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# Thinking through the guitar

## The sound-cell-texture chain

Marlon Titre

# Thinking through the guitar:
## The sound-cell-texture chain

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Dit proefschrift is geschreven als een gedeeltelijke vervulling van de vereisten voor het doctoraatsprogramma docARTES. De overblijvende vereiste bestaat uit een demonstratie van de onderzoeksresultaten in de vorm van een artistieke presentatie.

Het docARTES programma is georganiseerd door het Orpheus Instituut te Gent.

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# Introduction

## Central Aim

The central aim of this artistic research project is to establish and develop guidelines for the way scoring for the classical guitar can be used as a vehicle for musical thought, and to use these findings to write new music for the classical guitar.

## Framework and background

"The guitar is a miniature orchestra in itself!"[1] Yet, writing music for the guitar is a daunting task. Composers need to find a balance between the specific possibilities and limitations that the guitar poses, and at the same time use it as a means of artistic expression. In my experience as a performing guitarist, regularly receiving scores from composers and studying repertoire from well-known non-guitarist composers, I often notice scoring imprecisions as well as misinterpretations of the nature and conditions of the classical guitar potential. With such a well-established instrument as the classical guitar one would expect that there is common knowledge among composers of how to score for the guitar. But even in compositions of well-known composers, lack of understanding of the instrument is often evidenced by unplayable or impossible passages.[2] This may be caused by a general lack of familiarity in the composition world with the classical guitar and its scoring potential when compared to, for instance, the piano and string instruments with their long standing scoring traditions. This situation seems persistent, certainly in part because there are few studies explicitly dedicated to the topic of classical guitar scoring, that all leave a range of voids in their description of the guitar potential.[3] Two general orchestration guides that contain a chapter on guitar scoring, the Study of Orchestration by Samuel Adler and Instrumentation and Orchestration by Alfred Blatter, contain obvious mistakes and oversights in their

[1] This quote is often attributed to Beethoven, although no record exists of when and where he expressed this idea. A search on Google revealed that different websites attribute the quote to different musicians such as Beethoven, Mozart, Villa-Lobos, Segovia and Berlioz; it seems that the quote is apocryphal. There is, however, a history of guitarists and composers comparing the guitar to an orchestra. Fernando Sor made explicit connections between the guitar and orchestral instruments in his *Methode pour la Guitarre /Guitarre Schule* (Sor, 1831, pp. 15-19), explaining different ways of imitating the sound of orchestral instruments such as the horn, trumpet, the oboe and the harp. Andres Segovia is said to have described the guitar as "an orchestra seen through the wrong end of a telescope".

[2] Examples are unplayable guitar chords in Alban Berg's *Wozzeck* (Act II, Garden of an Inn. Quoted in Marriott (Marriott, 1984, pp. 30-34)). The published version of Rodrigo's *Invocacion y Danza* is an edited version by Pepe Romero (Rodrigo, 1997) full of *ossia* solutions proposed by the editor in the arpeggiated chord section.

[3] Publications that are specifically dedicated to the subject of scoring for the guitar are: *Composer's Desk Reference for the Classic Guitar* (Kachian, 2006), *La Grammatica della Chitarra* (Gilardino, 1994) and *How to write for the guitar* (Bream, 1957). The voids these publications leave in the description of the guitar potential are discussed in depth in the Theory Chapter.

discussion of the guitar.[4] With the lack of scoring literature, guitarists report personally informing composers on the possibilities of the instruments by making fretboard mock ups and neck charts (Musicians.com, 2010; Tosone, 2000, p. 27), making concise overviews on the possibilities of the instrument (Bream, 1957), while others report having to do extensive editing after receiving scores, even when composed by established composers as Kernis and Ponce (Tosone, 2000, p. 10; Segovia, 1989).

# Research questions

The main question directing this research is: How can scoring for the classical guitar be analyzed and improved as a means to capture the possibilities of the guitar in artistic creations and expressions of the composer?

Sub-questions are:

1. What are the historical origins of the problematic relationship between guitar, guitarist and composer?
2. What are the possibilities and characteristics of the classical guitar (e.g. range, sonority, harmony) and what are the (extended) techniques available to utilize them (e.g. tremolo, arpeggio, percussion, alternate tunings)?
3. What are the theories, methods and techniques on scoring for the classical guitar in terms of
    a. Instrumentation
    b. Writing style (e.g. single line, polyphonic, melody and accompaniment) and
    c. Nature of scores (e.g. desirable ranges, positions, tonal choices)?
4. How can analysis of scoring evidenced in historical and contemporary guitar repertoire be helpful in establishing guidelines for the scoring potential of the guitar?
5. What notation practices do we find in guitar scores, and how can these notation practices be improved so that they present clear and unambiguous instructions to the performer?
6. How can guitar scoring principles developed during the research trajectory be used to create new compositions in the form of works for solo guitar?

# Delineation

In the current section, the focus of this study is discussed. Questions leading the discussion are: what repertoire is considered in this study? Which styles and epochs are relevant? What are the latest scoring developments captured in this study? Which aspects of compositions are focused on in particular? Does

[4] Adler, for instance, does not include any fingering charts of the fretboard and gives his literature example in bass clef (Adler, 1989, pp. 104-105) a clef that is not used for guitar notation. Blatter, in an appendix to a chapter on guitar instrumentation misrepresents the range of the first string by an octave in his fingering chart (Blatter, 1997, pp. 445-446). For a more thorough discussion of problematic issues in the previous studies, please refer to the Theory Chapter.

this study emphasize structural analysis of larger forms, or detailed attention for shorter passages? What is missing in the existing literature on guitar scoring?

The research deals with scoring for the solo classical guitar as evidenced in classical guitar repertoire. In order to do justice to its complexity, this study focuses exclusively on scoring for the solo classical guitar. Chamber music and electronic music are not included as research topics as they all involve other instruments, and are therefore not directly related to guitar scoring. However, this study is not without benefits for these fields: a thorough understanding of the workings of the solo guitar can be of use to those who write chamber music and electronic music involving the guitar.
This study intends to be inclusive of the wide range of styles and epochs that the classical guitar community so characteristically incorporates in its repertoire. For this reason, there is attention for guitar music from the classical and romantic era (e.g. Fernando Sor, Francisco Tárrega), early twentieth century repertoire (e.g. Manuel Maria Ponce, Heitor Villa-Lobos) and later twentieth century repertoire (e.g. Luciano Berio, Arthur Kampela, José María Sánchez-Verdú). Although compositions by avant-garde composers play an important part in this study, it was not my intention to focus completely and exclusively on the most recent developments in the world of experimental music. Nevertheless, I did set out to treat sounds and techniques more commonly found in experimentally-oriented works, such as scratching sounds and inverted stopping sounds, with the same attention for detail as more traditional sounds, which resulted in detailed accounts of the possibilities and conditions for their use.
The *Sequenza XI* by Luciano Berio (1988) is an important composition of the late twentieth century that, due to its effective use of a wide range of scoring tools, plays an important role in this study. However, it does not reflect the final stage of developments. Representative of some of the latest developments is the work of Arthur Kampela, receiving ample attention in this study. Kampela, a student of Brian Ferneyhough, effectively uses the guitar to build on the musical innovations explored by other avant-garde composers, who did not always manage to translate their innovations into effective application on the guitar as convincingly as he did in his *Percussion Studies* (1993a; 1993b).
There is a difference between the musical style of a piece and the scoring tools used by the composer to achieve the sounding outcome. Although there is a relation between the two (scoring can contribute to the articulation of musical style), the focus of this research is on the scoring dimension. The latest developments in musical experimentation do not automatically amount to innovations in scoring. Compositions may be innovative and experimental in musical terms, but use scoring means that are rather conventional, relatively ineffective or not realizable on the guitar. Despite their experimental nature, such compositions do not qualify to be singled out as examples of innovative use of scoring. Vice versa, some compositions, even from the nineteenth century, are written in a style that is conventional for their time, but original in terms of scoring, even from our contemporary perspective (see, for instance, the Left hand alone texture by Francisco Tárrega in Chapter 11).
This study discusses guitar scoring in detail, and there is great attention for the subtle relation between notation, guitar-technical intricacies and the sounding result. Such relations are best shown in short passages of a few notes or bars, in order to pinpoint exactly what works, what does not work and why. Not included in this study are detailed analyses of the structural relation between discussed passages and the works as a whole, structural analyses of complete compositions, or descriptions of the expressive potential of particular pieces. Rather, by emphasizing the presentation of a wide range of

scoring tools in detail, including attention for their expressive potential, this study aims to facilitate the work of composers writing large structures that allow for expressive performance.
The existing literature on solo guitar scoring consists of guitar scoring guides, contemporary guitar instrumentation guides and information on the guitar scoring potential in general orchestration guides (see section 3.1). Various aspects are missing in the existing literature on guitar scoring: information on how to use and combine individual sounds as building blocks in scoring, information on textures that are not made up of plucked sounds, an overview of the intervals and chords that can be scored, accurate information about notation and technical difficulties, and a presentation model that is relevant for composers. This study aims to add to the existing body of knowledge by providing an account of how guitar sounds can be used as building blocks in scoring, by providing information on textures that are not exclusively made up of plucked sounds, by giving an account of the possibilities to score intervals and chords, by correcting inaccuracies in a number of previous studies concerning technique and notation, and by aiming to create a presentation model relevant for composers, (see section 3.2, 3.3 and 3.4).

# Theory

The dissertation introduces new concepts that are believed to be useful as tools and methods to describe and analyze scoring in guitar works, and in writing new compositions for guitar.

*Sound-cell-texture* chain: the *sound* concept captures the properties and characteristics of individual notes played on the guitar. The c*ell* concept captures the idiomatic ways in which *sounds* can be combined. The *texture* concept captures the way in which musical activity develops over time (a number of bars) and, through its timbral properties, density of intervals, number of voices, combination of *sounds*, temporal development and tempo creates a musical fabric possible on the guitar. The *chain* concept captures the simultaneous functioning of a musical passage on these three levels. For each sound category available on the guitar, a *sound-cell-texture* chain is presented.

The research further develops the perspective guitarist Chris Kachian presented in his work when he described the guitar potential through the musical textures that can be created on the guitar (Kachian, 2006, pp. 13-29). Unplayable or ineffective passages in guitar scores may stem from a lack of understanding of the way individual *sounds* become part of cells and textures.[5] The approach taken in this research is to describe the guitar's potential through the *sound-cell-texture* chain. The main thesis is that thinking through the potential of the guitar leads to more effective scoring, where effective scoring is achieved when the guitarist's performance of a score can sound in accordance with the sonic outcome suggested in the score.

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[5] Some composers, for instance, treat the guitar as an instrument that can play a melody. In much of the guitar literature, such a melody is usually accompanied by a harmonic accompaniment. A melody with a harmonic accompaniment on the guitar is a texture that requires more knowledge about the instrument. If that knowledge is not available to the composer, the texture of the music may look underdeveloped in comparison to other aspects of the composition. Examples of such pieces are: *Gobelin Imaginaire* by Arletta Weiss, winner of the 2008 Barmenia guitar composition competition (Weiss, 2008) and *Serious and Sincere Sentiments about Something* by Matthew Shlomowitz (Shlomowitz, 2004).

# Intended outcomes

## Academic and artistic outcomes

Coessens et al. propose that artistic research should contain an academic and an artistic outcome, of which the artistic outcome can take the form of a work of art (Coessens et al., 2009, p. 73). In addition, the “new products and experiences” that result from the research should also be “meaningful in the world of art” (Borgdorff, 2010, p. 46). In this research trajectory, the guidelines for the way in which guitar scoring can be used as a vehicle for musical thought are the intended academic outcome, while the compositions written with the help of these findings are the artistic outcome. The research makes aspects of the creative process of writing new compositions for guitar visible by showing the scoring tools that have been developed in the research process. These tools are articulated in a manner that allows them to be shared with other artists who wish to compose for the guitar, and in a manner accessible and relevant for composers. The research contributes to the repertoire of the guitar by assisting in the creation of compositions written on the basis of an informed understanding of the guitar: an understanding acquired through research.

## Contribution to the discussion on artistic research

Due to the relatively recent creation of doctoral programs in artistic research, doctoral researchers in this field are confronted not only by the specificities of their individual research projects, but have also been drawn into the parallel discussion on artistic research. This discussion involves questions on the legitimacy of artistic research as well as its values, delimitations, methods, benefits for the academic and artistic world, and questions about the nature of its dual character located in between these domains (Biggs & Karlsson, 2010a; Biggs & Karlsson, 2010b; Newbury, 2010; Borgdorff, 2010; Coessens et al., 2009). The effect of the artistic engagement of the artistic research with her subject of research and the inclusion of “an original work of art” (Borgdorff, 2010, p. 55) as an artistic outcome, is that the various research trajectories of artistic researchers differ and have a highly individual character. This, in turn, means that every doctoral project including the written account of the research can be a distinctive contribution to the body of experience in this field and, by extension, to the discussion on artistic research. This is particularly the case if the researcher is willing, in addition to contributing to knowledge on a specific and delineated topic of research, to articulate and communicate the nature and specifics of this contribution to the discussion on artistic research. This research intends to make such a contribution; in the opening chapters, the methodology, theories and context are outlined and linked to existing practices, while in the Discussion Chapter a section is dedicated to the academic contribution to the discourse on the complex of research in and through artistic practice.

Coessens et al. write that tacit knowledge and embodied knowledge play an important role in the artistic research process (Coessens et al., 2009). The concept of tacit knowledge, originating in the work of Polanyi (Yu, 2003; Polanyi, 1958) can be described as “knowledge that can not be fully articulated by verbal means” (Yu, 2003, p. 12). Embodied knowledge relates to tacit knowledge, and refers to the way the body tacitly “knows” how to perform actions without conscious reflection. This study intends to contribute to the discussion on the role of tacit and embodied knowledge in artistic research by demonstrating a manner of eliciting the tacit and embodied knowledge present in scoring skills, by subsequently developing this knowledge through artistic practice, and finally by articulating and communicating this tacit and embodied knowledge through writing, through score examples, through video recordings and through new compositions.

## Dissertation structure

In Chapter 1, Methodology, the research design and implementation are presented in detail, including the research processes, stages, and the application of theories, tools and methods. The Methodology Chapter contributes to answering the fourth research sub-question by sketching the grounded theory-based approach employed during the research process to generate a scoring theory.[6] Chapter 2, Research Context, describes the context of the subject of research by adopting the explanatory framework suggested for such a description by Coessens et al. (2009). In Chapter 3, Theory, theoretical approaches from previous studies are examined, voids in previous studies pointed out, while a set of concepts developed during the research process intended to fill these voids is presented, followed by an account of the way in which these concepts fill voids in the guitar scoring literature. The Theory Chapter contributes to responding to the third research sub-question by examining current theories and approaches to guitar scoring. Chapter 4, Guitar, Guitarist and Composer, traces the historical origins of the problematic relationship between the instrument, the performer and the composer.

Chapters 5-16 provide an overview of the twelve sound-cell-texture chains identified in this study, and give a report of findings relevant to these chains in a manner that allows artists wishing to score for the guitar to use these findings in their own creative scoring processes. These chapters contain a considerable amount of music score examples, ranging from historical to contemporary repertoire for the classical guitar, illustrating the theoretical framework generated from the grounded theory-based research on scoring elements in these scores. These chapters contribute to answering the second, third and fifth research sub-questions. The second sub-question is addressed by means of a structured and detailed outline of the sonic potential of the guitar, while the third research sub-question is addressed by means of revealing the scoring knowledge present in guitar compositions by viewing it through the sound-cell-texture chain perspective. The fifth sub-question is addressed through an evaluation of notation practices and suggestions for their improvement.

In Chapter 17, Etudes: Outline and Notes, an account of the composition process of the etudes is provided, as well as notes on each of the composed etudes. This chapter contributes to answering the sixth research sub-question by describing the relation between the scoring principles developed in the research trajectory and the etudes.

Chapter 18, Discussion, discusses the outcomes of the research trajectory: their scope and limitations,

[6] Grounded theory is a research methodology addressed in more detail in the Methodology Chapter.

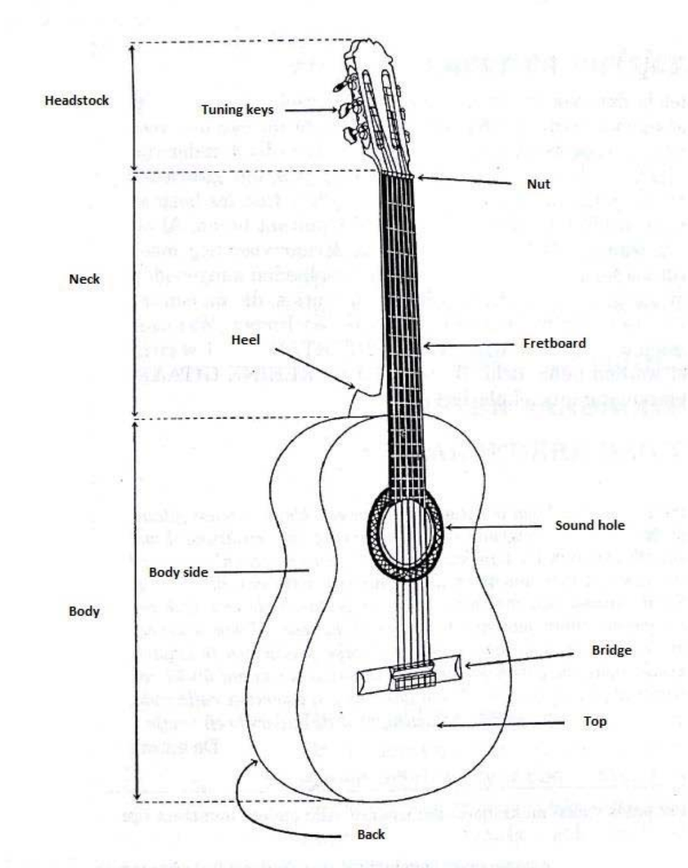
the role of tacit and embodied knowledge in the research process, the theoretical soundness of the sound-cell-texture chain, and the artistic and academic contribution. Finally, suggestions for future research are given.

