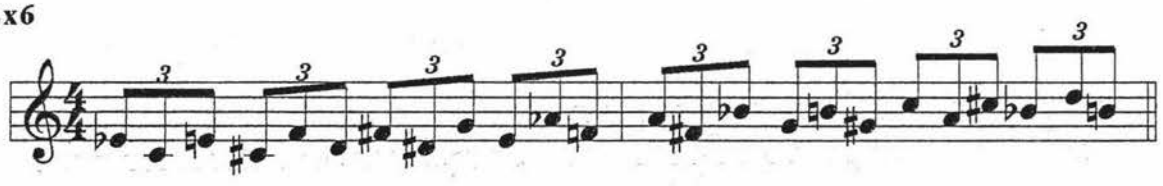


Example 5 contains a pattern that appears frequently in the solos of Bill Evans.[8] This pattern is based on an intervallic pattern that moves down a minor 3rd, down a semitone, up a minor 3rd and down a semitone. This pattern is an example of atonal chromaticism.

Ex5

Example 6 shows a line commonly used by jazz pianist Herbie Hancock in his solos. The construction is based on descending minor 3rd root movement that ascends by semitone. This line is also free of a tonal centre and works well because of its harmonic transparency.

Ex6



[8] An excellent example of this line appears in his solo on "The Peacocks" from the album *You Must Believe In Spring*

(d) Intervallic Lines

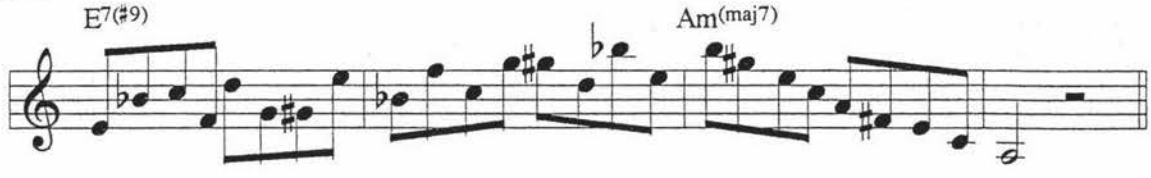
Tonal Intervallics

Example 1 shows a line improvised by guitarist Mike Stern, from the Miles Davis album *We Want Miles*. The line is completely modal within D Dorian. The movement is dominated by diatonic 5ths that go from low to high reversing at various points giving the line a semi-predictable shape. This is an excellent example of diatonic intervals in 5ths. Intervals of 4ths and 6ths also produce interesting possibilities.

Ex 1

Example 2 shows a similar line used in a V-I context in a minor key.[9] The note choices are from an E altered scale and move in 5ths, eventually resolving to A minor.

Ex 2



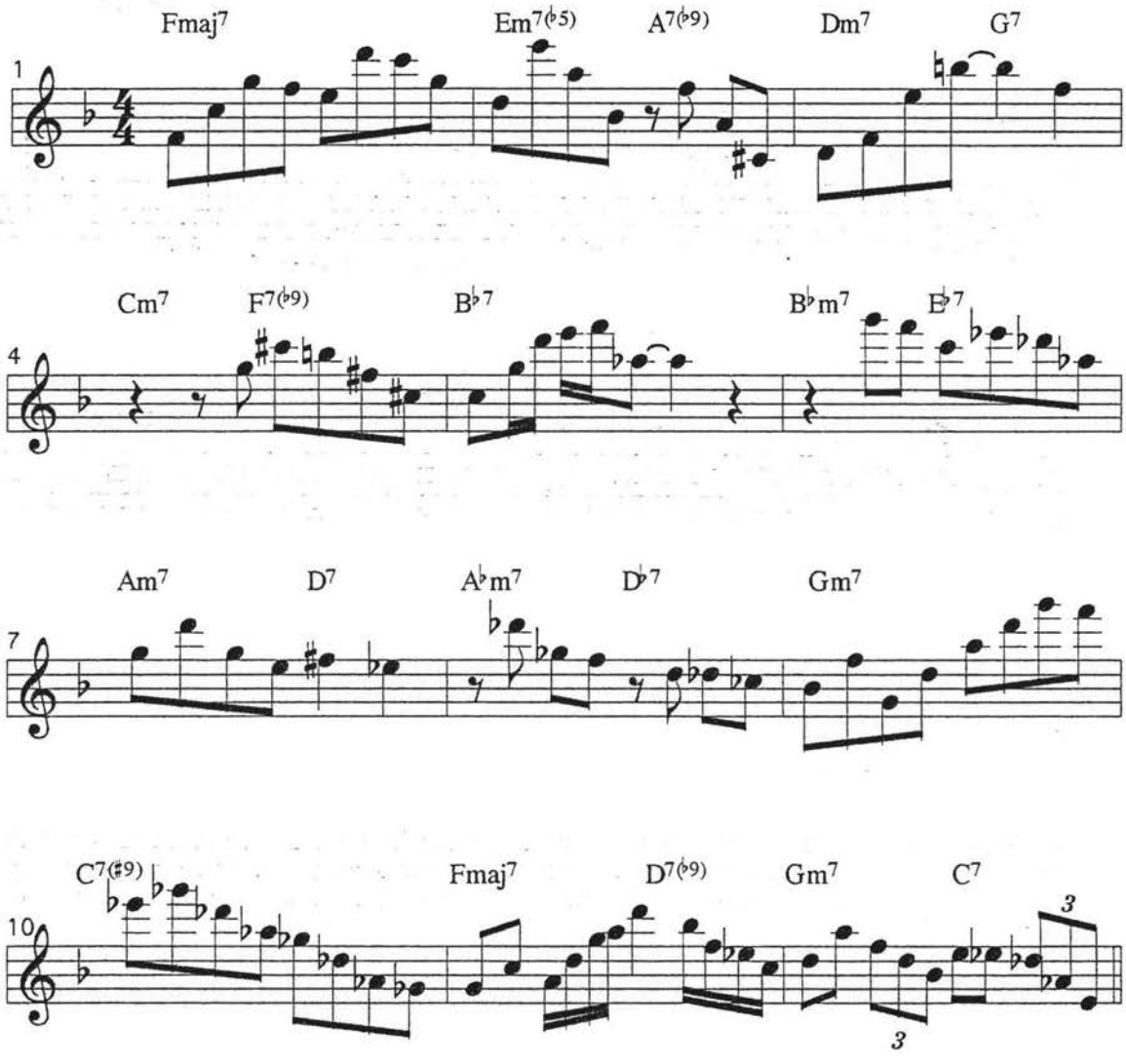
Example 3 shows a complementary line[9] to example 2, as it uses a similar technique, but moves in the opposite direction.

Ex 3

[9] Composed by the author.

Example 4 shows a tonal intervallic line conceived by jazz guitarist Dave Creamer,[10] over the chord changes of " Blues for Alice ". Dave Creamer has specialised in the use of intervallic lines and this example contains many interesting features. The line has an unpredictable contour, in that it rises and falls, peaking higher each time. The line is fairly diatonic except where the altered chords occur, in which case upper structure extension tones have been used. In bar 10 the C7#9 line has all the possible alterations appearing in an interesting descending structure predominantly in 4ths. The overall effect of this line gives a fragmented feeling, creating tension against its backing chords.

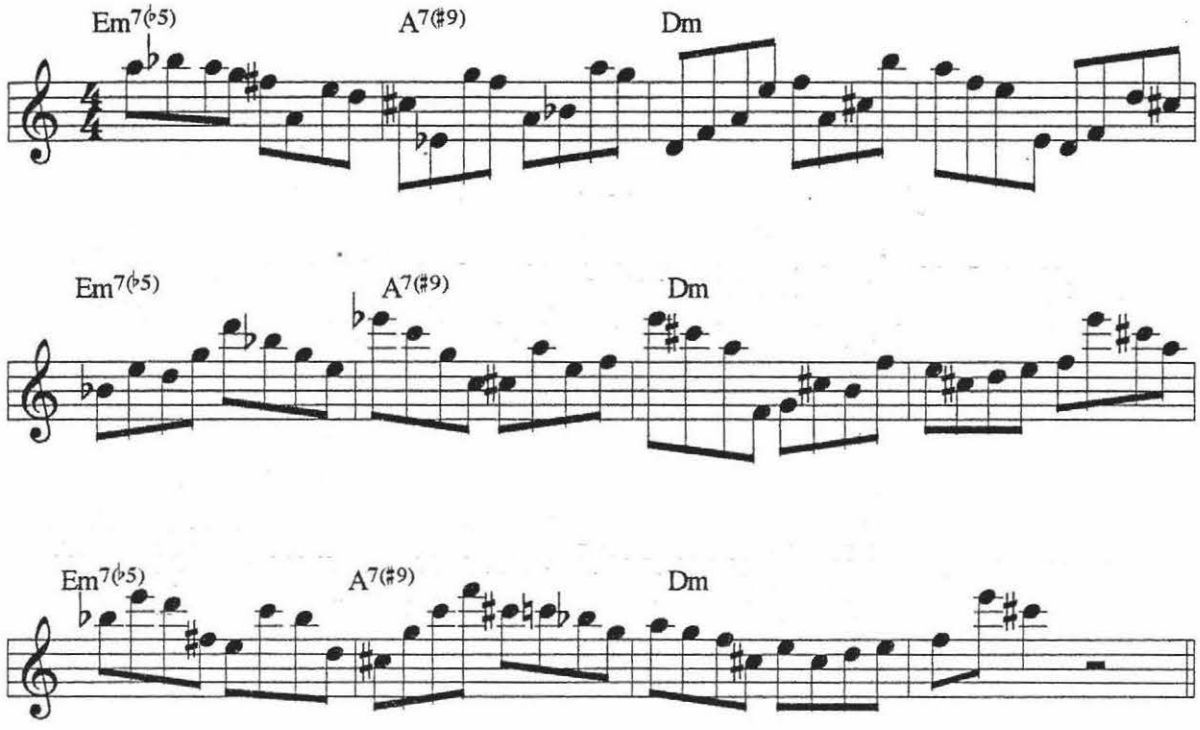
Ex 4 Blues for Alice



10 From a handout given to me in a lesson with John Scofield

Example 5 shows an original line constructed over a minor II-V-I progression. The line is representative of the chord scales with no chromatic passing notes. The use of different registers in this line gives the impression of more than one voice. This line was originally composed for the guitar.

Ex 5



Atonal intervallic lines

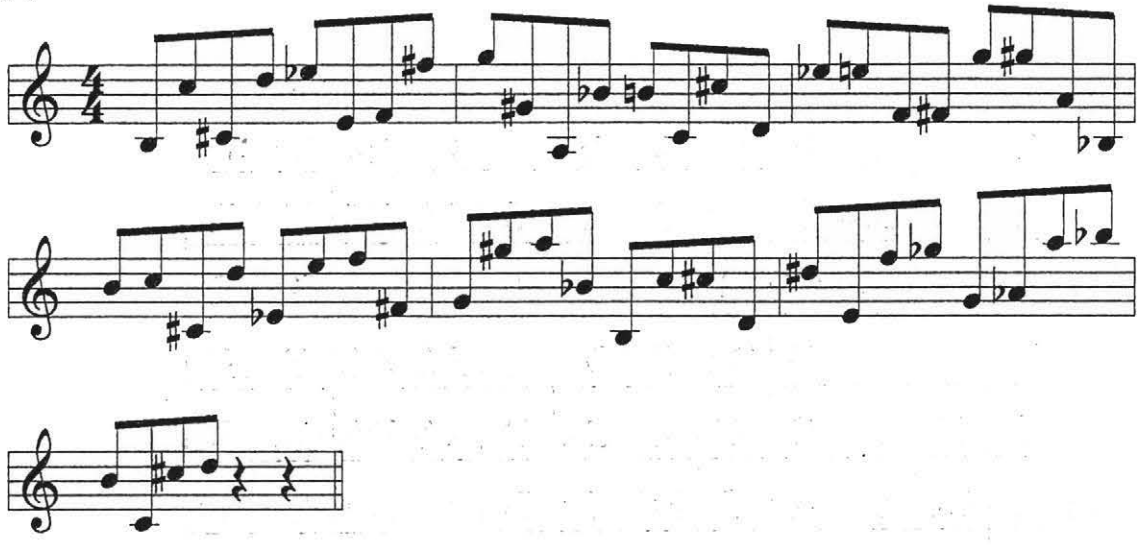
Example 6 shows a line[11] composed by jazz guitarist Steve Erquiaga to demonstrate the use of intervallic 4ths connected with 2nds. The line is an example of non-diatonic or atonal construction. The transparency of the 4th interval makes it particularly useful when creating atonal lines. Quartal voicings can also slip in and out of a key in the same way .

Ex 6

[11] From a handwritten line received during a lesson with Steve Erquiaga

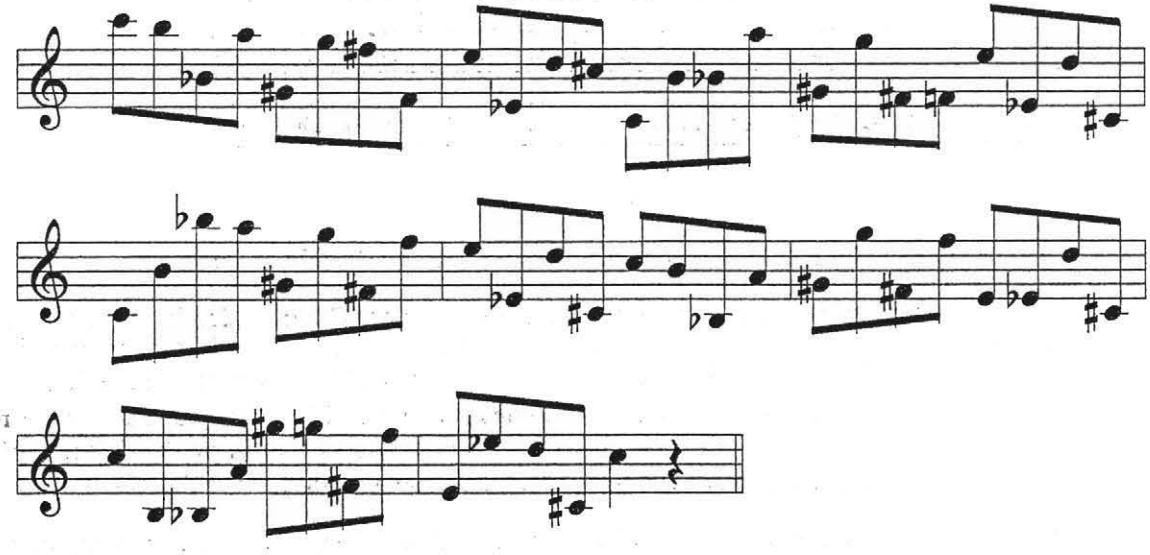
Example 7 shows a transcription of an intervallic structure as played by Pat Martino on his video 'Creative Force'. It is unlikely that the line is improvised, given its highly consistent structure. The line contains an ascending chromatic scale displaced in octaves in a thirteen-note pattern, that then repeats up a semitone. The predominant intervals are minor 2nds, minor 9ths and major 7ths. Lines like this have no tonal centre, but are used frequently to enhance a tonal environment. In the video he uses the line as an approach to a note which is strongly part of the key.

Ex 7



Example 8 is a further line[12] demonstrating chromatic displacement. The line is similar in principle to example 7, but is descending and uses a twenty six-note pattern that repeats down a tone, making the chromaticism continuous. The only intervals here are minor 9ths, minor 2nds and major 7ths. This line is undoubtedly chromatic and has no key.

Ex 8



[12] This line was composed by Steve Erquiaga

(e) Serial Techniques

The idea of serial composition was pioneered in classical music by Schoenberg and some of his contemporaries. In jazz, many avant-garde and free jazz players have used these techniques to improvise and compose. The notes C, A, Bb, F, Ab, D, B, G, Db, F#, Eb, E are simply a reorganised chromatic scale. A grid construction can be used to show all of the transpositions and inversions of this twelve-tone row.

Ex 1

	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9	I_{10}	I_{11}	I_{12}
R_1	C	A	Bb	F	Ab	D	B	G	Db	F#	Eb	E
R_2	Eb	C	Db	Ab	B	F	D	Bb	E	A	Gb	G
R_3	D	B	C	G	Bb	E	Db	A	Eb	Ab	F	F#
R_4	G	E	F	C	Gb	A	Gb	D	Ab	Db	Bb	B
R_5	E	C#	D	A	C	F#	Eb	B	F	Bb	G	G#
R_6	Bb	G	Ab	Eb	A	C	A	F	B	E	Db	D
R_7	Db	Bb	Eb	Gb	C	Eb	C	Ab	D	F	E	F
R_8	F	D	Eb	Bb	E	G	E	C	F#	B	Ab	A
R_9	B	Ab	A	E	Bb	C#	Bb	F#	C	F	D	D#
R_{10}	F#	Eb	E	B	F	Ab	F	C#	G	C	A	Bb
R_{11}	A	F#	G	D	Ab	Bb	Ab	E	Bb	Eb	C	C#
R_{12}	Ab	F	Gb	Db	G	Bb	G	Eb	A	D	B	C

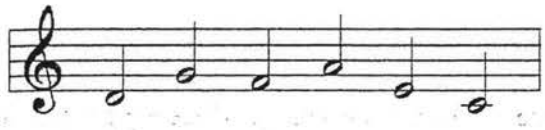
The top row ($R1$) from left to right, contains the notes from the original twelve-tone row.

The first column is the inversion or mirror image of the original row. The inversion is based around the first note C, so the next note in the row is A, which is a major 6th higher than C, so its mirror image would be down a major 6th giving Eb. $R2$ and $R12$ are transpositions of the row based on the first note of each of $I1$, this results in a grid which gives all of the transpositions and inversions of the original row. Retrograde rows can be found by going from right to left giving $RR1$ as a reversal of the first row. If the notes are played from bottom to top in the first column, a retrograde inversion row called $RI1$ is the result.

In serial improvisation the material is derived by travelling through part of the grid, playing the notes separately. Chord instruments can combine several consecutive notes into clusters. The material derived from the grid is dependent on the characteristics of the original row. The use of this technique in improvisation leads to good facility with intervals and is commonly used to organised lines incorporating atonal chromaticism in tonal contexts. In the previous example a twelve-tone row was used but smaller groups of notes can yield interesting results. The technique of creating grids with small diatonic phrases reveals many melodic variations which have similar intervallic structure.

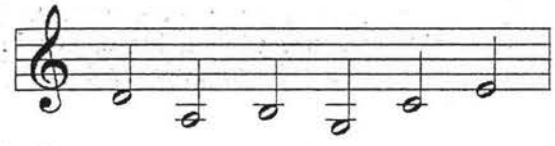
Example 2 shows a diatonic motif in D Dorian comprising of six notes.

Ex 2



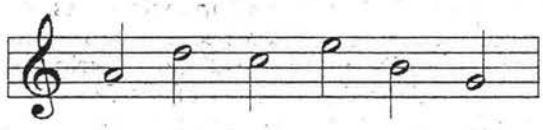
The mirror image or inversion around the first note results in the following sequence shown in example 3.

Ex 3



The transpositions of each row are done diatonically. Taking R1 and transposing it up a 5th to produce R2 will produce the following notes.

Ex 4



Example 5 shows the complete diatonic grid

Ex 5

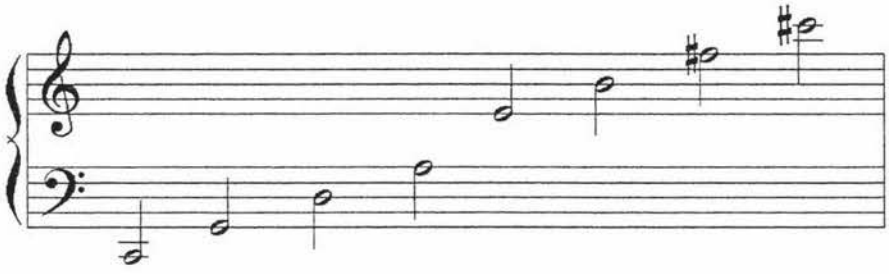
D	G	F	A	E	C
A	D	C	E	B	G
B	E	D	F	C	A
G	C	B	D	A	F
C	F	E	G	D	B
E	A	G	B	F	D

From a six-note motif 24 related generations can be produced. All of the transpositions and inversions here are done within the constraints of a diatonic framework. The importance of relating motifs is essential in improvisation as it can unify the direction of a solo. This technique is particularly useful when the area of modal improvisation is being considered, the grid can be explored melodically or harmonically. Guitarists and pianists can find a myriad of chord possibilities by playing groups of notes in a row simultaneously.

3. Exploring Voicings

One of the strongest characteristics of jazz is its unique harmonic vocabulary. Modern jazz has drawn heavily from European harmony, and in many ways has paralleled[1] its development. Despite similarities there have been many innovations in the structure of voicings and chord progressions. Bach's sense of line and harmonic relationships, Chopin's use of chromatic harmony and particularly diminished function, Scriabin's intervallic and quartal approach to chord structures, Ravel and Debussy's use of exotic harmony and parallelism, Bartok's rhythmic interest and Schoenberg's serial techniques, have all left their mark on the evolution of jazz. The combination of these elements, in an improvised environment, pioneered the development of a unique language. In the way that figured bass was used in baroque continuo, the jazz musician has developed a form of musical shorthand that enables the use of complex chords in an improvised environment. This chapter is concerned with the structure of chords and their function in jazz harmony.

The following example shows perfect 5ths stacked up to form an arpeggio. The first five notes are C, G, D, A, E and produce a major pentatonic scale. This scale is the most common scale in folk and world music, this is probably due to its very consonant structure. If two more 5ths are added to give C, G, D, A, E, B, F#, the result is the Lydian mode. In *The Lydian Chromatic Concept of Tonal Organisation* by George Russell, this scale is regarded as the brightest and most consonant of all scales. If a further 5th (C#) is added to the arpeggio, the result is a flattened 9th. Theoretically this note should sound quite dissonant but played in the context of the others it sounds curiously consonant. If the other notes are removed from the arpeggio the dissonance returns. The answer to this riddle probably lies in the harmonic series, and the abundance of 5ths within it. The important point is that dissonance and consonance in chord voicings is largely determined by the intervallic relationship between the notes. The resonance of chord voicings is also affected by the doubling of notes in other octaves. In most voicings the doubling of the 3rd creates an unwanted resonance and is best avoided. The interval of the flattened 9th between any two notes in a chord is usually avoided but in some chords adds a poignant quality.



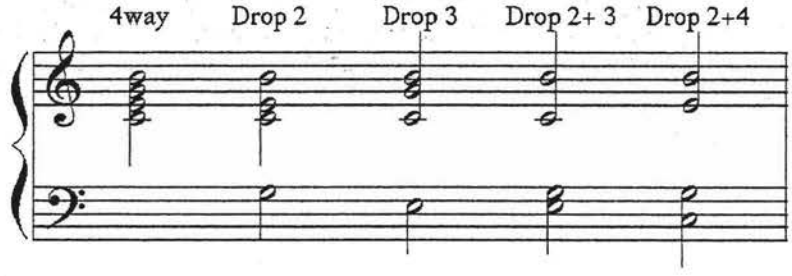
(a) Tertiary Structures

Inversion in jazz harmony is described in the same way as in classical theory with root position - a, first inversion - b, second inversion - c and so on. Spacing in tertiary type voicings is described in jazz harmony by the "drop" system.

Example 1 shows the original C major 7th chord as 4-way close structure, indicating there are four notes in the chord in close position (within an octave). 4, 5, or 6-way close are quite common in jazz harmony, although 5-way and 6-way are generally considered to be clusters. The 2nd chord in the example is spaced in drop 2, in which the second note from the top in 4-way, is lowered by an octave giving the characteristic tenth interval in the outer voices. Drop 2 is a very common way of harmonising block chords particularly in big bands. The group Supersax, which specialises in arrangements of classic solos, almost exclusively use this type of voicing, often with drop 2 double melody in which the melody note is doubled 2 octaves below by the baritone sax. Bill Evans was a master of instantly harmonising melodies in drop 2, and probably every other voicing for that matter.

1 The conclusion chapter contains an essay on the chromatic evolution of jazzand examines this parallel development.

Ex 1

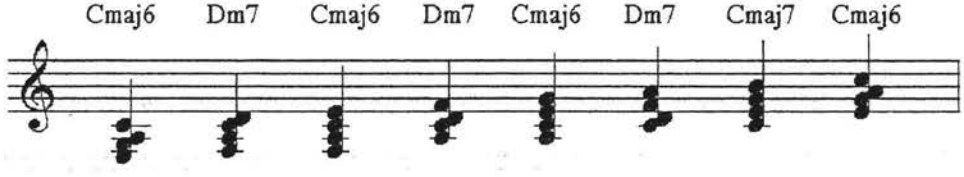


4-way close structures

The following examples of 4-way voicings are all based on melodies that have C major as their background chord, this technique leads to the possible harmonisation of every note of the chromatic scale.[2]

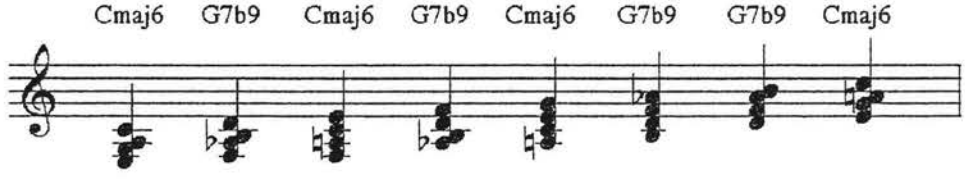
In example 2 a C major scale is harmonised with alternating I and II chords in close position. This is regarded as a soft harmonisation as the passing chords contain only diatonic notes. The Dm7 chords can be thought of as Fmaj6 and are functioning as subdominant passing chords. Soft, in this context, refers to the use of the subdominant passing chords, as opposed to dominant chords which have a much stronger need to resolve. Nat King Cole, George Shearing, Red Garland and countless others from the 1950s, were expert at harmonising a 4-way close double melody that contains a doubling an octave below the melody note.

Ex 2



Example 3 is a C harmonic major scale harmonised with C major 6th chord combined with G7b9 as the passing chords. The natural 6th degree of the scale is also added in in the form of a C major 6. It is important to note that each of these chords fall under the chord symbol of C major, so the bass note is always C, giving a particular kind of tension to the passing chords. The theory behind the dominant 7th b9 chords is explored in Chapter 4, which outlines the various uses of diminished chords. This harmonisation, in comparison to the one above, is harder in sound and more propulsive as it contains the non-diatonic tone of Ab. This note is borrowed from minor harmony.

Ex 3

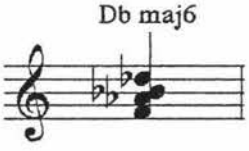


[2] The harmonisation of the chromatic scale is all done in reference to the background chord of C major.

Many jazz melodies contain passing tones, presenting several problems in harmonisation. Chords for the notes C, D, E, F, G, Ab, A and B have been discussed, leaving Eb, F#, Db and Bb. Eb and F# can be harmonised with the notes from a I diminished voicing, shown in example 4. The use of I diminished gives an alternative for harmonising the notes C and A. The note Db can be harmonised by taking a C major 6 voicing and moving it up in parallel by a semitone giving the voicing in example 5. Bb is really hinting at a C dominant chord and can be harmonised with a straight C7 chord with the 7th on top.

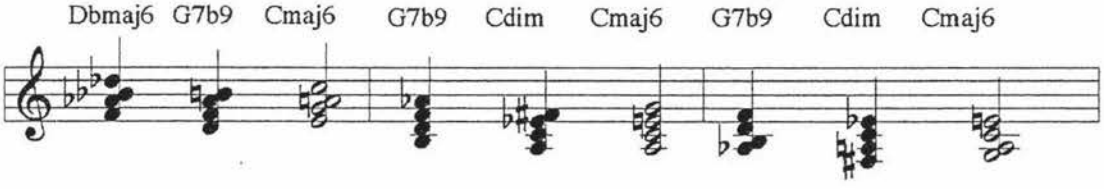
Ex 4

Ex 5



A good method of study with these voicings is to harmonise upper and lower neighbouring tones that surround the main chord tones, enabling better access to harmonising chromatic notes. Example 6 shows a harmonisation of the enclosure tones of the root, 5th and 3rd respectively. This example only covers the overall chord symbol of C major. Other chord symbols can also be approached in the same way, the minor chord can still use I diminished and the V7b9 as diminished passing chords. The V7b9 can also be thought of as chord VII from the harmonic minor or harmonic major. These are only some of the ways that 4-way close can work, using parallel approaches and secondary dominant chords a whole host of harmonisations can result.

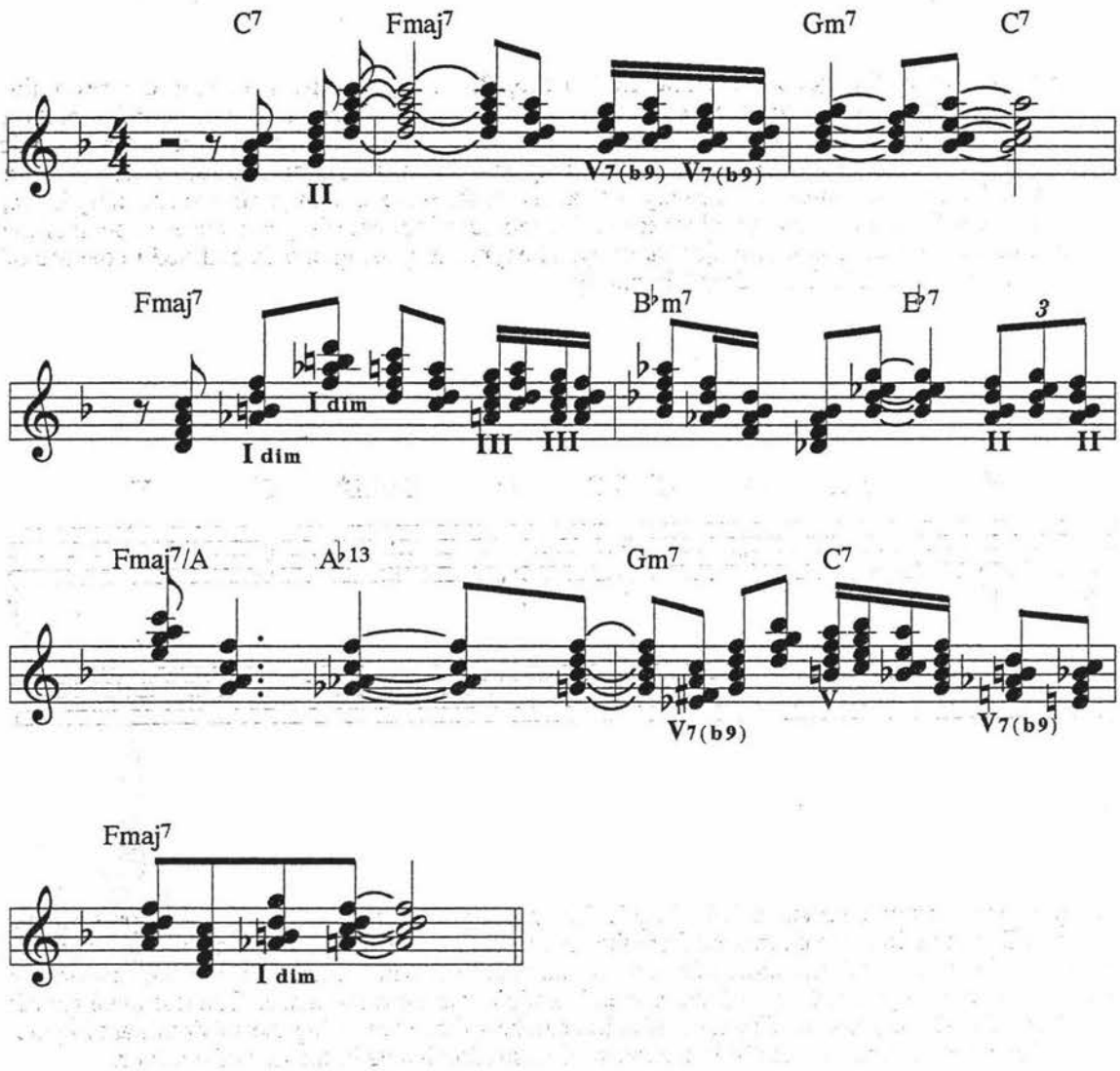
Ex 6



Example 7 is an excerpt from Clifford Brown's "Joy Spring" [3] in which the melody has been harmonised in 4-way close. The main passing chords are I diminished, V7b9 diminished and subdominants of either chord IV or chord II. Chord III is also used as a tonic substitution. The passing chords have been identified in relation to the temporary key that they are in at the time.

[3] As written in *The Essential Real Book*

Ex 7 Joy Spring



To summarise, passing chords can take the following form.

-Chord V7b9 : This is a dominant chord built on chord V of the key. Any chord can be preceded by a dominant chord a 4th below, this is known as a secondary dominant. The presence of the b9 is usually outside of the diatonic harmony and introducing notes from the harmonic minor and major. Dominant chords of other varieties are often used as passing chords.

-Chord IV or II: These chords are used in passing when a less dissonant (softer) connection is needed between the tonic chords. The use of the dominant is quite severe in some cases so a more diatonic approach is often used

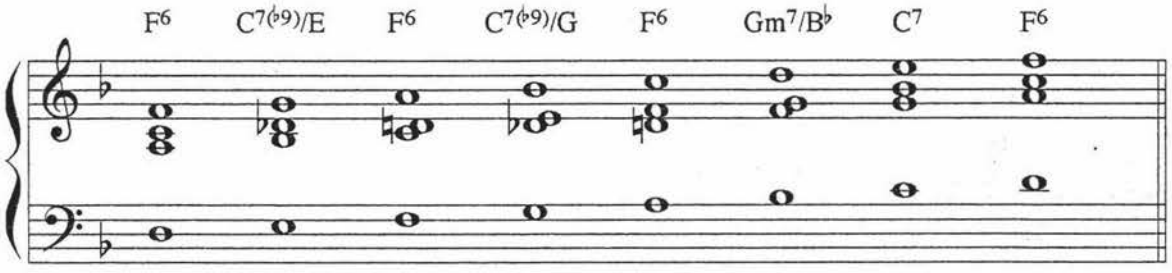
-Chord I, bIII, bV and VI diminished : These diminished chords are all basically a I diminished and function like a subdominant within a key. Diminished substitutes for chord I in F major may include G7b9, Bb7b9, Db7b9 and E7b9. See diminished subs in the chapter on Harmony.

-Parallel function : Any chord can be approached by an identical voicing a semitone or wholetone from above or below. This takes the chord out of the key temporarily and introduces non diatonic tones.

Drop 2 Voicings

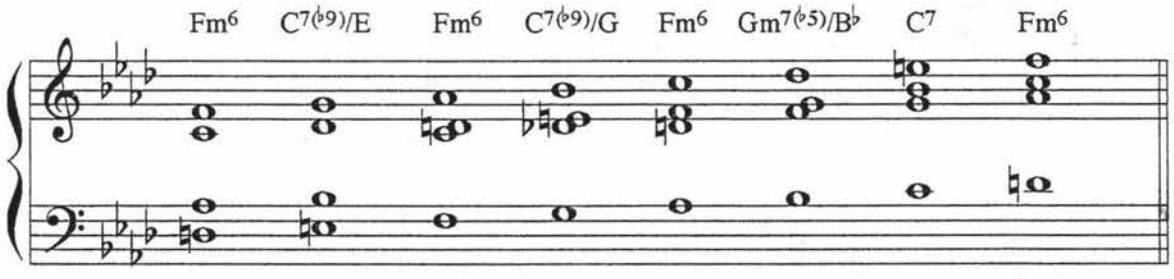
Example 8 shows the F major scale harmonised in drop 2. One of the distinguishing features of this harmony is that all of the notes are sandwiched mainly within a 10th, producing similar motion between the top and bottom parts. These voicings blend very well with upper structure and pentatonic chords which are explained in detail later in this chapter. The passing chords used in example 8 are based on C7b9 or E diminished. The only note added to the scale of F major in the harmony is Db, this note comes from the harmonic minor scale. Harmonic minor chords, with the exception of the tonic chord, can be used to colour major harmony. The types of passing chords outlined in the use of 4-way close are also applicable to drop 2 harmony.

Ex 8



Example 9 is a harmonic minor scale in drop 2. The passing chords are from C7b9. The presence of the E and D natural in some chords are from the melodic minor. The D is used in F minor chords to produce a minor 6th which has more of a tonic sound than Fm7 with an Eb. The F minor (major) 7th chord can be used in place of both of these, creating slightly more dissonance. The last three chords constitute a II-V-I progression. The harmonisation can be softened by using the subdominant in place of the C7b9 chords. Bbm6 or Gm7b5 function well as subdominants in the key of F minor.

Ex 9

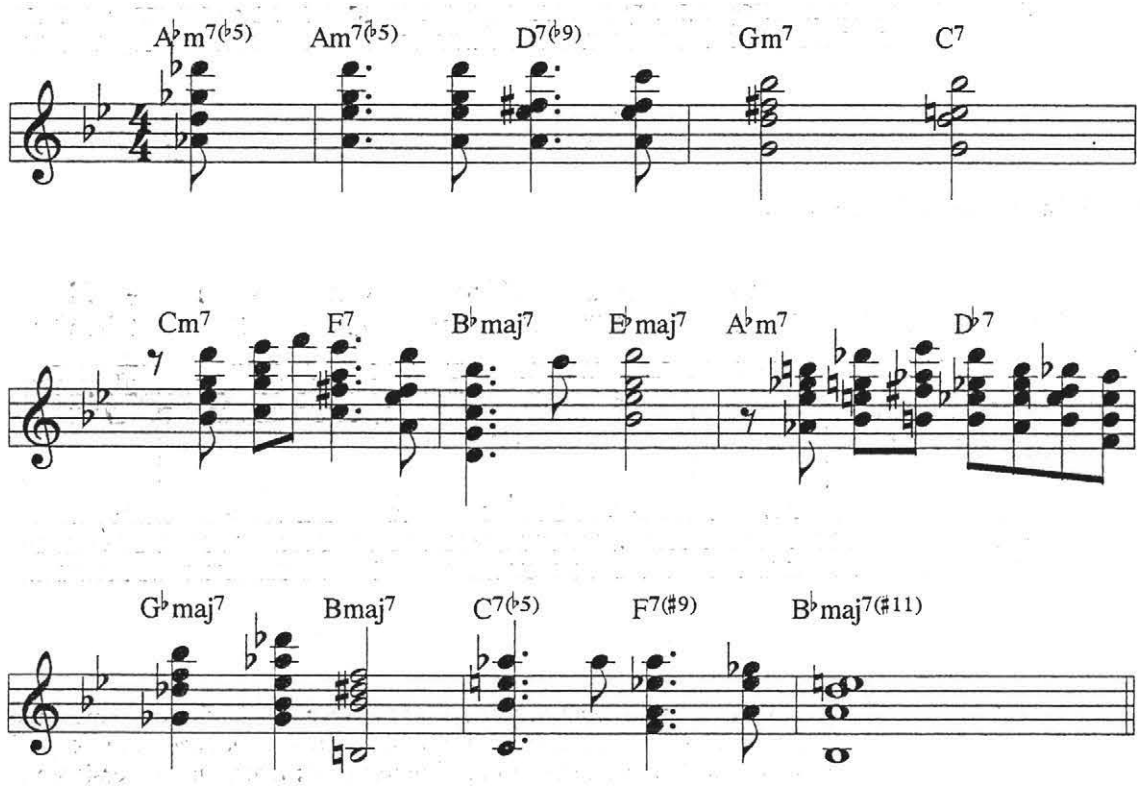


Example 10 shows a transcription of the harmonisation that Wes Montgomery plays on his Riverside recording of Dave Brubeck's "In Your Own Sweet Way". Bar 1 starts with parallel motion moving to the Am7b5. In bar 3 the Gm7 chord has a major 7th creating an unexpected dissonance that quickly resolves to the C7th chord. In bars 4 and 6 chord V7b9 passing chords are used. There are two types of passing chord used in this harmonisation.

-Parallel: The passing chord is the same structure a semitone above or below the target chord, this technique is used on the first two chords G#m7b5 to Am7b5.
-Diminished: Chord representing a V7 or a I diminished chord. In the Abm7 to Db7 bar Montgomery is using a G diminished chord substituting as Eb7b9 which is chord V in Abm.

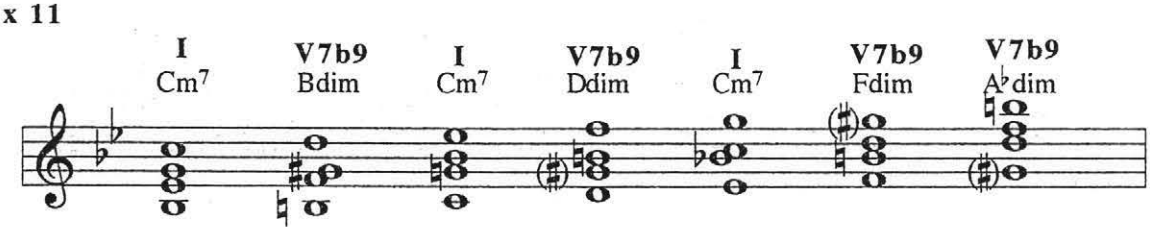
In addition to drop 2 chords bar 5 contains a chord structured from five stacked intervals of a perfect 4th.

Ex 10 In Your Own Sweet Way



Example 11 is an extrapolation of the diminished passing chords used in bar 4 in the previous example. They are used here as dominant function chords. The scale is C harmonic minor and shows a typical drop 2 harmonisation with chords I and V being used.

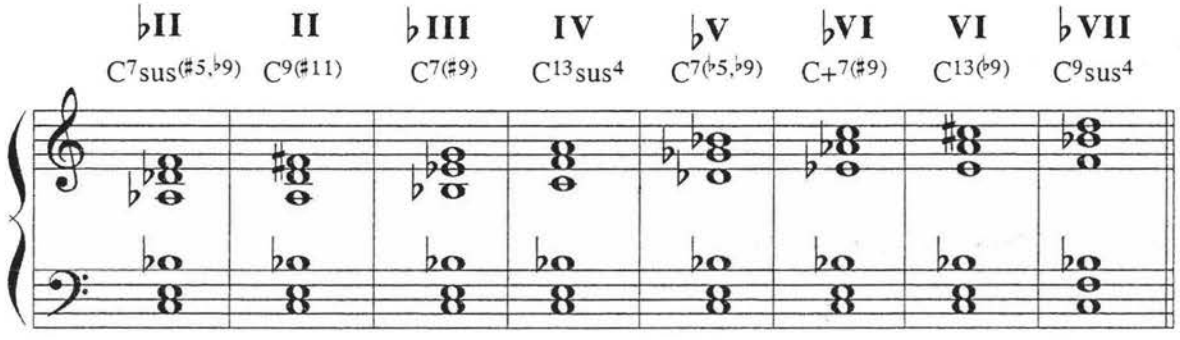
Ex 11



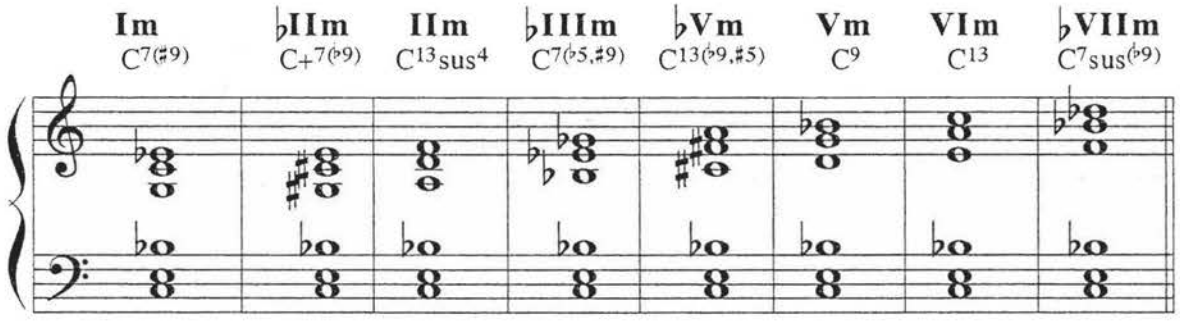
Dominant Upper Structure

In the context of chord voicing, upper structures are simply the combination of extensions to form recognisable chords that can be used to extend a basic voicing. Example 12 shows most of the common upper structures available over a C dominant chord. All of the chords in example 12 contain a 2nd inversion upper structure.[4] Other inversions can be used but this one works most of the time.

Ex 12 Major Upper Structures

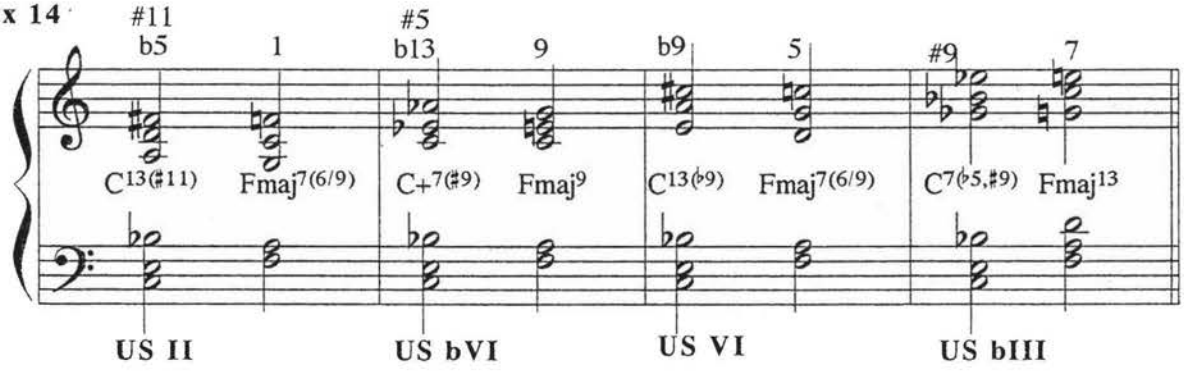


Ex 13 Minor Upper Structures



Using upper structures it is possible to harmonise any chromatic note over the C7 chord. In example 14 all of the main alterations, namely the #5, b5, #9 and b9, are built into a V-I cadence in the key of F. The top note voice-leading is indicated above each chord. The upper structure and inversion are indicated below the chord and the generic symbol between the staves.

Ex 14



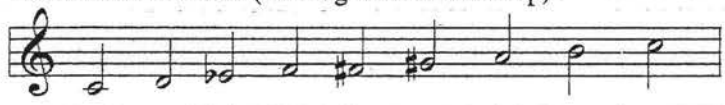
[4] This is largely due to the spacing of the notes and the resonance of the 3rd on top.

Diminished Chords

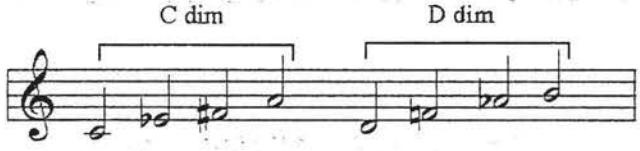
The diminished scale comes in two forms, the whole-step half-step construction (diminished scale) and the half-step whole-step (diminished-dominant scale). These scales are based on the same symmetrical construction of alternating half and whole steps, this means only three keys exist before the transposition of a minor 3rd occurs. The theory behind symmetrical scales and their relationship with chords is covered in chapter 1.

Ex 15

Diminished scale (starting with whole-step)

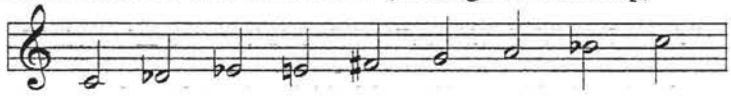


This scale is constructed of two diminished chords a whole tone apart.

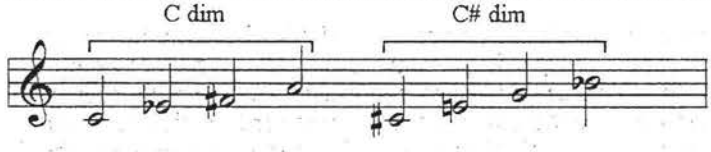


Ex 16

Diminished Dominant scale (starting with half step)



This scale is constructed from two diminished chords a semitone apart.



In example 15 and 16 it is interesting to note that both of these eight-note scales are constructed of two four-note diminished chords a semitone apart. If played together as a chord they form what is known as a double diminished chord which is particularly dense in sound. The nature of these double diminished chords means that they can function as diminished or dominant chords.

A single diminished scale contains:

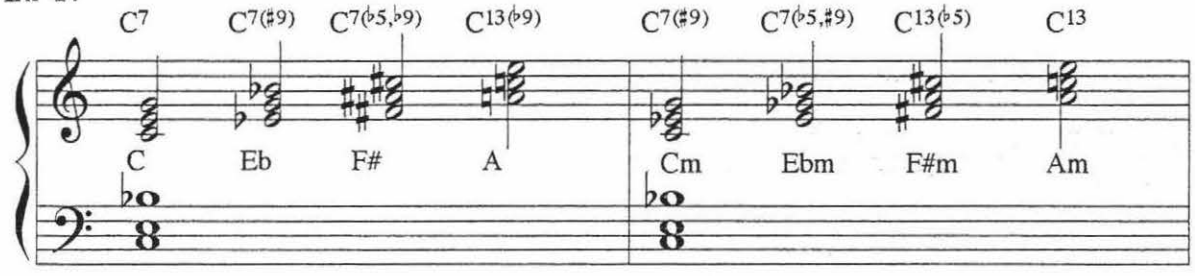
- 4 major triads
- 4 minor triads
- 4 dominant chords
- 4 minor 7th chords
- 4 half diminished chords
- 8 diminished chords

A single diminished scale contains all possible intervals. In fact there are only four more notes needed to produce a chromatic scale and these missing notes form yet another diminished chord. These are the 'outside' notes in a diminished scale. This symmetrical structure allows many melodic and chord structure possibilities, and many different functions in a harmonic environment. The various harmonic functions of diminished chords are covered in detail in chapter 4.

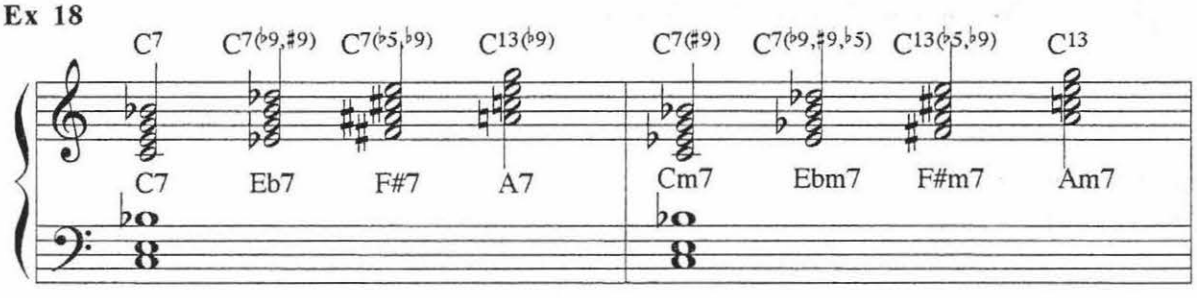
Diminished Upper Structure

Example 17 and 18 show the upper structure major, minor, dominant 7th and minor 7th chords that can be found in the C diminished dominant scale. These chords are all variations of C7 with the 3rd and 7th in the bass. The symmetrical nature of this scale indicates that Eb, F# and A diminished dominant and E, G, Bb and C# diminished scales contain the same upper structures. Even though the example above indicates the use of these chords as voicings for C7 chords, they can also be used as Eb7, F#7, A7, E dim, Gdim, Bbdim and C#dim chords.

Ex 17



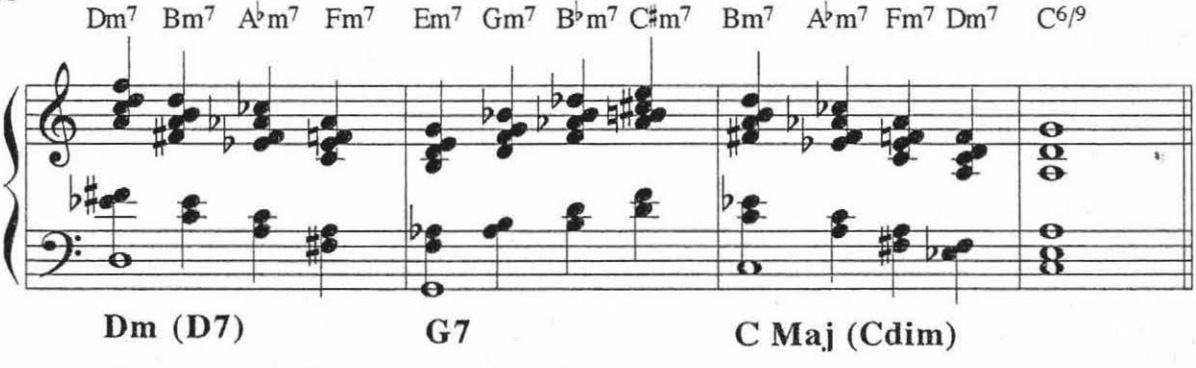
Ex 18



Example 19 shows how some of these upper structures can be used in a II-V-I situation. In bar 1 the chord II has a secondary dominant substitute of D7 replacing D minor. The upper structures are all minor 7th chords in second inversion. They are placed above two notes of the original diminished triad to give a five-note voicing. The chords are moving in a parallel minor 3rd relationship within each bar. The 2nd bar uses upper structures above a G7th chord. In the 3rd bar a C diminished chord is substituted as a I diminished function creating a delayed resolution to the final tonic chord in bar 4.

Ex 19

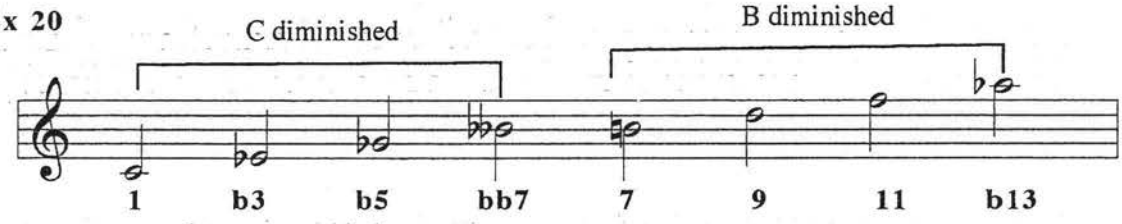
Upper Structures:



Double Diminished Structures

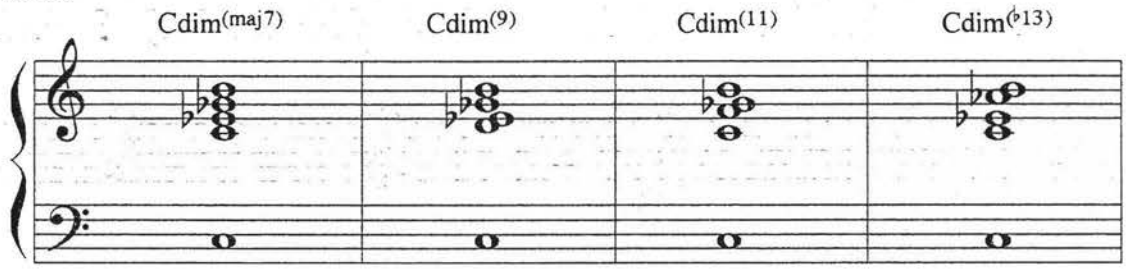
It has been established that a diminished scale consist of two interlocked diminished chords. A double diminished chord can be described simply as a voicing that has notes from two different diminished chords. A C diminished chord can have the notes of a B diminished chord as its extension notes. When the two chords are added together the diminished scale is the result. This relationship also occurs in the other form of the scale, the diminished dominant. This means that double diminished chords are useful in a dominant chord function as well. Example 20 shows a C diminished chord followed its extension notes which form a B diminished arpeggio.

