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Beyond borders : broadening the artistic palette of (composing) improvisers in jazz

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Beyond Borders

Broadening the Artistic Palette of (Composing) Improvisers in Jazz

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STYLE SHEET

Note names

Note names are written in lower-case letter, for example, "the triad e–g–b". In the main text, accidentals are written in superscript: $c^{\sharp}$, $d^{\flat}$, but in the musical examples, the accidentals are written in subscript.

Accidentals

Accidentals are arranged per bar. Flats and sharps apply to all similar notes in the bar.

Intervals

Intervals are notated with the names of the notes connected by a dash, such as in "the interval $e^{\flat}$–g".

Both the terms "augmented fourth" and "tritone" are used to define the interval of the augmented fourth.

A figure between brackets indicates the number of minor seconds between two notes. For instance (4) means: a major third interval.

In the subchapters 3.3 – 3.7, I have followed the interval notations of the authors.

Chords and tonalities

Keys and tonal centers are marked in capital letters, followed by the abbreviations "maj" (major), "m" (minor), "dim" (diminished), and "augm" or "+" (augmented). The additions and alterations are written in subscript. For example, "the triads are Cm, F, $B^{(\text{omit } 5)}$, and $C^{\sharp 5}$"; "F# sounds as the tonal anchor"; "After the keys of Amaj and Cm, a G pedal point, also written as " /G"; "examples of chords are Am^{maj7}, Gmaj7, Bm7, Fsus4, $Fmaj7^{\#11}$, Gm^{add11}, and F#7omit5".

For the sake of reading ease I sometimes omit abbreviations, such as in "This helps to evoke the tonal color of a D augmented triad, the triad of F augmented, or the E augmented scale".

Bars

Bar numbers are notated in lower-case figure, such as in: "After the saxophone melody in bars 1–4, bar 5 starts with an ostinato in the bass."

1. INTRODUCTION

1.1. The subject of this study

This study discusses the application of advanced compositional and improvisational techniques in the domain of contemporary jazz in order to help (composing) improvisers to extend their musical practices beyond functional harmony and beyond the conventional chord-scale approach. The first part contains comparative analyses of educational publications by five leading jazz artists on this subject: David Liebman, Jerry Bergonzi, George Garzone, Walt Weiskopf, and John O'Gallagher. In the second part, compositional techniques by two twentieth century composers are discussed: Peter Schat's Tone Clock and Olivier Messiaen's modes of limited transposition.

This exposition displays a variety of research methods. First, for all authors and composers, the content of their theories and techniques is summarized and illustrated with written parts and audio examples. Second, practical examples of applications by professional (composing) performers, including myself, are displayed and analyzed. Third, all models are evaluated, individually and in conjunction with one another. Finally, compendia of patterns constructed with the discussed models are presented to demonstrate how they add to the improviser's artistic palette.

The emphasis in this study is predominantly on issues of pitch content. Although I am aware of the relevance of rhythmic phrasing, dynamics, texture, register, and form in creating the effects of playing "outside the chords", I do not elaborate on these parameters. Yet, the practical applications of the actual techniques discussed throughout this study display adequate examples of operations exceeding the mere pitch content.

The techniques discussed in this study are none of them new, and not even all of them recent. What is new is their being connected as important bodies of knowledge that, among jazz practitioners, are generally known by hearsay, but that are often overlooked during the learning process that is so principally marked by its oral character. After all, jazz music is generally about playing on the ears, about allegedly spontaneous responding to musical impulses, and not so much about sitting down and working one's way through weighty written bodies of knowledge, as I can attest from my personal experience as a longtime teacher of jazz improvisation and as an eternal student.

For impatient musicians who quickly want to experience the musical space that can be

created by the techniques discussed in this study, it will possibly suffice to stroll through the large collection of examples that are displayed throughout this exposition. They should feel free to approach these examples as a compendium of melodic lines, repeatedly playing and adding variations to adapt them to their musical ends.

The readers who want to gain insight into the coherence between the distinct techniques are advised to join my journey through blending these new elements with their existing playing techniques. They will, like me, experience the sensation of arriving at places that were undiscovered before undertaking this effort.

1.2 My motivation to undertake this study

Jazz musicians are usually esteemed for their spontaneity and expressive qualities, by which their music is appealing to general public and has a substantial influence on other music styles. This appreciation is witnessed by the large number of jazz festivals and jazz clubs, and by the large number of students in professional jazz programs at universities and conservatoires around the world.

The motivation to undertake this study is a consequence of my longtime experience as a jazz artist and educator. If I were asked to describe my ideal jazz band on the imaginary 'Music TripAdvisor', I would describe it as the ultimate 'all-inclusive'. In my opinion, jazz is supposed to act as a guesthouse in which elements from the surrounding musical world are welcomed with curiosity. For instance, as a sequel to my projects with musicians from Mali, Turkey, India and Lapland, in my recent works I rearranged sources of western classical music. The subject of the present study resulted from the latter and, more specifically, from the need I felt to re-examine musical sources that tended to be overlooked.

The focus of this study is upon the development of jazz as art music in which, rather than to please the audience, "the major challenge is to express oneself through sincerely felt musical means" (Liebman 2013, 78). The relationship between improvised lines and the underlying harmonic structures is considered a substantial part of these musical means. As a consequence of its aforementioned all-inclusive character, with the blending of traditional jazz forms with many other musical styles, the chord-scale approach needs reconsideration. More specifically, this study is based on the problem I share with colleagues and students that we tend to reach the limits of the traditional chord-scale approach and that, in order to develop jazz improvisation to keep track with recent developments, we need to exploit the alternative techniques discussed here.

I consider the advanced compositional and improvisational techniques elaborated upon in

this study as crucial elements for the development of today's jazz. At first sight they seem to operate in opposition to the conventional functional harmony on which the majority of jazz music is still based, but a closer look reveals that they can be applied alongside, or as an extension to conventional jazz languages. Needless to say, applying any of these techniques does not mean that important characteristics of straight ahead jazz such as swing, syncopated rhythms, and traditional melodic and harmonic embellishments are to be disqualified: on the contrary, they could become more worthy when considered from new perspectives.

Why does jazz, often characterized by its celebration of the moment, need these technical models to innovate? Firstly, through the years of its existence, jazz has always been based on models. Most obvious is the model of functional harmony that is largely based on the western European music tradition and translated to jazz improvisation as the chord-scale method of linear improvisation. Over the years, numerous variations and modifications of this model have been applied. When it was left behind, partially or totally, by some protagonists of the free form jazz in the 1960s, other musical parameters and game rules took its place. Once these parameters started serving as shared points of reference, they could be considered models alike.

Secondly, I address the innovation issue. Just like composers of symphonic and chamber music, jazz practitioners are continuously in search of ways to surprise their listeners with new tone colors, textures, and ways of manipulating tension and relaxation, to shed a different light on existing practices or to combine these with new musical elements. Besides, they share the experience that innovative techniques generally arise from processes of trial and error. Considered from this viewpoint, I dare to ask why jazz would not give these alternative models a try.

Thirdly is the educational subject. Through the years of its existence, professional jazz education has been criticized for its excessive focus on functional harmony and the related chord-scale approach. Models containing intervallic and serial techniques could offer a strategy to extend the improvisations beyond this traditional approach. By importing elements that are developed outside the functional harmonic fabric, jazz musicians can enrich their creative palette with new harmonic colors. However, an interesting paradox evolves here. Meaningful application of these alternative techniques demands a thorough knowledge of functional harmony and a broad expertise in chord-scale improvisation. From the perspective of the performers who started their journey with the acquisition of the conventional functional harmonic skills, the techniques discussed in this study should be considered an addition, alongside or on top of their existing skills, rather than replacing them.

1.3 The utility of this study

This study addresses in the first place those readers who endorse the need to move forward by continuously enriching their artistic palette. After studying this exposition, they hopefully agree that in order to keep the jazz practice alive, these skills open new doors to enhancing the practice of (composing) improvisers and jazz educators.

Those who question the utility of compositional techniques such as those of Schat and Messiaen that were originally introduced more than 70 years ago, should realize that the development of western art music over a period of roughly three centuries can be traced back in the first fifty years of the development of jazz music. Until the rise of free form jazz in the 1960s, the development of jazz harmony followed that of the European music tradition, roughly the Baroque, the Classical period, Romanticism and Impressionism. During the jazz-rock fusions of the 1970s, the renaissance of be-bop in the 1980s, and the crossovers with world music in the 1990s, functional and modal harmony remained the leading issue in terms of improvising on chords. The jazz of the twenty-first century roughly shows an ongoing hybridization by boundlessly merging improvisations in a wide range of jazz styles, non-western music, odd meters, and the rediscovered sounds of analogue electronic equipment from the sixties and seventies.

As an experienced composer and improviser, I embedded a number of these ingredients in my music, but through the years I felt the need to reassert an intellectual power in the field of jazz harmony. Considering the fact that, together with the blues and the work songs, the European music tradition was one of the fundaments of jazz as a crossover music *avant la lettre*, I decided to refocus on harmonic issues in line with the historic development of classical music. The adaptation of twelve-tone and modal techniques by composers of twentieth-century music could provide a fruitful addition to the harmonic jazz toolkit.

Of course, it would be naive to assume that just offering new toolkits would be sufficient to innovate jazz music. Therefore I decided also to discuss five exemplary publications by leading jazz educators on playing beyond conventional functional harmony. I undertook this part of my research not only to provide a decent context of already existing advanced models: I was also curious how they would relate to the twelve-tone and modal techniques in the models of Schat and Messiaen.

But like getting acquainted with the chord-scale approach that underlies the conventional way of linear improvisation, mastering the applications of any new toolkit will result from a creative process of learning by trial and error. By going through this process, any (composing) improviser, however experienced, simply cannot avoid reconsidering his

overall potential as a music practitioner. Important aspects of form, texture, instrumental line-ups, and repertoire alike will have to be adapted, leading to a close relationship between composition and improvisation. The more mature the musician, the more effectively the model and its operations will be embodied and the better the meta-goal of this study will be achieved—to show how elements from outside one's musical space can be integrated to enhance one's personal sound.

But what about the next paradox that evolves, of working according to a model on the one hand and developing a personal sound on the other? Throughout this research, I provide insight into my own development as a composing performer. The examples of my personal applications of the techniques discussed in this study, such as the suggested embellishments of rows, scales, and modes, and improvisational patterns, are an essential quality of it. Together with the recordings of my compositions and improvisations, they are meant to motivate and help the interested reader to adapt these examples to his personal practice.

It should be noted that, compared to traditional jazz education, this study takes the opposite direction. Nowadays it is still common practice that jazz freshmen scrutinize the canon of exemplary jazz solos in the process of building their improvisational idioms. Derek Bailey already concluded that in the learning method "the three stages —choosing a master, absorbing his skills through practical imitation, developing an individual style and attitude from that foundation—have a tendency, very often, to be reduced to two stages with the hardest step, the last one, omitted" (Bailey 1993, 53). Imitating the style of a famous virtuoso is hard work and the result affords the musicians satisfaction and the admiration of their peers. From the early years during which I performed as a jazz soloist, I remember peers, bandleaders, and journalists asking me who was my absolute favorite artist, because they found it hard to identify 'whom I was sounding like'. This was how I experienced Bailey's observation that "in jazz, to say that someone 'sounds just like' a well-known somebody is usually meant as a compliment" (Bailey 1993, 53). Even today some young musicians tend to find themselves in a vicious circle in which their personal development is only possible by copying examples of the fashionable jazz artists of the moment.

In my opinion, the integration of *extra muros* materials—with few exemplary solos yet available—as done in this study, might stimulate students to find alternative ways to build their personal jazz idioms. Therefore, rather than just presenting a compendium of ready-made melodic patterns, this study demonstrates various operations that might help musicians to generate those patterns themselves. How to apply these to either a conventional or an innovative jazz repertoire is up to the individual's learning attitude,

artistic taste, and technical abilities.

From my experience as a jazz educator, I know that the stronger the motivation of students to be inspired by any information offered during their studies, the more effectively they can develop a personal sound. This observation is in line with recent developments in professional music education to relate directly to the interest of the individual students by motivating them, even during the early stages of their development, to actively consider and discuss their artistic choices. This imposes an obligation on the jazz educator to emphasize reflective processes rather than offering mere historical examples in the form of ready-made models, patterns, or sequences.

Just as in (foreign) language acquisition, enriching one's jazz idioms results from being overwhelmed by live concerts, recordings, videos, and talks from inspiring artists. Part of the new information is distilled intuitively 'at first sight'. Another part results from repeated listening and analysis, and hopefully results in an individual interpretation of how it was achieved and in storing this in a continuously extending personal backpack.

The utility of the methods and techniques discussed here largely depends on the attitude of the student. He should agree to consider these alternative techniques as an appropriate extension, or as a useful addition alongside his already existing skills. Referring to Liebman's characteristics of a musician's individual qualities, a good ear is required to distinguish intervals, rhythmic and harmonic aspects, and to recognize the form of a piece and the entire sequence of actual events taking place during a performance (Liebman 2013, 77). I agree with his image of improvising in a band as an informal conversation among a small number of people, where the attention may shift momentarily from one person to another, or from one topic to another. The richer the collection of skills in his backpack, the better the individual musician will be able to discern all these threads of communication and to participate at any time with his own, personal sound.

1.4 Developing my personal sound

In subchapters 1.1–1.3 I discussed the urgency of my study in general terms of subjects, motivation, and utility. In the following sections, I will illustrate this with examples of how my personal development and motivation directed me toward undertaking this study. Three characteristic elements in the development of my personal sound are discussed: improvising outside the chords, the construction of contrafacts, and pushing the boundaries of styles.

1.4.1 Improvising outside the chords

Just like any other musician, I have spent a lot of time defining and enhancing my personal sound, a simple term for a complex body of skills. First of all it implies the "body works", the physical production of a good sound and the mastering of the basic scales and chords in all tempos over the whole range of the instrument. Besides, and more importantly, it implies developing individual interpretations and phrasings of melodies, harmonies, and rhythms. Most of the initial body works take place in a dynamic and unordered process of observing jazz soloists during live performances, listening to their recordings, and trying to imitate their gestures and phrasings in the practice room. The next step on my way to a personal sound was to transcribe recordings of improvisations by exemplary soloists and to slowly transmit their idioms into my own.
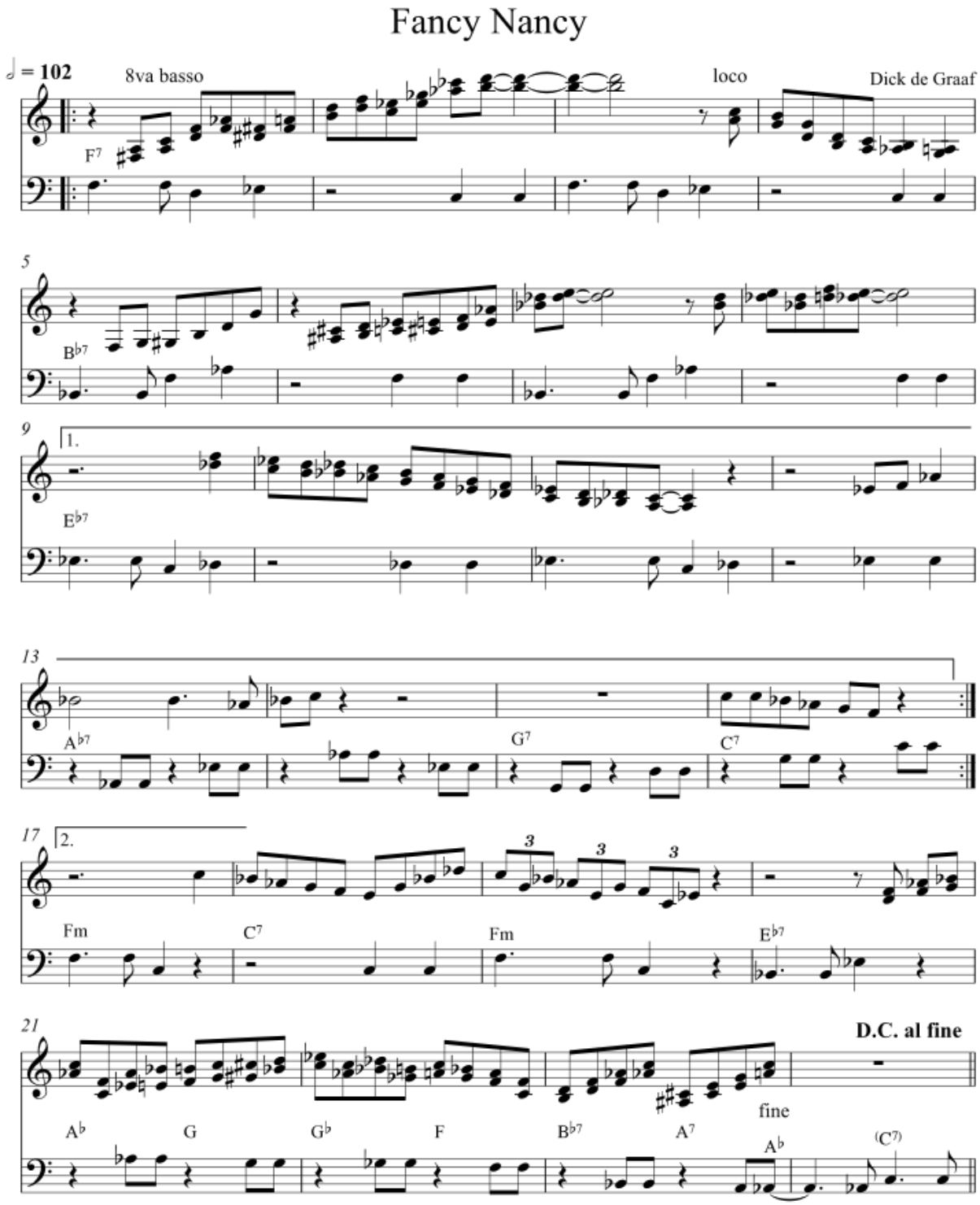
I started building my jazz vocabulary by scrutinizing recordings by Miles Davis, Chet Baker, Charlie Parker, Sonny Rollins, John Coltrane, Joe Henderson, Warne Marsh, and other legendary jazz icons. This showed me that, although a high level of technical command of the instrument is crucial, the proof of a personal sound finds its roots in the individual employment of melody, harmony, and rhythm. By exploring the basic repertoire of the Great American Songbook and the canon of original compositions that professional jazz musicians are considered to know by heart, I became familiar with the traditional melodies, forms, and chord changes of these bodies of reference.

Soon after I had reached a basic ability in linear improvisation, I became interested in manipulating tension and release by alternately playing inside and outside the chords. Playing inside the chords means playing the notes of a scale that correctly match the underlying chord. Playing outside the chords means playing notes that do not match the underlying chord exactly, but which still evoke a feeling of relationship with it. I discovered that enlarging my potential to play outside the traditional chord changes helped me to develop an individual approach to the standard jazz repertoire. Pushing the harmonic boundaries of the traditional repertoire appeared to be an effective technique to enhance this aspect of my personal sound.

1.4.2 Constructing contrafacts

Another characteristic element in the development of my personal sound was the construction of contrafacts. I recomposed existing jazz tunes by taking the harmonic and rhythmic structures apart, rearranging them, and putting new melodies on top. These operations were frequently put in practice by the early be-bop jazz artists as a way of disguising a melody to avoid copyright claims by the composers of the original tunes.

The next example shows one of my first contrafacts, "Fancy Nancy", based on the harmonic structure of the jazz standard "Sweet Georgia Brown", in a recording by the group CRY BABY! (2009). I changed the original 4/4 swing rhythm into a slow rock groove and wrote a new melody that underscored the bluesy character of the many dominant seventh chords of this tune.



[Example 1.4.2.1 "Fancy Nancy" lead sheet]

1.4.3 Pushing boundaries of style

In 1987, I started a septet that became my musical laboratory for almost 15 years. With an (in those days) unconventional line-up of violin, tenor saxophone, trombone, electric guitar, piano, bass, and drums, it combined seven musicians with distinct musical backgrounds in traditional and modern jazz, European improvised music, blues, and Latin jazz. The repertoire consisted of arrangements of jazz and blues tunes and of original compositions in an amalgam of musical styles. For instance, the title track of the septet's CD *Polder* (1991) shows the various textures I could create with this band by alternating between simple and complex melody lines, by arranging rhythmic diversity in suite-like compositions, and by writing edgy voicings in the riffs that were played behind the soloists. The hybridity of the repertoire and the distinct musical texture of this septet also have contributed to the development of my personal sound.

[Example 1.4.3.1 "Polder"]

From 1997 onward, I widened my musical horizon by initiating a series of crossover projects with musicians from Mali, India, Lapland, Curacao, and Turkey. Although, as a producer, I succeeded in entertaining my audiences with a catchy mix of folkloric sounds, swinging rhythms, and vivacious melodies, as an improviser I deeply missed a sense of mutual musical interaction and, more specifically, the intentions and abilities of jazz improvisers to push the limits of the harmonic content. For instance, as the producer of the CD *Les Sofas De Bamako* (2000), I was happy to play a few saxophone solos with some young musicians in Salif Keita's studio in Bamako, Mali. My improvisation over the Gm, Bb and F chords on this tune sounds inspired by their energetic and genuine rhythms, but at the same time it lacks the question-and-answer type of interaction between the soloist and the rhythm section that is so common in conventional jazz ensembles as well as in lots of African music.

[Example 1.4.3.2 "Gné Mufo"]

Another example is the jam session-type track of my composition "Summer Breeze" on the CD *Fo4r Winds* (2002). After singer Inga Juuso's improvised "yoik", steelpan player Konkie Halmeijer plays an inspired improvisation at the edges of the two chords Am and F. Next, kora player Mamadou Diabaté plays a virtuoso solo and uses his large rhythmic capacities to build up some rhythmic energy for my own solo. At the beginning of this solo I respond to the final lines that Diabaté played on the kora and then I try to start a question-and-answer interaction with the rhythm section. But my attempts unfortunately remain unanswered and I decide to guide the band to the final theme.

[Example 1.4.3.3 "Summer Breeze"]

Because of the lack of mutual interactions I experienced in my crossover projects, I decided to keep my focus on western European music and I initiated two crossover projects with rock and classical music. In 1998 I had already arranged a number of Jimi Hendrix' songs for my own septet. The forms and the modal harmonic structures of Hendrix' songs, as recorded on the CD *The Burning of the Midnight Lamp* (1999), appeared to be fertile ground for jazz interpretations, such as in our version of "Angel".

[Example 1.4.3.4 "Angel"]

Quite different from the Hendrix project, but no less pushing the boundaries of conventional jazz (and classical music), was the project I released on the CD *Schubert Impressions for Jazz Quintet* in 2003. In "Shaking Hands", a re-composition of the "Allegro ma non troppo" of Franz Schubert's *String Quintet in C major,* the form, harmonies, and dynamics of this movement transferred to a line-up of tenor saxophone, cello, piano, bass, and drums happened to serve well as vehicles for intense and interactive improvisations.

[Example 1.4.3.5 "Shaking Hands"]

1.4.4 The need for innovative harmonic issues

Despite my belief that with all these crossover projects I developed a distinct personal sound, as to the variety of repertoire and musical textures, I still felt the need for innovative harmonic issues. I considered my arrangements and improvisations as too much inside the traditional harmonic jazz fabric, as a continuous filling in and ornamenting of already existing forms. And although the musical examples I collected through the years kept inspiring me through their individual concepts and artistries, they did not satisfy my needs for alternative directions to the beaten tracks of functional harmony. They rather showed variations of diatonic superimpositions that overlapped operations I was already performing; or they appeared to be hermetic sound patterns with no apparent underlying systems. I was looking for something in between, for techniques that could generate autonomic melodic patterns that would connect well to a large variety of situations within and beyond functional harmony.

The idea of Dutch bassist and composer Theo Hoogstins to use twelve-tone concepts in jazz composition and improvisation served as a wake-up call. In his online article "Peter Schat's Tone Clock in Jazz and Improvised Music", he brought me back on the track of the compositional model of the Tone Clock as introduced by Schat (1993). After reading Schat's essay about this analytical model shortly after its first publication in the Dutch

language in 1984, I had discussed its possible adaptation to improvised music with some of my peers, but, drowned out by the sounds of everyday life, I had left it behind. At this time, Hoogstins' argumentation of introducing a modern compositional technique to create a style based on the chromatic scale, but with sufficient clues for musicians who are trained in jazz that is largely based on diatonicism, became a source of inspiration for me to undertake this research project.

While I was searching for more examples of composing performers combining twelve-tone techniques with their jazz, pianist and composer Frank Carlberg introduced me to the work of alto saxophonist John O'Gallagher who was about to finish a comprehensive method on twelve-tone improvisation (2013) that was firmly based on the Tone Clock.

Beside the ideas of Hoogstins and O'Gallagher, Liebman's (2013) treatise on chromatic improvisation and the parallels between the historic development of classical music and jazz also gave rise to the idea of importing musical elements of twentieth-century composed music that had not become commonplace in jazz. What other compositional techniques besides the Tone Clock could work to systematically enrich the artistic palette with colors off the beaten track of diatonic harmony?

A recording of a master class by guitarist Nelson Veras at the Amsterdam Conservatory in which he illustrated the adaptation of three of Messiaen's modes of limited transposition into his playing came to my mind as a possible answer to this question. Just as I remembered from practicing the technical saxophone exercises by Guy Lacour (1972), Veras' operations with Messiaen's modes managed to create the hybrid harmonic colors that I was looking for. This technical element of Messiaen's musical language thus became another part of my research. But, at the same time, I realized that a number of well-respected jazz educators during the last fifteen years had bothered to publish their individual systems designed to create alternatives to chord-scale improvisations and functional harmony. Since jazz improvisation is at the core of this study, I decided to start this research with an exploration of its context in the publications of the jazz educators introduced in the following paragraph.

1.5 Design of this study

1.5.1 Improvising with jazz models

The first part of this study contains a comparative analysis of improvisational models in jazz education that specifically deal with "alternative" jazz languages. Beside the works of Liebman and O'Gallagher, educational publications by composing performers—and saxophonists just like Liebman and O'Gallagher—Jerry Bergonzi (2000 and 2006), George Garzone (2009), and Walt Weiskopf (2009) are summarized in order to map and compare the systems and operations they designed in order to enrich the artistic palette beyond functional harmony. Examples of practical applications of all five methods are displayed and analyzed in order to evaluate their utility in jazz practice.

1.5.2 Improvising with the Tone Clock

The second part of this study discusses the transfer of Schat's theory of the Tone Clock into a model to generate and enrich jazz. After discussing applications in compositions and improvisations by a number of protagonists of this system, three movements of my saxophone quartet *Carillon* are analyzed. This work demonstrates my personal application of the Tone Clock both as a compositional device and as a source for improvisations. Its analysis is followed by a compendium of patterns serving as deep structures for improvisational uses.

1.5.3 Improvising with Messiaen's modes

The subject in the third part of this study was found in the theory and techniques of another twentieth-century composer whose techniques already appeared to inspire (composing) improvisers to advanced operations beyond tonality: Messiaen. This chapter starts with a summary of the seven modes of limited transposition as presented in Messiaen's *La technique de mon langage musical* (1944), along with examples of melodic patterns that can be created with embellishments of these modes. Then jazz applications by guitarist Veras, by baritone saxophonist Bo van der Werff, by tenor saxophonist Jasper Blom, and by myself will be compared and evaluated. What serial aspects can be defined in Messiaen's modes of limited transposition, in the works by the artists mentioned above, and in my own works? And how do these relate to the techniques and elements of the tone clock? This section also contains a compendium of patterns for improvisation.

1.5.4 CODA

In order to express the musical meaning of the results of my study, I conclude this research exposition with a coda in the form of a number of recent recordings of my compositions and improvisations in the context of this research project.
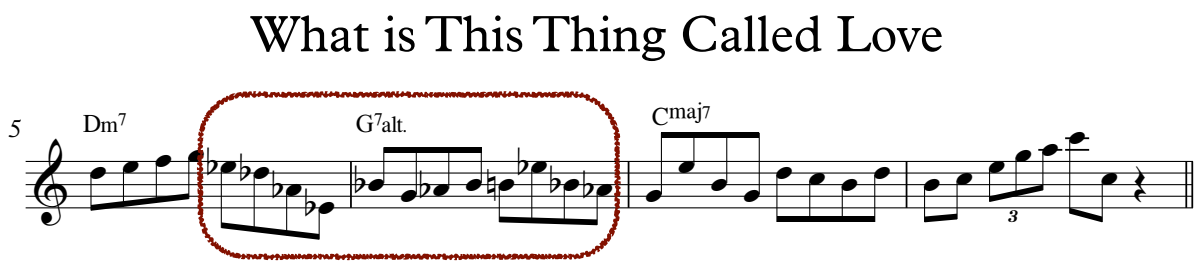
2. CONTEXT

These are examples of techniques I found in solos by saxophonists Michael Brecker, Mike Sim, Bunky Green and Gary Thomas and by pianist Paul Bley. The transcriptions of (fragments of) their solos served as models inspiring me to extend my improvisations beyond the traditional chord-scale approach. I have chosen the following examples because they represent operations that are relevant at all stages of the development of advanced jazz techniques. The same can be said about the order in which they appear in the sections below. In short, harmonic displacements precede tonal superimpositions and parallel harmonies, and from there it is a relatively small step towards non-tonal superimpositions. In jazz education these steps can also serve to illustrate the well-informed construction of a solo. The effect of sounding "outside the chords" can be increased by merging these displacements and superimpositions with traditional bebop patterns and conventional melodic and rhythmic sequences. From the time I discovered the operations in the following examples I transcribed them, transformed them, and transferred them into my personal musical backpack.

2.1 Michael Brecker: tonal superimpositions, and harmonic displacements
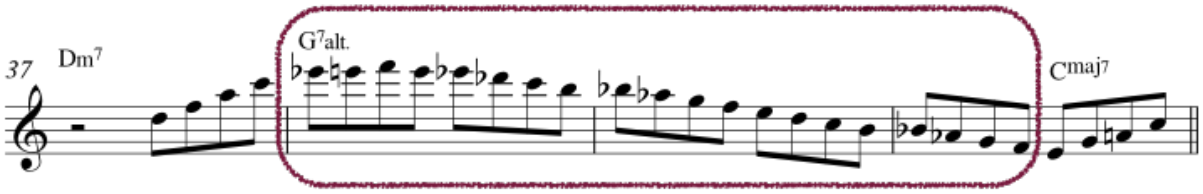
In a solo by tenor saxophonist Michael Brecker on Cole Porter's standard "What Is This Thing Called Love" on guitarist Jack Wilkins' LP *You Can't Live Without It* (1977), I encountered exemplary examples of tonal superimpositions and harmonic displacements.

First there is the superimposition of a minor melodic scale starting on the flatted ninth of the altered dominant seventh chord. In the following example Brecker superimposes a melodic pattern using the Ab minor melodic scale on the G7 altered chord. Beside he applies harmonic displacement by starting this pattern two beats too early, in the second half of bar 5, instead of on the first beat of bar 6.
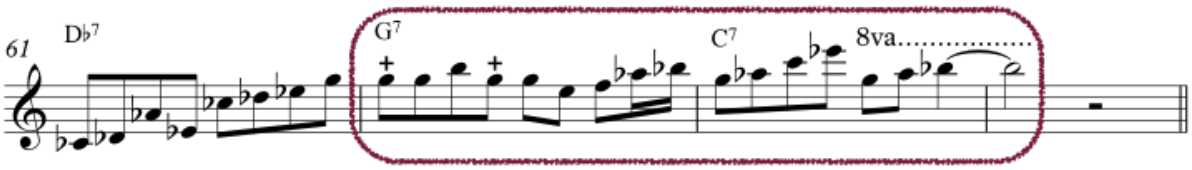


[ex 2.1.1]

Hereafter in bars 38–40 he applies harmonic displacement by extending another Ab minor melodic pattern over the bar. Hereby he delays the resolution of G7 to the tonic chord Cmaj7 with six beats.
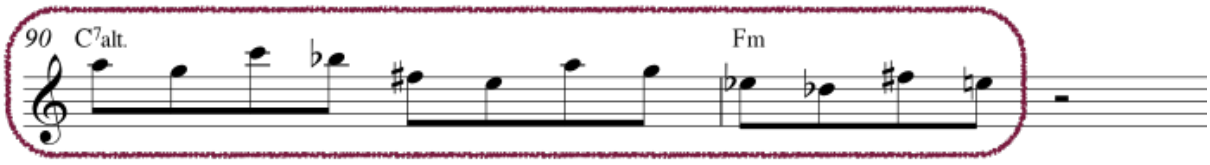


[ex 2.1.2]

In the following example the G7 chord in bar 62 is extended over the bar so that it partially obscures the C7 chord in bar 63.



[ex 2.1.3]
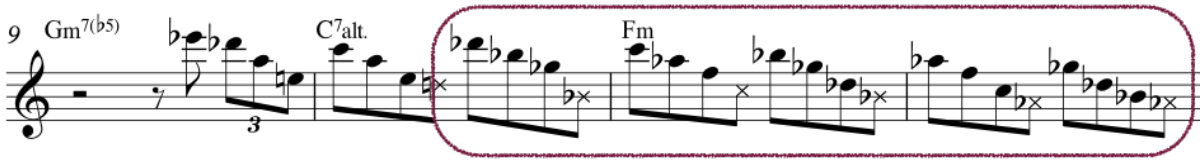
A comparable operation occurs in bars 90–91, but with the superimposition of an octatonic scale on a C7 chord. He extends this line over the bar and obscures the Fm chord.



[ex 2.1.4]
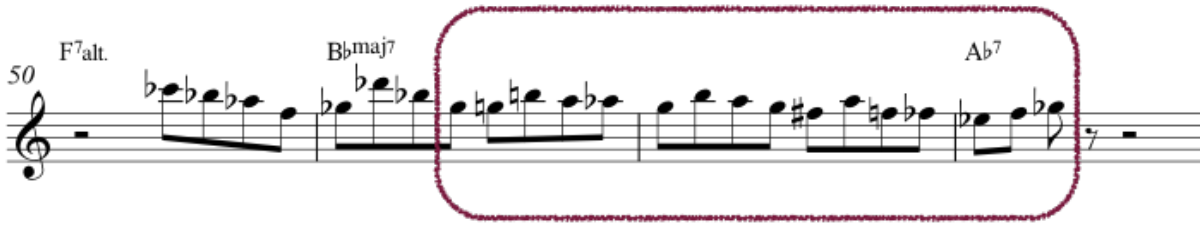
Beside these superimpositions that add tension to dominant seventh chords and delay the resolution to the tonic chord, Brecker's solo also contains superimpositions on minor and major seventh chords. For instance, starting from the second half of bar 10, by alternating descending pairs of triads Gb and Fm on the tonic chord in bars 11 and 12, a

harmonic movement is added to this static Fm chord, by the partial superimposition of the Gb triad, the tritone of its dominant C7 chord.



[ex 2.1.5]

Another interesting superimposition is that of a seemingly pre-composed chromatic line ending on a target note in the next chord, such as in bars 50 – 53. The shape of the encircled line is more important than the exact analysis of its harmonic content.

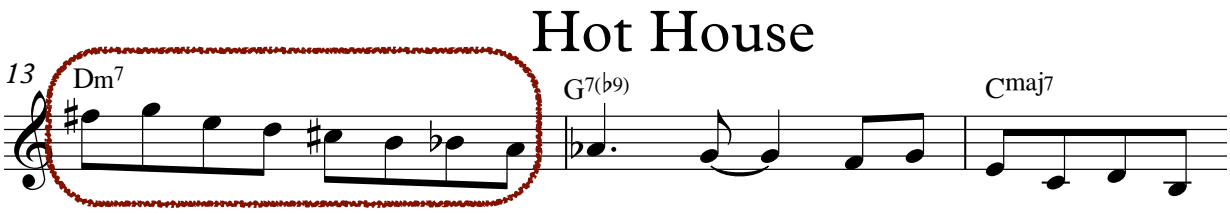


[ex 2.1.6]

This short solo on "What Is This Thing Called Love" by Michael Brecker comprehends examples of how to combine tonal superimposition with harmonic displacement. In the actual practice of jazz improvisers these techniques have become quite conventional operations to delay or obscure the resolution of dominant 7 chords.

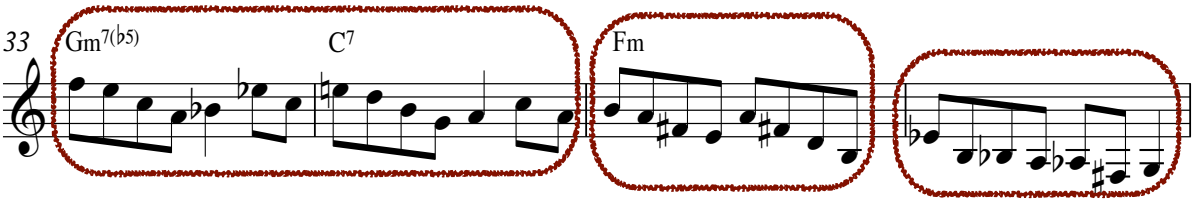
2.2 Mike Sim: "incorrect" parallel ii-V chords

In addition to these tonal superimpositions, alto saxophonist Mike Sim's solo on "Hot House", a contrafact by Tadd Dameron of "What Is This Thing Called Love" as played on Barbara Dennerlein's CD *Take Off (1995)*, demonstrated examples of the superimposition of theoretically incorrect changes on the original ones. The next example shows his application of parallel ii-V patterns in bar 13, where he superimposes Em7 – A on the original chord Dm7b5.



[ex 2.2.1]

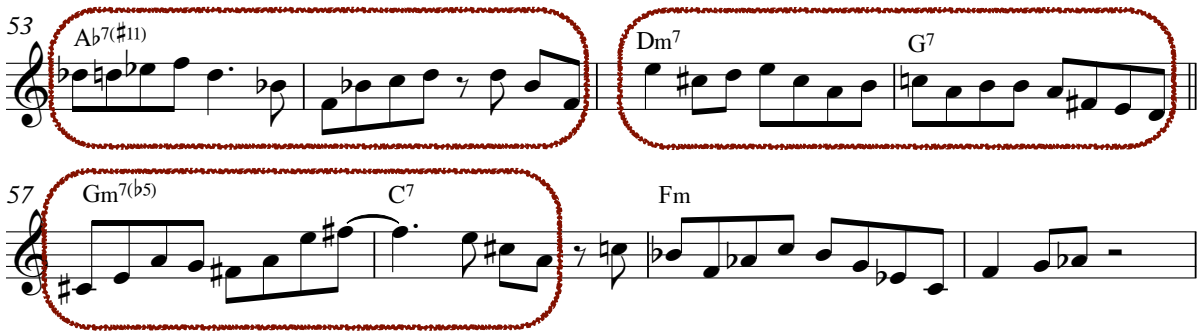
In the next example, the pattern in bar 33 is repeated as a sequence, starting a minor second down, in bar 34, superimposing a Cmaj7 sound on the original C7 chord. In bar 35, a broken Bm7 chord is superimposed on the original Fm. Together with a quasi Bb7-Eb major cadence in bar 36, it vaguely evokes the sound of a Bb7 altered chord.



[ex 2.2.2]

The following line – starting on the second half of the B-section of the tune and ending after the fourth bar of the last A-section – shows an interesting way of alternately playing inside, outside and again inside the stated chords. In bars 53–54, Sim plays a Bb triad as an upper structure of the Ab7$^{\#11}$ chord. In bars 55–56 he applies parallel V–V chords, by superimposing an A triad on Dm7, and a D7 chord on G7. The same in bars 57–58: an A7–D sequence is superimposed on Gm7, and an A triad on C7. In contrast with these complex harmonies, the way he embellishes the tonic Fm by including the implied Cm7 in the second half of bar 59 sounds again very conventionally inside the chord.

To me this line evoked the image of an airplane riding on the runway (bars 53–54), taking off (bars 55–56), flying (bars 57–58) and landing safely (bars 59–60).
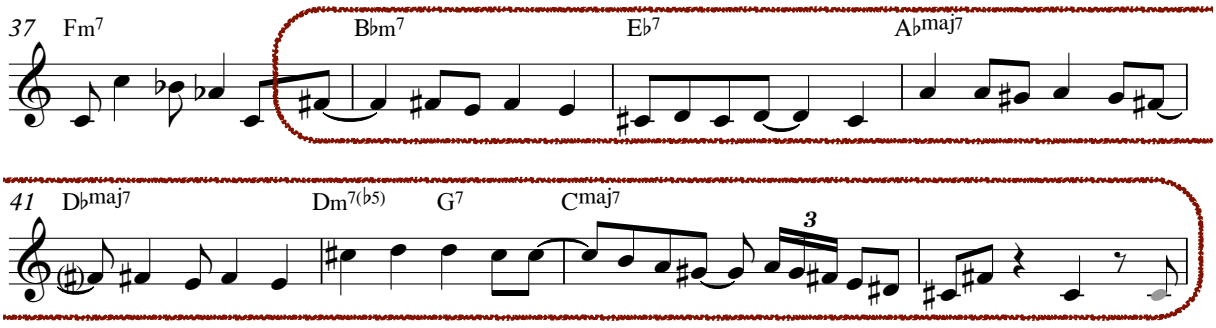


[ex 2.2.3]

2.3 Paul Bley: non-tonal superimpositions, and melodic and rhythmic sequences
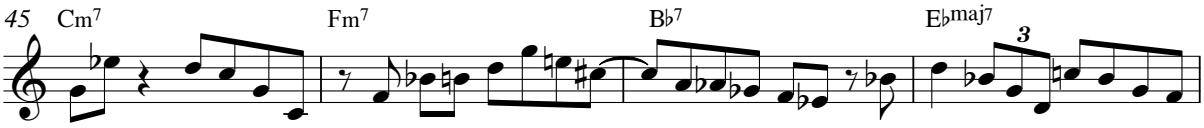
Pianist Paul Bley's solo on the standard "All The Things You Are" on Sonny Rollins' LP *Sonny Meets Hawk (1963)* served as an important example of switching between the inside and the outside of a jazz standard's original chords. During three solo choruses Bley alternates non-tonal superimpositions with conventional operations such as melodic and rhythmic sequences and elementary bebop patterns. Despite his intentional harmonic and rhythmic derailments and his fluid timing, his solo never looses contact with the original form.

For instance at the beginning of his second solo chorus in bar 37, Bley starts inside the original Fm7 chord. But from the last eight note of that bar until bar 44, he goes outside the chords by the superimposition of a melodic line that sounds a half note too high. However, thanks to the rhythmic sequences in bars 37,41 and 38,40 the solid structure of this line completely blurs these conflicts with the original chords.
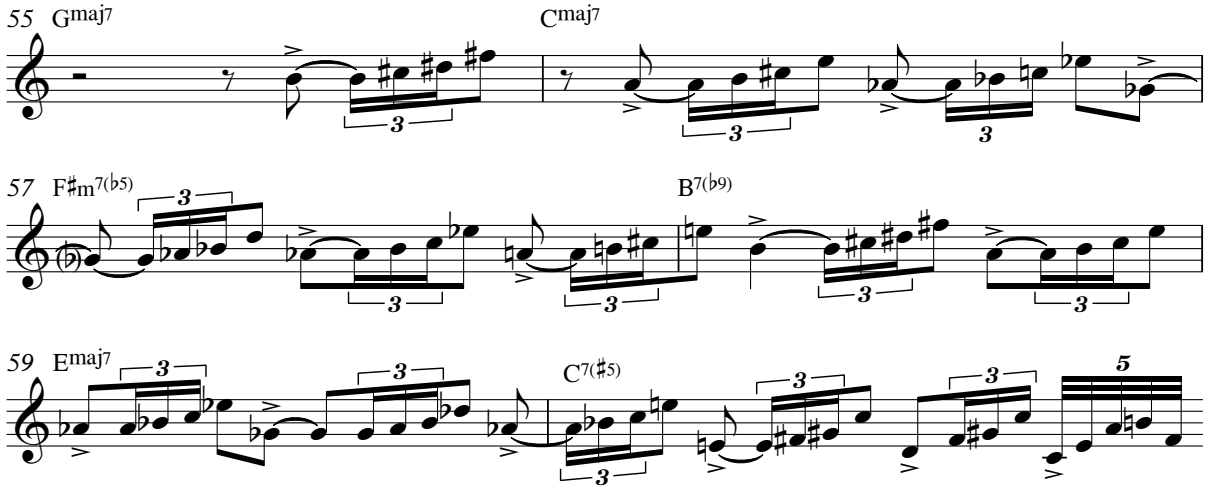


[ex 2.3.1]

In contrast with bars 37–44, bars 45–49 in the following line sound more inside the chords and end with a conventional bebop pattern in bar 48.
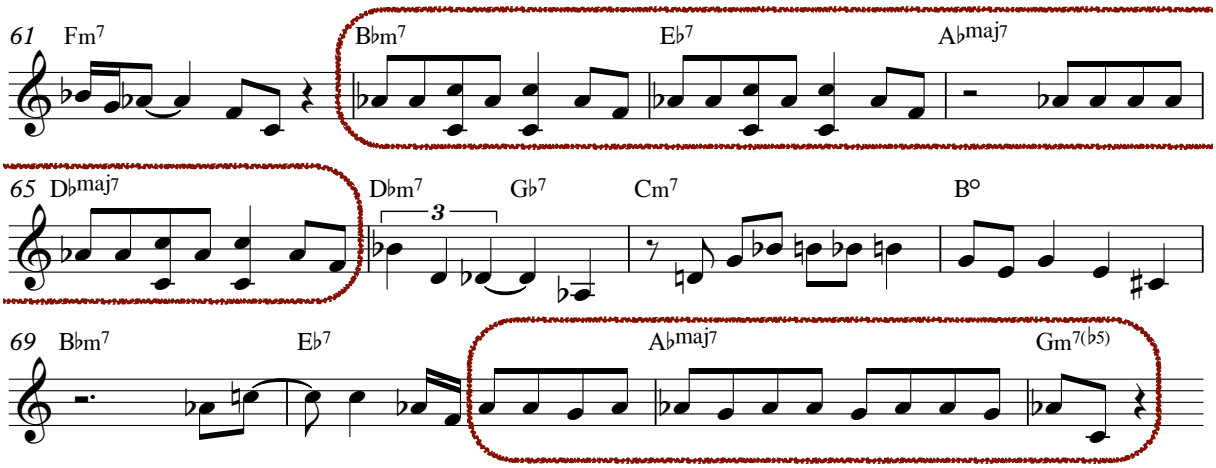


[ex 2.3.2]

Bley frequently switches between the inside and the outside of the harmonic and rhythmic structure by playing rhythmic sequences. For instance in bars 55–60 he plays a sequence of 12 times the same rhythmic pattern – in rhythmic displacement. The first (accentuated) notes of these patterns form a melodic line that, although rhythmically displaced (in order to correctly fit the chords it should have started from bar 57), refers well to the original melody.



[ex 2.3.3]

The sequences in bars 62–65, and in bars 70–71, take the opposite direction. With their more inside approach they refer to conventional rhythmic riffs to mark the end of this chorus.
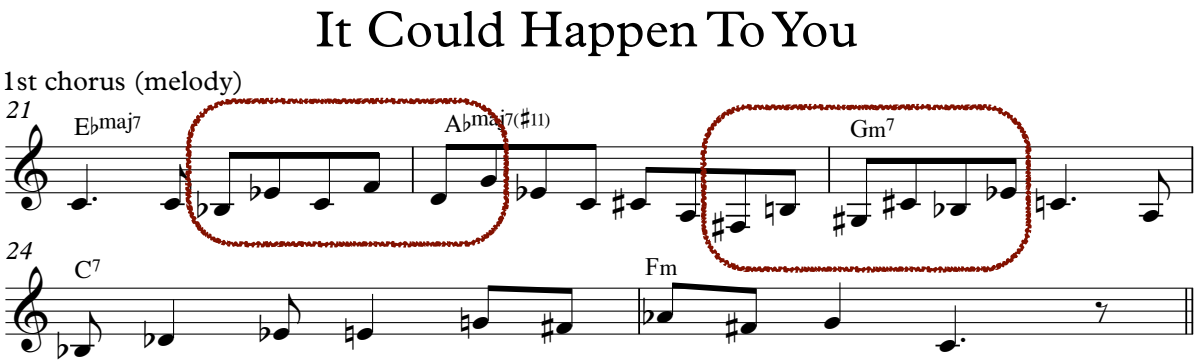


[ex 2.3.4]

By alternately moving away from and getting back to the form of the song, Bley evokes the image of someone driving his car on the service lane next to a highway, following, passing by, getting behind and meeting up again with the rhythm section who is driving on the main lane.

2.4 Bunky Green: stacked perfect fourth intervals, and superimposed triads
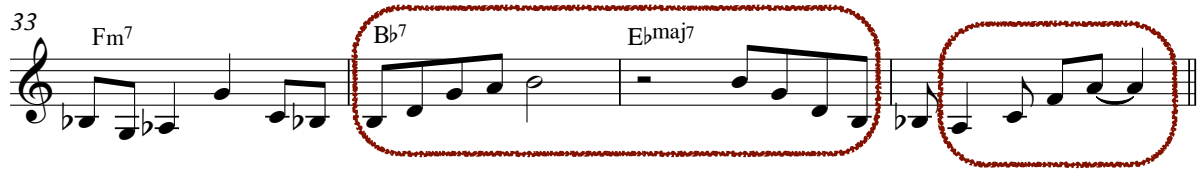
On his recording of "It Could Happen To You" on the CD *Another Place* (2004), alto saxophonist, jazz educator, and author of the method *Jazz In A Nutshell* (1985) Bunky Green primarily fascinated me by his floating timing. For instance in the melody he freely moves back and forth around the beat and accelerates to eight note triplets and double tempo passages, both times at the second half of the chorus.

Hereafter, Green shows how patterns with perfect fourth intervals can be moved intelligently in and out the harmonic fabric. For example during his playing of the first theme, the pattern of perfect fourths on a whole note distance, starting on the third beat of bar 21, stays inside the Eb and Ab chords, while the one starting on the fourth beat of bar 22 starts outside and moves back into the Gm chord.



[ex 2.4.1]

As an addition to the improvisational techniques discussed above, Green plays upper structure triads as tonal superimpositions, like in bars 33–36. The G triad on top of the Bb7 chord (in which he plays the note a instead of the correct a♭) in bar 34 is extended over the Ebmaj7 chord in bar 35, and followed by the F-triad on top of the Eb chord in bar 36.



[ex 2.4.2]

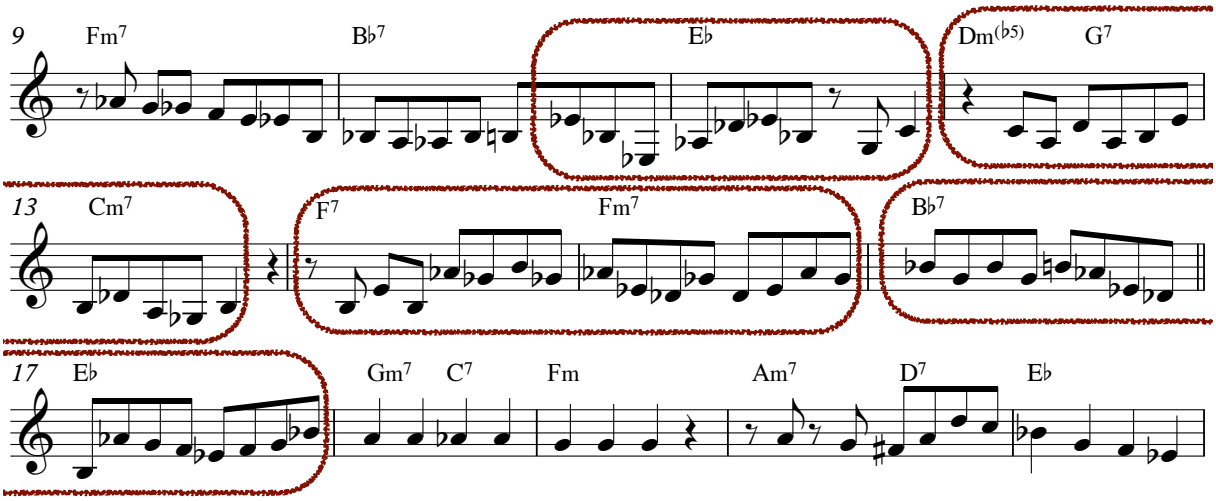
The following line in the third solo chorus illustrates Green's way of deliberately creating a harmonic vagueness. In the first two bars he starts a conventional bebop line that ends in a series of four perfect fourth intervals, starting on the sixth eight note of bar 10: descending b♭–e♭; ascending e♭–a♭; ascending a♭–d♭; descending b♭–e♭; and ascending g–c. The last interval creates harmonic vagueness, by superimposing the tonal color of C minor to the Eb chord.

In bars 12–13 he plays three intervals of perfect fourths (ascending a–d; ascending b–e in bar 12; ascending g♭–b in bar 13). In bar 12, he superimposes an A minor triad on Dm7–G7 which results in a conventional Gsus4 sound. In bar 13, he superimposes a Gb minor triad on the Cm7 chord, which results in a more outside sound. In bar 14, he

continues his playing outside the chords, by superimposing an E major triad (considering the notes a♭ and g♭, enharmonized into g♯ and f♯) on the original F7 chord.

Bar 15 contains two intervals of perfect fourths: descending e♭–a♭; and ascending d♭–g♭. These four notes are repeated in a permutated order. Together with the original root note f, they superimpose a Db major triad on the original Fm7 chord.

Next, in bars 16–17, Green starts his "landing procedure" by playing correctly inside Bb7, with added 11, b9, and b10, and by clearly resolving to the Eb triad in the second half of bar 17. Eventually bars 18–21 are played perfectly inside the original chords.



[ex 2.4.3]

2.5 Gary Thomas: changing expected scale qualities

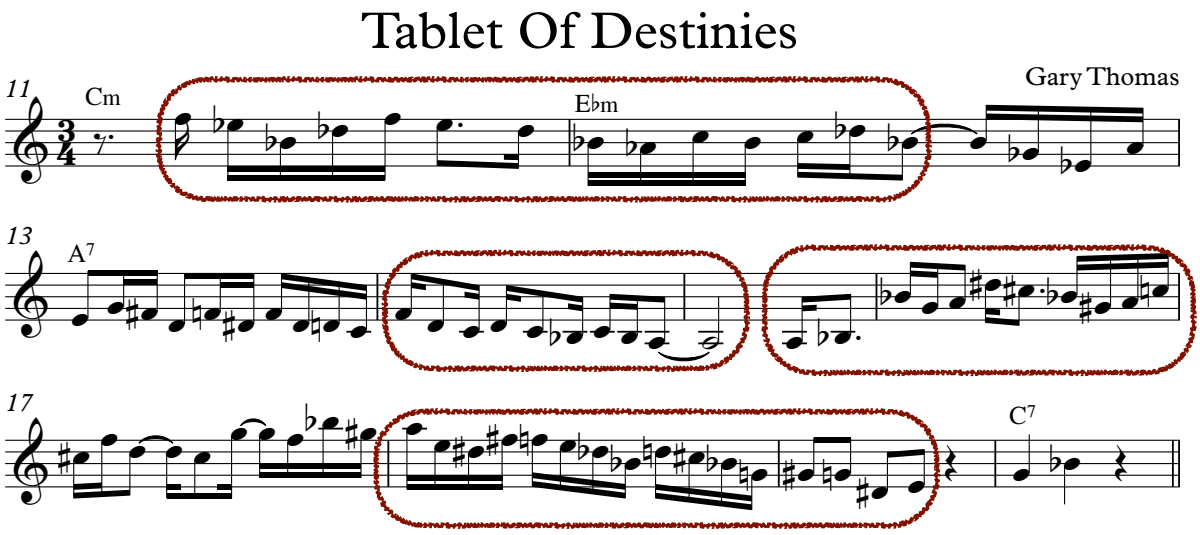
In his solo on "Tablet Of Destinies" on the CD *The Seventh Quadrant* (1987), tenor saxophonist Gary Thomas shows examples of various operations to create harmonic vagueness, by changing the quality of expected superimposed scales.

In bars 11–12, his superimposition of Bbmin7 on the Cm chord can be seen as a harmonic displacement of the upper structure of Ebm7. Arguably, his way of phrasing the Bbm pattern in bar 11 also suggests that he is preluding to the sound of the A7 altered chord in bars 13–19.

The Ebm triad on the last beat of bar 12 moves chromatically to Em in bar 13, and back to A7^{alt} in bar 14. Instead of applying the conventional tonal color of the Bbm melodic scale over the altered A7 chord, he superimposes the Bb major scale.
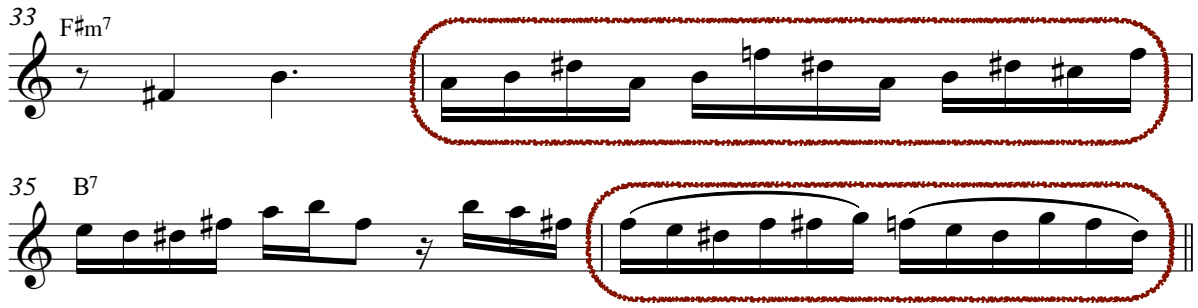
His line starting on the last beat of bar 15 is another example of how changing the quality of an expected scale can cause an outside sound. The notes in bar 16 constitute the nine-tone row a, b$^{\flat}$, c, c$^{\#}$, d$^{\#}$, f, g, g$^{\#}$, a. Despite the note g$^{\#}$, bars 16 and 17 still suggest the sound of an A7 altered chord, pulling to a tonal color of a D minor.

In bars 18–19, starting on the second beat, he plays a descending sequence over Bbm, Gm, and (incomplete) Dbm triads, the latter evoking C7^{alt}.



[ex 2.5.1]

At the end of his first solo chorus Thomas plays a line over a ii-V pattern over four bars. In bar 34, the line over F#m7 turns into an F whole tone scale pattern, with the note f itself overtly conflicting. After playing a very inside pattern on B7 in bar 35, he ads the tension notes f and g in bar 36. But by phrasing the line as a sequence of two six-note groupings (starting with the same three notes) he avoids the conventional sound of the C minor melodic scale.



[ex 2.5.2]

2.6 Conclusion

I am aware that the summary of techniques in my selection of solos in this chapter does not justify the level of artistry of the jazz artists that recorded them. It is just meant to illustrate the initial stage of my search for systematic approaches to broaden my harmonic skills as an improviser. In Brecker's early works, I found the characteristics of his style that quickly became imitated by many saxophone soloists of those days. Sim showed me how basically incorrect parallel harmonies can help a soloist to create attractive lines that alternate between clearly inside and distinctly outside the stated harmonies. Bley made me aware of the strength of autonomous melodic ideas, especially when these are phrased in melodic-rhythmic sequences. Green fascinated me by his capricious lines, his piling up of perfect fourth intervals, and his explicit ideas of harmonic vagueness and continuity as he expressed these in Anil Prasad's on-line article "Bunky Green, Urgency and Continuity". Green comments on his ideas as follows.

> "The way I approached the harmonic fabric was suggestive, rather than just playing the harmony as it was. I created a lot of tension and relief by going against standard harmony and then ultimately resolving it with continuity. That's the whole bag. You can play so many things. You can play whatever you hear, but it has to have continuity for it to all hang together" (Prasad 2012).

In his instruction booklet *Jazz In A Nutshell* Green defines his idea of continuity by listing the essential techniques it can be achieved with in an improvisation: sequential imitation, scale wise imitations, alternating chord progressions and rhythmically vital alternations between double-time and half-time feelings.

Thomas I have brought up in this survey because in my opinion he demonstrated a next level in outside playing at that time, by changing the tonal colors of conventional techniques of superimposition. His way of addressing superimpositions comes close to my personal approach to improvisation that is the subject of this research: creating a sound that is noticeably different from what the informed listener would expect to hear, but without loosing contact with an existing or imaginative harmonic source.

3. IMPROVISING WITH JAZZ MODELS

3.1 Introduction

3.1.1 The chord-scale technique
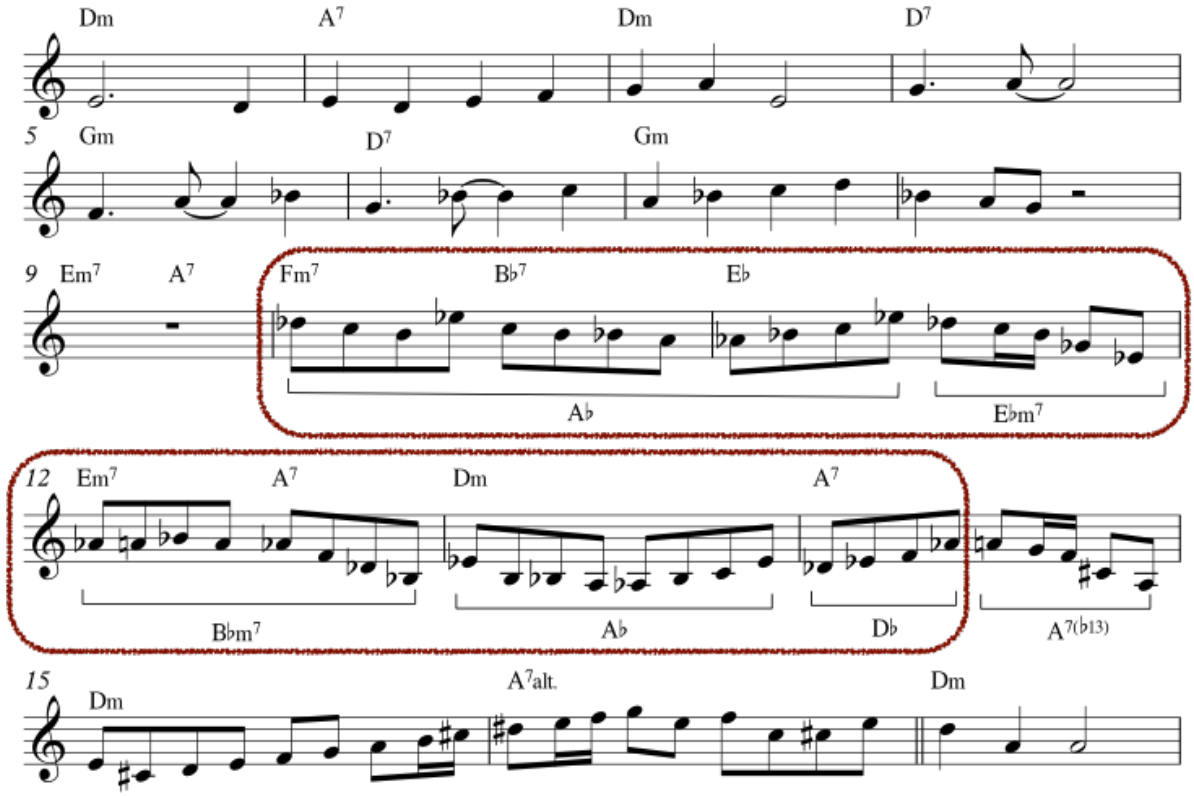
Through the years, a large number of educational methods on how to improvise in jazz have been published (for instance Oliver Nelson 1966; Jerry Coker, Jimmy Casale, Gary Campbell and Jerry Greene 1970; Bunky Green 1985; David Baker 1988; Hal Crook 1991; Jamey Aebershold 2010). The instructions and examples in these publications are basically meant to develop the musician's skills in chord-scale improvisation, which is generally considered as the basis of linear improvisation in functional and modal harmonies. In section 1.4.1, I have already discussed my endeavors to broaden my potential to play "outside" the stated chord changes, as one of the ingredients that would lead to a personal sound. Although few of the authors mentioned above have discussed comprehensive techniques of creating "alternative" jazz languages beyond functional harmony, countless jazz artists have developed their individual theories and strategies of "playing outside", as an alternative to or an extension of their conventional linear improvisational languages. Although in the present study the melodic patterns often sound "pretty far out", I agree with David Liebman's thinking pointed out in section 2.2.1, that improvised lines are generally related to existing or imaginary underlying chords. Unsurprisingly, throughout this study the chord-scale technique as a potential way to address melodic improvisation will occasionally emerge.

3.1.2 Playing outside the changes

With the notions "outside the changes", "playing outside", "outside sound" or "outside" in this study, I mean that an improviser intentionally plays phrases that do not correspond to the scales that match the underlying chords. Separated from each other, the melodic line and the harmony both sound right, but put together they create a surprising dissonance, a bitonal sound that is different from what the listener might expect. Whether such an outside phrase sounds "right" depends both on the authority with which the performer phrases his line and on the competence and the empathy of the listener.

The difference between inside and outside can be illustrated by a phrase that starts inside, goes outside and ends inside again. For instance, in the next example of a solo by alto saxophonist Eric Marienthal in Chick Corea's composition "Got A Match" (2003). The notes he plays in bars 1-8 of this fragment match correctly with the original chords that are written above the staff. But in bars 10–14 he goes outside the stated chords by

playing lines that evoke the alternative chords that are indicated by the brackets under the staff. From the second half of bar 14, his notes match the original chords again.



[ex 3.1.2.1 "Got a Match" – fragment of alto saxophone solo by Eric Marienthal]

Once again it should be emphasized that the effect of this desired dissonance depends on the listener's ability to explicitly or intuitively recognize the relation between the melodic line of the improviser and the harmonies played by the rhythm section. Even if the pianist plays sparsely (such as in this example), or even stops accompanying temporarily, and even when the bass player obscures the original chords by superimposing a stationary bass pedal, the listener should be able to keep imagining the form and the original changes of the tune, in order to appreciate the improviser's performance.

In the following subchapters, the theories, techniques and practical applications published by jazz saxophonists and educators David Liebman, Jerry Bergonzi, George Garzone, Walt Weiskopf and John O'Gallagher will be evaluated. Which techniques do they apply when playing outside the chords and – led by my intended operations with the Tone Clock and Messiaen's modes in the remainder of this study – what are their connections to serial compositional techniques?

3.2 David Liebman (2013). *A Chromatic Approach to Jazz Harmony and Melody.* Rottenburg: Advance Music.

3.2.1 Theory

Liebman's publication can serve as a theoretical framework and a treatise on how to step forward from conventional linear jazz improvisation by applying the concepts of tonal and non-tonal superimposition. The author defines his chromatic approach as "the construction of melodies and harmonies which can coexist with, or replace given key centers. It implies setting up contrary tonalities, thus creating a heightened degree of tension and release in order to expand one's expressive palette" (Liebman 2013:9). The term chromaticism is meant "specifically for a situation in which there is an intentional relationship between melody and harmony. [Because] for jazz, it is the harmonic accompaniment which frames the melody" (Liebman 2013:13).

Liebman discerns three categories of melodies in relation to the diatonic system, to define his concepts of tonal and non-tonal superimposition. In the first category are melodies that stay for the most part within the given harmonic background. If any chromatic tones appear, they are quickly resolved. In the second category are melodies that hold chromatic tones for longer periods. This can be called tonal chromatism. The third category hosts melodies that are not related to any specific overall tonal center, though they may temporarily resolve. This is called non-tonal chromatism.

Tonal chromaticism is achieved by applying techniques of harmonic superimposition, for example, in Liebman's terms, "tri-tone", "alternate ii-V", "scale quality", "modal", and "pedal point" substitutions. Although the resulting melodic lines may sound far outside the basic harmonic structures, Liebman still considers these techniques as extensions of the improviser's conventional chord-scale skills, and uses the familiar chord terminology to identify the notes.

Non-tonal chromaticism refers to melodic lines and harmonies in which, in Liebman's words, no key centers are given priority, but "shape, ambiguous tonality and overall color (resulting from factors of phrasing) are the important aspects" (Liebman 2013: 55). However, although these melodic lines are structured by interval connections, it is still possible to identify their pull towards temporary tonal centers. Liebman defines these as tonal anchors, which means that in these sort of melodic lines "tonality is flexible and in continuous flux as a line evolves. Within the progress of the line itself, temporary points of tonality may be established as anchors. This is a form of linear tonality and may result from several musical developments: the emphasis of one pitch or pitch cluster, leading
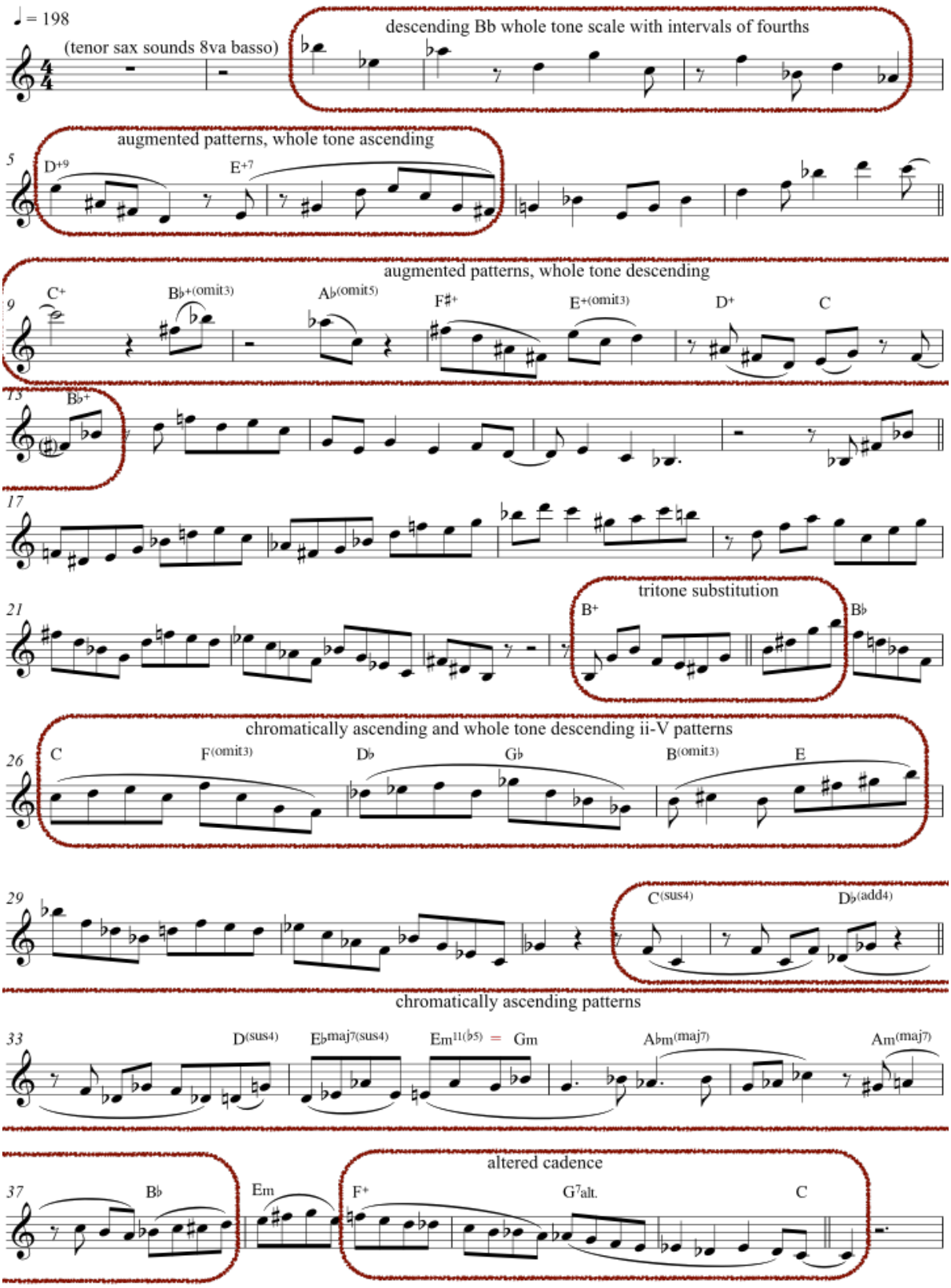
tone activity (half or whole tone step pull), rhythmical stress on a pitch, or how the intervallic shape seems to lead to a tonal center" (Liebman 2013: 55).

Liebman argues that in jazz harmony, non-tonal improvisation is a very relative term because any configuration of notes can be identified by using similar chord terminology, the numbered system figured from the root, as in functional harmony, or by constructing complex chords of stacked triads on the root.
How Liebman's theoretical concepts are put into practice depends on individual aesthetic choices and on the musical relationships in a group of musicians. One group may choose to facilitate musical communication by using names of chords or scales, to create a familiar point of reference. Another, without the need of such a safety net, will be challenged to communicate more instinctively and create fresh reference points. "Harmonically speaking, the spontaneous reference point may turn out to be diatonic or non-tonal; this has to do with the situation, style and particular musicians involved. Achieving a sense of no pervading harmonic center implies the absence of direct superimposition and means that the music is purely intervallic" (Liebman 2013: 30). In this type of playing the improvisers will have to use intervallic recognition as an important tool to react and play by ear instead of by knowledge of chords and scales. According to Liebman, this spontaneous playing in response to the direct musical context, without thinking of tonal references and harmonic relationships, can be truly called free music.

3.2.2 Practical applications

With most of the discussed techniques of tonal chromaticism, I had become familiar by analyzing musical examples, by the advice of my teachers and by experimenting with peers. Applying harmonic superimpositions such as tri-tone substitutions, alternate II-V substitutions and altered cadences had - by trial and error- become part of my musical language. This goes even more so for superimpositions of chord sequences such as cycles of fifths, chromatic ascending or descending ii-V patterns or whole tone sequences on a stationary chord or pedal note. The following example shows a number of these techniques in a recording of my improvisation over a C-pedal point in the A-part in "Sailing" (1995).
The first sixteen bars exhibit an overall whole-tone color. Firstly, by the fragmented descending Bb whole tone scale b♭, a♭, d, c, b♭, a♭) and its intervals of fourths (e♭ – a♭; d – g; c – f; d – a♭) in bars 2–4. Secondly, by the whole tone ascending augmented patterns in bars 5 and 6, and by the whole tone descending patterns in bars 9–13.
Bars 24–40 feature a number of superimpositions. The B augmented chord in bars 24–25 is a tri-tone substation of F7 and resolves to Bb as a temporary tonal center. Bars 26–28
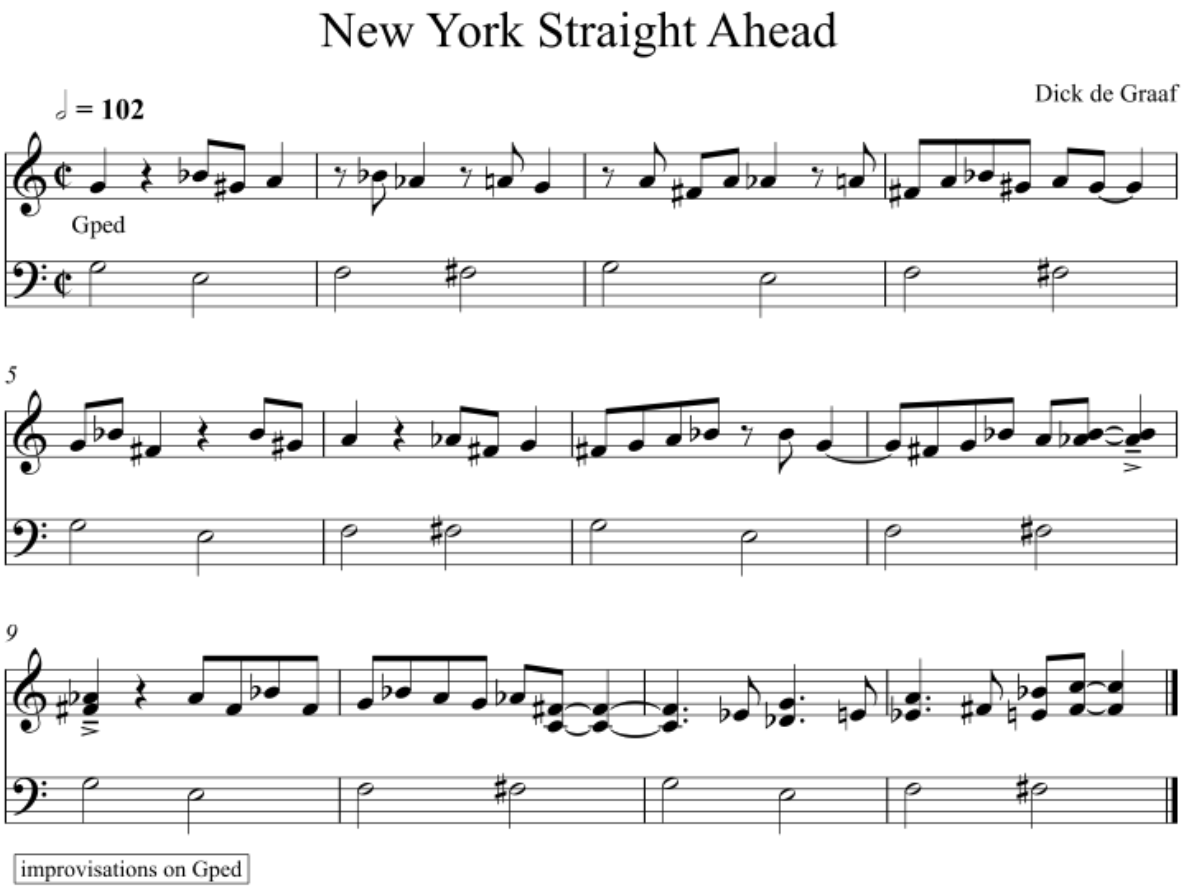
contain one chromatically ascending and one whole-tone descending ii-V pattern. Bars 31–37 show eight chromatically ascending patterns. The shapes of these patterns are different but in bars 31–34 the intervals of fourths suggest cycles of fifths. Finally, an altered cadence starts on the second half of bar 38 and resolves to the tonality of C in bar 41.



[ex 3.2.2.1 "Sailing" – fragment of tenor saxophone solo]
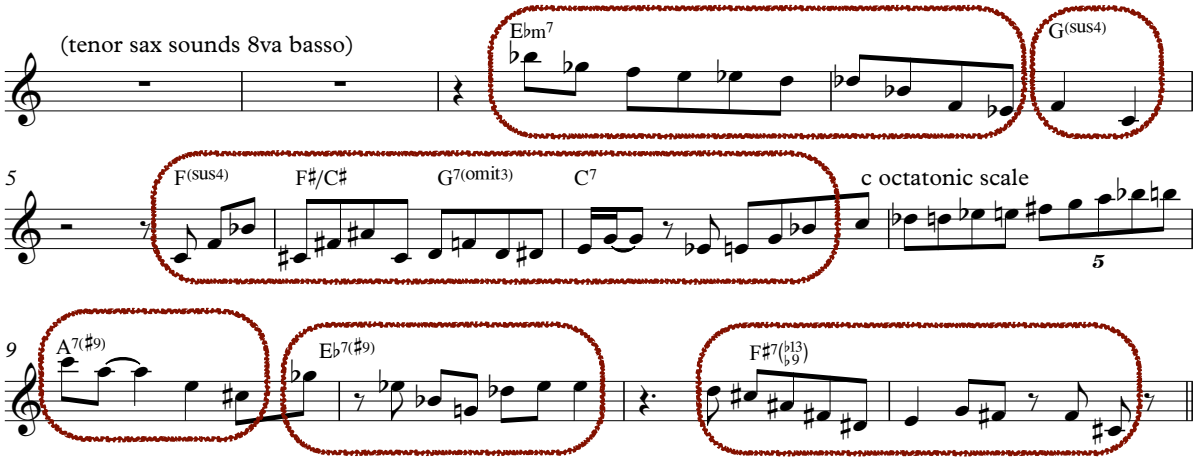
According to Liebman, hearing intervallically is the highest goal in chromatic playing. To facilitate intervallic recognition, he maps the intervals in three categories. The first contains major and minor seconds, thirds and sixths. These are considered smooth and relatively consonant (Liebman 2013:71). Second are the fifth and the perfect and augmented fourth intervals. The fifth and perfect fourth can be associated with the dominant and sub-dominant functions in diatonic harmony, while the tritone stands out because of its striking color (Liebman 2013:72). The third category hosts the major and minor sevenths and ninths. By using these intervals, one creates an angular shape in chromatic lines. Liebman argues that, "together with the half step, these intervals are the most characteristic of twentieth century contemporary music" (Liebman 2013:73).

Liebman's advice to practice intervallic construction by applying only one class of intervals moved me to conceive "New York Straight Ahead" (1994). The 12-bar melody of this tune consists of a limited number of notes (basically five notes in the first ten bars with four extra notes mainly in the second voice) using Liebman's first category intervals only: mostly minor and major seconds and minor thirds, and two major thirds. Only because I added a second voice from the end of bar 10, four intervals of augmented fourths occur in the two-voice harmonies. The bass ostinato and the frequent appearance of the note b♭ tend to imply the tonal color of G minor, but by the meandering character due to the many chromatic notes the tune lacks a specific harmonic color. In Liebman's terms it could be called "G-keyish."



[ex 3.2.2.2 "New York Straight Ahead" – theme]
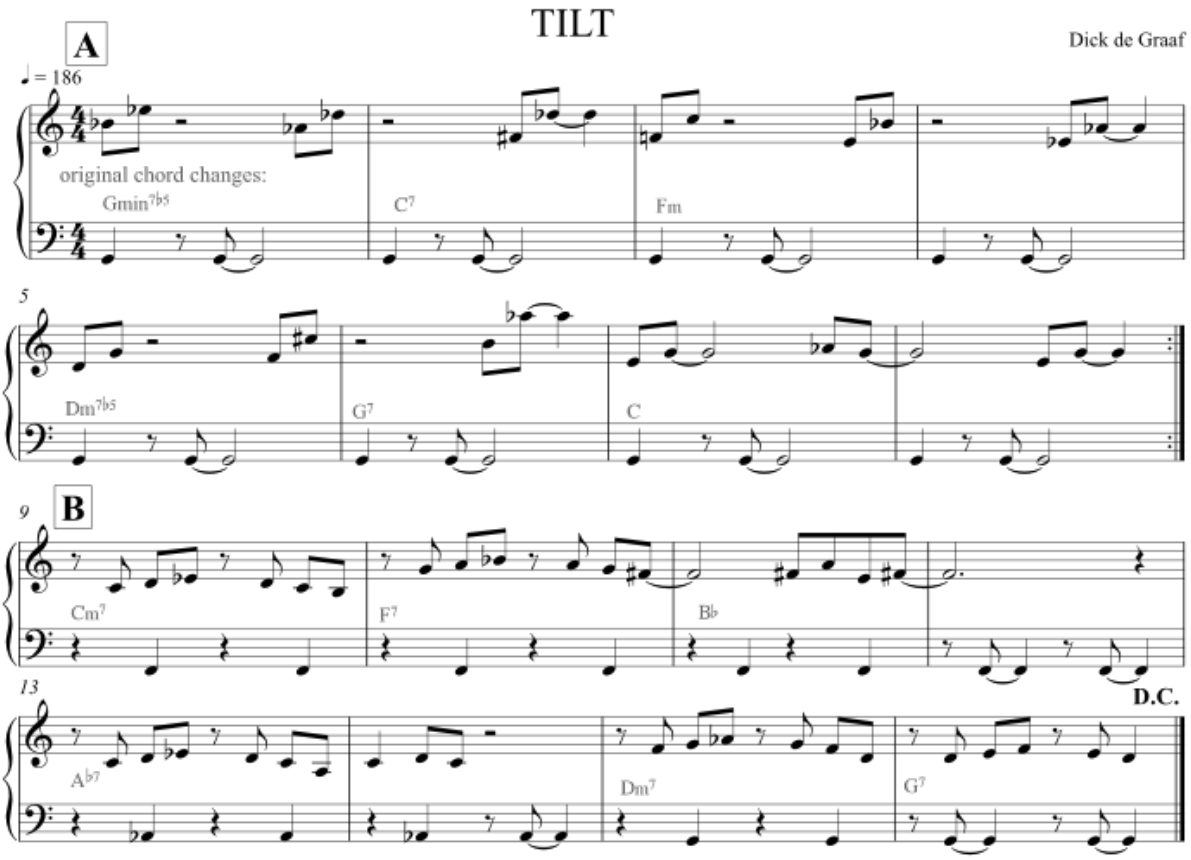
The following example is an illustration of the application of linear tonality in the first line of my improvisation on "New York Straight Ahead". It starts with Ebm7 that suggests the upper structure of a D7 altered chord to resolve to G. But by changing the note d into a $d^{\flat}$ in bar 4, Ebm7 tends to sound as a temporary tonal center on its own. Next, as an example of diatonic lyricism, the notes f and c together with the G-pedal in the rhythm section evoke the sound of Gsus4. The C7 chord in bar 7 can be seen as the next temporary tonal center. It resolves from the three chromatically ascending chords Fsus4, F#/C# and G7 in bars 5-6. On the last eighth note of bar 7, a C octatonic scale starts (with extra notes d and b added) that ends on the first note of bar 9. Bars 9 and 10 contain two similar descending patterns built upon the major thirds of $A7^{\#9}$ and $Eb7^{\#9}$, two dominant seventh chords at a tritone distance. Finally bars 11–12 contain a line over $F\#7^{b9}$, sounding a minor second below the stated G-keyish tonality. Just like C7, F#7 sounds convincingly like an independent temporary tonal center. But, together with the C7, $A7^{\#9}$ and $Eb7^{\#9}$ chords, it can also be considered as the last of four chords whose root notes together would form a diminished tetrachord, and as such would extend the tonal color of C7 octatonic in bar 8.



[ex 3.2.2.3 "New York Straight Ahead" – fragment of tenor saxophone solo]

As to Liebman's techniques of superimpositions, it is evident that most of these result in increasing harmonic tension. Different chords are added to existing ones, chains of chords are superimposed on single chords and scales and modes on given chords are substituted by other types of scales built on the same root. To his stratification of techniques, I would add an intervention that first goes the opposite way, by simplifying an existing harmonic structure, for example by creating a bass ostinato that obscures a number of chords, and by consequently applying Liebman's pedal point superimposition. This operation relates to what Liebman calls the "slack theory" in which emphasizing on one element is compensated by proportionally de-emphasizing others. For instance, in an improvisation on a complicated harmonic progression, an interesting effect can be created by playing a simple melodic line. And vice versa, on a basic rhythmic and harmonic fundament, one can superimpose a complex harmonic and melodic structure.

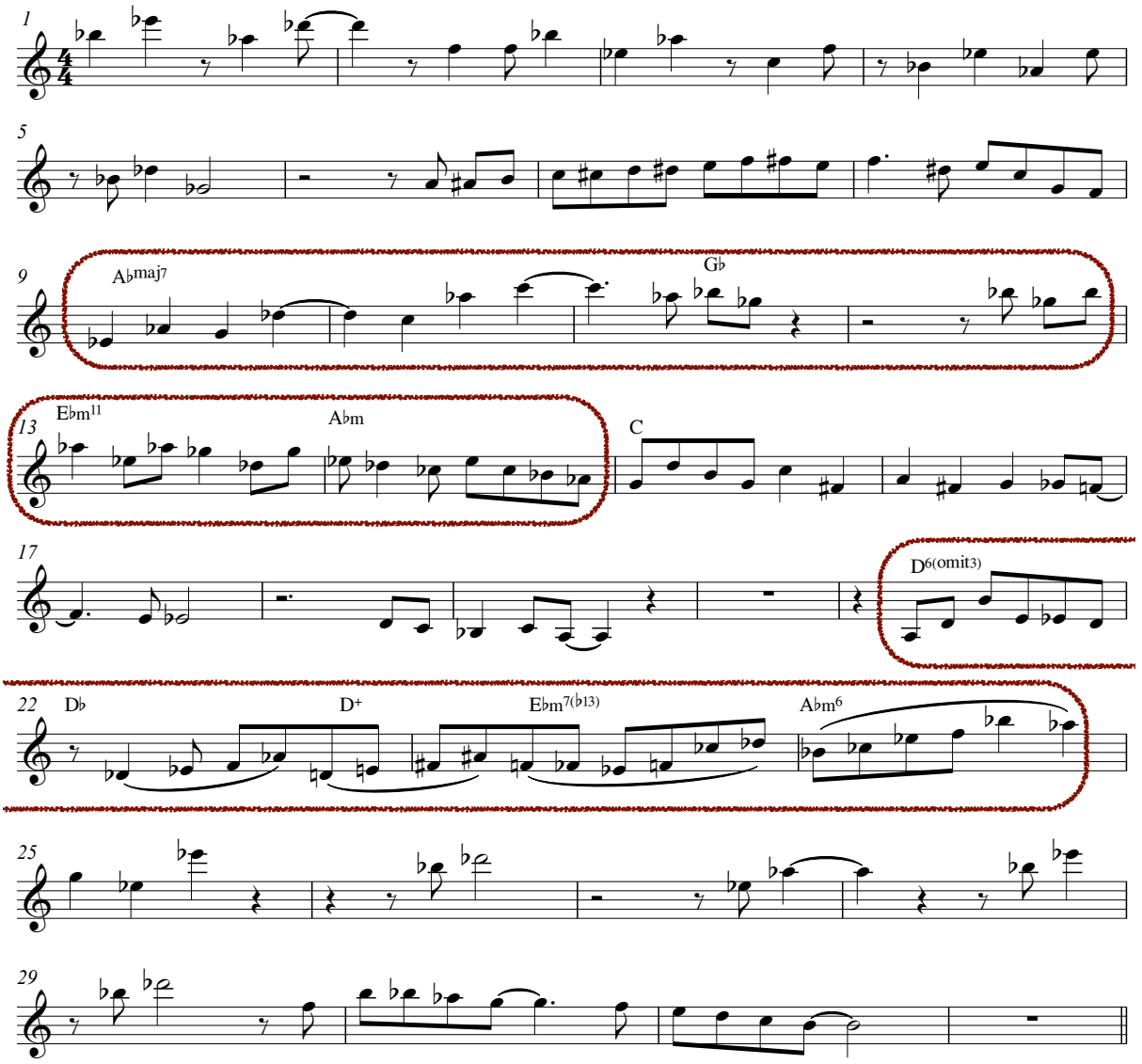
The following example shows this in "Tilt", my contrafact of the jazz standard "What Is This Thing Called Love" on the CD *Sailing* (1995). The original chord changes in the A-section are replaced by a single G pedal point, those in de B-part by three different pedal points, respectively G, Ab and again G.



[ex 3.2.2.4 "Tilt" – theme]
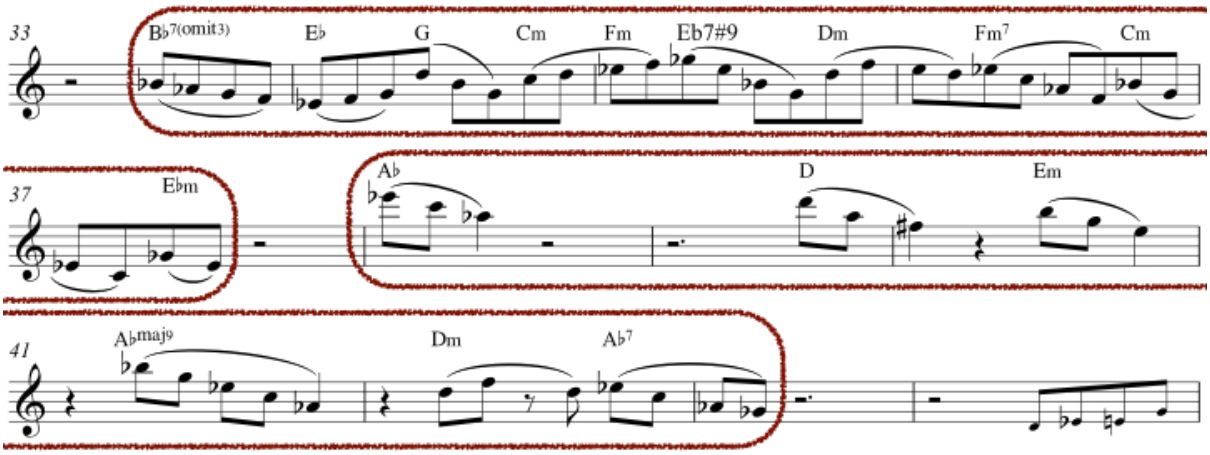
In this recording I wanted to challenge my group to shine a different light on both a well-known jazz standard and on the beaten tracks of our improvisation practices. Before we took off, I asked the rhythm section to strive for a maximum degree of harmonic vagueness, by giving priority to the pedal points and avoiding the original chords as much as possible. As expected, it appeared to be impossible to totally neglect the original changes of the jazz standard that were so upfront in our collective memory. Yet in this act of explicitly trying to avoid the expected harmonic structure of this tune, the chromatic techniques proved their worth to a maximum. The next fragment shows a number of examples in my first three solo choruses.

In bars 9–12 the Abmaj7 chord and the incomplete Gb triad sound like temporary tonal centers, obscuring the original changes Am7b5 - D7b9 – Gm. In bars 13–14 an altered cadence Ebm11 – Abm is played instead of the original Dm7b5 – G7b9 – Cmaj7 chords. The Ab minor chord can be considered the upper structure of the G7 altered chord.
Likewise in bars 21–24, where an alternate cadence blurs the original changes Ebm7 – Ab7 – Dm7 – G7, and the Abm6 chord in bar 24 can be considered the upper structure of G7 altered again.



[ex 3.2.2.5 "Tilt" tenor saxophone solo first fragment: temporary tonal centers and altered cadences]
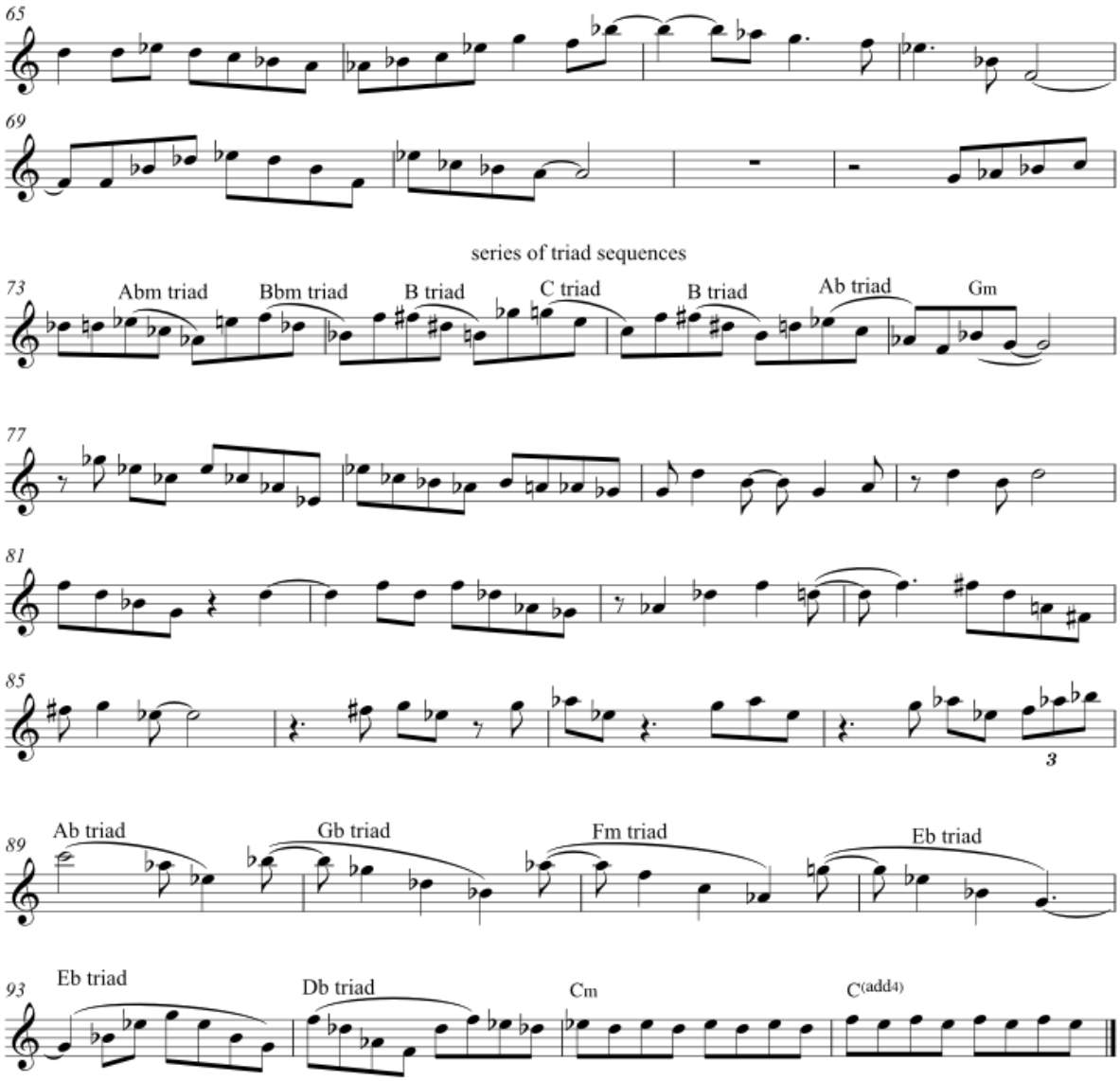
Bars 33–45 can be seen as an example of Liebman's definition of non-tonal chromaticism. By putting the accent on the mere shape and the overall color of the melodic lines as done here, the original chords completely disappear to the background. The uninterrupted succession of quavers in bars 33–37, gives the line a high density. A number of triads and chords are identifiable, but the line as a whole doesn't evoke an obvious tonal center. Bars 38–43 have a more open rhythmic structure and contain three- and four-note sequences. As a result of the Ab major triad in bar 38, the Abmaj9 chord in bar 41 and the Ab7 chord in bars 42–43, a tonal anchor of Ab-keyish is perceived.



[ex 3.2.2.6 "Tilt" tenor saxophone solo second fragment: non-tonal chromatism]

Bars 73–76 contain a series of ascending and descending triad sequences that start on Abm and end on Gm, obscuring the original $Gm7^{b5}$ – $C7^{b9}$ changes. Gm replaces Fm as a temporary tonal center.

Also, the end of this third solo chorus is well endowed with triads. In bars 89–90 the combination of the Ab and Gb triads replaces the Gm^{b5} – $C7^{b9}$ chords. This is a common tonal harmonic superimposition because all notes in these triads belong to the scale of the C7 altered chord that resolves to F minor. Likewise, the Eb and Db triads in bars 92–94 are superimposed on the $Dm7^{b5}$ – $G7^{b9}$ chords. Their notes together belong to the scale of the G7 altered chord that resolves to C minor.



[ex 3.2.2.7 "Tilt" tenor saxophone third fragment: superimposed triads]

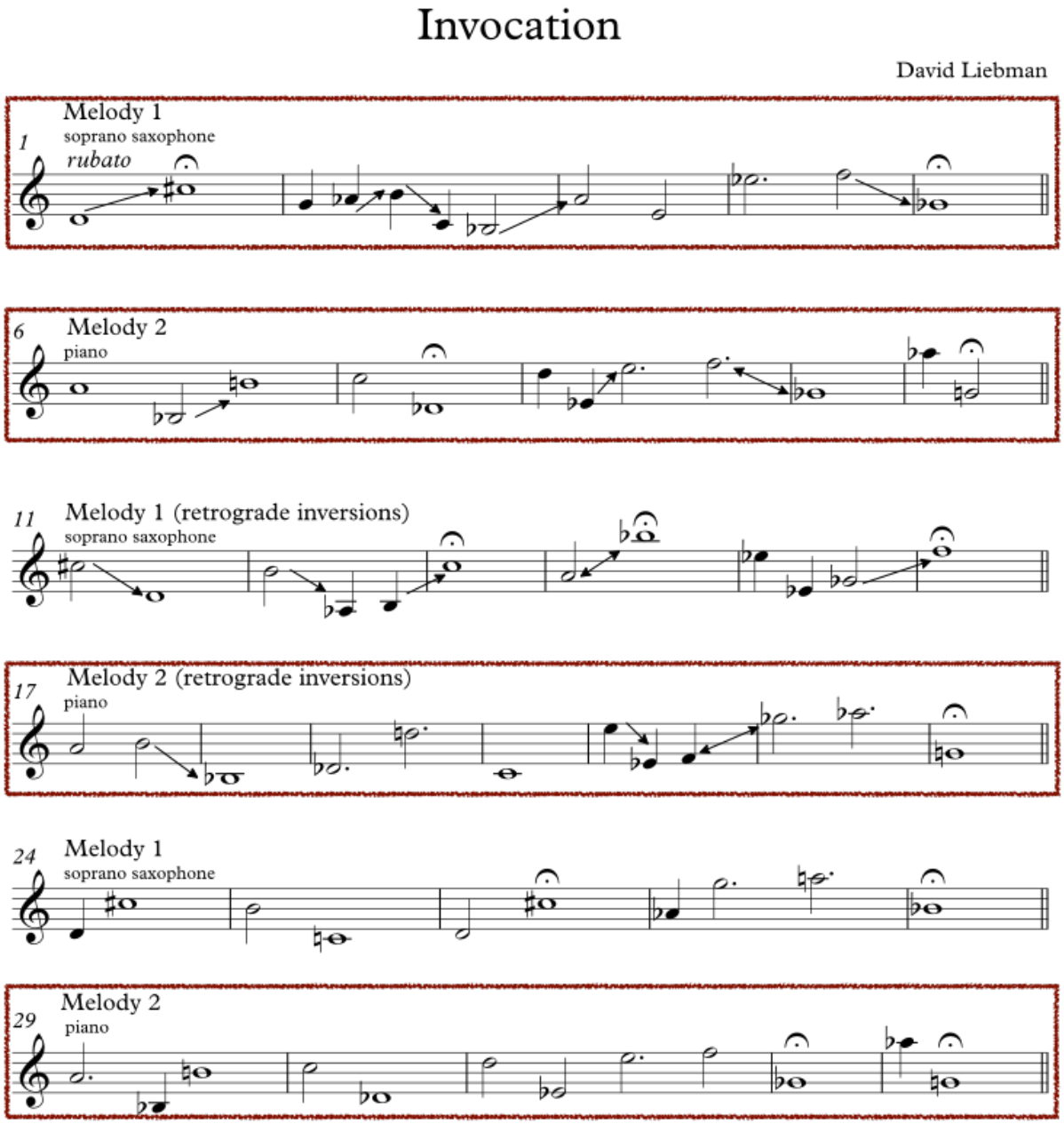
My operations in this solo, meant to play intentionally outside the original chord changes of this tune represent a number of the superimposition techniques that I had developed by trial and error. The analysis confirmed my assumption that according to Liebman's theory I mainly applied tonal, rather than non-tonal superimpositions.

3.2.3 Twelve-tone techniques

Encouraged by my acquaintance with the serial elements of the Tone Clock as discussed in chapter 1 and hereafter in chapter 4, I was attracted by Liebman's assertion that in his concept of non-tonal chromaticism the same principles are observed as in Arnold Schoenberg's concepts of the tone row. Liebman summarizes his interpretation of twelve-

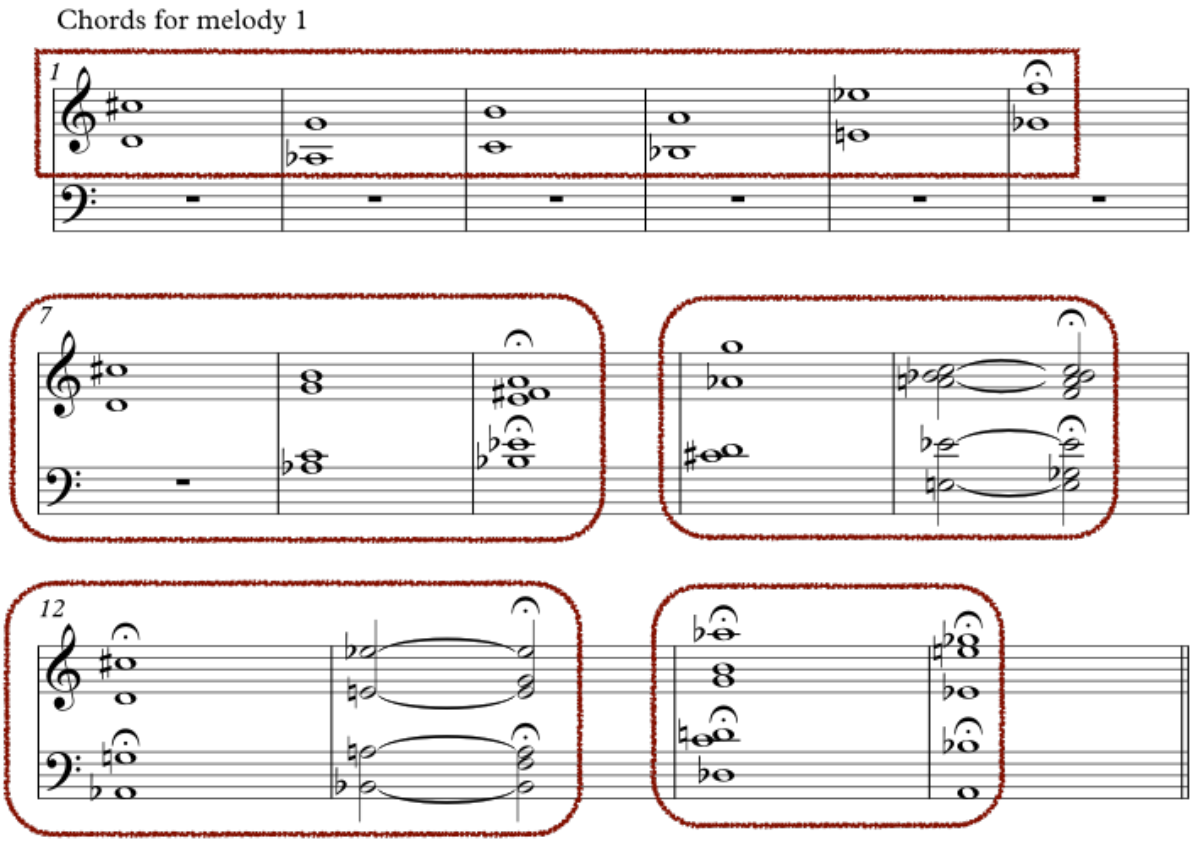
tone techniques as avoiding the harmonic dominance of any of the twelve tones, and the application of certain row variations. In this music, tension and release is effected by density of texture, speed and grouping of ideas, range, dynamics and form, rather than by the cadential resolution to fixed key centers in functional harmony. The row variations (retrograde, inversion and retrograde inversion) and compositional operations such as octave displacement, various serial techniques, and rhythmic permutations are applied to add variety and relative points of tension to the melodic lines (Liebman 2013:34).

