

Menne Smallenbroek

**Harmonic Textures
Rhythmic-driven Multi-layered Patterns
for Baritone Saxophone**

MMIA. 2016

Dissertação para a obtenção do grau de Mestre
em Música - Interpretação Artística
Especialização em Saxofone

Orientador – Professor Doutor Miguel Ribeiro-Pereira

Co-orientador – Professor Doutor Gilberto Bernardes

I dedicate this work to my parents,
Karin Hofstede and Tinus Smallenbroek,
with all of my love and gratitude.

Acknowledgements

Foremost, I would like to thank my advisor, Professor Miguel Ribeiro-Pereira, whose expertise, patience, and guidance accompanied me during the process of writing this document. I have always considered myself to be a performer, not a writer. However, you have shown me the potential where I could benefit both.

I would like to express my heartfelt gratitude to my co-advisor, Gilberto Bernardes, for so selflessly offering me his valuable time and knowledge. I am indebted for the many careful alterations and the endless technical assistance to my work. I would never have been able to finish this dissertation without your encouragement.

I am immensely grateful to my teacher and mentor of the last ten years, Henk van Twillert. Your support, musicality, and friendship have ultimately led me to the completion of this document. Thank you for believing in me, even in moments when I doubted myself the most.

I would also like to thank my teachers. To Fernando Ramos, thank you for the countless late night discussions we had in the past seven years. Your friendship and love for music have always inspired me throughout my musical discourse. To Jaap Dijkhuizen, thank you for teaching me how to play the saxophone.

To Anna Gonçalves, for your love and support.

To all my brothers and sisters: Anne, Jessa, Shouad, Rowald, Hassan, Ikram, and Sarah.

I would like to thank all my friends and colleagues that helped me greatly throughout these years, especially Tiago Ralha, Tiago Candal, and Rui Pinto Leite.

keywords

baritone saxophone, extended techniques, alternate fingerings, harmonic textures.

abstract

Since its invention, the saxophone family has expanded remarkably in regard to extended performance techniques, with sound itself at its nucleus. In the last decades, these techniques, such as multiphonics, overtones, and bisbigliando, have been documented extensively throughout countless manuals. Be that as it may, there will always be innovative developments that require imaginative documentation.

This thesis aims at providing a systematic documentation for a technique, entitled harmonic textures, which explores the left and right hand fingerings as separate entities in order to accomplish a rhythmic-driven texture.

I created a diagram with all the possible fingerings for the lowest chromatic scale on the baritone saxophone. These diagrams then served as resource material for both improvisations and arrangements of existing literature. Harmonic textures were developed as a new musical discourse that could be used for new repertoire for baritone saxophone.

palavras-chave

saxofone barítono, técnicas estendidas, chaves alternativos, texturas harmônicas

resumo

Desde a sua invenção, o saxofone tem sido alvo de uma grande trabalho de pesquisa sobre as suas técnicas performativas, com especial foco na exploração de novas sonoridades. Nas últimas décadas, técnicas como multifônicos, harmônicos, e bisbigliando, têm sido documentadas extensivamente em variados manuais. No entanto, haverá sempre possíveis desenvolvimentos que exigem documentação.

Esta tese tem como objetivo fornecer documentação sistemática de uma técnica, designadas de texturas harmônicas, que explora dedilhações distintas entre as mãos esquerda e direita, a fim de realizar texturas sobre bases rítmicas.

Eu criei diagramas para todas as dedilhações possíveis para a oitava mais grave do registo do saxofone barítono. Estes diagramas serviram posteriormente de material de base para a improvisação sobre, e arranjo de, composições musicais existentes. Texturas harmônicas foram desenvolvidas como um novo discurso musical que poderá ser usado em repertório original para saxofone barítono.

| | | |
|--------------------------|-----|---------------------------------------------------------------------------------|
| table of contents | Pg. | |
| | xii | List of Tables and Figures |
| | xv | Media contents |
| | | 1. Introduction |
| | 1 | 1.1. Motivation |
| | 4 | 1.2. Approach |
| | 5 | 1.3. Outline of the dissertation |
| | | 2. Extended techniques for saxophone |
| | 7 | 2.1. Introduction on extended techniques for saxophone |
| | 8 | 2.1.1. Harmonic textures |
| | 11 | 2.2. Review of the related literature |
| | 11 | 2.2.1. Multiphonics |
| | 16 | 2.2.2. Trills and bisbigliando |
| | 19 | 2.2.3. Polyrhythms on the saxophone |
| | 20 | 2.2.4. Key percussion |
| | 21 | 2.2.5. Circular breathing |
| | 22 | 2.2.6. Overtones |
| | 23 | 2.2.7. Extended techniques related to harmonic textures |
| | | 3. A systematic approach to harmonic textures for the baritone saxophone |
| | 26 | 3.1. Introduction on harmonic textures |
| | 27 | 3.2. Fundamentals |
| | 30 | 3.3. Fingering possibilities |
| | 32 | 3.4. Notating techniques for cross-fingerings |
| | 35 | 3.4.1. Notating techniques for harmonic textures |
| | 40 | 3.4.2. Explanation on the fingering diagram for harmonic textures |
| | 42 | 3.4.3. List of symbols |
| | | 4. Application of harmonic textures |
| | 43 | 4.1. Introduction |
| | 44 | 4.2. Trends at Odds |
| | 50 | 4.3. À Proa de José Afonso |
| | | 5. Conclusion |
| | 55 | 5.1. Summary and original contributions |
| | 57 | 5.2. Future Work |
| | 59 | Bibliography |
| | | Appendixes |
| | | A. Fingering diagrams for harmonic textures. |
| | | B. À Proa |
| | | C. Trends at Odds |

List of Tables

Table

1. 1st and 2nd level of partial differentiation in multiphonics (based on Weiss & Netti, 2010).
2. Fingerings used for harmonic textures
3. Symbols used in the fingering diagrams of harmonic textures.
4. Accidentals used in the fingering diagrams of harmonic textures.
5. Movements of Trends at Odds
6. Structure of *À Proa*, presenting the consecutive layers of the arrangement.

List of Figures

Figure

1. *Graffito sul mare* for soprano saxophone by Salvatore Sciarrino (2003).
2. *Argo* for saxophone solo by Mauricio Sotelo (1997).
3. *Materie oscura* for alto saxophone and ensemble by Nadir Vassena (2009).
4. *Concertino for Horn and Orchestra in E minor*, op. 45 by Carl Maria von Webber (1815).
5. *Sonate Pour Saxophone-alto et Piano* by Edison Denisov (1970)
6. *Sequenza IXb* for alto saxophone by Luciano Berio (1980).
7. *Les Sons Multiples Aux Saxophones* by Kientzy (1982).
8. Multiphonics in *Hello! Mr. Sax* by Jean-Marie Londeix (1989).
9. Threshold tones for the baritone saxophone *The Techniques Of Saxophone Playing* by Weiss and Netti (2010).
10. Usage of a trill in *Fantasie Sur Un Theme Original* by Jules Demersseman (1860).
11. Trills in *Het Vocht Verdwijnt Niet Door Een Vrouw Te Nemen* by Chiel Meijering (2000).

12. Bisbigliando in *The Techniques of Saxophone Playing* by Marcus Weiss and Giorgio Netti (2010).
13. Bisbigliando in *Sequenza IXb* for alto saxophone by Luciano Berio (1981).
14. Bisbigliando in *Anubis et Nout* for bass or baritone saxophone by Gérard Grisey (1990).
15. *Stan for baritone saxophone* by Christian Lauba (2001).
16. *Sarasax* for baritone saxophone by Theodor Köhler (1998).
17. *Materie Oscura* for alto saxophone and ensemble by Nadir Vassena (2007).
18. Key percussion in *Summer Victim on a Train* for saxophone ensemble by Massimo Botter (2011).
19. Key percussion in *Delta Waves* for tenor saxophone by Malin Bång (2007).
20. *Stan* for baritone saxophone by Christian Lauba (2001).
21. Overtone spectrum up to the 16th partial of the natural harmonic series in *Top Tones for the Saxophone* by Sigurd M. Raschèr (1941).
22. Overtone exercises in *Top Tones for the Saxophone* by Sigurd M. Raschèr (1941).
23. Fundamentals used for harmonic textures for baritone saxophone.
24. Low A fundamental with key 1 fingering.
25. Natural harmonic series up to the 3rd partial based on the fundamental B flat.
26. *Graffito Sul mare* for soprano saxophone by Salvatore Sciarrino (2003).
27. *Argo* for saxophone solo by Mauricio Sotelo (1997).
28. *Argo* for saxophone solo by Mauricio Sotelo (1997).
29. *Materie Oscura* for alto saxophone and ensemble by Nadir Vassena (2009).
30. First attempt on notating harmonic textures.
31. Second attempt on notation, purely rhythmical.
32. Third attempt on notation with fingering indications.
33. Writing technique of harmonic textures in *À Proa* by José Afonso (2010)
34. Writing technique of harmonic textures in *Trends at Odds* by Menne Smallembroek &Tiago Ralha (2014)

35. The first attempt on the fingering diagrams of harmonic textures.
36. Fingering diagram attempt for harmonic textures.
37. Final fingering diagram for harmonic textures.
38. Fingering diagram for harmonic textures.
39. Fibonacci sequence in the snare drum in *Trends at Odds*.
40. Fibonacci sequence in the kick in *Trends at Odds*.
41. Pythagorean tree as layout for the sound design in *Trends at Odds*.
42. Harmonic textures in *Trends at Odds*.
43. Harmonic textures in *Trends at Odds*.
44. Harmonic textures in *Trends at Odds*.
45. Harmony in the guitar in *À Proa* by José Afonso
46. Harmonic textures as used in *À Proa*
47. Harmonic structure as presented in the arrangement of *À Proa*.
48. Screenshot of *À Proa* project in Ableton as presented during the Master's recital.

Media Contents

Harmonic Textures Recorded Examples

Audio: All the harmonic textures are listed corresponding to their number in the fingering diagrams.

Trends at odds

Audio: Saxophone samples, archive that was recorded during the workshops.

Video: *Trends at Odds*_#Σ Café Concerto performance June 6th 2014.

Trends at Odds, final recital July 9th 2014.

À Proa

Audio: A mixed version of *À Proa*.

Video: *À Proa*, final recital July 9th 2014.

Chapter 1. Introduction

I didn't find the baritone saxophone, it found me.

– Gary Smulyan

1.1. Motivation

The first and most traditional contact young saxophonists have with the instrument is commonly through the alto saxophone, which is partially explained by the fact that many students are not tall enough to reach all the keys of the remaining saxophones. The remaining members of the saxophone family – viz. soprano, alto, tenor, baritone, and bass – are normally approached at a more advanced stage of the students' education. Additionally, a few saxophonists specialize on specific members, such as the case of Gerry Mulligan and Henk van Twillert, whom focus solely on the baritone saxophone. That was not any different in my case. In my initial years of education, my saxophone teacher Jaap Dijkhuizen introduced me to the alto saxophone, which I played for five years. During this period, nonetheless, I never felt comfortable playing the alto saxophone and its standard repertoire. Contrarily, I felt “at home” when I first played the baritone saxophone.

After my early years of musical education, when I played both the alto and the baritone saxophone, I stopped playing the alto saxophone altogether and decided to solely focus on the baritone saxophone. Since then, the baritone saxophone has captured my complete attention.

Despite knowing that the baritone saxophone was a better fit for my musical expression, I continued to feel a disconnection between the standard repertoire for this instrument and my personal musical interest. In fact, concerning the repertoire, I had the same experience on the baritone saxophone as I did on the alto saxophone. As much as I struggled to adjust the repertoire to my likings, namely by transcribing non-original repertoire for the saxophone and actively collaborating with young composers, I still could not grasp the level of satisfaction I sought from the repertoire I was playing.

There was, however, one important exception: the extended techniques¹ for saxophone, and how it increased the potential of the instrument with new sounds. Studying and applying these extended techniques captured my entire attention. Naturally, I started improvising with the techniques thus acquired, and before I knew it, my hours were spent exploring new and exciting possibilities.

At this point in time, performers like the bass saxophonist Colin Stetson (2011) and the flutist Andreas Stahel (2008) were truly inspiring for me, particularly by their way of exploring rhythmic patterns.² Stetson and Stahel are known for exploring the extended techniques I was experimenting with at the time within an improvisational setting. Consequently, I started to learn and apply the rhythmic patterns derived from Stetson and Stahel and gradually developed new patterns adapted for the baritone saxophone. I was able to combine extended

¹ Extended techniques are contemporary performance techniques that regard the areas of the embouchure, the tongue, the fingers, and blowing on the saxophone (cf. Weiss & Netti, 2010).

² Miller & Shahriari (2006) define rhythmic patterns as “the lengths, or duration of sounds as patterns in time” (p. 41).

techniques that explore alternate fingerings³ – as used in multiphonics⁴ and bisbigliando⁵ – with polyrhythms. This was achieved through a long process of trial and error. When I was able to master these techniques, I was overwhelmed with excitement and realized that I would further explore the technique as the topic for my master’s research.

From the large spectrum of possible extended techniques I could work upon, I decided to focus on the exploration of rhythmic patterns, which are obtained by the autonomous use of the right hand against the left. In other words, an extended technique explores complex rhythmic patterns produced by simultaneously playing different patterns with the right and left hands. While searching for literature on this particular topic, I learned that a few saxophonists and composers had used these techniques. Nonetheless, I was not able to find much documentation on the subject, with the notable exception of *The Techniques of Saxophone Playing* by Marcus Weiss and Giorgio Netti’s (2010), which devotes no more than a paragraph regarding this subject.

While discovering the potential of this new material, which can undoubtedly contribute to many musical areas such as composition, education, and performance, I decided to fill a gap in the literature and extensively experiment and document the many possibilities of the technique on the baritone saxophone – my first and foremost instrument of choice.

³ Alternate fingerings are fingerings that are used in place of the conventional fingering for a given note, as used in multiphonics, bisbigliando, and microtones.

⁴ Multiphonics are sounds in which more than one distinct pitch is discernible, but produced on instruments traditionally considered monophonic (cf. Latham, 2011).

⁵ Londeix (1989) defines bisbigliando as “a natural technique for harp, a type of timbral trill: soft, subtle and rapid, bringing the sound alive from within, without noticeably modifying the pitch” (p. 46).

1.2. Approach

My early exploration combining extended techniques and rhythmic patterns led to the formalization of the concept of *harmonic textures*. The concept of harmonic textures, seminal to this document, will be used throughout this dissertation as a reference to the combination of the two above-mentioned techniques. Soon after the beginning of this project, I realized that I have been playing harmonic textures long before I had an understanding of the technique. However, within the saxophone literature, there was a lack of terminology to describe the technique, namely how it is played and its potential application in music. Recognizing this impasse was a key motivation to start this research. Thus, it became clear to me that I needed to elaborate a structural foundation behind harmonic textures to grasp its essence.

In order to explore harmonic textures in a systematic manner, I started researching existing literature on extended techniques for the saxophone, including the techniques portrayed in Weiss & Netti (2010). Their work on performance techniques, specifically on multiphonics and bisbigliando, is of indispensable value for this research. Furthermore, the work's of Kientzy (1982) and Londeix (1989) are two notable references that guided me in the preparation of this thesis.

The above-mentioned material allowed me to determine the groundwork on which the concept of harmonic textures was constructed. These references provided the basis of exploring new rhythmic textures on the baritone saxophone. In detail, my first and foremost objective was to determine a strategy to systematically explore combinations of alternative fingerings. These fingerings correspond to the chromatic scale on the low register of the

baritone saxophone. These notes, which I hereafter refer to as *fundamentals*,⁶ allowed me to explore rhythmic patterns by opening and closing different combinations of keys, while having a fixed closed fingering that corresponds to a specific fundamental. This approach explores the right and left hand fingerings as separate entities in order to achieve a rhythmic-driven texture and/or cross-rhythms.⁷

An additional aspect of this study concerns with the notation of the technique, which should allow performers and composers to recognize it through a universal musical representation. Concerning the notation of the technique, my main objective was to create a fingering chart in which all the possible combinations of fingering producing harmonic textures are identified by unambiguous symbols recognizable for musicians, particularly saxophonists. For each found combination of fingerings, a sound example will be provided and documented extensively in the thesis.

1.3. Outline of the dissertation

Chapter 1 describes the motivation and approach to this dissertation. It shows the need for a manual that details the many possibilities of harmonic textures in a systematic manner within the contemporary saxophone literature. Here the objective of the thesis is stated and briefly highlighted are some specifics of the concept.

Chapter 2 reviews the existing literature on extended performance techniques for

⁶ Within harmonic textures fundamentals indicate the closed fingering of the lowest chromatic scale on the baritone saxophone, as the basis of a texture.

⁷ Cross-rhythms result from the use of complementary rhythmic structures, for example of three against four equally spaced notes (Latham, 2011).

saxophone. These techniques are the foundation on which harmonic textures are built upon. The extended techniques seminal to this thesis are: multiphonics, trills and bisbigliando, polyrhythms for saxophone, key percussion, circular breathing, and overtones. A final section is added to highlight the correlation between these performance techniques and harmonic textures. Additionally, three works for saxophone are mentioned that are correlative to harmonic textures are discussed.

Chapter 3 details a systematic approach to the concept of harmonic textures. Here the substructure of the technique is examined concerning the fundamentals of each harmonic texture. The fingering possibilities are explored in consideration with the technical limitations of the instrument and a discussion about the musical notation is proposed. Furthermore, a manual of fingering diagrams for harmonic textures is provided, specifying all the fingerings of harmonic textures alongside their sounding results.

Chapter 4 illustrates the application of harmonic textures within two original works for baritone saxophone solo. First, it shows the approach and application of harmonic textures on the arrangement of *À Proa* by José Afonso. Also, harmonic textures is reviewed as a free improvisational tool that served as the foundation for an original composition written by Tiago Ralha and myself, entitled *Trends at Odds*.

Chapter 5 concludes the research on harmonic textures, summarizing the content of this document. It states advantages of the technique in comparison with conventional fingering techniques, and its shortcomings. This chapter also focuses on future work regarding harmonic textures.

Chapter 2. Extended techniques for saxophone

Just as Dionysus in Sicily sang the secret of the conch shell as he held it to his ear, so today's composer writes what he "hears" in the instrument, without recoiling or shying away from crudeness, strangeness of unprecedented sounds.

– Jean-Marie Londeix

2.1. Introduction on extended techniques for saxophone

Since the invention of the saxophone in 1840 by the Belgian Adolph Sax, numerous performance techniques have been developed. Since then, composers and saxophonists have continuously contributed to extend performance techniques towards unexplored sonorities. From its early days, the saxophone has had an important presence in the contemporary musical literature. The instrument's versatility has been capturing the attention of many composers, such as Luciano Berio, Karlheinz Stockhausen, Edison Denisov, Betsy Jolas, Ryo Noda, Thierry Escaich, Fuminori Tanada, and Christian Lauba, whom have been extensively exploring the potential of the instrument. In parallel to the work of composers, performers have also actively contributed to the development and versatility of the instrument. Among these, we can

highlight the classical saxophonists Marcel Mule, Jean-Marie Londeix, Claude Delange, Sigurd Raschèr, and Marcus Weiss, and the jazz saxophonists and free improvisers, such as John Coltrane, Evan Parker, Colin Stetson, Roscoe Mitchell, and Joshua Redman.

Within the classical tradition, saxophonists and composers have looked critically at the saxophone through different perspectives in order to fully explore its timbral possibilities, presenting extended techniques that have been developed in the realm of the contemporary music scene. Within the jazz tradition, the most striking influence to my artistic practice is related to the approach and structural organization these musicians adopt in relation to extended techniques. For example, in *Saxophone Solos* (1976), Evan Parker builds sonic tapestries around the idea of unsynchronized fingerings, or *cross-fingerings* according to his terminology, which is a natural extension of his approach to free improvisation. While the classical tradition offered me a deep knowledge about how to extend the timbral qualities of the saxophone, it is through the jazz tradition that I learned how to incorporate those techniques in musical discourse. Next, I will deepen this topic, starting by defining my understanding of these concepts.

2.1.1. Harmonic textures

Harmonic textures is indeed an already existing concept that addresses a selection of performance techniques for the baritone saxophone. This concept correlates to a similar technique and can be named *cross pattern fingerings* or *mixed fingering*. *Cross pattern fingerings* refer to an unconventional fingering technique in which the left and the right hand play autonomous rhythmic patterns, as used by saxophonists like Evan Parker (1976) and Colin Stetson (2011). Weiss & Netti (2010) refer to this technique as *mixed fingering*.