# Reading Guide

## Score Examples

Examples have the name of the composer and composition included below them. When no such indication appears, the example has been created by me.

## Guitar anatomy[7]




## Guitar terminology

BARRÉ: The practice of simultaneously stopping multiple strings with one finger of the left hand.

CAPODASTRO: A device that stops all strings in a selected position, thus raising the open string pitches.

[7] The guitar drawing from this image originates from *De "kleine" Gitaarstarter* by Hartog (1992).

CIRCLED NUMBERS: These always refer to STRINGS in guitar scoring. A circled 1 refers to the first string, a circled 2 refers to the second string, and so on. Circled numbers are used to indicate fingerings; displaying a note with a numbered circle indicates that a note is to be played on that particular string.

FINGER 1,2,3,4: Designations used in guitar notation for respectively the index finger, middle finger, ring finger and little finger of the left hand.

FINGER C,A,M,I,P: Designations used in guitar notation for respectively the little finger, ring finger, middle finger, index finger and thumb of the right hand. These designations come from the Spanish words for the little finger (chiquito), ring finger (anular), middle finger (medio), index finger (indice) and thumb (pulgar).

FINGERING: Indication of a finger of the left hand to be used, a finger of the right hand to be used, the string on which a note is to be played, or a combination thereof.

NAILS AND FLESH: Guitarists cultivate nails on the right hand, but keep those on the left hand trimmed in order for them not to impede with the stopping of the string on the fretboard.

ROMAN NUMERALS: Indicates the fret position in which the leftmost finger of the left hand plays. In the case of natural harmonics, the Roman numeral refers to the fret above which the nodal point is found.

STRINGS: The six strings of the guitar are indicated through numbers; the highest string is referred to as the first string, with the numbers counting up toward the lowest, sixth string. The highest three strings are made of nylon, while the three bottom strings are metal-wound nylon strings.

# Definitions of frequently used terms

ARTICULATION: “The separation of successive notes from one another, singly or in groups, by a performer, and the manner in which this is done.... the term ‘articulation’ refers primarily to the degree to which a performer detaches individual notes from one another in practice (e.g. in staccato and legato)” (Grove Music Online, 2012b).

ARPEGGIO: “The sounding of the notes of a chord in succession rather than simultaneously; also, especially in keyboard music, the breaking or spreading of a chord” (Grove Music Online, 2012a). A guitar arpeggio differs from this standard definition of an arpeggio; because the individual notes that make up a chord on the guitar are spread over multiple strings, a technical guitar arpeggio is a succession of notes scored over multiple strings.

CELL: This concept captures the idiomatic ways in which sounds can be combined in intervals and chords (vertical cell) or short sequences (horizontal cell). For the distinction between chords and vertical cells, see: vertical cell.

CLUSTER: “A group of adjacent notes sounding simultaneously” (Grove Music Online, 2012c).

CHORD: “Any simultaneous combination of notes, but usually of not fewer than 3” (Oxford Dictionary of Music, 2012a).

EFFECTIVE SCORING: Scoring that can be made to sound in accordance with the sonic outcome suggested in the score.

EMBELLISHMENT: ”That element in music which is decorative rather than structural, and which in particular includes both free ornamentation and specific ornaments, whether indicated by notes or signs in the notation or left to be improvised at the discretion of the performer” (Grove Music Online, 2012d).

GLISSANDO ILLUSION: A glissando that connects notes or vertical cells by only bridging part of the pitch distance between the notes or vertical cells.

HARMONIC FLEXIBILITY: The degree of freedom available to the composer to choose pitches and pitch combinations in various registers, and combining various registers on the instrument, as opposed to the degree of constraint to the set of choices. Single line horizontal cells of plucked sounds are an example of horizontal cells with low constraints and high harmonic flexibility, while single line horizontal cells of rasgueado sounds are an example of horizontal cells with high constraints and low harmonic flexibility.

HOMOPHONY: “A term used to describe music in which one voice or part is clearly melodic, the others accompanimental and chiefly chordal” (Oxford Companion to Music, 2012a).

IDIOMATIC SCORING: Scoring that is ideally suited for performance on the guitar by a professionally trained guitarist, and that can be made to sound on the guitar in accordance with the instructions in the score. Idiomatic music may be easy or difficult to a performer, depending on the level, strengths and weaknesses of the individual performer.

MONOPHONY: “A term used to denote music consisting of only one melodic line, with no accompaniment or other voice parts (e.g. plainchant, unaccompanied solo song), as opposed to polyphony and homophony (each having several parts)” (Oxford Companion to Music, 2012b).

LITERAL GLISSANDO: A glissando that connects notes or vertical cells by bridging the complete pitch distance between the notes or vertical cells.

ORCHESTRATION: “The art of combining instruments and their sounds in composing for the orchestra, or, more simply and practically, the act of scoring a sketch or an existing work for orchestral forces. By extension, the term may also be used in the context of music for chamber forces or even for chorus or solo piano, since the basic concerns of orchestration —with balance, color, and texture—are common to music of all kinds” (Hurd & Griffiths, 2012).

REGULAR PLUCKED NOTE: the sound that emerges from the standard way of plucking the string. The designation “regular plucked note” is used in this work to distinguish it from other plucked sounds such as harmonics, which are plucked and lightly touched.

SCORDATURA: “A term applied largely to lutes, guitars, viols and the violin family to designate a tuning other than the normal, established one” (Boyden & al., 2012).

SCORING: "The art and process of orchestrating a composition" (Oxford Dictionary of Music, 2012c).

SINGLE LINE/VOICE: see monophony.

SOUND-CELL-TEXTURE CHAIN: This concept captures the simultaneous functioning of a musical passage on the sound, cell and texture three levels.

SPACING: "The arrangement of the notes of a chord with respect to the intervals separating them" (Rushton, 2012). In this research, a spacing is called narrow if it contains no intervals larger than a fourth.

SOUND: This concept captures the properties and characteristics of individual notes played on the guitar.

TEXTURE: This concept captures the way in which musical activity develops over time (a number of bars) and, through its timbral properties, density of intervals, number of voices, combination of *sounds*, temporal development and tempo creates a musical fabric that is possible on the guitar. It relates to the definition used in the Grove dictionary: "A term used when referring to the sound aspects of a musical structure. This may apply either to the vertical aspects of a work or passage, for example the way in which individual parts or voices are put together, or to attributes such as tone color or rhythm, or to characteristics of performance such as articulation and dynamic level" (Grove Music Online, 2012g).

TIMBRE/TONE-COLOR: "The quality of sound characteristic of a particular type of instrument or voice, as opposed to its register or pitch" (Bellingham, 2012). In this research, timbre refers to the way in which the timbre or tone color of a sound may be changed.

TRILL: "A type of embellishment that consists in a more or less rapid alternation of the main note" with the "tone or semitone above it. Different types of trill, or shake, are distinguished according to the way they begin, how long they last and how they end" (Grove Music Online, 2012h). In addition, a trill can also consist in an alternation of the main note with the tone or semitone below it.

TUNING KEY GLISSANDO: Refers to a pitch glissando performed by detuning a string with the tuning key.

VERTICAL CELL: Vertical combinations of sounds. This definition is deliberately broader than that of a chord, as it also includes two-note intervals, note combinations of at least three notes that contain less than three pitches, such as unisons, but guitar-technically provide the same possibilities and pose the same challenges as chords.

## Chapter 1 Methodology

### Contents

# Chapter 1 Methodology

In this chapter, the methodology of the present study is discussed. Four aspects are considered: the research stages, the characteristics of the open-ended methodology used in this research trajectory, the size and characteristics of the researched set of music scores, as well as the use of triangulation and reflectivity.

## 1.1 Research stages

The research was conducted in four main stages. In the first, second and third stage, the sound-cell-texture chain, which is the main set of constructs introduced in this study, was developed. The sound-cell-texture chain is introduced and discussed in more depth in the Theory Chapter. In the final stage, the findings of the initial stages were elaborated and used for the composition of a set of new etudes for the guitar. In this section, the research process is described in more detail. It discusses the search for a perspective on discussing guitar scoring, the use of the initial classification as an analytical tool, the development, elaboration and testing of the sound-cell-texture chain, and, finally, the similarity of the adopted research processes to methodology theories.

### 1.1.1 Finding a perspective

In the initial stage of the research trajectory, the existing body of knowledge on guitar scoring was studied through desk research. Studying guitar scores, reading previous studies and reading interviews with guitarists and composers was an important instrument in exploring the current notions in the field. The challenge at this stage was to find a way to discuss guitar scoring that is more than an enumeration of facts that are new to composers but already known to guitarists; after all, an objective of this research is to add new knowledge to the existing body of knowledge, rather than just reproducing existing knowledge to another audience. The development of a new way of discussing the guitar's scoring potential started out with the plan to collect guitar sounds. The initial plan was to build a library of guitar sounds, but during the research on the sizable corpus of scores (see section 1.3 for more details), it turned out that many musical events that were encountered in scores could not be categorized under the classification "sounds". What to do, for instance, with combinations of sounds, articulations, or particular idiomatic sequences and textures, all of which are relevant for scoring? Longer sequences of music were then categorized as textures, a designation referring to the "sound aspects of a musical structure" (Grove Music Online, 2012g). However, this still left certain musical events uncategorized. For instance, a score sample that consisted of a Bartok pizzicato followed by a glissando could not fit in either the sound or the texture category. A discussion of this sample in the sound category was not possible, as it consisted of multiple, distinct sounds. At the same time, it was too short to be considered a texture. At this stage, the idea arose to create an intermediate size building block that fitted between the individual sound on the one hand, and texture on the other hand: a cell. As a result, the library of sounds was subjected to re-coding, and it developed into a library of sounds, cells and textures. A typical library entry thus contained a score sample of a particular sound, cell or texture, details concerning the piece it originated from, comments on its characteristics and, if present, its special features. It also became apparent that multiple, sometimes contradictory and confusing, notations are used in the repertoire. These various types of notation were collected and added to the library. Notation turned out to be relevant at the sound, cell and texture level. Therefore, notation evaluations and suggestions were later given throughout the Findings Chapters. A number of pieces that were studied made use of alternative tunings; the tuning used in these pieces and the notation used for their representation were also added to the library. Scordatura functions on a meta-level in this dissertation; a change in the tuning affects the pitch range and vertical cell potential of all sound categories involving pitched string sounds. Scordaturas are therefore addressed separately in Appendix D.

### 1.1.2 Sounds, cells and textures as an analytical tool

After creating and developing the library of sounds, cells and textures, this classification was used as an analytical tool to explore and demonstrate the scoring characteristics in repertoire pieces. For this analysis, Ponce's *Sonata III* (Ponce, 1928) and Berio's *Sequenza XI* (Berio, 1988) were chosen. These two compositions were selected as I have extensively performed them, due to which I was aware of the musical and sonic characteristics of the pieces, as well as their technical and musical challenges. For the analysis of each piece, I created an overview of the sounds that were employed, with comments on the manner in which they were used, technical challenges for the performer, and notation. For the cells and textures, I followed the same procedure. In order to further assess the technical difficulty of the sounds, cells and textures in the pieces, I performed them on the guitar during the research process.

### 1.1.3 The sound-cell-texture chain: development

After the analysis of the works by Ponce and Berio, the insight arose that the classification of sounds, cells and textures could also be used as a perspective on the contents of a library of sounds, cells and textures, if this classification could identify characteristics that would connect the three levels. In the analysis on the works by Ponce and Berio, sounds, cells and textures had been grouped together in separate chapter sections. These categories were now combined into separate chains based on one particular sound category (functioning as a "core category"), which better illustrated the transition between the sound, cell and texture levels. This was a further advance in relation to the earlier analysis and was implemented in order to promote clarity in the structure of the sound-cell-texture model. As a result, twelve sound-cell-texture chains that can be used in guitar scoring were identified. The analysis on the works by Ponce and Berio also made clear that it was necessary to further explore a number of aspects of the sounds, cells and textures such as speed, dynamics, articulation, and rhythmic possibilities. The analysis also demonstrated that certain aspects could be applied to all sound categories and their related cells and textures, such as dynamic range, while other aspects were only applicable to a limited group of sound categories and their related cells and textures, such as the range of percussion sounds. In addition, the description cell was split into two designations in order to bring in more nuances: vertical cells for vertical combinations of sounds, and horizontal cells for horizontal combinations of sounds.

### 1.1.4 The sound-cell-texture chain: establishment, elaboration and testing

With the establishment of the sound-cell-texture chain based on the research, coding and categorization of the data in the library of sounds, the hypothesis was now that this model could be used to classify and describe the guitar scoring potential. At this stage, I researched the characteristics of the sound-cell-texture chains through practical experimentation. For instance, I played the score sample of the Bartok pizzicato followed by the glissando (mentioned in section 1.1.1). I determined that the core of this sample consisted of a Bartok pizzicato note, while the glissando was an articulation applied to this note in order to reach another pitch. It was then categorized as a horizontal cell with a glissando articulation in the Bartok pizzicato sound category. I then continued to see which other types of glissando were possible. By experimenting, I found that it was possible not only to score a glissando on the same string, but also to score a partial glissando followed by a pitch on another string. Additionally, I found that it was possible to create a glissando articulation to a Bartok pizzicato sound by detuning the string after the attack, thus creating a tuning key glissando. The various possibilities of the other aspects of each chain were researched in a similar manner.

The findings presented in this study, which can serve as a practical guide for composers wishing to score for the guitar, are accompanied by video snippets in which the score examples are performed. The findings were tested by applying them to write a set of guitar etudes, where each etude is based on one of the sound-cell-texture chains. Each of the twelve categories formed the motivation, subject matter and technical tool to write a solo guitar composition based on that particular chain, while the findings on the one hand allowed for a wide scope of guitar sounds to be employed and on the other hand provided normative information on the potential values of its variables. The twelve etudes are discussed in more detail in the Etudes Chapter of this dissertation.

### 1.1.5 Similarity to methodology theories

During the initial stages of this research, scoring methods were extracted from scores, collected, coded, categorized and provided with comments. Sample pieces were analyzed using the initial categorization, the categorization was updated, samples from the various categories were performed on the guitar (as a continuous form of reflection on the previous phase), and categorization and coding were subsequently updated. Various categories were combined into chains based on a core sound, and finally all chains were explored in detail through the described triangular method of measurement for possibilities on each level of the chain. These stages of the research process were similar to methods used in grounded theory[8] and may be compared to the initial coding and categorization (see section 1.1.1), concurrent

[8] Grounded theory is a qualitative research methodology originating in social research, and is defined by its founders as “the discovery of theory from data systematically obtained from social research” (Glaser & Strauss, The Discovery of Grounded Theory, 1967, p. 2). The premise put forward by Glaser and Strauss is that “the theory that emerges from the researcher’s collection and analysis of qualitative data is in one sense equivalent to what he *knows systematically* about his own data” (Glaser & Strauss, 1967, p. 225). This approach, in which the researcher

data collection, writing memos, theoretical sampling[9], constant comparative analysis, theoretical sensitivity[10], intermediate coding (see section 1.1.2), identifying a core category, advanced coding, theoretical integration and, finally, generating theory (see section 1.1.3), as described in the work of Birks and Mills[11] (2010, pp. 9-12). After the sound-cell-texture chain was established, the research continued with the hypothesis that using the sound-cell-texture chain as a template to view guitar scoring would be an appropriate model to describe its potential. This approach was taken because the generating of theory had been initiated, and it was now necessary to make the theory practically viable through practical testing and composing. The subsequent stage of practical experimentation was similar to “traditional research designs” in which the hypothesis is “put to the test by experimentation in the real world” (Allan, 2003, p. 1). Phases of discovery (such as the development of the designations sound, cell and texture) were followed by phases of hypothesis-led practical experimentation (testing their characteristics), which led to new insights about the practical dimension of these characteristics, which in its turn led to adjustments to the theoretical framework. My research process can thus be characterized as a “sequential procedure”, as the findings of one method were elaborated and expanded upon with another method (Creswell, 2003, p. 16). Although Borgdorff claims that “as a rule, artistic research is not hypothesis led, but discovery-led” (Borgdorff, 2010, p. 56), my research trajectory diverged from a purely discovery-led approach. Instead, an iterative process took place in which both discovery and hypothesis played complimentary roles. Consequently, rather than seeing these approaches as two diametrically opposed methods, I consider them both to be helpful tools that can be employed side by side in the artistic research process.