The following example shows Liebman's operations with twelve-tone rows on a duo recording with pianist Richie Beirach of "Invocation" (2006). The six lines in the following example are played alternately by the soprano saxophonist (melody 1) and the pianist (melody 2) at the beginning of the first part. In bars 1–5 Liebman plays a twelve-tone row containing five major seventh intervals. In bars 11–16 the arrows mark his retrograde inversions of these intervals. Because in bar 16, he repeats the note e♭ in the lower octave instead of playing it as the note e, the row contains eleven notes instead of twelve. In bars 24–28, constructed with only eight different notes, he plays again five intervals of a major seventh. Beirach keeps more strictly to the twelve-tone rows than Liebman, whose line in bars 6–10 contains four intervals of a major seventh and three intervals of a minor ninth. In bars 17–23 he repeats two of these minor ninth intervals as retrograde inversions. His last line in bars 29–33 is roughly a repetition of the one in bars 6–10.
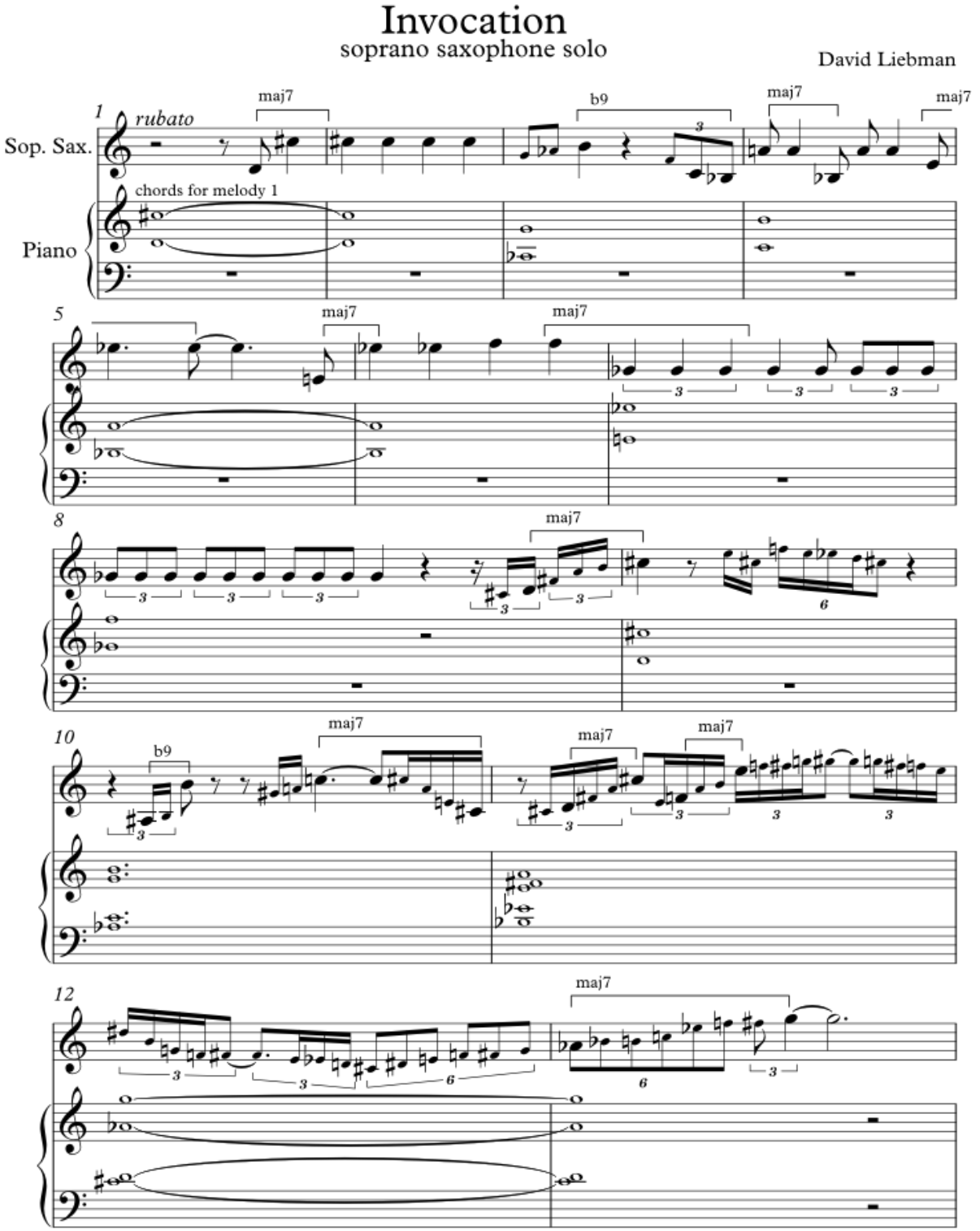


[ex 3.2.3.1 "Invocation" (David Liebman) – melody lines]

The next example shows how Liebman constructed vertical harmonies by stacking and intertwining the characteristic major seventh and minor ninth intervals from the soprano saxophone lines (melody 1). The pitch collection is played five times. Only the first time, in bars 1–6, are all twelve pitches from the row played. Bars 7–9 contain an eleven-tone row (the note f is missing), just as bars 9–10 (the note b is missing), and 14–15 (the note f is missing). Bars 12–13 contain a ten-tone row (the notes b and c are missing).



[ex 3.2.3.2 "Invocation" (David Liebman) – harmonies]

In the next example of a fragment of Liebman's solo it is easy to recognize the intervallic structure of the melody lines, as he plays ten intervals of a major seventh and two intervals of a minor ninth. Because he intends to follow the pianist's "chords for melody 1", he emphasizes the tonal anchors that these harmonies evoke, rather than taking the twelve-tone rows of melody 1 and 2 above into account. Examples of tonal anchors are Dmaj7 (bars 1–2), Abm^{maj7} and Abmaj7$^{\#11}$ (bar 3), Bbmaj7b9/C (bars 3–4), Dmaj7/Bb and Dm^{maj7} (bars 8–9). From bar 8 on, the two intervals are interwoven in diatonic scale patterns (bar 10) and sequences (bar 11) with an increasing dense texture (bar 13).
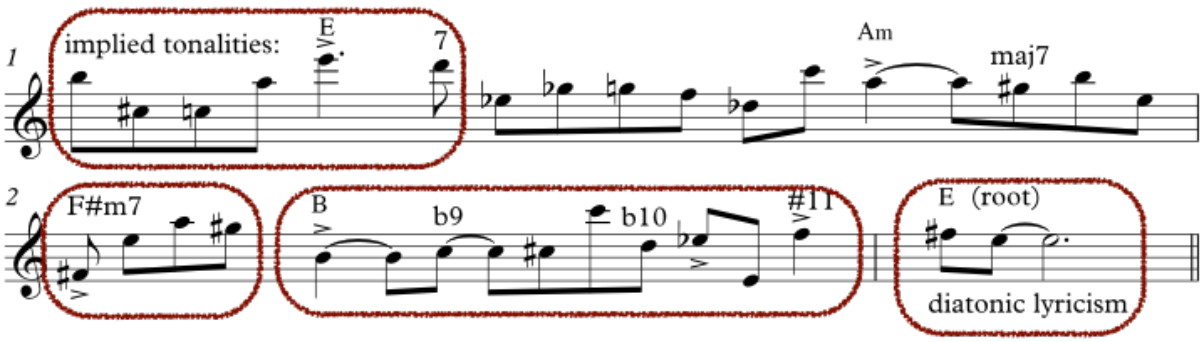


[ex 3.2.3.3 "Invocation" (David Liebman) – soprano saxophone solo fragment]

Twelve-tone techniques also appear in Liebman's line compendium, which consists of 100 randomly presented melodic lines. Liebman advises the reader to apply chromatic line variations to these lines: rhythmic variations, such as diminution, augmentation and

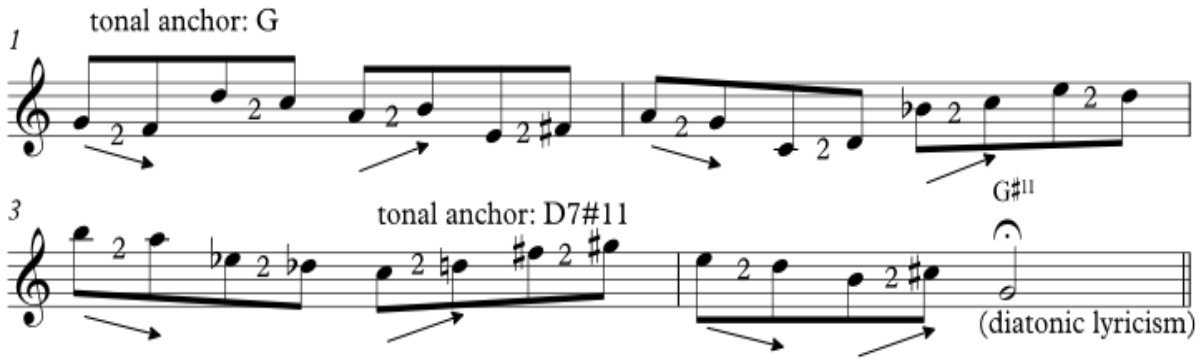
syncopation, and pitch variations, such as sequence change, neighboring tones, octave displacement and transpositions. He also advises to analyze his chromatic lines in order to identify tonal anchors, to apply intervallic analysis and to identify an implied tonality of the line in general.

The next example shows my analysis of one of Liebman's examples to define implied tonalities. As a result of both octave displacement of the notes e and c, and of the augmentation of the notes e and a in bar 1, the keys of E and Am^{maj7} can be identified as temporary tonal centers. Further line analysis reveals the tonal anchors F# and B in bar 2. F#m7 results from accentuating the note $f^{\sharp}$, while B (with tension notes b9, b10, #11) results by both the accent on, and the augmentation of the note b. Because I hear these tension notes evoke the tonal color E, I have added this as the root in the last bar, according to Liebman's observation that "consonance is achieved through diatonic lyricism: the well timed use of a phrase which clearly outlines a tonal center" (Liebman 2013:15).
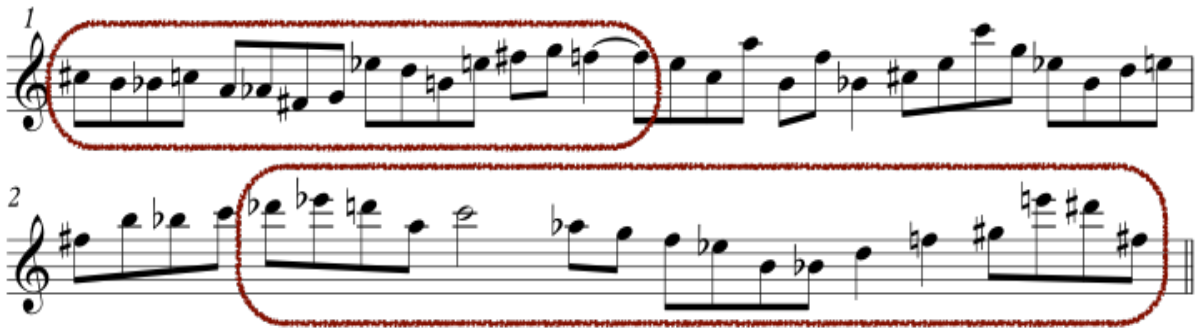


[ex 3.2.3.4 line compendium #29 (Liebman 2013: 194)]

An application of intervallic analysis is shown in the next example. All four-note patterns begin and end with a major second interval. The initial interval of all first patterns of bars 1–3 is put in descending direction; the initial interval of all second patterns in ascending direction. These alternating directions are repeated in the four-note pattern in bar 4. Then, the second pattern of bar 1 has the shape of a retrograde inversion, although the intervals between the mid voices are not similar. The same appears in bar 3, where the second pattern represents only the shape of a retrograde of the first without observing the correct intervals.



[ex 3.2.3.5 – line compendium #31 (Liebman 2013: 194)]

Line analysis of the next example reveals a quite strict twelve-tone application. Analysis of this line reveals three phrases. The first and the third contain twelve-tone rows, the first with three and the third with two pitches repeated. The second phrase contains eleven notes, with six repetitions. Because the overall phrasing of the line, just as in the example above, is mainly done in eighth notes, it suggests a dense texture. Or, in Liebman's terms (and depending on what tempo the line is played) it features a fast grouping of ideas. It doesn't contain any apparent implied tonalities, although the last four notes to my ears sounds like F#7 pulling to Bmaj.



[ex 3.2.3.6 – line compendium #12 (Liebman 2013:192)]

3.2.4 Evaluation

At the time of finding the first edition of Liebman's book in 1991, I had already applied a number of his techniques intuitively. Since then his terminology such as "tritone", "alternate ii-V", "scale quality", "modal", and "pedal point" and the step-by-step stratification of terms and practices served as a useful theoretical framework to articulate my endeavors of extending my playing beyond conventional linear improvisation.

Liebman's applications of twelve-tone operations are obvious in the examples above, but his interpretation of the twelve-tone theory in section 3.2.3 is quite global. By only

mentioning the name Schoenberg he does not define his own position to the current state of affairs in twelve-tone music. In the following paragraphs, I will summarize composer and theorist Charles Wuorinen's discussion of the theory and development of twelve-tone music (Wuorinen 1994) to clarify its relations with the applications by Liebman and the other authors to be discussed in the remainder of this study.

Wuorinen's publication *Simple Composition* (1994) provides a basic outline of the twelve-tone system of composition accompanied by assignments for composition students. The author defines the difference between the tonal and the twelve-tone systems as "the tonal system is based upon interval *content*, the twelve-tone system upon interval *order*" *(*Wuorinen 1994:5). In tonal music, the content of pitches and intervals can be identified by their positions in the diatonic scale and its implied triads and tetrachords. This content is fixed, and independent of where the notes appear in the melody, or in the chord. In twelve-tone music, all twelve pitches of the chromatic scale are equally important, in other words: there are no notes dominating the others. The twelve pitches are arranged in a row in which the fundamental structure principle is determined by the order of the pitches and their connecting intervals.

As to the state of affairs of twelve-tone music, at the time of publication 75 years after its introduction by Schoenberg, Wuorinen expresses observations that are important in the context of this study. He states that, now twelve-ness and the non-repetition of pitches before all twelve have been exposed is no longer compulsory, the principle of ordered interval succession is the main organizing factor of twelve-tone music. He considers the ongoing merging of content-based principles of pitch organization with the basically order-determined music as a next step "to demonstrate our assertion that the tonal and twelve-tone systems are not really separate musical entities" (Wuorinen 1994:9).

Now, if Liebman's chromatic concept of non-tonal superimposition can be considered as an example of Wuorinen's "highly chromatic music of the present day" resulting from this "reconciliation of the two principles of pitch organization, content and order (Wuorinen 1994:9)", his treatise can be regarded a stratification of operations that demonstrate this process within jazz music. Wuorinen's concept of reconciliation also sheds light on Liebman's observation quoted in subchapter 3.2.1 that non-tonal improvisation is a very relative term because any configuration of notes can be identified by root oriented chord symbols. This relativeness results from the combination of the vertically stacking of horizontally ordered pitches, and the orientation on a root note in a principally keyless

situation. These mixed operations again witness the merging of tonal and twelve-tone techniques.

Today's almost intuitively blending of (elements from) tonal and twelve-tone techniques explains the paradox throughout Liebman's book between his definition of non-tonal chromaticism referring to "melodic lines and harmonies that have no discernable key or root orientation [and can be considered to result from] linear counterpoint" (Liebman 2013: 34) and his positioning of chromaticism in "specifically […] a situation in which there is an intentional relationship between melody and harmony. [Because] for jazz, it is the harmonic accompaniment which frames the melody" (Liebman 2013:13).

Although the way Liebman designs and analyzes his complex chords and related scales is clear and useful, the complexity and quantity of his suggested twelve-tone operations might hinder the spontaneous creative process on stage. Simpler applications of twelve-tone techniques would be more attractive to help improvisers "inventing melodies which are fresh, alive and full of meaningful emotional and thoughtful content" (Liebman 2013: 13). As a demonstration of these simpler applications I will come back to "Invocation" in subchapter 4.6, discussing trichord analysis as a potential alternative to Liebman's derivation of scales from the complex chords in the fourth part of this composition.

One last comment on Liebman's line compendium. His adding of instructions and examples of line analysis and line variations, are an improvement compared to earlier editions of his book. As a kind of thesaurus, it may indeed inspire the interested reader to adapt (fragments of) these examples to his personal needs and taste. However, by the absence of musical context it still misses the instructional quality to help the improviser creating melodic lines alike. An example of the combination of a compendium with an explicit model to generate melodic lines beyond functional harmony, as an alternative to a mere thesaurus, will be discussed in the next subchapter.

3.3 Jerry Bergonzi (2000). *Thesaurus of Intervallic Melodies.* Rottenburg: Advance Music.

3.3.1 Theory

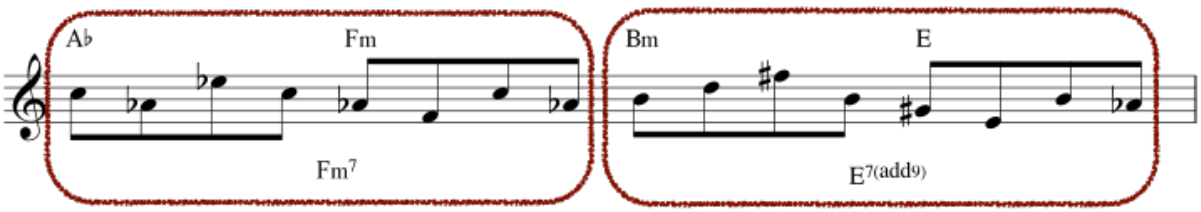
In this publication Bergonzi discusses a model to create melodic lines that are purely intervallic. The major part of it consists of a thesaurus of 1704 intervallic melodies that result from his applications of this model. (In fact, the collection contains 852 melodies, because from 853 on, the first 852 are repeated, transposed up a minor second and put in retrograde). Like Liebman, Bergonzi provides the reader with instructions to apply rhythmic and melodic variations to the lines in his thesaurus. However, the intervallic melodies in his book are presented consistently in four-note groupings of eighth notes, without any rhythmic variations.

With a limited amount of possible operations Bergonzi's system should be able to generate an infinite amount of "original lines and melodies." By calling his examples "some interval combinations" he wants to express that his selections are subjective, or in his words "motivated by intuition and based on the ear". Bergonzi's book requires the reader to use his intuition "while at the same time it helps to develop that faculty" (Bergonzi 2000: 7).

With these quotes, Bergonzi seems to express a somewhat outdated idea about intuition per se. In addition to his somewhat cryptic notions regarding the relationship between knowledge and intuition in the praxes of (composing) improvisers, I would rather use the term "informed intuition". Just like processing knowledge seems impossible without a certain degree of intuition, acting on intuition depends on a body of conscious or unconscious knowledge. I will use the term "informed intuition" to address the type of intuition allowing (composing) improvisers to (instantly) generate musical content in response to a variety of musical situations, depending on their knowledge acquired by formal education, professional experience, and taste.

Bergonzi considers his model as a way to get outside the chord changes of a tune. His basic aim is not to imply any tonal references. Just as Liebman, he argues that the shape and sound of the melodic lines are the intended purpose and that it is up to the reader to decide to either ignore or opt for tonal references. However, he admits that for skilled composers and improvisers, tonal references should be obvious. For instance, in the next example he combines the intervals of a minor third, a major third and a perfect fifth. This

melodic line can be analyzed as four groups of four notes, with the implied Abmaj, Fm, Bm and Emaj triads, or in two groups of eight notes with the implied Fm7 and E7 chords.



[ex 3.3.1.1 – implied tonalities (Bergonzi 2000:66)]

3.3.2 Practical applications

Before I discuss my experiences with Bergonzi's model, I will explain shortly how it works. As I have already mentioned, Bergonzi's choices of interval combinations are intuitive and based on concentrated listening. The sizes of these intervals range between a minor second and a major sixth. Major and perfect intervals are marked with numbers 2 (major second) until 6 (major sixth). Minor or diminished intervals are marked with a minus sign: -2 (minor second) until -6 (minor sixth). Augmented intervals are not identified. The following example shows Bergonzi's collection of "some three-interval combinations".

-2	2	-3
-2	3	5
-2	4	-5
-2	2	5
2	4	5
-2	3	6
2	3	-5
2	3	5
-3	3	-6
-3	3	5
-2	-5	5
-2	2	3
-2	2	4
2	-3	3
-3	3	4

[ex 3.3.2.1 – some three-interval combinations (Bergonzi 2000: 56)]

Next to the choice of the interval combinations, the essential parameters are the permutations (the order in which the intervals appear) and the note directions (either ascending or descending) of the chosen intervals. These tools to manipulate the interval

combinations are listed in two separate tables. The note directions are marked in Arabic numerals, the intervallic permutations are marked in capitals.

According to the numbers of intervals used, the thesaurus contains three types of melodies. In order of appearance, the first is constructed with four intervals, the second with three and the third with five. For each type Bergonzi has constructed separate tables. For all three types, the numbers of possible note directions and permutations are different.

As the next examples illustrate, four-interval melodies can take sixteen different note directions

16 Note Directions

A	↑	↑	↑	↑	I	↓	↓	↓	↓
B	↑	↑	↑	↓	J	↓	↓	↓	↑
C	↑	↑	↓	↓	K	↓	↓	↑	↑
D	↑	↓	↓	↓	L	↓	↑	↑	↑
E	↑	↓	↑	↓	M	↓	↑	↓	↑
F	↑	↑	↓	↑	N	↓	↓	↑	↓
G	↑	↓	↓	↑	O	↓	↑	↑	↓
H	↑	↓	↑	↑	P	↓	↑	↓	↓

[ex 3.3.2.2 – table of note directions of four-interval melodies (Bergonzi 2000: 11)]

and twenty-four permutations.

24 Permutations

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

[ex 3.3.2.3 – table of permutations of four-interval melodies (Bergonzi 2000:11)]

Five-interval melodies can take thirty-two note directions

32 Note Directions											
A	↑	↑	↑	↑	↑	Q	↓	↓	↓	↓	↓
B	↑	↑	↑	↑	↓	R	↓	↓	↓	↓	↑
C	↑	↑	↑	↓	↓	S	↓	↓	↓	↑	↑
D	↑	↑	↓	↓	↓	T	↓	↓	↑	↑	↑
E	↑	↑	↓	↑	↓	U	↓	↓	↑	↓	↑
F	↑	↑	↑	↓	↑	V	↓	↓	↓	↑	↓
G	↑	↑	↓	↓	↑	W	↓	↓	↑	↑	↓
H	↑	↑	↓	↑	↑	X	↓	↓	↑	↓	↓
I	↑	↓	↓	↓	↑	Y	↓	↑	↑	↑	↑
J	↑	↓	↓	↓	↑	Z	↓	↑	↑	↑	↓
K	↑	↓	↓	↑	↑	AA	↓	↑	↑	↓	↓
L	↑	↓	↑	↑	↑	BB	↓	↑	↓	↓	↓
M	↑	↓	↑	↓	↑	CC	↓	↑	↓	↑	↓
N	↑	↓	↓	↑	↓	DD	↓	↑	↑	↓	↑
O	↑	↓	↑	↑	↓	EE	↓	↑	↓	↓	↑
P	↑	↓	↑	↓	↓	FF	↓	↑	↓	↑	↑

[ex 3.3.2.4 – table of note directions of five-interval melodies (Bergonzi 2000:73)]

and one hundred twenty permutations.

120 Permutations

1	A	B	C	D	E	25	B	C	D	E	A	49	C	D	E	A	B	73	D	E	A	B	C	97	E	A	B	C	D
2	A	B	C	E	D	26	B	C	D	A	E	50	C	D	E	B	A	74	D	E	A	C	B	98	E	A	B	D	C
3	A	B	D	C	E	27	B	C	E	A	D	51	C	D	A	B	E	75	D	E	B	C	A	99	E	A	C	D	B
4	A	B	D	E	C	28	B	C	E	D	A	52	C	D	A	E	B	76	D	E	B	A	C	100	E	A	C	B	D
5	A	B	E	C	D	29	B	C	A	D	E	53	C	D	B	A	E	77	D	E	C	A	B	101	E	A	D	B	C
6	A	B	E	D	C	30	B	C	A	E	D	54	C	D	B	E	A	78	D	E	C	B	A	102	E	A	D	C	B
7	A	C	D	B	E	31	B	D	E	A	C	55	C	E	A	B	D	79	D	A	B	C	E	103	E	B	C	D	A
8	A	C	B	E	D	32	B	D	E	C	A	56	C	E	A	D	B	80	D	A	B	E	C	104	E	B	C	A	D
9	A	C	D	B	E	33	B	D	A	C	E	57	C	E	B	D	A	81	D	A	C	E	B	105	E	B	D	A	C
10	A	C	D	E	B	34	B	D	A	E	C	58	C	E	B	A	D	82	D	A	C	B	E	106	E	B	D	C	A
11	A	C	E	B	D	35	B	D	C	A	E	59	C	E	D	A	B	83	D	A	E	B	C	197	E	B	A	C	D
12	A	C	E	D	B	36	B	D	C	E	A	60	C	E	D	B	A	84	D	A	E	C	B	108	E	B	A	D	C
13	A	D	C	B	E	37	B	E	A	C	D	61	C	A	B	D	E	85	D	B	C	E	A	109	E	C	D	A	B
14	A	D	B	E	C	38	B	E	A	D	C	62	C	A	B	E	D	86	D	B	C	A	E	110	E	C	D	B	A
15	A	D	C	B	E	39	B	E	C	A	D	63	C	A	D	E	B	87	D	B	E	A	C	111	E	C	A	B	D
16	A	D	C	E	B	40	B	E	C	D	A	64	C	A	D	B	E	88	D	B	E	C	A	112	E	C	A	D	B
17	A	D	E	B	C	41	B	E	D	A	C	65	C	A	E	B	D	89	D	B	A	C	E	113	E	C	B	D	A
18	A	D	E	C	B	42	B	E	D	C	A	66	C	A	E	D	B	90	D	B	A	E	C	114	E	C	B	A	D
19	A	E	B	C	D	43	B	A	C	D	E	67	C	B	D	E	A	91	D	C	E	A	B	115	E	D	A	B	C
20	A	E	B	D	C	44	B	A	C	E	D	68	C	B	D	A	E	92	D	C	E	B	A	116	E	D	A	C	B
21	A	E	C	B	D	45	B	A	D	C	E	69	C	B	E	A	D	93	D	C	A	B	E	117	E	D	B	C	A
22	A	E	C	D	B	46	B	A	D	E	C	70	C	B	E	D	A	94	D	C	A	E	B	118	E	D	B	A	C
23	A	E	D	B	C	47	B	A	E	C	D	71	C	B	A	D	E	95	D	C	B	E	A	119	E	D	C	A	B
24	A	E	D	C	B	48	B	A	E	D	C	72	C	B	A	E	D	96	D	C	B	A	E	120	E	D	C	B	A

[ex 3.3.2.5 – table of permutations of five-interval melodies (Bergonzi 2000:74)]

Three-interval melodies can take eight different note directions

8 Note Directions

A	↑	↑	↑	E	↓	↓	↓
B	↑	↑	↓	F	↓	↓	↑
C	↑	↓	↓	G	↓	↑	↑
D	↑	↓	↑	H	↓	↑	↓

[ex 3.3.2.6 – table of note directions of three-interval melodies (Bergonzi 2000:55)]

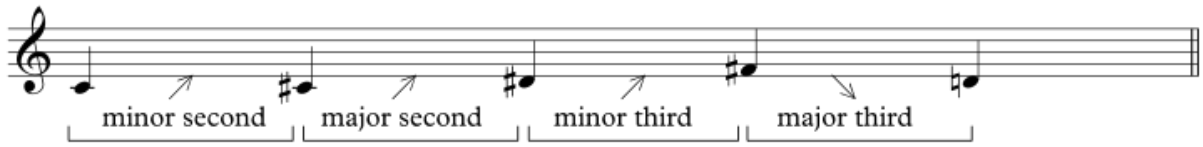
and twenty-seven permutations. Six of these are true permutations starting with ABC and ending with CBA while the other twenty-one contain repetitions of one of the intervals by which they have in fact been changed into a two-interval combination.

27 Permutations

1	A	B	C	10	B	C	A	19	C	A	B
2	A	C	B	11	B	A	C	20	C	B	A
3	A	A	B	12	B	B	A	21	C	C	A
4	A	A	C	13	B	B	C	22	C	C	B
5	A	B	A	14	B	A	B	23	C	A	C
6	A	C	A	15	B	C	B	24	C	B	C
7	A	A	A	16	B	B	B	25	C	C	C
8	A	B	B	17	B	A	A	26	C	A	A
9	A	C	C	18	B	C	C	27	C	B	B
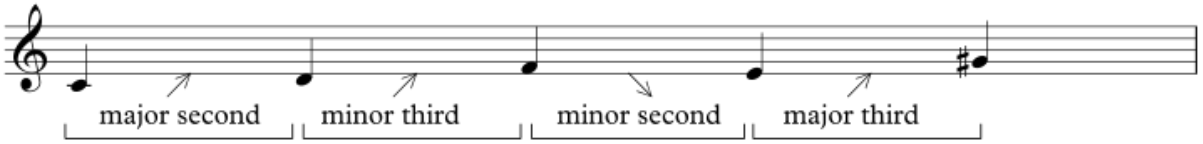
[ex 3.3.2.7 – table of permutations of three-interval melodies (Bergonzi 2000:55)]

The following example shows the manipulation of a four-interval combination with a minor second, a major second, a minor third and a major third, written /-2 /2/-3/ 3/ and manipulated by B1. With starting note c, Note Direction B (the first three intervals ascending and the fourth descending) and intervallic permutation 1 (in the order ABCD), the following four-interval melody occurs.



[ex 3.3.2.8 – four-interval melody /-2 /2/ -3/ 3/]

In another example, the manipulation called F11, with note direction F (two intervals ascending, the third descending and the fourth again ascending) and intervallic permutation 11 (BCAD) would result in the following four-interval combination.
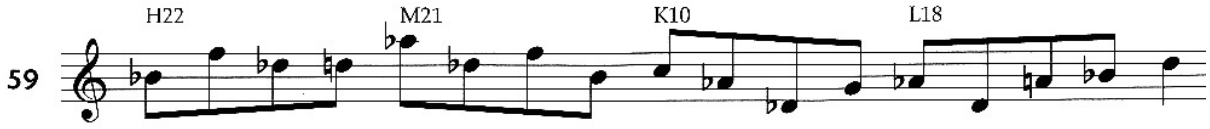


[ex 3.3.2.9 – alternative four-interval combination /-2 /2/ -3/ 3/]
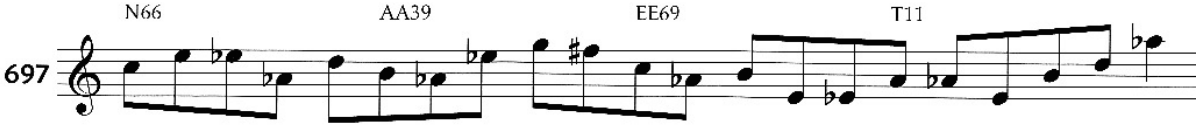
Bergonzi convincingly proposes educational applications of his model such as ear training and rhythmic development. However, in the context of this study I am primarily interested in the generative application of his model for the composing improviser. Analysis of the thesaurus reveals three types of intervallic melodies.

In the first type, all interval combinations are different. This results in capricious melodic lines that tend to serve the composer's use. For the improviser, they are quite complicated and therefore hard to memorize and to quickly transpose, especially when

there is no obvious tonal center implied. See for instance the next two examples. Because the first example evokes Bb as a tonal anchor it might linger in the ear more easily than the second one, which sounds purely intervallic. Therefore, for improvisers the first line would be easier to remember and manipulate than the second.
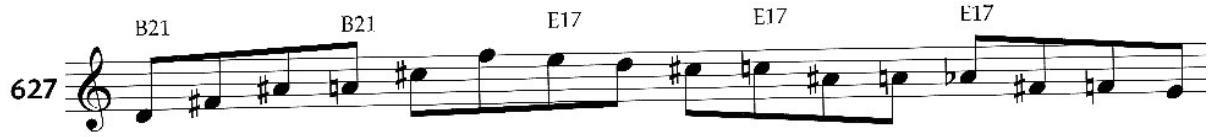


[ex 3.3.2.10 – Bb as a tonal anchor (Bergonzi 2000:17)]
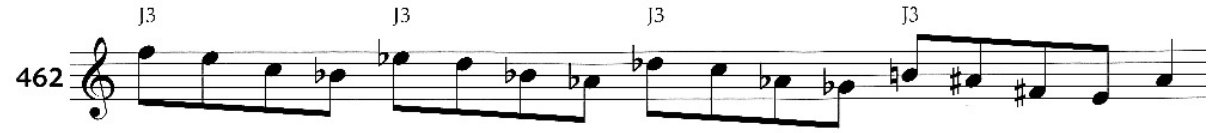


[ex 3.3.2.11 – sounds purely intervallic (Bergonzi 2000:78)]

In the second type of intervallic melodies, two or more interval combinations have the same structure. Hereby these "semi-sequential lines" sound more methodical than those of the first type. This makes them more predictable and therefore probably less interesting for composers unless they are for instance looking for accompanying riffs as vehicles for improvisations. However, for improvisers this type of line is easier to memorize and to quickly transpose.



[ex 3.3.2.12 – a semi sequential line (Bergonzi 2000:68)]

In the third type of intervallic melodies, all interval combinations have the same structure. The resulting "full-sequential lines" sound extremely methodical and predictable by which they are easy to manipulate by the improviser.
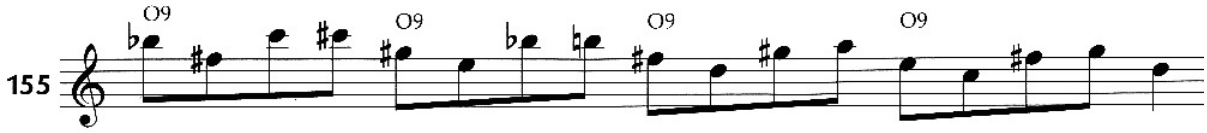


[ex 3.3.2.13 – a full sequential line (Bergonzi 2000:51)]

Memorizing a line is made even easier by full-sequential lines in which the first notes of the four-note patterns are connected by similar intervals of major seconds (such as in the example above: f, e♭, d♭, and b), minor thirds, major thirds or perfect fourths.
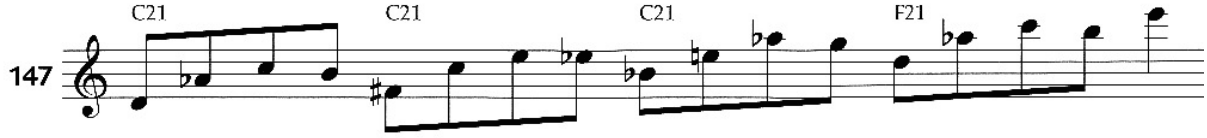
These connecting intervals can also help to facilitate the sounding of implied tonal colors such as in the next example. The four-interval combination A/-2, B/3, C/4 and D/-5, a

minor second, a major third, a perfect fourth and a diminished fifth, with the directions O (first interval descending, second and third ascending and the fourth descending) and permutation BDAC, results in the interval melody below. As a result of the major second intervals between the initial notes of the four-note patterns, in combination with their similar internal structure with three notes from the same whole-tone-scale, this line creates the sound of the D whole-tone scale.
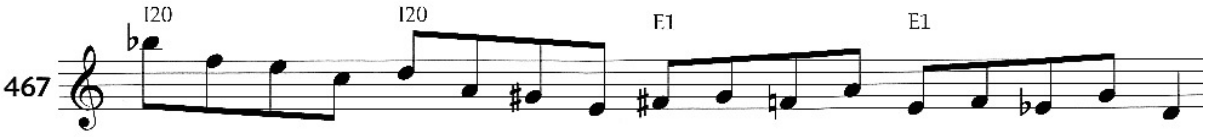


[ex 3.3.2.14 – whole tone scale as implied tonal color (Bergonzi 2000:25)]

In the following example, with the note b$^{\flat}$ enharmonically altered to a$^{\sharp}$, the intervals between the initial notes of the four-note groupings are major thirds. In combination with their internal structures, containing a flatted five and a major third this helps to evoke the tonal color of a D augmented triad.



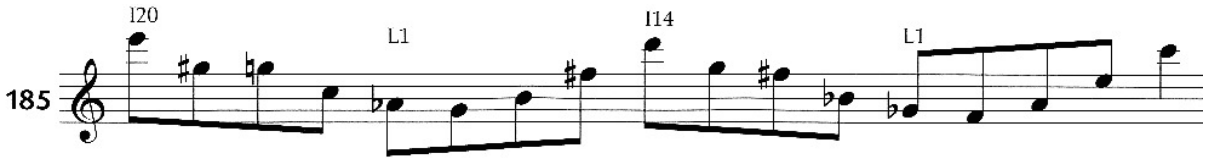
[ex 3.3.2.15 – D augmented triad implied (Bergonzi 2000:25)]

Although it is not Bergonzi's basic aim, some of his groupings of four-note patterns irresistibly evoke tonal references. For instance, by combining A/-2, B/2, C/3 and D/4 the following line could refer to a D pedal point,
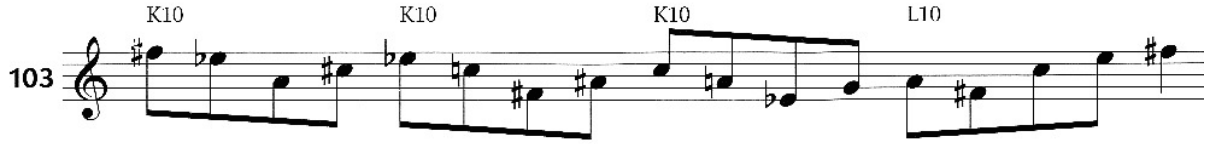


[ex 3.3.2.16 – D pedal point implied (Bergonzi 2000:51)]

while in the Interval Melody A/-2, B/3, C/5 and D/-6 the line could target a C pedal point.



[ex 3.3.2.17 – C pedal point as a target (Bergonzi 2000:28)]
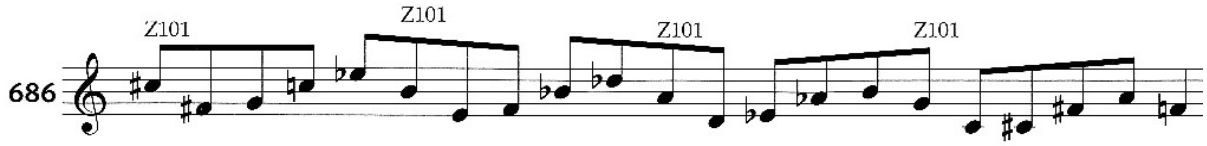
The next semi-sequential intervallic melody demonstrates an interesting quality of Bergonzi's system. Using A/2, B/-3, C/3 and D/-5, interval directions K and L, and permutation 10 (B D C A), the result is an intervallic sequence that clearly refers to the sound of F#7$^{13/b9}$, as a line variation of the F# octatonic scale. Thus, an original improvisational pattern that might not intuitively pop-up easily, is created to serve as an original addition to the jazz improviser's vast collection of "familiar licks" to embellish the octatonic scale.



[ex 3.3.2.18 – refers to a F# octatonic jazz pattern (Bergonzi 2000:21)]
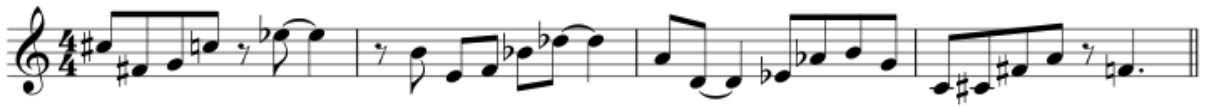
Just like his three- and four-interval melodies Bergonzi continues phrasing his five-Interval Melodies in four-note groupings instead of ordering them more logically in four groups of five notes in a 5/4 or 5/8 meter. The rhythmic displacement that results makes it harder to distinguish the individual patterns and to identify the melodic line as a whole. Is this the reason why Bergonzi seems to prefer sequential melodies above type-1 and type-2 lines? Of the 180 examples with five-Interval Combinations no less than 135 examples are full-sequential type-3 lines.

The following example is an illustration of such a line. By transposing the five-note patterns down by major seconds, a feeling of resolving to the tonal color of Fmaj is suggested.
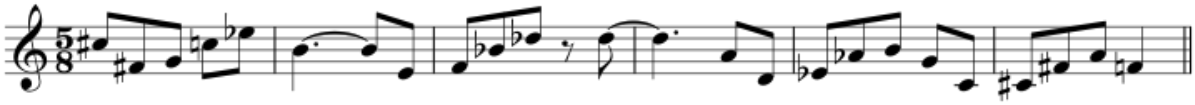


[ex 3.3.2.19 – pull to F (Bergonzi 2000:76)]

The next examples are rhythmic variations I added to the five-interval patterns in the example above, without changing their order of appearance. I applied two ways of re-arranging this interval melody as a means to clarify the obscured five-interval patterns. In the first example each 4/4 bar hosts one five-interval pattern.



[ex 3.3.2.20 – five-interval patterns in 4/4 bars]
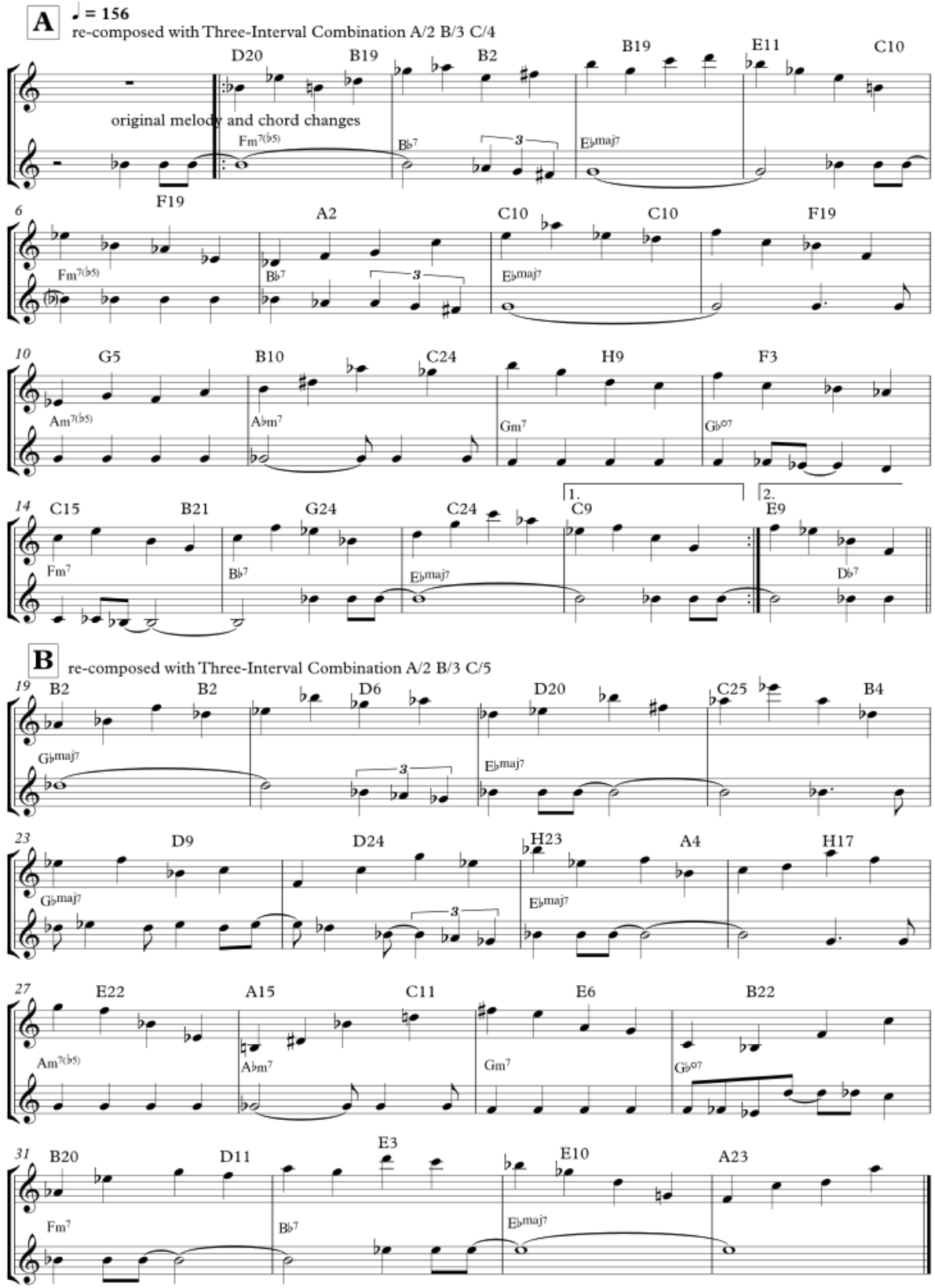
In the second example the same 5-interval patterns are re-arranged in six 5/8 bars.



[ex 3.3.2.21 – the same melodic line re-arranged in 5/8 meter]
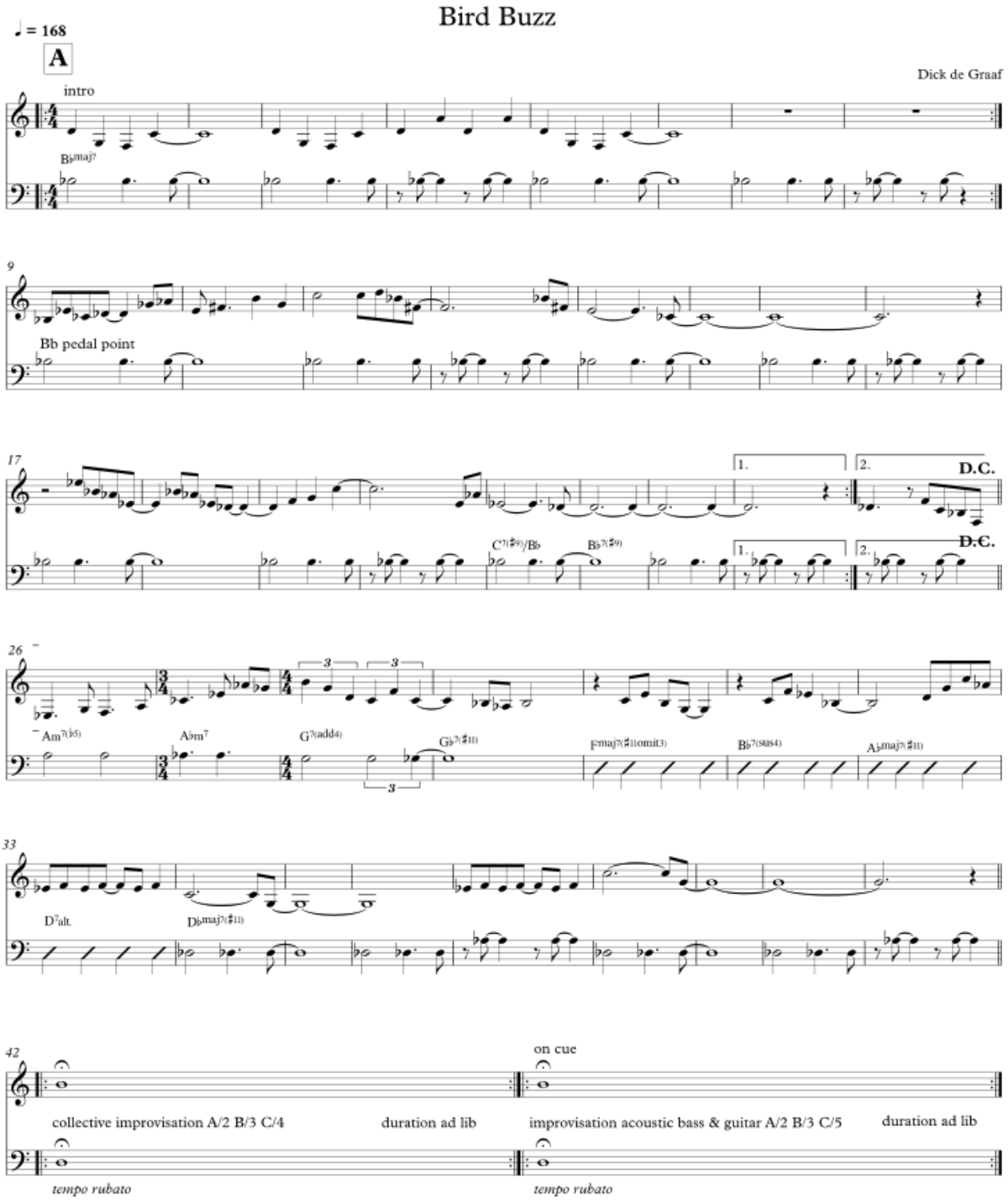
For a personal application of Bergonzi's model, I was inspired by his ear training instruction on how to sing intervallic melodies over major triads and other chord types. I transmitted this suggested application of his model to the construction of a contrafact of the jazz standard "Night And Day".

First I took the three-interval combination A/2 B/3 C/4 to create a melody in quarter notes on top of the chords of the A1 and A2 sections of the tune, and the three-interval combination A/2 B/3 C/5 to do the same on the B and A3 sections. I limited myself to these three-interval combinations because of the option, in Bergonzi's table of permutations, to apply similar intervals repeatedly. I assumed that this would facilitate spontaneity in the improvisations. My choice of size of the intervals was based on intuition, as were my decisions about the directions and the permutations of the interval combinations, although I tried to avoid obvious clashes with the original chords. Only after I had finished this first part of my re-composition did I use Bergonzi's tables of Note Directions and Intervallic Permutations to identify the Interval Melodies.
The next example shows the result of this first intervention. The new melody in quarter notes is written in the upper staff, the original melody and chords in the lower.
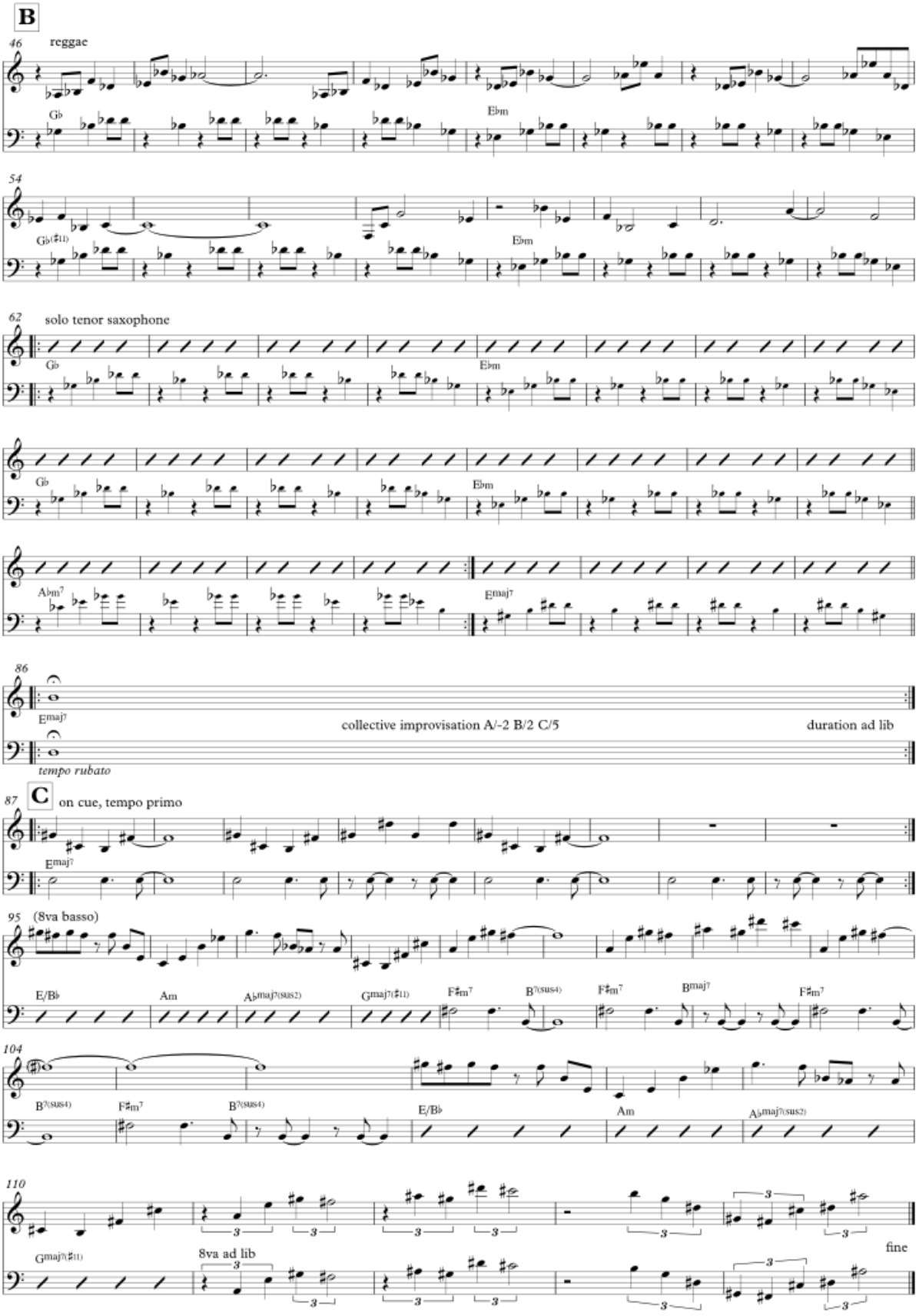


[ex 3.3.2.22 – "Night And Day" re-composed with Three-Interval Combinations]

My next step was to obscure the existing chords changes and to intuitively apply rhythmic variations and form interventions. Finally, I put back what to my ears remained the most characteristic chord changes (the four chromatically descending chords in bars 26–29) and adapted them to the new melodic and rhythmic structures. The result was my composition "Bird Buzz" (2015) as shown in the next examples. The tune is played in a rhythmic feeling of straight eights, with the drummer copying the rhythm of the bass ostinato. In bars 26–41 the harmonic movement refers to the original *Night And Day* but both changes and form here are thoroughly modified. At bar 42 the rhythm is interrupted and a collective solo in free rhythm is started, with all four musicians improvising. On cue at bar 43 the tenor sax and drums lay out and the guitar and bass continue their improvisations. At the end of this, the drummer leaps in and plays a cue to section B.



[ex 3.3.2.23 "Bird Buzz" – section A]

Section B is played in a reggae rhythm, with the saxophone improvising inside the modified chord changes of the B-section of "Night And Day". Also, this section turns into a collective and free form improvisation, again in a rubato rhythm, at bar 86. At the end of this the drummer plays a cue to section C in bar 87. This section is a transposed reprise of the theme in section A and played in the same tempo and rhythmic feeling.
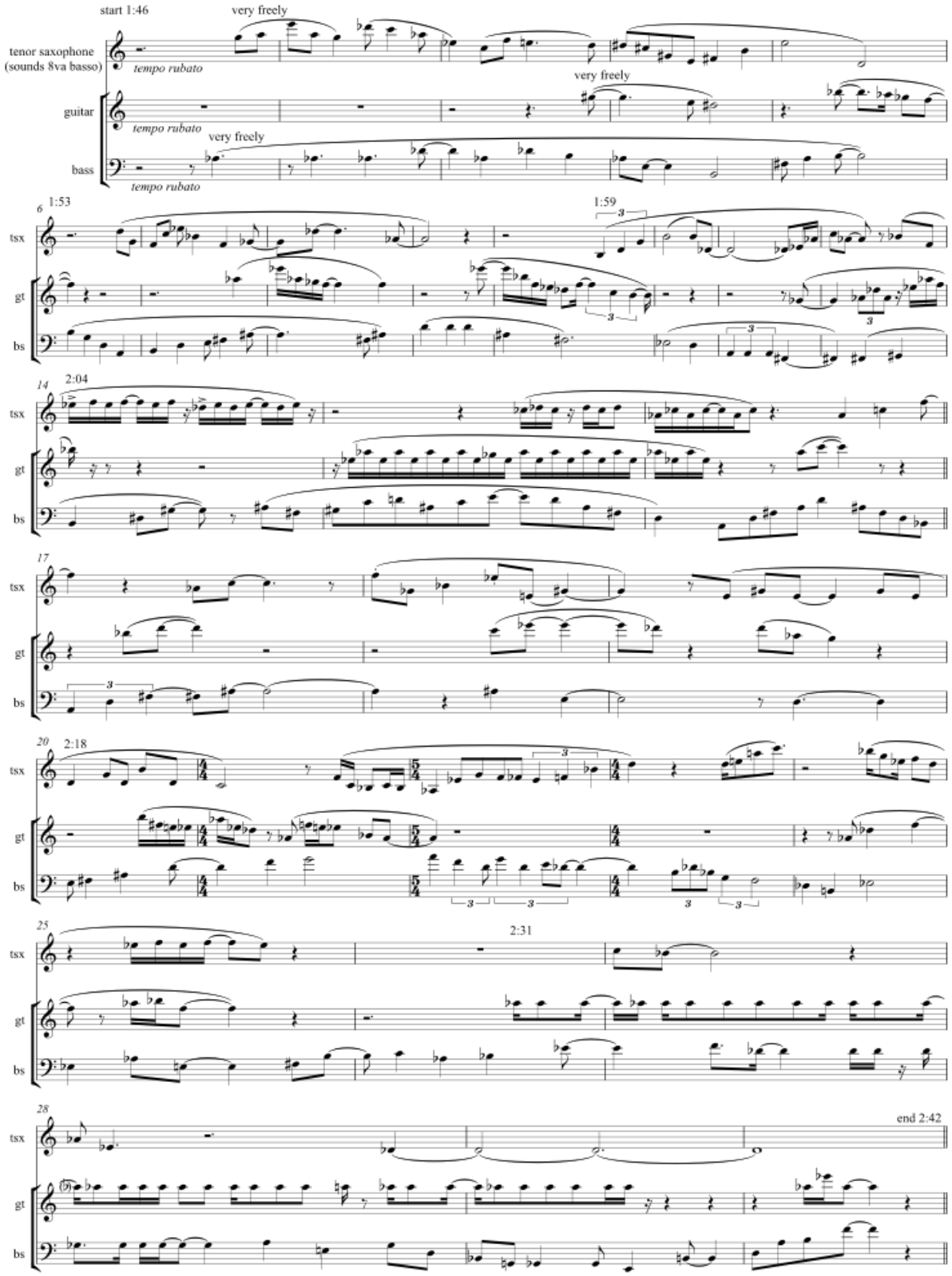


[ex 3.3.2.24 "Bird Buzz" – sections B and C]

As to the improvisations, I asked the musicians to confine themselves as much as possible to the selected intervals. The next example shows the transcription of the first part of the collective improvisation at the end of section A, where guitarist Federico Castelli, bassist Stefan Lievestro and I improvise with the intervals /2, /3, and /4 (a major second, a major third, and a perfect fourth). Apart from the idea to facilitate a close relation between composition and improvisation, I intended to avoid automatized diatonic scale patterns by leaving /-2 and /-3 (a minor second and a minor third) out.

In the interaction between the players, the saxophone and the bass are taking the lead. Guitar and drums are sparsely adding their accentuated fragments in between the lines of the leaders. As to the interval instruction, although quantitative analysis of the total number of the intervals played shows a considerable number of mistakes, several lines to my ears convincingly create the desired result to sound.[1] The bass for instance plays exemplary lines in bars 6–10 (with a minor third between the first two notes of bar 7 as the only mistake) and in bars 14–16. My opening line on the tenor saxophone reflects the intro before section A, by the mistaken fifths at the transition of bar 1 to bar 2. The second and third fragments of this line both contain a minor second as a leading note, and in bar 5 the interval of a major second is displaced one octave, into a major ninth. However, to my ears, due to the overall phrasing and the presence of all preferred intervals during the final fragments in bars 4–5, I consider this line to be convincing. The same goes for the guitarist where he plays four fragments in bars 4–10 that all end with a chromatic leading note. Apart from his playing of a mistaken fifth at the beginning of bar 8 (sounding, just as the first fragment of the tenor sax in bar 1–2, as a response to the intro before the A-section), all intervals are correct, as is the fragment in bar 13–14 that concludes his well-phrased melodic line that started at the end of bar 3.

[1] A quantitative analysis of the intervals shows that the percentage of correct intervals varies between 57 and 75%.



[ex 3.3.2.25 "Bird Buzz" – collective solo section A]

3.3.3 Twelve-tone techniques

In fact, Bergonzi launches a personal approach to creating tone rows with intervals arranged in an ordered succession, but without using this term or expressing any twelve-tone related theoretical context to it. His aim is to create original melodies; his means are a three-stage generative model and a thesaurus. However, the way he combines his sets of intervals, permutations and note directions can be considered an intuitive application of twelve-tone techniques. Likewise, the basic twelve-tone row variations, transposition, retrograde, inversion and retrograde inversion, are not theoretically addressed, but practically implied. They simply result from the manipulation of interval combinations by his tables of note directions and permutations.
Essential rhythmic variations are encouraged and discussed in his introduction, but how to apply these on the interval melodies in his thesaurus is left to the intuition of the reader. Likewise, compositional characteristics such as texture, range, dynamics and form are not within the scope of Bergonzi's method.

In principle Bergonzi wants to avoid tonal references but he admits that the saturated composer-improviser cannot exclude these. This observation points back to Wuorinen's (1994) notion of the reconciliation of the distinct principles of content (tonal music) and order (twelve-tone music) in section 3.2.4. Earlier in this chapter I discussed this phenomenon already in relation to the performance of "Tilt" and again about the collective improvisation in "Bird Buzz". Just like myself, most of my peers have learned the music they play in a context of functional harmony. In order to learn this, or any other new musical language that is in any way related to techniques of twelve-tone music, it seems a good strategy to focus exclusively on this new idiom. By doing so, one should try to reduce the analysis of each melodic line's possible harmonic reference to a minimum. But, unwantedly, by an almost automatic pull to one's musical "mother tongue", the harmonic reference cannot be avoided, popping up automatically as well. Although principally unwanted, this merging of new and existing idioms serves the part of the final goal of this operation: to connect these "new" idioms with the existing ones, or at least to use them alongside. "Tilt" serves as an example of how difficult this process of incubation can be in a group situation. At the relevant recording session I had to repeatedly convince my peers to let go or to "look beyond" their traditional approach of the original chord changes of "What is this Thing Called Love". Next, in the collective improvisations in "Bird Buzz" the intuitively adding of filler patterns in between the requested limited number of intervals witnessed the automatic reflexes of the musicians to complete their musical lines as conventionally meaningful "sentences".

3.3.4 Evaluation

Considered from an aesthetic standpoint, Bergonzi's intervallic approach facilitates the creation of melodic lines that one could find challenging to the ear. Therefore, it is well suited as a tool to create original melodic lines. For instance picking a random or conscious collection of intervals and manipulating them freely with Bergonzi's method can be a fruitful start of a composer's writing process. I used the process of creating "Bird Buzz" as an insightful illustration. Bergonzi's model served well to generate meaningful melodic lines, both in the composed and in the improvised parts.

Composing improvisers in jazz, as well as professional composers who work principally by ear and by musical intuition, may consider Bergonzi's system as a detour. Concerning the jazz artists, this has to do with their obligation of composing tunes that leave enough space for improvisation by themselves and their groups members, to be marked as true "vehicles for improvisation". I would even dare to say that a good jazz tune is partly unfinished, because it must be completed by its performance on stage, every time in a slightly different way. To the classical composer, experienced in working on intuition, the system by Bergonzi might recall the strict rules of serial composition in the second quarter of the twentieth century. All of them however should realize that Bergonzi's aim is to present the reader with a system that can be used according to his taste, technical possibilities and musical needs, in any application that appeals to his informed intuition.

As an analytic model, improvisers can use Bergonzi's system to analyze complex melodic sequences in order to memorize, modify or quickly transpose them. In my creation of "Bird Buzz" the codification of the intervallic patterns with the two tables rather served as an analytic tool afterwards than as a generative device. On the other hand, the restriction to the three intervals in the improvisations inspired all group members to play meaningful lines.
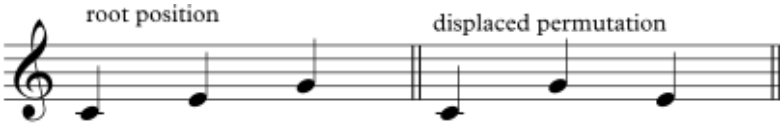
3.4 George Garzone (2009). "Basics of the Triadic Chromatic Approach." *Downbeat* 76/5: 58.

3.4.1 Theory

Garzone calls his chromatic triadic approach "a conceptual theory […] put together on the blackboard to improvise freely in the way I would like myself and the students to improvise". His method is an example of a simple model to create chromatic melodic lines. The author uses the four traditional types of diatonic triads: major, minor, augmented and diminished, to create melodic lines by connecting these triads in random inversions at a distance of a minor second. Apart from his "wish to be able to improvise freely" he does not share his thoughts on the tonal or post-tonal aspects of his method except that with his conceptual theory "you borrow from the 12-tone scale".
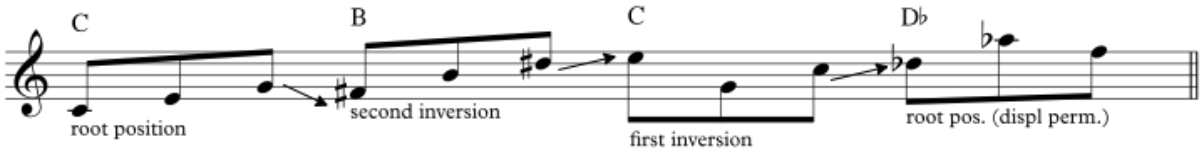
3.4.2 Practical applications

In Garzone's approach, triads can be played with the notes in their traditional order of appearance, either in ascending or in descending direction, or in "displaced permutation": with the notes sounding in alternating order. In the following example the C triad in root position is followed by the same triad in displaced permutation.



[ex 3.4.2.1 – displaced permutation (Garzone 2009:58)]

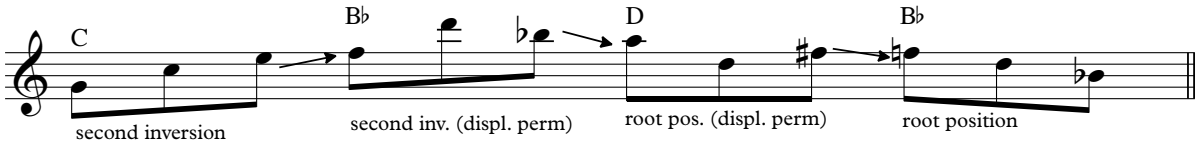
The playing rules of Garzone's Triadic Chromatic Approach are as follows: start with any triad in any position. From its last note either go one minor second up or one minor second down and play this as the first note of the next triad. This can again be played in any position, but one should avoid repeating the same position of the previous triad.
The following example illustrates a correct application of Garzone's approach. The C triad in root position is descending to the B triad in second inversion. The latter ascends back to the C triad in its first inversion that ascends to the Db triad in a displayed permutation of its root position.



[ex 3.4.2.2 – correct application]

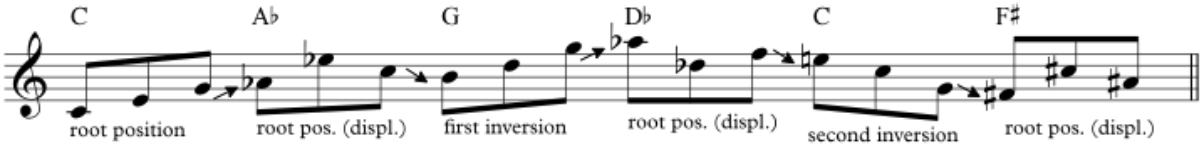
Because Garzone considers any displaced permutation of a triad as an inversion, he allows the same inversion to be used in adjacent triads as long as one of them is played

in displaced permutation. In the following example the adjacent triads C and Bb are both put in second inversion, and the D and Bb triad are both in root position. Garzone allows them to be coupled this way because the Bb and D triads are put in displaced permutation.



[ex 3.4.2.3 – displaced permutation]

In the following melodic line, Garzone demonstrates a correct approach to his method.

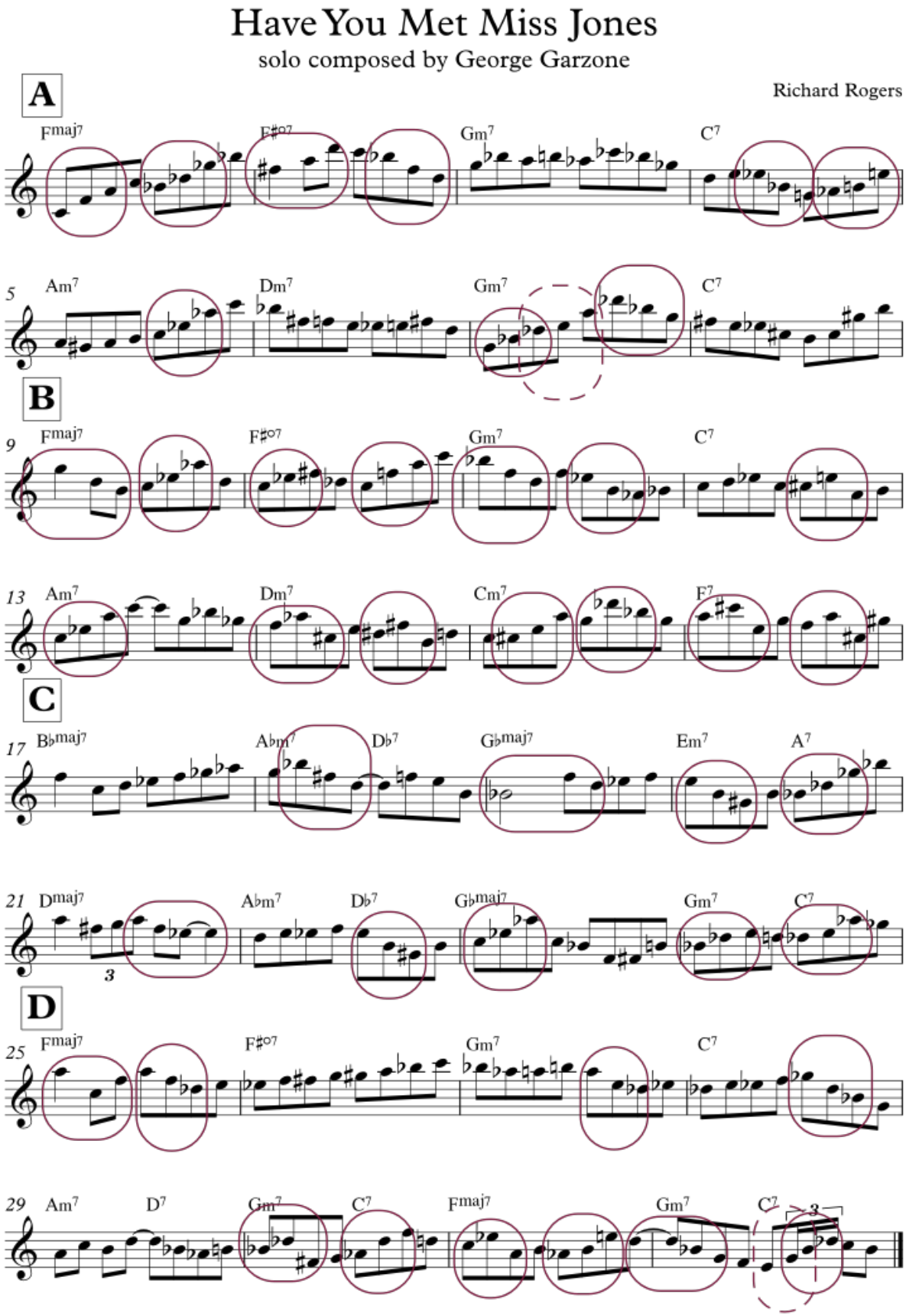


[ex 3.4.2.4 – appropriate approach of the method (Garzone 2009:59)]

In a composed solo over the chord changes of the jazz standard "Have You Met Miss Jones" Garzone puts his conceptual theory into practice. Garzone plays this composed solo as a countermelody in octaves with pianist Joey Calderazzo, while tenor saxophonist Joe Lovano plays the original melody. In the improvisation that follows, Garzone loosely alternates between echoes of this composed triadic countermelody and lines that are firmly rooted in traditional linear improvisation.

The next example shows this composed solo. While Garzone's article uses major triads exclusively to demonstrate his triadic chromatic approach, in this solo forty-five triads of different sorts can be found: twenty-eight major, four minor, four augmented and ten diminished triads. The connecting intervals between the triads are not only half steps, such as in bars 4 and 9, but also whole steps, such as in bars 15–16. The connections between the triads are created by repeating a note from the triad, such as in bars 22–23, or by inserting passing notes that are not in the triad. Examples of this can be found in bars 24 and 31. The triads are alternated with short diatonic and chromatic scale patterns.

Apparently, the shape of the melodic lines prevails over application of the correct scales to the chords, which results in interesting examples of outside notes. For instance, in bar 8 where the note b is played instead of the correct b$^{\flat}$ in the chord of C7 and in bar 14 where a B triad is superimposed on Dmin7. By choosing these notes, Garzone explicitly distances himself from a rigid chord-scale approach.



[ex 3.4.2.5 "Have You Met Miss Jones" – composed solo (George Garzone)]

Although Garzone presents his approach as a generative model for improvisers, the example of his composed solo above illustrates that it also can be used as an interesting arranger's tool.

The next example shows the application of the triadic chromatic approach in my improvisation on the coda of "Démasqué", on pianist Andrea Pozza's CD *Gull's Flight* (2011). The rhythm section repeats the notes as written in bars 1–4 eight times while I freely improvise together with alto saxophonist Christian Brewer over a Bb pedal, ending on the Bbmaj7 chord in the two final bars.

In bars 7–9, I play a chromatically descending line with the triads B (second inversion ascending, the fifth is repeated), Bb (second inversion descending, the third and fifth repeated) and A (root position descending). For the half-note coupling between the B and Bb in bar 8, the note e is played as an extra leading note. The half-note coupling between Bb and A is achieved after repeating the notes d and f from the Bb chord.

The line in bars 11–15 contains the triads of F augmented (ascending, first inversion), Db (ascending, root position, displaced permutation), C (second inversion, displaced permutation), E (root position, displaced permutation, root note e is repeated), Bm (root position descending, the fifth is repeated), and A (root position, note of f# added, third repeated, fifth repeated). Not all couplings in this line follow Garzone's instructions literally. Half-note couplings are played between F+ and Db, and between Db and C. However, the coupling between C and E is made by repeating the common note e. Next, the coupling between E and Bm is done by adding the note g, as a chromatic passing note to the note $f^{\sharp}$ in Bm. The coupling between Bm and A is done by adding the note $c^{\sharp}$ as the ninth of Bm and connecting this to the common note as the third in A6. The adding of extra notes to Bm and A in fact turns the triads into tetrachords. These operations are not provided in Garzone's model, but turned out to be effective in generating a melodic line like this.
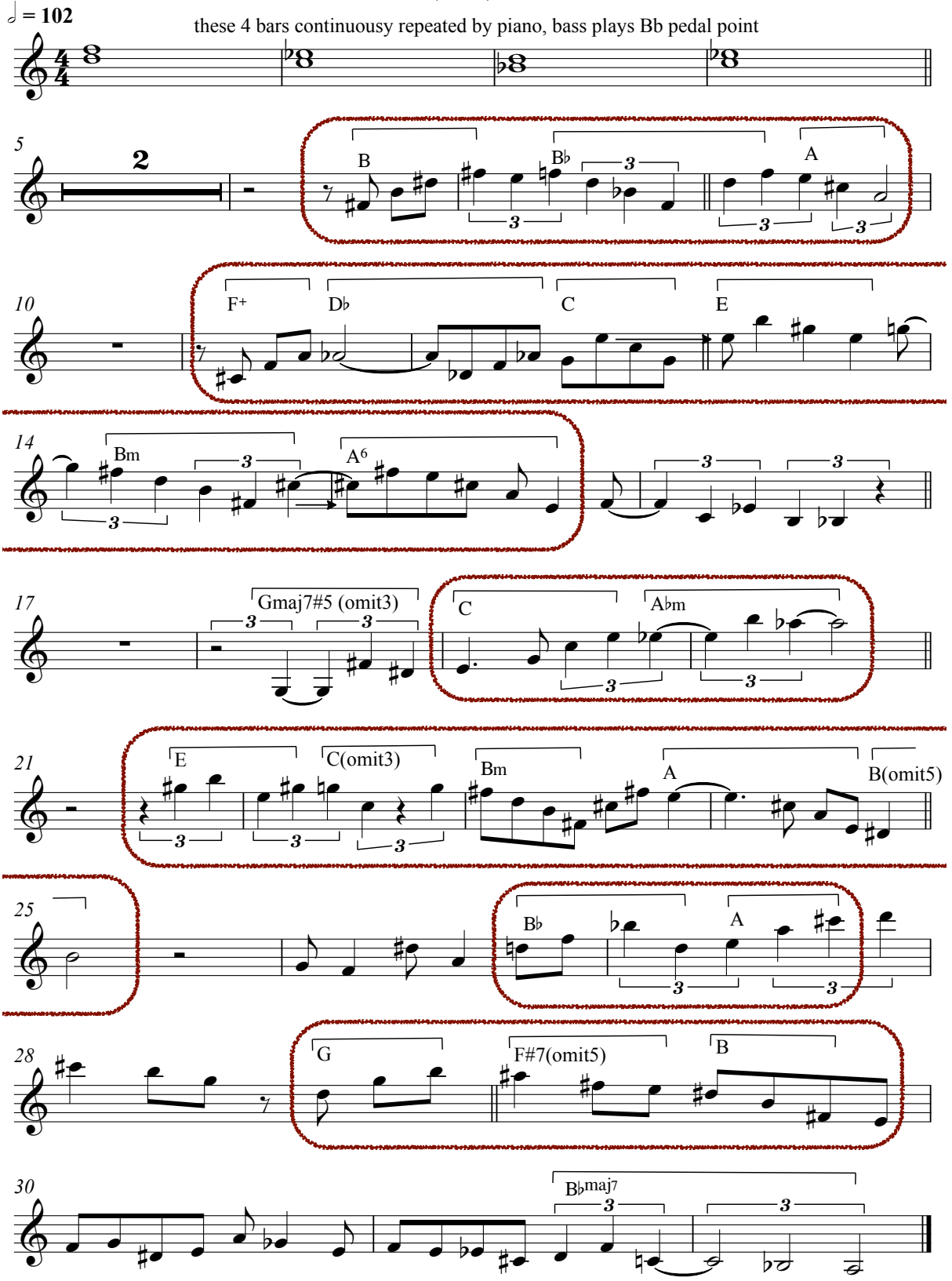
In bars 19–20 the triad of C (first inversion, the third is repeated) connects to Abm (second inversion, displaced permutation) by a half-note coupling. Bar 18 can be considered a $Gmaj7^{\#5}$ chord with the third omitted, connected to C by a half-note coupling, but this is again an operation beyond the scope of Garzone's triadic approach.
Another exemplary line in bars 21–25 shows two additions I made to Garzone's triadic approach. The first is the coupling of the triads Bm in bar 23 and A in bar 24, by the interval of a major second. This whole-note coupling is also applied in bar 27 to connect

Bb and A. The second addition is the use of incomplete triads, shown as C(omit3) in bar 21, B(omit3) at the transition of bars 24-25 and F#7(omit5).

Démasqué

tenor saxophone improvisation

(coda)



[ex 3.4.2.6 "Démasqué" – my tenor saxophone lines in the collective solo on coda]

3.4.3 Twelve-tone techniques

Although Garzone states that he is borrowing from the twelve-tone scale, he does not intend to create any twelve-tone collections. He designed his own limited applications of basic twelve-tone operations such as transposition, inversion and permutation instead. His most obvious ordering principle is that all triads should be ordered at distances of minor seconds, but he does not apply this strictly either.

Other elements are rooted into diatonic harmony, such as his limitation to the use of the four diatonic triads, and his avoidance of obvious twelve-tone terminology such as retrograde and rotation. Instead of the latter, he uses traditional tonal terminology such as first and second inversions of the triad. Likewise the applications of Garzone's approach as an arranging tool to the jazz standard in the example above look more like random superimpositions than like conscious twelve-tone operations.

3.4.4 Evaluation

In fact, Garzone is another author to discuss an individual approach aimed at the creation of tone rows by experienced performers. Just like Bergonzi's model discussed in the previous section, Garzone's approach addresses the advanced (composing) improviser who has both the curiosity and the technical ability to blend this distinctive model with his existing knowledge. Just like Bergonzi, a meaningful application of Garzone's approach largely depends on the composing improviser's informed intuition. Less experienced students might yet be confused by the quite strict playing rules as to the transposition, inversion and permutations of the four diatonic triads on the one hand, and the absence of any theory of its harmonic implications on the other.

At first sight, by its playing rules that are so easily explained, Garzone's triadic approach offers attractive techniques for creating melodic lines beyond functional harmony. But the simplicity of this approach is also deceptive. In order to generate meaningful lines one needs to develop an agility to make multiple decisions. After the last note of one's initial triad, in root position, first or second inversion, one has to take four decisions. The first is about the direction of the half-note coupling: either ascending or descending. The second is about the position of the next triad. Here, one again has two choices because copying the position of the previous triad is not allowed. The third decision to make is about the direction of the triad: once again two choices, ascending or descending. The fourth choice is to either play the triad "straight", i.e. with the three notes in natural order, or to apply

a permutation. Actually, with every step to the next triad this procedure has to be repeated.
Interestingly, the author himself presents his application of the model in a composed solo instead of for instance, in a number of examples transcribed from solos.
As I experienced myself, after taking some time to embody Garzone's way of manipulating triads chromatically, it enabled me to create surprising melodic lines, particularly in a context without a stated harmony or with only a limited number of stationary chords. For example, as an intro on a pedal point or an ostinato in the bass part, as a solo over a stationary chord, or as a harmonic superimposition over the chord changes in a blues or in the A sections of "I Got Rhythm", or other familiar forms that can be reduced to a single overlapping tonal color.

My personal experiences with Garzone's method were surprising from the first time I started practicing it. At every attempt, I felt challenged to find a meaningful balance between its formally correct application and my spontaneous responses to the surprising tonal colors it inspired. The intense concentration this process requires sometimes results in a feeling of meditation.

3.5 Walt Weiskopf (2009). *Intervallic Improvisation. The Modern Sound: A Step Beyond Linear Improvisation.* New Albany: Jamey Aebershold Jazz.

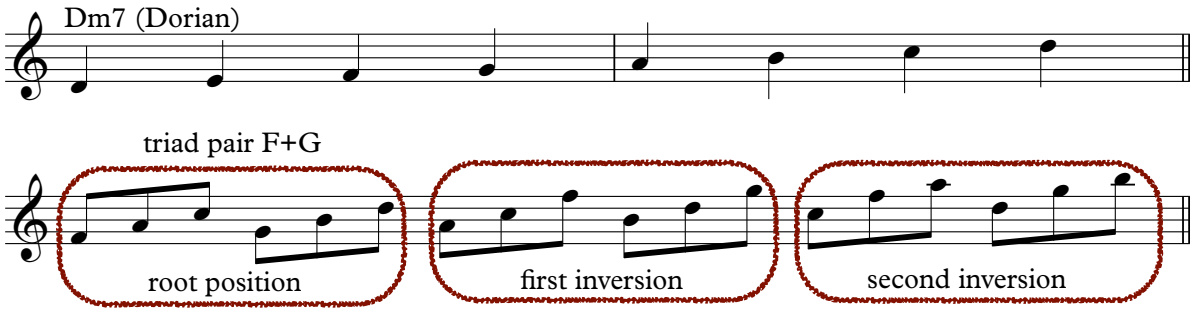
3.5.1 Theory

Weiskopf's book codifies a method of intervallic improvisation for advanced improvisers who want to modernize their vocabulary. It is motivated by his observation that jazz players, although they have a certain competence in the chord-scale approach that is the basis of linear improvisation, "often feel a large piece of the puzzle is still missing" (Weiskopf 2009:3). They hear modern jazz musicians improvise more intervallically and lack a method for developing this vocabulary.
Weiskopf argues that intervallic improvisation has the same principle as traditional chord-scale improvisation in that the artist chooses material that sounds good over an underlying harmony. The difference is that in intervallic improvisation, selected intervals from the scales are played instead of traditional scale embellishments. Thus, in contrast to Liebman's non-tonal superimpositions, Bergonzi's intervallic melodies and Garzone's chromatic triadic approach, Weiskopf's concept of intervallic improvisation is explicitly based on existing harmonic structures.

3.5.2 Practical applications
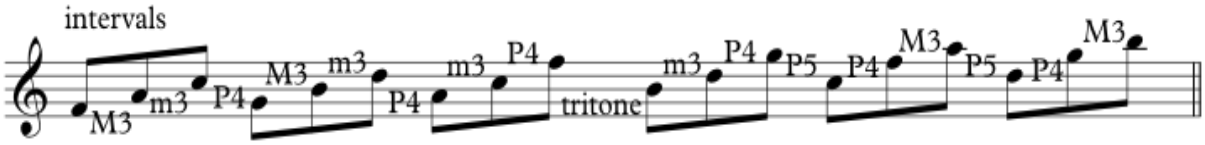
The intervals discussed in Weiskopf's book result from arranging pairs of triads that are derived from scales. These triad pairs – defined as "two triads that do not share any notes" (Weiskopf 2009:5) – can be derived from the modes of the major scale: the melodic and harmonic minor scales, the diminished, augmented, and whole tone scales. Every mode hosts one or more triad pairs that capture the tonal color of that particular mode. By playing these triad pairs, alternating their root positions and inversions, a series of intervals is represented.

For instance, the F major and G major triads capture the tonality of Dm7 because together these six notes contain all notes of the scale except the note e.
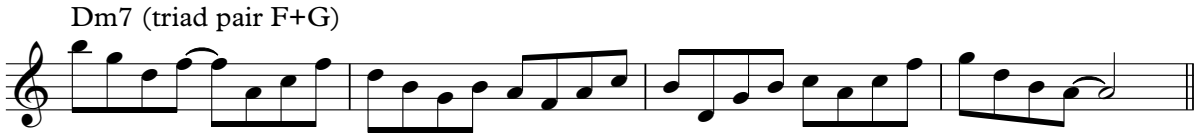


[ex 3.5.2.1 – triad pair F+G with inversions]

With the two triads played in root position, first and second inversion, the following succession of intervals of major thirds (M3), minor thirds (m3), perfect fourths (P4) and perfect fifth (P5) occurs.
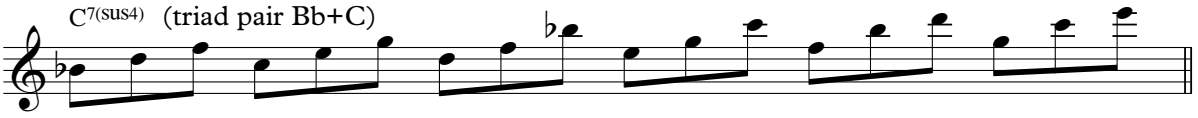


[ex 3.5.2.2 – intervals resulting from triad pair operations (Weiskopf 2009:4)]

As a practical application of his method, Weiskopf expects the player to learn the different permutations of the triad pair and to use these to create melodic patterns such as the following.
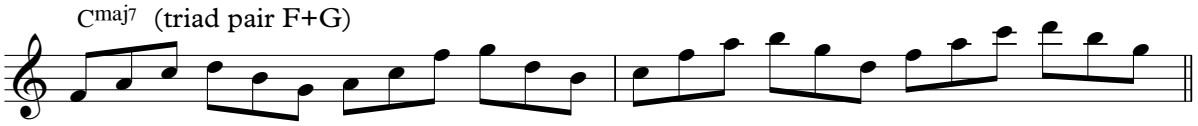


[ex 3.5.2.3 – melodic pattern constructed with triad pair F+G (Weiskopf 2009:4)]

Weiskopf discusses examples of a large number of triad pairs that are derived from the major and minor scales, the diminished, whole tone and augmented scales and the application of his method on polychords. The example above shows the most inside (i.e. diatonic) application of his approach on a Dm7 chord: a pair of major triads placed a major second apart, on the third and the fourth degree of the D Dorian mode. The next example deals with the dominant seventh sus4 chord. Here the most inside sounding triad pair is placed on the root and on the flat seventh, resulting in triad pair Bb+C on the chord $C7^{sus4}$.
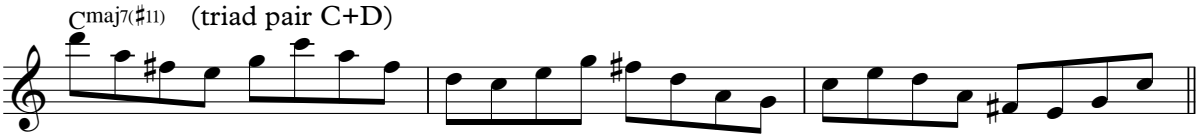


[ex 3.5.2.4 – triad pairs on $C7^{sus4}$ (Weiskopf 2009:6)]

On major seventh chords the inside triads should be put on the fourth and the fifth degree of the scale,



[ex 3.5.2.5 – triad pairs on Cmaj7 (Weiskopf 2009:7)]
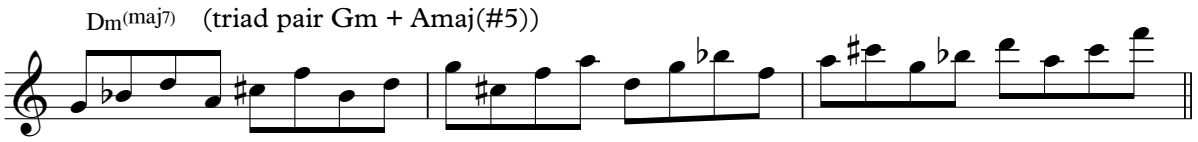
or, in the case of an augmented fourth (#11) sounding in the chord, on the root and the second degree of the scale.



[ex 3.5.2.6 – triad pairs on $Cmaj7^{\#11}$ (Weiskopf 2009:7)]
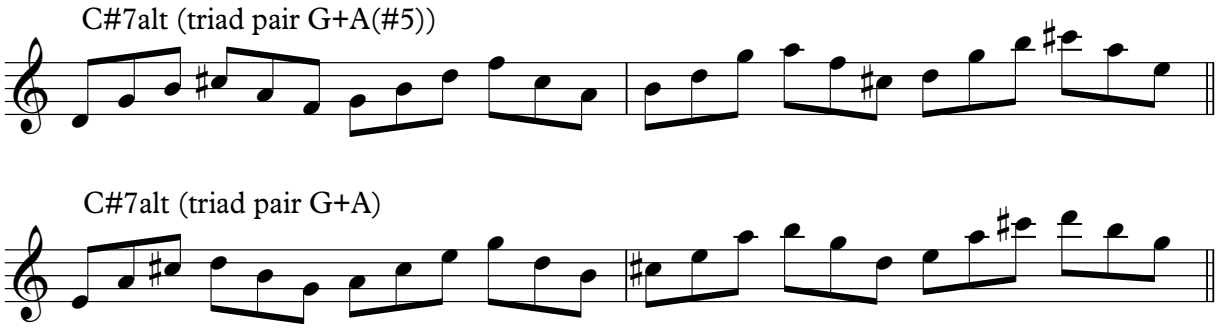
Weiskopf extensively discusses examples of triad pairs that are derived from the harmonic and melodic minor scales, for instance in the following example. Because in the ii-V-I progression $Emin7^{b5}$ – $A7^{b9}$ – Dm, all chords are in the key of D harmonic minor,

the triad pair Gm, Amaj$^{\#5}$ will sound well and inside all three chords – recalling a common embellishment of the minor chord in the bebop style.
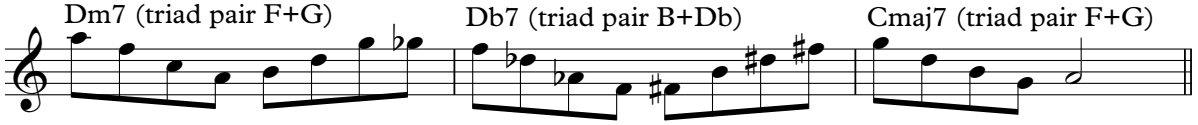


[ex 3.5.2.7 – triad pairs on Dm^{maj7} (Weiskopf 2009:10)]

Different triad pairs derived from the same melodic minor scale will result in different tonal colors. This is shown in the next examples of two different triad pairs, derived from the D minor melodic scale that is imposed on the C#7altered chord. Both lines contain the triad pairs G and A, but in the first, the note e in the A triad is changed to an f. This f, together with the notes d, a, and c$^{\sharp}$, confirms the tonal color of d melodic minor more convincingly than in the second example, where the triad pair G and A is used without this altered note. This triad pair creates an ambiguous tonality. It can sound either as G$^{\#11}$, or as an A7^{sus4} chord on a C# pedal point.



[ex 3.5.2.8 – triad pairs on C#7alt (Weiskopf 2009: 10,11)]

Another illustrative example of creating such an outside effect results from the adaptation of tritone substitutions to dominant chords. The next example shows the superimposition of a triad pair that belongs to the tritone substitution of the original G7 chord by Db7 in the ii-V-I progression Dmin7 – G7 – Cmaj7.



[ex 3.5.2.9 – triad pairs on ii-V-I (Weiskopf 2009:19)]

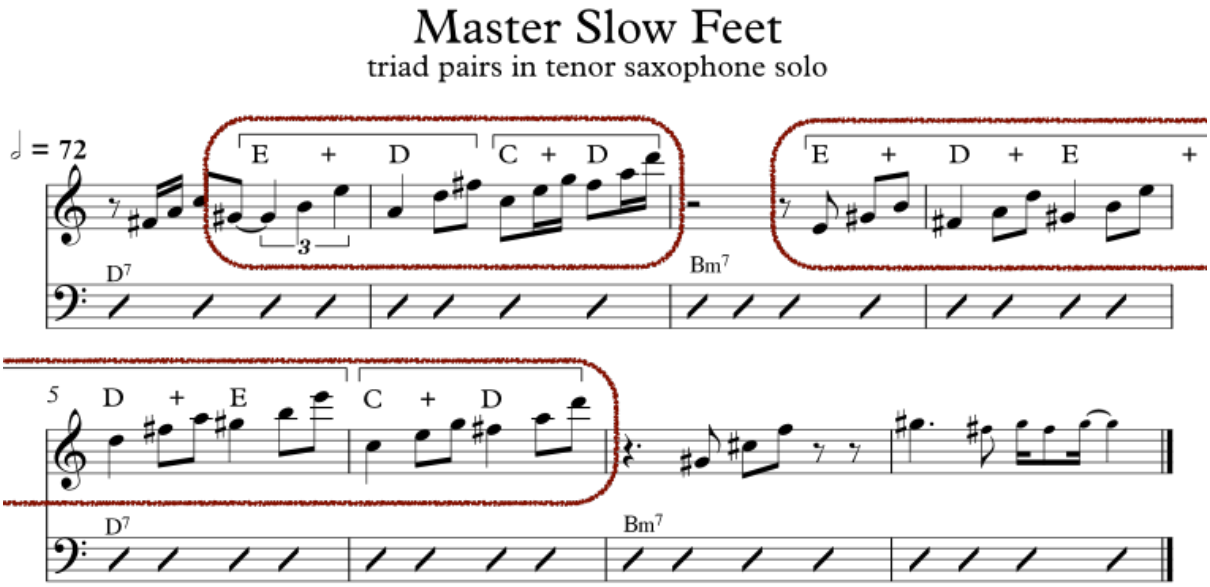
The musical examples in the introduction are followed by a table of triad pairs, listing eight categories of scales and their derived triad pairs: major, minor and augmented triads ordered at a major second, a minor second, a tritone and a minor third apart, in twelve keys. In the left column of his table the possible triad pairs are listed, in the right one the appropriate keys. The four columns in between mark the possible chords symbols that the triad pairs can be applied to.
The next example from his table of triad pairs shows the author's options of triad pairs in harmonic major scales.

Harmonic major derivations - One major triad and one augmented triad a half step apart

Gmaj and Abaug	$Cmaj7^{+5}$	$E7^{+5}$	Fmin/maj7	$Dmi9^{b5}$	C harm.maj.
Abmaj and Aaug	$Dbmaj7^{+5}$	$F7^{+5}$	Gbmin/maj7	$Ebmi9^{b5}$	Db harm.maj.
Amaj and Bbaug	$Dmaj7^{+5}$	$Gb7^{+5}$	Gmin/maj7	$Emi9^{b5}$	D harm.maj.
Bbmaj and Baug	$Ebmaj7^{+5}$	$G7^{+5}$	Abmin/maj7	$Fmi9^{b5}$	Eb harm.maj.
Bmaj and Caug	$Emaj7^{+5}$	$Ab7^{+5}$	Amin/maj7	$F\#mi9^{b5}$	E harm.maj.
Cmaj and Dbaug	$Fmaj7^{+5}$	$A7^{+5}$	Bbmin/maj7	$Gmi9^{b5}$	F harm.maj.
Dbmaj and Daug	$Gbmaj7^{+5}$	$Bb7^{+5}$	Bmin/maj7	$Abmi9^{b5}$	Gb harm.maj.
Dmaj and Ebaug	$Gmaj7^{+5}$	$B7^{+5}$	Cmin/maj7	$Ami9^{b5}$	G harm.maj.
Ebmaj and Eaug	$Abmaj7^{+5}$	$C7^{+5}$	C#min/maj7	$Bbmi9^{b5}$	Ab harm.maj.
Emaj and Faug	$Amaj7^{+5}$	$Db7^{+5}$	Dmin/maj7	$Bmi9^{b5}$	A harm.maj.
Fmaj and Gbaug	$Bbmaj7^{+5}$	$D7^{+5}$	Ebmin/maj7	$Cmi9^{b5}$	Bb harm.maj.
Gbmaj and Gaug	$Bmaj7^{+5}$	$Eb7^{+5}$	Emin/maj7	$C\#mi9^{b5}$	B harm.maj.

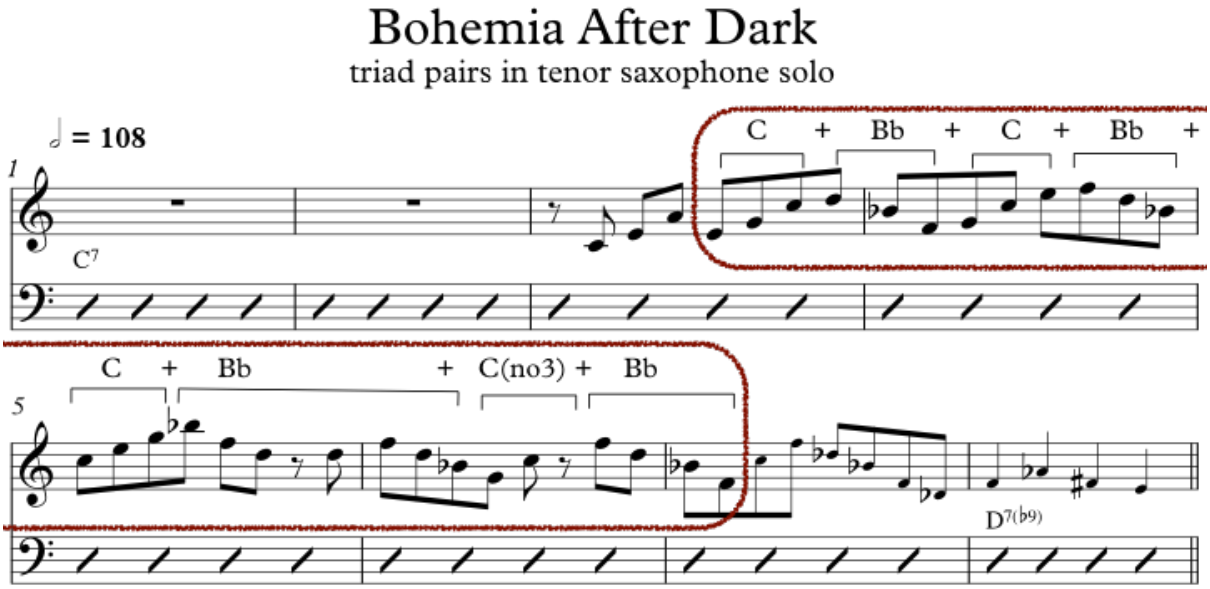
[ex 3.5.2.10 – harmonic major derivations: a major and an augmented triad at a minor second apart (Weiskopf 2009:21)]

The next fragment of eight bars from my tenor saxophone solo in a recording of my composition "Master Slow Feet" (2015) shows my application of triad pairs.
Instead of grouping two triads on top of the D7 chord in bars 1–2, I group three triads. The triad pair E+D, superimposed on the D7 results in the tonal color of $D7^{\#11}$, while the triad pair C+D evokes the sound of $D7^{sus4}$. Apparently the slow straight rhythmic groove of this tune allowed me the opportunity to combine both ideas.
In the line in bars 3–6 the triad pair E+D is played over both the Bm7 and again over the D7 chord. As superimposed on Bm7, these triads define the tonal color of the B Dorian mode. In bars 5–6, the triad pair C and D again follows the superimposition of the triad pair D+E on D7, just as in the first line.



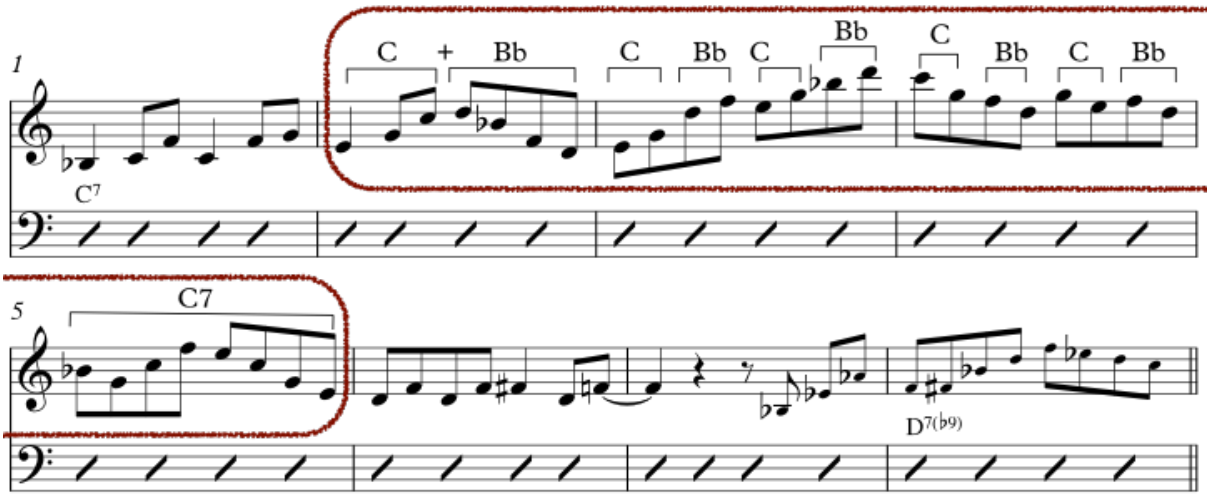
[ex 3.5.2.11 "Master Slow Feet" – fragment tenor saxophone solo]

The following example shows my application of triad pairs in the B-sections of three solo choruses on Oscar Pettiford's "Bohemia After Dark". The transcription shows a development in my operations with the triads. The line in bars 3–7 is an exemplary illustration of turning the tonal color of the C7 chord into $C7^{sus4}$, by playing the triad pair C+Bb in alternating positions and directions.



[ex 3.5.2.12 "Bohemia After Dark" – fragment tenor saxophone solo in first B-section]

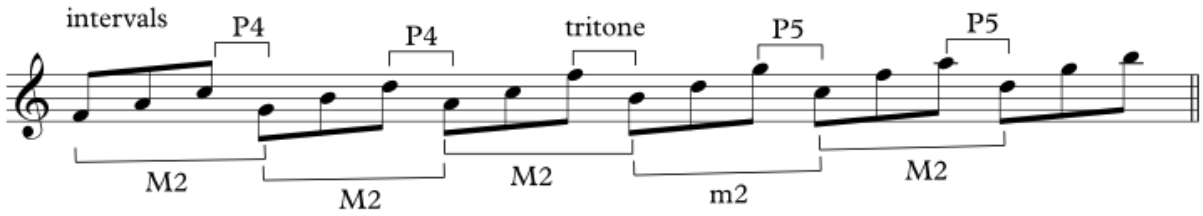
Then, the line in the B-section of the next chorus, as shown in bars 2–5, shows a variation on Weiskopf's model. Here the triad pair C (first inversion) +Bb (second inversion, the third is repeated) is followed by a series of four pairs of dyads that can be considered incomplete C and Bb triads. The effect is the same as with the triad pairs in the previous example: the original C7 sound is obscured, and in this case delayed to bar 5, where a diatonic melodic pattern confirms its original tonal color.



[ex 3.5.2.13 "Bohemia After Dark" – fragment tenor saxophone solo in second B-section]

3.5.3 Twelve-tone techniques

In Weiskopf's approach, a succession of intervals is defined by the internal structures of the four diatonic triads in prime form and inversions. His model does not specify the intervals between the trichords that result from his triad operations. For instance, looking once again at example 3.5.2.2 above, the intervals inside the F and G major triads are major and minor thirds and perfect fourths, as a result of their positions in prime form, first and second inversion. However, the intervals between the first notes of the triads, four major seconds and one minor second – and those between last and first notes of the triads– two perfect fourths, a tritone and two perfect fifths – are not taken into account. However characteristic the sounds of these additional intervals are, they just occur by accident, as an interesting "bycatch" after the arrangement of the triads.

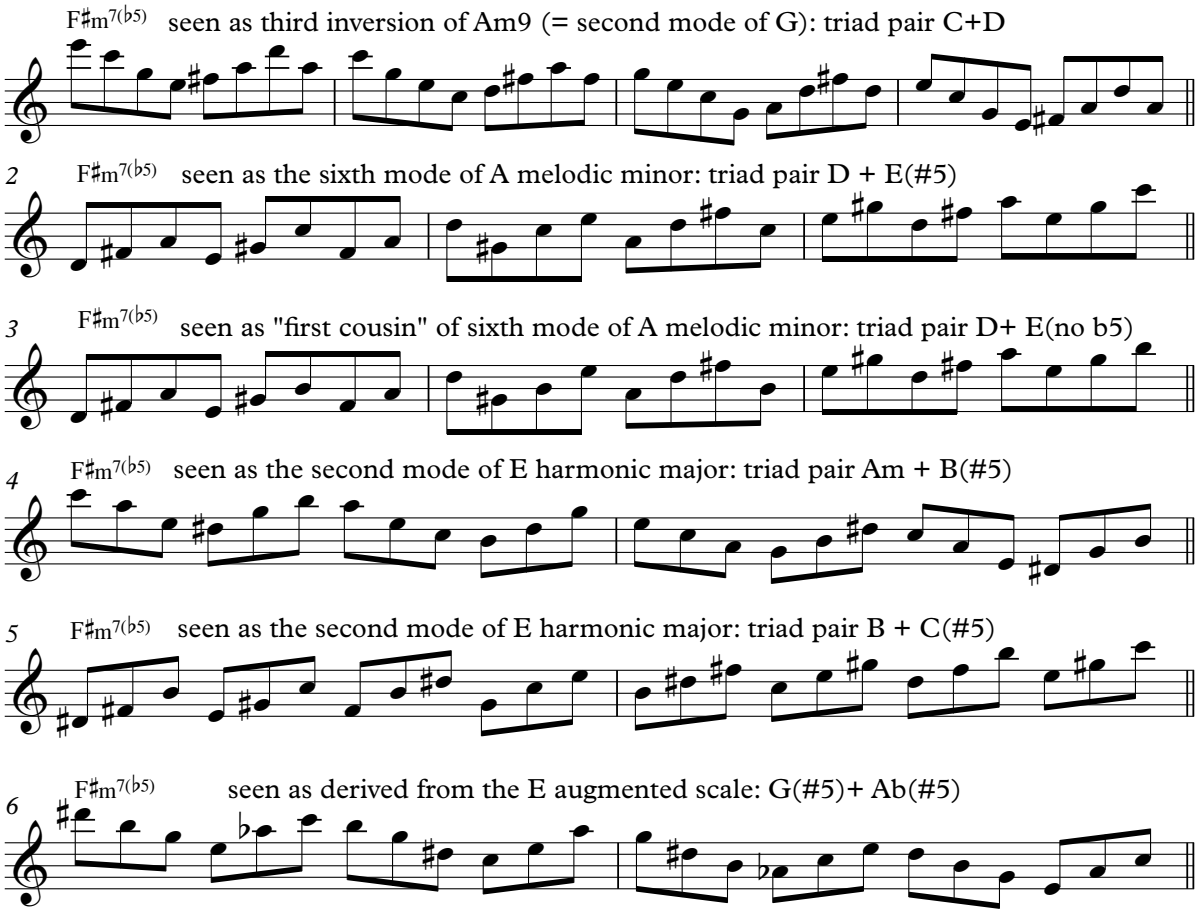


[ex 3.5.3.1 – intervals resulting from triad pair operations]

In contrast to Liebman's non-tonal superimpositions, Bergonzi's intervallic approach, and Garzone's triadic chromatic approach, Weiskopf's method is intended to create tonal superimpositions on chord changes. That is why it should be considered as an advanced chord-scale approach rather than as a technique to deliberately play outside the chord changes. Thus, at first sight, there are no intended elements of twelve-tone theory or operations in his method. However, Weiskopf's ways of manipulating diatonic triad pairs helps the improviser to create lines with characteristic shapes, with high densities of texture and with intentionally vague harmonic colors that according to Liebman could be considered as twelve-tone characteristics. Furthermore, although Weiskopf's triad pairs match the scales from which they are derived correctly, he also manages to create an amount of harmonic vagueness by gradually obscuring the underlying harmonic content as the triad patterns become "more advanced".

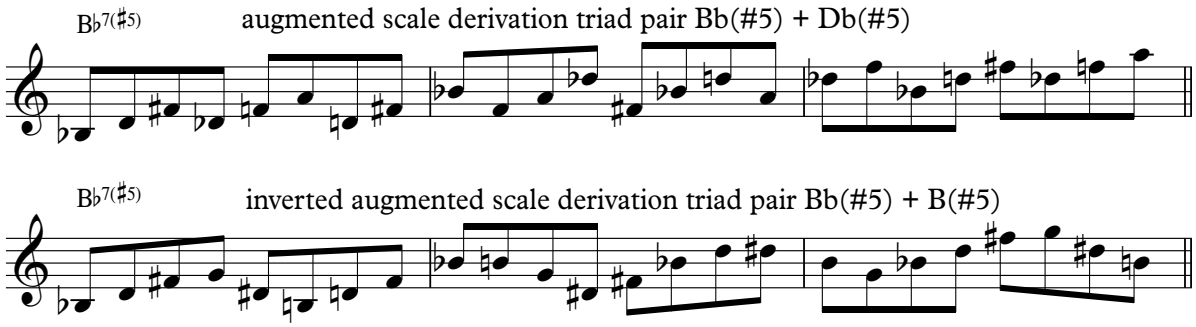
For instance, of the six examples of triad pairs derived from half diminished chords the first and fourth sound the most inside because the triad pairs include the root, the minor third, the flatted fifth and the minor seventh of the F#m7^{b5} chord. The second has the major ninth instead of the more common flatted ninth. The third triad pair misses the flatted fifth of the chord and the fifth triad pair misses the minor third. As a result of the

absence of these characteristic notes, these triad pairs sound outside the expected F#m7^{b5} tonality. The sixth triad pair is derived from the E augmented scale that does not imply the root or the minor third of the tonality, but it implies both the flatted ninth and the major ninth instead. As a result, this triad pair sounds pretty much outside but still has a discernable relation to the underlying chord.