Ex 20

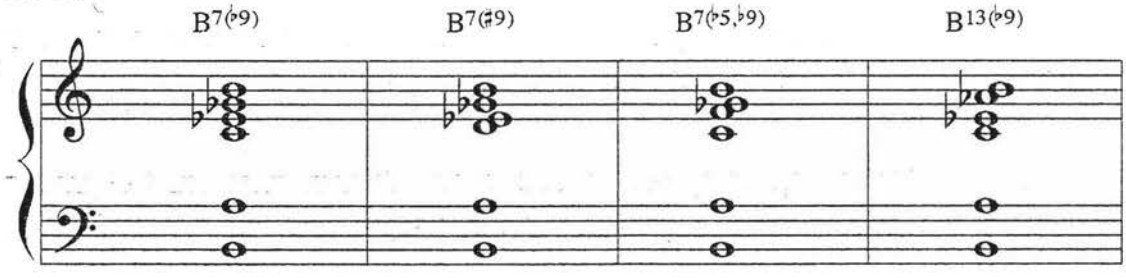


Example 21 shows the gradual introduction of extensions into a C diminished chord. These extensions have to be managed carefully in harmonic situations as often the extensions are from outside of the key. Example 22 shows the same chords but now functioning as a B7th chord. Each of these chords are technically double diminished structures as they contain notes from both diminished chords in the scale.

Ex 21

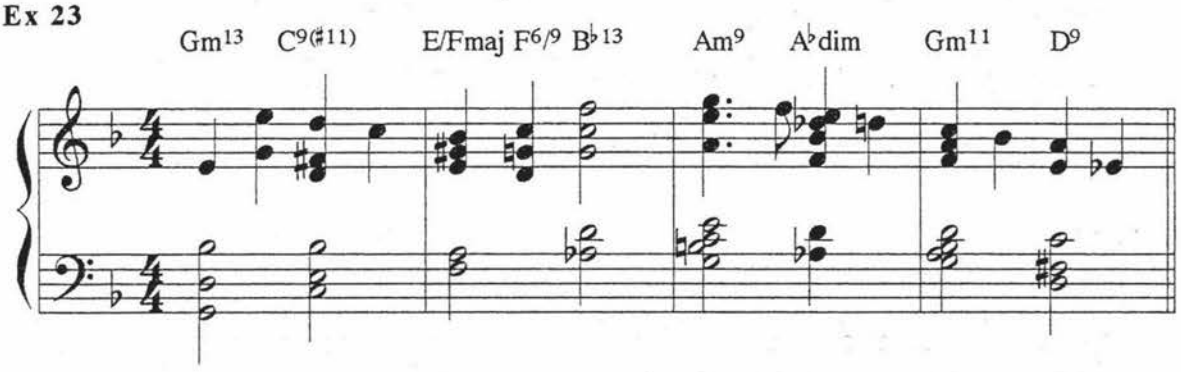


Ex 22



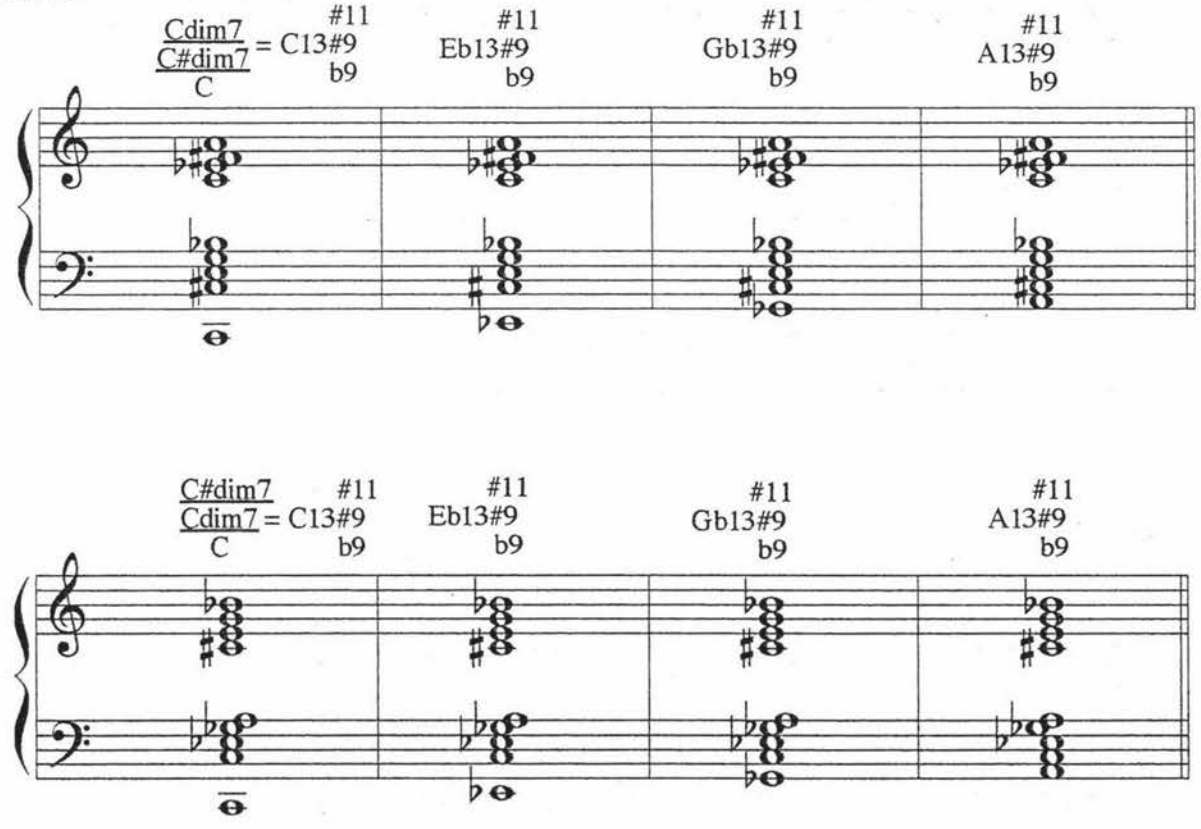
Example 23 shows a transcription from " When You Wish Upon a Star" from Keith Jarrett's video *Standards*. The Ab diminished chord in the 3rd bar contains the notes Bb, Db and E. These notes constitute a Bb diminished chord making the overall structure a partial double diminished.

Ex 23



In Dave Liebman's book *A Chromatic Approach to Jazz Harmony and Melody*, he outlines many interesting structures and their equivalent uses. Example 24 shows these double diminished chord structures with equivalent chord symbols. The chords in the first line are reversed on the 2nd line and are quite different in sound even though they perform the same dominant function. Full double diminished chords are very dissonant in nature and should be used with care in tonal music. They are often used in atonal music and are very distinct due to their overtone density.

Ex 24

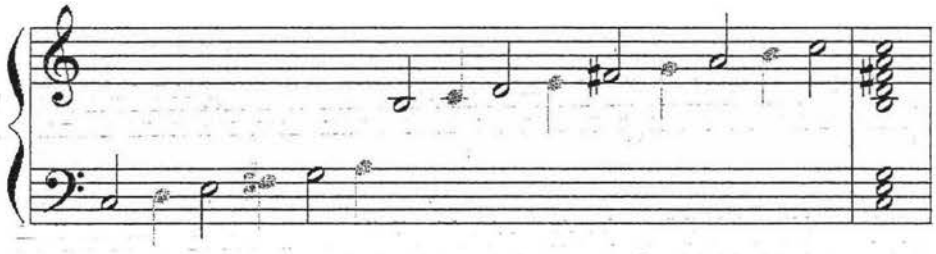


(b) Quartal and Pentatonic Chord Structures

With seven-note scales, tertiary chords are built by skipping every other note in the scale to produce a cycle of diatonic thirds.

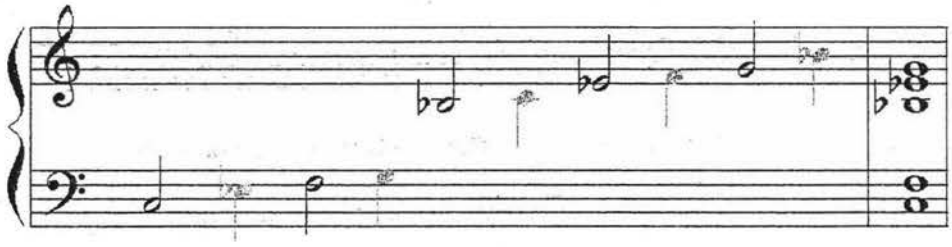
Example 1 shows a C Lydian scale that has been stacked up in diatonic 3rds to produce the chord of Cmaj 13#11. This is a common method of deriving chords from scales but results primarily in chords built in 3rds. If the process is applied to pentatonic scales many interesting chord structures become available.

Ex 1



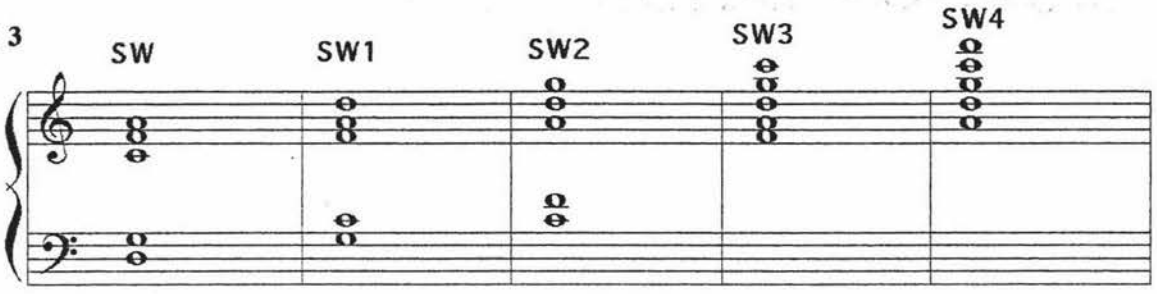
Example 2 shows how a C minor pentatonic scale can be used to produce a chord from alternating note choices. This results in a five-note chord built primarily in perfect 4ths with a major 3rd on the top. This is known as a 'So What' voicing. These voicing became popular in the early sixties as modal harmony was introduced. The classic Miles Davis album '*Kind of Blue*' is considered to be the seminal recording in the use of modal harmony and contains the composition that gave the chord its name. This album featured Bill Evans on piano, who is regarded as the founder of these voicings, no doubt he was hugely influenced by European classical music particularly Debussy and Ravel. In the way that tertiary chords can be stacked above any note in a seven-note scale, the same is true for pentatonics, this results in five possible structures.

Ex 2



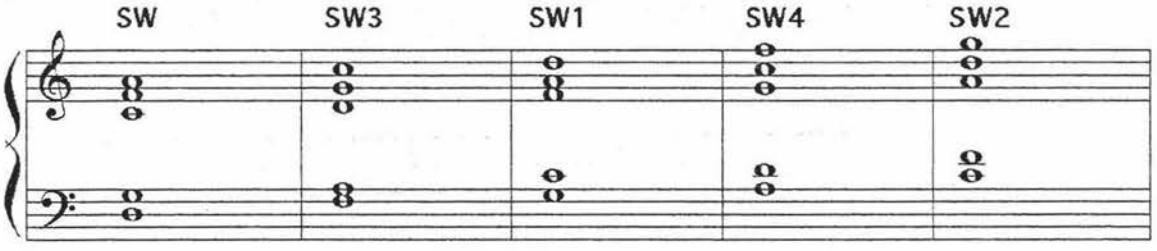
Example 3 shows the original chord and its four inversions. Each of the voicings can be used in the same situations as would fit the scale. The D minor pentatonic scale works over Dm7, Bbmaj, Ebmaj7#11, G7sus, B7alt, Fmaj,Gm7 and Am7#5 chords. Consequently these five voicings can be used when encountering any of these chord symbols as equivalent structures, when comping or harmonising melodies. To analyse these structures a system of labelling the inversions is required.

Ex 3



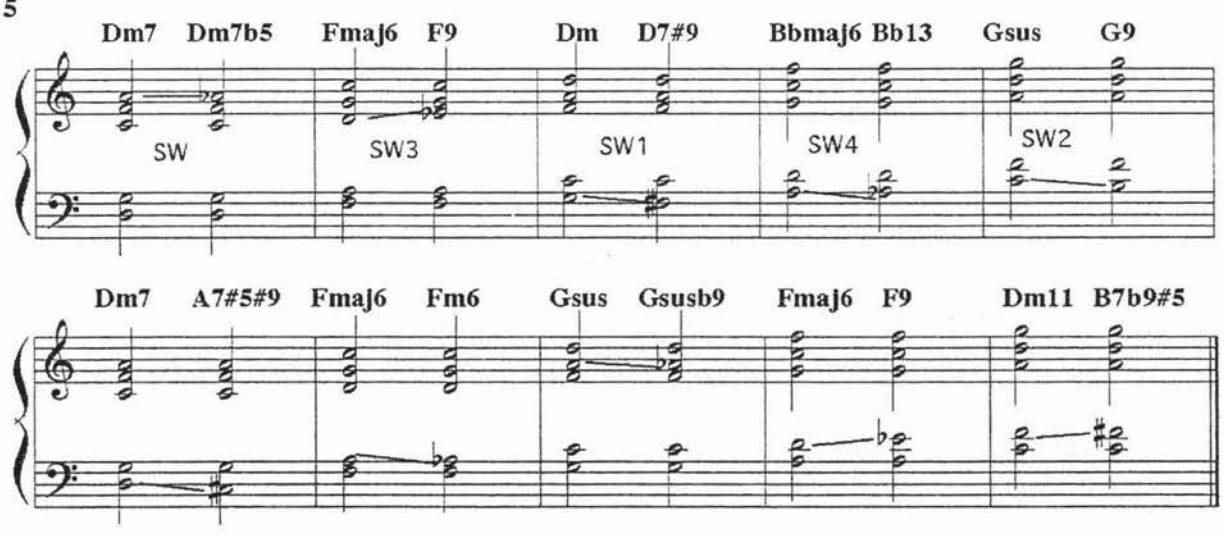
Example 4 shows the same chords laid out in sequence within an octave producing a different structure on every note of the minor pentatonic scale.

Ex 4



Example 5 shows how these voicings can be altered by raising or lowering one note to produce many interesting variations.[5] Not all the voicings are usable in every inversion, particularly if the interval of a b9 is encountered inside the voicing, although in some cases the tension is quite acceptable. It is interesting to note that many of these chords relate to a pentatonic scale.

Ex 5



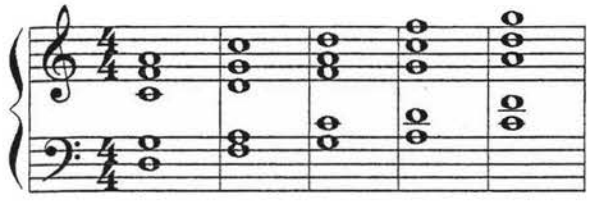
Pentatonic minors chart

The following page is a chart of all of the possible 'So What' chords in all keys. Each key has five chords associated with it, built on every degree of the scale. Above each set of voicings are six equivalent chords that can be substituted by each of them.

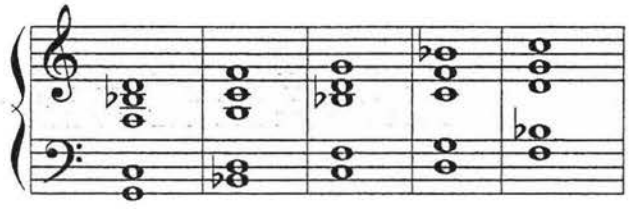
[5] The raising and lowering of notes in pentatonic scales is discussed on page 12.

Pentatonic Minor Voicings

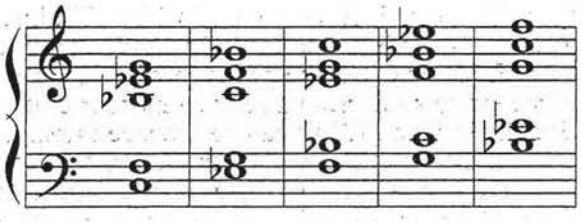
Dm,Fmaj,Bbmaj,Ebmaj,G7sus,B7alt



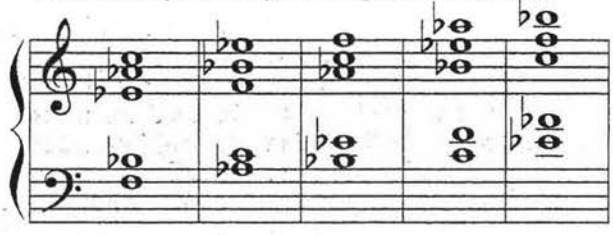
Gm,Bbmaj,Ebmaj,Abmaj,C7sus,E7alt



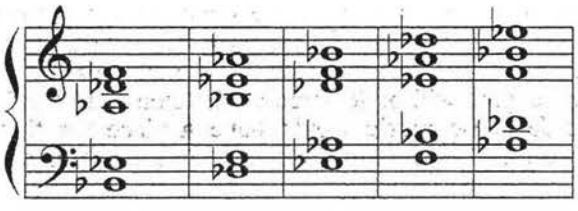
Cm,Ebmaj,Abmaj,Dbmaj,F7sus,A7alt



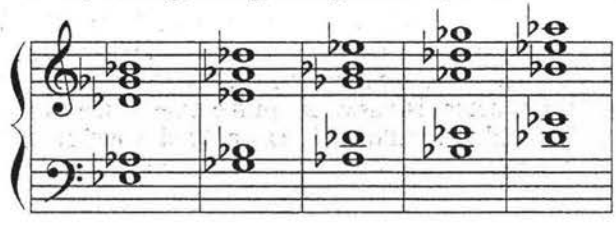
Fm,Abmaj,Dbmaj,Gbmaj,Bb7sus,D7alt



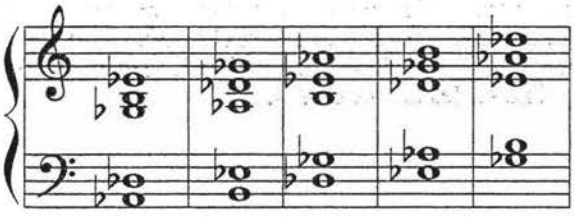
Bbm,Dbmaj,Gbmaj,Bmaj,Eb7sus,G7alt



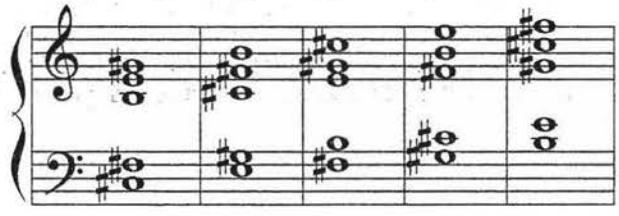
Ebm,Gbmaj,Bmaj,Emaj,Ab7sus,C7alt



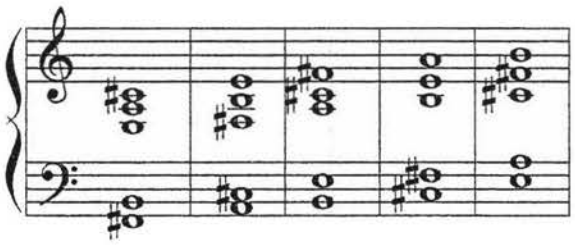
Abm,Bmaj,Emaj,Amaj,Db7sus,F7alt



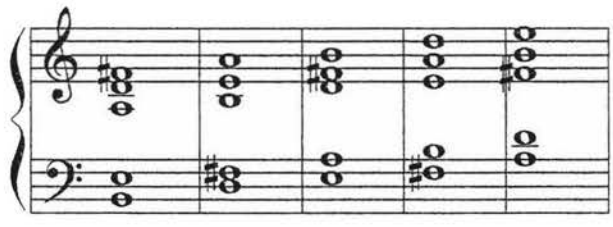
C#m,Emaj,Amaj,Dmaj,F#7sus,Bb7alt



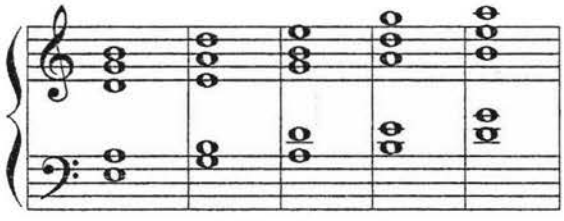
F#m,Amaj,Dmaj,Gmaj,B7sus,Eb7alt



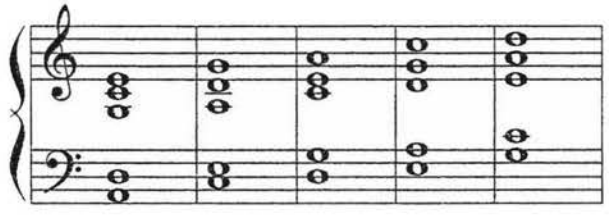
Bm,Dmaj,Gmaj,Cmaj,E7sus,Ab7alt



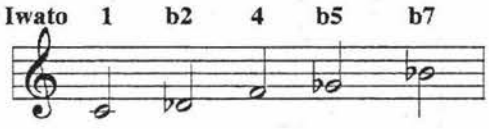
Em,Gmaj,Cmaj,Fmaj,A7sus,Db7alt



Am,Cmaj,Fmaj,Bbmaj,D7sus,F#7alt



Other pentatonic structures



The iwato scale is common in Japanese music, it has many traditional melodies associated with it. The insen scale is also widely used.[6] When the principle of deriving chords is applied, a particularly interesting set of voicings becomes available. The iwato scale in C is C, Db, F, Gb and Bb. The presence of a minor and major 3rd combined with the flattened 2nd leads to some interesting structures that have a number of uses. The chords of Cm7b5, Ebm7, Gbmaj7 #11, Bbm7#5, F7sub9, Gb/F and A7 alt can be produced from the C iwato mode. Even though A and Eb don't appear in the scale, the structures work with these notes in the bass. One interesting principle worth mentioning is this scale can be used over these chords even if the voicings are extended beyond the scale tones, an example might be Ebm11 which includes Ab. One point of interest is that by adding an E and A to this scale the result is an oriental (A) structure, if E and Ab are added the result is the oriental (B) form.

Applying the same principle as used in the 'So What' voicings these scales can be stacked up to produce some very interesting sonorous structures. One way of managing these structures is to have a strong knowledge of the minor pentatonic chords so that notes can be lowered or raised depending on the scale that the structure is based on. In the case of the iwato the 2nd degree will be lowered a wholetone and the 5th lowered a semitone. It is doubtful whether traditional Japanese music would have a place for these harmonies, but in the hands of a jazz pianist or arranger these chords present new and interesting sounds.[7]

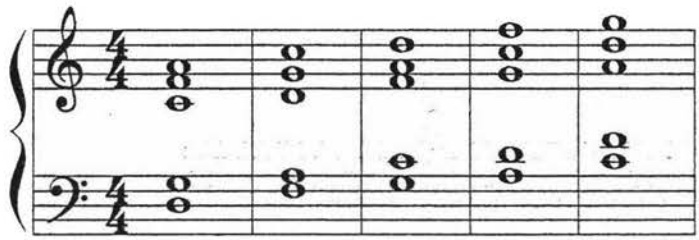
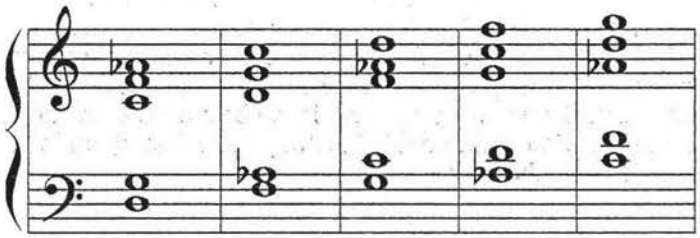
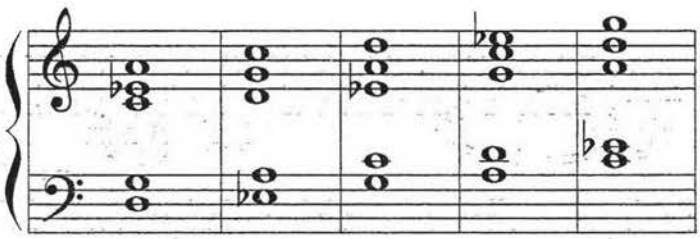
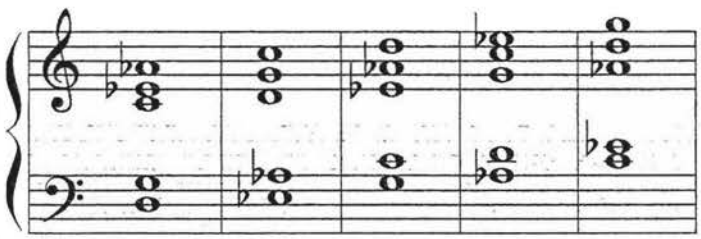
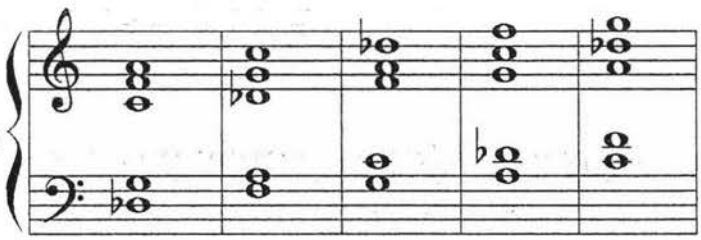
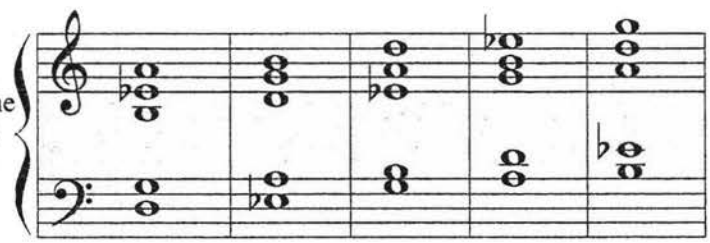
Comparison of Selected Pentatonics Structures

The chart on the next page shows a comparison of selected pentatonics and the structures that result along with equivalent chords. When playing through these structures each of root notes should be put in the bass to hear the full sound of the chord. Some of them contain the interval of a b9 which is generally to be avoided but in some situations can sound quite acceptable. The scales all start on D.

[6] The construction of these scales and relationship to other modes is examined on page 11.

[7] Complete charts of insen and iwato chords appear in Appendix 2

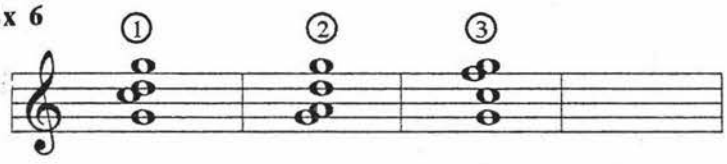
Comparison of Quartal Pentatonic Structures

Construction of scale in comparison with minor pentatonic		Equivalent chord symbols
D Minor pentatonic		**Dm** **G7sus** **Fmaj7** **Bbmaj7** **Ebmaj7#11** **B7alt**
Minor b5 pentatonic (5th lowered semitone)		**Dm7b5** **E7alt** **Abmaj7#11** **Fm6** **G13susb9** **Bb13**
Insen (3rd lowered wholetone)		**Am7b5** **D13susb9** **Cm13** **Ebmaj7#11** **F13** **Ab/G**
Iwato (3rd lowered wholetone 5th lowered semitone)		**Bb13sus** **Fm13** **Abmaj7#11** **Cm#5** **Ab/D** **Ab/G**
Scriabin pentatonic (root lowered semitone)		**A7#9** **Eb13#11** **Dbmaj7#5** **Fmaj7b13** **Bbm6** **Gm7b5**
Altered pentatonic (3rd lowered wholetone 7th lowered semitone)		**B7alt** **F13#11** **Ebmaj7#5** **Cm(maj7)** **Am9b5** **Gb13**

Ambichords

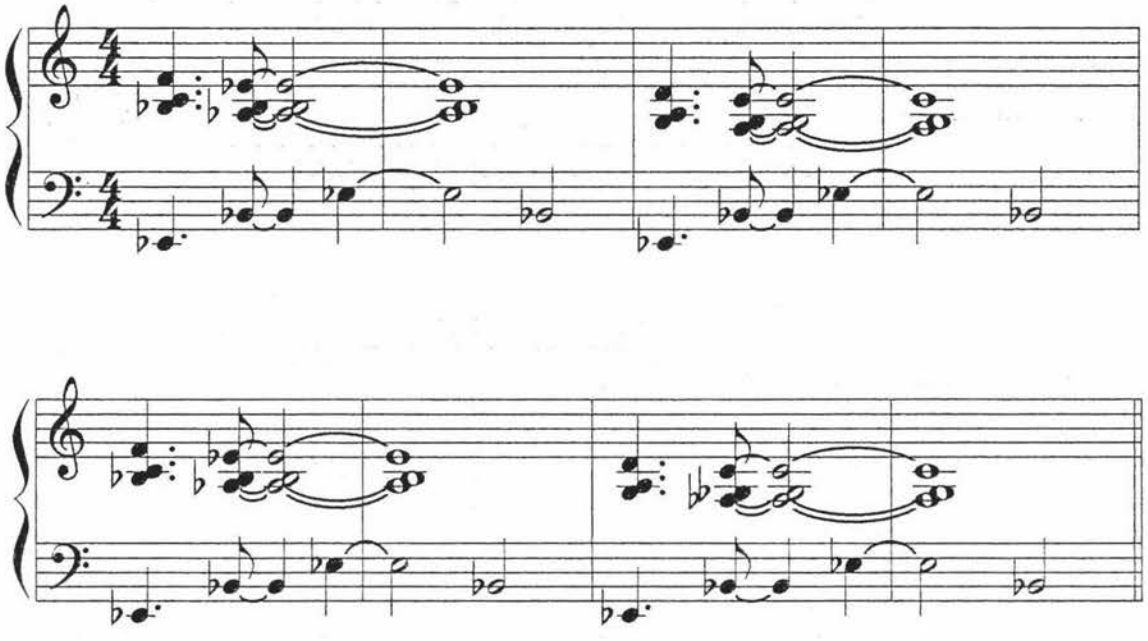
Incomplete chords built from 2nds and 4ths are often referred to as ambichords, presumably relating to their harmonic ambiguity. These so called ambichords contain only three different notes giving a clue as to their harmonic flexibility. The main forms are shown in example 6 (the bottom note in each case is optional).[8]

Ex 6



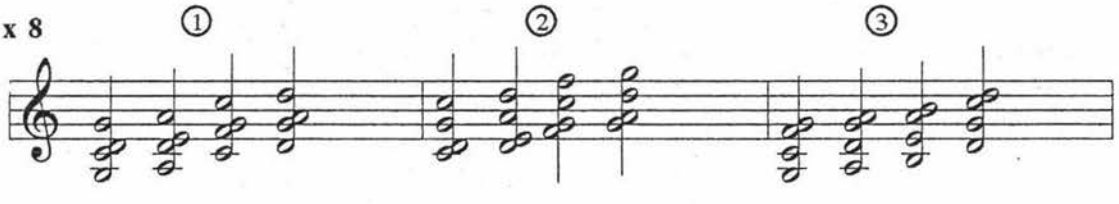
Example 7 is the chord sequence played in the intro by Alan Pasqua on the Eddie Daniels recording of the standard "I Hear a Rhapsody". The left hand plays a bass figure while the right hand uses 3-note ambichords that move in parallel. The right hand chords all have an interval of a perfect 4th sitting on top of a major 2nd, giving them the same construction as the type 1 ambichord. The fact that these chords only have three notes means that it can be related to many different scales. In this example the ambichords are without the doubled melody. The last chord in the example shows an interesting variation to the ambichord structure.

Ex 7 I Hear a Rhapsody



Example 8 shows the four possible ambichords, of each type, that exist in a C major scale. The modes of the C major scale also share the same structures. There are only three of each of the ambichords possible in a jazz minor scale (melodic minor ascending). Only two of each possible in the harmonic minor, one of each possible in the double harmonic, and none possible in the symmetrical scales.

Ex 8



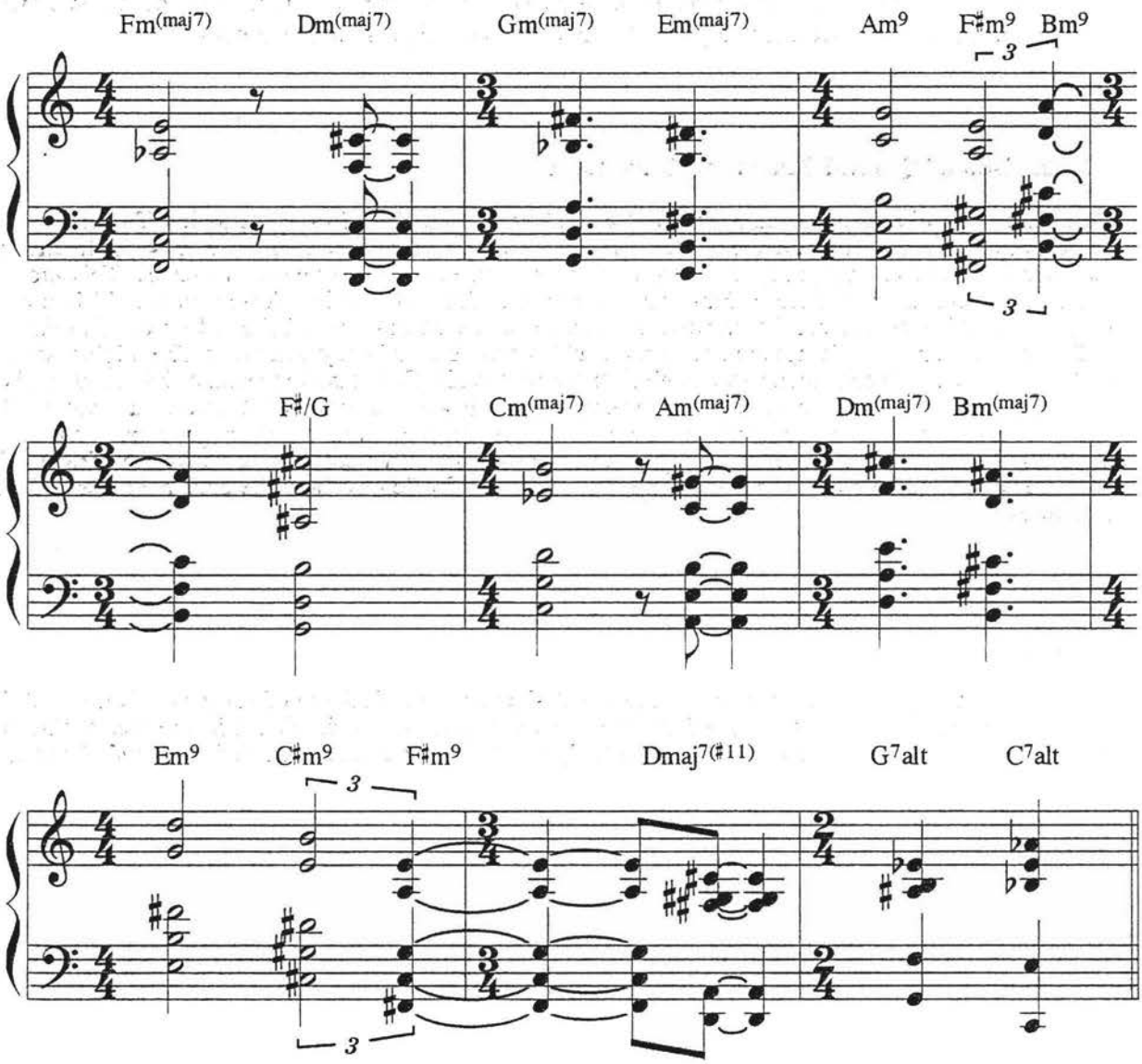
[8] The forms here are based on techniques discussed in a lecture by Donny Nolan at the IAJE conference in New Orleans 2000.

(c) Chords based on 5ths (Quintal structures)

When 5ths are stacked up to produce a chord voicing, many interesting and complex structures result. Quintal voicings are common in jazz, particularly in the European influenced music. The 5th is a very strong interval and when combined with others creates a very sonorous voicing. Jazz pianist Kenny Barron is often attributed as being the founder of these voicings, it's more likely he just used them more than anybody else. Pianist Lyle Mays has written many compositions that utilise these structures since the early 70s, reflecting a European approach. The British jazz pianist John Taylor has explored the use of 5ths in many of his compositions. They have a full-bodied sound that utilises the overtones of the piano to its full. They are also very effective with horns and sound excellent with strings.

Example 1[9] shows an excerpt from a composition by John Taylor called " Evansong", written for Evan Parker. The harmony is constructed almost exclusively in quintal voicings.

Ex1 Evansong



[9] From a transcription by Nicky Iles.

Explanation for Following Charts

Voicings in 5ths (common forms)

This chart shows the common quintal forms and explains their structure and function. Each of the chords contains two sets of spread out 5ths with an interval of a semitone or wholetone between. These are the most common structures in use in jazz. Each voicing is accompanied by an explanation of its origin and function.

Equivalent uses of Structures in 5ths

This chart shows the equivalent uses of each of the common forms. To get each variation the bottom note of the voicing is replaced with a new note, giving a different quality to the original voicing. Chords that fit within the melodic minor scale are very versatile and have several possible root notes.[10]

Comparison of Quintal Pentatonic Structures

This chart is a variation of the comparison of quartal voicings derived from pentatonics. To derive quartal voicings from a pentatonic scale the chord is built by piling up alternate notes from each scale. In this chart the chords are derived by piling up every third note from each of the pentatonic scales. This produces chords that have an abundance of 5ths, with 6ths and diminished 5ths in a lesser amount. This use of a formula to derive chords has its drawbacks as some of the chords are unbalanced or too dissonant for ordinary use, but many voicings are usable and could not be derived in any other way. The original scale for each set of voicings is compared to the original minor pentatonic. For example the minor b5 pentatonic is the same scale as a minor pentatonic but has a lowered 5th, an insen scale has its 3rd lowered a semitone. This can be most useful when memorising these structures. If the original minor pentatonic chords are memorised then it is just a matter of raising or lowering the appropriate notes of the voicing to bring it in line with the scale. The chord symbols to the right of each set of voicings show the equivalent uses of those structures.

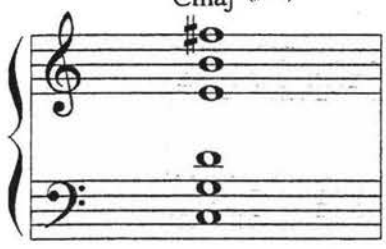
Azimuth 5

This is a short original by the author for piano that shows the musical use of some of this material. The piece has no fixed key and is almost dodecaphonic in some parts. A few simple motifs are used to thread all the keys together. The voicings here tend to be fairly bright in sound as they are derived mainly from major and minor scales.

[10] The principle of melodic minor substitution is covered on page 84

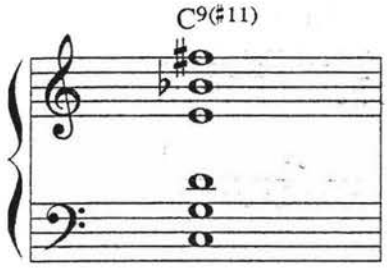
Voicings in 5ths (common forms)

Cmaj$^{9(\sharp 11)}$



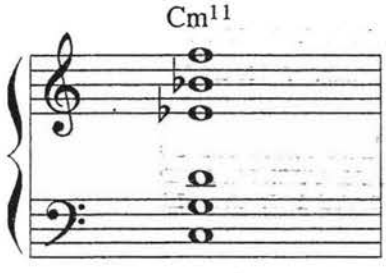
The first structure is the maj9# 11 voicing which is just two groups of perfect 5ths separated by a wholetone. This chord is particularly bright with the raised 11th on top and the way the 5ths are separated gives it a resonant tone.

C$^{9(\sharp 11)}$



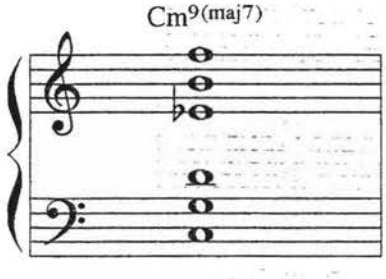
This is the same chord as above but the 7th has been lowered giving it a darker sound, making it useful for dominant function. This alteration puts it in the realm of melodic minor harmony so many equivalent uses are possible.

Cm^{11}



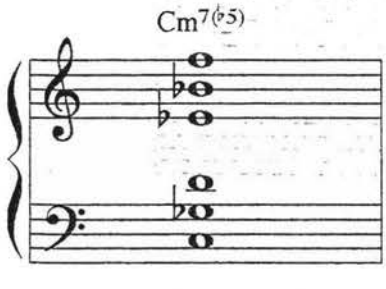
This quintal structure is based on two sets of perfect 5ths separated by a semitone giving it a structure that is compatible with minor function, either as a subdominant or tonic minor The minor 2nd in the middle of the chord gives it a strong character.

Cm$^{9(maj7)}$



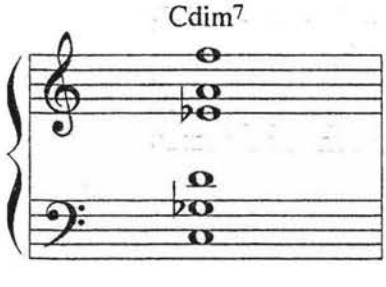
This chord is the same as the one above with the exception of the 7th which has been raised by a semitone, producing a minor (major) 7th chord. This chord functions well as a tonic minor. It comes from melodic minor harmony so consequently has many equivalent uses.

Cm$^{7(\flat 5)}$

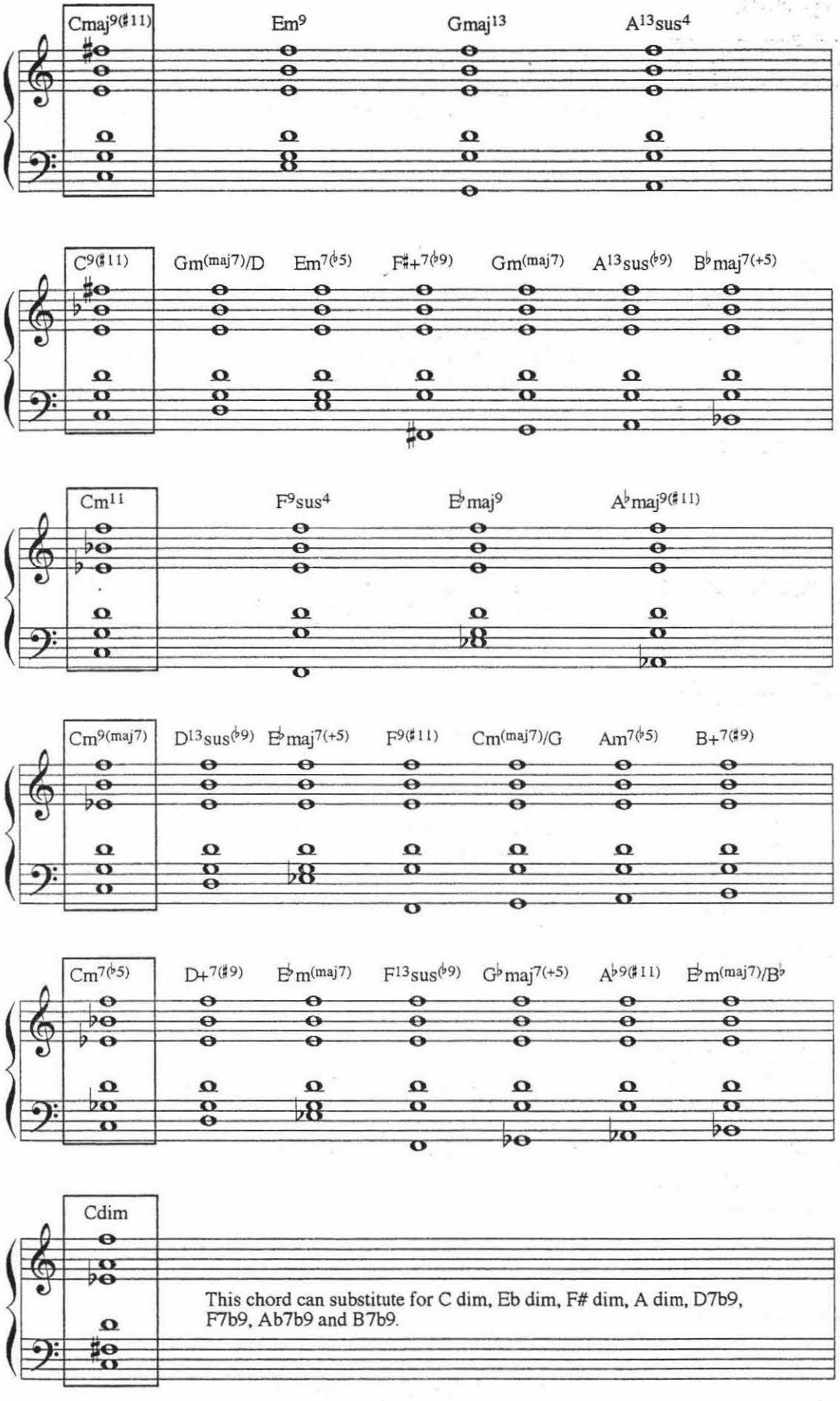


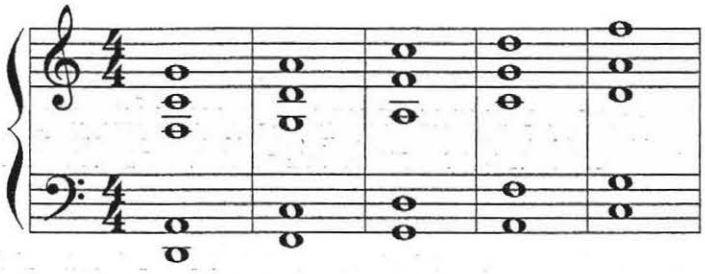
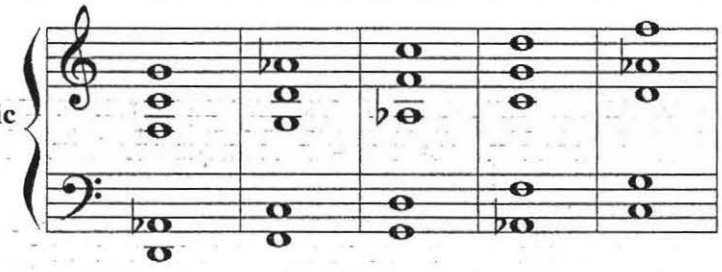
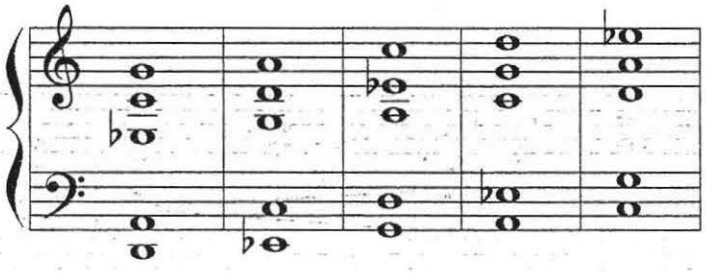
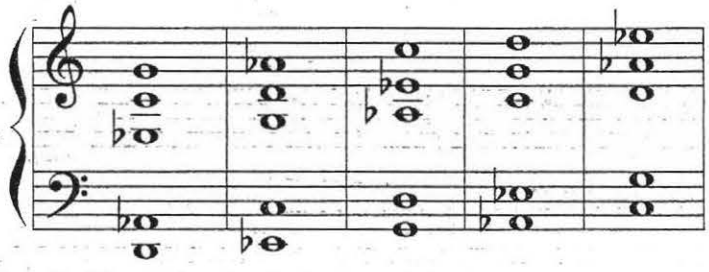
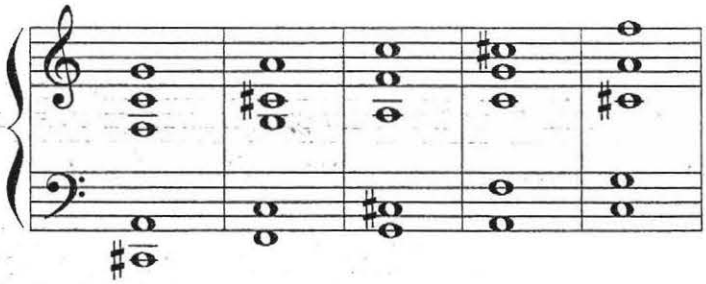
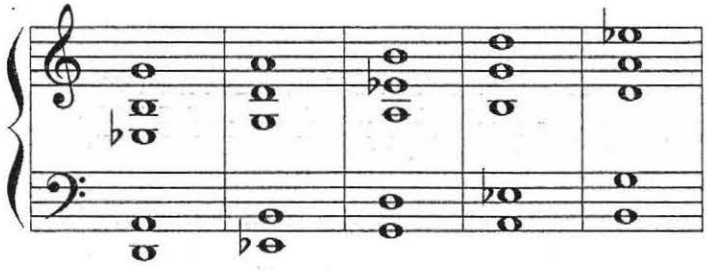
This is the minor 7th voicing with a lowered 5th giving an excellent voicing for half diminished function. This one is based on melodic minor harmony giving it many equivalent uses. It functions well as chord II in a minor key or can be used in any subdominant role.

Cdim^{7}



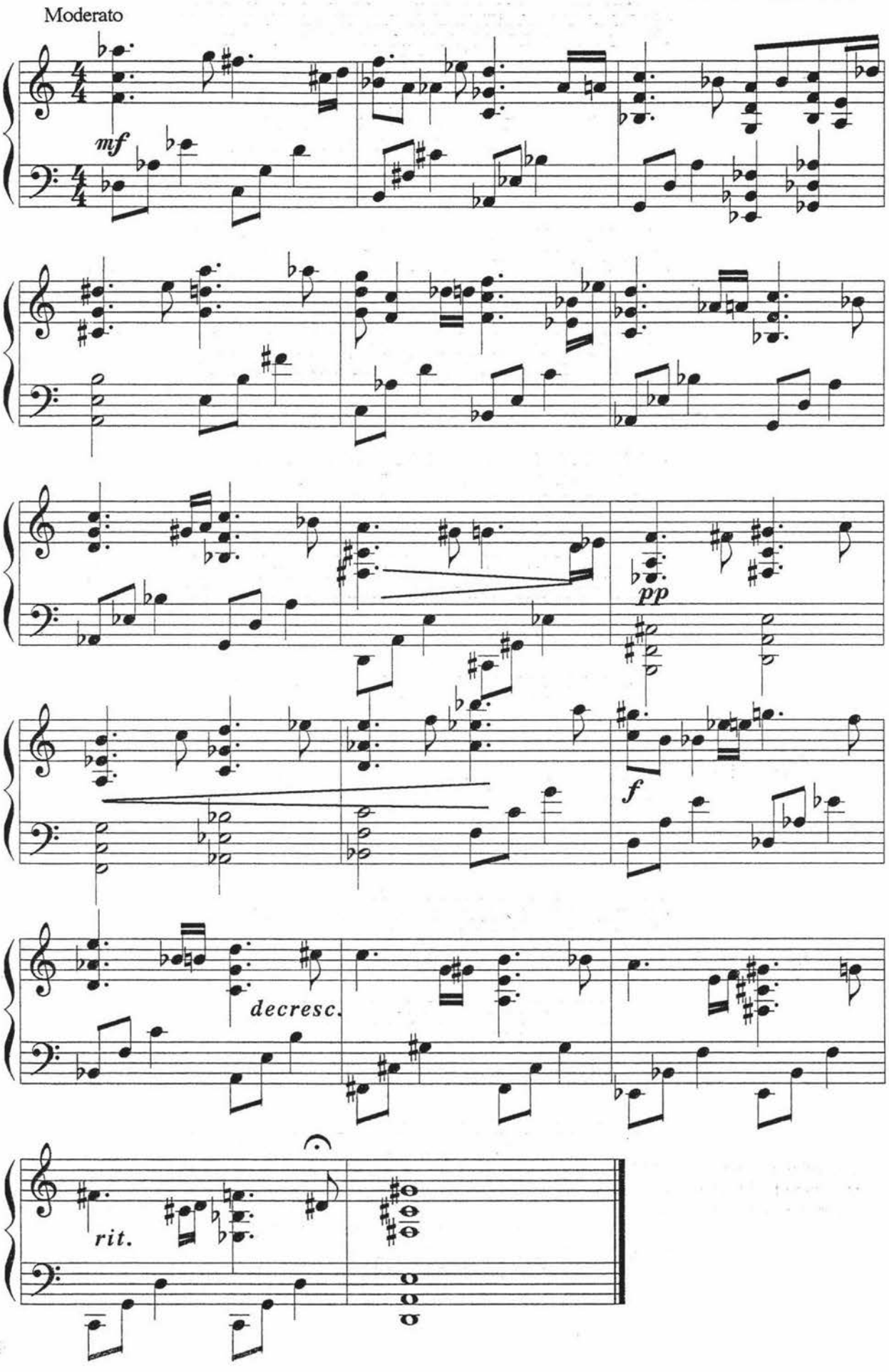
This chord is the basic minor shape with the 7th lowered to give a 6th, and the 5th is lowered to create a dark voicing that functions as a diminished. The density of this chord is due to its double diminished nature and can function in any diminished relationship.


Cmaj9(♯11)
Em9
Gmaj13
A13sus4
C9(♯11)
Gm(maj7)/D
Em7(♭5)
F♯+7(♭9)
Gm(maj7)
A13sus(♭9)
B♭maj7(+5)
Cm11
F9sus4
E♭maj9
A♭maj9(♯11)
Cm9(maj7)
D13sus(♭9)
E♭maj7(+5)
F9(♯11)
Cm(maj7)/G
Am7(♭5)
B+7(♯9)
Cm7(♭5)
D+7(♯9)
E♭m(maj7)
F13sus(♭9)
G♭maj7(+5)
A♭9(♯11)
E♭m(maj7)/B♭
Cdim
This chord can substitute for C dim, Eb dim, F# dim, A dim, D7b9, F7b9, Ab7b9 and B7b9.

Names of scale with comparison to minor pentatonic		Equivalent chord symbols
D Minor pentatonic		**Dm** **G7sus** **Fmaj7** **Bbmaj7** **Ebmaj7#11** **B7alt**
Minor b5 pentatonic 5th lowered semitone		**Dm7b5** **E7alt** **Abmaj7311** **Fm6** **G13susb9** **Bb13**
Insen 3rd lowered wholetone		**Am7b5** **D13susb9** **Cm13** **Ebmaj7#11** **F13** **Ab/G**
Iwato 3rd lowered wholetone 5th lowered semitone		**Bb13sus** **Fm13** **Abmaj7#11** **Cm#5** **Ab/D** **Ab/G**
Scriabin pentatonic root lowered semitone		**A7#9** **Eb13#11** **Dbmaj7#5** **Fmaj7b13** **Bbm6** **Gm7b5**
Altered pentatonic 3rd lowered wholetone 7th lowered semitone		**B7alt** **F13#11** **Ebmaj7#5** **Cm(maj7)** **Am9b5** **Gb13**

Azimuth 5

L.Jackson

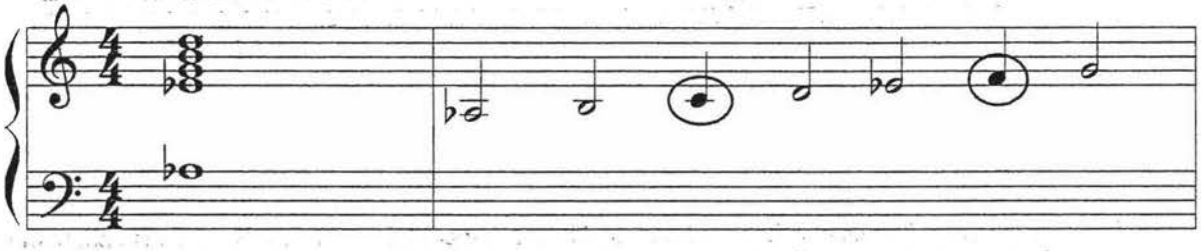


(d) Voicing Analysis

If all of the notes in a chord voicing are reduced to fit within one octave they can be written out in a form resembling a scale. Unless the chord contains seven notes the scale is certain to have gaps in it. These gaps can be filled with several different note possibilities resulting in multiple scale options.