## 1.2 Open-ended methodology in the research trajectory

One of the discussion points on the nature, status and value of artistic research is the question of its methodology (Borgdorff, 2010; Newbury, 2010; Biggs & Karlsson, 2010a; Coessens et al., 2009; Borgdorff, 2006). In this respect, a number of questions may be posed, for instance: should artistic research adopt a methodology from other academic disciplines, or should it develop its own? If it does develop its own methodology, why is this necessary, and how should outcomes obtained through such a methodology be assessed? Borgdorff convincingly argues for a methodology that is led by the art practice itself, joined by methods borrowed from other disciplines (Borgdorff, 2010). What distinguishes the artistic research methodology from methodologies employed in other disciplines is the ever-presentness of the practice

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discovers hypotheses on the basis of data, may be contrasted with more traditional research methods, in which “preconceived hypotheses” are tested by experimentation (Allan, 2003, p. 1).

[9] Theoretical sampling relates to the decision of the researcher on “what or who will provide the most information-rich source to meet their analytical needs” for the development of categories (Birks & Mills, 2010, p. 11). It is used by researchers to "focus and feed their constant comparative analysis of the data" (Birks & Mills, 2010, p. 10). During this process, researchers get more insight into areas of their theory that are in need of further development.

[10] Theoretical sensitivity refers to the “level of insight” researchers have into “both themselves and the area that they are researching”, as well as their “intellectual history, the type of theory that they have read, absorbed and now use in their everyday thought” (Birks & Mills, 2010, p. 11).

[11] Melanie Birks is Professor of Nursing at James Cook University in Queensland (Australia). Jane Mills is Associate Professor of Nursing at the same institution.

itself; this is dictated by the fact that the research is conducted through practice, rather than on practice, as is common in much research on art in the humanities. Borgdorff points out that artistic practice is not only present throughout the artistic research process, but that “art practice is paramount as the subject matter, the method, the context and the outcome of artistic research” (Borgdorff, 2010, p. 46).

The course of my research process was not determined in advance. The creation of the library of sounds, for instance, was originally motivated by the idea that such an overview would benefit composers that are interested in composing with sounds other than regular plucked sounds. During the subsequent collection and categorization of sounds, it gradually turned out that this categorization could be used as a perspective to explain guitar scoring (see section 1.1). As a result, the development of this categorization started to occupy a much more prominent place in the research. Similarly, the creation of new compositions was a process which could not be determined in advance. This absence of a pre-determined course of research can be compared to what Coessens et al. call an “open-ended methodology” (2009, p. 65). Their open-ended methodology is defined as a methodology that leaves room for an open-ended approach, but does give an account of the social, epistemic and ecological situatedness of the research, the reflective aspects of the research, while it aspires to attain artistically relevant outcomes. This type of flexible methodology offers most possibilities for a sound artistic research trajectory, as on the one hand it allows for sufficient space for the individual character of the artistic dimension of the research to flourish, while on the other hand it requires specification of context, application of self-reflection and indication of the artistic value of the outcomes of the trajectory. In addition, Coessens et al. provide a framework for the assessment of the outcomes of artistic research: they should be evaluated on the basis of artistic content, technical approach and historical value (Coessens et al., 2009, p. 72).

### 1.2.1 Adopted research methodology

In the light of the above, an open-ended methodology that gives space to the explorative and experimental nature of artistic practice was adopted for this artistic research trajectory, taking into account the methodological requirements and criteria for the evaluation of research outcomes that Coessens et al. propose. In addition, research processes were used that bear similarities to a number of methodologies (see section 1.1.5). The use of multiple methodologies relates to Borgdorff’s suggestion to adopt suitable methods from other fields as complementary forces in the artistic research process (Borgdorff, 2010, p. 46). Borgdorff identifies three types of research in art: research on the arts, research for the arts and research in the arts (Borgdorff, 2006, pp. 6-7). The first is art research as practiced in disciplines such as musicology and art history, in which the researcher is not directly engaged in the production of art. The second is defined as research that “provides insights and instruments that may find their way into concrete practices” (Borgdorff, 2006, p. 6). This type of research “delivers…the tools and the knowledge of materials that are needed during the creative process or in the artistic product”. The third is defined as research in which “the artistic practice itself is an essential component of both the research process and the research results” (Borgdorff, 2006, p. 7). The ideal type for artistic research, according to Borgdorff, is the third type, as “methodological pluralism…should be regarded as complementary to the principle that the research takes place in and through the creation of art”

(Borgdorff, 2010, p. 46). With “in and through the creation of art”, Borgdorff refers to the idea that this type of research not only takes place in art, with the artistic practice as an essential component, but also that its results are expressed through a work of art. The current research can be regarded as having taken place in and through art, by including practical experimentation and the composition of new works, as well as for art, by creating tools that can be beneficial to other artists in the composition of new guitar works. It is my belief that artistic research can increase its impact and relevance for the artistic community if, in addition to taking place in and through art, it is carried out for art in that it produces knowledge and tools that are valuable for other artists.

### 1.2.2 Social, epistemic and ecological situatedness

Both Coessens et al. and Borgdorff point out the importance of the researcher acknowledging the context in which the artistic research is “situated” or “embedded” (Borgdorff, 2010, pp. 56-57; Coessens et al., 2009, pp. 65-74). Coessens et al. provide a framework for the description of this situatedness, consisting of an account of its social, epistemic and ecological aspects. The social situatedness of the research refers to the social context in which the subject of research is located. The epistemic situatedness refers to the state of knowledge on the research subject, while the ecological situatedness refers to the “ecological, physical and perceptual embeddedness of the action – and actor- in the specific context of research” (Coessens et al., 2009, p. 67). These aspects are discussed in the Research Context Chapter of this study.

### 1.2.3 Reflective research

Coessens et al. stress the importance of reflective research, as it allows the artistic researcher to become “a participatory observer of her or his own research practice and artistic practice” (Coessens et al., 2009, p. 70). Participant observation is a qualitative research method in which a researcher simultaneously observes and acts as participant in the situation that is under research. In artistic research, the practice of the researcher is part of the situation under research, which means that participant observation refers to observation of the self in the research context. Coessens et al. advocate awareness of the important role tacit and embodied knowledge can play in the process of reflective practice by the researcher (Coessens et al., 2009, p. 71). The evaluation of the tacit and embodied dimensions of the reflective practices applied in the trajectory is presented in section 18.2 of the Discussion Chapter.

### 1.2.4 Artistic content, technical approach and historical value

Coessens et al. propose that the outcomes of artistic research may be assessed on the basis of three aspects: artistic content, technical approach and historical value. This evaluative framework is employed for the evaluation of the research in section 18.4.1 of the Discussion Chapter. Artistic content refers to the artistic aspect of the research outcomes, which in the case of this research consists of a set of new compositions for guitar. Technical approach refers to clarity to the research trajectory, as well as a “concise, understandable and scientifically acceptable formulation, elaboration and expression of its results” (Coessens et al., 2009, p. 73). Historical value refers to the way the research relates to the body of knowledge in the field. Both the artistic and the academic content may be critically examined for their value for artists and art. However, both aspects of the research may be interpreted by the research community in diverging ways. According to Coessens et al., “the artist researcher should be aware of the different and/or complementary impact of both dimensions of his or her artistic research: the art manifestation and the research output” (Coessens et al., 2009, p. 73). This aspect of the framework of Coessens et al. is discussed in more detail in section 18.4.2.

## 1.3 Music scores examined during the research trajectory

During the research process, a number of classical guitar scores were examined. In the following section, the number and the type of scores used in the research are described.

### 1.3.1 Number of scores

The score research corpus consisted of the following scores:

- My personal guitar library, consisting of approximately 600 guitar compositions, containing much of the canonical guitar repertoire.
- A nearly 11,000 page PDF file compiled by Andrey Balalin (Balalin, 2002), containing guitar works by well-known as well as lesser known composers.
- A miscellaneous set of works found in libraries and on the internet.

### 1.3.2 Types of scores

The research was primarily concerned with scoring for the solo classical guitar. For this reason, scores written for solo classical guitar received most attention. The guitar parts of some chamber music works and concertos were also examined; passages in some of these works contained sounds, cells or textures that were also relevant for solo classical guitar scoring and were therefore included in the findings.

## 1.4 Triangulation and reflectivity

In the research process, measurements were made through triangulation, which means that data or methods are mixed “so that diverse viewpoints or standpoints cast light upon a topic” (Olsen, 2004, p. 103). Measurements were conducted on constructs through their variables. Constructs are approximated concepts that may not be observed directly. Variables, which are observable and measurable units of constructs, are then used for the measurement of constructs (Bacharach, 1989). In the Theory Chapter, a detailed account of the constructs and variables researched in this study is provided under the header “The sound-cell-texture chain”. In this section, the triangular method of measurement in the research process is discussed, as well as the role it played in reflectivity.

### 1.4.1 Three approaches

The triangular method of measurement of constructs through their variables in this study consisted of the following three approaches:

- Experiential knowledge
- Research on musical scores
- Practical experimentation

### 1.4.2 Experiential knowledge

My professional knowledge as a guitarist can also be called experiential knowledge, as it was “gained through direct encounter with a subject” (Burnard, 1999, p. 57). Variables were measured on the basis of my experiential knowledge. During the research on plucked sounds, for instance, maximum speeds for the scoring of single lines and arpeggios were recommended. With my extensive professional training and experience on the guitar, I was able to report the measurement of these variables based on my experience. Taking into account the issue that the use of tacit and embodied knowledge based on experience is considered a key component of artistic research (Coessens et al., 2009, p. 71), this approach had an important place in the measurement process.

### 1.4.3 Research on musical scores and literature study

In order to widen the potential scope of variables of constructs and their potential values, further study of guitar scores and guitar scoring literature was undertaken during the research process and used as an additional method of collecting data. This was done to complement my existing knowledge of guitar technique and repertoire.

### 1.4.4 Practical experimentation

When the conceptual categories and their variables were established during the research process, only a number of variables relevant to each conceptual category were available in the music scores that were used for research. At that point, I conducted research on potential values for the missing variables by creating score examples, trying them out on the guitar and reporting the value range of variables. This was necessary because the two approaches mentioned in 1.5.2 and 1.5.3 are bound by the context in which they appear. My experiential knowledge is nurtured by the context of my education, while research on musical scores leads to reports from the specific pieces that are researched. In order to make this knowledge useful in a context of reporting and measuring the guitar potential, practical experimentation was used to complement and verify measurements reported through experiential knowledge, as well as score and literature research. Considering the issue that practical engagement of the artistic researcher is of critical importance to the research trajectory (Borgdorff, 2006, p. 46), the practical experimentation approach was another key component in the measurement process.

### 1.4.5 Role of Reflectivity

Through the use of triangulation, in which practical experimentation played an important role, the research trajectory took on a reflective character as it allowed me to observe myself as a practitioner on the guitar. During the research process, the data collected through experiential knowledge and research on musical scores was investigated, subjected to experiment and complemented by performing on the classical guitar. In a later stage of the research, the A/V recordings of the score examples were recorded and added to the dissertation to serve as a verification of the analysis presented in the written text. In the final stage, these findings were used as a tool in the creative process of writing new compositions for the classical guitar. Thus, in each stage of the research, reflection on findings of a previous phase took place.

# Chapter 2 Research Context

## Contents

# Chapter 2 Research Context

Both Coessens et al. and Borgdorff point out the importance of the researcher acknowledging and describing the context in which the artistic research is "situated" or "embedded" (Coessens et al., 2009, pp. 65-74; Borgdorff, 2010, pp. 56-57). Coessens et al. provide a framework for the description of situatedness of a given artistic research trajectory, consisting of an account of its social, epistemic and ecological aspects (Coessens et al., 2009). In this chapter, each of these aspects is discussed in order to sketch the research context of this study.

## 2.1 Social, epistemic and ecological situatedness

### 2.1.1 Social situatedness

The subject of this research is socially situated in the classical guitar community, which can be considered as a "community of practice". Wenger et al. describe a community of practice as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002, p. 4). The structure of a community of practice consists of a domain, a community and a practice (Wenger et al., 2002, p. 27). There are three levels of participation in a community of practice: a core group of the most active participants that take on a *de-facto* community leadership, an active group and a peripheral group of participants who rarely participate. Externally, there are people who show an interest in the community but that are not members, such as "customers, suppliers and 'intellectual neighbors'" (Wenger et al., 2002, pp. 56-57). Through a process of "legitimate peripheral participation", in which newcomers perform tasks beneficial to the community by learning from insiders, newcomers acquire the skills that are required to enter one of the groups in the community (Lave & Wenger, 1991). Communities of practice play an important role in the transfer of tacit and explicit knowledge: they are "in the best position to codify knowledge, because they can combine its tacit and explicit aspects" (Wenger et al., 2002, p. 9).

The classical guitar community, viewed as a community of practice, has the classical guitar as its domain. The community is distributed globally, and has meeting points in music schools, conservatories, guitar festivals, guitar competitions, concert halls and festivals with classical guitar programming, classical guitar magazines (e.g. *Classical Guitar Magazine*, *Gitarre und Laute)* and, increasingly, online communities such as forums (e.g. *classicalguitardelcamp.com*, *classicalguitarforum.*com) and Facebook groups (e.g. *Guitar Players on Facebook*, *Guitaromania*). The core group of the community is formed by its leading artistic and academic figures (such as Julian Bream, Eliot Fisk, Peter Päffgen), while the group of participants consists of, but is not excluded to, professional guitarists, guitarist composers, composers who write for the guitar and cooperate with a guitarist, guitar makers, concert and festival organizers, guitar teachers, guitar students, guitar scholars, journalists writing for guitar journals. The peripheral group in the community is formed by individuals of the above professions and specializations who rarely participate, and newcomers who are in the process of entering the group of active participants through the process of legitimate peripheral participation. In addition, there is an external group that consists of, but is not excluded to, the guitar audience, interested artists from other disciplines and those who aspire to enter the community. Within the larger community, we fund sub-communities of performers specializing in a genre or breaking through expected forms of artistic expression within the classical guitar community, sometimes bordering on other artistic communities. Here we find, for instance, guitarists performing in prisons, performers specializing in improvisation on the classical guitar, composers, and guitarists or guitarist composers specializing in contemporary music on the guitar or the electric guitar. The practice of a community consists of its “set of frameworks, ideas, tools, information, styles, language, stories and documents that community members share” (Wenger et al., 2002, p. 29). For the guitar community, features of its practice are, for instance, its shared ideas about sound production, guitar quality and guitar technique, its instruments, strings and other accessories, its performance styles and genres, and its scores and recordings.

### 2.1.2 Epistemic situatedness

Epistemically, the subject of research is located within a context of artistic and academic publications appearing in the guitar community. In recent years, guitar scholars have published works on various aspects of the classical guitar experience, adding to a growing body of academic knowledge on the subject. Artistic creations in the form of new compositions, meanwhile, also continue to populate the guitar community: part of the knowledge applied to create these compositions (technical knowledge of scoring for the guitar, compositional knowledge of form, content, and knowledge of creative processes), are tacitly present in these compositions. This knowledge may be reconstructed by distilling it from the composition, not just by reading the score, but also by performing the score, developing appropriate tools of analysis and description, analyzing alternative modes of performing, studying scholars’ comments on the work, and studying interviews with the respective composers. Indeed, according to Borgdorff, it is the task of the artistic research to “employ experimental and hermeneutic methods that reveal and articulate the tacit knowledge that is situated and embodied in specific artworks and artistic processes” (Borgdorff, 2006, p. 18).

The debate on the status and value of artistic research or “practice-led research” in art is very much a current one, and evidenced by contributions in the field by artistic research scholars and theorists in the steadily growing number of academic publications on the subject. Recent years have seen the publication of collected writings and lectures by various scholars (Biggs & Karlsson, 2010b; Balkema & Slager, 2004) and publications of individuals or cooperating scholars (Borgdorff, 2012; Coessens et al., 2009). Above all, it is the hidden dimension of the knowledge present in creative works that “causes problems and divides opinion” about and on its status and value (Cox, 2009, p. 8). This study intends to reveal the hidden dimension of scoring knowledge active in the creative process of composing new works for guitar and therefore adopts the position on artistic research presented by Coessens et al., who propose that “artistic research demands a reintegration of the artistic trajectory with the artistic manifestation, a more explicit dialogue between the research process and the end-product, outcome or performance", in order to reveal otherwise hidden aspects of the creative act (Coessens et al., 2009, pp. 117-118). It does so by presenting the artistic manifestation of the research, consisting of a set of new compositions written for the guitar, and the tools created and developed during the research process, in the form of the written dissertation and video examples. According to Coessens et al., artistic research demands not only the wish of an artist-researcher to create a new work of art, but also "a moment when the experience of making demands some kind of re-examination, reappraisal or renewal" (Coessens et al., 2009, p. 92). As described in the Theory Chapter, the knowledge available in previous studies on guitar scoring contains a number of serious voids that demand a re-thinking of the guitar potential, which in this research aims at creating new works for the guitar and developing tools for creation in the process.