[ex 3.5.3.2 – triad pairs sounding from inside to outside F#m^{b5} (Weiskopf 2009: 13,14)]

In the last example, Weiskopf's strategy offers an interesting solution to make a Bb7$^{\#5}$ chord sound more interesting than by simply playing a whole tone scale over it. By superimposing the augmented scale (b$^{\flat}$, d$^{\flat}$, d, f, f$^{\#}$, a) or the inverted augmented scale (b$^{\flat}$, b, d, e$^{\flat}$, f$^{\#}$, g) he creates alternatives that sound more outside the chord.



[ex 3.5.3.3 – triad pairs derived from augmented scales (Weiskopf 2009:16)]

3.5.4 Evaluation

Compared to the authors discussed earlier in this chapter, Weiskopf's publication is exclusively addressed to performing improvisers. His approach is useful as a step-by-step method to extend one's improvisations beyond conventional linear improvisation, because it guides the reader from the most inside to the more outside sounding triad pairs.

Between Garzone's triadic chromatic approach and Weiskopf's pairs of triads, there are more differences than similarities. Garzone's approach depends largely on the performer's informed intuition and stands far away from Weiskopf's didactical approach of arranging triad pairs. For the coupling of his triads, Garzone principally uses minor seconds. Weiskopf uses four intervals, coupling his triad pairs by intervals of a minor second, a major second, a minor third and a tritone apart. Due to this difference, there are only two overlaps between the two: Weiskopf's harmonic major derivations (one major and one augmented triad, a minor second apart) and his inverted augmented scale derivations (two augmented triads, a minor second apart) could also result from applying Garzone's method.

In the context of my research into developing improvisational techniques beyond the conventional chord-scale approach, I am principally interested in the possibilities of Weiskopf's method to create, in Liebman's terms, a certain harmonic vagueness. Despite its obvious connections to the functional harmonic fabric, it can serve as an effective tool to start making "educated steps" outside the stated chords. I experience this both in my own practice as with the students in my classes of saxophone improvisation at Codarts University of the Arts. However, the fact that this technique facilitates the improviser to create approved melodic lines just by playing variations of the same six notes implies the danger of a mechanical approach. "Remembering" the right triad pair might prevail over

"actually hearing" its musical meaning in relation to the underlying harmonies. But again, considering the aim of my research to help improvisers sound outside the chords, this drawback seems less momentous. From experience, I have noticed the advantage of this tool to evoke a tonal color that suggests an outside effect, while at the same time I "trust" that there is a plausible connection with the underlying harmonic structure. It is hard to cut my roots in chord-scale improvisation.

3.6 Jerry Bergonzi (2006). *Hexatonics*. Advance Music.
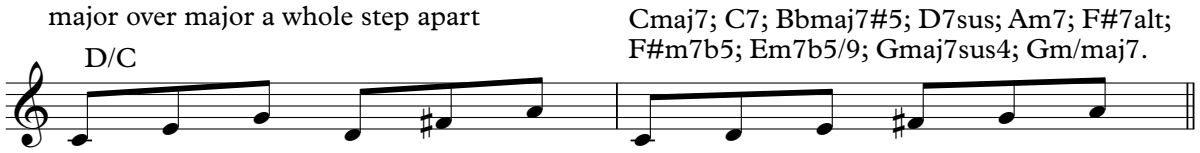
3.6.1 Theory

In *Hexatonics* (2006) Bergonzi displays his method of creating melodic devices by combining two triads that do not have any common tones. His system looks similar to Weiskopf (2009), but there is one major difference. In contrast to Weiskopf, who derives his triad pairs from existing diatonic scales and church modes, Bergonzi defines his collection of sixteen triad pairs and hexatonic scales simply as "the ones that are practical for the improviser and composer" (Bergonzi 2006:6). His collection is randomly ordered along the tonalities of his combined triads (major, minor, and augmented) and the distant intervals between them (major second, minor second, minor third, and tritone). Again, just as with his intervallic system elaborated upon in subchapter 3.3, Bergonzi exposes a relatively simple device generating unlimited possibilities. And again, the suggested operations are related to the musician's informed intuition rather than to a comprehensive theoretical concept. As a consequence, it is left to the discretion of the individual artist to decide which tonal references can be associated to which triad combinations.

3.6.2 Practical applications

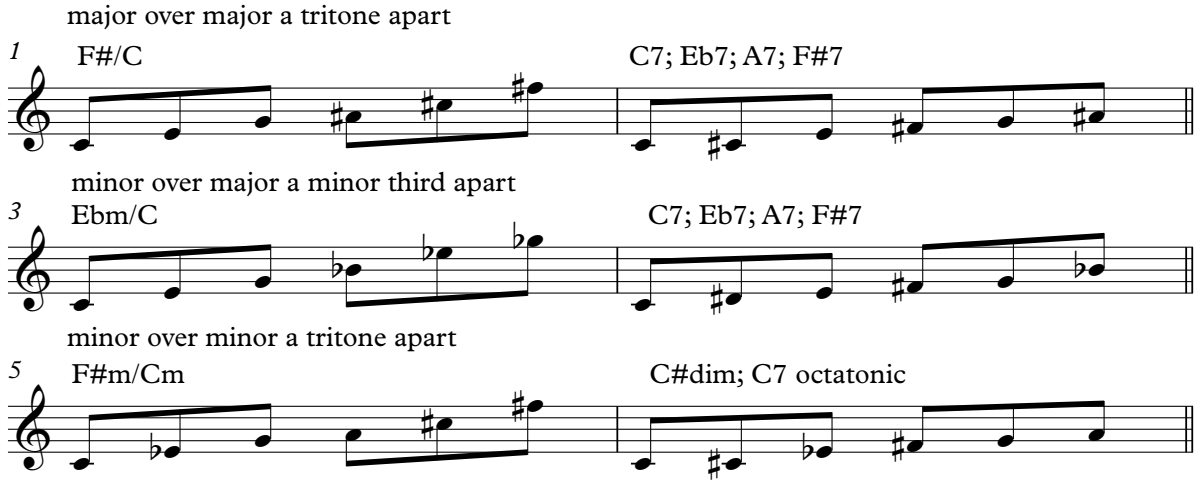
Bergonzi categorizes his collection of sixteen hexatonics along the tonal qualities of their triad pairs and the intervals between them. To each category, he adds a résumé of the various chords that they are supposed to match.

For instance in the next example, in the category "major over major a whole step apart" he puts a D major triad over a C major triad (D/C). In the first bar these triads are put in succession, and in the second bar they are intertwined to form a hexatonic scale. The chords that Bergonzi considers this hexatonic refers to are written above the bar.



[ex 3.6.2.1 "major over major a whole step apart" (Bergonzi 2006:9)]

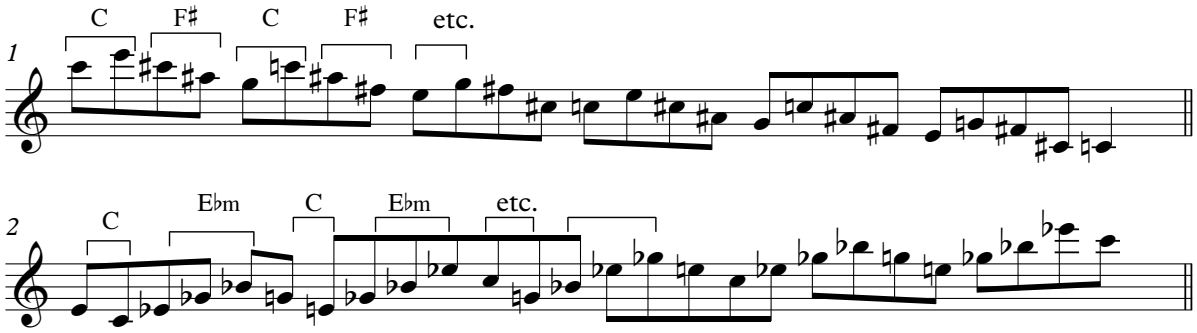
The next example illustrates how diversity results from Bergonzi's approach, taking a variety of triad pairs as a point of departure instead of just picking two triads from an existing scale as in Weiskopf (2009). The triad pairs in bars 1, 3, and 5 sound really different but, as the chords written above bars 2,4, and 6 indicate, they all refer to the C octatonic scale.



[ex 3.6.2.2 – triad pairs referring to the C7 octatonic scale (Bergonzi 2009: 117, 281,247)]

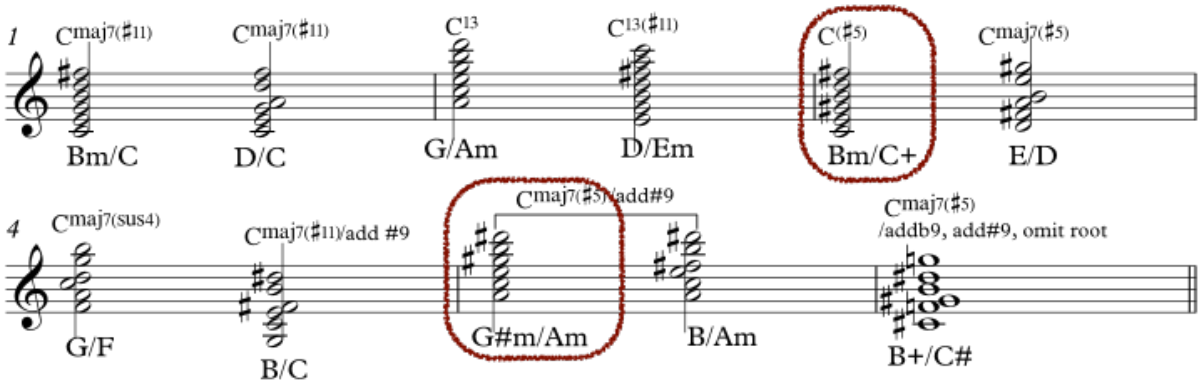
Concerning the phrasing of his triad combinations, Bergonzi also manages to create more diversity than Weiskopf (2009). In order to avoid an abundance of three-note groupings or four-note groupings in which one of the pitches of the triad is repeated, he creates four-note groupings with fragments of two notes from the triads as illustrated in the first

line of the example below. The second line shows how he creates five-note groupings by skipping a note in one of the triads.
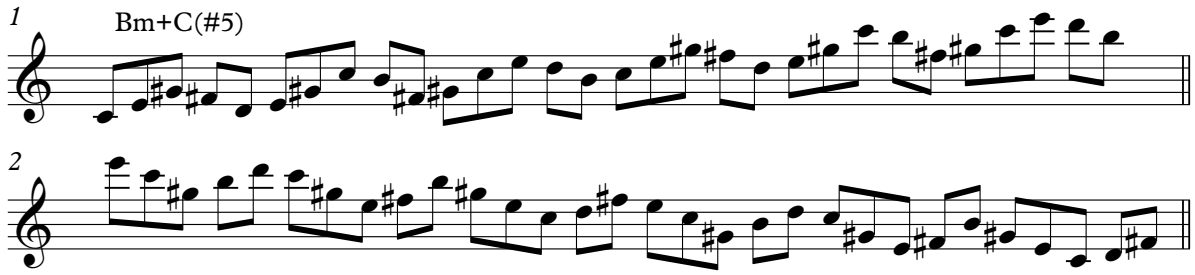


[ex 3.6.2.3 – alternatives to three-note groupings (Bergonzi 2006: 124, 282)]

In the context of my research goal to create improvisational patterns that sound outside the chords, I consider a reverse application of Bergonzi's model to be more fruitful. Instead of Bergonzi's associating a single combination of triads to a variety of possible chords, I suggest to map a variety of triad combinations that could be associated to a single chord. I would for instance, take a single major chord and map the vertically stacked hexatonics in which (according to Bergonzi) this chord is identified, ordering them from more inside to more outside the sound of the basic chord. The next example shows this in a succession of C major chords arranged in increasing complexity. Below the staff are the triad combinations that according to Bergonzi refer to these chords.
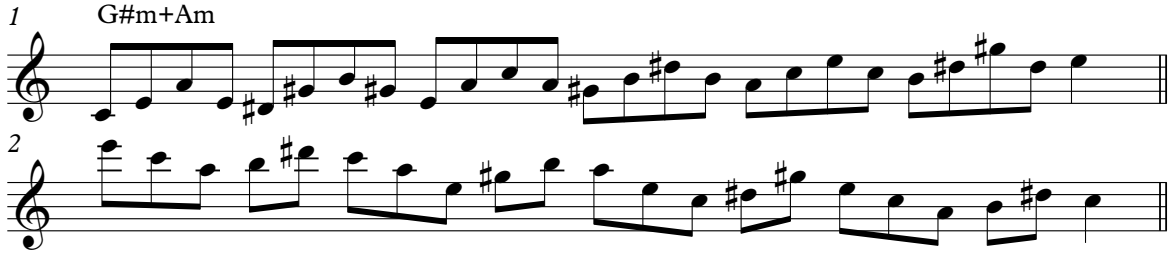


[ex 3.6.2.4 – Cmaj chords resulting from stacked triad pairs]

The two highlighted chords above are illustrated in the following examples. The first illustrates two variations of triad pair Bm+C$^{\sharp 5}$, superimposed on C major. Both lines contain five-note groupings constructed with three notes of the C$^{\sharp 5}$ triad and two notes of the Bm triad in alternating ascending and descending directions.



[ex 3.6.2.5 – variations of triad pair Bm+C$^{\sharp 5}$ (Bergonzi 2006:276)]

In the second example the superimposition of triad combination G#m+Am manages to create an even more outside sound.

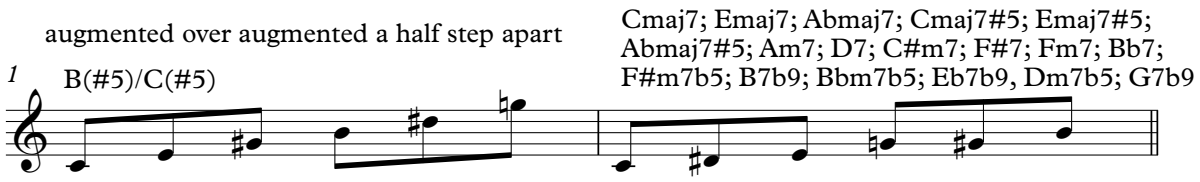


[ex 3.6.2.6 – variations of triad combination G#m+Am (Bergonzi 2006: 276)]

Both examples illustrate how Bergonzi's method serves to create diversity in superimpositions with triad combinations.
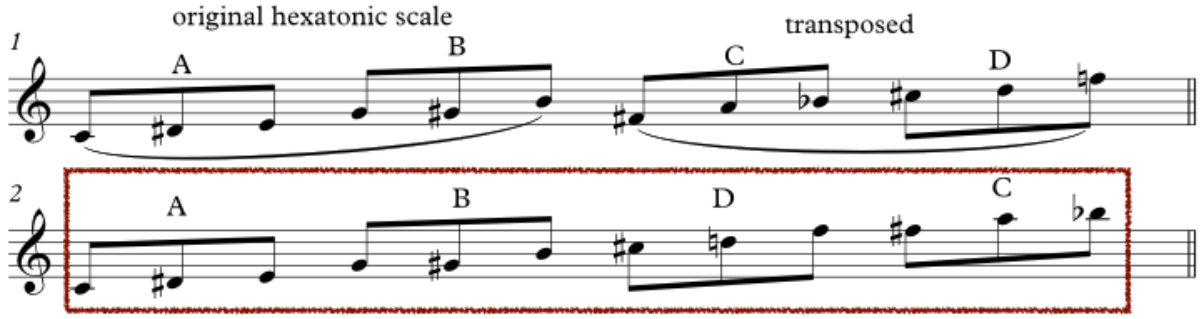
3.6.3 Twelve-tone techniques

Although Bergonzi does not discuss any relations to twelve-tone techniques, some of his patterns can be considered as one half of a twelve-tone row. The next example shows his category "augmented over augmented a half step apart". Due to its symmetry, it refers to a number of chords arranged at distances of major third intervals.



[ex 3.6.3.1 – "augmented over augmented, a half step apart" (Bergonzi 2006:91)]

By transposing its hexatonic scale up a tritone and adding the resulting scale to the original one, the twelve-tone row in bar 2 is derived. It consists of three triads with the same interval structure of a minor second and a minor third.



[ex 3.6.3.2 – transposition of hexatonic scale completes a twelve-tone row]

This, and other types of twelve-tone techniques will be discussed in detail in chapter 4.

3.6.4 Evaluation

After what has been said about Garzone (2009) in subchapter 3.4 and about Weiskopf (2009) in subchapter 3.5, I cannot disagree with Bergonzi considering triads as "incredibly strong melodic devices. They are easy to think of and combining them is an accessible task for the soloist" (Bergonzi 2006: 6). In my experience, it is the diversity of Bergonzi's suggested triads, rather than the related hexatonic scales that is most valuable here. Treating the hexatonic scales as separate objects risks a reduction of not only the accessibility but also the effectiveness of this method. Because they can easily be identified as fragments of existing diatonic, octatonic and whole-tone scales they contain the danger of emphasizing obvious tonal elements instead of moving beyond them.

In contrast to Weiskopf's presenting his method as a strategy to modernize the techniques of the improvising performer, Bergonzi advocates his method as a tool not only suitable for improvisation, but also for arranging, and composing. Experience with application by my students and myself has proven it to be a valuable improvisational tool, offering the improviser freedom of choice as to how and when it should be applied to the underlying harmonies. Moreover, it also incorporates an advanced chord-scale approach that can be very effective in creating outside sounding patterns on pre-given chord symbols.

Thus, by these various options to move beyond the limits of tonality, Bergonzi's method relates very well to the subject of my research. Weiskopf's *Intervallic Improvisation*, by its focus on finding triad pairs in familiar diatonic scales and church modes, could serve as a pre-stage for Bergonzi's *Hexatonic's,* creating a more varied sense of harmonic vagueness. But just like Weiskopf, Bergonzi's model also contains the danger of a rather mechanical approach, namely by playing the combinations one has studied by muscle memory instead of actually hearing them in the actual moment. Therefore, these steps outside the pre-given chords should always go hand in hand with patient and conscious ear training. The same might go even more so for another method enriching the (composing) improviser's palette to be reviewed in the following chapter: O'Gallagher's application of twelve-tone techniques in improvisation.

3.7. John O'Gallagher (2013). *Twelve-Tone Improvisation. A Method for Using Tone Rows in Jazz.* Mainz: Advance Music.

3.7.1 Theory

O'Gallagher's publication connects twelve-tone applications to jazz improvisation. His method is based on the system of Schat's Tone Clock. This analytic model consists of 12 twelve-tone rows, each of them constructed by sets of similar tri-chords types. The twelve-tone rows are interrelated because they share common interval connections. In chapter 4 applications of the theory of Schat's Tone Clock will be discussed in detail.

O'Gallagher transfers Schat's compositional system into a practical tool for the improviser. As the theoretical background for his trichord and row operations he briefly

discusses Anton Webern's use of derived rows based on trichords and his trichord transformations: inversion, retrograde, retrograde inversion and transposition. He recommends the first operation, transposition, as the key technique to get familiar with the trichords and their inversions, with the triad combinations and with the rows as a whole. The other three he considers "operations composers typically applied to twelve-tone rows." Of these, retrograde is more familiar to improvising performers – as the descending way of playing traditional scales and modes – than inversion and retrograde inversion, which are more current in composer's practices. O'Gallagher's connection with twelve-tone techniques is also obvious by his terms and definitions such as pitch (note); set (a collection of pitches either ordered or unordered); tri-chord (any set or segment of 3 pitches); tetrachord (any set or segment of 4 pitches, in traditional jazz harmony known as a seventh chord); prime form (the fundamental form of a trichord, a set of trichords or a row from which all variations are derived, in traditional harmony called root position); rotation (a cyclic permutation of either pitches or sets in which the first pitch of a set is moved to the last positions or the first set is moved to the last position of the set order, in traditional harmony called inversion).
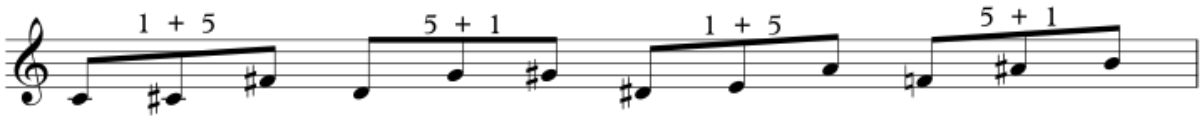
Despite these connections to the domain of twelve-tone composition O'Gallagher explicitly discards the basic rule that rows should be careful not to imply any kind of traditional harmonic movement. Moreover, the student is advised to use his method creatively and to not limit himself exclusively to the twelve-tone system, because, according to O'Gallagher, any combination of tri-chords can generate a musically valid statement without necessarily using a twelve-tone row. With this he confirms the observation of Wuorinen that, in the current state of twelve-tone practice, the main determinants of musical coherence are "the ordered successions of intervals" and that "even twelve-ness […] cease[s] to have the fundamental significance [it was] once thought to possess" (Wuorinen 1994:8).

O'Gallagher presents his devices as practice tools "to help the ear create interesting sounds." His exercises are intended to train the ear to a new way of hearing harmonic and intervallic space, as an addition to the linear improvisation skills that are taught in traditional jazz education. The goal of this method is to expand the reader's melodic content and understanding of interval relationships. Working with his exercises would enable a musician to recognize the distinct sound of each tri-chord and its corresponding row in the same way he recognizes harmonies from major and minor scales. O'Gallagher claims that although his method can be approached as a tool that generates musical lines and chords that are not related to traditional music theory, it can also be applied to functional harmony. The way his exercises are arranged represents this duality.

The three main elements in O'Gallagher's method are intervals, trichords and twelve-tone rows. These rows consist of four tri-chords and the tri-chords consist of two intervals.
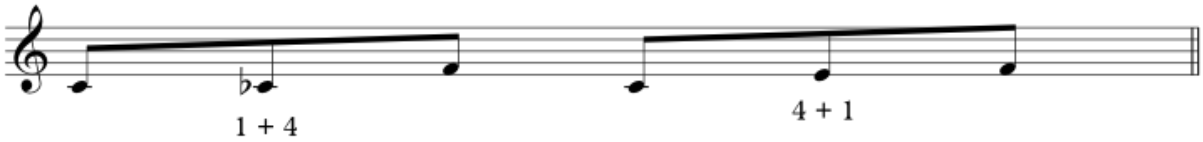
The sizes of the intervals in the trichords range between a minor second and a perfect fourth. They are indicated by figures: 1 means a minor second; 2 a major second; 3 a minor third; 4 a major third; and 5 a perfect fourth. Each trichord is marked by the two figures of its intervals – the smallest interval first –, connected with a plus sign.

For example, interval 1+4 means a minor second, followed by a major third; for instance c–c♯–f♯. The twelve-tone rows each consist of four members of the same trichord family, arranged in such a way that a complete twelve-tone row results. For instance, of the four trichords of the 1+5 family in the twelve-tone row below, the first and the third display the order 1+5. The second and the fourth trichord display the order 5+1.



[ex 3.7.1.1 – twelve-tone row 1+5 and 5+1 (O'Gallagher 2013:24)]

O'Gallager's method discusses all trichords in five steps. First he lists the trichords in their prime forms, first and second rotations, followed by a survey of all possible combinations of two trichords. Seven tri-chords are non-symmetric, with different intervals between the three pitches: 1+2; 1+3; 1+4; 1+5; 2+3; 2+4 and 3+4. They are presented in two versions. The first starts with the smaller interval followed by the larger interval. The second goes the other way around.



[ex 3.7.1.2 – trichord 1+4 and 4+1 (O'Gallagher 2013: 97)]
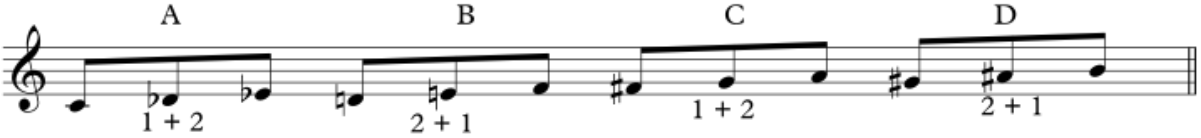
The remaining five trichords are symmetric and contain the same distances between the pitches: 1+1; 2+2; 3+3; 4+4 and 2+5; the first four are presented in only one version because rotation doesn't change their intervallic structure.



[ex 3.7.1.3 – trichord 4+4 (O'Gallagher 2013:244)]

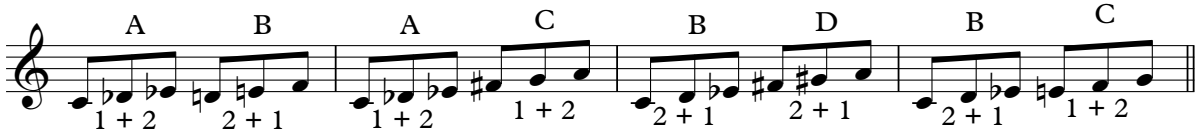
Trichord 2+5 is an exception. O'Gallagher considers this a symmetric trichord because its first rotation turns the non-symmetric 2+5 into a symmetric 4+4.

Next O'Gallagher constructs trichord combinations from the row. In the following example the trichords in row 1+2 are ordered as A B C D.



[ex 3.7.1.4 – row 1+2 (O'Gallagher 2013:50)
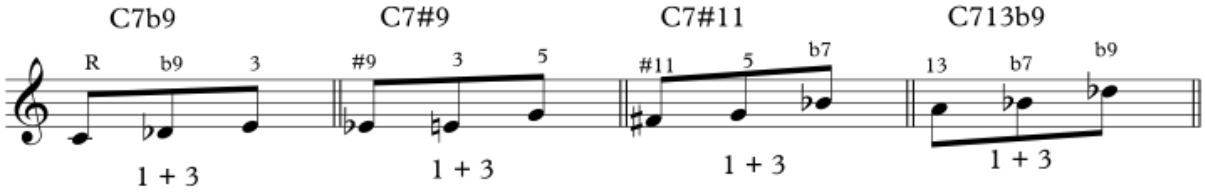
From this row, the following trichord combinations can be derived: A+B; C+D; A+C; B+D; B+C; and D+A. In the resulting six-note patterns displayed in the following example, each pattern is transposed to start from the root note c. Trichord combinations C+D and D+A are left out because, as a result of this transposition, they would sound exactly the same as combinations A+B and B+C.



[ex 3.7.1.5 – combinations of trichords 1+2 and 2+1 (O'Gallagher 2013: 37-39)]
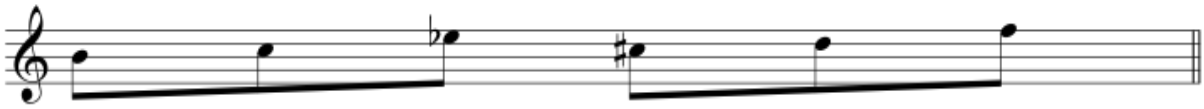
After the exposition of all trichords, O'Gallagher thoroughly discusses their diatonic applications in three steps. First, he superimposes single trichords as chord voicings over all 12 tones as bass notes and attributes the appropriate harmonic qualities as chord

symbols to each of them. Next, he superimposes single tri-chord and combined tri-chord applications that fit the chord tones and tensions from the associated modes on the "common chord types" Gm, C7 and Fmaj7. The next example shows tri-chord 1+3 in prime form and in three transpositions, fitting respectively the modes of C mixolydian b2; C blues; C Lydian b7; and C half-whole tone diminished.



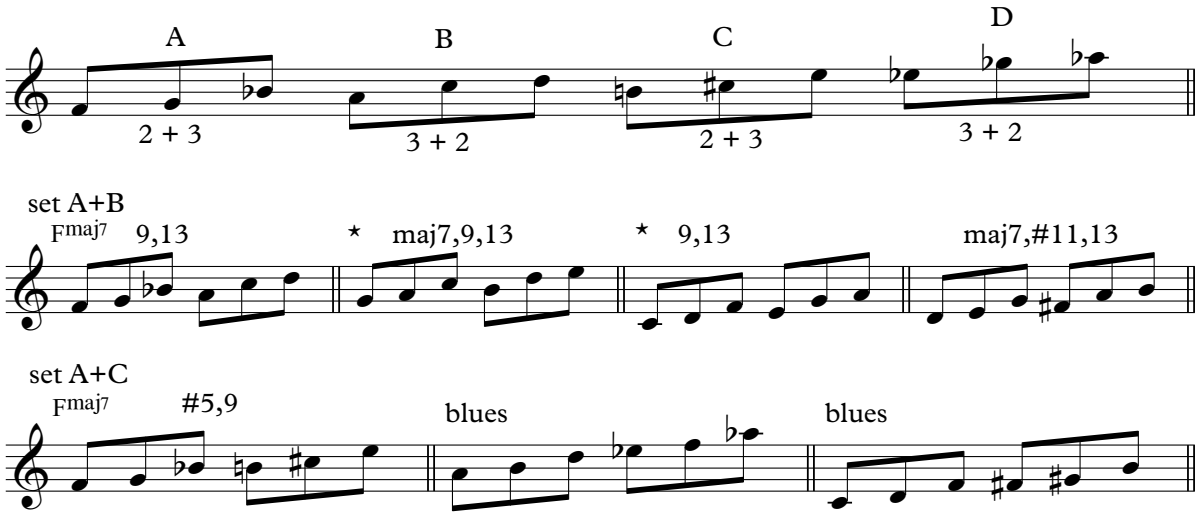
[ex 3.7.1.7 – single trichord 1+3 over C7 (O'Gallagher 2013:84)]

As his third step, O'Gallagher superimposes all possible sets of two trichords on each of the three common chord types. Many of the diatonic applications of these sets depend on the ear of the performer. They can contain a mixture of inside and outside trichords, for instance the next example, superimposed on Gm. To my ears it sounds as a $D7^{b9b10}$ chord, with a pull to Gm.



[ex 3.7.1.8 – combined 1+3 trichords superimposed on Gm (O'Gallagher 2013:85)]

As to the diatonic application of his trichords and combinations of trichords on common chord types, O'Gallagher's method is able to define levels of dissonancy by manipulating the trichords. The next example illustrates diatonic applications of the trichord 2+3 on Fmaj7. The first line shows row 2+3 and 3+2 in prime form. The second shows a succession of combinations of prime form and transposed trichord combinations A+B (2+3 and 3+2). The ones marked with an asterisk are the most important in defining the sound of the chord. In other words, they sound the most inside. The second line shows combinations of set A+C. The interval of an augmented fourth between the initial notes of the trichords cause these combinations to sound more outside.



[ex 3.7.1.9 – diatonic applications of trichord 2+3 on Fmaj7 (O'Gallagher 2013: 151)]

Only after his extended discussions of the trichords and trichord combinations from each row does O'Gallagher display its complete form, its steering trichords and the number of unique transpositions, i.e. the number of transpositions that is possible before the row repeats itself in another key. To some of the rows he also connects their characteristic tonal colors, such as diminished or augmented, or a color that suggests the sound of any of Messiaen's modes of limited transposition.

Finally, he discusses the related or embedded rows. These rows are constructed with the so-called steering trichords that are found by grouping the first notes of the trichords in the basic row. Five of the non-symmetric rows and two of the symmetric rows can appear in different orderings that are related to different steering trichords. The reader is advised to use these relationships first in compositions and then later in improvisations. I will come back to the issue of the steering hours in chapter 4.
The following table summarizes the trichords, their number of possible constructions, the number of unique transpositions, their steering trichords and their tonal colors.

type of trichord	number of constructions	type of steering trichords	tonal colors	number of unique transpositions
Non symmetric rows				
1+2; 2+1	1	2+4	partial dim 1/2-1; dim 1-1/2	6
1+3; 3+1	2	2+3; 5+1	symmetric at tritone; 2 symm augm scales at a whole step dist	6
1+4; 4+1	3	2+2; 2+4; 3+3	augmented; Messiaen 4th and 5th mode of lim transp	12; 6; 3
1+5; 5+1	1	2+1	various; Messiaen 5th, 4th; partial dim scales; quasi blues sound	12
2+3; 3+2	1	4+2	pentatonic; quasi blues scale; Messiaen 4th (truncated)	6
2+4; 4+2	3	1+3; 3+1; 4+1	whole tone scale; augmented; resolving strength	12
3+4	2	2+2; 2+4	conventional triads in unconventional orderings; V7alt-i inside hexachords	12; 6
2+5	3	1+2; 2+4; 3+3	fourth chords	12; 6; 3
Symmetric rows				
1+1	1	3+3	chromatic scale; harmonically undefined; cluster chords	3
2+2	2	1+5; 3+3	whole tone scale; two incomplete major scale at tritone distance	6; 3
4+4	6	1+1; 2+1; 5+1; 2+3; 3+3; 3+2+1	augmented	4; 4; 4; 4; 4; 4
3+3+3	1	1+1	diminished	1

[ex 3.7.1.10 – table of trichord characteristics]

3.7.2 Practical applications
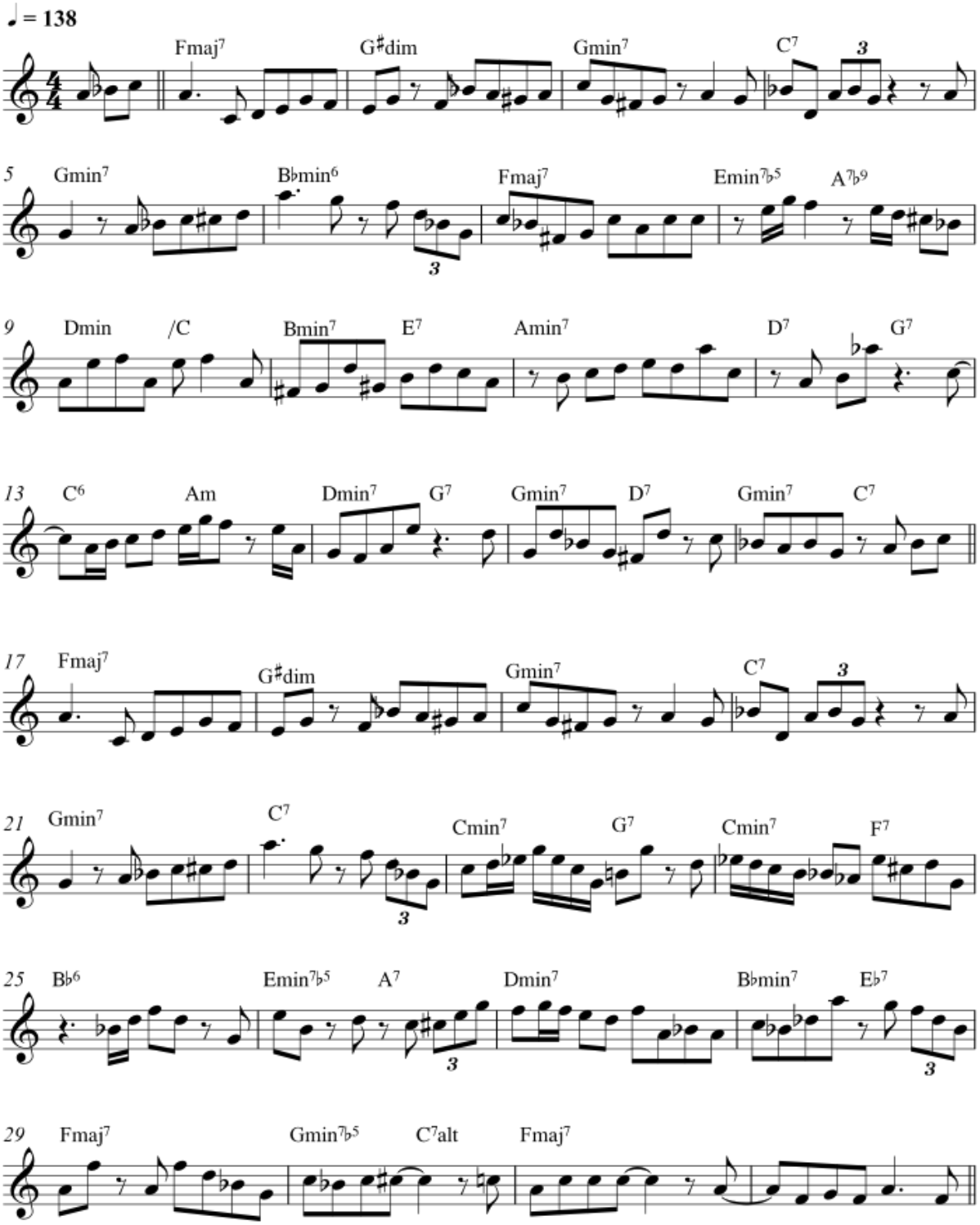
The analysis of trichord types in a melodic and harmonic context as discussed by O'Gallagher in his introduction inspired me to apply a trichord reduction on Charlie Parker's "Quasimodo" and to redistribute the pitches in random permutations and intuitive rhythmic phrasings, while I kept to the original chords. Next I re-harmonized Miles Davis' "Tune Up" by superimposing a new chord structure based on a succession of 1+5 trichords on the original chord changes.

The following three examples illustrate my trichord operations as applied to "Quasimodo". The first example is the lead sheet for tenor saxophone in Bb. The second example is my trichord analysis of the theme. The third example shows the lead sheet of "Quasi Mad Though", my re-composition of "Quasimodo" on the basis of this trichord analysis.
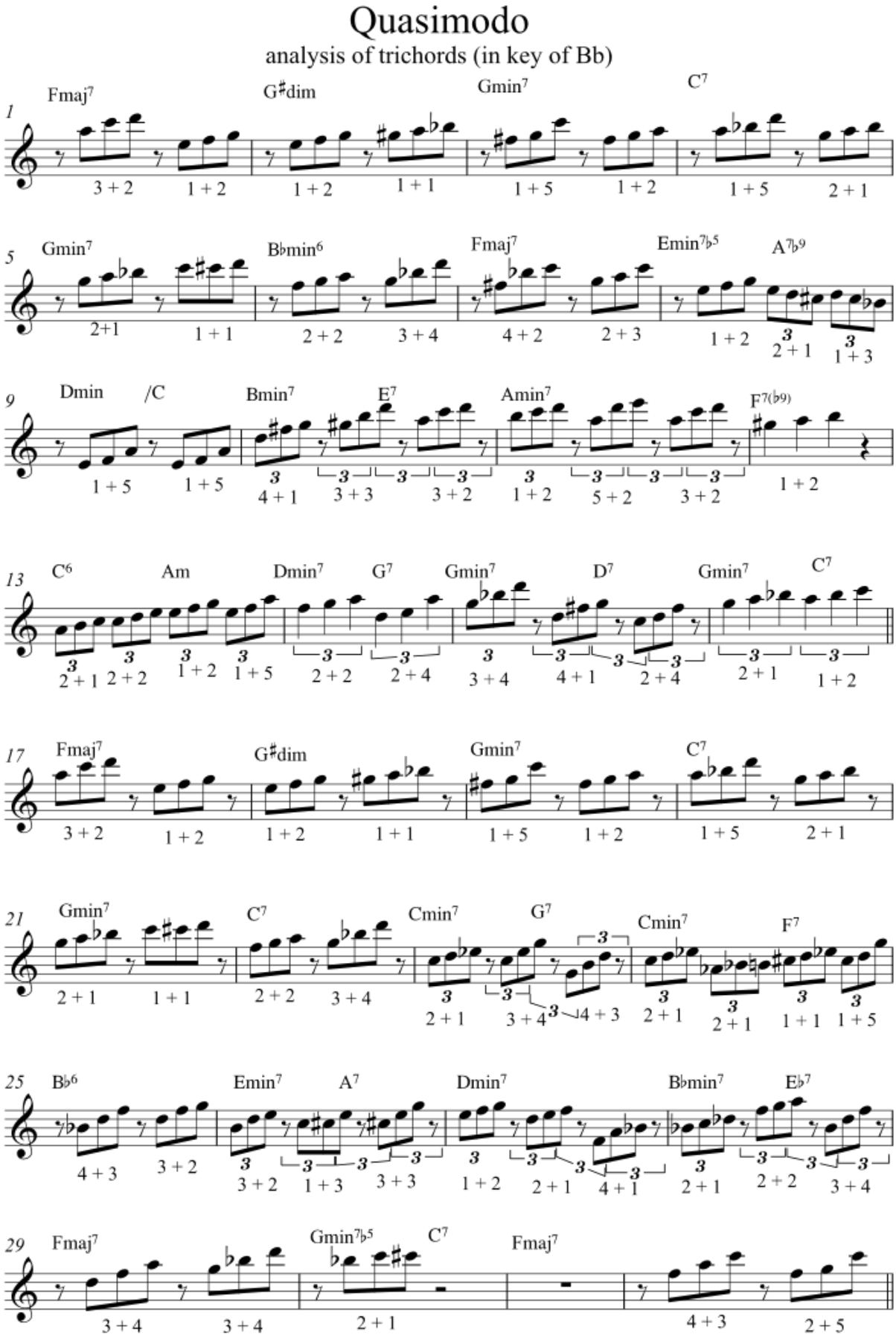
Quasimodo

theme transposed to Bb tenor saxophone

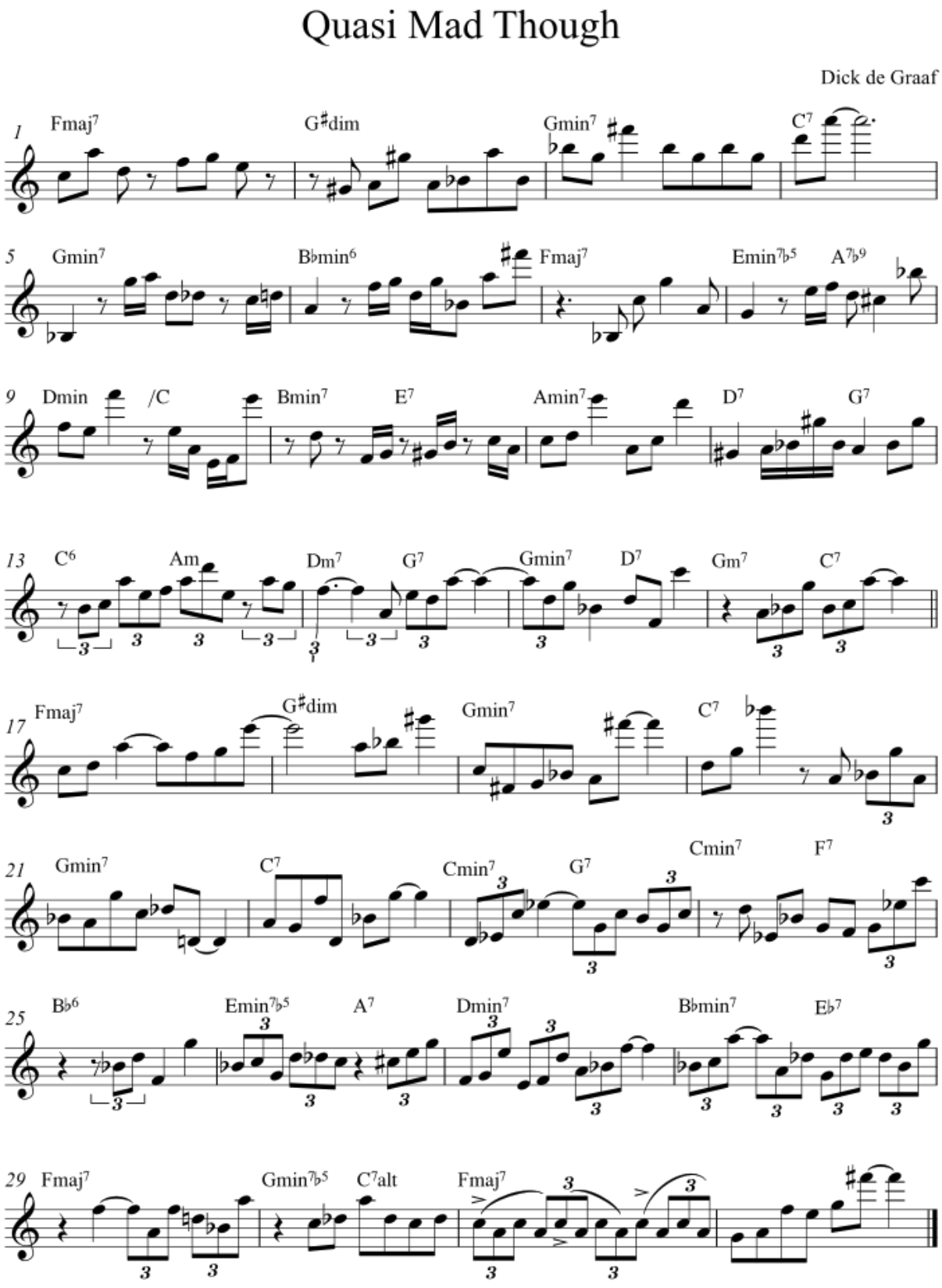
Charlie Parker



[ex 3.7.2.1 "Quasimodo" (Charlie Parker) – original theme (Bb-insturments)]
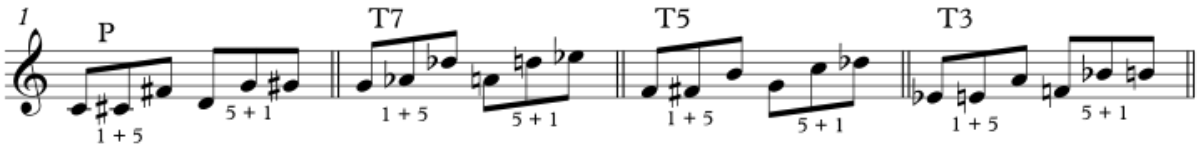


[ex 3.7.2.2 – trichord analysis of "Quasimodo"]
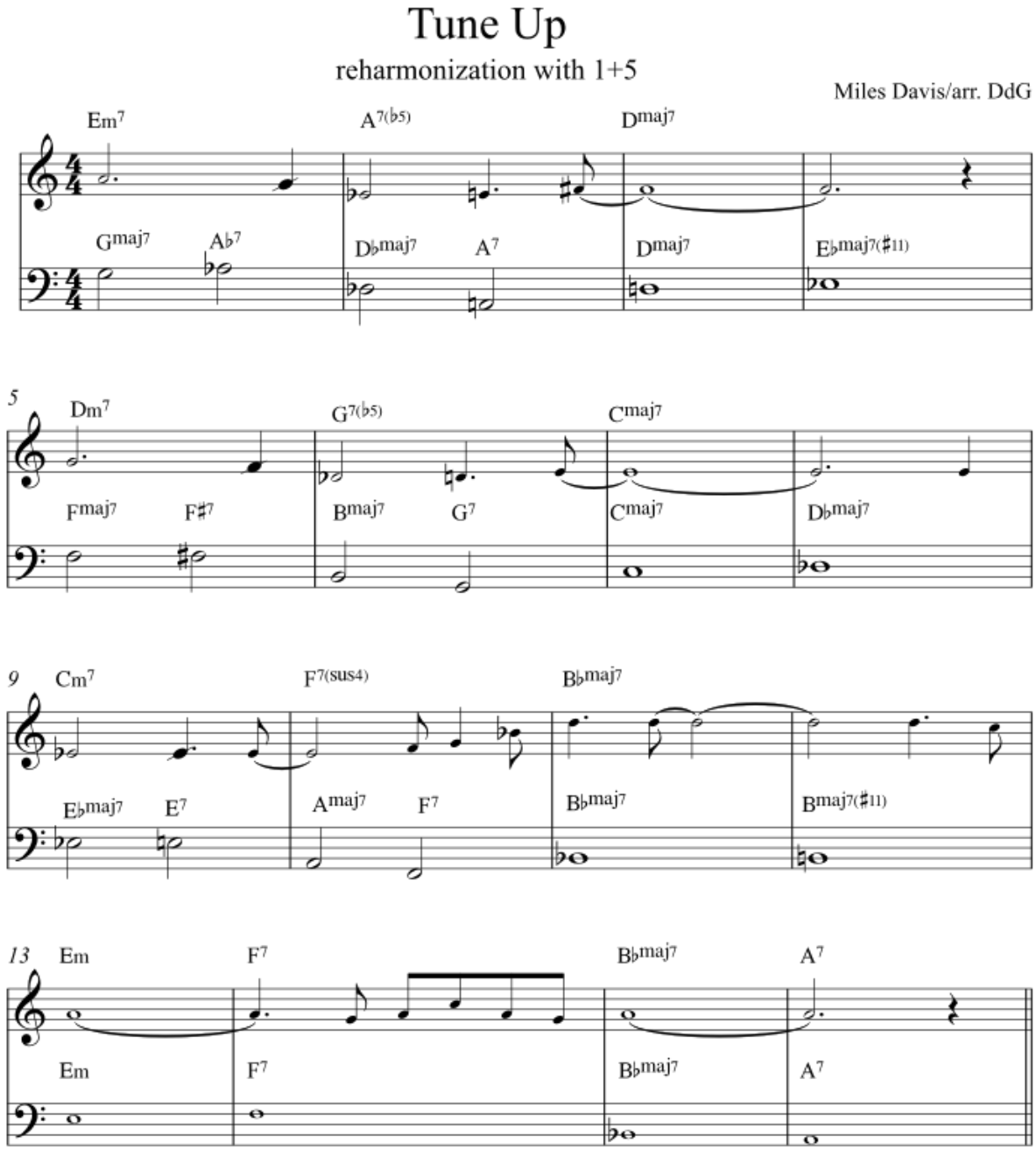


[ex 3.7.2.3 – re-composition on the basis of tri-chord analysis of "Quasimodo"]

The next example shows my application of trichords to reharmonize the chord changes of the jazz standard "Tune Up" (Davis) by superimposing combinations of trichord 1+5. The following line shows how the prime form (P) of trichord combination A+B from the 1+5 row is transposed by T7 (a perfect fifth), T5 (a perfect fourth) and T3 (a minor third). In my re-composition, the pitches resulting from these operations become the root notes of the new chord changes.



[ex 3.7.2.4 – transpositions of A+B from row 1+5]
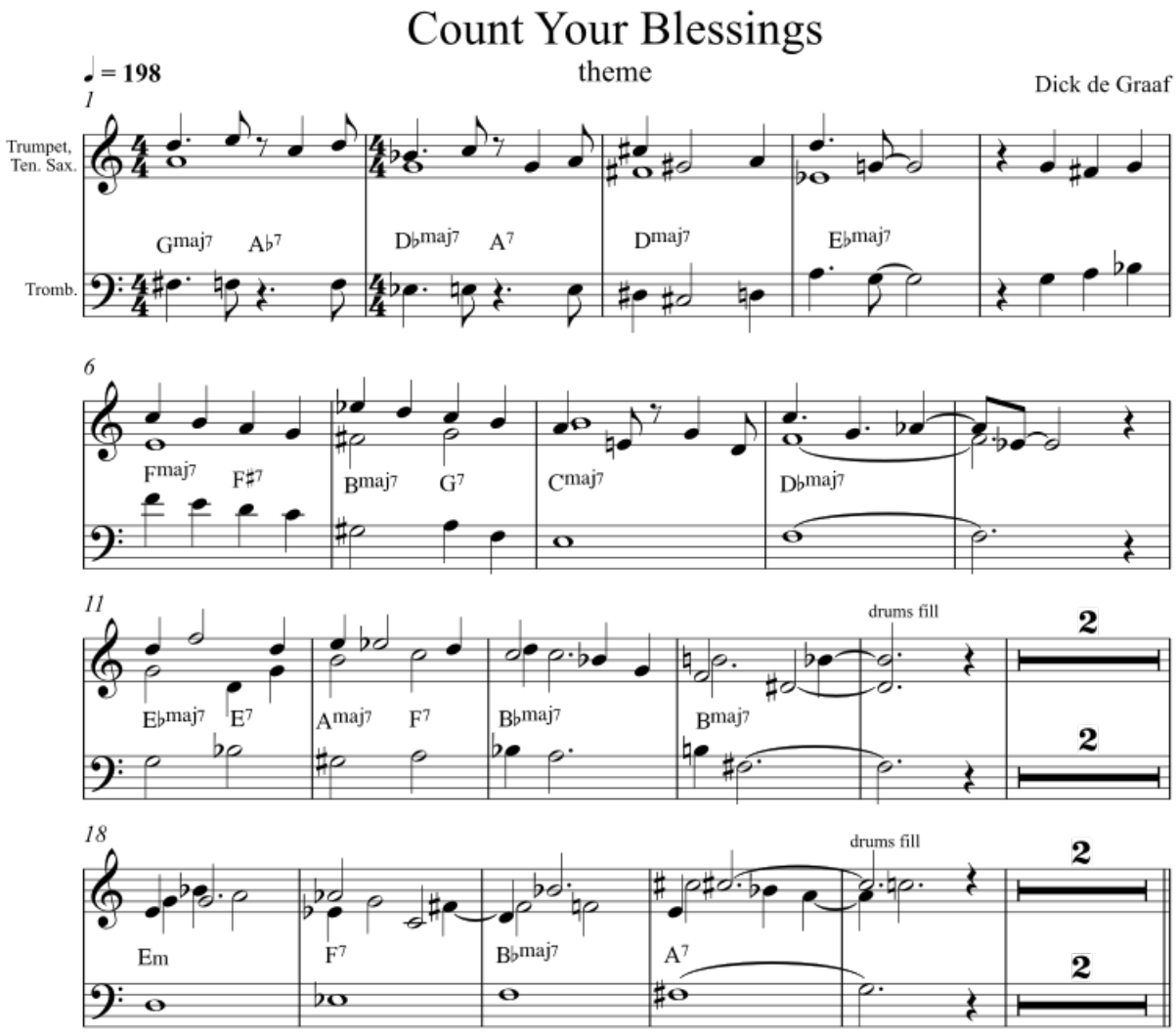
In the next example the upper staff shows the original melody and chords, the lower my superimposed harmonies. The notes in the original melody that conflict with the new accompanying chords are crossed.



[ex 3.7.2.5 "Tune Up" (Miles Davis) – reharmonization with combinations of trichord 1+5)]

The following example displays my composition "Count Your Blessings" in an arrangement for tenor saxophone, trumpet, trombone, bass guitar and drums. The upper staff shows the trumpet and the tenor saxophone melodies. The lower staff shows the trombone part. In between the staffs are the basic accompanying chords that also serve as chord changes for the solos. I imagine that, just as with the concept of "Coltrane changes", tenor saxophonist John Coltrane's superimposed chord structures on ii-V-i
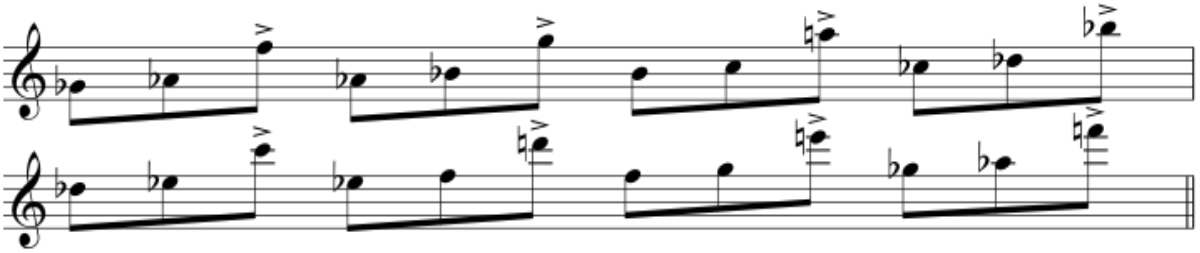
cadences, my chord changes derived from the fifth hour can be used alike to add a fresh sound to these conventional chord changes. This application of the Tone Clock serving as a bridge between dodecaphony and tonality can be considered a useful technique to help improvisers enriching their artistic palette.



[ex 3.7.2.6 "Count Your Blessings"]

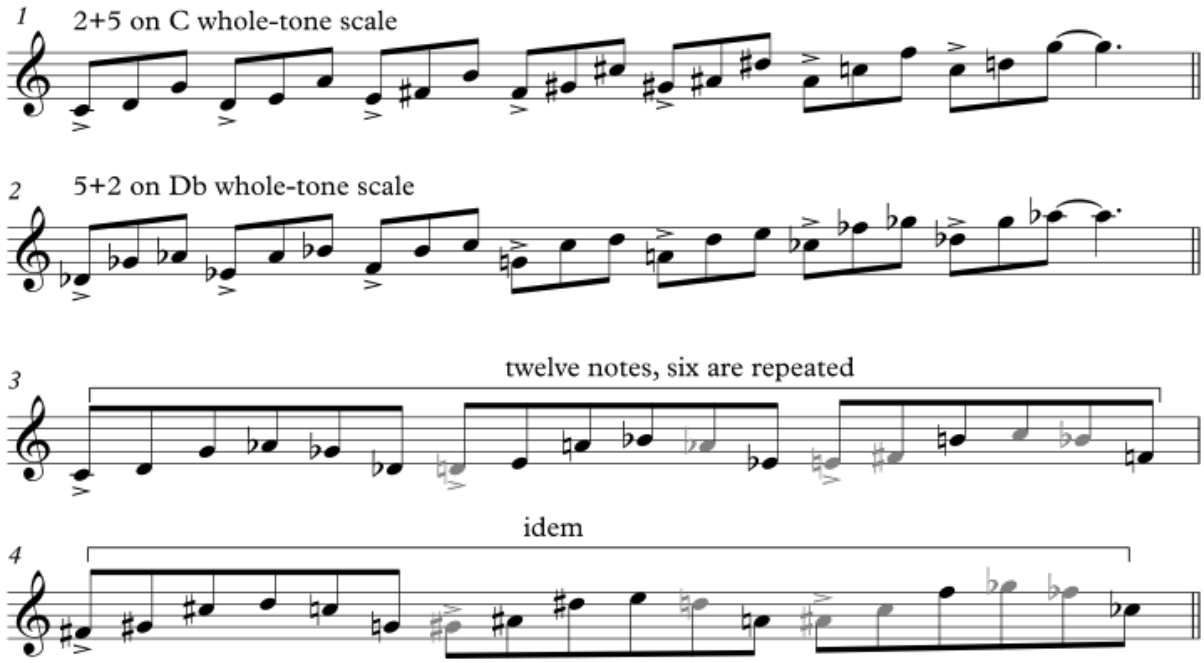
The following applications of trichords and rows in a tonal context, are examples of operations that quickly became part of my personal improvisational language. The first is based on row 1+2. Because of the combination of the sound of a major second between the first and the second note and the sound of a major seventh between the first and the third, I became attracted to the first rotation of row 1+2 as an operation to embellish pitches, groups of pitches and complete scales. The next example shows the embellishment of the scale of F major. All trichords are constructed as a first inversion of

1+2. As a result of this intervention, the scale is represented in the top notes while the lowest notes form the scale of Gb major.



[ex 3.7.2.7 – row with 1+2 R1, embellishing the scale of F major]

The second example shows my application of the trichord 2+5 in combination with two whole-tone scales. In bar 1 the trichord 2+5 is placed on every degree of the C whole-tone scale and in bar 2 the trichord 5+2 is placed on every degree of the Db whole-tone scale. By merging these two scales and by alternately playing the trichords in ascending and descending directions the row in bars 3–4 results. This row contains two twelve-tone rows, each with six notes repeated. These repeated notes, marked in grey colors, together form the C whole-tone scale. With its high density, this scale pattern lacks an obvious tonal reference, making it an attractive pattern to be superimposed on using a multitude of pre-given or imaginary chord changes.



[ex 3.7.2.8 – twelve-tone pattern of trichord 2+5 combined with two whole tone scales]

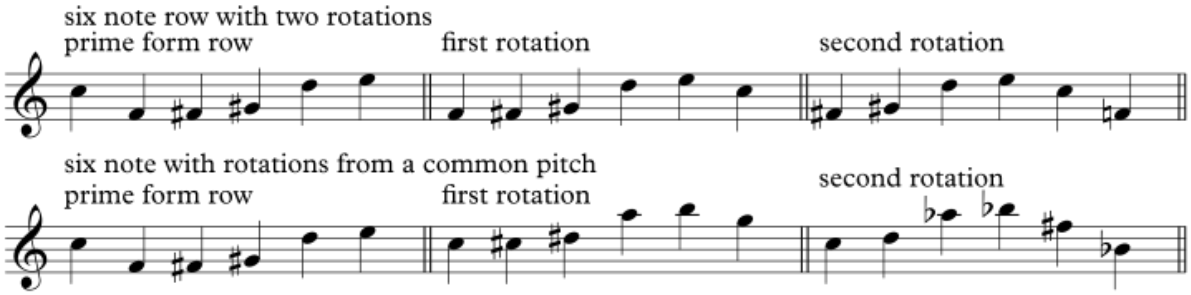
3.7.3 Twelve-tone techniques

In contrast to Liebman's treatise on chromatism, Bergonzi's systematic intervallic method, Garzone's chromatic triadic approach, and Weiskopf's and Bergonzi's applications of triad pairs, O'Gallagher's method is explicitly based on twelve-tone techniques. Both in his examples and in his practical instructions, he thoroughly addresses the twelve-tone operations of transposition, rotation and extension. For example, he advises to apply the following seven exercises to every type of trichord as follows. (O'Gallagher 2013:36) I have marked the appropriate techniques between parentheses.

1. Practice root position trichords chromatically in various directions [transposition].
2. The same with first rotation trichords [rotation, transposition].
3. The same with second rotation trichords [rotation, transposition].
4. Practice longer patterns of each trichord using all rotations [rotation and extension].
5. Practice trichord rotations from common tones [rotation, transposition].
6. Practice freely combining the various transpositions and rotations [rotation, transposition].
7. Practice all two trichord combinations using all transpositions [transposition, extension].

Furthermore, in his exposition of row 1+2 he demonstrates retrograde, inversion and retrograde inversion as "basic operations on the row" (O'Gallagher 2013: 52) listing all possible combinations of two, three and four trichord combinations from the row and outlining comprehensive row exercises.

Compared to Bergonzi, Garzone and Weiskopf, the performer who wants to become familiar with O'Gallagher's operations will have to spend substantially more time and effort mainly on the typical composer's operations that are suggested. For instance, the following rotation from a common pitch – referred to as "one technique by Stravinsky and other composers to develop a row" (O'Gallagher 2013:6) - is an interesting addition to the technique of mere transposition to get familiar with the trichords, but it takes time before a composer's operation like this will pop up spontaneously in an improvised line.



[ex 3.7.3.1 rotations from common tones (O'Gallagher 2013: 32,33)]

3.7.4 Evaluation

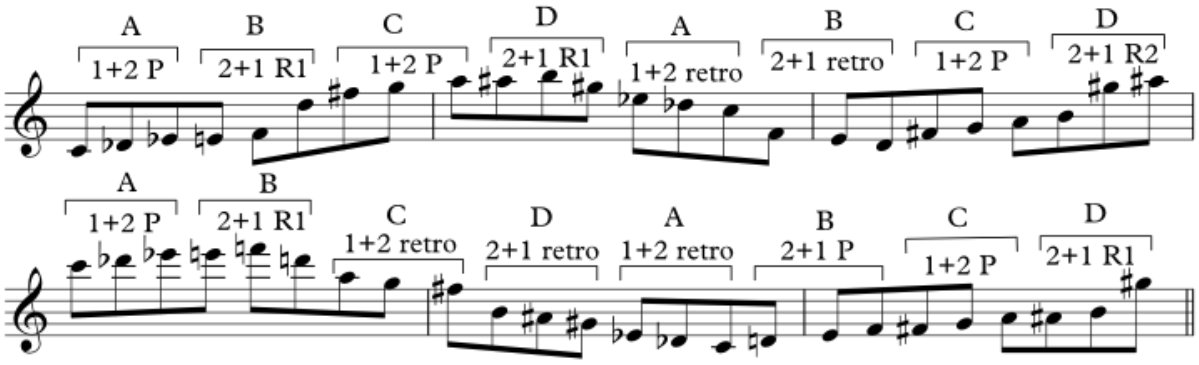
As a composing improviser O'Gallagher created a method for twelve-tone improvisation based on the analytic model of the Tone Clock that was designed by Schat, a twentieth century composer of modern classical music with no connections to jazz and improvised music. The relationship between composition and improvisation based on this actual model is however missing in O'Gallagher's book; he mainly addresses the improvising performer. The act of composing is merely mentioned as a pedagogical tool to learn to apply the trichords, their combinations and their variations. His advice to examine the relationship between the rows, by applying them first in compositions, before they are transferred into improvisations is quite open-ended. Furthermore, although the players of chordal instruments are advised to "play these trichord exercises as simultaneities as well" (O'Gallagher 2013:70,96), the polyphonic application of the method is also given few attention.

As to the aesthetic aspect of his approach, I consider it an inspiring tool that enables a performer to create infinite quantities of interesting sounds by manipulating a relatively small number of basic intervals, rows, and operations. It helped me to deepen my hearing and understanding of interval relationship, as a useful addition to my existing skills. Because of the large number of detailed examples, O'Gallagher's book can be considered a thesaurus of operations with trichords and related rows. "Whether it works" depends on the artistic motivation of the individual artist who wants to find out "how it works" for him.

One could argue that the melodic lines that result from applying O'Gallagher's complex operations don't always allow the informed listener to clearly identify the distinct trichords and trichord combinations. I assume that O'Gallagher's preferred audience has a level of experience with listening to complex music, by which it is able to appreciate his twelve-tone approach as an interesting way of playing outside the beaten tracks of jazz improvisation. However, particularly in the initial stage of mastering these techniques of intervallic improvisation, performers should be able to hear and play the distinct trichords clearly before they start blending them with members of the other trichord families.

Unfortunately, the implications of the predominant three-ness as a result of the trichord manipulations are not given attention in his book. The same goes for the directions of the lines. Although in the summary of trichord exercises the student is advised to practice the trichord and its inversions in various directions, it is striking that the exercises are basically written in ascending directions. Only at the end of the exposition of row 1+2

does O'Gallagher display examples of trichord combinations in both ascending and descending directions. For instance, in the next example he creates a melodic line using the trichords from row 1+2 in alternating directions. The connections between the trichord sets are made by using the next closest neighboring tone and continuing the direction of the line. There are a variety of rotations in this line that follow the set pattern ABCD repeatedly (O'Gallagher 2013:67).



[ex 3.7.4.1 – trichords from the row in various shapes (O'Gallagher 2013:54)]

In addition to the five publications discussed earlier in this chapter, O'Gallagher's book offers a new perspective on playing outside the chords that highly meets my motivation to undertake this research project. With his pragmatic approach of an analytical model related to twelve-tone music, he introduced an alternative approach to intervallic improvisation, in the form of a detailed and systematic device with clear playing rules. His method is applicable both in twelve-tone as in tonal contexts. Thereby, in the improvisers' "backpacks" it can be both connected to, and stored alongside their existing knowledge and practices. Because O'Gallagher's publication combines the characteristics of a thesaurus with those of a didactical method, it offers the student multiple directions towards the selection of his personal applications.

My analysis of O'Gallagher's method showed three major problems. First, as I already mentioned before, in the practical applications of his twelve-tone approach, composing and arranging don't receive as much attention as improvisation. Second, the excessive collections of tonal references of all trichords and trichord combinations illustrate the drawback of presenting entire numbers of options in the form of a thesaurus. Because these patterns are not related to musical examples, for less experienced readers they will look like barely meaningful patterns that display a more theoretical than practical quality. Third, and more importantly, O'Gallagher did not offer clear solutions for a major rhythmic problem with his trichordal approach: the overwhelming three-ness, or more

precisely: the predominant presence of three-note groupings. These problems will be addressed in chapter 4.7.

3.8 Comparing the models

The authors of all six publications reviewed in this chapter express a variety of motivations to help (composing) improvisers learn new musical techniques. The effectiveness of their methods depends on the attitude of the students. Liebman expresses that an exploratory attitude in his students is crucial. He compares their artistic motivation to extend their playing beyond the limitations of functional harmony to their response to contemporary music, favoring those who prefer the dissonant sounds of the music of the twentieth century above the ordered diatonicism of earlier periods. Bergonzi's remarks on the importance and value of the musician's intuition allowed me to propose the concept "informed intuition" in order to express that this "precious gift" can probably never be isolated from the knowledge the students have achieved through study, experience and taste. Garzone addresses the motivational issue in plain language, saying that his method should simply enable him and his students to improvise freely. Weiskopf presents his book as a response to the actual need of his students to learn how to improvise with intervals because they hear that many modern jazz artists do so. O'Gallagher aims at those students who are motivated to learn a new way of hearing harmonic and intervallic space.

As to the applications of twelve-tone techniques, all authors in one way or another present their personal strategies to create tone rows. The term tone rows is not used in the traditional sense of a set of twelve pitches with strict serial principles, but to express that these lines are not based on diatonic or modal scales, but on successions of pitches that are ordered by intervals. Liebman, Garzone and O'Gallagher mention their relations to twelve-tone techniques explicitly, while Bergonzi and Weiskopf only implicitly refer to these techniques by taking intervallic constructions of melodic lines as their focal points. All five authors leave it to the discretion of the individual musician to make his choices from their models.

Remarkably, all authors consider their models as an addition to existing chord-scale improvisation. Liebman and O'Gallagher emphasize the importance of substantial expertise in linear improvisation before making steps into their new areas. Just as Weiskopf, they are able to precisely define the relationships between their operations and the underlying chord structures. O'Gallagher's, Bergonzi's and Garzone's intervallic

approaches basically intend to not imply tonal references, but Bergonzi argues and Garzone demonstrates that their systems can not be seen as totally distracted from conventional functional harmony.

O'Gallagher even emphasizes that, although his system provides his readership with the tools to hear and think in the twelve-tone system, it should not be limited exclusively to twelve-tone usages. Thus, his model is meant, in Wuorinen's terms, to create interactions between content and order of pitches and intervals. Weiskopf assumes that learning intervallic improvisation will improve his students' linear improvisation. Bergonzi and Garzone are more in favor of an intuitive approach. Bergonzi loosely formulates that "everyone internalizes and applies concepts in a unique way and [his] system is wide open for interpretation" (Bergonzi 2000:7). Likewise, the performers applying his operations discussed in *Hexatonics* (2006) are expected to rely on their informed intuition in order to find their way through the wealth of possible melodic and harmonic possibilities with this actual method.

Liebman, Bergonzi, and O'Gallagher explicitly advocate didactical applications of their methods such as ear training, rhythmic development, and composition of individual exercises. Although in the context of the actual study I am mainly interested in the creative applications of these and of related approaches, I now take a moment to summarize my experiences with applying their models in my own practice as an educator.

Liebman's treatise supported my educational practice just like it had supported my playing skills. It served as a roadmap for the journey into the more advanced improvisational practice beyond the chord-scale approach. His analysis of this developmental process, his chromatic concepts of tonal and non-tonal superimpositions and his sketch of the parallels with the development of classical music through the ages served as an illustrative theoretical background. Bergonzi's intervallic approach appeared to work well in a small ensemble class when the students were asked to write short compositions using a collection of three intervals. All students took advantage of having this clear context as a point of departure. Because I left open how strictly they should apply the operations with the orders and directions of their selected intervals, the results showed a large variety of compositions. The approach served particularly well to accelerate their process of getting started with composing and arranging their notes. Bergonzi's model appeared easily accessible as a compositional device, but any spontaneous application in the improvised part caused serious problems to most of the

students. Small exercises constructed with random selections helped them to develop their awareness and hearing of the interval combinations.

The introduction of O'Gallagher's approach in my improvisation classes was met with interest, but also with suspicion. To some students, the thorough and comprehensive structure of this publication caused certain pessimism, because they felt that they should master his tone rows and trichords completely before they would be able to apply them to their everyday improvisational language. On the other hand, some of them easily got used to manipulating certain trichords and started using them in little compositions. Examples from my compendium of generative patterns from the Tone Clock, discussed in subchapter 4.7, helped them to blend some of the trichord techniques with their existing improvisational languages.

Regarding Garzone's chromatic triadic approach I can say nothing other than the students in my improvisation classes had a lot of fun with it. With its simplicity, it is a quick and suitable tool to make the students feel comfortable playing outside the chords. Moreover, we experienced that by repeatedly playing certain lines, tonal colors would emerge. Consequently, it also served as a demonstration of Liebman's concepts of linear tonality, tonal anchors and harmonic lyricism.

In my improvisation classes, Weiskopf's operations combining triad pairs from underlying scales and modes appeared to be the most accessible of all models in this chapter. Bergonzi's hexatonics served well as a next step after Weiskopf, resulting in more advanced trichord combinations evoking more ambiguous tonal colors.
Thus, apart from my own practical experiences with the actual methods, I have noticed how they have inspired my students to add them to their existing skills. I assume that this will apply even more so to the techniques I will be discussing in the following chapters.

4. IMPROVISING WITH THE TONE CLOCK

4.1 Introduction: tonal and twelve-tone music

In the previous chapter, a variety of methods, implicitly or explicitly related to twelve-tone techniques, as alternatives to traditional chord-scale improvisation, were discussed. They were taken from publications by saxophonists who combine their practices as composing improvisers with their careers as leading jazz educators. After summarizing their systems and comparing their theories and practical applications, I discussed a number of applications of some of them to my own musical practices.

In this chapter I will summarize Peter Schat's Tone Clock in theory and in practice. Examples of Tone Clock application in jazz practices will be discussed using compositions by bassist Theo Hoogstins, pianist Frank Carlberg, and alto saxophonist John O'Gallagher. After the analyses of relevant fragments from their compositions and improvisations, I will discuss three movements of my saxophone quartet "Carillon", each of which is based on a distinct hour of the Tone Clock. The penultimate section of this chapter will display possible ways of constructing improvisational patterns with Tone Clock trichords as an alternative and addition to existing improvisational idioms.

The application of the twelve-tone system in this study is largely determined by my own search for a musical space that could serve as an alternative to my existing diatonic practices as a composing improviser. In section 1.4.4 I expressed certain dissatisfaction with my arrangements and improvisations, and a need for innovative harmonic issues as alternatives to my continuously filling in and ornamenting of existing forms within the tonal system. Inspired by Dutch bassist and composer Theo Hoogstin's article "Peter Schat's Tone Clock in Jazz and Improvised Music" I ended up experimenting with Schat's compositional model that pretended to bridge the tonal and twelve-tone systems.
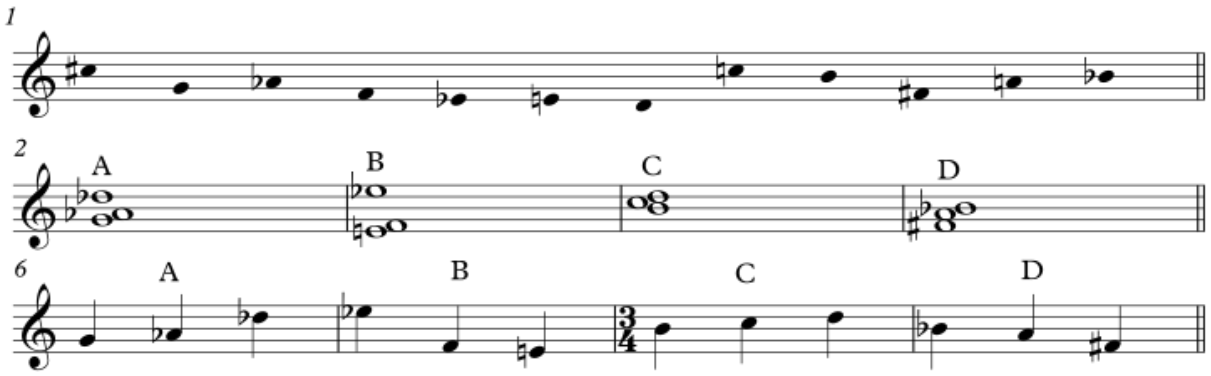
Before discussing Schat's Tone Clock, I look back to *Simple Composition* (1994) by composer and theorist Charles Wuorinen introduced in section 3.2.3. In the context of my experiences with the Tone Clock, an important element in Wuorinen's publication is his summary of both the differences and the similarities between tonal and twelve-tone music. According to Wuorinen, and put in its most simple way, tonality can be identified in terms of "content" and twelve-tone in terms of "order". That is, in tonal music the content of pitches and intervals is determined by their functions in the diatonic scale and its implied triads. We are able to identify such content as "the tonic", or "the root of the triad" independently, regardless of where the note or the interval appears in the melodic line, what register it is played in, or in whatever inversion of the chord. Contrarily, in

twelve-tone music the fundamental structure of the tone row is identified by the order of the pitches and their connecting intervals. The pitches do not have any functional content, and do not dominate each other. Only the order of the pitches and their connecting intervals identify the fundamental structure of a tone row.

Wuorinen explains how, both in the decades before the introduction of the twelve-tone system by the Austrian composer Joseph Matthias Hauer in 1920, and during its development until 1994, the two systems showed a number of similarities. Wuorinen uses the solemn term "reconciliation" to express these shared elements. Twelve-tone music can be seen as resulting from the evolution of the tonal system during the nineteenth century. New tones were added to the basic triads, resulting in extended chords that were hard to identify in terms of functional content. And by means of increasing melodic counterpoint, for instance in the music of Wagner, Stravinsky and the "freely" chromatic music by Schoenberg before he launched his 12-tone system, the amount of unresolved chromatic notes increased. So one could say that in the history of the development of Western classical music the two systems were intermingled before Arnold Schoenberg developed the idea of twelve-tone sets as a source for both the melodic and the harmonic material in a composition.

As to present-day practice, Wuorinen observes a blend of basic operations of twelve-tone composing, such as the derived tone row, the basic operations of transposition, inversion and retrogression of pitch successions, and the expansion of pitch successions to twelve-tone sets by adding other notes with tonal elements. The "reconciliation" results from the re-introduction of principles of pitch organization derived from interval content in small segments of twelve-tone sets, for instance trichords or tetrachords. By their small sizes these segments can be perceived as content groups rather than as rigidly ordered pitch successions (Wuorinen 1994: 21).

Wuorinen gives the following example as an illustration. The first line is a twelve-tone row in a strictly ordered succession. In bar 2 this line is divided into four groups of three notes. They are randomly arranged in vertical order. In the third line the notes of each group are internally re-ordered at pleasure, which in this case means in alternating ascending and descending directions.



[ex 4.1.1]
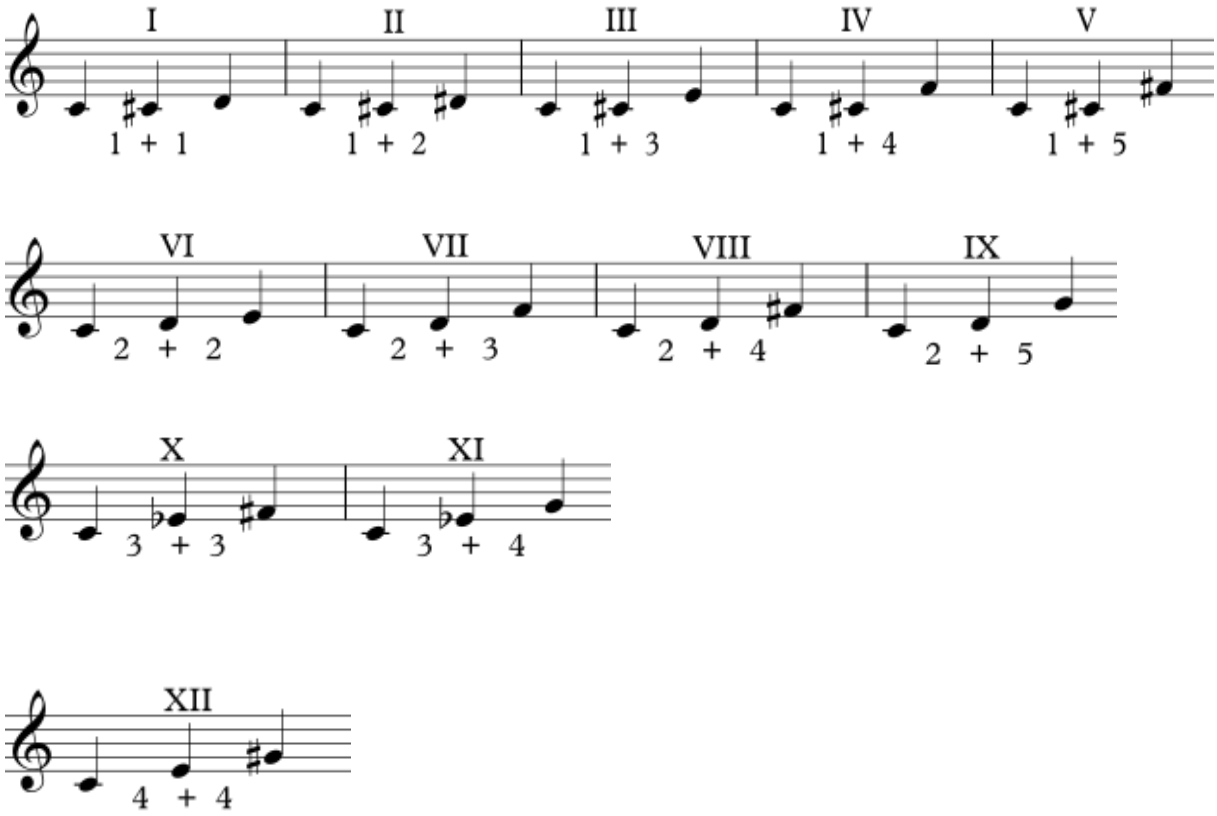
According to Wuorinen, the critical response to twelve-tone music is mainly due to its numerical notation allowing composers to translate the basic twelve-tone operations discussed above into arithmetic operations that could be applied to (segments of) the twelve-tone sets. In section 4.3.1, this will be illustrated by Schat's ferocious criticism on the numeric aspect of twelve-tone music.

4.2 Peter Schat's Tone Clock

Schat introduced the Tone Clock as "a tool for scanning the relations between the different notes of our tone-system" (Schat 1993: 57). With this definition, he intended to include both parts: the tonal system in which every pitch has its proper content at one side, and the twelve-tone system in which the order and the intervallic structure are the main elements of determination at the other.

At the core of what he calls his "system of pitch organization" is his inventory of twelve possible "triads" that can be combined in order to let all twelve pitches of the octave sound. He called each of these "triads" a "tonality" and marked them with the Roman numerals of the hours of the clock. To avoid confusion with traditional functional harmony, his term "triad" in this study is changed into the term "trichord", in accordance with conventional twelve-tone terminology. For the same reason, the term "tonal color" is used instead of his term "tonality" to characterize the distinct sounds of the twelve trichords.
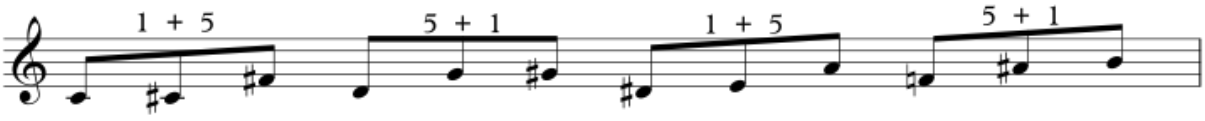
Below are the twelve hours of his Tone Clock, marked by Roman numerals above the staff. The numbers connected with a plus sign under the staff refer to the number of semitones between the pitches.



[ex 4.2.1]
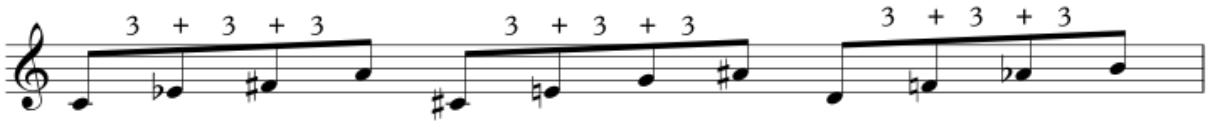
Schat could limit the number of possible trichords to a total of twelve by applying two rules. The first is: trichords containing similar intervals but in different order belong to the same Tone Clock hour. For instance, the trichords 1+5 and 5+1 in the example below both belong to the fifth hour. As a consequence of this rule, a succession of trichords from the same hour, but in different orders will be named by the trichord with the smallest interval first.

By alternating the order of the intervals in the trichords, Schat managed to derive twelve-tone rows with four trichords from the same Tone Clock hour. The next example shows his derivation of the row of the fifth hour. Of the four trichords in the twelve-tone row below, the first and the third are put in the order 1+5. The second and the fourth trichord are put in the order 5+1. Together they form a twelve-tone row.



[ex 4.2.2]
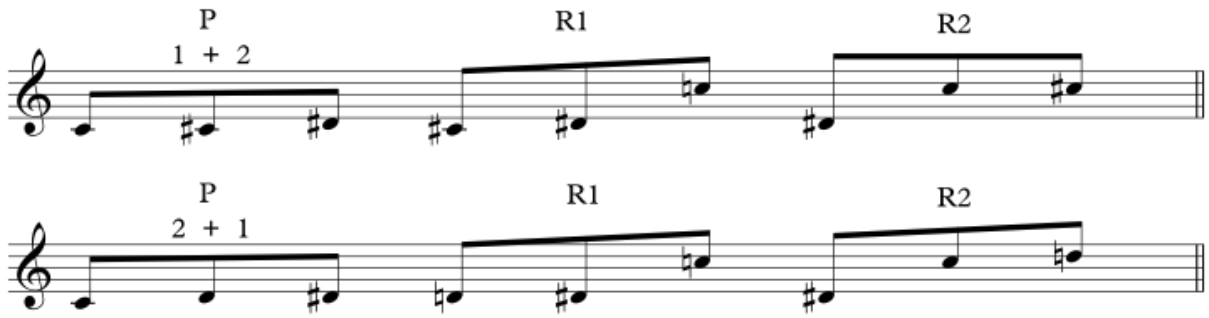
The only exception is the tenth hour, representing the diminished trichord 3+3. This is displayed as three tetrachords, because it is impossible to include all twelve notes with four 3+3 trichords.



[ex 4.2.3]
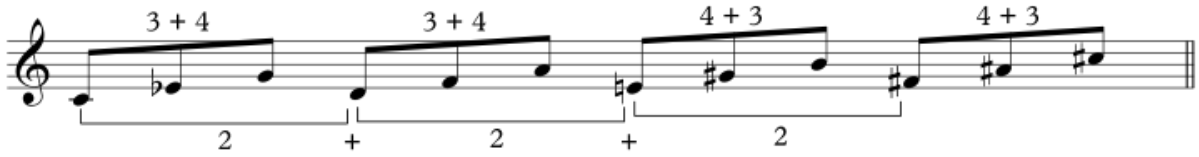
For his second rule to limit the number of possible trichords, Schat defined trichords containing an interval larger than 5 semitones (a perfect fourth) as an inversion of a smaller trichord. For example, the 1+6 trichord c–c$^{\#}$–g is regarded as the first inversion of the 5+1 trichord g–c–c$^{\#}$ and therefore belongs to the fifth hour. Likewise, the 2+6 trichord c–d–g$^{\#}$ belongs to the eighth hour as the first inversion of the 4+2 trichord g$^{\#}$–c–d. As another example, the 8+3 trichord c–g$^{\#}$–b should be regarded as the second inversion of the 3+1 trichord g$^{\#}$–b–c and therefore belongs to the third hour. Trichords with two intervals larger than a perfect fourth should also be regarded as inversions of trichords of these intervals in their smallest form. For instance, the trichord in wide voicing g–f$^{\#}$–c should be reduced to the first inversion of the 1+5 trichord f$^{\#}$–g–c, with the note c in octave displacement.

The Tone Clock hours I, VI, X and XII are symmetrical, which means that the intervallic structure of the inversions of their trichord types is the same as that of their prime forms. The hours II, III, IV, V, VII, VIII, IX and XI are non-symmetrical, which means that their types of trichords can be put in three different positions: prime form, first and second inversion. In accordance with the conventional twelve-tone terminology, the term "inversion" in this study is replaced by "rotation". The next example shows the prime form (P), the first (R1) and the second rotation (R2) of trichords 1+2 and 2+1 from the second hour.
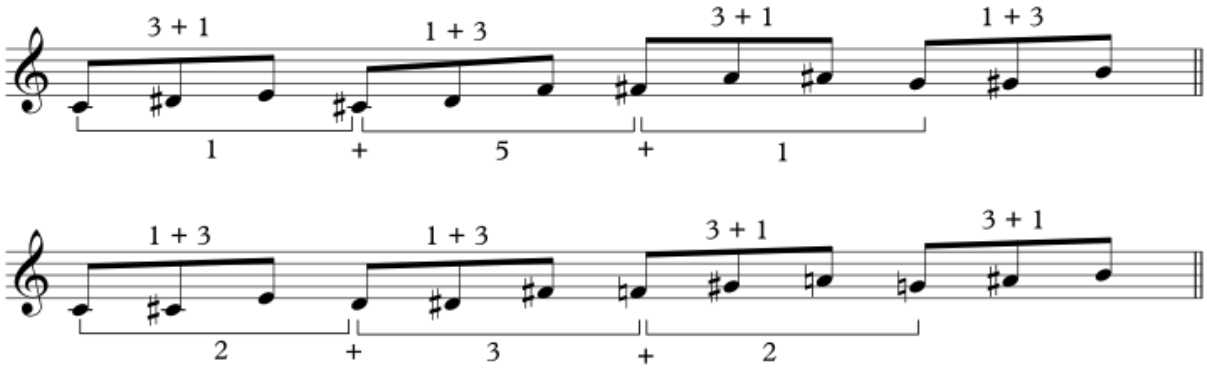


[ex 4.2.4]

Another principle of the Tone Clock is that every hour is "steered" by at least one trichord that belongs to another hour. For instance, the following example shows a twelve-tone row in which the 3+4 trichord of the eleventh hour is steered by the 2+2 trichord from the sixth hour. The trichords of the row are written above the staffs, and the steering trichord is written under the staffs.



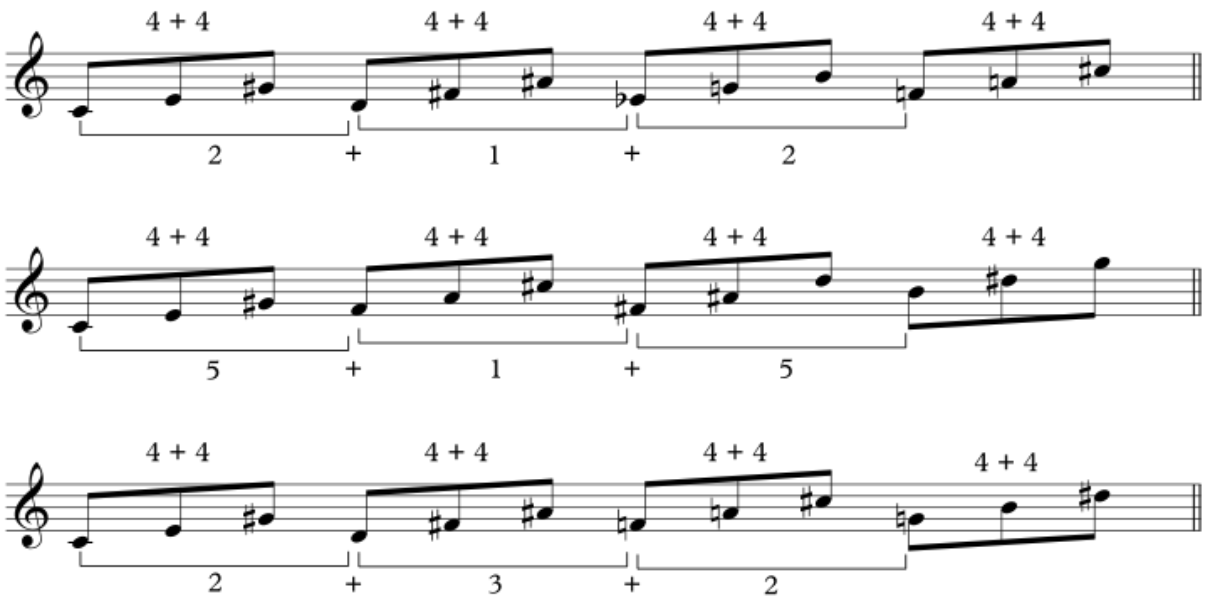
[ex 4.2.5]

The next example shows two variations of a twelve-tone row constructed with 1+3 trichords of the third hour. In the first variation, the 1+3 trichords are steered by the 1+5 trichord of the fifth, and in the second variation by the 2+3 trichord of the seventh hour. As a result of these distinct steering hours, these rows of the third hour sound notably different.



[ex 4.2.6]

The last example is about the row of the twelfth hour, containing four 4+4 trichords (augmented triads) that can be steered by the 1+1 trichord of the first hour. However, steering these trichords by the 1+2 trichord of the second, the 1+5 of the fifth, or the 2+3 of the seventh hour, results in notably distinct sounds.



[ex 4.2.7]

4.3 Theoretical context of Peter Schat's Tone Clock

4.3.1 Allen Forte's pitch set class theory

How does Schat's Tone Clock relate to music theorist and musicologist Allen Forte's pitch class set theory? The principle difference lies in the aims of the two systems. Forte designed his for the harmonic analysis of post-tonal music, meant to discuss twentieth-century music in an objective way by avoiding references to individual compositional techniques or traditional harmony (Forte 1973). Schat proclaims a similar analytical practice, but the emphasis of his model is more on its compositional quality.

Concerning the layout of the models, the principal difference is that in Forte's system each pitch of the chromatic scale has its own "pitch class" number independent of the register in which it sounds: c has number 0, $c^{\sharp}$ has number 1, d number 2, etc. The term "set" is used for any combination of two or more, equal or different pitch classes, independent of octave displacement and enharmonic spelling. Thus Forte's three-pitch class sets correspond to Schat's trichords although they are presented in quite a different way. In contrast to Schat's relatively simple ordering of trichords alternating between prime and inverted forms in twelve-tone rows, Forte lists all prime forms of "cardinal number 3" according to their number of possible transpositions and inversions, to their interval vector (the total number of all intervals between the pitches in the set), and to a number of other categories enabling numerical analyses of post-tonal compositions.

Another difference concerns the number of intervals identified within the set and the trichord. Schat considers a trichord as a collection of two intervals a–b, and b–c; Forte considers a three-pitch class set as a collection of three intervals: a–b, b–c, and a–c. As a consequence in Forte's system the intervals between 1 (minor second) and 6 (tritone) are taken into account; in Schat's system those between 1 and 5 (perfect fourth).

In a reaction to an article by composer Maarten van Norden (1997) about possible compositional applications of Forte's set theory, Schat admits that there is a connection between his Tone Clock and Forte's set theory. The fact that Forte's theory indeed gives a complete overview of all harmonic possibilities of the twelve tones, he calls "attractive at first sight" (Schat 1998: 41). In the rest of this polemical essay he explains why he finds this theory unattractive from a composer's standpoint. Apart from his rejection of Forte's changing of the note names by numerical pitch notations, it was mainly the arithmetic concept underlying Forte's set theory, in order to facilitate a composer to calculate various relations between different sets, that was emotionally disapproved of by Schat, because "[he] studied to be a composer, not a bookkeeper" (Schat 1998: 42).

Considering the actual summary comparison between Forte's extensive pitch–set class collection and Schat's limitation to compositional applications I endorse the latter's recommendation of the Tone Clock as a technique that is "self-explaining and therefore meets the most important requirement for a "common language"" (Schat 1998: 44).

4.3.2 The problem of the three-ness

Composer and organist Gerrit de Marez Oyens (1997) came up with the idea to divide the Tone Clock's twelve-tone rows into three tetrachord segments. He constructed a list of tetrachords corresponding with Forte's twenty-nine pitch class sets with cardinal number 4 and found seven tetrachords that could be manipulated to fit three times in the row. Six of these tetrachords also appear as the "all-combinatorial four-notes source sets" of composer Milton Babbitt that I found in music theorist George Perle's publication *Serial Composition and Atonality* (Perle 1991: 98, 130).

With his emphasis on tetrachords, De Marez Oyens addresses a problem with the trichordal approach of the Tone Clock that was already mentioned in the evaluation of O'Gallagher's method of twelve-tone improvisation in section 3.7.4. As to the rhythmical aspect, in their operations with this overwhelming "three-ness", performers are forced to either phrase their lines in three-note patterns and triple signatures (¾, 6/8, 9/8, 12/8, bars), or to inventively re-phrase the trichordal patterns into four-note groupings. But by dividing twelve-tone rows in three tetrachords, the constructions by De Marez Oyens and Babbitt show a way to combine the creation of twelve-tone patterns with the quadrature

that is such an important characteristic in most jazz meters. Sections 4.7.8 – 4.7.12 contain examples of patterns created with combinations of the actual tetrachords.

4.3.3 Controlled revolution and natural evolution

Music critic and author of Schat's biography Bas van Putten's (2015) argues that Schat in an early stage of his development had sacrificed the "natural" way of an artistic evolution to a "controlled" revolution. This assumption sheds an interesting light on the applications of his Tone Clock in this study. Schat's choice for a kind of serialism that he embraced in the traces of the international avant-garde in those days, forced him to break with the music tradition he had grown up with until then. This break was a decision by which he deliberately ignored his musical intuition and the comfortable, open-minded leaning on his beloved predecessors.

In the context of this study into the practices of jazz artists, such a break-up with existing tonal practices and historical examples is hard to imagine. As was mentioned at the end of section 3.7.1 in the discussion of O'Gallagher's twelve-tone method, the application by (composing) improvisers of a post-serial model such as the Tone Clock is principally not meant to break with their existing harmonic practices. It is rather considered a potential skill to enrich their techniques to improvise outside the pre-given chords. It can either replace or it can be used alongside the musicians' existing practices.
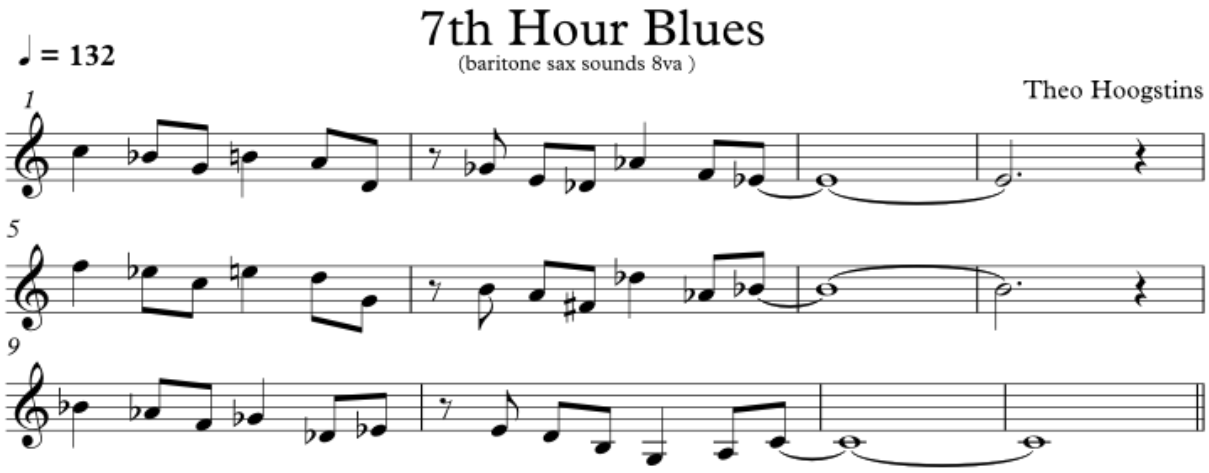
Yet, in order to at least learn to apply such a new tool, the students have to learn to sacrifice at least some of their "natural" habits to allow and embed new and "controlled" elements into their backpack of musical idioms. But is this not exactly what is expected from serious (composing) improvisers: importing "building blocks" taken from foreign musical idioms, in order to permanently refresh and enrich their expressive palettes? The obvious difference with van Putten's opinion about Schat's radical change as a young composer, is that for a saturated improviser, this process of innovation does not mean that existing elements should be radically discarded, but rather intelligently re-ordered.

4.4 Applications of the Tone Clock in jazz

In this subchapter, three compositions will be analyzed that are constructed with the Tone Clock. Hoogstins' relation with the Tone Clock is confirmed by the title of the first tune to be analyzed in this section: "7th Hour Blues". The second, "Green Room" was introduced by Carlberg to the Clazz Ensemble as being based on an hour of the Tone Clock, although he intentionally didn't give away on which one. The third example is both written and performed by O'Gallagher. By email O'Gallagher advised "Petulant Snoot" as a convincing example of his operations with the Tone Clock. In order to disclose the compositions of and improvisations on the tunes in this section I applied O'Gallaghers method of trichord analysis introduced in section 3.7.1.
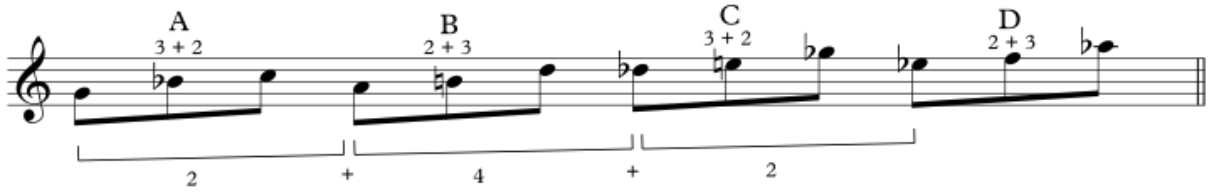
4.4.1 "7th Hour Blues" (Theo Hoogstins)

In "7th Hour Blues" on the CD *Triosonic* (1997) Hoogstins superimposed the 2+3 trichords of the seventh hour of the Tone Clock on a twelve-bar minor blues form. Its blend of twelve-tone and tonal elements allows analysis from both sides.
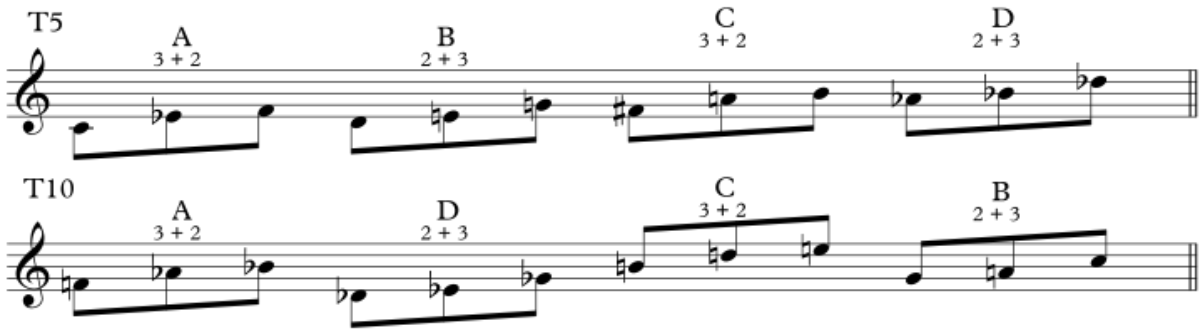


[ex 4.4.1.1 "7th Hour Blues" – theme]

The theme consists of three twelve-tone rows with the same rhythmic structure. The following example shows the derived row, the basic row with the trichords put in prime form.



[ex 4.4.1.2]

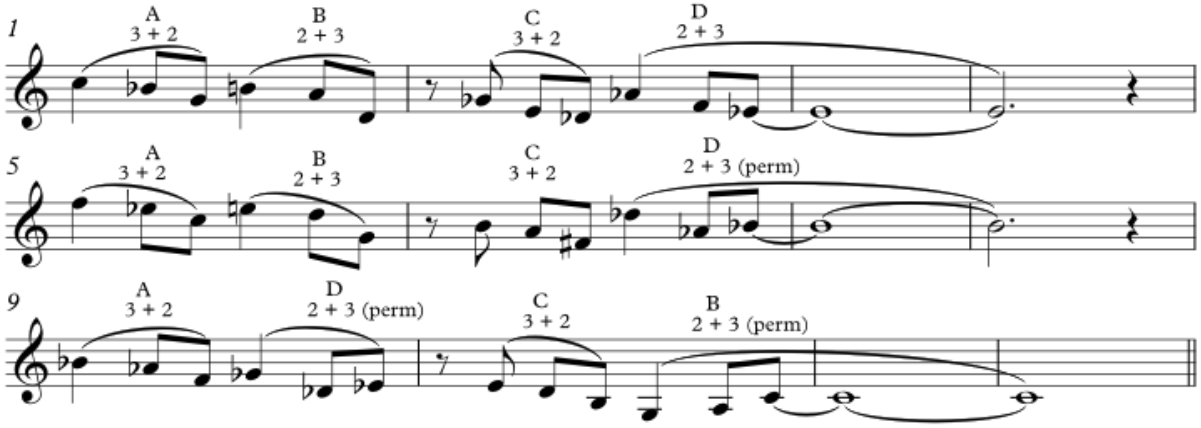
The second and third rows are transpositions of the first: the second is a transposition of a perfect fourth (T5), and the third is a transposition of a minor seventh (T10). In the third row the trichords are put in displaced order: A–D–C–B.



[ex 4.4.1.3]
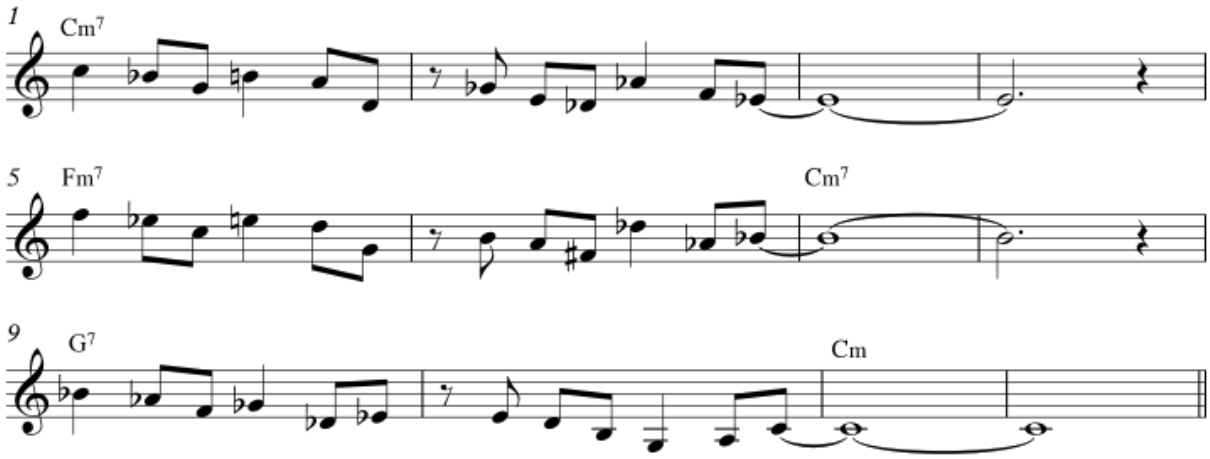
The next example shows the result at the surface of Hoogstins' manipulation of trichord 2+3. The order of the pitches in the trichords is changed, and to add variety to the transpositions of the first line, the order of the pitches in trichords D in bars 6 and 9, and of trichord B in bar 10 is permutated (perm).

It should be noted that also in the trichord analyses in this study, trichords are represented in their root positions, i.e. in their smallest form in ascending direction. For instance in the first bar of this example the smallest ascending form of the first trichord is g–b♭–c. Therefore it is marked 3+2. And because the root position of the second trichord is a–b–d, it is marked 2+3. For ease of reading, markings of the positions (prime form, first and second rotation) and retrogrades of trichords are left out, except in cases where these are a relevant aspect of the discussion.



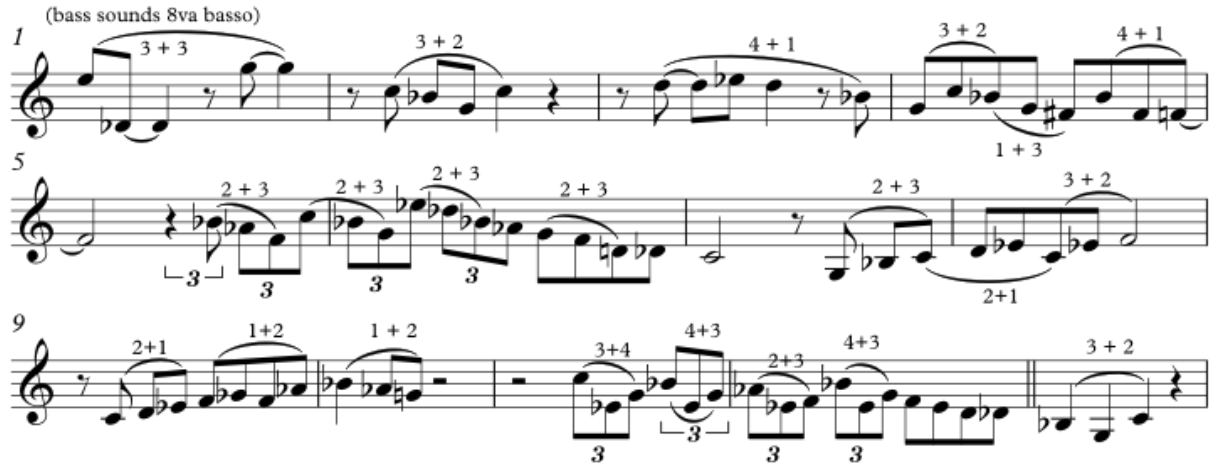
[ex 4.4.1.4]

In the next example the basic chords of the minor blues form are added to the theme. Considered from the tonal point of view, the first three notes of each row each contain basic or altered chord notes. All three lines move outside the chords from the second half of their first bar, and land on a chord note again at the last beat of the second bar. The root note of C minor, the key of this tune, only appears as the first and the last note of the theme.