The only definition to be found of this technique is by Weiss & Netti (2010), who not only named the technique and describe its sonic result, but also explained in detail the need for a specific notation which avoids unnecessary information and clearly represents the sounding effect.

The technique of “mixed fingering” that goes well beyond simple trilling was explored in particular by the improviser Evan Parker. An attempt to notate the exact order of events in such playing, however, would result in a highly complex notation. Since a mix of the implied partial spectra of the instrument is in fact the aim of this performance technique, a tablature, or an action notation would be more appropriate, not the notation of the sound result (Weiss & Netti, 2010, p. 168).

Undoubtly, one can attribute the only definition and attempt to systematize the technique to Weiss, who worked closely with three composers that explored the technique. This is in reference to these particular pieces: *Graffito sul mare* (Salvatore Sciarrino, 2003, see Figure 1), *Argo* (Mauricio Sotelo, 1997, see Figure 2) and *Materia oscura* (Nadir Vassena, 2009, see Figure 3).



Figure 1. *Graffito sul mare* for soprano saxophone by Salvatore Sciarrino (2003).



Figure 2. *Argo* for saxophone solo by Mauricio Sotelo (1997).

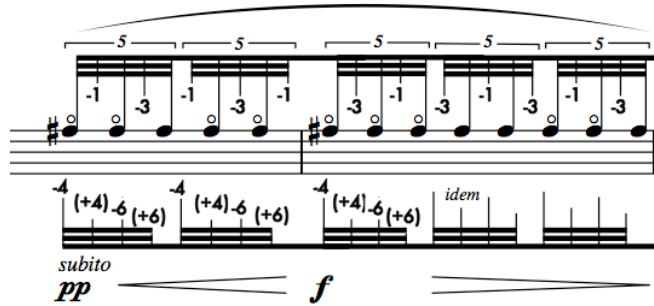


Figure 3. *Materie oscura* for alto saxophone and ensemble by Nadir Vassena (2009).

A noticeable difference between these three pieces is that they do not follow the same systematic approach to notate the same sonic phenomena. One can conclude then that even renowned composers, such as the three aforementioned ones, do not conform to a standard notation of a similar performance technique. Thus, a systematic documentation of the technique is required to establish a grounding representation that every saxophonist and composer can read and identify. Both *cross-pattern fingering* and *mixed-fingering* techniques are built around the same musical parameters and produce a similar result that will be addressed here interchangeably to refer to the same sonic phenomenon. These techniques are at the foundation of my research, which aims to create a handbook to systematize and synthesize the concept of harmonic textures within a composition or improvisational setting. In detail, the handbook will consist of a tablature of fingerings and a valuable guide for introducing composers and saxophonists to the performance and understanding of the technical basis of harmonic textures.

To explain the distinction between my concept of harmonic textures and existing extended techniques for the saxophone, I will start by describing a selection of extended techniques for the saxophone (Kientzy, 1982; Londeix, 1989; Weiss & Netti, 2010; Raschèr, 1941). These descriptions aim at providing a basis to further substructure my concept of harmonic textures.

2.2. Review of the related literature

A great variety of extended techniques exist for the saxophone. In this chapter, however, I will detail a selection of techniques that underpin my concept of harmonic textures for the baritone saxophone. The extended techniques I detail next are: multiphonics, trills and bisbigliando, polyrhythms, key percussion, circular breathing, and overtones. I start with a thorough description of the aforementioned techniques and subsequently define how and to what degree that they contribute to harmonic textures.

2.2.1. Multiphonics

Multiphonics are an extension to monophonic instruments towards the possibility of producing multiple simultaneous tones. Multiphonics can be produced on the saxophone in two different ways: by playing a note while singing into the instrument, or by changing conventional performance parameters such as alternate fingerings, embouchure adjustment, reed position, and air flow. Their resulting sound is a combination of multiple tones that are not part of the same harmonic series, thereby perceived as distinguishable notes being played at the same time.

Multiphonics are commonly found in music from the 20th century onwards. However, as shown in Figure 4, the technique was known for quite a while and can be found on *von Weber's Concertino for Horn and Orchestra*, which dates back to 1815.



Figure 4. *Concertino for Horn and Orchestra in E minor* by Carl Maria von Weber (1815), op. 45.

Among early adopters of multiphonics in the compositional process, we can pinpoint Luciano Berio's *Sequenza* (1958), and Franco Evangelisti's *Proporzioni* (1958). The first saxophone pieces adopting multiphonics, as shown in Figure 5 and 6, are the *Sonate Pour Saxophone-alto et Piano* (1970) by Edison Denisov and *Sequenza IXb* (1980) by Luciano Berio. Another typical example is the *Sequenza VIIIb*, which was transcribed for soprano saxophone by Claude Delange in 1993 with the full approval of Berio (Roberts, 2007).

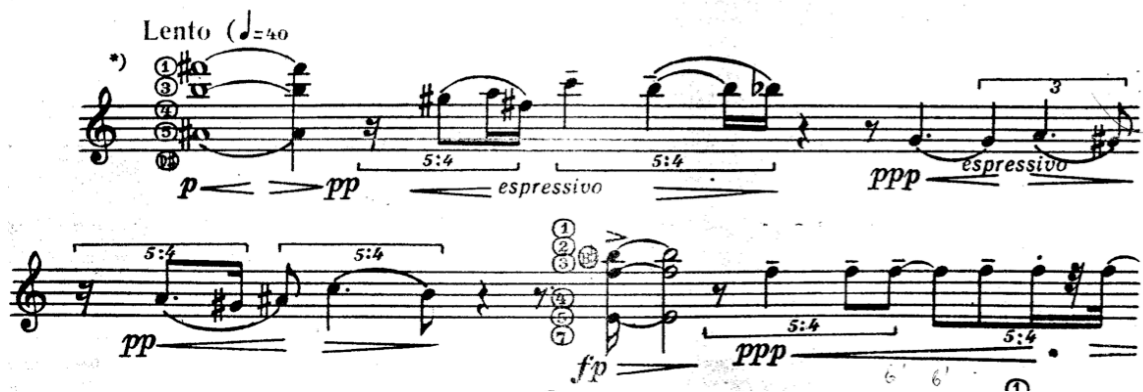


Figure 5. *Sonate Pour Saxophone-alto et Piano* by Edison Denisov (1970).



Figure 6. *Sequenza IXb* for alto saxophone by Luciano Berio (1980).

These works were written in times when no systematic documentations on multiphonic techniques were available. Composers such as Luciano Berio and Edison Denisov were obliged to work in a close collaboration with saxophonists, namely Claude Delange and Jean-Marie Londeix, to compensate the lack of documentation on multiphonics.

Today, to the best of my knowledge, there are three fundamental books detailing extended techniques for saxophone, and in particular multiphonics: Kientzy, 1982; Londeix, 1989; Weiss & Netti, 2010. The first manual detailing multiphonics is Kientzy's 1982 *Les Sons*

Multiples Aux Saxophones, where the author identified an extensive list of multiphonics for each member of the saxophone family, from the soprano to the bass saxophone. These multiphonics are presented in tables, as shown in Figure 7, and include the following information: written pitch (transposed notes as they are notated for the saxophonist), concert pitch, dynamic range, fingering, shakes, separate sounds, and other possibilities.

| N ^o Transp. | Sons | Répétition Nuances | Doigté | Batteries Possibles Avec | Sons séparés | Autres Possibilités | <u>BARYTON</u> |
|---------------------------|------|-----------------------|------------------|-------------------------------------------|-----------------|---------------------|----------------|
| 37 | | | X 2 4 5 | 16-35-36-38 40 (44) 45-46 53-74 | | | |

Figure 7. *Les Sons Multiples Aux Saxophones* by Kientzy (1982).

The next manual is *Hello! Mr. Sax* (1989) by Jean-Marie Londeix, which offers a new strategy for presenting and learning the multiphonics, organized according to an ascending chromatic pitch range, as can be observed in Figure 8. Overall, Londeix's proposal is mainly oriented towards the performer who focuses on learning new contemporary techniques, while Kientzy's proposal is more oriented towards composers, by providing a bigger number of examples (close to all possible combinations). However, many multiphonics are difficult to achieve.

Saxophone Baryton en Mib - Baritone in Eb

Figure 8. Multiphonics in *Hello! Mr. Sax* by Jean-Marie Londeix (1989).

Weiss & Netti's 2010 *The Techniques of Saxophone Playing* continued the work of Kientzy and Londeix in a more detailed manner. In addition to the previous meticulous manuals, Weiss and Netti catalogue their work using symbols to group collection of multiphonics that share common features, which they refer to as "families." Each multiphonic belongs to one of five categories, or families, which are organized according to its partials.⁸ These five families are then split into secondary sub-families, which organize multiphonics according to specific characteristics. The division into the five families and their subdivisions are summarized in Table 2. The first level of families is divided by the different qualities in vibrating behaviour of the multiphonics. Although divided into five different families in the first level, the authors concentrate on the families B, C, D, and E. Family A has been disregarded because, for the saxophone, it belongs within the realm of partials of the instrument that regards an embouchure technique known to every saxophonist. Elsewhere, such sounds are also called *son fondu* (Weiss & Netti, 2010, p. 60).

| 1 st level | |
|-----------------------|------------------------------------------------------|
| A | Layer of natural overtones over a fundamental |
| B | Sound with strong oscillation |
| C | Wide dyad, stable |
| D | Aggregate of two or more partials over a fundamental |
| E | Narrow dyad |

| 2 nd level | |
|-----------------------|---------------------------------------------------------------------------------------------------|
| Ba | Detuned octave and twelfth, creating a stable oscillation, open and fast; <i>p-ff</i> |
| CE | Dyad between a fourth and fifth, stable; <i>pp-p</i> |
| Ce | Dyad between a minor sixth and seventh, stable; <i>pp-p</i> |
| Cb | Approximately an octave, with the possible presence of the twelfth, usually unstable; <i>pp-p</i> |
| C | Between a minor ninth and an eleventh (octave+fourth), stable; <i>pp-mp</i> |

⁸ Partial is any pure tone that is a component of a complex tone (cf. Colman, 2008).

| | |
|---------|-----------------------------------------------------------------------------------------------------------------------------|
| D/ B | Wide multiphonic, usually built on a minor ninth (also second), partly oscillating; <i>mp-ff</i> |
| Da | Wide multiphonic, usually built on a ninth (also tenth, third or fourth, stable; <i>p-ff</i> |
| E | Triads; <i>ppp-p</i> |
| Eb | Seconds, as minor seconds usually oscillating strongly, with the possible presence of a low fundamental tone; <i>ppp-mp</i> |

Table 1. 1st level and 2nd level of partial differentiation in multiphonics (based on Weiss & Netti, 2010).

Another addition to the aforementioned material is the description of *threshold tones*. Threshold tones are the partials of a certain multiphonic that can be separated or played individually, used to enter or to exit a specific multiphonic. In a diagram, shown in Figure 9, the authors describe all the threshold tones, in chromatic ascending order, with the corresponding numbers of the specific multiphonics listed below.

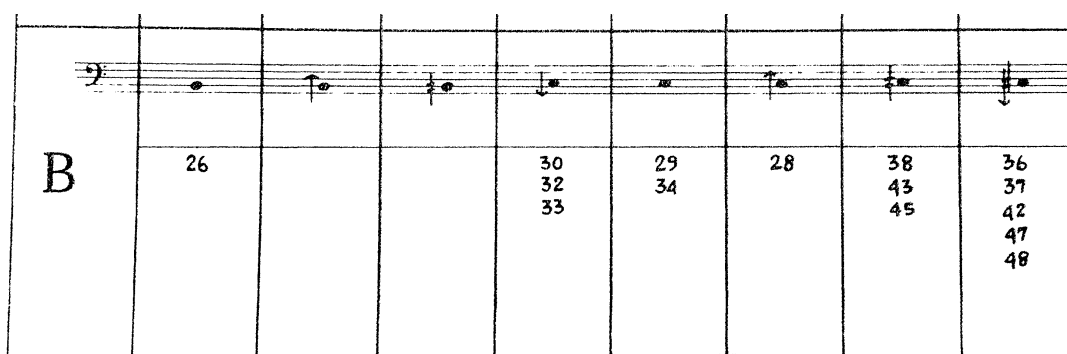


Figure 9. Threshold tones for the baritone saxophone *The Techniques Of Saxophone Playing* by Weiss and Netti (2010).

In summary, while Kientzy's manual is mainly oriented towards the composer and Londeix's to the performer, Weiss & Netti's manual is suitable for both parties. The latter showcases a wide-ranging method where an abstract concept like multiphonics has been broken down into little pieces, and thus becomes more accessible to performers and composers alike.

2.2.2. Trills and bisbigliando

Trills are musical ornaments that consist of rapid alteration between two notes. Their use can be found in both traditional and contemporary saxophone literature. Trills were originally presented in the Baroque period and are frequently used in compositions for the saxophone. In Figure 10 and 11, two examples are shown of trills within contemporary literature.



Figure 10. Usage of a trill in *Fantasie Sur Un Theme Original* by Jules Demersseman (1860).



Figure 11. Trills in *Het Vocht Verdwijnt Niet Door Een Vrouw Te Nemen* by Chiel Meijering (2000).

On the saxophone, a trill between two adjacent notes is a rather easy technique and is produced by alternately opening and closing the appropriate key. These trills tend to be stable in terms of intonation and can be produced in any dynamic. However, when trills contain a larger interval, they tend to lose their stability and the range of dynamics on which they can be produced gets narrower.

Not all trills, though, are equally easy to perform. In fact, instrument builders have continuously added new side keys to the saxophone to facilitate the performance of particular trills. As a result, these specific trills became very easy to perform at a considerably fast velocity (cf. Londeix, 1989). Additionally, most side keys on the saxophone are played with the upper part of the index fingers, which are motoric quite adept. For example, the trill produced

by using the side key *Ta* opens the *Bb*. The side key *Tc* indicates the opening of the C key. The *Tf* is played with the ring finger and opens the *F#* (please refer to Table 1 for a visual understanding of the keys nomenclature).

In addition to conventional trills, there exist alternate fingerings for each tone. These alternate fingerings slightly change the tone color and can be used to achieve an effect called bisbigliando. This is a soft, subtle trill where the tone color changes but not the note. Weiss & Netti (2010) refer to bisbigliando as timbral fingerings and, through diagrams, they show first the conventional fingering for the indicated pitch, followed by several alternate fingerings. For example, in Figure 12, the conventional fingering for a *D3* (*F* in concert pitch) is shown, followed by four alternate fingerings which change the tone color of the *D* without changing the pitch

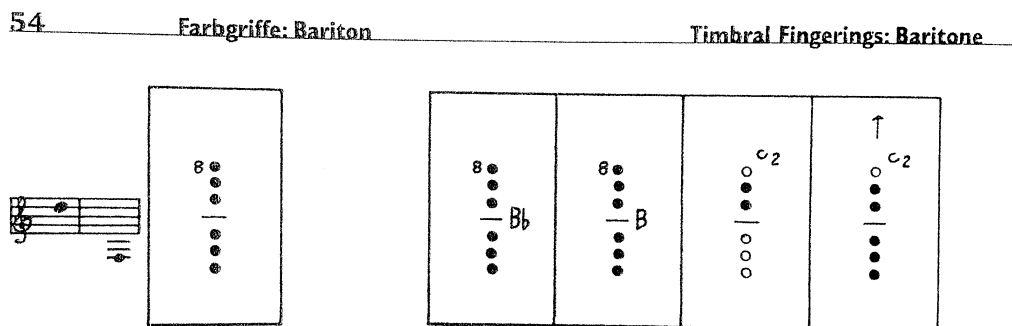


Figure 12. Bisbigliando in *The Techniques of Saxophone Playing* by Marcus Weiss and Giorgio Netti (2010).

Many composers in the contemporary saxophone literature frequently use bisbigliando. An early example, shown in Figure 13, can be found in Berio's (1981) *Sequenza IXb*. Here the exact fingering is indicated with the little diagrams above the notes. The *F sharp* is repeated several times with the addition of the low *B flat* and the low *C*.

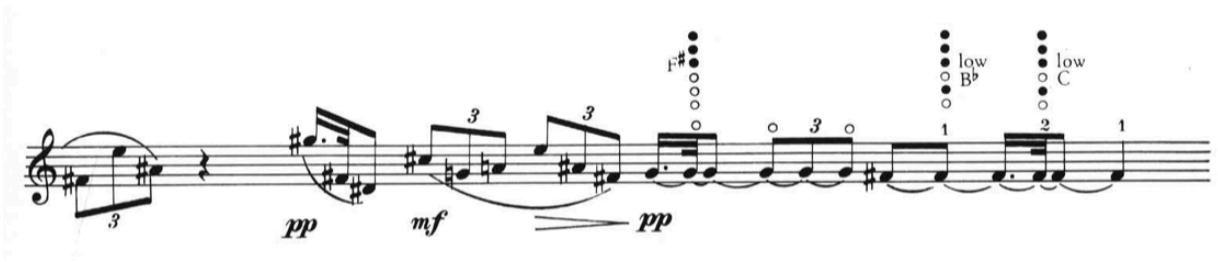


Figure 13. Bisbigliando in *Sequenza IXb* for alto saxophone by Luciano Berio (1981).

Another example of the use of bisbigliando can be found in *Anubis et Nout* (1990), as seen in Figure 14. The pitch continues unchanged while a timbral change is required, indicated in the lines with open notes above the staff. Often, the performer is left to choose an appropriate fingering for these bisbigliando. This choice mainly depends on the technical compatibility, tone color, embouchure, and small deviations of pitch according to the build of the instrument. For example, in Figure 15, the composer gives a clear indication of bisbigliando but does not write an indication of the appropriate fingerings.

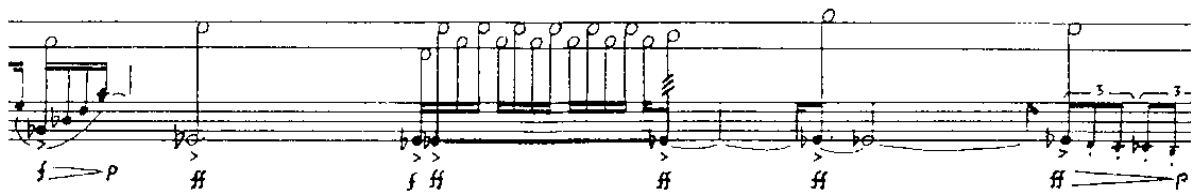


Figure 14. Bisbigliando in *Anubis et Nout* for bass or baritone saxophone by Gérard Grisey (1990).

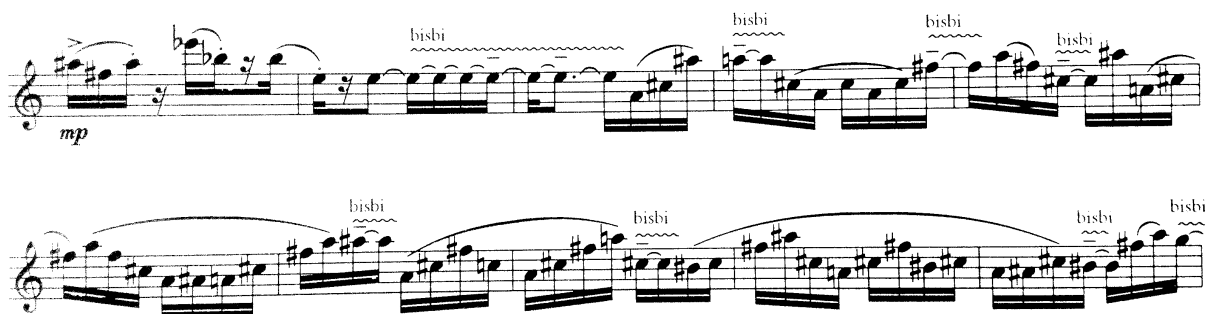


Figure 15. *Stan* for baritone saxophone by Christian Lauba (2001).

2.2.3. Polyrhythms on the saxophone

In the current saxophone literature, the use of polyrhythms is almost non-existent. Polyrhythms can only be suggested due to the limitations of the instrument. However, there are several examples to be found in which polyrhythms are attempted. In the first movement of *Sarasax*, polyrhythms clearly serve as the rhythmical structural. In Figure 16, at the 4th quaver in bar 15, an A flat has to be played at the same time as the C. Since this is not possible on the saxophone the composer has indicated that the A flat has to be played first, which results in the A flat being played as if a grace note. So instead of achieving the simultaneous existence of two conflicting rhythms, it only mimics polyrhythms on the saxophone.