### 2.1.3 Ecological situatedness

According to Coessens et al., ecological situatedness refers to the "ecological, physical and perceptual embeddedness of the action – and actor – in the specific context of research" (Coessens et al., 2009, p. 67). In terms of the physical and perceptual embeddedness, this research is located within a context of conventions on guitar technique, conventions on the position of the body in guitar performance, conventions on reading guitar scores, as well as conventions on ideal environments for performance (such as a concert hall) and recording (such as a chapel) due to their acoustically advantageous properties. Another aspect of ecological situatedness is the relation between the musician and the instrument, as she has to engage in "a profound interaction with the musical instrument and respond to its possibilities" (Coessens et al., 2009, p. 67). Although it is commonly known that ecology in general can be regarded as the mutual influence of all environmental (f)actors on the body and mind of a living being (and vice versa), within the context of this research I will mainly concentrate on one of those interactions, that is the one between a musician and her instrument. This is because the subject of my research is strongly connected to the classical guitar as an instrument: it has its shape, the materials, the type and number of strings, and the non-amplified sound as its starting point. As such, the ecological situatedness bears a relation to the social situatedness: performing on the classical guitar is a condition for a performer to be seen as part of the classical guitar community. There are many other options to enter an alternative guitar community with another type of guitar, such as a jazz guitar or an acoustic steel string guitar. These various guitar communities have been extensively documented by Dawe in his study *The new guitarscape in critical theory, cultural practice and musical performance* (Dawe, 2010), and are not the focus of this study.

### 2.1.4 Relevance

The specification of the social, epistemic and ecological situatedness is relevant as it clarifies the context in which the research takes place. The ecological situatedness of the classical guitar, determined in part by conventions on the materials used for its construction as well as conventions on ideal spaces for performance and recording (which are a result of the characteristics of classical guitar construction and the fact that amplification is not always used), and the resulting social situatedness, separate the classical guitar from other guitar communities. The ecological and social situatedness also relate to the epistemic situatedness. After all, the performer who enters the classical guitar community with a classical guitar, should demonstrate knowledge of its body of knowledge (e.g. canonical compositions, conventions on technique) in order to be recognized as a member of the community. The ways in which guitarists and composers have related to the characteristics and the construction of the guitar through history, as well as their mutual relation, are discussed extensively in Chapter 4.

## Chapter 3 Theory

### Contents

# Chapter 3 Theory

In this chapter, the theoretical framework of the dissertation is discussed. Five aspects are considered: the relevant previous studies, voids in the current state of knowledge on the subject, the concepts developed in this study, the way in which this study aims to contribute to filling voids in the current state of knowledge and, finally, the definition and significance of the notion of idiomatic scoring in this study.

## 3.1 Previous studies

The previous studies on composing for the guitar may be divided into three categories: studies concerned with guitar scoring, studies concerned with contemporary guitar instrumentation and the, usually rather short, presentation of the scoring possibilities of the guitar in general orchestration guides.

### 3.1.1 Guitar scoring studies

There are but few studies explicitly dedicated to the topic of classical guitar scoring. Chris Kachian, classical guitarist and Professor of Music at St. Thomas University in Minnesota, primarily discusses traditional repertoire in his *Composer's Desk Reference for the Classic Guitar*. It briefly addresses scoring questions particular to the electric guitar and introduces the concept of viewing the guitar potential through textures (Kachian, 2006). Angelo Gilardino, classical guitarist, composer, musicologist and holder of a professorship at the Antonio Vivaldi Conservatory in Alessandria from 1981 until 2004, similarly focuses on traditional repertoire in *La Grammatica della Chitarra*. This work systematically relates guitar technique to combinations of notes and gives an account of possible interval and chord combinations (Gilardino, 1994). In his article *How to Write for the Guitar*, Julian Bream, one of the foremost classical guitarists of the twentieth century, gives a concise but clear and informative overview of the guitar scoring potential as employed in the more traditional repertoire (Bream, 1957).

### 3.1.2 Contemporary guitar instrumentation

Jean-Luc Mas, classical guitarist and composer, gives an expose of contemporary guitar techniques and effects with the use of self-composed examples and samples from scores in *Sonorités nouvelles pour guitares* (Mas, 1986). John Schneider, classical guitarist and Professor of Music at Los Angeles Pierce College, discusses at length the acoustical measurements of sounds on acoustic and electric guitars, and goes on to present an expose of contemporary guitar sounds as found in a number of well-known and lesser known compositions in his study *The Contemporary Guitar* (Schneider, 1985). *La Chitarra Nella Musica del '900* by Patrizia Rebizzi, classical guitarist and Ruggero Tajè, composer and professor at the Giuseppe Verdi Academy of Music in Milan, is a study that directs its attention to a limited number of techniques, among which harmonics, tremolo, rubbing sounds and percussive sounds (Rebizzi & Tajè). These techniques are then discussed in depth; the reader is served with information on a range of variations on each technique and an account of its sonic consequences. Next to the categorization of sounds according to the technique used to produce them (such as tremolo, tambora sounds), Rebizzi and Tajè reserve a section for different kinds of oscillating sounds, produced with different techniques. Just recently in 2010, another work on contemporary guitar instrumentation was authored by Robert Allan Lunn, guitarist and composer, who submitted his work *Extended Techniques for the Classical Guitar: A Guide for Composers* as his dissertation at Ohio State University in 2010 (Lunn, 2010). Lunn gives a systematic account of the available extended techniques on the guitar, and supplies this account with examples from compositions that have been “professionally published”. In his discussion of extended techniques, Lunn pays particular attention to the practical consequences for the performer of the various techniques that are discussed. *How to write for the guitar – an explanation for non guitarist composers* by Rafael Andia, classical guitarist, composer and teacher at the Ecole Normale de Musique in Paris, is an unpublished article written in 1983 that is available on his website (Andia, 1983). The article consists of an exposition of general starting points, such as fingerings and range, and continues to discuss “new sounds”. The discussion of new sounds relies primarily on written explanations and a number of self-prepared examples. A short practical study, *Prepared Guitar Techniques* by Matthew Elgart and Peter Yates is a guide to performers on how to prepare the guitar with various objects (Yates & Elgart, 1990). The study describes a variety of techniques, gives tips on avoiding pitfalls and makes suggestions for notation.

### 3.1.3 General orchestration guides

In his *Traité general d’instrumentation* (1837), the composer Jean-Georges Kastner briefly discusses the chordal possibilities of the guitar. Hector Berlioz, the renowned 19th century composer who was in possession of some guitar skills, dedicates considerable attention to the guitar in his *Grand traité d’instrumentation et d’orchestration* (Berlioz, 1843?). Berlioz informs the reader that “it is almost impossible to write well for the guitar unless one is a player oneself”, and points out that most composers who write for the instrument fail to achieve much in terms of sonority and effect. An overview is given of the guitar’s potential for accompaniment with an outline of possible chords, followed by an account of possible harmonics. The guitar is discussed very briefly in a standard work on orchestration written by Samuel Adler, who is composer and Professor of Composition at Julliard in New York. *The Study of Orchestration* provides an account of the guitar’s tuning, its range and the types of scoring it can accommodate, and includes a score sample from Stravinsky’s *Tango* (Adler, 1989). Although still concise, the guitar receives a more in-depth discussion in *Instrumentation and Orchestration* by Alfred Blatter, composer and member of the faculty of the Curtis Institute of Music in Philadelphia. The study contains an account of various types of guitars, tunings, harmonics, vibrato, pitch bends, barré and capodastro[12], as well as some typical guitar scorings with four score samples by Bach, Smith-Brindle, Boulez and Crumb (Blatter, 1997).

[12] For barré and capodastro: see *Reading Guide.*

## 3.2 Voids in the literature

One of the issues in the problematic relationship between the guitar, the performer and the composer in the history of the guitar has been the dearth of information on how to write for the guitar. The context and origins of this problematic relationship are explored in more detail in Chapter 4. The current chapter section is dedicated to a discussion of the aspects that are missing in previous studies on guitar scoring. In section 3.4, the ways in which this study intends to fill these voids are discussed.

Various aspects are missing in the previous studies that appeared on the subject of guitar scoring: an account of how to use and combine individual sounds as building blocks in scoring, an account of scoring that includes an extensive discussion of sounds other than regular plucked notes, attention for textures that are not made up of plucked notes, a presentation model that is relevant for composers, an overview of the intervals and chords that may be scored, and, in some cases, accurate information about notation and technical difficulties.

### 3.2.1 Guitar sounds as building blocks in scoring

The studies concerned with contemporary guitar instrumentation all give an overview of a variety of sounds that can be created on the guitar. What is insufficiently addressed in these works is the way in which the composer can use and combine these individual sounds to create a musical fabric ideally suited for the guitar. Without such information, the sound overviews tend to be an anecdotal collection of sounds. Similar criticism on the studies by Schneider and Mas is raised by Brill in his *Die Gitarre in der Musik des 20. Jahrhunderts*. Brill considers Schneider's work as "[eine] aufzählende Darstellung der einzelnen Klangphänomene" and the study by Mas as no more than "ein technischer Leitfaden zur Tonproduktion auf der Gitarre" (Brill, 1994, p. 4).

### 3.2.2 Scoring guides discussing scoring of contemporary sounds

Where contemporary guitar instrumentation studies are primarily concerned with contemporary sounds, guitar scoring guides by Gilardino, Kachian and Bream are more concerned with scoring (Kachian, 2006; Gilardino, 1994; Bream, 1957). In these works, the scoring of regular plucked notes takes a prominent position. However, this focus on traditional scoring has as its result that sounds employed in contemporary music are discussed only marginally (in Gilardino and Kachian), or not at all (Bream). When sounds used in contemporary music are discussed, they are addressed in the same manner as in contemporary guitar instrumentation studies: as a miscellaneous collection of sounds.

### 3.2.3 Textures made up of sounds other than regular plucked sounds

In his work *Composer's Desk Reference for the Classic Guitar*, Kachian introduces the idea that one could consider the guitar through the perspective of the textures that can be created on the instrument (Kachian, 2006). In his discussion of these textures, Kachian relies on traditional voice leading principles in naming his textures (monophony, arpeggio, homophony, chord voicing, and polyphony). Kachian only considers textures consisting of plucked sounds, but not those that can be created with the multitude of other sounds available on the guitar, such as rasgueado, percussive sounds and tambora. The literature is thus lacking a broad vocabulary of textures suitable for the guitar, and lacking an account of the types of textures that are created with sounds other than regular plucked notes.

### 3.2.4 Vertical cell range overview

In the relevant studies, no clear overviews of the possibilities to create vertical cells (introduced and defined in this study as “vertical combinations of sounds”; see also next chapter section and the *Reading Guide*) are provided that account for the changing possibilities in various playing positions on the guitar. Considering the complexity of the guitar’s fretboard, and the widespread practice of scoring impossible vertical cells in scores of non-guitarist composers, such an overview and explanation would be a great step forward toward informing these composers on the way in which vertical cells can be combined, as well as toward a general understanding of this phenomenon.

### 3.2.5 Accurate practical information

Some of the relevant studies contain notorious inaccuracies, misinforming the target audience on the possibilities of the instrument. A number of the chords in Berlioz’s *Treatise* that are marked as difficult are in fact not very difficult, and commonplace in the guitar repertoire (Berlioz, 1843?, p. 84). Even at the time the *Treatise* was published, the chords mentioned as difficult are on a technical level commonplace in the works of composers as Mauro Giuliani and Johann Kaspar Mertz.
The orchestration guides by Adler and Alfred Blatter contain mistakes and oversights in their respective chapters on the guitar: Adler in misrepresenting the guitar’s range and giving his literature example in bass clef (Adler, 1989, p. 105), while Blatter, in his appendix on guitar instrumentation misrepresents the range of the first string by an octave in his fingering chart (Blatter, 1997, p. 446).

### 3.2.6 Presentation model relevant for composers

In many of the relevant studies, a categorization is chosen that makes sense from the guitarist’s view, but less from the perspective of a non-guitarist composer. Lunn, for instance, divides his findings into chapters: the left hand, the right hand, percussive sounds, with objects, borrowed from other traditions and miscellaneous techniques, while harmonics are an appendix. For composers wishing to know which sounds can be produced on the guitar, and how one can score with these sounds, some of these categories (such as left hand, right hand) are not their primary concern and can turn using these studies into a hide-and-seek game for the composer. The categorizations into left hand and right hand only start to make sense, once the composer has more intimate knowledge of how to score for the guitar.

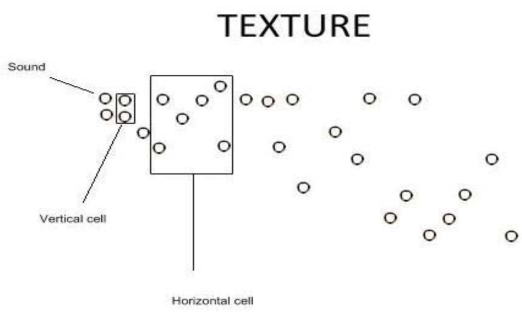
## 3.3 The sound-cell-texture chain

The sound-cell-texture chain is a set of constructs developed during the research process to re-think the scoring potential of the guitar and fill the voids in the literature on guitar scoring.[13] In this section, an account is provided of the constructs discussed in this study, the sound categories they relate to and the variables of the constructs.

### 3.3.1 Overview of constructs

This study aims to contribute to the body of knowledge on guitar scoring by filling the gaps described in the preceding chapter section with the use of a number of constructs: the *sound* construct, the *cell* construct, the *texture* construct, and the *chain* construct that refers to the hierarchic relationship between the first three constructs. The underlying assumption of this research is that the sound-cell-texture chain gives the composer access to the scoring potential of the guitar.

*Figure 3.1 Texture construct*




The *sound-cell-texture chain* is a set of constructs developed during the research process to investigate the scoring potential of the guitar. The *sound* construct captures the properties and characteristics of individual notes played on the guitar. The c*ell* construct captures the idiomatic ways in which *sounds* can be combined in intervals and chords (*vertical cell*) or short sequences (*horizontal cell*). The *texture* construct captures the way in which musical activity develops over time (a number of bars) and, through its timbral properties, density of intervals, number of voices, combination of *sounds*, temporal development and tempo, creates a musical fabric that is generic for the guitar. Figure 3.1 provides a visual representation of the relationship between sounds, vertical cells, horizontal cells and texture. The hierarchical relation between above constructs is captured in the *chain* construct. This construct indicates that all constructs are related; the characteristics of the larger constructs (e.g. texture) are dependent on the characteristics of the smaller constructs that are incorporated into them (e.g. sounds, cells). For instance, when one considers the texture level of a composition, the possibilities and

[13] The term "construct" is derived from the discussion of theories by Bacharach (1989). In his work, Bacharach distinguishes between theories, concepts, constructs and variables. A theory is defined by Bacharach as a "statement of relations among concepts within a set of boundary assumptions and constraints" (Bacharach, 1989, p. 496). Concepts may be approximated into constructs as they may not be observed directly. In such case, observable and measurable units of constructs are derived; they are called variables. The discussion of this matter in the work of Bacharach was useful in my research, as it allowed me to give a structured outline of the constructs and variables used in my study.

limitations of the sound and cell levels that contribute to the texture still apply. For each sound category available on the guitar, a *sound-cell-texture* chain is presented in this study.

My research further develops the perspective Chris Kachian presented in his work when he described the guitar potential through the musical textures that can be created on the guitar (Kachian, 2006, pp. 13-29). The additions and adjustment to his views that are presented in this study are discussed in section 3.4 of this chapter. The assumption in my study is that the examination and subsequent conceptual and practical understanding of *sounds, cells* and *textures* available on the guitar leads to a more informed starting point for composing. Unplayable or ineffective passages in guitar scores may stem from a lack of understanding of the way individual *sounds* become part of cells and textures.

### 3.3.2 Sound categories

In this study, twelve different sound categories have been identified: plucked sounds, harmonics, rasgueado sounds, strummed sounds, percussive sounds, tambora sounds, hammered sounds, Bartok pizzicato sounds, buzzing string sounds, scratching string sounds, inverted stopping sounds and bottleneck sounds. For each of these sounds, a *sound-cell-texture* chain is presented with findings relevant for scoring.

The first two categories (plucked sounds and harmonics) represent pitched sounds, after which a discussion follows of sounds that are more noise-oriented (rasgueado sounds, strummed sounds, percussive sounds, tambora sounds, hammered sounds, Bartok pizzicato sounds, buzzing string sounds, scratching string sounds). Finally, there is a discussion of sounds that, without detuning, produce microtones (inverted stopping sounds) and those that are produced with the help of a movable external object (bottleneck sounds).