[ex 4.4.1.5]

After the theme is played twice, Hoogstins plays the first solo chorus on the bass. In this improvisation he shows a preference for the 2+3 trichord as well. Out of the twenty-one trichords that are identified in the example below, ten are members of the 2+3 trichord family. In contrast to the theme these trichords now do refer to the bluesy minor pentatonic sound. Then, the 3+2 trichords in bars 2 and 4, and the sequences in bars 5–6 and 7–8, also confirm the (pull to the) key of Cm. The same goes for the bars in which successions of different trichords could be identified. For instance in bars 11–12, the 2+3 trichord is surrounded by 3+4 trichords, resulting in C minor and Eb major triads that explicitly emphasize the key of the tune.
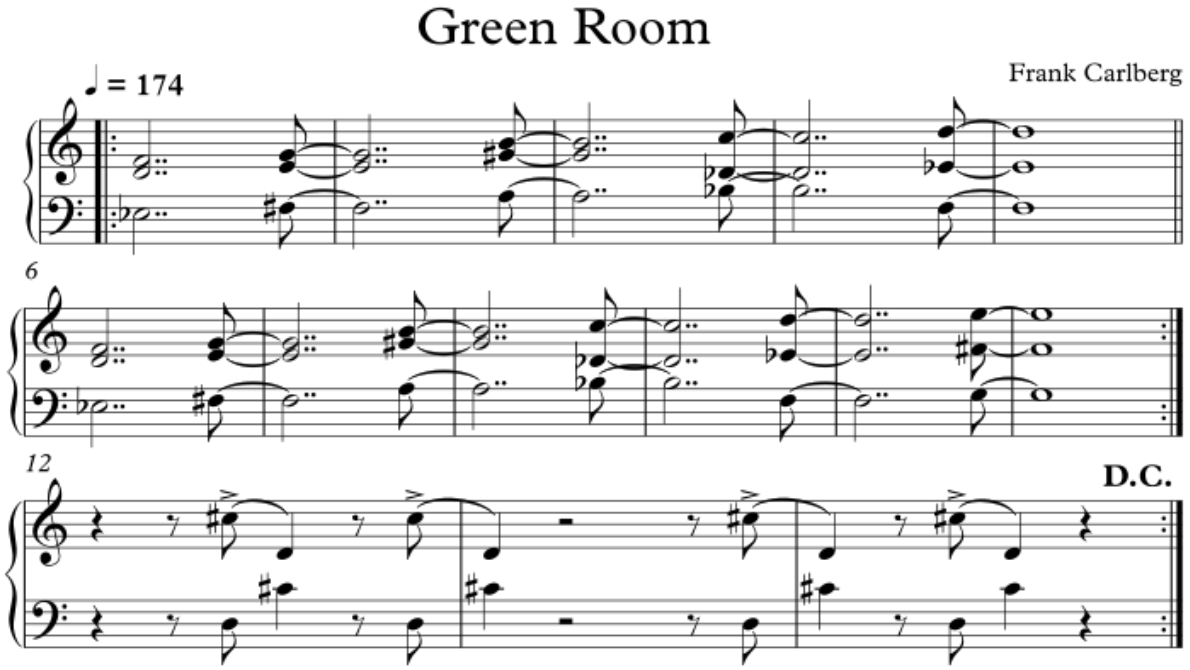


[ex 4.4.1.6 "7th Hour Blues" – bass solo]

Evaluation

In Hoogstins' theme, twelve-tone operations are intentionally limited to trichord 2+3 from the row of the seventh hour of the Tone Clock. His choice for this trichord seems inspired by its tonal reference to the minor pentatonic scale, although he manages to avoid this typical "bluesy" sound by his sparse permutations of trichords and rows. On the other hand, his improvisation is overwhelmed by his intuitive response to the compelling force of the Cm key, despite the numerical majority of the same 2+3 trichord. The minor pentatonic reference of this trichord together with the various trichords surrounding them confirm the soloist's emphasis on the tonal content of the blues. This is slightly disappointing in comparison to his intelligent avoidance of this tonal reference in the construction of the theme. I would rather have taken this as a point of departure for a less root-oriented improvisation.
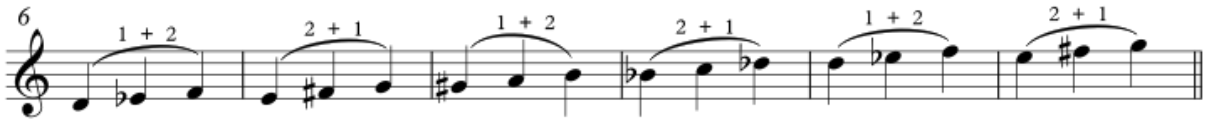
4.4.2 "Green Room" (Frank Carlberg)

Carlberg's composition "Green Room" on the CD *Federico On Broadway* (2011) is composed with the second hour of the Tone Clock. It has an eleven bar form that is repeated and followed by another three bars. The next example shows a mini-score of this tune.
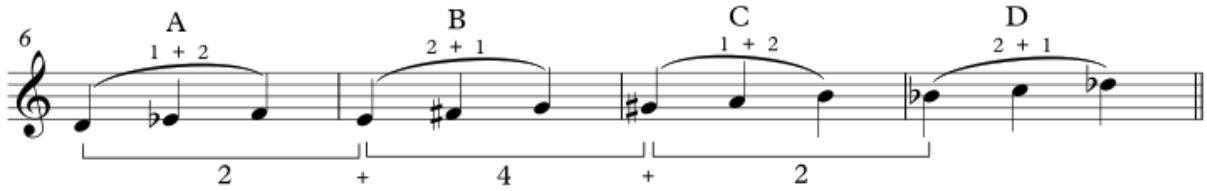


[ex 4.4.2.1 "Green Room" – theme]

Bars 6–11 contain all trichords of the tune. The next example shows them in their prime forms.
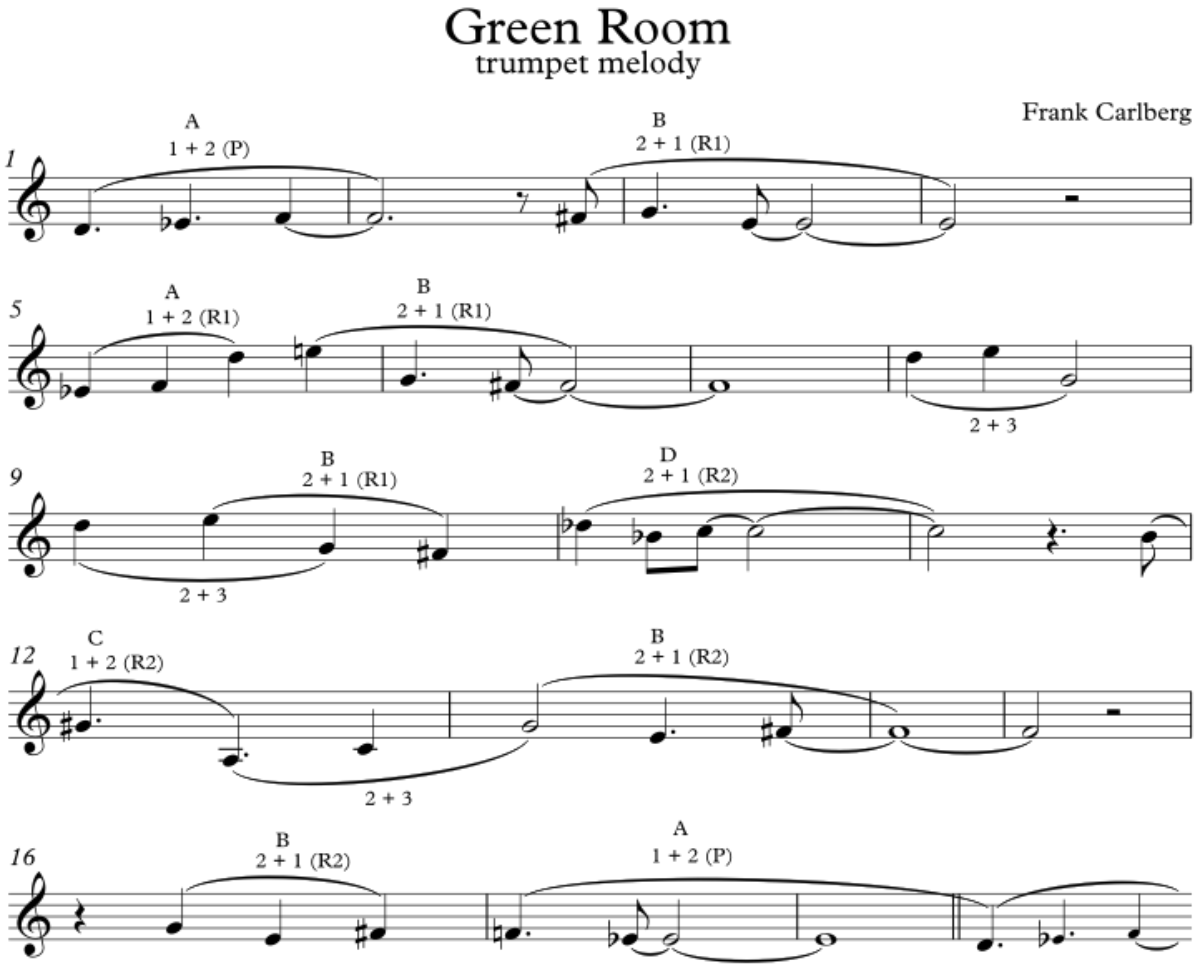


[ex 4.4.2.2]

The last two trichords are repetitions of the first two. Leaving these out, the following twelve-tone row of 1+2, steered by 2+4, appears.



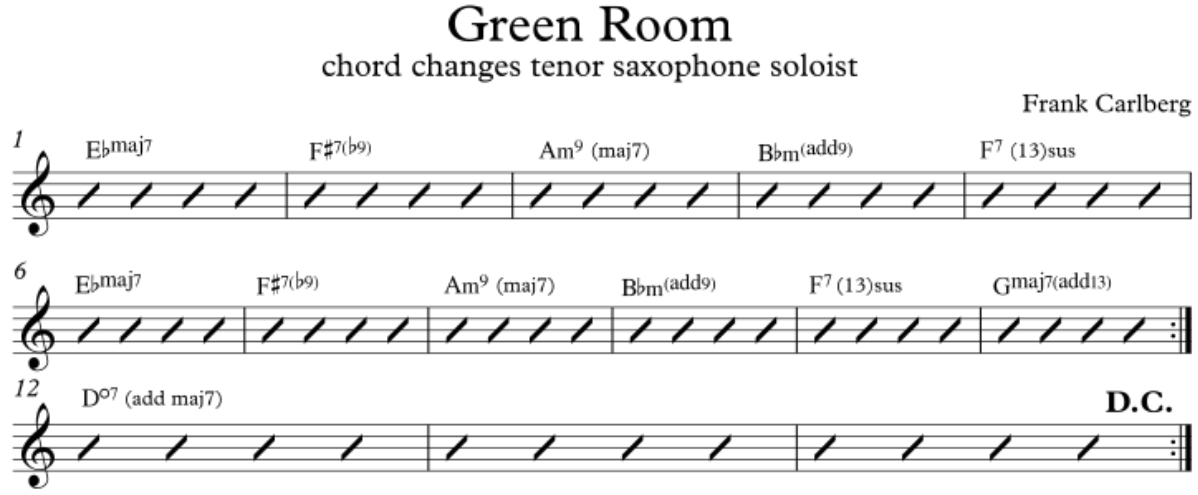
[ex 4.4.2.3]

The following example shows how all four trichords can be identified in the rubato trumpet melody, put in their prime forms (P), first (R1) and second (R2) rotations.



[ex 4.4.2.4 "Green Room" – trumpet melody]

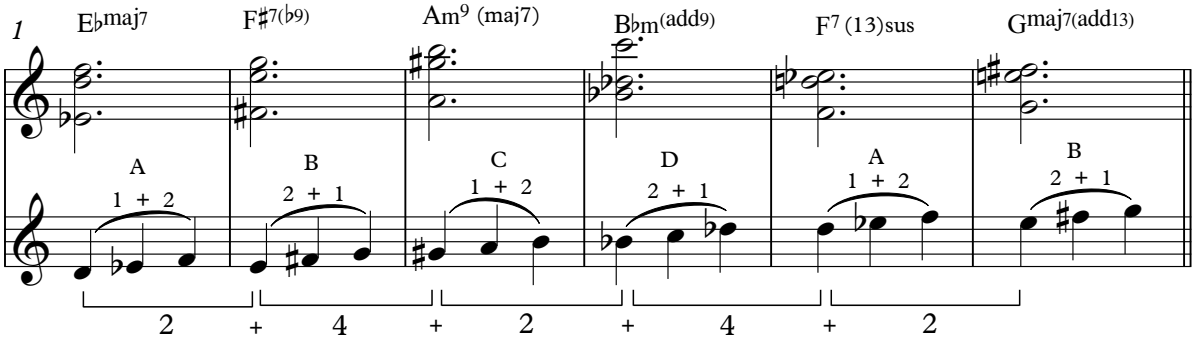
The example below shows the chord changes for the tenor saxophone soloist in Carlberg's arrangement for the Clazz Ensemble. Instead of writing a fixed melody, he gave the instruction to start off with sparse filling notes and to gradually increase the density of the improvised lines along the way.



[ex 4.4.2.5]

The next example displays the relationship between the basic row, written in the lower staff, the vertical orderings of the trichords (as in example 4.4.2.1), written in the upper staff, and the tenor saxophonist's chord symbols, written above the upper staff. It shows how the trichords are considered as content groups and how the pitches of the twelve-tone row are attributed tonal content. In bars 5 and 6 the trichords A+B are put in a different vertical order than in bars 1 and 2, which allowed Carlberg to construct different chords.
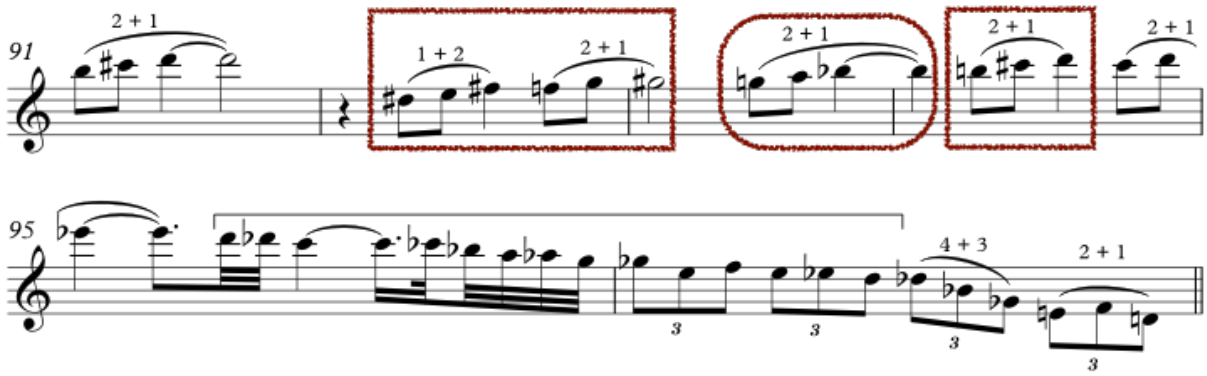
The lowest notes of the trichords have become the root notes of the chords. The remaining two pitches do not determine the tonality of the chords. They express the seventh (bars 1–3, and 5–6), the ninth (bars 1–4), and the sixth (bars 5–6) of the chords that Carlberg has created. Only in the fourth bar, the note d♭ determines the Bbm tonality.



[ex 4.4.2.6]

The transcription of my tenor saxophone solo on "Green Room" displays a combination of conventional tonal techniques and dodecaphony. In the following fragment, bars 91–96, I intentionally refer to the row of the second hour of the Tone Clock. I start and end my phrase with trichord 2+1. In bars 92–94 the trichords captured within the rectangles
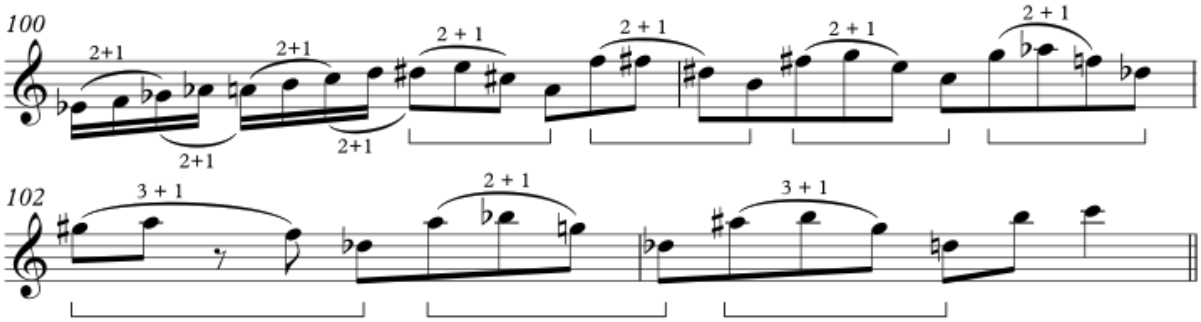
belong to the same twelve-tone row. The trichord in between, starting at the second half of bar 93, is only one note away from being the missing link to make this twelve-tone row complete. To achieve this, I should have played the 1+2 trichord a–b♭–c. The notes under the bracket in the second line are an embellishment of a descending chromatic scale leading to the 4+3 trichord that evokes the temporary tonality of Gbmaj.



[ex 4.4.2.7 "Green Room" – fragment tenor saxophone solo]

To get acquainted to the sound of the second hour and its trichords, I related it to the harmonic color of the diminished scale and to familiar practices of transposing motives by distances of minor seconds. These operations popped up in this solo as my intuitive response to the intended harmonic vagueness of the chord changes. The next example shows these two operations combined in bars 101–104.

The two first beats of bar 100 show the Eb diminished scale, marked as a succession of four 2+1 trichords. From the third beat of the bar, an ascending sequence of conventional diatonic triads can be identified. The brackets under the staffs mark the triads of A, B, C and Db. Because the first note of every triad is approached by an accentuated leading note, and because the line is phrased as a sequence of four tetrachords, these four 2+1 trichords can be identified. Thus, my assumption that these familiar operations of tonal chromatism would connect well with the Tone Clock hour is confirmed by the trichord analysis of this line.



[ex 4.4.2.8 "Green Room" – fragment tenor saxophone solo]

Evaluation

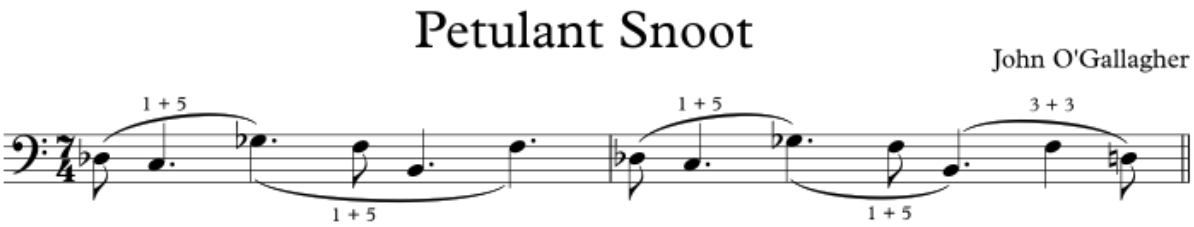
Just like "7th Hour Blues", "Green Room" is based on operations with a distinct hour of the Tone Clock. "Green Room" has a more complex structure and shows a more comprehensive approach to the Tone Clock, because the row of the second hour is applied both in horizontal and vertical orderings. Carlberg operates in the border area of twelve-tone and tonal music by combining the ordering principle of a twelve tone row with the tonal content of his trichords and the derived and extended chords.

As to the improvisations, in "7th Hour Blues" Hoogstins managed to manipulate his prevailed trichord better than I did in "Green Room", but he was unable to transfer the non-tonal structure of his theme into trichord manipulations in his solo. In my solo I deliberately operated in the musical space between a real chord-scale approach (almost impossible due to the rapid succession of the chords) and the yet poorly embodied knowledge of twelve-tone operations. As a result, it contains a mixture of sparse twelve-tone operations, tonal references and familiar chromatic techniques.

4.4.3 "Petulant Snoot" (John O'Gallagher)
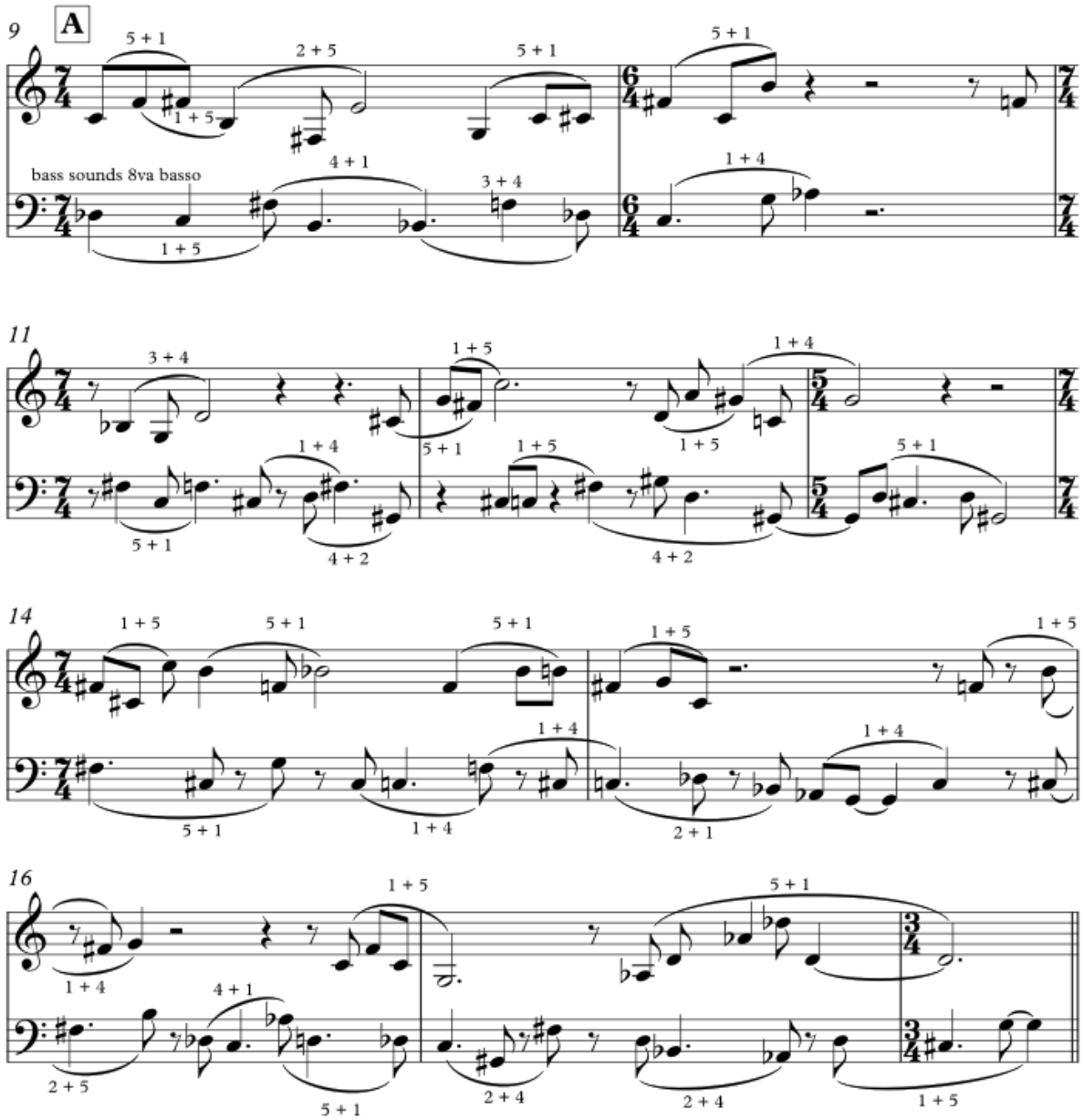
O'Gallagher's composition "Petulant Snoot" on his CD *The Honeycomb* (2015) was released after publication of his method for improvisation that was discussed in subchapter 3.7. In this subchapter I will discuss possible relations between the Tone Clock and the composition and the alto saxophone solo.

"Petulant Snoot" starts with a repeating bass ostinato that is constructed with trichords 1+5 only. Trichord 3+3 at the end of the second bar results from the note d that is added there just as a leading tone to the next bar.
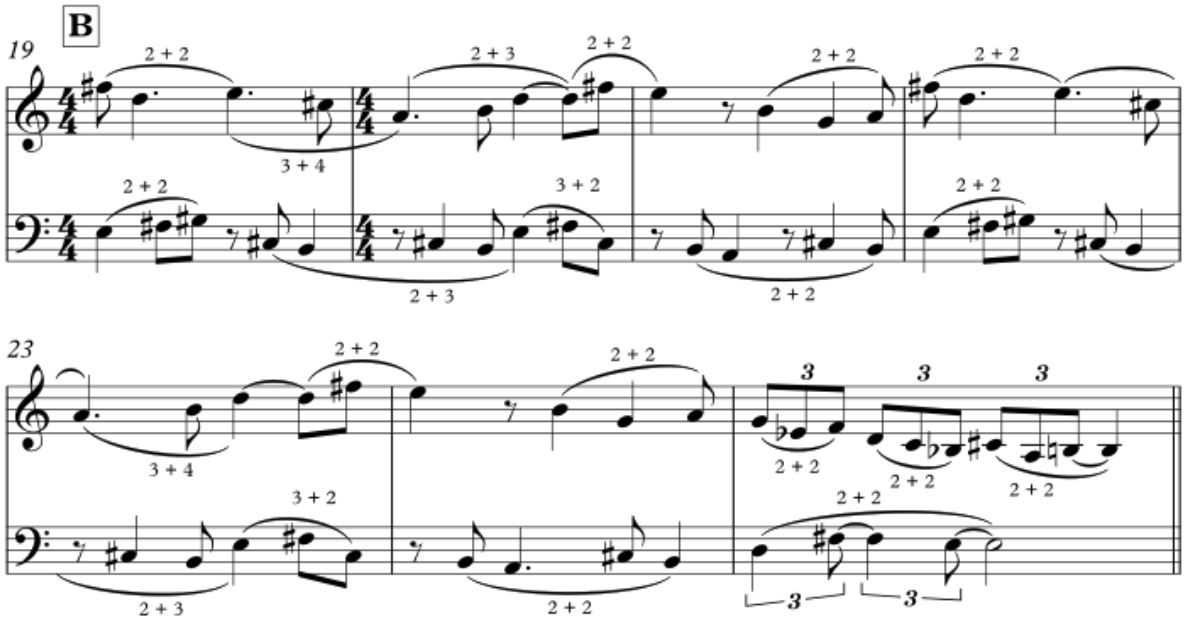


[ex 4.4.3.1]

In the following example trichord analysis of the alto saxophone melody in section A reveals a dominating number of trichords 1+5: fourteen 1+5 trichords, versus one 1+4 trichord, one 2+5 trichord, and one 3+4 trichord. Meanwhile the contrapuntal melody played by the acoustic bass shows a wider variation of trichords: seven 1+5, seven 1+4, four 2+4, two 3+4, one 1+2, one 2+5, and one 3+4 trichords can be identified.
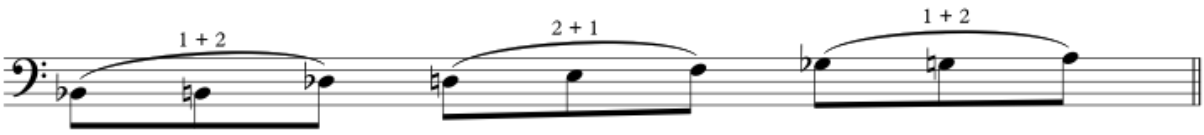


[ex 4.4.3.2 "Petulant Snoot" – section A melody]

In contrast to section A, bars 19–25 of section B do evoke a harmonic color: that of A7. Trichord analysis illustrates this by the types of trichords found. The alto sax plays seven 2+2, two 2+3, two 2+4, and two 3+4 trichords. The bass line contains five 2+2 and four 2+3 trichords. Except the two 3+4 trichords, all trichords played in section B, both by the alto saxophonist and by the bassist, are different from the ones they played before in section A.



[ex 4.4.3.3 "Petulant Snoot" – section B melody]
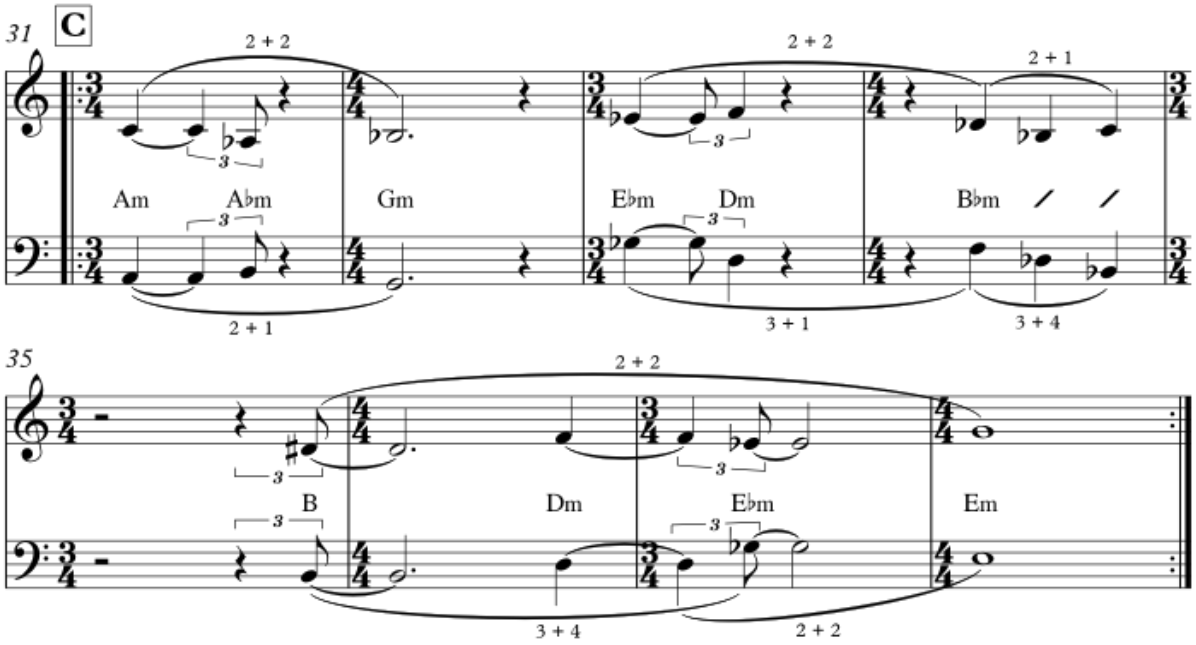
Compared to sections A and B, where the alto saxophone melody and the bass part are played as independent lines in contrapuntal movement, section C displays rhythmic accents on two-voice vertical harmonies. The notes of the alto saxophone's part together form the Ab major scale. The bass line displays two symmetric four-note groupings g♭–g–a–b♭ and d♭–d–e–f, with the note b in between. The following nine-tone row containing trichords from the second could be derived.



[ex 4.4.3.4]
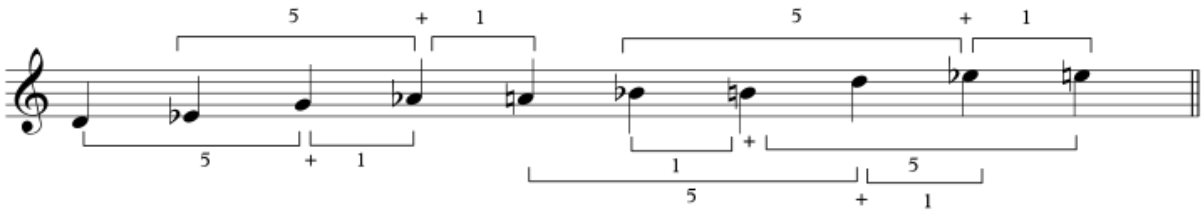
It seems as if O'Gallagher, after the tonality of A7 in section B, with this choice to continue in the tonality of Ab takes distance from his twelve-tone approach and the Tone Clock. Is he intentionally alternating between a twelve-tone (read: a trichordal) and a purely tonal approach? Is this the interpretation of his idea in section 3.7.1, stating that his operations with twelve-tone techniques are not exclusively reserved to twelve-tone use, but also can be combined with tonal settings? That would be a disappointing finding, because he recommended this tune as an intended application of the Tone Clock. Or

should it be worthy to take a closer look into the relationship between the lines of the bass and the alto saxophone to understand what operation is involved here?



[ex 4.4.3.5 "Petulant Snoot" - section C melody]
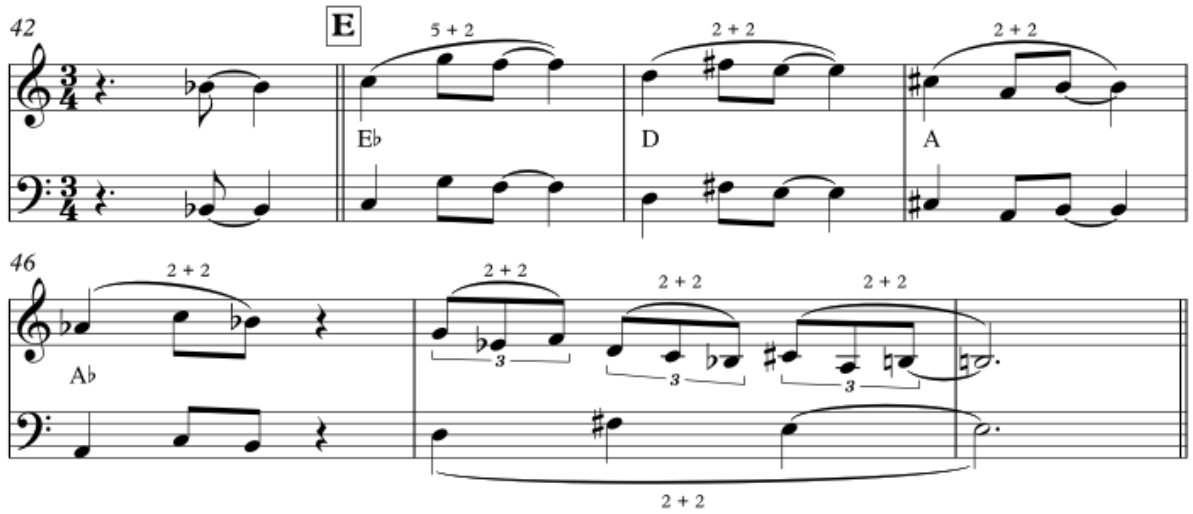
The example above shows how between the alto saxophone in the upper staff and the bass notes in the lower staff a succession of major and minor intervals in alternating directions can be identified. For ease of reading, they are notated as triads, but in fact the fifth is missing. This succession can be divided into two segments. The first segment sounds in descending direction: Am – Abm – Gm – Ebm – Dm. The second one sounds in ascending direction: Bbm – B – Dm – Ebm – Em. Now, if we consider the root notes of these intervals as pitches of a tone row, it is possible to derive the following ten-tone row, that hosts four 1+5 trichords. The re-appearance of these trichords obviously relates to the dominance of trichord 1+5 that was found in section A.



[ex 4.4.3.6]

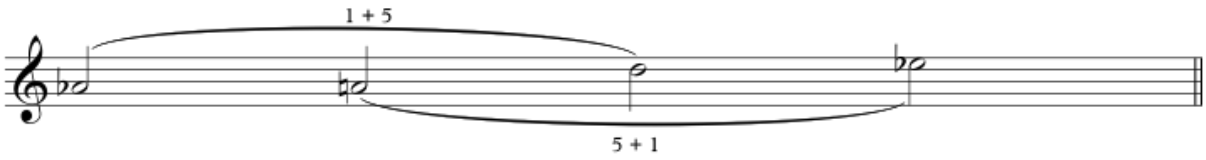
Thus, this analysis of section C reveals how O'Gallagher managed to combine a twelve-tone ordering principle with the interval relations between the two lines. Thus, the dominance of the 1+5 trichord in section C is continued in the deep structure instead of at the surface of the composition.

After the solo section D, to be discussed hereafter, section E displays trichord 2+2 six times, versus 2+5 once. Bars 43–46 display an eleven-tone row, with the note c repeated. Only the note d♯ is absent in order to complete the twelve-tone row.



[ex 4.4.3.7 "Petulant Snoot" – section E melody]

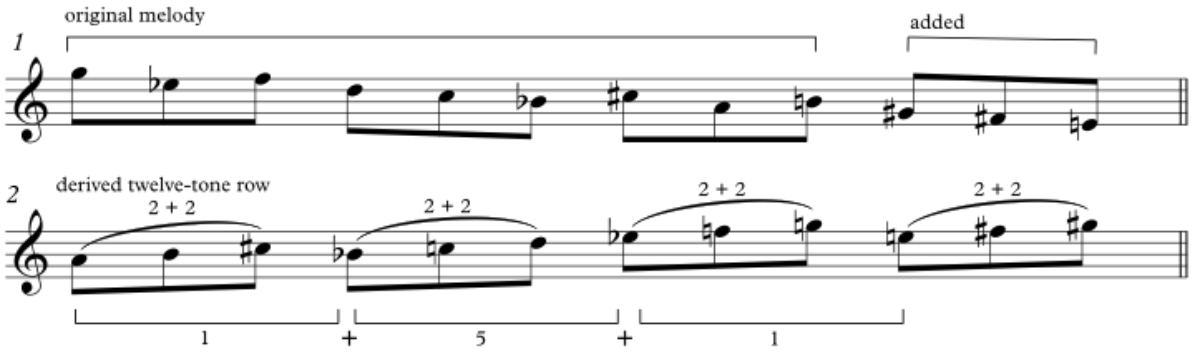
Although alto saxophone and bass play the same melodic line in octave intervals, bars 43–46 evoke the harmonic colors of the Eb – D – A – Ab triads. Between their root notes again two 1+5 trichords can be identified, as shown in the following example. The structural presence of trichord 1+5 that was confirmed in sections A and C is also evident in section E.



[ex 4.4.3.8]

The next example shows how from the original melody by the alto saxophone in bar 47 of the example above, a twelve–tone row with four 2+2 trichords can be derived. Interestingly, the 1+5 trichord appears again, this time as the steering trichord of this derived row.

The addition of this fourth trichord results from my interpretation of the twelve-tone technique called "derivation" which is defined by Wuorinen as "the generation of new sets from segments, which may themselves be segments of other sets previously employed in a composition" (Wuorinen 1994: 111). In this case the added trichord D is simply a transposition by a tritone interval (T6) of trichord B.

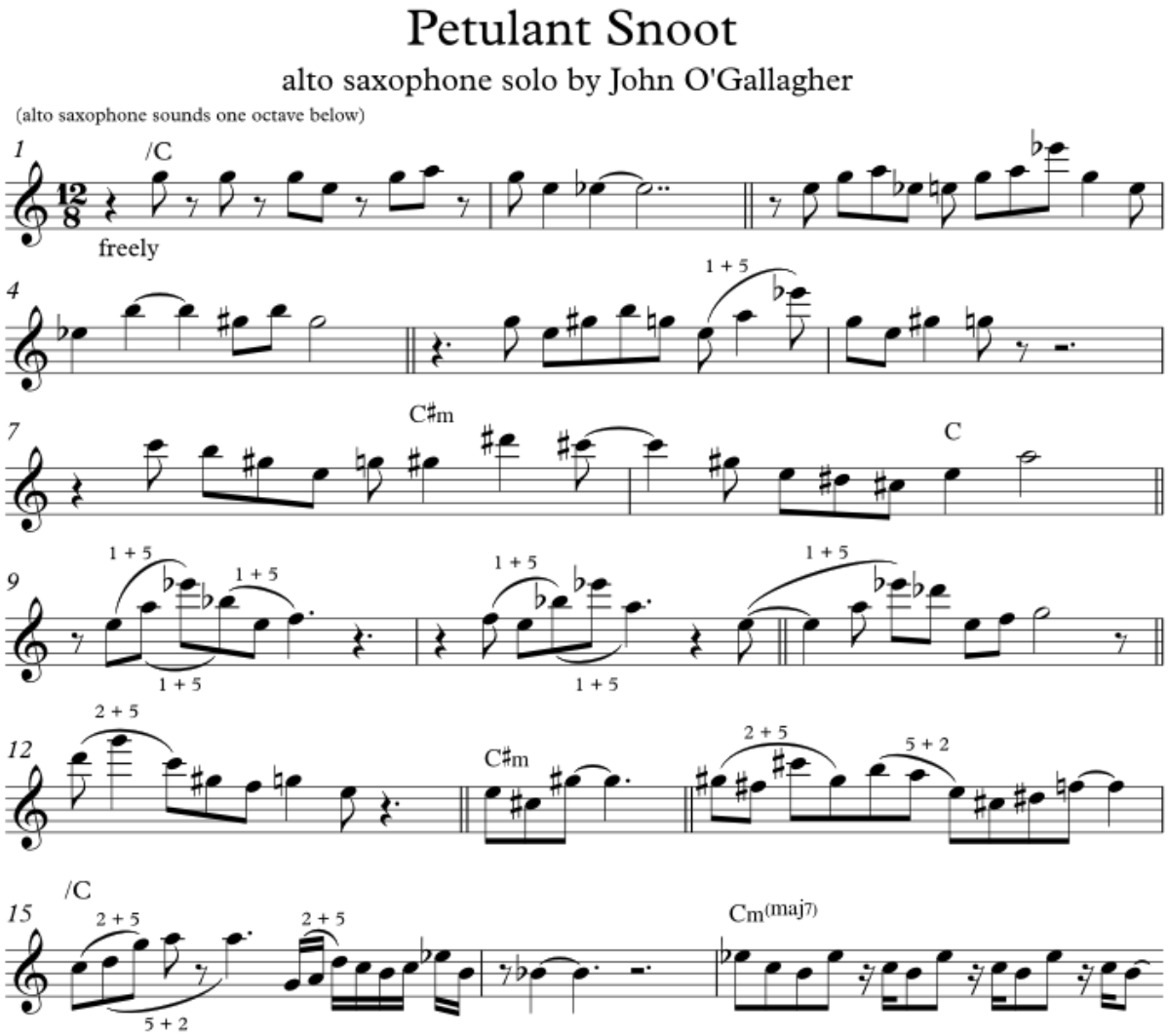


[ex 4.4.3.9]

To summarize my analyses of the composed parts of "Petulant Snoot", O'Gallagher's examples of the application of the Tone Clock are his operations with predominant trichords 1+5 from the fifth hour and 2+2 from the sixth hour. Trichord 1+5 can be identified both at the surface and in the deeper structures. Throughout the composition these operations are applied both in tonal and non-tonal contexts. Furthermore multiple derivations of Tone Clock rows can be identified in section E.

In the following section three fragments of O'Gallagher's alto saxophone solo will be analyzed to find out how his applications of the Tone Clock in the composed part are reflected in his improvisations. It should be noted that this tune was played in a free rhythm. For ease of reading and to give priority to the melodic and harmonic qualities of his melodic lines, they are transcribed into a 12/8-meter, and in some cases notation of the rhythms is simplified.
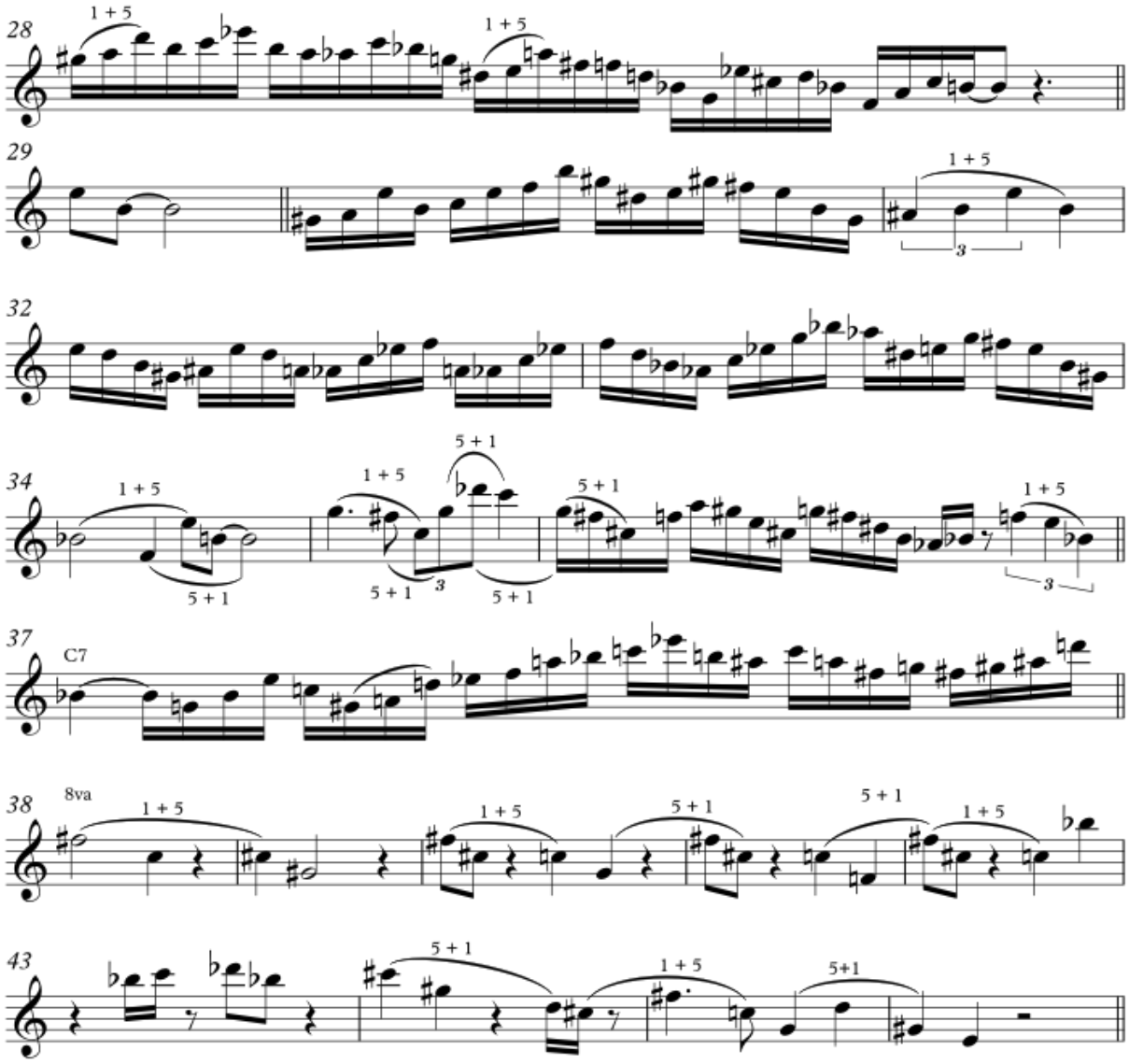
In the first eight bars of the following fragment, O'Gallagher is mainly concerned with the embellishment of a C pedal tonality by means of stressing certain notes. In bars 1–6 the notes e$^{\flat}$–e–g–g$^{\sharp}$–a–b, together with the pedal point C played by the bass, evoke the harmonic color of Cmaj$^{\#5}$.
In bars 9–16 O'Gallagher displays a deliberate trichordal approach. In bars 9–11 the emphasis is on the trichord 1+5, and in bars 12–15 a number of 2+5 trichords. These trichordal operations sound as short excursions outside the C pedal tonality that, apart from two sideslips to C#m in bars 7 and 13, is omnipresent in the whole fragment.



[ex 4.4.3.10 "Petulant Snoot" – alto saxophone solo fragment]

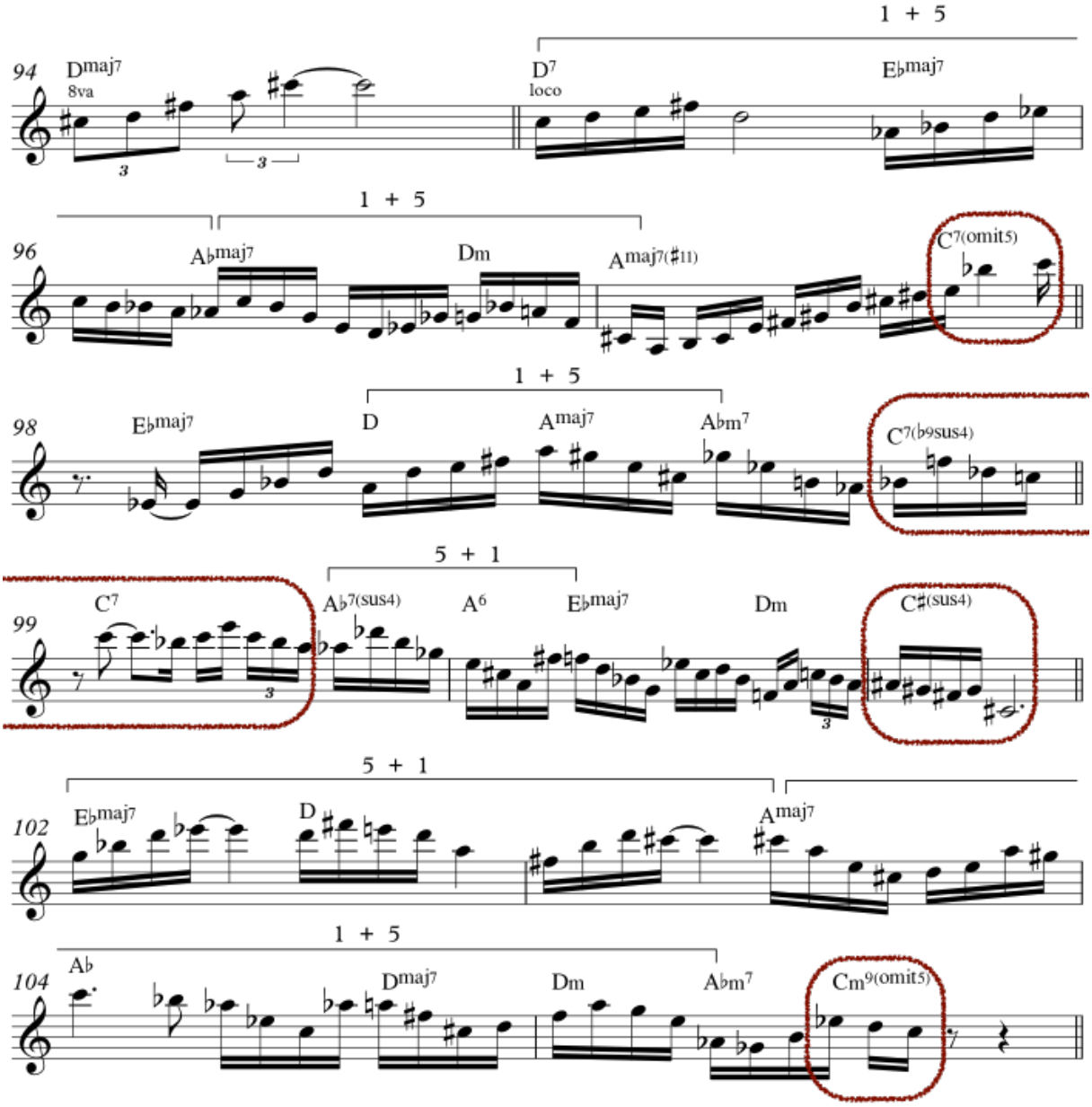
Hereafter, in bars 28–37, fast sixteenth-note runs are alternated with short patterns that sound as rest areas between the dense textures of these fast passages. Apart from the perfect fourth interval in bar 29 that points forward to the trichord in bar 31, these short patterns are constructed with 1+5 trichords exclusively. The transcription also suggests a connection between the two 1+5 trichords in bar 28 because they are both played at the start of six-bar patterns. I assume that O'Gallagher played them deliberately, but due to the fast tempo these trichords have minimum effect.

Finally, bars 38–46 show a large emphasis on the 1+5 trichord. This fragment displays a chromatically descending sequence of four trichords. The top note of each group, an f♯, remains unchanged, while the lowest notes are descending: g♯, g, and f.



[ex 4.4.3.11 "Petulant Snoot" – alto saxophone solo fragment]

In the following fragment of the solo O'Gallagher connects his improvisation to the composition in a different way. Instead of emphasizing the predominant 1+5 trichord in his melodic lines, it is now implied in the harmonic colors of Ab – A – D – Eb that I identify in section E of the composition. In the next example the chord symbols mark the tonal content of the melodic lines. All four lines contain four triads or chords built on the root notes a♭–a–d–e♭. They can be considered as non-tonal superimpositions on the C pedal point, creating tension before "landing" either on a C tonality in bars 97, 98, and 105, or on its chromatic sideslip C# (bar 101).



[ex 4.4.3.12 "Petulant Snoot" – alto saxophone solo fragment]

To summarize his operations in the improvised part of "Petulant Snoot", O'Gallagher shows coherence with the emphasis of the predominant trichord 1+5 in the composed part. This appears both in tonal and in non-tonal contexts. In his improvisation he also demonstrates a tonal application of this trichord 1+5, by means of designing the order of the root notes of the chords implied in his solo lines.

Evaluation

Twelve-tone elements and operations can be identified throughout all composed and improvised examples discussed. But rather than following "rigid" serial rules dictating strictly defined operations with twelve-tone sets, derived rows, and segments from the row, the actual examples display combinations of selective operations with a pre-given or implied tonal context. Although it is impossible to "prove", I consider these practices as examples of how Schat imagined his Tone Clock as a way to bridge the twelve-tone techniques of atonal music with the more intuitive and context-driven practice of tonal music. Likewise, the examples seem to illustrate how the trichords from the Tone Clock hours seem to support Wuorinen's ideas of small segments serving as quickly perceptible content groups rather than as rigidly ordered interval successions (see subchapter 4.1).

In all examples both composers and improvisers apply the twelve-tone techniques transposition, inversion and retro-gradation of pitches, trichords, and combinations of trichords, with the emphasis on those from the Tone Clock hour at stake. Trichord analysis identified the dominating presence of trichords 2+3 (Hoogstins), 1+2 (Carlberg), and 1+5 (O'Gallagher). Of these trichords, those containing a minor second interval worked better to create non-tonal sounds than trichords 2+2, 2+3, 2+4, 3+3, and 3+4 marking passages with a more diatonic character.

In the context of the above-mentioned blending of twelve-tone with tonal techniques, all soloists were obviously challenged to connect the assigned trichord operations to their informed intuitive habits of embellishing pentatonic scales (Hoogstins), applying non-tonal superimpositions (de Graaf, O'Gallagher), or creating high-density chromatic textures (O'Gallagher). No matter what inconvenience this challenge may have created for the performing musicians, it seems to have helped them all to create meaningful solos.

Expectedly, most applications of twelve-tone techniques were found in the composed parts. In the solos, the fragments where twelve-tone techniques are intentionally played are relatively short. As to O'Gallagher's soloing, I find this disappointing and in contrast to his well-structured method on twelve-tone improvisation discussed in subchapter 3.7. In his method, he favors a comprehensive approach of trichords and trichord combinations to both non-tonal and tonal musical, but in his otherwise impressive solos, this approach is not as obviously present as I had expected. On the other hand, the trichord successions in his improvisations are often related to implied tonalities. Therewith he demonstrates their qualities as non-tonal superimpositions on tonal harmonies.

To find out if separate applications of all distinct hours of the Tone Clock would lead to a better understanding of their potential musical space, I undertook the composing and playing of *Carillon*, which will be discussed in the next subchapter. My aims were to concentrate on operations with all basic tone rows by creating both horizontal and vertical successions of their trichords and trichord combinations. I also wrote suggestions for improvisations, to help performers making meaningful connections with the composed material. In the next subchapter I will discuss three movements of *Carillon*. Chapter 6 contains the complete recording of this composition for saxophone quartet.

4.5 My applications of the Tone Clock

I have called my saxophone quartet *Carillon* in response to Schat's idea to construct a carillon that every hour plays the appropriate Tone Clock row (Schat 1993:73). During initial finger exercises in order to become acquainted with the distinct sounds of a number of Tone Clock hours, I became fascinated by the surprising sounds that occurred from applying these trichords. Therefore, I decided to broaden my individual experience with the Tone Clock by completing all twelve movements.

The choice for the line-up of a saxophone quartet was made for three reasons. First, it follows from my personal experiences as a saxophonist and composer, being familiar with the instrument and with this particular combination of instruments. Second, after I had rehearsed and recorded the first exercises with my students at Codarts University of the Arts, the professional saxophone quartet Koh-i-Noor showed an interest in rehearsing and performing the first five movements I had written (using the first, third, ninth, eleventh and twelfth hours) with myself as the soloist. Their comments stimulated me to finish the rest of the twelve movements. In 2013, I recorded *Carillon* with my fellow saxophonists of the Clazz Ensemble at that time. Third, I considered that working with this small line-up and without a rhythm section, would help us to leave our comfort zones and to fully concentrate on the "new stuff", without the opportunity to "lean back" on the rhythm section, and just rely on their common jazz idioms.

My aim was to compose twelve compact pieces, one to every hour of the Tone Clock, which could be performed within a time period of forty-five minutes, so that listeners could experience the distinct sound qualities of the hours of the Tone Clock in a coherent way. To highlight these sonic qualities, I wrote the twelve movements in the form of "riffs", short and repetitive fragments. From the early days of jazz music, riffs have been played as compact melodic phrases to create continuous movement and as backgrounds in solo sections to support the efforts of the soloists. A number of these riffs have found their way into the codex of jazz originals, such as for instance "C-jam Blues" (Duke

Ellington) and "Bemsha Swing" (Thelonious Monk). Thus, I agree with composer Gordon Delamont's ideas expressed in a publication about twelve-tone techniques: "In formal jazz composition, using serial techniques, it is desirable that the characteristic rhythms of jazz be retained. Also, repetition of melodic elements is likely to occur more frequently in jazz composition" (Delamont 1973: 24).

I realized that, besides the challenge to get acquainted with the Tone Clock hours, this carillon would contain rhythmic challenges for the performers. But thanks to their long time professional experiences in various musical styles, they responded quite naturally to the rhythmic requirements such as distinguishing between swing timing and straight timing in all tempos, and mastering Latin American rhythms, odd meters, and flexible (accelerating and retarding) tempo's.

Schat's metaphors of his Tone Clock hours, such as "Pale sun through grey cloud-cover. Or also: a sharp, icecold moon" (Schat 1993: 59), associated with the seventh hour, and "Much dust in the atmosphere. Rush hour" (ibidem: 63) with the fifth, are not taken into consideration. The same goes for his suggestions to combine different Tone Clock hours to complete twelve-tone rows. As I discussed before, my aim with the construction of "Carillon" was to experiment with each individual hour and I was afraid that intentionally blending distinct hours would obscure this idea.

As to the arrangement of the Tone Clock's trichords, I mainly took their prime forms as points of departure. This seemed the best way to optimize the expression of their distinct colors. In my opinion, deliberately obscuring the rows by complex permutations and (retrograde) inversions would reduce the listeners' ability to distinguish the differences between the hours.

To help find patterns for solos, I devised a sort of guided improvisation by attaching a number of subjective and rather random suggestions to the distinct hours. These suggestions contain a selection of melodic patterns that are constructed with the trichords from the rows. Initially they were meant for my saxophone students to show them possible applications of the Tone Clock hours and trichords, as introductions to the distinct sounds of the rows and trichords, and as examples of how to connect these twelve-tone techniques to their existing improvisational practices.

In the following sections my individual interpretations of the Tone Clock are discussed in three movements of *Carillon*. First is "Onsa", based on the first hour, the symmetric row with the highest dissonance and the most obvious twelve-tone structure: the chromatic scale. Next is "Pontiac", based on the fifth hour, the 1+5 trichord. The attractive dissonance of this trichord was already obvious in the previous examples of O'Gallagher's music. And finally, "Dicke Pitter", based on the 2+5 trichord from the ninth hour. By its
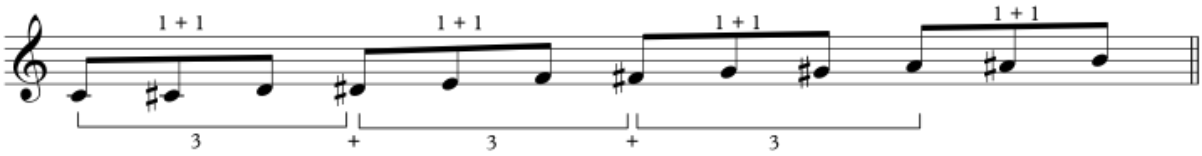
intervals of a major second and a perfect fourth it sounds less dissonant than "Onsa" and "Pontiac".

As to each movement, I will discuss the applications of the Tone Clock in the composed sections, the suggestions for improvisation, and how the improvisations relate to the compositions. As to the analysis of both the composed parts and the solo transcriptions, trichord analysis will be applied. For the sake of reading ease, I have removed all indications concerning tempos, dynamics, phrases and directions from the examples.

Trichords are displayed both in horizontal and in vertical orderings. Similar to the sections above, trichords in horizontal orderings are marked by legato lines above or below the staff, and notated with spaces between the numerals and the plus signs. Trichords in vertical orderings are marked above the notes that sound as similarities, and notated without these spaces between the numerals and the plus signs. The figures mark the trichords in their prime forms, the smallest possible form of the trichord. For the ease of reading, the octave disposition of the pitches is not indicated. Trichords in which one pitch is repeated are considered incomplete trichords or "dyads".

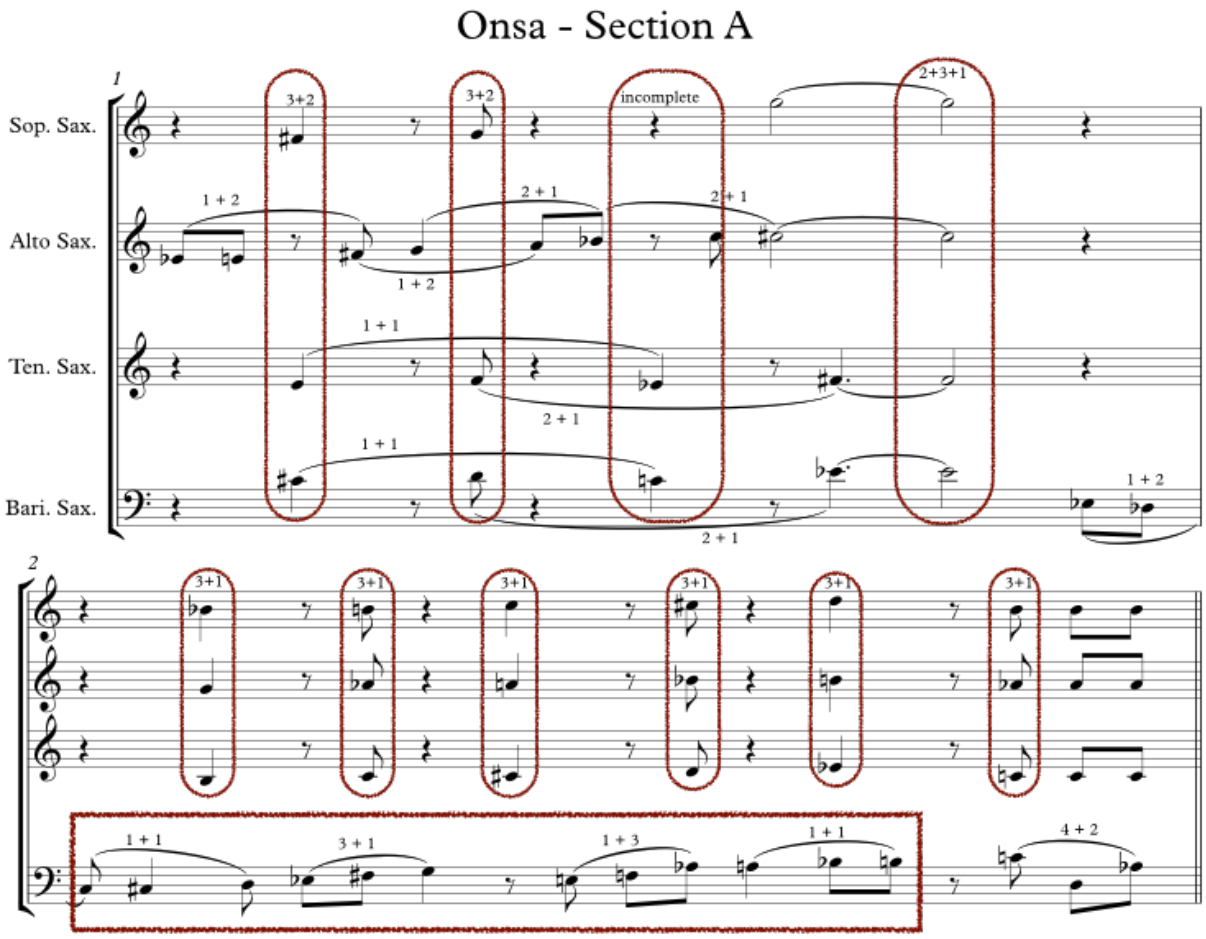
4.5.1 "Onsa"

In the basic row of "Onsa" the 1+1 trichords of the first hour of the Tone Clock are steered by the 3+3 trichord of the tenth hour.



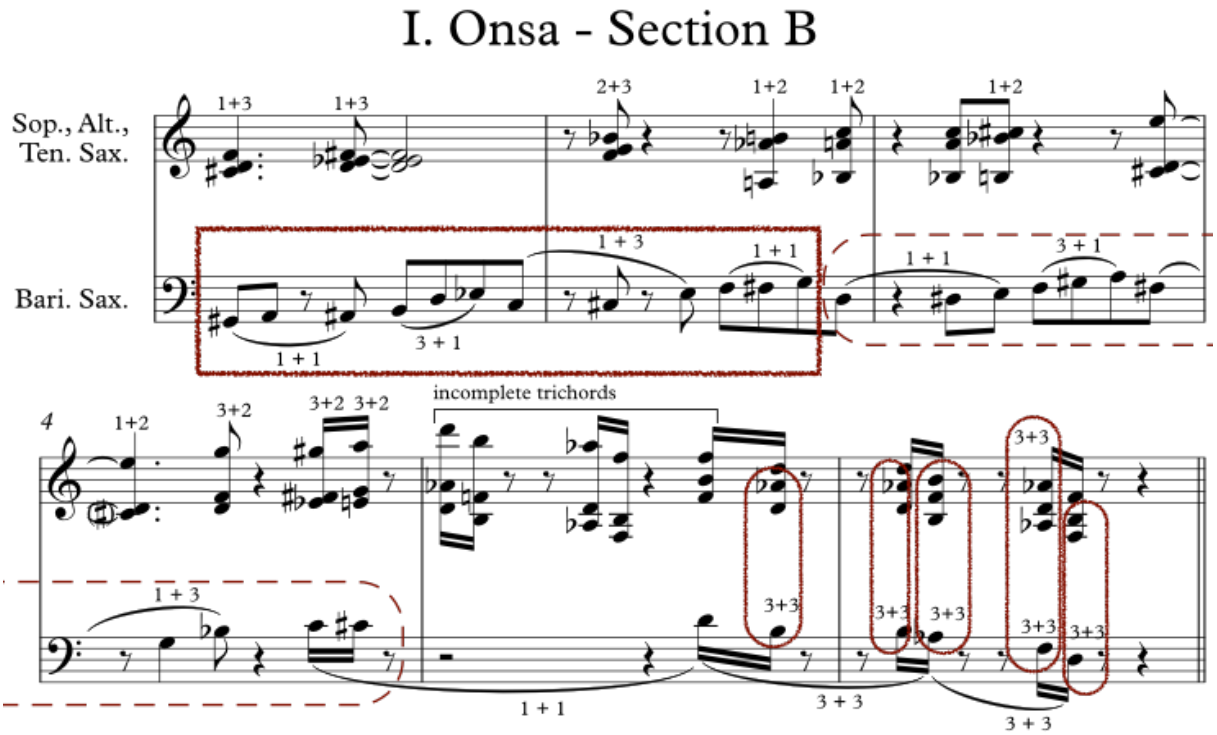
[ex 4.5.1.1]

In section A, the alto saxophone plays an $e^{\flat}$ octatonic scale. Trichord analysis shows it construction with 1+2 and 2+1 trichords. The vertical orderings in bar 1 display 3+2 trichords $c^{\sharp}$–e– $f^{\sharp}$, and d–f–g; and tetrachord $e^{\flat}$–$f^{\sharp}$–$c^{\sharp}$–g marked as 2+3+1 (prime form). Then, after his two pick-up notes at the end of bar 1, the baritone saxophone plays a twelve-tone row marked by the rectangle in bar 2 combining the trichords 1+1, 3+1, and 1+3. The remaining saxophones play stacked 3+1 trichords.
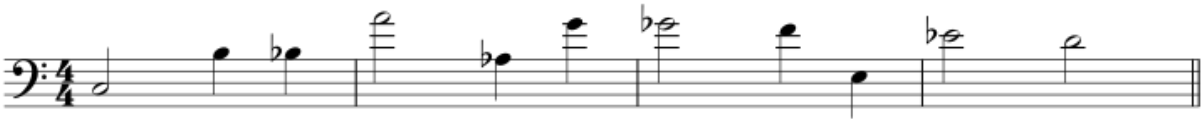


[ex 4.5.1.2 "Onsa" – section A theme]

At the beginning of section B the baritone saxophone repeats the twelve-tone row, transposed from C to G# (T8, in the rectangle). Then, another transposition of this line to D (T6) seems to appear, marked by dotted line, but, with the note b left out, this is not a complete twelve-tone row. Trichord analysis of the clusters played by the remaining saxophones displays a collection of 1+3, 2+3 and 1+2 trichords. Bars 5–6 are dominated by incomplete, complete and stacked 3+3 trichords.
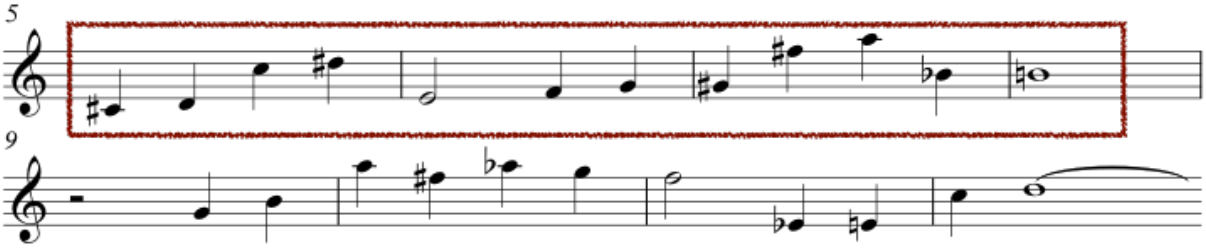


[ex 4.5.1.3 "Onsa" – section B theme]

In the first four bars, and in the first note of the fifth bar of section C, the third twelve-tone melody is introduced, a descending C chromatic scale that is obscured by octave displacements and by its distribution over the four voices, in such a way that the last note of a melodic fragment overlaps the first note of the next.
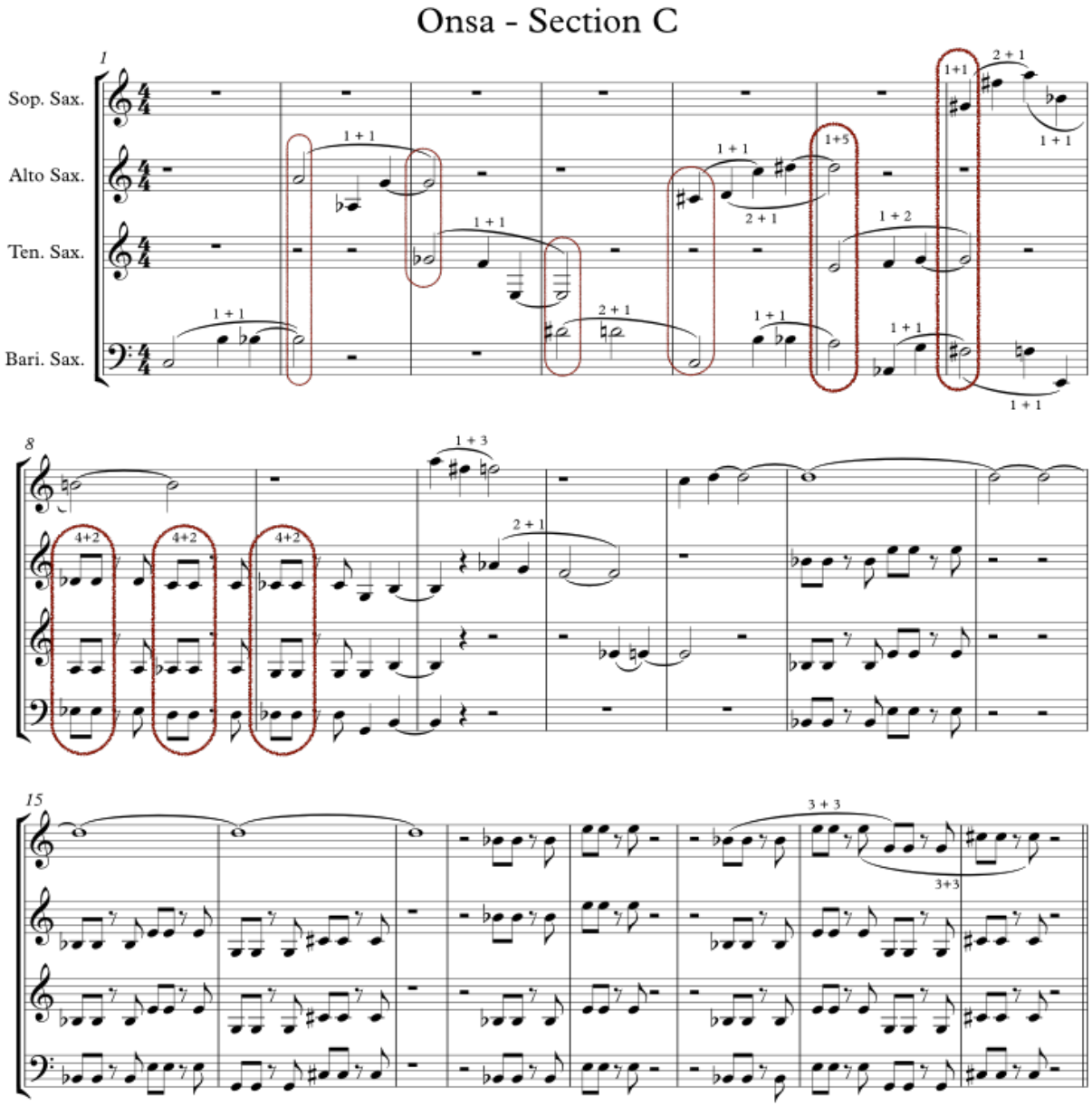


[ex 4.5.1.4]

From bar 5 the following melody is distributed over the four voices. The first four bars display a twelve-tone row, the second half a ten-tone row with one note repeated.



[ex 4.5.1.5]

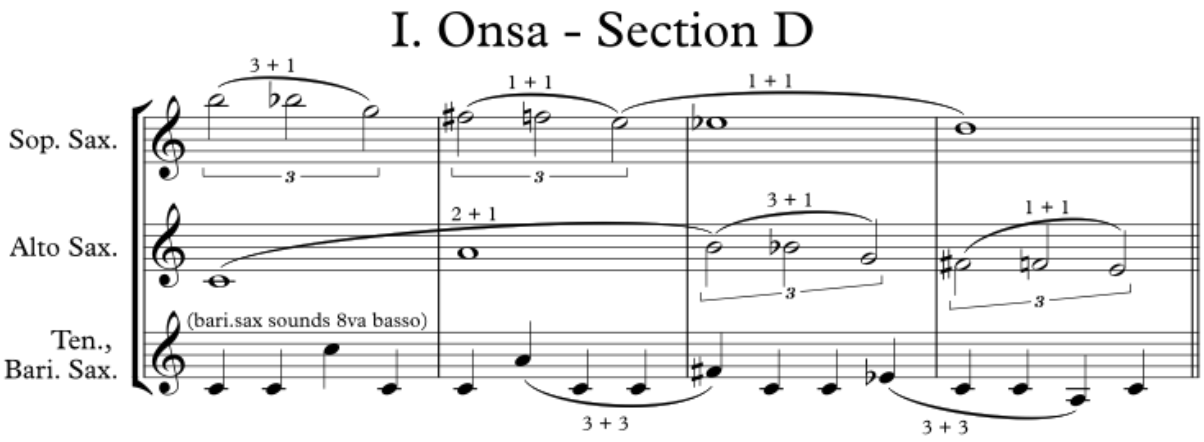
The following example shows section C. The encircled dyads and triads in bars 2–7 all contain minor second intervals that emphasize the dissonance of the first hour of the Tone Clock. The unison parts in the last four bars are constructed with trichords 3+3, the steering trichord of the first hour.



[ex 4.5.1.6 "Onsa" – section C theme]

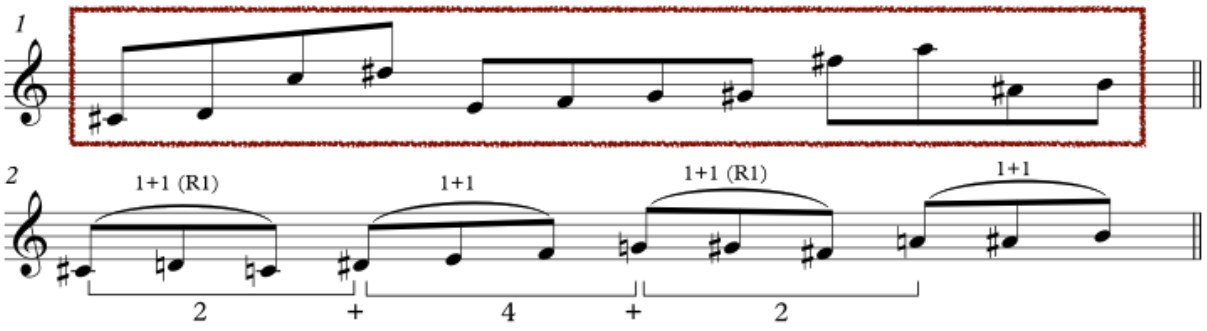
Section D, the solo section of this tune, serves as a continuously repeated background line behind the solos of the baritone, alto and soprano saxophonists. Only after the last soloist has finished his part, it is played by all four horns. The soprano and alto saxophones play crossing lines that together display a ten-note row, while the tenor and the baritone saxophones combine the root note c with the notes a, $f^{\sharp}$, and $e^{\flat}$. Together

they create a C-diminished chord by stacking two rotations of the 3+3 steering chord: c–e♭–f♯, and e♭–f♯–c.



[ex 4.5.1.7 "Onsa" – section D theme]

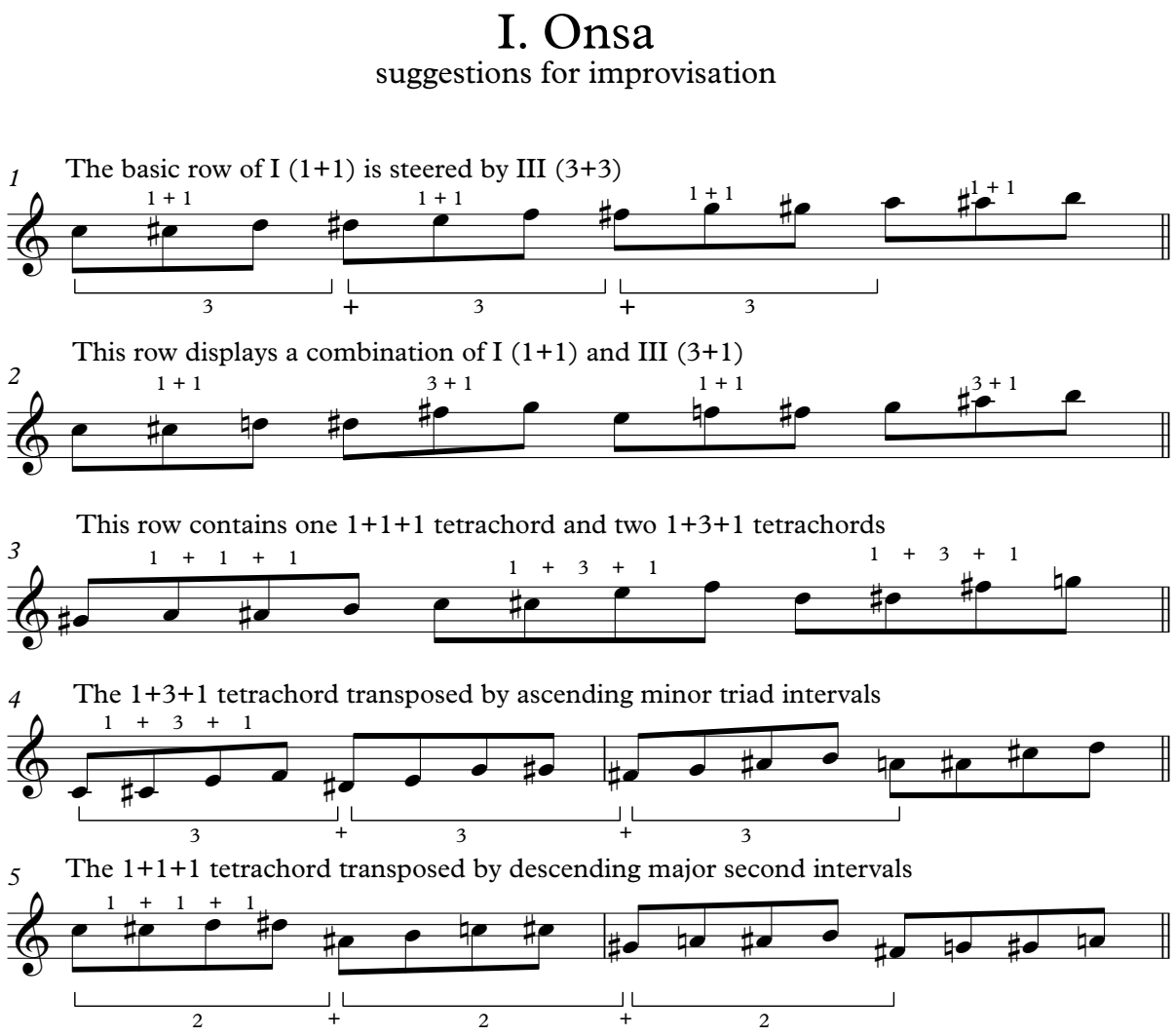
Section E repeats the twelve-tone row from section C. After being played in a number of variations, it ends in the form of a canon. The first line in the next example shows the melody in its simplest form. The second line displays its basic twelve-tone row.



[ex 4.5.1.8 "Onsa" – section E theme]
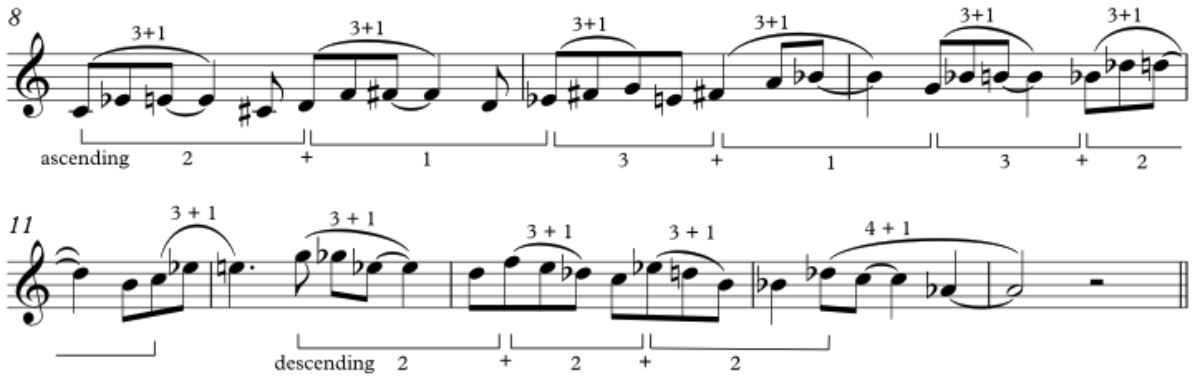
The example below shows my suggestions for improvisation with the first hour. The first three bars display complete twelve-tone rows. To prevent from an abundant use of the chromatic scale, I suggest the (combination of) trichords 1+1 and 1+3 in bar 2 as a possible point of departure. To help getting acquainted with the sound of this row I point at the tonal reference of the combination of trichords 1+1 and 3+1 to what is called the

harmonic minor of the fifth degree, the second tetrachord of a minor (or major) harmonic scale. To highlight this characteristic sound of the first hour my advice is to create sequences by transposing this trichord combination up and down by intervals of (combinations of) minor seconds, minor thirds and major seconds. Extended forms of these trichords in bar 3 result in three tetrachords completing a twelve bar row. Bars 4 and 5 contain simple manipulations of the form and the order of similar trichords. Bar 4 shows a succession of the extended 1+3 trichords steered by trichord 3+3. The presence of this steering trichord refers to the tonal color of the diminished chord. In bar 5 trichord 2+2 is used as steering trichord to order the extended trichords of the basic row in bar 1. Here the steering trichord refers to the tonal color of the whole-tone scale.
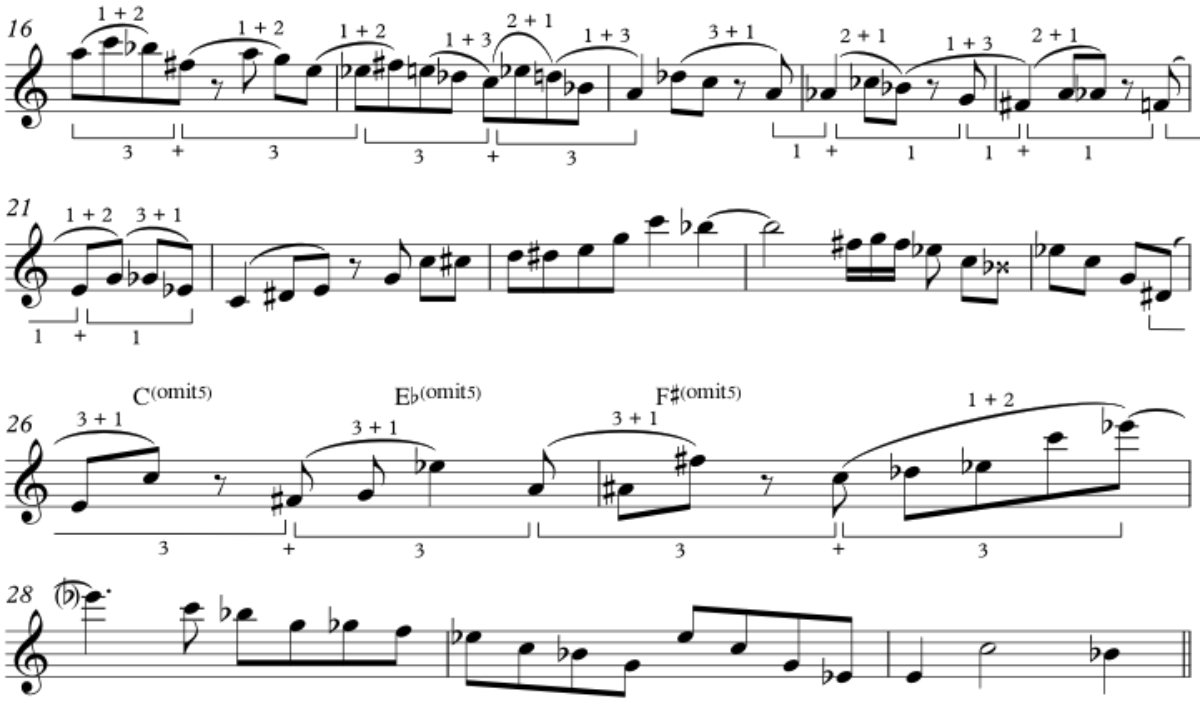


[ex 4.5.1.9]

The following fragment of my own tenor saxophone solo shows examples of trichord operations as suggested above. In bars 8–11, I play an ascending sequence of 3+1 trichords. The steering hours of these trichord combinations are quite random: 2+1, 3+1, and 3+2. In the following bars, I play a descending succession of 3+1 trichords in retrograde. This sequence is steered by the symmetry of the extended trichord 2+2+2. This fragment refers both to my ideas of both repeating trichords by freely transposing them up an down, and to create orderings by applying symmetric steering trichords, as demonstrated in bar 5 of my suggestions for improvisations. Both operations are meant to illustrate and emphasize the sound possibilities of the trichords and trichord combinations at stake rather than to manipulate the complete Tone Clock hours.



[ex 4.5.1.10 "Onsa" – tenor saxophone solo fragment]

In the next fragment of my solo the symmetry of the first hour's row is illustrated by the 3+3 steering trichords in bars 16–17 and 26–27. These bars point back to the idea of ordering segments at minor third distances as expressed in bar 4 of my suggestions for improvisation. In bars 18–21, the basic 1+1 trichord of the first Tone Clock hour itself serves as a steering hour of a sequence of 1+2 and 1+3 trichords.



[ex 4.5.1.11 "Onsa" – tenor saxophone solo fragment]
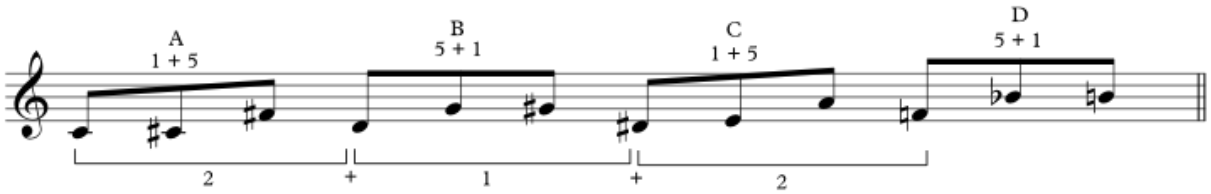
Evaluation

The composed parts in "Onsa" display conscious applications of various twelve-tone operations. Operations with three distinct twelve-tone rows are applied to construct the melodic lines. They are manipulated by octave displacements, by re-ordering trichords and trichord combinations from the row, and by transpositions of these elements. Vertical orderings are created by stacking the trichords and trichord combinations from the first Tone Clock hour and from other hours. The trichord terminology appears to be an insightful tool to identify these vertical orderings that are difficult to express in conventional chord symbols.

The transcription of my tenor saxophone solo demonstrates a deliberate use of successions of trichords from the basic row and from related rows. It provides clear illustrations of ordering these trichord successions by the steering chord of the row or by other symmetric steering trichords. These operations illustrate the possible applications of my suggestions for improvisation.
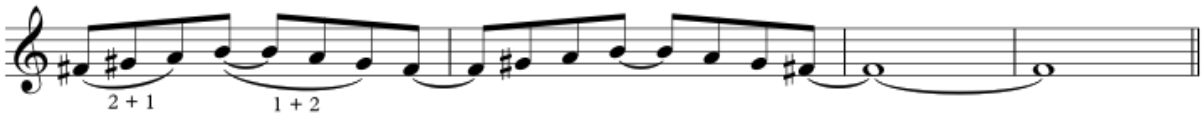
4.5.2 "Pontiac"

In the basic row of "Pontiac" the 1+5 and 5+1 trichords of the fifth hour are steered by trichord 2+1 from the second hour.
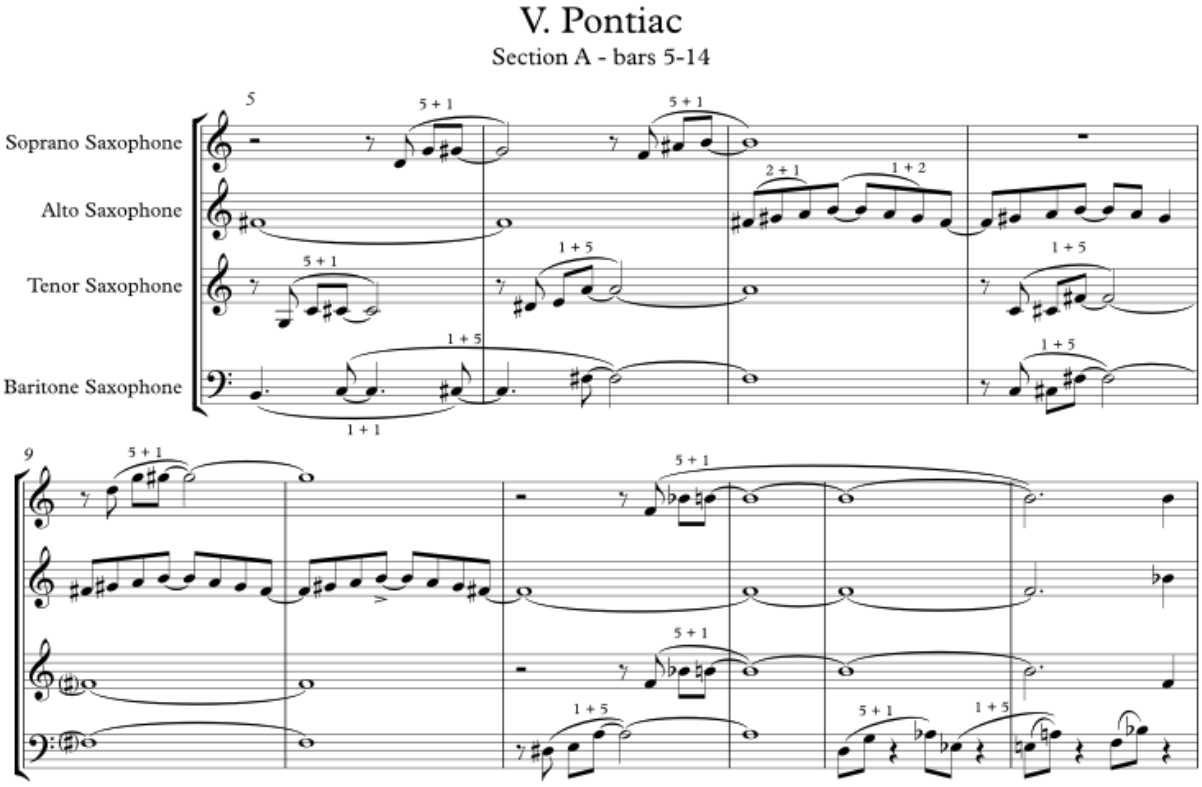


[ex 4.5.2.1]

The alto saxophone opens section A with the following fragment, created with the steering trichord of the second hour, that will serve as a basic line all through this movement.



[ex 4.5.2.2 "Pontiac" alto saxophone melody]
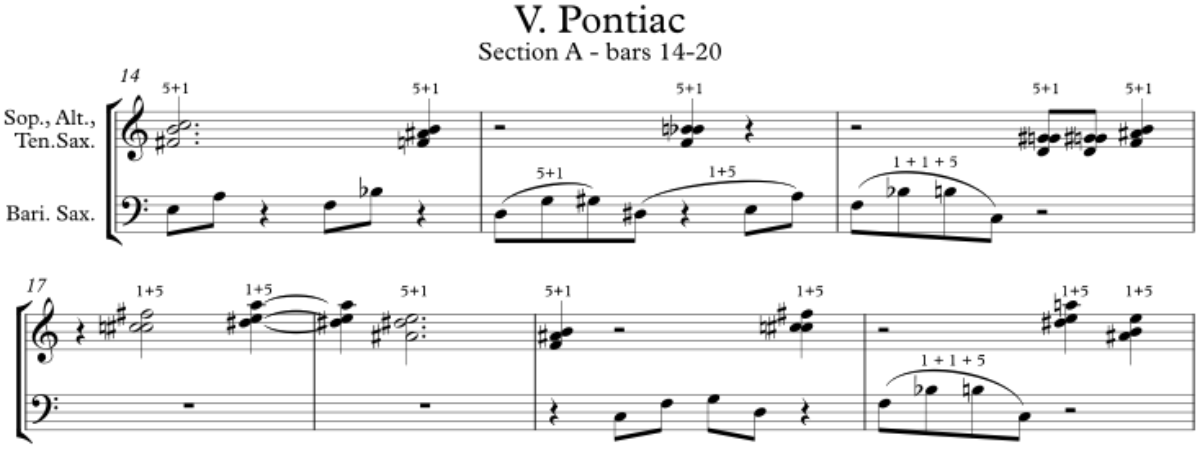
From bar 5 in section A, the alto saxophone continues this basic line, while the soprano and tenor saxophones play 5+1 and 1+5 trichords. So does the baritone saxophone, but he adds a chromatic pick-up note. This combination of trichords 1+1 and 1+5 results in fact into a 1+1+5 tetrachord.



[ex 4.5.2.3 "Pontiac" – section A fragment]

Then, the baritone saxophone continues playing perfect fourth intervals, largely at distances of minor seconds, again resulting in 1+5 and 5+1 trichords. In bars 16 and 20 the 1+1+2 tetrachord is played again, with the note c in octave displacement.

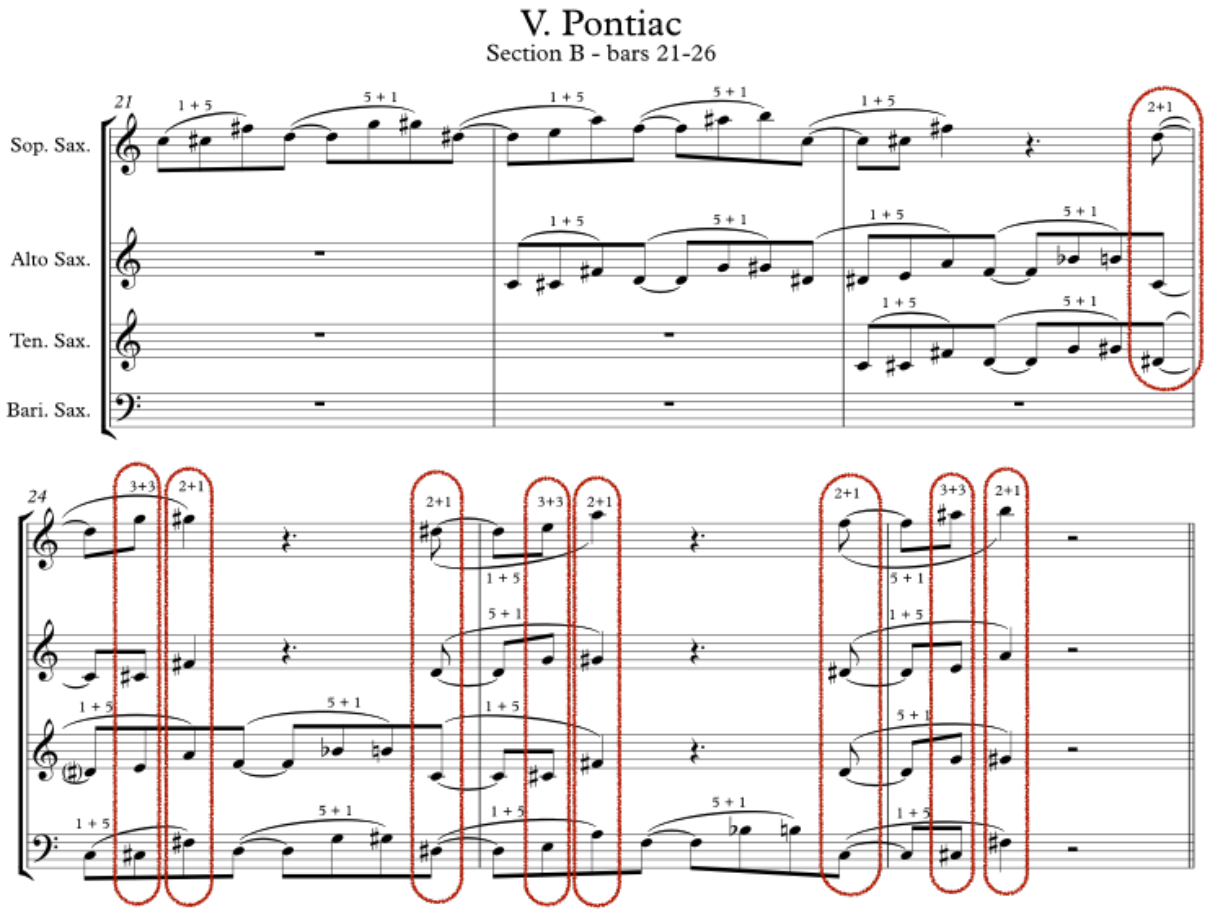
Tenor, alto, and soprano saxophones play vertical orderings of trichords 1+5 and 5+1.



[ex 4.5.2.4 "Pontiac" – section A fragment]
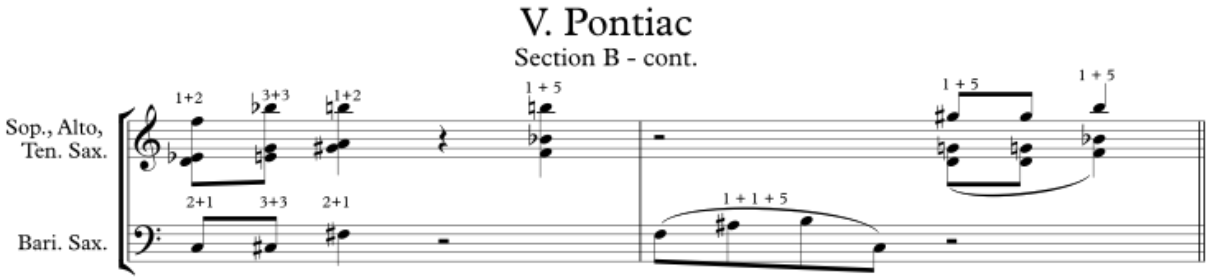
In section B the centrifugal sound of the fifth hour is emphasized by repeating the complete basic twelve-tone row as a canon over all four voices. As a result of this

arrangement of the rows, vertical orderings of steering trichord 2+1 and trichord 3+3 could be created.



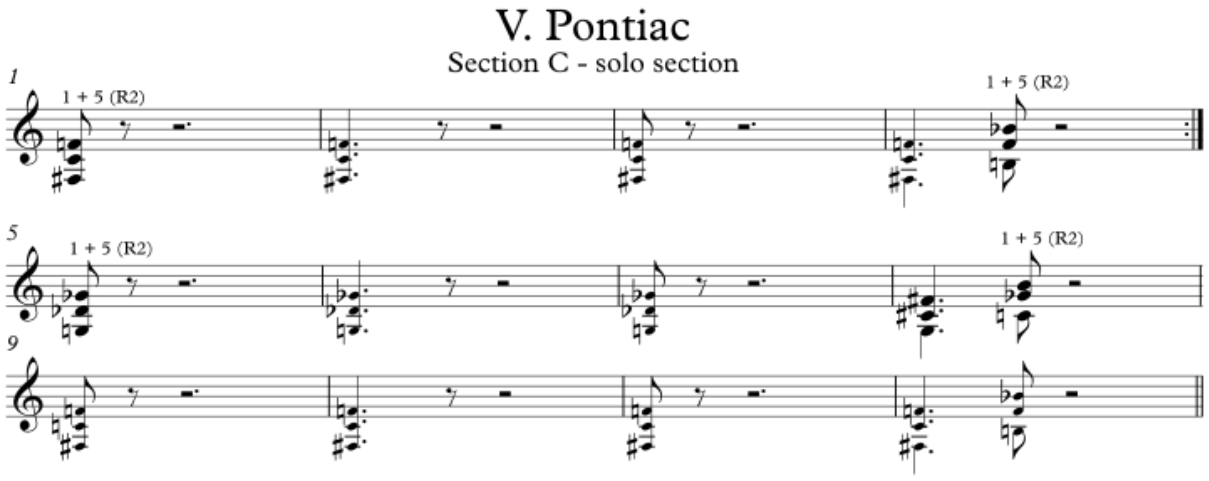
[ex 4.5.2.5 "Pontiac" – section B fragment]

In the continuation of section B the stacked 1+2 and 1+5 trichords, with the soprano part in octave displacement, keep emphasizing the dissonant sound of the fifth hour.



[ex 4.5.2.6 "Pontiac" – section B fragment]

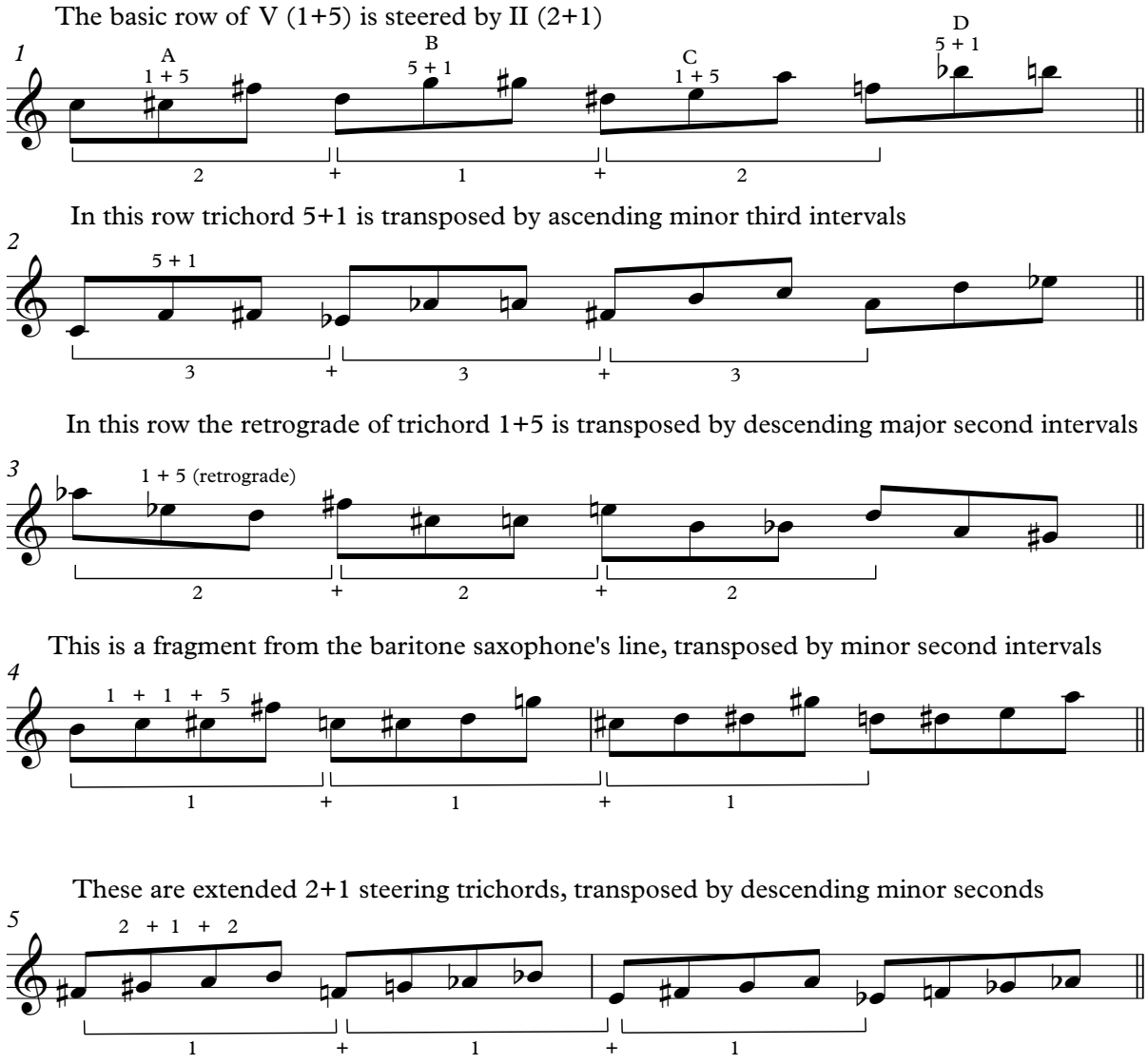
The solo form in section C is a traditional A1 (bars 1–4) - A2 (bars 1–4 repeated) - B (bars 5–8) – A3 (bars 9-12) form that is – although usually arranged in lengths of eight bars per section – quite common in jazz. The accompanying part is made of stacked 1+5 trichords in second rotations, resulting in intervals of augmented and perfect fourths.