Example 1 shows an Ebmaj7#5 chord with an Ab in the bass. To analyse this voicing it is helpful to find a scale that is compatible. The first step is to write the notes in a scale form by putting all of the notes within an octave. In this case there are five notes, so two more are needed to make a common seven-note structure. The C is almost certain as the only other note possible between B and D is C#, this would mean that there would be three semitones in a row making a possible link with an exotic scale. F seems a logical choice between Eb and G. An E would produce another interval of a minor 3rd, so would the use of an F#. The idea is to find notes that conform to the most basic scale. Even though these minor 3rd intervals might work with an exotic scale, it is important to find its function first in a major or minor harmonic environment. On closer inspection the scale appears to be a C harmonic minor, revealing the function as an extended voicing for chord VI in a minor key.

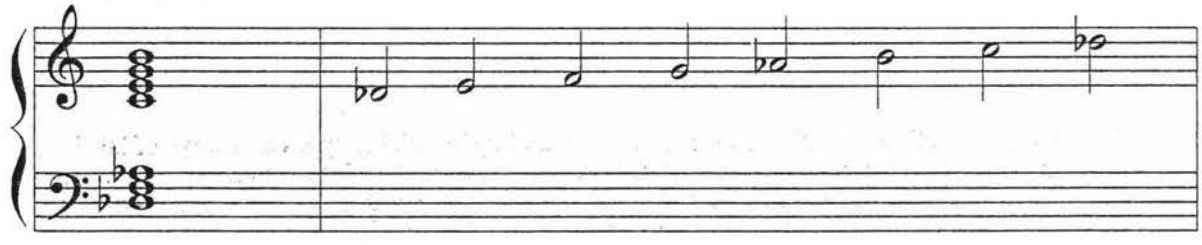
Ex 1



The scale in example 1 is only one possible scale for this chord. It is interesting to note that many scales can be identified by putting different notes between the existing chord tones. This is a particularly useful technique when non-diatonic tones are needed to elaborate diatonic harmony.

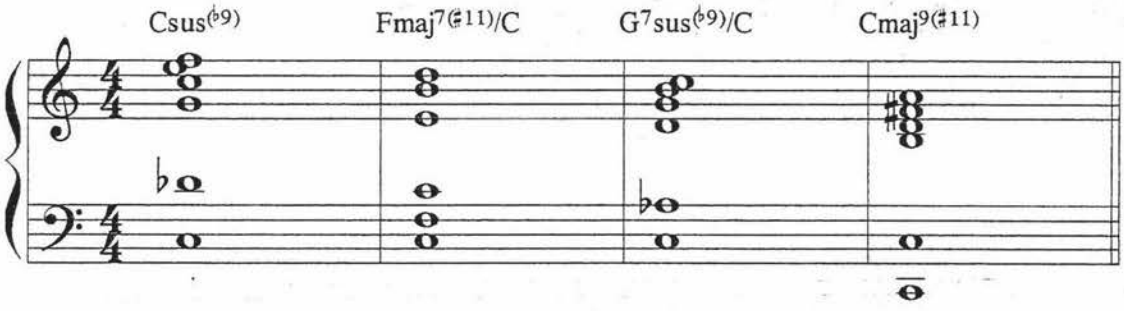
As a rule of thumb, the more notes contained in a chord, the easier it is to identify the parent scale. If the chord voicing has more than seven notes that can present other problems. Example 2 is a chord with seven different notes making it an easy task to find a scale. However, naming the scale and trying to find a function is another matter. The incidence of two minor 3rds indicates that it may be related to an exotic scale construction. The scale here is the seventh mode of the double harmonic, which as yet is without a name. In terms of function it is often best to play the chord to determine if it has a resolving tendency.

Ex 2



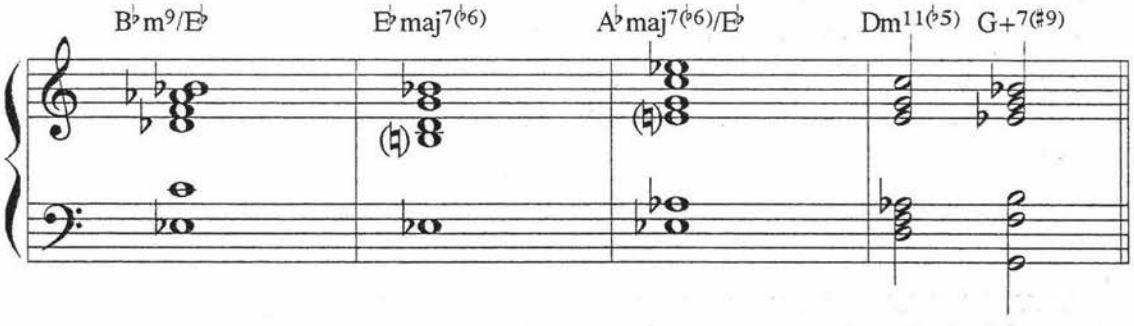
Example 3 shows the first few bars of the first movement of "*Symbiosis* "[11] written by Claus Ogerman and performed by Bill Evans. In the opening bars these chords appear in the horns but without the C pedal in the bass. At the end of the section the chords appear again, this time with the C pedal. On closer inspection the Csus(b9) is functioning as a dominant chord that resolves into the F Lydian chord in bar 2. Without the C in the bass the first chord is still functioning as a dominant chord. This is clear when it is played in the context. This fact makes it more likely to be a dominant chord, although there are many possible spellings. Bar 3 to 4 contains a similar relationship but this time the C pedal creates a more dissonant dominant chord.

Ex 3 Symbiosis



Example 4 shows the piano voicings played by Herbie Hancock in the last 4 bars of his composition "Dolphin Dance". The chord in bar 2 appears to have a natural 5th and a raised 5th. This indicates that the latter is really a lowered 6th. If the chord is converted into a scale the best option seems to be an Eb harmonic major. Bar 3 contains a chord that is a transposition of the one in bar 2 but an Eb pedal is added. The final bar has a D minor 7th with a lowered 5th and a bVII major upper structure. The final chord is a G dominant chord with a bVI major upper structure.

Ex 4



The principles outlined in this chapter give a grounding in voicing types and ways of labeling them. Pentatonic derived chords, upper structures, 4-way-close, drop 2, quintal voicings, double diminished chords, ambichords and clusters are all distinct structures. Slash chords are analysed in detail in chapter 4 as their function is very dependent on their harmonic environment.

[11] From the score of *Symbiosis* published by Glamorous Music, New York.

4. Exploring Harmony

"A succession is aimless; a progression aims for a definite goal. A progression has the function of establishing or contradicting a tonality. The combination of harmonies of which a progression consists depends on its purpose - whether it is establishment, modulation, transition, contrast or reaffirmation. A succession of chords may be functionless, neither expressing an unmistakable tonality nor requiring a definite continuation." [1]

Schoenberg distinguishes between a succession and progression of chords as being a matter of expressing a tonality. A progression is clearly defined as being a series of chords that either contradict or establish a tonal region. No matter how far the chord may be from the key it is still serving to establish a tonality. This definition fits a large percentage of the harmonic movement in jazz. Although most chord sequences contain substitution, alteration or superimposition they are constructed to affirm an overall tonal centre. Substitution, alteration and superimposition are explored in this chapter.

Jazz musicians have pioneered the use of remote harmony to such an extent that it has been necessary to develop a distinct language and syntax. As chromaticism in melody and harmony gradually increased in jazz, a new way of codifying this more remote harmonic material was needed. Most of the finest examples of jazz harmony are available only in recorded form, adding to the difficulty in researching this area. This knowledge is held by the practitioners of the craft and passed down in the manner of a master-apprentice relationship. All the early improvisers learnt their craft this way, as there were no colleges or university programmes in existence. The first of these began around 1960 with the New England Conservatory under the guidance of Gunther Schuller.

As jazz became more popular in college curricula around the world, its structure was codified and a new language was born. This material was based on a language that musicians had already been working with in a practical sense for years. Most of the people that codified and classified this music were practitioners themselves. The language of jazz is constructed so it is applicable to the act of improvisation. The use of chord symbols, formulas for chord progressions, scales and digital patterns are all concepts that facilitate fast thinking and lead to the possibility of more spontaneity in a performance situation. In the way that figured bass was the chord accompanists shorthand in the baroque era, the harmonic complexity of jazz has led to the development of its own specialised shorthand in the form of chord symbols. The very fact that many great jazz compositions in its history have been conveyed just by a written melody and chord symbols, is a tribute to the efficiency of this system, not to mention the creativity of the artist.

To understand how jazz harmony has developed into such a complex form it is necessary to trace its origins in European classical music. The harmonic and melodic devices of J.S. Bach and his contemporaries were fundamental in the development of modern harmonic techniques. The organ chorales by Bach are an essential source of material for any musician, jazz or otherwise, as they contain extensive reharmonisations of simple melodies. Much of this material forms the basis for the teaching of classical harmony and is still regarded as the mainstream core of study, much in the same way that bebop is fundamental for the student of jazz. The tradition of the church organist is still practised throughout Europe, and is part of a tradition that is centuries old. Many colleges in France have programmes of study that have changed little since the time of Bach. It is one thing to understand the academic principles behind counterpoint and harmony, but to deal with these elements as a resource for improvisation presents a completely different challenge.

Although jazz has developed a unique language its harmony undoubtedly has its roots in European classical music, as the fundamental principles are very similar. The harmonic language of jazz fits into four main categories.

Diatonic
Extended diatonic
Tonal chromaticism
Non-tonal chromaticism

[1] From Structural Functions of Harmony.

(a) Basic Resolutions

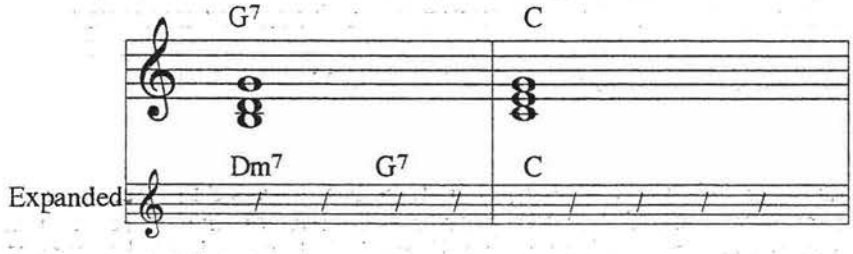
Despite the complexity of jazz harmony most cadential resolutions fit into one of four categories.

Perfect Cadence: Very common in standards, has many relative substitutions coming from V7b9 diminished. G7-Cmaj, Bb7-Cmaj, Db7-Cmaj and E7-Cmaj are all related to the perfect cadence.

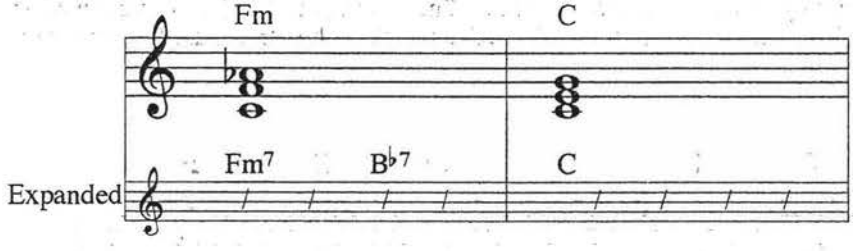
Plagal Minor: Based on harmonic minor harmony containing the lowered 6th. This is also related to the backdoor cadence which is Bb-Cmaj. Harmonic minor harmony works well in a major context but not vice-versa

Diminished: this cadence is common when delayed resolutions are used, or sometimes for pedal point harmony. The use of diminished substitution produces relative cadences of F7-Cmaj, Ab7-Cmaj, D7-Cmaj and B7-Cmaj.

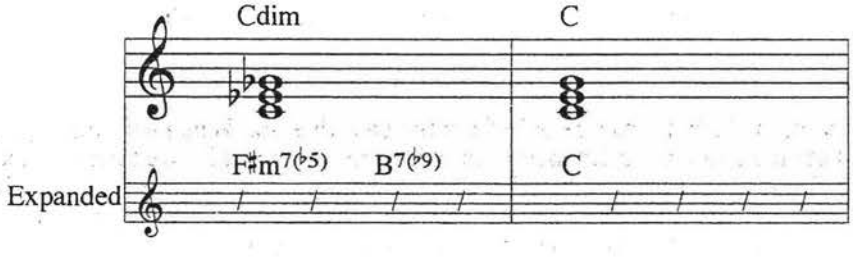
Plagal: This covers all subdominant resolutions. In C this would be F-Cmaj or Dm to Cmajor. The lack of strength in this cadence means that it is often found in conjunction with the others.



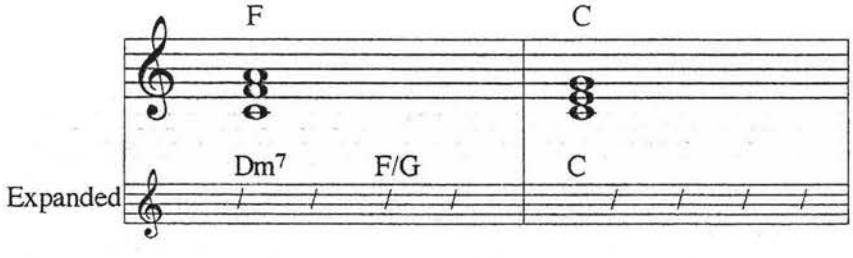
Perfect
V-I



Plagal Minor
IVm-I



Diminished
I dim - I

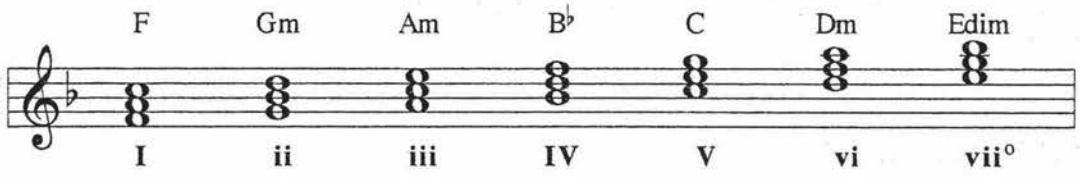


Plagal
IV-I

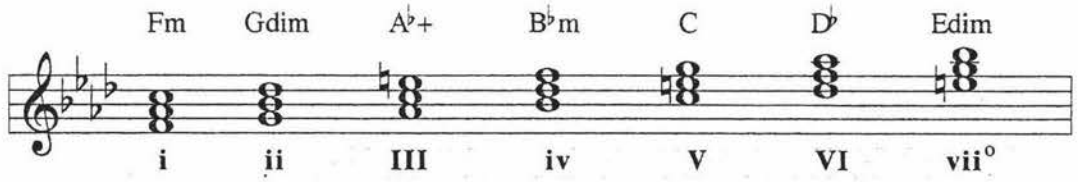
(b) Basic Harmonisation

Example 1 and 2 show the chord scales of F major and F harmonic minor with triads piled up on each scale note. The roman numerals underneath represent the diatonic degree of the chord as in classical music theory. Most simple chord progressions are made up from diatonic chords each with their own individual function in the tonality. Most jazz progressions are based on these simple functions but with much more use of extended chromaticism and extensions.

Ex 1 **F Major**

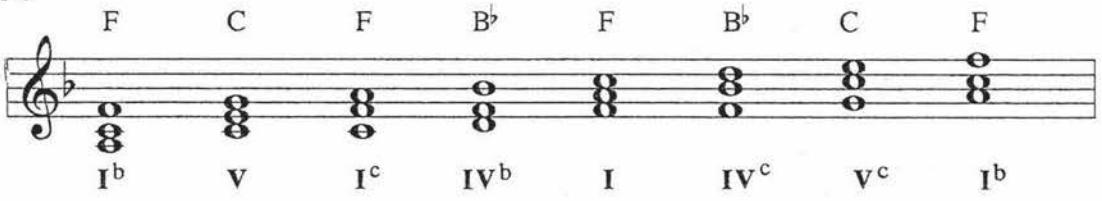


Ex 2 **F Harmonic Minor**



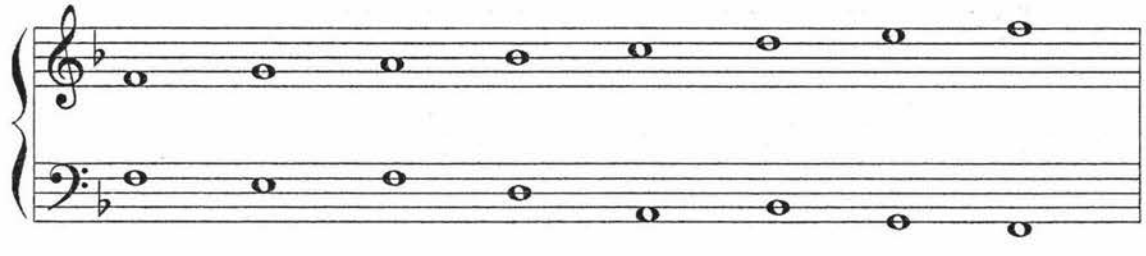
In jazz chord progressions and harmonisations, voicings tend to be based around the melody they are supporting. In standard jazz harmony many of the voicings are constructed from the top down. This is as necessary as being able to harmonise from the bass line up. Example 3 shows a simple harmonisation of the major scale using chords I, IV and V. The roman numeral system of inversions is the standard notation as in classical harmony where b - 1st inversion, c - 2nd inversion etc. The basic function of chords can be demonstrated on the harmonisation of a scale, which is then translatable to the complex harmonisation of melodies.[2]

Ex 3



One feature of this type of harmony is that it can be built from the bass line up. When learning 4-part harmony it is essential that the melody and independent bass line are connected by well constructed functional chords. Example 4 shows one possible bass line which can be used to harmonise the scale. There are hundreds of possible bass lines, each having its own unique set of chords. The best way to come up with these is to sing them while the scale is being played on the piano.

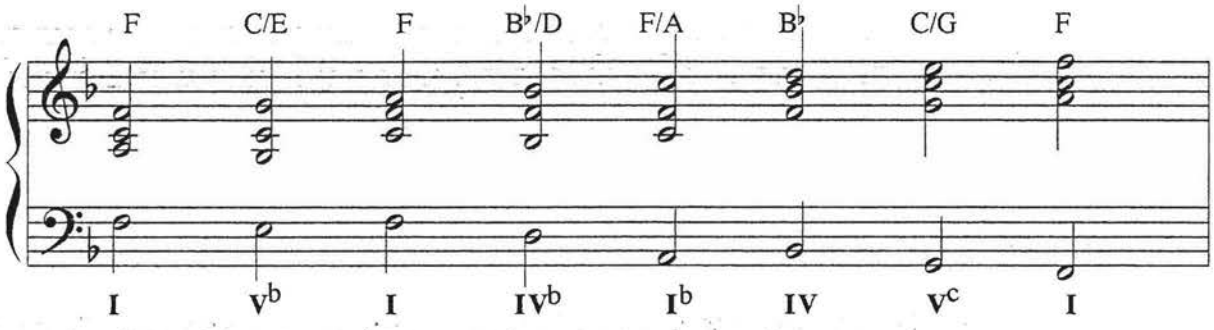
Ex 4



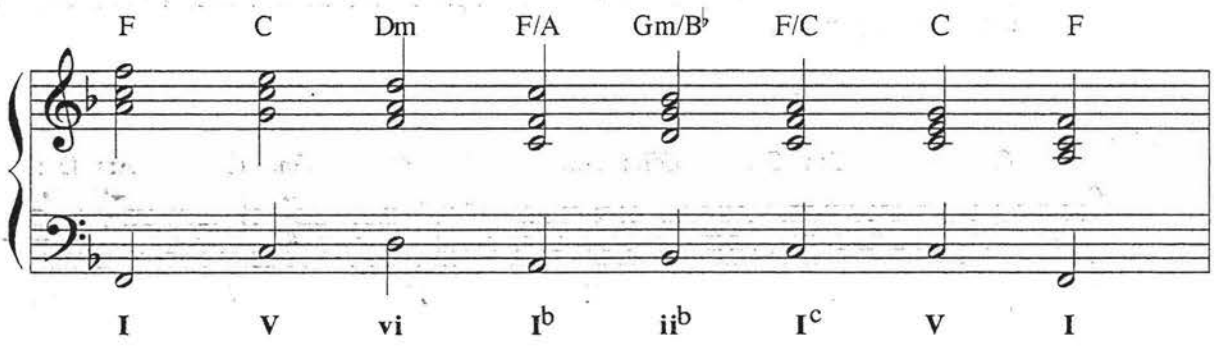
[2] The use of a ascending and descending scales to demonstrate various harmonisations are used throughout this thesis. This gives enough information to be applicable to harmonising melodies.

Example 5 is a harmonisation that connects the bass and treble lines together. The subject of 4-part harmony is large and many books have been written on the subject. This type of harmony is fundamental to understanding the function of chords and the connection with polyphony. In these examples the harmony is largely a function of the two polyphonic voices of the bass and treble and the harmonic implications inherent in them. Example 5 through to 8 are sample harmonisations of scales underpinned by an independent bass line.

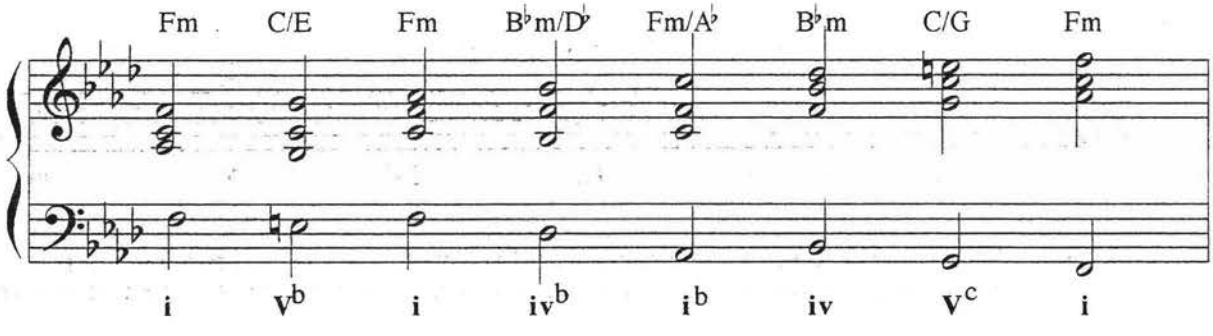
Ex 5 Major Ascending



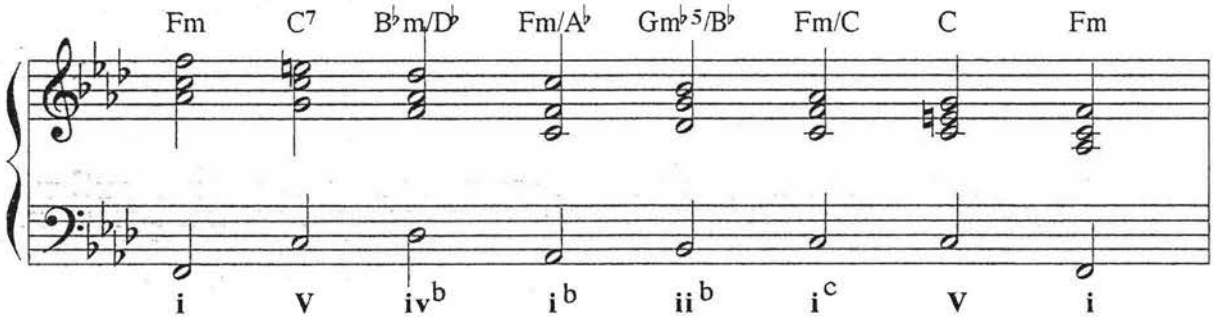
Ex 6 Major Descending



Ex 7 Harmonic Minor Ascending

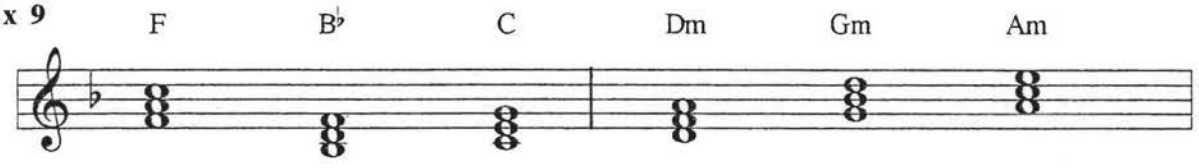


Ex 8 Harmonic Minor Descending



The diatonic chords of F major are shown in example 9. There are three major, and three minor key centres. The chord left over is chord VII which is really a chord V substitute.

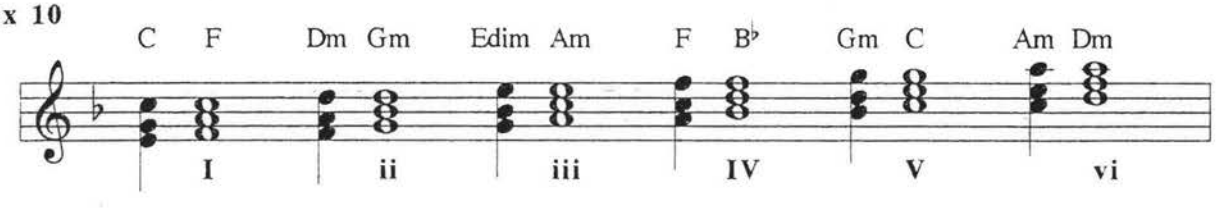
Ex 9



Passing Chords

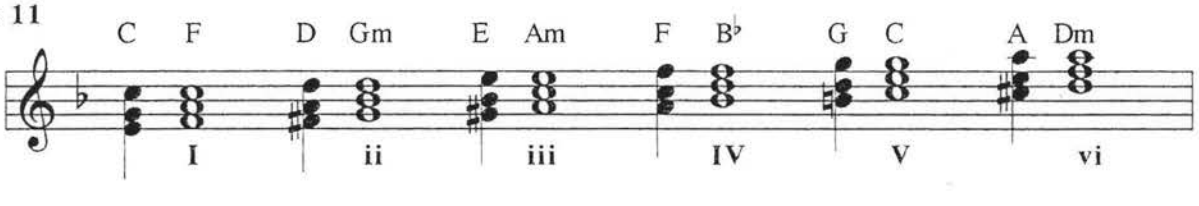
Chord V or the dominant of a key undoubtedly produces the strongest cadential movement. The dominant chord has a lack of stability that insists on resolution to the tonic chord. In fact most chords in a diatonic situation can be preceded by a chord built a 5th above or a 4th below. Example 10 shows each diatonic chord being preceded by its own V chord. Even though these V chords are not dominant structures they still create a need for resolution. This principle is fairly simple but is fundamental to how passing chords work in diatonic harmony in jazz.

Ex 10



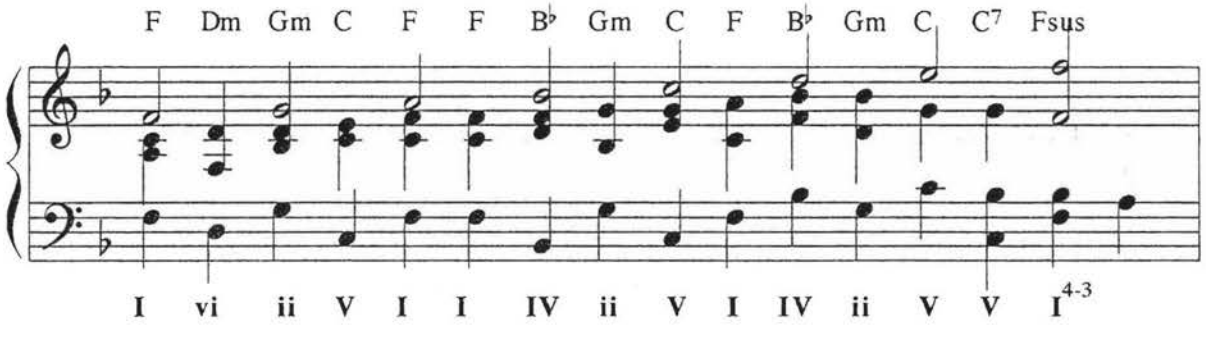
Example 11 shows what happens if each of the diatonic V chords are replaced by major chords, functioning as dominant chords in each case. These are known as secondary dominant chords.

Ex 11



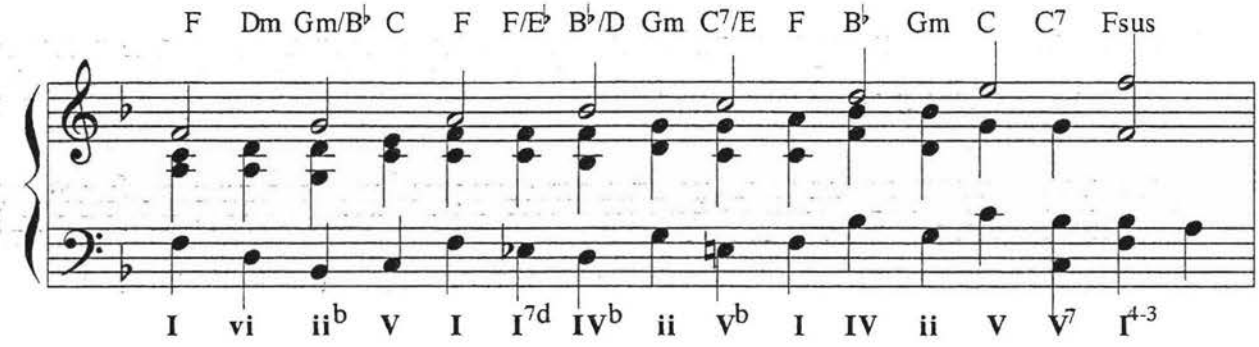
Example 12 shows the diatonic use of these passing chords when applied to a scale harmonisation. The chord sequence is based entirely on root position chords giving a large degree of movement in the bass.

Ex 12



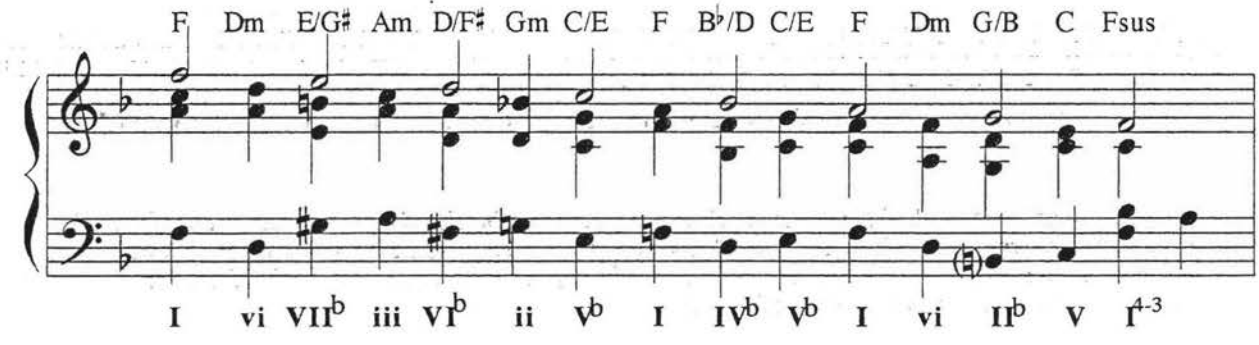
Example 13 is the same chord progression but has a revised bass part. By using inversions the movement in the bass is much smoother. The use of an F dominant in 3rd inversion (F/Eb) leading into the Bb/D is an example of secondary dominant function. It is important not to double the 3rds in the voicings as this affects the resonance. Traditionally, in this context anyway, it is best to avoid consecutive 5ths.

Ex 13 Major Ascending

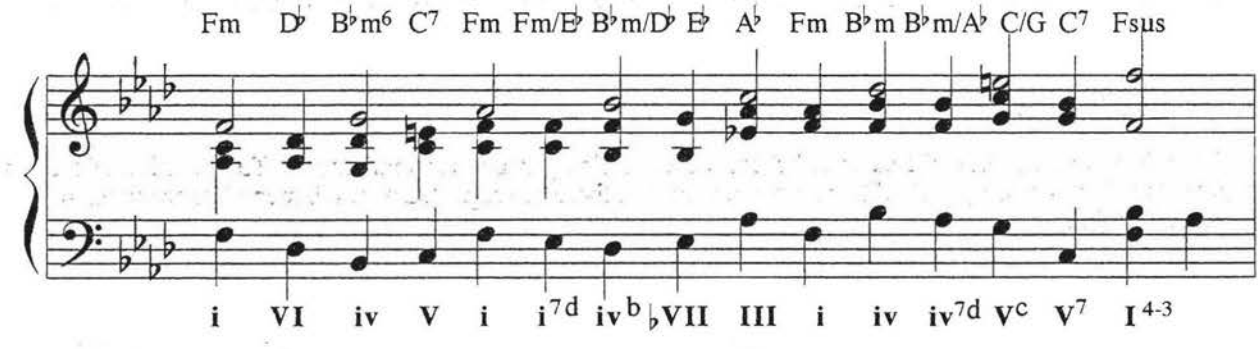


Example 14 shows a harmonisation of the descending major scale. Each of the main chords has been preceded by its own dominant. Having the secondary dominant chords[3] on the strong beats gives the harmonisation more of a sense of motion. The dominant chord G/B (third chord from the end) propels the harmony toward the suspension on the last chord. Example 15 and 16 show possible harmonisations of the harmonic minor scale.

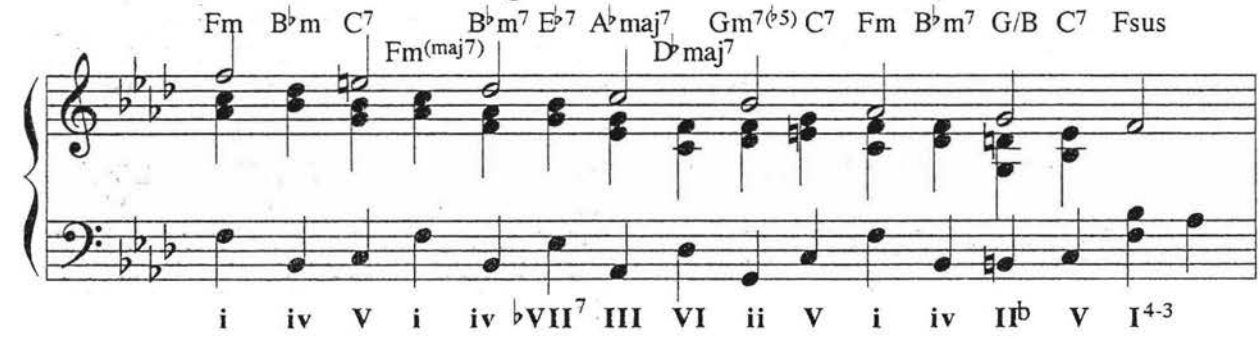
Ex 14 Major Descending



Ex 15 Harmonic Minor Ascending



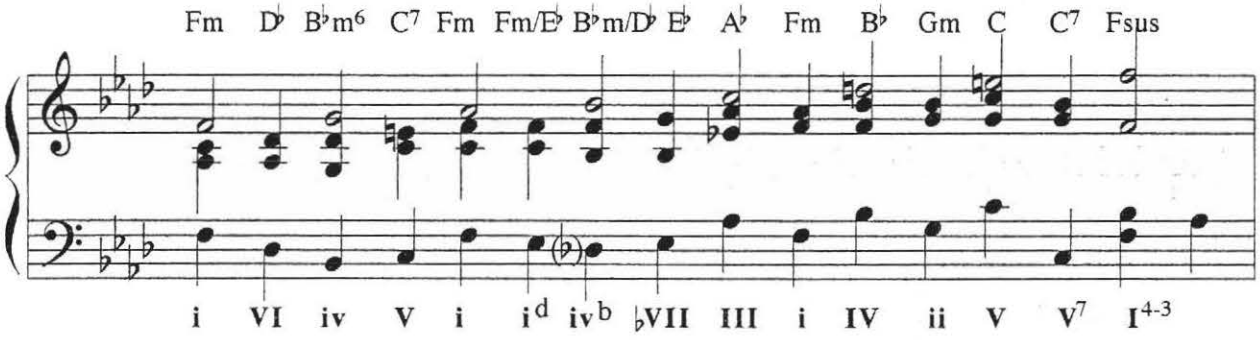
Ex 16 Harmonic Minor Descending



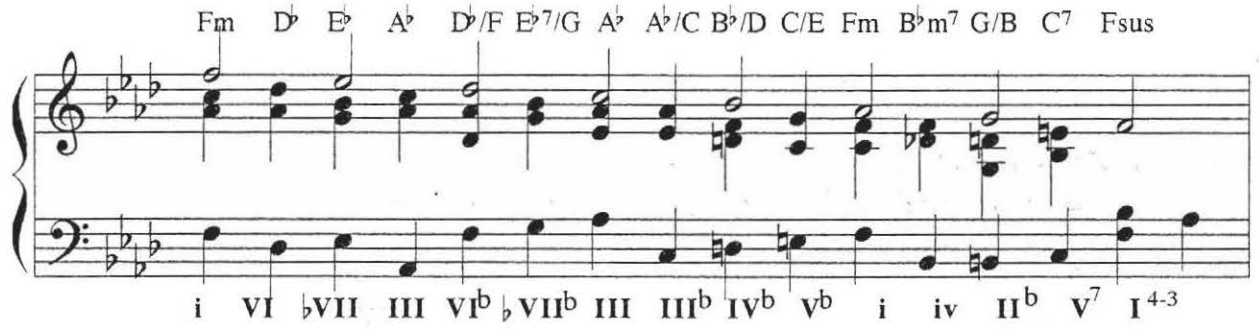
[3] The use of secondary dominant chords in jazz harmony is covered on page 75.

Example 17 and 18 show a harmonisation of the ascending and descending form of the melodic minor scale.

Ex 17 Melodic Minor Ascending



Ex 18 Melodic Minor Descending



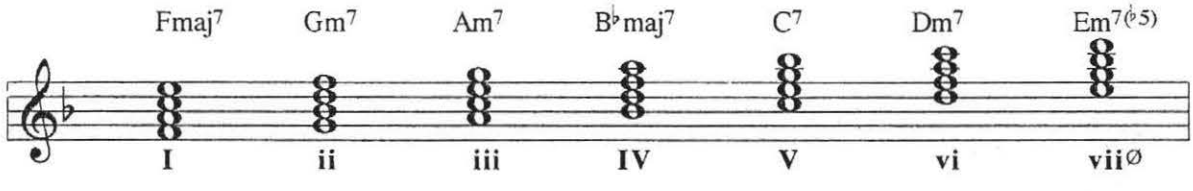
The main principle established here is the cyclic movement of the chords, which has most of them being preceded by a chord built a 4th below or a 5th above. In the case of some chords a secondary dominant is used resulting in a perfect cadence. This simple principle gives momentum to the chord sequence and was used a great deal from the baroque period onward

The above harmonisations are more reminiscent of J.S.Bach than anything found in jazz. This has a lot to do with how the extensions to the chord are used. None of these chords have any extension above a 7th.

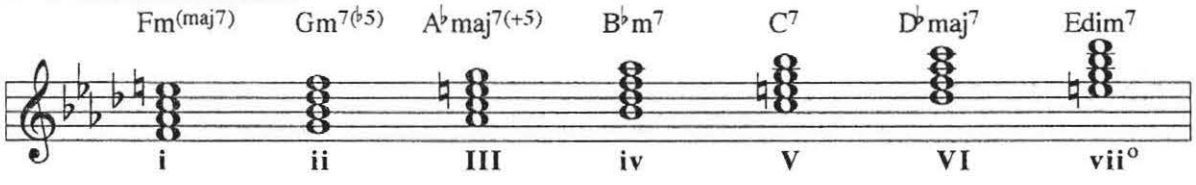
Adding Extensions

Example 19 and 20 show the extended chord scales of F major and harmonic minor. The addition of the 7th gives the chords a completely different colour. In jazz these are regarded as fundamental chord tones rather than extensions.

Ex 19 F Major

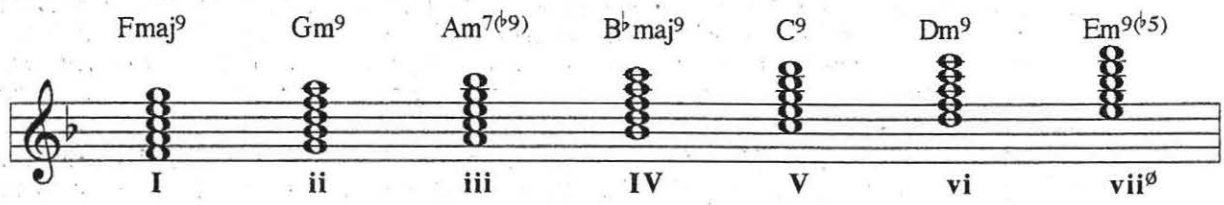


Ex 20 F Harmonic Minor

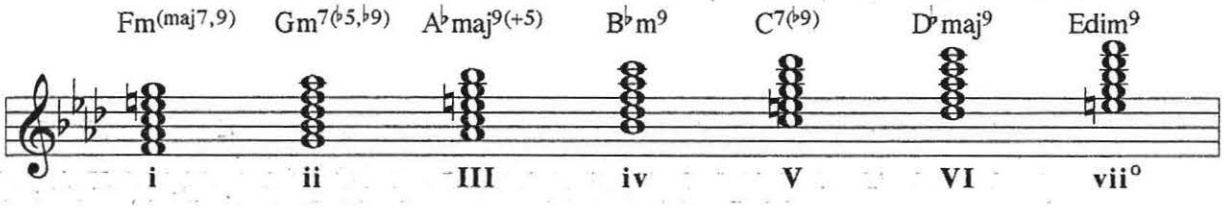


Example 21 and 22 show the chord scales for F major and harmonic minor. The sound of the 9th is added producing chords with a richer series of overtones. Each of these chords can be extended further, but beyond a 9th some of the chords become quite dissonant and unusable in this form.

Ex 21 F Major



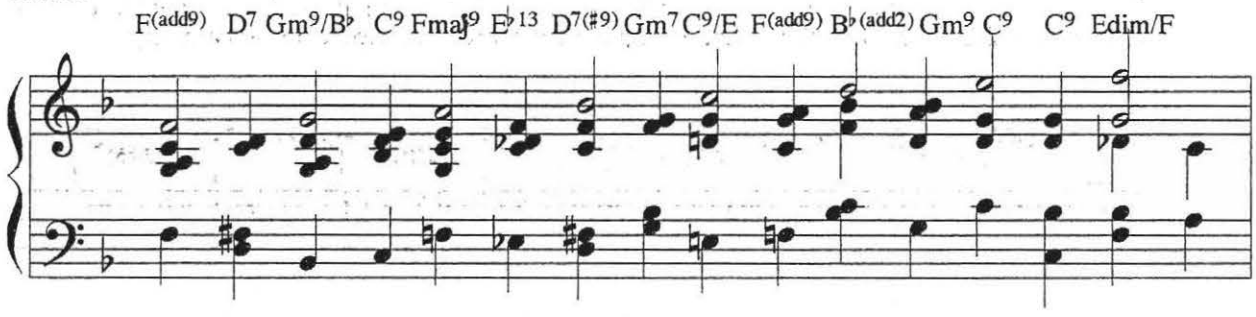
Ex 22 F Harmonic Minor



Extended Harmonisation

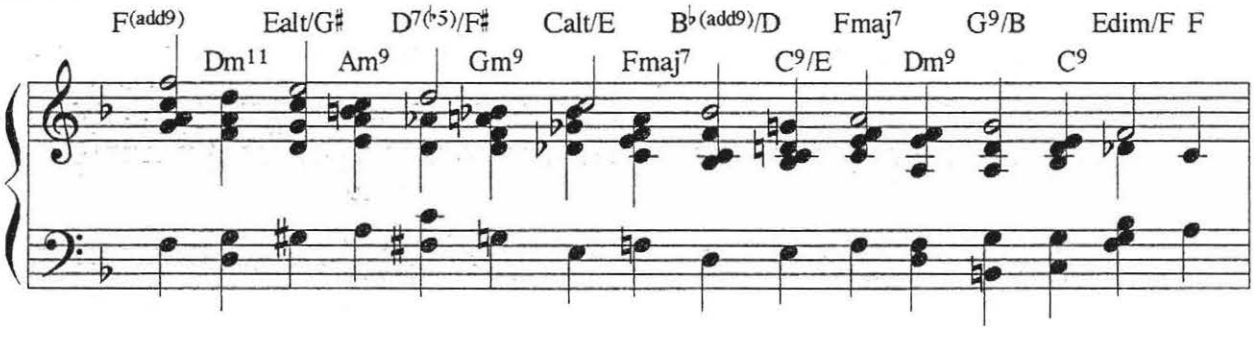
Example 23 is an enhancement of the original scale harmonisation in example 13. The addition of 7ths, 9ths and 13ths creates extended diatonic harmony which has a more dense sound than the original. The use of D7 as the second chord appears as a secondary dominant replacing the original chord of D minor. The sixth chord here is Eb13 which replaces the F/Eb chord which resolves to a Bb major in first inversion. The movement is to the chord VI dominant giving a D7 chord with a #9 and a #5 melody note. The choices here have been made based on what sounds good, as the options increase it becomes more difficult to have a set of rules.

Ex 23



Example 24 is based on the harmonisation in example 14 and shows more use of non diatonic notes, giving a very different harmonic colour. In the third chord, E7/G#, the upper structure bVI is used because of its diatonic nature within the key of F. Although many upper structures are available over dominant chords the choices are made based on the level of dissonance required at the time. An upper structure containing more non-diatonic tones in relation to the key, will create more tension. Most of the dominant chords have been altered, creating a thicker texture with more dissonance.

Ex 24

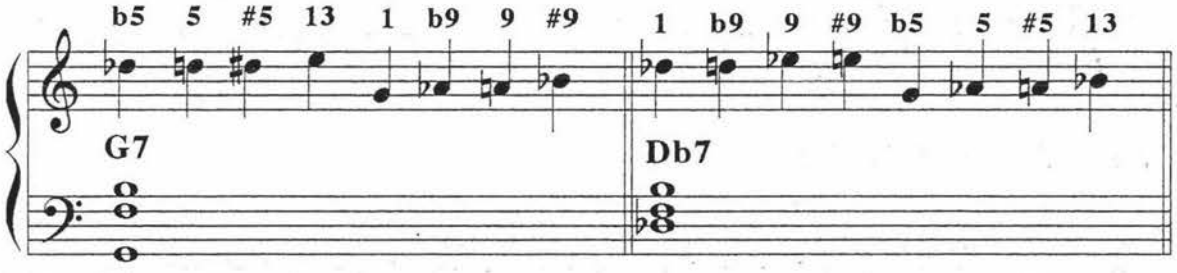


Polyphonic Elaboration

One important feature of chord movement in jazz is its polyphonic nature. Most harmony came out of the weaving together of vocal strands. Jazz big-band music of the 1930s and 1940s, particularly the writing of Duke Ellington, contained a degree of polyphonic technique. In jazz this technique has the grand title of "Contrapuntal Elaboration of Static Harmony," or CESH for short. In jazz harmony there are many more options available than the traditional uses of polyphony. The addition of all chromatic extension notes and many more ways of cadencing has taken polyphony to a new level of complexity. To fully understand the use of polyphonic movement in jazz harmony it is necessary to understand how variable areas work.

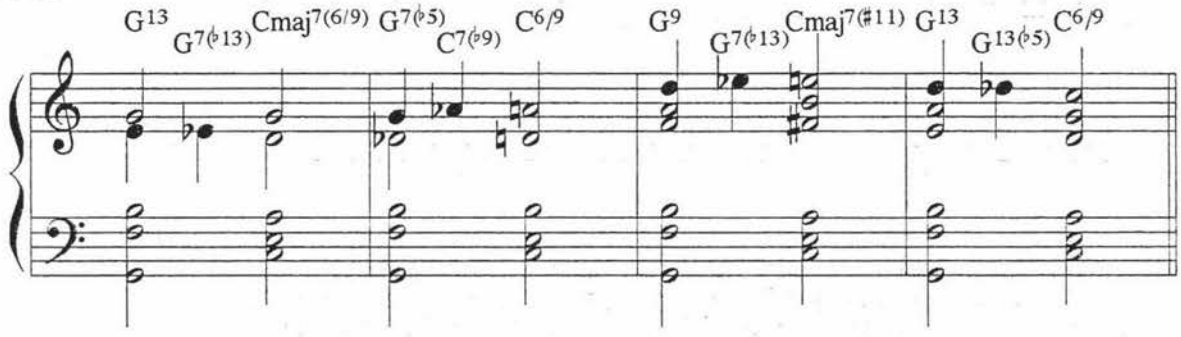
Example 25 shows the relationship between two dominant chords a tritone apart. Both share the same variable area but under each chord symbol the notes form different extensions. These are by no means the only notes that are moveable in a dominant chord but this is a good place to start. As an aside, this relationship is fundamental to the way tritone substitution works, and is covered in detail in the area on diminished harmony on page 74.

Ex 25



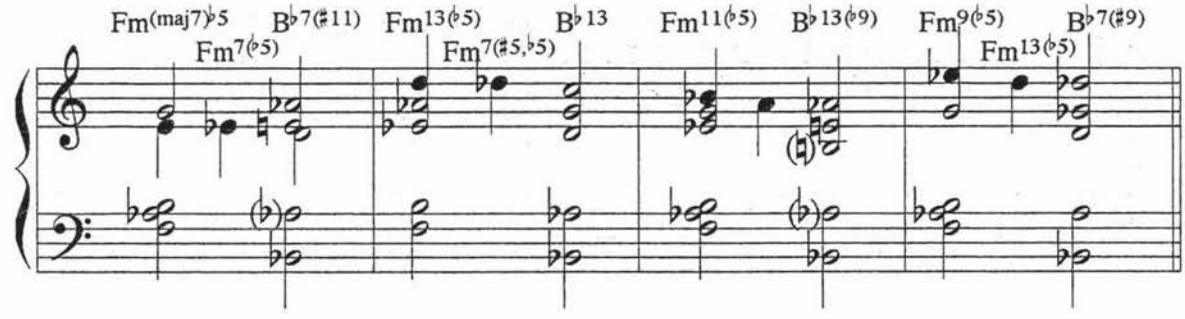
Example 26 shows some possible passing notes between G7 and C major by using these variable areas. This is a fraction of what is possible in a perfect cadence but gives some idea of the possibilities. The use of variable areas is not limited to dominant chords but is possible on they any type of chord. The variable areas above appear to work only for G7 and Db7 but in actual fact they work for Fm7b5, Abm(maj7), Bmaj7#5, Bbsusb9. These are equivalent chords in melodic minor harmony.

Ex 26



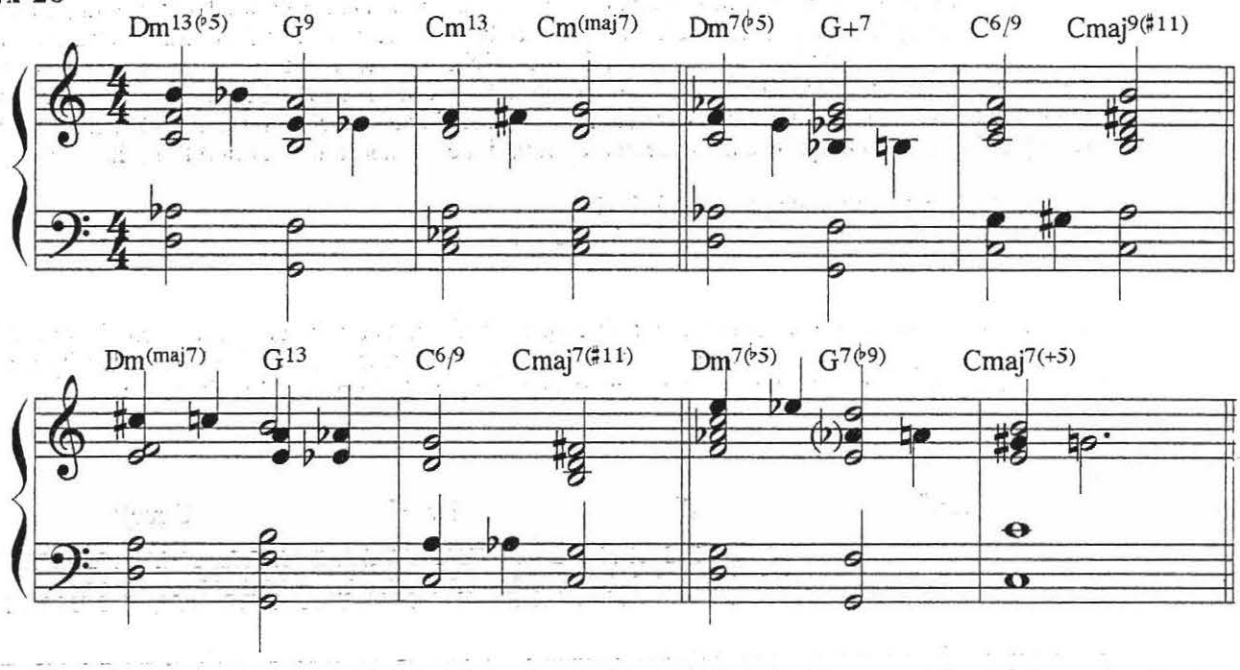
Example 27 shows how the Fm7b5 uses the same variable area on its way to a Bb7 chord in the key of Eb major or minor. The Fm7b5 is functioning as a chord II producing some very interesting structures.

Ex 27



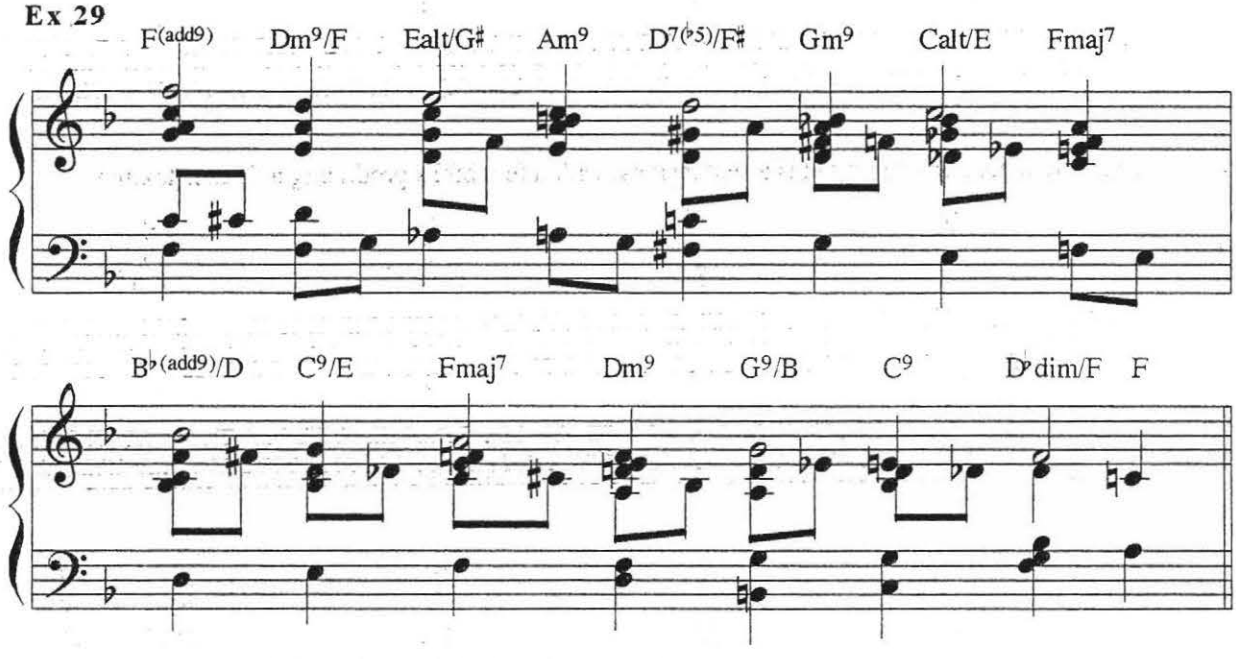
Example 28 shows the use of several variable areas in the context of a II-V-I progression in C major and minor.

Ex 28



Even though there are many extensions and non-diatonic tones, the key centre is still firmly established and the melody well supported. Example 29 shows the use of these connecting notes in the descending major scale harmonisation in example 13. To keep it sounding close to the key it is important what upper structures or extensions are used on the dominant chords. For example if the E7 alt appearing in F major has a b VI US (upper structure) then a C chord is used to create the extensions keeping it closer to the key. If a US II is used over E7 an F# chord is used to create extensions giving F#, C# and A#, two of which are very remote to the key of F.