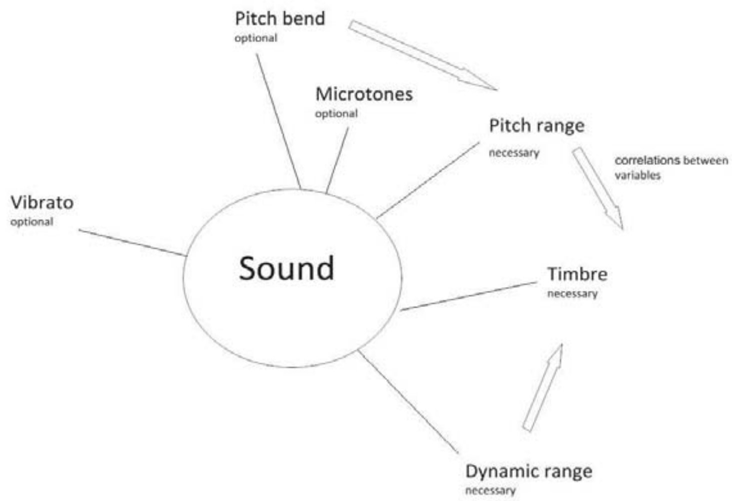
The sound categories are thus based on their core sound, which is pitched or more noise-oriented in character. The parameters timbre, articulation, rhythm or speed, and dynamics are discussed in detail in the chapters on each individual sound category because they are considered to be applied to the core sound in question. A second reason why pitch occupies an important place in this study is because its use on the guitar has traditionally been a stumbling block for non-guitarist composers. Such composers have often struggled to comprehend the possibilities and limitations to ways in which guitar sounds can be combined horizontally and vertically. This has led to the infamous unplayable chords in *Wozzeck* by Alban Berg and *Invocacion y Danza* by Joaquín Rodrigo, and compositions with underdeveloped textures (see Introduction). The emphasis on pitch in this study is therefore also intended to put an end to such confusion and misunderstanding.

### 3.3.3 Overview of variables

The findings are presented in a way that focuses on the potential of the guitar, rather than its impossibilities. In the following section, an overview will be given of the variables of the sounds, cells and textures that have been researched and presented in the findings. The variables are operationalized constructs: they make the construct observable and measurable. Variables have been researched for the constructs operating in each of the twelve sound-cell texture chains. When in one of the chapters a certain variable is missing, it is because it is not available for that particular chain. For instance, in the discussion of horizontal cells in the chapter on percussion sounds, slurs are not discussed as an articulation option, as it is not possible to create slurs with percussion sounds. In some chapters, the outline has been adapted to the particular characteristics of the sound category discussed. The chapter on percussion sounds, for instance, contains a discussion about one-hand and two-hand percussion in the vertical cell section, rather than a discussion of chord spacings.

## Sound

*Figure 3.2 Plucked sound construct and variables*




In the sound section, the variables of the individual sound in question are presented. These variables are: pitch range, timbre possibilities, dynamic range, vibrato, pitch bends and microtones. Some of these variables are necessary components of the sound, while others are optional (see Figure 3.2). There are correlations between many of these variables: the stopping position of a high pitched note, for instance, leads to a change in timbre (see section 5.1.2 under the header "Sound color and playing position indications"), and a note of which the pitch is bent has a limited dynamic range because of the decaying resonance of the string. For each of these variables, its relevance for the sound in question is discussed, a notation is proposed and its performance explained. Although timbre is commonly understood as "the quality of sound characteristic of a particular type of instrument or voice, as opposed to its register or pitch" (Bellingham, 2012), thus referring to the characteristics of any sound, in this study, timbre is distinguished from a sound category by the fact that it is considered a tone color variation on a particular sound. This is done in order to make visible the effects of these timbre alterations on the standard range of characteristics of the initial sound, and to demonstrate how such alterations can be achieved across the various sound categories. Etouffé, for instance, is a timbre that may be applied to the majority of the sound categories. Inverted stopping sounds and bottleneck sounds could arguably be seen as timbre changes, as they may be used as timbre changes in the majority of the sound categories. However, the impact of using this timbre change is so dramatic on range, horizontal and vertical cell possibilities that they are treated as a separate sound. For a detailed evaluation of the employed distinctions between a sound category and timbre, please refer to section 3.3.4.

#### Vertical cells

In the vertical cell section, the various ways in which sounds can be vertically combined are presented. Vertical cells can be created from one sound, or in combination with other sounds. For the various ways in which vertical cells may be composed, an explanation as to the structure of the vertical cell is presented, a notation is proposed if necessary, and its performance explained.

#### Horizontal cells

In the horizontal cell section, the various ways in which sounds can be combined horizontally are presented. Horizontal cells can be created from one sound category, or in combination with other sound categories. The types of horizontal cells discussed are: single lines, arpeggios, vertical cell sequences and multiple parts. For each of these types of horizontal cells, the following variables are discussed: horizontal cell design, resonance, harmonic possibilities (used here in the sense of harmony, not in the sense of a harmonic overtone), speed, rhythmic possibilities, articulation (slurs, legato, accents, staccato, and glissando), embellishment and combinations with other sounds. For the combinations with other sounds, particular attention is given to the speed with which the sounds in question can be alternated. Additionally, for each type of horizontal cell, examples are given of non-functional writing.

#### Textures

The texture section functions as an expose of literature examples of textures that have been created with the sound in question. The textures are divided into two groups: textures as continuations of horizontal cells and textures as combinations of horizontal cells. In the first category, literature examples are presented that repeat a horizontal cell discussed in the horizontal cell section for more than just a few measures, creating a texture in the process. In the second category, literature examples are presented that combine or alternate a variety of horizontal cells; these combinations may consist of various horizontal cells of one type of sound, as in for instance an arpeggio horizontal cell of plucked sounds combined with a single line horizontal cell of plucked sounds, or a combination of various sounds, such as a an arpeggio horizontal cell of plucked sounds combined with a vertical cell sequence of rasgueado sounds.

### 3.3.4 Identifying the sound-cell-texture chains

In this section, questions as to how the sound-cell-texture chains were identified are addressed. The questions are: how was each chain identified and conceptually separated from other chains? What were the issues in identifying chains and how were they resolved?

## Criteria for identifying sound-cell-texture chains

The naming of the twelve different sound-cell-texture chains was conducted on the basis of the characteristics of their core category: sound. During the research trajectory, it became clear that in order to construct an account of the potential of the guitar, the simultaneous presence of two dimensions was relevant: the sonic characteristics of the produced sound, and the technique used to produce the sound. Surely, without the presence of a guitar-technical cohesion between the various sounds in an account of scoring possibilities on the guitar, control over these sounds would prove to be elusive for composers, as guitar-technical aspects have implications in terms of possibilities and impossibilities in terms of scoring. And vice versa, without a sonic cohesion between the various techniques, an account of such guitar techniques would, in musical terms, prove to be a meaningless exercise for composers. Thus, awareness of the interdependence of these two dimensions was an important condition for conducting a meaningful research trajectory that illuminates musical as well as technical matters central to guitar scoring. By extension, sound, as the core category, was separated on the basis of its sonic characteristics as well as the technique used for its production. Plucked sounds, for instance, can be identified on the basis of their sound and a set of techniques pertaining to the production of the plucked sound, and may be distinguished from harmonics due to a difference in sonic characteristics and technique. Similarly, tambora sounds may be distinguished from rasgueado sounds based on differences in their sonic characteristics and technique. This approach, consisting of awareness on the part of the researcher of the interdependence between sound and technique, also made it possible to describe the ways sounds can be combined into larger building blocks, dubbed cells and textures in this study, on the basis of the related technical potential.

### Sound versus timbre

In some cases, a decision had to be taken as to whether a sound constituted the core category of a separate chain, or rather could be considered as a timbre variation of another sound. The standpoint adopted was that a tone color variation succeeds in altering the characteristics of the sound, but largely or completely leaves the technical production of the sound intact. By extension, this means that a timbre variation can be present in more than one sound-cell-texture chain. As such, the timbre category is, hierarchically speaking, a weaker player and is therefore a category subordinate to the sound level. Examples of timbre alterations are the etouffé playing and the prepared guitar. In etouffé playing, the performer produces a sound, for instance a regular plucked sound, while a part of the hand is used to simultaneously slightly damp the string, thus changing its sonic characteristics. The etouffé timbre is created by a movement that is additional to the regular plucked sound, the slight damping of the string, and may be used across a range of various chains, such as rasgueado sounds, strummed sounds and harmonics. In prepared guitar playing, an object is placed between the strings, altering the sonic characteristics of the sound. During production of the sound, no additional technical movement is necessary; the technical production of the sound thus remains completely intact. The prepared guitar timbre is available across a range of various chains, such as rasgueado sounds, strummed sounds and harmonics.

With the sound-cell-texture chains discussed in the latter two chapters, the inverted stopping sounds and the bottleneck sounds, distinguishing sounds from timbre was a more complex task. One could argue that inverted stopping, and to a lesser extent bottleneck sounds, are in technical terms not far removed from regular plucked notes and could therefore be described as timbres. Indeed, in both cases, the production of the sound may be seen as an addition to, for instance, the regular plucked sound. Even more, both leave the technical production of another sound largely intact, meaning that it is possible to create, for instance, rasgueado inverted stopping sounds, strummed inverted stopping sounds, rasgueado bottleneck sounds and strummed bottleneck sounds. However, both categories contain characteristics so radically different in terms of range, dynamics or notation, with corresponding radically different characteristics on the cell and texture level, that it was decided - in order to accurately and orderly describe their characteristics - that each should be described as a distinctive sound-cell-texture chain.

One could argue that a sound event such as the performance of the Bartok pizzicato sound followed by string resonance with the addition of vibrato and preparation of paper clips should be viewed as a complex sound object, rather than as a sound event belonging to the Bartok pizzicato sound category, as the initial Bartok pizzicato sound is not audible during the complete sonic event. This argument pays attention to the fact that certain sonic events on the guitar evolve, and have different characteristics at their onset than during their resonance. In answer to this point, it should be stated that the vibrato and the preparation can be used to alter both the onset and, in particular, the resonance of the Bartok pizzicato sound. In addition, the vibrato and preparation of paper clips can be applied to most other sound categories. This would, however, not work the other way around: the Bartok pizzicato could not be used to alter a vibrato sound (because the vibrato itself does not create a sound), nor can the Bartok pizzicato sound be used to alter a paper clip preparation sound (the paper clip does not create a sound either). It is true that a vibrato or paper clip preparation adds complexity to the sound object, but the elements in this compound sound can be distinguished hierarchically: the Bartok pizzicato, which sets the sound in motion, is located at a higher hierarchical level than the addition of the vibrato and paper clip preparation. For this reason, sound events are discussed under the header of the sound category that sets the sound in motion.

## 3.4 Filling the voids

As indicated in chapter section 3.2, the previous studies on guitar scoring exhibit a number of serious voids in their description of the guitar potential. In the current section, the ways in which this research addresses the voids in the current state of knowledge are explained.

The first void that this study aims to fill is that of the insufficient manner in which other studies address the way in which sounds can be used to create a musical fabric ideally suited for the guitar (see section

3.2.1). An account of such idiomatic possibilities would answer a need on the part of composers.[14] Among other things, this study informs the reader on how guitar sounds can be used as building blocks in scoring. The sound-cell-texture chains provide an overview not only of the characteristics of a sound, but also of the way in which it can be combined horizontally, vertically, and turned into textures. The three layers of the sound-cell-texture chain, each of which demonstrates the possibilities of idiomatic use on the level of the layer in question, can be seen as an extension of the two layers many scoring guides use: namely that of instrumentation, to describe the workings of an instrument, and orchestration, to describe the way one or more instruments can be used to create a score. Demonstrating the idiomatic potential of an instrument according to layers is a particularly suitable approach, as it allows for allocation of idiomatic issues to the appropriate layer, thereby making the presentation of the scoring potential structured and more readily recognizable. Scoring guides for the classical guitar fall short in demonstrating the idiomatic possibilities of the instruments according to a layered approach, but some orchestral guides have answered the composer's need to know how to idiomatically score for one instrument, or for groups of instruments by taking a layered approach through the separate discussion of instrumentation and orchestration. Adler (1989) and Blatter (1997), for instance, separate instrumentation from orchestration, while Hijmans makes a similar distinction in his instrumentation guide for the electric guitar, separating the first part that explains the machinery of the electric guitar from part 2 that discusses the way in which the electric guitar is used (Hijmans, 2008). In this study, I also use a layered approach to the discussion of the scoring potential, in this case for the classical guitar.
The second void that is addressed is that of the failure of scoring guides to discuss scoring of sounds other than regular plucked sounds (see section 3.2.2). Instead of only discussing the way in which traditional sounds such as plucked sounds can be used in scoring, this study proposes twelve categories of sounds and presents ways in which each of these sounds can be used in scoring. Another critical shortcoming in previous studies is the lack of a detailed and accurate overview of the possibilities to create vertical cells (see section 3.2.3). In order to fill this third void, Appendix A is provided with an account of the possibilities to create vertical cells in various positions, with the inclusion of the additional possibilities the barré offers. Previous studies on guitar scoring have frequently been the source of inaccurate and misleading information (see section 3.2.5). In order to present the findings of this research as accurately as possible, the literature examples in this dissertation are accompanied by video registrations. The video is an appendix to this written dissertation. The A/V materials of the repertoire examples are also intended to give readers a more complete impression of the sound of these examples and the manner in which they are performed on the guitar. The inclusion of such materials answers a need on the part of composers.[15] Other scoring guides, such as those by Blatter, Adler and Hijmans, similarly include audio materials.

[14] Authoritative composers writing for the guitar have expressed an interest in writing for the guitar idiomatically: Crumb expressed hesitation about the way to approach a guitar piece due to his lack of knowledge on how to write for the guitar idiomatically (Tosone, 2000, p. 171), while Berio was interested in engaging with the idiomatic characteristics of the instrument and declared that overlooking or ignoring these characteristics would be "undeniably impoverishing" (Berio, 2006, p. 27).
[15] Composers such as Crumb have also expressed the wish to "hear" the instrument they write for (Tosone, 2000, p. 123). Similarly, guitarist Eliot Fisk, for whom Berio wrote the guitar *Sequenza*, stated that "composers who hear really well, and can write what they hear, can write successfully for the guitar (Tosone, 2000, p. 44).

In addition to filling the voids described above, this study aims to present its results in a manner that is relevant for composers by using a categorization based on the sonic potential of the guitar rather than its techniques, by demonstrating idiomatic ways to write for the guitar, and by supplying A/V materials of the repertoire examples. In some of the previous studies, a typical guitarist's perspective is apparent in the presentation model, for instance when the scoring potential is categorized according to sounds of the left hand versus sounds of the right hand (see section 3.2.6). Guitar-technical considerations pertaining to the way these sounds can be scored are a fundamental component of a scoring guide, but they should not be an ordering principle for the presentation of the scoring potential. The view propagated in the current study is that a presentation of the guitar's scoring potential through a categorization of types of sounds, rather than guitar techniques, is the most appropriate, as this method of explanation better matches the experiential world of composers than one based on technical details of an instrument they have little familiarity with. The categorization in this study is, therefore, not grouped according to technical issues guitarists deal with, but based on the various sounds the guitar has to offer. We find successful examples of scoring guides that use such a classification: in his scoring guide for percussion, Solomon organizes his guide into different categories of sounds (Solomon, 2002). Similarly, many scoring guides for orchestra answer this to need by organizing their work into different categories of instruments (Berlioz, 2002; Blatter, 1997; Adler, 1989; Rimsky-Korsakov, 1964).

In response to interests and needs of composers described above, this dissertation thus presents a collection of sounds, categorized into 12 different conventional and less conventional guitar sounds, and demonstrates how each of these sounds can be used idiomatically, alone or in conjunction with other sounds, with the help of repertoire examples and A/V materials.

# 3.5 Idiomatic scoring

In this section, the notion of idiomatic scoring is discussed. The questions are: what is idiomatic scoring? What is its significance in this study?

## 3.5.1 Definition

In music literature and music dictionaries, the term "idiomatic" is eagerly and often used, but rarely defined.[16] The meaning of idiomatic scoring is generally understood as scoring that is well-written in technical terms for a particular instrument. The nature of the current work, professing to map out the idiomatic potential of the guitar, requires the author to explain in more detail how the term is used in this study. Two definitions can be used as a starting point. Tanaka (2000) defines idiomatic writing as "the art of writing music that is suited, adapted, and optimized for the instrument". In contrast to the *New Grove Dictionary*, *Wikipedia* does have an entry called "Instrumental Idiom" (2013) that is useful for the current discussion. The *Wikipedia* article defines instrumental idiom as a term referring to how well

[16] The *Oxford Dictionary of Music*, the *Oxford Companion to Music* and the *Grove Music Online*, for instance, all make extensive use of the terms "idiom" and "idiomatic", particularly in their descriptions of composer's works, without providing a definition of these terms.

musical composition, individual parts in a score and performance are “suited to the specific instrument intended, in terms of both ease of playing and quality of music and the inherent tendencies and limitations of specific instruments”. In both definitions, the idea of suitability for the instrument is an important factor. In addition to technical suitability, the *Wikipedia* article also explicitly points to musical suitability. However, what is missing in both definitions is any reference to the relationship between instrument and performer. If we imagine a situation in which an instrumentalist who is not a guitarist, for instance a percussion player or a cellist, is presented with a classical guitar to play on, this player can produce sounds on the guitar that are idiomatic from her perspective, based on her instrument-specific training and relationship to, respectively, percussion instruments, or the cello, but not idiomatic for the guitarist. The notion of idiomatic use of an instrument, therefore, is related to the instrument-specific training of the performer, and does not simply encompass any conceivable possibility of the instrument as an object, isolated from its practical use as a musical instrument. This research includes in its notion of idiomatic use of the guitar the perspective of the professionally trained classical guitarist. Furthermore, this research takes the position that the claim of the *Wikipedia* definition that music written with consideration for the instrumental idiom should be characterized by “ease of playing”, is false. Ease of playing is a characterization that greatly depends on the level of the individual performer. Many guitar techniques require serious and professional study before they can be played accurately and with any ease, such as the tremolo technique, but this does not make such techniques any less idiomatic for the guitar.