[ex 4.5.2.7]

In my suggestions for improvisations in the example below, I intend to present ideas of meaningful melodic lines. I mention for instance in bar 2 that a transposition of trichord 5+1 by minor third intervals will create a stronger melodic line than applying the same operations to trichord 1+5. The latter will result in a pattern evoking a "cliché embellishment" of a diminished seventh chord, a pattern that in my opinion should be avoided in order to keep distance from obvious tonal references. In bar 3, I suggest the retrograde of trichord 5+1 played in descending direction, transposed by major second intervals. I find this line attractive because in this ordering the major second interval is added to the minor second and perfect fourth of the trichord, to result in a higher harmonic vagueness and at the same time in a larger emphasis on the basic trichord. The suggestions in bars 4 and 5 are related to elements in the theme of "Pontiac". In bar 4, I suggest to pick the tetrachord played by the baritone saxophone in bar 5–6 of section A, a characteristic pattern in the composed part, and to transpose this by minor second intervals. In bar 5 the extended 2+1 steering trichord of the row, which plays an important role in the vertical structures of the composition, is transposed by descending minor second intervals.
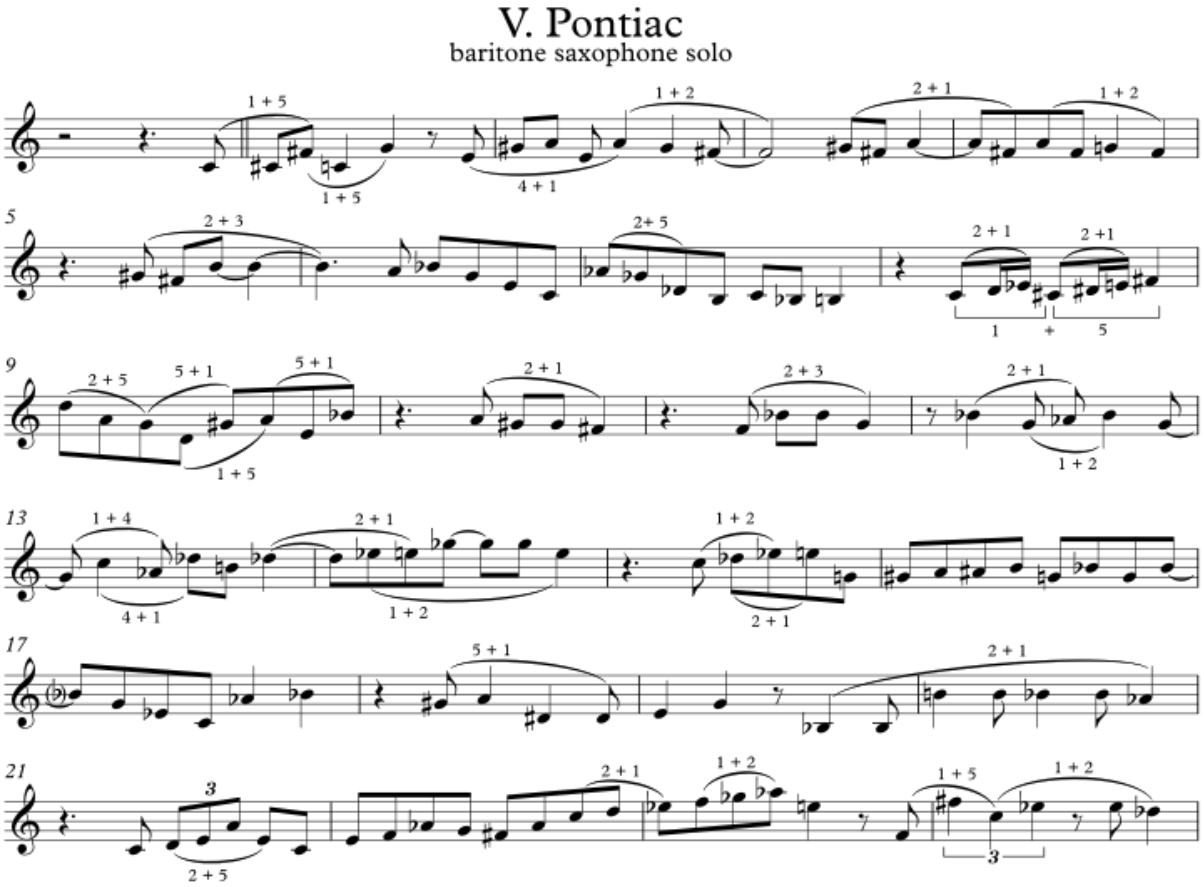
V. Pontiac
suggestions for improvisation



[ex 4.5.2.8]

The transcription of the first twenty-four bars of Nils van Haften's baritone saxophone solo doesn't show any concrete links to my suggestions for improvisation above. However, thanks to his well-informed intuition and his substantial experience as a jazz improviser he manages to play a solo that displays evident connections with the structure of the fifth hour's row and its application in "Pontiac". In bars 1, 9, 18, and 24 he relates explicitly to the 1+5 row of the fifth hour, but also to trichords 1+2 from the steering trichord that is important in the melody of this tune. This is evident in bar 14 that sounds like an echo of the alto sax melody in section A. It is also illustrated in bar 8, were the 1+2 trichord is played in the melody, while the basic 1+5 trichord is the steering interval.

An important ingredient of the 1+5 trichord, the perfect fourth interval is emphasized several times in Van Haften's solo. Beside in the 1+5 trichords from the row, this interval is also implied in the 2+5 trichords in bars 7, 9, and 21. Likewise, in the interval successions that are marked by trichords 1+4, 4+1 (bar 2, 13) and 2+3 (bar 5, and 11) the perfect fourths might lead him to use them as a references to the fifth hour of the Tone Clock. Although this striking element in his solo does not comply strictly with the appointed 1+5 trichords of the fifth hour, it is tenable in musical terms. In the next section I will come back to the relations between trichords 1+5, 2+5, and 2+3.



[ex 4.5.2.9 "Pontiac" – baritone saxophone solo fragment]
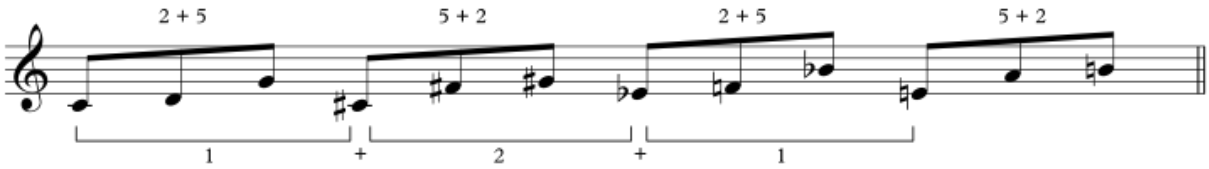
Evaluation

Compared to "Onsa", the focus in "Pontiac" has been changed from manipulations of complete twelve-tone rows to operations with the trichord segments of the row. As a result, the horizontal relationship in the melodic lines between the 1+5 basic trichord of the row and the 2+1 steering trichord, ordered in alternating positions, is more intense. In their vertical orderings both trichords effectively support the characteristic dissonant sound of the fifth hour.

In his solo, Van Haften's reference to the Tone Clock hour is more distant than mine in my solo in "Onsa". Instead of deliberate operations with a single predominant trichord, he intuitively refers to the appointed intervals of a minor second and a perfect fourth. This is the direct result of my additional advice to the soloists, to refer intuitively to the written parts while following my written suggestions for improvisation.

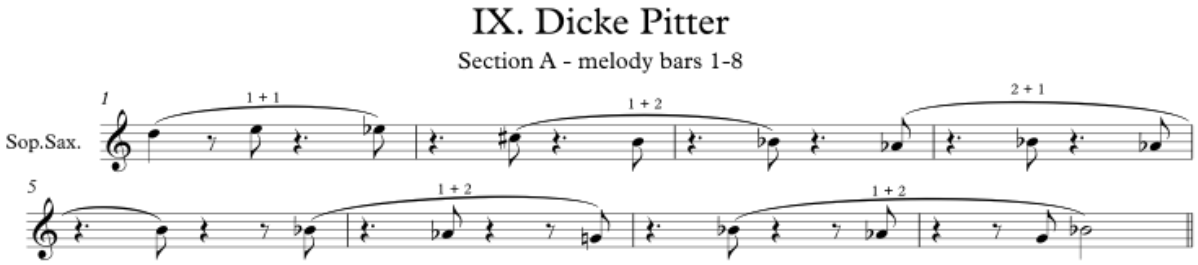
4.5.3 "Dicke Pitter"

In the basic row of "Dicke Pitter" the 2+5 and 5+2 trichords of the ninth hour are steered by trichord 1+2 from the second hour.



[ex 4.5.3.1]
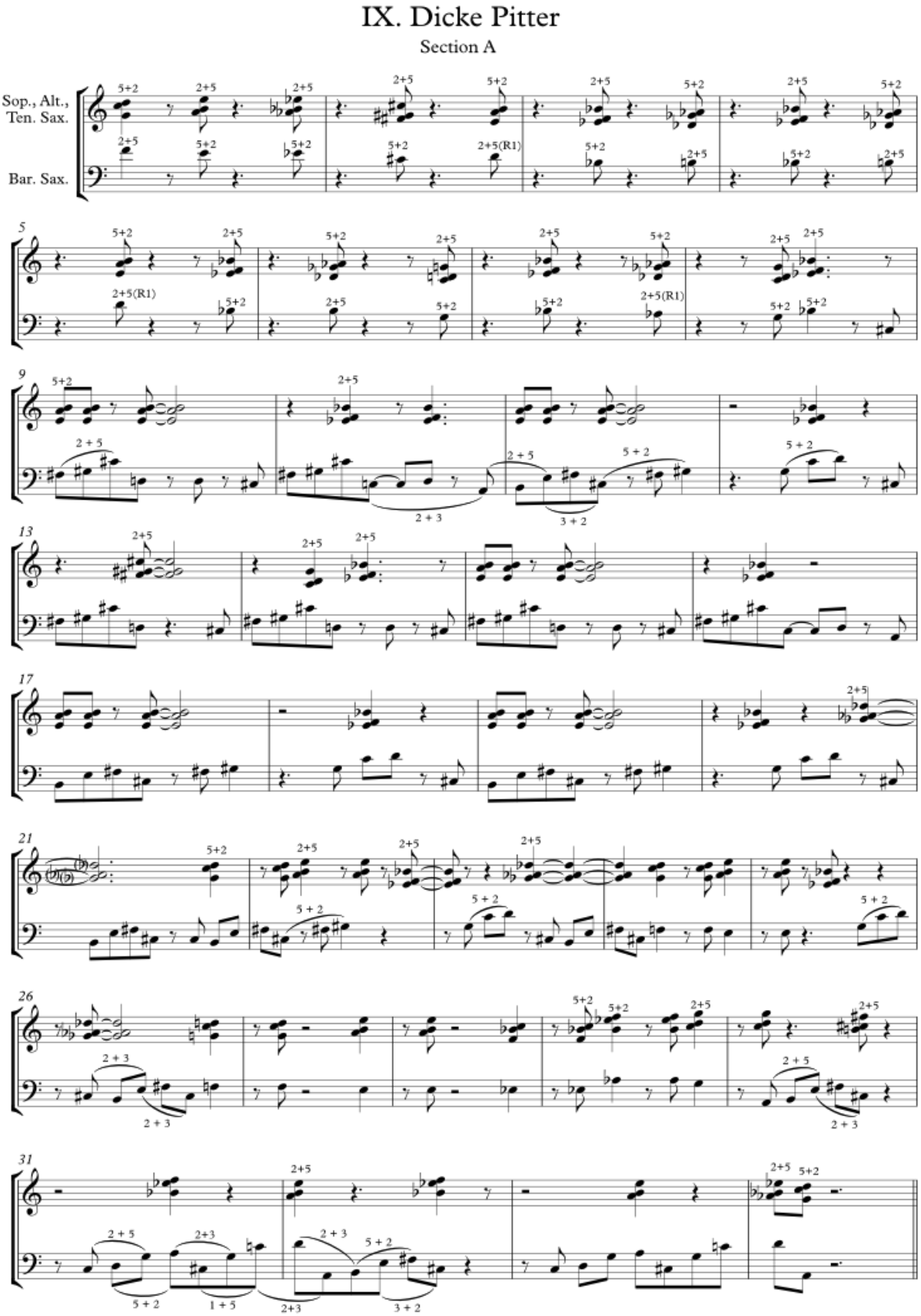
In section A of "Dicke Pitter" the bells of the cathedral in Cologne are sounding. This fragment mocks the rhythmic effects of bells in a clock tower ringing at the same time. In the first eight bars the soprano saxophone plays a series of accentuated notes constructed with 1+1 and 1+2 trichords.



[ex 4.5.3.2 "Dicke Pitter" – section A fragment]
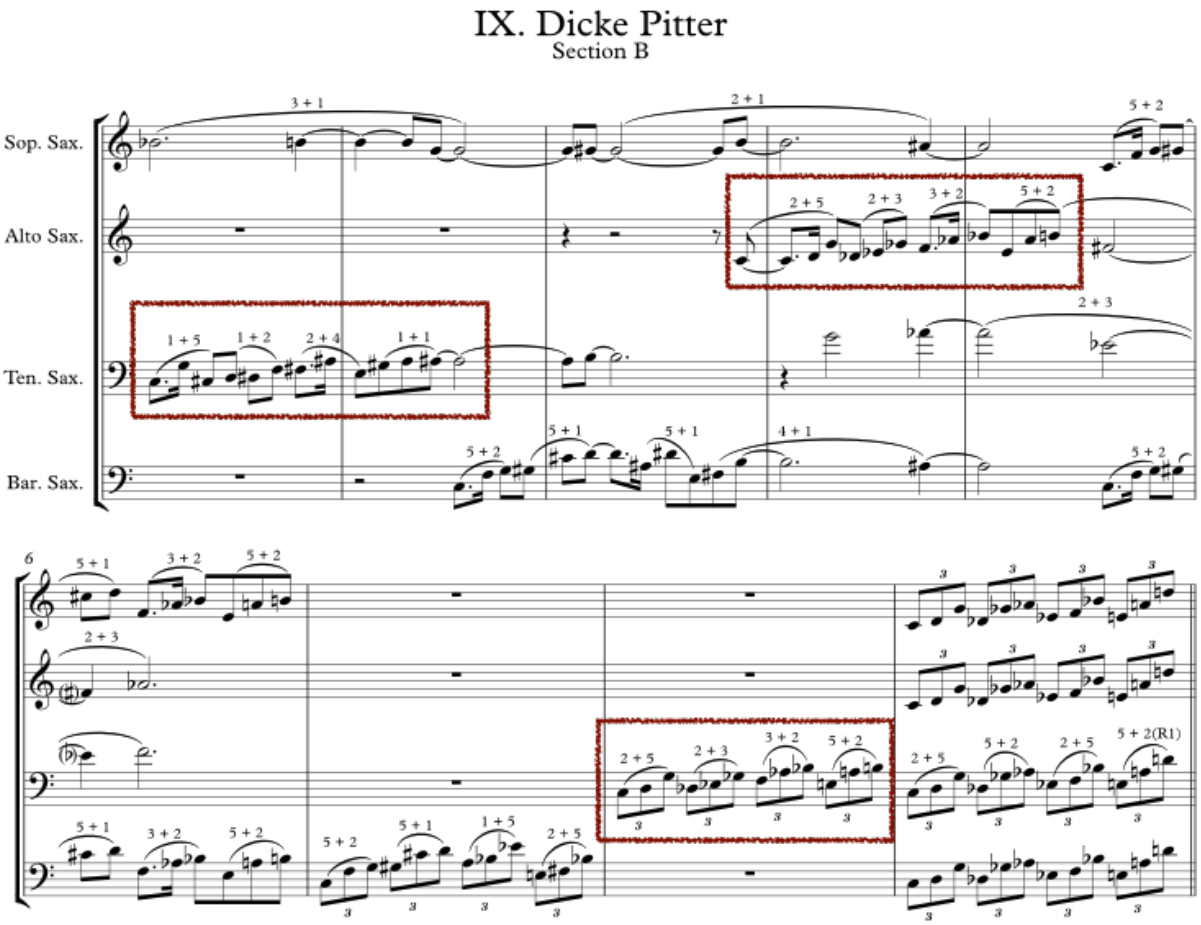
This melody is harmonized with vertical orderings of 2+5 and 5+2 trichords. Trichords 5+2 are stacked on 2+5 trichords and 2+5 trichords stacked on 5+2 trichords, resulting in tetrachords of 2+5+2 and 5+2+5.

From bar 9 until the end of section A, the baritone saxophone plays a melodic line that is mainly constructed with 2+5 trichords. The fragments in bars 10–11 and in bars 30–34 display combinations of trichord 2+5 with trichords 2+3 and 1+5. These bars can serve as demonstrations of Schat's statement that trichord 2+5 "easily makes contact with other tonalities […] such as that of the Seventh Hour […] or more distantly, that of the Fifth Hour" (Schat 1993: 67).
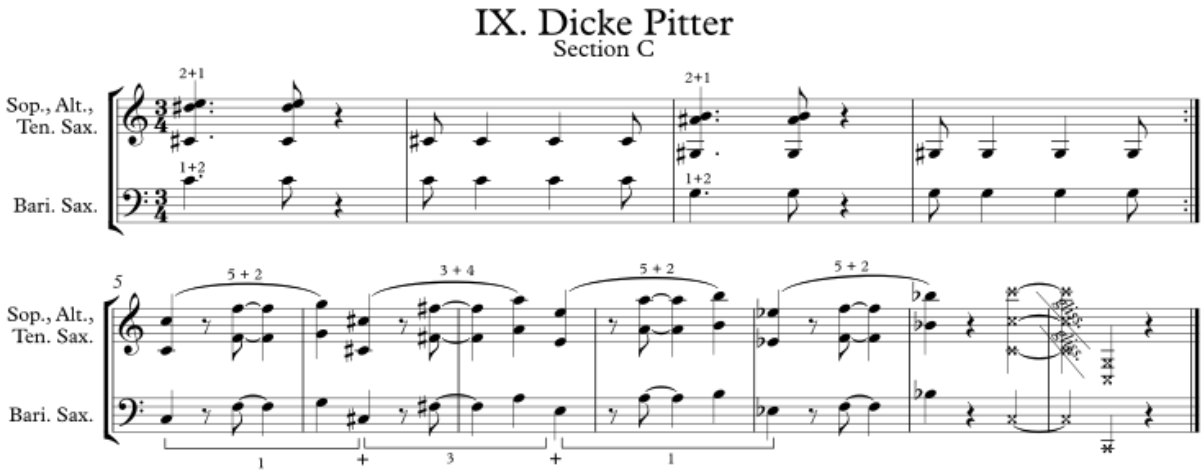


[ex 4.5.3.3 "Dicke Pitter" – section A fragment]

In section B the tenor saxophone sets up a melodic line that in bars 1–2 displays a twelve-tone row ordered with a succession of trichords 1+5, 1+2, 2+4 and 1+1. The other saxophones successively answer this line with rows of different lengths and different trichords. The soprano and baritone saxophones together in bars 5–6 play a combination of 5+2, 5+1, 3+2, and 5+2 that results in a ten-tone row. The alto sax in bars 4–5 plays a twelve-tone row that combines trichords 2+5 and 5+2 with trichords 2+3 and 3+2, and is repeated by the tenor saxophone in bar 8. These lines again provide evidence for Schat's statement about the easy contact between these trichords. The baritone saxophone plays a ten-tone row in bars 2–3 and repeats this in bar 7. The line in bar 9, played in unison and octaves, almost displays the complete twelve-tone row of the ninth hour. The last note b is changed into the note d, to end this short theme with a trichord of two perfect fourth intervals, the first rotation of 2+5 trichord d–e–a.



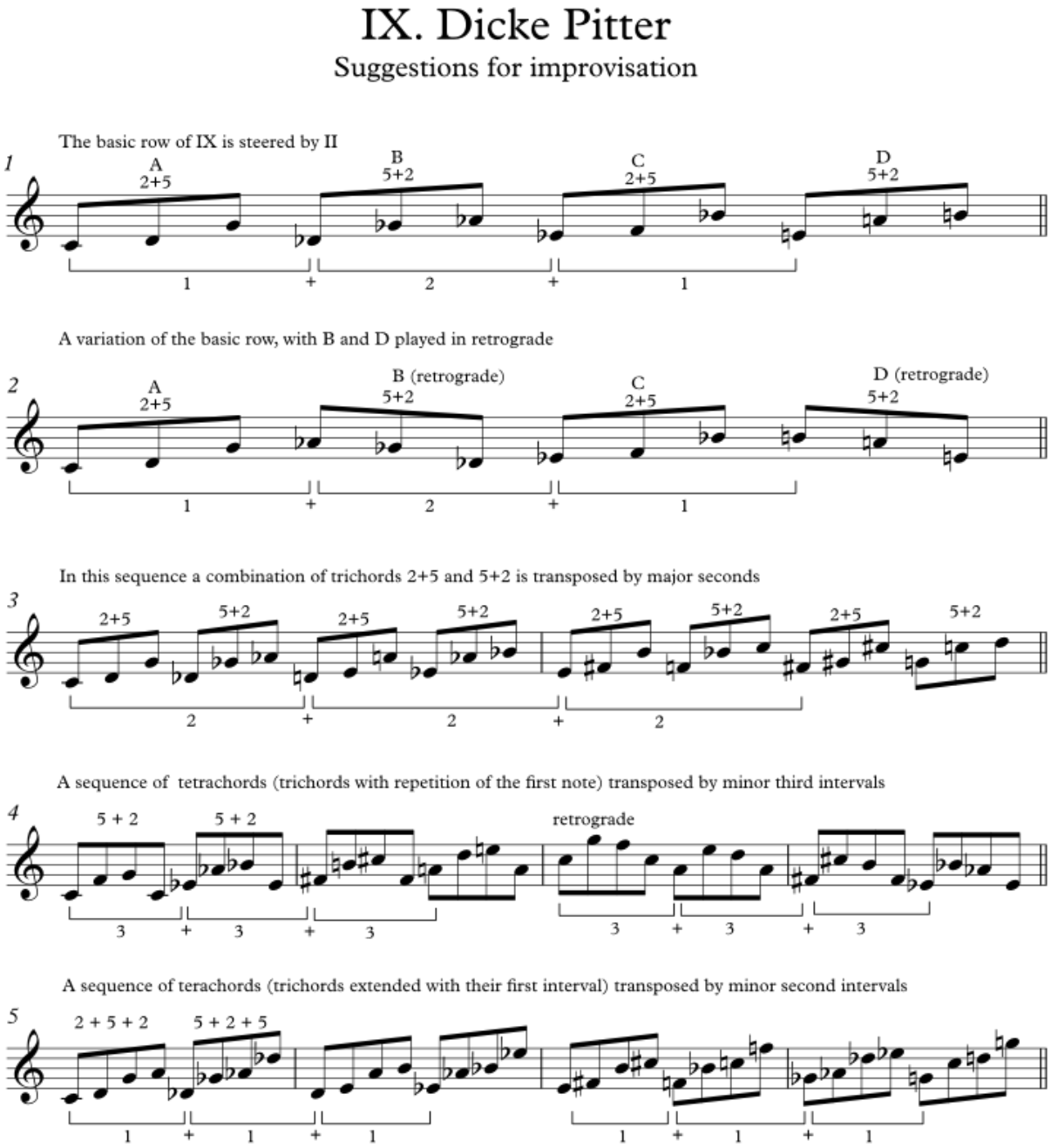
[ex 4.5.3.4 "Dicke Pitter" – section B fragment]

Section C is open for a tenor saxophone solo. The accompaniment is a succession of vertically ordered steering trichords 1+2 and 2+1. This results in a harmonic reference of a C pedal point and a G pedal point. The tutti part starting at bar 5 is finished abruptly by a long "fall" played by all four saxophones.



[ex 4.5.3.5 "Dicke Pitter" – section C bars 5-11]

As a first suggestion for improvisation in bar 2, I stay close to the basic row of the ninth hour, by putting the second (B) and fourth trichord (D) of the row in retrograde. In bar 3 I suggest a sequence of a trichord combination A+B, transposed by major second intervals. Then, in order to escape to the "three-ness", the continuous presence of 12/8 triplets in the twelve-tone rows, I play the 5+2 and 2+5 trichords in bars 4 and 5 in extended forms. The sequence in bar 4 is created by repeating the root notes of all 5+2 trichords and by transposing the resulting tetrachords by minor third intervals. In bar 5 I extend the trichords by repeating their first intervals: trichord 2+5 becomes tetrachord 2+5+2, and trichord 5+2 becomes tetrachord 5+2+5. The resulting tetrachords are steered by minor thirds and by minor second intervals. Here I again show my preference to create differences between the intervals in the trichords and the steering intervals.
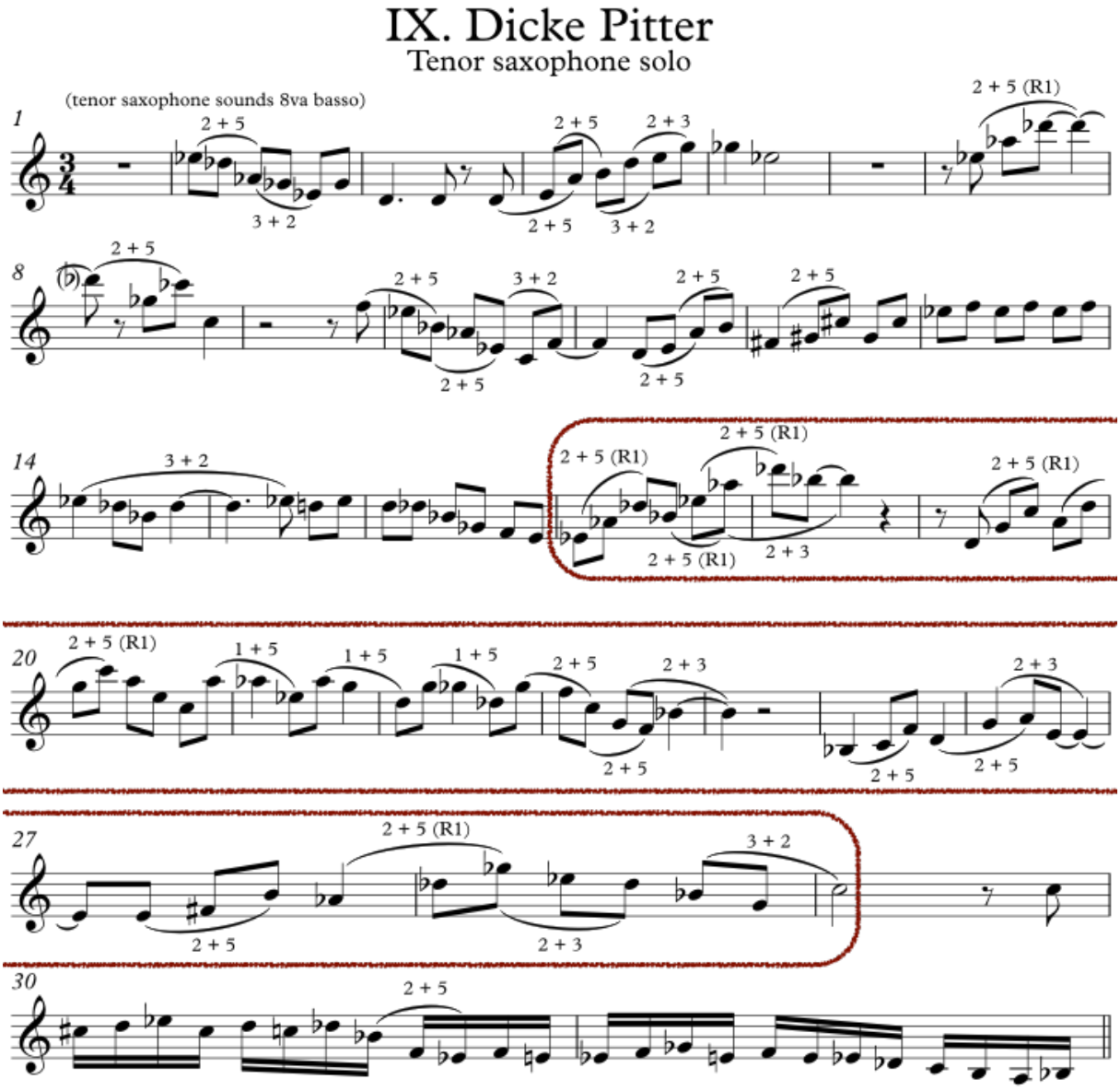


[ex 4.5.3.6]

Trichord analysis of my tenor saxophone solo reveals a large number of deliberate applications and variations of the 2+5 trichord; there are no clear references to the suggestions for improvisation above. The encircled fragment of bars 17–29 summarizes a number of characteristic applications. First, in bars 17–20 the first rotations (R1) of trichord 2+5 draw the attention by the symmetric combinations of two perfect fourth intervals. These are followed by several 2+5 trichords in prime forms in bars 23–27.

Bars 21–28 also show combinations of trichord 2+5 and trichords 2+3, and 2+5. This again recalls Schat's statement that the ninth hour easily makes contact with the seventh

and the fifth. The trichord analysis indeed shows a connection between trichord 2+5 and the 2+3 and 1+5 trichords of these hours. I admit that at the moment I played this solo I was not aware of this connection. Just as in Van Haften's baritone saxophone solo in "Pontiac", the connection seems to result of my emphasis on the interval of a perfect fourth which is also a component of trichord 1+5, and the "sum" of the trichord 2+3.



[ex 4.5.3.7 "Dicke Pitter" – tenor saxophone solo]
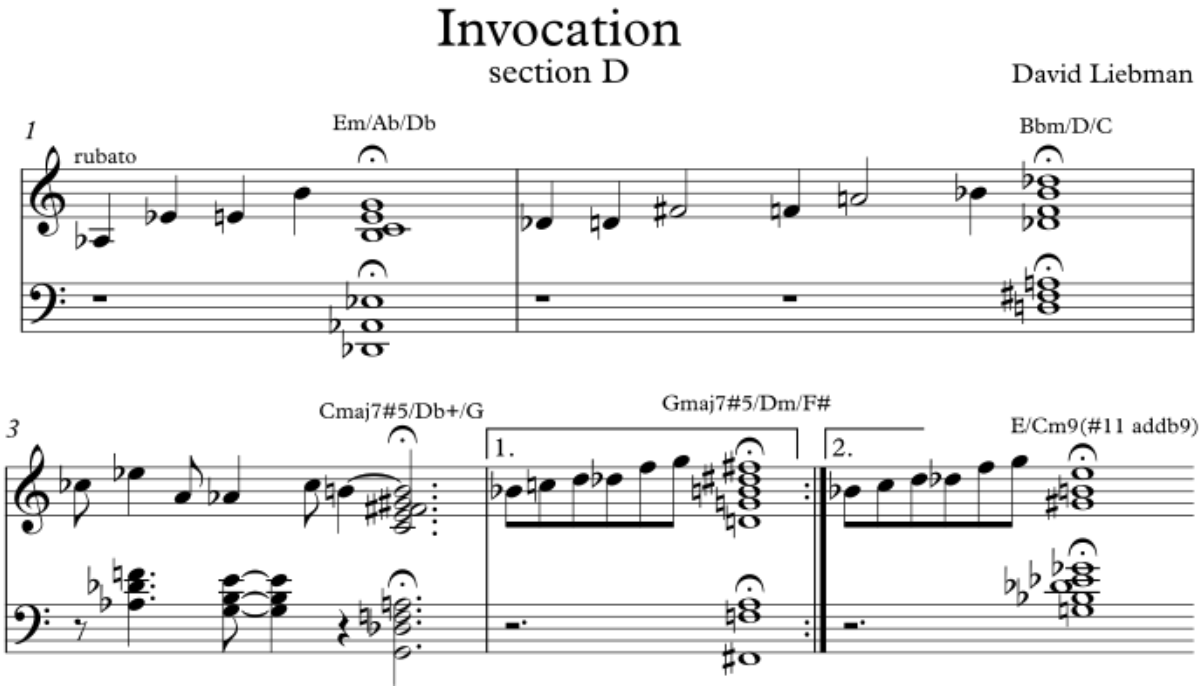
Evaluation

Two different twelve-tone rows, two different ten-tone rows, and one eleven-tone row can be identified in "Dicke Pitter". Both twelve-tone rows are constructed with trichords from various Tone Clock hours. Only the eleventh-tone row is constructed with ninth hour trichords exclusively. Despite the sparse references to the ninth hour in the melodic lines, the vertical ordered fragments contain separate stacking of both its rather consonant basic 2+5 trichord and the more dissonant 1+2 steering trichord. Schat's assumption of an "easy contact" between trichord 2+5, 2+3, and 1+5 is confirmed both in the composed part and in the tenor saxophone solo. Although not mentioned in the suggestions for improvisation, the second rotation of trichord 2+5 resulting in a stacking of two perfect fourth intervals, proved to be an interesting tool to create combinations of 2+5 trichords.

The combination of trichord 2+5 (rather consonant) with its steering trichord 1+2 (rather dissonant) on the one hand, with friendly trichords 2+3 (rather consonant) and 1+5 (rather dissonant) on the other, make this ninth hour of the Tone Clock an attractive tool in the border area between twelve-tone technique and tonality.

4.6 Trichord operations instead of "composite scales"

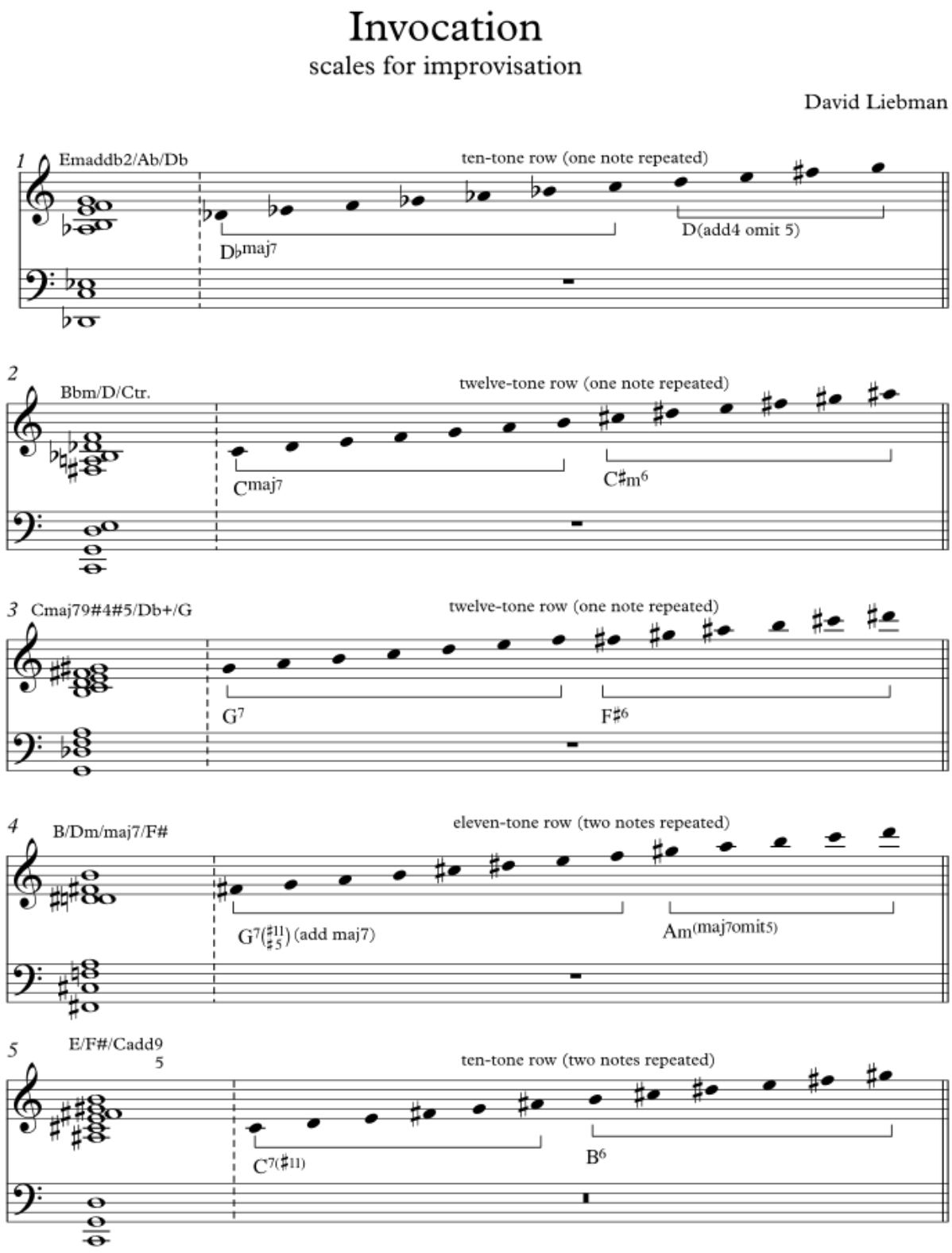
In section 3.2.3 I discussed the first three sections of Liebman's composition "Invocation" (Liebman 2013: 170). The example below displays a fragment of the slow ballad in section D of this composition. I will take this as an example to discuss trichord operations as a simple alternative to Liebman's complex improvisational approach.



[ex 4.6.1 "Invocation" – fragment section D]

Regarding the improvisations Liebman suggests to connect his "triple polychords" to a number of "composite scales" (Liebman 1993: 174), I have concerns with the complexity of these suggestions for improvisation. In my opinion, Liebman's scales as such sound like twelve-tone rows, without a clear link to the structure of the accompanying chords. This, combined with the fact that the separate "tonalities" of the last four bars each, tend to evoke an "anything goes" approach to improvisation that I dislike. As an alternative to his approach, I will demonstrate how twelve-tone techniques with the Tone Clock's trichords can be applied as a useful alternative to Liebman's random mixture of twelve-tone and tonal approaches.

The example below displays the rows, ranging between ten-tone and twelve-tone rows, as well as the implied fragments of diatonic scales in each row. The polychords (slightly different from those in the fragment above) are notated as root note with, stacked upon them, a combination of either two triads or a triad with a seventh chord.

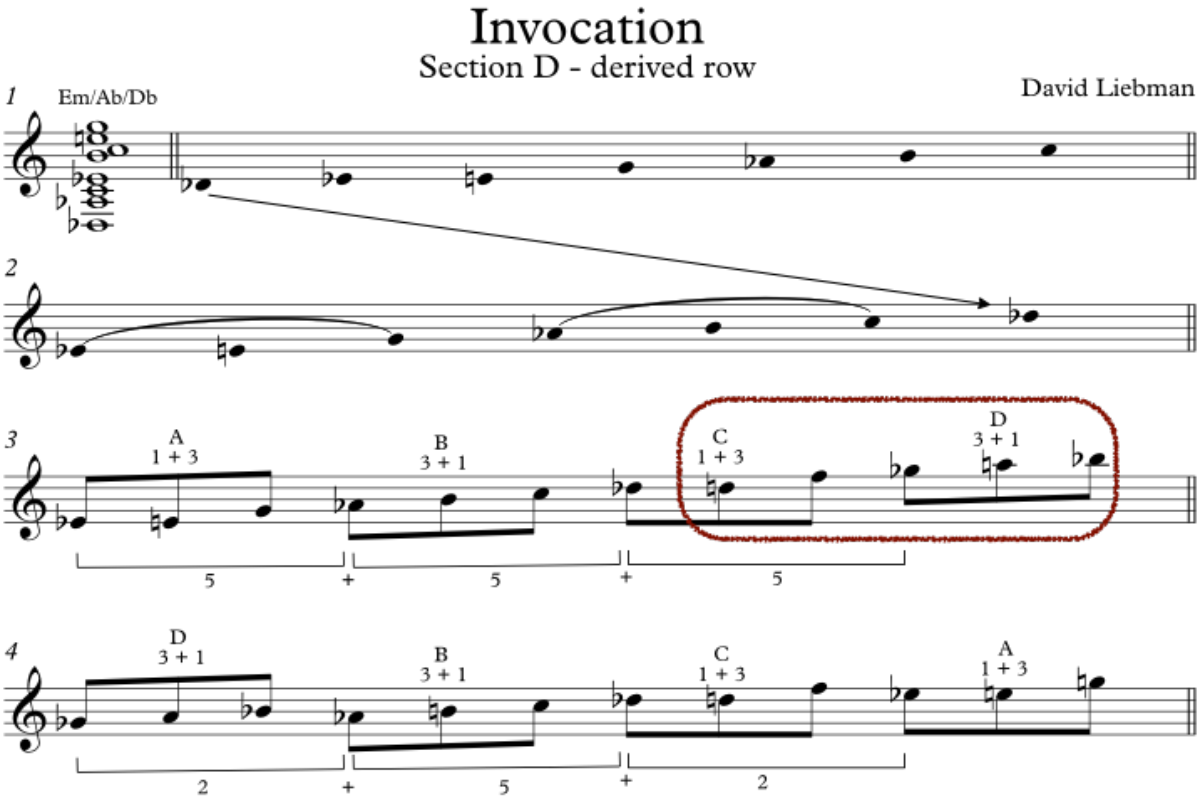


[ex 4.6.2]

The following examples show my trichord operations to the first, the second and the last accompanying chords in the fragment of section D shown above. In order to maximize

the connection between composition and improvisation, I chose the complex chords from that section, instead of Liebman's slightly modified solo chords.

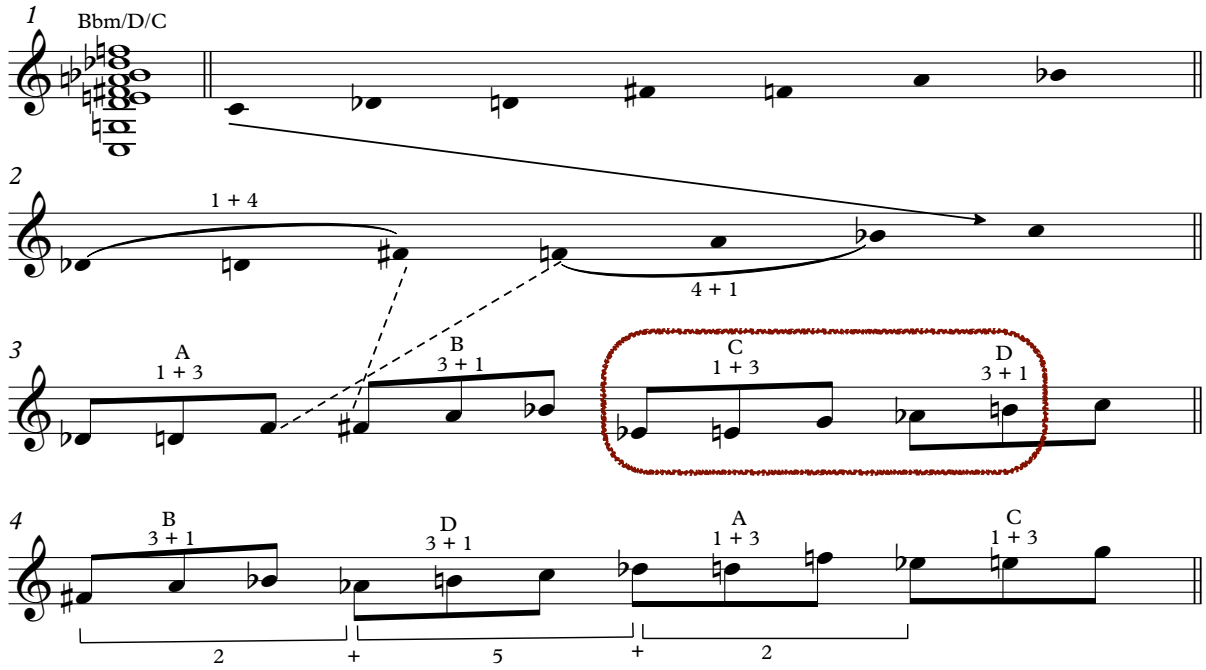
The first line contains all pitches from the melody and the chord in the first bar, in displayed order. By moving the note d♭ to the end of the row, this line starts with a combination of trichords 1+3 and 3+1. By transposing this combination up a minor seventh (T10), so that it starts with the note d♭, the twelve-tone row in bar 3 is created, containing a succession of 1+3 and 3+1 trichords from the third hour of the Tone Clock. This row is steered by tetrachord 5+5+5, a combination of two 5+5 trichords. The notes that are added to complete the row are encircled. As seen in "Dicke Pitter" in section 4.5.3, trichord 5+5 is the first inversion of trichord 2+5. With this in mind, the correct row that is displayed in the fourth line can be derived. It is steered by tetrachord 2+5+2, a combination of trichords 2+5 and 5+2. Thus, improvisers who are familiar with the Tone Clock can use this row as the basis for their improvisations on the stated complex chord.



[ex 4.6.3]
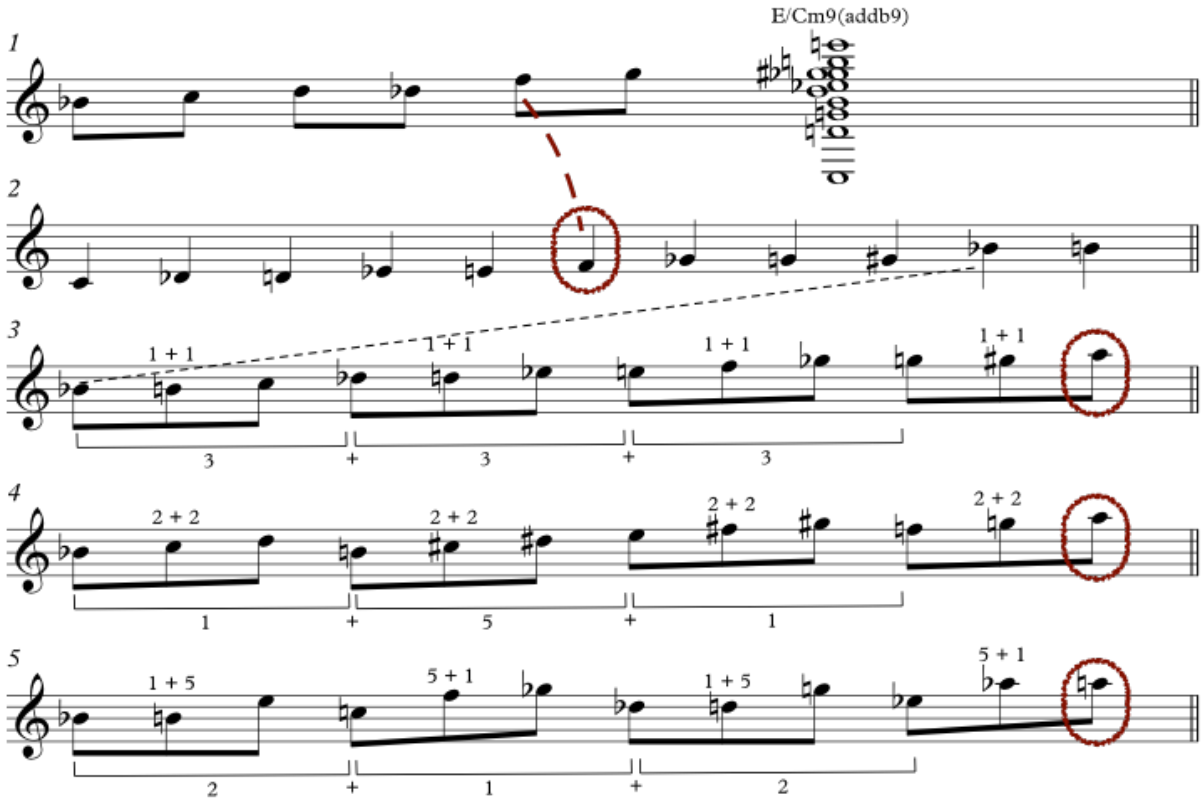
In the next example, all seven pitches present in the second bar of "Invocation" are ordered in a succession of trichords 1+4 and 4+1 plus the note c, the root note of the chord, which is displaced to the last position of the row. By changing the positions of the

notes f$^{\#}$ and f, a combination of trichords 1+3 and 3+1 is created. By transposing this trichord combination up a major second, a twelve-tone row is created with the note c at the last position. The added notes are encircled. The fourth bar shows how I re-ordered these trichords with steering hour 2+5. This row sounds the same as the fourth one in the previous example. Thus, improvisers could create continuity between the chords in bar 1 and 2 by taking this row as their reference.



[ex 4.6.4]

From the chord in the last bar of the fragment of section D (see example 4.6.1) an eleven-tone scale can be extracted as is shown in bar 2. To complete a twelve-tone row, the note a has been added in bar 3. This chromatic scale allows improvisers to superimpose the trichords 1+3 again, adding continuity to the previous rows. But they could also derive various (different) rows at pleasure, as shown in bars 3–5. Bar 3 shows the derivation of a twelve-tone row constructed with 1+1 trichords from the first hour, steered by the 3+3 trichord from the tenth hour. Bar 4 displays an alternative derived tone row with trichords 2+2 from the sixth hour, steered by trichord 1+5 from the fifth hour. The derived row in bar 5 is constructed with the same trichord, steered by trichord 2+1 from the second hour.



[ex 4.6.5]

Evaluation

For sure, Liebman's complex scales justify the hybrid tonal colors that can be distinguished in his chords. But, as an addition to this, the trichord applications demonstrated above could help the improviser to create consistent melodic lines in complex harmonic contexts. Experienced improvisers will manage to superimpose these twelve-tone techniques to express their individual harmonic colors as an alternative to, or alongside the advanced chord-scale approach that Liebman is pointing at. They can create continuity between complex chords even when they are not intentionally composed with these twelve-tone techniques. The continuation of the 1+3 trichord between the first and second chord is a clear example of this. The actual application of manipulating the Tone Clock's trichords proves the value of this system as a self-employing tool for improvisation in a complex harmonic context.

4.7 Generative compendium of melodic patterns

The improvisations by the saxophonists in "Carillon" display a combination of guided and informed intuitive improvisation. The guided part results from my written suggestions, my verbal explanations, and my sonic demonstrations of how to operate with the basic trichords, trichord combinations and row variations. The intuitive part results from how the saxophonists launch their individual musical experiences to connect this new information to their existing improvisational practices.

Saxophone quartet "Carillon" was composed and recorded before the publication of O'Gallagher's method on twelve-tone improvisation, discussed earlier in subchapter 3.7. There I expressed my concerns with his rather encyclopedic approach, resulting in a large quantity of barely meaningful patterns by which his method shows rather a theoretical than a practical quality. As another drawback, I mentioned that O'Gallagher didn't offer clear solutions for a major rhythmic problem with the trichordal approach: the predominant presence of three-note groupings.

I consider my suggestions in the following sections as an addition to O'Gallagher's method. I share the same goal as O'Gallagher, "to acclimate and train the ear to a new way of hearing harmonic and intervallic space" (O'Gallagher 3013: 8), but considered from a different perspective. I intend to show how I derived this selection of patterns from particular trichords and trichord combinations.

In this section I present a selection of melodic lines that are created with the trichords in the twelve hours of the Tone Clock. I constructed these lines as row patterns, to express the characteristic sound of each trichord family. The trichord patterns are followed by patterns of tetrachords, brought up by Babbitt and De Marez Oyens as discussed in section 4.3.2.

I realize that my presentation of these lines as patterns consisting of symmetrical sequences of intervals can raise problems. In chapter 2, I mentioned Liebman's difficulty with the excessive use of patterns or "licks" in improvisations. Although, by their specific contours, "these shapes can act as a kind of *filler* material as a connecting phrase between main musical ideas […] there is always the danger of overuse leading to a mechanized and predictable musical statement" (Liebman 2013: 69). I emphasize that, just as the basic bebop patterns a beginning improviser repeatedly plays to internalize the harmonic, rhythmic and melodic aspects of the traditional jazz idioms, my suggested trichordal patterns are not meant as "ready-mades" to be quoted literally on stage, but rather serve as basic structures and a point of departure for personal embellishments
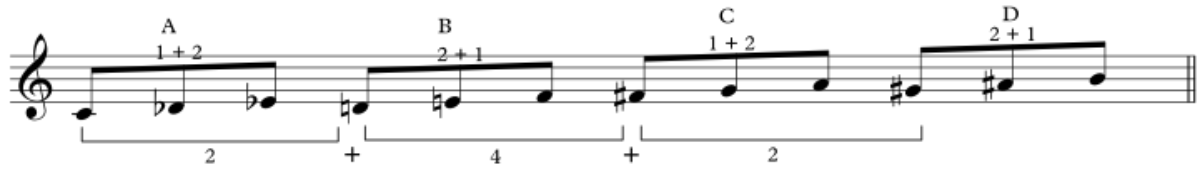
and variational techniques. Jazz students are used to working like this in order to permanently understand, organize, and embody new musical knowledge. This manipulation of sequential patterns is omnipresent during this learning process, from the two quadrants in a conventional major scale, to the multiple divisions of the chromatic scale in composer Nicholas Slonimsky's *Thesaurus of Scales and Melodic Patterns* (1975). And therewith practically: repeating and transposing scales and scale patterns is a sequential effort that helps to memorize new musical information. In section 3.3.2, I discussed this in the context of memorizing interval combinations in Bergonzi's *Thesaurus of Intervallic Melodies* (2000).

From here on, the trichords are named by their interval combinations, no longer by the numbers of the Tone Clock hours. The series of examples starts with the non-symmetric trichords 1+2, 1+3, 1+4, 1+5, 2+3, 2+4, 3+4, and 2+5. It is followed by the tetrachords 1+5+1, 2+1+2, 2+3+2, 5+1+1, and 1+2+3. To facilitate the reader's practice, every section starts with the display of the basic twelve-tone row in one or more steerings. Next, its trichords, trichord combinations, and tetrachords are presented in different positions and transpositions. In a number of cases their potential tonal colors are discussed. Patterns constructed with symmetric trichords and tetrachords have been left out because they refer predominantly to diminished and augmented tonal colors. By applying them as steering trichords, these harmonic references are less obvious because then the emphasis is on the trichords they connect. Moreover, the symmetric steering hours serve well to order the trichords and tetrachords along the five possible equal divisions of one octave. Trichord 1+1 refers to the chromatic scale itself and points at transpositions at distances of a minor second interval. Trichord 2+2 refers to the division of the octave in six equal parts, trichord 3+3 to the division in four equal parts, and trichord 4+4 to three equal parts. The division into equal parts results from tetrachord 2+2+2.

My operations to avoid obvious tonal references go hand in hand with my intentions to evoke a certain amount of harmonic vagueness. Thus, it appeared to work best by creating contrasts between intervals in the basic trichords and tetrachords of the row on the one hand, and those in the symmetric steering hours on the other. As expected, even this maximum emphasis on interval variation would not rule out any tonal references, but it appeared to be an effective strategy to avoid too obvious chord-scale applications. In his identification of the content of his Tone Clock hours and their fragments, Schat loosely alternates between notions of (meteorological) atmospheres and unfavorable associations to examples in classical music. For the time being, I prefer to remain connected to Liebman's notions of implied tonalities, temporary tonal centers, tonal anchor, linear tonality and diatonic lyricism discussed in subchapter 3.1.
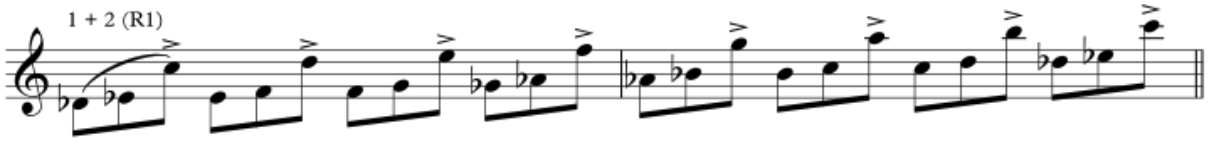
4.7.1 Trichord 1+2

In its basic row, trichord 1+2 is steered by trichord 2+4.
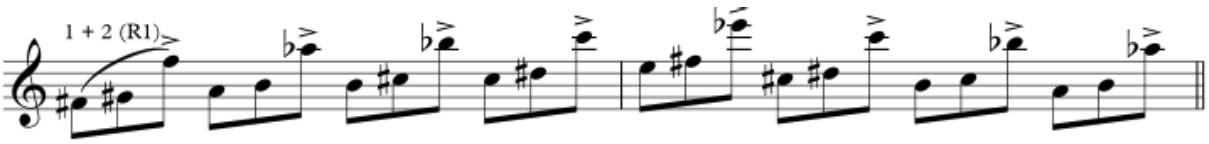


[ex 4.7.1.1]

In the first rotation (R1) of trichord 1+2, the interval between the two outer notes is a major seventh. Because of the "contemporary" sound of this wide and dissonant interval, I use this to embellish single notes or scales, such as the C major scale (shown by the accentuated notes) in the following example. As a result of this operation the resulting line sounds as an upper structure of the scale of d♭ major, with two notes adapted. To comply with the demand of merely playing 1+2 trichords in first rotation, I play g instead of g♭ in the third grouping, and d instead of d♭ in the penultimate grouping.



[ex 4.7.1.2]
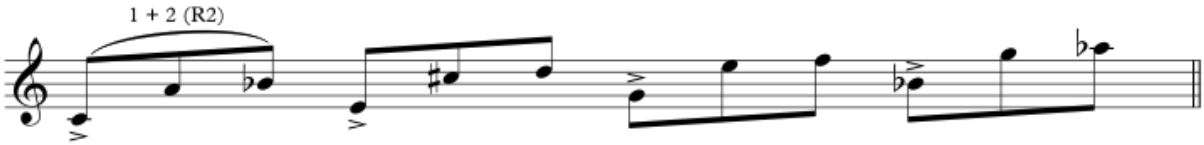
In the next example an f minor pentatonic scale (shown by the accentuated notes) is embellished with this first rotation of trichord 1+2. Just as the example above, the interval between the first and the last note of every trichord is a major seventh, and the f minor pentatonic scale sounds as an upper structure of the f♯ minor pentatonic scale.



[ex 4.7.1.3]

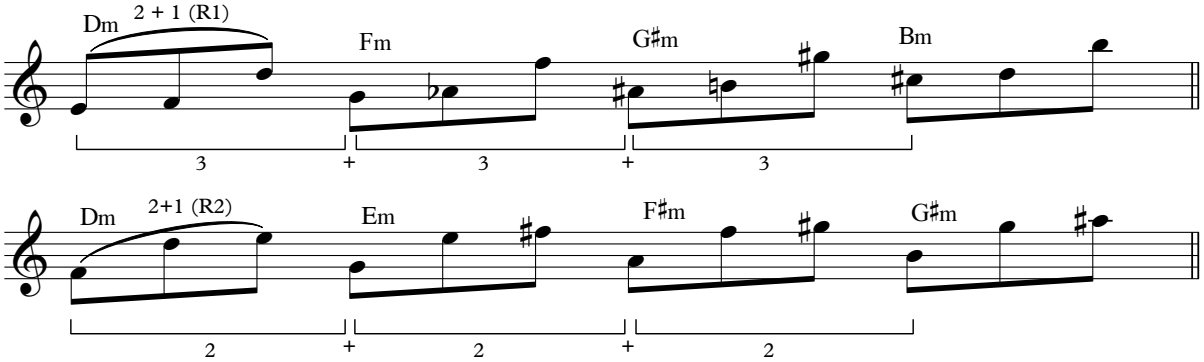
The following example shows a pattern with the second rotation (R2) of trichord 1+2 put on the (accentuated) chord notes of C7. This operation results in a melodic line that also

implies the chord tones of A7 and Bb7, while each separate trichord evokes the harmonic color of a major7/sus2/omit5 chord.



[ex 4.7.1.4]
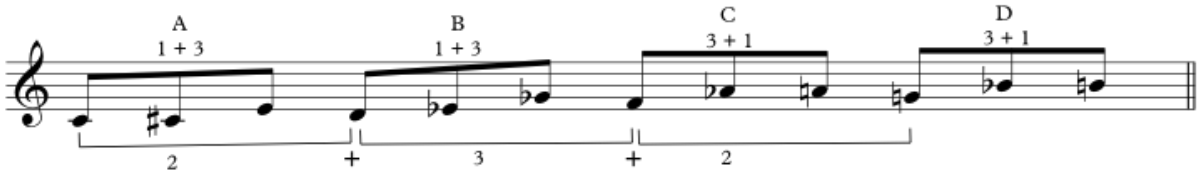
Next, both rotations of trichord 2+1 are shown. Both can be used to embellish the first three notes of a minor triad. In the first sequence minor triads are transposed in distances of minor thirds. In the second sequence they are arranged at distances of a major second.



[ex 4.7.1.5]
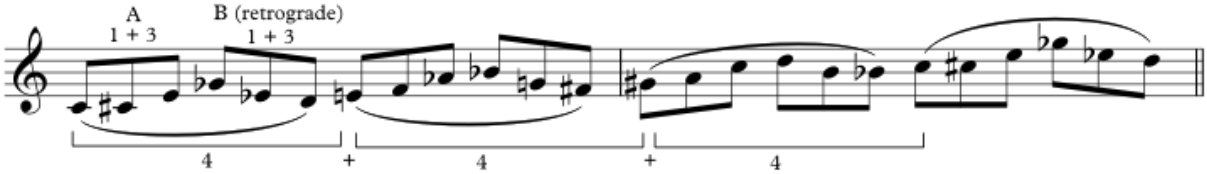
4.7.2 Trichord 1+3

In the following example the basic row of trichord 1+3 is steered by trichord 2+3.
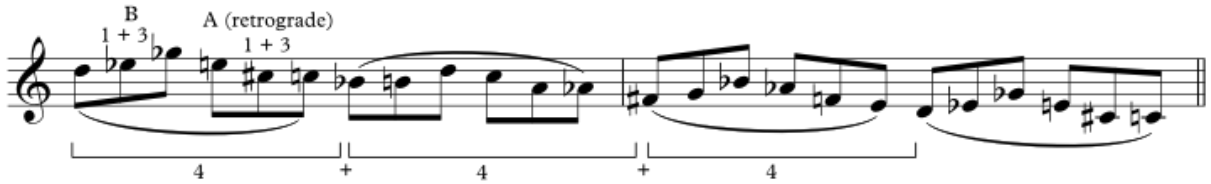


[ex 4.7.2.1]

In the example below, trichord combination A+B from the row above, with trichord B put in retrograde, results in hexachords transposed in ascending steps of major thirds.



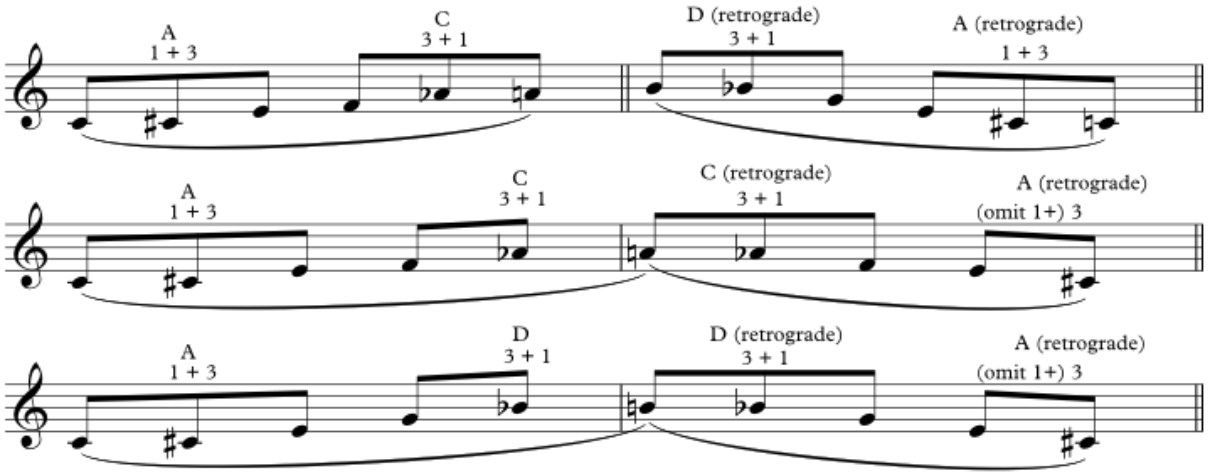
[ex 4.7.2.2]

The descending variation of this sequence shows hexachords of trichord combination B+A, now with A in retrograde. It is interesting to hear how in this arrangement, the genuine minor/major7 harmonic color of the 1+3 trichord is overlaid by the whole-tone/augmented color that results from the steering trichord 4+4 and the major second intervals between the last and first notes of the hexachords.
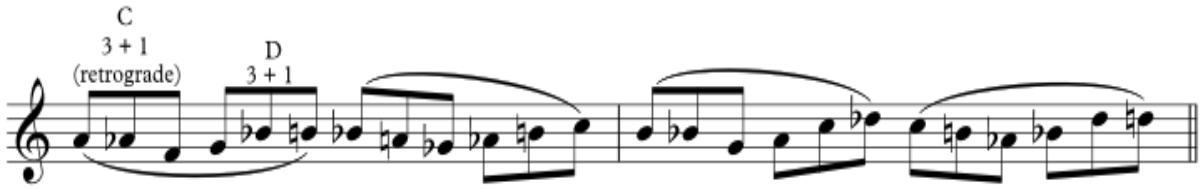


[ex 4.7.2.3]

Other interesting trichord combinations with the trichord 1+3 family are A+C that sounds as a composite triad of $c^{\sharp}$ augmented over c augmented, and D (retrograde)+A (retrograde) that evokes the sound of a C7b9 chord. Both trichord combinations sound particularly well as an ascending-descending riff that is phrased in five-note groupings, as shown in the second and third line of the example below.
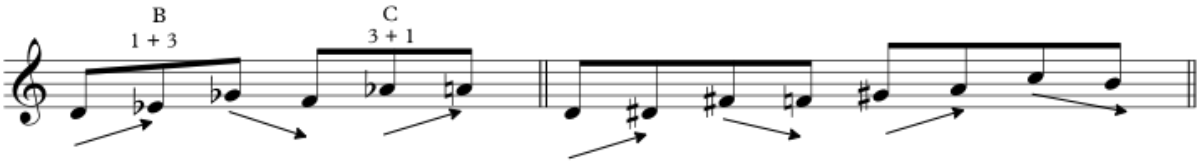


[ex 4.7.2.4]

Combining trichords C+D, with C played in retrograde, creates a chromatic sound with an interesting harmonic vagueness. In the next example this trichord combination is transposed with minor second intervals. The contrast between the ascending direction of the trichord combination and the descending minor second interval between its last note and the first note of the next combination creates an interesting effect in this line.
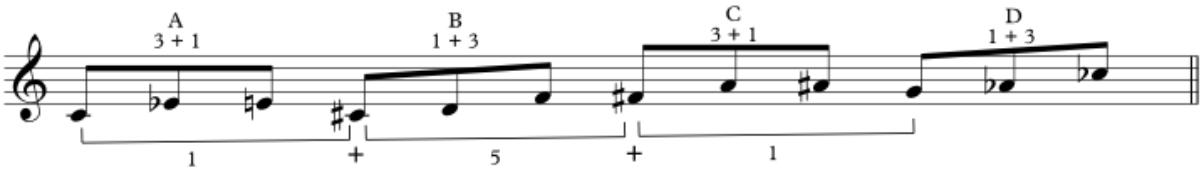


[ex 4.7.2.5]

Trichord combination B+C in the example below shows an embellishment of an incomplete octatonic scale. In the second bar this octatonic scale is completed and enharmonized. By adding the notes c and b, it evokes the sound of B7 (b9, b10, #11, 13).
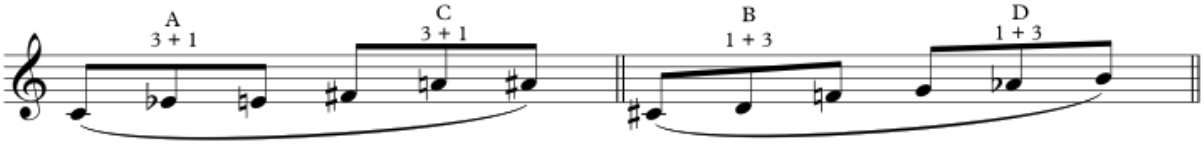


[ex 4.7.2.6]

The relationship of trichord family 1+3 with the octatonic scale is even more obvious when we take the next row, steered by trichord 1+5, as a point of departure.



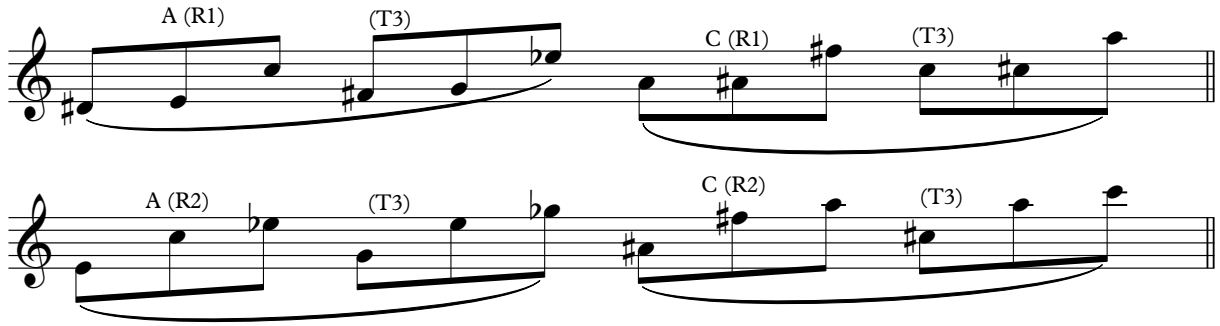
[ex 4.7.2.7]

Trichord combination A+C shows a fragment from the C octatonic scale, while trichord combination B+D shows a fragment from de C$^{\#}$ octatonic scale.



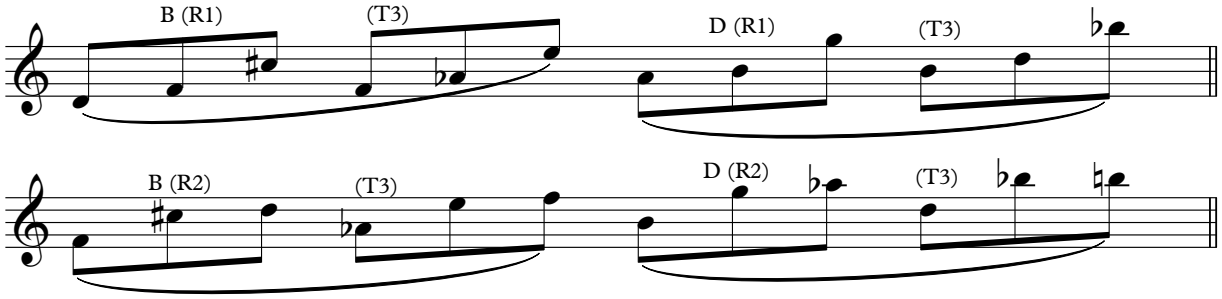
[ex 4.7.2.8]

Both rotations of trichord A and C, each transposed in steps of minor thirds (T3), result in quite common embellishments of the octatonic scale, as we see in the next example.



[ex 4.7.2.9]
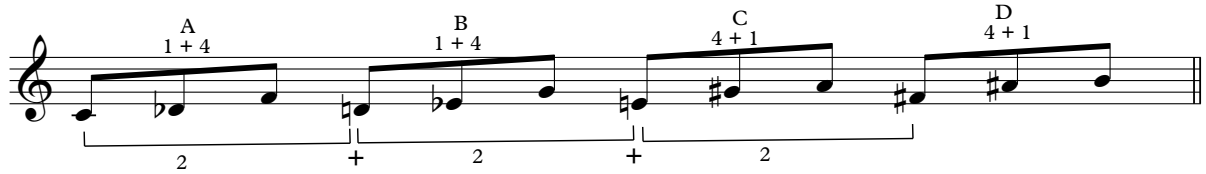
The same goes for both rotations of trichord combination B+D as is shown in the next example.
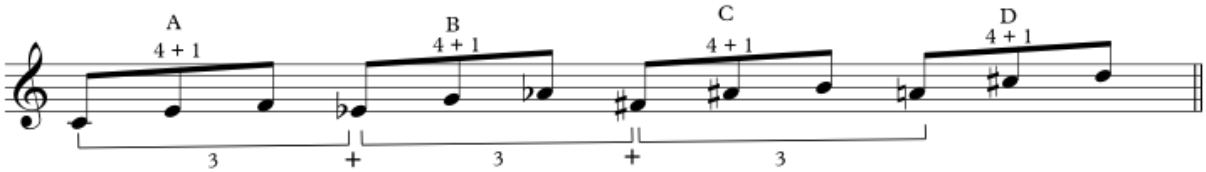


[ex 4.7.2.10]

4.7.3 Trichord 1+4

The basic row of trichord 1+4 is steered by trichord 2+2.
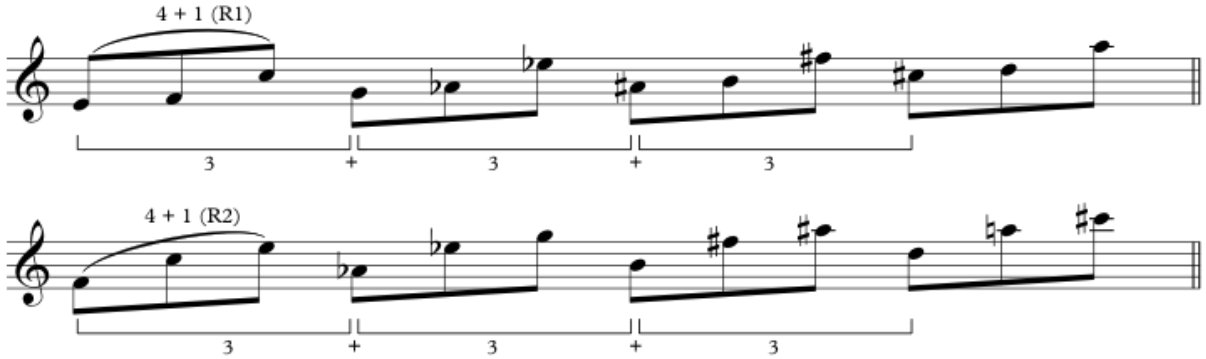


Due to the sound of the perfect fourth in the outer voices of these trichords in prime form, in particular the 4+1 trichord refers to conventional V–i cadences. This is for instance the case in the row with steering 3+3 in the example below, which contains 4+1 trichords exclusively.
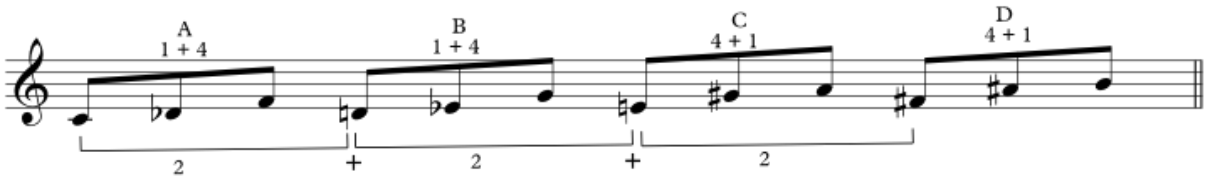


[ex 4.7.3.1]

Both in their prime forms in the row above and in their first and second rotations in the examples below, these trichords display the harmonic color of maj7/omit3 chords, transposed in ascending direction by minor third intervals.
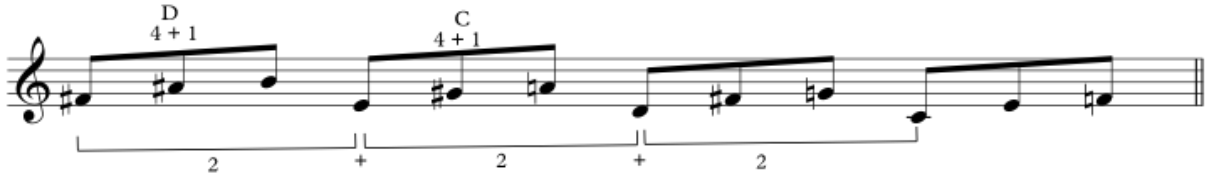


[ex 4.7.3.2]

More variations are found in the next row in which 1+4 is steered by trichord 2+2.
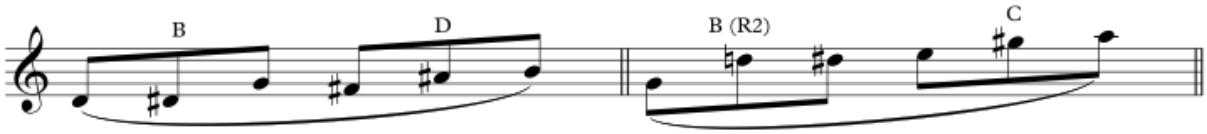


[ex 4.7.3.3]

By playing trichords D – C in reverse order and transposing C by major second intervals down, a cycle of fourths results: F# – B – E – A – D – G – A – F.
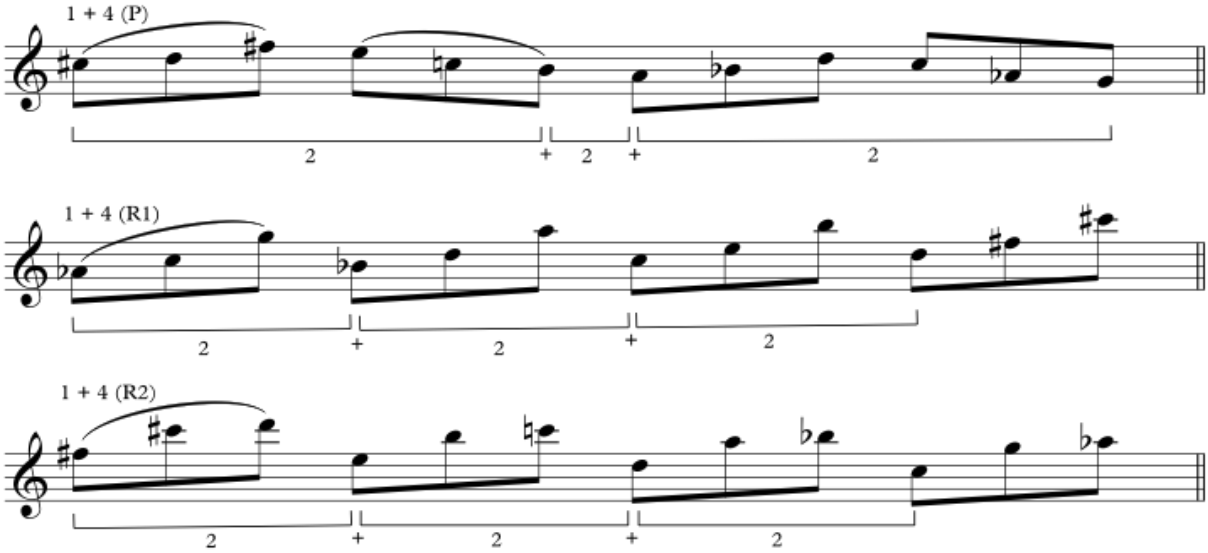


[ex 4.7.3.4]

The next example shows two chord embellishments that result from two different trichord combinations from the row above. Combining trichords B+D in their prime forms (with $e^{\flat}$ enharmonized to $d^{\sharp}$) results in an embellishment of Bmaj7$^{\#5}$. The combination of the second rotation of B, and the prime form of C evokes a harmonic color of Amaj7/omit3.



[ex 4.7.3.5]
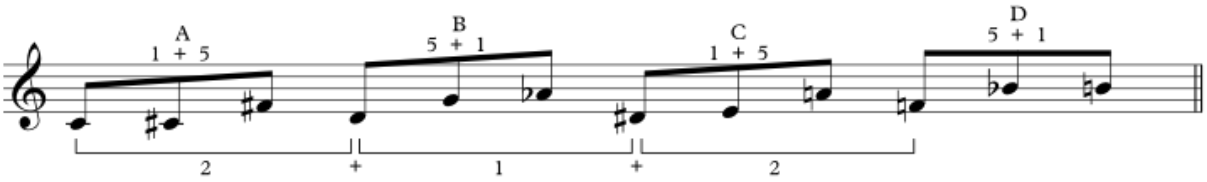
The next three sequences of 1+4 trichords evoke the harmonic color of maj7/omit5 chords. The first line shows 1+4 trichords in prime forms in a descending line transposed by a major second, with the trichords in alternating directions. The second line shows the trichords in first rotation, transposed in distances of a major second, in ascending direction. The same transposition is again used in the third line, in descending direction, with the trichords in second rotation.



[ex 4.7.3.6]

4.7.4 Trichord 1+5
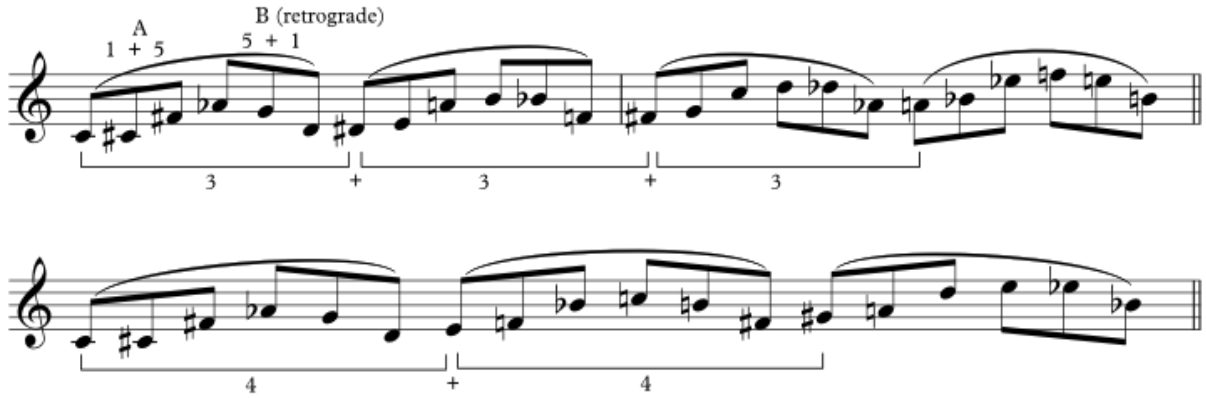
The next example shows trichord 1+5 steered by trichord 2+1.



[ex 4.7.4.1]
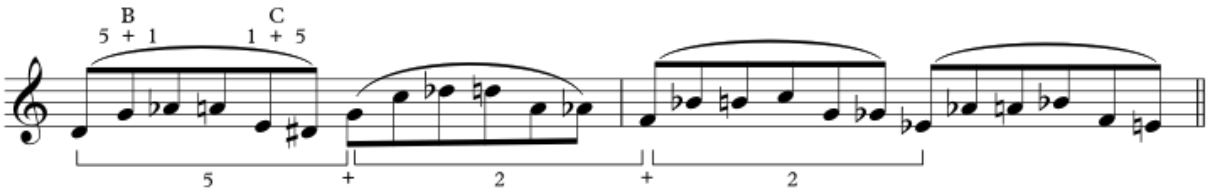
The centrifugal sound of the basic 1+5 trichord is illustrated in the following trichord combinations. The first example shows orderings of trichord combinations A (prime form) and B (retrograde). In the first line four hexachords are ordered at minor third distances. Because the last note connects back to the beginning of this sequence, the line evokes

the idea of a "turnaround" in a C tonality. The same could be said about the second line, but I consider the abundance of major second intervals making this line more predictable and therefore less interesting.
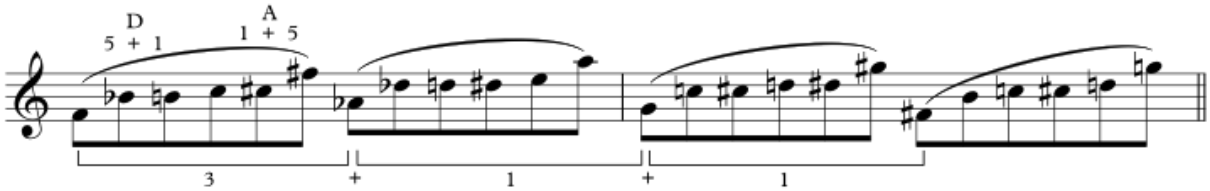


[ex 4.7.4.2]

Next is a pattern of hexachords of B (prime form) and C (retrograde). It is transposed a perfect fourth up, and then descends by major second intervals. I imagine that this pattern evokes a turnaround on, for instance, a Dsus chord.



[ex 4.7.4.3]
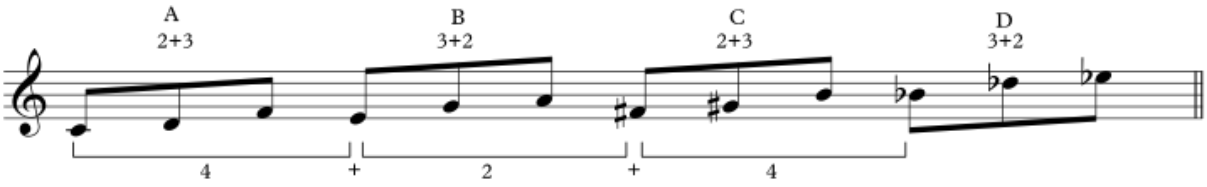
The final example shows a hexachord of trichords D and A. These are steered by 3+1+1 to evoke a turnaround of a Fsus chord.



[ex 4.7.4.4]
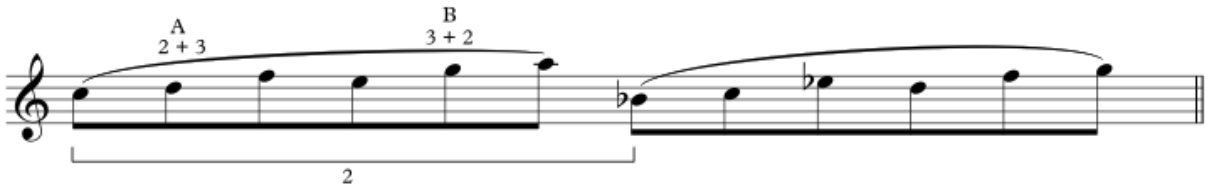
4.7.5 Trichord 2+3

The basic row of trichord 2+3 is steered by trichord 2+4.



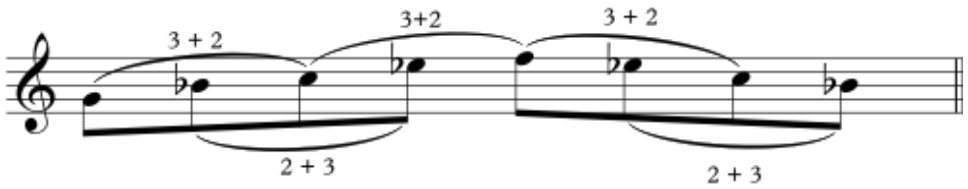
[ex 4.7.5.1]

A hexachord with the combination A+B evokes the harmonic color of Cmaj6, or (Gm7–) C7. In the following line this hexachord is transposed down by a major second interval, evoking the iii – vi – ii – V progression G7sus – C – F7sus – Bb.
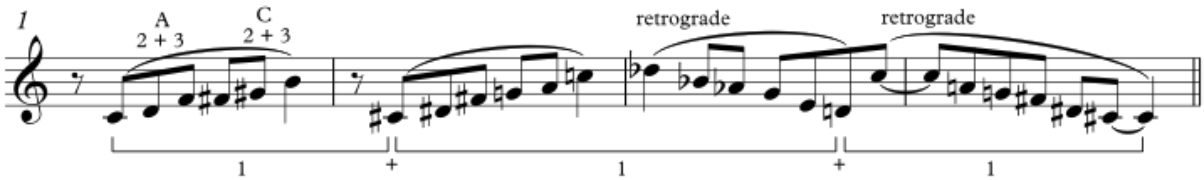


[ex 4.7.5.2]

As I already discussed in section 4.4.1, the trichords 2+3 and 3+2 are basic elements of the minor pentatonic scale.



[ex 4.7.5.3]
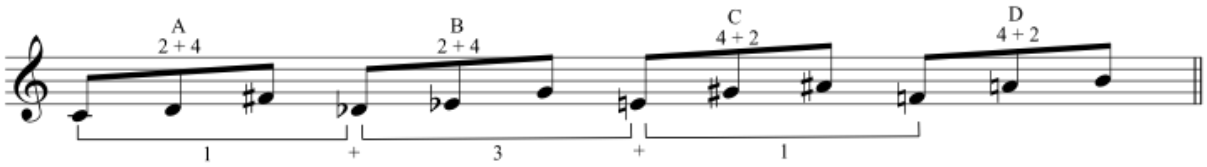
By ordering trichord pairs such as in the following line, the obvious pentatonic sound of this trichord can be slightly obscured. The hexachord with the trichord combination A+C is arranged in ascending order, at distances of two ascending and one descending minor second intervals. In bars 3 and 4 they are put in the retrograde form.



[Example 4.7.5.4]
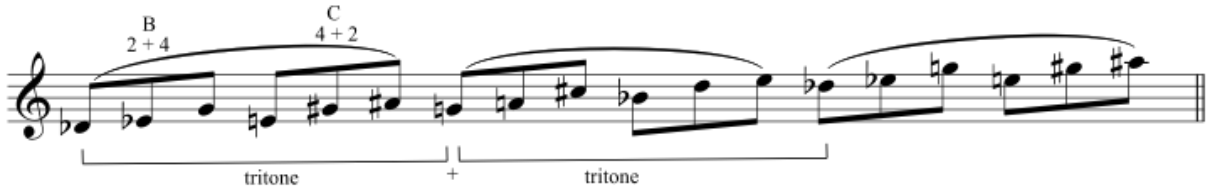
4.7.6 Trichord 2+4

In the following example the basic row of trichord 2+4 is steered by trichord 1+3.
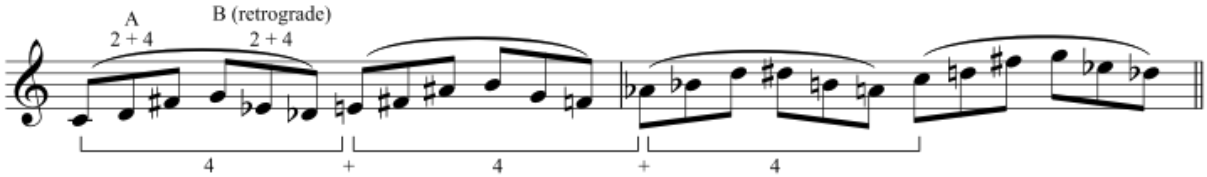


[ex 4.7.6.1]

Combinations of trichords from this row tend to evoke tonal colors of whole tone scales, and intervals of augmented fourths and fifths. The following hexachord with trichords B+C emphasizes this tonal reference. It is transposed twice, by tritone intervals, in ascending direction.
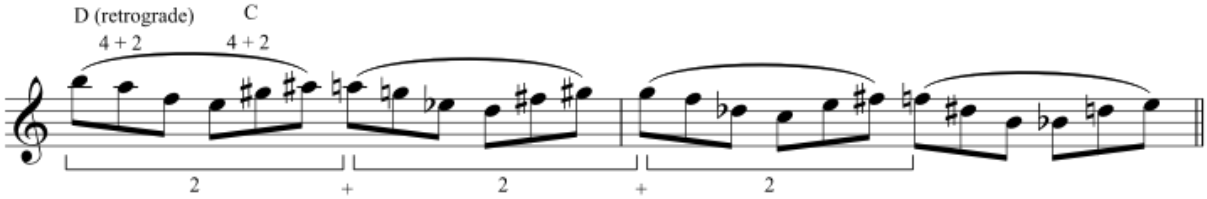


[ex 4.7.6.2]

In the next example a hexachord with trichords A+B is transposed a major third up twice. The steering tetrachord 4+4+4 emphasizes the augmented tonal color of this eighth hour of the Tone Clock. The combination of this augmented tonal color of the steering trichord, the minor second intervals between the trichords inside each hexachord, and the minor third intervals between the last and first notes of the adjacent hexachords, creates an interestingly vague harmonic color.
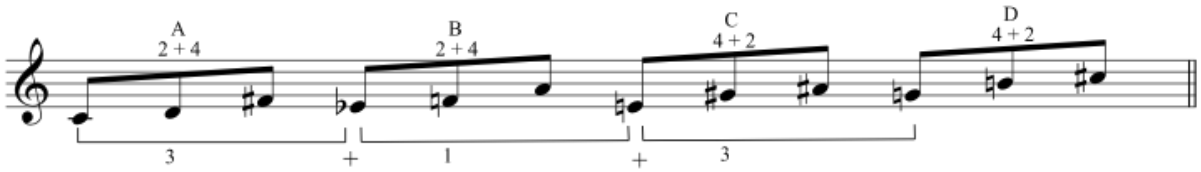


[ex 4.7.6.3]

The hexachord of trichords D (in retrograde) + C in the following example shows a variation in descending direction, transposed by distances of a major second.
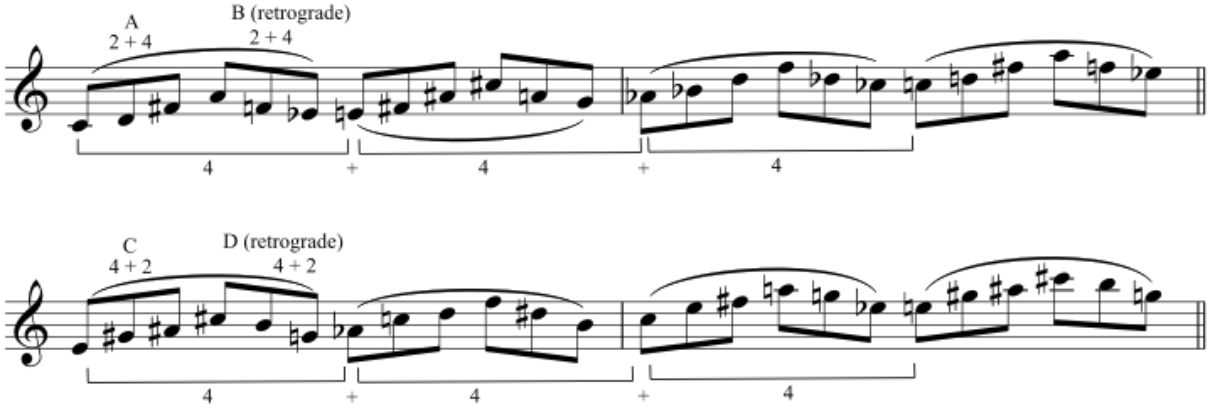


[ex 4.7.6.4]

The basic row of trichord 2+4 can also be steered by 3+1, as shown in the next row.
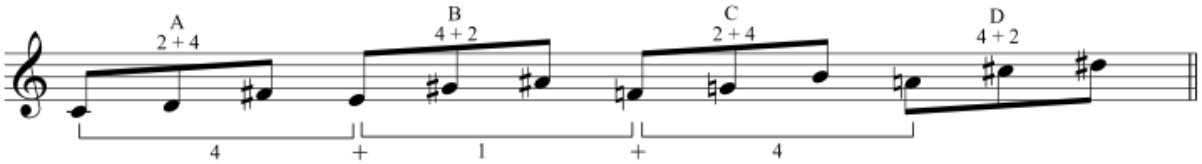


[ex 4.7.6.5]

The next example shows two lines evoking an intriguing sound. The first shows a hexachord of 2+4 trichords A+B, the second a combination of 4+2 trichords C+D. The steering trichord in both lines is 4+4, while the intervals between the trichords inside the hexachords are minor thirds and the intervals between the last note of each hexachord and the following is a minor second. As a result, both lines combine the diminished sound of their hexachords with the augmented sound of the steering trichords.



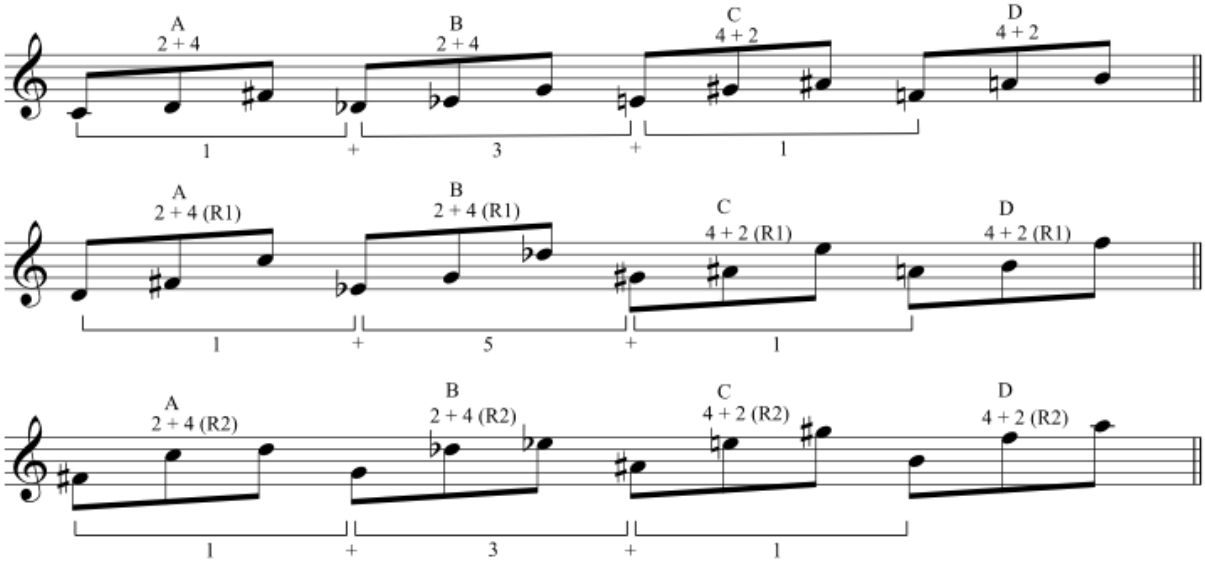
[ex 4.7.6.6]

The next row shows trichord 2+4 steered by 4+1. Trichord combination A+B shows an embellishment of the C whole tone scale and trichord combination C+D does the same with F whole tone scale.
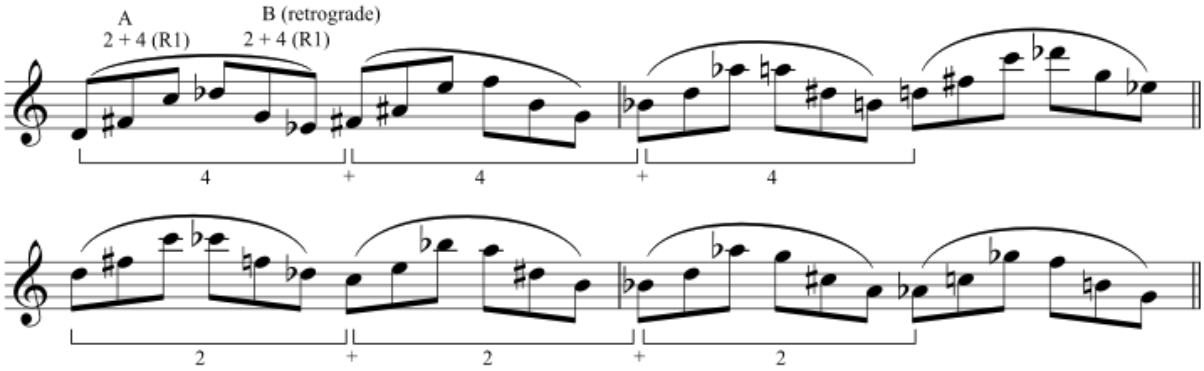


[ex 4.7.6.7]

The following paragraphs show patterns resulting from the inversions of the 2+4 trichord family. The example below shows the 2+4 row steered by 1+2. The second line shows the first rotations, and the third line shows the second rotations of the trichords in the row.
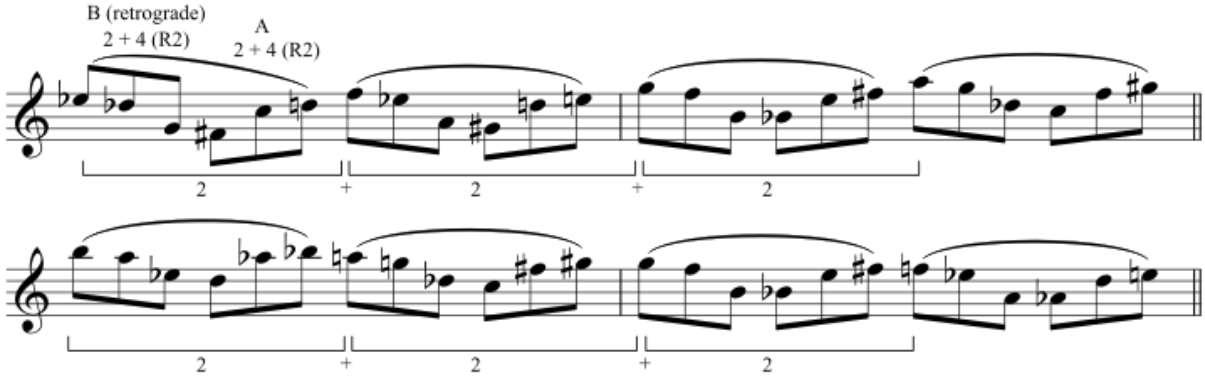


[ex 4.7.6.8]

The combination of trichords A+B in their first rotations evokes the tonal color of D7(omit5) – Eb7(omit5). In the first line the example below, the trichord combinations are transposed by a major third up. In the second line the retrograde of the trichords are transposed down by minor seconds. The result sounds as a hexachord that is transposed by major seconds in descending direction.



[ex 4.7.6.9]
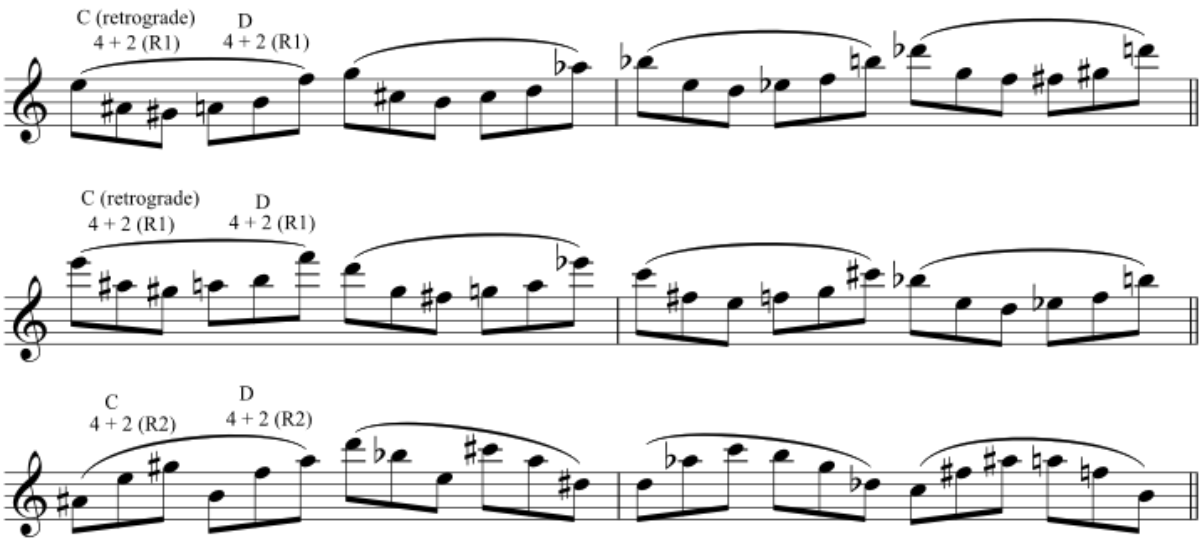
The same trichord combination in second rotation triggers the interval of an augmented fourth. Both lines in the example below show operations with trichord combination B+A, with B put in retrograde. In both lines the interval combinations are transposed at distances of major seconds. In the second line the intervals between all trichords are minor seconds. In the first line the intervals between the trichords inside the combination are minor seconds, but those between the last note of each combination and the first note of the next one are ascending minor thirds.



[ex 4.7.6.10]

Both inversions of the trichords C and D contain the augmented fourth interval as well. Both the first and the second line display transpositions of trichord combination C+D, with C put in retrograde. In the first line they are transposed a minor third up, in the second line a major second down. The intervals between the trichords inside the combinations are again minor seconds.
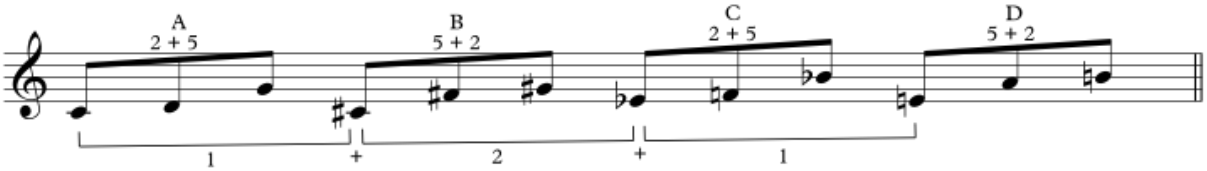
The third line shows variations with trichord combination C+D in their second rotations. The first bar displays C+D ascending and, transposed a major third up, descending chromatically. The second bar continues the descending line by two combinations of trichords in alternating directions, a major second apart.



[ex 4.7.6.11]
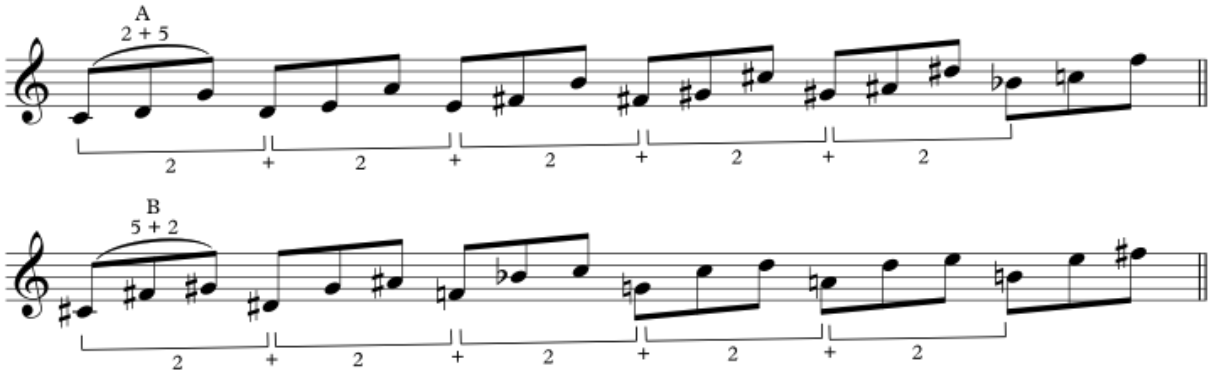
4.7.7 Trichord 2+5

The last trichord family to be discussed here is that of 2+5. In the next example the basic row of trichord 2+5 is steered by trichord 1+2.
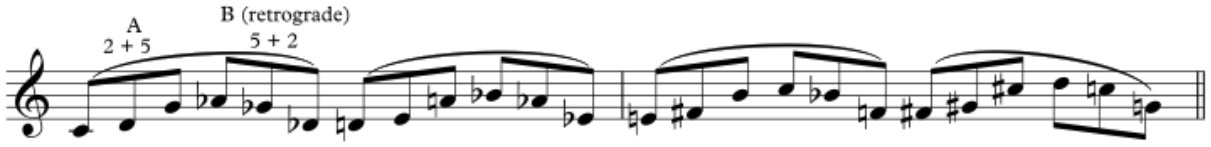


[ex 4.7.7.1]

The example below shows two patterns in which the trichord is transposed at distances of major seconds. In the first line this is done with trichord 2+5, and in the second line this is done with trichord 5+2. In the first line, the first two notes of all trichords together belong to the c whole tone scale, and all third notes of the trichords together belong to the g whole tone scale. In the second line, all first notes together form the $c^{\sharp}$ whole tone scale, while all second and third notes together form the $f^{\sharp}$ whole tone scale.