Figure 16. *Sarasax* for baritone saxophone by Theodor Köhler (1998).

Another example, seen in Figure 17, where an attempt on polyrhythms on the saxophone can be found is *Materie Oscura* (2007). Here, alternate fingerings are used to have two rhythmical patterns coexist. The rhythmic patterns in the example below just indicate the fingering positions; the upper line for the left hand and the lower line for the right hand fingerings.



Figure 17. *Materie Oscura* for alto saxophone and ensemble by Nadir Vassena (2007).

2.2.4. Key percussion

Key percussion is pizzicato percussive-like effect that is produced by strongly tapping the keys without blowing into the saxophone. Due to the relatively large keys and the resonating body of the instrument, key percussion produces a clearly audible pitch. This effect is especially used when a softer dynamical range on the saxophone is required, ranging from *pp* to *p* depending on the key that is used. On the lower saxophones, the tenor, baritone, and bass saxophone, key clicks generally have a stronger sonic result, as opposed to the soprano and alto saxophone. In general, on most saxophones, the key percussive sounds in the lowest register work best. Key percussion is often used in the contemporary saxophone literature, as can be seen in Figure 18-19.

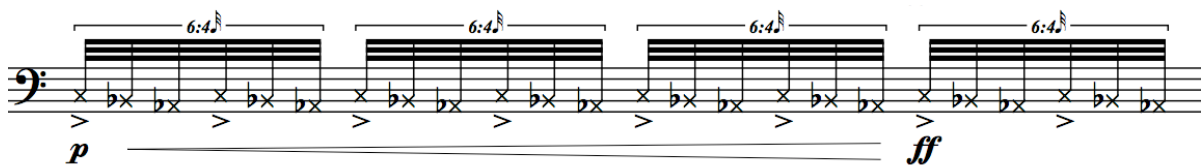
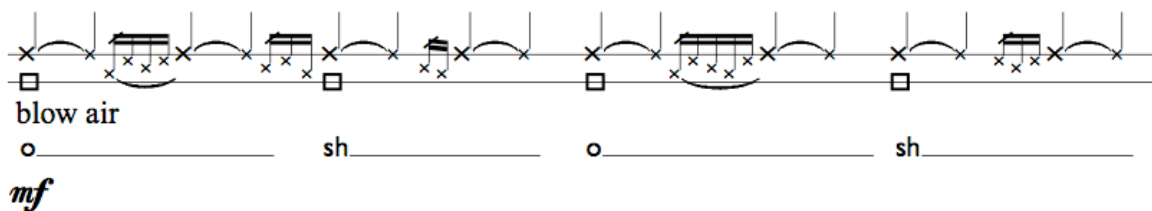


Figure 18. Key percussion in *Summer Victim on a Train* for saxophone ensemble by Massimo Botter (2011).

key clicks

mf



mf

Figure 19. Key percussion in *Delta Waves* for tenor saxophone by Malin Bång (2007).

2.2.5. Circular Breathing

“Circular breathing” is a technique that can be found through many cultures. It is used in many traditional instruments like the Australian didgeridoo, and the Mongolian limbe (Pegg, 2001) Also within the classical and jazz tradition, circular breathing is applied by many performers and composers. Free improvisers like Colin Steson and Evan Parker are renown for their extensive use of this technique. The song *Judges* (Stetson, 2011), for example, is performed in its entirety using circular breathing. Evan Parker is maybe best known for his intensive use of circular breathing on his album *Saxophone Solos* (1975).

Circular breathing is a technique in which air is inhaled through the nose while simultaneously being exhaled through the mouth. This technique allows the performer for uninterrupted playing keeping up a constant flow of air. Londeix (1989) states that it consists of playing while puffing out the cheeks, then emptying this air while refilling the lungs, by simultaneously breathing in through the nose; the technique must be sufficiently mastered in order to avoid an inflexion of the sound during the delicate and critical phase of breathing in through the nose (page 82). Another manual, describing circular breathing is Kynaston’s *Circular Breathing for the Wind Performer* (1978). The author portrays a detailed description of the technique and provides numerous exercises on perfecting the performance of circular breathing.

Although circular breathing is frequently used within contemporary saxophone literature, only few composers provide indications on when to use it. It is mostly a choice of the performer, depending on the length as well as other musical aspects of the phrase. In some cases, like Christian Lauba’s *Stan* for baritone Saxophone (2001), it becomes a necessary technique to master as can be seen in Figure 20. The description on the first page states,

“...respiration continues...”, which translates to continuous respiration or circular breathing.

$\text{♩} = 150$ *molto legato, croches régulières en respiration continue et sans rubato*

Saxophone
baryton



pp

The image shows a musical score for a baritone saxophone. It consists of two staves of music. The top staff is labeled 'Saxophone baryton'. Above the first staff, there is a tempo and performance instruction: '♩ = 150 molto legato, croches régulières en respiration continue et sans rubato'. The music is written in a key with two sharps (F# and C#) and a common time signature. It features a continuous, flowing line of notes, with a dynamic marking of 'pp' (pianissimo) at the beginning of the second staff. The notes are connected by a long, horizontal slur, indicating a continuous breath.

Figure 20. *Stan* for baritone saxophone by Christian Lauba (2001).

2.2.6. Overtones

The technique of producing overtones is very common in most instruments. Overtone techniques can be found in brass, strings, voice, and woodwinds alike. Although every instrument group has different ways of producing overtones, they are all based on the same principles, namely, they are one of the ascending group of tones that form the harmonic series.⁹ Figure 21 shows the harmonic series of the overtone spectrum derived from a fundamental pitch. On the saxophone, overtones are part of an extended technique in which a fundamental tone is overblown¹⁰ to produce tones in a higher register. It is relatively easy to produce them on the saxophone, especially in the lower register. In fact, it tends to be simpler for the lower family of saxophones, going down from tenor to baritone and bass saxophone.

⁹ Harmonic series are a set of frequencies consisting of a fundamental and the harmonics related to it by an exact fraction (Stevenson, 2010).

¹⁰ Overblowing is the process of producing higher registers from the fundamental register of a wind instrument. Overblowing is accomplished by changing the pressure in the embouchure, air flow, and the creation of a resonating space in the trachea and throat (Ellsworth, 2014).



Figure 21. Overtone spectrum up to the 16th partial of the natural harmonic series in *Top Tones for the Saxophone* by Sigurd M. Raschèr (1941).

Additionally, the saxophonist Sigurd M. Raschèr developed in 1941 an excellent manual concerning overtones, *Top-Tones for the Saxophone*. This manual describes in a very detailed manner various exercises, such as embouchure, airflow, tone imagination, dynamics, and overtones. In Figure 22, an exercise is shown in which the performer plays the conventional fingerings for the bottom notes, while using overblowing techniques in order to obtain the upper notes.



Figure 22. Overtone exercises in *Top Tones for the Saxophone* by Sigurd M. Raschèr (1941).

2.2.7. Extended techniques related to harmonic textures

Multiphonics and bisbigliando are extensively documented in manuals for learning contemporary techniques for the saxophone. The most important part for the basis of harmonic textures is the alternate fingerings as used in multiphonics. The fingerings of multiphonics, as described in the methods of Weiss & Netti (2010), Kientzy (1982), and Londeix (1987) were an important basis for starting to explore the appropriate fingering used in my

harmonic textures. By comparing these manuals with the necessary information concerning harmonic textures, I was able to find an appropriate format (see section 3.4.1.).

Polyrhythms are not an essential part of producing harmonic textures but rather a rhythmic possibility which is achievable through the separation of the left and the right hand fingerings. The technique works by simply playing a trill or any desired rhythm with the appropriate fingerings. This on its own gives already enough material to work with. However, by adding polyrhythms to the texture, which can be played by using the left and the right hand as individual rhythmic meters, another sonic layer appears. This layer is what allows the saxophonist to closely imitate polyrhythms.

Key percussion is an effect that is obtained on the saxophone as a side effect of its acoustic properties. Commonly it is used to achieve rhythmic effects. The effect works especially well in the lower range of the saxophone; and having harmonic textures based on the twelve lowest tones of the baritone saxophone, it adds a pizzicato-like effect when the textures are played in soft dynamics. Even when the fingers are tapping without blowing, there is still an audible pitch. This is not essential for producing harmonic textures, but rather a technique worth mentioning for its artistic capabilities.

Circular breathing is added to the concept of harmonic textures, since it helps the performer to maintain the intensity and direction in a musical sense, not being allowed to breathe in between sequences. The performer should be aware that when the technique is not properly executed, the harmonic textures lose their intensity: instead of maintaining their character, (s)he diminishes their effect. So it is necessary to completely master circular breathing in order to perform harmonic textures. Although being very difficult, especially on the baritone saxophone, it requires much work, time, and effort to master this technique.

Overtone techniques are added to further detail the relation between the sonic phenomena of harmonic textures and the possible ways of influencing and changing the sounding result by using techniques similar in overtones. While these techniques are based on the use of the partials of the natural harmonics, the partials can be played by changing the pressure in the embouchure, air flow, and the creation of a resonating space in the trachea and throat. By mastering the technique of overtones, a greater control of harmonic textures is achieved, easing multiple sonorities with the same fingering positions.

Chapter 3. A systematic approach to harmonic textures for the baritone saxophone

The choice of pitch and timbre in my music has always been intuitive. Even the choice of rhythmic structure is finally intuitive. In fact, although there is always a system working itself out in my music, there would be no interest in the music if it were merely systematic. ... The truth is, musical intuition is at the rock bottom level of everything I've ever done.

–Steve Reich

3.1. Introduction on harmonic textures

The idea and ground basis behind harmonic textures sprouted while studying several extended performance techniques on the saxophone. While studying these techniques I started to experiment with alternate fingerings—which basically means playing any given note and randomly opening and closing keys on the saxophone. Around the same time, Colin Stetson's *New History Warfare Vol. 2: Judges* (2011) was within my music playlist, which I listen quite often. I soon realized that my “random” experiments closely resembled the sound he produces. Struck by this resemblance I started playing these alternate fingerings more

consistently up to a point where I devoted many hours of study to it. It was not until I found a way to apply rhythmical textures to these experiments that the idea of researching these harmonic textures became a serious endeavour. I realized that most saxophone players have already, consciously or unconsciously, played harmonic textures out of random experimentation. Thus, the reader must know that I do not claim its invention, but rather aim to document it in a structural and systematic manner.

The name of the technique Harmonic Textures was chosen for several reasons. Textures in music result from the interaction of melodic, harmonic, and rhythmic materials, which I mimic on the saxophone – a monophonic instrument – through the use of multiple layers of fingerings played simultaneously. The term harmonic was chosen to underline the complexity of the sound result driven by technique. Given the impossibility to produce polyphony on the saxophone, one strives to imitate the effect of multiple simultaneous layers with the technique that I will detail next.

3.2. Fundamentals

The strategies behind harmonic textures are based on a chromatic scale in the lowest register of the baritone saxophone, ranging from the low A2 to the *G sharp* 3 (C2 to the B2 in concert pitch). These twelve chromatic tones, as shown in Figure 23, form the basis of harmonic textures, which for simplicity's sake will hereafter be referred to as fundamentals.¹¹ We can trace an analogy between the concept of fundamental to the harmonic textures and the concept of root of a chord.

¹¹ It is possible on the baritone saxophone to play a quartertone scale, however, alternate fingerings are required to produce these quartertones. Seeing as harmonic textures are already based on a comprehensive system of alternate fingerings, using a quartertone scale, as fundamentals, would result in a rather complicated technique. Therefore, to keep harmonic textures manageable, I have chosen to not include quartertones in series of fundamentals and only work with the chromatic scale.



Figure 23. Fundamentals used for harmonic textures for baritone saxophone.

The fundamentals combined with alternate fingerings establish the framework of the harmonic textures. For example, the fundamental A, in which all keys of the baritone saxophone are closed, can act as a starting point for discovering alternate fingerings, which consequently produce harmonic textures. If one experiments with alternate fingering such as opening a random key or small sets of keys, we start shifting the sound and entering in the scope of my technique. For example, as shown in Figure 24, using the fundamental A and opening the key 1 (see Table 1) the sounding result changes to a C quartertone flat.



| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------|---------------------|
| 1 |  |  | A ● ± O ● ● ● ● C | |

Figure 24. Low A fundamental with key 1 fingering.

The key system on the baritone saxophone is inspired on the Boehm system.¹² This key system allows the performer to apply the same fingering when changing the octave in the mid register of the baritone saxophone. Within harmonic textures, this system allows us to use the octave key (played by the thumb on the left hand) to help exploring new textures, however it does not shift basic aggregate of notes.

¹² Boehm system is a key system for the flute invented by the flautist Theobald Boehm in 1832 Michels (2005).

Due to the adoption of the Boehm system on the saxophone, only one octave of fundamentals can be used in my harmonic textures techniques. By simply pressing the octave key all the textures can be played an octave higher, accordingly. This could also be achieved by changing the embouchure (e.g. lip pressure) and airflow.

Playing harmonic textures an octave higher by increasing the airflow and embouchure pressure produces a shift of the fundamentals to an octave higher (i.e., 2nd partial in the natural harmonic series on saxophone, as shown in Figure 25). This effect is relatively easy to perform on the lowest register of the baritone saxophone. In many harmonic textures, the 3rd partial above the fundamental is also very easy to perform. This effect can also occur as a result of a particular fingering (e.g. as used in harmonic textures 8, 9, 24, 25, 26, etc.).



Figure 25. Natural harmonic series up to the 3rd partial based on the fundamental B flat.

From the several fingering and embouchures changes I experiment with, the sounding result close to the 3rd partial above the fundamental becomes increasingly difficult to perform, because without proper tone control the fundamental shifts almost automatically to the 3rd partial. This also depends on the speed on which the specific harmonic texture is performed, generally, the faster the texture, the harder it gets to perform.

To properly master the harmonic texture technique, it is important to be able to play all fundamentals simultaneously with (at least) the 2nd, and (if possible) the 3rd partials in order to gain flexibility in the technique, which allows the saxophonists to remain in tight control of the sounding result. This was another important reason to constraint the fundamentals to the lowest octave on the baritone saxophone.

It is possible to play harmonic textures above the 3rd partial, but then the technique starts to become unrecognizable, because of the increased difficulty to obtain clear tones at a reasonable speed without lacking tone quality and the identity of the technique. Therefore, I limited it until the 3rd partial.

3.3. Fingering possibilities

Based on the twelve fundamentals, all the possible fingerings were explored on the baritone saxophone. In order to systematically study all possible fingerings combinations, I started by making a division between fingerings for the left hand and fingerings for the right hand. This division was made so that every alternate fingering on the two hands could be used independently from one another. All possible fingerings generating harmonic textures were then notated and grouped according to their fundamentals as well as complemented with the sounding result.

| Left hand | Right hand |
|---------------------|-----------------|
| 1 = B key | 4 = F key |
| 2 = A key | 5 = E key |
| 3 = G key | 6 = D key |
| G# = G# key | Eb = Eb key |
| C# = C# key | C = C key |
| B = Low B key | Ta = A side key |
| Bb = Low B flat key | Tc = C side key |
| A = Low A key | |

Table 2. Fingerings used for harmonic textures

The fingering possibilities shown in table 3 are used to perform harmonic textures. These do not include all possible fingerings on the baritone saxophone, which were presented in Table 1, because when pressed, some keys result in sounds, which are contrary to the idea of harmonic textures by shifting the partials to undesired registers. These sounds are so unbalanced that the technique loses its identity. Therefore, the following fingerings are not included in harmonic textures: *C1*, *C2*, *C4*, and *X* for the left hand, and *C3*, *C5*, and *Tf* for the right hand.

In the right hand, the harmonic textures resulting from the fundamentals and the key 5 or the combination of keys 4 and 5 are not used, because they cannot be accessed individually. Due to the construction of the saxophone, particularly the Yamaha *YBS-62* baritone saxophone, these key combinations cannot be closed or opened without affecting the key 6. For example, when one attempts to close the key 5, the key system automatically closes the key 6. On the Selmer Series III baritone saxophone this key combination is possible, however, other key combinations can perform a close sounding result that all baritone saxophone models are able to play. Therefore, these fingering possibilities are not accounted for in the fingering diagram in order to keep the technique as inclusive as possible to all baritone saxophone practitioners.

Since harmonic textures are based on opening and closing alternate fingerings while maintaining the fundamental, all the result depends on the speed on which the technique is performed. The limit to the speed for harmonic textures can be compared with the speed of which trills are performed, because every harmonic texture could be performed as if a trill. However, with certain key combinations, harmonic textures become increasingly harder to perform regarding speed. For example, a harmonic texture based on the fundamental *B flat*, with opening and closing the key 1, can be performed faster than a combination of opening and closing key 1 and 3, due to the motoric limitation of the hand.

3.4. Notating techniques for cross-fingerings

In the work of Sciarrino (2003) a technique is required in which left and right hands play two separate motives, as shown in Figure 26. The left hand is still based on conventional fingerings and plays the motive written down as you normally would. At the same time a trill, using the right hand, is played with the C5 (see Table 1). It is a very clear way of notating the intention of the composer, but lacks on providing essential information related to harmonic textures. In this example there is no way of writing down a specified rhythm for the right hand, nor show any sounding result. Thus, the result of the required technique is completely left to the choice of the performer, assuming the performer is not able to consult the composer.



Figure 26. *Graffito Sul mare* for soprano saxophone by Salvatore Sciarrino (2003).

Sotelo (1997) uses a complete different musical notation than the abovementioned. In Figure 27, the composer divides the fingering into the left and the right hand, and provides the performer with a detailed explanation of the technique.



Figure 27. *Argo* for saxophone solo by Mauricio Sotelo (1997).

The small circles represent a notated fingering, from top to bottom: the upper three circles represent the keys of the left hand (B, A, and G keys); the lower three represent the keys of the right hand (F, E, and D keys). The notated 'tone' is the corresponding depressed key. Tones that are not notated are either open tones or to be opened in regular, independent rhythm of the left hand in contrary motion to the right hand (Sotelo, Argo, 1997).

With this notation the composer succeeds in detailing very specifically two different meters, one for each hand, used as autonomous entities. The upper system exists of 6 lines and only corresponds to the indicated keys. This allows for a very clear system in terms of which key is to be opened or closed, aside from what the sounding result should be. Additionally, in this example the composer demonstrates very clearly what I refer to as fundamentals. The procedure described is essentially the exact same technique as used for harmonic textures. Be that as it may, such a notation does not provide the performer with the required sounding result. Sotelo offers us yet another aspect on cross-fingering techniques (see Figure 28) and, again, provides us with a very detailed description.

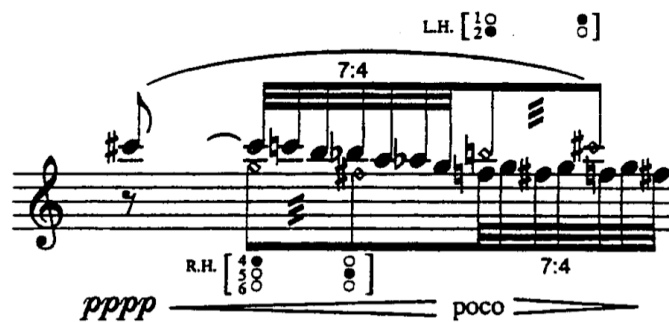


Figure 28. Argo for saxophone solo by Mauricio Sotelo (1997).

In the left hand, the descending chromatic line from C-sharp to G is played, then the trill on B-natural/C. Simultaneously, the right hand plays first a trill on F/F-sharp, then the succession of notes on G/F-sharp/G (Sotelo, Argo, 1997).

The last notable example of a writing technique that heavily influenced harmonic textures is *Materie Oscura* (2006). In Figure 29, Vassena provides the performer with the same information as the abovementioned composers. The F-sharp written is the basic fingering, in harmonic textures referred to as fundamentals, after which the upper line indicates the opening of the specified keys for the left hand, and the bottom line for the right hand. Opening the keys are indicated as a -, followed by the specific key, and closing of the keys are indicated with a +, followed by the specific key. As with the other composers, this technique allows for a very detailed notation, regarding fingerings as well as rhythm, but none actually includes the sounding result.