Idiomatic guitar scoring in this research is thus defined as: scoring that is ideally suited for performance on the guitar by a professionally trained guitarist, and that can be made to sound on the guitar in accordance with the instructions in the score. Idiomatic music may be easy or difficult for a performer, depending on the level, strengths and weaknesses of the individual performer.

### 3.5.2 Significance

This study presents a wide range of sound categories that can be produced on the guitar, and each chapter on one of the sound categories of the sound-cell-texture chain describes an arena of idiomatic use. This arena of idiomatic use is described by indicating the possibilities and limitations of the various building blocks of scoring identified in this work (sounds, cells and textures) and their associated variables (such as pitch range, resonance and articulation) that are ideally suited for performance on the guitar, based on the technical perspective of the professionally trained guitarist. The technical dimension of instrument suitability determines the borders of the arena of idiomatic use that is described: those variables of sounds, cells and textures that can be realized technically are included in this study, while those that are technically not possible are either excluded or commented upon as being examples of non-functional scoring. The use of techniques that fall outside the range of common use, sometimes called extended techniques, is discussed in the same manner: those variables of sounds, cells and textures produced with the technique in question that can be realized on the guitar are included, while those that cannot be realized are excluded or used as examples of non-functional scoring. Thus, less commonly used sounds (e.g. inverted stopping sounds) receive the same treatment as more commonly used sounds (e.g. plucked sounds). The musical dimension of instrument suitability appears in the form of extensive commentary on those technical uses of sounds, cells and textures that are possible and suited for the guitar. The twelve sound-cell-texture chains represent a particularly wide range of possible guitar sounds, based on extensive score study and sound selection (see Methodology Chapter). These sound categories all appear in the guitar repertoire and are likely to have been trained by the professional guitarist.

## Chapter 4 Guitar, guitarist and composer

**Contents**

# Chapter 4 Guitar, Guitarist and Composer

In this chapter, the history of the relationship between the guitar, performer and composer is explored. In the first part of the chapter, the characteristics of this relationship are examined for the various eras of the development of the guitar. The second part of the chapter seeks to answer the question whether there currently is a mismatch between guitar, guitarist and composer.

## 4.1 Guitar composition through the ages

In this section, the historical conditions under which composers have written for the guitar are examined. The history of the guitar is divided here into three eras that are separated by important changes in construction and instrument characteristics. The first era, starting in the early sixteenth century, covers the renaissance guitar, baroque guitar and related instruments like the lute and the vihuela, and ends with the demise of the lute and the extension of the amount of strings on the guitar. The second era, starting in the late eighteenth century, begins with the introduction of the six-string classical guitar and runs until a period of decline for the guitar in the middle of the nineteenth century. The third era, starting in the late nineteenth century, begins with the introduction of the modern classical guitar and continues until the present day.
Questions leading the examination are: what were the characteristics of the instrument (appearance, number of strings, loudness, tuning, and number of frets)? Which developments occurred in the construction of the instrument? What type of music notation was used? What kind of repertoire (solo, accompaniment, and chamber music) was written for the instrument? What composers wrote for the instrument and how did the music of non-guitarist composers relate to that of guitarist composers? Which actions were taken to explain the scoring potential of the guitar to non-guitarists?

### 4.1.1 Renaissance and Baroque

#### Instrument characteristics and development

In sixteenth century Europe, three categories of guitar- and lute-like instruments were in use: the four- and five-course[17] renaissance guitar (developing into the five-course baroque guitar in the seventeenth century), the vihuela, and the lute (Päffgen, 2002, pp. 45-89; Dausend, 1992, pp. 6-9). The guitar, the smallest of the three, was stringed with four courses and had a flat back. The vihuela was a six- or seven-course instrument with a flat back, while the lute was a five-course instrument with a single top string and a rounded back. Strings were made of gut and were not overspun, which meant that the loudness of the instruments was relatively low, which was partially compensated by the use of courses instead of

[17] A course is a “group of strings tuned in unison or in the octave and plucked simultaneously so as to give extra loudness” (Oxford Dictionary of Music, 2012c). Guitars, vihuelas and lutes were stringed with double courses.

single strings. On the lute, the weakness of sound was also partially compensated by a cross-grain bracing that created a “relatively loud, but rapidly decaying sound” (Heck, 1971, p. 47). The loudness of the guitar and the lute improved with the gradual adoption of overspun strings starting in the end of the seventeenth century, although many players did not make use of this development due to their habits and taste (Dausend, 1992, p. 23; Peruffo, 1994). The vihuela had fallen into disuse by this time.
For the four-course renaissance guitar, two relative tunings were used: an “old tuning” and a “new tuning” (Bermudo, 1555). The “new tuning” is identical to the tuning of the relative tuning of the fourth to the first string on the modern classical guitar, while the “old tuning” had the fourth course tuned a second lower. The tuning of the seventeenth century five-course baroque guitar is identical to the tuning of the fifth to the first string on the modern classical guitar. In addition to the usual order of historical and contemporary tunings, in which the lowest string was tuned to the lowest pitch, there existed a practice in which the fifth, and sometimes also the fourth, courses were tuned an octave higher. These types of tunings, called re-entrant tunings, contained upward as well as downward jumps in their relative intervals, as the fifth course was tuned higher than the third course. On the one hand, these tunings made it possible for the performer to play scale passages more rapidly over multiple strings (so-called campanellas), and change the timbre of the guitar as the result of the scordatura. The possibilities of these tunings were widely exploited by composers in a way they saw fit for different types of works. Sanz, for instance, used standard tunings and two different types of re-entrant tunings for basso-continuo playing, but preferred only one re-entrant tuning for solo works (Dausend, 1992, p. 23). On the other hand, this feature made the baroque guitar tuned in re-entrant a complex instrument to understand for composers who did not play the instrument.
The customary relative tuning of the renaissance lute and the vihuela was the same, making it possible for lutenists to play vihuela scores and vice versa (Dausend, 1992, p. 9). Due to the similarity in tuning, amount of strings, the possibility to play vihuela music on the lute and vice versa, and the fact that the vihuela was primarily used in Spain, the vihuela is often considered to be the Spanish version of the lute (Griffiths, 2010, p. 126). Around 1650, the hitherto customary tuning of the lute lost ground to the d minor tuning, in which the instrument was tuned to a d minor chord.
The number of frets on the renaissance guitar, the vihuela and the lute was much lower when compared to the nineteen frets of the modern guitar. In the early seventeenth century, Dowland described the lute as an instrument with eight frets, and points to a French development of fretting the lute with ten frets (Lowe, 1976, p. 14). The vihuela and the four-course renaissance guitar usually had no more than ten frets. For the lower strings on the fingerboard of the lute (excluding the non-fretted basses) this meant that up to four notes could be doubled in unison on the next higher string. The complexity of the fingerboard was lower than it is on the modern classical guitar: with the exclusion of the first string, which does not have a higher neighboring string, all strings on the modern guitar contain at least fifteen pitches that are also present on the next higher string. On the baroque guitar, an increase of the amount of frets can be seen when compared to the renaissance guitar: the baroque guitar is described as having had twelve frets reaching to the edge of the instrument’s body (Dausend, 1992, p. 22).

In addition to the extension of the number of frets, the development of the lute included the addition of strings. During the course of the sixteenth to the eighteenth century, various types of lutes were constructed that contained additional bass strings connected to a second pegbox: the theorbo and chitarrone, for instance, were manifestations of the lute with added bass notes placed above the fretboard in order to extend the bass range of the lute. These bass notes were tuned diatonically and could not be fingered with the left hand, although it was possible to raise or lower the pitch of the open bass strings to suit the key of a piece. For some players, the bass note additions on the theorbo and chitarrone made mastering the instrument more challenging when compared to learning to play the six-course lute. The varying amount of strings and differences in body shape led to a myriad of different lute types. Although some efforts were made by luthiers in the eighteenth century to reduce the number of strings on the lute, probably under the influence of the growing popularity of the guitar (Hellwig, 1974, p. 29), the lute collapsed in the mid of the eighteenth century when its “grass-roots support” disappeared due to the impracticality of the instrument and other options, such as the keyboard, seemed easier for beginning players (Wade, 1980, p. 88). The life-span of the vihuela was even shorter than that of the lute: it disappeared at the end of the sixteenth century. Factors cited as having contributed to its demise are the increased popularity of the guitar, which took the position of the vihuela, and the failure of lute players to adopt the vihuela (Turnbull, 1976, p. 32).

## Notation

Composers used tablature, a notation system that records fingering positions rather than notes, for the notation of music for the guitar, vihuela and lute. Tablature took the form of horizontal lines representing the courses, while letters or numbers represented the finger positions of the left hand. Above the staff, note values were added to indicate the note length of the letters or numbers on the staff. For the performance of chordal accompaniments on the guitar, an alphabetic reference system for chords was introduced by Montesardo (1606). This so-called alfabeto notation expressed a fingering position for a chord in one symbol, much in the same way as our contemporary guitar chord symbols do. Some composers wished to benefit from the advantages of both tablature and alfabeto, and adopted a hybrid notation in which tablature notation for polyphonic lines was mixed with alfabeto for the notation of chords. This type of notation can be found in the works of Sanz, Foscarini and Corbetta. As tablature notation was the chosen form of notation for composed music for the guitar-like instruments, and alfabeto was used as a shorthand notation of chords sometimes integrated into tablature, the following discussion will primarily concentrate on the advantages and disadvantages of tablature notation.

The advantages of tablature notation stem from the fact that it has a strong visual relation to its performance on the instrument; tablature essentially instructs the reader where to place the fingers. Tablature made it relatively easy to learn to play the instrument, to acquaint oneself with sophisticated music, and to notate music (Griffiths, 2002, p. 93). Tablature provided a direct and practical means of capturing a composition in notation, even for players in early stages of the development of their skills. Griffiths points to the fact that tablature notation makes a “graphically compact” notation possible, thus, notation on one staff without the help of ledger lines (Griffiths, 2010, p. 129). Instead of having to learn music notation and translate the notes in a score to positions on the fretboard, which was and still is particularly challenging for the performer of a guitar or guitar-like instrument as a note in a music score can be played on various strings in different positions, players could immediately read finger positions instead. Moreover, tablature made it possible for players and composer to switch between tunings (such as standard and re-entrant tunings on the baroque guitar), and to explore unusual or experimental tunings without complicating the reading and notation process (Campion, 1716, p. 22). The intention of the alfabeto notation was that it would enable the performer to play pieces without a teacher (Montesardo, 1606). Due to the ease with which this system could be learned, alfabeto notation was particularly popular, especially in its country of origin Italy (Päffgen, 2002, p. 101). In addition, reading chords in alfabeto is easier than reading chords from tablature, as the complete chord is captured in one symbol. Alfabeto notation was therefore used as an extension of tablature by some composers, as described above.

Two types of disadvantages of tablature can be distinguished: the first in terms of its notation, and the second in terms of the difficulties it raises for non-guitarist composers to write for the instrument. Tablature is notoriously inadequate in demonstrating the distinction between voices, which is of particular importance in polyphonic music. The moment a note should be played is indicated in the tablature, but as soon as subsequent notes appear inside a measure, it is not clear for how long the initial note should ring on. Lutenists at the time of the birth of these works knew how to separate the voices, based on their experience in playing polyphonic music (Griffiths, 2002, pp. 96-97). Separating voices in a tablature thus required experience, knowledge and skill. As a result of the imprecision of tablature, transcribing a tablature from this era into music notation is a question of interpretation rather than a one-on-one transcription (Dausend, 1992, pp. 56-57). Lute, vihuela and guitar tablatures can be transcribed into staff notation with a literal or an interpretative notation. The literal notation only indicates the moment a note should be plucked, but not its duration, leaving the interpretation to the performer. The interpretative notation, on the other hand, seeks to interpret the note durations of the tablature and translate them into staff notation. In the nineteenth and twentieth century, differing opinions as to which of these two types of transcription is the more appropriate have led to extensive discussion and disagreement in the lute world (Ophee, 1998).
The second type of disadvantage stems for the fact that tablature notation differs from staff notation and is therefore not familiar to non-players. For composers, guitar-like instruments of this era were not primarily accessible through the established method of music notation. Composers had to familiarize themselves with the instruments and their notation, or rely on a knowledgeable performer to transcribe their music notation into tablature. Perrine, who published a lute book in 1679 containing harmonic instruction and transcriptions, both in music notation and tablature, criticized tablature for keeping lutenists from playing with other instruments (Perrine, 1679, p. 15). His suggestions for notating lute music in music notation were not widely followed, conceivably due to the fact that tablature had more advantages for the average player, was widely and overwhelmingly used, and because learning to play music notation took more time than learning tablature, as Perrine himself pointed out. Not much later, de Visée added staff notation to publications with his tablature works for baroque guitar. The reason de Visée used this notation was not primarily to help the guitarist play with other instruments, but on encouragement of his friends, to allow his works to be played on “le Clavecin, le Violon et autres instruments” (de Visée, 1682, p. 4).

## The repertoire and its composers

The effective use of the guitar, lute or vihuela in a solo composition required intimate knowledge of their techniques and notation practice. As a result, composers of solo repertoire were predominantly player composers. Apart from use in solo repertoire, the lute and guitar were also widely used as ensemble instruments, in which case scores were often written by non-player composers.[18] The lute or guitar was then used as a continuo instrument. For the performance of this part, the lutenist or guitarist created a more elaborated part based on the figured bass indications in the score. On the one hand, this demonstrates the trust composers appear to have had in the abilities of lutenists to improvise on the basis of the figured bass indications. On the other hand, the minimal detail in notation when composing basso continuo parts for the lute by non-player composers signals the limited access these composers had to the practice of tablature reading. Solo pieces, which required fully worked-out scores, were seldom written by non-player composers. In the case of Bach, who is one of few non-player composers who wrote extensive solo works for the lute, there exist serious doubts in modern scholarship as to whether Bach wrote his lute suites to be played on the lute.[19]

Apart from the fact that solo works were primarily written by player composers, the difference between the works of player composers and non-player composers appears to have been relatively small in the sixteenth century. Besides, Griffiths points to the proximity of vocal polyphony to lute music in the sixteenth century (Griffiths, 2002). Because of the widespread practice of intabulating vocal works, lutenists were well aware of the polyphonic conventions of the sixteenth century. Moreover, many of the composers who are nowadays considered to have been primarily lutenists, such as da Milano and Dowland, were also composers of vocal polyphony (Griffiths, 2002). In the early eighteenth century, during the decline of the lute, the compositional practice of player composers started to drift away from the practice of non-player composers. The voice leading of music written in the seventeenth century by lute and guitar composers, and the way lutenists and guitarists performed their basso continuo parts were different from the standard of polyphony in vocal music (Miles, 2011; Dean, 2009). Scholars have criticized voice leading in early seventeenth century guitar accompaniments (Miles, 2011, p. 143), but these divergent voice leading practices of player composers are sometimes judged positively as having had a positive influence on continuo playing (Dean, 2009, pp. 218-273), or even as being inspirational for composers in the twentieth century.[20] De Visée apologized in advance for possibly breaking musical rules in his *Livre de guittarre*, claiming that it is the instrument that desires these offenses, and that the music is lastly meant to please the ear (de Visée, 1682, p. 4). Miles defends the criticism on voice leading by explaining that the harmonies appearing in guitar accompaniment were solutions performed on an

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[18] For section 4.1.1, the term player composer is used instead of guitarist composer for composers who played the guitar, lute or vihuela.

[19] The autographs of Bach's lute works were written in two staff music notation rather than in tablature, and are believed to have been written for the lute-harpsichord, a keyboard instrument strung with gut strings that imitated the sound of the lute while taking advantage of the technical possibilities of the keyboard (Bach J. S., 2002, p. ix).

[20] "This style knows nothing of the otherwise usual requirements and prohibitions of voice-leading; it can only be understood in relation to the fingering technique; it frequently applies the sound of open strings and in no way avoids the otherwise so despised parallel 5ths and octaves or unisons. The dissonances and other conflicting sounds which appear so often ... strike me as exciting and revealing" (Orff, 2013).

instrument with a limited bass range, and that they had to be suited to the instrument in order to be playable (Miles, 2011, pp. 129,157-158).

## Communication of scoring potential

The literature of this era in which technical and musical possibilities of the guitar-like instruments were described took the form of instruction works, written for those wishing to master the art of playing such instruments. Two of the most well-known examples of such works, both written for vihuelists, are *El Maestro* by Milán (1535) and Bermudo's *Declaracio de instrumentos musicales* (1555). Where Milan's work was primarily intended to teach the reader to play the vihuela through an understanding of the technical issues pertaining to the instrument, Bermudo sought to instruct the reader in musical understanding (Griffiths, 2010, pp. 126-127). In the *Declaracio*, Bermudo taught the reader to play, compose and arrange on the vihuela. According to Bermudo's method of instruction, composing could be learned by, first, practicing to intabulate (i.e. notate in tablature) vocal works of increasing difficulty, absorbing compositional techniques by playing works of the great masters, and finally, using this knowledge to create one's own works. Bermudo advised the aspiring composer and arranger to create a score in mensural notation first and only then to intabulate the music. This advice rises from Bermudo's idea that first notating music in mensural notation allows the composer to be "able to predict problems likely to arise in intabulating" (Griffiths, 2010, p. 130).