[ex 4.7.7.2]

By combining these two trichord collections based on trichord combination A+B, and by putting the B trichords in retrograde the following sequence results.
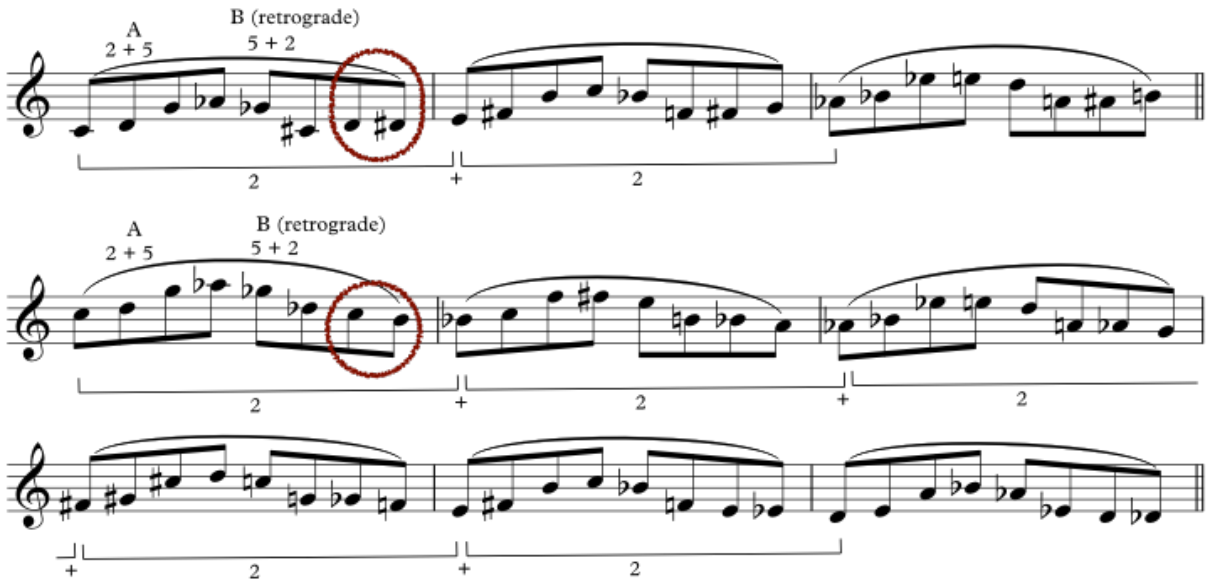


[ex 4.7.7.3]

The lines in the following example show variations of the sequence above, using extended trichord combinations. The first line is based on trichord A+B, with B played in retrograde. After the last note of trichord B, the c♯, I have added two chromatic notes (encircled) to lead to the second trichord combination that starts at a distance of a major third above the first. The same operation is repeated and results in the third pattern.
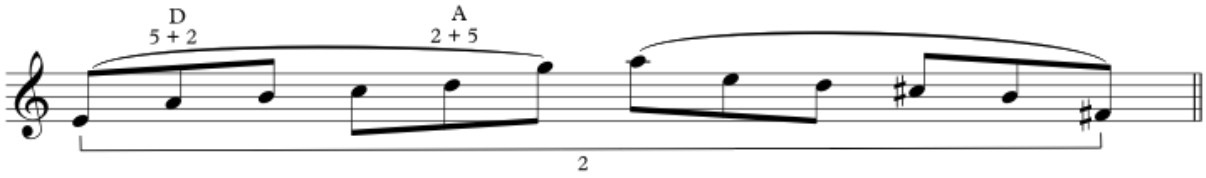
The second line also starts with trichord combination A+B, but now, after the last note of trichord B, enharmonized into d♭, two descending chromatic notes are added, to lead to the next trichord combination, starting a major second below the first.

With these operations I combine my preference to connect patterns by using chromatic leading tones with the creation of four-note groupings to solve the dominance of three-note groupings in the operations with the Tone Clock so far.
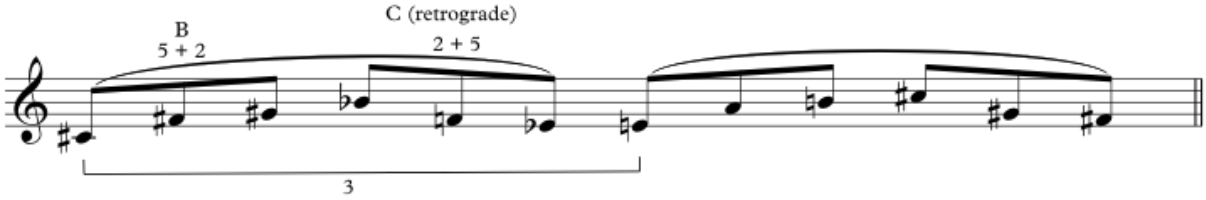


[ex 4.7.7.4]

The following examples show trichord combinations in prime forms, displaying obvious tonal colors. In the first example trichord combination D+A evokes the harmonic color of Am7. It is followed by its transposition a major second up, and put in retrograde, sounding as Bm7.



[ex 4.7.7.5]

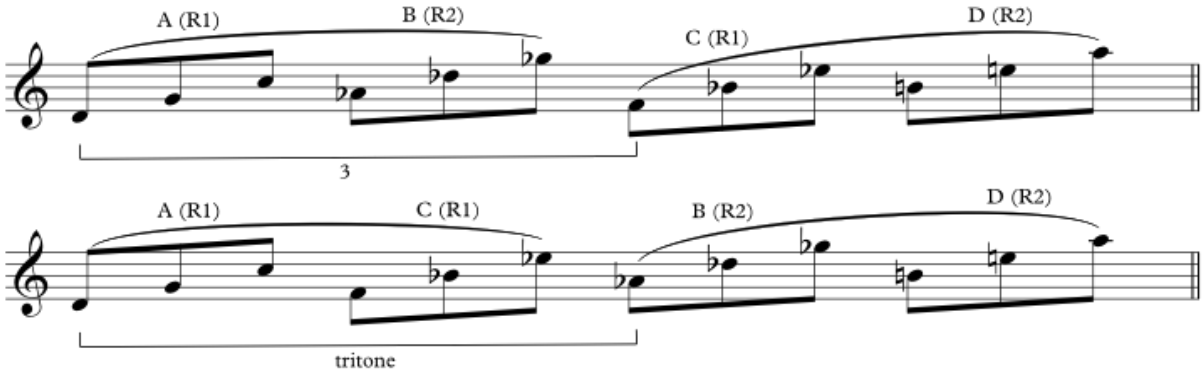
The second example shows trichord combination B+C, with C put in retrograde. This evokes the sound of F#maj7. The next trichord combination starts a minor third interval above the first, as a result of my preference to play a leading tone to connect both parts. This second part of the sequence sounds as Amaj7.



[ex 4.7.7.6]
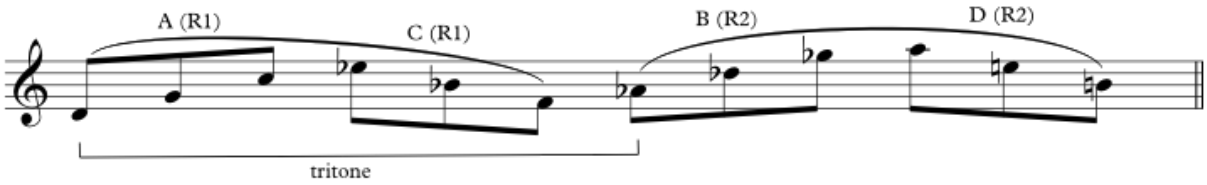
Both the first inversion of trichord 2+5 and the second inversion of trichord 5+2 display the trichord 5+5, a stacking of two intervals of a perfect fourth. In the example below, the first line I applied these inversions to the basic row steered by trichord 1+2. In the second line the same inversions are applied, but the order of occurrence in the basic row

has been changed into A – C – B – D. As a result, the intervals sound at a distance of a minor third interval.
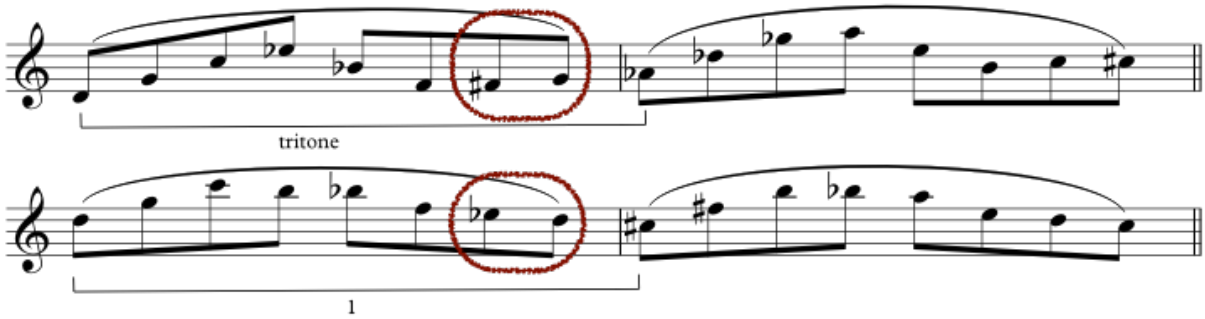


[ex 4.7.7.7]

As a variation to the sequence above, it is played with the trichords in alternating directions, by which the steering interval of a minor third sounds at all connections of the trichords.



[ex 4.7.7.8]

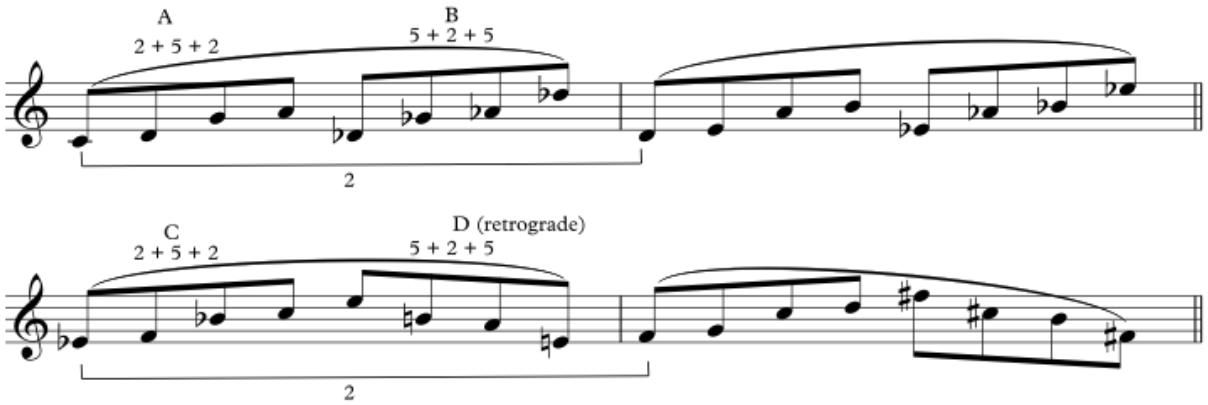
Two variations of this sequence are played in the example below. Once again I have added two chromatic leading tones at the end of both trichord variations A+C and B+D above, to create four-note groupings and to suggest conventional voice leading at the connection of both parts of the sequence.



[ex 4.7.7.9]

Another way to create four-note groupings is to extend the trichord by repeating its first interval. For instance trichord 2+5 is extended into trichord 2+5+2 and trichord 5+2 is
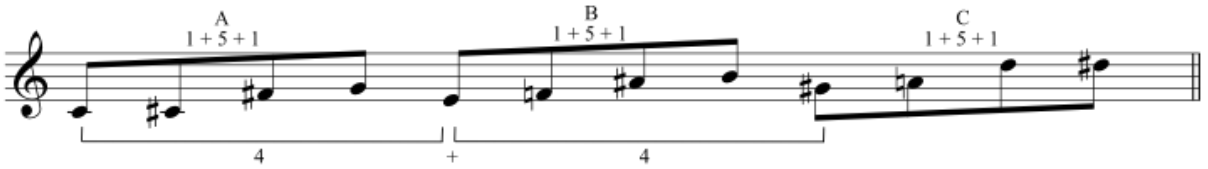
extended into trichord 5+2+5. In the next example this is applied to the trichord combinations A+B and C+D and their transpositions of a major second up.



[ex 4.7.7.10]
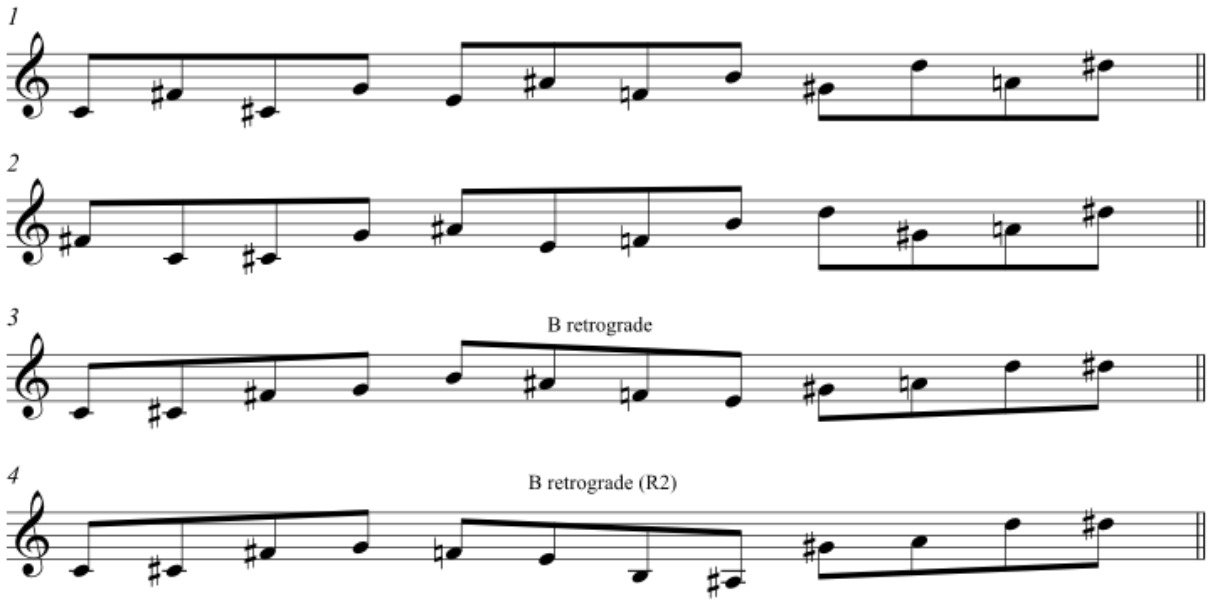
4.7.8 Tetrachord 1+5+1

The following example displays tetrachord 1+5+1, the second of Babbitt's all combinatorial four-notes sets (see section 4.3.2). It is steered by trichord 4+4.
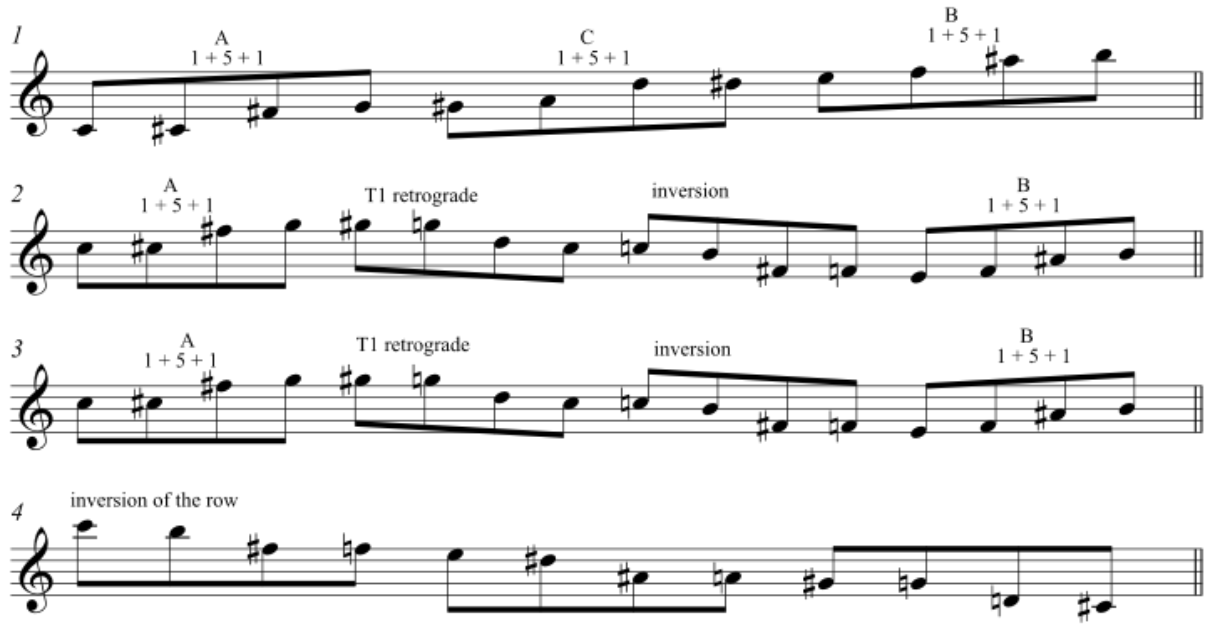


[ex 4.7.8.1]

The next example shows the implied augmented fourths intervals. In bar 1 they are played in ascending directing and in bar two in alternating directions. In bar 3 the second trichord of the row (B) is played in retrograde and in bar 4 in the second rotation of the retrograde. By this rotation, the 4+4 steering that is obvious in bars 1–3, is obscured. As a result, the lines sound less predictable than those in the bars before.



[ex 4.7.8.2]
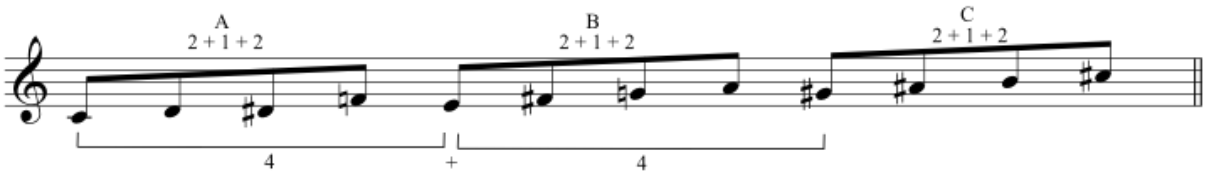
In the following example tetrachord B has been extrapolated to avoid the compelling sound of the 4+4 steering trichord. It is true that it is still present in the steering trichord c–g♯–e, but the minor second intervals between the connecting notes between the intervals obscures the sound of the two augmented fifths (c–g♯–e) in the permutated steering trichord.



[ex 4.7.8.3]
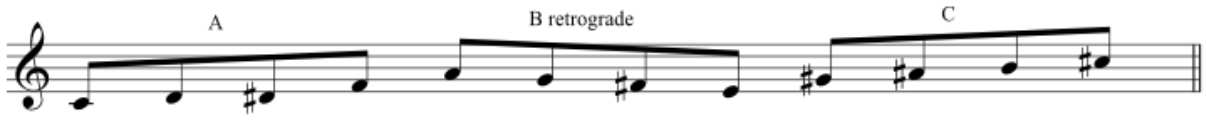
4.7.9 Tetrachord 2+1+2

The following example displays trichord 2+1+2, the fourth of Babbitt's all combinatorial four-notes sets. It is steered by trichord 4+4.



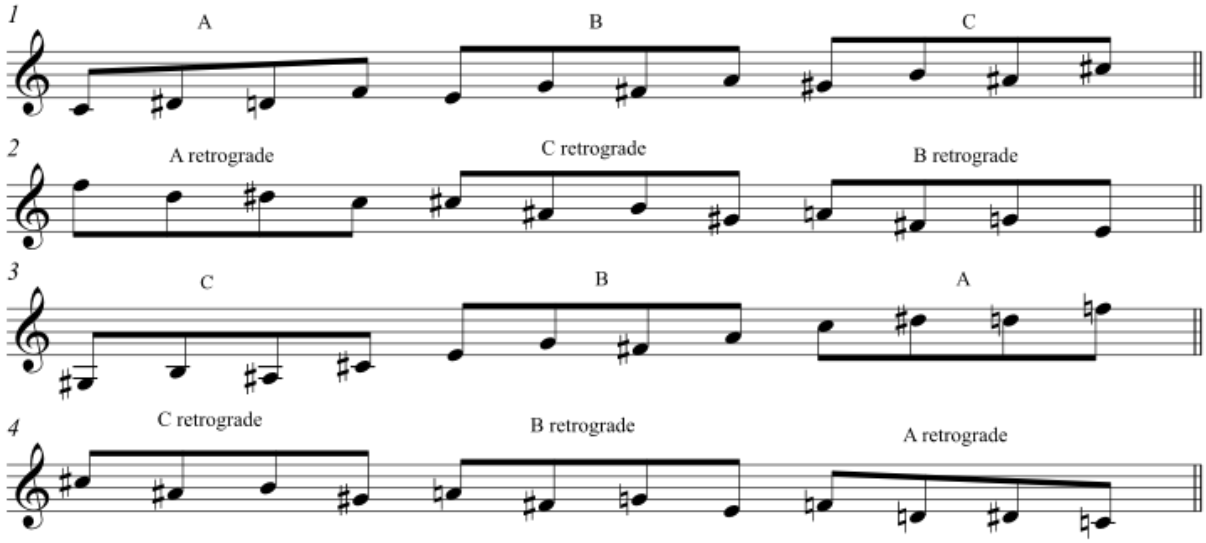
[ex 4.7.9.1]

By playing the second tetrachord in retrograde, it sounds a bit less predictable, and the obvious minor tonal color gets slightly obscured.



[ex 4.7.9.2]
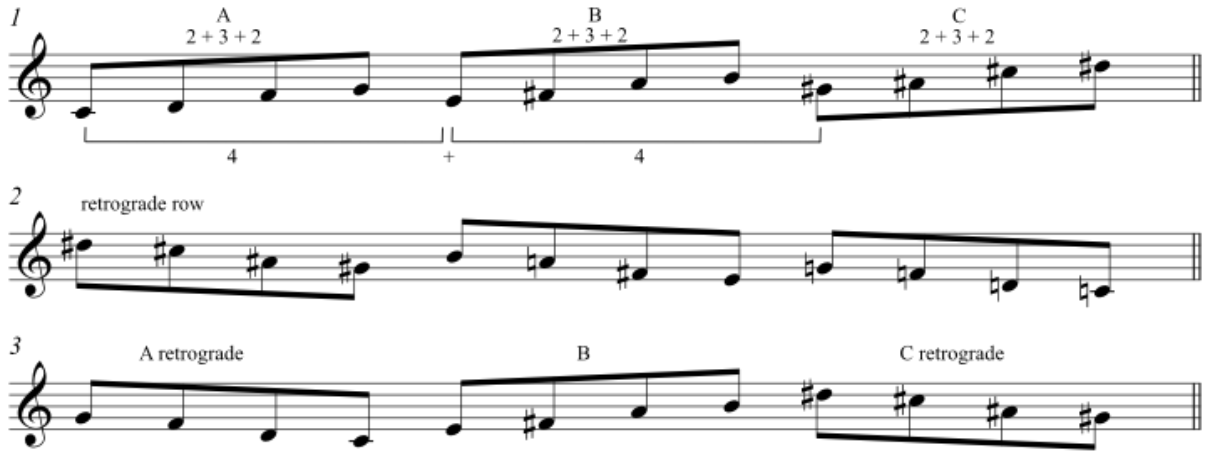
The next example shows the minor third intervals implied in these tetrachords, played in ascending and in descending directions. In bar 3, I have again changed the order of the tetrachords to obscure the compelling augmented color of steering hour 4+4.



[ex 4.7.9.3]
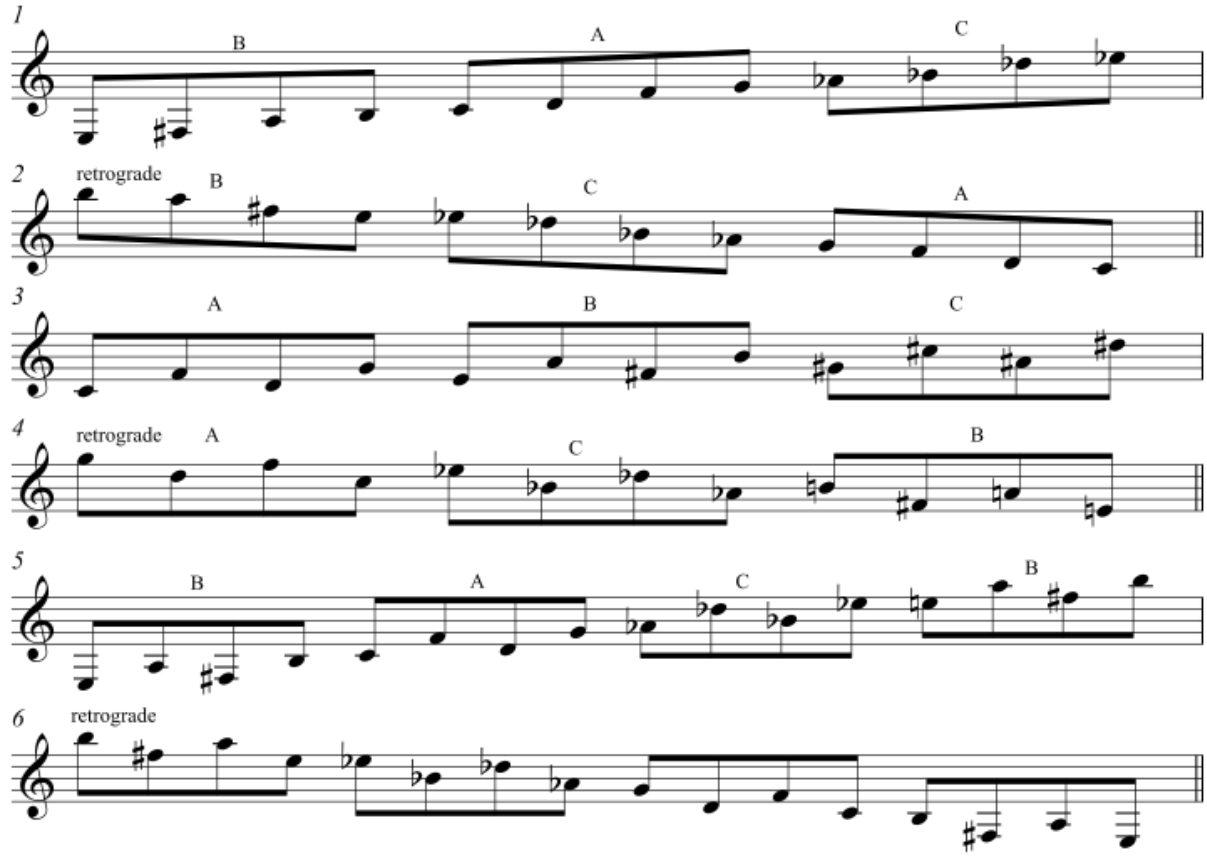
4.7.10 Tetrachord 2+3+2

The next tetrachord is 2+3+2, the fifth of Babitt's all combinatorial source set. Bar 1 shows the basic row, steered triad 4+4, while bar 2 the basic row is put in retrograde. Bar 3 displays the basic row with tetrachords A and C in retrograde.



[ex 4.7.10.1]
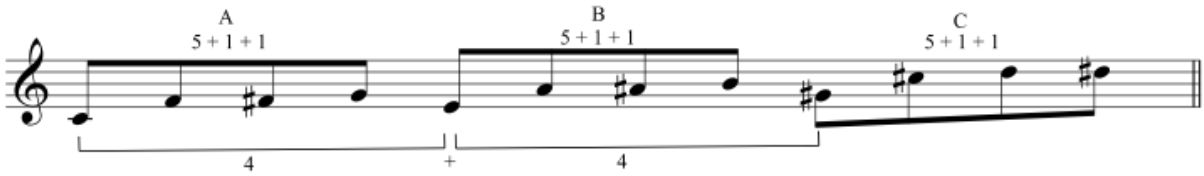
In the following examples three different dispositions of the tetrachords are combined with three different retrogrades.



[ex 4.7.10.2]

4.7.11 Tetrachord 5+1+1
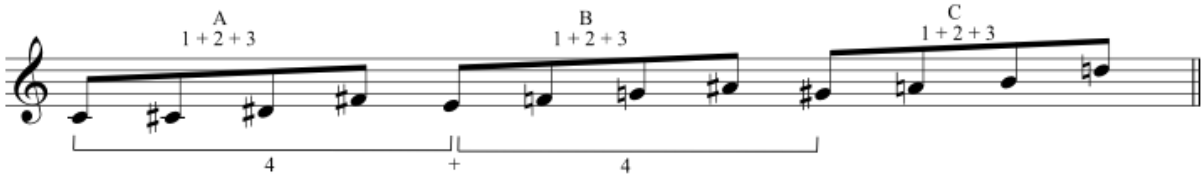
The next example displays the sixth basic row of Babbitt's all comprehensive four-notes source sets, a permutation of row 1+5+1 discussed in section 4.7.8. The steering trichord is again 4+4.



[ex 4.7.11.1]

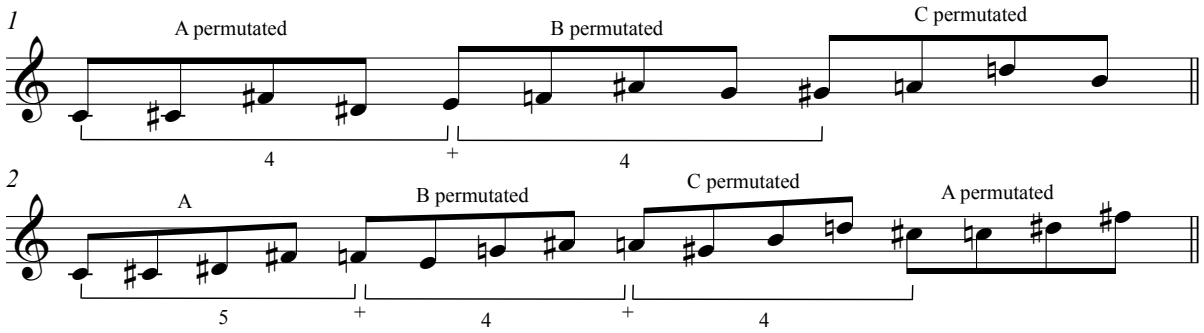
4.7.12 Tetrachord 1+2+3

The next example shows the basic structure of a twelve-tone row constructed with tetrachord 1+2+3 and steered by trichord 4+4. This row does not belong to Babbitt's all combinatorial four-notes sets, but was suggested by De Marez Oyens (1997) (see section 4.3.2).



[ex 4.7.12.1]

The next two lines are examples of permutations of the tetrachords. These permutations again create a more smooth transition from one tetrachord to another by replacing the major second interval in the basic row by a minor second interval. As a result of these permutations in the tetrachords the 4+4 steering chord is again obscured in bar 1. Due to the permutations of tetrachord A at the end, bar 2 has a steering tetrachord 5+4+4.



[ex 4.7.12.2]

Evaluation

The examples in this section represent my subjective selection of numerous possibilities of combining trichords, clarifying the thinking behind their construction. They are meant to serve improvising musicians as an inspiration to add variations or to create different combinations according to their individual musical preferences.

In general, the examples given show a preference for connections at distances of minor seconds, because they create the effect of leading tones and therewith suggest a type of conventional voice leading. Second, the examples show a preference for steering intervals that contrast with the prevailing harmonic color of the trichord and the row at stake. Sequences containing these contrasting steering intervals, such as for example major seconds and major thirds contrasting with trichord 1+3, minor third intervals contrasting with trichord 2+4, and minor seconds contrasting with trichord 2+5, evoke an interesting harmonic vagueness. Thereby they have the potential to create new ways to move outside the expected sounds of certain tonal or non-tonal contexts.

4.8 Conclusion

The applications of the Tone Clock in this chapter confirm the utility of its twelve-tone operations and elements for the practice of (composing) improvisers in jazz. They show compositional and improvisational techniques based on characteristic operations, both with complete twelve-tone rows and with segments of these rows. In improvisations however, the emphasis is more on manipulating these segments, namely the trichords and tetrachords of the Tone Clock hours. From the perspective of my research aim, to develop improvisational techniques beyond tonal limitations, these operations with trichords and tetrachords appear to be attractive.

O'Gallagher (2013) provides examples of trichords and trichord combinations with explicit references to tonal colors of scales and chords, by which they are supposed to "blend" with the content characteristics of diatonic phrases. Just like Bergonzi (2000) and Garzone (2009), both discussed in chapter 3, I do not intend to refer to explicit tonal colors although I am aware that I cannot prevent them from emerging spontaneously. Few examples of these references can be found in my suggestions for improvisation in subchapter 4.5 and in the patterns presented in subchapter 4.7. The identification of implied tonal colors depends on the individual performers' informed intuition (defined in section 3.3.1) and on their intention to deliberately avoid or create tonal connections. In the latter case, the twelve-tone operations can be merged with fragments of conventional chord-scale approaches. In this respect, I agree with Liebman who likewise

expressed the purpose of his chromatic approach as "… to integrate this material alongside already established and familiar tonal ideas … into a coherent musical statement to satisfy both the intellectual and emotional needs of artistic creation" (Liebman 2013: 9).

The process of learning twelve-tone improvisational idioms is at large comparable with the traditional language acquisition of a jazz student. It includes the creation and manipulation of patterns as deep structures for "spontaneous" variations. Most jazz musicians are familiar with this learning strategy from the day they started to develop their improvisational skills. Similarly, this application of variation techniques is meant to enrich ones "backpack" with a choice of individual patterns that, after being securely memorized, will pop up "spontaneously" during improvisations. However, due to the absence of a substantial body of existing examples, developing twelve-tone skills will appeal more to the student's individual curiosity than to his imitation and emulation of existing examples.

Besides the fruitful application of the Tone Clock as a model to generate interesting melodic patterns, its quality as an analytic tool also helps the (composing) improviser to enrich his artistic palette by applying interventions to existing repertoire. In section 1.4.2, I explained how I re-composed two jazz standards into contrafacts as a step to develop my personal sound. How trichord analysis likewise can help to re-compose a diatonic melody, as demonstrated in section 3.7.2, with my transformation of Parkers "Quasimodo" into the contrafact "Quasi Mad Though". There, I also demonstrated how existing chord changes can be re-composed by twelve-tone ordered successions of alternative chord changes. The reharmonization of Davis' "Tune Up" becoming the harmonic structure of "Count Your Blessings" can be considered as a convincing example. Next, in my discussion of Liebman's "Invocation" I have shown how trichord analysis can be successfully applied to identify complex simultaneities that result from multiple contrapuntal lines, and how such analysis can serve as a thoughtful point of departure for improvisations.

One could argue that trichordal analysis leads to a simplification of the complex web of intervallic structures in a composition or improvisation. It is obvious that selecting trichords, and reducing them to their prime form, neglects the surface of the music with its complexity of distinguishing features as registers, texture, tempo, rhythm, and dynamics. But it is also obvious from the transcriptions of the improvised fragments in this chapter, that experienced (composing) improvisers are not at all tied down by this simple format in the deep structures of their musical grammar.

The theory of the Tone Clock strives for simplicity instead of complexity, allowing the performer to freely employ its "self-explaining quality" that Schat considered as "the most important requirement for a 'common language'" (Schat 1998: 44). Thus, it appears not only a useful, but also an easily accessible tool to embed twelve-tone techniques in the improvisational languages of contemporary jazz artists. By its limited number of intervals and orderings it looks like a relatively simple musical grammar that can be quickly memorized, without the compulsions and restrictions of a complex arithmetical system, but with the basic elements and operations of the twelve-tone system. Tonal references can be avoided or easily obscured by the twelve-tone techniques in its DNA, giving priority to orderings of notes and intervals above their tonal meanings. The next chapter highlights a compositional technique combining serial elements with tonal elements that are more obvious: Messiaen's modes of limited transpositions.

5. IMPROVISING WITH MESSIAEN'S MODES

5.1 Introduction

In the previous chapter, practical applications of the Tone Clock were demonstrated, concluding that it can serve as a useful tool to embed twelve-tone techniques in the improvisational languages of contemporary jazz artists. In this chapter, I will discuss a compositional technique that also contains serial elements, yet with more obvious tonal references: Messiaen's modes of limited transposition.

As well as composing an impressive oeuvre, Messiaen disseminated his theories and practices in a large number of publications, such as the seven volumes of the comprehensive *Traité de rythme, de couleur, et d'ornithologie (1949-1992)* and the earlier[2] and more compact *Technique de mon langage musical* (1956), in which he explained his modes of limited transposition for the first time.

Organist and theorist Vincent Benitez (2008) explains that Messiaen's modes of limited transposition, devised in 1929, originated from his improvisation classes with composer-organist Marcel Dupré, which implied the application of unconventional modalities as part of the Catholic liturgy. Benitez also claims a close relationship between Messiaen's abilities as an improviser and the applications of the modes in his compositions, because in a number of passages he examined, "the harmonies lie comfortably in the hands, suggesting that they emerged from Messiaen's improvisations" (Benitez 2008: 135).

The first time I became acquainted with Messiaen's modes of limited transposition was in my days as a saxophone student, practicing Guy Lacour's *28 Etudes pour saxophone sur les modes à transpositions limitées d'Olivier Messiaen* (Lacour 1972). Lacour arranged the transpositions of all seven modes into comprehensive exercises that caught my interest by their mysterious sounds. However, presenting a book with technical exercises to enhance the dexterity of saxophone players, Lacour did not explain the theoretical or aesthetical context of these modes within the complex musical universe of Messiaen, nor its possible application to (jazz) improvisation.

In the context of this study, I will neither examine the role of the modes in Messiaen's oeuvre, nor his practices as an improviser. My fascination with Messiaen's modes

[2] First time published in 1944. I refer to the English translation published in 1956.

concerns their options for (composing) improvisers to transcend conventional tonal practices. In section 1.4.4, I mentioned as my motivation for this study that I was unhappy with my writing and improvisations. Can operations with Messiaen's modes satisfy my need for innovative harmonic issues as alternatives to my practices with the tonal system? Just like the twelve-tone related techniques in chapter 4, I consider the operations with Messiaen's modes, discussed in this chapter as practical tools with the potential to help (composing) improvisers enriching their artistic palette. Since the focus in this study is mainly on the melodic and harmonic applications, other compositional techniques developed and discussed by Messiaen, such as his comprehensive approach to rhythm, will only receive limited attention.

The layout of this chapter is as follows. After an outline of Messiaen's basic theory in subchapter 5.2, subchapter 5.3 displays interval analyses of all modes followed by examples of basic mode embellishments. In subchapter 5.4, I discuss applications of Messiaen's modes of limited transposition in the jazz practices of guitarist Nelson Veras, baritone saxophonist Bo van der Werf, tenor saxophonist Jasper Blom, and soprano saxophonist Steve Lacy. Instead of presenting a historic overview of jazz artists who applied Messiaen's modes in their compositions and improvisations, for instance from guitarist Jim Hall's composition "Two's Blues" on the LP *Concierto* (1975), via drummer Bill Stewart's compositions on the CD *Telepathy* (1997), to pianist Pablo Held's improvisations such as in "Gray" on Sebastian Gille's CD *Anthem* (2011), I decided to focus on the works of Veras, Van der Werf, Blom, and Lacy, because, in their compositions and improvisations, and in the relationships between them, they show a diversity of applications of all of Messiaen's modes that are relevant in the context of this study.

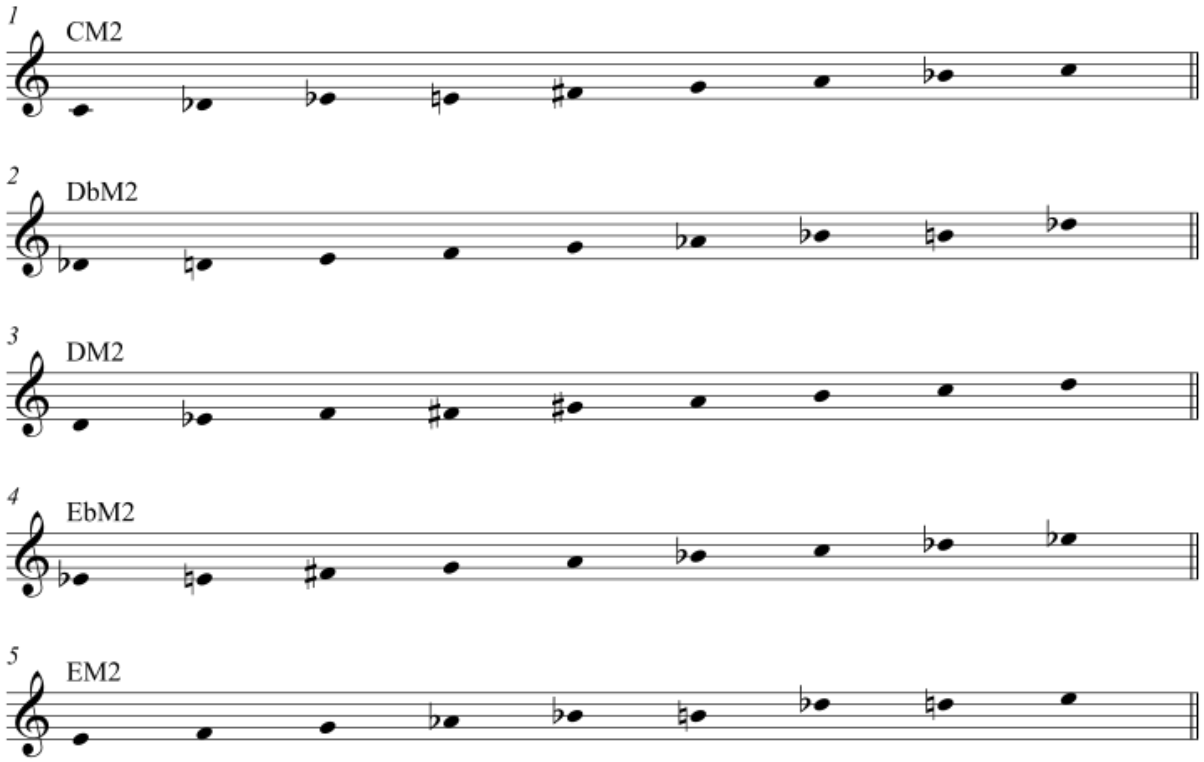
Then, in subchapter 5.5, I will discuss a number of examples of my own applications of Messiaen's modes. Questions that will be dealt with are: How do my works relate to Messiaen's ideas and to the works discussed in subchapter 5.4, and how do they contribute to my research aim to investigate techniques helping (composing) improvisers to move beyond their usual tonal practices? Subchapter 5.6 contains a generative compendium of melodic patterns, meant to serve other musicians as a point of departure for creating their own variations. In subchapter 5.7, the operations with Messiaen's musical techniques in this chapter will be evaluated in the context of my principal research question and the methods discussed in chapters 3 and 4.

5.2 Messiaen's seven modes of limited transposition

Throughout his career as a composer and educator, Messiaen has explained his modes of limited transposition in a number of publications, the first being *Technique de mon langage musical* (1956). Meant for the students who wanted to get acquainted with his works, the "little theory" is accompanied by a second volume with musical examples quoted from his own works. In chapter XVI Messiaen exposes the "mechanism" of his seven modes of limited transposition that "can be used melodically, and especially harmonically, melody and harmonies never leaving the notes of the mode" (Satterfield in Messiaen 1956: 58).

In volume VII of his impressive *Traité de rythme, de couleur, et d'ornithologie* (1992) Messiaen provides more detailed information on the structures and applications of modes 2, 3, 4, and 6. He explains that his modes of limited transposition have nothing to do with tonalities, neither with rows, nor with (his detailed expositions of) Chinese, Hindu, Greek, and church modes, claiming that "the chords that can be formed with the modes have to be thought and read modally, and not following the rules of classical harmony" (Messiaen 1992: 50, my translation). Rather than in terms of tonic and dominant, or serial principles, he defines them as "colors, harmonic colors. Every mode […] has its particular color, due to that actual impression of a closed door, or a closed circuit, and also to the different combinations of sounds which cause its limited number of transpositions" (Messiaen 1992: 51, my translation).

How does the concept of limited transposition work? In contrast with conventional diatonic scales and modes, occurring in twelve possible transpositions, the options of transposing Messiaen's modes are restricted, because beyond a certain number of transpositions the same notes will sound again. For instance, as shown in the following example, taking CM2 ("M2" refers to the second mode, while the "C" indicates the first note of the mode) with its three possible transpositions (bars 1–3), the fourth transposition (bar 4) displays exactly the same notes as the first, while the fifth (bar 5) will give exactly the same notes as the second (bar 2).



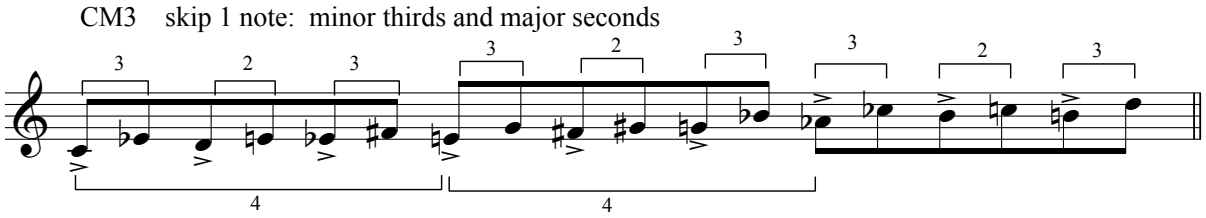
[ex 5.2.1]

The exposition of his "own modes of limited transposition" (Messiaen 1992 VII: 50) is only one of Messiaen's compositional techniques. Their potential for application by (composing) improvisers will become evident from the practical examples discussed in this chapter. Other techniques such as extended rhythms and operations with "non-retrogradable rhythms" (rhythmic palindromes: rhythms that, played from right to left, sound the same as played from left to right) will be less apparent. Looking back to the concepts of "playing outside the chords" and "creating intended harmonic vagueness," introduced as potential techniques to develop the improviser's personal sound in chapters 1 and 2 of this study, the important question is how these operations with Messiaen's modes can enhance the practices of (composing) improvisers.

The arrangement of this subchapter is as follows. Sections 5.2.1 – 5.2.7 are meant to expose the structures of Messiaen's modes. Each section displays the basic mode followed by an analysis of its intervallic and segmental structure. This is followed by examples of so-called "mode embellishments" which I define here as scale variations. Dividing the scales into dyads with intervals that can be gradually increased (starting with thirds, then fourths, fifths, etcetera), could be applied effectively to study the individual colors of Messiaen's modes. I connect each degree of the mode to the one that

is a fixed number of steps higher or lower. Put in its simplest form, I call these embellishments "skip 1 note", "skip 2 notes", "skip 3 notes", etcetera.

The following example illustrates the application of the "skip 1 note" embellishment to CM3, resulting in three segments at a major third (4) distance, each containing a combination of a minor third (3), a major second (2), and again a minor third (3). Regarding the notation, the intervals within the dyads are written above the staff, unless all intervals are similar. In the latter case, they are omitted. The intervals between the segments are written under the staff. The degrees of the basic modes are always accentuated.
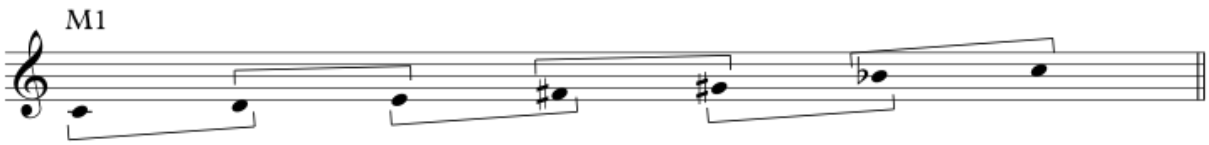


[ex 5.2.2]

In order to make the embellishments in the following sections sound less predictable, I will randomly add variations to them, by alternating the ascending and descending directions of the lines and the dyads.

5.2.1 First mode (M1)

Structure of M1

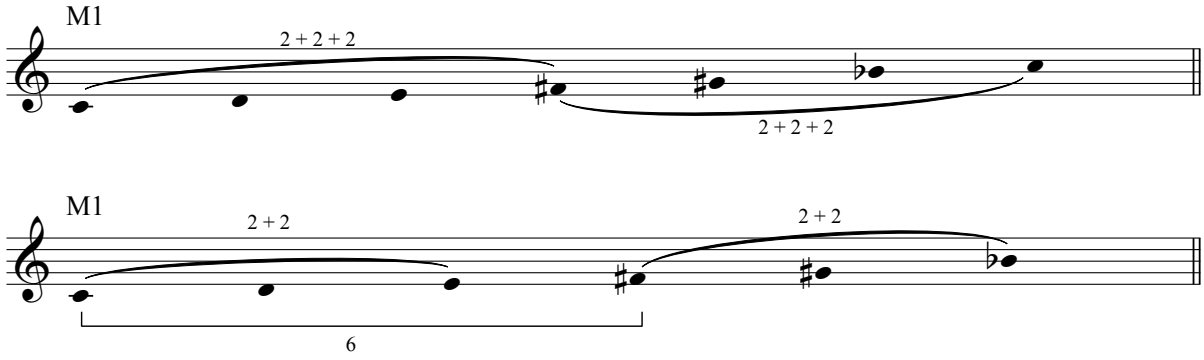
The first mode of limited transposition (M1) is formed with six groups of two notes. Messiaen explains that M1 has two transpositions. In the following example, its basic form starting on the note c, is called the first transposition. The second is its transposition up a minor second. The next transpositions are irrelevant because they would contain the same notes as the first and the second transposition.



[ex 5.2.1.1]

M1 can be identified as the whole tone scale. It is also embedded in the modes M3 and M6 (see 5.2.3 and 5.2.6).

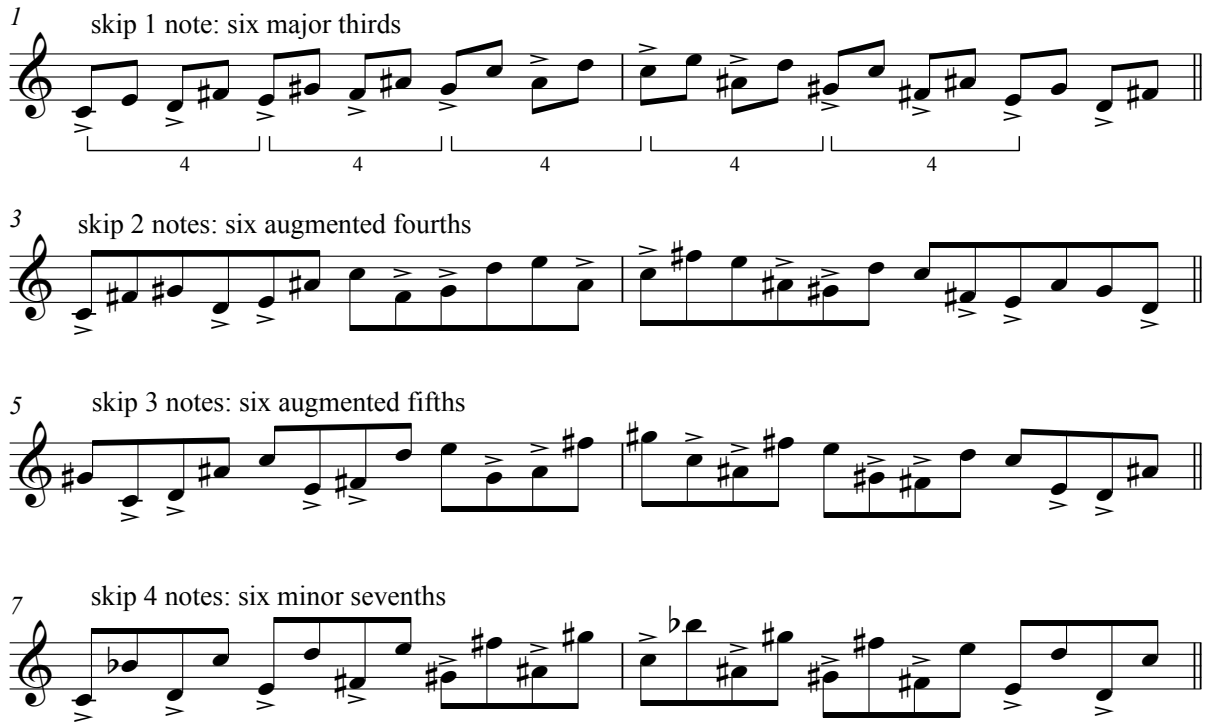
Interval analysis shows that there are two ways to divide M1 into two symmetrical segments. Instead of Messiaen's six groups of two notes, two groups of four notes are marked in the first line, still matching his principle of "the last note of a group always being common with the first of the following group" (Messiaen 1956: 58). The second line displays M1 as two separate trichords, arranged at the distance of an augmented fourth, without repetition of the root note c.



[ex 5.2.1.2]

Embellishments of M1

The following examples display the "skip 1 note", "skip 2 notes", "skip 3 notes", and "skip 4 notes" operations on all (accentuated) degrees of the basic mode. They result in successions of similar intervals, respectively major thirds, augmented fourths, augmented fifths, and minor sevenths. In bars 1–2, and in bars 7–8, all intervals are played in ascending direction. In bars 5–6, and 7–8, the intervals are played in alternating ascending and descending directions. The successions of six similar intervals emphasize the characteristic symmetry of the whole-tone scale and its tonal color of the augmented chord (see section 5.6.1).
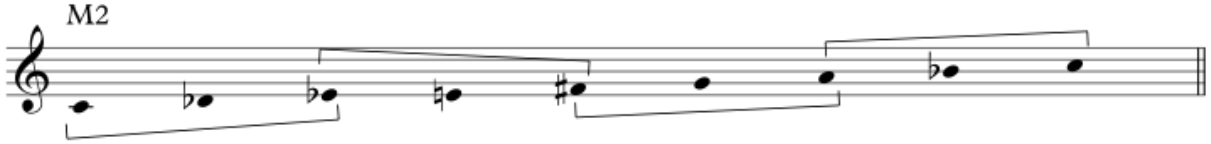


[ex 5.2.1.3]

5.2.2 Second mode (M2)

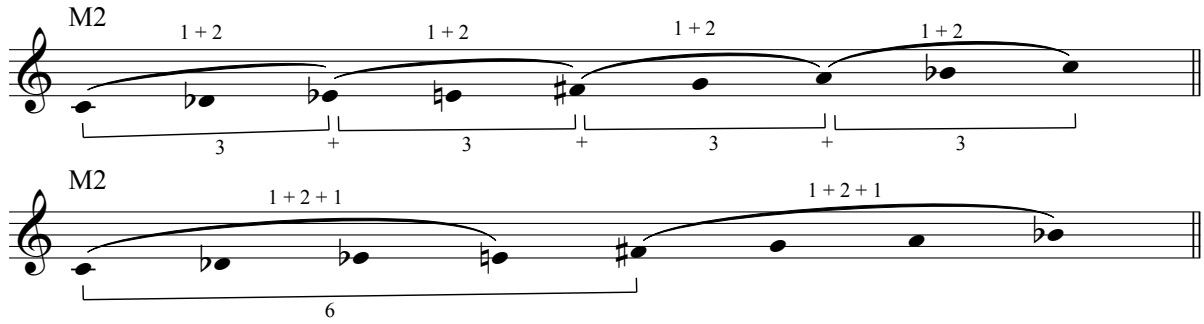
Structure of M2

Messiaen's second mode of limited transposition (M2) has three transpositions. It is formed with four symmetrical groups of three notes (each). Thus, M2 displays four trichords, themselves divided into two intervals: a minor second and a major second.



[ex 5.2.2.1]

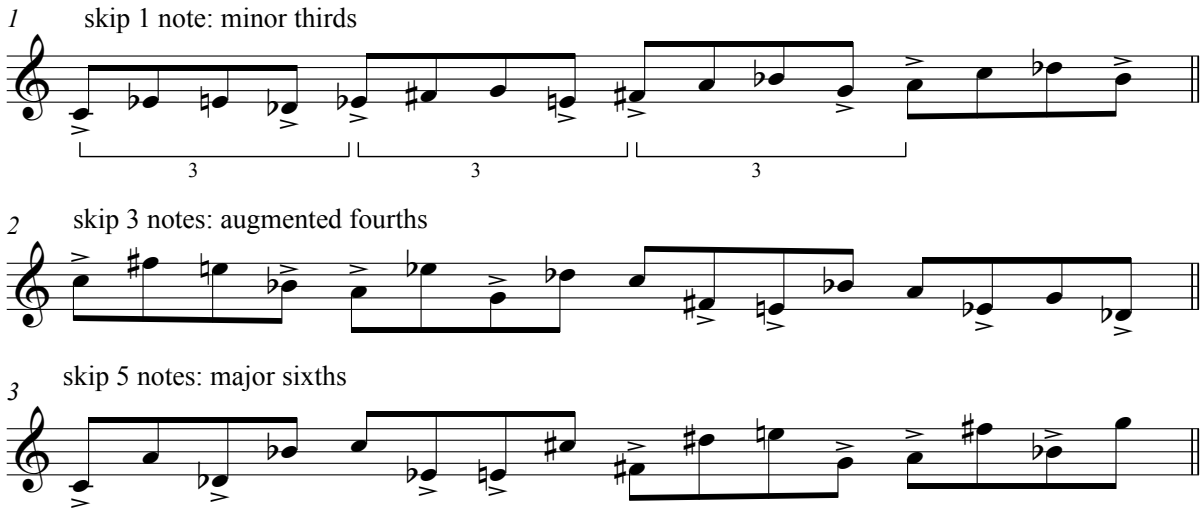
Among jazz improvisers, Messiaen's second mode is widely known as the octatonic (eight-tone) scale, or as the diminished scale ordered in a succession of minor and major seconds (the so-called "half-tone–whole-tone" ordering). In the first line of the following example, interval analysis reveals four overlapping 1+2 trichords, steered by intervals of minor thirds, with every next group starting on the last note of the preceding one. In the second line the eight-tone scale is divided into two segments of 1+2+1 tetrachords at a tritone distance. Both lines clearly express the symmetry of this mode.



[ex 5.2.2.2]

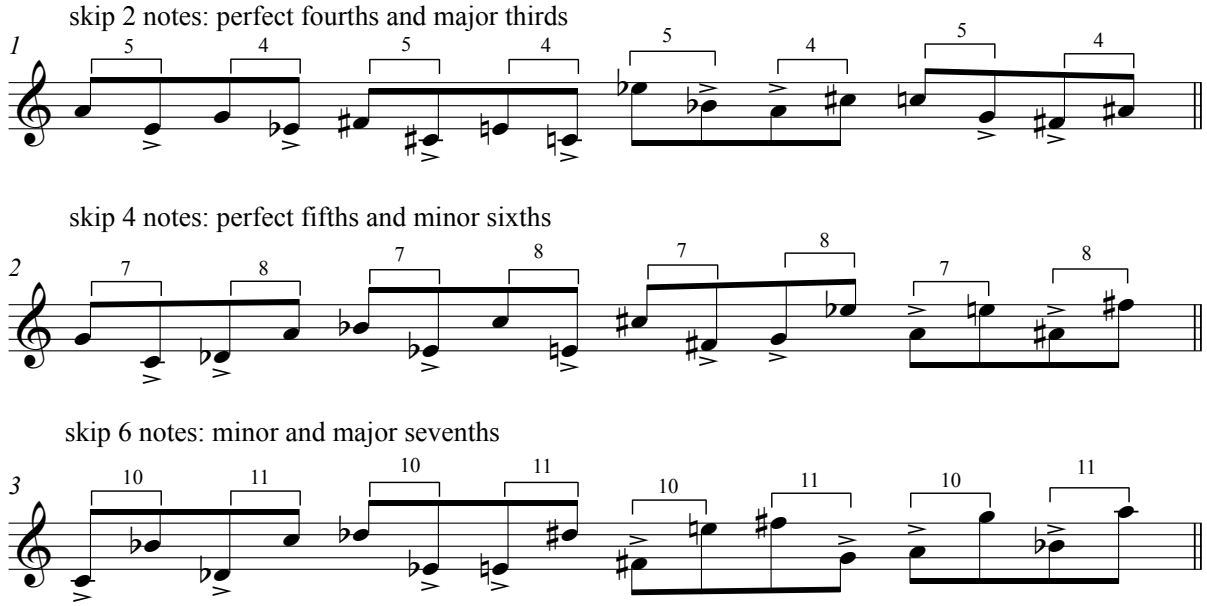
Embellishments of M2

Both the symmetry of M2 and its tonal color of the diminished chord are illustrated in the following lines. All of the operations, "skip 1 note", "skip 3 notes", and "skip 5 notes", divide the mode into four symmetric segments at a minor third distance. Each segment contains two dyads with similar intervals: minor thirds, augmented fourths, and major sixths. In order to avoid a predictable sound, I randomly modified the directions of the dyads and the lines.



[ex 5.2.2.3]

Next, the operations "skip 2 notes", "skip 4 notes", and "skip 6 notes" result in segments containing dyads with dissimilar intervals: a perfect fourth (5) and a major third (4), a perfect fifth (7) and a minor sixth (8), and a minor seventh (10) and a major seventh (11). Because of these dissimilar intervals and their irregular directions, the following mode embellishments could sound less predictable than the ones in the example above.



[ex 5.2.2.4]

5.2.3 Third mode (M3)

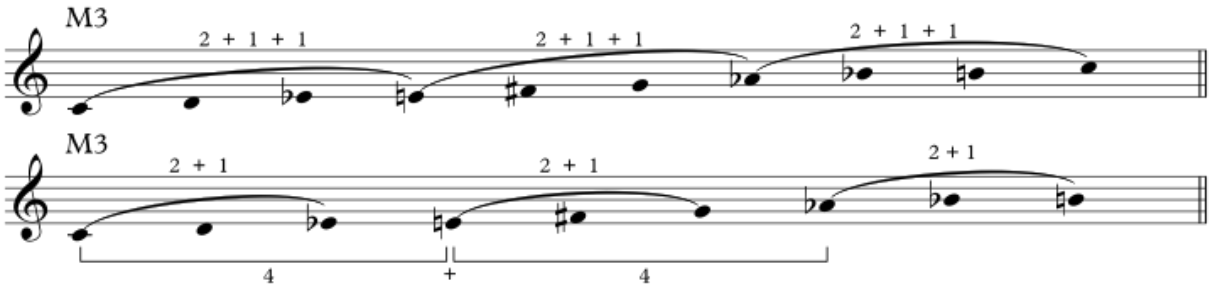
Structure of M3

Messiaen divides his third mode of limited transposition (M3) into three symmetrical groups of four notes (each). It has four possible transpositions. Messiaen refers to this mode as "the chord of the augmented fifth" (Messiaen 1956: 60). M1 (the whole-tone scale) is embedded in this nine-tone scale.



[ex 5.2.3.1]

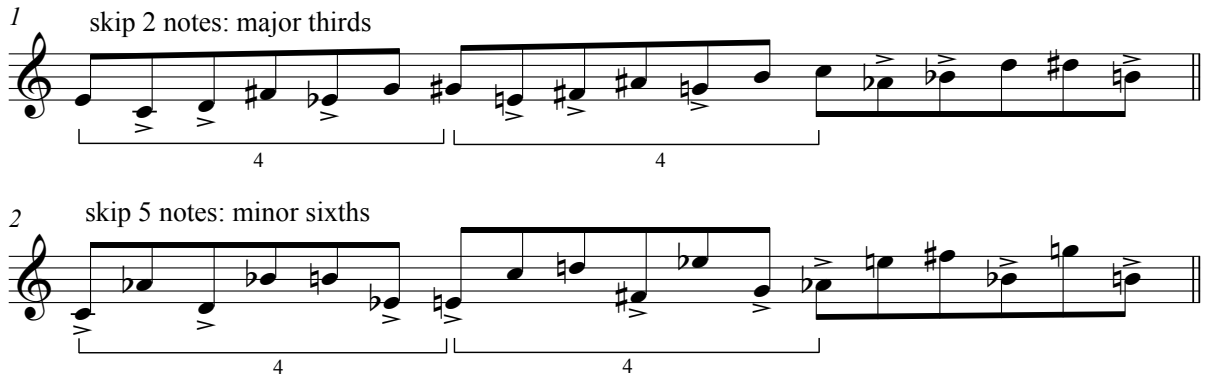
Interval analysis reveals that two ways of grouping the segments are possible. The first line reflects Messiaen's division shown above, displaying three 2+1+1 tetrachords, with every next tetrachord starting on the last note of the preceding one. The second line shows that, without repeating the root note, it can also be considered as a sequence of three 2+1 trichords at distances of major third intervals.



[ex 5.2.3.2]

Embellishments of M3

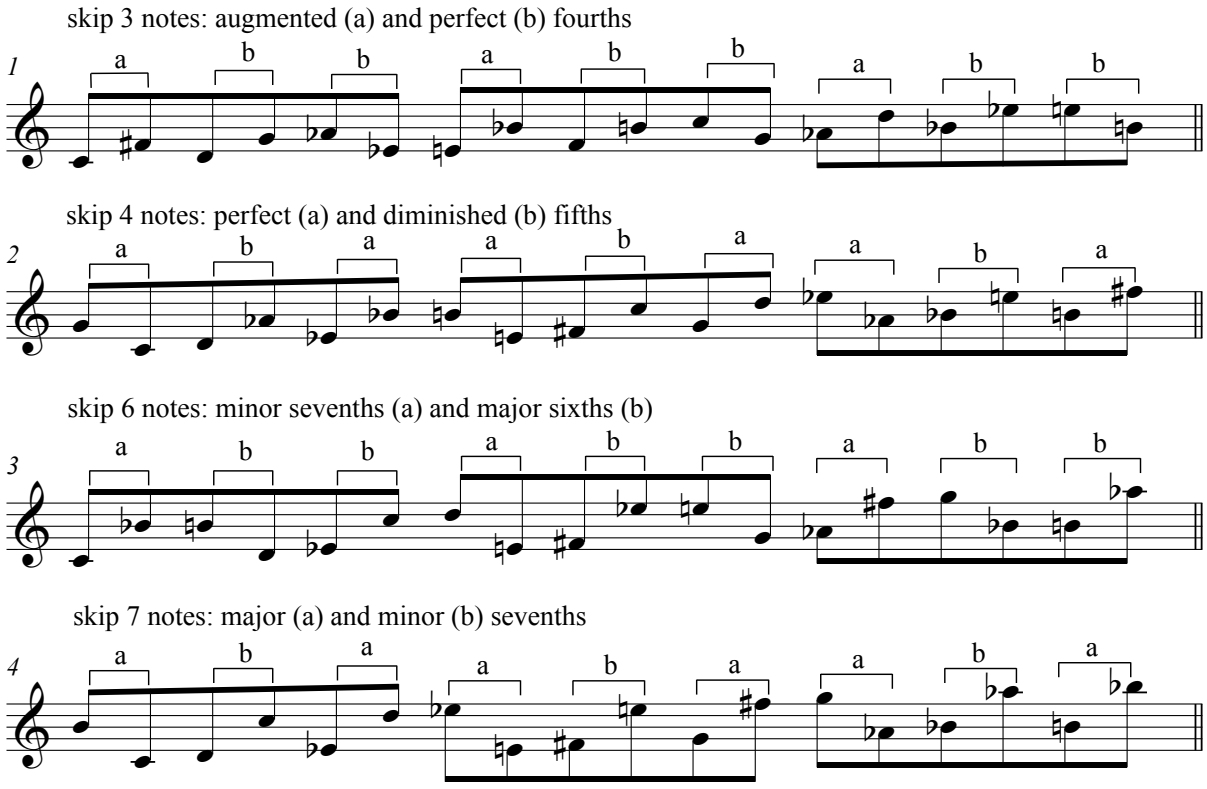
M3 allows the improviser a large variety of scale embellishments. The operations "skip 2 notes" and "skip 5 notes" result in three segments at a major third (4) distance, each containing three dyads with similar intervals: major thirds, and their inversions, minor sixths.



[ex 5.2.3.3]

In the following lines, the operations "skip 3 notes", "skip 4 notes", "skip 6 notes", and "skip 7 notes", result in segments containing combinations of dissimilar intervals. Augmented and perfect fourths, perfect and diminished fifths, minor sevenths and major sixths, and major and minor sevenths, appear in different orderings: a–b–b in bars 1 and 3; a–b–a in bars 2 and 4. The combination of these larger intervals with their specific

orderings highlights the interesting structure of this mode that, constructed of three symmetric segments, includes the minor and major thirds as well as the minor and major sevenths on the "root notes" of the parallel segments.
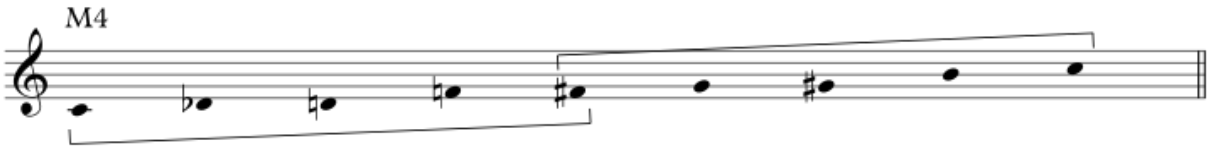


[ex 5.2.3.4]

5.2.4 Fourth mode (M4)

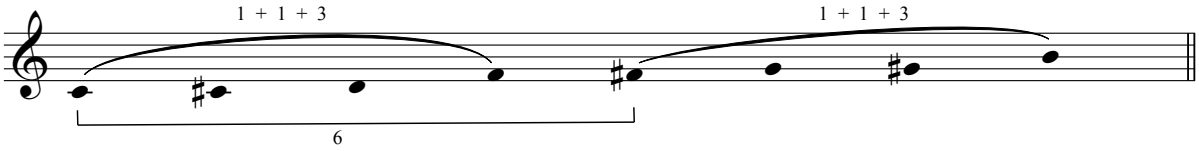
Structure of M4

Messiaen relates his modes M4, M5, M6 and M7 to the interval of the augmented fourth: "These modes are transposable six times, like the interval of the augmented fourth" (Messiaen 1956: 61). Each of these four modes can be divided into two symmetrical groups, an augmented fourth interval apart. Messiaen divides M4 into two groups of five notes as follows.



[ex 5.2.4.1]

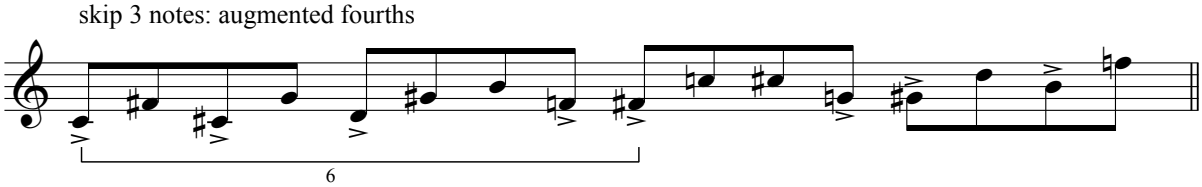
Interval analysis of this mode without repetition of the initial note reveals two tetrachords with the similar intervallic construction 1+1+3, two minor seconds and a minor third, at the distance of an augmented fourth.



[ex 5.2.4.2]

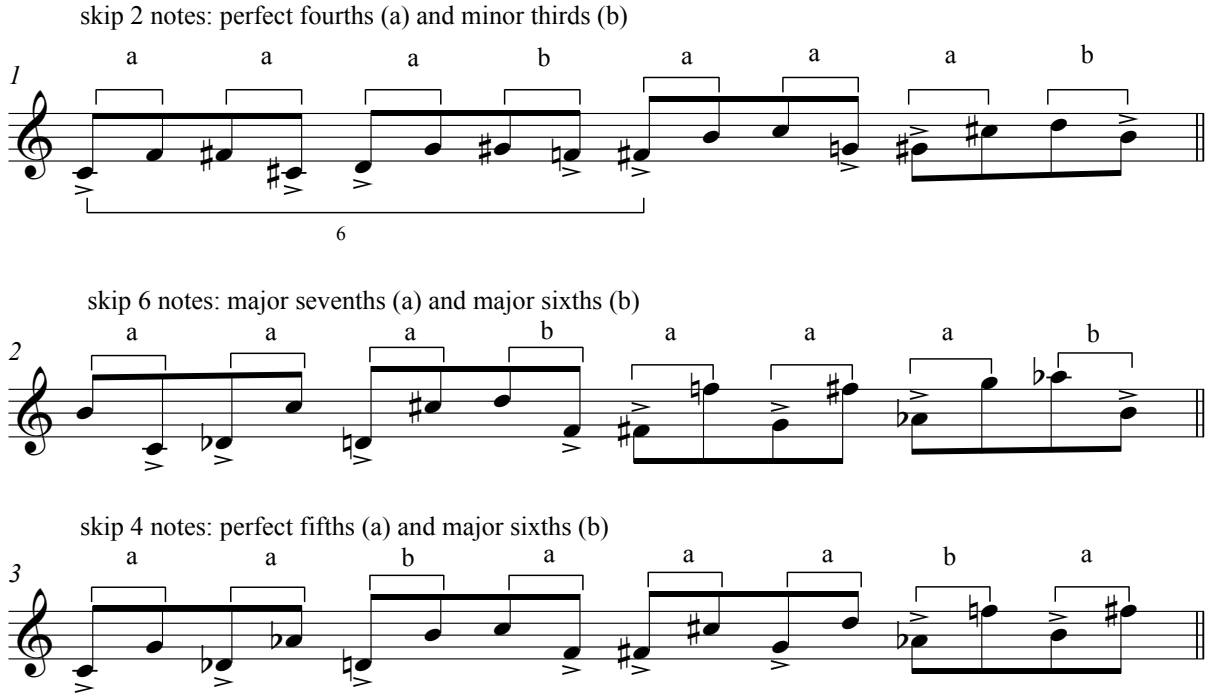
Embellishments of M4

Operation "skip 3 notes" perfectly illustrates the symmetry of CM4: two symmetrical segments at an augmented fourth distance, both containing a succession of dyads with the same augmented fourth intervals.



[ex 5.2.4.3]

In the following example, the operations "skip 2 notes", "skip 6 notes", and "skip 4 notes" work well to illustrate the characteristic sound of M4. They all result in two segments containing dyads with dissimilar intervals. In the first and second lines they are ordered a–a–a–b, in the third line they are ordered a–a–b–a.
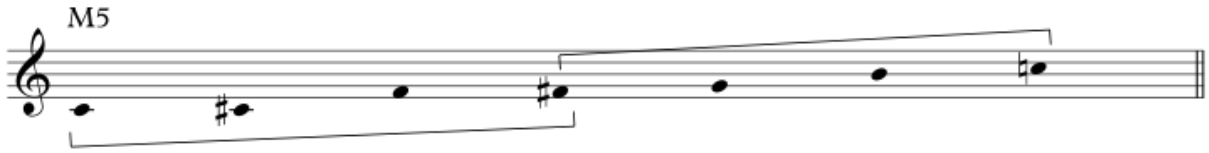


[ex 5.2.4.4]

5.2.5 Fifth mode (M5)

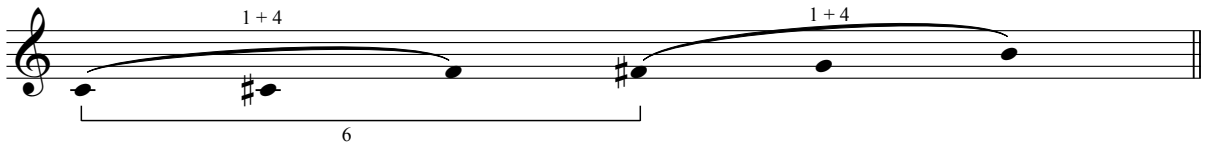
Structure of M5

The fifth mode of limited transposition (M5) is the same as the fourth, but with the third and the seventh note omitted. According to Messiaen, it is formed with two groups of four notes as follows.



[ex 5.2.5.1]

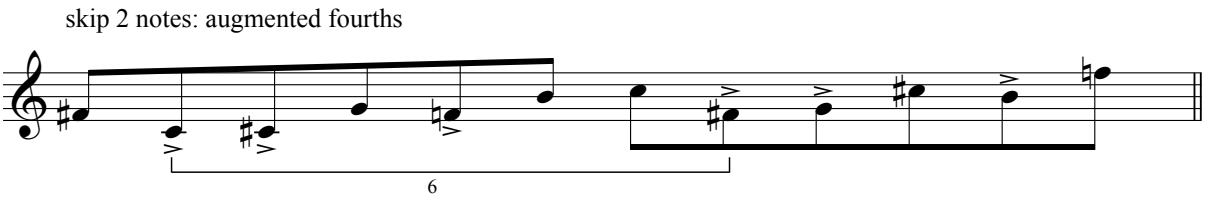
The following interval analysis of this mode without the initial note repeated reveals two 1+4 trichords at the distance of an augmented fourth.



[ex 5.2.5.2]

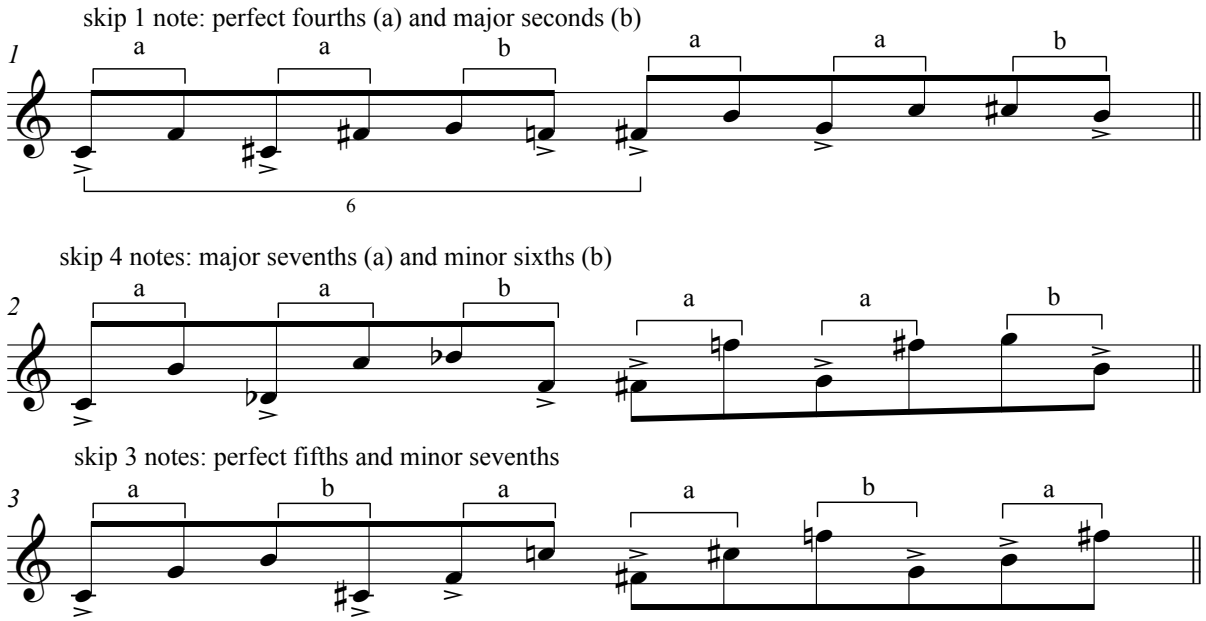
Embellishments of M5

Operation "skip 2 notes" in the following example demonstrates the symmetry of M5. Just as in section 5.2.4 two symmetrical segments appear at an augmented fourth distance, both containing a succession of dyads with the same intervals.



[ex 5.2.5.3]

Operations "skip 1 note" and "skip 2 notes" result in the interval groupings of perfect fourths and major seconds, and major seventh and minor sixths, both in the order a-a-b. The third line shows combinations of perfect fifths and minor sevenths in the order a-b-a.
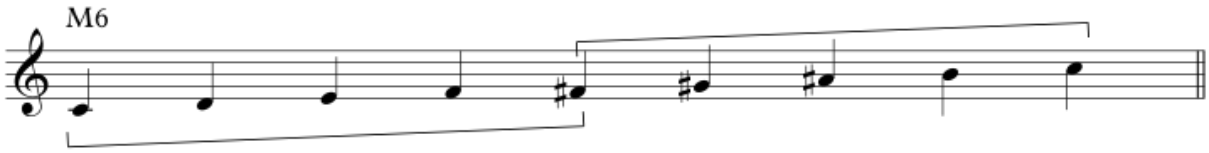


[ex 5.2.5.4]

5.2.6 Sixth mode (M6)

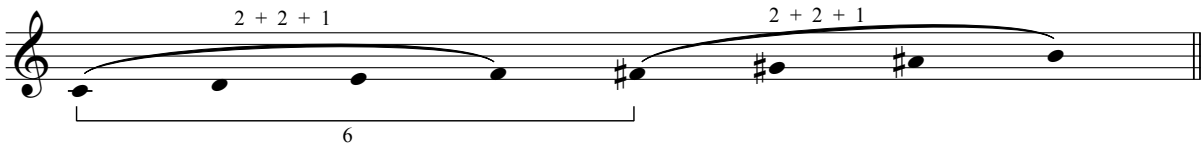
Structure of M6

According to Messiaen, his sixth mode is formed with two segments of five notes. Each group contains two major seconds followed by two minor seconds.



[ex 5.2.6.1]

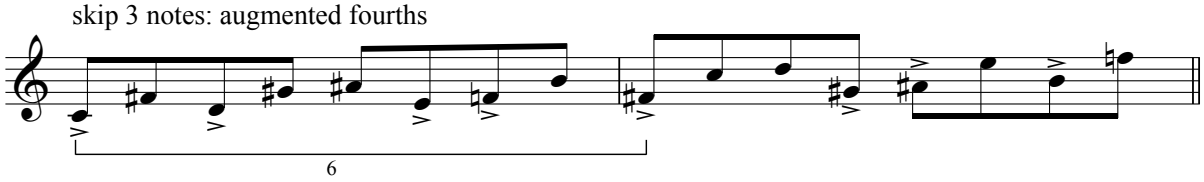
Interval analysis of the sixth mode without repetition of the initial note displays two 2+2+1 tetrachords at the distance of an augmented fourth (6). In other words, Messiaen's mode M6 displays the first tetrachords of the C and the F# major scales.



[ex 5.2.6.2]

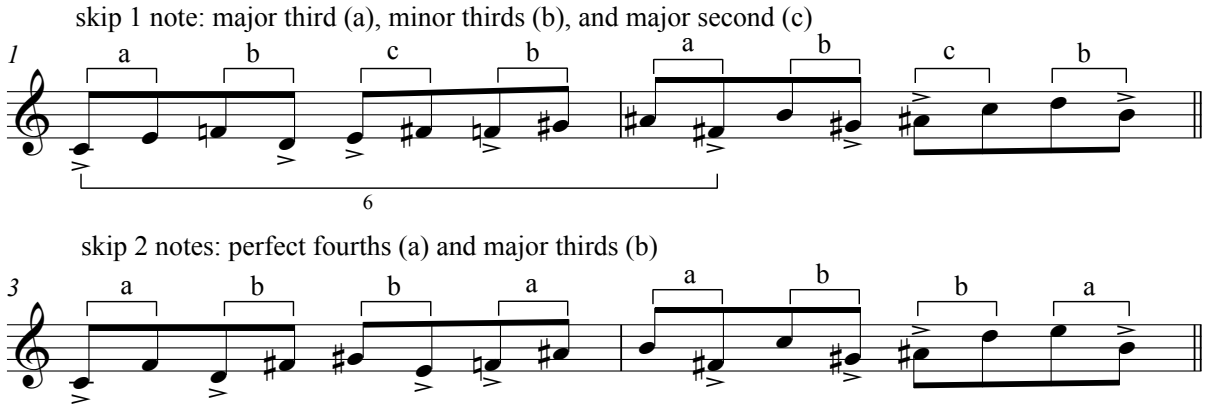
Embellishments of M6

The next succession of dyads with similar intervals of augmented fourths inside two segments at an augmented fourth distance results from operation "skip 3 notes".



[ex 5.2.6.3]

The application of operation ”skip 1 note” on CM6 creates the most complicated interval collection so far: both segments, arranged at the distance of an augmented fourth (6), in the first line of the following example contain dyads with intervals of a major third, two minor thirds, and a major second in the order a-b-c-b. Operation “skip 2 notes” executed in the second line creates two segments containing two perfect fourths and two major thirds in the order a-b-b-a. By manipulating the directions of the intervals, both lines manage to obscure the bare symmetric structure of CM6.
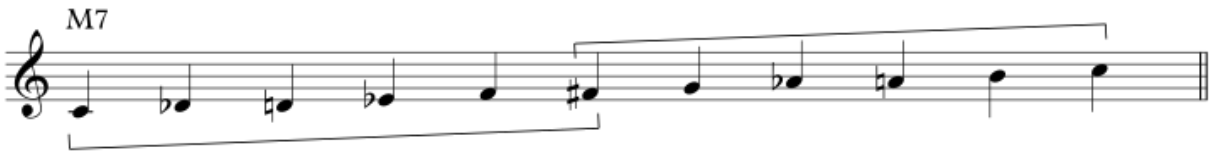


[ex 5.2.6.4]

5.2.7 Seventh mode (M7)

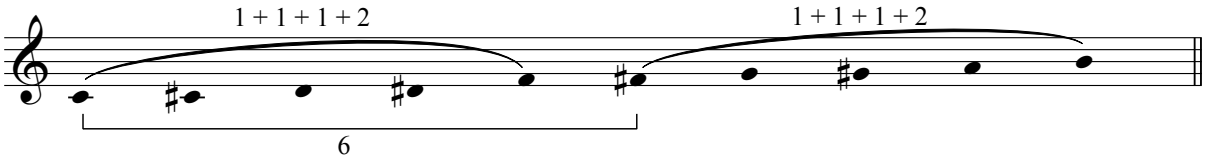
Structure of M7

With ten pitches, the seventh mode contains the largest number of pitches of all modes. It is only two pitches away from being a chromatic scale. According to Messiaen it is formed with two groups of six notes. Each group displays the intervallic structure of three minor seconds, followed by one major second and another minor second.



[ex 5.2.7.1]
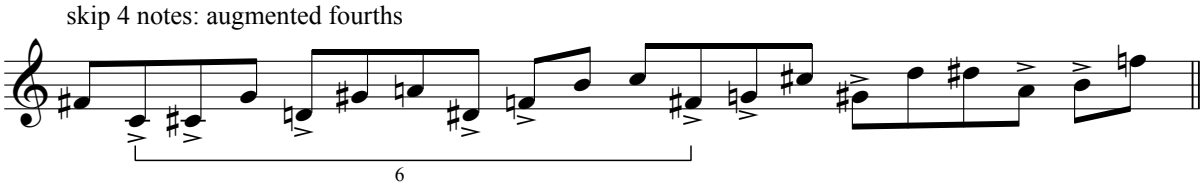
Interval analysis of the mode without repetition of the initial note displays two groups of five notes at a distance of an augmented fourth interval. Each of the two groups consists of three minor seconds and one major second.



[ex 5.2.7.2]

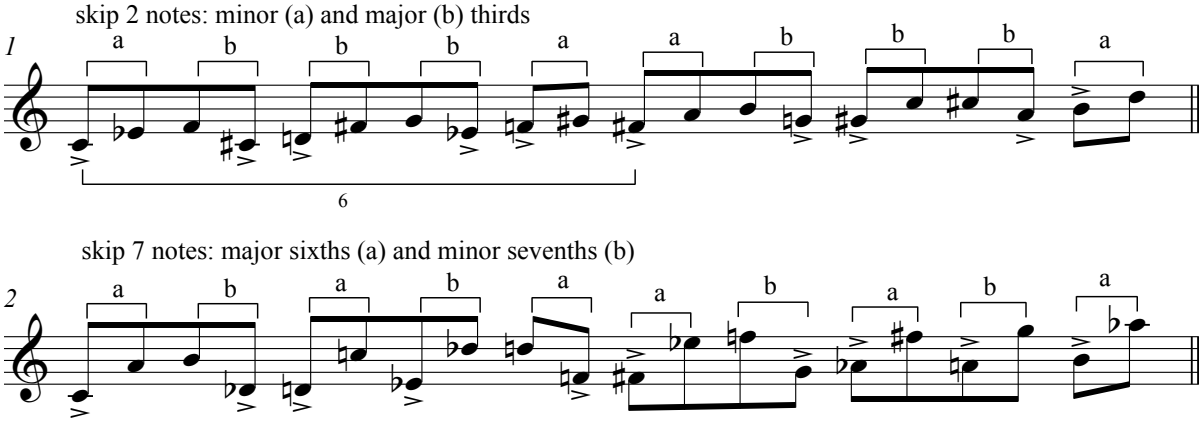
Embellishments of M7

Operation "skip 4 notes" results in a succession of similar intervals of augmented fourths within two segments at the distance of an augmented fourth.



[ex 5.2.7.3]

The following example shows how operation "skip 2 notes" results into two segments containing successions of dyads with minor and major thirds in the order a-b-b-b-a. In the second bar "skip 7 notes" creates successions of major sixths and minor sevenths in the order a-b-a-b-a.



[ex 5.2.7.4]

To summarize the exposition of Messiaen's seven modes, both the interval analyses and the embellishments of the modes illustrate Messiaen's notion of the "charm of impossibilities" (Messiaen 1956: 58). With this term, he indicates the "strange charm" of the modes due to their limited transpositional possibilities. However, this does not mean that the sound of the modes becomes more interesting when the amount of their transpositions is smaller. Certainly, M1 (two transpositions), M2 (three transpositions), and M3 (four transpositions) have strong characteristics. However, in my opinion, the same goes for (the embellishments of) M4, M5, and M6, which contrasts with Messiaen's statement that they are "transposable six times, and presenting less interest, for the very reason of their too great number of transpositions" (Messiaen 1956: 58). In the case of M7, I consider the large amount of pitches, rather than the numerous possible transpositions, as the main reason for being less interesting.

Based on my musical experiments and experience, I maintain that my examples of mode embellishments manage to create a form of "strange charm" even to the less interesting modes; besides, they also enhance the charm of the less transposable ones. Therefore, in my predominantly melodic approach to Messiaen's modes, embellishment techniques are as important as the numbers of possible transpositions.

The interval analyses I have added as an alternative to Messiaen's expositions of the modes are meant to mark the segments they are formed with more precisely. Thus, the symmetry of their segments, responsible for their characteristic tonal ambiguities, is illustrated more clearly, helping the musician to either emphasize the various tonalities or to leave them aside. After all, according to Messiaen, his modes are "at once in the atmosphere of several tonalities, *without polytonality,* the composer being free to give predominance to one of the tonalities or to leave the tonal impression unsettled" (Messiaen 1956: 58).

The following subchapter discusses applications of Messiaen's modes by four (composing) improvisers introduced in subchapter 5.1. How do Veras, Van der Werf, Blom, and Lacy use the modes, and how do they treat the tonal ambiguities? Rather than present a kind of historic overview, I have selected their works because they show melodic applications of one or a limited number of modes in a way that connects to the predominantly melodic approach to improvisation that is the subject of this study. Moreover, taken together, the following four examples show applications of all seven modes.
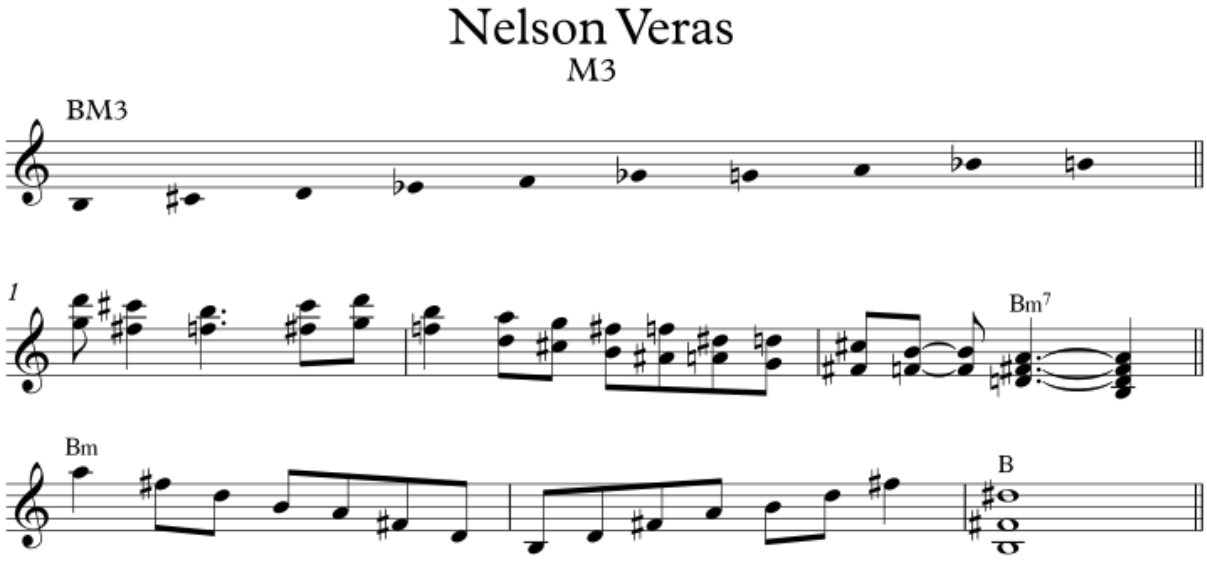
5.3 Applications of Messiaen's modes in jazz

5.3.1 Master class (Nelson Veras)

An interesting blend of intuitive and well-informed applications of Messiaen's modes M3, M6, and M4 was demonstrated during a master class by Brazilian guitarist Nelson Veras at the Conservatory of Amsterdam on November 27, 2009. Veras strikes me as a creative improviser who, as he mentioned during his master class "is constantly looking for new ways to surprise himself." The following sections examine a number of the lines he played, instantaneously responding to the questions by students attending this master class.

5.3.1.1 M3

Veras first plays BM3, Messiaen's third mode starting from the root note b. In bars 1–3 of the example below he plays a succession of intervals of fifths and augmented fourths[3], resulting from the operation "skip 4 notes" (see section 5.2.3), and ends with a conventionally arpeggiated Bm7 chord. Next, in bars 4–6, he illustrates the ambiguous tonal color of this mode by firstly extending the Bm7 chord before changing it into a B major triad at the end. Both tonal colors are implied in BM3 (see sections 5.2.3 and 5.6.3).

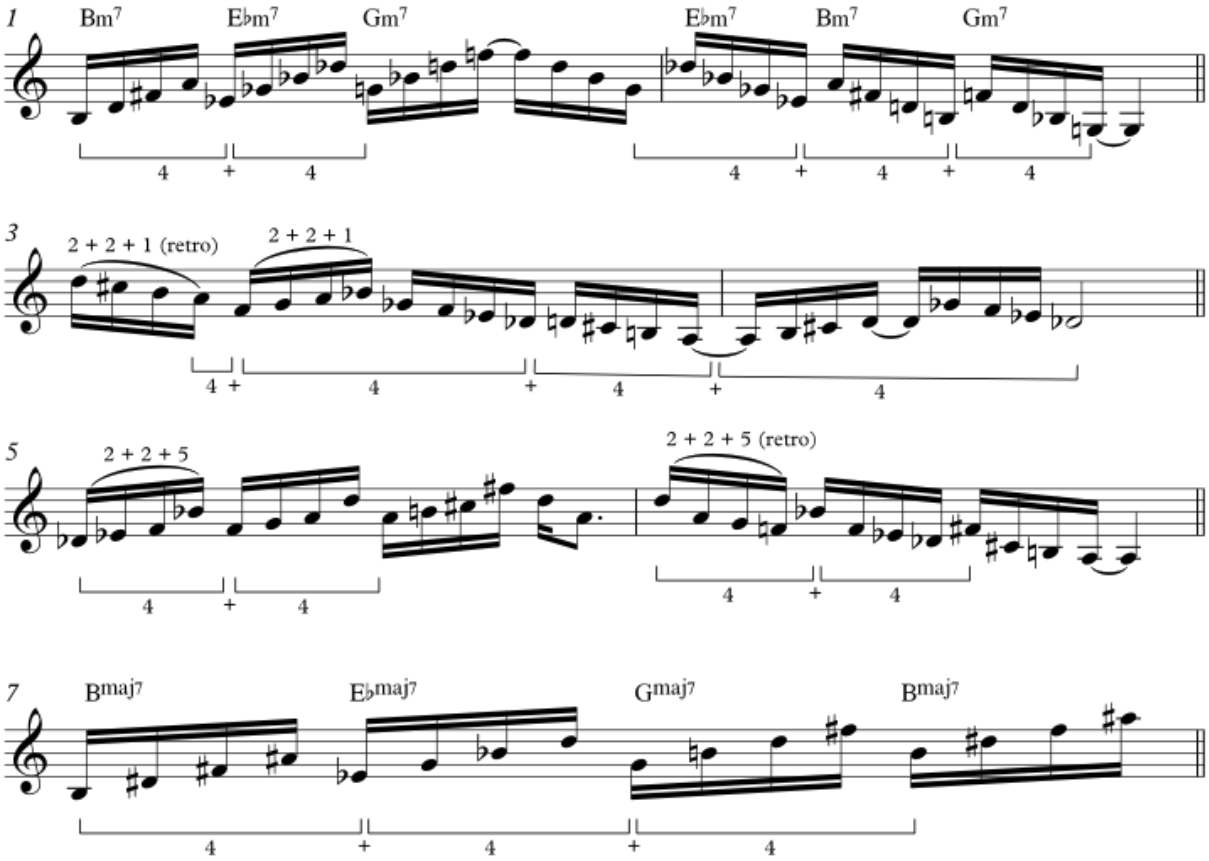


[ex 5.3.1.1.1 Nelson Veras first example]

[3] Veras consistently uses the term "raised fourths"

In the following example Veras demonstrates how M3 can be considered as a sequence of three parallel tonal centers at distances of a major third. Due to this partition of the mode he explains that, without leaving the notes of the mode, "everything you do, you can do a major third above or below."
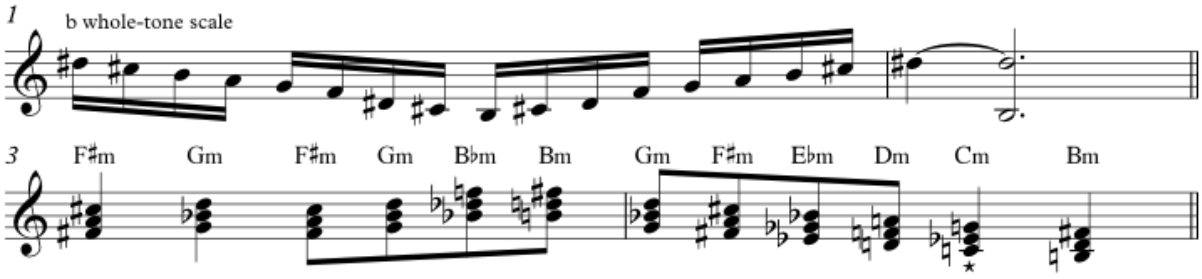
In bars 1–2 he plays the three implied minor seventh chords Bm7, Ebm7, and Gm7. Bars 3–6 display symmetrical four-note patterns (2+2+1 tetrachords) at major third distances in alternating directions. In bars 3–4 interval analyses reveal a sequence of six 2+2+1 tetrachords, and in bars 3–6 a sequence of six 2+2+5 tetrachords. In bar 7 he plays a sequence of major seventh chords. All pitches in the examples below belong to mode BM3.



[ex 5.3.1.1.2 Nelson Veras second example]
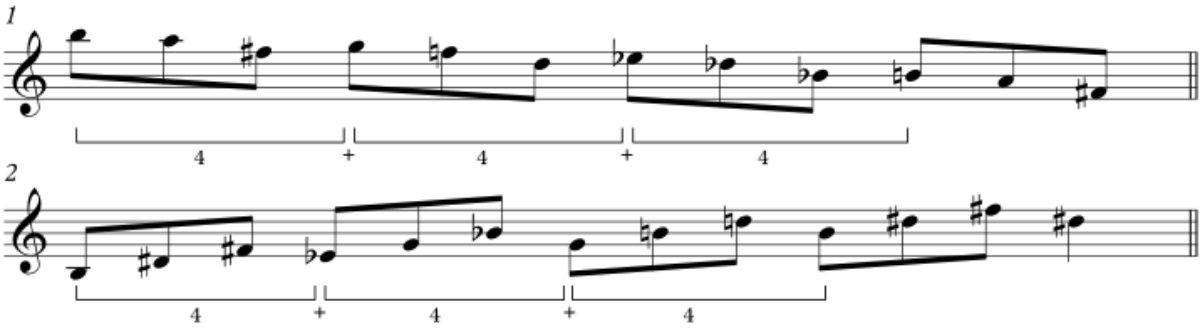
In bars 1–2 of the next example, Veras plays the embedded b whole tone scale. BM3 matches here with BM1 as discussed in sections 5.2.1 and 5.2.3. Finally, in bars 3–4 he plays a sequence of embedded minor triads, starting with F#m and ending on Bm, the root of BM3. With this example, he shows that minor triads can be built both on the roots

of the three implied tonal centers, and on the preceding notes in the mode. The C minor chord in bar 4 is marked with an asterisk because it is foreign to mode BM3.



[ex 5.3.1.1.3 Nelson Veras third example]
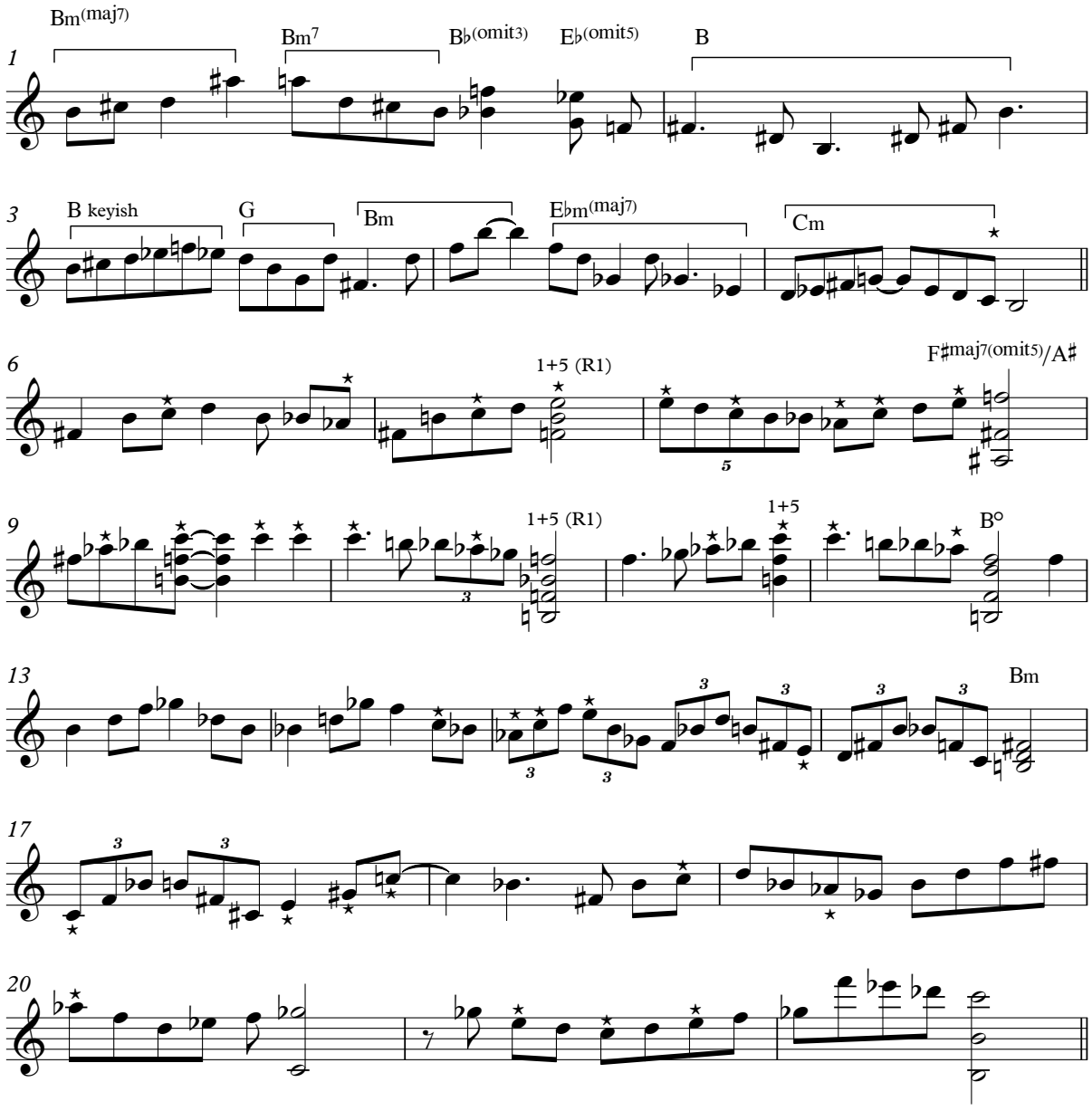
After these technical demonstrations, Veras discusses his aesthetic approach to the Messiaen modes, which is principally melody-oriented. As he explains during the workshop: "I like the sound of these modes melodically. I like [them] harmonically too but I like just the melodies that can appear. […] Actually I avoid the symmetry of it. I try to not play, say, all the time like…" [plays the following two sequences].



[ex 5.3.1.1.4 Nelson Veras fourth example]

Veras continues, "I try just to see where it takes me [plays bars 1–5 of the following examples] and what kind of colors I can find [plays bars 6–22]." There is a noticeable difference between these two fragments. In bars 1–5 Veras strictly keeps to the notes in the mode. Only in the last bar does he add the note c, which is foreign to the mode, evoking the sound of Cm. Then, in bars 6–22 he continues playing the note c, and combines this with two other notes that are not in the mode: e and a♭. The notes that sound outside the mode are marked by and asterisk. Together these notes form the augmented triad c –e–g♯, sounding a minor second above the basic triad b–e♭–g of the mode. It could be considered as a tritone substitute of its F# dominant-seventh chord.

Furthermore, in bars 6–22 five three-voice harmonies appear. Two of these, in bars 12 and 16, can be identified as B diminished and Bm triads. The others are the incomplete F#maj $^{(omit5)}$ /A# chord in bar 8, and two cluster chords in bars 7 and 10 that can both be regarded as first rotations of 1+5 trichords.



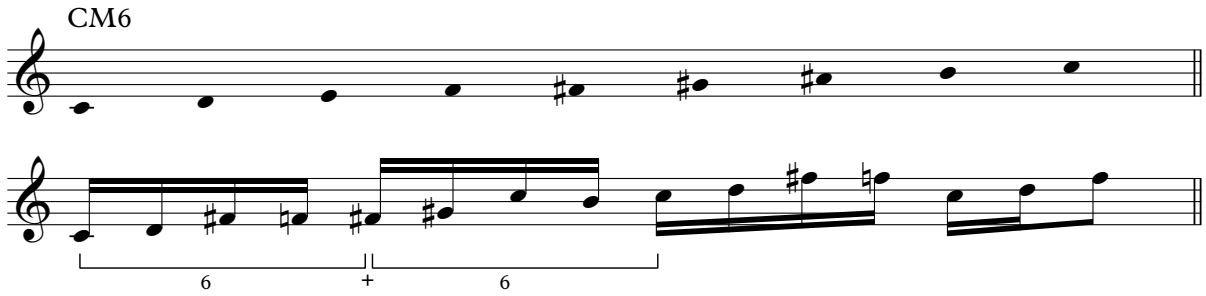
[ex 5.3.1.1.5 Nelson Veras fifth example]

With his application of BM3 that combines an intelligent usage of the mode with a deeply embodied knowledge of functional harmony, Veras manages to create unconventional melodic lines that evoke an intended harmonic vagueness. Admittedly, he occasionally leaves the mode. As such, he seems to act in conflict with Messiaen's intentions as discussed in subchapter 5.2, of "never leaving the notes of the mode." However, I agree

with Veras that these "false" notes are acceptable both from an aesthetic perspective ("they sound good in the line") as well as from the perspective of the jazz improviser: risk-taking is an important part of the improvisational practice. Thus, Veras' approach convincingly proves the potential of M3 in the context of the subject of my research.
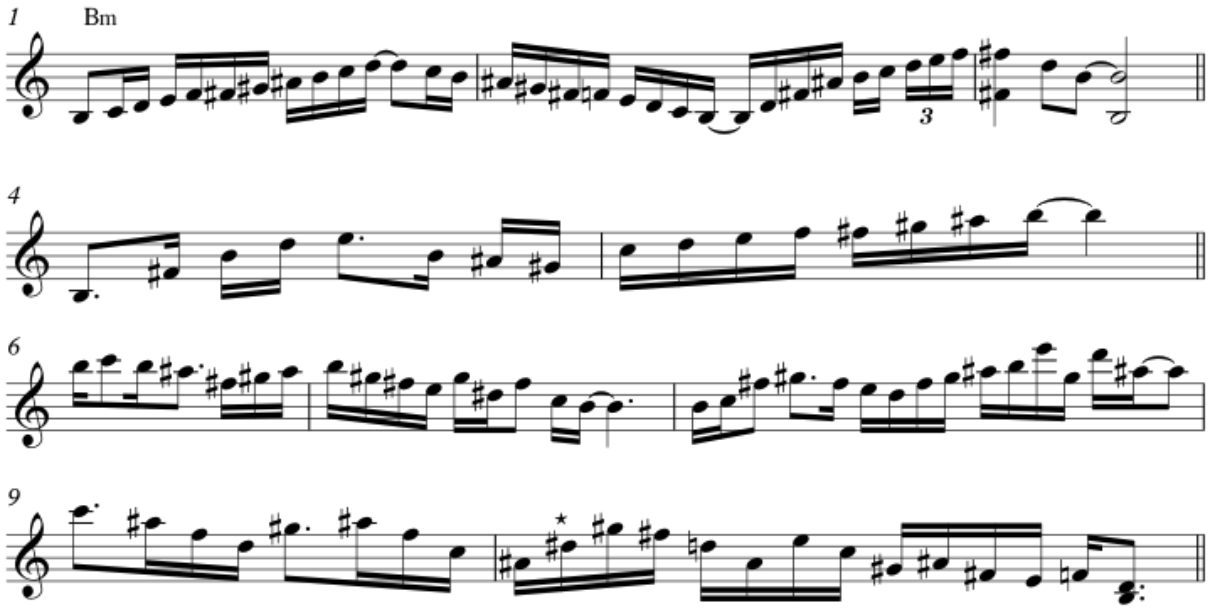
5.3.1.2 M6

Veras' approach in subsection 5.3.1.1 is also obvious in his operations with M6 as shown in the following examples. First, he demonstrates his tactic named "everything you do on this one, you can do a raised four above." After exposing the basic mode CM6 he illustrates its characteristic sound, playing a sequence of tetrachords at distances of an augmented fourth (6).