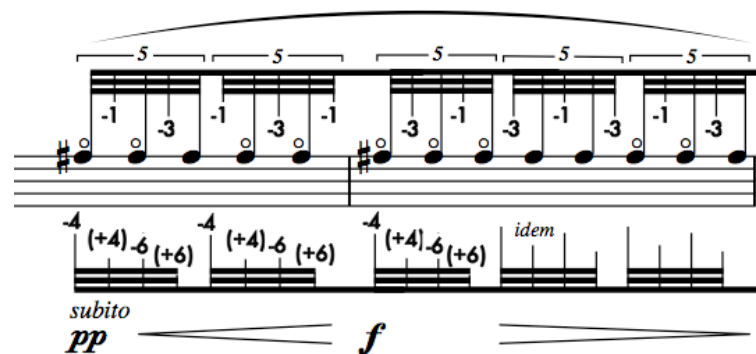


Figure 29. *Materie Oscura* for alto saxophone and ensemble by Nadir Vassena (2009).

What all these examples of cross-fingering hold in common is, unfortunately, the lack of sounding result. When these techniques of alternate fingerings are applied, in all cases the performer is left in the dark on what the sounding result should be. My technique of harmonic textures attempts to fill in this gap in the existing literature by providing the performer with a detailed system of the fingerings and their sounding results. The fingering diagrams for harmonic textures serve as a manual for performers and composers alike. Most performers do not have the good fortune of being able to consult with the composer of the work they are performing. With this systematic approach, a performer can find the exact sounding results, on baritone saxophone, simply by consulting the fingering diagrams and comparing them with the aforementioned compositions.

3.4.1. Notating techniques for harmonic textures

Notating the technique was extremely challenging due to the discrepancy between the sounding result and the fingerings used to achieve it. How would a performer understand which fingering position to use, when he or she reads a score? Realizing the difference between the notation and its sounding results was the main obstacle that I had to solve. By reviewing the already existing literature on musical notation for extended techniques—such as multiphonics, *bisbigliando*, and overtones—numerous options emerged as possible answers to the problem. Additionally, original works written for saxophone, which adopt similar techniques as used in the harmonic textures, offered me useful insights regarding the notations of the technique. These works are shown in Figures 26–29.

The notation of harmonic textures went through several stages. Initially, a theoretical approach was developed as a design strategy for presenting it to the novice players. Later, I introduced this technique in several of my compositions (detailed at a later stage in this document), which made me once more revisit the notation process toward a more practical approach for composition. One of the first strategies for notating the harmonic textures was a purely technical approach, which did not include any sounding results (much like the composers reviewed above). The focus of these early attempts was therefore merely on writing down a rhythmical and fingering specific approach, with no regard for its precise sounding result. This can be clearly observed in the following figures.

In Figure 30 you can see already the division between the left and the right hand (indicated as L and R), but any performer or composer would have no inkling as to the sound result (even pitch) produced by the fingerings. Another problem is the indication of fingerings written in the system and not above the notes, which makes the excerpt unclear as to which

note correspond to which key. This approach was quickly abandoned.

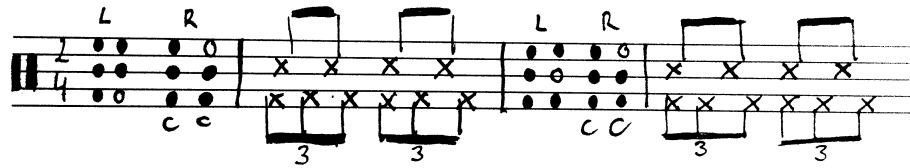


Figure 30. First approach on notating harmonic textures.

A second approach was worked out, see Figure 31, where the fingering indicators are removed and only the rhythmical aspect is left. This notation solely focuses on when to open or close a key: a cross for a note-head stands for closing a key, an white note-head for opening a key. Once again, however, with no concern for the sounding result.

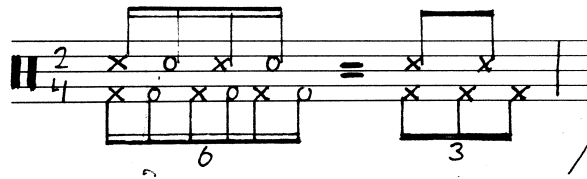


Figure 31. Second approach on notation, purely rhythmical.

Quickly thereafter a third approach was made (see Figure 32), including the fingering indicators combined with a rhythmic pattern. Rhythm has always been an important driver for harmonic textures, but realizing the need for an approach focused on the sounding result made the notation shift drastically.

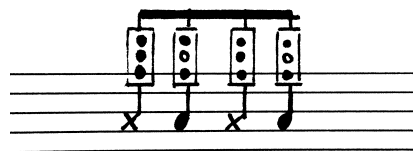


Figure 32. Third approach on notation with fingering indications.

A first trial at notating the sounding result was presented in the arrangement of *À Proa* (see Figure 33). The indication for the alternate fingerings is written above the system while maintaining the sounding result and rhythmic structure. The crossed note-heads are an indication for the closing of the key combination and the black note-head stands for when the key combination should be opened.

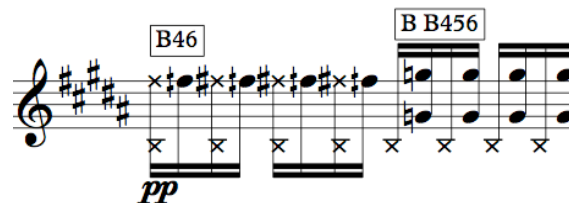


Figure 33. Writing technique of harmonic textures in *À Proa*.

A similar notation technique was offered in *Trends at Odds* (see Figure 34), with the only difference being the indication for when a key combination should be closed. In Figure 33 this is shown by a crossed note-head; in Figure 34, by a smaller note-head compared to the rest of the score.

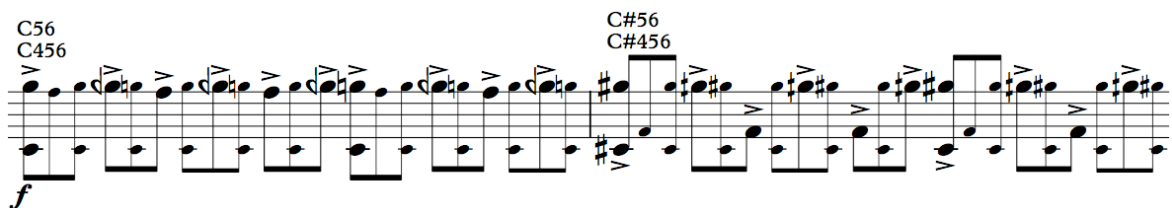


Figure 34. Writing technique of harmonic textures in *Trends at Odds*.

In the both cases the sounding result is written down as well as the technical approach. A major problem, however, is that the technique becomes increasingly inaccessible the more information a score contains. In both excerpts only alternate fingerings for the right hand were used, and if a left hand fingering be introduced, notating the sounding result would become too complex. Furthermore, the indications for the fingering combinations look like chord symbols, which could be very confusing to both the performer and the composer. At this point in the research I decided to focus on creating a fingering diagram for the technique, which would

include the sounding result as well as the technical approach. But, of course, a notation for a specific composition would always be the choice of the composer.

A first approach to create a fingering diagram (Figure 35) is a mixture of all the notation techniques presented above. Every texture is named according to the appropriate fundamental, followed by a number that indicates the key that is to be opened or closed. The result of the fingering is then notated in the staff with an X indicating when the key is closed, and a black note-head when the key is opened. This diagram is very unclear since it simulates very closely the notational method for key percussion. Another reason for abandoning this approach is that the fingering and the harmonic results are too similar.

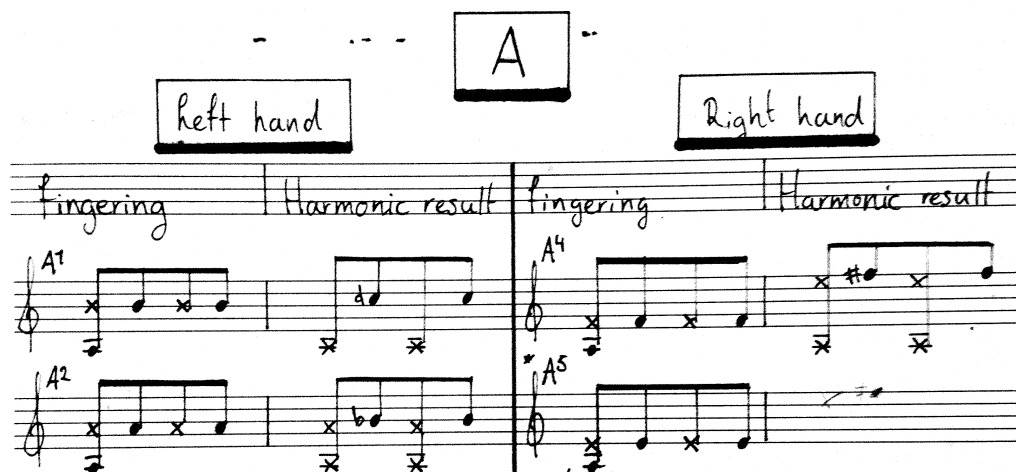


Figure 35. The first approach on the fingering diagrams of harmonic textures.

A second approach on the notation of the diagram does not include the indication of the opening and closing of the key combination in the staff. It first shows the fundamental followed immediately by the result of opening or closing the appropriate key combination(s). In Figure 36, every texture has a description that contains first the fundamental (indicated as C) followed by the specific key (combinations). The opening and closing of the specific key(s) are then shown again in the fingering symbol, indicated with the circle with a diagonal line.

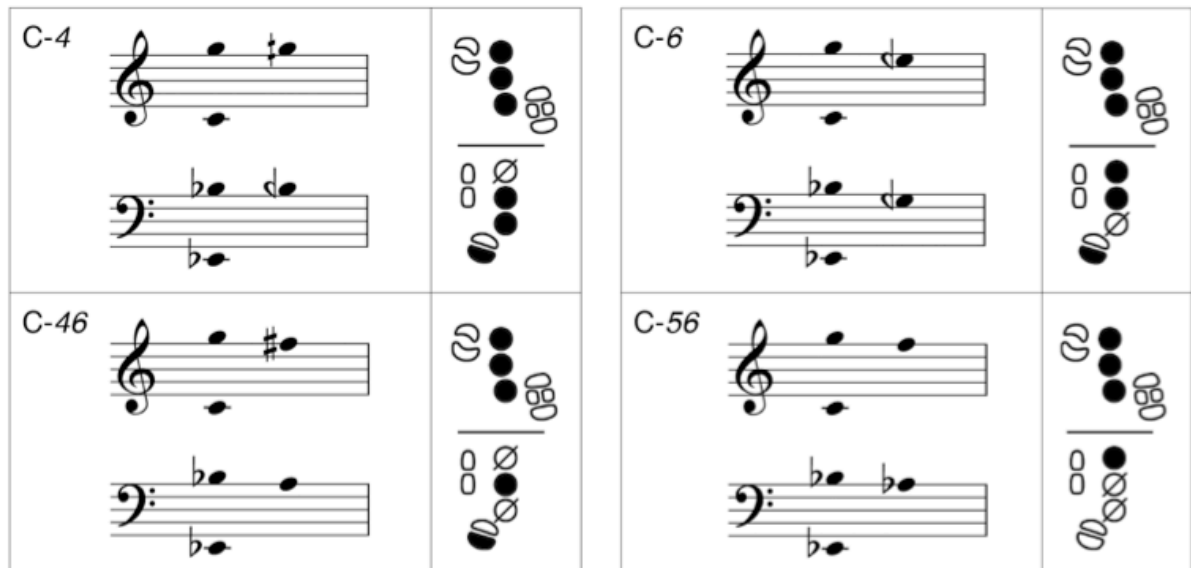


Figure 36. Fingering diagram approach for harmonic textures.

In this attempt the name of each texture can still be confused with chord symbols and therefore is taken out in the final fingering diagram. The sounding result has in most cases the 2nd or the 3rd partial already written above the fundamental and the result. This could be easily confused with the notation of multiphonics or implies that a chord is being played. Since this is not the case this was also taken out in the final fingering diagram.

The final fingering diagram, as can be seen in Figure 37, show many changes since the first attempt of notating harmonic textures. The biggest difference with the aforementioned approaches is the addition of other possibilities, which shows the 2nd and sometimes the 3rd partial as a sounding result with the same fingering position.


| N° | In C | In Eb | Fingering | Other possibilities |
|----|------|-------|-----------|---------------------|
| 72 | | | | |
| 73 | | | | |
| 74 | | | | |

Figure 37. Final fingering diagram for harmonic textures.

The fingering diagrams for harmonic textures are mainly focused on the performer and on how the desired textures are produced. However, the musical notation as used in *À Proa* and *i* (see Appendix B and C) were based on early attempts of notating harmonic textures. These scores were just meant for research purposes and they do not represent the musical notation of harmonic textures as presented in this document.

3.4.2. Explanation on the fingering diagram for harmonic textures

The fingering diagrams (see Appendix A) are presented with the following information: fundamental, number of the texture, concert pitch, sounding pitch, fingering position, and other possibilities (see Figure 38).

 B - left hand fingerings



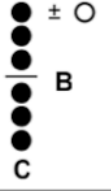



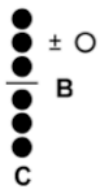
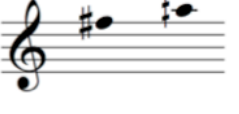


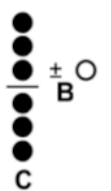
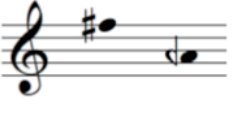
| N° | In C | In Eb | Fingering | Other possibilities |
|----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 32 |  |  |  |  |
| 33 |  |  |  |  |
| 34 |  |  |  |  |

Figure 38. Fingering diagram for harmonic textures.

All the textures are group according the fundamental they are constructed on. The fundamental is always written above the table containing the textures and is followed by an indication for left or right hand fingerings.

Each harmonic texture can slightly vary in intonation according to the key arrangement of the particular instrument. The research for this diagram of harmonic textures was done of a Yamaha-YBS 62 baritone saxophone.

3.4.3. List of symbols used in harmonic textures

Symbols

| | |
|---|-------------------------------------------------------------------------|
| ○ | Opened key. |
| ● | Closed key. |
| ± | Indicates the opening or closing of a specific key. |
| - | This line indicates the separation between the left and the right hand. |

Table 3. Symbols used in the fingering diagrams of harmonic textures.

Accidentals

| | |
|----|-----------------------------|
| ♮ | Natural |
| ♯ | Sharpened by a half-tone |
| ♭ | Lowered by a half-tone |
| ♯̣ | Sharpened by a quarter-tone |
| ♭̣ | Lowered by a quarter-tone |

Table 4. Accidentals used in the fingering diagrams of harmonic textures.

Chapter 4. Application of harmonic textures

In the last resort, the form of a piece becomes comprehensible only when we find the connection between the single (thematic) personalities, who appear and pass away, and the individual (motivic) threads which run through the whole course of a piece's evolution, crystallizing in (thematic) personalities.

–Miguel Ribeiro-Pereira

4.1. Introduction

Throughout the process of writing this dissertation, the technique of harmonic textures has proven to be very versatile and rich. Its potential lies hidden in its simplicity. During the writing process, I formalized this concept and, by doing so, I discovered new musical possibilities. A newfound clarity upon the concept impelled me to arrange and rethink existing repertoire through new sonorities. Additionally, by gaining more control over the alternate fingering patterns, I was able to apply harmonic textures in free improvisation, a process that interested me for many years now. This experimentation led me to create more formal and planned compositional structures, following a similar approach as a composer. In this chapter, I will describe the compositional process of two points in time throughout the development of

my concept of harmonic textures, which I will detail at length: the initial work, my arrangement of José Afonso's piece *À Proa*; the mature work, an original composition, *Trends at Odds*, in collaboration with Tiago Ralha. In particular, I will describe how the harmonic textures are applied in their structure. Both pieces were included in my Master's recital, whose audio and video recordings are included in the DVD.

4.2. Trends at Odds

Trends at Odds is a piece for baritone saxophone and live electronics I composed in collaboration with Tiago Ralha. This piece was written in the context of the academic course Práticas Oficiniais II – Som at the Superior School of Music and the Performing Arts of Porto. It was premiered on the 6th of June 2014 at *Café Concerto Francisco Beja*, and a video of this performance can be found in the DVD. In *Trends at Odds*, the concept of harmonic textures is used as one of the main elements of the composition.

The piece contains an introduction followed by five movements (see Table 5): The Void, Spatial Awareness, Kinaesthetic Awakening, Society, and Industry. The introduction is recaptured in the end, but in inversed direction or retrograde motion, thereby closing the composition. Each movement is a representation of a concept and aims at demonstrating various compositional tools in which the musical implication of numerology is best exemplified. The use of harmonic textures is highly emphasized in the last movement, "Industry."

The introduction of *Trends as Odds*, titled "Noise," resembles the beginning of everything; the Big Bang. The first movement, "The Void," in which a single note is being played on the baritone saxophone, illustrates the vacuum of pure emptiness. The second movement, "Spatial Awareness," highlights a natural process similar to abiogenesis, in which the first

musical information arises and shows the first signs of life. In the third movement, “Kinaesthetic Awakening,” a beginning of intelligent life is displayed and intends on showing the physical movement of simple organisms. The fourth movement, “Society,” shows tradition being translated through a repetitive musical phrase. This movement slowly progresses into the fifth movement, “Industry,” in which the wheels of industrial revolution are imitated and played through the use of harmonic textures on the baritone saxophone. The piece ends with a closing, called Reversed Noise, in which the introduction is repeated in reversed direction.

| Movement | Duration | Characteristics |
|---------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise | 7s | Pink noise sample, Extreme loud, sax freakout..... mute. Big bang. The beginning of the universe. |
| The Void | 55s | Long note (G#), very soft. The emptiness, vacuum, pure sound, like a dream. |
| Spatial awareness | 55s | Key clicks, delays, air, slap-tongue, space, the first organisms, pregnancy, reversed |
| Kinaesthetic Awakening | 1min50s | Beauty, glissando, Tibetan monks, Doppler effect, movement, simplicity, something awakens. |
| Society | 4min35s | Repetitive drone, explorations of a structure, tradition. Puzzle, method, a form, harmonizer, movement, dissonance, the beginning of the end. |
| Industry | 7min20s | Harmonic textures, soundscape, minimal, beats, metal, key-clicks, confusion, wheels of industry, accelerando, machine-like, saturated, to fill it up. |
| End | 7s | Noise, crash, reversed pink noise sample, blackout with the music. |
| total | 15min49s | |

Table 5. Movements of *Trends at Odds*.

This work was developed with the objective of creating a performance in a specific location – Café Concerto Francisco Beja – based on several premises. These premises were, on the one hand, to explore the technical possibilities and tone colours of the baritone

saxophone, and on the other, to investigate possible sound synthesis, audio techniques, and sound design strategies that could fit the concept of harmonic textures. These two groups of premises were intrinsically related to a single conceptual framework and a creative process – viz. numerology.

The preparation of this work was done over the course of four workshops in which I explored several techniques on the baritone saxophone that were recorded by Tiago Ralha. With this work a sound bank of samples was created (see DVD Saxophone samples) that later was used in the electronic part of the composition. During the workshops and the performance, two different microphone sets were used to capture the sounds of the baritone saxophone. The first set consisted of four piezoelectric¹³ microphones applied to the lowest part of the tube of the baritone saxophone. This microphone is ideal to record percussive-like effects such as the closing and opening of the keys on the saxophone. The second set of microphones included: a dynamic microphone placed inside the bell of the saxophone to capture the low frequencies, another dynamic microphone positioned above the bell of the saxophone to capture the full pitch range of the instrument, and a condenser microphone mounted on the mouthpiece of the saxophone to capture reed and breathing noises. Every aspect of sound inherent to the baritone saxophone could be amplified separately with this intricate setup. Operating so many microphones allowed us to transform the original sound of the baritone saxophone to the requirements of all individual movements of the composition. However, with a setup this complex, a great disadvantage was the amount of feedback from the amplification inside the room. To balance this problem, we created a box of sound absorbing panels in which I performed the piece. Despite solving the feedback problems we were facing, this solution also isolated me (the saxophonist performer) from the audience. The disconnection between performer and audience in a live setting can be problematic and is one of the aspects we would

¹³ The piezoelectric microphone is based on the direct piezoelectric effect, that is, conversion of sound vibrations to electrical signals (cf. M.S. Vijaya 2012).

like to improve in future performances.