Ex 29



Although Bach never delved into this kind of harmony it is reminiscent of the polyphonic approaches taken by him and many of his contemporaries. In jazz this type of polyphonic harmony has been developed by a number of musicians including, Bill Evans, Keith Jarrett, Herbie Hancock, Clare Fischer, Gil Evans and Jim Hall, each with his own unique approach. The use of this material in larger ensembles lends itself to the combination of instruments and many voicing possibilities. Arrangers and composers started using this technique much earlier than instrumentalists in jazz, and developed it to a very high level. Eventually chord instrumentalists caught up and it started to appear more and more in piano music. The guitar, because of its physical limitations, was late to catch on to these principles and still hasn't that many players who have developed a polyphonic approach to chord voicing

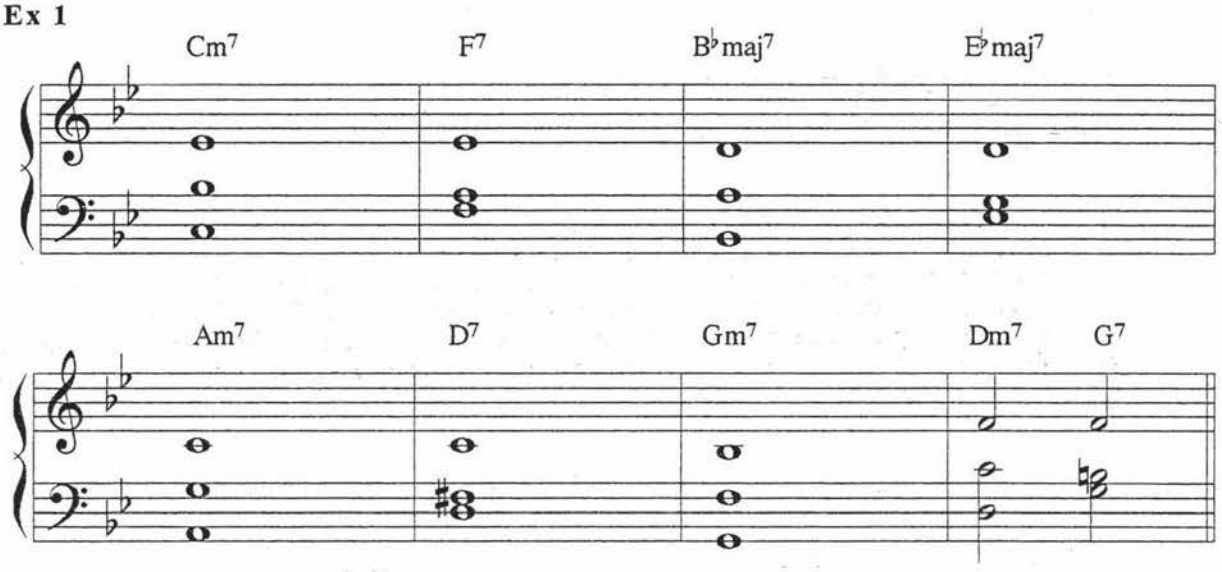
(c) Harmonic Density

If in a standard classical harmonisation extensions beyond a 7th are used the listener will perceive the harmony as slightly "Jazzy". This quality has a lot to do with the amount of harmonic density, in other words how many non-chord tones are present in the voicings. In early jazz, the chord voicings used by pianists and arrangers were fairly fundamental with little above a 9th, but in contemporary writing many extensions and upper structures are used giving the chords a richer sound. Extensions to chords basically fall into two categories, those centered around the 9th and those around the 5th.

Extensions around the 9th are b9 ,9,#9
Extensions around the 5th are 11, #11, #5, b13 and 13

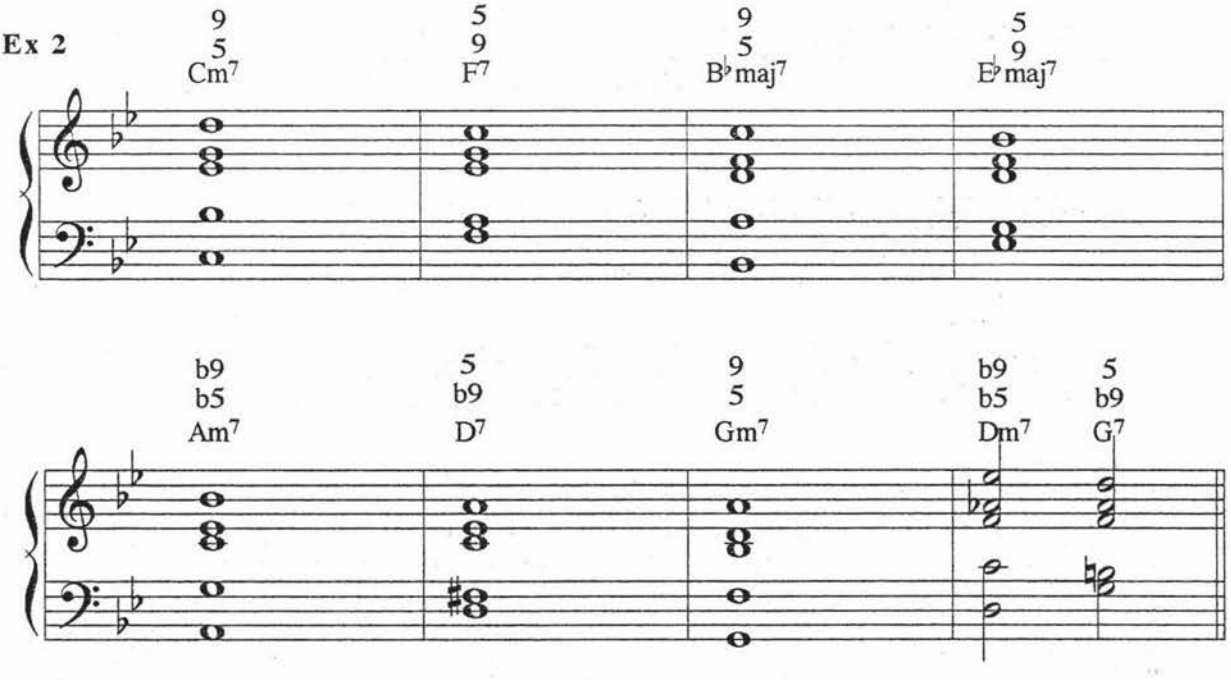
Example 1 shows chord voicings that are in three parts and don't contain any extension above a 7th. This example has a very plain sound. If the number of parts are increased it still lacks the density required to make it sound like jazz. This type of harmony occurs frequently in pop and rock music.

Ex 1



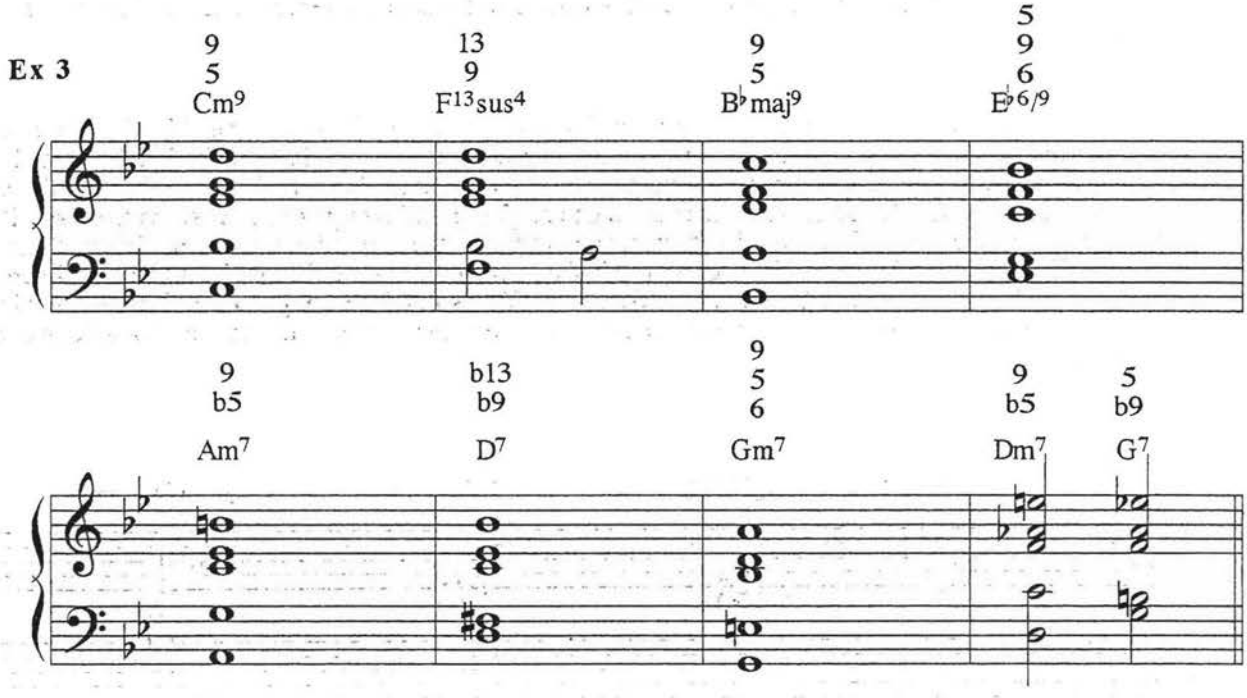
Example 2 contains mainly 9ths as extensions, with a few b5ths producing a thicker texture.

Ex 2



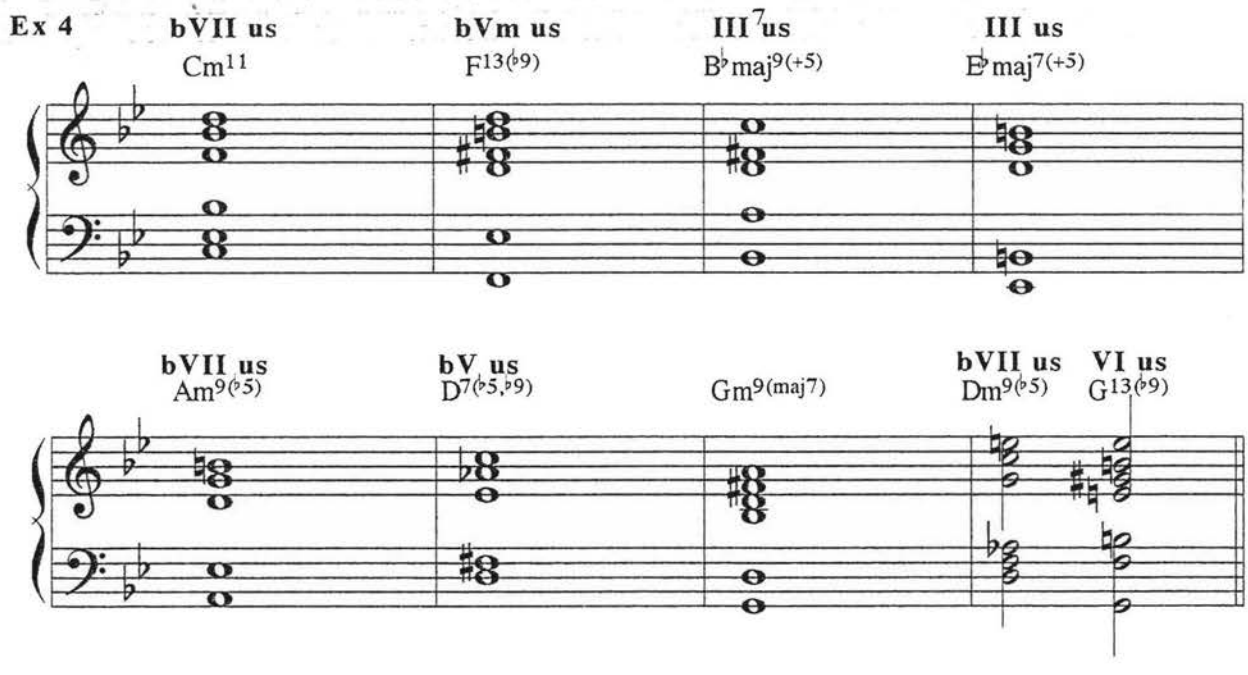
Example 3 shows a higher degree of extension, containing 13ths and alterations on the dominant chords.

Ex 3



In example 4 the use of higher extensions takes the harmony to the next level of dissonance. The extensions are grouped into upper structures and are notated above each chord. The use of upper structures is very common in modern harmony and helps facilitate the use of non-diatonic tones. The use of the raised 5th is useful on major chords to match the density of the surrounding chords.

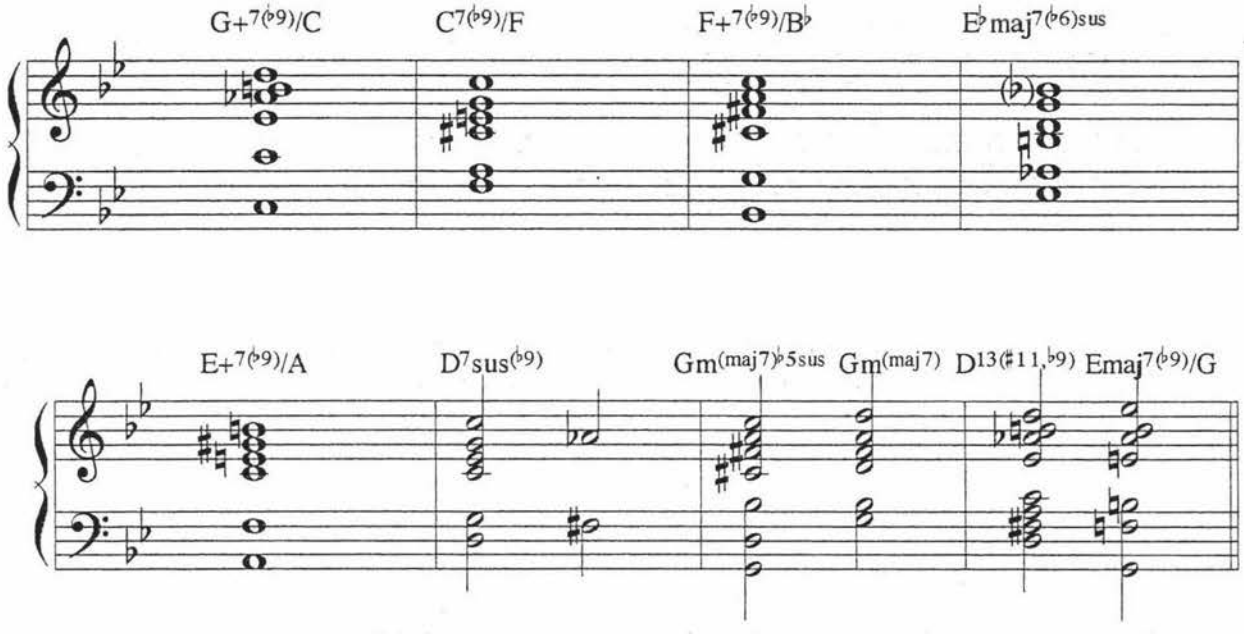
Ex 4



To create the next level of tension the technique of superimposition is needed as most of the extensions have been used in the upper structures. Superimposition is the use of a chord that is a substitution, but with the original note in the bass. This introduces a level of dissonance which is used to create maximum tension in a harmonisation.

Example 5 shows the use of dissonant superimpositions of a type used by jazz pianist Herbie Hancock. In the first bar the original chord of C minor has been replaced by its own dominant with C in the bass. Herbie Hancock frequently uses the superimposition of chord V over I in the bass. In the fourth bar a major chord appears with both the 5th and the #5, hence the name maj7 (b6), allowing both extensions to exist. It also contains a suspended 4th. The chord in 7th bar is derived from the hungarian minor containing all notes of the scale. The second to last chord is a double diminshed structure.[4] The final chord is particularly interesting as it forms a dominant chord of G that has the 6 and b6. This sort of harmony is very dissonant and hardly resembles the original chords but it serves to demonstrate the highest level of dissonance possible in a tonal environment.

Ex 5

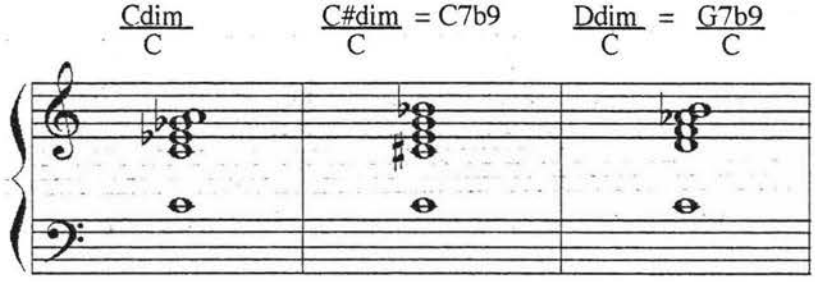


[4] Double diminished structeres are examined on page 45.

(d) Diminished Harmony

Example 1 shows the uses of the diminished chord over bass notes, these chords outline the three basic functions that can be assigned to the diminished structure.

Ex 1



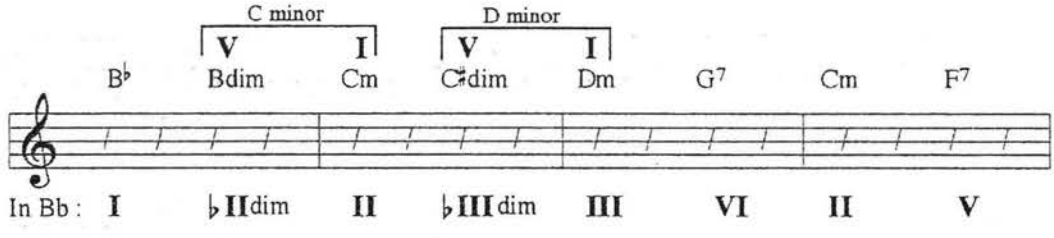
- The first chord is the root diminished chord that quite often functions as a I diminished chord resolving to a I major or minor chord, or alternatively can function as a V7b9 with the b9 or 3rd in the bass. The diminished scale works well over this chord in most circumstances.
- The second chord functions as a dominant 7th b9 structure and functions like a V chord, in this case a C7 b9 that resolves to Fmajor. Because of the symmetrical nature of diminished chords this C7b9 can resolve to F, D, Ab and B major. The diminished dominant scale works well over this chord in most circumstances, but has many notes out of the key, so must be used with caution.
- The third chord is essentially a V7b9 chord with the suspension in the bass. This chord was frequently used by Bach and appears (among others) in the music of Duke Ellington and John Lewis. The standard "Django" contains several examples of this type of chord. This G7b9 with C in the bass would typically resolve to C major or C minor. The harmonic minor or harmonic major scale of the resolving key is the origin of this chord, often referred to as VII with I in the bass.

Chord V Diminished Function

In the chapter on chord scale relationships it was stated that chord VII in a major or minor key is regarded as a diminished chord that can resolve upward by a semitone. It can also be thought of as a chord V in 1st inversion, as it fulfils the function of a dominant chord.

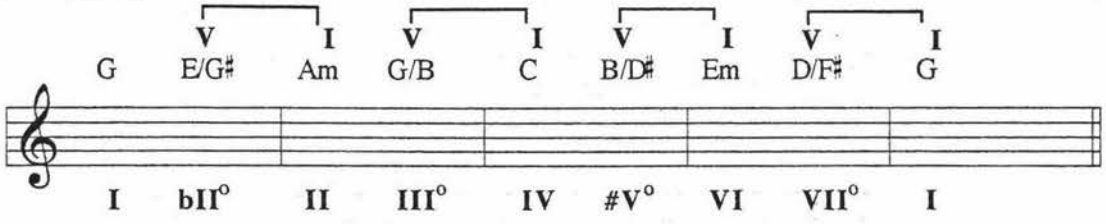
Example 2 shows a progression that is typical of what might be found in the first 4 bars of a standard 'Rhythm Changes' chord progression. The progression is analysed in Bb and has chord V diminished preceding the II chord and the III chord. The result is smooth bass motion as the dominant chords are replaced by their diminished counterpart. For more variation the chord V diminished substitutes can be applied when enhancing this type of progression.

Ex 2



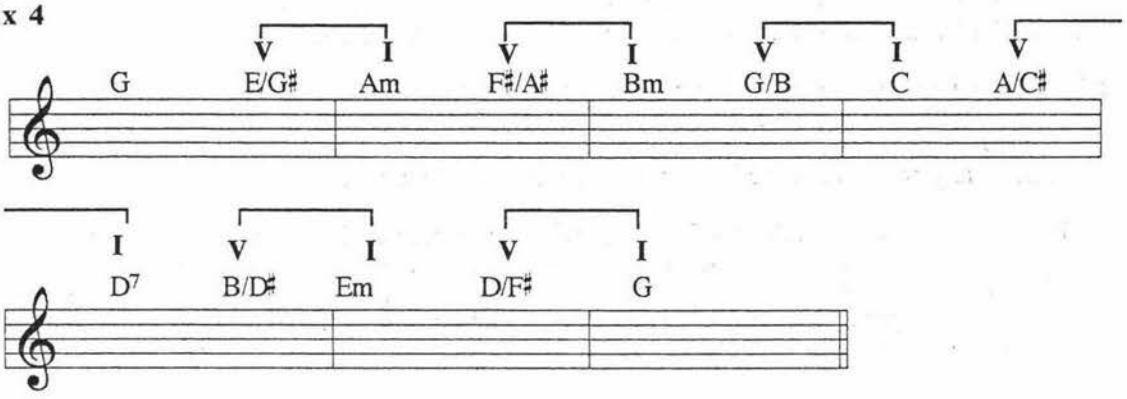
Example 3 shows an excerpt of the bridge section of "James" by Pat Metheny.[5] The use of perfect cadences that resolve to diatonic chords is featured here. These are called secondary dominants. Each temporary V chord is inverted to create chromatic motion in the bass. The relationship with diminished chords is shown under the stave.

Ex 3 James



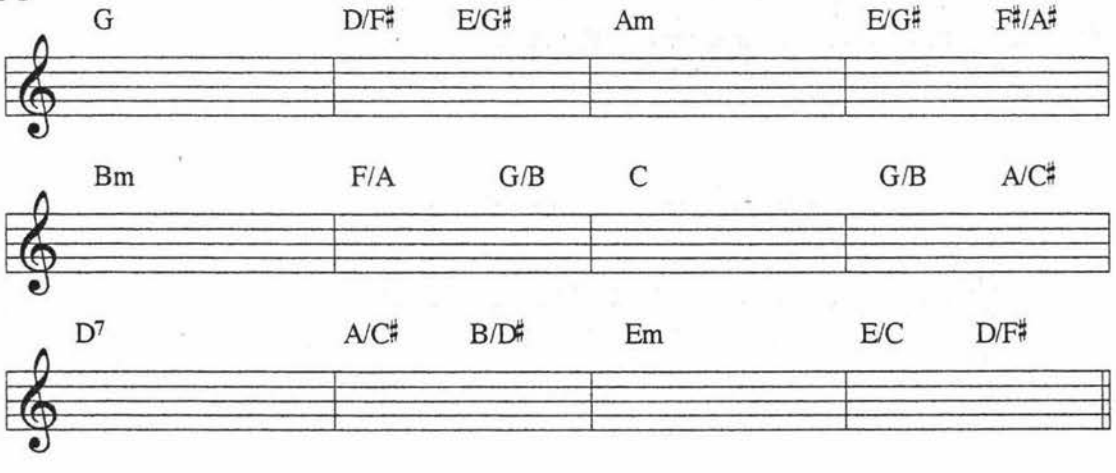
Example 4 shows the use of perfect cadences resolving to each of the three major and three minor key centres found in a major key.[6] Each of these temporary V chords can be replaced by a diminished chord built from the 3rd.

Ex 4



A further use of this principle in example 5 shows each temporary V chord being preceded by a dominant chord a tone below. This produces chord V of V substitute. By moving a diminished chord up a tone it is effectively acting as a cycle of dominant chords. When approaching chord II (Am) the chords of D/F# and E/G# are used. The E/G# is related to chord VII diminished but is used in its dominant chord form. This chord is preceded by an F# diminished substitute of D/F#. F# diminished can also be thought of a B7b9/F# giving the true chord V of E/G#. These chords are used to precede each of the diatonic chords of G major.[7]

Ex 5



[5] From the album *Offramp*.

[6] This theory is explained on page 65.

[7] Based on notes from a lesson with Peter Churchill.

In the key of C major, chord V can be stacked up in 3rds to produce G7b9. The resulting chord could be thought of as B^{o} with G in the bass. Most harmonic function is built from notes contained in the harmonic minor or harmonic major scales, this means the b6 is available for use in chords. This is an explanation for the relationship between dominant b9ths and diminished chords. Diminished chords, when taken out of context, can have four names, as the diminished chord is based on stacked minor thirds. Each note yields the same intervallic structure above it.

Bo, Do, Fo, Abo and G7b9, Bb7b9, Db7b9, E7b9 are all equivalents for each other and can perform similar functions in chord progressions. The V chord can therefore be replaced by any of the above chords in a V-I resolution. Each of these substitutes for chord V has a name in jazz, and different names in classical music.

Example 6 shows these progressions and their names also included are the relevant II chord that would normally precede each of these in their associated keys.

Ex 6

Standard	**Dm7**	**G7b9**
Backdoor, Yardbird	**Fm7**	**Bb7b9**
Tritone	**Abm7**	**Db7b9**
Latin, Deceptive	**Bm7**	**E7b9**

When harmonising these resolutions in a diatonic environment, consideration must be given to the alterations to create smooth movement so the chords represent as closely as possible the resolving key. In this case the resolving key is C so the extensions have been adjusted accordingly. A revised chart, taking into consideration the tonality is shown in example 7.

Ex 7

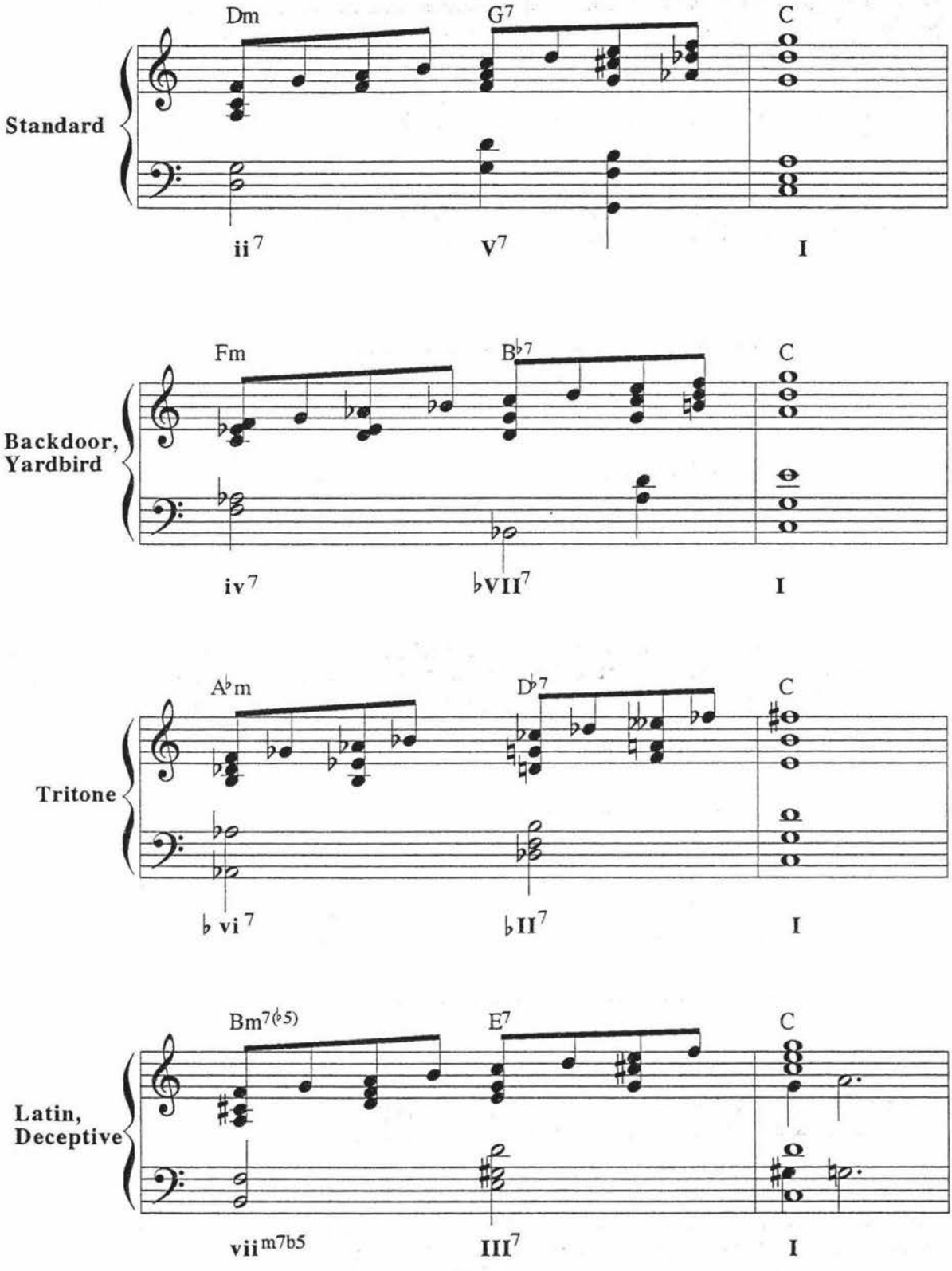
Standard	**Dm7**	**G7**
Backdoor, Yardbird	**Fm(maj7)**	**Bb7#11**
Tritone	**Abm(maj7)**	**Db7#9**
Latin, Deceptive	**Bm7b5**	**E7#9**

The symmetrical construction of the diminished scale is such that any of the above chords can resolve to the key of C, Eb, F# and A major and their relative minors which are Am, Cm, Ebm and F#m.

Different combinations of II and V chords can be used in combination producing a myriad of substitutions for a II-V-I cadence.[8] These are commonly used as substitutes to enhance chord progressions and as superimpositions that create more dissonance. The following page shows harmonisations for each of these cadences.

[8] A chart of II-V-I substitution is shown on page 106.

Chord V Diminished Substitiutions



I Diminished Substitutution

Another common diminished function is as I° - I, which is frequently used in jazz harmony to prolong or delay a resolution. The structure of the diminished chord allows it to function as a dominant 7th with a b9th. C°, Eb°, Gb°, A° and D7b9, F7b9, Ab7b9 and B7b9 are equivalent structures, each dominant chord can be preceded by its own II chord.

Ex 8

Am7	**D7b9**	**C, Eb, Gb, A major or minor**
Cm	**F7b9**	
Ebm	**Ab7b9**	
F#m	**B7b9**	

The grid can again be adjusted to conform to more diatonic function by changing the alterations of the chords. These cadences can each resolve to one of four keys in the function of I diminished. The chords have been altered to be diatonic in the key of C.

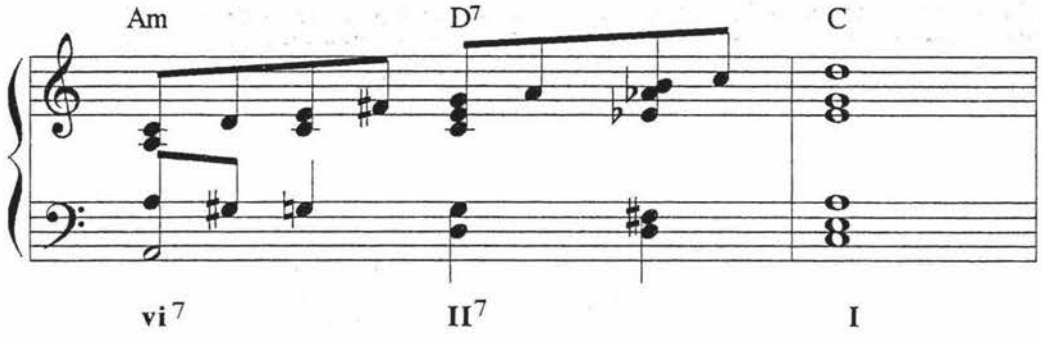
Ex 9

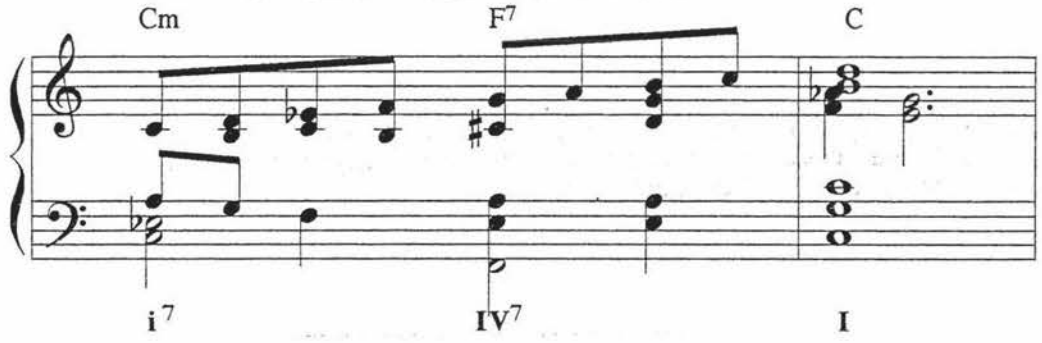
Am7	**D7#9**	**C major**
Cm(maj7)	**F7#11**	
Ebm(maj7)	**Ab7#11**	
F#mb5	**B7#9**	

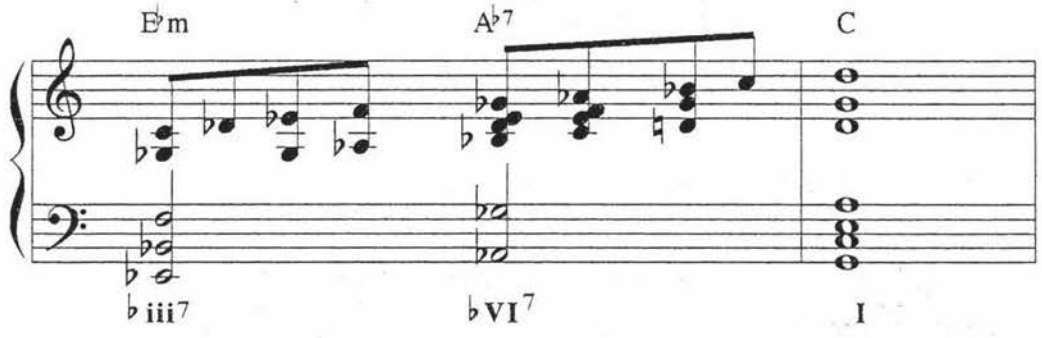
The technique of employing chord I substitution makes this theory particularly useful if long periods of time are spent on one chord. It is common to encounter poorly harmonised leadsheets that indicate several bars of a static major or minor chord. I diminished substitution is ideal as all the chords can function even if the bass player holds just the root note. The melody, if there is one, has to be taken into consideration for this to work effectively. The combination of chord V and I diminished substitution used to enhance a II-V-I progression is a powerful harmonic tool and can lead to countless variations.

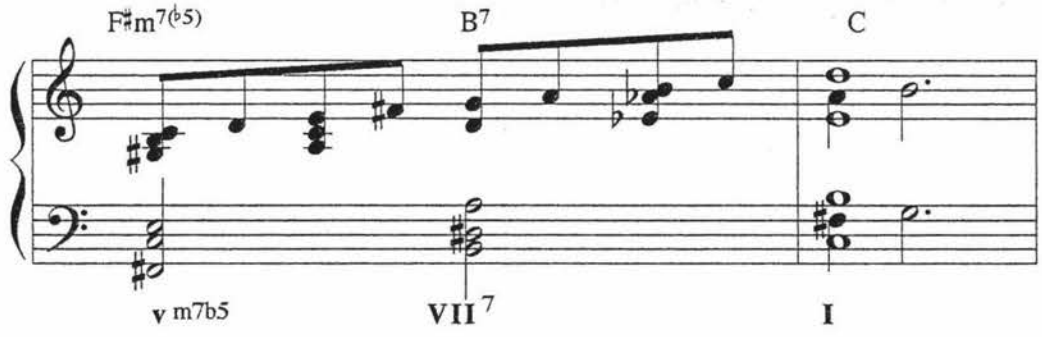
On the following page are sample harmonisations outlining this principle of I diminished substitution.

Chord I Diminished Substitutions









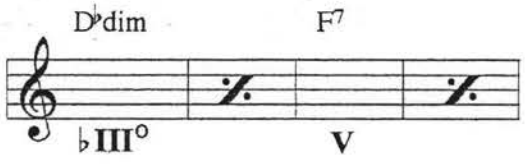
bIII Diminished Function

Another common use of the diminished chord in jazz is the function of III°. In jazz standards the chord progression III° - III - II -V is common. This progression can bee seen in "The Song is You", "Body and Soul", "Ain't She Sweet", "Embraceable You", "A Fine Romance"and "How Insensitive". Applying substitutions for III° is a common method in the reharmonisation of standards.

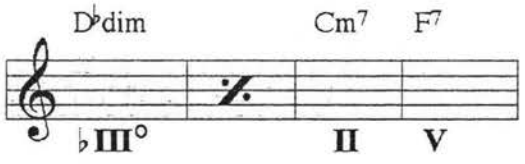
This progression is the key to understanding the first 4 bars of Stella by Starlight.

Ex 10

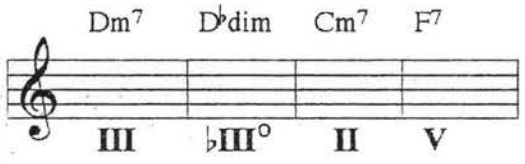
The original leadsheet chords for the standard "Stella by Starlight" show the bIII° moving to chord V



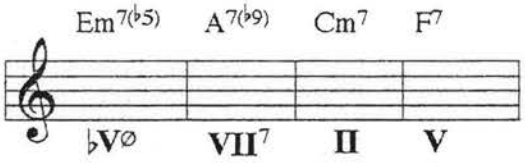
In this variation the II chord is placed before a V chord. This is a very common technique of reharmonisation.



The inclusion of the III chord before the bIII° gives a more modern flavour and underpins the melody well.



Db diminished is really chord VII in D minor and consequently is a sub for A^{7b9}. If the Db° is replaced with an A^{7b9}, and is preceded by its own II chord, the more modern harmonisation results.

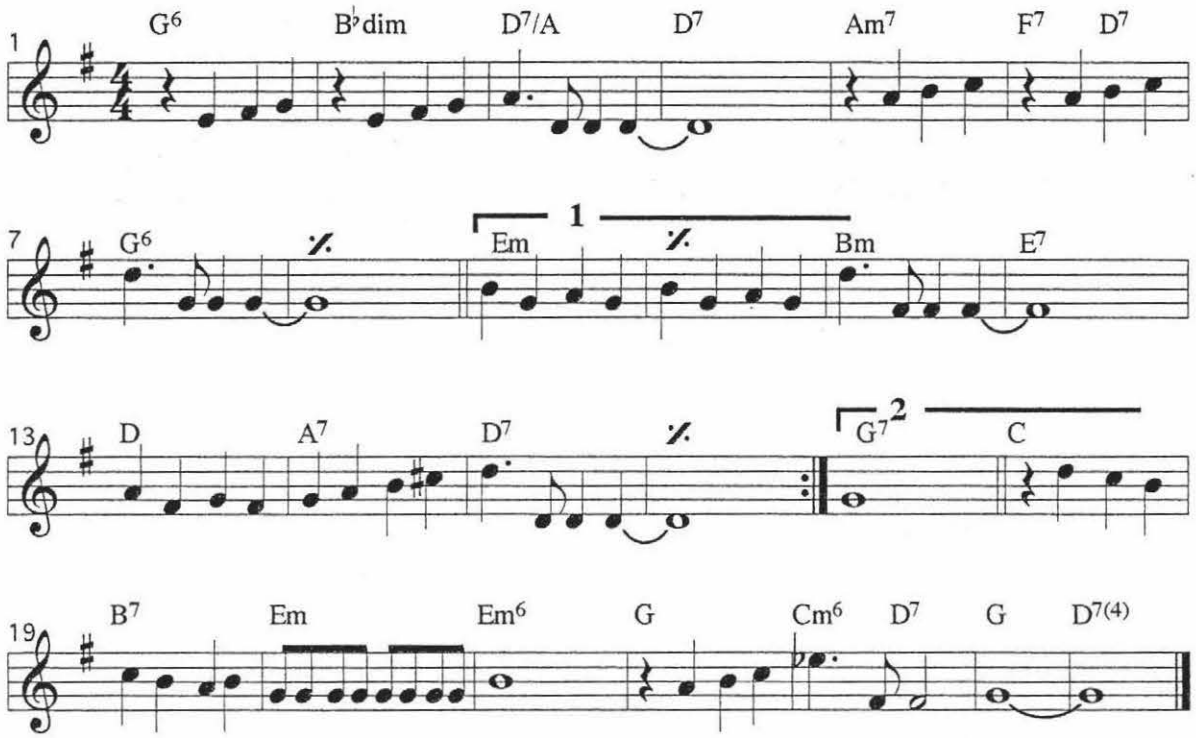


Application of Diminished Harmony

While melodies in songsheets are generally quite accurate, the same could not be said of chord changes. Many of these publications have been simplified for general consumption, usually relying on the simplest harmonisation that will support the melody. Diminished function is essential in the repair of these poorly harmonised originals.

Example 11 illustrates the original published songbook melody and chords for the 32 bar standard " Embraceable You ". These chord changes give a rough idea as to the harmony but stick very close to the key providing very little interest. This harmonisation typically has many of the problems that occur in original leadsheets.

Ex 11 Embraceable you



Bar 2: the Bb diminished chord is functioning as a bIII diminished, as part of a I - bIII^{o}- II - V chord progression. In the section on bIII diminished substitution the theory behind the use of equivalent dominant chords was examined. The best approach for analysis is to realise that Bb diminished is chord VII of B minor, and if it was heading in that direction is a chord V sub. In other words Bb diminshed is a substitute for F#7, or more correctly F#7b9 which is chord V in B minor. It is important to note that any of the three major (G,C and D) and three minor (Em, Bm and Am) key centres within G, can be approached by their own dominant, constituting a very useful form of reharmonisation. If chord II (Bminor) is placed in front of F#7b9, the chord progression of C#m7b5-F#7b9-D7 is the result.

Bar 3: The D7/A in the 3rd bar is best substituted by its own chord II to delay the resolution. Placing a II before a V is a very common technique, the problem is that Am to D7 appears twice. It is best to either change the first II-V or the second, or both. These options are best worked out on the piano, as every situation is slightly different and every substitution has an effect on the melody. Bar 3 to 7 is really a 4-bar approach to the tonic G major, so it might seem reasonable to use an extended turnaround in the form of Bm7b5 - E7b9 - Am - D7, which would actually fit with the melody.

Bar 6: The appearance of the F7 in bar 6 is an interesting precursor to backdoor substitution, although it is really functioning as Am7b5 (chord II in Gminor). It is common to use harmony from the harmonic minor in major keys.

Example 12 shows the repaired version of the song.

Bar 2: The diminished substitute has been used to lead into A minor, then a II-V in A minor is used to relieve the monotony of the 4 bars of dominant chord.

Bar 6: The melody lends itself to a chord V diminshed sub, in this case a backdoor resolution fits well. This is a good place for substitution as the ear expects to go to the dominant chord, but the use of the Cm to F7 is a pleasant deviation.

Bar 8: The original leadsheet stays on G but for the sake of preparing for a new section a II-V in E minor is employed, leading into the new section more smoothly.

Bar 11: The original goes to chord III (B minor), so to lead into this it would be possible to use a II-V in B minor. A II-V progression in E minor occurs in bar 10 giving the impression that it may be heading back to E minor, but instead it leads into E7sus (Bm/E). It eventually lands on the E minor in bar 13 as it transforms into a temporary II-V-I in D which gives way to the II-V leading back to G.

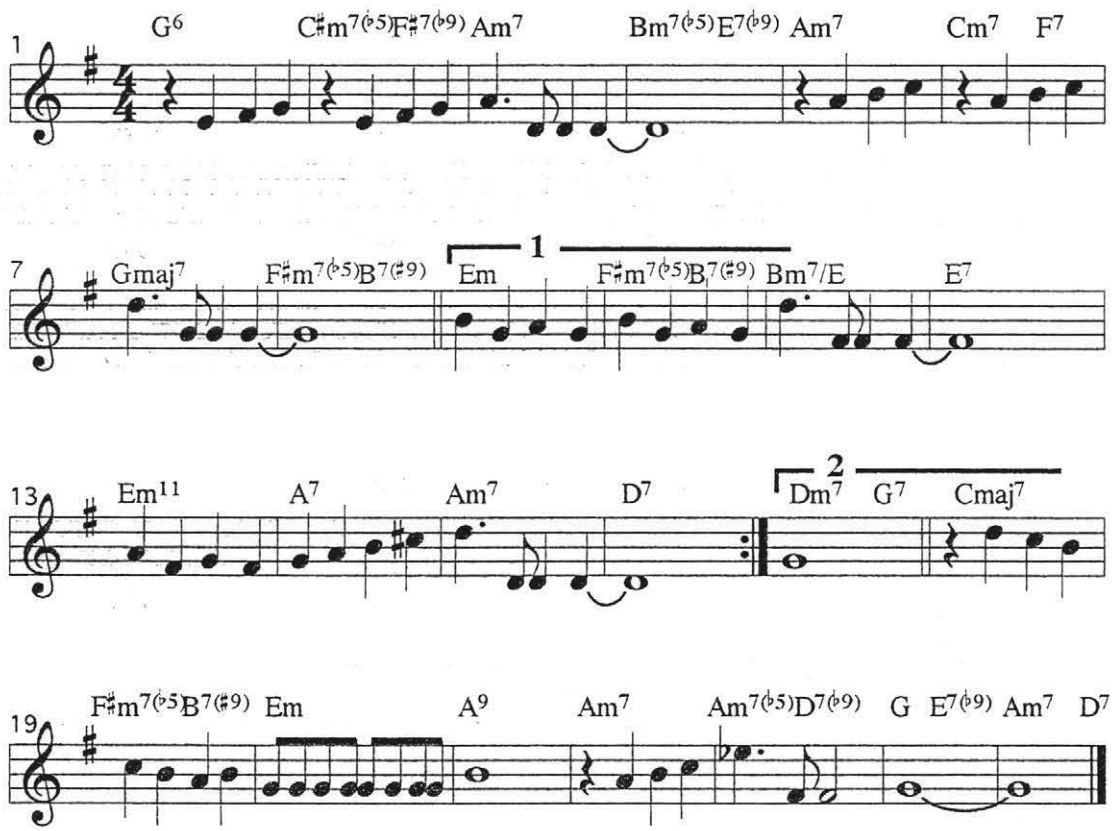
Bar 17: A simple II in front of the V leading into C.

Bar 19: The II before a V technique.

Bar 20: has an E minor going to an Em6 which sounds particularly bad going back to the tonic in bar 22. The use of A7 in bar 21 sets up a temporary II-V in D followed by a II-V-I resolving back to G.

Bar 23: uses the II-V borrowed from G harmonic minor, which is also the origin of the melody note Eb. The original chord of Cm6 is a common error encountered in songsheets and is really Am7b5.

Ex 12 Embraceable you



(e) Plagal Minor Substitution[10]

A common cadence in jazz and classical music is the plagal minor which is essentially IVm(maj)7 - I. In the key of C the chords are Fm(maj)7 - Cmaj. The IV minor chord acts functionally as a subdominant. Example 1 shows many possible functions for the plagal minor.

The substitutions for the chord IV are derived from melodic minor theory. Fm(maj)7 relates to the melodic minor of F. In the section on melodic minor[9] derivatives it can be seen that Bb7#11, E7#9, Abmaj7+5, Dm7b5 and G13sus4b9 are all equivalents for one another. Essentially they are the same chord with different bass notes.

The plagal minor can resolve to C major substitutes like Em, Am. F Lydian is related to C and is also available as a substitute. The plagal minor resolution is used a great deal in intro's and tags and occurs in standards like" A Child is Born", "Night and Day", "Red Snapper" and "All of you".

The use of the plagal minor with G in the bass results in the chord G13sus4b9 and is often referred to as a Phrygian chord. It can also be thought of as a V chord with II in the bass.

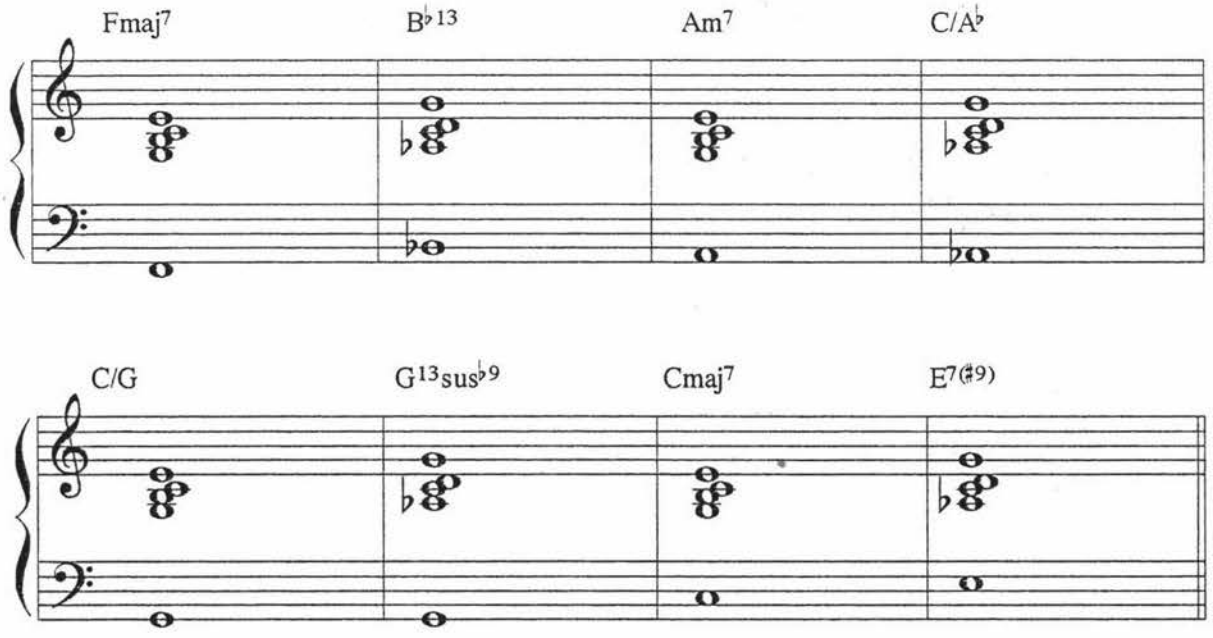
Plagal Resolutions

IVm	I
Fm(maj)7	Cma7
Fm(maj)7	Em or C/E
G13sus4b9	Cmaj7
Abmaj7+5	Cmaj7
Abmaj7+5	Gsus or C/G
Bb7	Cmaj7
Bb7	Am7
Bb7	Em7
Dm7b5	Cmaj7
E7alt	Cmaj7
E7alt	Fmaj7 or C/F

Ex 1

Example 2 shows several variations for a IVm-I progression. They all share the same voicings with varying bass notes.

Ex 2

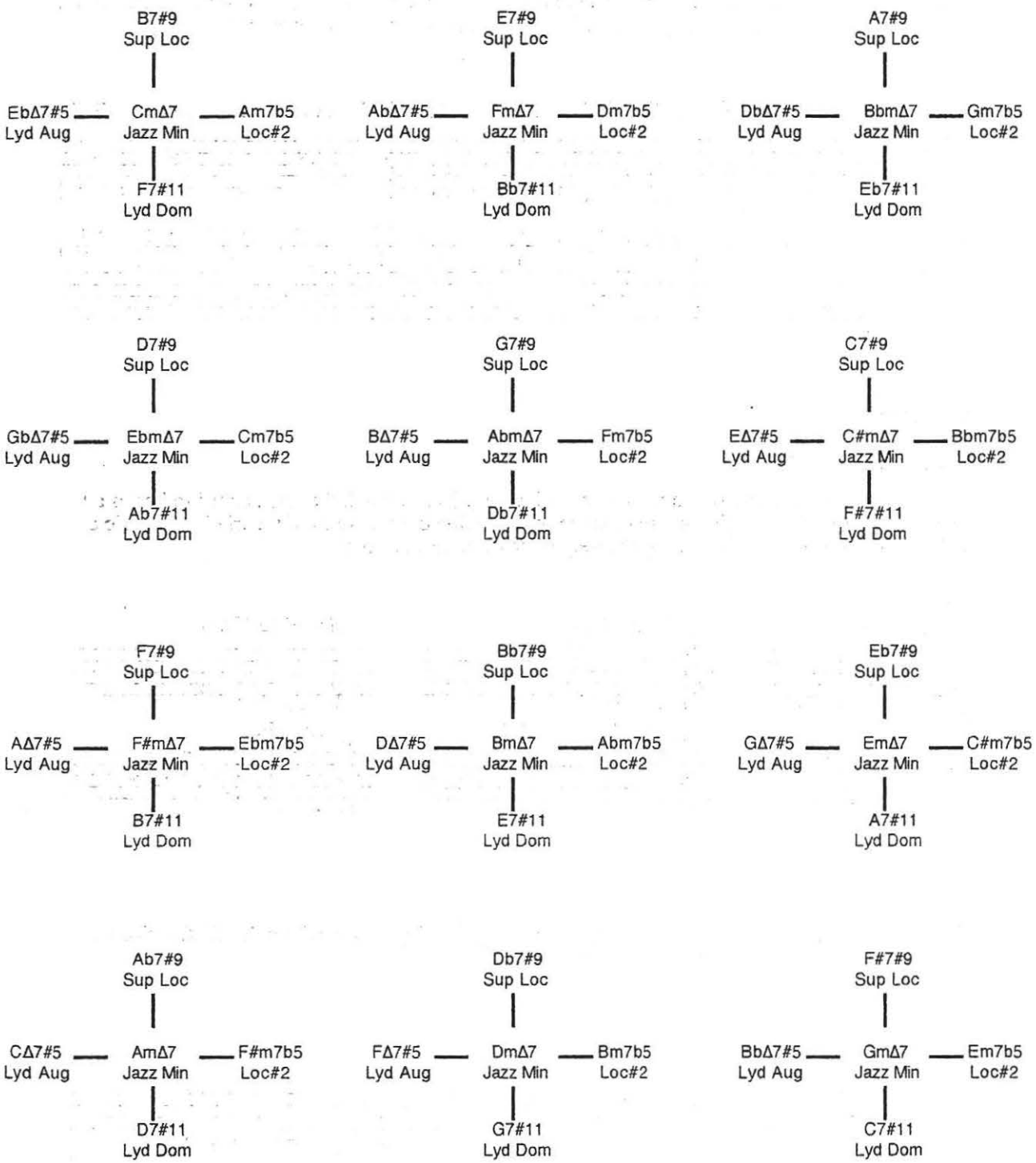


[9] Melodic minor substitution is examined on page 84.

[10] Based on a chart by Peter Churchill

(f) Melodic Minor Substitution

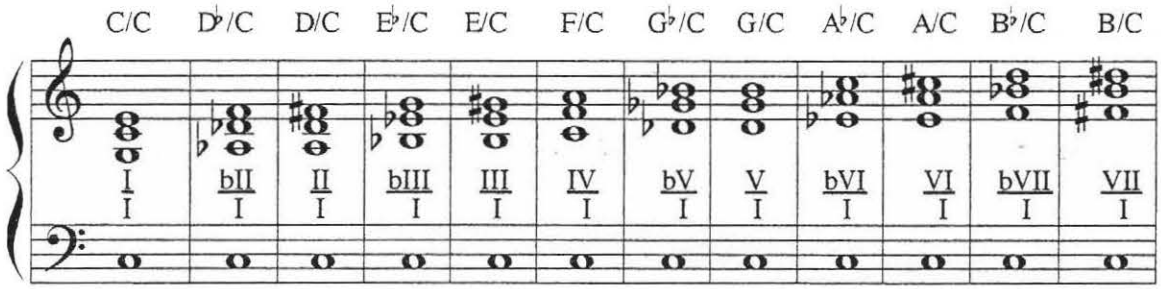
The lack of avoid tones in melodic minor harmony means that there are many uses for the same chord. For example a chord of Eb major 7th with a raised 5th is derived from the C jazz minor. This chord corresponds to the first matrix that has C jazz minor at its centre. The other chords around it are opposing tritones. The Ebmaj7#5 can have any of these notes as a bass, resulting in five different qualities of chord. Any of the chords within each matrix can substitute for each other, constituting a common form of reharmonisation known as jazz minor substitution.