[ex 5.3.1.2.1 Nelson Veras sixth example]

Then, as shown in bars 1–3 of the next example, he plays the same mode, but now starting on the last note, to create a Bm tonality. The lines in bars 4–5 and in bars 6–10 show embellishments of Bm. Despite their increasing complexity, Veras almost never leaves the notes of the mode. The note $d^{\#}$ in bar 10 is the only exception.
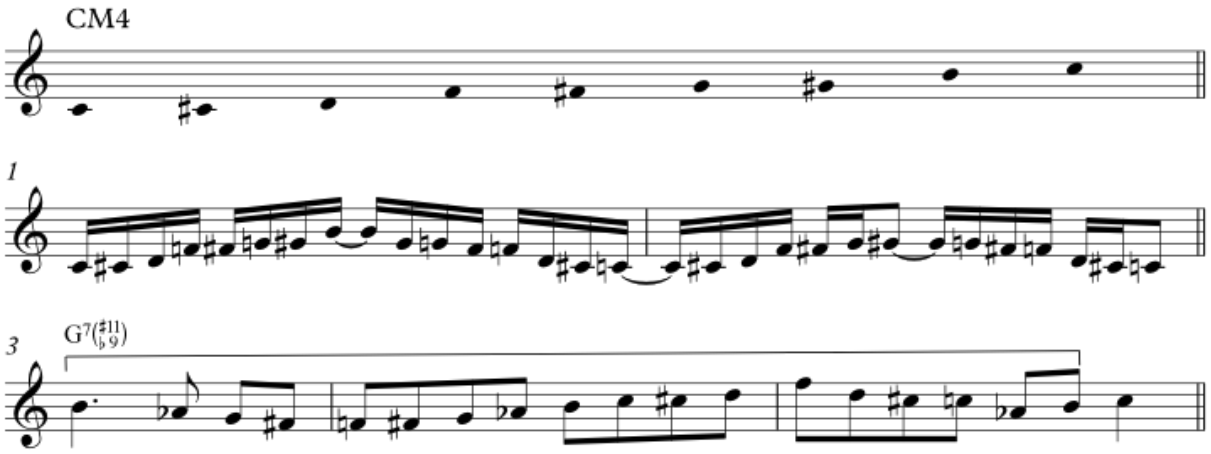


[ex 5.3.1.2.2 Nelson Veras seventh example]

Taking the note b as a pivot and building a B minor tonality on it, Veras inventively solves the "problem" of the two separate fragments from the tonalities of C and F# by merging them into one scale with a B minor tonal color.
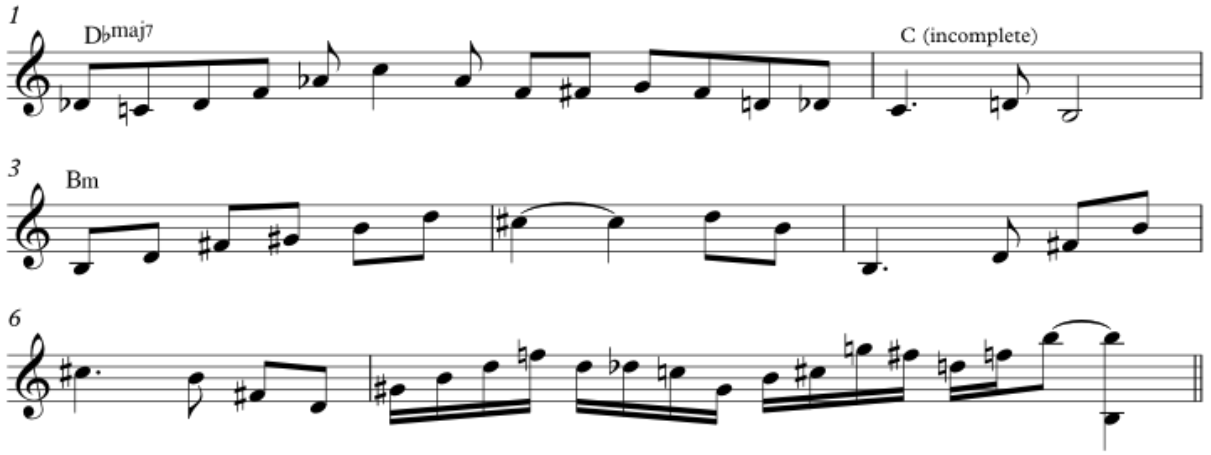
5.3.1.3 M4

In the following examples, Veras demonstrates his operations with M4. After his exposition of CM4, he plays the mode up and down in bars 1–2. By stretching the notes b in bar 1, and $g^{\#}$ in bar 2, he suggests the presence of the harmonic dominant on the fifth, sounding as the characteristic ending of the C major or minor harmonic scale: g–$g^{\#}$–b–c. The fragment of the mode he plays in bars 3–5 continues to illustrate this tonal reference inside M4: the dominant-seventh chord with tension notes b9 and #11. It is resolving to the note c because since the minor or major third is lacking, it is not possible to create a conventional C chord. The notes under the bracket represent the scale of g mixolydian with passing notes between the root and the seventh and between the fourth and fifth degrees of the chord.
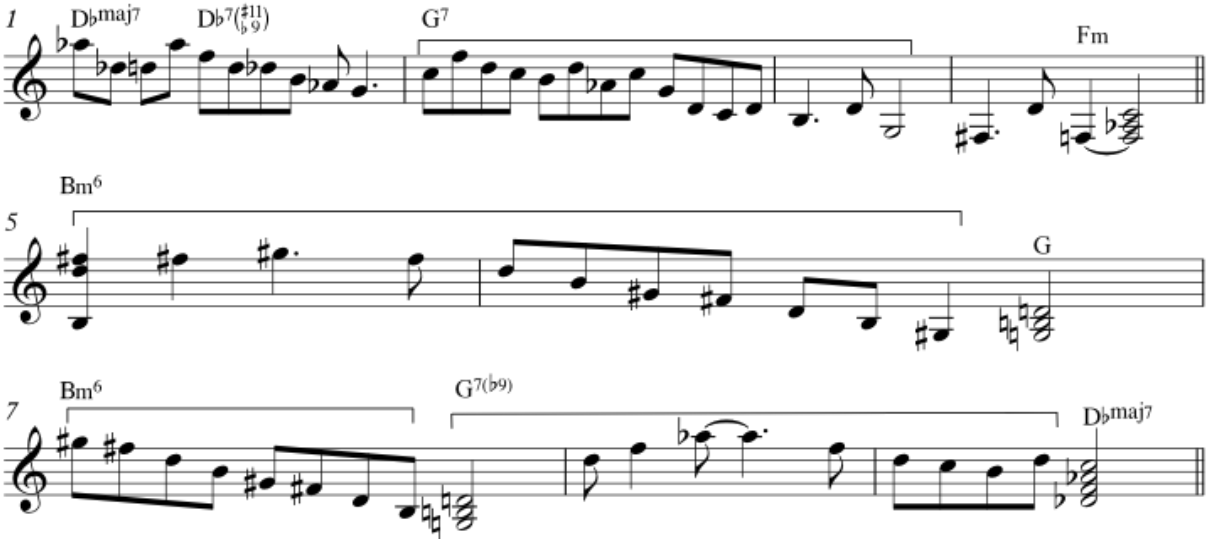


[ex 5.3.1.3.1 Nelson Veras eighth example]

Veras played the following lines to highlight the chords that are implied in CM4 as a kind of compensation for the "missing" C chord. In the first bar it is Dbmaj7, and in bars 3–7 it is Bm. Bar 2 contains the root, the second, and the major seventh, representing a (very) incomplete C chord.



[ex 5.3.1.3.2 Nelson Veras tenth example]

In the next example Veras introduces the G7b9 chord, as a parallel to the Db tonality in the example above. The resulting line shows an advanced blending of the tonalities Db, G, and Bm. The Db chord appears both as a major seventh and a dominant seventh chord. With F minor and Bm considered as the third degrees of Dbmaj7 and Gmaj7, the following line strictly covers these two tonalities appearing at a tritone distance in CM4.



[ex 5.3.1.3.3 Nelson Veras eleventh example]

Evaluation

Veras offers instructive practical examples of improvising with M3, M6, and M4. He clearly shows their tonal ambiguities by concentrating on diatonic structures embedded in the modes as well as by picking various pivot notes as temporal tonal centers in order to simulate harmonic cadences. With his emphatic melodic approach of the modes, he convincingly demonstrates how he profits from their "soft guidance" to arrive at surprising tonal colors. I consider his sparse additions of "foreign" notes to the actual modes, resulting from his intuitive approach to improvisation, as acceptable operations from an aesthetic point of view, for instance in order to make lines sound less predictable, or to avoid the obvious symmetry of the mode. Thus, his applications of Messiaen's modes M3, M6, and M4 show their potential to help (composing) improvisers move beyond the obsolete tracks of conventional harmony. Conversely, objections could be raised against the fact that his lines, however instructive and useful they are, only show one side of the coin. Freely scattering his applications of the actual modes, he does not limit them to any context of a composition or a set of chord changes. This particular aspect, the use of Messiaen's modes in jazz compositions and the interactions of the improvisations with the composed material, will be addressed in section 5.3.2.

5.3.2 "Calcutta" (Bo van der Werf)

Baritone saxophonist and composer Bo van der Werf is widely known for his use of Messiaen's compositional techniques in his writings for the ensemble Octurn, and in his improvisations. A recording of his piece "Calcutta" on the CD *21 emanations* (2006) shows examples of multiple applications.

This section will first discuss the harmonic structure of "Calcutta" in relation to Van der Werf's intended applications of Messiaen's modes M2 and M6. Next, the contrapuntal bass and melody lines will be analyzed in relation to these modes. Finally, fragments of the alto saxophone and Van der Werf's own solo on the baritone saxophone will be investigated.

"Calcutta" is based on the following rhythmic structure that contains two "non-retrogradable rhythms." Messiaen coined this term for rhythmic palindromes: rhythmic sequences that, repeated in reverse order, sound the same. These are the non-retrogradable sequences in "Calcutta":

a–b: 7/8 – 3/4 – 7/8 – 2/4 – 2/4 – 7/8 – 3/4 – 7/8

c–d: 3/4 – 7/8 – 3/4 – 7/8 – 3/4

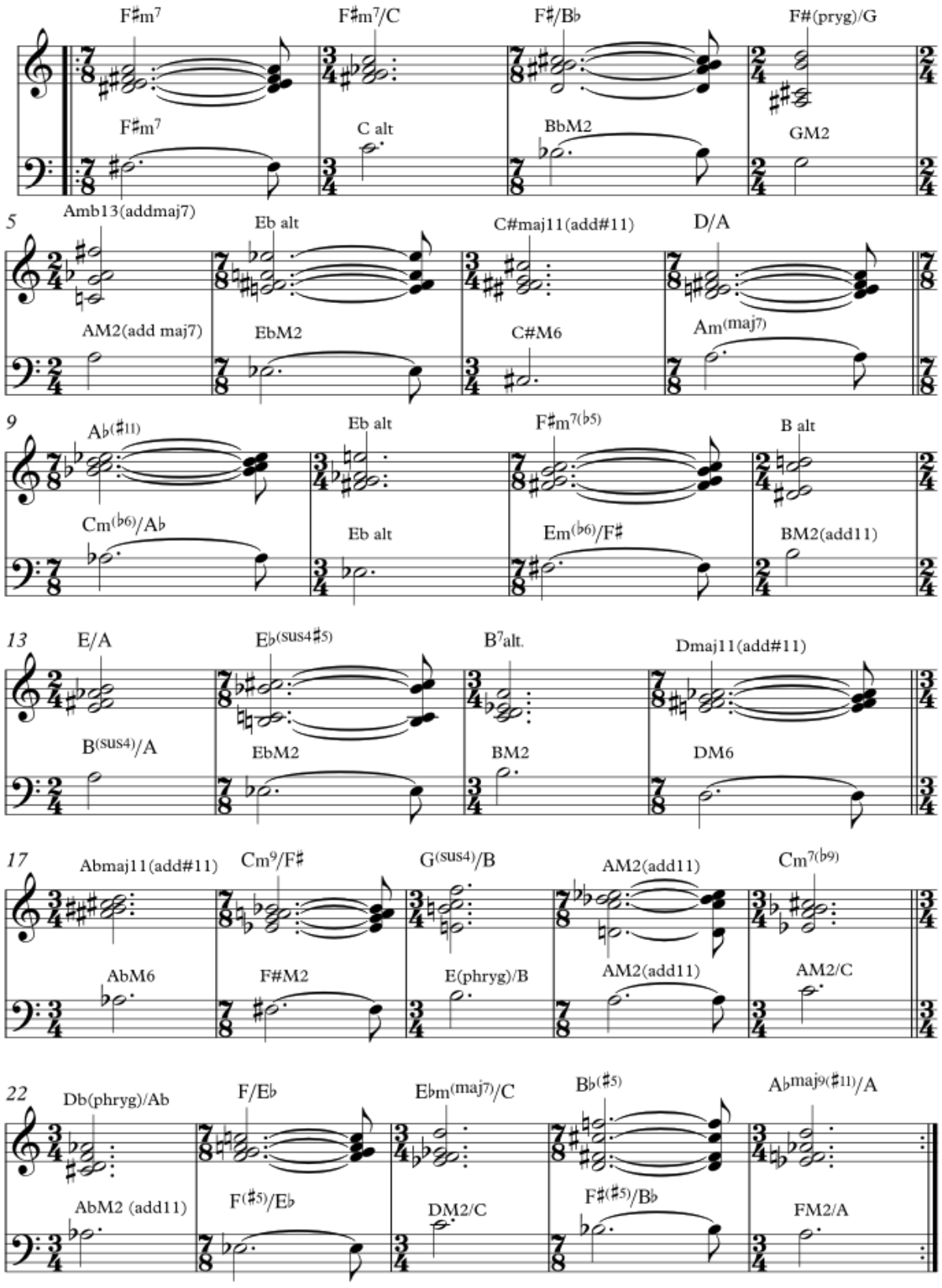
The following example shows the first solo form, underlying the solos by the alto saxophonist and the guitarist. The upper staff exposes the tetra-chords that are continued throughout the tune, with the associated chord symbols written above them. The lower staff displays the bass notes of these chords with, written above them, Van der Werf's chord symbols or Messiaen modes M2 and M6. Van der Werf indicates that it is up to the soloist which of the lines to pick, but that his principal reference should be the succession of tetrachords notated in the upper staff and their relation to the bass notes.

In bars 3, 4, 6, 15, 18, 20, 21, 24, and 26 all pitches can be identified as members of various transpositions of M2. Bars 12, 20, and 22 contain one note that is not in the transpositions of the present M2: the fourth note from the root (add 11). In bars 7, 16 and 17 all pitches belong to various transpositions of M6.

Calcutta

first solo form

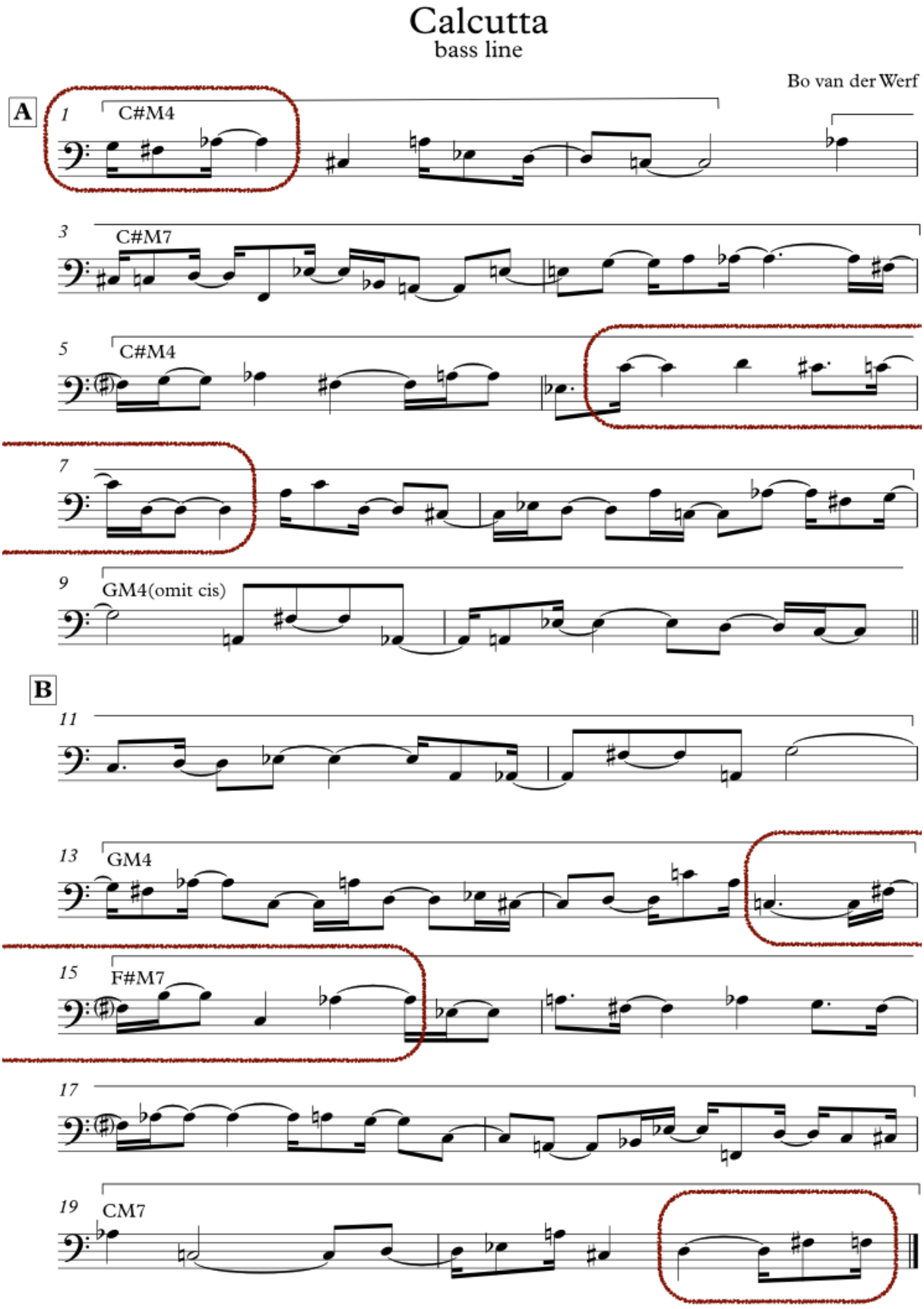
Bo van der Werf



[ex 5.3.2.1]
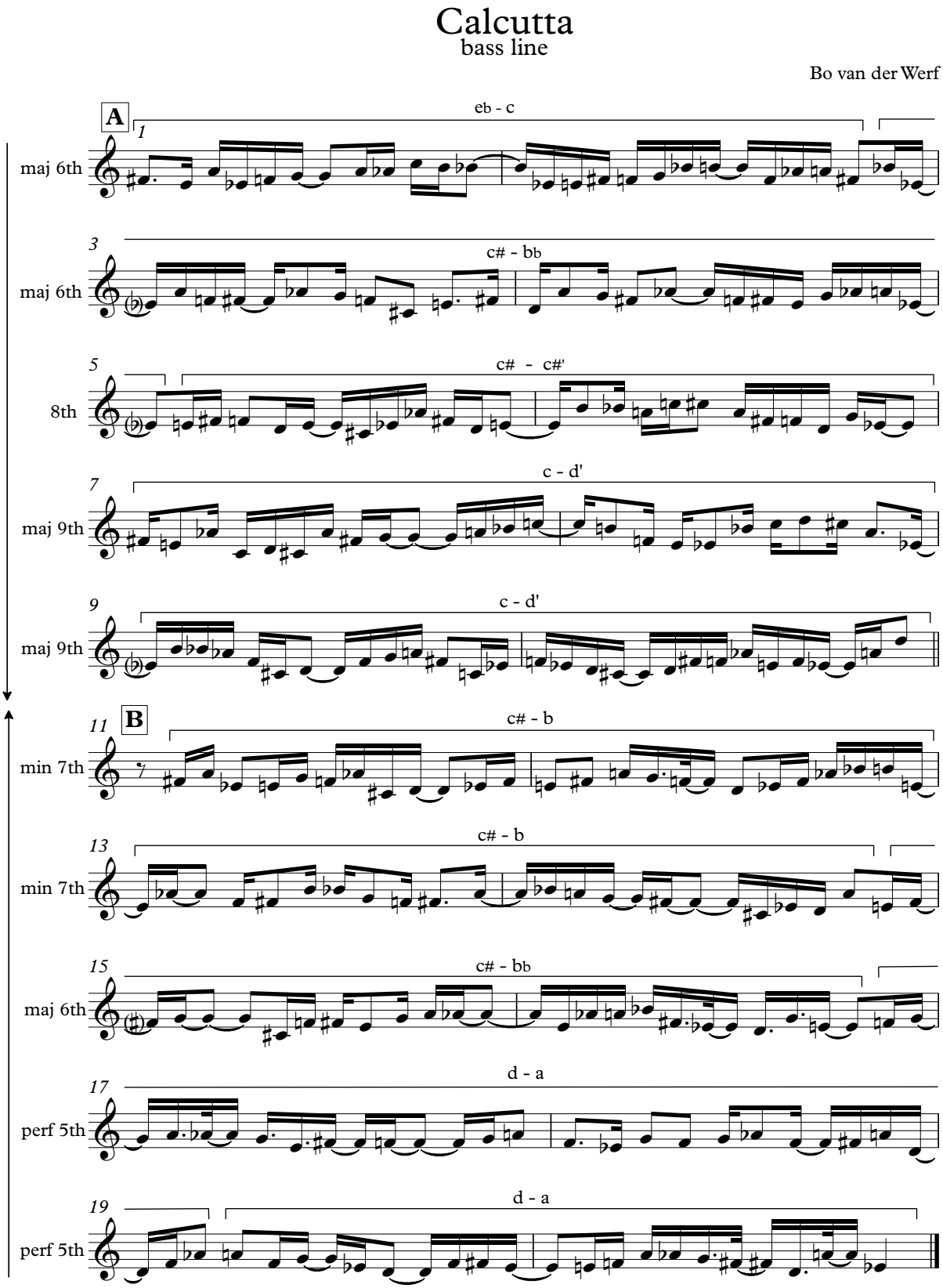
The next example shows the bass melodies in sections A and B. They are different from the solo form above, and arranged in a non-retrogradable rhythm: section B contains the retrograde of the rhythmic structure of section A. Both sections are identical, except the encircled notes. The bass line as a whole contains seven fragments in which seven Messiaen modes can be identified, reflecting a symmetrical structure in this part. C#M4 and GM4 contain the same notes, just like F#M7 and CM7. The first two modes of A and the last two modes of B do not match, but the third and fourth of A and the first and second of B do.

[A] C#M4 – C#M7 – C#M4 – GM4 [B] GM4 (continued) – GM4 – F#M7 – CM7



[ex 5.3.2.2 “Calcutta” (Bo van der Werf) - bass line]

The melody lines in section A and B contain fragments of chromatic scales. Although these fragments imply transpositions of all of Messiaen modes, it does not make sense to mark them individually. Therefore, I rather consider them as incomplete chromatic scales. In the following example I have subdivided section A into parts of roughly two bars, each displaying distinct fragments. The range between the lowest and the highest note of each fragment is marked above the brackets. Listing the intervals between the lowest and the highest notes displays another symmetric structure. From the first to the last line in section A, the intervals are getting larger. From the first to the last line of section B, the intervals are getting smaller, in both sections by groupings of two, one, and two lines. The axis of the symmetry is between bars 10 and 11.



[ex 5.3.2.3 "Calcutta" (Bo van der Werf) - melody]

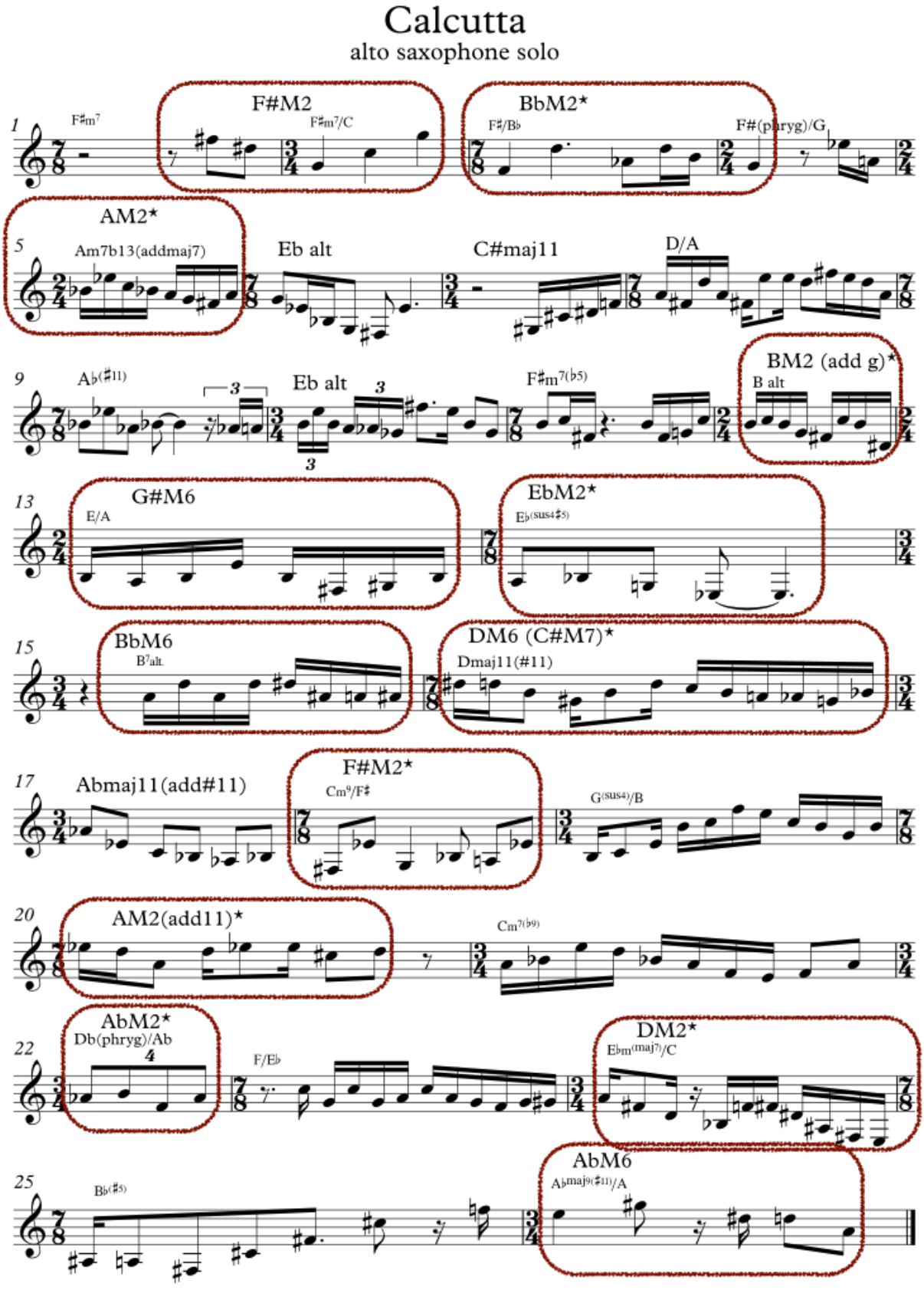
The next example shows the transcription of the first half of the alto saxophone solo by Guillaume Orti over the first solo form as shown in example 5.3.2.1.

As noticed before, the solos can be based on both distinct accompanying lines in solo section A, but the principal reference should be the succession of tetrachords in the upper staff and their relation to the bass notes (example 5.3.2.1). Analysis of section A above confirmed a close connection between the pitches in the tetrachords and the transpositions of M2 and M6 indicated above the lower staff. In most cases, all notes belong to the actual mode, while only in a few cases are other notes added. How does Orti's solo respond to the demands and the actual structure of this solo section?

The thirteen encircled passages show solo fragments in which the notes can be connected to an actual transposition of M2 or M6. Of the nine passages that contain transpositions of M2, seven match Van der Werf's suggestion written in the lower staff (example 5.3.2.1). These passages are marked with an asterisk. Four passages contain transpositions of M6, of which only one, marked with the asterisk in bar 16, matches the composer's suggestion. The remaining bars contain melodic ornamentations of the chords written above them. In bars with the chords written in normal format, all notes fit in the actual chord. In bars with the chords written in cue notes, one or more notes sound outside the written chords.

Thus, in connection to Van der Werf's arrangement of the solo section, Orti's solo contains a mix of Messiaen's modes and conventional chord ornamentations, both elements displaying variable grades of discipline. Just like Veras, both Van der Werf in his composed part, and Orti in his solo, take the freedom to occasionally leave Messiaen's modes. Orti applies the same principle to the stated chord symbols, which creates a sound as if he is slightly playing outside the chords.

The operations above connect well to the usual practice of the jazz artist, whose principal goal is to instantly create musical lines that are meaningful in the context of their actual musical environment. Just like tonal ornamentations – tonal, and non-tonal superimpositions on conventional chord changes – these creative applications of Messiaen's modes appear to be a useful tool, helping (composing) improvisers to broaden their artistic horizon.



[ex 5.3.2.4 "Calcutta" (Bo van der Werf) – alto saxophone solo fragment]

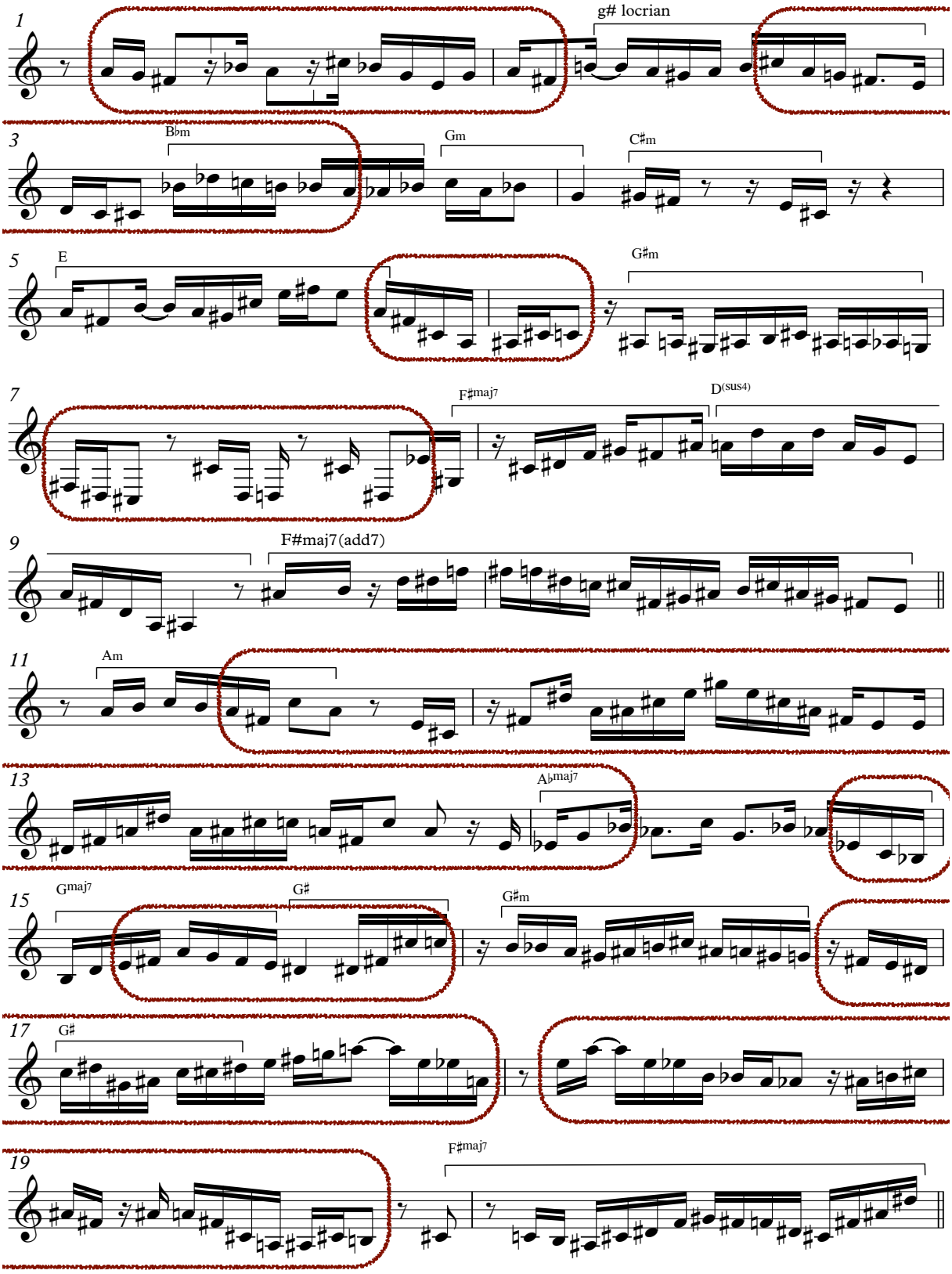
The next example shows the first half of Van der Werf's baritone saxophone solo, played on the second solo form. The accompanying chords are the same as in the first solo form, but now the chords are played twice as fast, and strongly punctuated. In contrast with the predominant chord-scale approach in the alto solo, Van der Werf plays a loose application of F#M2 as an overall superimposition on the complex rhythmic and harmonic structure accompanying his solo.

The encircled passages in the transcription mark the fragments containing F#M2 patterns with zero or few notes added to the basic mode. These additions are either chromatic passing tones, such as the notes d and b in bar 3, or notes added intentionally such as the note d in bar 7, $g^{\#}$ in bar 17, and b in bars 18 and 19.

The brackets above selected groups of notes mark the tonal colors appearing alongside the basic F#M2 mode. These excursions outside the mode are the result of Van der Werf sparsely adding neighboring notes. Because of this, the notes within the brackets sometimes overlap the encircled fragments.

Calcutta

baritone saxophone solo



[ex 5.3.2.5 "Calcutta" (Bo van der Werf) – baritone sax solo fragment]

Evaluation

"Calcutta" is a complex piece in which a variety of Messiaen's techniques can be found, both in the composed and improvised parts. In his accompanying text "About 'CALCUTTA'"[4], Van der Werf explains that the piece is based on two modes, M2 and M6, "but the main reference for soloing should be the written chords (four notes-chords and their relation with the bass)." Furthermore, he employs non-retrogradable rhythms in connection with symmetric melodic structures.

How do my analyses relate to the mentioned operations with M2 and M6? First, in the composed parts it is striking that, in contrast to the apparent presence of M2 and M6 in the majority of the chords, the bass melody rather uses M4 and M7. Second, by the abundance of notes added in the melody lines of A and B, these should rather be analyzed as (fragments of) chromatic scales. Third, concerning the solos, Orti plays embellishments of various transpositions of M2, but his embellishments of M6 are sporadic. Since during his solo the chords are played at half tempo, he succeeds to apply

4

About 'CALCUTTA'

This tune is constructed on the following rhythmic form

7/8 – 3/4 – 7/8 –2/4 – 2/4 – 7/8 – 3/4 – 7/8
7/8 – 3/4 – 7/8 –2/4 – 2/4 – 7/8 – 3/4 – 7/8
3/4 – 7/8 – 3/4 – 7/8 – 3/4
3/4 – 7/8 – 3/4 – 7/8 – 3/4

the chords played during the head (A+B) follow this basic rhythmic form (2x faster)

the 'bells'-figure played during the solos also follow this basic rhythmic form (2X faster)

in the alternate solo form, the whole harmonic structure is played 2X faster, while the backing melody is based on the original rhythmic form

about the chords notation:

there are two different harmonic structures for the solo parts, but the main reference for soloing should be the written chords (four notes-chords and their relation with the bass)

M2 : 2nd of the modes of limited transpositions (ex: CM2= C C# D# E F# G A Bb)
M6 : 6th of the modes of limited transpositions (ex: CM6= C D E F F# G# A# B)

a chord-scale approach, matching the complex harmonic structure. His embellishments navigate between the written chords and the transpositions of the relevant modes. Van der Werf's solo takes M2 as its point of departure for excursions to implied and neighboring harmonies by adding foreign notes to the mode. Thus, he displays an inside-outside-inside approach to the mode. Within the context of this study, this can be considered as another interesting tool to transcend the conventional chord-scale approach.

In addition to what has been said about the operations by Veras and Orti, Van der Werf adds a next step into the creative application of Messiaen's modes. Veras quite simply demonstrated the content and structure of M3, M4, and M6, with sparse additions of notes outside of the original modes. Orti's solo displayed the form of a chord-scale approach by obvious references to Van der Werf's composed structures. But he also felt free to creatively embed notes that were outside the chords or outside the modes. The same freedom Van der Werf took in the composed parts of "Calcutta," that is, to embed "foreign" notes alongside the original notes of the modes, is also present in his improvisation. In my opinion, his application of M2 convincingly illustrates how the combination of a strictly arranged mode and a freely creative approach facilitates a composing improviser to enrich the jazz idiom in a convincing way.
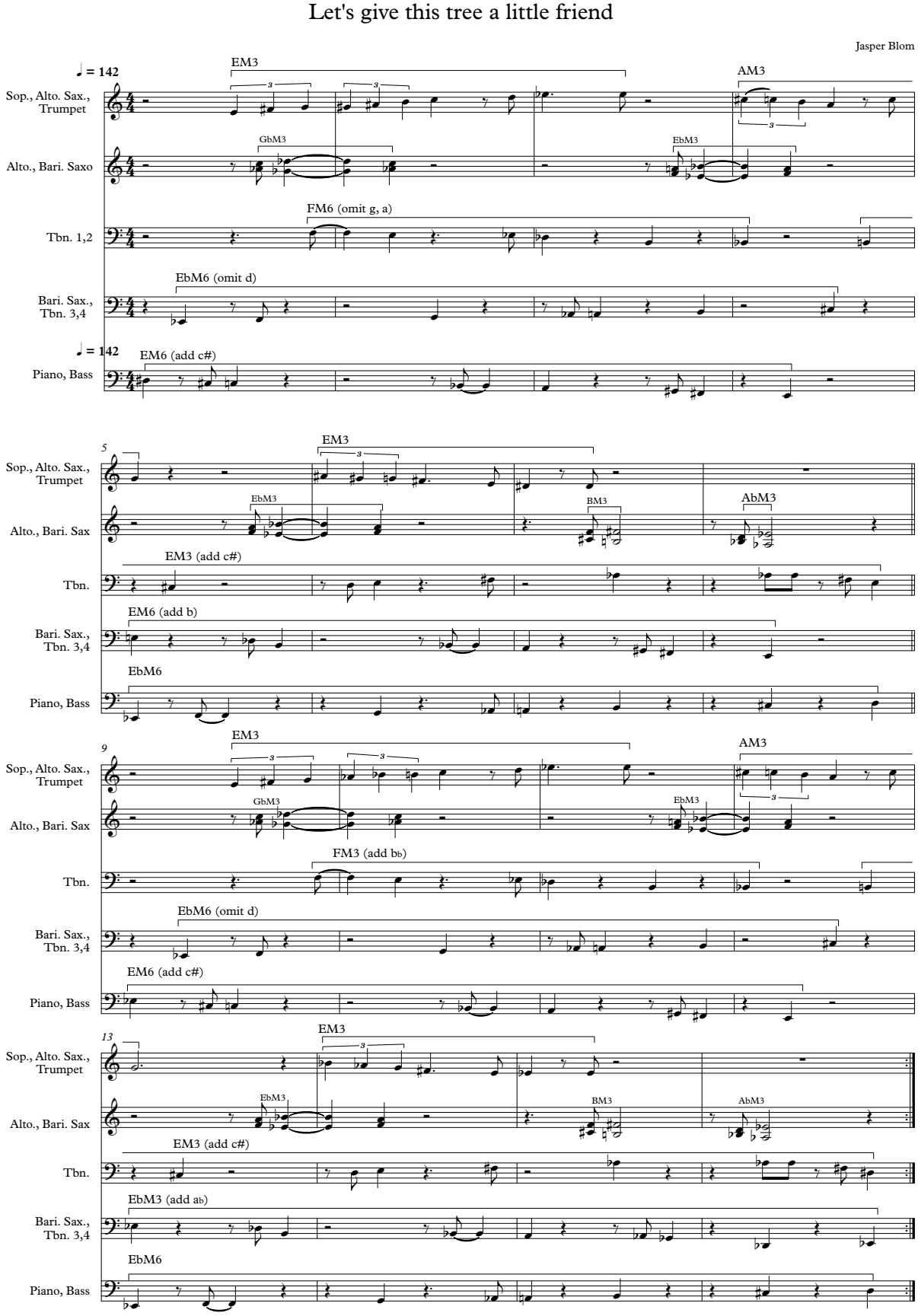
It should however be noted that adding too many notes to the basic transposition of a mode could cause problems. The more notes that are added to the original mode – adding two notes to M7, three to M3, or four notes to M2 or M6, changes these modes into twelve-tone rows – the more its symmetry and thereby its characteristic sound tends to be obscured. Although I am not arguing in favor of a strict approach to any of Messiaen's modes and although I do not have objections to improvisational operations with twelve-tone scales (see chapter 4), I advise students who employ these modes in their compositions or improvisations to avoid (or to only sparsely apply) the addition of extra notes.

5.3.3 Jasper Blom "Let's Give This Tree A Little Friend"

In his composition "Let's Give This Tree A Little Friend" (2014) for saxophone quartet and big band, saxophonist and composer Jasper Blom applies combinations of different transpositions of M3 and M6 in layers of contrapuntal lines. The following example displays the first sixteen bars of the melody that is formed by stacking five layers upon each other. Every time this section is repeated, another group of instruments is added.
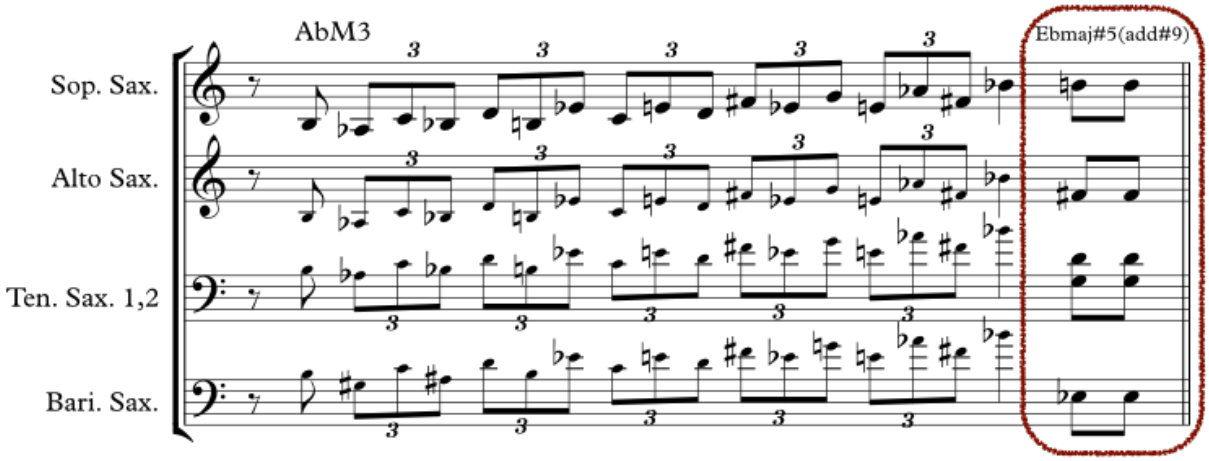
Piano, bass and drums (not notated) start off with a descending line constructed with mode transposition EM6 (with the note c♯ added), followed by an ascending line constructed with EbM6. At the first repetition, the baritone saxophone and the bass trombone play a contrapuntal line of EbM6 (ascending) and EM6 (descending). At the second half of this first repetition, first and second trombones enter their parts with contrapuntal lines that contain fragments of FM3 (a♭ added) and AM3 (f♯ added). Next, both the saxophone quartet (not notated in this score) and the saxophone section of the big band appear. The alto and baritone saxophones play four different groups of four notes that are arranged in intervals of major thirds and perfect fifths. Each group can be related to a distinct transposition of M3: GbM3 in bars 1–2; BbM3 in bars 3–4 and 5–6; BM3 in bar 7; and AbM3 in bar 8.

The soprano and alto saxophones and the fourth and fifth trumpets expose the main melody which contains two transpositions of M3, in three short fragments and in prime forms: EM3 in bars 1–3; AM3 in bars 4–5; and again EM3 in bars 6–7. Because AM3 belongs to the same mode as FM3, the melody can be considered as a construction of two transpositions of M3 at a minor second distance. Thus, it reflects the structure of the rhythm section and the lowest horns, but with EM3 and FM3 instead of EbM3 and EM3.



[ex 5.3.3.1 "Let's Give This Tree A Little Friend" (Jasper Blom) – mini score first section]
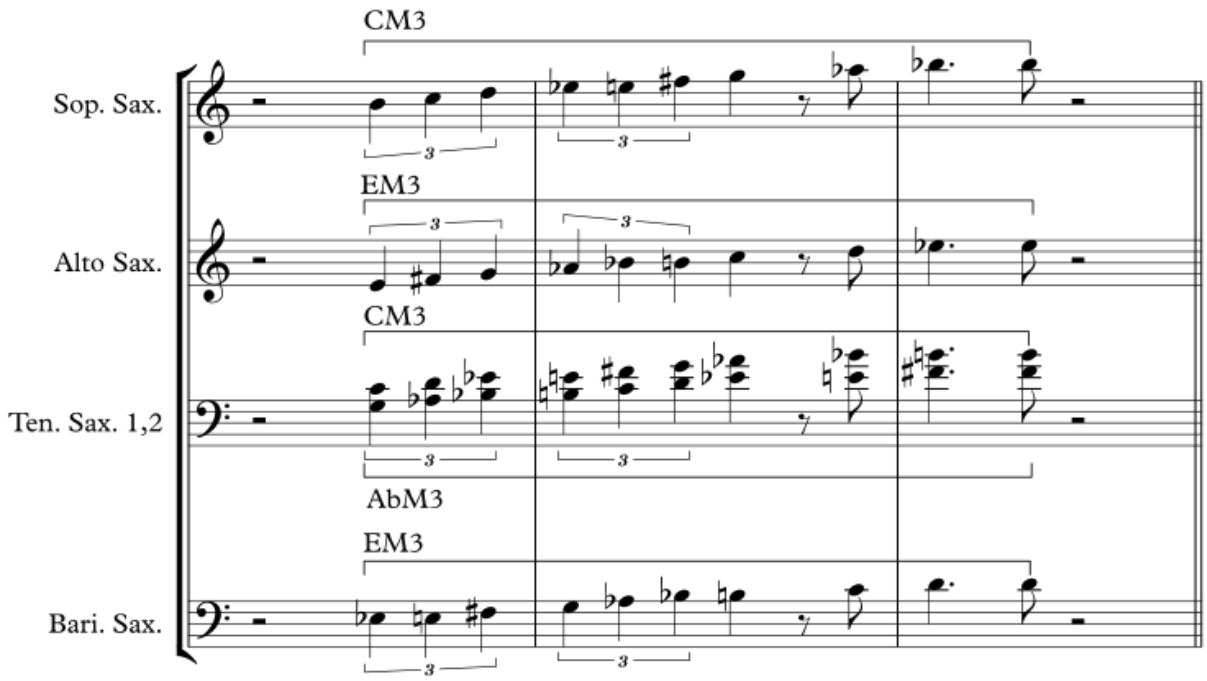
Further on, the solo section of Blom's composition is introduced by a "break" played in unison and octaves by the saxophone section. This line is a "skip 1 note" embellishment of AbM3 (see ex 5.2.1). The final chord Ebmaj7$^{\#5\ (add\#9)}$ is built on the fifth degree of AbM3.



[ex 5.3.3.2 "Let's Give This Tree A Little Friend" (Jasper Blom) – break by saxophones]

After this break, the saxophone quartet repeats the first line of the main melody, as a "send-off" to Blom's unaccompanied solo. The line is now arranged in a parallel harmony of five stacked layers of CM3, each starting on different positions of the mode.[5] These positions are marked above the brackets. They refer to the three implied tonalities of C, E, and Ab within CM3. Only in the alto saxophone and first tenor saxophone parts do the lines start on the root notes of these tonalities. In all other parts the lines are marked after the root notes that are closest to the first note of the line.

[5] Messiaen calls this a harmony "en succession parallèle d'accords" (Messiaen 1992 VII: 192).



[ex 5.3.3.3 "Let's Give This Tree A Little Friend" (Jasper Blom) – "send off" to the tenor saxophone solo]
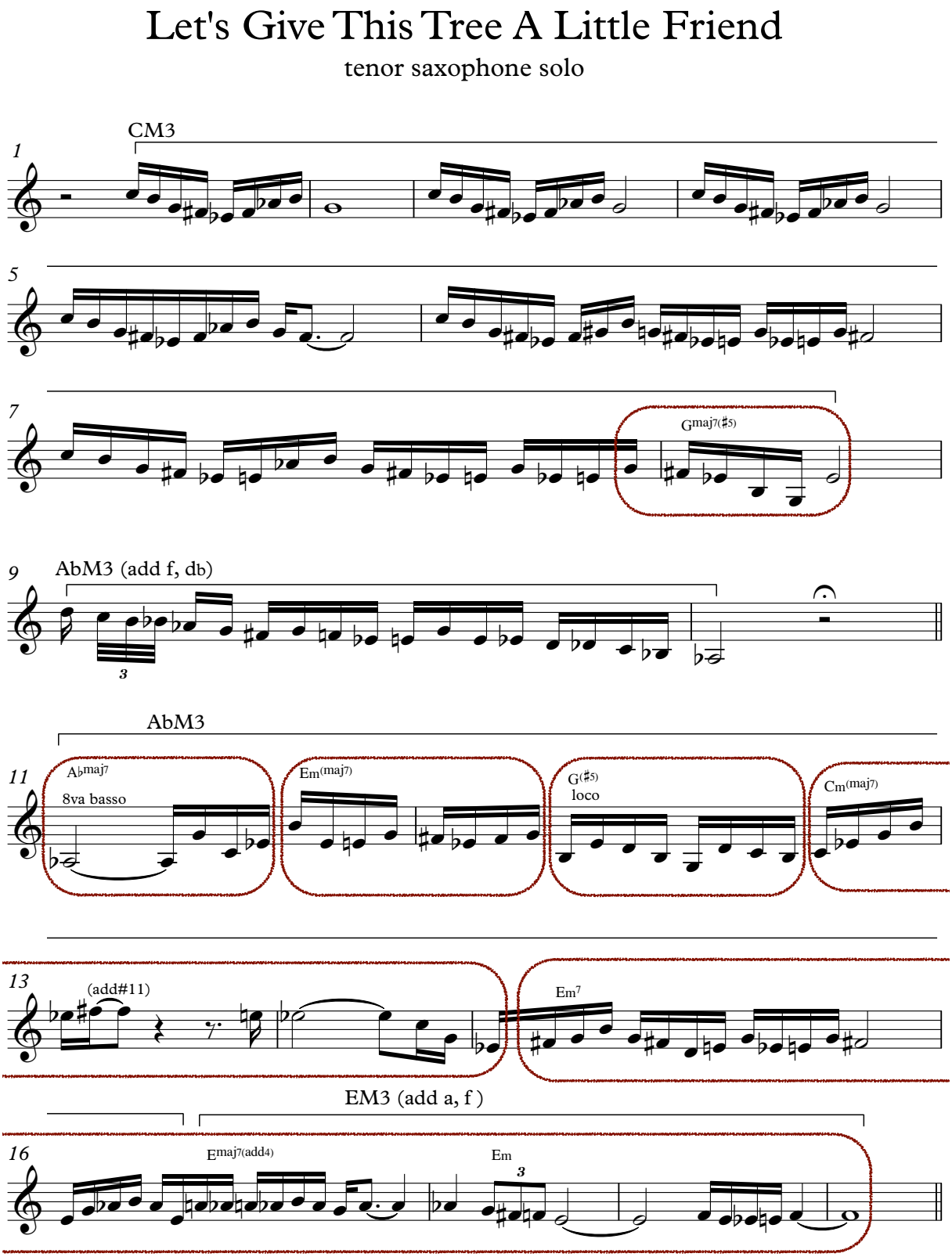
The following example shows a transcription of Blom's first unaccompanied solo fragment. This passage as a whole can be considered an embellishment of CM3, illustrating its various characteristic tonal colors. The brackets above the staff indicate which of the three "basic tonalities" actually dominates the line: C, E, or Ab. The parts that are encircled mark the chords that are evoked in Blom's lines.

Bars 1–8 contain repetitions and variations of a limited fragment of CM3. The whole and half notes at the end of the fragment express the tonal anchors G and F#. The tonal color of Gmaj7$^{\#5}$ is confirmed in bar 8. The line in bars 9–10 is disjointed because two foreign notes, f and d$^{\flat}$ are added. Both notes serve as chromatic passing notes. Because of the forceful ending on the a$^{\flat}$, this line is marked AbM3.

Just as in bars 1–8, Blom's line in bars 11–18 never leaves the M3 mode. Due to the strong presence of once again the a$^{\flat}$, this time as a fortissimo-played initial note, bars 11–16a are marked as AbM3. In bars 16b–19, as a result of playing "false fingerings", the "foreign" notes a and f are added to the line that is originally based on EM3.

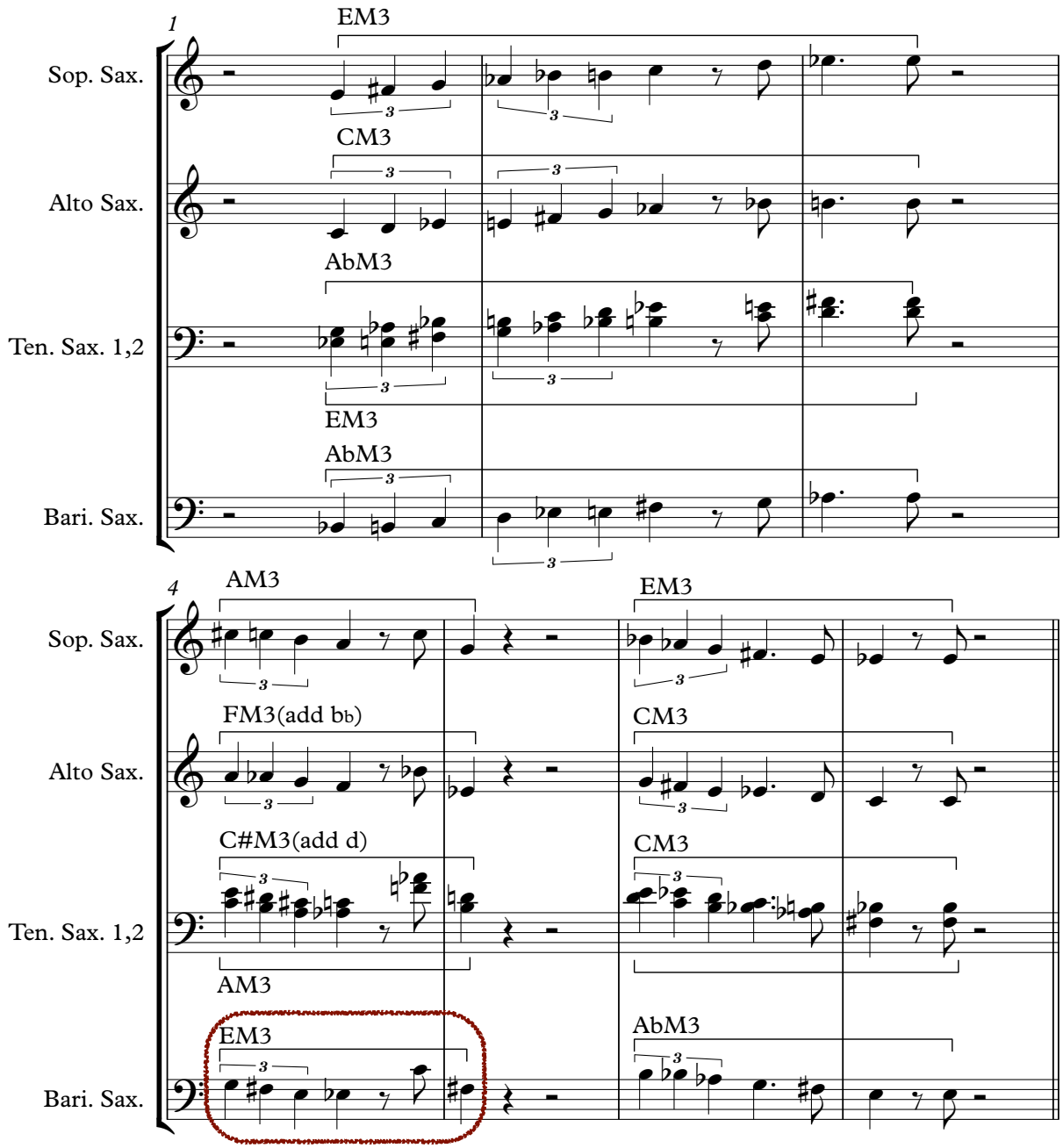
The encircled parts indicate a number of chords that can be identified in Blom's embellishments of M3. After the tonal color of Gmaj7$^{\#5}$ in bar 8, bars 11–19 show a

variety of chords constructed on the three basic roots: Abmaj7; $Cm^{maj7(add\#11}$); Em, Em7, $Emin^{maj7}$, and $Emaj7^{add4}$. Beside these, the G augmented tonal color sounds again.



[ex 5.3.3.4 "Let's Give This Tree A Little Friend" (Jasper Blom) – tenor saxophone solo first fragment]

After this solo the saxophones repeat the main theme, again arranged in a five-part parallel harmony. In bars 1–3 all lines are again samples of CM3, starting from different positions in the mode. This also goes for the descending line in bars 6–7. The descending line in bars 4–5, however, breaks the overall unity of CM3. By playing EM3 (encircled) the baritone saxophone persists, but the parts of the remaining four saxophones play parallel harmonies with AM3, starting from different positions in the mode.



[example 5.3.3.5 "Let's Give This Tree A Little Friend" (Jasper Blom) – saxophones repeating the main theme]

Evaluation

Both in the composed and in the improvised parts, "Let's Give This Tree A Little Friend" demonstrates how the ambiguous tonalities in Messiaen's third mode can be used to create adventurous musical content. The construction of the composed parts is kept relatively simple in comparison to Van der Werf's "Calcutta", and the operations with M3 and M6 are quite basic. As an addition to Messiaen's compositional techniques applied by Van der Werf, Blom demonstrates the creating of parallel harmonies, by stacking parallel successions of notes along the order of the modes. In his first tenor saxophone solo he shows obvious operations with M3, highlighting the mode's characteristic ambiguous harmonic content. Altogether he manages to create an unconventional musical space incorporating a clear relation between the composed and the improvised parts of his piece.
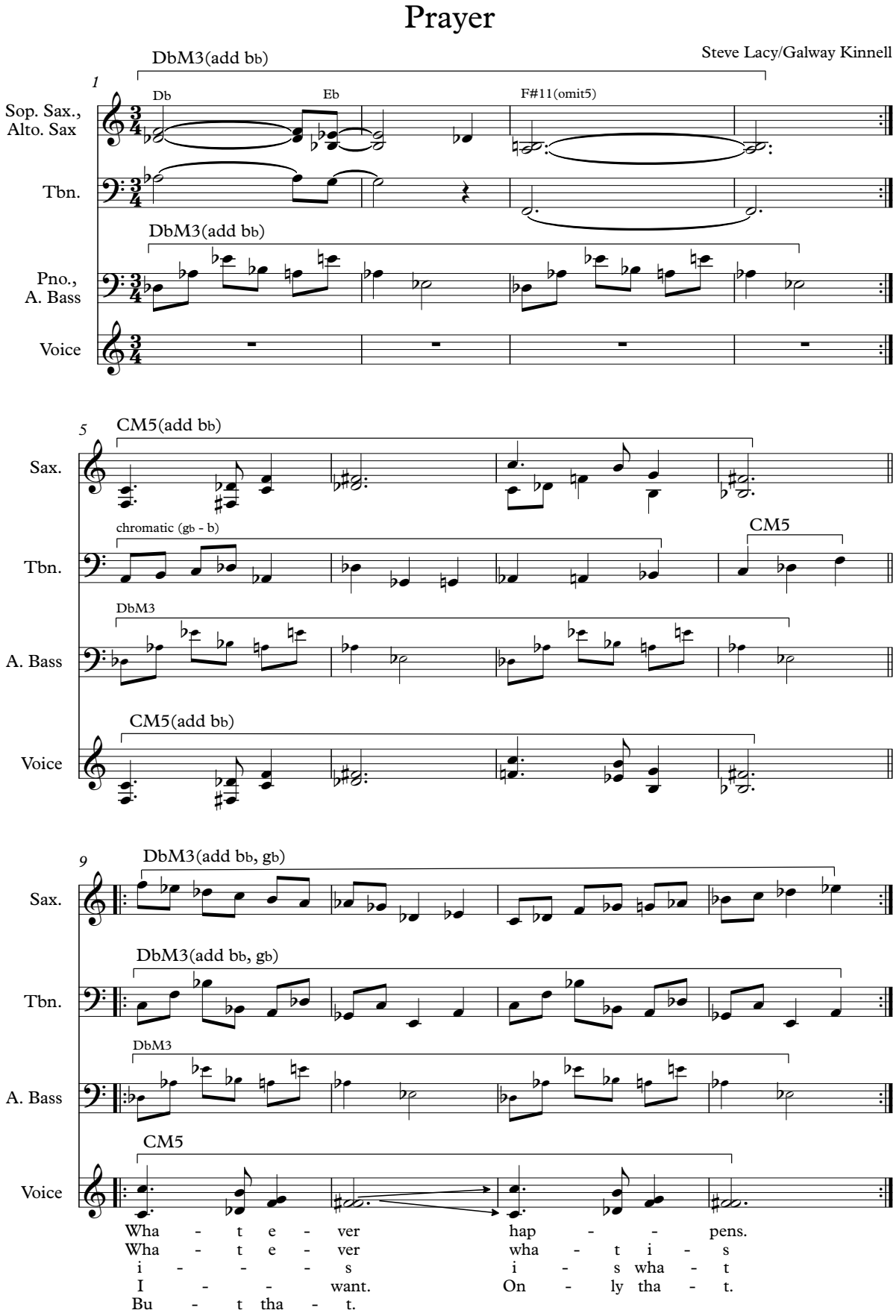
5.3.4. Steve Lacy "Prayer"

In his composition "Prayer," soprano saxophonist and composer Steve Lacy combines transpositions of M3 and M5 in an arrangement for sextet, plus two vocalists reciting a poem written by Galway Kinnell, on the CD *Anthem* (1990).

In bars 1–4 the three horns play the triads Db, Eb, and $F^{\#11(omit5)}$. Together the notes in these bars form the mode DbM3(add b♭). The two-bar ostinato by piano and bass can be considered an incomplete representation of DbM3 (add b♭). Its missing notes f, g, a, and b, are played by the horns.

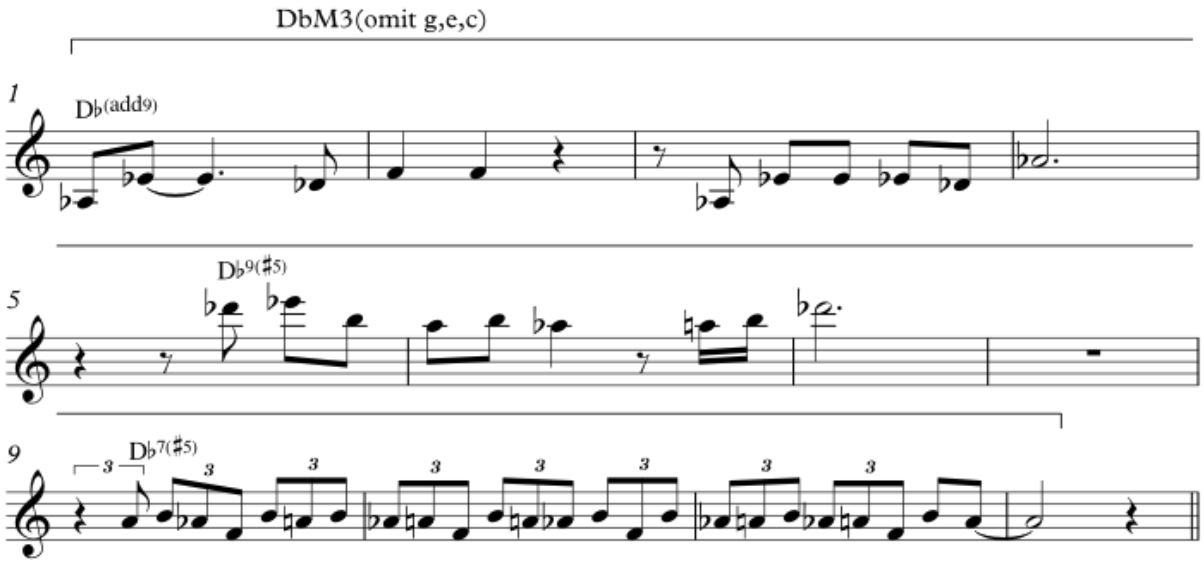
In bars 5–8 a two-part harmony line by the saxophones and the two vocalists exposes the main melody using notes from mode CM5(add b♭). The trombone now plays a contrapuntal line in which a chromatic succession between the notes g♭ and b leads to bar 8 where he plays the first half of CM5.

In bars 9–12 the vocalists continue their melody with CM5 in alternating orders and directions, emphasizing the symmetry of the melody line in which the second half is the inversion of the first line transposed up an octave. The soprano saxophone and the trombone play contrapuntal lines that again represent DbM3(add b♭), now with the addition of the note g♭.



[ex 5.3.4.1 "Prayer" (Steve Lacy) – introduction and theme]

The DbM3 mode also determines the sparse notes in the following first fragment of Lacy's soprano saxophone solo. Here, by omitting the notes e, g, and c, he uses only six of the nine possible notes: d♭–e♭–f–a♭–a–b, evoking the augmented tonal color of Db7$^{\#5}$.



[ex 5.3.4.2 "Prayer" (Steve Lacy) – soprano sax solo fragment]

Evaluation

Compared to the comprehensive compositions by Van der Werf (2006) and Blom (2014), Lacy creates a convincing result with limited means, and with a small line-up. By means of the many repetitions of the mode, he evokes an almost spiritual atmosphere. Lacy's dividing of the mode between the horns and the rhythm section, thereby considering the latter as the complement of the incomplete DbM3(add b♭) in the horn section, is an interesting compositional operation. Even more convincing are his contrapuntal lines, particularly the trombone line in bars 9–12, displaying a contrast with the straightforward mode pattern in the soprano saxophone part. Further on, the first fragment of Lacy's improvisation shows a deliberate selection of notes from DbM3, creating an unconventional superimposition on the Db pedal point played by the rhythm section.

Résumé

So far, the analyses in this subchapter have disclosed various applications of M2, M3, M4, M5, and M6. M6 was announced quite often, but only sparsely applied. Veras showed a useful approach to M6 in his improvisation examples, Blom applied it in his contrapuntal lines, and in Van der Werf's piece it got sporadic applications both in the composition and in the alto saxophone solo. The most frequently applied was M3. Veras and Blom referred to its implied minor, diminished, major, and augmented triads and seventh chords. The aesthetic qualities of M4, and particularly M5, were emphasized by their repetitive applications in Lacy's piece. M7 could be found in Van der Werf's composed bass line as a result of notes added to M4.

However different the compositions and solos, they all illustrate the potential of Messiaen's modes to be applied as advanced operations for (composing) improvisers creating less conventional musical spaces. Yet, it should be noted that, in the strict sense, the addition of notes outside the actual modes, found in all pieces analyzed here, does not match Messiaen's original aim of "never leaving the notes of the modes." Although I advise my students to avoid the addition of "foreign" notes as much as possible (see section 5.3.2), I simply cannot disapprove of these additions in the practices of (composing) improvisers applying the modes to create fresh and meaningful musical content, combining the modes explicitly or intuitively with their conventional improvisational languages.

Unfortunately, operations with basic or advanced mode embellishments, highlighting the splendor of the modes, are rare in the music analyzed so far. Only the operation "skip 1 note" could be identified in Blom's saxophone section's riff accompanying his solo. There, Blom is also the only one creating parallel harmonies with the modes.

In the next subchapter I will display my applications of mode embellishments and parallel harmonies, as well as a more comprehensive application of Messiaen's sixth mode in some of my own compositions and improvisations.
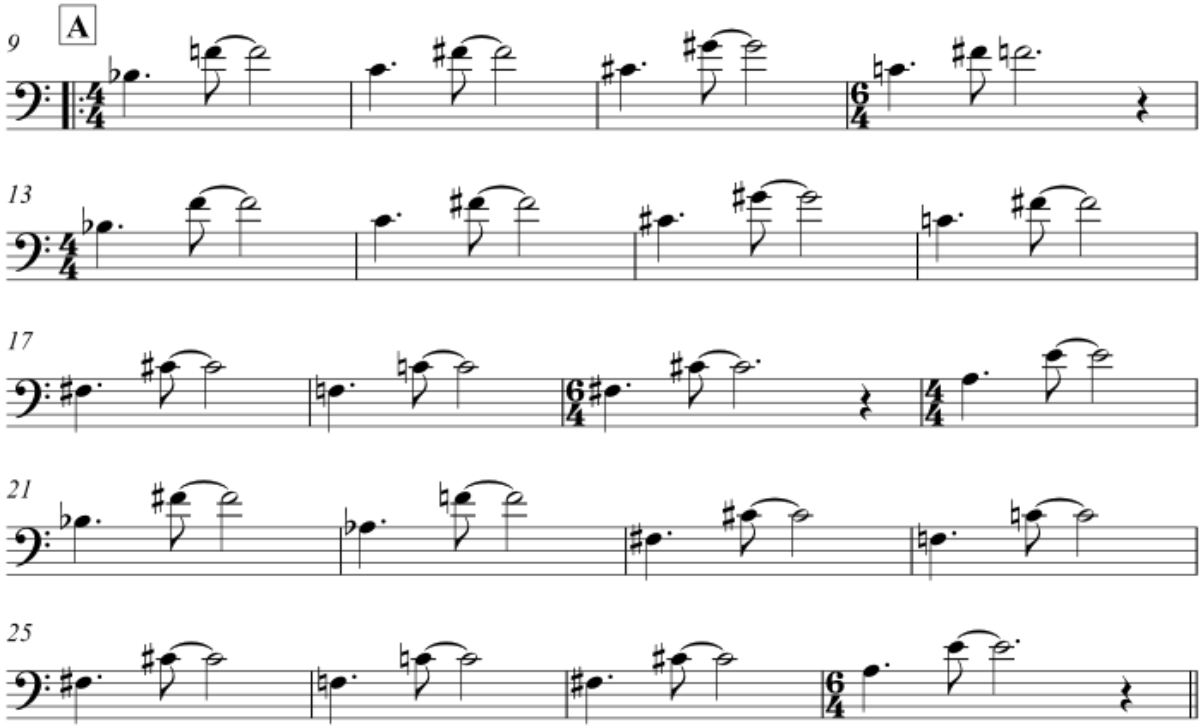
Messiaen would have probably disliked the way jazz musicians run off with the contrived applications of his modes. In the examples so far, they are mainly commended for their ambiguous tonal colors, facilitating (composing) improvisers to connect them freely to various environments. He may even have denounced these connections as they contain the possible danger of "pan-tonality", an interpretation of twelve-tone music in which, instead of all twelve pitches, all keys are equally important. I dare to counter this possible objection by quoting John Satterfield's words in his "Introduction to the English Translation" of Messiaen's *Technique de mon langage musical*: "The cataloguing and explanation of methods of building tonal structures may strike a creative response in a

student or mature composer" (Satterfield in Messiaen 1956: 3). I consider the actual interventions with Messiaen's modes as typical responses by creative jazz artists, founded on their traditions and broadening their artistic palette by adapting elements from surrounding musical worlds. This reflects my view of jazz music, expressed earlier in subchapter 1.2, acting as a guesthouse in which elements from other musical worlds are welcomed.

5.4 My applications of Messiaen's modes
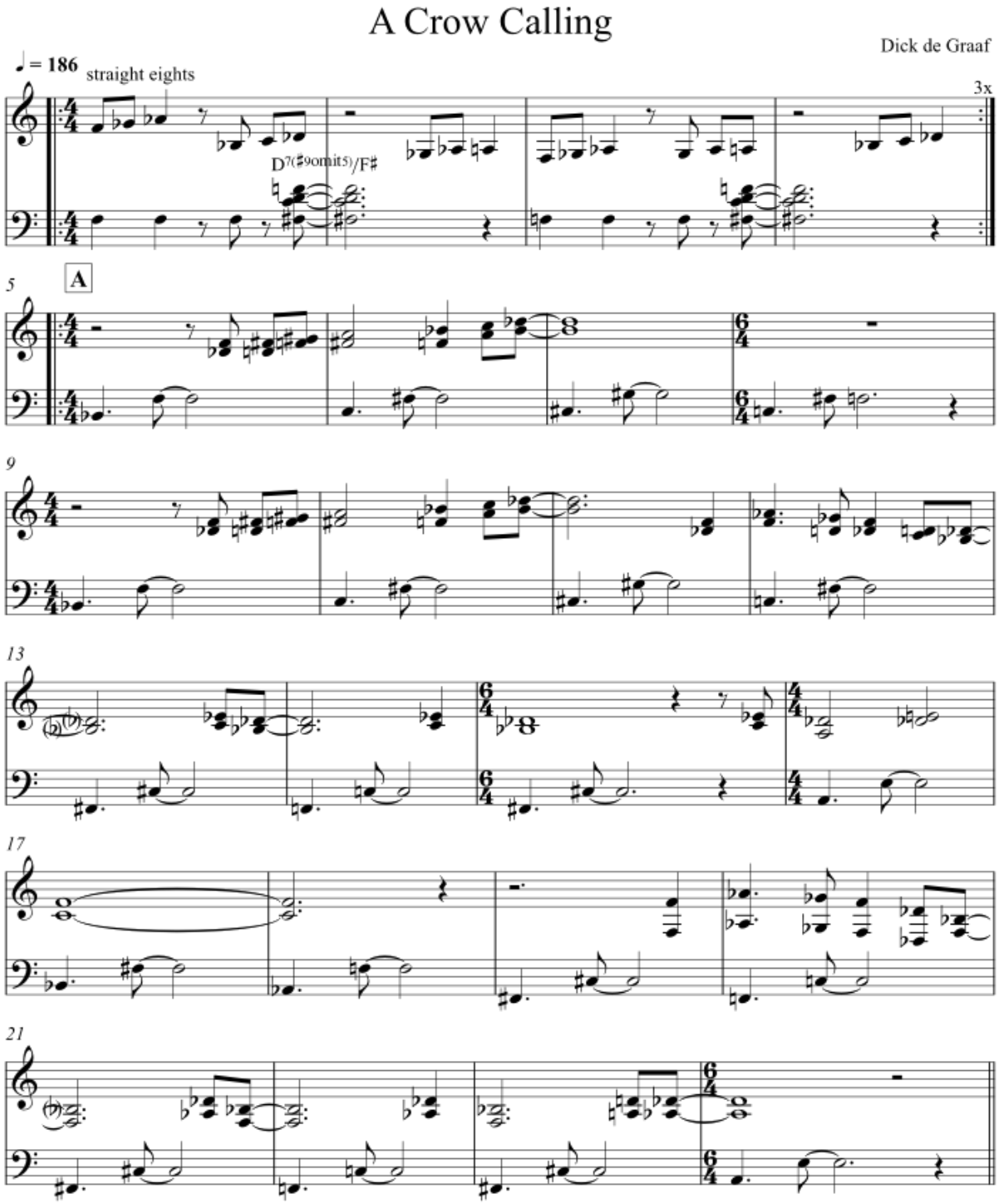
5.4.1 "A Crow Calling"

My composition "A Crow Calling" is based on BbM3: b♭–c–d♭–d–e–f–f♯–g♯–a. The bass melody, shown in the example below, serves as the backbone of the theme and the solo sections. It consists of two mode embellishments. The first, played in bars 9–20 and 25–28, displays the operation "skip 4 notes" (example 5.2.3.4). The second, played in bars 21–24, displays the operation "skip 5 notes" (example 5.2.3.3).
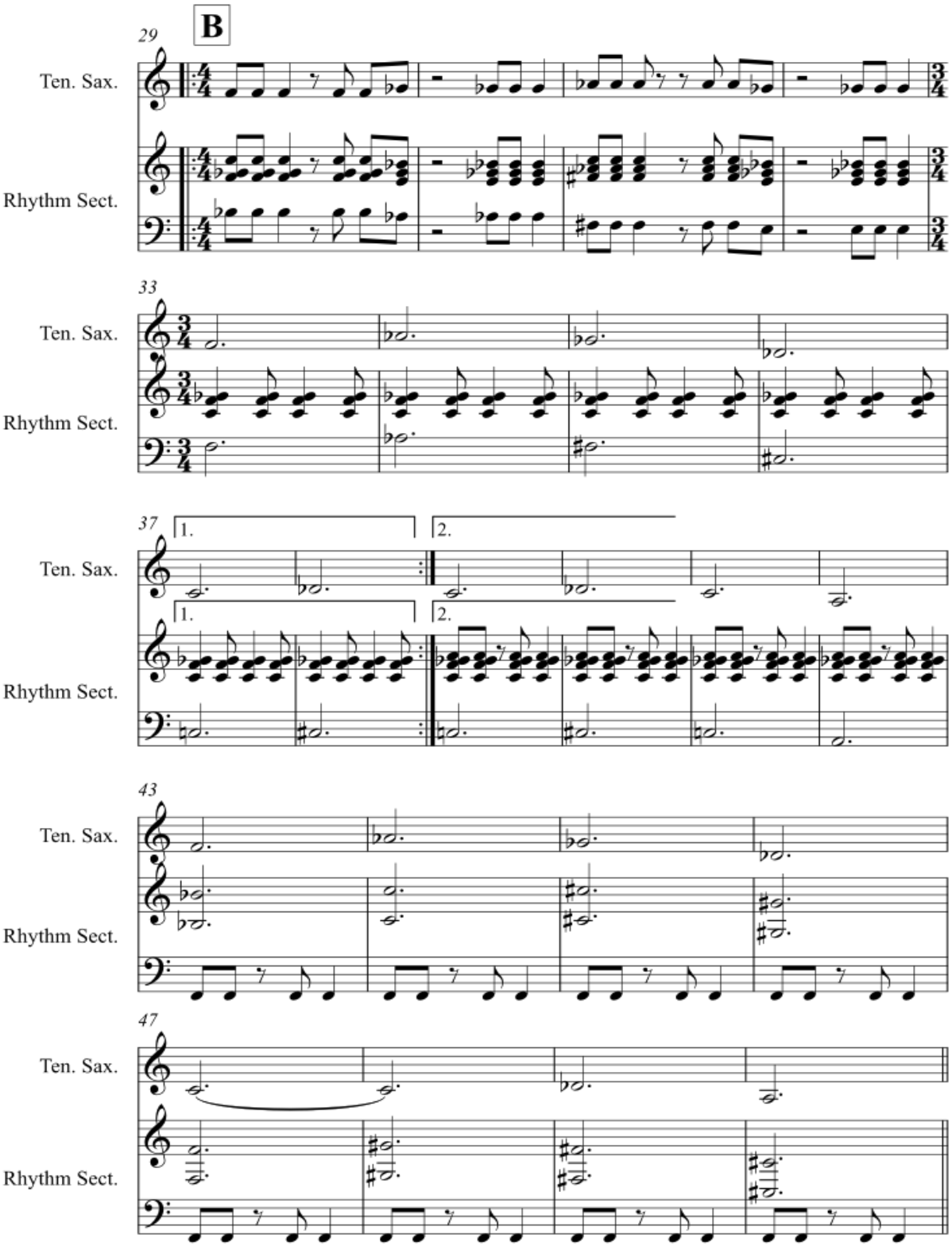


[ex 5.4.1.1]

The following example shows a mini score of the intro and the A section. In both parts the notes never leave the BbM3 mode. In section A, the tenor saxophone plays the upper melody, and the guitar the lower. Thus, together with the bass melody, section A contains two contrapuntal melodies that together emphasize the melodic wealth of mode M3.
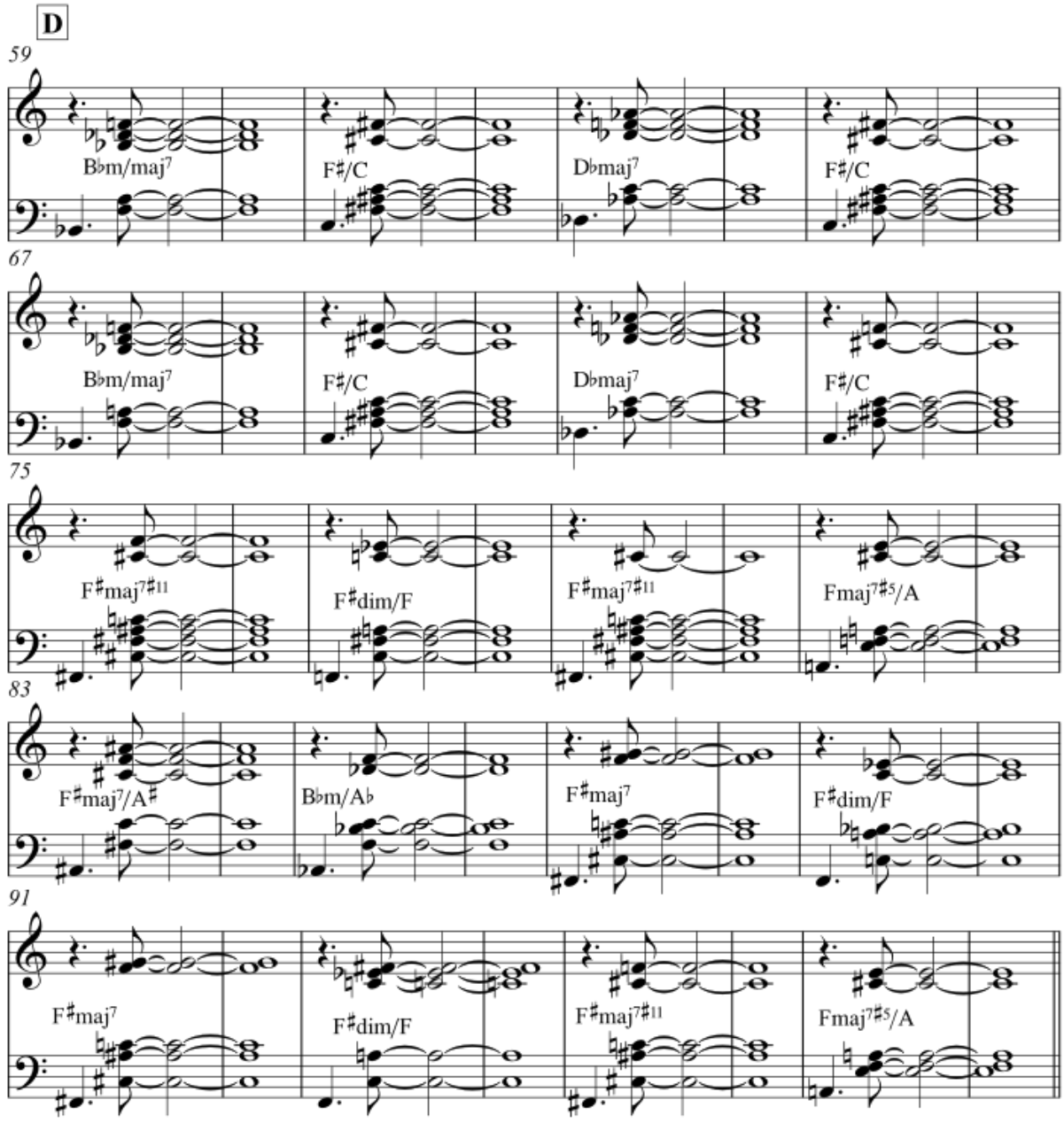


[ex 5.4.1.2 "A Crow Calling" – intro and A section]

The following examples shows section B, which is again strictly created with BbM3. In bars 29–32, the bass plays the descending Bb whole-tone scale that is implied in BbM3. From bar 33 on, both the cluster harmonies as well as the (contrapuntal) melody parts do not leave the notes of BbM3.



[ex 5.4.1.3 "A Crow Calling"– B section]

As the following example shows, the bass line in section A is continued throughout the solo section D. It is based on the same bass line as section A, serving as the basis for the chord changes that are derived from BbM3. The chord symbols merely serve as suggestions for the accompaniment of the soloists. The guitarist or pianist is free to change the chord constructions, as long as he stays with the notes of the mode. Despite suggested "voice-leading" operations such as the top lines in bars 83–90 and in bars 91–98, the chords do not intend to express any functional harmonic relations. They rather represent a choice of local harmonic colors implied in BbM3. However, amidst these quite random harmonies, there is still a sense of unity due to the characteristic melodic quality of Messiaen's third mode.
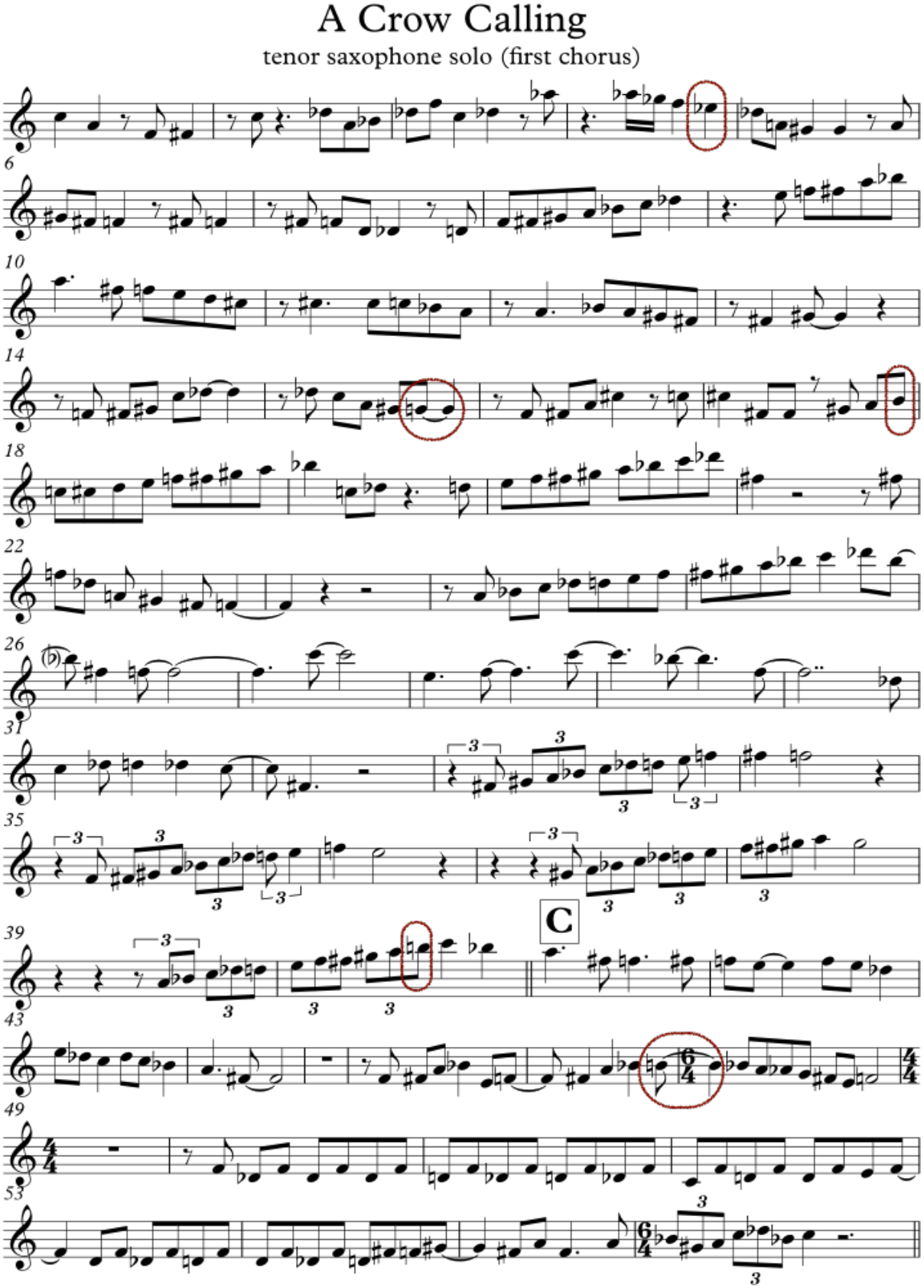


[ex 5.4.1.4 "A Crow Calling" section D chords]

The next example shows the first half of the tenor saxophone solo in an unpublished recording of "A Crow Calling" (2015). The encircled notes are notes outside BbM3.

The solo as a whole follows the baseline that is shown in example 5.4.1.1. It meanders through the BbM3 mode intertwining its various implied tonal colors. For instance in bar 7, the presence of the note d evokes a Bb major tonality, changing into Bbm7 by the note d♭ in bar 8. Then in bars 9–11, the presence of the notes f, f ♯, and a, evokes the tonal color of Bb harmonic minor.
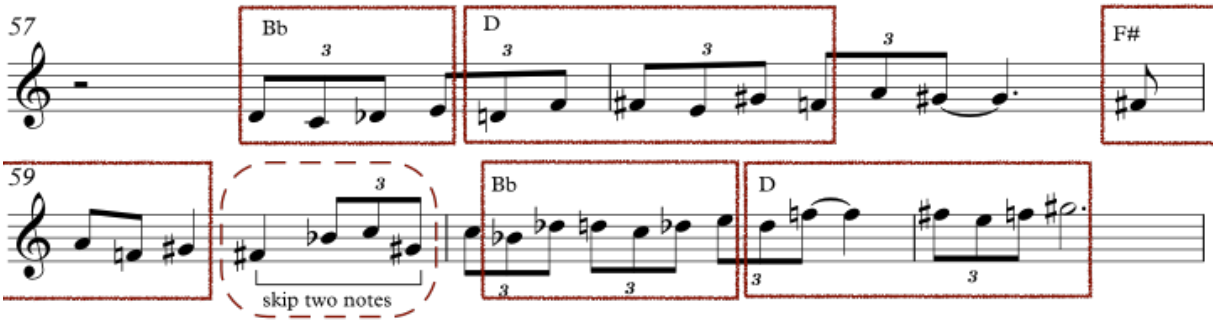
In bars 24–32, BbM3 is played continuously. First, in bars 24–25, the mode is exposed in its basic form, followed in bars 26–32 by a lyrical passage with larger intervals, never leaving the mode.

Bars 33–40 contain a sequence of four fragments from the mode. Each of these ends with two descending notes from the mode, creating a tension that quasi resolves to the interlude in section C, which starts in bar 41. From bar 50 on, minor and major third and perfect fourth intervals with the top note f are played, ascending to bar 56 that contains a short fragment of a “skip 1 note” embellishment.



[ex 5.4.1.5 "A Crow Calling" – tenor saxophone solo first fragment]

The "skip 1 note" embellishment in bar 56 is continued in bars 57–61 of the second solo chorus. The parts within the rectangles mark the "skip 1 note" operations around the symmetric root notes b♭ -flat, d, and f♯. The fragment within the dotted line contains two major third intervals that result from operation "skip 2 notes."



[ex 5.4.1.6 "A Crow Calling" – tenor saxophone solo second fragment]

Evaluation

"A Crow Calling" displays the characteristic melodic quality of BbM3 in various ways. Both in the composed parts and in the tenor saxophone solo, the ambiguous colors of the three implied parallel tonalities, Bb, D, and F#, are found in a variety of mode embellishments. Its basic structure consists of the embellishments "skip 4 notes", and "skip 5 notes." The latter, added with the embellishment "skip 1 note" are found in the tenor saxophone solo, in which the ambiguous colors of the implied tonalities are illustrated as well.

The dyads in the melody and the accompanying chords for the guitarist are exclusively constructed with notes from the mode. Although these pre-stated harmonies serve well to emphasize the characteristics of BbM3, they should be considered as suggestions rather than obligatory chord changes. The guitarist however is not supposed to leave the notes from the mode while constructing his chord variations.

As I mentioned in my resume at the end of section 5.3.4, the tonal colors of Messiaen's modes can be highlighted effectively by shaping them as mode embellishments. With "A Crow Calling" I want to highlight these particularly melodic operations, demonstrating that, maybe even more than their implied harmonic structures, these embellishments serve remarkably well to emphasize the characteristic sound of M3.
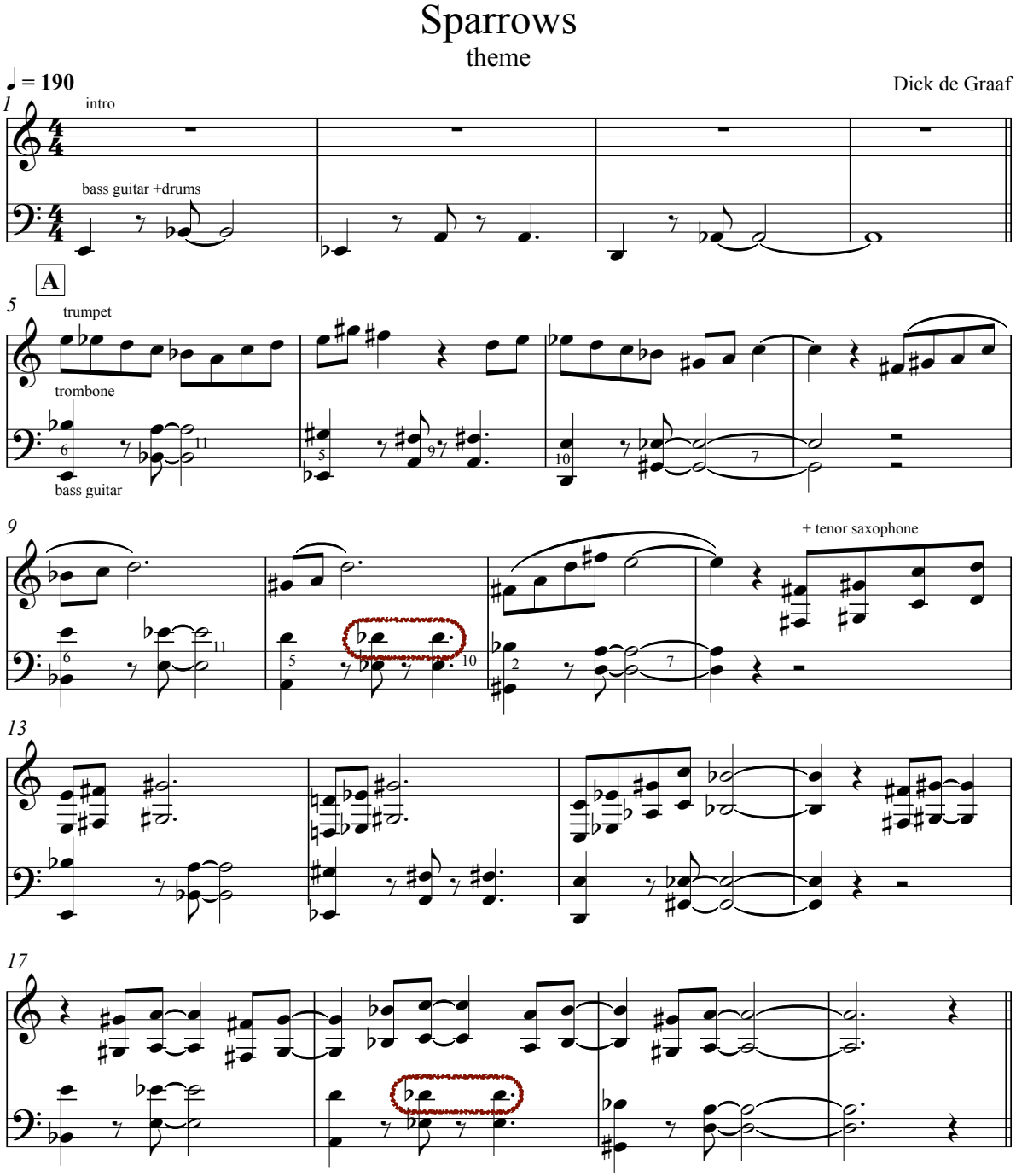
The transcribed fragment of my tenor saxophone solo proves that the three symmetric minor/major tonal centers intertwined with the shape of the mode are a fruitful source

for melodic improvisation. The solo is triggered by the embellishments in the bass lines, either by copying them or by playing other, contrasting interval embellishments, without leaving the mode.

5.4.2 "Sparrows"
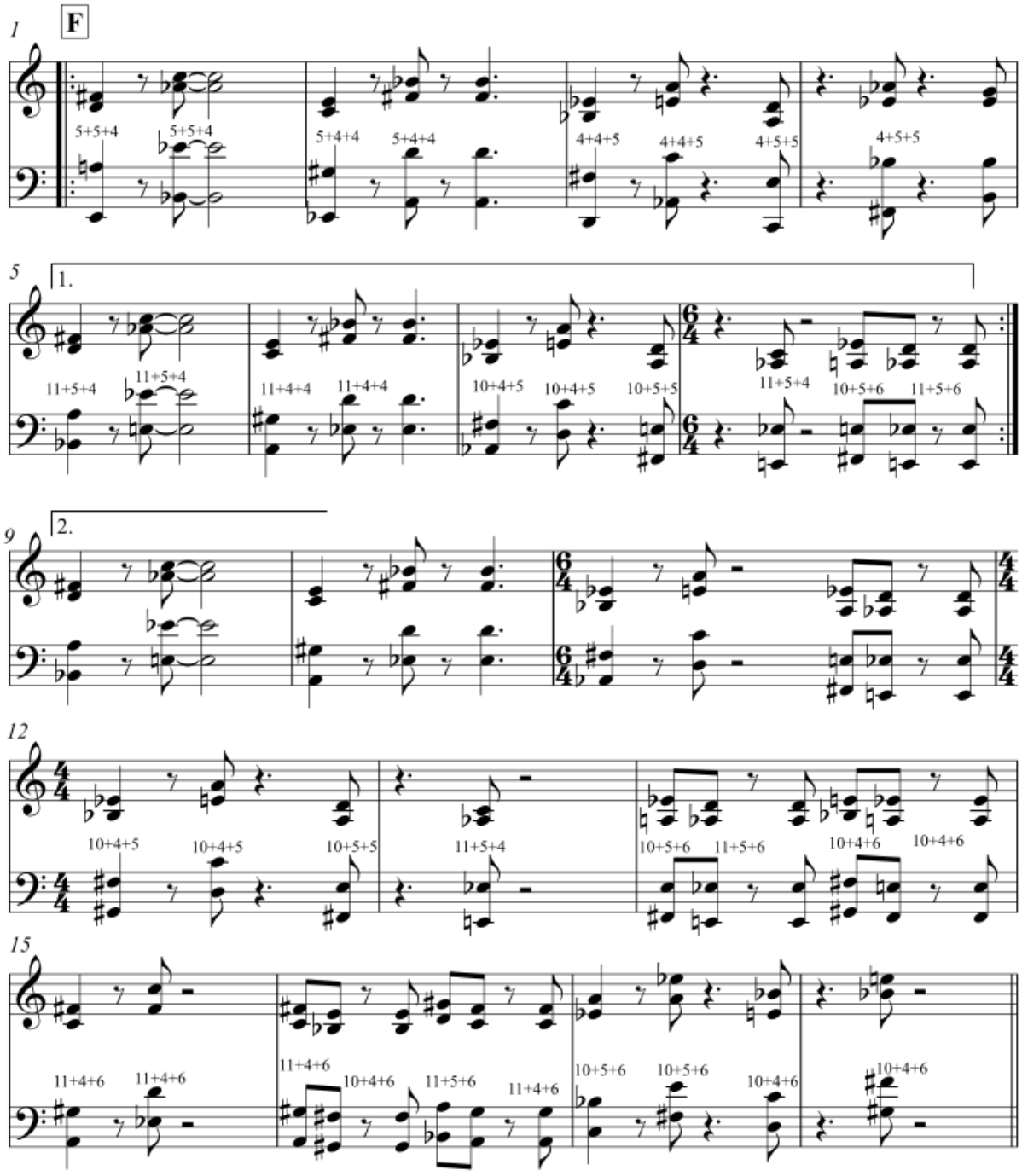
In my resume at the end of subchapter 5.3, I concluded that I have found only a few applications of Messiaen's sixth mode in the discussed works. This is one of the reasons I created a first version of "Sparrows" using BbM6 for a line-up of tenor saxophone, trumpet, trombone, bass guitar, and drums. In the mini-score of this composition, shown in the next example, only the note d♭ in bars 10 and 18 sounds outside of this mode.

The trumpet plays the melody, with doublings by the tenor saxophone from bar 12 on. In the lower staff, the bass guitar plays intervals of an augmented fourth, the "steering" interval that divides M6 in two symmetric parts. Between the bass line and the contrapuntal trombone line, a variety of intervals between a major second and a major seventh results. This variety obscures the austere symmetric structure of M6. In bars 5–12, I have marked these intervals in the lower staff. Intervals larger than an octave are marked according to their root position within the octave.



[ex 5.4.2.1 "Sparrows" – theme]

Section F in the following example displays an application of parallel harmonies. All horizontal lines are basically constructed by "skip 3 notes" operations (example 5.2.6.3). In other words, in all four melodic lines, augmented fourth intervals are omnipresent. While moving in ascending and descending directions, they all follow the order of BbM6, starting from different positions in the mode. The vertical intervals that appear as a result of these horizontal operations are marked in between the staffs.

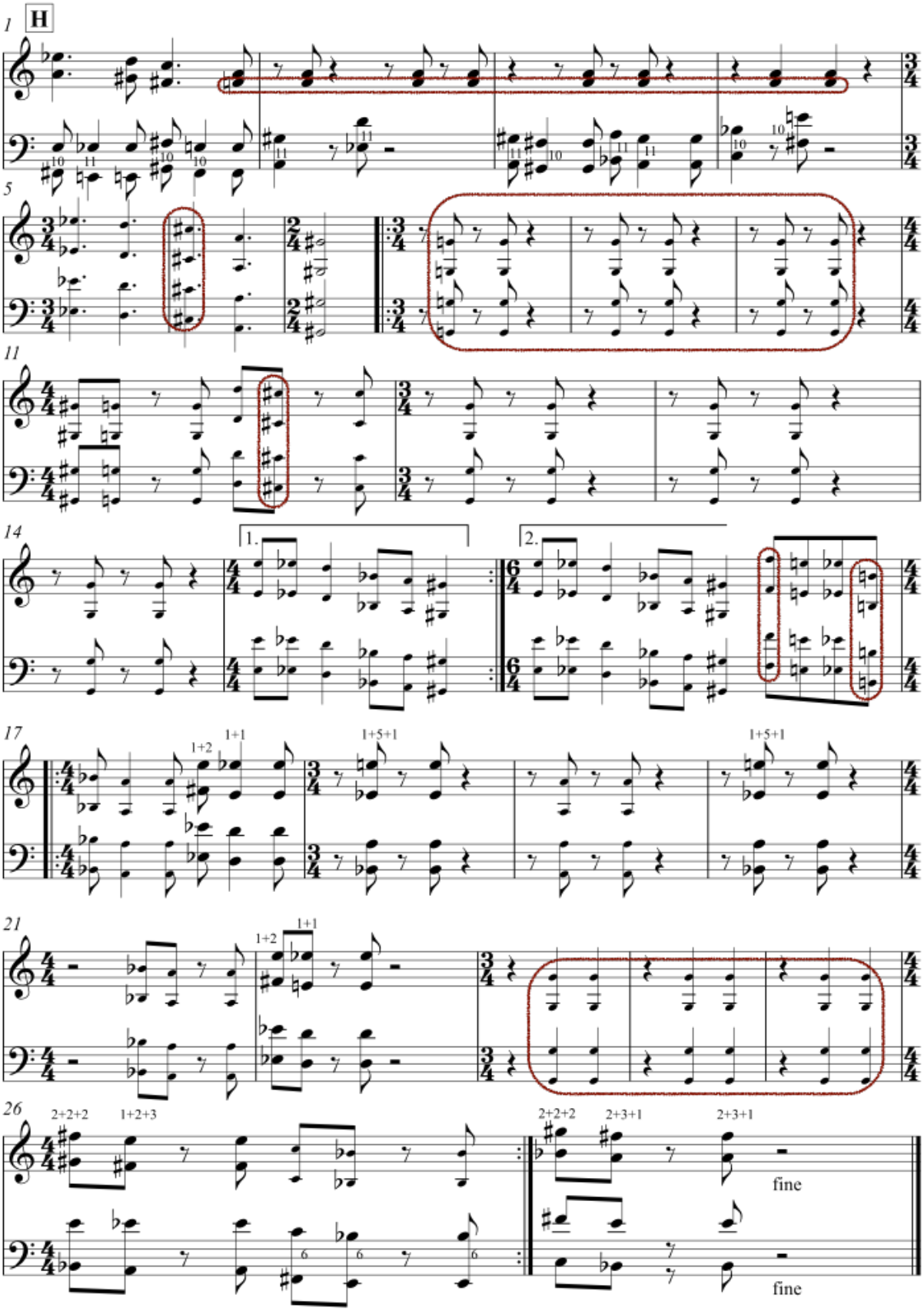


[ex 5.4.2.2 "Sparrows" – parallel harmonies]

Section H contains repetitive riffs, mostly played in unison. In the extracted score below the unison passages are written in small notes. The encircled notes are notes outside of BbM5.