Trends at Odds is based on simple yet concise numerology concepts that helped structuring musical parameters such as durations, rhythm, and sound design. The duration of the five movements follow a set of numbers that fit (loosely) within the Fibonacci sequence¹⁴ [1, 1, 2, 5, 8]. Every number is then multiplied by fifty-five seconds to structure the length of each movement in real-time (see also Table 5). The first and second movement last 55 seconds, the third lasts 1 minute and 50 seconds, the fourth lasts 4 minutes and 35 seconds, and the fifth movement takes 7 minutes and 20 seconds. The Fibonacci sequence was also used to establish the rhythmic patterns of the virtual drums, played on the electronics, in the last movement, “Industry.” In Figure 43, the sample of the snare drum performs a rhythmic pattern of quavers divided in [3, 5, 5, 3, 1, 3, 1]. A variation (see Figure 40), of this rhythm can also be found in the sample of the kick drum, divided in [1, 3, 5, 8, 1, 3].

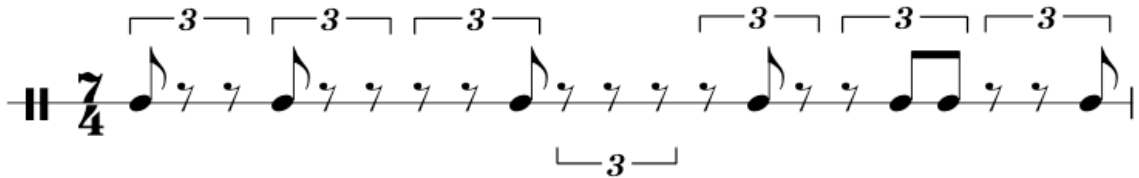


Figure 39. Fibonacci sequence in the snare drum in *Trends at Odds*

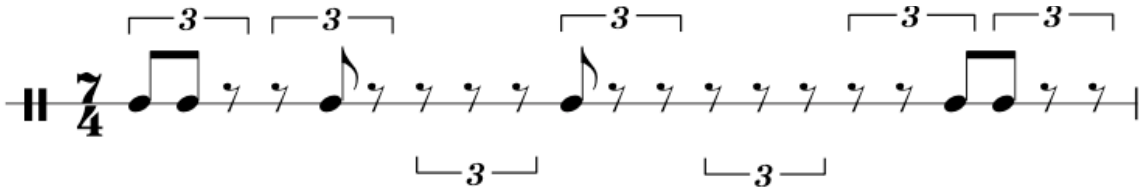


Figure 40. Fibonacci sequence in the kick in *Trends at Odds*.

¹⁴ The unending sequence [1, 1, 2, 3, 5, 8, 13, 21, 34, ...] where each term is defined as the sum of its two predecessors

Another example of the concept, numerology, can be found in the sound design for the location – *Café Concerto Francisco Beja* – The loudspeakers were placed in the space following the principles of the Pythagorean tree¹⁵ (see Figure 41). In this Figure, order zero resembles the subwoofer placed behind the audience in the back of the space. Order one stands for the stereo PA in front of the audience, and order two, portrays four satellite quadrophonic loudspeakers above the audience mounted in the roof of the space.

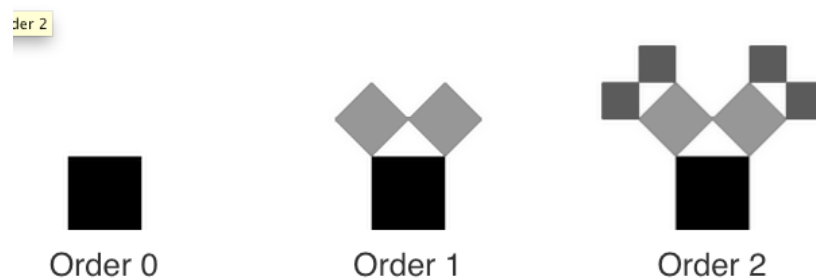


Figure 41. Pythagorean tree as layout for the sound design in *Trends at Odds*.

Of all the movements, “Industry” is the one that best portrays the use of harmonic textures in *Trends at Odds*. Harmonic textures were chosen to emulate the repetitive and shrill character of industrial sounds. The piezoelectric microphones were used to amplify the rhythmic patterns produced by the alternate fingerings, and together with the sound tapestries that define harmonic textures strengthen the design of this movement. In Figure 42, the beginning of the movement shows two different harmonic textures. The first texture is based on the fundamental of G# and created by alternating between the left hand keys 1 and 3. On the right hand, it alternates by opening and closing the key 4 (see Appendix A: harmonic textures n° 154/157). In the second texture, the fundamental changes to a G natural while the fingering in both hands stays the same (see Appendix A: harmonic textures n° 142/146).

¹⁵ The Pythagorean tree is a plane fractal constructed from squares. Invented by the Dutch mathematics teacher Albert E. Bosman in 1942.

Figure

42. Harmonic textures used in *Trends at Odds*.

After these two textures are repeated four times, the progression changes into a different pattern using only a fingering with the right hand (C). In Figure 43 and 44, three different textures are shown in which again the fundamental changes while the alternate fingering for the right hand – the 4 and 5 keys, and 4, 5, and 6 keys – stay the same (see Appendix A: harmonic textures n° 61/62, 75/76, 27/28).

Fi

Figure 43. Harmonic textures used in *Trends at Odds*.

Figure 44. Harmonic textures used in *Trends at Odds*.

Trends at Odds was the very first composition applying the concept of harmonic textures. Of all the seven movements that altogether comprise the composition, its final and longest movement, "Industry," has a particular interest here, solely relying as it does on harmonic textures. Applying the technique in an artistic setting was very insightful for me and very challenging, too, as it needed to be sustained for the considerable duration of 7 minutes and 20 seconds. This required a lot of energy from me, and through this experience I learned a great disadvantage to apply my concept. All the textures are based around the same sonic phenomenon, and without the additional energy, i.e. motivation of the performer, the technique could be simply experienced as uninteresting for the audience.

4.3. À Proa de José Afonso

À Proa (1985) is an instrumental composition for guitar, flute, and percussion written by the renowned Portuguese musician and composer José Afonso, produced by Júlio Pereira and José Mário Branco. José Afonso is considered as one of the most prominent traditional and political musicians of Portuguese history. *À Proa* called my attention for it is one of the few compositions by José Afonso, which is entirely instrumental. I arranged it for baritone saxophone solo and electronics based on the collection of transcription *José Afonso, Todas as Canções* (2010) done by Guilhermino Monteiro, João Lóio, José Mário Branco, and Octávio Fonseca.

The arrangement was premiered on July 9th of 2014 at the Superior School of Music and Performing Arts of Porto as part of my master recital. A video recording of the performance can be found in the DVD (attached). At a later stage, I created a new audio version of the performance, which is also included therein.

The arrangement of *À Proa* began as an exercise to explore harmonic textures. It is used as a strategy to perform the harmony as played by the guitar in a melodic instrument. The project of writing this arrangement started around the same time my first draft of the fingering diagrams was finished. Prior to this point, I had exclusively used harmonic textures in improvisational contexts. The transparency I obtained by structuring the initial fingering diagrams allowed the concept of harmonic textures to be applied systematically.

The song *À Proa* was chosen for the repetitive structure of the composition. The composition starts with a small introduction based on a two-chord harmony (see Figure 45), followed by two melodies addressed here as melodies A and B. The two-chord harmony of the introduction is repeated four times up until the first melody appears. When the melody A appears, the introductory harmony becomes a structural bass line which keeps playing with little variation throughout the whole song. Then, after being repeated for several times, the first melody shifts towards a new motive, the melody B. Next, the melodies A and B are repeated interchangeably. In the 1985 recording of *À Proa* (the basis for my arrangement), towards the end another melody is added. Melody C is built as a canon-like structure, in which the flute plays the same melody, A or B, but starts a bar later.



Figure 45. *À Proa* by José Afonso (2010).

My arrangement of *À Proa* has six different layers, which are presented consecutively (see Table 6). The electronics are then responsible for recording the live saxophone input and looping it indefinitely until the piece ends. Each layer is then superimposed on all material previously played.

The early work on the arrangement started with an experiment designed to find out if harmonic textures could be applied onto the harmonic structure of a composition. Assisted by the fingering diagrams, it was relatively easy to find the correct alternate fingerings that would fit within the harmony of *À Proa*. The alternate fingerings are all based on the fundamental of B, and use a combination of the right and left hand fingerings, namely, textures n° 42, 44/152, 44 and 34/44 (see Appendix A) as can be seen in Figure 46.

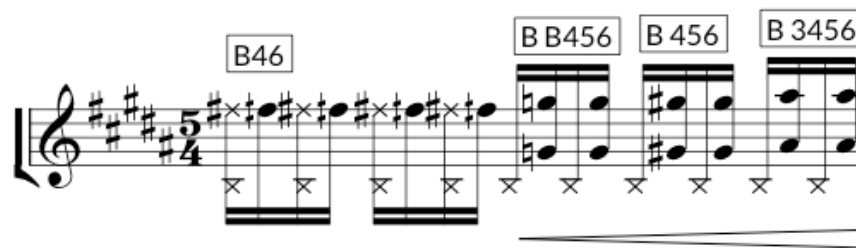


Figure 46. Harmonic textures as used in *À Proa*.

However, presenting the harmonic textures on its own as a substitute for the harmony was not sufficient. Two more layers were added to produce the harmonic structure. This structure is presented gradually by superimposing three layers: the bass layer, mid layer, and the high layer. Each of them is composed of ten bars and not only follow the same harmonic structure but essentially contribute to their completeness. The mid layer consists of conventional fingerings in sync with the rhythmic structure of the harmonic textures in the bass layer. The third (high) layer plays the roots of the harmonic structure an octave higher. The combination of these three layers provides all harmonic content of the original composition (see Figure 47).

The image shows a musical score with three staves. The top staff is labeled 'IV high layer' and contains a melody in treble clef with a dynamic marking of *mp*. The middle staff is labeled 'V mid layer' and contains a rhythmic pattern in treble clef with a dynamic marking of *pp*; it is annotated with 'played only the 2nd time'. The bottom staff is labeled 'VI bass layer' and contains a bass line in treble clef with a dynamic marking of *pp*. Two chord boxes are present: 'B46' and 'B B456'.

Figure 47. Harmonic structure as presented in the arrangement of *À Proa*.

The two different melodies are then performed on top of the harmonic structure and are presented with very distinct panoramic. After being performed, melody A keeps looping by electronic means on the left speaker, while melody B follows the same approach but is played on the right speaker. Towards the end of the piece, the canon melody (i.e. melody C) finally appears. This divides the arrangement into six different layers, summarizing;

| | |
|------------|-------------------------------------------------------------------------------------------|
| Bass layer | Harmonic textures (alternate fingerings) |
| Mid layer | Rhythmic conventional fingerings |
| High layer | Roots of the chord progression |
| Melody A | Single melody line of the 1 st melody. |
| Melody B | Single melody line of the 2 nd melody. |
| Melody C | Single melody line of the 1 st or 2 nd melody starting a bar later. |

Table 6. Structure of *À Proa*, presenting the consecutive layers of the arrangement.

The electronics of *À Proa* were performed with the music software Ableton Live 9,¹⁶ a Behringer FCB-1010 midi foot pedal,¹⁷ and a Sennheiser MD421-II microphone. The software was programmed to work as live looping, i.e. the recording and playback in real-time. The flexibility and ease of the software allowed me a full control over every layer of the arrangement. In Figure 48 a screenshot of the project in Ableton is shown.

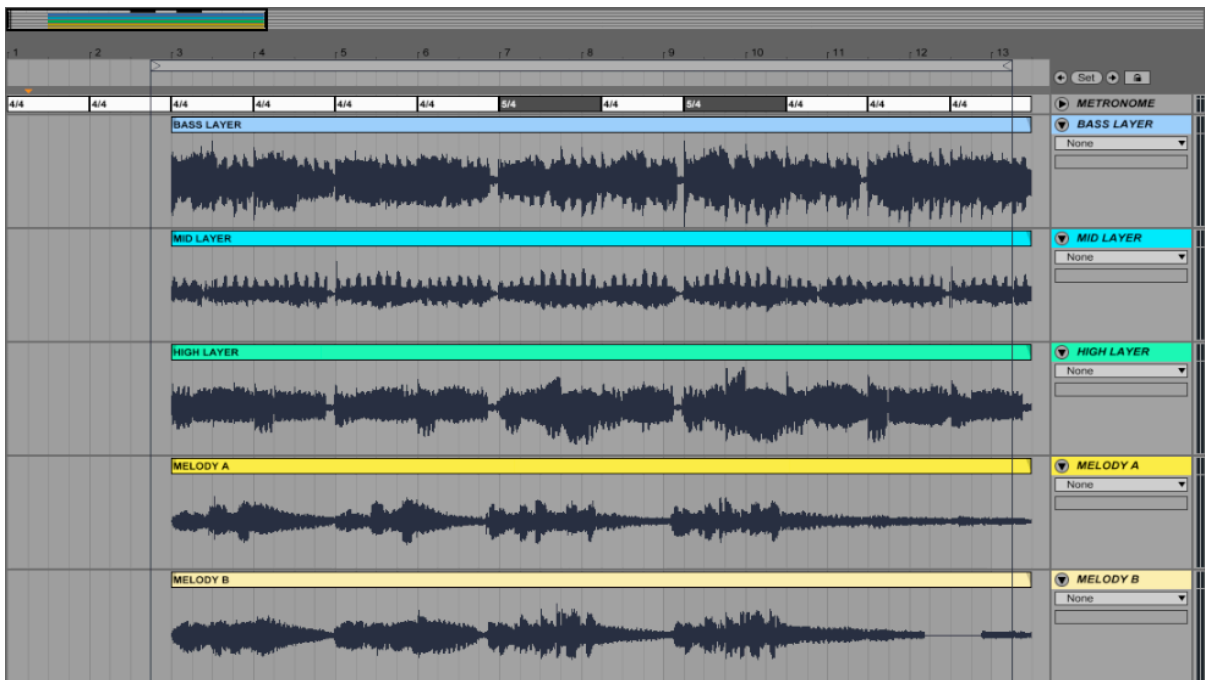


Figure 48. Screenshot of *À Proa* project in Ableton as presented during the masters recital.

What was initially an exercise in applying my concept to a harmonic structure became quickly a complete arrangement with the technique at its basis. The technique could, in a similar fashion, be applied to virtually any harmonic structure of already existing compositions. Thus, opening many possibilities for future works.

¹⁶ www.ableton.com

¹⁷ www.music-group.com/brand/behringer/home

Chapter 5. Conclusion

The experience of one who performs music and one who writes music are, however, in the truest sense, polarities of the same musical experience. Following this line of reasoning, what seems especially important to us is that the performer acquires a deeper understanding of the circumstances and context of his actions and that the composer experiences a more direct contact with the materials with which he is working.

– Marcus Weiss and Giorgio Netti

5.1. Summary and original contributions

In this thesis I began by establishing a systematic comparison of related concepts such as alternate fingering techniques, *cross-rhythm fingering* and *mixed-fingering*. The manual, *The Techniques of Saxophone Playing* by Marcus Weiss and Giorgio Netti (2010), had an indispensable value for recognizing a gap in contemporary literature. In chapter 2, a detailed review of literature related to contemporary saxophone techniques – including multiphonics, bisbigliando, key-percussion, circular breathing, and overtones – was provided. This chapter presents the basis of my harmonic textures concept. In chapter 3, a systematic approach to harmonic textures was presented by detailing the various features of my concept – such as

fundamentals, fingering possibilities, writing techniques, and the fingering diagrams – of harmonic textures. In this chapter, three compositions for saxophone by Nadir Vassena, Mauricio Sotelo, and Salvatore Sciarrino were analysed to illustrate the discrepancies between various uses of similar concepts, especially in terms of music notation. In chapter 4, two new works for baritone saxophone and electronics implementing my concept of harmonic textures were presented.

My concept of harmonic textures introduces both performers and composers to new resource material, in the form of fingering diagrams, concerning an already existing performance technique. I believe it is a rich and versatile technique, which contributes to many new possibilities on an artistic level. Its main advantage, as opposed to conventional fingering techniques, is the division between the left and right hand fingerings. This division allows the saxophonist to perform rhythmic structures that closely imitate polyrhythms, consequently, a new performance strategy. The fingering diagrams presented in this document are designed specifically as research material. They should provide performers and composers an extensive resource on the performance of the technique. However, the musical notation used in the diagrams only show the appropriate fingering and their sounding result, therefore lacking the comprehensiveness to be used in a composition. For example, a harmonic texture with conflicting rhythmic structures in the left and right hand fingerings would become too complex to be written down with conventional musical notation. Now, in order to include all the necessary information while maintaining a simple and straightforward notation, a new system would have to be created.

During the process of writing this document, harmonic textures were applied in the context of two new compositions for baritone saxophone and electronics. In the first, *À Proa* by José Afonso, the technique was used as an exercise to replace the harmonic structure of the composition. Finding the appropriate alternate fingerings that closely resemble to the original

harmony was rather effortless, since a first version of the fingering diagrams was finished around the same time. The harmonic textures served the purpose for superimposing the remaining layers, by programming *Ableton Live* to loop each layer until the end of the composition. *Trends at Odds*, the second piece in which I explored harmonic textures, was composed by myself in collaboration with Tiago Ralha. It portrays an array of extended techniques, in combination with electronic processing methods within a conceptual framework, namely, numerology. Due to the repetitive nature of the rhythmic-driven textures, they were used in the last movement of the composition to symbolize the industrial revolution. In this movement a motive of four textures is repeated, while over the course of 7 minutes and 20 seconds (roughly half of the piece), they increase in both speed and volume. Harmonic textures form the core of both compositions, *À Proa* and *Trends at Odds*.

During the many hours I devoted to the study of harmonic textures, I noticed mainly one flaw. Due to repeatedly opening and closing the same key combinations, the muscles in the forearms tend to get fatigued. In comparison to conventional fingerings, harmonic textures could be harmful, if not the right counter-measures are taken. With a simple warm-up exercise, the exhaustion of the muscles can be avoided and thus serious injuries prevented.

I humbly believe that harmonic textures have the potential of becoming valuable musical elements that can enrich the existing repertoire for baritone saxophone.

5.2. Future work

While the fingering diagrams seems to be a most valuable resource material regarding harmonic textures, many possibilities arise for me to follow through the present research. Since

I am primarily a baritone saxophonist, the fingering diagrams presented are only fitted for the baritone saxophone. Future work should naturally develop into a complete manual for the remaining members of the saxophone family – i.e. soprano, alto, tenor, and bass – including rhythmic and melodic exercises specifically devised for each one of them.

Along such a theoretical-pedagogical work, another line of development for the future will engage an artistic-performative approach. I intend to pursue my collaboration with composers, commissioning original pieces within the musical parameters of harmonic textures for the baritone saxophone. Obviously, that new repertoire should be not only performed in live concerts, on stage, but also duly recorded in a dedicated CD.

Bibliography

Afonso, J. (2002). Galinhas do Mato. [CD]. Lisboa: MVM Records.

Colman, M.A. (2008) A Dictionary Of Psychology (3 ed.). Oxford: Oxford University Press.

Kientzy, D. (1982). Les Sons Multiples Aux Saxophones. Paris: Éditions Musicales Durand-Salabert-Eschig

Kynaston, T.P (1978). Circular Breathing for the Wind Performer. Van Nuys, CA: Alfred Publishing Co. Inc.

Latham, A. (2011) The Oxford Companion To Music. Oxford: Oxford University Press.

Londeix, J.M. (1989). Hello! Mr. Sax. Paris: Éditions Musicales Alphonse Leduc

Michels, U. (1990, 2001, 2005). Sesam Atlas van de muziek, deel 1, Atlas zur Musik, Tafeln und Texte. München: Taschenbuch Verlag & Bärenreiter Verlag Karl Vötterle GmbH & Co KG.

Miller, T.E. & Shahriari, A. (2006). World Music, A Global Story. New York: Taylor & Francis Group, LLC

Monteiro, G. Lóio, J. Branco, J.M. Fonseca, O (2010). José Afonso, Todas As Canções. Lisboa: Assírio & Alvim.

Parker, E. (1975). Saxophone Solos. [CD]. London: Incus Records.

Pegg, Carol (2001). *Mongolian Music, Dance, & Oral Narrative: Performing Diverse Identities*, Volume 1. Washington: University of Washington Press.