(g) Slash Chord Harmony

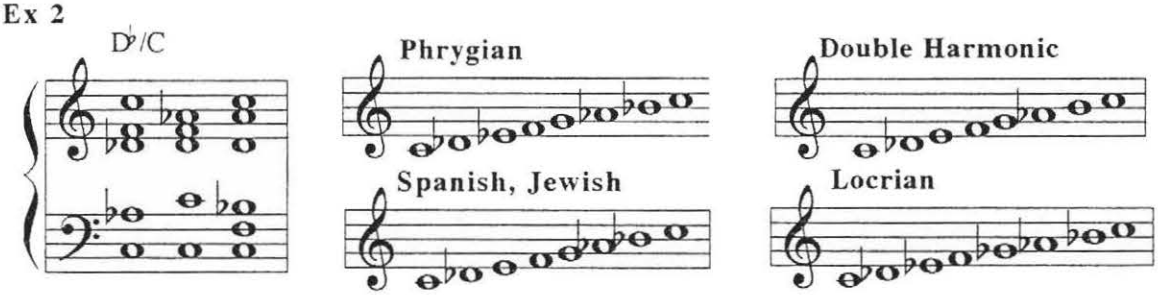
Slash chords are simply a root note with another structure placed over the top, major chords are commonly used but any chord can be used in slash chord theory. All of the chords have a functional use, and fit into a harmonic environment (see diatonic cycles)! [11] Several scales can also be associated with a slash chord. The following section examines each type in detail with some exclusions. C/C is never used for obvious reasons, Eb/C is a C minor 7th chord, F/C is a 2nd inversion F major chord, G/C is another spelling for C major 9th and Ab/C is an Ab chord in 1st inversion.

Ex 1



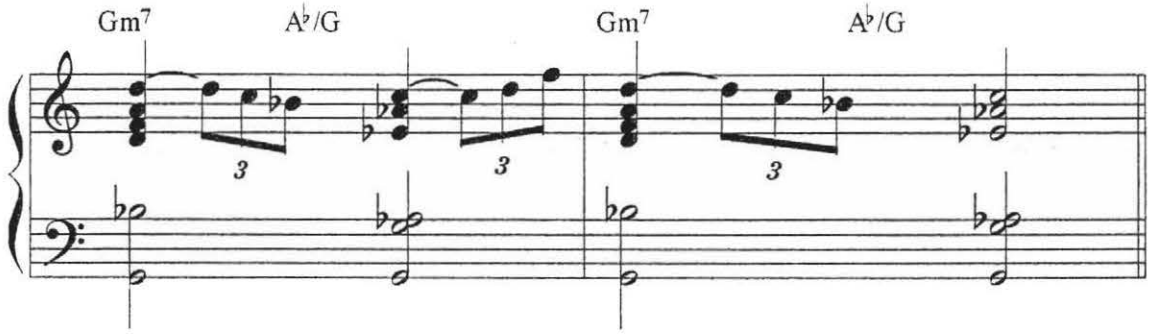
Example 2 shows various voicings for this slash chord. Even though the slash chord indicates a triad over a bass note, many voicings are possible by spreading out the notes of the triad. The basic chord only has 4 notes defined, indicating a variety of possible scales that fit.

Ex 2



Example 3 is an excerpt from "Search for Peace"[12] by McCoy Tyner, where the bII functions as a dominant chord substitute (D7), moving into G minor.

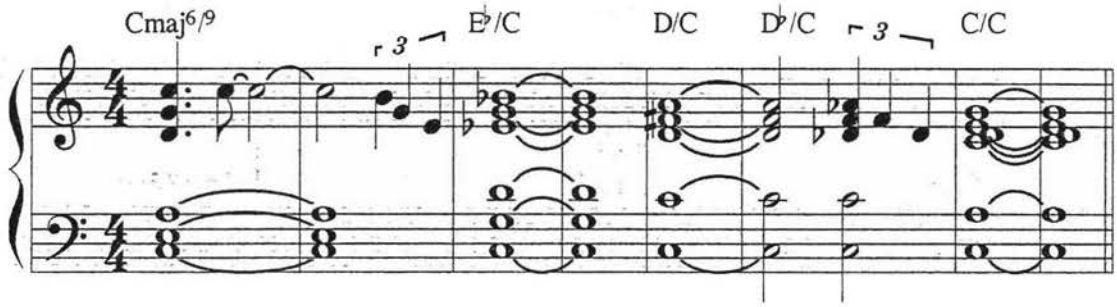
Ex 3 Search for Peace



[11] Diatonic cycles are dealt with on page 97.
[12] From *The Real McCoy*.

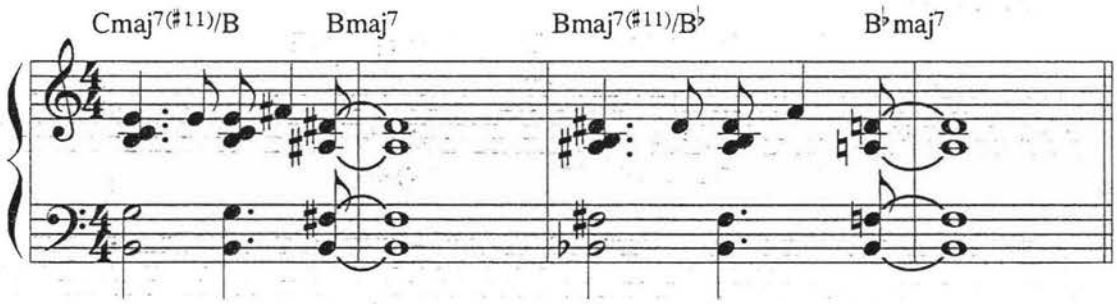
In example 4 the standard " Green Dolphin Street " uses several slash chords in the first 8 bars. The Db over C in the 6th bar is probably related to the Phrygian mode. This slash chord is often referred to as the Phrygian chord in jazz theory.

Ex 4 On Green Dolphin Street



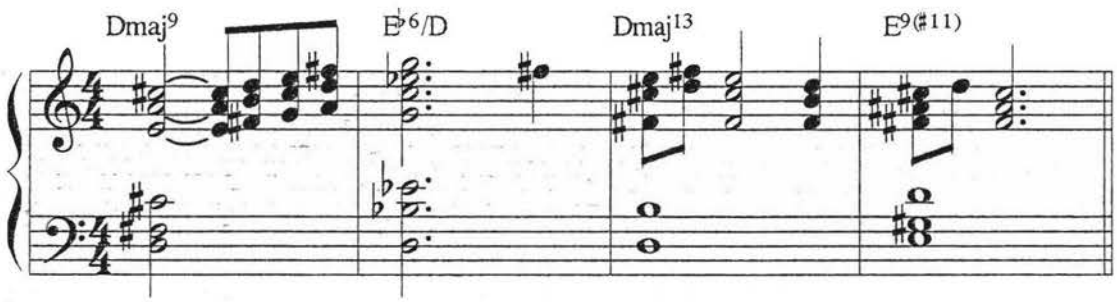
"Think On Me" by George Cables has an interesting use of this slash chord about 8 bars in. The use of the Lydian sound over the top of the pedal is indicated in the original score making it a Phrygian sound from the root.

Ex 5 Think on Me



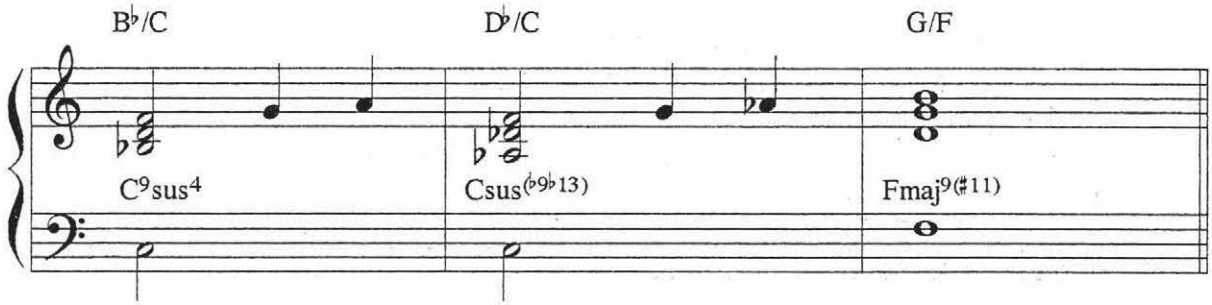
Example 5 shows Johnny Mandell's beautiful tune," A Time for Love" which has in its 2nd bar a variation on the bII slash chord. The chord above the D in the second bar could be thought of as Cm, a very close relative of Eb6.

Ex 6 A Time for Love



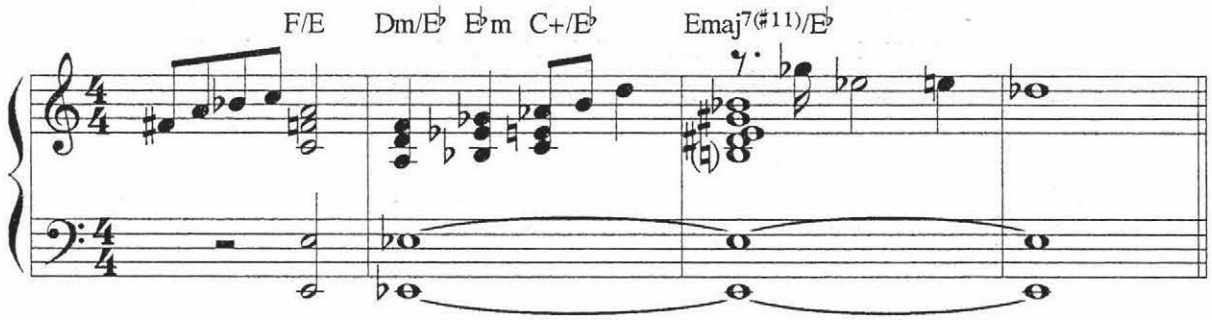
In example 7 the chord Db/C can be thought of as b VI over V resulting in a dominant chord function in F harmonic minor. This chord is based on the Spanish-Jewish scale. Since most harmonic minor harmony is applicable to major and minor keys this chord can resolve to F major or minor. The chords here are functioning as a substitute for a II-V-I in a major key.

Ex 7



Example 8 shows an excerpt from the beginning of Herbie Hancock's "Little One"[13] which has an extended use of the slash chord in question. The appearance of the #11 in the top chord darkens the overall sound of the chord and gives it more mystery.

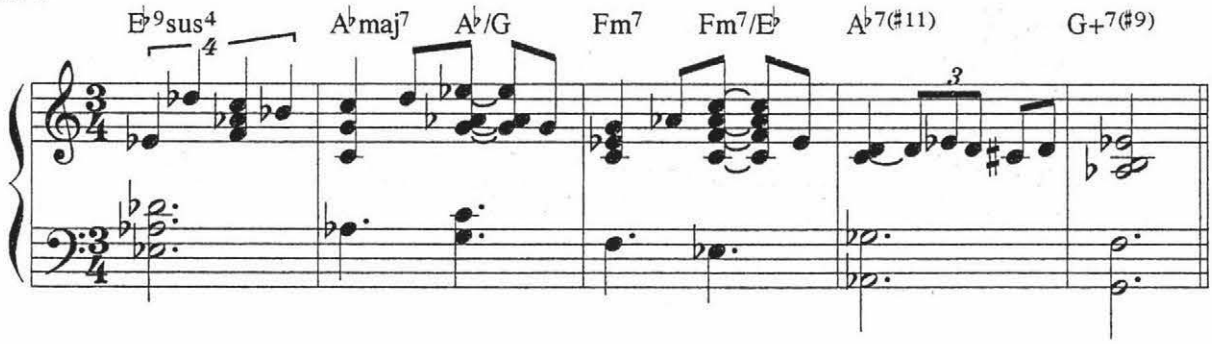
Ex 8 Little One



Example 9 shows a small excerpt from an original by the author called " Till You Wake ". In bar 2 a temporary slash chord occurs half way through the bar. The slash chord here is really a function of the bass movement toward the F. In chords like this the tonal pull is very much from the top chord unlike most of the other examples that have the lower note firmly sounding like the root.

Till You Wake

Ex 9

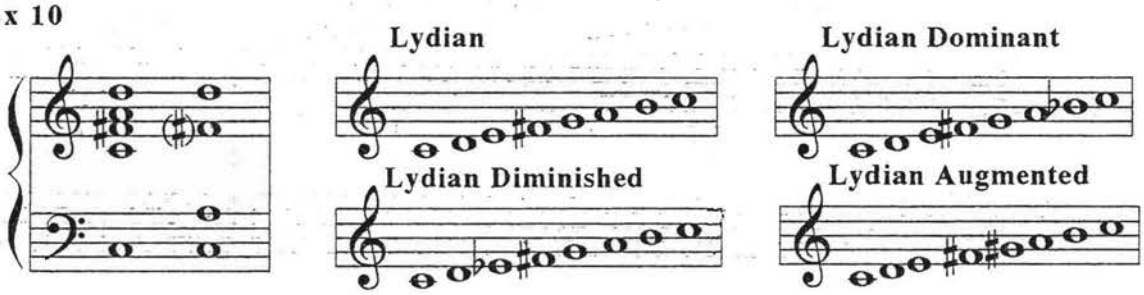


[13] From a transcription by Mel Martin in the book *Herbie Hancock's Greatest Hits.*

II D
I C

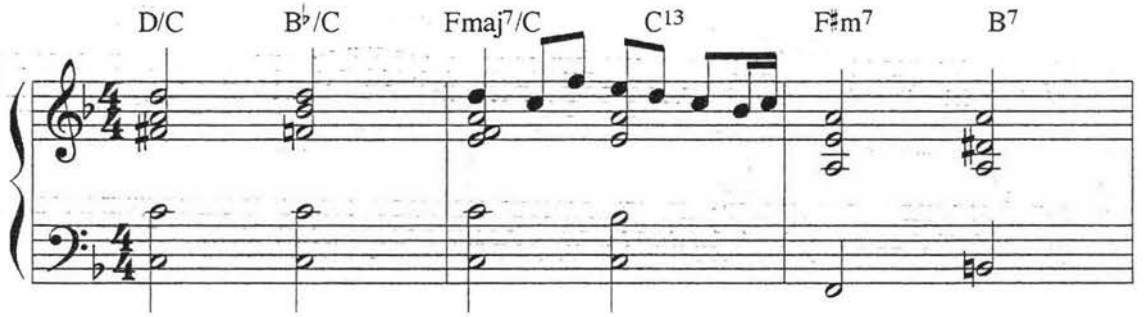
Chord II over a bass note functions quite often as a #11 major or dominant chord. In the case of the Lydian and Lydian augmented mode, the chord D/C performs the function of an extended tonic chord. The slash chord used in a Lydian diminished context is chord IV of a major key, in this case G major. The Lydian dominant applied to this chord functions as chord V of a key, in this case F major.

Ex 10



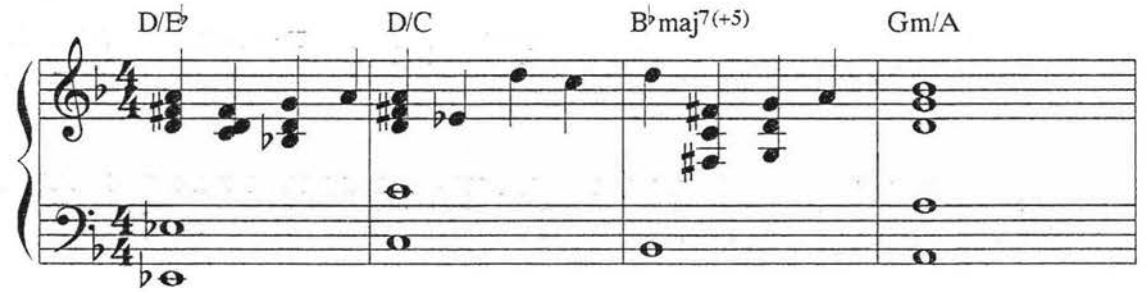
In this reharmonisation of the first few bars of "Skylark,"[14] the first chord functions as a C7#11 chord that eventually resolves to F in the 2nd bar. This version comes from the Jazz Messengers in 1962.

Ex 11 Skylark



Example 12 shows the D over C slash chord appearing as chord IV in G minor. The Romanian mode works well and defines this chord best in its harmonic context.

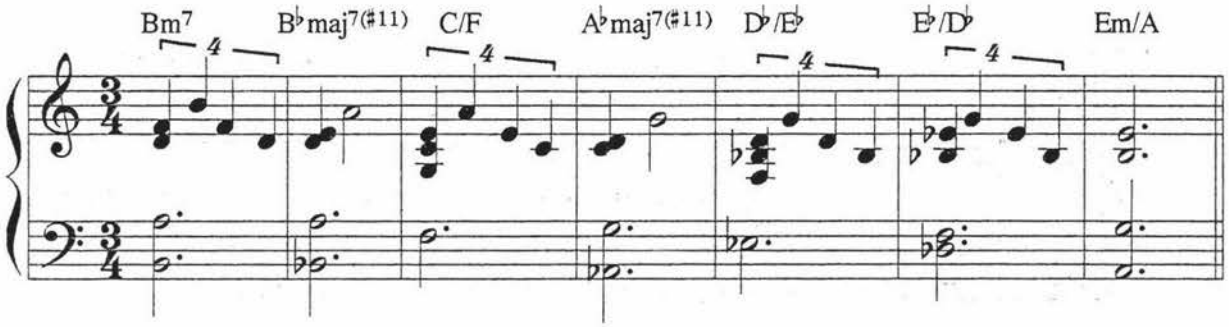
Ex 12



[14] From *The Jazz Theory Book* by Mark Levine.

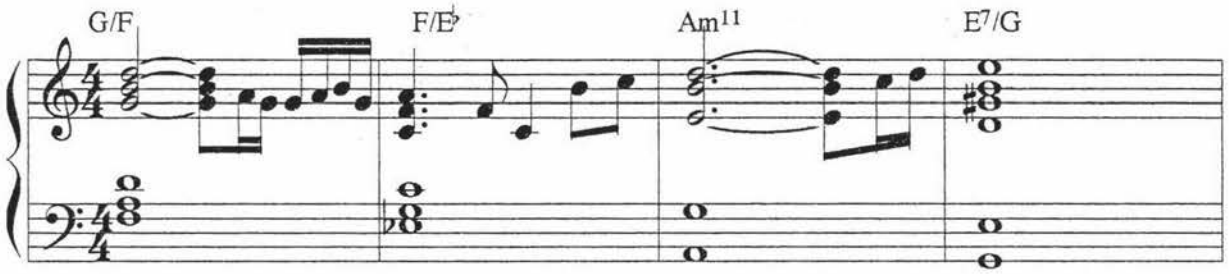
Example 13 shows an excerpt of an original called "Kandinsky"[15] in which #11 chords and II slash chords are used. The difference between the two is largely due to voicing and function. In bar 2 the Bbmaj7#11 is functioning as a subdominant or plagal resolution into the C/F, which is functioning as chord I in F. The same relationship occurs down a tone in the next two bars. The last three bars constitute a II-V-I with the Eb/Db functioning as a subdominant preceding the suspended dominant, which then resolves to Dm. The use of the slash chord is as a substitute for chord VII in D minor. The Eb/Db is very close to an A altered dominant chord with the third in the bass, and is sometimes used as a substitute for it.

Ex 13 Kandinsky



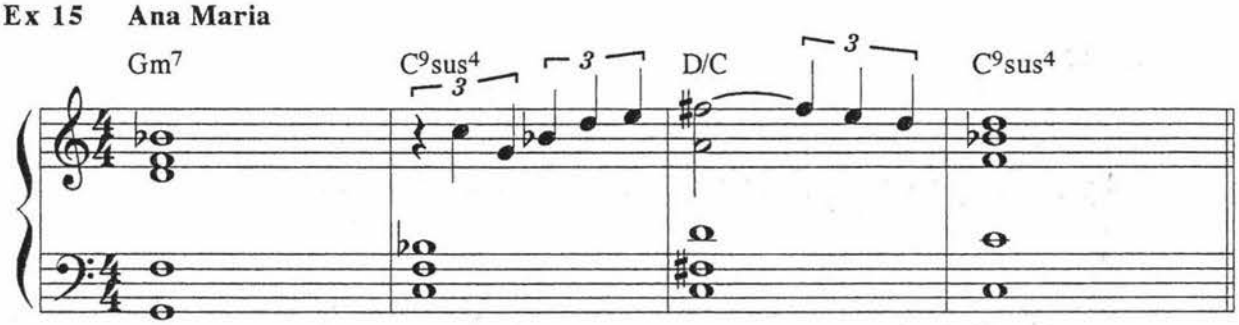
Example 14 is the first 4 bars of Paul Dyne's composition " Blue in Blue".[16] In the original the slash chords were notated as well as the equivalent major7#11 chords. The first two chords in this example both function as major7#11 chords. In the original manuscript the chord is G over F major 7th, making it clear that it is not mistaken for a dominant chord with the 7th in the bass, which has another function entirely.

Ex 14 Blue in Blue



Example 15 shows the Wayne Shorter composition "Ana Maria". Wayne Shorter used many varieties of slash chord in his compositions. The slash chord here in bar 3 is as a dominant link between the two sus chords. The C sus is essentially a Bb/C and is one of the many slash chords that can occur over a pedal.

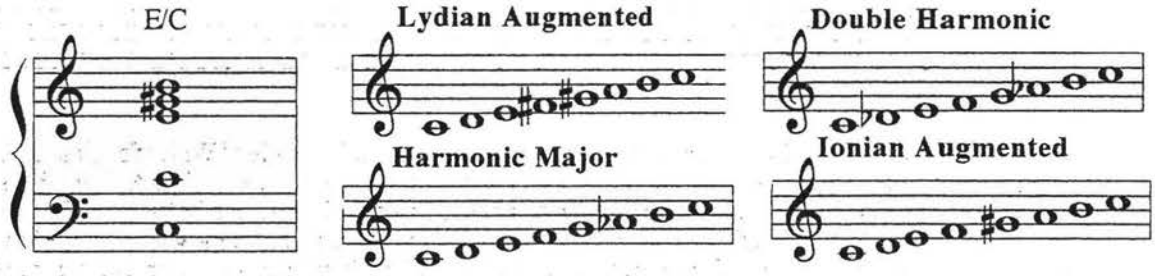
Ex 15 Ana Maria



[15] Kandinsky was written by the author and appears in *The Kiwi Realbook Volume 2* as Rose Waltz.
[16] From a manuscript by Paul Dyne.

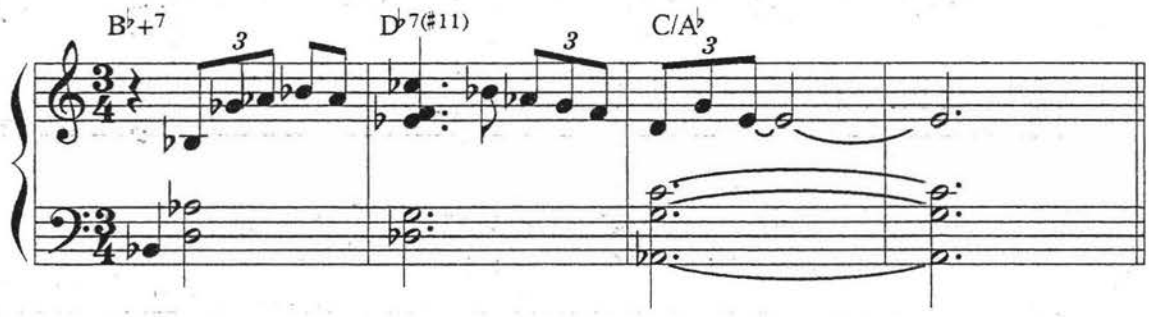
III	E
I	C

This slash chord is common in contemporary music and is often used in place of a tonic major. The presence of the #5 gives the major chord a distinctly modern flavour. There are a few scale choices that relate to this sound, the most common being the Lydian augmented. This chord is sometimes used in harmonic minor harmony as it occurs as chord III, in this case the key of A. This chord is also used occasionally in replacement for a dominant chord, (see Wyndrum) in which case it functions as chord V in a key either major and minor.



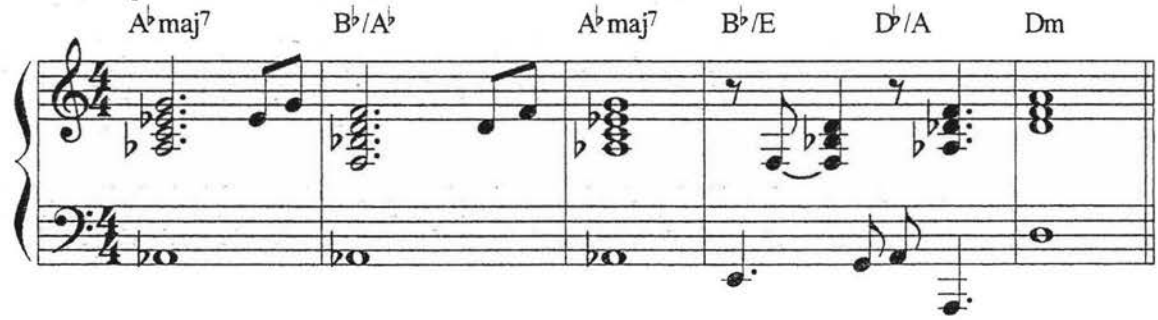
Example 16 shows bars 5-8 of Wayne Shorter's composition " Iris" which was first recorded on the Miles Davis album *ESP*. The chord sequence is not technically a II-V-I but functions much the same in terms of tension and release. The two chords preceding the slash chord are really substitutes for I diminished, in this case Ab diminished. In the section on diminished substitutes this principle is explained in detail. The C/Ab is a sub for Abmaj7#5.

Ex 16 Iris



Example 17 is from a suite by Paul Dyne called "Wyndrum"[17] This excerpt occurs at the end of the first A section. The last three chords are essentially a set of substitutes for a II-V-I in a minor key. Using the bV upper structure over the II chord, and III over the dominant chord it leads to the resolution in D minor. The Db over A results in an augmented major 7th on A, in this case it is functioning as a dominant chord.

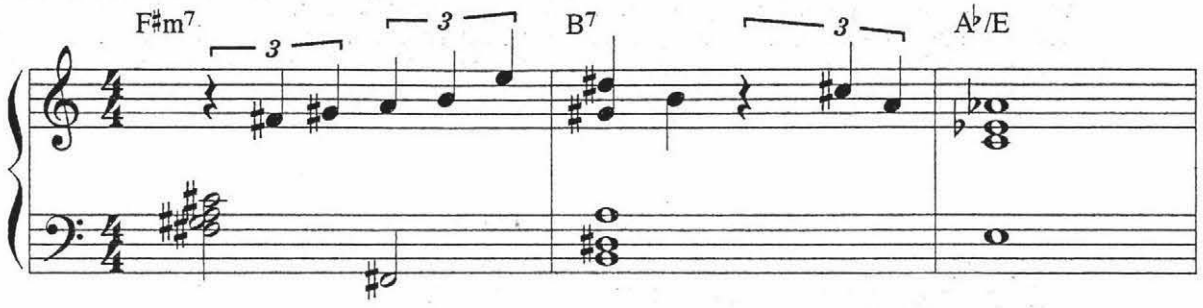
Ex 17 Wyndrum



[17] From a manuscript by Paul Dyne.

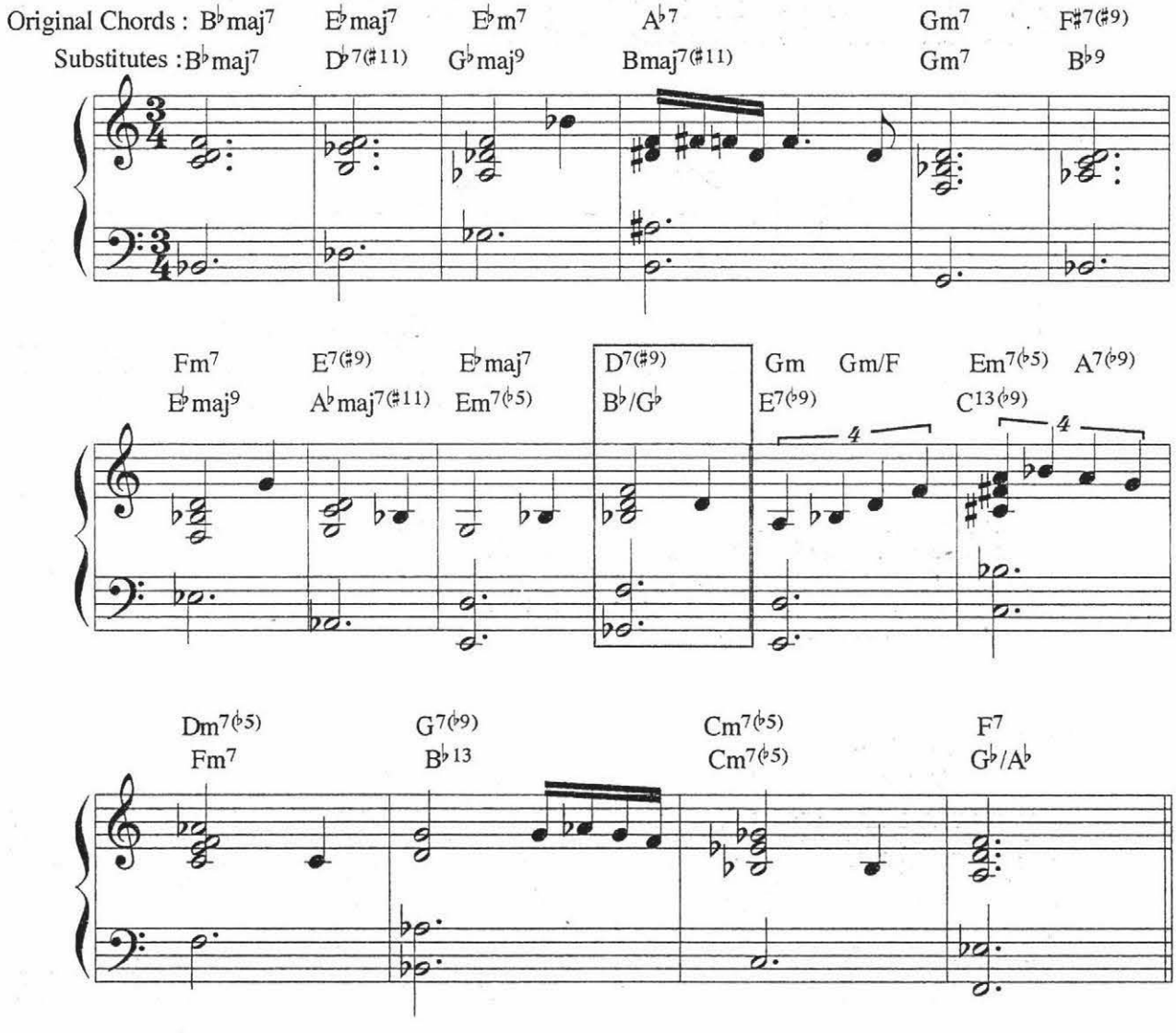
In example 18 Keith Jarrett's composition " So Tender " has a II-V-I with the I chord being substituted by a III major slash chord. The Ab over E is essentially an E major 7th with a raised 5th functioning as a tonic major.[18]

Ex 18 So Tender



Example 19 shows a 16-bar excerpt from an original by this author called "Waltz for Disney"[19] In this example the second a section occurs which has the same melody as the first A, but with substitute chords. This example shows a further use for this slash chord which occurs in bar 10. The Bb/Gb is a substitute for the D7#9, functioning as chord VII in G minor, and is essentially a F# major7th #5. The chord never gets to resolve to G minor, but leads in to E7#9 which uses G minor as its upper structure.

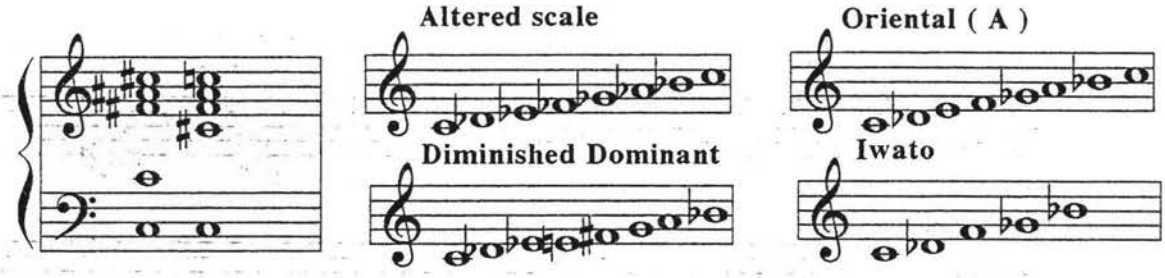
Ex 19 Waltz for Disney



[18] From notes taken by Kirsten MacKenzie in a lesson with Nicky Iles.
[19] From *The Kiwi Realbook* Volume 1.

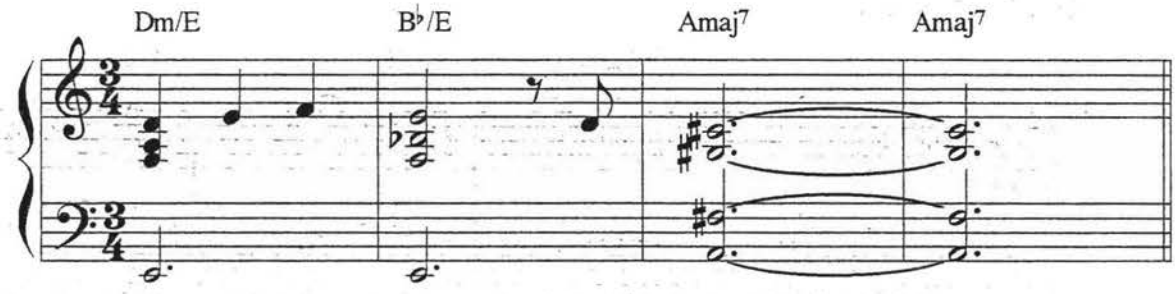
b5	Gb
I	C

b5 slash chords are quite often used as substitutes for chord V and sometimes as secondary dominants for II chords in a II-V-I. The iwato pentatonic is an interesting structure and fits well into this slash chord, the presence of the F gives it a suspended altered dominant sound.



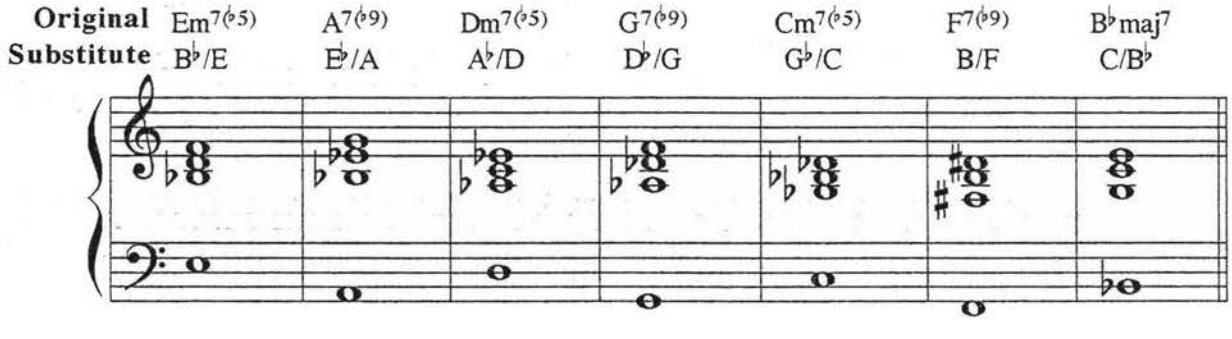
Example 20 is from Kenny Wheeler's tune " For Jan",[20] which uses slash chords to replace a II-V-I in a major key. The II chord in the key of A major is Bm7, but here it is treated as Bm7b5 because of the presence of F natural in the melody. The Dm/E is a substitute for Bm7b5, and Bb/E is a substitute for chord V in the key of A.

Ex 20 For Jan



Example 21 shows the last 8 bars of the standard " Stella by Starlight " and a common chord sequence found in a number of compositions. It is essentially an extended cycle starting on the b5 that works its way back to the tonic. With the exception of the last voicing, each chord has been replaced by a slash chord with a b5 upper structure. The slash chord in this situation is functioning as an altered dominant each time, with the half diminished chords being substituted by secondary dominants. The last chord is just a II major upper structure creating a substitute for Bbmaj7#11.

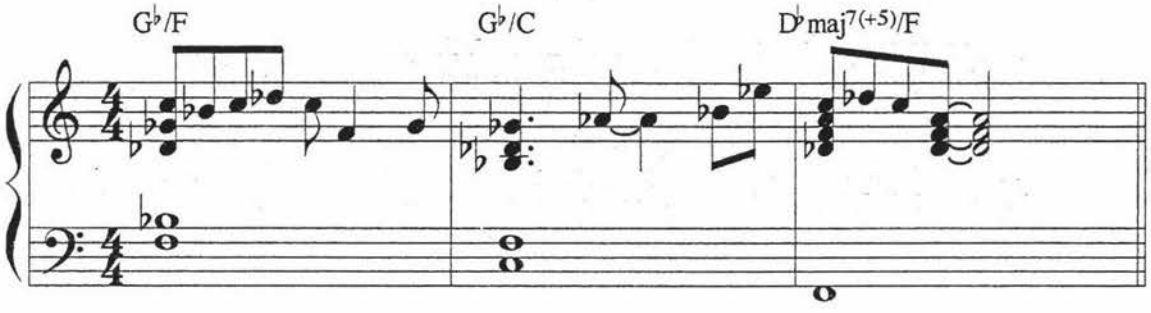
Ex 21



[20] From a manuscript by Kenny Wheeler.

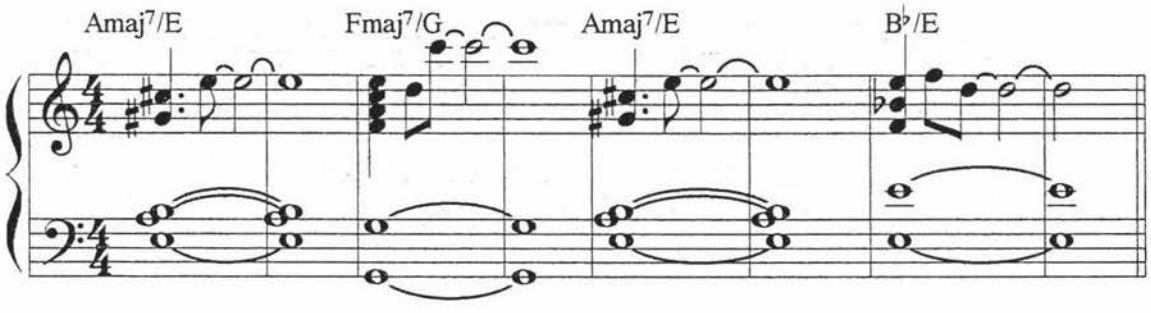
Example 22 is an excerpt from an original by this author called "Monsoon", in which a bV slash chord is demonstrated in the 2nd bar. This chord contains the note F which throws it into a different tone colour. In fact the slash chord is really Gbmaj7/C which acts as a suspended dominant with a b9 and a b5. The first two bars are based on the harmony associated with the pentatonic scale known as the iwato scale. More information on iwato chord construction is available in the section on pentatonic voicings on page 50.

Ex 22 Monsoon



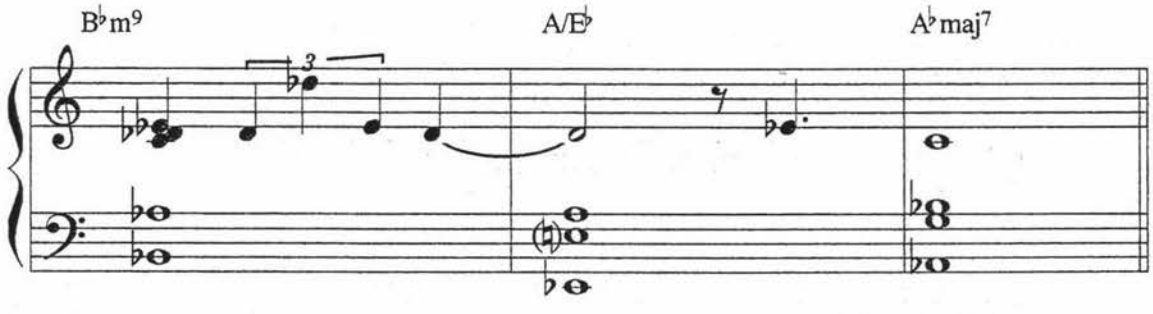
Example 23 shows the first 8 bars of Billy Hart's composition "Duchess," on the album *Oshumare*, in which the bV slash chord is made use of in the 6th bar. In the 9th bar (not shown) the Bb/E goes to A/E so the slash chord is acting as a chord V substitute.

Ex 23 Duchess



In example 24 Kenny Wheeler's " We Salute the Night " has the bV slash chord. It occurs in the context of a II-V-I and substitutes for an Eb7 altered chord.[21]

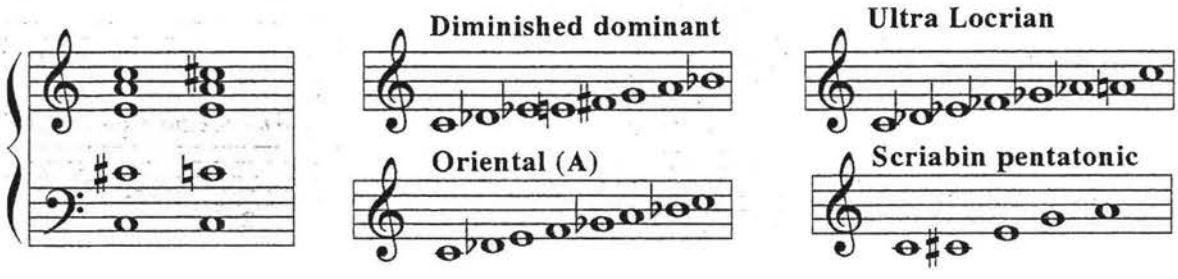
Ex 24 We Salute the Night



[21] From a handout by Nicky Iles

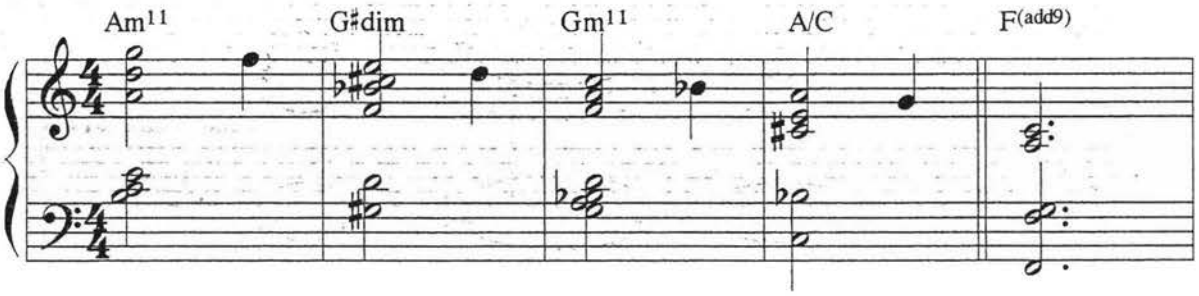
$\frac{\text{VI}}{\text{I}}$ $\frac{\text{A}}{\text{C}}$

The VI slash chord is derived from diminished upper structure and performs the same function as a V7b9 chord. The most common use for this chord is as a V chord.



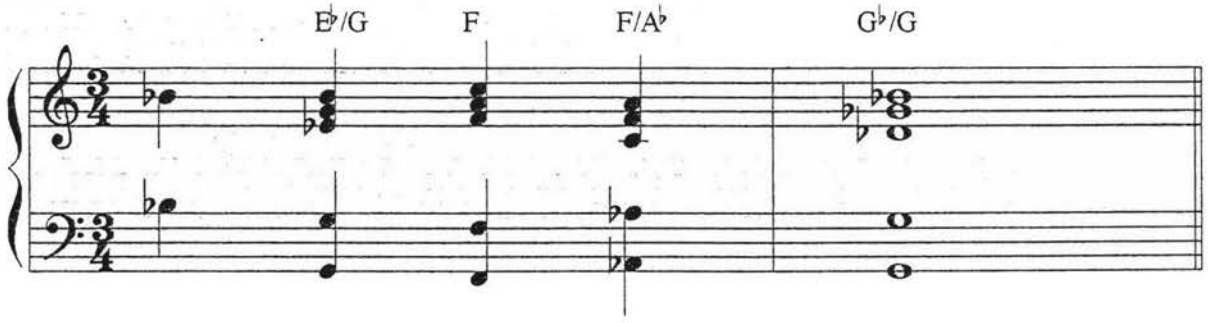
Example 25 shows the voicings used by Keith Jarrett in the last part of the bridge for "When You Wish Upon a Star".[22] The slash chord played in bar 4 is representative of a C dominant chord and is used in a V-I context.

Ex 25 When You Wish Upon a Star



This short extract from Bud Powell's "Glass Enclosure" [23]shows the use of the VI major slash chord here functioning as a dominant chord. The resolution to the last chord is incomplete as this chord is functioning as a I diminished chord

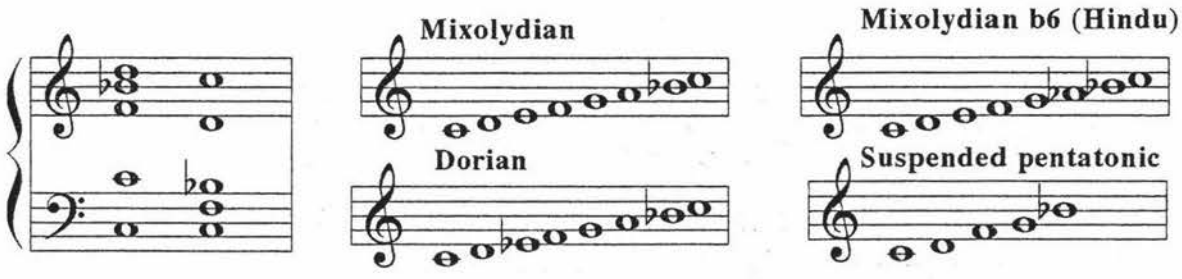
Ex 26 Glass Enclosure



[22] Transcribed from the video *Standards 2* , featuring the Keith Jarrett trio.
[23] This extract is from *The Amazing Bud Powell* as transcribed by Mark Levine in *The Jazz Theory Book*.

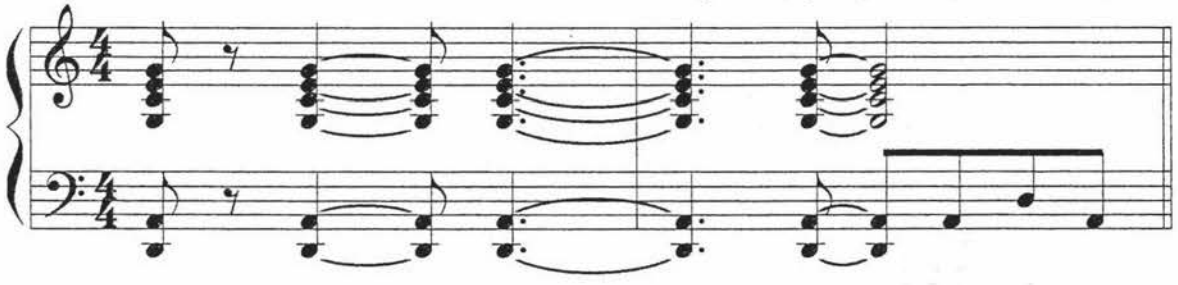
bVII	Bb
I	C

The bVII slash chord occurs commonly as a dominant chord but is often used in a modal context. As a functional chord it appears as a suspended 4th chord and can be used as chord V or chord IV in a key. This slash chord appears frequently in modal music in which it can function as a tonic chord.



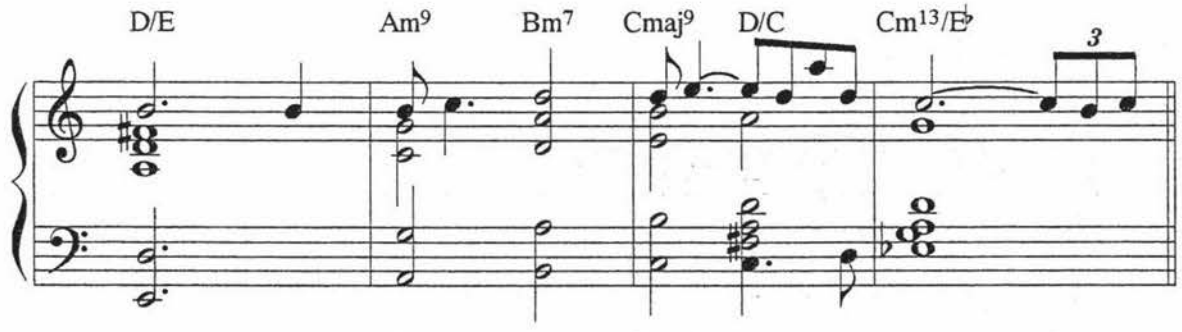
A classic use of the bVII slash chord appears in "Maiden Voyage" by Herbie Hancock. This modal composition uses several of these chords as non-functioning dominant 7sus chords.

Ex 27 Maiden Voyage



Example 28 is an excerpt from the slow movement of "Symbiosis"[24] by Claus Ogerman. The slash chord in question appears in the 1st bar as a substitute for an E minor chord, the melody note is B so it could also be thought of as Bm over E.

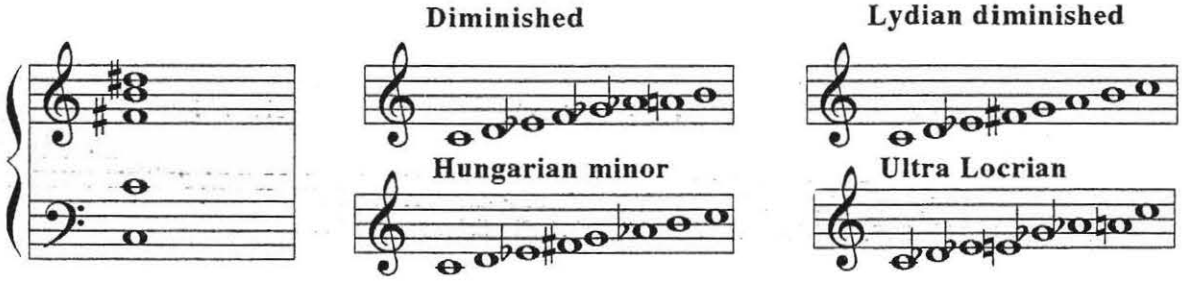
Ex 28 Symbiosis



[24] From the score of *Symbiosis*.

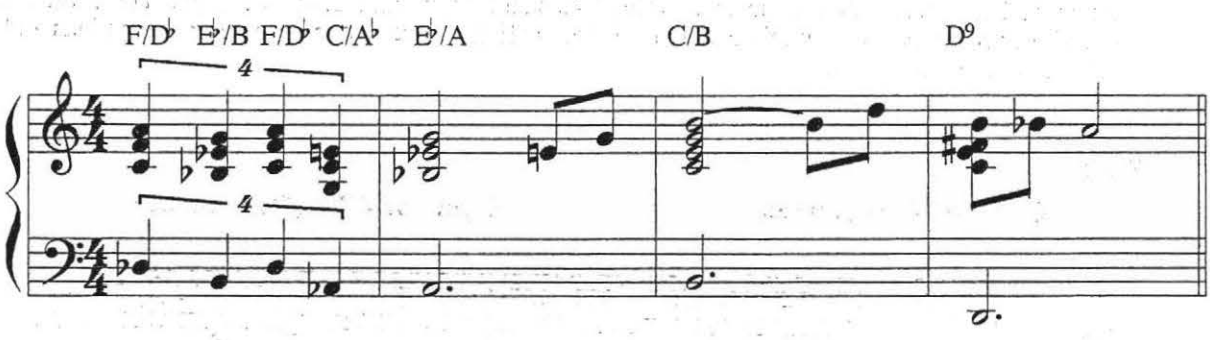
VII	B
I	C

This slash chord is commonly used in place of a diminished chord based on the bottom note. The B chord is actually an upper structure contained in the scale but has quite a different sound when used as a slash chord. This chord appears frequently in a I diminished to I as part of a delayed resolution.



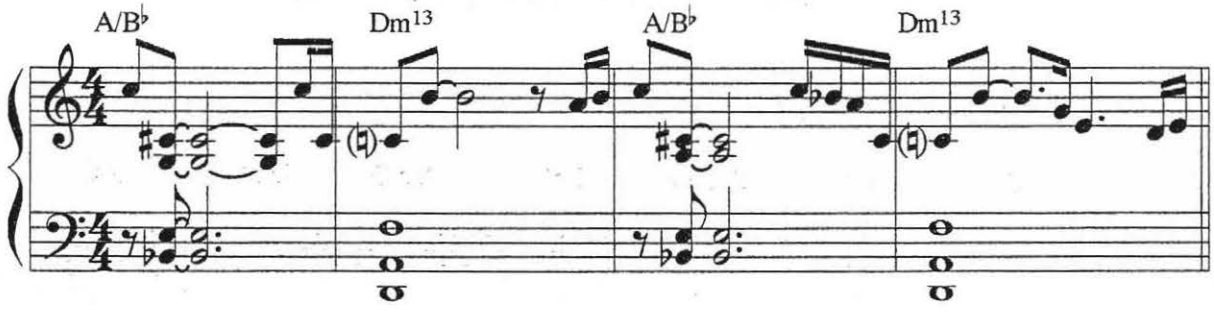
Example 29 shows the chord used by Mulgrew Miller to reharmonise the song "What the World Needs Now" by Burt Bacharach.[25] The slash chord appearing in bar 3 is functioning as a subdominant chord or chord II before D7. This unusual use of this structure is very interesting and combined with the other chord produces a very different feeling to the original chords.

Ex 29 What the World Needs Now



Example 30 shows a short excerpt from "For P.A" (Pepper Adams) by trumpeter Kenny Wheeler.[26] This compostition uses the VII slash chord as a dominant chord substitute resolving to D minor. The resulting chord is more like a Bb diminished structure or it could be thought of as an A7b9 with the b9 in the bass.

Ex 30 For P.A.



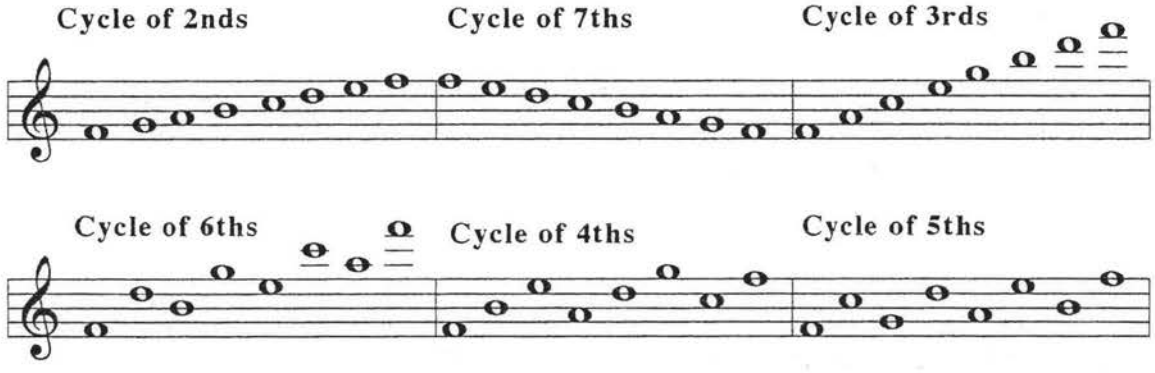
[25] This example was taken from *The Jazz Theory Book* by Mark Levine.
[26] From a handout on slash chords by Nicky Iles

(h) Diatonic Cycles and Hybrid Structures

Slash chords and upper structures are a useful way of structuring triads over bass notes but hybrid upper structures offer a further system of organising chords.[27]

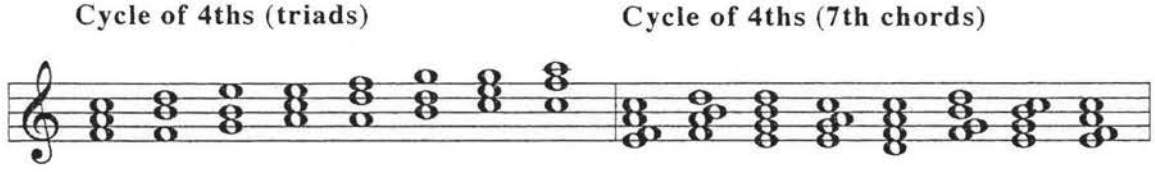
Example 1 shows all of the possible diatonic cycles within an F Lydian scale.