In bars 1–4 the upper and lower parts are played in rhythmic counterpoint; from bar 5 on, all instruments play the same rhythm. The quasi-pentatonic line in bar 1 is

harmonized in augmented fourths, the lower staff in alternating minor and major seventh intervals. From bar 17 on, the four instruments display three- and four-part cluster harmonies. I have defined these clusters by trichord and tetrachord notations of their prime forms, written above the upper staff. These harmonies are again created without leaving the notes of the mode.
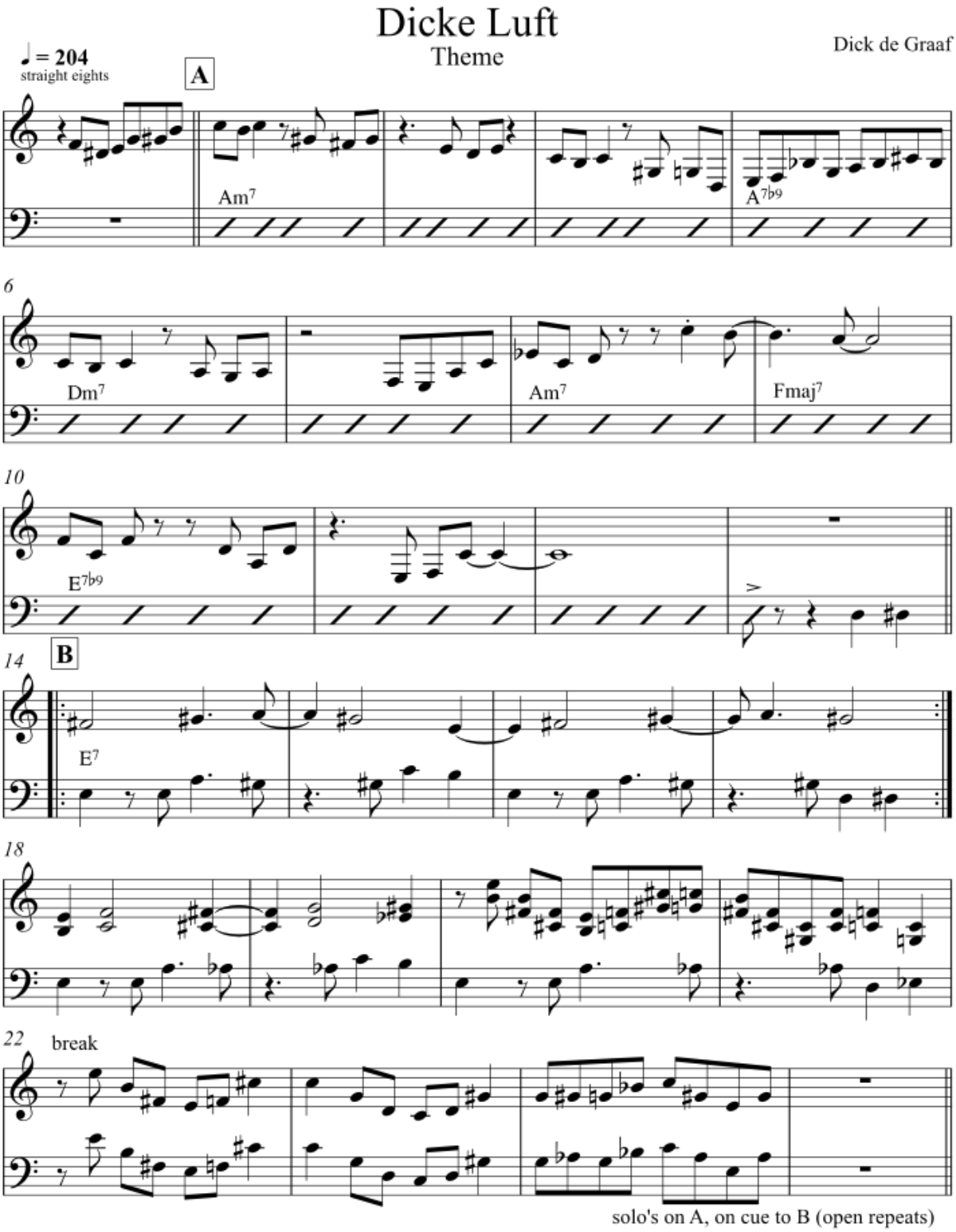


[ex 5.4.2.3 "Sparrows" – final section]

Evaluation

Because BbM6 is a combination of the two first tetrachords of the diatonic major scales of Bb and E, it inspired me to create melodic lines that sound like conventional scale patterns within the limited range of a perfect fourth. These lines are phrased as if they are common diatonic melodies, however without gravitating towards a tonal center. At the same time the augmented-fourth "steering" interval that defines the distance between the two symmetrical segments of the mode is omnipresent, both in the horizontal and vertical structures of the piece. Compared to the wealth of variations and tonal colors that are possible with M3, M6's possibilities are more limited. But in this composition, the blunt and dissonant presence of the augmented fourth's sound works well in connection with the percussive elements in this piece.
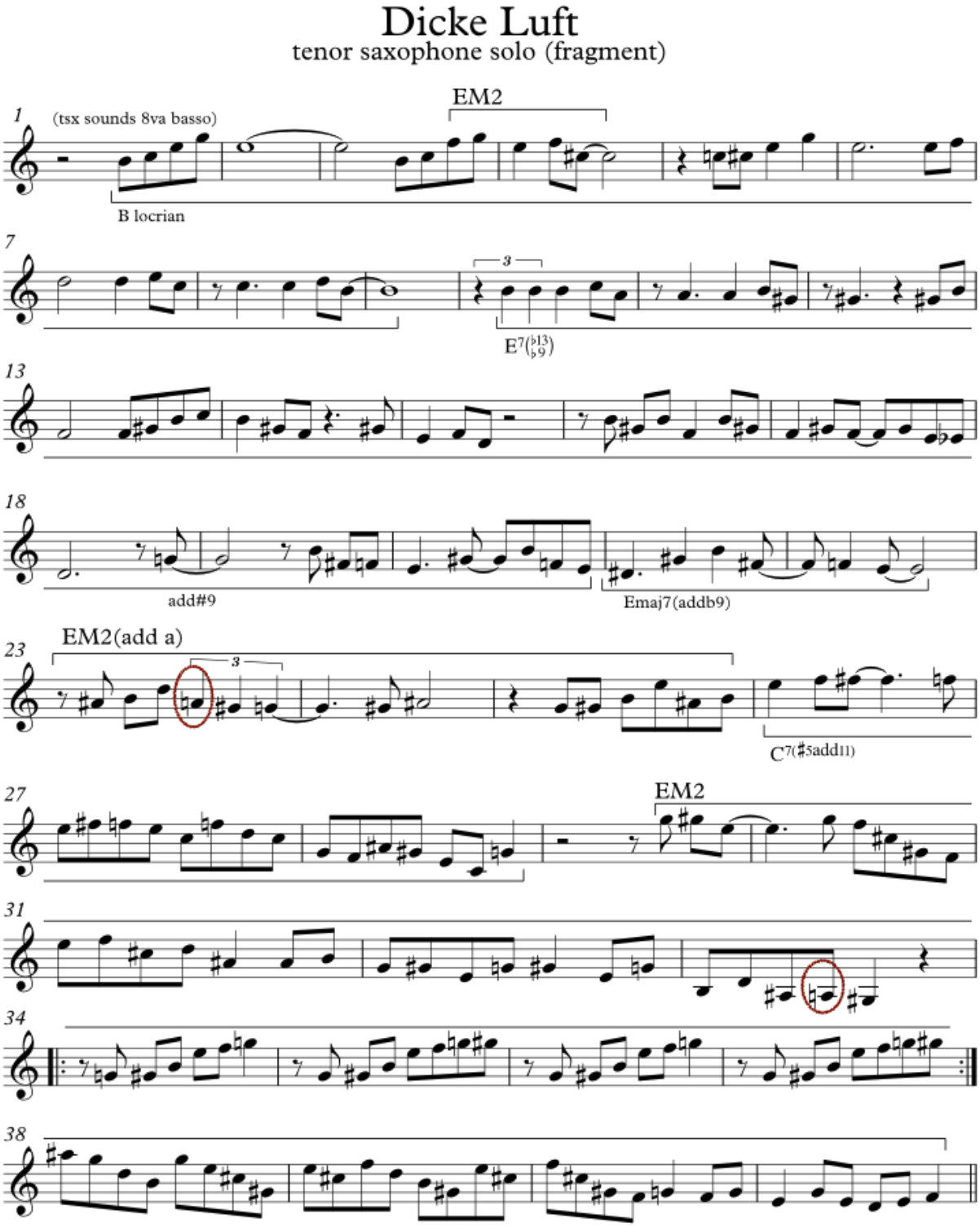
5.4.3 "Dicke Luft"

As a third example of my personal application of a Messiaen mode, I will discuss the superimposition of EM2 in a part of my tenor saxophone solo on "Dicke Luft," as played with my septet on the CD *The Burning Of The Midnight Lamp* (1999). The next example shows an abstract of the theme, based on a conventional twelve-bar blues in Am. There are no references to any M2 mode in this theme.



[ex 5.4.3.1 "Dicke Luft": theme]

My solo consists of three choruses on the minor blues in Am. After the third chorus, as a reference to the B part of the theme, the E7 chord is extended. The rhythm section embellishes an E pedal, on which I play various superimpositions. The passage below shows how I gradually change from the tonal color of B locrian in bars 1–9 to a long passage using EM2 from bar 29 on. EM2 is already present in bars 3–4, but it becomes obscured by the strong presence of the note c. Bars 9–20 contain a long embellishment of an E7 chord with the alterations b13, b9 and #9. After a short excursion to Emaj7 in bars 21–22, EM2 pops up again in bars 23–25. Then, after an interruption in bars 26–28, starting with a chromatic embellishment of the note e, and ending with the augmented tonal color of $E7^{\#5}$(add f), the fragment ends with a long run in bars 29–41 which, with the exception of the (passing) note a in bar 33, exclusively consists of notes from EM2.
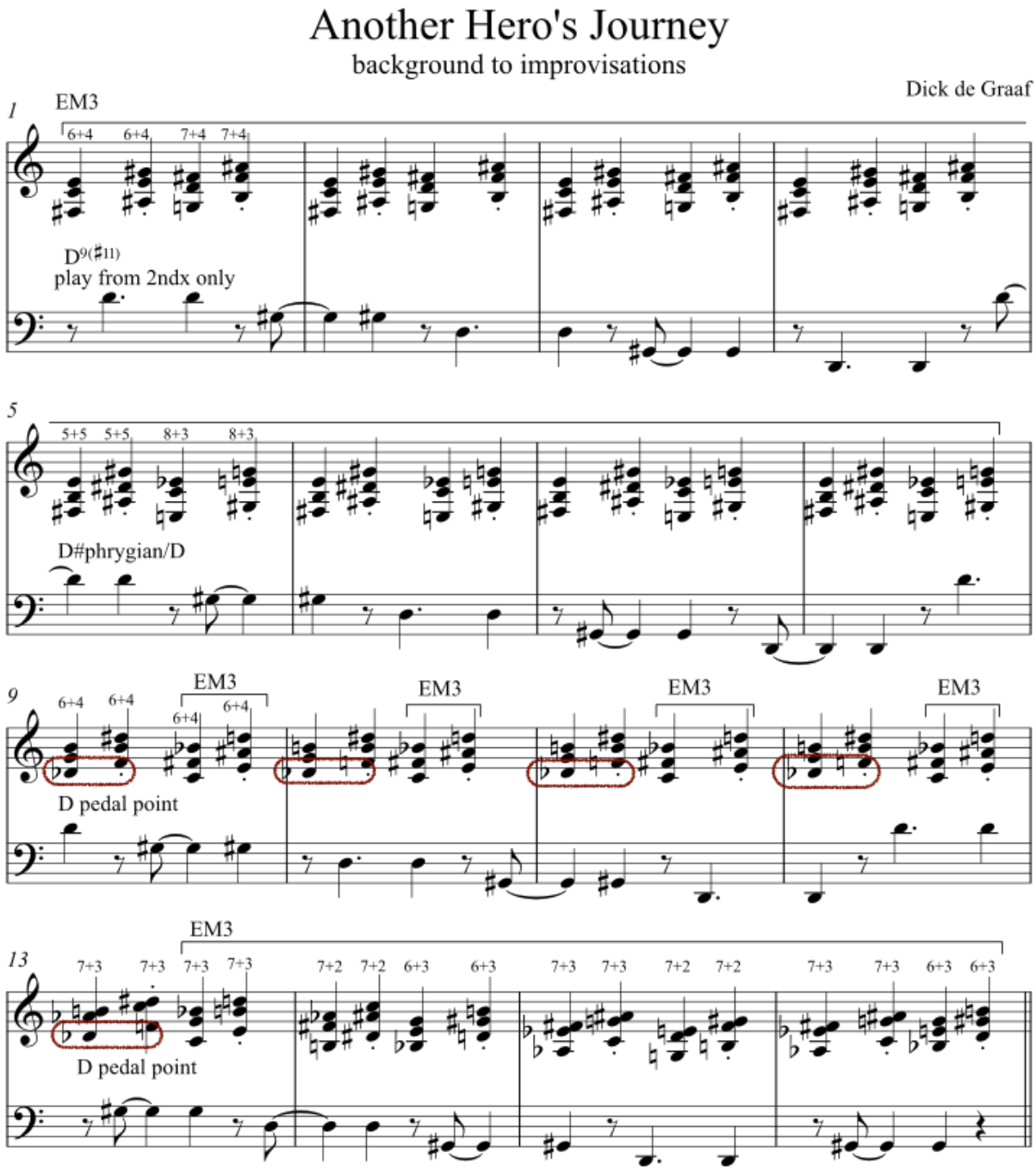


[ex 5.4.3.2: "Dicke Luft": tenor saxophone solo]

Evaluation

In contrast with all examples so far, in "Dicke Luft" the application of the Messiaen mode is only used in a restricted part of the improvised section, rather than being a concept for the piece as a whole. As an addition to Van der Werf's embellishments of F#M3 on top of a complex rhythmic and harmonic structure, my solo shows an application of M2 in a more quiet harmonic environment. The static E pedal point played by the rhythm section allows me the freedom to intuitively whirl around the exact content of EM2, switching between embellishing the basic notes EM2, its implied E7 chord with ad libitum alterations, and, as a result of intuitively added notes, Emaj7.

5.4.4 "Another Hero's Journey"

"Another Hero's Journey" is written for the same line-up as "Sparrows" (section 5.4.2): tenor saxophone, trumpet, trombone, bass-guitar, and drums. It is largely based upon mode EM3 and includes a riff that is constructed with stacked "skip 2 notes" embellishments of the mode. The following example intends to show the resulting parallel harmonies, serving as a background to (and as an interlude between) the solos. The upper line shows the three-part harmonies as played by the horns, the lower one the tritone d–g♯, played by the rhythm section. In contrast with the application of M3 in "A Crow Calling" (section 5.4.1) emphasizing the minor tonal colors inside this mode, in "Another Hero's Journey" I was inspired by its implied intervals of major thirds (4), perfect fourths (5), augmented fourths (6), and perfect fifths (7). Apart from the encircled notes d♭-flat and f, all pitches belong to EM3.



[ex 5.4.4.1 "Another Hero's Journey": background to improvisations]

Evaluation

This short fragment shows the remarkable sounds resulting from creating a parallel harmony with M3. Although the individual voices "only" follow the genuine order of EM3, the resulting vertical structures display interesting and unconventional harmonies.

Translating these three-part harmonies into traditional chord terminology appears problematic, but, just like in examples 5.4.2.2 and 5.4.2.3, trichord notation of the consisting intervals serves as a useful option.

Résumé

Referring meaningfully to these abstract harmonies, or to the conventional chords and scales implied in Messiaen's modes, the soloist has to be informed about their differences and similarities. For instance, M1 is implied in M3 and M6; M4 is implied in M5 and M7. Other relations between the modes have to do with their "steering" intervals. This term, introduced in chapter 4 to identify the intervals between the trichords in the Tone Clock hours, I use here to define the intervals between the symmetric segments of the modes. Mostly present is the augmented fourth. With the exception of M3, all modes can be divided into two symmetric segments at a tritone distance. Consequently they can all be played as mode embellishments displaying successions of equal augmented fourth intervals. Divisions of M1 and M3 can result into successions of equal intervals of major thirds (or their inversions: augmented fifths). Divisions of M2 can result in successions of equal intervals of minor thirds. In sub-chapter 5.2 the operations leading to these embellishments are explained in detail (see also the summary in section 5.5.8).

In all works examined in this subchapter, the discrete melodic characteristics of the modes prevail over the chords that could be constructed with them. Harmonies so far occurred as a result of melodic operations: mode embellishments, linear counterpoint, vertically stacking (fragments of) modes, and assigning tonal centers to (alternative) pivot notes.
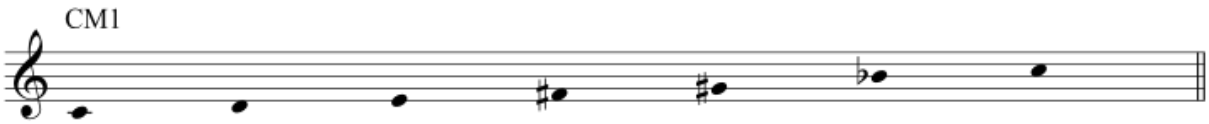
Just as the applications of the Tone Clock hours, Messiaen's modes have the potential to enrich the jazz musician's skills in improvising beyond functional harmony. However, compared to the twelve-tone techniques discussed in chapter 4, in Messiaen's modes, references to (ambiguous) tonalities are omnipresent. They can help (composing) improvisers to add a certain "harmonic vagueness" to their music. Liebman (2013) coined this term to define chords in which the third, fifth, or seventh are deliberately absent or ambiguous. This ambiguity can best be demonstrated by mapping the different thirds, fifths, and sevenths occurring in the chords that can be built on the root of CM3. This mode contains both the minor ($e^{\flat}$) and the major third (e); the diminished ($f^{\#}$), the perfect (g), and augmented fifth ($g^{\#}$); and the minor ($b^{\flat}$) and major seventh (b). The resulting variety of chords will be discussed in section 5.5.3.

Although the aim of my research is to look beyond the limitations of functional harmony, harmony plays such an important role in Messiaen's modes, that the following brief summary of their implied tonalities cannot be omitted.

5.5 Connections between Messiaen's modes and traditional harmony

This section discusses the traditional chords and scales that can be identified inside Messiaen's modes. This may seem in contrast with the aim of this research to help the (composing) improviser move beyond the limitations of conventional chord-scale practices, but I think it is not. Just like in diatonic scales, the implied chords are interpretations of harmonies that can be created by grouping the available notes in intervals of thirds and fourths. In the case of Messiaen's modes, these chords are not extracted from a complete diatonic scale; or, the underlying mode contains more notes that do not all fit the extracted chord. More important, through the absence of a predetermined hierarchy among the notes, these chords have no functional meaning either. As Messiaen remarks, "the composer [is] free to give predominance to one of the tonalities or to leave the tonal impression unsettled" (Messiaen 1956 I: 58). Transferred to the (composing) improviser addressed in this study, this means that the modes allow the freedom to extract, manipulate, and interpret complete and incomplete chords and scales as long as one does not leave the notes of the mode. Considering the aim of my research, these implied chords and scales could be employed to serve as superimpositions on pre-stated or imaginative chord changes in order to achieve fresh and surprising sounds.
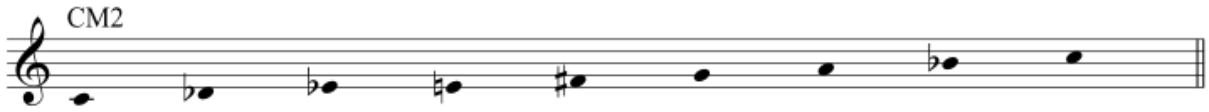
5.5.1 CM1



[ex 5.5.1.1]

CM1 is constructed with six parallel segments steered by intervals of a major second. It contains a $C7^{\#5}$ as its most comprehensive chord that can be transposed by a major second, a major third, an augmented fourth, an augmented fifth and a minor seventh, "fitting" on every stage of the mode.

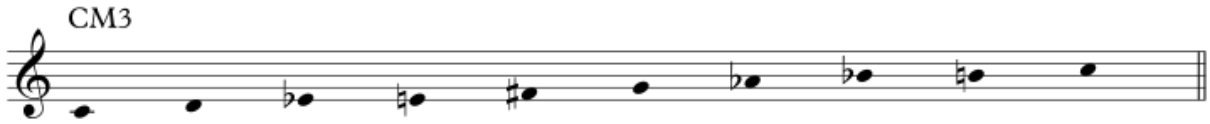
5.5.2 CM2



[ex 5.5.2.1]

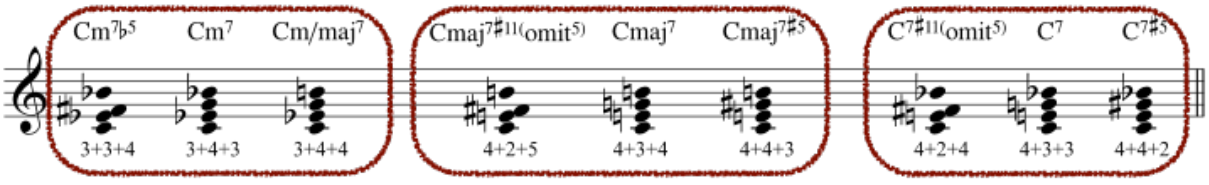
CM2 embeds the minor chords Cm6, Cm7, Cm7^{b5}, Cdim7, and Dbdim7, as well as the major chords C7, C7^{b9}, C7^{b10}, and C7$^{13/b9}$. The latter chord symbol is commonly used to indicate the C octatonic scale. M2 is constructed with four segments steered by intervals of a minor third so all chords can be transposed by intervals of a minor third, an augmented fourth, and a major sixth.

5.5.3 CM3



[ex 5.5.3.1]
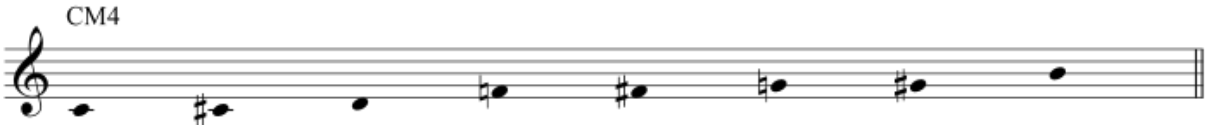
The following example shows how three minor, three major seventh, and three dominant seventh chords can be constructed with notes from CM3.



[ex 5.5.3.2]
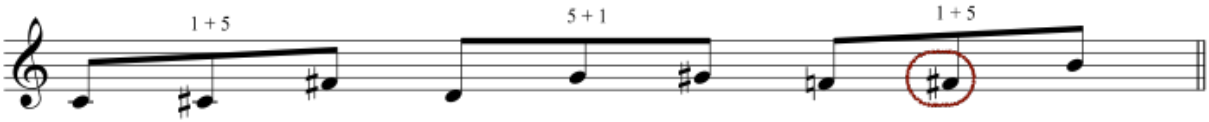
In addition to these chords built on the root, the following "adjacent" chords are also possible: Bm^{maj7} and Bmaj7. Because M3 is constructed with three segments steered by intervals of a major third, all chords can be transposed by a major third or an augmented fifth interval.

5.5.4 CM4
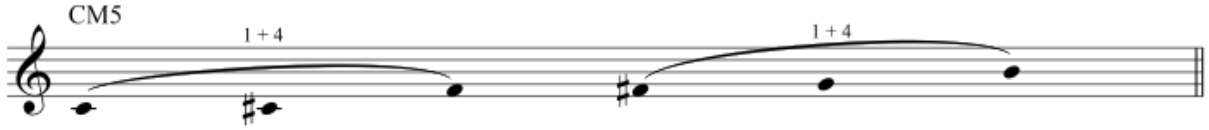


[ex 5.5.4.1]

Remarkably, by the absence of a major or minor third in CM4 conventional chords can be built only on its second and eighth stages. On the second stage the chords C#maj7$^{\#11}$ and C#7^{b9} are possible, and on the eighth stage Bm6, and Bdim7. All chords can be transposed by augmented fourths, because CM4 is constructed of two segments steered by a tritone interval. As the following example shows, M4 relates partly to the fifth hour (trichord 1+5) of the Tone Clock (subchapter 4.2, and section 4.7.4).
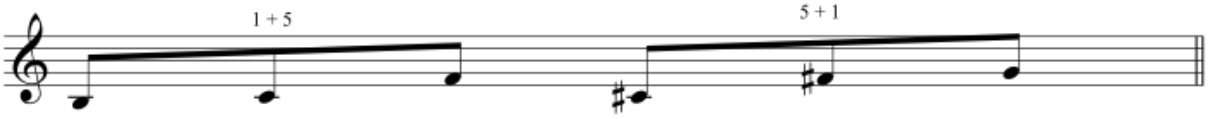


[ex 5.5.4.2]

5.5.5 CM5
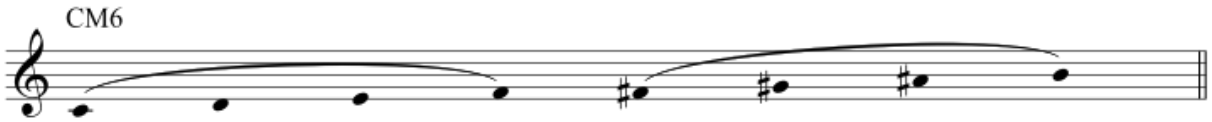


[ex 5.5.5.1]

This mode is constructed of two 1+4 trichords at a tritone distance, by which it relates to the fourth hour of the Tone Clock (trichord 1+4). No conventional chords can be found. M5 also relates to the fifth hour (trichord 1+5) of the Tone Clock.



[ex 5.5.5.2]

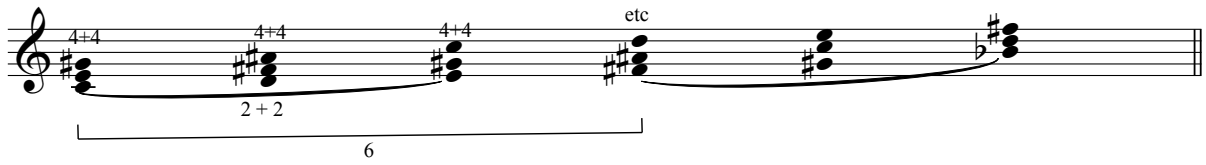
5.5.6 CM6
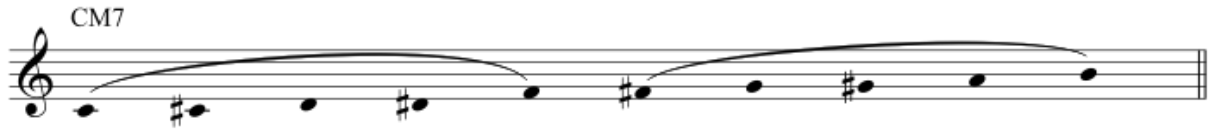


[ex 5.5.6.1]

CM6 implies the following chords built on the first tetrachord: Cmaj7$^{\#5}$, C7$^{\#5}$, Dm7^{b5}, Ddim7, E7$^{b9/\#11/b13}$, and E9. M6 is constructed of two segments at a tritone distance, so all chords can be transposed up or down an augmented fourth.

The symmetry of the sixth mode – in which M1 (the whole-tone scale) is embedded – sounds clearly in the following line of the six 4+4 trichords. Or in traditional terms: the augmented triads on the first, second, and third degrees of both segments.



5.5.7 CM7



[ex 5.5.7.1]

The following chords can be built on the notes in the first segment of M7: Cm6, Cm^{maj7}, Cdim, C#maj7$^{(\#11)}$, C#7$^{(\#11/b13)}$, Dm7, Dmaj7$^{(\#11)}$, D7$^{(b9/b10/\#11/13)}$, D#m^{maj7}, D#dim, Fmin7, and F7. All chords can be transposed by augmented fourth intervals, because M7 is constructed of two segments at a tritone distance.

5.5.8 Summary

In the following diagram the characteristics of the seven modes of limited transposition ("MOLT" in ex 5.5.8.1) are summarized. The term "steering interval" in the third column indicates the intervals between the segments within the modes (see subchapter 5.2).

MOLT	segments	steering interval	implied chords	Diatonic scale	Character
CM1	6	2 (major second)	C7#5	Whole-tone	Also implied in M3 and M6
CM2	4	3 (minor third)	C713b9; Cm6; Cm7; Cm7b5; Cdim	Diminished half-tone - whole-tone; "octatonic"	Contains characteristic tension notes
CM3	4	4 (major third)	Cm6; Cm7; Cm7b5; Cdim; C7b9; C7b10; C713/b9	Whole tone; augmented	Combination of colors due to presence of both maj and min 3rd, perfect and augmented 5th; minor and major 7th
CM4	2	6 (tritone)	Dominant 7th of the root (G7#11); Bdim; C#7); Gmaj7(#11); C#maj7(#11)		Contains no major or minor third; embeds a "turn-around" of root notes of the two segments; relates to the fifth hour of the Tone Clock
CM5	2	6 (tritone)	Dbmaj7(omit 5); Gmaj7(omit5)		M4 minus two notes; relates to the fifth hour of the Tone Clock
CM6	2	6 (tritone)	Major seventh (Cmaj7#5; F#maj7#5);dominant 7th (C7#5;F#7#5); more dominant 7th possibilities on third and seventh stage (E7#11; Bb7#11); minor/major seventh(B/maj7); Fm/maj7)	Whole tone; augmented	Ambigious, with complex harmonies
CM7	2	6 (tritone)	Cm6; Cm/major7; Cdim; C#maj7(#11); C#7 (#11/b13); Dm7; Dmaj7(#11); D7 (b9/b10/#11/13); D#m/maj7; D#dim; Fmin7; F7	Harmonic minor; melodic minor (on the parallel root notes)	Due to its ten notes this mode misses a characteristic color
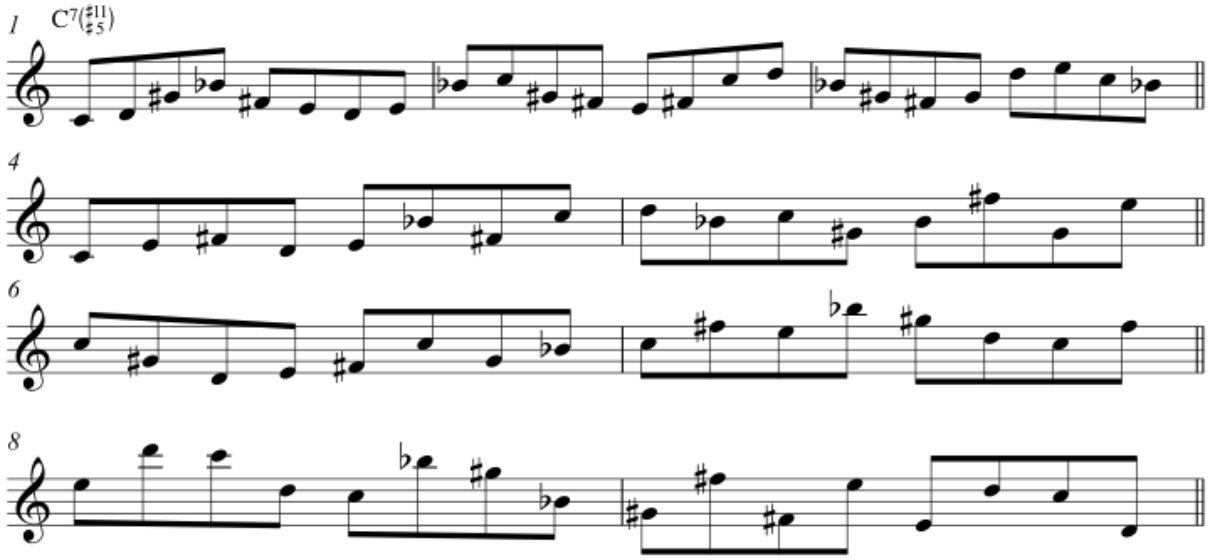
[ex 5.5.8.1]

5.6 Generative compendium of melodic patterns

As in subchapter 4.7, I call the following collection of patterns with Messiaen's modes a "generative compendium," meaning that the patterns are arranged in such a way that they allow musicians to adapt them to their own taste. The examples are displayed along the individual modes in first transposition, with random variations of shapes and directions. At the start of each section, I comment on characteristic (steering) intervals, the relation to other modes, and on implied harmonic structures. Thus, I intend to suggest possible applications of the actual patterns. Just as with the melodic patterns derived from Tone Clock trichords (subchapter 4.7), this compendium represents a rather subjective choice, displaying my personal adaptation of the characteristic colors of Messiaen's modes. By combining the concrete patterns and my additional comments on their characters and usages, I intend to motivate and help musicians to use them as a point of departure for their individual applications.

5.6.1 CM1
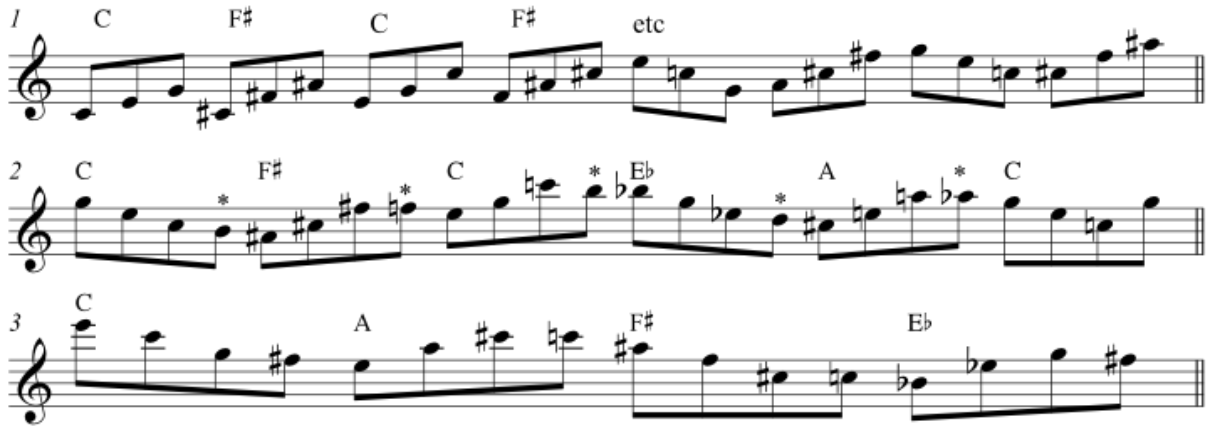
In the following lines, I have mixed the characteristic intervals of mode CM1: major seconds, major thirds, augmented fourths and fifths, and minor sevenths. This mode refers to the augmented dominant 7th chord. Because M1 is also implied in M3 and M6, the following patterns can also be played in combination with modes CM3 and CM6.



[ex 5.6.1.1]
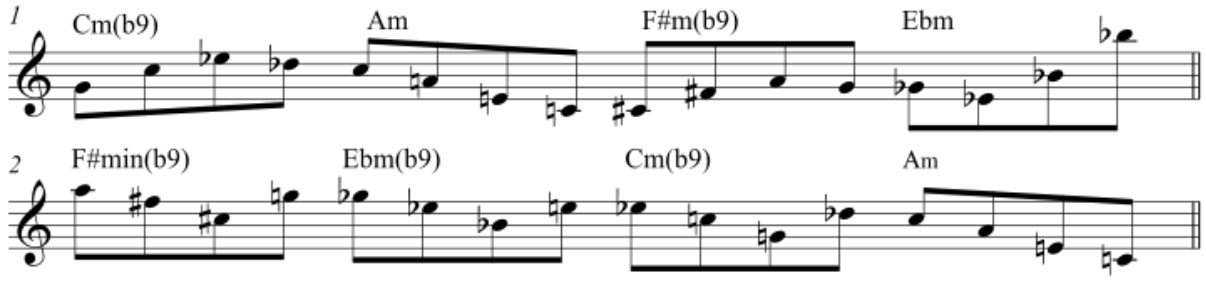
5.6.2 CM2

The following melodic patterns show mode variations with successions of the implied major triads, at distances of minor thirds and augmented fourths. The notes marked with an asterisk are chromatic passing notes. I took the freedom to add them to the original notes of the mode in order to create four-note groupings instead of the usual three-note groupings that result from creating triad pairs.



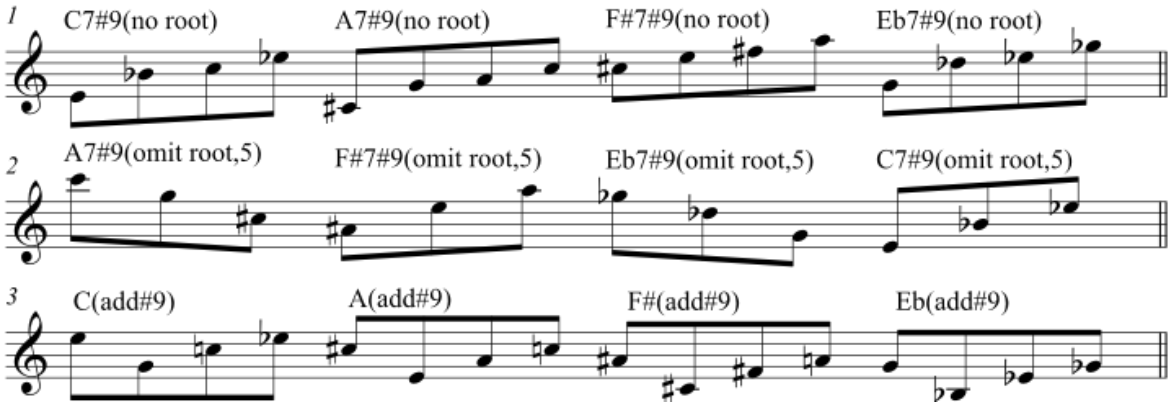
[ex 5.6.2.1]

The steering interval of a minor third in this mode is emphasized in the following successions of minor triads at minor third distances.



[ex 5.6.2.2]
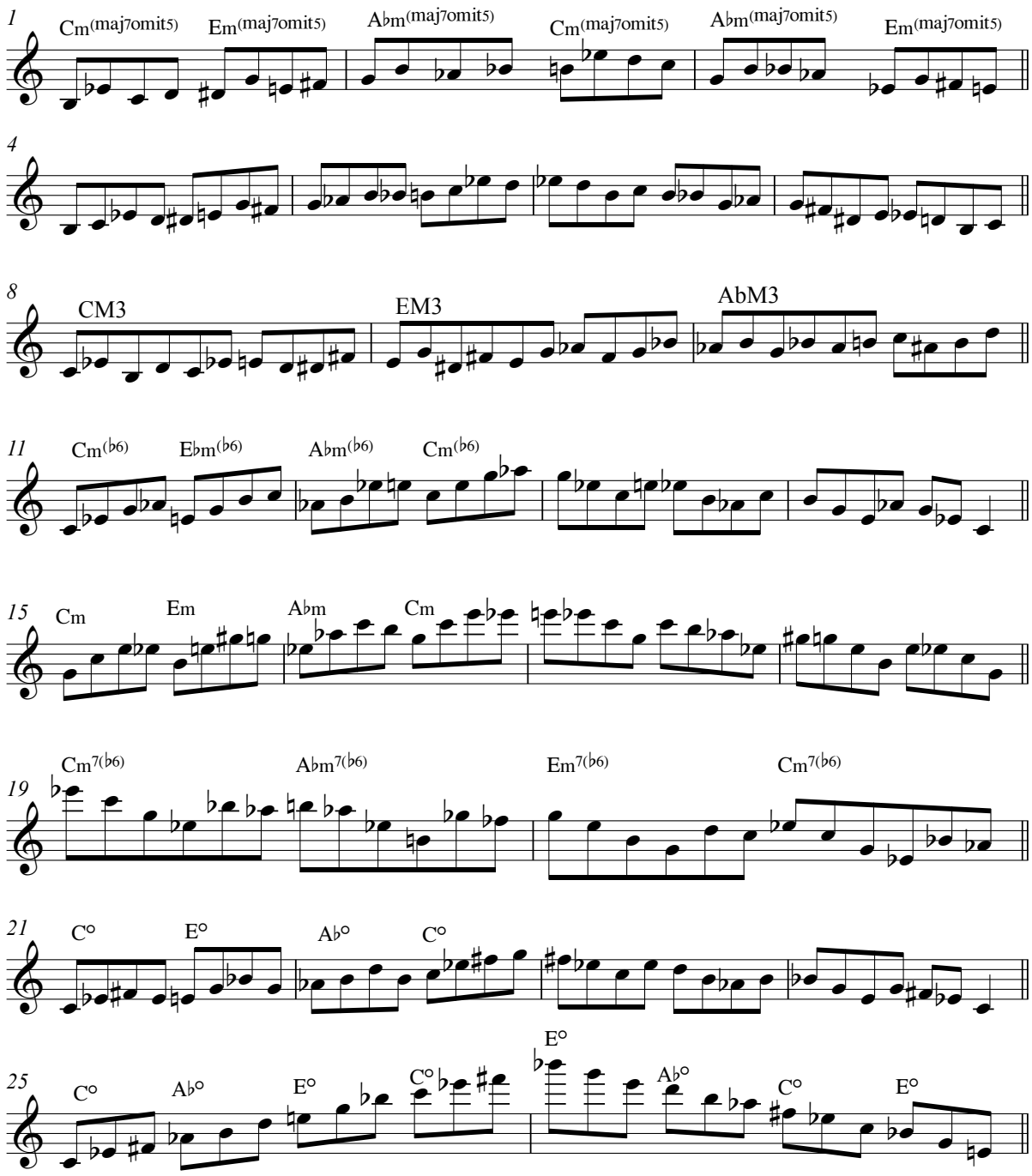
The ambiguous tonality resulting from the presence of both the major and minor third of the C tonality is well expressed in the next lines, containing embellishments of incomplete dominant seventh chords with the added sharp ninth.



[ex 5.6.2.3]

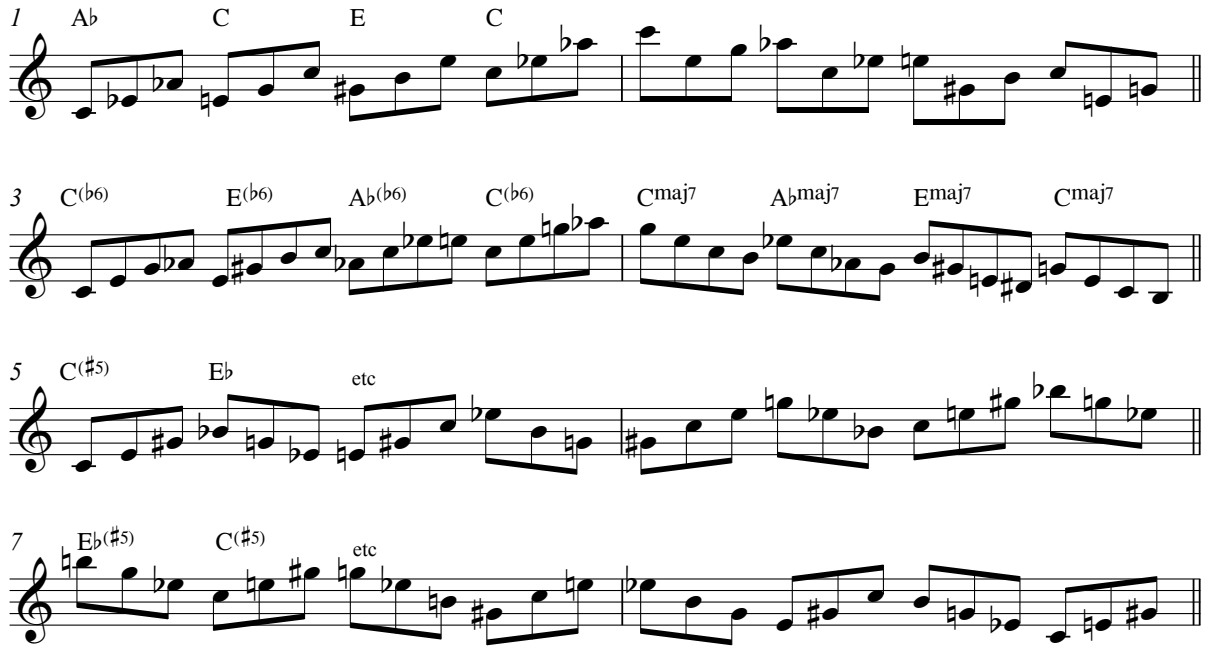
5.6.3 CM3

The next example shows eight lines in which the minor and the diminished tonal character of Messiaen's third mode are emphasized. In bars 15–18, I play the major third as a passing note to the minor third to stress the ambiguous tonal character of M3.


1
Cm(maj7omit5)
Em(maj7omit5)
A♭m(maj7omit5)
Cm(maj7omit5)
A♭m(maj7omit5)
Em(maj7omit5)
4
8
CM3
EM3
AbM3
11
Cm(♭6)
E♭m(♭6)
A♭m(♭6)
Cm(♭6)
15
Cm
Em
A♭m
Cm
19
Cm7(♭6)
A♭m7(♭6)
Em7(♭6)
Cm7(♭6)
21
C°
E°
A♭°
C°
25
C°
A♭°
E°
C°
E°
A♭°
C°
E°

[ex 5.6.3.1]
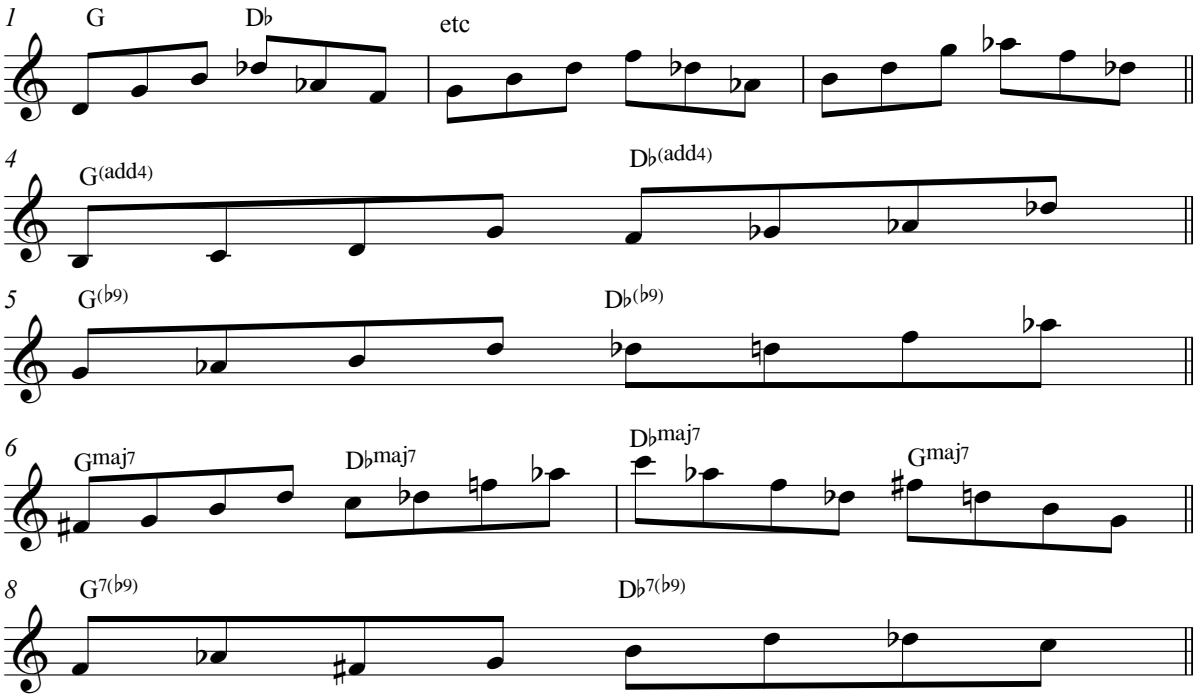
The major and augmented tonalities implied in M3 are expressed in the following patterns.



[ex 5.6.3.2]

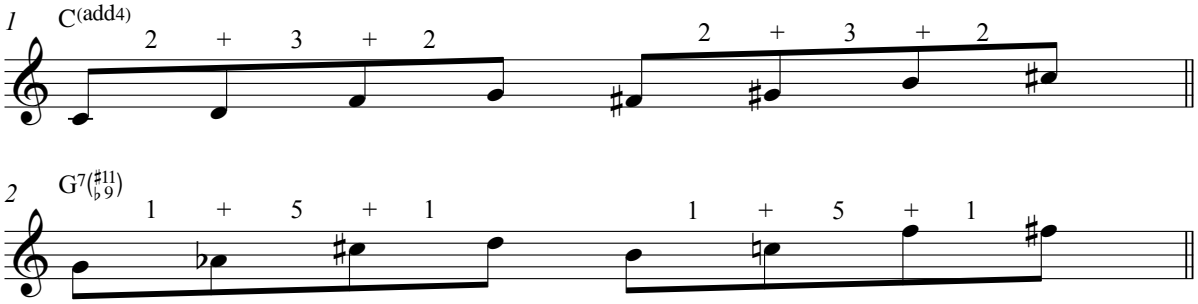
5.6.4 CM4

Due to the absence of a major or minor third in CM4, the following examples highlight the triads and chords on the fifth degree of the tonalities of C and F# implied in the mode. The lines show triad pairs, triads with additions, major seventh chords, and dominant seventh chords.
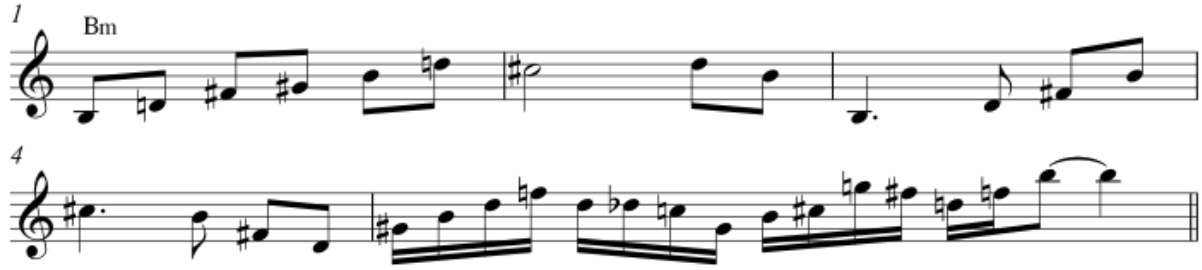


[ex 5.6.4.1]

The following patterns can be created with two similar tetrachords: 2+3+2 on the root note c; and 1+5+1 on the g, resulting in an extended G dominant-seventh chord, in addition to the one in bar 8 in the example above.



[ex 5.6.4.2]
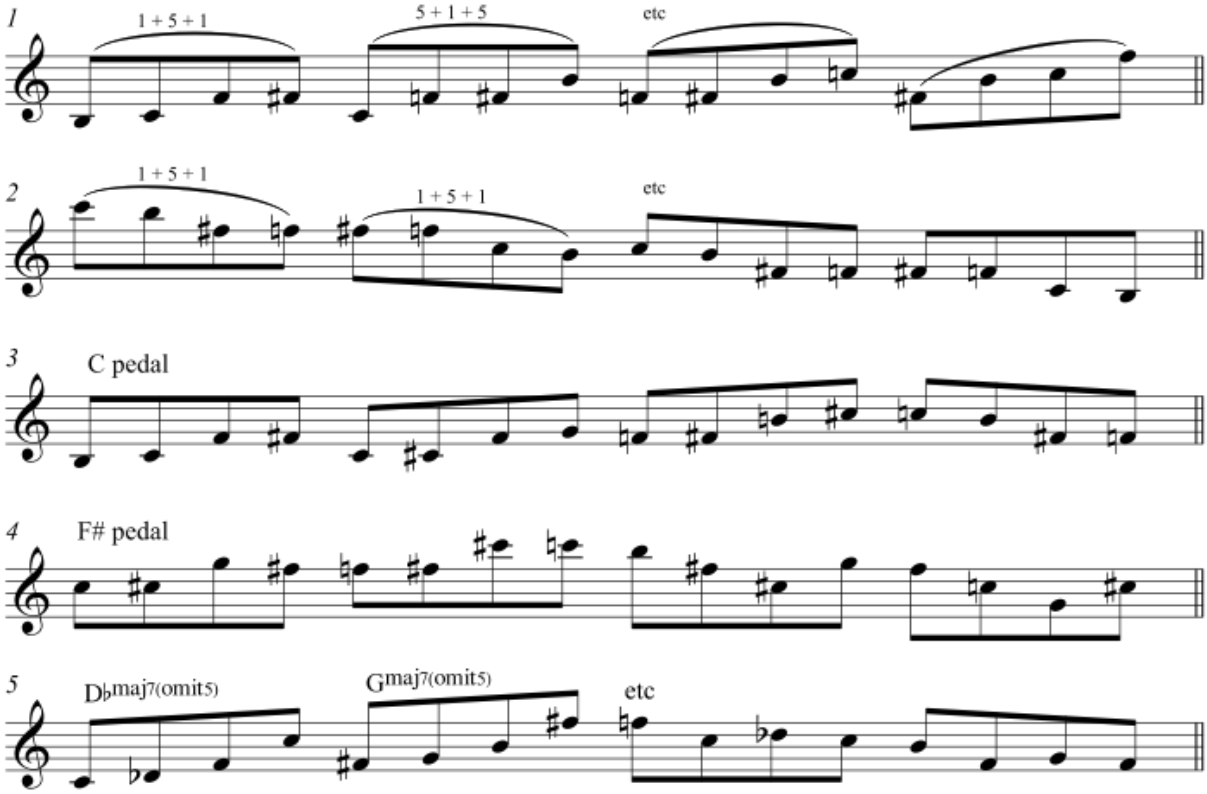
An alternative approach to CM4 is to emphasize its implied B minor tonality (as an upper structure of Gmaj7). The following example is also discussed in section 4.3.1.3.



[ex 5.6.4.3]

5.6.5 CM5
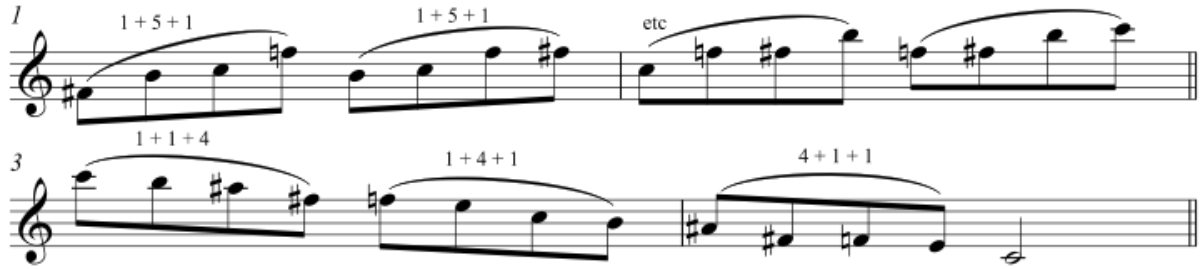
Since M5 is implied in M4, all lines in the following example can also be played in combination with CM4. The lines in bars 1–3 can also be played in combination with CM6.



[ex 5.6.5.1]
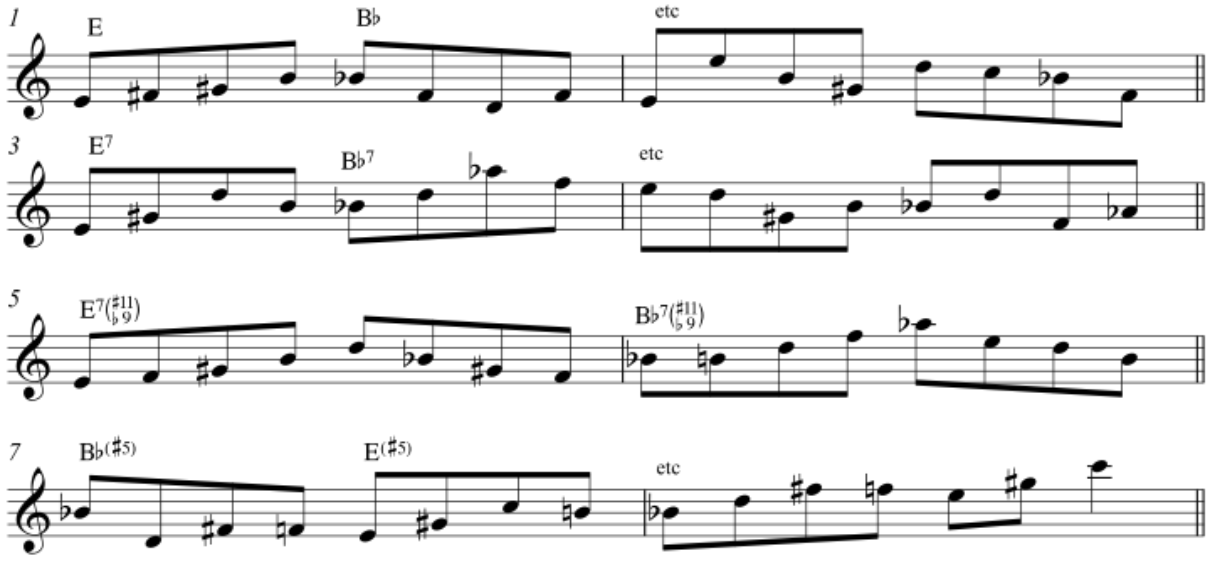
5.6.6 CM6

Because it is impossible to associate a tonal reference other than a C or F# pedal point to the next two lines, I have identified them by their intervallic structure. Bars 1–2 can also be played in connection with M4 or M5.



[ex 5.6.6.1]
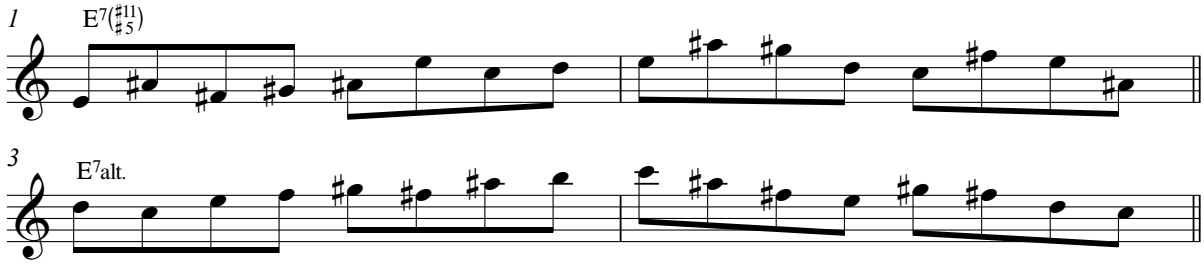
By taking the notes e and b as pivot notes, triads and dominant seventh chords with altered notes can be found in CM6. They can either be played over those pre-stated chords, or be superimposed over C or F# pedal points.



[ex 5.6.6.2]
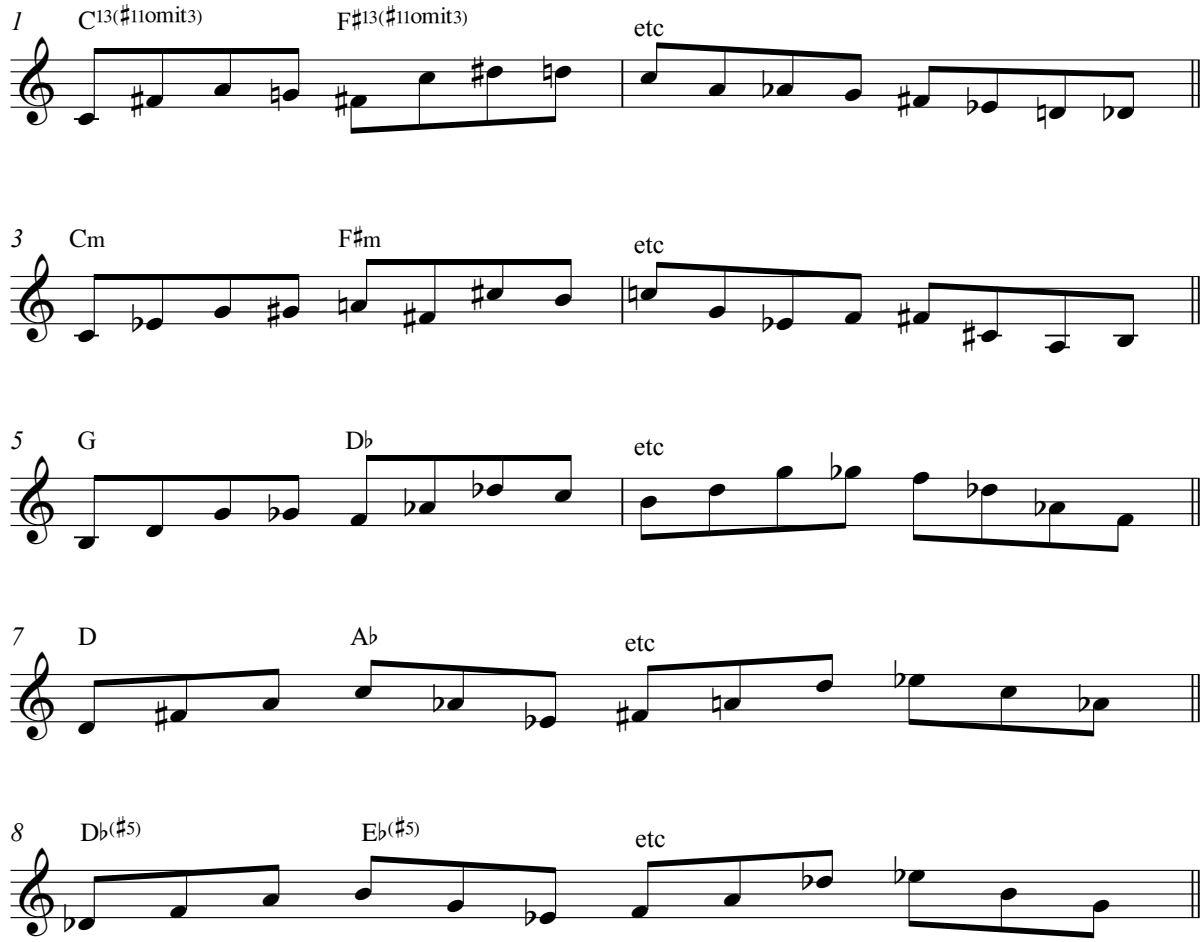
The following example displays the implied whole tone scale starting on the note e. The notes in bars 1–2 do not leave the mode. In the pattern in bars 3-4, the notes f and b

are added. Thus, the tonal color of the E7alt chord is consolidated without leaving the notes of the actual mode.



[ex 5.6.6.3]

5.6.7 CM7



[ex 5.6.7.1]

5.7 Connections with the Tone Clock and the jazz models

Are there any connections between Messiaen's modes of limited transposition, the Tone Clock, and the methods of the jazz educators in chapter 3? After all, Schat and Messiaen represent musical worlds that are quite separate from each other, and from those of the jazz educators discussed in chapter 3.
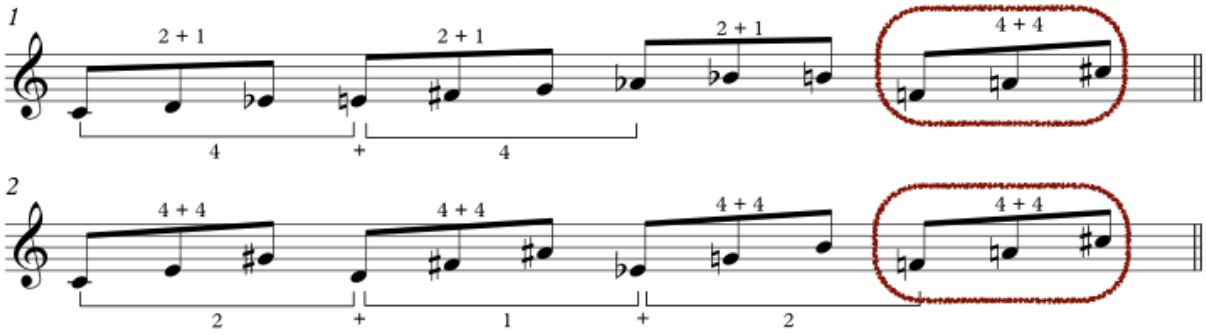
This study so far has shown how elements from compositional techniques used by Schat and Messiaen are brought together in the works of various (composing) improvisers. Thus, it illustrates how crossing borders, drawn by those composers of new music, helps the improvisers to broaden their musical space. The same can be said with regard to the connections with the educational methods in chapter 3. However, employing these methods to enrich one's artistic palette is more obvious, because most of them result from the practices of actual jazz improvisers.

A systematic comparison between Messiaen's modes of limited transposition, Schat's Tone Clock, and the jazz educators' improvisational techniques is not relevant here, as it would not create any new perspectives on the usage and utility of the separate techniques. However, it is important to stress that jazz easily allows a combining of those techniques, which, in their original state, appear so radically different from one another. Therefore, the remainder of this subchapter will contain short examples of my applications in which interrelations between twelve-tone techniques in the Tone Clock, Messiaen's modes, and the methods of Liebman, Bergonzi, Weiskopf and O'Gallagher become apparent and productive.

Firstly, I consider the theoretical connections between Messiaen's modes of limited transposition and the Tone Clock. According to the definition of twelve-tone techniques by Wuorinen (1994) discussed in section 2.2.3 and in subchapter 4.1, both systems are based on pitch successions arranged by interval orderings instead of tonal hierarchies of triads or chords. In both systems, these successions can be divided into a number of symmetrical segments, so-called "content groups" that stand out from the strict intervallic ordering of the basic form of the row.

As a practical example, I consider the relationship between Messiaen's third mode of limited transposition and the twelfth hour of the Tone Clock. With its nine pitches, mode M3 is only 3 pitches away from being a twelve-tone row. With the twelve-tone techniques discussed in chapter 4, it would be possible to analyze M3 as an incomplete row of the third hour of the Tone Clock, which consists of three 2+1 trichords. The three missing pitches f–a–$c^{\#}$ represent a 4+4 trichord that would complete the twelve-tone row. In order to obtain a Tone Clock hour with four equal trichords, the twelve-tone row in bar 2

of the following example can be constructed. With its four 4+4 trichords, it represents the twelfth hour of the Tone Clock. This highlights the augmented tonal colors implied in M3 in a clear and effective way. Thus, this example shows how an operation using twelve-tone techniques can be applied alongside the mode embellishments such as the ones in section 5.2.3 in order to emphasize an actual tonal color implied in the mode.



[ex 5.7.1]

And what about connections between Messiaen's modes and the educational publications in chapter 3? Which techniques, discussed in chapter 3, could, possibly be employed to these modes? Concerning the relation with Liebman's concept of chromatism (subchapter 3.2), operations with Messiaen's modes can be added to Liebman's survey of techniques of non-tonal superimpositions on pre-stated or imaginary chords and chord changes. My tenor saxophone solo on "Bohemia After Dark" (Oscar Pettiford) on the unpublished duo recording with pianist Andrea Pozza (Milan, 2015) can serve as an illustration. The embellishments of GM3 that I play in the A-sections of the first three solo chorusses[6] show basic examples of the application of Messiaen's modes, as non-tonal superimpositions over the pre-stated chord changes.

Concerning the connection of Messiaen with Bergonzi's concept of intervallic melodies (subchapter 3.3), the tables of interval directions (section 3.3.2) can be used as effective tools to construct mode embellishments or mode patterns. However, since all of Messiaen's modes contain fixed interval structures, it is not relevant to connect them to Bergonzi's quite random construction of intervals successions. The same conclusions can be drawn regarding the interconnection of Bergonzi with the Tone Clock. Conversely, the concepts of Weiskopf's triad pairs (subchapter 3.5) and Bergonzi's hexatonics (subchapter 3.6) can be efficiently applied to illustrate the characteristic tonal colors of Messiaen's modes. For instance, triad pair $C^{\#5}$+$D^{\#5}$ can be played to define the

[6] Time codes are: 00:33 (first chorus); 01:07 (second chorus); 01.41 (third chorus).

augmented tonal colors inside CM1, CM3, and CM6. The triad pairs Bm+Cm, and $C^{\#5}$+Ebm, can be played to mark the ambiguous tonal colors of CM3. The triad pairs C+F#, and Cm+F#m, can be played over CM2; and the triad pair Db+G can be superimposed on CM4 and CM7.

Finally, O'Gallagher addressed relations between segments of the twelve-tone rows with trichords 1+4 and 1+5 and Messiaen's modes M4 and M5 (example 3.7.1.10). Example 5.6.6.1 above shows a similar relationship between those rows and M6. Example 5.6.4.2 shows how tetrachords 2+3+2 and 1+5+1 can be considered as twelve-tone segments, in superimposition on CM4.

To summarize the relevance of the combinations of elements from the various techniques discussed in this study, I once again stress that among the characteristics of jazz there is the tendency of (composing) improvisers to cross musical borders in their search for new elements to enrich their current jazz languages. In the context of my research aim to help improvisers extend their practices beyond conventional harmony, combining the techniques discussed separately in this study seems a logical next step to add to its value. During the years of my research, I experienced how combining the elements from the various techniques was an important step after my initial acquaintance with their basic forms, in order to become new "building blocks" of my personal sound.

5.8 Conclusion

The symmetry of Messiaen's modes, their implied tonalities, and their horizontal and vertical applications are potential ingredients that can be taken from his musical language to enrich the (composing) improviser's artistic palette. Just like the Tone Clock, Messiaen's modes represent a well-defined collection of tools that can be freely adapted by (composing) improvisers in order to extend their musical vocabulary. Once connected to the musicians' already existing musical knowledge and practices, these tools can also contribute to their informed intuition. From there on, they gradually turn into skills that can pop up spontaneously during actual improvisations.

The various examples of composed and improvised content discussed in this chapter reveal bits and pieces of the musical vocabulary, created in and through the musical practice of a number of (composing) improvisers including myself. Altogether, these data prove that Messiaen's modes can serve as tools to operate creatively both outside and alongside functional harmony. It is up to the individual musician to either respect Messiaen's intended "charm of impossibilities" and the obvious tonal references found in most of his modes, or to bypass these and apply (parts of) them as superimpositions on

pre-stated or imaginary chord changes. As such, these operations can be seen as supplements of more conventional (non-)tonal techniques of superimposition.

Ironically, in *Conversations with Claude Samuel*, Messiaen remarks: "Personally, I've never had an affection for jazz. I'm sorry to say it, but I think that jazz is a 'robber' whose 'innovations' are, really, borrowing from previous symphonic music" (Samuel 1976: 195). Within the musical space that I am operating in as a (composing) improviser, usually called "contemporary jazz", innovation is regarded as the continuous extension of existing musical conventions. "Robbing" elements from other musical genres and cultures, and adapting these to one's own artistic needs, is one of the ways innovation can be achieved. The blending of existing practices with these "extra muros" elements acquires meaning as a result of the interaction of the actual repertoire, the line-up of a band, and the concrete physical environment of a live performance or a recording session. It is within these limitations of time and space that performing jazz artists usually develop and evaluate new elements and operations, such as those distracted from Messiaen's musical language. Their dissemination can only be achieved during the very "celebration of the moment" that the musicians are able to create, individually or together, by their open-mindedness and informed intuition, and thanks to their inquisitive practicing, listening and mutual influencing.

In the first two chapters of this dissertation, I summarized my personal development as a (composing) improviser during my early years as a performer. More recently, my findings with elements from Peter Schat's Tone Clock and Messiaen's modes of limited transposition inspired me to undertake the present study into advanced tools to enrich the skills of (composing) improvisers. During the initial phase of my research into the techniques of these composers of new music and their practical applications in jazz praxis, I realized the contextual relevance of the publications of the jazz models in chapter 3. They provided educational frameworks to make steps beyond the strict borders of tonality, while some of them also contained connections to the serial techniques discussed in chapters 4 and 5.

My recent musical practice displays a mixture of elements from those jazz models and from the techniques derived from Schat and Messiaen. To express the musical results of my study more concretely, I will in the next chapter conclude with a coda in the form of a number of recent recordings in which the journey I have embarked upon in this study comes to a temporary end.

6. CODA

The selected recordings in this chapter are the result of my artistic developments during the years of my research.

Section 6.1 contains all twelve movements of *Carillon* as recorded in January 2013 by saxophone quartet "Dicke Luft". Each movement is constructed on the basis of a single hour of the Tone Clock. In sections 4.5.1 – 4.5.3, three movements, "Onsa", "Pontiac", and "Dicke Pitter", have been analyzed in depth. Both in the composed and improvised parts of these pieces, the twelve-tone applications with the trichords from the Tone Clock hours appeared to be attractive and useful tools to operate beyond tonal limitations.

Of the five pieces presented in section 6.2, three have been discussed before in this study: "Bird Buzz" (sections 3.3.2), "Master Slow Feet" (section 3.5.2), and "Count Your Blessings" (section 3.7.2). Changes in the line-up of my Dick de Graaf New Quartet have had a remarkable effect on the band's sound. Thanks to the contributions of pianist Loran Witteveen, the approach to my compositions has become more focused on moving beyond tonality, also one of the aims of my research. Most of the pieces are not new, but as a result of my developments during the last few years they have been re-considered and re-styled to sound remarkably different than in their initial forms. Not only have I enriched my artistic palette considering my improvisational idioms as a result of the transcriptions and analyses I have made, and of the construction of the improvisational patterns in chapters 4 and 5. I also feel more confident now in expressing my new approach to my band members, in words and in music.

6.1 *Carillon* (2013)

Saxophone Quartet "Dicke Luft" (2013)

Arno Bornkamp – soprano saxophone
Werner Janssen – alto saxophone
Nils van Haften – baritone saxophone
Dick de Graaf – tenor saxophone

6.1.1 "Onsa"

6.1.2 "Seiko"

6.1.3 "Mondaine"

6.1.4 "Ancre"

6.1.5 "Pontiac"

6.1.6 "Swatch"

6.1.7 "Heuer"

6.1.8 "Emporio Armani"

6.1.9 "Dicke Pitter"

6.1.10 "D.H. Quartz"

6.1.11 "Junghans"

6.1.12 "Omega"

6.2 *Bird Buzz* (2017)

Dick de Graaf New Quartet

Loran Witteveen – piano
Stefan Lievestro – bass
Jimmi Hueting – drums
Dick de Graaf – tenor and soprano saxophones

6.2.1 "Bird Buzz" (2015)

This piece is a contrafact of the jazz-standard "Night and Day". Both its structure, based on the application of two three-interval sets, and the collective improvisations on a previous recording, have been discussed in detail before in section 3.3.2. In the current recording the approach to the composed parts and the improvisations sound a lot freer than in the previous one. Apart from the collective solos at the end of the first part, this is particularly apparent in the saxophone and piano improvisations during the second

part (with the reggae rhythm). On top of the repetitive bassline, consisting of six four-bar patterns constructed with a non-retrogradable rhythm, a number of techniques mentioned in this study can be identified, such as tonal and non-tonal superimpositions (Liebman) and the application of triad pairs (Weiskopf, Bergonzi, Garzone), also combined with elements from Messiaen's modes and Tone Clock trichords.

6.2.2 "Titmouses" (2017)

The composed parts of this piece are largely based on Milton Babbitt's second all-combinatorial source set 1+5+1, demonstrated before in section 4.7.8. This tetrachord, and tetrachord 2+3+2 are also the points of departure for my solo. In section 5.5.4 I have shown that tetrachord 1+5+1 is also embedded in Messiaen's mode M4. The same goes for tetrachord 2+3+2. By superimposing Messiaen's fourth mode on the piece's tonal center F, FM4 implies the tetrachords f–g–b$^{\flat}$–c and b-c$^{\#}$–e–f$^{\#}$.

6.2.3 "Master Slow Feet" (2004)

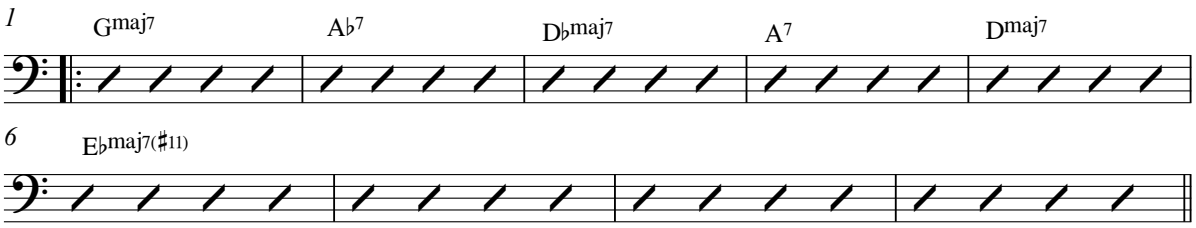
The solo section of this somewhat older piece is based on a limited number of chords, allowing the soloists a free modal approach. In my improvisation, I play superimpositions of triad pairs (hexatonics) and Messiaen's modes M2, M3, and M4.

6.2.4 "Why Birds Always Sing" (2004)

This composition has been recorded before on the CD *Moving Target* (2007). In my solo, I play superimpositions of M4, and of the fifth hour of the Tone Clock. For instance, on top of the static C7 chord, I freely superimpose C – D$^{\flat}$7 – G$^{\flat}$– D7– Gmaj7 – Abmaj7.

6.2.5 "Count Your Blessings" (2011)

"Count Your Blessings" is a contrafact of Miles Davis' "Tune Up". The construction of this piece has been mentioned before in section 3.7.2. The original chords of "Tune Up" are reharmonized with the fifth hour of the Tone Clock. However, in contrast with "Why Birds Always Sing", where the fifth hour reharmonization is applied as a superimposition on the static C7 chord, in "Count Your Blessings" the reharmonizations of the first three tonalities of "Tune Up", D, C, and Bb, are notated as three chord successions, which the soloists are considered to treat as "traditional" chord changes. The example below shows the first nine bars of the solo section.



[ex 6.2.7.1 "Count Your Blessings" – first nine bars of the solo section

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CURRICULUM VITAE

Dick de Graaf studied saxophone and flute at the Rotterdam Conservatoire. Beside, he attended master classes with John Clayton, Joe Diorio, David Schnitter, Lee Konitz, and Bob Brookmeyer and took private lessons with Joe Lovano.

As a side-man and as a leader of his own groups, Dick has performed at many national and international jazzstages. He played with a.o. Chet Baker, Misha Mengelberg, Jasper van 't Hof, Kenny Weeler, Tom Harrell, Benny Golson, Billy Hart, Toumani Diabaté and Erkan Ogur, and toured festivals and clubs in Europe, South and West Africa, Japan, Indonesia, New Zealand, USA and Canada.

As a soloist, composer, arranger and self-managing artist dedicated to jazz – in his vision "acting as a guesthouse in which elements from the surrounding musical world are welcomed with curiosity"- he recorded more than 30 CD's that received positive response by both public and press. His Challenge Records Awarded CD's *Sailing* and *New York Straight Ahead* got enthusiast critics in Down Beat magazine.

After a number of cross-over projects, a.o. "The Burning of the Midnight Lamp: Dick de Graaf plays Jimi Hendrix", "Djigui: les Sofas de Bamako featuring Dick de Graaf", "Schubert Impressions for Jazz Quintet", "Istanbul Connection", and "Trio Nuevo: Jazz Meets Tango", he became the co-founder and artistic director of the Clazz Ensemble, a concert band operating on the borders of jazz and contemporary composed music. Dick's compositions and arrangements were prominent in the projects "Aventures" (2007), "Clazz in Zeeland" (2009), "His Master's Choice" (2012) with his arrangements of Louis Andriessen's music, "Bach DNA" (2014), commissioned by the International Bach Festival Dordrecht, and "Monk Inside Out" (2015).

With the reed section of the Clazz Ensemble, Dick formed the saxophone quartet Dicke Luft, to perform and record his composition *Carillon* (2013), based on the twelve hours of Peter Schat's Tone Clock. With his Dick de Graaf New Quartet, he released the CD *Bird Buzz* in November 2017*,* with music composed in the context of his doctoral study *Crossing Borders*. *Broadening the Artistic Palette of (Composing) Improvisers in Jazz.*

Dick de Graaf is a teacher of saxophone and small ensembles, as well as a research coach at the master programme of Codarts University for the Arts in his hometown Rotterdam. Beside he conducts clinics, master classes, and lecture concerts in conservatoires and at various stages in the Netherlands and abroad.

ABSTRACT

This study discusses the application of advanced compositional and improvisational techniques in the domain of contemporary jazz in order to help (composing) improvisers extend their musical practices beyond functional harmony and conventional chord-scale approach.

Although today's jazz acts as a guesthouse in which elements from the surrounding musical world are welcomed with curiosity, the relationship between improvised lines and the underlying harmonic structures is still considered a substantial part of its structural elements. As a consequence of this "all-inclusive" character, the harmonic approach of traditional jazz improvisation needs reconsideration. This study is based on the issue I share with colleagues and students that we tend to reach the limits of the conventional chord-scale approach. In order to let jazz keep track with recent developments, the advanced compositional and improvisational techniques elaborated upon in this study can be a relevant contribution. However, important to stress is that instead of operating in opposition to functional and modal harmony on which the majority of jazz is still based, these new techniques can be applied alongside, or as an extension to this convention.

Considering the fact that, together with the blues and the work songs, the European classical music tradition was one of the fundaments of jazz, making it a crossover music *avant la lettre*, this study focuses on harmonic issues in line with the historical development of classical music. For those musicians who feel the need to move on by continuously enriching their artistic palette, the adaptation of twelve-tone and modal techniques by composers of twentieth-century Western art music could provide a fruitful addition to the already existing jazz toolkit. Because it would be naive to assume that just offering new toolkits would be sufficient to innovate jazz music, I decided to also analyze six exemplary publications by leading jazz artists and educators on advanced compositional and improvisational techniques. I undertook this part of my research not only to provide a decent context, formed by already existing educational models: I was also curious how these models would relate to the twelve-tone and modal techniques of the two composers I took as subjects of my research: Peter Schat and Olivier Messiaen.

First, the ideas of Dutch bassist Theo Hoogstins concerning his applications of twelve-tone techniques from Peter Schat's Tone Clock to jazz music became a source of inspiration to undertake this research project. Second, a recording of a master class by guitarist Nelson Veras at the Conservatory of Amsterdam inspired me to take Olivier Messiaen's modes of limited transposition as another source to enrich the artistic palette

beyond traditional harmony.

The following research question resulted from the considerations summarized above: How can advanced improvisational techniques by expert jazz educators, and adaptations of serial techniques of composers of Western art music help jazz composers and performers to extend their musical practices beyond functional harmony?

As for the selected methodological tool, I have first reviewed and illustrated the models of all authors and composers. Secondly, their practical applications by professional (composing) performers, including myself, are displayed and analyzed. Thirdly, all practices are evaluated, individually and in conjunction with one another. Finally, in chapters 4 and 5, compendia of patterns constructed with the discussed models are presented to demonstrate how they can add to the improviser's artistic palette.

Most of the models in the educational publications discussed in chapter 3 represent improvisational strategies based on intervallic orderings of pitches rather than on diatonic or modal scales. All five saxophonist-educators mention their relations to twelve-tone techniques: David Liebman, George Garzone, and John O'Gallagher explicitly, Jerry Bergonzi and Walt Weiskopf implicitly.
Liebman's (2013) definitions of terms and his step-by-step stratification of improvisational practices serve as a useful framework to articulate the (composing) improvisers' steps beyond traditional chord-scale techniques. His concept of non-tonal superimposition can be considered as a demonstration within jazz music of what composer and theorist Charles Wuorinen has called the "highly chromatic music of the present day" resulting from a "reconciliation of the two principles of pitch organization, content and order" (Wuorinen 1994: 9).
Bergonzi's (2000) intervallic approach facilitates the creation of unconventional melodic lines. For instance, applying variations to a random or conscious collection of intervals according to his suggested operations can be a fruitful start of a composer's writing process.
Just like Bergonzi, Garzone's (2009) approach, aimed at the creation of tone rows, largely depends on the (composing) improviser's *informed intuition*. Less experienced students might be confused by the strict playing rules on the one hand, and the absence of any theory of the harmonic implications on the other. However, the model enables musicians to create surprising melodic lines, particularly in a context without a stated harmony or with only a limited number of stationary chords.
Weiskopf's (2009) intervallic approach is useful as a step-by-step method to extend one's improvisations beyond conventional linear improvisation, guiding musicians from the

most inside to the more "outside" sounding triad pairs. Despite its obvious connections to functional harmony, it can serve as an effective tool to start making "educated steps" outside the stated chords to create an intended *harmonic vagueness*.
Bergonzi's (2006) concept of hexatonics – combinations of two triads – can be considered as a valuable addition to Weiskop's model. As a result of his intuitive approach, the triad pairs forming his hexatonic scales contain more variety than those in Weiskopf's model.
O'Gallagher's book (2013) offers a perspective on playing "outside the chords" that meets my motivation to undertake this research project. With his pragmatic approach of an analytical model related to twelve-tone music, he offers an alternative approach to intervallic improvisation in the form of a detailed and systematic model that is applicable both in twelve-tone and tonal contexts.

Chapter 4 discusses theoretical and practical aspects of Peter Schat's Tone Clock. This model consists of an inventory of twelve possible trichords that can be arranged to display all twelve pitches of the octave. The resulting twelve-tone rows represent the twelve hours of the Tone Clock. Examples of applications in jazz practices are discussed in pieces by bassist Theo Hoogstins, pianist Frank Carlberg, saxophonist John O'Gallagher, and myself.
In Theo Hoogstins' piece "7th Hour Blues", both the composed part and the bass improvisation are constructed with the twelve-tone row of the Tone Clock's seventh hour. By means of his permutations of the row, Hoogstins manages to deliberately avoid the typical "bluesy" sound in the theme in order to move away from the expected conventional harmonies.
Frank Carlberg's composition "Green Room", also based on Schat's Tone Clock, displays a much more complex structure than Hoogstins' "7th Hour Blues". Carlberg uses the structure of the row of the second hour to construct both the melodic lines and the vertical harmonies of the piece. Hereby he manages to combine the ordering principle of the twelve-tone row with the tonal content of trichords and tetrachords. I consider my improvisation in this piece an example of how twelve-tone operations can be played alongside already existing improvisational practices such as tonal chromaticism and traditional chord-scale techniques.
Likewise, the composed parts of O'Gallagher's piece, "Petulant Snoot", contain examples of the application of elements from the Tone Clock in both twelve-tone and tonal contexts. Yet, the construction of O'Gallagher's composition is even more complex than Carlberg's "Green Room", because it is based on elements from two different hours of the Tone Clock: the fifth and the sixth. The complexity of the composed parts is reflected

in O'Gallagher's alto saxophone solo, containing fragments in which twelve-tone and tonal applications of the fifth hour can be identified.

In all three examples, twelve-tone operations can be defined, predominantly in the composed parts. As for the solos, the fragments where twelve-tone techniques are intentionally applied to the rows of the Tone Clock hours are relatively short. Rather than limiting themselves to strictly use the Tone Clock hours at stake, the soloists are freely connecting them to their informed intuitive habits of embellishing pentatonic scales (Hoogstins), playing tonal and non-tonal superimpositions (De Graaf, O'Gallagher), or creating high-density chromatic textures (O'Gallagher). I consider these practices as illustrations of Schat's idea of the Tone Clock as a way to connect the twelve-tone techniques of atonal music with the more intuitive practice of tonal music.

In order to create a "controlled" environment in which both the compositions and the improvisations express the distinct colors of the separate Tone Clock hours, I composed my saxophone quartet "Carillon".
The three pieces discussed in chapter 3 ("Onsa", "Pontiac", and "Dicke Pitter") display conscious compositional applications of twelve-tone operations, varying from combinations of three distinct twelve-tone rows to construct melodic lines ("Onsa"), to operations in which segments of the row are used to create both horizontal melodies and vertical harmonies ("Pontiac"), and random combinations of the aforementioned techniques ("Dicke Pitter"). Examples of applied twelve-tone techniques are: octave displacements, transpositions, and the re-ordering of segments (such as trichords, or trichord combinations) from the basic rows. As an addition to Schat's suggested operations, I did not only combine the segments from the actual Tone Clock hours with their embedded steering hours, but also connected them to the rows of "foreign" hours in order to emphasize their characteristic dissonant ("Pontiac") or consonant ("Dicke Pitter") sound colors.

The responses of the soloists to the "suggestions for improvisations", appended to all movements of the piece, appear to be quite diverse. For instance, in my solo in "Onsa" I demonstrate my suggestions for improvisation on the first Tone Clock hour quite clearly, while in Van Haften's solo in "Pontiac" the reference to the fifth hour is far more intuitive. This observation relates to the concept of *informed intuition*, indicating that the allegedly spontaneous operations of (composing) improvisers in response to a variety of musical situations depend on a body of conscious or unconscious knowledge acquired by formal education, professional experience, cultural background, and taste.

In order to learn to apply twelve-tone techniques related to the Tone Clock, musicians have to learn to sacrifice at least temporarily some of their "natural" habits to allow and embed new and "controlled" elements. On the other hand, mastering these new techniques does not mean that they should break up with their existing practices. I consider improvising with the Tone Clock as a potential skill to enrich techniques to improvise outside the pre-given or imaginary chords. It is meant to become part of their informed intuition alongside the already existing practices. In other words, twelve-tone techniques can be used alongside existing compositional an improvisational practices.

Chapter 5 discusses Messiaen's modes of limited transposition as practical tools with the potential to help (composing) improvisers to transcend traditional tonal practices. In contrast to the twelve-tone rows of the Tone Clock hours, the individual characteristics of the seven modes are determined by their restrictive transpositional possibilities, their symmetric structures, and their ambiguous tonal colors.
Examples of performances by Nelson Veras, Bo van der Werf, Jasper Blom, and Steve Lacy are presented as practical jazz applications of Messiaen's modes.
Veras' particularly melodic applications of Messiaen's third (M3), fourth (M4), and sixth (M6) mode convincingly demonstrate their tonal ambiguities: by taking different degrees of the mode as pivot notes of temporal tonal centers, various embedded diatonic structures inside the modes can be highlighted.
In Van der Werf's complex composition "Calcutta", a variety of Messiaen's techniques, including non-retrogradable rhythms, are combined. The piece is based on the second (M2) and the sixth (M6) mode, but the soloists are also offered a succession of chord changes as a basis for their improvisations. In contrast to Veras, who only sparsely leaves the notes of the mode, Van der Werf continuously adds "foreign" notes, both in the composed and improvised parts. As a result, it is often difficult to identify the actual modes. In his solo, Van der Werf displays an interesting inside-outside-inside approach, taking the second mode (M2) as his point of departure for excursions into tonal structures inside and outside the mode.
Both in the composed and in the improvised parts, the ambiguous tonality of Messiaen's third mode (M3) is the main subject of Blom's composition "Let Give This Tree A Little Friend". As an addition to Van der Werf's operations, Blom displays Messiaen's concept of parallel harmonies, by playing (fragments of) M3 on top of each other, each one starting on a different degree of the mode. His tenor saxophone solo contains comprehensive operations with M3, highlighting the mode's characteristic ambiguous harmonic content. Altogether he manages to create an unconventional musical space, incorporating a clear relation between the composed and the improvised parts of his piece.

Lacy's composition "Prayer" is involved in this chapter to demonstrate that operations with Messiaen's modes can also be achieved in pieces with simple structures, with limited means, and in a small line-up. In addition to his emphasis on the particular colors of the fifth mode (M5) by playing frequent repetitions, Lacy applies Messiaen's modes to conduct ingenious contrapuntal operations.

In my composition "A Crow Calling" the ambiguous colors of the three parallel tonalities implied in M3 are found in a variety of mode embellishments, both in the composed parts and in the tenor saxophone solo. The harmonies in the melody and in the accompanying chords are exclusively constructed with notes from the mode. My tenor saxophone solo shows how the three symmetric minor/major tonal centers, intertwined with the embellishments in the bass lines, can become a fruitful source for melodic improvisation.
Because a composition based on Messiaen's sixth mode (M6) is lacking in the examples discussed so far, I decided to use this mode to compose "Sparrows". In the composed parts of this piece I frequently refer to the augmented fourth interval that is quite prominent in this mode.
In my composition "Dicke Luft" the application of the second mode (M2) is only used in the last part of my solo. On top of a static pedal point, played by the rhythm section, I intuitively whirl around the exact content of the actual mode, freely switching between embellishments (defined here as scale variations) of the basic notes of the mode, its implied dominant-seventh chord with alterations, and, eventually, a superimposed major-seventh chord.

Just like the applications of the Tone Clock hours in chapter 4, all discussed works in chapter 5 illustrate the potential applications of Messiaen's modes to enrich the jazz musicians' palette beyond functional harmony. However, compared to the twelve-tone techniques, in Messiaen's modes, references to (ambiguous) tonal colors are omnipresent. Hence they can help (composing) improvisers to add an intended "harmonic vagueness" to their music.
Yet, it should be noted that, in the strict sense, the addition of notes outside the actual modes, found in all pieces analyzed here, does not match Messiaen's original aim of "never leaving the notes of the modes." However, although I usually advise other musicians to avoid the adding of "foreign" notes as much as possible, I simply cannot disapprove of these additions if combined explicitly or intuitively with existing improvisational techniques; these operations are typical representations of how jazz practitioners are used to import new elements in order to broaden their musical space. However strict the rules of the newly imported techniques are, the curious (composing)

improvisers are free to adapt and transform them, which is simply one aspect of a creative process.

After a summary overview of the relations between Messiaen's modes and traditional harmony, a generative compendium of melodic patterns is presented. By commenting on characteristic (steering) intervals, on relations with other modes, and on implied harmonic structures, I intend to motivate and help musicians to use these patterns as a point of departure for their individual applications.

To end the journey I have embarked upon in this study, chapter 6 contains more concrete and up-to-date results: a coda in the form of a number of recent recordings.

SAMENVATTING

Deze studie gaat over de toepassing van geavanceerde compositie- en improvisatietechnieken die dienen om musici op het gebied van eigentijdse jazz te helpen om zich met hun composities en improvisaties buiten de grenzen van de functionele harmonie en de gebruikelijke "chord-scale" aanpak te begeven.

Alhoewel de jazz van vandaag de dag lijkt op een herberg waarin muzieksoorten uit omringende muzikale werelden een nieuwsgierig en gastvrij onthaal krijgen, blijft de relatie tussen de geimproviseerde lijnen en de onderliggende harmonieën een belangrijk structureel element. Als gevolg van dit "all-inclusive" karakter van de jazz, is het nodig om de traditionale harmonische benadering van jazzimprovisatie te heroverwegen. Deze studie is ingegeven door een kwestie die niet alleen mij, maar ook mijn collega's en studenten bezig houdt, namelijk dat de grenzen van de conventionale "chord-scale" aanpak in zicht lijken te komen. Om gelijke tred te houden met de recente ontwikkelingen in de jazz, kunnen de geavanceerde compositie- en improvisatie-technieken die in deze studie worden toegepast een belangrijke bijdrage leveren. In plaats van als vervanging van de functionele harmonieleer waarop veel van de jazz nog grotendeels gebaseerd is, kunnen ze als een aanvulling op deze conventionele technieken worden toegepast.

Bezien vanuit het oogpunt van de Europese klassieke muziektraditie, die, samen met de blues en de work songs, een basisingrediënt was van de jazz als cross-overmuziek *avant la lettre*, kunnen de harmonische aspecten in deze studie beschouwd worden in het verlengde van de historische ontwikkeling van de klassieke muziek. Voor musici die zich constant willen ontwikkelen door hun artistieke palet te verbreden, kan de toepassing van modale en twaalftoonstechnieken van twintigste-eeuwse componisten van kunstmuziek een welkome aanvulling zijn op hun bestaande "jazz tools". Maar omdat het naief zou zijn om te denken dat alleen het aanbieden van een aantal nieuwe tools voldoende zou zijn om de jazz te vernieuwen, analyseer ik in deze studie ook zes voorbeeldige publicaties van toonaangevende jazzartiesten en -docenten over geavanceerde compositie- en improvisatietechnieken. Ik doe dit niet alleen om een verantwoorde context voor mijn studie te creëren in de vorm van reeds bestaande "alternatieve" jazz modellen, maar vooral ook omdat ik benieuwd ben hoe deze zich verhouden tot de twaalftoons- en modale technieken van de twee klassieke componisten die ik als onderwerp voor mijn onderzoek heb genomen: Peter Schat en Olivier Messiaen.

De ideeën van de Nederlandse bassist en componist Theo Hoogstins over zijn toepassingen van twaalftoonstechnieken uit Peter Schat's Toonklok (1993) vormden mijn eerste inspiratie tot het beginnen van dit onderzoek. Een opname van een masterclass door gitarist Nelson Veras op het Conservatorium van Amsterdam vormde de aanleiding om Olivier Messiaen's "modes of limited transposition" (1956) te bestuderen, als een tweede bron ter verrijking van het artistiek palet buiten de traditionele harmonieleer.

Op grond van de hierboven uiteengezette overwegingen ben ik gekomen tot de volgende onderzoeksvraag: In hoeverre kunnen de geavanceerde jazzmodellen van experts in de jazzeducatie, en toepassingen van seriële compositietechnieken uit de westerse kunstmuziek componisten en uitvoerende musici in de jazz helpen om hun muzikale vaardigheden uit te breiden voorbij de grenzen van de functionele harmonieleer?

Wat betreft mijn onderzoeksmethode ben ik als volgt te werk gegaan. Eerst bespreek ik de modellen van alle auteurs en componisten en illustreer ik ze met voorbeelden. Ten tweede beschrijf ik praktische toepassingen van deze modellen door professionele componisten en improvisatoren, waaronder die van mijzelf. Ten derde evalueer ik de praktische toepassingen van alle modellen afzonderlijk en in samenhang met elkaar. Tenslotte presenteer ik in de hoofdstukken 4 en 5 compendia met "patterns" die zijn geconstrueerd met behulp van de besproken modellen, om te laten zien hoe ze kunnen bijdragen aan de verbreding van het artistiek palet van de improvisator.

De meeste modellen in de educatieve publicaties in hoofdstuk 3 bevatten improvisatie-strategieën die gebaseerd zijn op intervalrelaties tussen de noten, in plaats van op diatonische of modale toonladders. Van de jazzdocenten, alle vijf saxofonisten, vermelden David Liebman, George Garzone, and John O'Gallagher de relaties van hun modellen met twaalftoonstechnieken expliciet. Jerry Bergonzi and Walt Weiskopf doen dat slechts impliciet.
Liebmans (2013) terminologieën en zijn stapsgewijze inventarisatie van improvisatietechnieken kunnen dienen als een nuttig stappenplan voor de (componerende) improvisator om de grenzen van de traditionele "chord-scale" techniek te overschrijden. Zijn concept van *non-tonal superimposition* kan dienen als een voorbeeld van wat componist en theoreticus Charles Wuorinen (1994) de "in hoge mate chromatische muziek van vandaag de dag" heeft genoemd die het gevolg is van de "verzoening" van de twee muzikale systemen: het tonale systeem, gebaseerd is op de betekenis van de noten en het twaalftoonssysteem, gebaseerd op de volgorde de noten.

Bergonzi's (2000) intervalsysteem maakt het gemakkelijk om onconventionele melodische lijnen te creëren. Zo kan het toepassen van variaties op een willekeurige of bewust gekozen verzameling intervallen volgens zijn spelregels een nuttige start zijn van het schrijfproces van een componist.
Net als Bergonzi, richt ook Garzone (2009) zich op het creëren van toonreeksen en is het effect van zijn aanpak grotendeels afhankelijk de *informed intuition* van de (componerende) improvisator. Vanwege de strikte spelregels enerzijds en het ontbreken van enige theorie wat betreft de harmonische implicaties anderzijds, kan zijn methode problematisch zijn voor minder ervaren musici. Hoe dan ook, het model kan musici helpen om verrassende lijnen te creëren, vooral in een situatie zonder of met een beperkt aantal (statische) akkoorden.
Weiskopf's (2009) intervalmethode stelt musici in staat om zich buiten het pad van de gebruikelijke "chord-scale" methode te begeven, door ze stap voor stap van de meest "inside" naar de meest "outside" klank van zijn "triad pairs" te leiden. Ondanks het feit dat zijn model sterk gerelateerd is aan de functionele harmonieleer, biedt het de musici een degelijk stappenplan om "outside the chords" te spelen om zo opzettelijk een harmonische vaagheid creëren.
Bergonzi's (2006) "hexatonics" – combinaties van twee drieklanken – beschouw ik als een waardevolle aanvulling op Weiskopfs model. Door zijn meer intuïtieve aanpak klinken zijn combinaties van drieklanken gevarieerder dan die van Weiskopf.
O'Gallaghers (2013) methode biedt een benadering van het "outside the chords" spelen die goed aansluit bij de motivatie voor mijn onderzoeksproject. Met zijn pragmatische aanpak van een model dat gerelateerd is aan twaalftoonsmuziek biedt hij een alternatieve benadering van het improviseren met intervallen in de vorm van een gedetailleerd en systematisch model dat zowel toepasbaar is in een twaalftoons- als in een tonale omgeving.

Hoofdstuk 4 behandelt theoretische en praktische aspecten van Peter Schats Toonklok. Zijn model bestaat uit een verzameling van twaalf verschillende drieklanken die zo gerangschikt kunnen worden dat ze alle twaalf tonen van het octaaf omvatten. De zo ontstane twaalftoonsreeksen vertegenwoordigen elk een uur van de Toonklok. Voorbeelden van toepassingen in jazzcomposities en -improvisaties worden besproken aan de hand van stukken van bassist Theo Hoogstins, pianist Frank Carlberg, saxofonist John O'Gallagher en van mijzelf.
In Theo Hoogstins compositie "7th Hour Blues" zijn zowel het gecomponeerde gedeelte als zijn improvisatie op de contrabas opgebouwd met de reeks van het zevende uur van de Toonklok. Door middel van zijn permutaties van deze reeks slaagt Hoogstins erin om de

typische "bluesy" sound in het thema te vermijden om zodoende afstand te nemen van de gebruikelijke functionele harmonieën.
Frank Carlbergs compositie "Green Room" is ook gebaseerd op de Toonklok, maar dit stuk heeft een veel complexere structuur dan "7th Hour Blues". Carlberg gebruikt de structuur van de reeks van het tweede uur voor de constructie van zowel de melodielijnen als de akkoorden. Hierdoor slaagt hij erin om de serialiteit van de twaalftoonsreeks te combineren met de tonale inhoud van zijn drieklanken en vierklanken. Mijn improvisatie in dit stuk kan beschouwd worden als een voorbeeld van hoe twaalftoonsoperaties gebruikt kunnen worden naast meer conventionele improvisatietechnieken zoals tonale chromatiek en traditionele "chord-scale" patterns.
Ook de gecomponeerde gedeeltes in O'Gallagher's stuk "Petulant Snoot" bevatten voorbeelden van de toepassing de Toonklok in zowel twaalftoons- als tonale situaties. De constructie van O'Gallaghers stuk is complexer dan van Carlbergs "Green Room", omdat het gebaseerd is op onderdelen uit twee verschillende uren van de Toonklok: het vijfde en het zesde. De complexiteit van de compositie wordt weerspiegeld in O'Gallaghers altsaxofoon solo, die fragmenten bevat waarin zowel twaalftoons- als tonale toepassingen van het vijfde uur kunnen worden aangewezen.

De toepassing van twaalftoonstechnieken in de drie besproken voorbeelden is het duidelijkst in de gecomponerde gedeeltes. In de solo's zijn de fragmenten waarin twaalftoonstechnieken opzettelijk zijn toegepast op de uren van de Toonklok relatief kort. Wel slagen de solisten er in om de twaalftoonselementen vrijelijk te combineren met hun door kennis en ervaring ontwikkelde gewoontes als het omspelen van pentatonische ladders (Hoogstins), het spelen van tonale en niet-tonale superimposities (De Graaf, O'Gallagher), of het creëren van chromatische lijnen met een dichte textuur (O'Gallagher).

Met de bedoeling om een "gecontroleerde" omgeving te creëren waarin zowel in de composities als de improvisaties de afzonderlijke uren van de Toonklok bewust doorklinken, componeerde ik mijn saxofoonkwartet *Carillon*.
De drie delen die in dit hoofdstuk besproken worden ("Onsa", "Pontiac" en "Dicke Pitter") tonen bewuste compositorische toepassingen uit de twaalftoonsmuziek, variërend van het combineren van drie verschillende twaalftoonsreeksen ("Onsa"), tot het gebruiken van onderdelen uit de reeks om zowel horizontale melodieën als verticale harmonieën te creëren ("Pontiac"), en willekeurige combinaties van deze technieken ("Dicke Pitter"). Voorbeelden van twaalftoonstechnieken die ik gebruikt heb zijn: registerveranderingen, transposities, en het hergroeperen van trichords en combinaties van trichords uit de reeksen.

De respons van de solisten op de "suggesties voor improvisaties" die toegevoegd zijn aan alle delen van de compositie, is wisselend. Ik zelf laat bij voorbeeld in mijn solo in "Onsa" mijn suggesties voor improvisaties met het eerste uur vrij letterlijk horen, terwijl de referentie aan het vijfde uur in Nils van Haftens baritonsaxofoonsolo in "Pontiac" veel intuïtiever is. Zijn solo kan gezien worden als illustratie van het concept *informed intuition*, om aan te geven dat de veronderstelde spontane handelingen van (componerende) improvisatoren, als reactie op uiteenlopende muzikale omstandigheden, afhankelijk zijn van een hoeveelheid bewuste of onbewuste kennis die het resultaat is van formele scholing, professionele speelervaring, culturele achtergrond en smaak.

Om de twaalftoonstechnieken van de Toonklok onder de knie te krijgen, moeten musici leren om tenminste tijdelijk af te zien van hun "natuurlijke" gewoontes, teneinde nieuwe en "gecontroleerde" elementen toe te laten en te laten beklijven. Daarentegen betekent het zich eigen maken van deze nieuwe technieken niet dat deze ten koste moeten gaan van hun bestaande manier van spelen. Ik beschouw het improviseren met de Toonklok als een belangrijke techniek ter verrijking van de mogelijkheden van musici om "outside the chords" te spelen. Hij moet een plaats krijgen in hun muzikale bagage en gebruikt worden naast hun bestaande vaardigheden, om uiteindelijk onderdeel te worden van hun *informed intuition*. In andere woorden, twaalftoonstechnieken kunnen gebruikt worden naast bestaande compositie- en improvisatievaardigheden.

Hoofdstuk 5 behandelt Messiaen's "modes of limited transposition" als praktische hulpmiddelen om (componerende) improvisatoren te helpen buiten de grenzen van hun tonale gewoontes te treden. In tegenstelling tot de twaalftoonsreeksen van de Toonklok worden Messiaens zeven modi gekenmerkt door hun individuele symmetrische structuren en ambigue tonale kwaliteiten.
Als voorbeelden hiervan worden toepassingen in de jazzpraktijk van gitarist Nelson Veras en de saxofonisten Bo van der Werf, Jasper Blom en Steve Lacy gepresenteerd.
Veras geeft overtuigende demonstraties van de tonale ambiguïteit van de derde (M3), vierde (M4) en zesde (M6) modus. In zijn melodische omspelingen gebruikt hij verschillende trappen van de modi als grondtonen van tijdelijke tonale centra. Daarmee laat hij de verschillende diatonische structuren die ingebed zijn in de modi, duidelijk horen.
In zijn complexe compositie "Calcutta" combineert van der Werf verschillende compositietechnieken van Messiaen, waaronder die van de *non-retrogradable rhythms*. Het stuk is gebaseerd op de tweede (M2) en de zesde (M6) modus, maar de solisten krijgen daarnaast ook een akkoordenschema om over te improviseren. In tegenstelling

tot Veras, die maar zelden andere noten dan die uit de modus speelt, voegt Van der Werf voortdurend "vreemde" noten toe, zowel in zijn compositie als in zijn solo, waardoor het soms moeilijk is te bepalen welke modus er gebruikt wordt. Ook demonstreert hij een interessante "inside-outside-inside" toepassing door de tweede Messiaense modus (M2) als uitgangspunt te nemen voor uitstapjes naar de tonale structuren binnen en buiten de modus.
Zowel in de gecomponeerde als in de geïmproviseerde gedeeltes van Bloms compositie "Let's Give This Tree A Little Friend" is de ambigue tonaliteit van Messiaen's derde modus een belangrijk kenmerk. Als aanvulling op Van der Werfs technieken gebruikt Blom Messiaen's concept van parallelle harmonieën, waarin de instrumentalisten tegelijk (fragmenten uit) de modus spelen, ieder vanaf een andere noot. Zijn solo op de tenorsaxofoon bevat uitgebreide toepassingen van M3 waarin het ambigue harmonische karakter van de modus wordt benadrukt. Al met al slaagt hij erin om een onconventioneel muzikaal beeld te creëren waarin de relatie tussen de gecomponeerde en de geïmproviseerde gedeeltes van zijn stuk duidelijk waarneembaar is.
Lacys compositie "Prayer" heb ik in dit hoofdstuk opgenomen als een voorbeeld van hoe met het gebruik van Messiaens modi ook in stukken met een eenvoudige structuur en in een kleine bezetting een overtuigend resultaat kan worden bereikt. Niet alleen door de vele herhalingen benadrukt hij de bijzondere kleuren van Messiaens vijfde modus (M5), hij gebruikt de Messiaense modi ook voor het creëren van vernuftig contrapunt.

In mijn compositie "A Crow Calling" klinken de ambigue kleuren van de drie parallelle tonaliteiten van de derde Messiaense modus (M3) door in de diverse omspelingen ervan, zowel in de gecomponeerde gedeeltes als in mijn tenorsaxofoon solo. Daarin blijken de drie symmetrische ambigue tonale centra, in samenspel met de omspelingen van de modus in de baslijn, een vruchtbare bron voor melodische improvisatie.
Omdat een compositie gebaseerd op de zesde modus (M6) tot nu toe ontbrak in de getoonde voorbeelden, besloot ik om deze modus te gebruiken voor het schrijven van "Sparrows". In de gecomponeerde gedeelten van dit stuk maak ik veelvuldig gebruik van het interval van de overmatige kwart, dat prominent aanwezig is in deze modus.
In mijn compositie "Dicke Luft" pas ik Messiaens tweede modus (M2) toe in het laatste gedeelte van mijn solo. De ritmesectie speelt daar een *pedal point* waarboven ik me intuïtief in de modus rondbeweeg. Daarbij schakel ik vrijelijk over van variaties met de noten uit de modus, het dominant-septiemakkoord met alteraties dat in de modus besloten is en, met intuïtief toegevoegde noten, de superimpositie van een majeur septiemakkoord.

Net als de voorbeelden van de Toonklok in hoofdstuk 4, illustreren de besproken werken in hoofdstuk 5 de mogelijkheden van toepassing van Messiaens modi om het artistiek palet van de jazzmusicus te verrijken buiten de grenzen van de functionele harmonieleer. Echter, vergeleken met de twaalftoonstechnieken in hoofdstuk 4, ligt in de toepassingen van Messiaens modi veel vaker de nadruk op hun (ambigue) tonale kleuren. Hierdoor zijn ze voor (componerende) improvisatoren geschikt als hulpmiddel om hun muziek van een gewenste harmonische vaagheid te voorzien.

Overigens moet worden opgemerkt dat, strikt genomen, het toevoegen van niet modus-eigen noten, zoals het geval is in alle hier besproken werken, niet strookt met Messiaens voorschrift om nooit buiten de noten van de modus te treden. Echter, alhoewel ik andere musici gewoonlijk adviseer om dit soort toevoegingen zo veel mogelijk te vermijden, keur ik ze geenszins af. Immers, dit soort vaak intuïtieve handelingen zijn illustratief voor de gebruikelijke zoektocht van jazzmusici naar nieuwe technieken die aan de bestaande kunnen worden toegevoegd, ter verbreding van hun muzikale ruimte. Hoe strikt de oorspronkelijke regels van de geïmporteerde technieken ook mogen zijn, het staat de nieuwsgierige (componerende) improvisatoren vrij om ze, als deel van het creatieve proces, geschikt te maken voor eigen gebruik.

Na een korte samenvatting van de relaties tussen Messiaens modi en de traditionele harmonieleer, volgt een generatief compendium van melodische "patterns". Door middel van mijn toelichtingen op hun karakteristieke (sturende) intervallen, op hun relaties tot andere modi en op hun ingebedde harmonische structuren, wil ik andere musici stimuleren om deze patterns te gebruiken als startpunt voor hun eigen toepassingen.

Tot besluit van de reis die ik begonnen ben met dit onderzoeksproject, toon ik in hoofdstuk 6 meer concrete resultaten: met een coda in de vorm van een aantal recente geluidsopnamen.