Publications expressly written for the purpose of explaining the potential of the lute, vihuela or guitar to a composer rather than a player did not appear at this stage, nor do they appear in the seventeenth and eighteenth century. The publication of such a work would not have been inconceivable: Roeser published his *Essai de l'instruction à l'usage de ceux, qui composent pour la clarinet et le cor* in 1764 (Roeser, 1764), answering to a need existing on the part of composers for learning how to write well for the clarinet and the horn. With the observed difficulties of access to the guitar-like instruments for non-player composers, how could it be that there was no such work written for these instruments? Four responses to this question are given here.

First, the lute and the guitar were primarily used by non-player composers when writing ensemble works. Basso continuo, which consisted of a bass line or a bass line with figures, provided the lutenist (or guitarist) with the musical and harmonic cues for the part. It was then up to the performer to translate this into music suitable for the instrument. The performer could improve this craft with the help of lute manuscripts that supplied formulas to be used in "improvised works during performance" (Griffiths, 2010, p. 134). Basso continuo notation took away from the composer the responsibility to write out the music for the lute, and gave this responsibility to the performer. Paradoxically, the disadvantage of the complexity of the instrument and tablature notation thus turned out to have its questionable benefits: it allowed the composer to score basso continuo parts without having to worry about writing impossible or non-idiomatic parts, and without having to study in more detail the techniques and notation practice of the lute or guitar.

Second, where the lute took the position of a central instrument of the sixteenth century music experience, comparable to that of the nineteenth century piano (Griffiths, 2002, p. 92), it increasingly lost this central position in the course of the seventeenth and eighteenth century. Where composers of the sixteenth century were more likely to have some lute-playing skills, and were therefore able to write for the lute, the degradation of the lute's central position was accompanied by a decline in the popularity and use of the lute. In France, for instance, the five-course baroque guitar experienced an increase of popularity in the second half of the seventeenth century (Dausend, 1992, pp. 36-39; Lowe, 1976, p. 19), although the theorbo was still used until the second half of the eighteenth century. In Germany, some of the greatest lute composers, such as Weiss, Baron and Reusner, wrote lute works in the first half of the eighteenth century (Dausend, 1992, p. 44). With the subsequent decline of the lute, the publication of a lute scoring guide became even less likely. Although the guitar did increase in popularity, it did not possess the same level of prestige as the lute, nor was it a central instrument in music practice.

Third, it is important to recognize that the emergence of scoring guides specifically aimed at composers started in the second half of the eighteenth century and were intended to explain the effective use of newly introduced instruments in an orchestra. The first of these works, by Roeser (1764), Francoeur (1772) and Vandenbrock (1793) were all written to describe the scoring potential for the clarinet and horn, as these were, at the time, only recently introduced in the orchestras (Bartenstein, 1971). Later orchestration guides also included the rest of the orchestra, while instruments that were not part of the orchestra were only first described by the orchestration guide by Kastner (1837). It is in his *Traité general d'instrumentation* that we find brief overviews of the potential not only of the guitar, but also of the decacord (a ten string guitar), the lute and the theorbo. As the guitar-like instruments were not part of the orchestra, they were only described in the later orchestration guides of the nineteenth century, and in little detail. And finally, fourth, influential vihuela players such as Bermudo propagated the idea that one learned to compose through playing the instrument, rather than learning to write from a distance without knowing how to play. In the *Declaracio*, Bermudo gave careful instructions as to how this process of learning to compose through the instrument was to take form. The idea that a composer could learn to write for the instrument without being able to play is quite at odds with this method of compositional instruction.

### 4.1.2 From the classical era to the Torres guitar

#### Instrument characteristics and development

Towards the end of the eighteenth century, the sixth course was added to the five-course baroque guitar, extending the bass range of the guitar. The sixth course made it possible to easily create I-IV-V progressions on the guitar, "giving the classic guitar a kind of perfection which the five-course baroque guitar had resisted for about 200 years" (Heck, 1971, p. 40). Soon after the adoption of the sixth course, the courses were abandoned altogether, which left the guitar with six single strings. The use of double courses, a leftover from the Baroque era that was intended to increase the resonance of the string, became unnecessary when overspun strings were adopted (Päffgen, 2002, p. 124). As a result, six-string guitars were louder than their five-course forebears.

The standard tuning of the six-string guitar from the end of the eighteenth century is the same as that of the non-re-entrant five-course baroque guitar tuning, and has an added sixth string a perfect fourth below the fifth string. In the repertoire of the end of the eighteenth century and the nineteenth century, the standard tuning was only rarely abandoned. When the standard tuning was changed in this era, it typically meant a downward detuning of the sixth string by a major second. Scordaturas fell into relative disuse: there are no works for six-string guitar from this era that display the wide array of tunings that were seen in the five-course Baroque guitar works of Campion (1705). The reason behind the lack of variation in tuning can partly be explained through Heck's assertion that the six-string guitar was conceived as a "chord-oriented instrument" (Heck, 1971, p. 40). By keeping the tuning of the guitar fixed, the composer could rely on familiar left-hand positions for the harmonic progressions of his music. The fall into disuse of the various tunings may also in part be explained by the transition from tablature to staff notation, as will be discussed in more detail under the header "Notation". Re-entrant tunings disappear altogether, as they were "*Notlösungen"* for the "inadequate" range of the baroque guitar (Päffgen, 2002, p. 124), now fixed by the extended range of the six-string guitar. Unusual keys are now reached with the standard tuning, facilitated by the extended range, as is demonstrated in the set of preludes in all major and minor keys by Legnani (1822).

A significant development of the six-string guitar was that its range was extended upward by the addition of frets. In the 1820's, guitar maker Stauffer built his guitars with the still customary first string range of an octave on the neck with an additional range of a fifth on the body of the instrument (Heck, 1971). The extension of the range of frets, coupled with the addition of the sixth string meant that the range of the guitar was extended upward and downward. This enlarged its musical possibilities, but also complicated the already complex grid of the fretboard. Position playing became more common, as the composer could now benefit from the three bass strings. In higher positions, the composer could score a melody two octaves above a bass line. The number of notes that could be reached in the bass register was limited when playing in higher positions, as the lowest range of bass notes can only be played in one position. This led to the use of typical keys, centered on open string pitches of the bass register. With the new, extended fretboards, each string with the exception of the highest string had at least fifteen pitches that could also be played on a higher string on the fretboard, and with the exception of string one and two, each string had at least fifteen pitches that could be played on at least two other higher strings.

A number of guitar offshoots were invented, such as a guitar modeled after a lyre, and guitars with seven to twenty strings. The romantic guitar composer Johann Kaspar Mertz, for instance, first used a six-string guitar, and later moved towards a ten string guitar (Wynberg, 1985), and Giuliani wrote duets for a guitar and terz guitar, a smaller guitar tuned a minor third higher. None of these instruments, which guitar scholar Wade dismissingly called "monstrosities" (Wade, 1980, p. 98), enjoyed widespread adoption. The lack of adoption was conceivably caused by the same factors as those responsible for the demise of the lute: a large number of strings made these instruments harder to learn and less practical in use.

## Notation

From the early nineteenth century, music for the six-string guitar was notated in staff notation, rather than tablature. Simon Molitor, one of the pioneers of the six-string guitar, motivated the necessity of using staff notation by claiming that this allowed the guitar and its music to be removed from a limited circle of amateurs, and to be introduced to the general musical arena. As a result, Molitor claimed, guitar music could now be subjected to criticism or praise by knowledgeable critics (Heck, 1971, p. 86). For the notation of guitar music, the treble clef was chosen, with guitar notes sounding an octave lower than notated. According to Peter Päffgen, guitarist and guitar scholar, it is not clear how and why the transposing treble clef was chosen (2002, p. 137), but it quickly became a generally accepted notation custom, despite the awkwardness it entails for the notation of the three-and-a-half octave range of the guitar, requiring multiple ledger lines for the notation of its upper and lower registers. The influential guitar composer Sor agitated against the use of the treble clef, claiming it lacked "precision" (Sor, 1824?). Instead, Sor suggested a non-transposing two-staff notation with alternating use of the treble clef, alto clef and bass clef, which he introduced in his *Fantaisie op. 7* (Sor, 1824?). The score of the *Fantaisie* was very difficult to read for even professional guitarists; the two staves after all did not refer to two different hands, guitarists were not familiar with simultaneous reading in three clefs, and the new notation was not adopted. In his second edition of the *Fantaisie* and in the rest of his guitar works, Sor abandoned his suggestion for two-staff notation with three clefs altogether and reverted to the standardized single- staff, octave transposing notation. Although staff notation was widely accepted by guitarists as the customary means of notating guitar music, the quality of notation often left much to be desired. In its early days, staff notation of guitar music was still influenced by tablature notation, which meant that scores did not distinguish between voices. In the course of the nineteenth century, this practice improved, and guitar music that contained multiple voices was increasingly notated correctly (Päffgen, 2002, pp. 138-139). Hereafter, the customary notation for the classical guitar has remained staff notation, and it still is today.

The advantage of the adoption of staff notation was, indeed, that guitar music became accessible to non-guitarists. Through the correct use of staff notation, guitar scores could now specify more clearly what the desired length was of the various notes. The disadvantage of staff notation was that playing, reading and writing guitar scores became more challenging. Reading passages in higher positions became particularly difficult, as it required excellent knowledge on the part of the player of the multiple locations where a note could be found, as well as the best ways to finger combinations of multiple notes, combinations that could be fingered on multiple locations. Another disadvantage of staff notation was that reading and writing music that employs alternative tunings became particularly challenging. Staff notation for alternate tunings is much more complex than tablature notation, both for the composer to score and for the performer to decipher, as it changes the range of possible intervals and chords for the composer, while the player has to re-learn playing positions for each detuned string. As we have seen above, Campion excused his use of tablature by the fact that he used multiple tunings (Campion, 1716). Remarkably few pieces in unusual tunings appeared in the era from the introduction of the six-string guitar to the invention of the Torres guitar. To the present day, compositions scored for an alternative tuning other than the two most commonly used (i.e. sixth string to d, or sixth string to d and fifth string to g), two staves are often used, one of which is provided for the purpose of facilitating reading for the performer and notates pitches as they would have sounded in standard tuning.

## The repertoire and its composers

The early nineteenth century saw the emergence of the first guitarist composers who created a large body of solo and chamber music repertoire, as well as a number of concertos for guitar and orchestra. The era between 1800-1850 is considered a "miniature golden age" of musical and technical progress for the guitar, while that of the latter half of the nineteenth century is again considered to be an era in which the guitar survived but was not blessed with inspiring composers (Wade, 1980, pp. 99,130). The era between the introduction of the six-string guitar to that of the Torres guitar is being credited as being the first in history in which guitarists looked outward to the mainstream music world for inspiration, while also laying the foundations of modern guitar technique (Wade, 1980). The transition from courses to single strings required a new technique, which was developed in a wave of publications of guitar instruction works and etudes. Virtuoso performers primarily wrote their own solo, chamber and orchestral works for their performances and published etudes for the market. The Italian composer Mauro Giuliani and his Spanish counterpart Fernando Sor are considered to be the most distinguished guitar composers of this generation (Päffgen, 2002; Wade, 1980; Turnbull, 1976). Although their works made a “distinguished contribution to the repertoire” (Turnbull, 1976, p. 92), they do not display the same level of excellence as works by the greatest composers of their day. I agree with Wade that their smaller works are often received favorably, but their larger works sometimes “veer towards the grandiose” (Wade, 1980, p. 104). The picture of guitar works written by guitarist composers is one of extremes: while the virtuoso performers wrote dazzling and impressive pieces for their own performances (still challenging for professional players today), sometimes with considerable musical merit, there is much guitar music written in this age that is characterized by a “tedious sameness” and a content that is “cliché-ridden” (Turnbull, 1976, p. 88).The difficulty in creating large works was certainly partly caused by the difficulties in escaping the favorable tonalities of the guitar through harmonic and technical inventiveness, so much required in the development section of, for instance, the sonata form.

Non-guitarist composers only rarely wrote for the guitar, and when they did, their pieces were usually not solo works. Pieces written by non-guitarist composers such as Schubert and Berlioz, invariably confined the guitar’s role to that of accompaniment. The guitar parts in their scores are usually unassuming and are very simple for the professional guitarist to play. This is in part explained by the fact that they may have written for players that were not virtuoso performers themselves, but even the solo and chamber music works of Paganini “do not reach the complexity one might expect from the man whose performances on the violin were the talk of Europe” (Turnbull, 1976, p. 87). Despite the efforts of the six-string guitar pioneers to enter the guitar into the music mainstream, the guitar music written in this period was almost exclusively composed by composers who also played the instrument. Why was it that during this era the guitar was so confined to a narrow circle of guitarists and guitarist composers? An important factor was the difficulty to write for the guitar, especially for those who did not play the guitar. As may become clear from the discussion of the development of the instrument and its notation, the instrument’s already complex fretboard had extended greatly, and through the adoption of staff notation, scoring became further removed from the visual aspect of the performer’s playing experience on the guitar. A second and equally important factor was the lack of information on how to write well for the guitar (Turnbull, 1976, p. 88). Considering this difficulty, the lack of practical information was a considerable burden for composers. Berlioz undertook efforts in lowering this burden by including the guitar in his orchestration study. These efforts are discussed in more detail in the following section. A third factor was that of the guitar’s weak tone in comparison to other instruments. This almost disqualified the guitar for use as an orchestral instrument, and nearly disqualified it for use in all but the most intimate chamber music works, as it was easily overshadowed by instruments from other instrument families. Giuliani, who premiered his first guitar concerto in 1808, was ridiculed by a music critic for trying to use the guitar as a solo instrument next to a full orchestra (Turnbull, 1976, p. 98; Heck, 1971, p. 94). Berlioz attested the limited use of the guitar to "*la faible sonorité*" of the instrument (Berlioz, 1843?, p. 86). Finally, a widespread disdain for the instrument in educated music circles further explains the lack of non-guitarist composers writing for the instrument. This disdain comes forward in music dictionary entries of the guitar and critiques of guitar performers in this age (Heck, 1971, pp. 60-63). The guitar was not a lute, and had never occupied an important position in musical life. Rather, it was considered to be an instrument not fit for serious musical study and performance. This prejudice against the instrument was actively countered by the composing and performing activities of, in particular, Sor and Giuliani, who, however, as the above criticism on their works indicates, only partially succeeded in their efforts.

## Communication of scoring potential

While guitarists produced a large amount of pedagogical works for amateur guitarists, only a small number of works explaining the guitar's scoring potential were published during this period. Scoring for the guitar was discussed in two orchestral scoring guides, by Kastner (1837) and Berlioz (1843?). Kastner's description of the guitar is short and rudimentary, and presents the guitar as a chord instrument. His representation of the range of the guitar is not entirely accurate, and neither is his description of favorable keys. Berlioz's presentation of the guitar is more extensive, but also suffers from inaccuracies, such as an erroneous representation of difficult chords. Closest to a scoring guide for the guitar was a work published by the guitarist Carulli under the title "*L'Harmonie Appliquée à la Guitare*". The book shows how an accompaniment can be created on the guitar, but this work is primarily intended for use, as Carulli puts it himself, by "amateurs" (Carulli, 1825). Carulli's book thus fits in the category of Bermudo's *Declaracio*, which propagated the idea that one could learn to compose through playing the instrument. Why was it that no more publications on the scoring potential of the guitar have appeared, despite the introduction of staff notation, the more outward looking attitude of guitarists, and the popularity of the guitar at the beginning of the nineteenth century?

The first factor is the difficulty of explaining the scoring potential for the guitar. Berlioz who, after all, took it upon himself to explain scoring for a large number of instruments in his orchestration study, seems to make a slight retreat when he discusses the guitar: "Il est presque impossible de bien écrire la Guitare sans en jouer soi même.La plupart de compositeurs qui l'emploient sont pourtant loin de la connaître aussi lui donnent ils à exécuter des choses d'une excessive difficulté sans sonorité et sans effet" (Berlioz, 1843?, p. 86). Berlioz then decides to continue his discussion of the guitar, limiting himself to "*simples accompagnements*". Explaining the potential of the guitar that transcended its use in simply accompaniment was thus a complex task for a non-guitarist, which Berlioz was not able to accomplish. The second factor is the belief held among guitarists and non-guitarists that one could only write well for the guitar if one was able to play it. Berlioz made statements to this effect, as we have seen above, while Carulli's work, the only guitar scoring guide written by a guitarist in this era, was written for guitarists and not composers. The third factor is that professional guitarists, who were the designated experts to create and publish such works, apparently did not see it as their task to help composers. Instead, they published pedagogical works for the large population of guitar amateurs, which carried more financial benefits than a score guide for an instrument that was often looked down upon may have yielded. Guitarists seem to have been quite content with their own works, and did not recognize the necessity to enrich their repertoire with that of non-guitarist composers as they did in the twentieth century. If guitarists in the nineteenth century would have taken the development of the guitar's repertoire more seriously, they would have tried to work together with renowned composers and would have created scoring guides for non-guitarist composers, rather than just trying to emulate them. Instead, they looked outward to the musical mainstream for inspiration, but did not ask for works.