Pereira, José Miguel Ribeiro. (2005). "A Theory of Harmonic Modulation: the Plastic Model of Tonal Syntax and the Major-minor Key System." PhD Dissertation. Columbia University.

Reich, S (2002). *Writings on Music 1965-2000*. New York: Oxford University Press, Inc.

Roberts, P (2007). *The Chemins Series. Berio's Sequenzas: Essays on Performance, Composition and Analysis*. Janet K. Halyfard (ed.) Hampshire, UK. Ashgate Publishing Limited.

Sciarrino, S. (2003). *Graffito Sul Mare*. Milano: Casa Ricordi

Sotelo, M. (1997). *Argo*. Vienna: Universal Edition Aktiengesellschaft

Stahel, A. (2008). *Circular Hocket* [CD]. Bern: Tonus-Music-Records.

Stetson, C. (2011). *New History Warfare Vol. 2: Judges* [CD]. Montreal: Constellation Records.


Stevenson, A (2010). *Oxford Dictionary of English* (3 ed). Oxford: Oxford University Press.

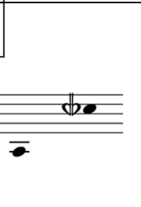

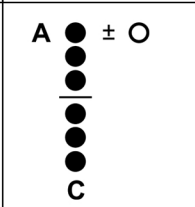
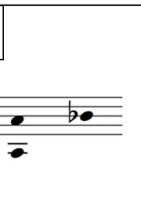

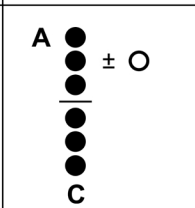
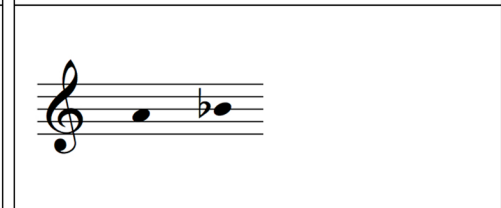


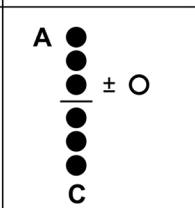
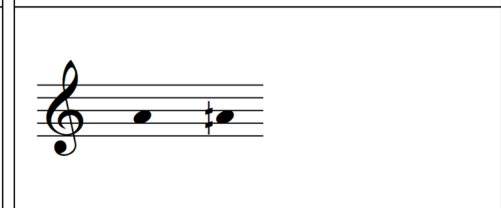


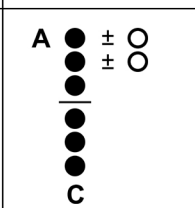


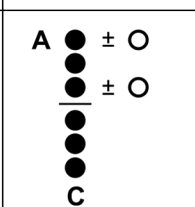


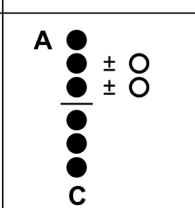
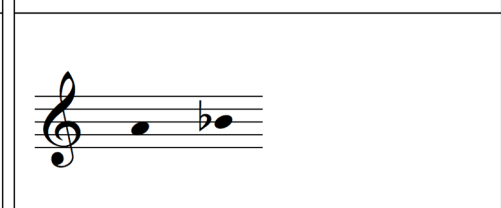


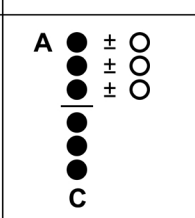
Vassena, N. (2010). *Mute Materie*. Milano: Nadir Vassena


Vijaya, M.S (2012). *Piezoelectric Materials and Devices: Applications in Engineering and Medical Sciences*. Boca Raton: Taylor & Francis Group, LLC.

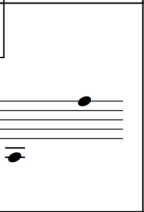

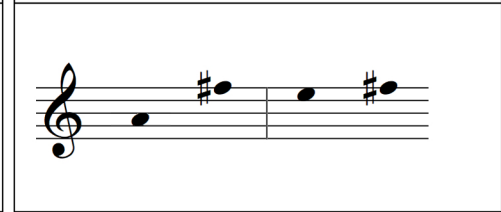
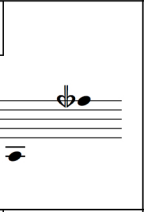
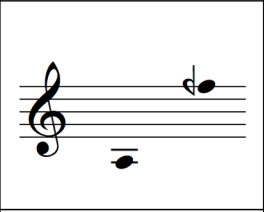
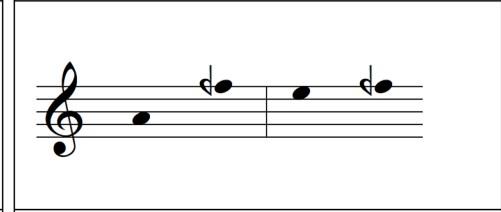
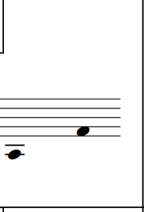

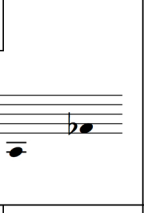

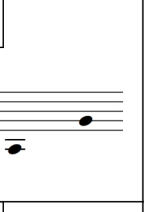

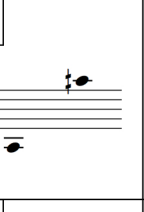

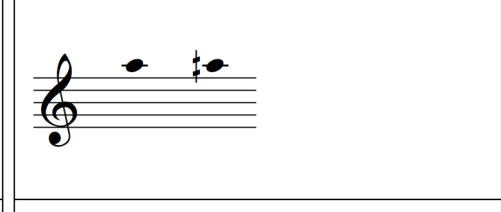
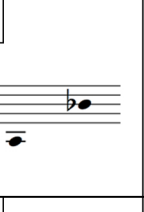




Weiss, M. & Netti, G. (2010). The Techniques Of Saxophone Playing. Kassel: Bärenreiter-Verlag
Karl Vötterle GmbH & Co.


Appendix A. Fingering diagrams for harmonic textures



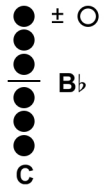


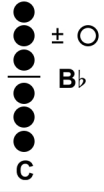



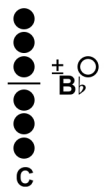
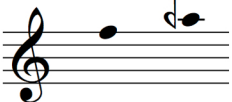


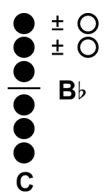



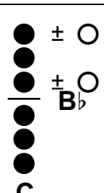

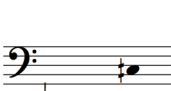
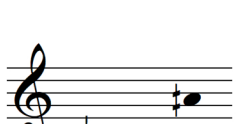
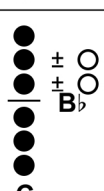
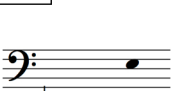
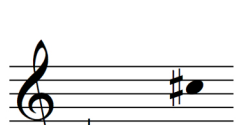
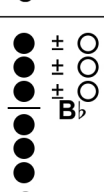

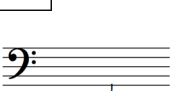

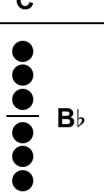
 A - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1 |  |  |  | |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  | |
| 5 |  |  |  | |
| 6 |  |  |  |  |
| 7 |  |  |  | |



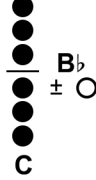
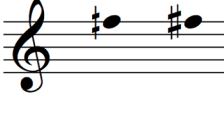


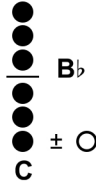



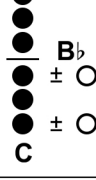



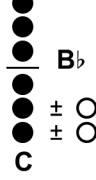


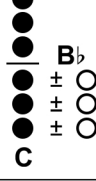


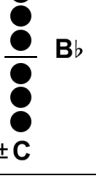


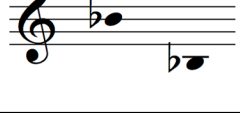
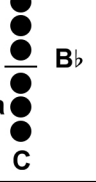
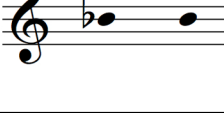
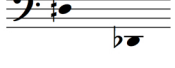
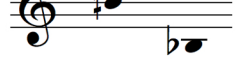
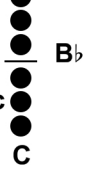
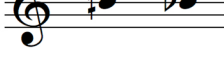
 A - right hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 8 |  |  | <p>A ●●●●</p> <hr/> <p>± ○</p> <p>●●●●</p> <hr/> <p>C</p> |  |
| 9 |  |  | <p>A ●●●●</p> <hr/> <p>± ○</p> <p>●●●●</p> <hr/> <p>C</p> |  |
| 10 |  |  | <p>A ●●●●</p> <hr/> <p>± ○</p> <p>●●●●</p> <hr/> <p>± ○</p> <p>C</p> | |
| 11 |  |  | <p>A ●●●●</p> <hr/> <p>± ○</p> <p>± ○</p> <p>C</p> | |
| 12 |  |  | <p>A ●●●●</p> <hr/> <p>± ○</p> <p>± ○</p> <p>± ○</p> <p>C</p> | |
| 13 |  |  | <p>A ●●●●</p> <hr/> <p>± C</p> |  |
| 14 |  |  | <p>A ●●●●</p> <hr/> <p>± Ta</p> <p>●●●●</p> <hr/> <p>C</p> |  |
| 15 |  |  | <p>A ●●●●</p> <hr/> <p>± Tc</p> <p>●●●●</p> <hr/> <p>C</p> | |

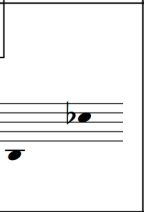

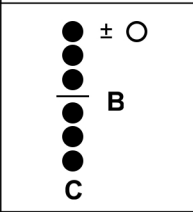
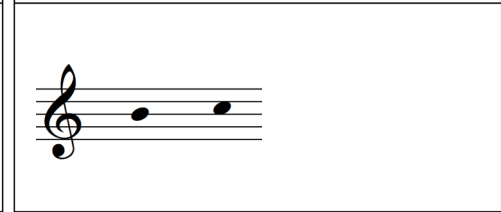
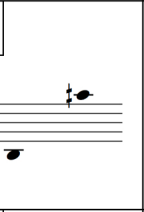

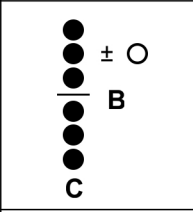
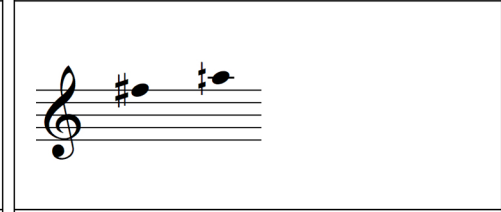
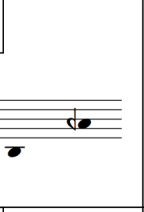

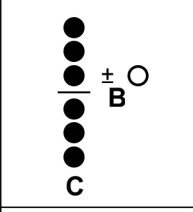
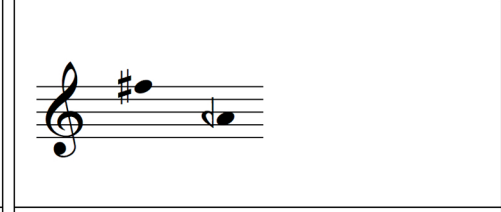
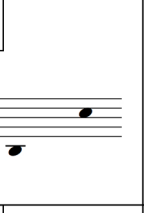

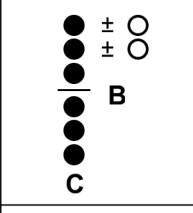
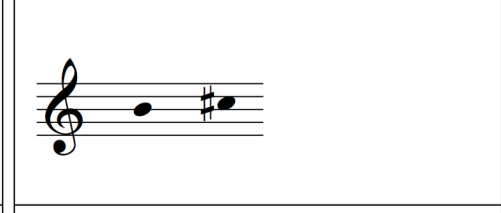
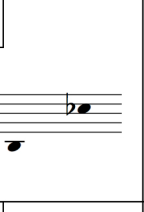

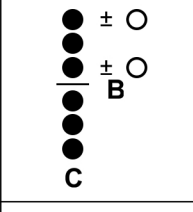
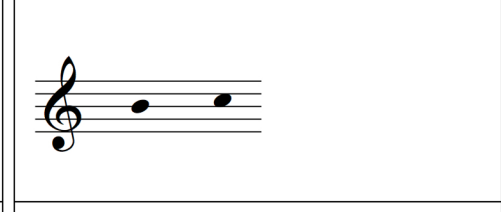
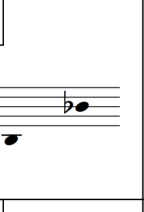

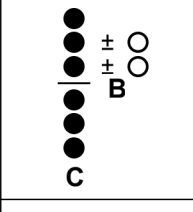
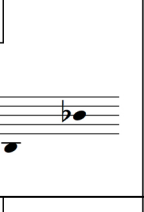

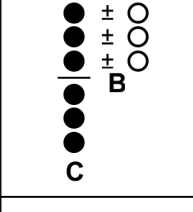
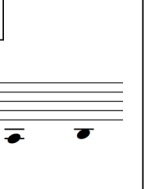

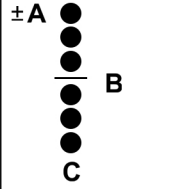
 B \flat - left hand fingerings


| N° | In C | In E \flat | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 16 |  |  |  | |
| 17 |  |  |  |  |
| 18 |  |  |  |  |
| 19 |  |  |  |  |
| 20 |  |  |  |  |
| 21 |  |  |  | |
| 22 |  |  |  |  |
| 23 |  |  |  | |

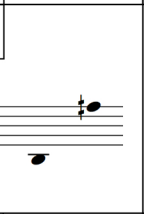

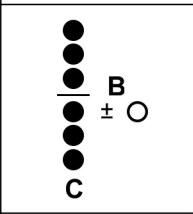
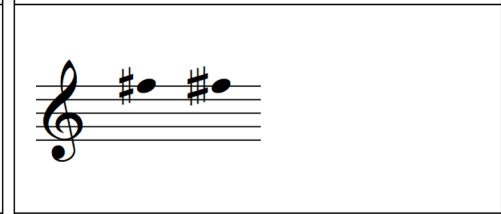
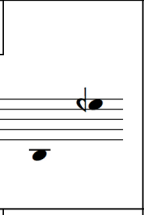

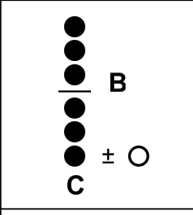
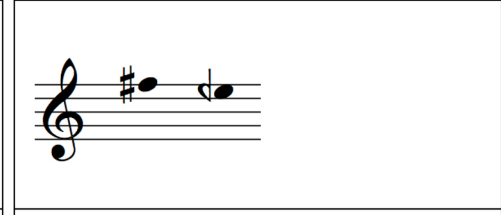


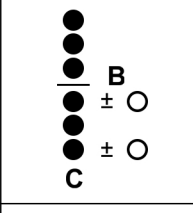
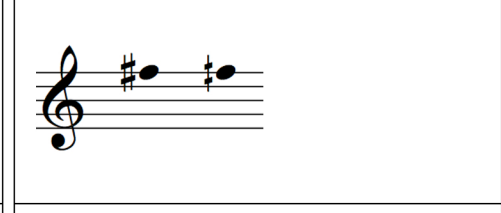
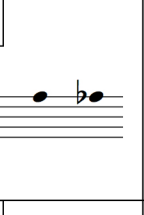

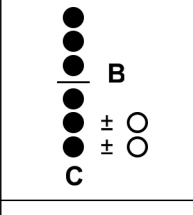
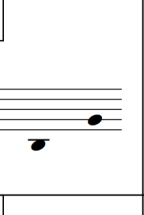

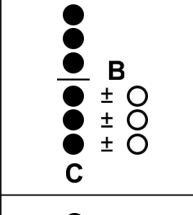
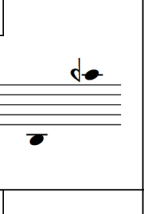

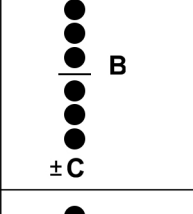
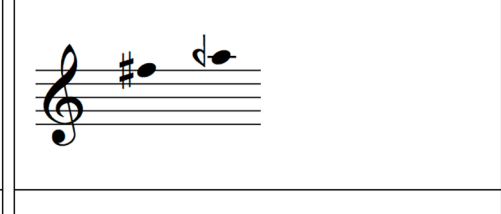
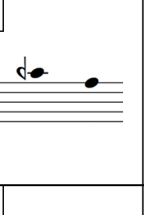

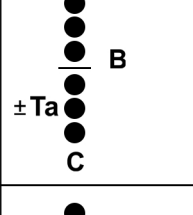
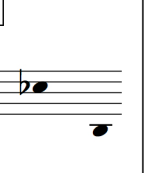
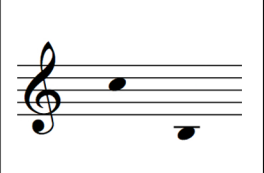
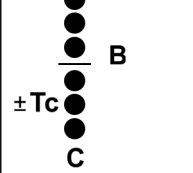
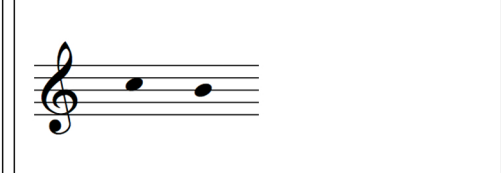
 B \flat - right hand fingerings


| N° | In C | In E \flat | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 24 |  |  |  |  |
| 25 |  |  |  |  |
| 26 |  |  |  |  |
| 27 |  |  |  | |
| 28 |  |  |  | |
| 29 |  |  |  |  |
| 30 |  |  |  |  |
| 31 |  |  |  |  |



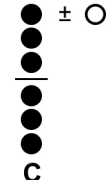



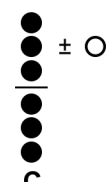



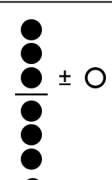
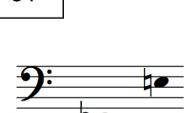
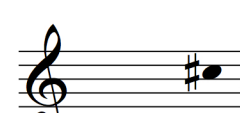
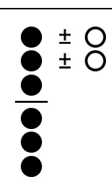

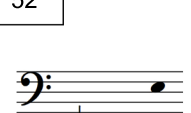
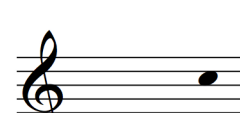
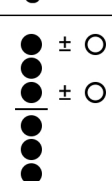



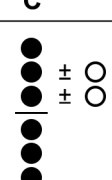

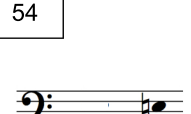

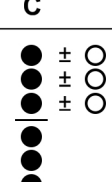


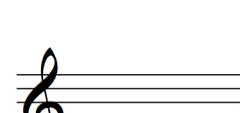
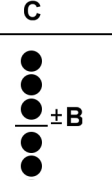
 B - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 32 |  |  |  <p>± O B C</p> |  |
| 33 |  |  |  <p>± O B C</p> |  |
| 34 |  |  |  <p>± O B C</p> |  |
| 35 |  |  |  <p>± O ± O B C</p> |  |
| 36 |  |  |  <p>± O ± O B C</p> |  |
| 37 |  |  |  <p>± O ± O B C</p> | |
| 38 |  |  |  <p>± O ± O ± O B C</p> | |
| 39 |  |  |  <p>± A B C</p> | |



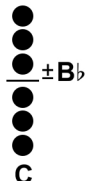

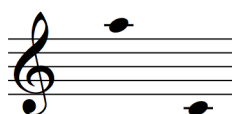
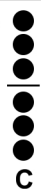
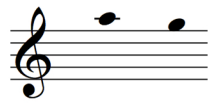
 B - right hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 40 |  |  |  <p>B ± ○ C</p> |  |
| 41 |  |  |  <p>B ± ○ C</p> |  |
| 42 |  |  |  <p>B ± ○ ± ○ C</p> |  |
| 43 |  |  |  <p>B ± ○ ± ○ C</p> | |
| 44 |  |  |  <p>B ± ○ ± ○ ± ○ C</p> | |
| 45 |  |  |  <p>B ± C</p> |  |
| 46 |  |  |  <p>B ± Ta C</p> | |
| 47 |  |  |  <p>B ± Tc C</p> |  |