Ex 1



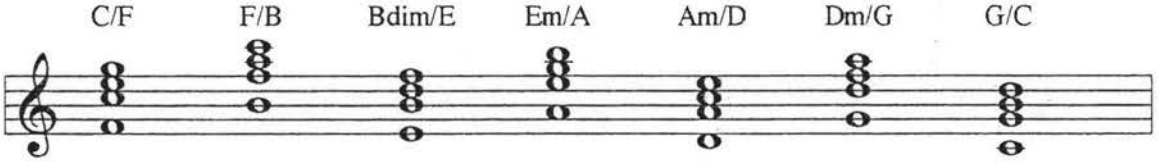
Example 2 shows chords in a diatonic cycle of 4ths still within an F Lydian context. The chords have been inverted so they stay within a similar range, the first set are just three-note primary triads and the second set are 7th chords.

Ex 2



Example 3 shows another cycle of 4ths. This time the technique of hybrid upper structure is used to create the voicing. The name of the hybrid upper structures is determined by the highest extension present in the top chord. These chords have 9ths in relation to the root, so they are called hybrid 9th upper structures. Hybrids are just another form of managing extensions.

Ex 3 Hybrid 9ths in a cycle of 4ths

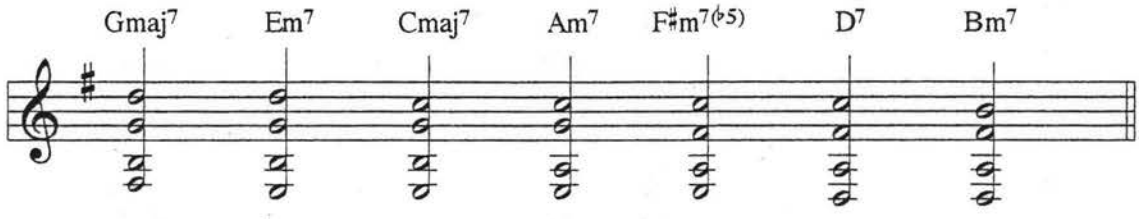


[27] Some of this material is based on an extension of ideas found in the book *The Advancing Guitarist* by Mick Goodrick.

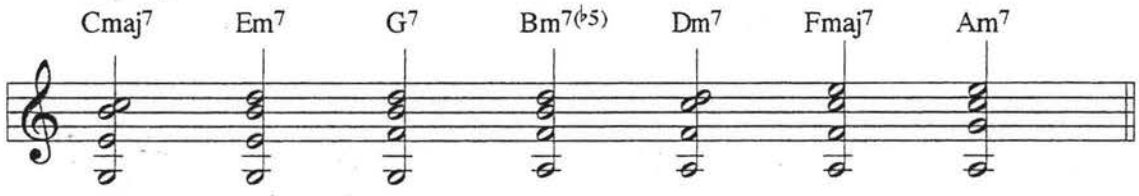
Example 4 shows several hybrid cycles which are structured in the drop system. To keep the chords within a similar range the voicings are inverted, giving very restricted movement of individual voices. The movement from one chord to the next may be the difference of only one note, yet the harmonic direction is propulsive and clear.

Ex 4

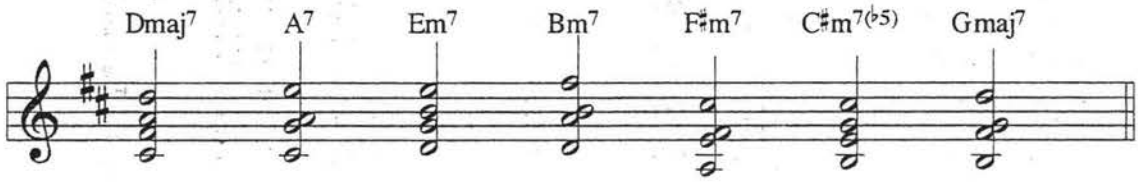
6ths in drop 2,4



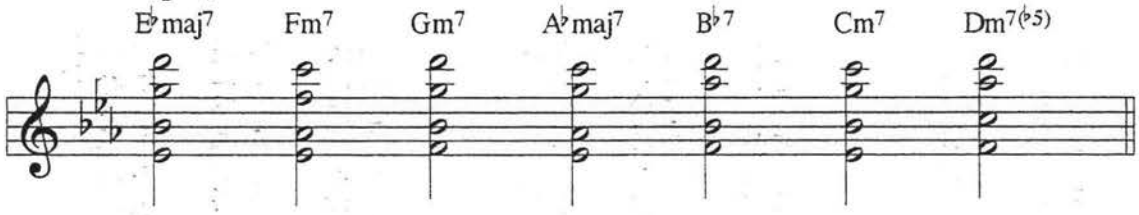
3rds in drop 3



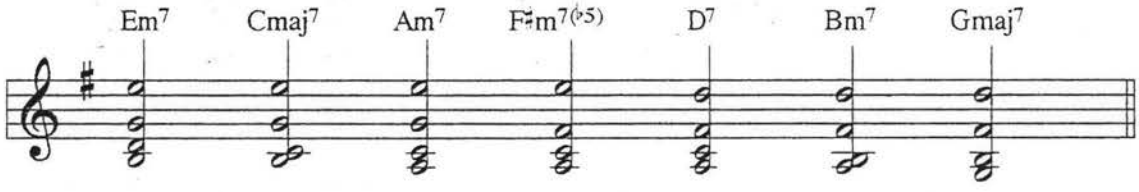
5ths in drop 2



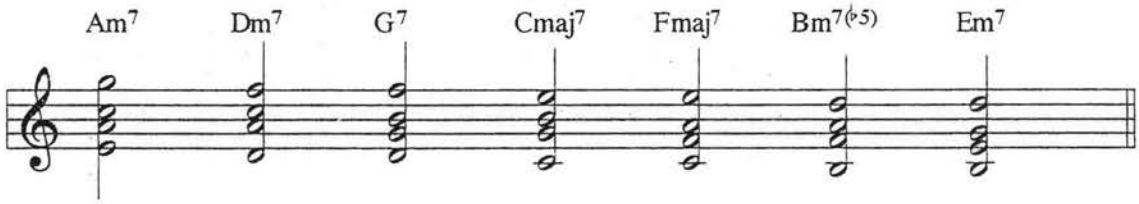
2nds in drop 2, 4



6ths in drop 2, 3



4ths in drop 2



The next two pages contain charts that indicate the use of this material to create hybrid upper structures. These 3-note hybrids are divided into 7ths, 9ths, 11ths and 13ths. The top note of the upper chord indicates the extension from which each chord derives its name. The hybrids are organised into diatonic cycles of 2nds, 3rds and 4ths. Cycles of 7ths, 6ths and 5ths can be found by reversing these.

Diatonic Cycles - 3-note hybrid upper structures

Major

	7th	9th	11th	13th
2nds	$E^m\ F^{maj}\ G^{maj}\ A^m\ B^o\ C^{maj}\ D^m$ C D E F G A B	$G^{maj}\ A^m\ B^o\ C^{maj}\ D^m\ E^m\ F^{maj}$ C D E F G A B	$B^o\ C^{maj}\ D^m\ E^m\ F^{maj}\ G^{maj}\ A^m$ C D E F G A B	$D^m\ E^m\ F^{maj}\ G^{maj}\ A^m\ B^o\ C^{maj}$ C D E F G A B
3rds	$E^m\ G^{maj}\ B^o\ D^m\ F^{maj}\ A^m\ C^{maj}$ C E G B D F A	$G^{maj}\ B^o\ D^m\ F^{maj}\ A^m\ C^{maj}\ E^m$ C E G B D F A	$B^o\ D^m\ F^{maj}\ A^m\ C^{maj}\ E^m\ G^{maj}$ C E G B D F A	$D^m\ F^{maj}\ A^m\ C^{maj}\ E^m\ G^{maj}\ B^o$ C E G B D F A
4ths	$E^m\ A^m\ D^m\ G^{maj}\ C^{maj}\ F^{maj}\ B^o$ C F B E A D G	$G^{maj}\ C^{maj}\ F^{maj}\ B^o\ E^m\ A^m\ D^m$ C F B E A D G	$B^o\ E^m\ A^m\ D^m\ G^{maj}\ C^{maj}\ F^{maj}$ C F B E A D G	$D^m\ G^{maj}\ C^{maj}\ F^{maj}\ B^o\ E^m\ A^m$ C F B E A D G

Harmonic Minor

2nds	$E^{b+}\ F^m\ G^{maj}\ A^{bmaj}\ B^o\ C^m\ D^o$ C D E^b F G A^b B	$G^{maj}\ A^{bmaj}\ B^o\ C^m\ D^o\ E^{b+}\ F^m$ C D E^b F G A^b B	$B^o\ C^m\ D^o\ E^{b+}\ F^m\ G^{maj}\ A^{bmaj}$ C D E^b F G A^b B	$D^o\ E^{b+}\ F^m\ G^{maj}\ A^{bmaj}\ B^o\ C^m$ C D E^b F G A^b B
3rds	$E^{b+}\ G^{maj}\ B^o\ D^o\ F^m\ A^{bmaj}\ C^m$ C E^b G B D F A^b	$G^{maj}\ B^o\ D^o\ F^m\ A^{bmaj}\ C^m\ E^{b+}$ C E^b G B D F A^b	$B^o\ D^o\ F^m\ A^{bmaj}\ C^m\ E^{b+}\ G^{maj}$ C E^b G B D F A^b	$E^{b+}\ G^{maj}\ B^o\ D^o\ F^m\ A^{bmaj}\ C^m$ C E^b G B D F A^b
4ths	$E^{b+}\ A^{bmaj}\ D^o\ G^{maj}\ C^m\ F^m\ B^o$ C F B E^b A^b D G	$G^{maj}\ C^m\ F^m\ B^o\ E^{b+}\ A^{bmaj}\ D^o$ C F B E^b A^b D G	$B^o\ E^{b+}\ A^{bmaj}\ D^o\ G^{maj}\ C^m\ F^m$ C F B E^b A^b D G	$D^o\ G^{maj}\ C^m\ F^m\ B^o\ E^{b+}\ A^{bmaj}$ C F B E^b A^b D G

Melodic Minor

2nds	$E^{b+}\ F^{maj}\ G^{maj}\ A^o\ B^o\ C^m\ D^m$ C D E^b F G A B	$G^{maj}\ A^o\ B^o\ C^m\ D^m\ E^{b+}\ F^{maj}$ C D E^b F G A B	$B^o\ C^m\ D^m\ E^{b+}\ F^{maj}\ G^{maj}\ A^o$ C D E^b F G A B	$D^m\ E^{b+}\ F^{maj}\ G^{maj}\ A^o\ B^o\ C^m$ C D E^b F G A B
3rds	$E^{b+}\ G^{maj}\ B^o\ D^m\ F^{maj}\ A^o\ C^m$ C E^b G B D F A	$G^{maj}\ B^o\ D^m\ F^{maj}\ A^o\ C^m\ E^{b+}$ C E^b G B D F A	$B^o\ D^m\ F^{maj}\ A^o\ C^m\ E^{b+}\ G^{maj}$ C E^b G B D F A	$D^m\ F^{maj}\ A^o\ C^m\ E^{b+}\ G^{maj}\ B^o$ C E^b G B D F A
4ths	$E^{b+}\ A^o\ D^m\ G^{maj}\ C^m\ F^{maj}\ B^o$ C F B E^b A D G	$G^{maj}\ C^m\ F^{maj}\ B^o\ E^{b+}\ A^o\ D^m$ C F B E^b A D G	$B^o\ E^{b+}\ A^o\ D^m\ G^{maj}\ C^m\ F^{maj}$ C F B E^b A D G	$D^m\ G^{maj}\ C^m\ F^{maj}\ B^o\ E^{b+}\ A^o$ C F B E^b A D G

Diatonic Cycles -3-note hybrid upper structures (page 2)

HarmonicMajor

	7th	9th	11th	13th
2nds	$E^m\ F^m\ G^{maj}\ A^{b+}\ B^o\ C^{maj}\ D^o$ C D E F G A^b B	$G^{maj}\ A^{b+}\ B^o\ C^{maj}\ D^o\ E^m\ F^m$ C D E F G A^b B	$B^o\ C^{maj}\ D^o\ E^m\ F^m\ G^{maj}\ A^{b+}$ C D E F G A^b B	$D^o\ E^m\ F^m\ G^{maj}\ A^{b+}\ B^o\ C^{maj}$ C D E F G A^b B
3rds	$E^m\ G^{maj}\ B^o\ D^o\ F^m\ A^{b+}\ C^{maj}$ C E G B D F A^b	$G^{maj}\ B^o\ D^o\ F^m\ A^{b+}\ C^{maj}\ E^m$ C E G B D F A^b	$B^o\ D^o\ F^m\ A^{b+}\ C^{maj}\ E^m\ G^{maj}$ C E G B D F A^b	$D^o\ F^m\ A^{b+}\ C^{maj}\ E^m\ G^{maj}\ B^o$ C E G B D F A^b
4ths	$E^m\ B^o\ F^m\ C^{maj}\ G^{maj}\ D^o\ A^{b+}$ C F B E A^b D G	$G^{maj}\ D^o\ A^{b+}\ E^m\ B^o\ F^m\ C^{maj}$ C F B E A^b D G	$B^o\ F^m\ C^{maj}\ G^{maj}\ D^o\ A^{b+}\ E^m$ C F B E A^b D G	$D^o\ G^{maj}\ C^{maj}\ F^m\ B^o\ E^m\ A^{b+}$ C F B E A^b D G

Double Harmonic

2nds	$E^m\ F^m\ G^{(b5)}\ A^{b+}\ B^{sus2\,(b5)}\ C^{maj}\ D^{bmaj}$ C D^b E F G A^b B	$G^{(b5)}\ A^{b+}\ B^{sus2\,(b5)}\ C^{maj}\ D^{bmaj}\ E^m\ F^m$ C D^b E F G A^b B	$B^{sus2\,(b5)}\ C^{maj}\ D^{bmaj}\ E^m\ F^m\ G^{(b5)}\ A^{b+}$ C D^b E F G A^b B	$D^{bmaj}\ E^m\ F^m\ G^{(b5)}\ A^{b+}\ B^{sus2\,(b5)}\ C^{maj}$ C D^b E F G A^b B
3rds	$E^m\ G^{(b5)}\ B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{b+}\ C^{maj}$ C E G B D^b F A^b	$G^{(b5)}\ B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{b+}\ C^{maj}\ E^m$ C E G B D^b F A^b	$B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{b+}\ C^{maj}\ E^m\ G^{(b5)}$ C E G B D^b F A^b	$D^{bmaj}\ F^m\ A^{b+}\ C^{maj}\ E^m\ G^{(b5)}\ B^{sus2\,(b5)}$ C E G B D^b F A^b
4ths	$E^m\ A^{b+}\ D^{bmaj}\ G^{(b5)}\ C^{maj}\ F^m\ B^{sus2\,(b5)}$ C F B E A^b D^b G	$G^{(b5)}\ C^{maj}\ F^m\ B^{sus2\,(b5)}\ E^m\ A^{b+}\ D^{bmaj}$ C F B E A^b D^b G	$B^{sus2\,(b5)}\ E^m\ A^{b+}\ D^{bmaj}\ G^{(b5)}\ C^{maj}\ F^m$ C F B E A^b D^b G	$D^{bmaj}\ G^{(b5)}\ C^{maj}\ F^m\ B^{sus2\,(b5)}\ E^m\ A^{b+}$ C F B E A^b D^b G

Neapolitan Minor

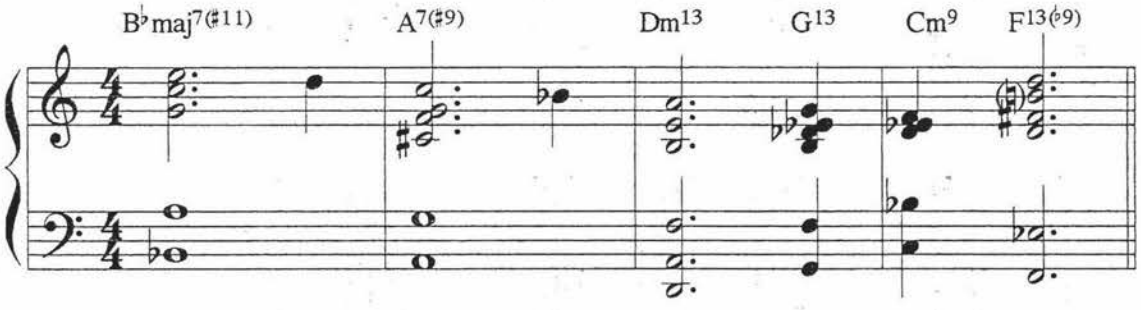
2nds	$E^{b+}\ F^m\ G^{(b5)}\ A^{bmaj}\ B^{sus2\,(b5)}\ C^m\ D^{bmaj}$ C D^b E^b F G A^b B	$G^{(b5)}\ A^{bmaj}\ B^{sus2\,(b5)}\ C^m\ D^{bmaj}\ E^{b+}\ F^m$ C D^b E^b F G A^b B	$B^{sus2\,(b5)}\ C^m\ D^{bmaj}\ E^{b+}\ F^m\ G^{(b5)}\ A^{bmaj}$ C D^b E^b F G A^b B	$D^{bmaj}\ E^{b+}\ F^m\ G^{(b5)}\ A^{bmaj}\ B^{sus2\,(b5)}\ C^m$ C D^b E^b F G A^b B
3rds	$E^{b+}\ G^{(b5)}\ B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{bmaj}\ C^m$ C E^b G B D^b F A^b	$G^{(b5)}\ B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{bmaj}\ C^m\ E^{b+}$ C E^b G B D^b F A^b	$B^{sus2\,(b5)}\ D^{bmaj}\ F^m\ A^{bmaj}\ C^m\ E^{b+}\ G^{(b5)}$ C E^b G B D^b F A^b	$D^{bmaj}\ F^m\ A^{bmaj}\ C^m\ E^{b+}\ G^{(b5)}\ B^{sus2\,(b5)}$ C E^b G B D^b F A^b
4ths	$E^{b+}\ B^{sus2\,(b5)}\ F^m\ C^m\ G^{(b5)}\ D^{bmaj}\ A^{bmaj}$ C G D^b A^b E^b B F	$G^{(b5)}\ D^{bmaj}\ A^{bmaj}\ E^{b+}\ B^{sus2\,(b5)}\ F^m\ C^m$ C G D^b A^b E^b B F	$B^{sus2\,(b5)}\ F^m\ C^m\ G^{(b5)}\ D^{bmaj}\ A^{bmaj}\ E^{b+}$ C G D^b A^b E^b B F	$D^{bmaj}\ A^{bmaj}\ E^{b+}\ B^{sus2\,(b5)}\ F^m\ C^m\ G^{(b5)}$ C G D^b A^b E^b B F

(i) Basic Reharmonisation

The concept of changing chords or background harmony to alter the effect of a melody is an essential element in jazz. The topic of reharmonisation is extensive and would go well beyond the boundaries of this thesis but some general principles are worth covering. As mentioned in the chapter on melody, a strong line has inherent harmonic implications. If a melody contained a F major 7th arpeggio, these notes can fit a large amount of chords. Dm7, G7sus, Am#5, E7susb9, Bbmaj7#11, Gm7, Dbmaj7#5, Bm7b5 and Csus all contain an F major 7th arpeggio. Each of these chords would have a different feeling or expression of mood and that is what makes the subject complicated, because a large aesthetic component exists. The F maj7 arpeggio, with four notes, seems to have many chord possibilities, but if it is reduced to a three-note triad of F then the possibilities multiply. A single note has almost infinite possible harmonisiations available depending on the intensity or mood required at that time. This singular note above a chord can be supported by a structure that can give it stability or tension or any graduation between. A Bb major 7th used to support an F melody note is quite inert and doesn't insist on resolution, but an A major7th #5 used instead has a large degree of tension that needs resolution or some sort of harmonic movement.

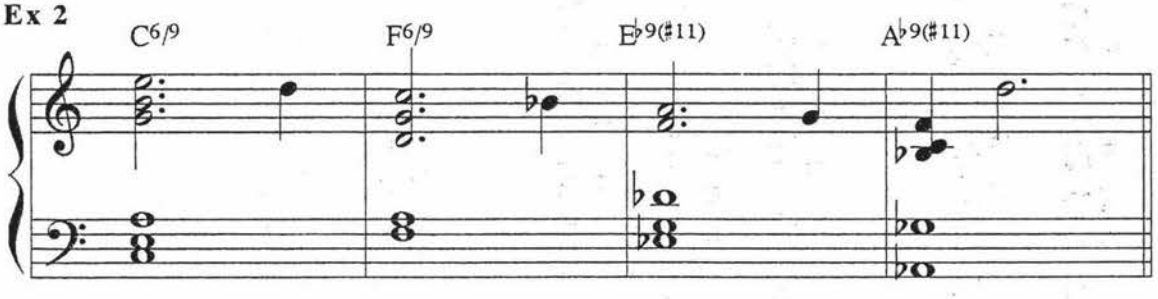
Example 1 shows the first 4 bars of the Miles Davis composition "Blue in Green". The first note appears as a #11 extension on a Bb major chord giving it an instability and a need to resolve. If the first chord was changed to C major 7th the effect of the melody would be changed completely as the 3rd is quite stable and creates litttle tension. The first few bars are actually a variation on a minor II-V-I with the Bb major 7#11 constituting a melodic minor substitute for Em7b5.[28]

Ex 1 Blue in Green



The reduction of tension at the beginning has a devastating effect on the momentum of this melody. Some reharmonisations can actually ruin a melody instead of enhancing it (example 2). With every change of chord the dramatic tension of a melody is altered with one or two substitutions producing an entirely different effect.

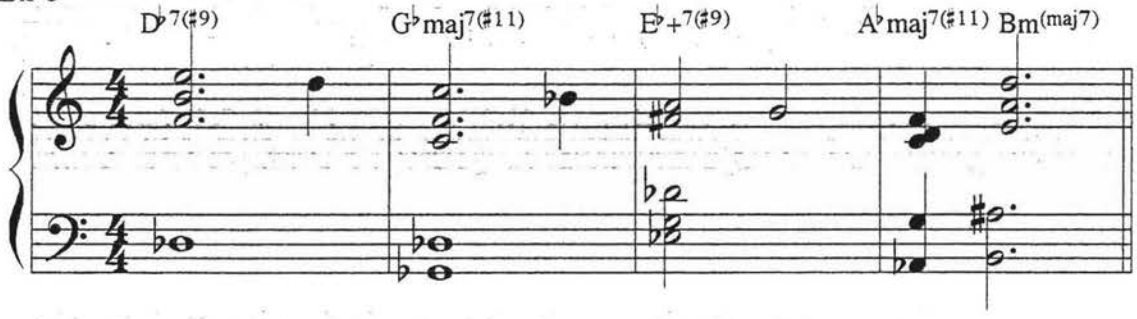
Ex 2



[28] Melodic minor substitution is covered on page 84.

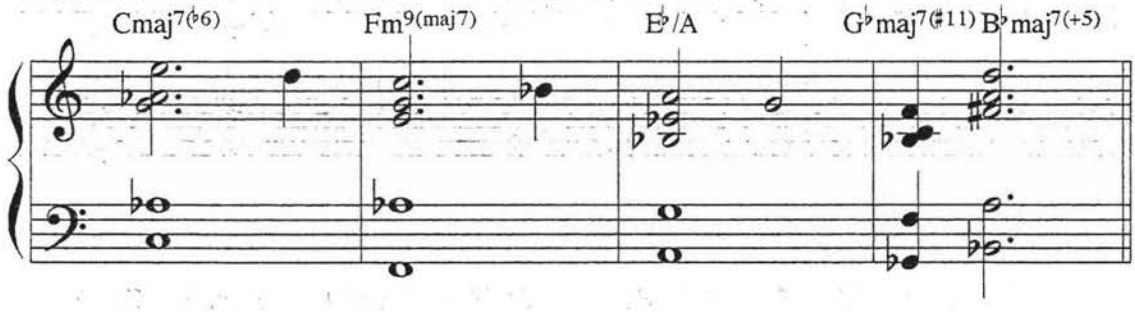
Example 3 shows a harmonisation that has no element of release. The tension is sustained by ensuring that all of the melody notes are extensions in relation to the background chords. This has an unsettling effect on the melody giving it no rest in the first four bars. For this harmonisation to be successful a resolution of some sort would have to occur within the next few bars, otherwise the initial dissonance would not be accepted by the ear.

Ex 3



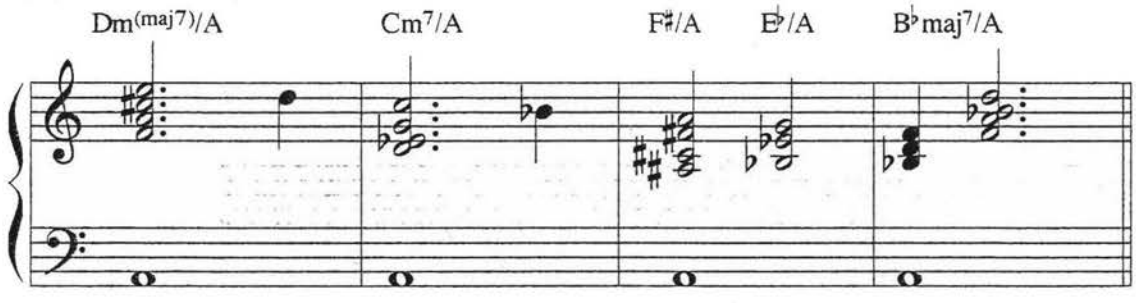
Another interesting effect occurs when the melody is regarded as a chord tone (1,3,5,7) and the tension is produced by altering the chord. Example 3 shows the melody harmonised as basic chord tones with extended dissonant chords underneath.

Ex 4



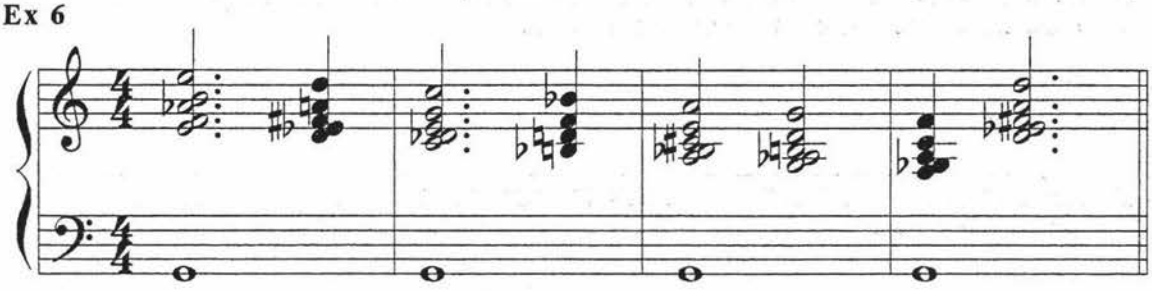
Example 5 makes use of pedal point in which all of the chords have A as a root note. This adds drama to the melody as most of the upper chords are dissonant.

Ex 5



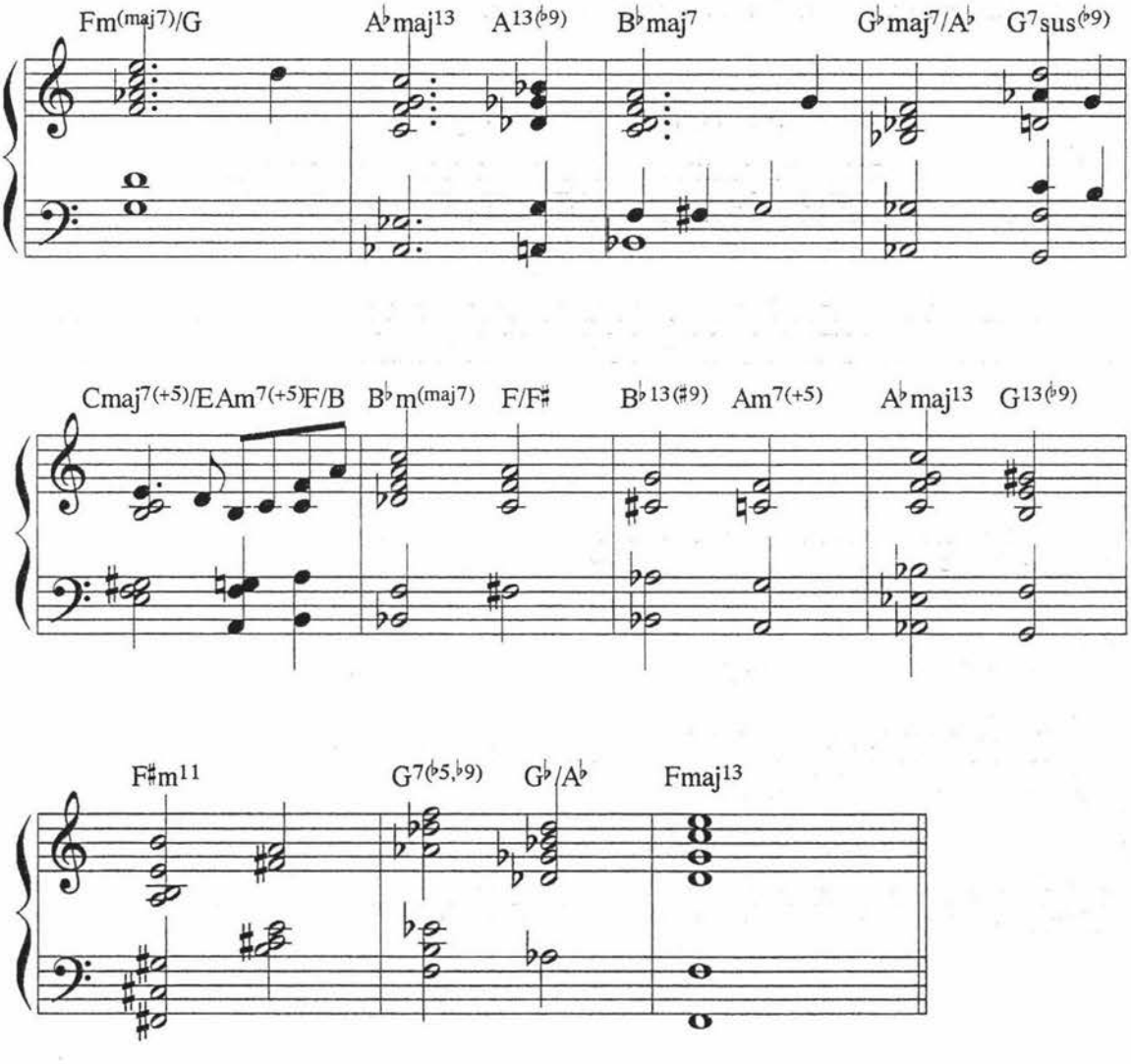
Example 6 shows a diminished voicing moving in parallel with the melody over a pedal tone. The use of this type of material creates a very strong tone colour and an atmosphere of mystery. As a method for reharmonisation this use of parallel structures is best as a flavour rather than a constant texture. The use of ambiguous chords in sequence creates a lack of functional tonality and could be regarded as a procession of chords.

Ex 6



Example 7 shows a full reharmonisation of the melody using a combination of the previous methods. The mood and emphasis is quite different from the original.

Ex 7 Blue in Green



(j) Variations in Chord Progressions

The next few pages show how the harmonic variations discussed in this chapter can be applied to common chord progressions.

II-V-I-VI Substitution Chart

This chart shows the main types of variations applied to a II-V-I-VI progression. The VI is used as a link back to the II chord making it possible to loop each of these variations. The type of substitution being applied is labelled to the left of each line. Some of these progressions are associated with the artists that invented them and are labelled as such.

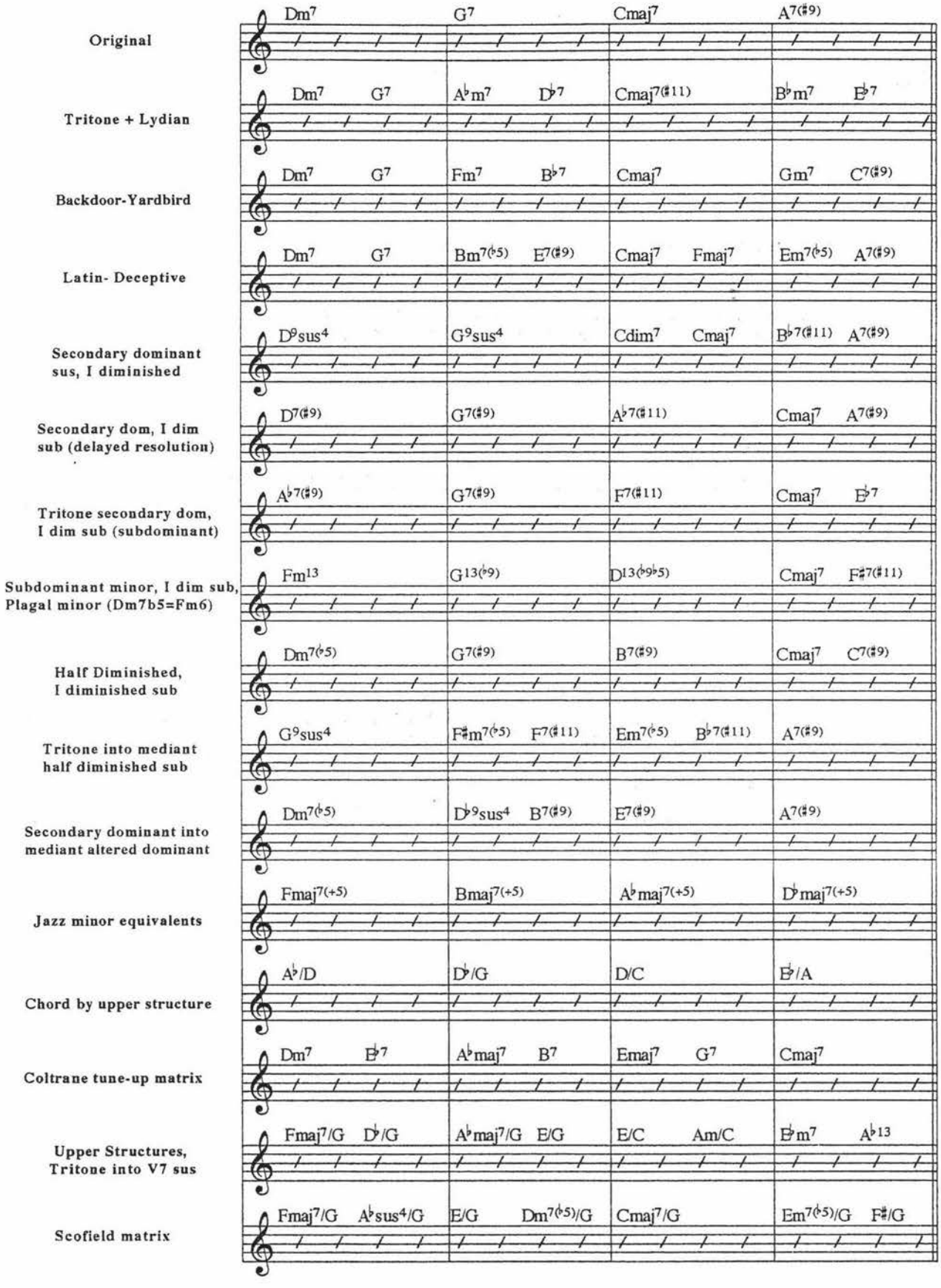
I-V-II-V Minor Turnarounds Chart

The minor turnarounds outlined here are all variations of a basic I-VI-II-V. Although a turnaround is commonly thought of as a two-bar harmonic loop the principle can be extended to longer chord progressions.

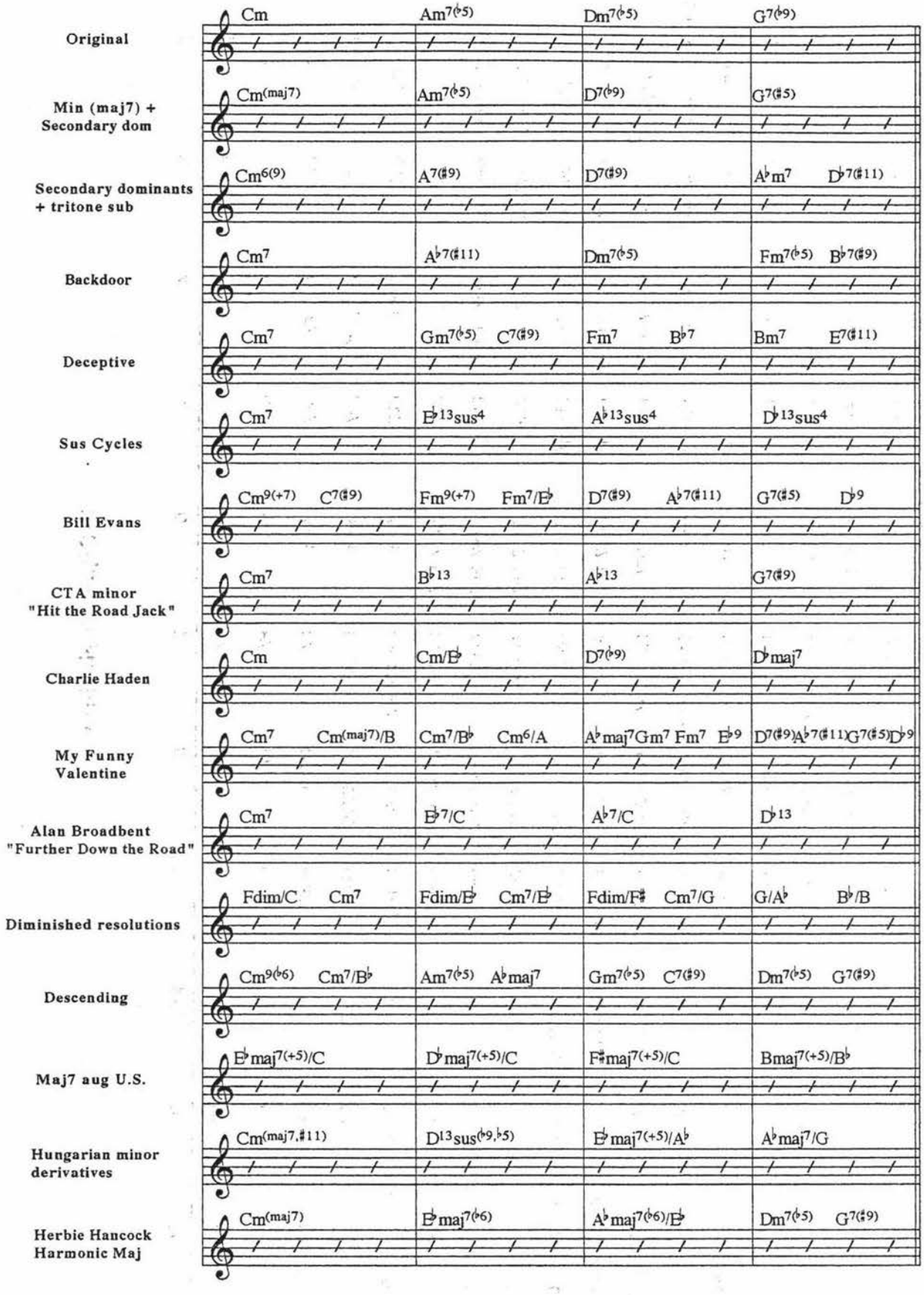
Blues Variations

The blues is a large part of pop music as well as jazz. During the Rock 'n' Roll era almost all the songs were based on this 12 bar form. However, the basic I, IV and V chords were not enough for jazz musicians in the bebop era so many substitutions were added. Although the pianists at the time were more knowledgeable about chords and progressions. It seems the main innovations came from horn players. Charlie Parker's early rhythm sections played a far more fundamental progression than was being hinted at in the horn lines. One feature of Parker's solos and melodies was that the accompaniment could be taken away and the line would still outline a very clear harmonic path. This led to new chord progressions and more elaborate substitutions. Most prominent jazz musicians contributed a set of changes (several in some cases) that became part of the repertoire.

II-V-I-VI Substitution Chart



I-VI-II-V Minor Turnarounds Substitution Chart



F Blues Variations

	1	2	3	4	5	6	7	8	9	10	11	12
1	F7	F7	F7	F7	Bb7	Bb7	F7	F7	C7	C7	F7	F7
2	F7	Bb7	F7	F7	Bb7	Bb7	F7	F7	C7	Bb7	F7	C7
3	F7	Bb7	F7	Cm7 F7	Bb7	Bdim	F7	D7#9	Gm7	C7	F7	Gm C7
4	F7	Bb7 Bdim	F7	Cm7 F7#9	Bb7	Bdim	F7 E7	Eb7 D7#9	Gm7	C7#9	F7 Eb7	Db7 C7
5	F7	Bb7 Bdim	Cm7	F7#9	Bb7	Bdim	Fmaj7 Gm7	Am7 D7#9	Gm7	C7#9	Fmaj7 D7#9	Gm7 C7#9
6	F7	Bb7 Bdim	Cm7	F#m7 B7	Bb7	Bbm7 Eb7	Fmaj7	Ebm7 Ab7	Gm7	C7#9	Am7 Ab7	Gm7 F#7
7	Fmaj7	Em7b5 A7alt	Dm7 G7	Cm7 F7	Bbmaj7	Bbm7 Eb7	Am7 D7	Abm7 Db7	Gm7	C7#9	Fmaj7 Dm7	Gm7 C7
8	Fmaj7	Em7b5 A7alt	Dm7 G7	Cm7 F7	Bbmaj7	Bbm7 Eb7	Abmaj7	Abm7 Db7	Gm7	C#m7 F#7	Fmaj7 Dm7	Gm7 C7
9	Fmaj7 Ab7	Dbmaj7 E7	Amaj7 C7	F7 F7#9	Bbmaj7	Bbm7 Eb7	Am7 D7	Abm7 Db7	Gm7 C7	C#m7 F#7	Fmaj7 Abmaj7	Dbmaj7 C7#9
10	Fmaj7	Cm7 Db7	Gbmaj7 A7	Dmaj7 F7	Bbmaj7	Bbm7 Eb7	Am7 D7	Gm7 Ab7	Dbmaj7 E7	Amaj7 C7	Fmaj7 Abmaj7	Dbmaj7 Gb7#11
11	F7	C#m7 F#7	Cm7 F7	F#m7 B7	Bb7	Gm7 C7	Fmaj7 Bb7	Ebm7 Ab7	Gm7	Fm7 Bb7	Am7 Ab7	Gm7 C7#9
12	F#m7b5 B7alt	Em7b5 A7alt	Dm7 G7	Cm7 F7	Bbmaj7	Cm7	C#m7b5 F#7	Bm7b5 E7#9	Am7 D7	Gm7 C7	Fmaj7 Eb7	Ab7 Gb7
13	F7#9	Bb7#5	Ebm7	Ab7	Bbmaj7	G7#9	C7#9	F7#9	Bbm7	Eb7	Fmaj7 Ab7	C#m7 F#7
14	F7#11	Abmaj7	Gb7 F7	A7#9	Bb7	Ab7 Db7	F7	D7sus	Db7sus	C7sus	F7 D7	B7 Ab7
15	F7	Bb7	F7	F7	Bb7 Eb7	Ab7 Db7	Dm7b5 Eb7	E7 F7b9	Gm7b5	C7#9	F7 Ab7	Db7 Gb7
16	F7	Eb7	F7	F#m7 B7	Fm7 Bb7	Bbm7 Eb7	Am7 D7	Abm7 Db7	Gm7	C7#9	Fmaj7 Ab7	Dbmaj7 Gbmaj7
17	F7	Eb7	F7	F7	Bb7	Eb7	Ab7	Db7	C7	Bb7	F7 Eb7	F7

5. Exploring Rhythm

The inclusive nature of jazz means that it has been influenced by many types of music. The rhythmic roots of jazz were principally west African, but it was also strongly influenced by other African-based styles; namely, Afro-Cuban, West Indian calypso and the Brazilian-African blend. The forging of these rhythms with regional influences gave birth to what is regarded as the swing rhythm. One feature of jazz rhythm is the emphasis on a continuous pulse. In jazz the importance of a continuum is paramount, and words like 'swing' and 'groove' are often used when describing this aspect of the music. This continuum has undergone many transformations in forty years, ranging from the solid quarter-note feel of Jimmy Cobb and Paul Chambers with Miles Davis, to the polyphonic freedom and rhythmic displacement demonstrated by Scott LaFaro and Paul Motian in the Bill Evans Trio, to the freer non-metric approaches taken by free-jazz groups.

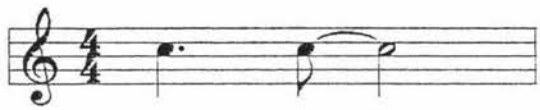
In its short life jazz has developed a unique rhythmic language. As jazz evolved through the fifties, the rhythm became freer and less stated, with more interaction taking place between the melody instruments and the rhythm section. An interesting development occurred early in the sixties with techniques of displacement, counterpoint, polyrhythm and metric modulation replacing the previous roles of strict timekeeping and metric subdivision. Essentially the drums became more interactive, and as a parallel development to chromaticism in harmony, polyrhythms and other complex rhythmic techniques occurred more frequently.

One of the characteristics of jazz rhythm is the way in which syncopation and subtle accents are used to create the rhythm known as Swing. Swing also refers to an early era of jazz, but in this context it refers to the underlying rhythmic feel that forms the basis of most jazz. To illustrate the complexity of the swing feel it is necessary to examine the relationship between downbeats and off-beats.

(a) Elements of Swing

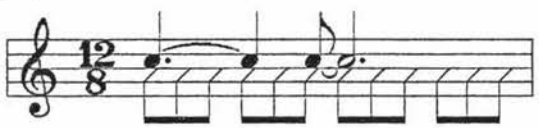
Example 1 shows a simple 4/4 rhythm consisting of one downbeat and one off beat

Ex 1



Example 2 shows the correct placement of the rhythm in a swing feel using the time signature of 12/8. The underlying subdivision is triplets. Most swing jazz is written in straight eighths in 4/4 but is essentially in 12/8. Example 2 shows the offbeat, occurring on the sixth triplet. This offbeat is now closer in time to the next main beat, than in the previous straight-eighth example. The placement of this offbeat is crucial to the feel of the rhythm and often presents the musician with difficulty. At a slower metronome marking the triplet swing feel works well. As the tempo increases the offbeat tends toward the straight-eighth feel.

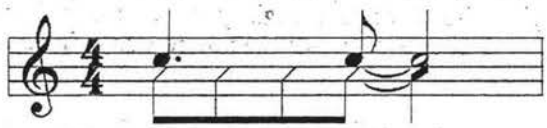
Ex 2



To understand the tempo-dependent relationship between downbeats and off beats, it is useful to delve into a little mathematics. If the quarter notes are thought of as the main beat then the straight-eight note occurs at the exact halfway point between two quarter notes. This is referred to as the 50% mark because it is equidistant between two main beats. The last of a group of three triplets would occur at the 66% mark between two quarter notes. The last of a group of four semiquavers is at the 75% mark. When a jazz musician plays, they have to determine the placement of the offbeat according to the tempo and feel of the other musicians. An experienced improviser would be familiar with the placement of these notes resulting in the characteristic swing feel. A common misinterpretation of the swing feel results in the rhythm being too bouncy, interfering with the momentum and flow of the rhythm.

In example 3 this straight-eighth offbeat on the "and" of 2, occurs at the 50% mark and is equidistant between beat 2 and 3

Ex 3 **50%**

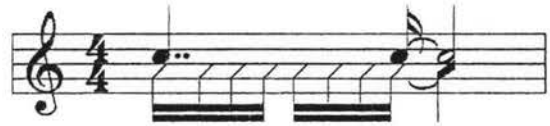


The 12/8 rhythm in example 4 has the offbeat occurring on the last triplet of beat 2, putting it in the 66% region.

Ex 4 **66%**

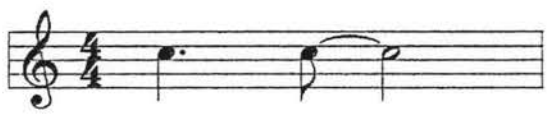
The rhythm in example 5 is the semiquaver offbeat which occurs on the last semiquaver of beat 2 putting it at the 75% mark between beat 2 and 3.

Ex 5 **75%**



In the notation of jazz these different rhythms appear the same (Ex 6) so the emphasis is largely one of interpretation.

Ex 6



As a swing rhythm increases in tempo the offbeat tends toward the 50% zone as opposed to the 66% found in a medium swing tempo. At the slower tempo the triplet feel is common, but at higher tempos, anything above 240, the triplet offbeat sounds tight and impedes the flow of the rhythm. At about 280 the swing feel starts to straighten out. The 75% offbeat is commonly used to maintain propulsion at lower and medium tempos. Steve Gadd is an example of a drummer who favours the 75% zone at medium tempos, this is often referred to as a "tightened skip," the skip meaning the offbeat. An interesting feature of the 75% offbeat is that it is commonly used to hint at the double-time swing. The tempo and the skip are by no means bound to each other, an experienced musician will use the various placements to enhance the rhythm. Though these percentages are demonstrated here as separate zones, in practice the offbeat can occupy any placement between 50, 66 and 75%. The placement of these off beats and their emphasis is crucial to the flow and amount of tension present in the rhythm.

It is common to hear an inexperienced player misinterpret the amount of swing required at a certain tempo; they will almost always err on the side of making the rhythm to bouncy. This characteristic sound faces every teacher of jazz at one time or another, and is often referred to as 'Skippy'. This over emphasis is often accompanied by a tendency to start and end phrases on downbeats, making the rhythm heavy and liable to drag. The expert musician has isolated the amount of emphasis and offbeat placement so that the rhythm swings at all tempos. The principles outlined here in an academic sense, seem simple enough, but the application of this material can take many years of hard work, proving quite elusive for many students of jazz. Many musicians use the technique of delaying the downbeat slightly while the offbeat is emphasised and lengthened. This gives a laid back type of forward motion commonly associated with players like Keith Jarrett and John Scofield.

The previous explanations are far too simple and academic to describe the intricacies of swing, as the success of achieving this modern feel relies on many variables. A good understanding of jazz rhythm can only be achieved through practical application. The principle of modern swing is much more complex than just the placement of the offbeat. Elements of touch, emphasis, placement, steadiness, accent and evenness, all have a large bearing on the quality. The intricacies of swing can only be experienced as a sound, and in the the case of a musician, the physical feelings. Notation and written explanations are too inaccurate to convey its subtleties. The swing feel has traditionally been learnt by imitation and not as an academic principle.[1] The rhythmic element of jazz is as elusive as it is exclusive, often requiring years of involvement to reveal its mysteries.

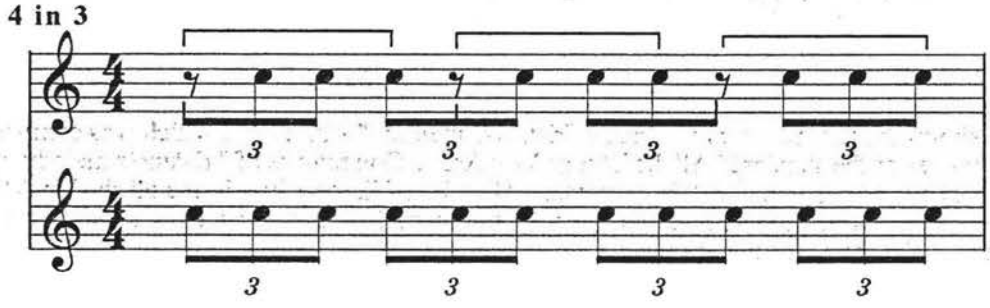
[1] The teaching of rhythm is often done using the African approach . This is discussed further in the conclusion chapter.

(b) Rhythmic Groupings

In jazz many rhythmic techniques have been explored in its history, one of the most common is the use of phrases that are grouped within certain subdivisions. As an example, a standard subdivision of triplets in a bar of 4/4 gives twelve possible notes in total. The idea of grouping these triplets in groups other than 3 leads to many interesting rhythmic possibities.

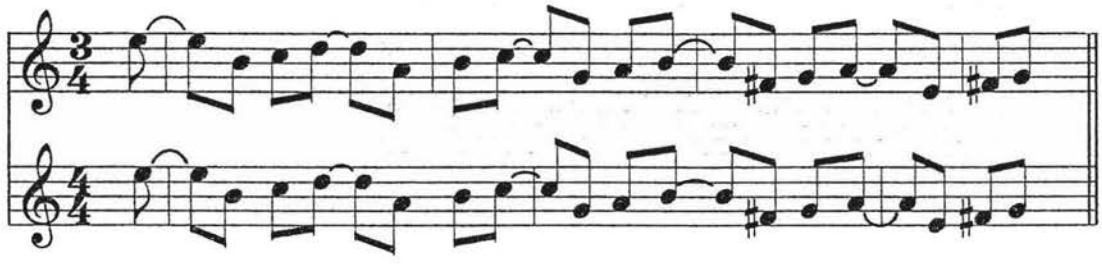
Example 1 shows how a triplet rhythm occurs in groups of 4, so instead of having 4 groups of 3, 3 groups of 4 are used to make up a bar of 4/4. This is known as 4 in 3, as the pattern is based on groups of 4 within a 3 subdivision. Once this technique became popular in jazz the possibities of different combinations were almost endless. This concept liberated jazz rhythm in the 1960s resulting in the gradual blurring of bar lines.

Ex 1



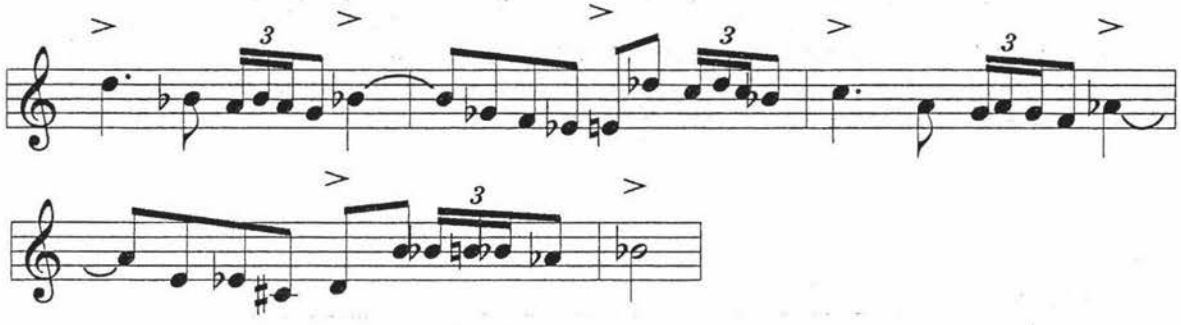
In example 2, the composition is in 3/4 but the phrase is actually in 4/4. This phrase uses a rhythm found in the first few bars of 'Four' by Miles Davis, and in 4/4 has a good sense of propulsion due to the anticipations. When put it in 3/4 it crosses over the barline in a very interesting way, and creates a large degree of rhythmic tension and forward motion. Even though the stated pulse is in 3/4 the ear gravitates toward the 4/4 nature of the line resulting in a pull away from the main pulse, causing a degree of apprehension. Experimentation by improvisers in the 60s meant that it becomes possible to utilise any 4/4 phrase in 3/4 time. This blurring of the bar line led to a new found freedom which gave new possibilities of rhythmic interaction between soloist and rhythm section. The use of this material on chord changes poses a particular challenge as the harmonic rhythm always stays the same. Decisions have to be made as to whether chords are anticipated or delayed. Often with advanced rhythmic techniques in jazz, the harmonic rhythm is left untouched. It is important to remember that these rhythmic concepts were being pioneered on the spot, in real time, so for the sake of musical consistency it was important that the soloist have something to come back to if the rhythm was aborted.