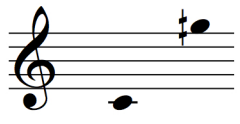
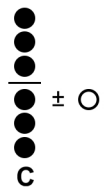


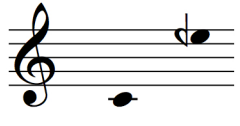
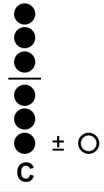


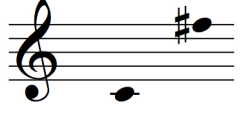
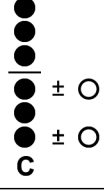


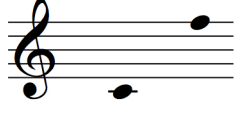
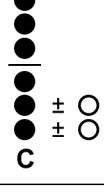
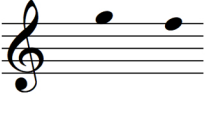

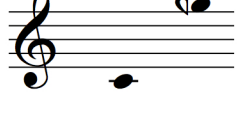
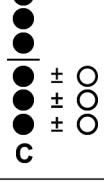


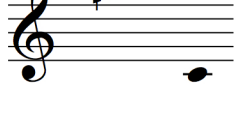



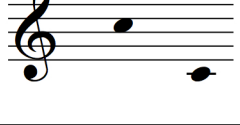
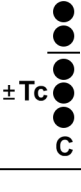

 C - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 48 |  |  |  |  |
| 49 |  |  |  |  |
| 50 |  |  |  | |
| 51 |  |  |  |  |
| 52 |  |  |  |  |
| 53 |  |  |  |  |
| 54 |  |  |  |  |
| 55 |  |  |  | |



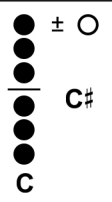

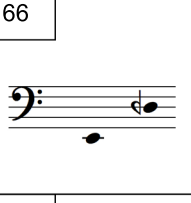

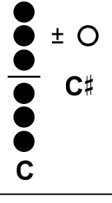

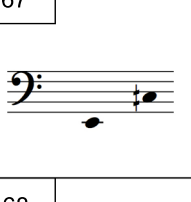

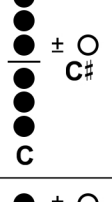

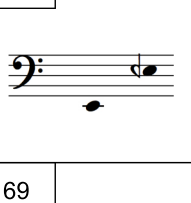

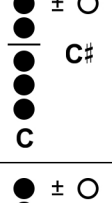

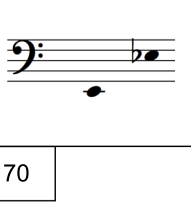

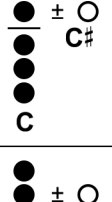

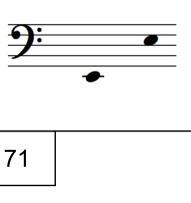

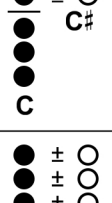

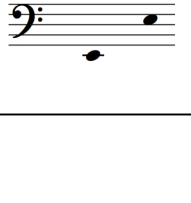

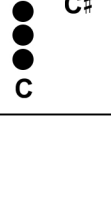

 C - left hand fingerings


| N° | <i>In C</i> | <i>In E\flat</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 56 |  |  |  | |
| 57 |  |  |  |  |



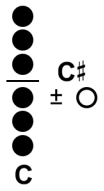


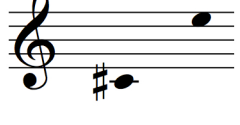
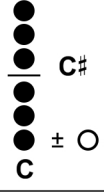

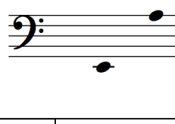
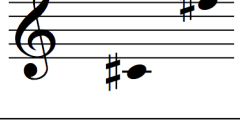
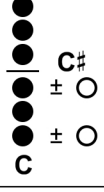

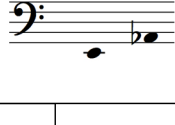
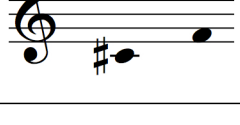
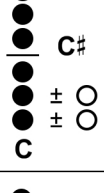
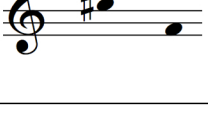
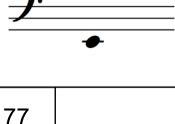
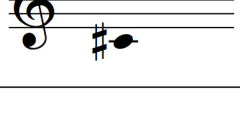
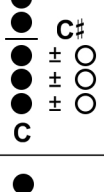
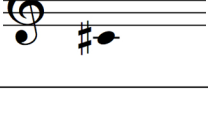
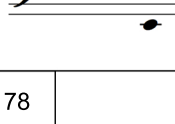
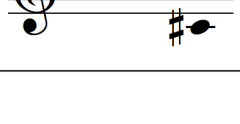
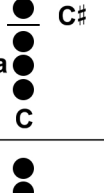
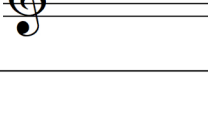
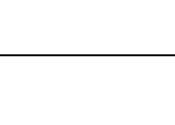
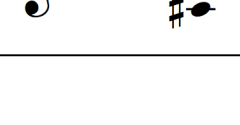
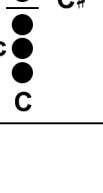
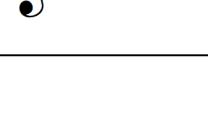
 C - right hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 58 |  |  |  |  |
| 59 |  |  |  |  |
| 60 |  |  |  |  |
| 61 |  |  |  |  |
| 62 |  |  |  |  |
| 63 |  |  |  |  |
| 64 |  |  |  |  |


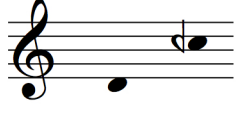
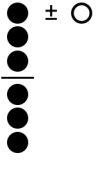


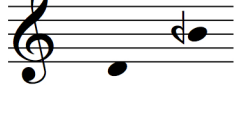
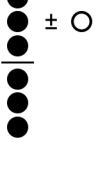


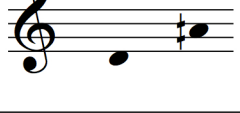
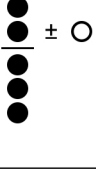
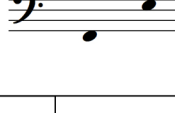
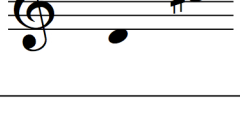
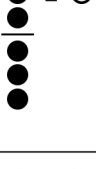
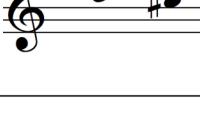
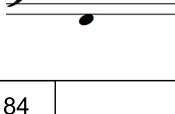
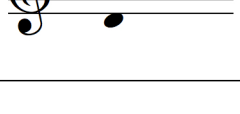
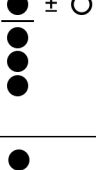
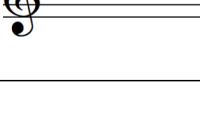
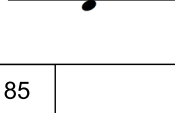
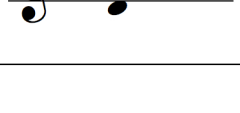
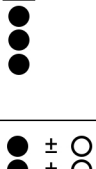
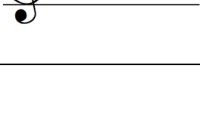
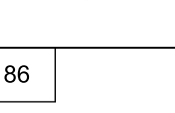
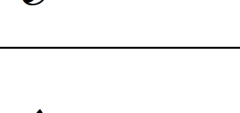

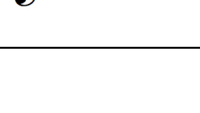
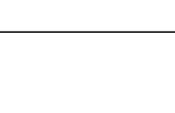
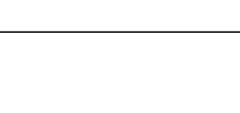

 C# - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 65 |  |  |  |  |
| 66 |  |  |  |  |
| 67 |  |  |  |  |
| 68 |  |  |  |  |
| 69 |  |  |  |  |
| 70 |  |  |  |  |
| 71 |  |  |  |  |


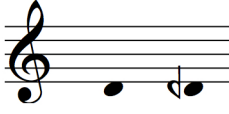
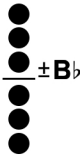




 C# - right hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 72 |  |  |  |  |
| 73 |  |  |  |  |
| 74 |  |  |  |  |
| 75 |  |  |  |  |
| 76 |  |  |  |  |
| 77 |  |  |  |  |
| 78 |  |  |  |  |

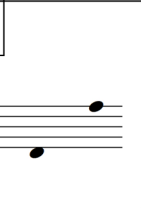

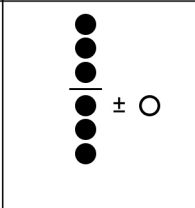

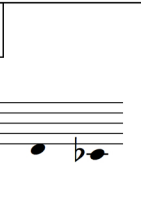

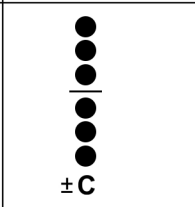


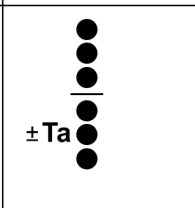


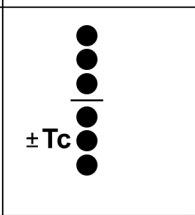
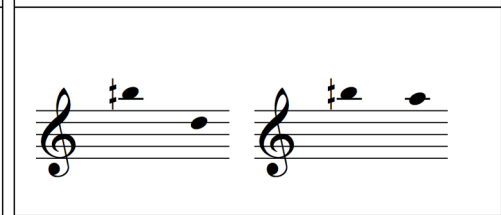
 D - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 79 |  |  |  |  |
| 80 |  |  |  |  |
| 81 |  |  |  | |
| 82 |  |  |  |  |
| 83 |  |  |  |  |
| 84 |  |  |  |  |
| 85 |  |  |  |  |
| 86 |  |  |  | |



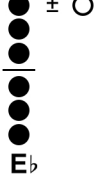



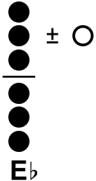



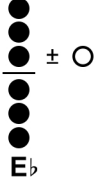



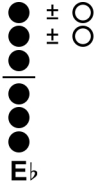



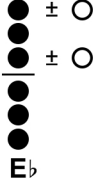



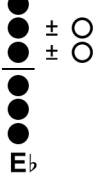



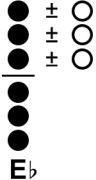

 D - left hand fingerings


| N° | <i>In C</i> | <i>In E\flat</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 87 |  |  |  | |
| 88 |  |  |  |  |



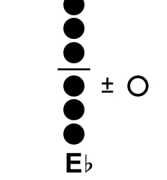



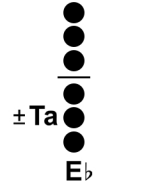
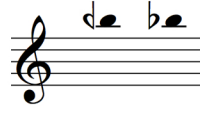
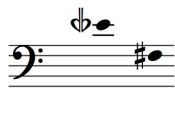

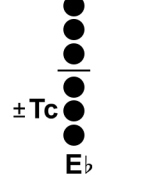

 D - right hand fingerings

| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 89 |  |  |  |  |
| 90 |  |  |  | |
| 91 |  |  |  | |
| 92 |  |  |  |  |

 D# - left hand fingerings

| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 93 |  |  |  |  |
| 94 |  |  |  |  |
| 95 |  |  |  |  |
| 96 |  |  |  |  |
| 97 |  |  |  |  |
| 98 |  |  |  |  |
| 99 |  |  |  |  |


 D# - right hand fingerings



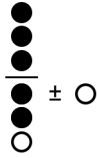


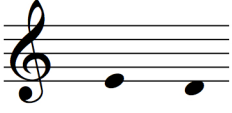
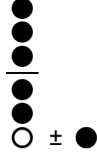

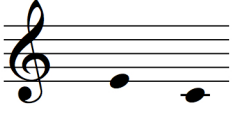
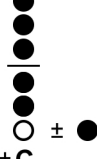
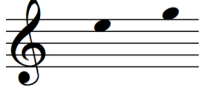

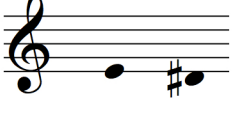
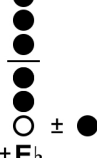
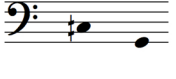


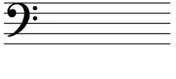
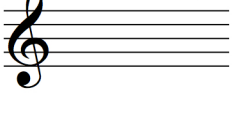
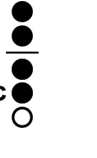
| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 100 |  |  |  |  |
| 101 |  |  |  |  |
| 102 |  |  |  |  |





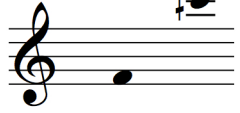
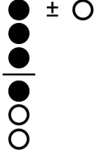

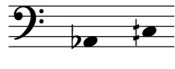
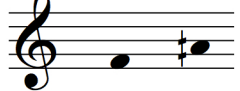
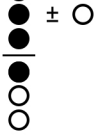
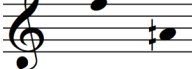
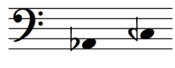

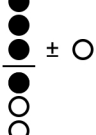
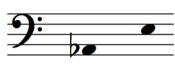
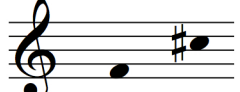
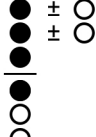

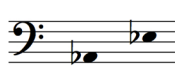
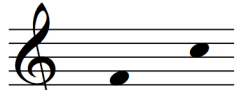
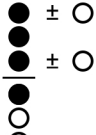
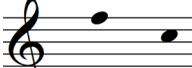
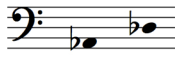
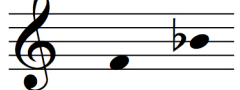
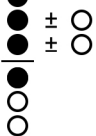
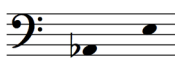
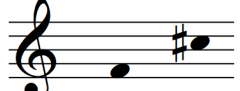
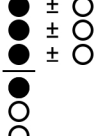
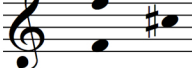
E - left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|-----|------|-------|-----------|---------------------|
| 103 | | | | |
| 104 | | | | |
| 105 | | | | |
| 106 | | | | |
| 107 | | | | |
| 108 | | | | |
| 109 | | | | |


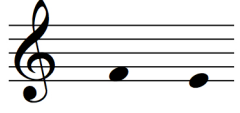
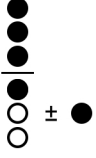
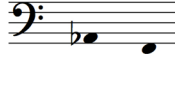
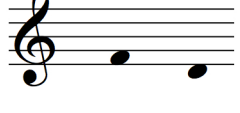
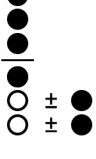

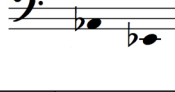
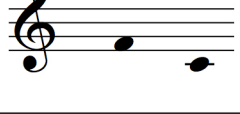
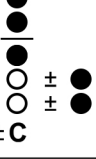
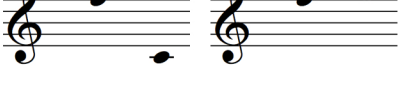
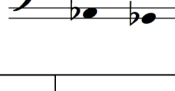
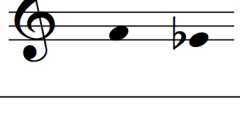
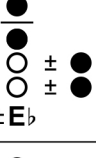
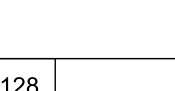
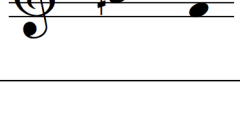
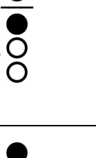
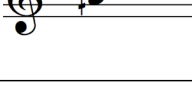
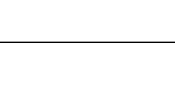
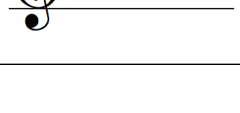
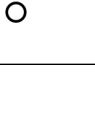
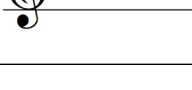
 E - right hand fingerings


| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 110 |  |  |  |  |
| 111 |  |  |  | |
| 112 |  |  |  |  |
| 113 |  |  |  | |
| 114 |  |  |  | |
| 115 |  |  |  | |



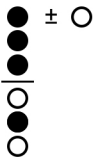



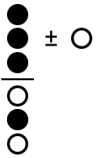



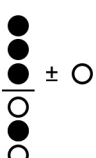
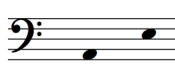

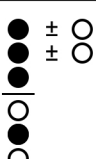
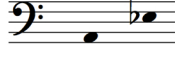

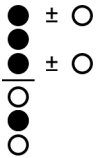



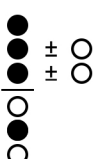

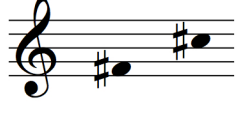
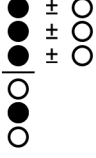

 F- left hand fingerings


| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 116 |  |  |  |  |
| 117 |  |  |  |  |
| 118 |  |  |  | |
| 119 |  |  |  |  |
| 120 |  |  |  |  |
| 121 |  |  |  | |
| 122 |  |  |  |  |



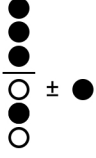



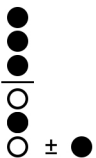



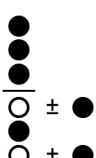

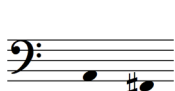

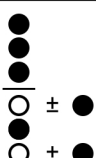



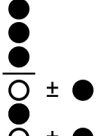

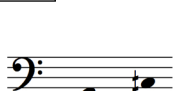

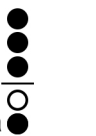

 F- right hand fingerings

| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 123 |  |  |  | |
| 124 |  |  |  |  |
| 125 |  |  |  |  |
| 126 |  |  |  | |
| 127 |  |  |  |  |
| 128 |  |  |  |  |

 F#- left hand fingerings

| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 129 |  |  |  |  |
| 130 |  |  |  |  |
| 131 |  |  |  | |
| 132 |  |  |  | |
| 133 |  |  |  |  |
| 134 |  |  |  | |
| 135 |  |  |  |  |


 F#- right hand fingerings

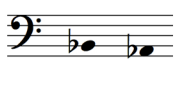
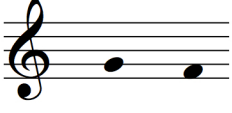
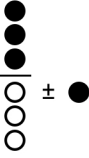
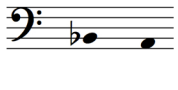
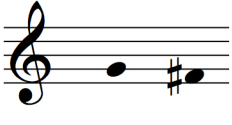
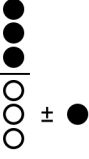
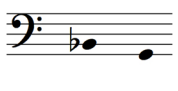
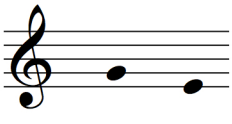
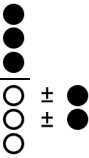

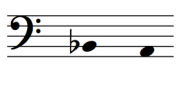

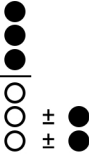

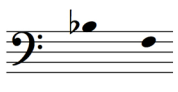
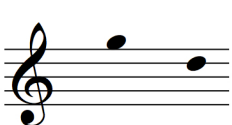
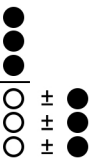



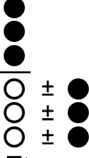


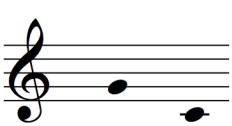
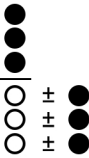



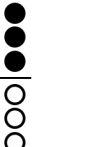
| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 136 |  |  |  |  |
| 137 |  |  |  |  |
| 138 |  |  |  |  |
| 139 |  |  |  ± Eb |  |
| 140 |  |  |  ± C |  |
| 141 |  |  |  ± Ta |  |





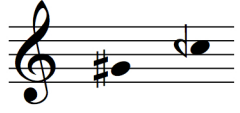
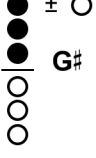
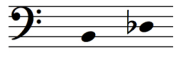

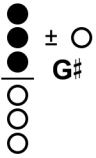
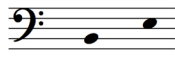

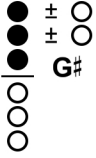
G- left hand fingerings


| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|-----|-------------|--------------|------------------|----------------------------|
| 142 | | | | |
| 143 | | | | |
| 144 | | | | |
| 145 | | | | |