Ex 2



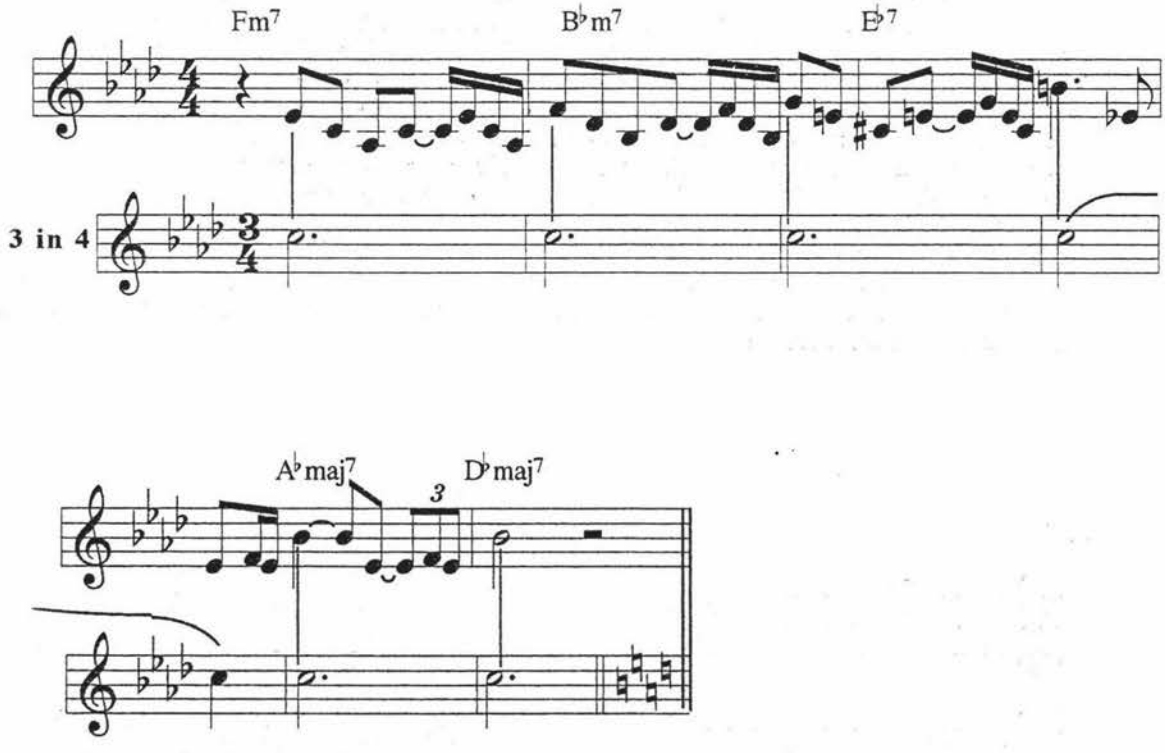
Example 3 shows an excerpt from the bridge of Clifford Brown's "Joy Spring". The phrasing falls into a 3, 3, 2 pattern or, in other words, the first eight beats are divided by two bars of 3/4 and one bar of 2/4. So it is more of a temporary shift to 3/4 rather than an extended use. This regrouping is commonly used in jazz composition, "In the Mood" by Glenn Miller is an example of a 3, 3, 3, 3, 4 grouping that occurs over 16 beats or 4 bars.

Ex 3



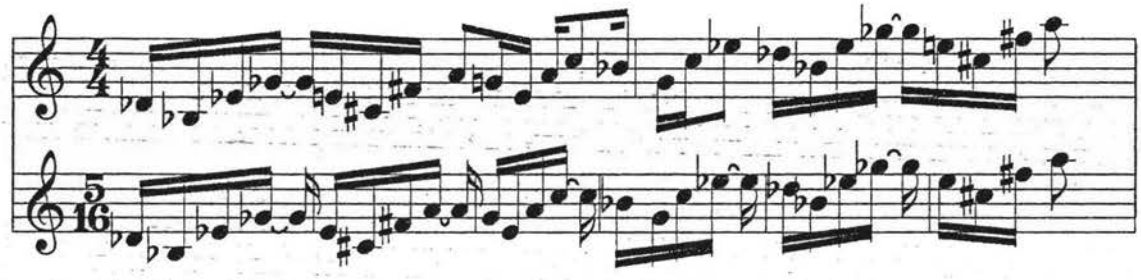
Example 4 shows the first few bars of Lennie Tristano's melody " Ablution ", which was composed over the chord changes of the standard" All the Things You Are ". One feature of Tristano's melody writing is the use of other time signatures within a regular 4/4 swing. The top line is the original in 4 /4 but the melody is really in 3/4, it appears to have been started on beat 2 so that it would come out in the fifth bar which is the first harmonic resolution.

Ex 4 Ablution- Lennie Tristano



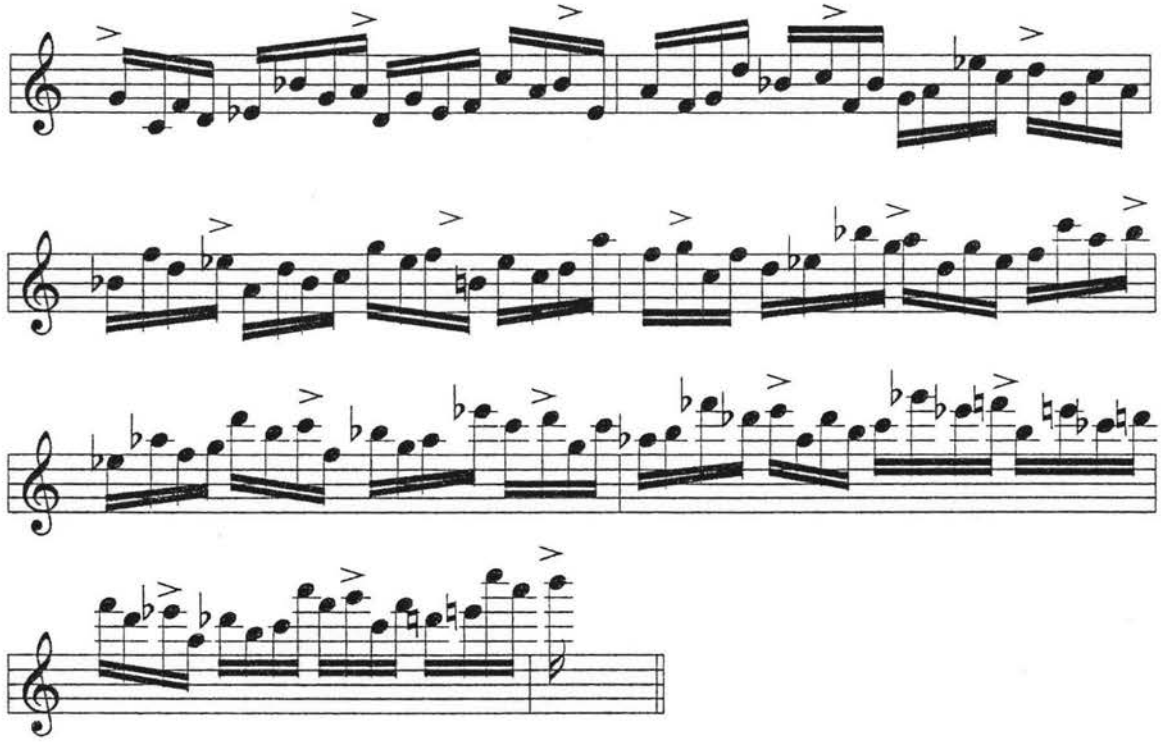
Harmonically the line in example 5 is constructed from the upper structures available in a diminished scale In this case the triads of Ebm7, F#m7 Am7 and Cm7 are used respectively placed in a five -note pattern. The use of a five-note motif in a sixteenth-note flow creates an interesting degree of instability when played. After five beats (quarter notes) the rhythmic pattern re-occurs. The bottom staff in example 5 has the line written out in 5/16 in which it fits perfectly, the point being that the line is in 4/4. The principle of using non-metric placements of rhythmic ideas is very common and used by most modern improvisers at some time.

Ex 5 5 in 4



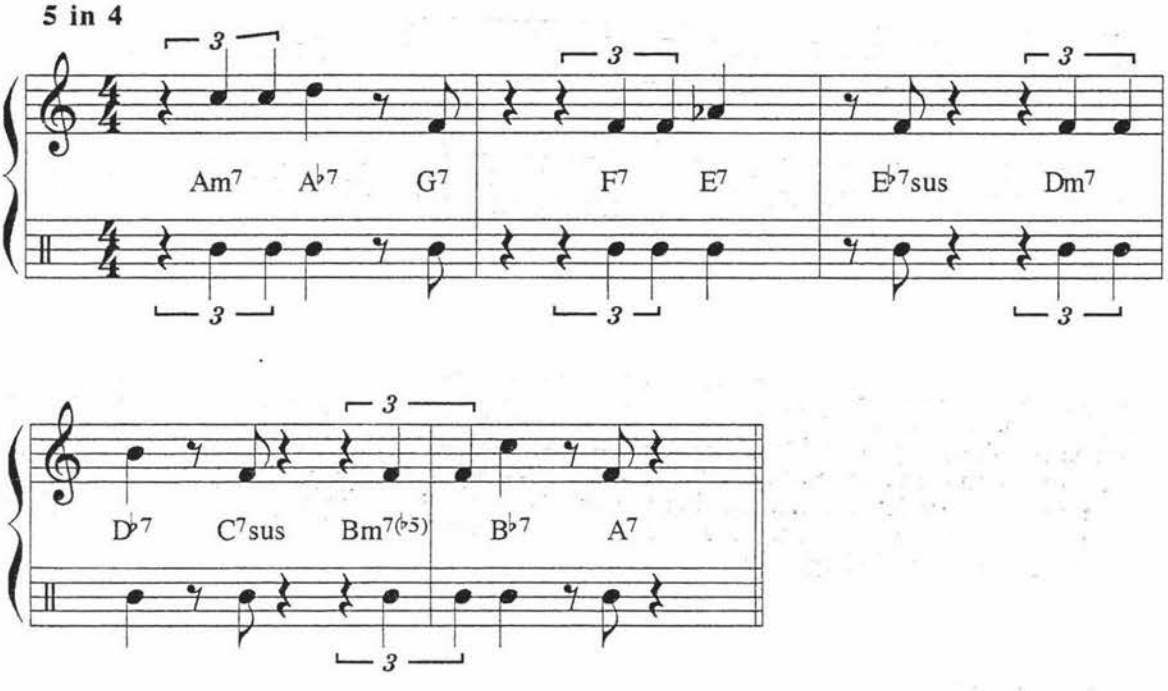
Example 6 uses the principle of 7 in 4, in which the grouping of seven works within a sixteenth-note subdivision. This is a technique employed by pianist Lyle Mays in many of his solos. If the left hand emphasises the grouping in 7 the tension is increased. Example 6 shows that it takes seven bars to cycle round and land on beat 1 again. This particular pattern is probably too long for musical use as the ear starts to predict its cycle. Starting in other parts of the bar would shorten the resolution of the pattern. Often in jazz this technique is used as a flavour rather than as a feature, so it is often disguised and happens as part of a larger idea.

Ex 6 7 in 4



Example 7 shows a Darrell Grant arrangement of the standard "I Thought About You".[2] This rhythm appears in the coda section and demonstrates the use of a 5/4 phrase that is played within a 4/4 time signature. The 5/4 phrase occurs four times, taking up a total of 20 beats. 20 beats is five bars in 4/4 time. This is an excellent example of rhythmic groupings that are used to enhance the arrangement and present the musicians with a challenge.

Ex 7

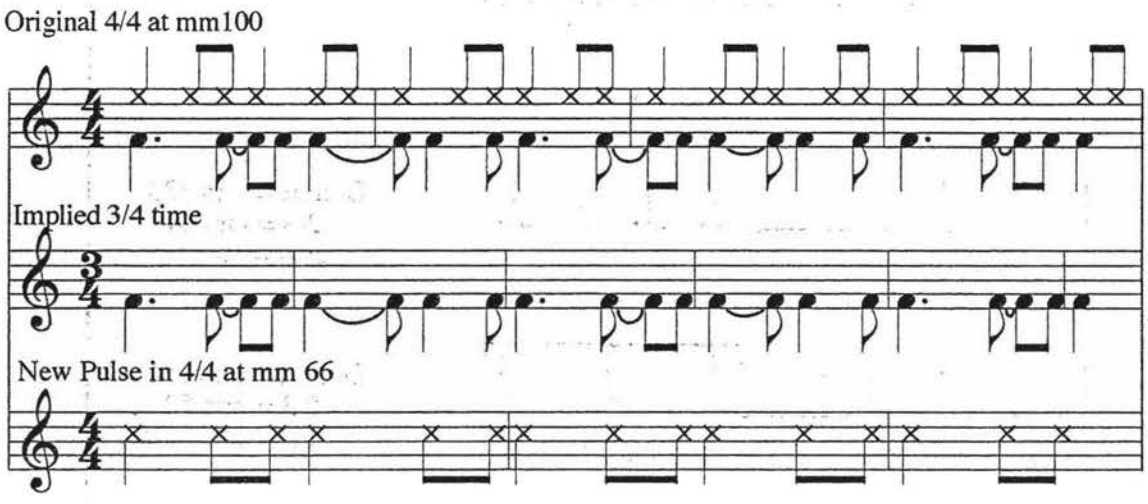


[2] From a manuscript by Darrell Grant.

(c) Metric Modulation

Example 1 shows a pattern used by Elvin Jones to break up the 4/4 swing feel. The most interesting aspect of this rhythm is that it creates another swing feel at 2/3 of the original tempo, creating a link between the two tempos. The first line indicates the ride cymbal rhythm in the 4/4 pulse, directly underneath is the linking rhythm written in 4/4, but actually in 3/4. Underneath that is the same rhythm written on a 3/4 stave, so that the pattern can be seen clearly in 3. On the bottom stave the rhythm is now metrically modulated to 4/4, and the new ride cymbal rhythm is notated. This principle is complicated on paper but makes perfect sense to the ears when demonstrated practically.

Ex 1

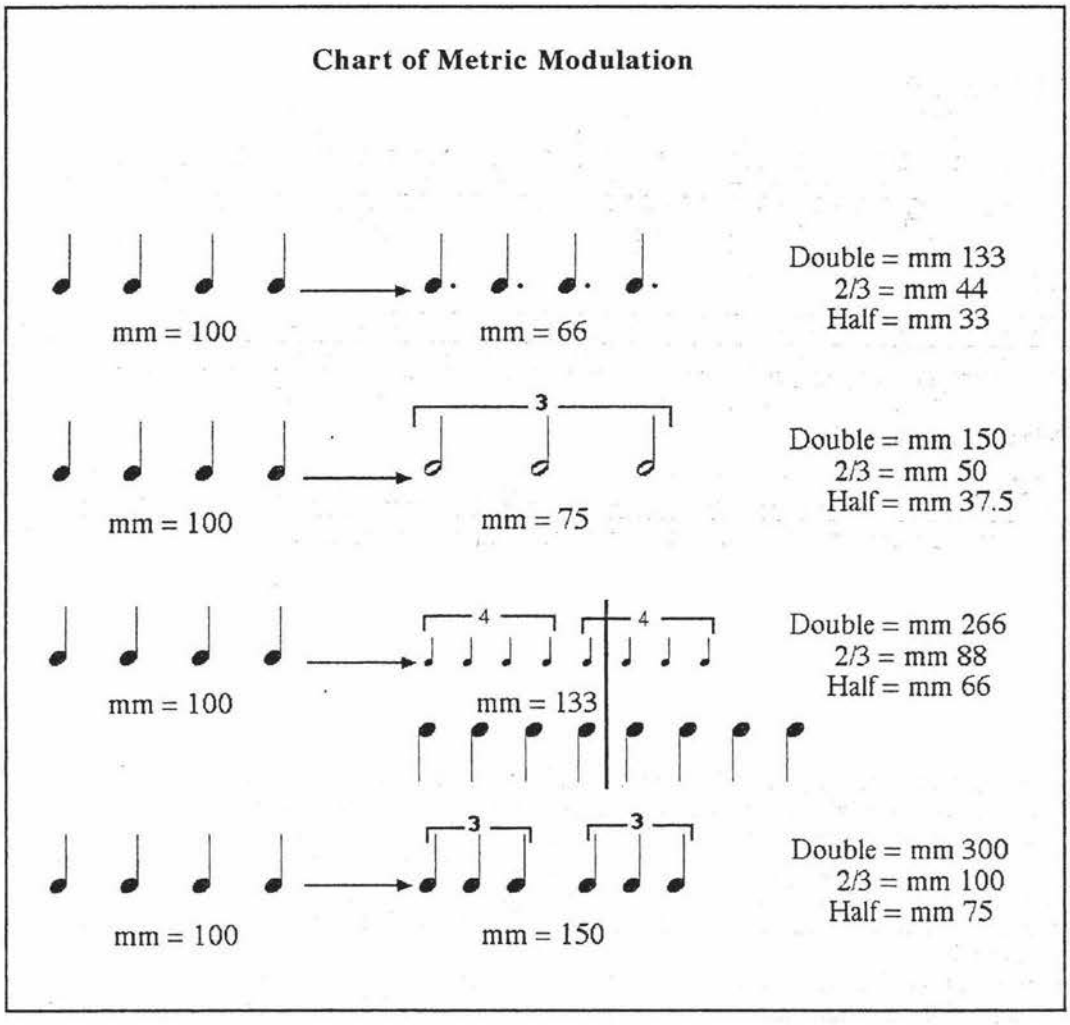


Many arrangements by the trumpeter Wynton Marsalis, particularly on *Standard Time*, are based on this principle which has its origins in the Miles Davis group, featuring Herbie Hancock and Tony Williams in the mid 1960s. Miles Davis employed this principle to create a huge amount of flexibility within the group. It also made listening and interaction an absolute necessity. Early attempts were always done on simple chord progressions. At times the variations became so complex that the band would start to sound frayed, at which time Miles would come back with the original tempo, releasing the tension and locking the band in.

It is interesting to note that Bill Evans, with his trio, was working on a similar concept around about the same time, and over many years took it too an astonishingly high level. Evans' classic renditions of 'My Romance' would contain many changes of tempo and feel and at times sound like a roller coaster ride for the rhythm section. In an informal discussion with this author Joe la Barbera (drummer for Bill Evans in the last trio) explained that the cross-rhythms resulting in a new tempo were different every time they performed the piece. The basic principle of 2 against 3 or 3 against 4 would apply so it was just a matter of "following Bill". Even though Bill Evans recorded "My Romance" numerous times, each version is unique for the direction it takes through various metric modulations.

Example 2 shows some of the possible tempo changes that can be facilitated by using these parallel time techniques. One or two tempo transitions from a metronome marking of 100 can lead to the following tempi: 33, 37.5, 44, 50, 66, 75, 88, 133, 150, 266 and 300. By utilising one further transition, up to thirty more metronome markings can be reached. It must be stressed that these transitions are not thought of as academic principles but as concepts to be played and absorbed into common use.

Ex 2

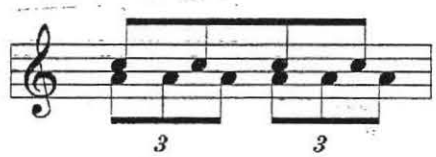


(d) Polyrhythm

Polyrhythm literally means many rhythms or, more specifically, rhythms that can't be directly subdivided within each other. A 2 against 4 rhythm would not be a polyrhythm, nor would 6 against 3 because they can directly subdivide.

The simplest polyrhythm available is 2 against 3 shown in example 1.

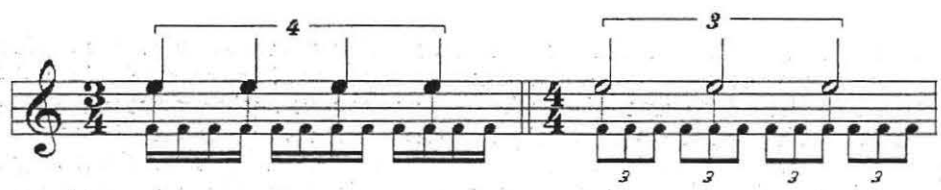
Ex 1



2 against 3, and 3 against 4 are common rhythms in jazz composition as well as in improvisation. To understand simple polyrhythms it is necessary to find a common subdivision that is divisible by both. Example 2 shows how the rhythms can be subdivided using standard subdivisions. In the case of four notes to a bar in 3/4 time the four notes can be thought of as semiquavers grouped into 3.

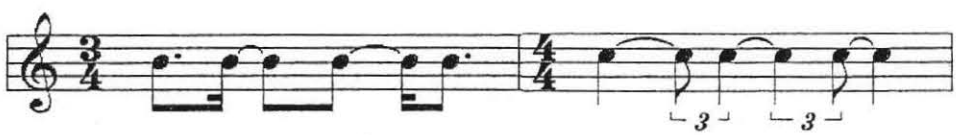
In example 2, a 4 against 3 polyrhythm is written out using a semiquaver subdivision to divide both in the 3/4 and a triplet subdivision to divide the 4/4.

Ex 2



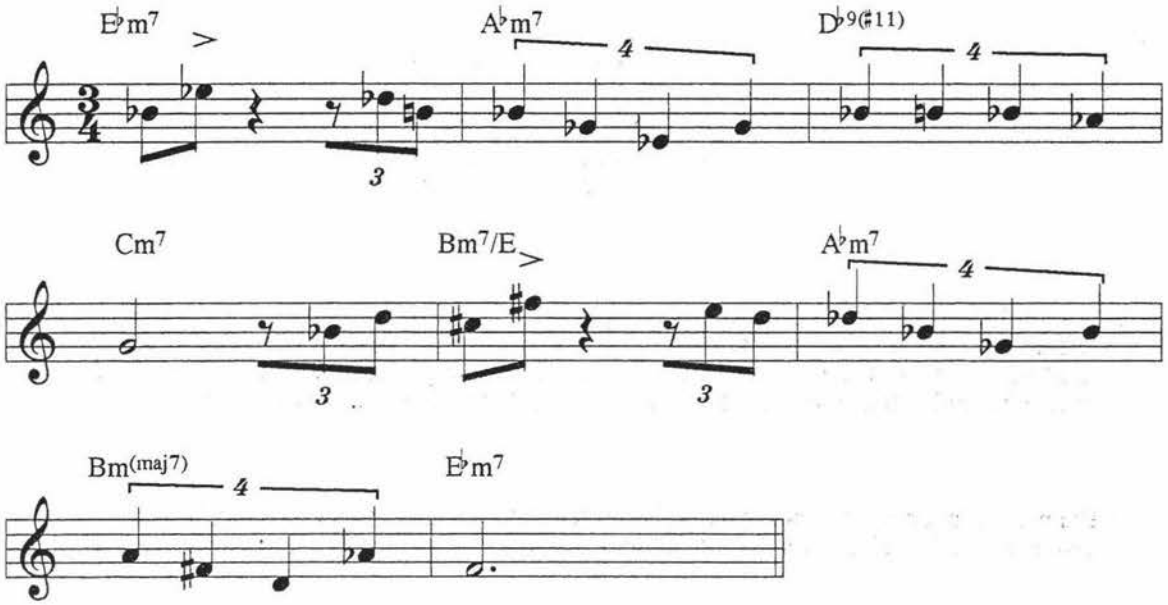
In example 3 the rhythms are written out in full in their respective time signatures. Many jazz compositions use variations of 4 against 3.

Ex 3



Example 4 is an excerpt of the first 8 bars of "Sno Peas" written by Phil Macowiz. It uses a variation of a 4 against a 3/4 pulse. This excerpt is taken from the Bill Evans/Toots Thielemans album *Affinity*. On the original recording the band creates a very smooth 4 over 3 making the 4 sound almost disconnected from the main pulse. The characteristics of the tune show through in the solo sections as many references are made to the polyrhythm.

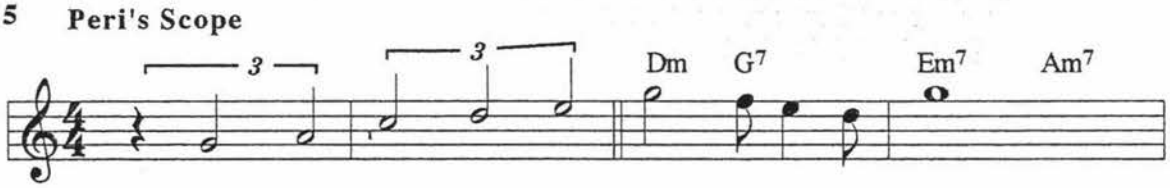
Ex 4 Sno Peas



When improvising in this context, the 4 pulse can often feature as a rhythmic device in the solo. The 4 over 3 can become so pervasive that it almost sounds like the soloist is in 4/4. In some examples the soloist will depart the 3/4 waltz time and completely improvise in the 4/4 pulse. This creates a fascinating tension with the rhythm section. It also gives the soloist the possibility of using all of the vocabulary that exists in 4/4. If this is taken one step further the rhythm section can follow into the new time signature at the faster tempo. The harmonic rhythm stays the same and is still synchronised with the original bar length. This technique is known as metric modulation. Some improvisers use this technique frequently, taking the rhythm section backward and forward through various time signatures.

Example 5 shows the first part of "Peri's Scope" by Bill Evans. The polyrhythm used here is a 3 against 4 idea within an overall swing feel in 4/4.

Ex 5 Peri's Scope

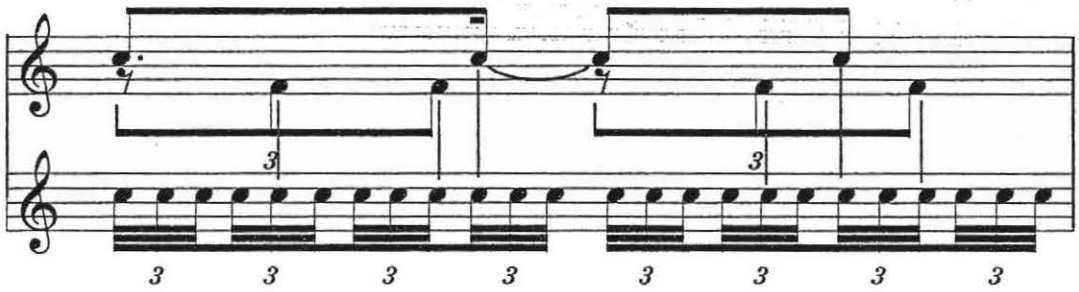


The best method for deciphering polyrhythms is to find the minimum subdivision that coincides with all notes. In the case of 3 against 4 the bar needed to be divided into 12, which is triplets in 4/4, to include both rhythms. Example 6 shows a polyrhythm that has essentially semiquavers against an eighth-note triplet or a compacted 4 against 3. In this case both rhythms are subdividable by 32nd note triplets (sometimes called 24th notes). The last triplet note of beat 1 and the last semiquaver are only a 32nd note triplet apart. To further understand this rhythm it is best to score it out.

Ex 6

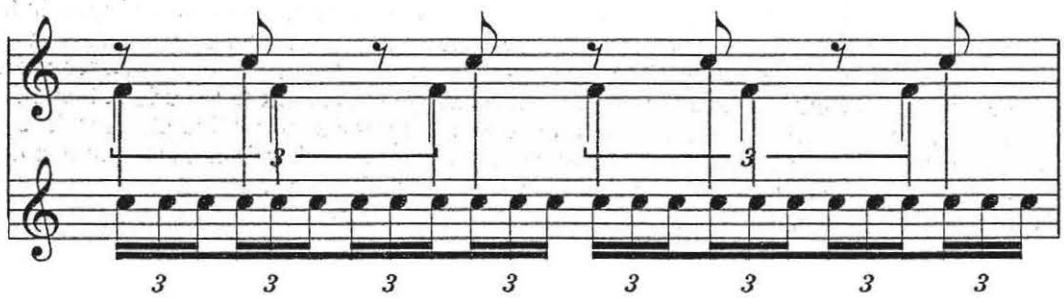
In example 7 the rhythm is subdivided into 32nd note triplets with dotted lines indicating the places where the rhythm coincides. Even though it looks complex both rhythms fit neatly inside the subdivision

Ex 7



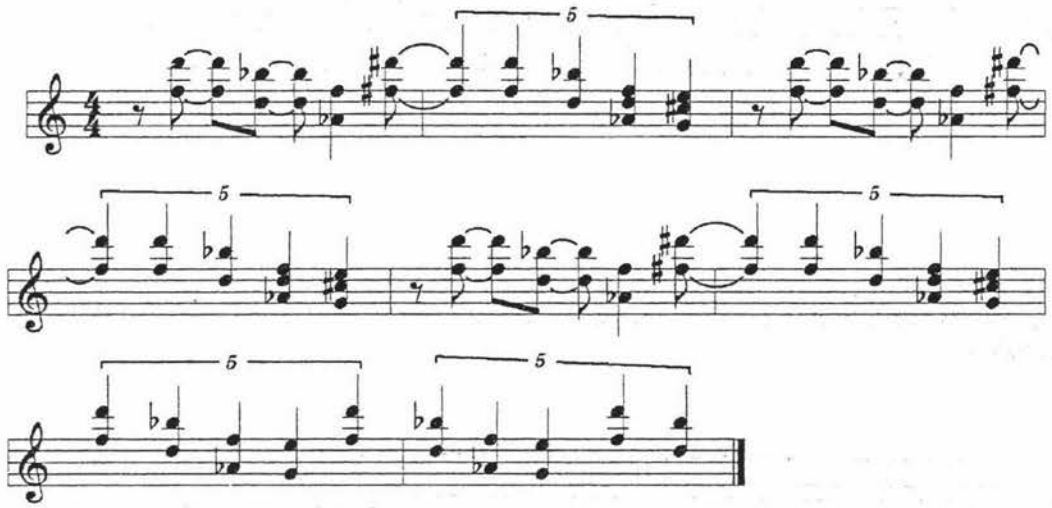
The rhythm in example 8 is another variation of the 3 against 4 technique, in this case sixteenth note triplets are used to link these two rhythms. This rhythm is particularly difficult in practice as the notes are very close to each other.

Ex 8



Example 9 shows an excerpt of "Five" by Bill Evans from the album *New Jazz Conceptions*. This example illustrates the use of complex polyrhythms of 5 against 4. The first bar has an offbeat figure in 6ths, which is echoed in the next bar but stretched into a 5 against 4 feel, giving the effect of rushing. In the last three bars the quintuplet polyrhythm is used again, but this time the melodic material is grouped into three lots of four, with two notes over at the end. This juxtaposition of melodic phrasing and polyrhythmic material makes it hard for the listener to retain the pulse, although it still fits perfectly in common time. This composition was written more than forty years ago and remains a challenge to play today.

Ex 9 Five - Bill Evans



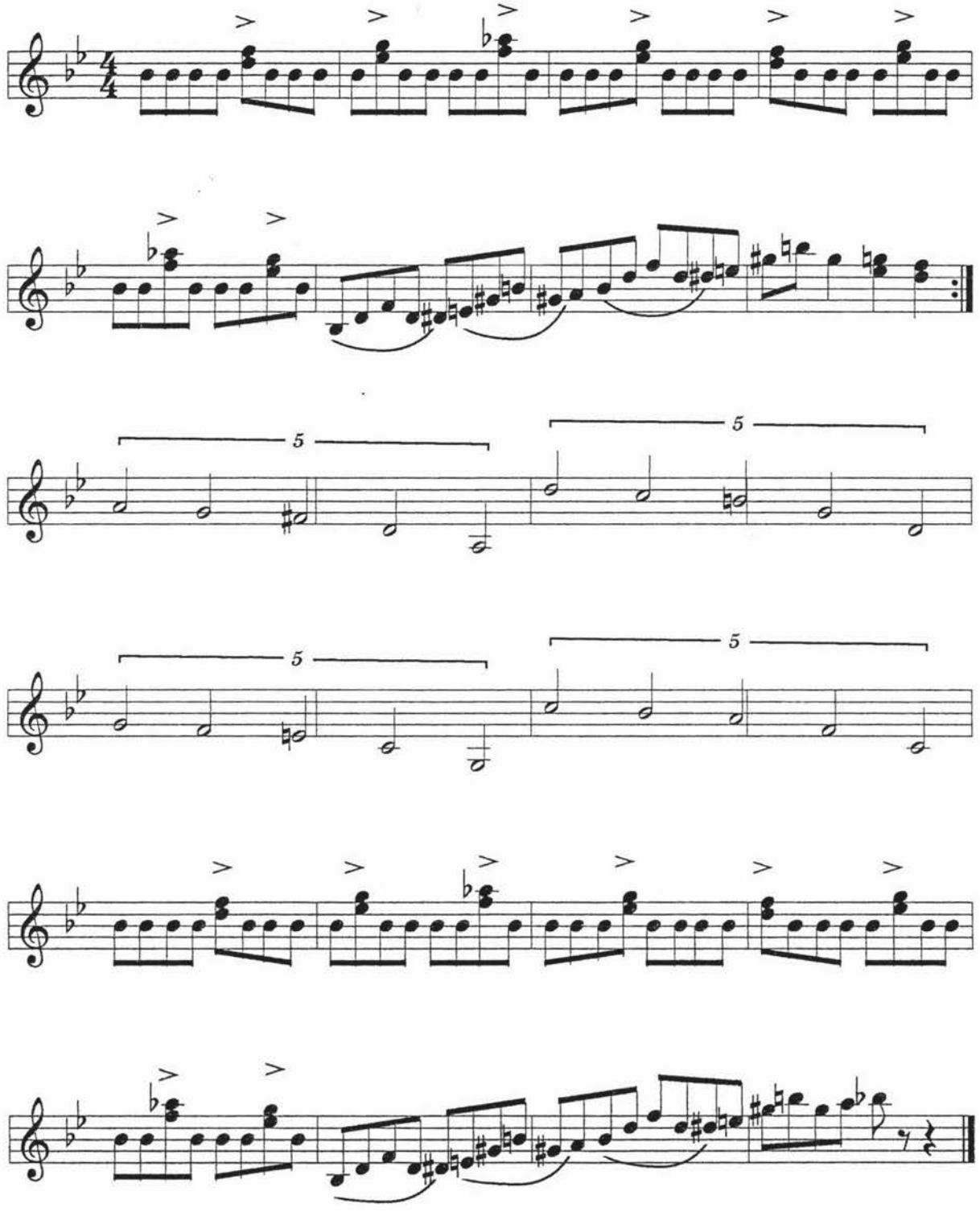
Five Crazy - Analysis

"Five Crazy," on the following page, is a composition by this author that demonstrates polyrhythm and the use of rhythmic groupings in five. The A section starts with a pattern that is constructed of four drone notes followed by a single melody note, making a five-note pattern which displaces against the 4/4 pulse as the bars progress. At the end of bar 5 the drone note is dropped, and the melody occurs an eighth-note earlier, giving a better feeling of stability in bar 6 as the 4 pulse is reinforced. A five-note pattern is taken through Bb and E triads, ending in a stabilising phrase in the last bar of the A section. One aim of this first section is to accent the upper melodic movement of the 3rds, giving them a feeling of independence from the main groove. The B section is very simple melodically but is a 5 against 8 cross-rhythm whilst the 4/4 pulse lies behind the rhythm. The idea is to treat each of these notes as quarter notes in a 5/4 swing feel, making the entry into the final section a challenge to get back to the original tempo. After the theme is played each musician improvises on the chord progression of rhythm changes. The musicians are instructed to use as much material as possible based on the number five. This may include melodic patterns that are five notes long, quintuplets, accents on every fifth note, even using the interval of a 5th repeatedly. The group may also trade in bars of five to add to the overall interest.

Five Crazy

Rhythm Changes

mm=340



(e) Rhythmic Displacement

One important area of modern jazz improvisation is the technique of taking a known melodic fragment or rhythm and starting it early or late in relation to the bar line. As a compositional device this can be quite effective but as a tool in improvisation it is indispensable. Thelonius Monk frequently used displacement in his compositions giving the melody an unpredictable shape. A classic example of this occurs in the melody of "Rhythm-a-ning" in example 1. A simple 6-note motif is repeated 2 beats earlier than the ear is expecting. Many musicians have come to grief playing this melody as it is easy to lose the placement of beat 1 and cross the rhythm over.

Ex 1

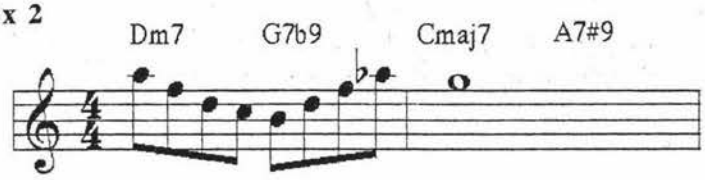
The principles of displacement are an excellent way of utilising melodic material to enhance improvisation. The technique is often used by expert improvisers to produce these variations in real time. Many improvisers who have developed skill with the displacement of lines have probably learnt through writing variations and practicing them. Many aspects of improvisation are first learnt in written form then translated to a spontaneous context as the material becomes more familiar. This technique produces large amounts of melodic material from a few small phrases and trains the ear to tolerate a larger variety of phrasing .

In an improvisation class held by the author, the students were instructed to write out the Charlie Parker standard "Billies Bounce" starting on a different displacement of the eighth-note. The following week each student had learnt to play their own displacement of the theme, giving seven variations plus the original. The playing of each variation produced interesting results as either the melody player or the drummer would lose the placement of the beat, unable to tolerate the types of phrasing that resulted. After repetition each variation became more tolerable to the ear. When all the variations were played simultaneously the result was chaotic, one student commented that it sounded like "Billies Bounce Soup."

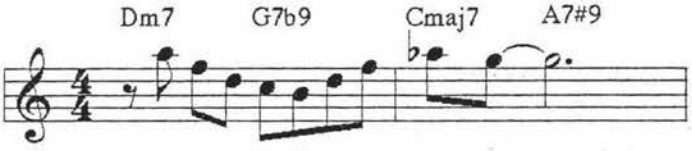
In Latin music the technique of displacement is commonplace and happens at all levels from the bass up to the horn lines. The use of complex displacements is one of the most difficult aspects of the music to master and a strong sense of internal rhythm is required to participate fully. While many of these complex rhythms are stylistic and conform to strict patterns in Montunos and Tumbaos, their use in more modern Latin fusion has become more flexible. The elements of displacement found in Latin music have spread into swing-based jazz and have become essential techniques for the composer and improviser.

Example 2 shows a 2-bar simple line over a II-V-I-VI progression with its various displacements. Each line, although containing the same notes, has a uniquely different sound. The primary subdivision of the line is eighth-notes so the first displacement starts an eighth-note later than the original .

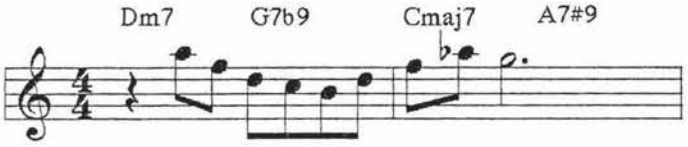
Ex 2



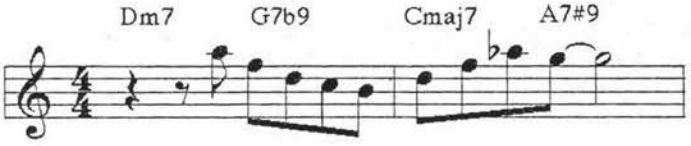
Original Line



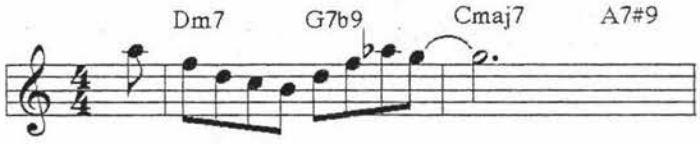
Displacement late by an eighth-note



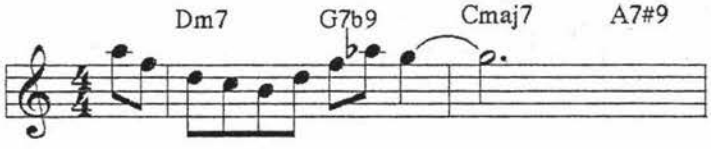
Displacement late by a quarter-note



Displacement late by a dotted quarter note



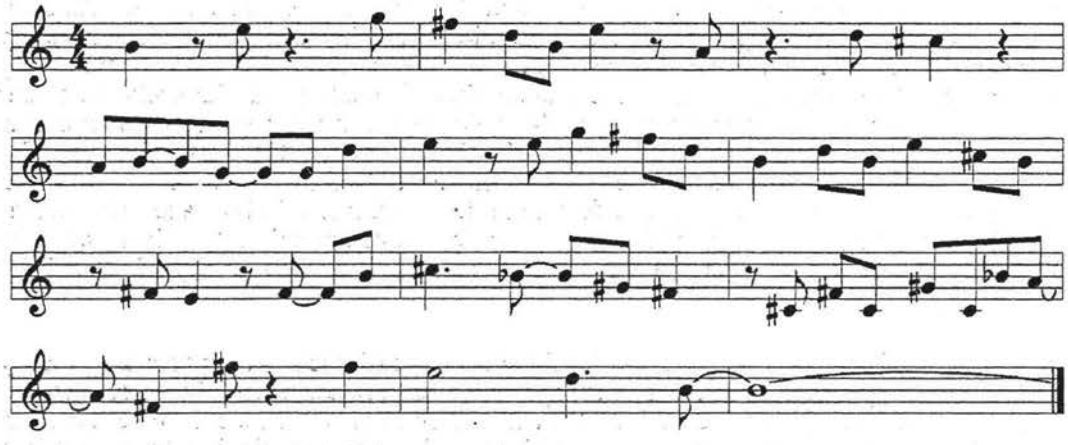
Displacement early by an eighth-note



Displacement early by a quarter-note

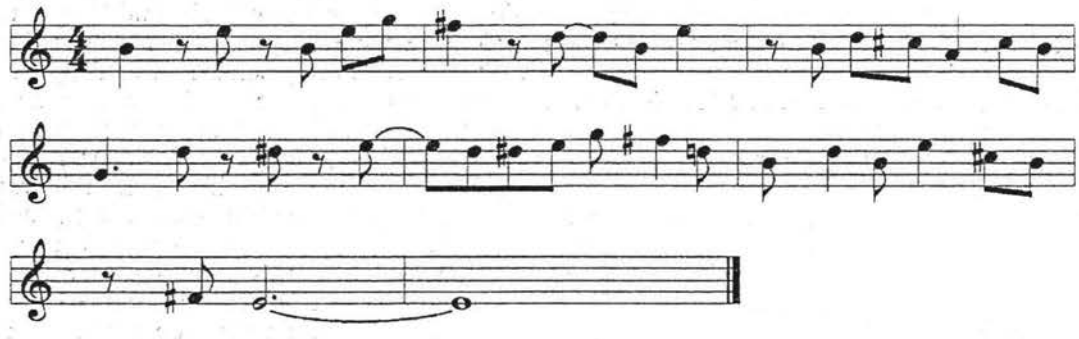
Example 3 is an excerpt of Chick Corea's original melody on his composition "Spain". The melody contains an interesting balance of downbeat and syncopated feel. This is further emphasised by hand claps on beat 1 and 3 as the melody is played in unison.

Ex 3 Spain



Example 4 is the revised version found on his trio recording "*Akoustic Band*", which was recorded in 1989. Sixteen years later he has modernised the melody by displacing where the notes fall in the bar, along with passing notes that lead into the main notes. It is also interesting to note that the melody is curtailed in the seventh bar, at which time the piano improvises, giving the effect of just hinting at the melody as a flavour.

Ex 4



Conclusions

(a) The Evolution of Chromaticism in Jazz

In its history classical music has undergone a gradual evolution of chromaticism in melody and harmony. The early stages of this evolution relied on a gradual introduction of material into diatonic melodies as ornamentation. The use of appoggiaturas, upper and lower neighbouring tones and accented passing notes became common, but anything chromatic was still seen in terms of its eventual resolution. Only later in this evolution were dissonances prolonged. The proliferation of counterpoint ultimately led to basic harmony, but as the chromaticism and ornamentation in the melodies increased, new chord structures and sequences became necessary. The chorale harmonisations of J.S. Bach are extraordinary for their use of the chromatic harmonisation of simple melodies. These are essential study for preparation in the understanding of chromaticism in jazz harmony. After a few centuries, concepts of dissonance and atonalism became accepted, culminating in the work of Schoenberg and his contemporaries. "In this music a sound could be equal to all others with no subordination or superiority. Dissonance was subjective, and resolution truly became a relative term." [1]

Jazz, in its short history has paralleled this development in a melodic and harmonic sense. Early jazz, before bebop, used mainly chromatic tones in passing as they led towards a chord-tone resolution. This gave a strong feeling of tonality and dictated the harmonic movement which lacked extensions or substitution. Many melodies and solos in the early stages of jazz used the blues scale, in which the minor 3rd and the flattened 5th would be used against chords containing major 3rds and natural 5ths. These are known as "blue-notes" which gave jazz a characteristic harmonic clash common in this era. The use of these notes was sometimes prolonged and would not necessarily lead to a resolution. Combined with an abundance of unstable dominant chords in the harmony, these notes gave blues and early jazz a distinct flavour. In bebop these blue notes eventually became chord extensions. The minor 3rd became the raised 9th and the b5 became the raised 11th. This new form of dissonance led to the freeing up of harmonic backgrounds resulting in many new innovations in chord substitution and superimposition. This core of melodic and harmonic material (along with innovations in rhythm) became the core of bebop, which in turn has become essential knowledge for the modern jazz musician and the backbone of jazz education around the world.

In the late 1950s jazz started to reflect some of the directions taken in 20th-Century classical music. Modal music was unique in that for the first time a static harmonic background allowed superimpositions by the soloist that could be supported or opposed by the accompaniment. The album *Kind of Blue* saw the birth of modalism which was beautifully impressionistic but quite diatonic. George Russell is sometimes credited as being the founder of modalism, with the release of his book "*The Lydian Chromatic Concept of Tonal Organisation* ." On reflection his work had little to do with what was happening on *Kind of Blue*. The harmonic material was more likely due to the influence of Bill Evans (pianist on *Kind of Blue)* and the fact that he had just been in Europe performing the music of Debussy and Ravel. The mid 1960s saw the groups of Miles Davis and John Coltrane taking the harmonic developments much further with the introduction of another level of chromaticism and polyrhythm. The harmonic developments pioneered by pianists McCoy Tyner with John Coltrane, and Herbie Hancock with Miles Davis, were milestones in the evolution of chromatic jazz harmony. Bill Evans, who was developing music in another direction, also added to the equation by liberating the role of the bass and drums enabling parallel developments in rhythm. The development of free-bop in the 60s gave the improviser more freedom, with the need for resolution at a minimum. With this freedom came the necessity for other ways of organising the musical material. Twelve-tone serial technique, intervallic cell development, superimposed dissonance, chords based on intervals and pan-tonality were pioneered in this period. Many of these elements are used in mainstream and fusion-jazz, as well as in free-jazz. Unlike classical music, the major developments in jazz were pioneered as improvising tools, though many of these elements had previously occurred in composition. The other main feature is that melodic and harmonic developments all took place within a spontaneous rhythmic framework, which was also developing its own language of polyrhythm, metric modulation and non-metric approaches to time. The development of melody, harmony and rhythm are inseparable in jazz as they have paralleled and influenced the development of each other. On the following page is a simplified chart outlining this evolution.

[1] Dave Liebman's description of music after Schoenberg from p11, *A Chromatic Approach to Jazz Harmony and Melody.*

Chart of Chromatic Evolution in Jazz

	Melodic	Harmonic	Rhythmic
Early New Orleans Swing	-Melodies and solos very much within the harmonic background -Passing tones quickly resolved -Dissonance at a minimum -Blue notes used as a precursor to extended harmony **Louis Armstrong,Ben Webster, Coleman Hawkins**	-Simple chord structures based in thirds. -No substitution or extended chords -Bass plays root note of chord with diatonic passing tones **Duke Ellington, Art Tatum**	-Drums in pure accompaniment and timekeeping role. -Little elaboration of main beat -Occasional snare drum rolls followed by a cymbal crash used to punctuate melodic resolutions **Sid Catlett, Gene Krupa, Chick Webb**
Middle Bebop	-Chromatic tones started to become common as extensions to the harmony. -Melodic chromaticism influenced extended chord structure. -Melodies started outlining new chord progressions, necessitating substitution **Charlie Parker, Bud Powell Lester Young, Clifford Brown**	-Chords adapted to reflect melodies and solos. -Chords contained more extensions and upper structures. -Chord substitution started to occur in reharmonised standards. -Passing chords became more common **Bud Powell, George Shearing**	-Strong pulse related grooves offset by heavy accents and bass drum figures -Drums became more interactive with melody and bass. -Odd time signatures start to appear **Max Roach, Kenny Clarke, Art Blakey, Philly Jo Jones**
Modern Modal Cool	-Superimposition of melodies over chords -Exotic non western scales used -Departure from tonality, leading to Bi-Tonality and side-slipping **John Coltrane, Miles Davis, Wayne Shorter, Thelonius Monk, Lennie Tristano**	-Modal techniques explored -Voicings in 4ths. -Complex techniques of substitution -Pedal point became a feature of chromatic explorations -Bass players became free to colour and depart from planned harmony . **Bill Evans, McCoy Tyner, Gil Evans, Scott LaFaro, Herbie Hancock.**	-Polyrhythm and 'broken time' becomes a feature of drumming. -Drums becomes more melodic and interactive. -Metric Modulation starts to occur -Latin influence increases rhythmic vocab. -Four limb independance **Elvin Jones, Tony Williams Paul Motian, Jack deJohnette**
Free New-Bop	-Pan-Tonal improvisation -Intervallic and serial twelve-tone techniques employed. -Extreme ranges combined with wide interval non-tonal chromaticism -Linear counterpoint **John Coltrane, Albert Ayler Eric Dolphy, Ornette Coleman**	-Interval-based chord and clusters -Chord changes used more as a point of departure. -Chords used as colours without specific harmonic relationships. **Cecil Taylor, Paul Bley**	-Non-Metrical rubato pulse -Strict timekeeping gives way to free interaction in the group -Experiments in density, texture and form prevail. -Standard drumkit extended **Ed Blackwell, Tony Oxley Sunny Murray, Billy Higgins**

(b) Is Jazz a Branch of Twentieth Century Classical Music?

To be a composer in Bach's time it was common to have a profile as a performing musician and as an improviser. For the consumer of music, the only way to witness the greatness of a musician like Bach was to see him perform. This might have involved long and perilous journeys through 17th-Century Europe. For the aspiring musician the only way to reproduce his extemporisation, apart from hearing him live, was to learn from the published edition, as not all musicians were as skilled in improvisation as J.S. Bach. Through publishing, music became more widespread and more accessible, but since many of these compositions were more like planned improvisations in performance, the music often had to be abbreviated and put into a more manageable form. A parallel can be seen in our century, where jazz standards made famous by great musicians are approximated in sheet music form, so that a generic version of the song is available to the general public that sounds roughly like the original. The recent trend toward publication of full transcriptions of the original improvised music means that with good technical facility a pianist may be able to play exactly like Art Tatum or Bill Evans, or at least the notes they played.

The publication of music undoubtedly helped the proliferation of European music, but it might have also contributed to the downfall of improvisation. The gradual separation of roles of the composer, the performer and improviser have led to a situation where improvisation is no longer regarded as worthy of study in most institutions. The art of the church organist is still alive and well in prestigious colleges throughout Europe particularly in France. With the exception of early music this is probably the only surviving remnant of a traditional culture of improvisation in classical music. The improvisational study of the professional church organist [2] has many parallels with the learning of jazz, where the architecture of harmony and melody is studied in such detail that the musician has access to these elements spontaneously. The need to combine a thorough knowledge of harmony, a sound technique and the ability to output music in a spontaneous way, may have lead to the decline of the complete musician in classical music. Since the baroque era a gradual separation of roles has occurred in classical music, we now see a general division of roles.

- The performer need not know the theoretical intricacies of the music but is likely to be highly skilled in interpretation.
- The performer doesn't need to be able to compose, although a few top performers still prefer to write (or improvise in a few rare cases) their own cadenzas.
- The composer, while skilled in theoretical and instrumental arranging techniques, doesn't have to possess the fine technique of the performer. The best composers however have a good knowledge of the instrument they are writing for though they may not necessarily be able to play it.
- The theorist and academic don't need the ability to compose or perform but possesses great knowledge of the structure or history of music and often has rudimentary skills in performing and composing.

This division is very general and there are exceptions, but the roles have been clearly defined. In jazz the roles are quite different. The major contributors to the history of jazz were equally skilled in composition and improvisation as well as possessing a virtuoso technique. In addition to this many of these contributors possessed a deep knowledge of the theoretical aspects of the music and often added to the body of knowledge. The emphasis on improvisation in jazz has always prevented these roles from diverging too far, keeping improvisation accessible to only the well-rounded musician.

It is interesting that while the art of improvisation has faded in classical music it remains as a strong idealistic principle. Classical musicians are often praised for their ability to make it seem as if the music is being improvised by them at the moment of performance. Although the notes in a performance are the same every time, a performer can attain a sense of immediacy through skilled interpretation. This sense of spontaneity is highly regarded by critics, listeners and musicians alike with comments like " He made the music his own" or "It sounded so vital, almost like it was being played for the first time", constituting the highest of compliments for the artist. Teachers of composition also encourage their students to try to attain the quality of spontaneous invention in their work and go to great lengths to make sure the score is capable of being interpreted as closely as possible to the original conception. This elevation of the importance of improvisation undoubtedly harks back to the days when these elements were inseparable. Bill Evans comments on how he sees the relationship between composition and improvisation.

[2] Based on discussions with Peter Churchill about techniques taught to him by his father, a church organist renowned for his skills in extemporisation.

"It might be interesting to note that any good teacher of composition, that is in the serious classical music sense, will always tell the student that the composition should sound as if it is improvised, and have this spontaneous quality. So actually the art of music is the art of speaking with this spontaneous quality and that is the thrilling part about jazz, that it has more or less resurrected the art of spontaneous creative music again that hasn't been heard from since the 17th and 18th century in classical music". [3]

It is no coincidence that Bach, Beethoven, Mozart, Paganini, Rachmaninoff, Chopin and Liszt who head the list of great classical improvisers were also renowned composers.

The proliferation of jazz, ethnomusicology and world music courses at music institutions have helped to redress this divergence of roles. The sheer joy of creating music of the moment is something that has been largely neglected in classical music education. Many musicians that have achieved a high degree of proficiency on their instrument are often afraid to even attempt improvisation, yet privately the desire to be involved may be quite strong. The recent inclusion of jazz studies in the renowned A.B.R.S.M external examinations syllabus confirms a growing change in attitude. This change has meant that specialist training for examiners now requires skills in the assessment of improvisation, rhythmic feel, stylistic accuracy and creativity as well as all of the skills expected of a classical candidate.

Jazz musicians have traditionally drawn their source material from every type of music, although certain stylistic streams have deliberately isolated and excluded elements. The word 'jazz' may conjure up images of banjos and clarinets for some, it may mean the hard driving swing of bebop, for others it may mean the dynamic and chaotic improvisations of free jazz. The one thing that unifies these varied approaches is that they all have a large degree of spontaneity and any music that purports to be jazz without a large degree of improvisation is regarded as highly suspect by the jazz community. The musician Kenny G constitutes a prime example of someone who enjoys notoriety as a jazz musician in the media but is dismissed by most jazz musicians as a fake. The demands of surviving in the business world of music are such that improvisation and creativity do not sell records. Many great jazz musicians have had to hide their talents and work to more of a formula to survive in the business of music, though the essence of their talent still often showed through. Louis Armstrong, and the latter part of Wes Montgomery's career undoubtedly fit into this category, for which they were strongly criticised by the jazz community as selling out. Classical musicians who successfully cross over to jazz are very rare indeed. Andre Previn and Wynton Marsalis are among the few that could straddle both disciplines successfully.