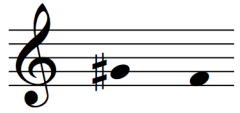
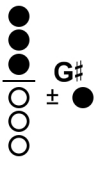



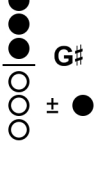



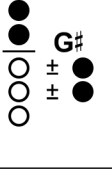

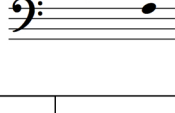
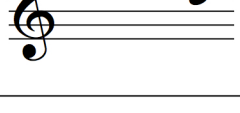
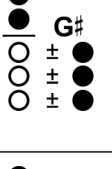
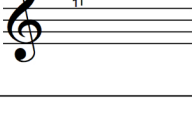
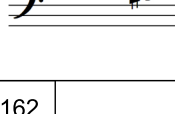
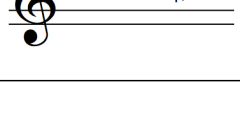
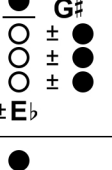
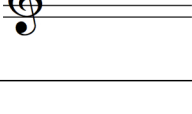
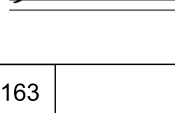
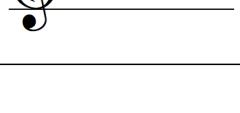
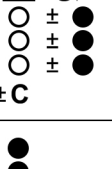
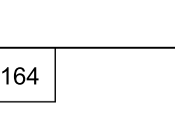
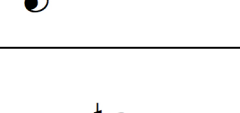
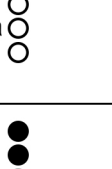
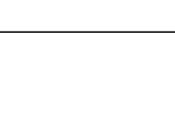
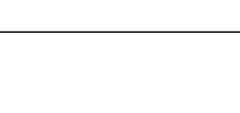
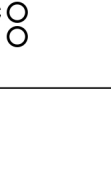
 G- right hand fingerings

| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 146 |  |  |  | |
| 147 |  |  |  | |
| 148 |  |  |  |  |
| 149 |  |  |  |  |
| 150 |  |  |  |  |
| 151 |  |  |  |  |
| 152 |  |  |  |  |
| 153 |  |  |  | |

 G#- left hand fingerings

| N° | <i>In C</i> | <i>In Eb</i> | <i>Fingering</i> | <i>Other possibilities</i> |
|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------|
| 154 |  |  |  | |
| 155 |  |  |  | |
| 156 |  |  |  | |

 G#- right hand fingerings

| N° | In C | In Eb | Fingering | Other possibilities |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 157 |  |  |  |  |
| 158 |  |  |  |  |
| 159 |  |  |  |  |
| 160 |  |  |  |  |
| 161 |  |  |  |  |
| 162 |  |  |  | |
| 163 |  |  |  | |
| 164 |  |  |  | |

Appendix B. À Proa

A Proa

José Afonso
arr. Menne Smalbroek

I
melody A

II
melody B

III
melody C

IV
treble layer

V
mid layer

VI
bass layer

played only the 2nd time

pp

B46

B B456

pp

3

This musical score is for guitar and consists of six staves. The top four staves are empty, indicating they are for upper strings that are not played in this section. The fifth staff contains a melodic line in the treble clef, and the sixth staff contains a bass line in the treble clef with guitar-specific notation, including 'x' marks for muted strings and bar lines for double stops. The key signature is three sharps (F#, C#, G#) and the time signature is 5/4. The score is divided into two measures by a vertical bar line.

5

The image shows a musical score for five staves. The first four staves are empty. The fifth staff contains a melodic line in 5/4 time, changing to 4/4 in the second measure, and returning to 5/4. The sixth staff contains a bass line with chords labeled B B456, B 456, and B 3456, also changing time signatures. The score is marked with *pp* (pianissimo) in both the fifth and sixth staves.

7

The image shows a musical score for five staves, covering measures 7 and 8. The key signature is G major (one sharp) and the time signature is 5/4. Measures 7 and 8 are marked with a 4/4 time signature. The top four staves are mostly empty, with a few notes in measure 7. The fifth staff (bottom) contains a rhythmic accompaniment with notes and rests, marked with 'x' below. The bottom staff includes a 'pp' dynamic marking.

9

This musical score is for guitar and consists of six staves. The first four staves are empty, each beginning with a treble clef and a key signature of three sharps (F#, C#, G#). The fifth staff contains a melodic line of eighth notes, starting on G4 and moving in a stepwise fashion. The sixth staff contains a bass line with guitar-specific notation, including 'x' marks for muted strings and chord diagrams. The score is divided into two measures by a vertical bar line, and each measure ends with a double bar line and repeat dots. The piece concludes with a final double bar line and repeat dots at the end of the sixth staff.

11

played only the 2nd time

The musical score consists of six staves. The first staff has a treble clef and a key signature of one sharp (F#). It begins with a first ending bracketed over measures 11 and 12, with the instruction "played only the 2nd time" above it. The notes in the first ending are: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter), B4 (quarter), A4 (quarter), G4 (quarter), and a whole rest. The dynamic marking *mf* is placed below the first staff. The second and third staves are empty, with only a treble clef and key signature. The fourth staff has a treble clef and key signature, with notes: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter), B4 (quarter), A4 (quarter), G4 (quarter), and a whole rest. The dynamic marking *mp* is placed below the fourth staff. The fifth staff has a treble clef and key signature, with a continuous eighth-note accompaniment: G4-A4-B4-C5-B4-A4-G4. The dynamic marking *pp* is placed below the fifth staff. The sixth staff has a treble clef and key signature, with a complex accompaniment pattern involving sixteenth notes and rests, with 'x' marks below the staff indicating muted strings. The dynamic marking *pp* is placed below the sixth staff.

13

This musical score is written for guitar and consists of six staves, all in the key of D major (indicated by two sharps) and 5/4 time. The score is divided into two measures by a vertical bar line. The first measure contains the following parts:

- Staff 1:** A melodic line starting with a dotted quarter note, followed by eighth notes, and ending with a quarter note. A slur covers the first five notes. A '7' is written above the staff, and a fermata is placed over the final note.
- Staff 2:** A whole rest.
- Staff 3:** A whole rest.
- Staff 4:** A series of quarter notes.
- Staff 5:** A series of eighth notes.
- Staff 6:** A complex rhythmic pattern with eighth notes and rests, marked with 'x' symbols below the staff.

The second measure contains the following parts:

- Staff 1:** A whole rest.
- Staff 2:** A whole rest.
- Staff 3:** A whole rest.
- Staff 4:** A series of quarter notes.
- Staff 5:** A series of eighth notes.
- Staff 6:** A complex rhythmic pattern with eighth notes and rests, marked with 'x' symbols below the staff.

The time signature 5/4 is indicated at the end of each staff.

15

The musical score consists of six staves. The first staff contains a melodic line in treble clef, starting with a half note G4 and followed by eighth notes. A slur covers the first six notes. The time signature changes from 5/4 to 4/4 at measure 16. The second and third staves are empty. The fourth staff contains a bass line in treble clef with quarter notes G4, A4, B4, C5, and D5. A slur covers the first four notes. The dynamic marking *mp* is placed below the staff. The fifth staff contains a piano line in treble clef with eighth notes G4, A4, B4, C5, and D5. A slur covers the first four notes. The dynamic marking *pp* is placed below the staff. The sixth staff contains a figured bass line with 'x' marks below the notes, indicating a specific fingering or articulation. The time signature changes from 5/4 to 4/4 at measure 16 and back to 5/4 at measure 17.

17

The musical score consists of six staves. The first staff begins with a treble clef, a key signature of three sharps (F#, C#, G#), and a 5/4 time signature. It contains a melodic line with a long note in the first measure followed by a series of eighth notes. A slur spans across the first measure of the second staff, which is otherwise empty. The third staff is also empty. The fourth staff contains a melodic line with a long note in the first measure followed by a series of eighth notes. The fifth staff contains a rhythmic accompaniment of eighth notes. The sixth staff contains a complex rhythmic accompaniment with many beamed notes and rests. A vertical bar line is placed between the first and second measures. The time signature changes to 4/4 after the bar line. The dynamic markings *mp* and *pp* are placed below the fourth and fifth staves, respectively, after the bar line.

19

The musical score is written for guitar and consists of six staves. The key signature is three sharps (F#, C#, G#). The notation includes various rhythmic values and guitar-specific symbols like 'x' for muted strings. The score is divided into two measures by a vertical bar line. The first measure contains the initial notes and rests for all staves. The second measure continues the melodic and rhythmic lines. The sixth staff features a complex rhythmic pattern with many 'x' marks below the notes, indicating muted strings.

21

A musical score for six staves, all in treble clef and F# major (three sharps). The score is divided into two measures. The first measure contains the following parts:

- Staff 1:** A melodic line starting with a repeat sign, followed by a series of eighth notes and quarter notes, ending with a fermata.
- Staff 2:** A whole rest.
- Staff 3:** A whole rest.
- Staff 4:** A melodic line consisting of quarter notes.
- Staff 5:** A melodic line consisting of eighth notes, marked with the dynamic *pp*.
- Staff 6:** A bass line with chords and eighth notes, marked with the dynamic *pp* and containing 'x' marks below the notes.

The second measure contains the following parts:

- Staff 1:** Continuation of the melodic line from the first measure.
- Staff 2:** A whole rest.
- Staff 3:** A whole rest.
- Staff 4:** Continuation of the quarter note melodic line.
- Staff 5:** Continuation of the eighth note melodic line.
- Staff 6:** Continuation of the bass line with chords and eighth notes.

23

A musical score for guitar, consisting of six staves. The music is written in the key of D major (indicated by two sharps) and a 5/4 time signature. The score is divided into two measures by a vertical bar line. The first measure contains a melodic line in the top staff, a whole rest in the second and third staves, a bass line in the fourth staff, and a complex rhythmic pattern in the fifth and sixth staves. The second measure continues the melodic line in the top staff, has whole rests in the second and third staves, and continues the bass line in the fourth staff. The fifth and sixth staves continue with a complex rhythmic pattern. The number '23' is written above the first staff at the beginning of the first measure. The time signature '5/4' is written at the end of each staff.

25

Musical score for guitar, page 25. The score is in G major (one sharp) and 5/4 time. It features a melodic line in the first staff, a bass line in the fourth staff, and a guitar accompaniment in the sixth staff. The piece is divided into two measures by a vertical bar line. The first measure is in 5/4 time, and the second measure is in 4/4 time. Dynamics include *mp* and *pp*.

27

Musical score for a piece in E major, 5/4 time, starting at measure 27. The score consists of six staves. The first staff has a melodic line with a fermata. The second and third staves are empty. The fourth staff has a melodic line with a fermata and a dynamic marking of *mp*. The fifth staff has a rhythmic accompaniment with a dynamic marking of *pp*. The sixth staff has a complex rhythmic accompaniment with 'x' marks below it.

29

The musical score consists of six staves, all using treble clefs and a key signature of three sharps (F#, C#, G#). The score is divided into two measures by a vertical bar line. The top three staves contain whole rests. The fourth staff contains a sequence of quarter notes: F#4, C#5, G#5, F#5, G#5, C#5, F#4. The fifth staff contains a sequence of eighth notes: F#4, C#5, G#5, F#5, G#5, C#5, F#4. The sixth staff contains a complex rhythmic pattern with eighth notes and rests, and includes 'x' marks below the staff.

33

This musical score is written for guitar in 5/4 time and consists of six staves. The key signature is three sharps (F#, C#, G#). The score is divided into two measures by a vertical bar line. The first measure contains the following parts:

- Staff 1:** A melodic line starting with a dotted quarter note, followed by eighth notes, and ending with a quarter note. A slur covers the first four notes.
- Staff 2:** A melodic line similar to Staff 1, but with a different rhythmic pattern for the eighth notes.
- Staff 3:** A whole rest.
- Staff 4:** A series of quarter notes.
- Staff 5:** A rhythmic pattern of eighth notes.
- Staff 6:** A complex rhythmic pattern with eighth notes and rests, indicated by 'x' marks below the staff.

The second measure contains the following parts:

- Staff 1:** A whole note followed by a quarter rest and a quarter note.
- Staff 2:** A whole note followed by a quarter rest and a quarter note.
- Staff 3:** A whole rest.
- Staff 4:** A series of quarter notes.
- Staff 5:** A rhythmic pattern of eighth notes.
- Staff 6:** A complex rhythmic pattern with eighth notes and rests, indicated by 'x' marks below the staff.

The time signature 5/4 is indicated at the end of each staff.

35

The image shows a musical score for six staves, spanning measures 35 to 37. The key signature is three sharps (F#, C#, G#). The time signature is 5/4, which changes to 4/4 in the middle of measure 36 and returns to 5/4 at the end of the system. The first two staves feature melodic lines with slurs. The third staff is empty. The fourth staff contains a simple melodic line with a dynamic marking of *mp*. The fifth staff contains a rhythmic accompaniment of eighth notes with a dynamic marking of *pp*. The sixth staff contains a complex rhythmic accompaniment with 'x' marks below the notes, possibly indicating fingerings or specific articulation.

37

The musical score consists of six staves. The first two staves have a melodic line with a long slur over measures 37-40. The third staff is empty. The fourth staff has a melodic line starting in measure 39 with a dynamic marking of *mp*. The fifth staff has a rhythmic accompaniment of eighth notes starting in measure 39 with a dynamic marking of *pp*. The sixth staff has a complex accompaniment with eighth notes and rests, marked with 'x' symbols, starting in measure 39. The time signature changes from 5/4 to 4/4 at the beginning of measure 39.

39

Musical score for guitar, consisting of six staves. The score is in treble clef with a key signature of three sharps (F#, C#, G#). It consists of two measures. The top three staves contain whole notes and rests. The fourth staff contains a sequence of eighth notes. The fifth staff contains a sequence of eighth notes. The sixth staff contains a sequence of eighth notes with 'x' marks below them, indicating muted strings.

41

3x

The musical score consists of six staves, all in treble clef and F# major (three sharps). The first staff begins with a treble clef, a key signature of three sharps, and a time signature of 4/4. A repeat sign is present at the start of the first measure. The first staff has a dynamic marking of *mf* and a slur over the first two measures. The second staff has a dynamic marking of *p* and a slur over the first two measures. The third staff has a dynamic marking of *mf* and a slur over the last two measures. The fourth staff has a dynamic marking of *mp* and contains four quarter notes in the first measure and four quarter notes in the second measure. The fifth staff has a dynamic marking of *pp* and contains a continuous eighth-note pattern. The sixth staff has a dynamic marking of *pp* and contains a complex rhythmic pattern with eighth notes and rests, marked with 'x' symbols below the notes. The score is divided into two measures by a vertical bar line.

43

This musical score is written for guitar and consists of six staves, all in the key of D major (indicated by two sharps) and 5/4 time. The score is divided into two measures by a vertical bar line. The first measure contains the following parts:

- Staff 1:** A melodic line starting with a half note D5, followed by eighth notes E5, F#5, G5, A5, B5, C6, and D6. A fermata is placed over the final D6.
- Staff 2:** A melodic line starting with a half note D5, followed by eighth notes E5, F#5, G5, A5, B5, C6, and D6. A fermata is placed over the final D6.
- Staff 3:** A whole note D5.
- Staff 4:** A series of quarter notes: D5, E5, F#5, G5, A5, B5, C6, D6.
- Staff 5:** A series of eighth notes: D5, E5, F#5, G5, A5, B5, C6, D6, E5, F#5, G5, A5, B5, C6, D6.
- Staff 6:** A series of eighth notes: D5, E5, F#5, G5, A5, B5, C6, D6, E5, F#5, G5, A5, B5, C6, D6. Below the staff are 'x' marks indicating fretted notes.

The second measure contains the following parts:

- Staff 1:** A whole note D5, followed by a fermata, and then eighth notes E5, F#5, G5, A5, B5, C6, and D6.
- Staff 2:** A whole note D5, followed by a fermata, and then eighth notes E5, F#5, G5, A5, B5, C6, and D6.
- Staff 3:** A series of eighth notes: D5, E5, F#5, G5, A5, B5, C6, D6.
- Staff 4:** A series of quarter notes: D5, E5, F#5, G5, A5, B5, C6, D6.
- Staff 5:** A series of eighth notes: D5, E5, F#5, G5, A5, B5, C6, D6, E5, F#5, G5, A5, B5, C6, D6.
- Staff 6:** A series of eighth notes: D5, E5, F#5, G5, A5, B5, C6, D6, E5, F#5, G5, A5, B5, C6, D6. Below the staff are 'x' marks indicating fretted notes.

45

This musical score consists of six staves, numbered 45 to 47. The key signature is three sharps (F#, C#, G#). The time signature is 5/4, which changes to 4/4 in the middle of each measure.

- Staff 1:** Features a melodic line with eighth and sixteenth notes, starting with a fermata over the first measure. A slur covers the first two measures.
- Staff 2:** Mirrors the melodic line of Staff 1.
- Staff 3:** Features a melodic line with eighth and sixteenth notes, starting with a fermata over the first measure. A slur covers the first two measures.
- Staff 4:** Features a simple melodic line with quarter notes and a half note.
- Staff 5:** Features a rhythmic pattern of eighth notes.
- Staff 6:** Features a complex rhythmic pattern with eighth notes and rests, marked with 'x' symbols.

Dynamics are indicated as *mp* (mezzo-piano) and *pp* (pianissimo).

47

The musical score consists of six staves. The first two staves are melodic lines in treble clef, both in G major (one sharp). The first staff begins in 5/4 time and changes to 4/4 at measure 49. The second staff follows a similar pattern. The third staff is a melodic line in treble clef, also in G major, with a fermata over the first measure and a 7-measure rest. The fourth staff is a piano accompaniment in treble clef, G major, with a fermata over the first measure and a dynamic marking of *mp* at the start of measure 49. The fifth staff is a piano accompaniment in treble clef, G major, with a fermata over the first measure and a dynamic marking of *pp* at the start of measure 49. The sixth staff is a bass line in treble clef, G major, with a fermata over the first measure and 'x' marks below the notes in measures 47-50.

49

A musical score for guitar, consisting of six staves. The music is written in treble clef with a key signature of three sharps (F#, C#, G#). The score is divided into two measures by a vertical bar line. The first measure contains the following notation:

- Staff 1: A whole note chord consisting of F#, C#, G#, and D.
- Staff 2: A whole note chord consisting of F#, C#, G#, and D.
- Staff 3: A whole note chord consisting of F#, C#, G#, and D, with a long slur extending over the bar line.
- Staff 4: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.
- Staff 5: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.
- Staff 6: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.

The second measure contains the following notation:

- Staff 1: A whole rest.
- Staff 2: A whole rest.
- Staff 3: A whole rest.
- Staff 4: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.
- Staff 5: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.
- Staff 6: A sequence of eighth notes: F#, G#, A, B, C, D, E, F#.

At the bottom of the page, there are several guitar-specific notations: a series of 'x' marks indicating fretted strings, and several chord diagrams (triangles) showing the fingerings for the chords in the first measure.

Appendix C. Trends at Odds

26

panning

fading speakers

+ 2-3
- 1

Growl
huge crescendo together with the electronics
on sign mute subito

♩=68
5 3'47" SOCIETY

44

ppp

muffle

mute master

stand by
1-2-3-4-5-6-7
1-4-5-6-7

7/4 + 2-3
- 1
1-2-3
- 1

gliss.

p

p

mp

keys

2
2-3
4-6
5
6

Always growing together with the harmonizer until it's one block of sound

repeat

64

- ☐ 3
- ☐ 5-7
- ☐ 7

☐ 4-5-6-7

☐ tape

4 73

1. G#13 4x

mf 3

first 2 times extreme legato, after the 3rd time slowly introducing the accents

G#4 3

mf 3

only 4th time

mf 8x G#13

G#4

mf 1-2

mf 1-2-3 ad libitum

mf 2-3 keys

mf 1-2-3-4-5-6-7

77

G#13

G#4

Bb56

Bb456

mf 3

strong accents, always growing,
harmonizer will be slowly added till the end

82

9x

C56
C#56
C456

Bb56
Bb456

f

4-5-6-7 ad libitum

1-2-3-4

86

G#13
G13
G#4
G4

all

all dry
all dry
φ

90

C#56
C#456

C56
C456

the end