What is this essential difference between jazz and classical music? Whilst classical music has drawn widely from almost every culture (mainly European), it has been quite selective in its influences. Most of the primary sources of rhythm in classical music have been of ethnic or folk origin. There have been many innovators in recent times who have explored different rhythmic possibilities, but these developments have occurred late in its history and show a lack of tradition. Steve Reich has injected many interesting techniques of rhythm into 20th-Century classical music, but many of these sophisticated approaches to rhythm have been part of world music for thousands of years. The main difference between jazz and classical music appears to be the approach taken to rhythm in its varied facets. The most complex of all rhythmic conceptions in world music seems to come from West Africa and India, with Indian music undoubtedly being more evolved melodically. Flamenco and eastern European music also have a deep history of syncopated and polyrhythmic content.

The influences of African rhythm, music and dance have been around since the Renaissance period, but for whatever reason this influence is absent in European classical music, and seems to have been deliberately stifled. Whether this absence was for political, racist or just for reasons of cultural imperialism, is open for debate. It is apparent that the exclusion of this particular influence affected the direction of classical music by suppressing its rhythmic content. The African influence has been integral in the development of most popular music streams in the 20th-Century and is also behind the rhythmic complexity of the Cuban-African cross-fertilisation that has taken place since the arrival of the slaves in the 1500s. The African slaves, through music and dance, also made their mark in Brazil, giving Latin music its distinct flavour, which in turn had a large influence on jazz and pop music.
When asked about the origins of jazz Dizzy Gillespie said [4]

"*A student of our music, if he goes back far enough, will find out that the main source of our music is Africa. The music of the Western Hemisphere (not just our music)- All have something in common from the mother of their music. Rhythm. The basic rhythm, because Mama Rhythm is Africa. In Africa you can go one way and hear some rhythms, then go two miles away and the cats are playing something different. They play what they live. Africa's children in the Western Hemisphere used different means of expressing their closeness to Mama. The Brazilian Africans created the samba, the West Indians created the calypso, the Cubans created the rhumba and various other rhythms, and my own is blues, spirituals. All of them showed different characteristics. Yet they're together, so it was a natural thing for me to fall under the influence of these different rhythms.* "

3 From a transcription of an interview conducted by Harry Evans on the video *The Universal Mind of Bill Evans.*
4 From an unidentified source on the internet, the site has disappeared without trace.

The globalisation of musical styles and multi-cultural influences has led to so much cross-fertilisation it has become difficult to identify pure streams of music. Popular music alone seems to spawn a new movement every year with rap, ska, new wave, new age, punk, heavy metal, speed metal, thrash metal, gothic, reggae, soul, funk, motown all appearing within the last 40 years. All these styles have a strong rhythmic element that in most cases came indirectly from the influence of African music. Many significant developments in jazz have been made by African Americans; Louis Armstrong, Art Tatum, Charlie Parker, Thelonius Monk, Miles Davis, John Coltrane, and Ornette Coleman to name a select few. In its early stages, the teaching of jazz was communicated in true African tradition, without the use of written music. The skills were learned using the apprentice system where the master would pass on the nuances of the art directly to the student. This oral tradition is still very strong in the teaching of jazz despite the recent institutionalisation and codification of this material. Hal Galper is a great advocate of traditional methods of teaching jazz and is often outspoken on issues of education. As a teacher his approach firmly emphasises the African tradition. [5]

"So many times I've met students and teachers who have been misled by a Western, classical approach to learning and elevate the importance of a theoretical background over knowing how to play intuitively. The most important methodology for learning jazz, distinct from Western tradition is epitomised by the African tradition of learning by imitation. The master tells you, "make it sound like this," and he plays something on the drum, and you copy it. Then you play with other musicians while the master supervises your performance...this is completely different from a Western classroom teaching mode that is entirely out of context with the reality of playing improvised music. Western education can be used quite successfully in conjunction with African methodology. Each has its limitations. Imitation is very one dimensional. By learning how to analyse things you develop freedom to expand upon what you copied and can understand on a deeper level. What I object to is an overemphasis on theory and analysis that is much too formal. Academically useful as a learning technique, it is virtually useless on the bandstand. Western theory and analysis should be taught as an adjunct to the African oral tradition and not the other way around."

The significant advancements in jazz were not made in institutions and colleges, but on the "street," where the music was communal and open to all influences, musical and otherwise. European classical music undoubtedly provided the harmonic foundation, from which jazz developed its own unique vocabulary. In that sense it is strongly related to 20th-Century classical music. Jazz has, in its short life, paralleled the harmonic and melodic development of 20th-Century classical music, but rhythmically has taken its own path, making it quite different in concept and tradition. The rhythmic language, and extended use of spontaneous improvisation is unique to jazz, and is not shared by classical music or any other western musical genre. For this reason, like Brazilian, Cuban and Blues music, jazz stands apart and is more likely to be a branch of African music, or a fusion of African rhythm and western harmonic and melodic concepts.

5 From an interview with David Udolf, originally published in "Jazz Notes" magazine August 1993.
Also archived at http://www.upbeat.com/galper/13_arti/_8_jazz.htm

(c) The Culture of Improvisation

The act of improvising music draws on all aspects of a musicians skill and constitutes one of the most demanding aspects of jazz. Improvisation is by no means the preserve of the jazz musician as the art of spontaneous music has been around as long as music itself. If all music is taken into account, most music in the world still has its roots firmly in improvisation. The desire to notate and freeze music into a manuscript so that it can be endlessly reproduced with only small variations in interpretation is a more recent innovation. The need to be actively involved in 'making music' is a fundamental need for most musicians. Some are content just to work with the elements of interpretation and embellishment, others need a higher level of involvement. For a jazz musician creative involvement and the need to participate in the architecture of the music are fundamental. In his book *"Improvisation its Nature and Practice in Music,"* Derek Bailey makes the distinction between idiomatic and non-idiomatic forms of improvisation. Idiomatic is described as being all the styles concerned with the expression of an idiom such as jazz, flamenco or baroque. Non-idiomatic improvisation is usually found in so-called 'free' jazz and is not concerned about representing a style although it may be highly stylised. This type of music has almost always grown from idiomatic beginnings. Many exponents of free jazz started as bop players and became dissatisfied with the boundaries that had been imposed. Some took the existing language and added new elements, others threw away any reference to a style, preferring to seek out music that wasn't in any way recognisable. Steve Lacy took part in the early developments of free jazz in New York in the late '50s. Commenting on that time in an interview by Derek Bailey, Steve Lacy says [6]

"It reached a point where I, and many other people, got sick and tired of the 'beat' and the' 4 bars' - everybody got tired of the systematic playing, and we just said 'Fuck it'. But, I think the question of appetite is very important. Some people are of a progressive bent, and some are not. And you can't ask either of them to change. Some people are interested in carrying on in an old tradition, and they can find their kicks in shifting around patterns and they are not in any rush to find new stuff. They can rummage around in the old stuff all of their lives. People become obsessed with not just maintaining a tradition but with perfecting it. Some people search for the perfect arrangement of the old patterns and that is progress for them. Other people want to beat down the walls and find some new territory."

Whilst it is true that there are many jazz musicians devoted to keeping traditions alive, the core of jazz improvisation has always been one of exploration. Much of that exploration takes place within traditional boundaries as new ways of playing evolve. In some cases the rejection of idiomatic improvisation has become the basis for a new philosophy. Many exponents of free improvisation have striven to reject any kind of idiomatic identity, sometimes this has led to an even stronger set of stylistic codes. Most improvisation in the world is idiomatic, in the sense that the structure and many of its elements conform to a specific vocabulary or style. For much non-western music the traditions of improvisation have evolved over centuries and are often interwoven with the culture and religion. Culture and religion often change gradually, with new traditions occurring as an outgrowth of existing ways, they are rarely subject to quantum leaps. Most of the major developments in jazz improvisation have occurred as a result of a gradual introduction of new techniques, usually as an outgrowth of the existing vocabulary. Most of the seminal figures in jazz were well versed in the improvising vocabulary of the day but chose to pioneer new material that eventually led to the birth of a new style. The principle of variation within structure has been a constant in the development of music. Derek Bailey sees this as a celebration of music-making. [6]

"The procedure of variation is one of the oldest and most persistent of performing principles, being present without interruption from the earliest known musics to the present day. Early vocal and instrumental improvisation, while it might take the form of embellishment, was not used merely to alter what already existed but as a means of celebrating the act of music-making. It was an end in itself - the means of expression open to the performer. The composition stood or fell on whether or not it provided a good vehicle for improvisation."

The desire to be involved in improvisation appears to be universal among musicians. From simple embellishment to free-jazz, the motivation is the same. Despite all the academic and intellectual achievements in music the joy of improvisation remains fundamental.

[6] From *Improvisation its Nature and Practice in Music.*

Said of Albert Einstein [7]

'"... improvisation on the piano was a necessity of his life. Every journey that takes him away from the instrument for some time excites a home-sickness for his piano, and when he returns he longingly caresses the keys to ease himself of the burden of the tone experiences that have mounted up in him, giving them utterance in improvisations"

The prerequisites for being able to improvise vary greatly from one idiom to another. Aside from the technical considerations of playing an instrument, there are various sensitivities that must be present to begin the process. To begin improvising melodically a sense of tonic gravity is important in providing a foundation for creating meaningful harmonic lines. The identification of the tonic chord in a progression is essential to the learning of tension and release. These attributes are present among most musicians and hopefully all jazz students. Is it possible that these attributes are common among a wider group of people? To test the universality of some of these skills in non-musicians a simple experiment was devised by the author using a group of 4th-form high school students.[8]

A scale-like continuous eighth-note melody was improvised for each student in turn, who would raise his or her hand when the tonic note was played. Although it was a 4th-form music class, many students were not instrumentalists, but every student could identify the root note within the context of other scale notes. A similar experiment was conducted to see whether their perception of chord tonality was also close to universal. A sequence of chords was played within a major or minor key, taking care not to start on the tonic chord. The students had to indicate when the tonic or home base chord was played. 92% of the students could do this easily. The others could do it after repetition as they were having trouble establishing the key centre. It also appears that with a minimum of instruction, other chords could be recognised, particularly the chord V7 of a key. Many high school guitar students playing the chords to the Blues for the first time, will almost always change from the I, IV and V chords in the right place, after the minimum of instruction. Although the experiment was done with a small group, similar results would likely be found among the wider population in western society. Possibly as a result of conditioning, there appears to be a fundamental tonic 'gravity' in melodies and chord progressions that even the layman can sense with ease. Like rhythms that can be perceived as in or out of time, and notes that are in or out of tune, so too can most people discern notes that are in or out of key, and sense the occurrence of a tonic chord in a tonal progression. From this experiment it seems that the basic skills needed to improvise (aside from instrumental technique) may be present in most people. Improvisation is a very natural process and on some level is probably universal, but as it becomes more complex and idiomatic, a process of rationalisation seems to follow. In the late baroque era a series of rules was imposed by academics, presenting a serious threat to European improvised music. Ernst Ferand wrote of these developments.

"... they point to a certain waning of the impulse to improvise - a truly creative art of ornamentation stimulated by the inspiration of the moment is replaced by the rationalistic mechanising trend towards the convenient employment of diminution formulas supplied "ready made". [9]

In the same way this process of codification has occured in jazz improvisation. The need to reproduce and explain the intricacies of improvisation has led to the proliferation of texts and theories of which this thesis is one. It appears that as soon as a new way of concieving music occurs it is shortly followed by rationalistic texts that seek to explain and almost undermine the spontaneous process involved in creating it. A modern student of jazz improvisation has more than enough information available with transcriptions, methods and play-alongs, but the challenge to 'make' music is still the same. Despite this trend toward documentation the challenge of improvisation remains one of process rather than content. It is not about information but rather the creative process that underlies the application of it.

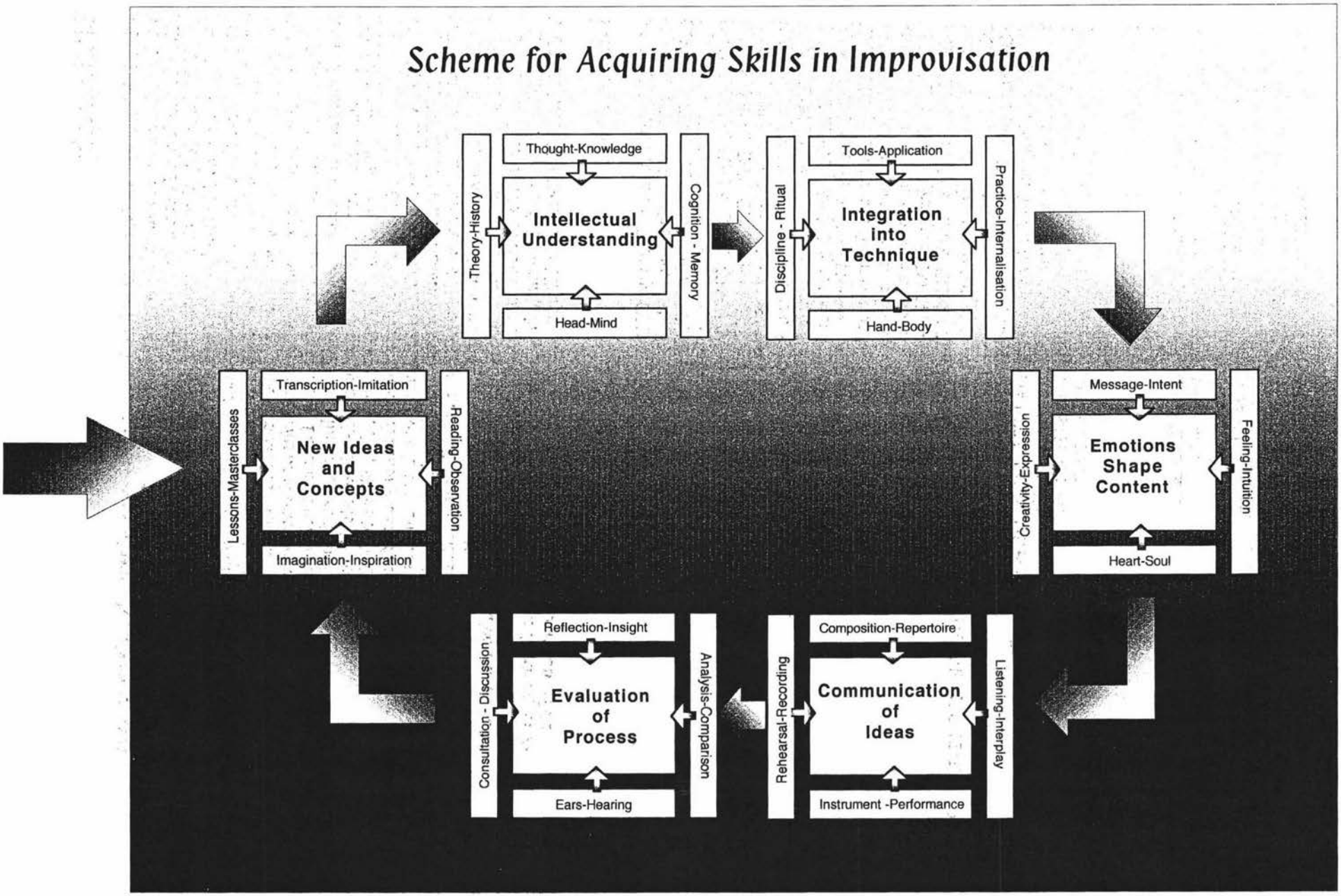
The flow chart on the following page outlines the elements deduced by this author as being fundamental to the process of acquiring skills in jazz improvisation.[10]

7 Alexander Moszkowski's account of a conversation with Albert Einstein , from *Conversations with Einstein*

8 Conducted at Hutt Valley High School, Wellington, New Zealand.

9 From *Improvisation in Nine centuries of Western music* by Ernst Ferand

10 Although entirely original this chart is undoubtedly inspired by the teaching of Dave Liebman and expands principles outlined in his book *A Chromatic Approach to Jazz Harmony and Melody.*


Scheme for Acquiring Skills in Improvisation
Thought-Knowledge
Theory-History
Intellectual Understanding
Cognition - Memory
Head-Mind
Tools-Application
Discipline - Ritual
Integration into Technique
Practice-Internalisation
Hand-Body
Transcription-Imitation
Lessons-Masterclasses
New Ideas and Concepts
Reading-Observation
Imagination-Inspiration
Message-Intent
Creativity-Expression
Emotions Shape Content
Feeling-Intuition
Heart-Soul
Reflection-Insight
Consultation - Discussion
Evaluation of Process
Analysis-Comparison
Ears-Hearing
Composition-Repertoire
Rehearsal-Recording
Communication of Ideas
Listening-Interplay
Instrument -Performance

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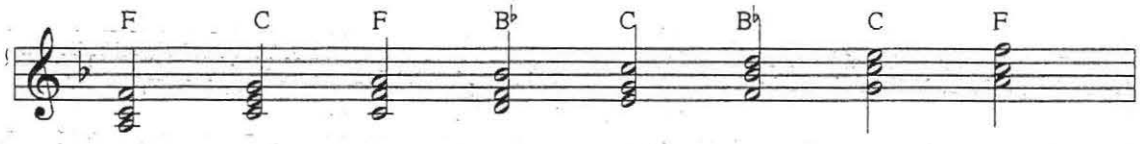
Appendix I

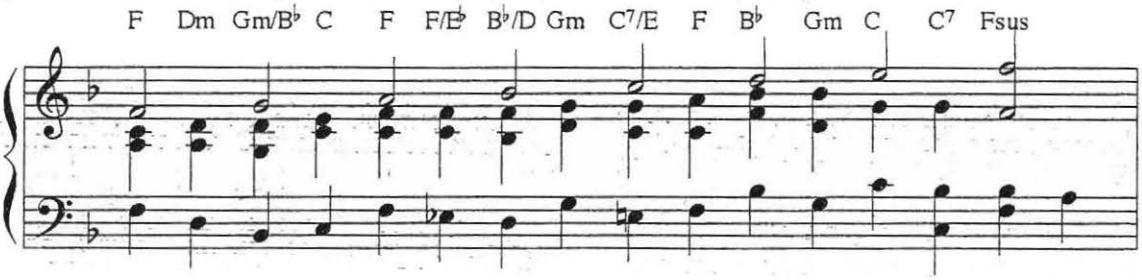
Musical Examples

(a) Comparitive Harmonisations of an F major scale

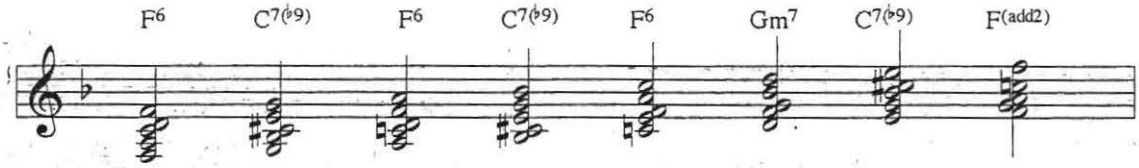
Diatonic Triads



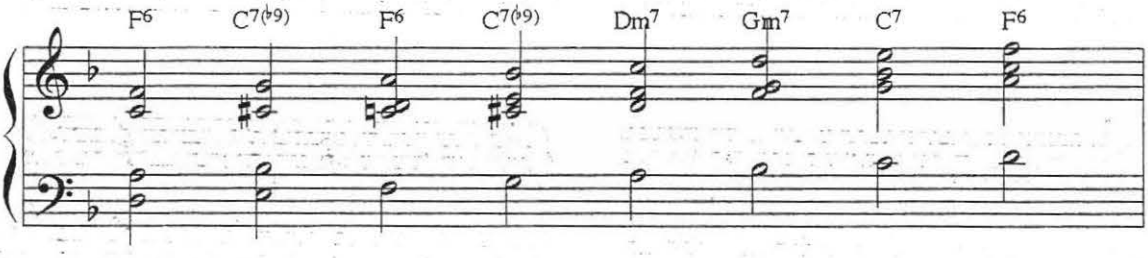
4-part Classical



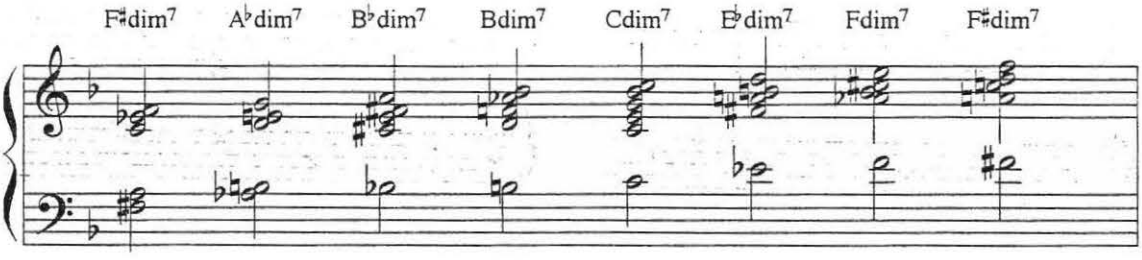
4-Way Close Double Melody



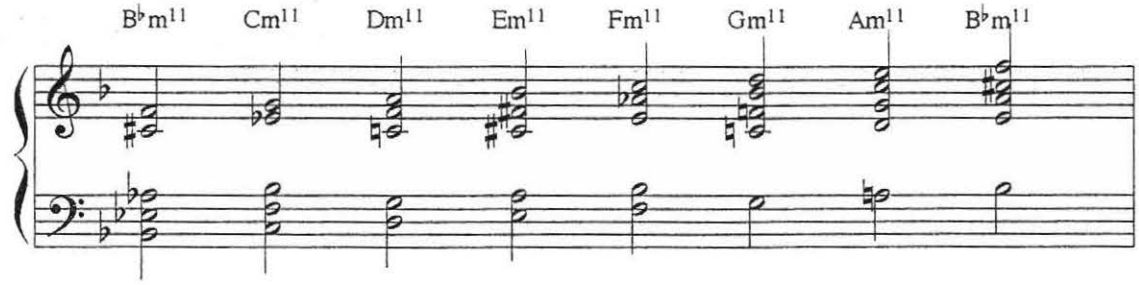
Drop 2



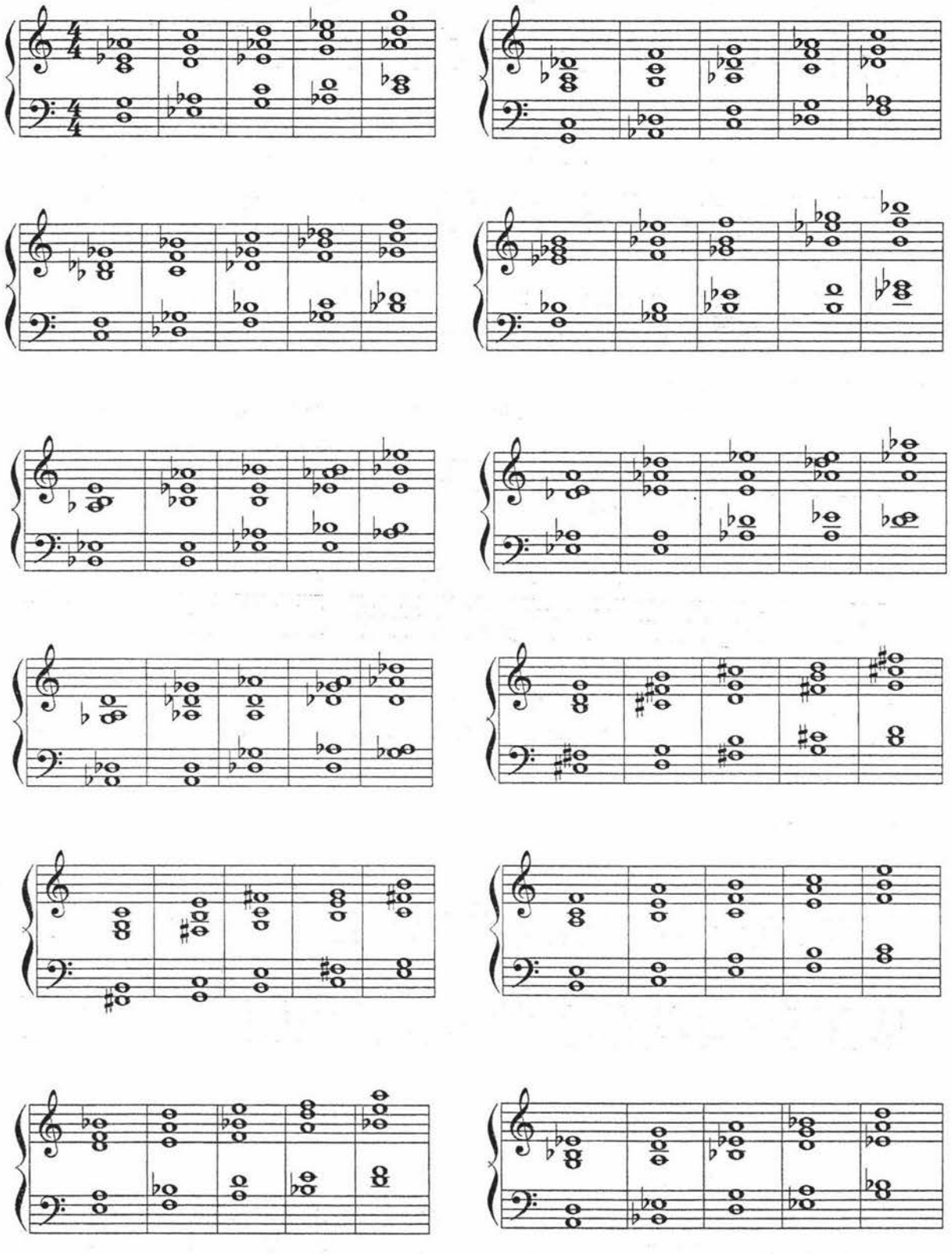
Parallel Diminished



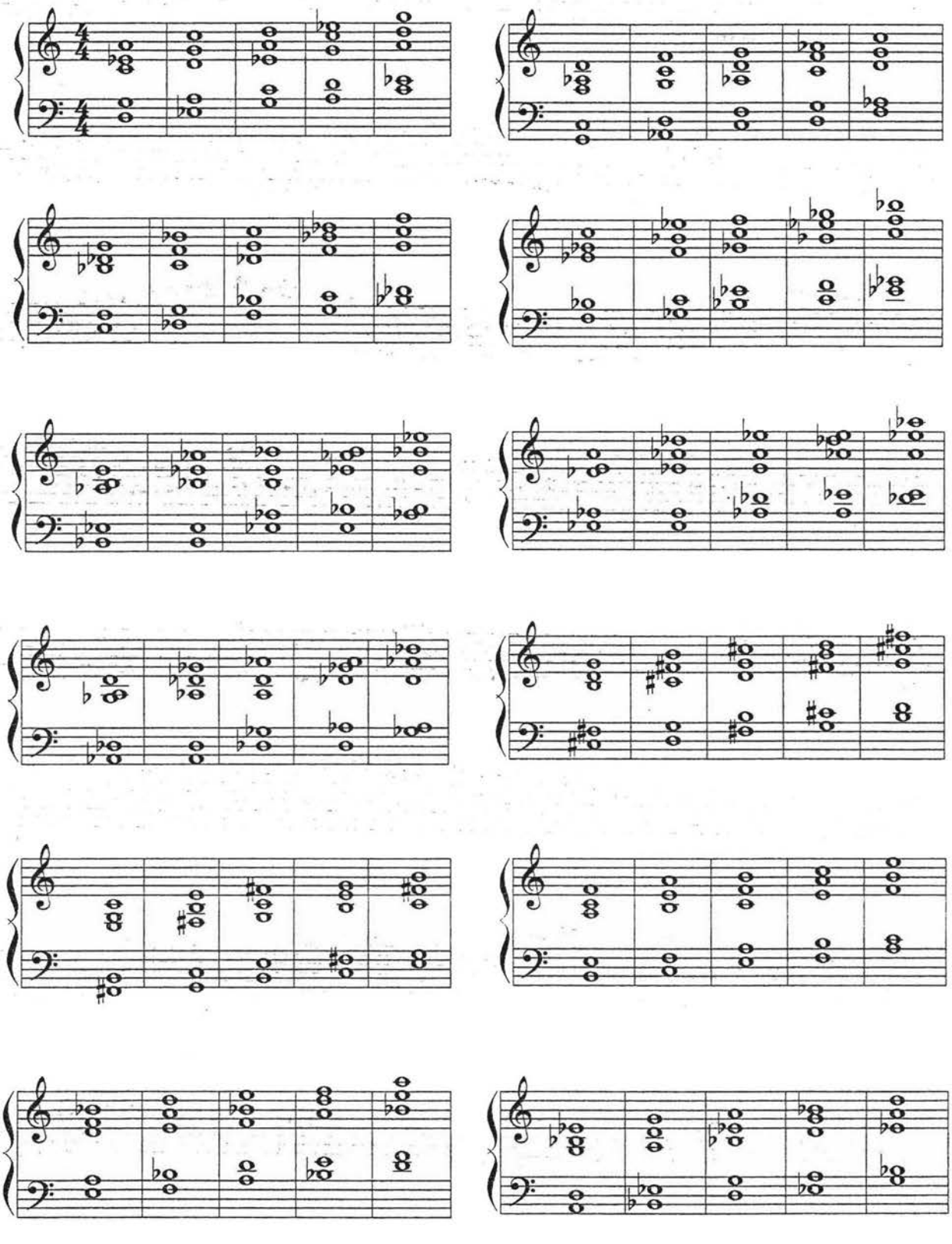
Parallel So What Chords



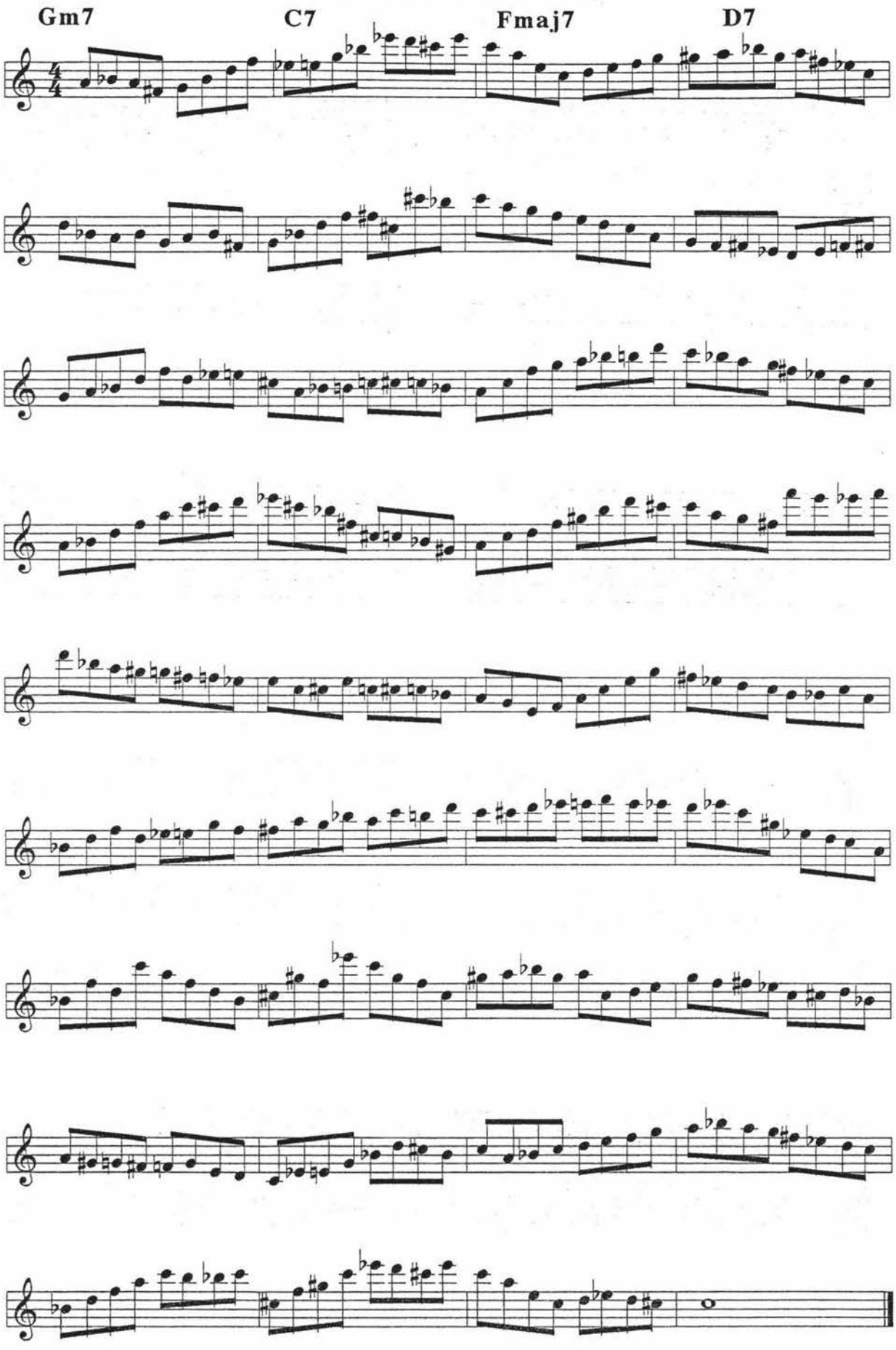
(b) Pentatonic Voicings-Iwato



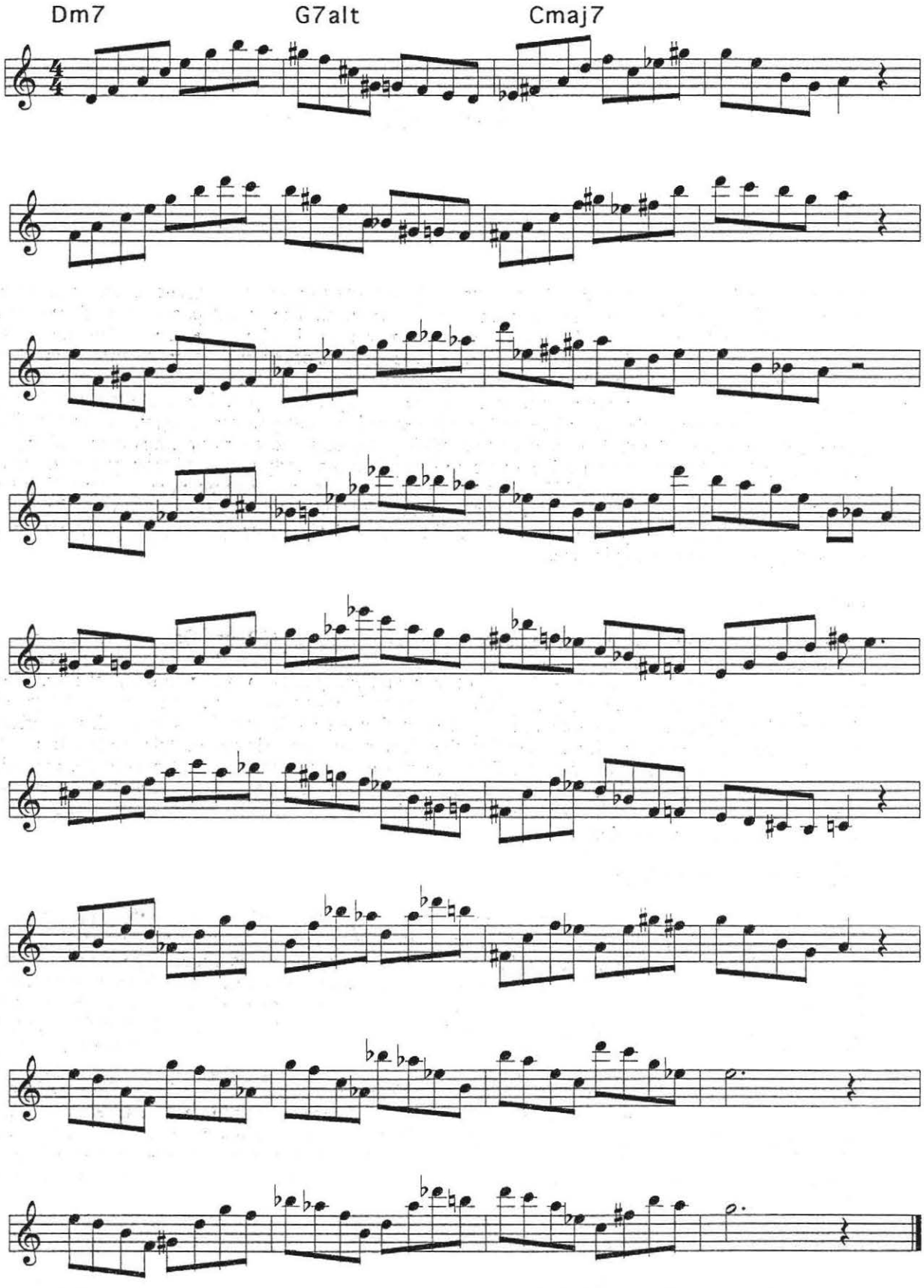
(c) Pentatonic Voicings-Insen



(d) Chromatic Lines



Chromatic Lines 2



Appendix II

Practical Approaches

(a) Transcribing

Until recently the only way to unlock the secrets of jazz was to transcribe, notate and then analyse the musical material and try to imitate the nuances of the original. The recent publication of transcription books of solos and arrangements has made the task somewhat easier, but the essence of the music is not made any more approachable by these quick-fix methods. To uncover material in its context is the most direct form of imitation, and has been the main way in which jazz musicians have learnt their craft.
Ear training in jazz is very important and often dictates what you truly perceive and understand in music. It also works in reverse, that your knowledge will determine what you can recognise in music. This is particularly true when the difficult area of transcribing melodies and chord voicings comes along. You are more likely to be able to transcribe a voicing that you can already play, and often you don't have to transcribe every note in a melody if it conforms to some scale or pattern you already know. If someone played you a major scale and told you it started on F, you wouldn't have to work out the other notes to be able to write it down. If you recognise that Bill Evans is playing a string of drop 2 block chords, then part of the job of transcribing is done.

Equipment

Until recently the only way of transcribing was to use Tape, CD or (God forbid) records. The introduction of digital technology has changed this with the invention of the solid state recorder (http://www.reedcottler.com). This enables the use of start and end points to facilitate the repetition of short phrases. Half speed playback at original pitch along with finer control over equalisation is also possible. The reduction of speed without a change of pitch function has its drawbacks as the quality deteriorates, and the pitches become harder to identify the slower you go. However, this makes it ideal for transcribing percussion and drum parts. Software programmes now exist that enable the analysis of chord structures, so that individual notes that make up a chord may be deduced. The use of headphones is essential, as stereos played in small rooms can lead to masking of various pitches caused by standing waves and resonant frequencies.

Transcribing Solo Lines

Transcribing an improvised solo can serve many purposes, particularly in the early stages of improvisation where acquisition of a vocabulary is so essential. Many students get caught up in the intricacies of notation and technical problems and often overlook the essential importance of imitation through listening. To take it to that level requires great skill and perseverance with accents, articulation, and time feel often presenting a serious challenge. If I had the choice of fussing over the notation or getting it to sound right, I would go for the sound every time. For the experienced transcriber it may not be necessary to commit the whole solo to paper, it may only be practical to notate the more complex sections. The transcription of solo lines is essential to the study of jazz. One essential thing to emphasise here is the role of the voice. When you hear a line or fragment of melody repetitively, the act of listening is backed up by an internal recording mechanism that may need to hear the phrase several times before the fragment can be internalised, and eventually played back on the instrument. An effective way of "fixing" the pitches and rhythms in the mind is to vocalise the phrase. In the case of rapid runs it may not be possible to find the notes, no matter how often you hear it, so half speed machines or computer based pitch devices may be necessary.

Transcribing Chord Charts

To make sense of a melodic line it is essential to find out the background chords. Particularly if it is a standard, it often pays to compare variations in changes between one version and another. This is a great way to find out about chord substitution and how it works rather than just reading about it, which in my experience can lead to confusion. Many artists use their own unique set of changes, and in most cases these became more complex as their artistry developed. Keith Jarrett has made a career out of reworking standard repertoire.

An incredible understanding of harmony comes through in his reharmonisations, which are by no means radical, but may just have one or two well-placed variations. Comparing versions of harmonisations is really only possible by transcribing, as very little in this area has been published. Many songs from the forties did not become jazz standards until they were reharmonised and recorded by great artists. Bill Evans took average pop songs and made them part of the repertoire by reworking the harmonic and rhythmic aspects of the structure. As simple as it sounds it is just a matter of working out the bass notes and a general quality of the chords, this is often enough to give an idea of the harmonic direction. The more sophisticated the harmony, the more likely you will have to uncover the exact voicings to reproduce the original satisfactorily.

Transcribing Chord Voicings

Sometimes it is not enough just to take down a chord chart when learning a composition. This is particularly true in contemporary jazz where the composition is often reliant on the right voicing and not just the general voicing as interpreted from a lead sheet. This is one of the most demanding areas of transcription, and it must be stressed that success in this area is partly dependent on your own knowledge of different types of voicing, unless you have perfect pitch then that is another matter. After hearing the album *Kind of Blue* I was very keen to find out how Bill Evans was structuring his chords as they seemed to be very different to anything I was hearing at the time. The chords were very reminiscent of Debussy and Ravel, and had a definite impressionistic flavour about them. At that point I knew very few jazz voicings so I had to transcribe each note of the chord, which became a very painstaking process. It is important to note that a practical working knowledge of standard forms of voicing is essential, and not just an academic theoretical approach. To recognise voicings the ear must be familiar with this material not just the mind.

Here is a method for chord transcription

- The first step is to find the root note, whether it is actually played or not. I have found that by singing the root as I hear the chord, the sound comes into focus more clearly so often a general quality can be perceived. The root note is often carried by the bass instrument; in more modern approaches the bass may be playing another note other than the root.

- The next step is to listen to the chord enough times so that a basic quality can be perceived. With modern CD players or digital transcribing devices, the repeat function can be used to freeze-frame the chord. If a basic quality is not perceived after several listenings, it may be useful to run a few scales whilst the chord is paused, or just after hearing it.

- In piano and guitar chords the top note should be fairly prominent so the next step is to find this note. If the root note, top note and general quality can be ascertained, then it narrows down the possibilities somewhat.

- At any stage you may have a hunch as to what the voicing might be, again this will depend on your knowledge of voicings. Try playing the chord on CD or tape, then pause it and play your hunch chord straight after. You will have a feeling whether you are close or not.

- If the hunch method doesn't work then the individual notes will have to be identified. Sounding the notes of the chords individually whilst listening to the original chord, you will hear whether the chord is being fattened up or not. If you have found a note that exists in the chord, you will notice that it seems quite transparent when played simultaneously with the recording. A wrong note will either sound wrong, or will fatten up the sound of the chord. On some digital devices the freeze frame technique gives the chord an organ like sound making it easier to try your hunch notes. This process seems to be easier when done with headphones (the type that enable you to hear extraneous sounds) giving more clarity to the overall sound.

- One thing to be aware of is the touch of the pianist, you could hear the same chord played by Bill Evans and Red Garland or Thelonius Monk and Cecil Taylor and they would sound quite different. The recording quality has a large bearing on the tone of the chords

- If this process fails, it can be useful to learn more about jazz voicings. Chapter three of this thesis contains a comprehensive exploration of most of the types of chord construction in jazz. There are several books of transcriptions of the piano comping on the Jamey Aebersold play-alongs, the Hal Galper volume and volume 1 have both been transcribed. There are more and more exact transcriptions of jazz piano music coming on the market revealing many types of chords in their context. As a last resort there are several computer programmes on the market that can show a spectrum analysis of a chord voicing. This is not as easy as it sounds as the harmonic series of each note in the chord is displayed. The process of deciding which are overtones and which are notes becomes an issue.

Transcribing percussion and drums

Transcribing drums is significantly easier in terms of pitch but obviously more complex in terms of rhythm. It is best to start with notating repetitive patterns in this area, and these will be more easily found in rock and Latin music rather than swing-based jazz. Some degree of facility on the drums will make the task significantly easier. From time to time you hear a drum machine that has been so badly programmed that the drummer seems to have more parts of the kit being played than he has limbs, even non drummers can pick this as it adds to the overall artificiality of the feel. Drum machines, usually in the hands of drummers, can sound very effective in fusion and rock music but have largely not found their way into the jazz tradition. The recent tendency to humanise feels and to program the fills from an electronic kit, has made them almost indistinguishable from the real thing. Band-in-a-box contains hundreds of drum patterns in various feels, it's a great place to get to grips with the fundamentals of how drum and percussion patterns are put together. BIAB has a feature in which you can see the drum notation as the track is playing, this is a very effective learning tool, and until recently rhythms have not been exposed in such an explicit way.

When the skill of transcribing patterns is achieved, the next step may be to try some simple trades. Drum trading can vary hugely in complexity, so don't start with Elvin Jones or Jack De'Johnette if you want to get anywhere. The best preparation for this sort of transcribing is to spend a lot of time just counting through trades. The trading of Philly Joe Jones, on the superb album *"Everybody Digs Bill Evans,"* is a good place to start counting, as most of the material is of moderate complexity and fairly easy to feel. The fact that he is using a drum kit without toms reduces the complexity and makes it an ideal place to start transcribing. One thing you notice is that there is a lot of flexibility with the timing, as Philly Joe is not thinking just in rhythmic patterns but is working in a more melodic way.

Many drum trades are best negotiated by trying to feel the melody or harmonic flow, rather than the metronomic and strict bar line approach. Most jazz musicians have been thrown by a drum solo that has an unusual grouping, cuts across a bar line, or displaces a standard rhythm that appears to cross the time over. It is interesting to listen to the entry of a soloist after a complex trade to see how they deal with the situation. Many people will err on the side of caution and come in later in the bar, unfortunately this can lead to a loss of momentum and a time lag in some cases. I once saw Michael Brecker doing some extended trading with Jeff "Tain" Watts in a duo situation. The rhythmic complexity increased during the interaction to such a level that the feeling of bar lines became non existent, yet their sense of phrasing was so clear that it was obvious on they were totally connected on some level. As more and more displacement occurred it got to a point that it was very hard to tell where they were, yet the resolutions were still totally synchronised. It felt like a tug of war with a piece of elastic that they would pull out then let it snap as they released the tension. If any unsureness would occur it appeared that they would err on the side of coming in earlier rather than waiting around which kept the energy and excitement levels high. For this reason, some drum solos are close to impossible to notate, but for enhancing improvisation and arranging skills it is sufficient to transcribe solos of moderate complexity.

(b) Learning Approaches for Improvisation

Tools

Play-alongs, and more recently Band-in-a-box computer software, have proven themselves invaluable tools for the serious jazz improviser. They provide a trusty, but stiff (in the case of BIAB), rhythm section that doesn't care how long you solo. Jamey Aebersold has 99 play-alongs available now, with many other music minus one recordings available. These can be great places to try material and concepts, but it is important to realise the difference between practice and performance of improvisation. Play-alongs and BIAB are an excellent way of trying out ideas, and getting flying hours without causing too much damage. The main drawback of this sort of practice is that the band can't interact with you and make the minute adjustments to propel and inspire your solo in the way an experienced rhythm section can (funny that). After many repetitions even the best play-alongs will become predictable and lose their excitement. The mistake in the first place might be looking for that excitement and feeling of inspiration that is often only found in the real time interaction with a live rhythm section. A lack of balance between play-along and real playing can quite often lead to a feeling of isolation and make you unavailable to participate in the spontaneous events that make improvisation exciting. As long as this difference is kept in mind, it can be a wonderful tool for settling in new material and a great aid to conceptual development that often needs countless repetitions to become part of your improvising vocabulary.

In Hal Galper's article on Stage fright and Relaxation he says [1]

"Practising and performing involve completely different mind sets. Practising is a goal oriented, intellectual activity, while performing is a holistic, process oriented and emotional and intuitive activity."

In a recent lecture I attended at the 2000 IAJE conference in New Orleans, top jazz educator Jerry Coker stated that the intellect is too slow and interferes with improvisation, but is necessary to negotiate junctures or places where there are several choices available. He compared the interaction between the conscious and subconscious mind to the relationship between the Captain of a ship and his crew. The Captain (the conscious mind) would send orders below deck to the crew (the subconscious) then maybe after several hours the task was completed and the Captain would get a knock at the door. The experience of trying to remember a person's name and not being able access it immediately is common, but the answer often unexpectedly pops up a few hours later. Mean time you have been going about your daily business and the subconscious has been processing and working below decks so to speak. He talked about the importance of these subconscious processes in improvisation, with the mind making conscious decisions at difficult junctures in the chord changes, while these deeper processes continue in the subconscious mind. He also referred to the possibility of the crew going below decks, and punching holes in the side of the ship, alluding to the issue of self-sabotage no doubt.

The Importance of Performance

Many teachers have said the thing you learn most from in jazz (and presumably any type of music) is playing. Yet for many musicians the prospect of failure in this forum can prevent them from seeking out playing opportunities, instead preferring to dwell in the security of practice and study. There is no question that a period of intense preparation and wood-shedding should be observed, but even with the guidance of a teacher the imagination is not enough to let you know what you really need to work on. In an article on his web site Hal Galper says[1]

"In their early formative years, students tend to spend more time practising than playing. Without realising it they are developing a practising attitude. Because they don't have much playing experience under their belts, they assume that the mind-set developed from practising can be applied to the performing experience. It cannot. The result is usually a frustrating musical experience. Although the intellectual process is appropriate for practicing, it is too slow to use while playing."

The acceptance of failure and the directions it leads in is an essential part of the process and often leads to more effective learning by finding out what you really need to work on. Assessing a performance in an objective way is highly complex and has it's own associated problems tied up with expectations, peer pressure, self-image, self-doubt and stage-fright. The need to overcome these obstacles faces all musicians at one time or another, but the act of improvisation amplifies these problems.

[1] from an article on Hal's web site at http://www.upbeat.com/galper/

Virtual Improvisation

In the Glenn Gould biography [2] he referred to an incident when his mother was vacuuming around the piano while he was practicing. At this point he realised he could still hear the notes, even though the vacuum cleaner was obliterating the sound. This discovery led to him being able to hear and practice on this virtual piano that existed inside his head. Eventually, he discarded practice altogether and spent most of his time learning music whilst sitting on the banks of Lake Ontario, or on the plane on the way to the gig! A sax player I once worked with would sit in the bus with the bottom half of his horn on which he would practice for hours at a time. I once had the pleasure of watching him fall asleep whilst he struggled to maintain control over his fingers. The technique of learning to play your instrument without the physical touch can radically change the way you practice and how you perceive music in general. If you haven't tried this before, there are some steps that may facilitate this. Developing this virtual instrument may take several years, but some degree of accuracy can usually be developed straight away.

Here is a method

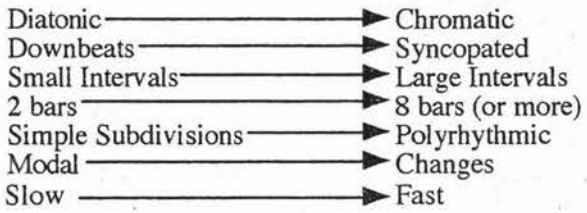
Play a scale up and down on your instrument whilst singing the tones just getting used to the fingering and range. Choose a scale and play some simple improvised melodies within this scale. The next step is to play and sing the scale without producing a sound from the instrument. Guitarists could just use their left hand whilst damping with the right, horn players don't blow, pianists can raise their fingers above the keys. On some pianos you can detach the hammer action from the strings. After running a few scales you may want to try a simple phrase or two. In time it will become possible to do it away from the instrument, and you may even be able to discard the voice preferring to internalise the sound of the notes. When I discovered this I included it as part of my practice routine, it would involve playing a short melody line in the air then checking it on the instrument for accuracy. After a while it became unnecessary to move my fingers at all. With the right training it becomes possible to improvise phrases complete with internal sound and correct fingering without moving a muscle. It appears that it is much harder to translate material from an external source (transcribing or call and response) and put this on your virtual instrument. Transcription can become a much quicker process with only occasional reference being made to the instrument, and even without perfect pitch it becomes possible to estimate the actual pitch more accurately. In outlining this technique it is important to note that improvement can take several years and progress can be inconsistent, but like many long term projects it is more than worth it.

Call and Response

Call and response in jazz is the technique of hearing a melodic and rhythmic phrase and responding instantly with the correct notes or rhythms. This is best practiced with another musician, but it can be done on your own. I was first introduced to this kind of learning of phrases in a David Baker class in which he would start each day with a period of call and response. The great thing about it is that all elements of accents, dynamics and rhythmic subtleties are being communicated.

Here is a method

Record yourself playing 2-bar improvised phrases with a gap of two bars of silence between. This should be done with the accompaniment of an audible time source (drum machine or metronome). Keep the phrases simple and start with the tonic of the key on beat one. The melodies should have a minimum of chromaticism and contain no large leaps. Simple structures like arpeggios or scale passages should not be challenging for too long as the logic behind these is easier to perceive. In your next practice session play back the tape and try to respond to the phrases in the gap. Alternatively this is best done with another musician so each will get a feel for the degree of difficulty, and be able to incrementally make the phrases more challenging. When you begin, your phrases should contain elements on the left in the diagram. As the material becomes more comfortable the elements in the right hand column can be gradually introduced.



[2] From *Glenn Gould Reader*

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Composition as an Aid to Improvisation

Bill Evans said [3]

"jazz as we tend to look at it is as a style, but I feel that jazz is not so much a style but a process of making one minutes music in one minutes time. But when you compose you may take three months to compose one minutes music".

As an improviser it is essential to gain control over strong melodic structure. The use of composition as a tool to create a vocabulary of lines becomes essential as the environment becomes harmonically more complex. Good melodic construction is easier to achieve on paper than in real time. The improvising of lines is fairly transitory and doesn't give the soloist a chance to use a large degree of what they know. Writing lines gives the possibility of editing and including new concepts. The improvisation and the composition of lines are similar to the technique of telling a story and writing a story. It can also be likened to the difference between improvising a speech in public or reading out loud from cue cards or a combination of both. Many people prefer to improvise a speech with notes or cue cards on the main topics to prompt them. In a sense the jazz improviser uses a similar technique, utilising patterns and preconceived lines to negotiate awkward junctures.

On the advice of several good teachers I started by writing simple lines over II-V-I progressions. At the same time I was transcribing lines and reading through Dave Baker's book of II-V-I patterns from the bebop era. As some of these lines would start to make an appearance in my solos they soon became stale and felt a bit phony as they had nothing to do with improvisation but rather were the result of good planning. Scott Henderson, on his video, suggested that composed lines should be top and tailed. In other words, leading into the phrase and adding in some notes at the end to disguise it. This did seem to help, but at the end of the day the material still lacked something and went stale very quickly. At one point I became quite frustrated and embarrassed with my soloing over "Rhythm Changes" which would crop up in performances and workshops from time to time, usually at a cracking tempo. My solos would have two basic modes either patterny and blatant or aimless and unsure but not a lot between. I set about writing a good solo of about 3 or 4 choruses in length that I would commit to memory and play instead of improvising. The first few times I used it in performance it sounded and felt great giving the impression that I was really improvising. I couldn't help feeling that everybody in the room, particularly the band, knew what was happening. Whether this was true or not, I was doing a poor job of fooling myself. One night I fumbled and lost my place in the second chorus. I was amazed to find that I could keep going for several choruses, having abandoned the written solo. I ended up improvising with similar fluency as the written line, surprising myself as well as the band. After several years of learning and composing phrases and trying them on the gig, it seemed that the structure of my improvised lines was benefiting almost by osmosis, giving them more variety and interest.

Recently, several classic jazz recordings have been released with alternative takes (some as high as take 17) giving the opportunity of comparing solos from the same artist on the same day on the same tune. One such solo was Wes Montgomery's solo on "Fried Pies" from the album *Boss Guitar*. I had a published transcription of the original solo and a transcription of an alternate take done by a student. I found it fascinating that some parts of the solos were almost identical and other parts were vastly different. This led me to believe that the artist was using preconceived phrases to get things going. One of the best pieces of advice I received was in a John Scofield improvisation class in which he said several times "write out lines, write out lines, even if you think I'm blowin it out my ass, write out lines". It became clear that to be a good improviser I would have to look seriously at how to construct the lines needed to build up a vocabulary. In informal discussions with pianist/composer Alan Broadbent, I asked him about how he acquired his phenomenal ability to harmonise melodies spontaneously. He pointed out that since 1960 part of his practice routine would be to score out harmonisations and arrangements, trying new voicings and techniques each time. This approach over a period of years resulted in his ability to spontaneously apply these elements.

[3] from an interview conducted by Harry Evans on the video The Universal Mind of Bill Evans by Rhapsody films.