### 4.1.3 The modern classical guitar since Torres

#### Instrument characteristics and development

At the end of the nineteenth century, Spanish guitar maker Antonio de Torres created what is now considered the prototype of the modern guitar (Päffgen, 2002, pp. 167-168). The guitar remained a six-string instrument, but Torres built a larger body with a longer string length and larger frets, and changed the internal bracing. The result was a louder guitar with more resonance, which in effect prepared the guitar for a more fruitful life on the concert stage. The downside to this development, as pointed out by Heck, was that the guitar was now, and has since remained, a more difficult instrument to master as the frets are much further apart when compared to the early nineteenth century classical guitar (Heck, 1971, pp. 55-56). As the guitar's relatively low dynamic potential was one of its major weaknesses, guitar makers have tried to improve the sound level by making changes to its construction. Since the end of the twentieth century, guitar makers have experimented with ultra-thin tops, innovative internal bracing and alternative materials in order to expand the guitar's sound with varying results: while some performers enjoy the larger volume, others criticize the lack of timbre diversity on louder guitars (Vowinkel, 2008). A second answer to the issue of the guitar's weak tone is amplification: with the development of its technology, amplification was gradually adopted to enlarge the sound of the classical guitar, primarily for performances of guitar concertos and chamber music, but in the last decades also increasingly for solo recitals. Although some guitarists resist the use of amplification and even play their concertos without amplification, others do not have objections and some even see their use of amplification as an important factor contributing to their popularity (Tanenbaum, 2003, p. 199). A third answer to the issue of the guitar's weak tone is to both develop its construction and use amplification: this path led, in the first half of the twentieth century, to the invention of the electric guitar. The electric guitar then rapidly branched off into various types of electric guitars (such as jazz guitars, rock guitars), for which instrument- and style-particular playing techniques were developed. Although the electric guitar opened a wealth of new possibilities, such as the possibility to electronically alter timbre and a longer fretboard further extending the pitch range upward, electric guitar techniques were mostly plectrum based, and turned out to have limitations when compared to the classical guitar right hand technique (Dawe, 2010, pp. 49-50).
The standard tuning of the guitar has remained the same since the nineteenth century, and this is also the standard tuning for the electric guitar. Towards the end of the twentieth century, composers have increasingly used unusual alternative tunings (other than the usual major second downward detuning of the sixth string) in order to change the possibilities to form chords and to change the timbre. Such

alternative tunings were usually employed in works by guitarist composers such as Brouwer, Domeniconi and D'Angelo. The pitch range of the guitar has remained the same as it was in the nineteenth century, although, as explained above, the frets are now wider. The fretboard thus remains as complex today as it was in the nineteenth century, and more difficult to play on.

Although instruments with diverging amounts of strings have appeared since the Torres guitar, the six-string instrument has very much remained the norm, both for the classical guitar and for the electric guitar. Notable exceptions on the classical guitar include the ten-string guitar of Narcico Yepes and the eight-string guitar of Paul Galbraith. The ten-string guitar of Yepes contained additional, chromatically tuned basses, allowing for resonance of non-open string bass pitches. The guitar of Galbraith has one added higher string as well as an added lower string, thus extending the range both upward and downward. Although both guitarists have been followed in their endeavors by other players, their guitars have not enjoyed widespread popularity among guitarists. The early German guitar scene led by Heinrich Albert used guitars with differing range for the performances of guitar quartet repertoire (Morris, 2001). This was done in order to emulate the "range and instrumental disposition" of the string quartet. In the flowering activities of guitar orchestras, usually consisting of amateur guitarists, the use of guitars with different ranges, such as the soprano guitar, terz guitar and baritone guitar (Hampshire guitar orchestra, 2012), has met with widespread adoption.

## Notation

The use of staff notation for guitar music on one staff, in treble clef and an octave higher than sounding has remained the standard since its introduction in the late eighteenth century. Although few non-guitarist composers in the eighteenth and nineteenth century wrote for the six string guitar, the adoption of staff notation eventually did make the guitar more accessible to such composers in the twentieth century, as will be discussed in more detail in the next section. With the development of contemporary classical music in the second half of the twentieth century, issues surrounding the development of contemporary music notation also affected guitar notation. Many composers developed their own symbols and notation practices. This sometimes led to confusion concerning notation, for instance in the case of harmonics (Warfield, 1973-1974). The guitar, now more part of the classical music world, saw the introduction of a plethora of notation practices, both within and outside the boundaries of staff notation, and various studies on guitar notation and guitar scoring examined contemporary forms of guitar notation and their relation to new playing techniques (Lehner-Wieternik, 1991; Schneider, 1985). Many of these forms of notation were, and still are, composer-specific and remain unstandardized; some composers even change their ways of notating a particular sound from one piece to the next, conceivably in an effort to improve it. Some of these notation practices are more effective and precise than others, and suggestions will be made for the improvement of notation.

The last decades of the twentieth century and the beginning of the twenty-first century saw a remarkable return of tablature for pedagogical solo guitar music and for tablatures published online in a variety of music styles. This revival of tablature was evidenced by publications of classical guitar etudes, methods and pieces in tablature by major guitar publishing houses such as Mel Bay (Bach & Pincus, 1992) and Schott (Schmidt, 2004). Since the end of the twentieth century, the internet has enabled guitarists without notation software to publish their tablatures online. Modern tablature published on the internet is virtually identical to baroque tablature, although it usually does not indicate note durations. As in the days of the lute and the baroque guitar, tablature again proves its attraction due to its easy access, this time to amateur guitarists.

## The repertoire and its composers

The era since the introduction of the modern classical guitar has seen the greatest growth of solo, chamber, and concerto repertoire for the guitar. For the first time in its history, the guitar repertoire was enriched with solo repertoire written by non-guitarist composers. Andrés Segovia, who is widely credited for having been personally responsible for lifting the guitar to the level of the concert stage, accomplished this by maintaining a successful international concert career on a level hitherto unseen for a guitarist and his quest to expand the guitar's repertoire by asking "great composers" to write for it (Päffgen, 2002, pp. 185-190).The canonical guitar repertoire of today is still largely formed by pieces explicitly written for Segovia, such as the solo works written by Turina, Ponce and Moreno-Torroba. However, due to his "*konservative Ästhetik*" (Brill, 1994, p. 3), Segovia did not play works by the more progressive contemporary composers, did not request them to write works, and ignored the pieces they sent him. Schoenberg reportedly offered to write a work, but Segovia turned him down (Tanenbaum, 2003, p. 184). In the last decades, this has led to criticism of Segovia, and consequentially, of guitarists for accepting a canonical repertoire that is, to a large extent, based on the limited tastes of one person (Brill, 1994). Guitarists of the generation after Segovia with broader musical tastes have actively worked to broaden the repertoire, and managed to enrich the guitar repertoire with works by leading composers of the second half of the twentieth century. British guitarist Julian Bream, for instance, commissioned pieces by Henze, Britten, Bennett and Takemitsu. His American colleague Eliot Fisk commissioned works by Berio and Maw, while David Starobin, also from the United States, had pieces written for him by Carter, Crumb and Babbitt. From the above composers, works by Henze, Britten and Takemitsu are regularly featured on recital programs of guitarists, while other works by non-guitarist composers from the second half of the twentieth century are played more rarely. While there were relatively few guitarist composers in the first half of the twentieth century, Villa-Lobos and Barrios being notable exceptions, the second half of the century saw a "re-emergence of the guitarist/composer" in terms of output and popularity (Dawe, 2010, pp. 25-26). Among this group, Brouwer, Domeniconi, Dyens and Bogdanovic are now among the most prolific and most played. The works of above guitarist composers are often written in an idiom that takes strong influence from folk music, jazz and popular music. The popular features of such works coupled with their effective scoring for the guitar has led many guitarists to include these works in their programs. For some guitar scholars, the popularity of such works among guitarists and the increased blurring of the borders between classical and popular idioms are explained by the typical background of many classical guitarists: they initially start learning to play rock & roll, and only later discover the classical guitar (Coelho, 2003, p. 10; Tanenbaum, 2003, p. 198). Aesthetical objections to popular music are therefore perhaps not as widespread among classical guitarists. Other scholars consider the choice for works by contemporary guitarist composers over those written by the great composers of the second half of the twentieth century as the result of a narrow focus and a lack of curiosity for new music on the part of guitarists and guitar students (Evers & Brill, 1994).
Both explanations ring true, but it is important to recognize that affinity for popular music should not

obstruct guitarists' view of the contemporary repertoire written by leading non-guitarist composers, as this repertoire is also highly valued outside the guitar community. The lack of curiosity for new music on the part of classical musicians to engage with contemporary music has not been unique to classical guitarists: composers in the second half of the twentieth century have often lamented classical musicians' lack of enthusiasm for contemporary music, and some have called for musicians or ensembles specializing in contemporary music (Andriessen, 2002, p. 121). Such developments also took place in the guitar world; the late twentieth century saw an increase of guitarists specializing in the performance of contemporary music (Tanenbaum, 2003, pp. 200-201).
As major composers only started to compose for the guitar in the course of the twentieth century, some guitarists, understandably, felt dissatisfaction with the musical level of the guitar repertoire written before this point. Consequently, they turned to the practice of creating transcriptions of works originally written for other instruments. The practice of transcribing is widespread in the guitar world, but it does not come without its problems. Transcriptions are sometimes successful: Albéniz for instance appears to have been satisfied with the guitar arrangements of his piano works (Turnbull, 1976, p. 107). At other times, transcriptions can be problematic, for instance when the performance practice of the work is not always taken into account by the guitarist (Evers & Brill, 1994, pp. 173-174), or when the work is simply not as effective on the guitar, for instance due to a more limited range of the guitar, or because the original contains highly idiomatic techniques for another instrument.

Chamber music involving the guitar followed quite a different path of evolution during this era. In early twentieth century Vienna, composers first borrowed the guitar from the cabaret tradition as a symbol for decadence and eccentricity. Because of its use in serious music, the guitar then became a legitimate instrument without these notions (Marriott, 1984). Subsequently, composers who used the guitar in chamber music were often interested in its timbral potential. Marriott credits Webern as being the first composer who used the guitar to add color to the musical texture rather than using references to popular or cabaret music in his *5 Stücke für Orchester* (Webern, 1951). Brill sees the timbre possibilities of the guitar as the main reason why all of the principal members of the Second Viennese School, Schoenberg, Berg and Webern, used the guitar in their works (Evers & Brill, 1994). Several decades later, Boulez also included the guitar in *Le marteau sans maître* (Boulez & Char, 1957) for coloring reasons: the guitar was included to imitate the sound of the Japanese koto (Boulez, 1971). The use of the guitar and the works by the composers of the Second Viennese School established the guitar as an instrument deserving serious attention of composers. Until the 1960's, composers preferred composing chamber music with the guitar rather than writing solo pieces, as "the instrument's technical complexity and its curious notation were too bewildering" for many of them (Marriott, 1984, p. 84). In order to make the guitar better heard in their chamber and orchestral music, composers such as Boulez and Stockhausen resorted to the use of the electric guitar. While these composers primarily used the electric guitar as a "loud guitar" (Mackey, 2002), there were increasing calls in the seventies for contemporary music to use the electric guitar in conjunction with its idiomatic possibilities and its associated electronic apparatus (Kozzin, 1977). The music of Steven Mackey in the late twentieth and early twenty-first century, often written for electric guitar in a chamber music setting, can be seen as one answer to that call.

### Communication of scoring potential

Dearth of information on how to write for the guitar has remained a major obstacle for non-guitarist composers. In comparison to the complexity of the guitar and its age, the amount of works explaining to non-guitarist composers how to write for the guitar has remained conspicuously small. The first works explicitly written for this purpose only appeared at the end of the twentieth century, which is more than two centuries after the appearance of the first guide on how to write for the clarinet and the horn (1764). Accuracy and usefulness of the works that were published are questionable.[21] Many renowned composers have expressed the frustration and difficulty at coming to terms with the scoring potential of the guitar.[22] Guitarists, in turn, have expressed their discontent with the works of non-guitarist composers by massively turning to works by player composers. On the one hand, the re-emergence of player composers and the adoption of their works enrich the repertoire. On the other hand, when this is accompanied by a turn away from pieces by non-guitarist composers, it represents a regression to the circumstances of the nineteenth century, where the guitar was poorly integrated into the musical mainstream.

The described situation is particularly astonishing when one realizes that the classical guitar became much more integrated in both the classical mainstream and the world of contemporary composition during the twentieth century. Why would there be such a dearth of information on the guitar scoring potential, especially considering the efforts of guitarists to extend the repertoire with the works of non-guitarist composers? Why were there so few works and why are the works that were published not impressive in terms of their accuracy and utility? Two main factors play a role in this respect. First, the guitar has remained a complex instrument, with a labyrinth-like fretboard, making the playing possibilities difficult to explain, and difficult to understand for a non-guitarist. The view articulated in this study is that the guitar potential requires the development of a framework and a vocabulary that both suits the characteristics of the instrument, and allows for understandable communication to non-guitarists. Such a work has not appeared yet. Second, collaboration has served as a substitute for theoretical information. Guitarists have worked extensively with composers since the introduction of the Torres guitar. Particularly in the case of solo works, composers often write for a particular player who is consulted on how to write for the guitar, rather than a manual. However, cooperation with a performer is an unfitting substitute for theoretical information on scoring. Instead, theoretical information should be available to the composer in order for the cooperation between composer and performer to reach a level of creative exchange that supersedes instruction of the composer by the guitarist. This instruction is largely dependent on the ability of the guitarist in question to understand and explain the guitar's scoring potential.

## 4.2 Match or mismatch?

[21] These works are discussed and evaluated in more detail in section 3.1.
[22] See section 3.2.6.

In each of the eras of the guitar history, we find examples of a mismatch in the triangle of guitar, guitarist and composer. In the renaissance and baroque era, the tablature notation that players used to manage the complex fretboard of their instruments limited access to composers. Instead, composers wrote basso continuo parts, leaving the idiomatic implementation to the lutenist. In the classical era, performers did not translate knowledge of their complex instrument into scoring theory for composers, but preferred to compose their own works. A widespread disdain for the instrument, and criticism of its weak tone, further diminished its position in the classical mainstream. In the first half of the twentieth century, the growth of the solo guitar repertoire overwhelmingly depended on the scoring advice, rigorous editing and conservative personal taste of one individual, Segovia. Guitarists were interested in playing solo works, while the great composers of the age, such as Berg, Schoenberg and Webern, wrote chamber music works with guitar that were often neither challenging nor very suitable for the guitar. Few solo works were written by the great composers, either because of the difficulties they encountered when writing for the instrument, or because their offers were turned down by Segovia. While non-guitarist composers struggled with the challenging nature of writing a solo guitar work, the number of theoretical publications on how to score for the guitar remained small and unimpressive. At the end of the twentieth century, guitarists increasingly turned away from non-guitarist composers again and started playing works of guitarist composers out of dissatisfaction with the effectiveness of works written by non-guitarist composers. The lack of effectiveness of such works was caused by the complexity of the instrument for non-guitarist composers and the relative absence of useful scoring information. An overwhelming amount of the guitar repertoire was written by guitarist composers. Many of these guitarist composers received little or no training in composition, as a result of which many of their works were below professional guitarist's ideal standards for concert works. These pieces were then played only sporadically, while their expressive and musical powers failed to inspire and capture the imagination of non-guitarist composers. Non-guitarist composers, meanwhile, continued to avoid the guitar, due to their lack of knowledge and interest, and the amount of high-quality repertoire fell behind. In order to make up for this lack, guitarists developed the habit of creating transcriptions of high-quality works written for other instruments, thus expanding and improving the guitar repertoire, but not solving the mismatch between guitar, guitarist and composer.

In each era, efforts have been made by performers, composers and luthiers to minimalize the mismatch. In the baroque era, performers and scholars called for the use of staff notation, which was consequently adopted at the start of the classical era. In the classical era, guitarists started to look at the mainstream classical world for inspiration. The pitch range of the guitar was extended, which augmented the scoring possibilities of the guitar. Torres built louder guitars, while luthiers and experts on amplification have ever since tried to further raise the dynamic potential of the guitar. Segovia undertook serious efforts, for the first time in the guitar's history, to enlarge the repertoire of the guitar with the works of non-guitarist composers. Other guitarists with less conservative tastes than Segovia continued this quest for works, thereby greatly extending and enriching the repertoire and improving the standing of the guitar in the classical mainstream and contemporary music world. A number of guitarists specialized in the performance of new music, and worked in close collaboration with non-player composers. For the first time, scoring guides on how to write for the guitar were published, although it is argued here that these guides had various, and serious, shortcomings.

In conclusion, it should be stated that there still exists a partial mismatch between guitar, guitarist and composer, although efforts have been undertaken to diminish the mismatch. The most serious mismatch exists in the field of theoretical information on scoring: the lack of this information serves as a major mismatching factor. It is natural that a certain tension exists between the three actors in the triangle guitar, guitarist and composer. However, when a persisting need of one of the actors in this relationship is not fulfilled, in this case on the part of composers, the tension is not productive, but rather destructive. A case in point is the trend of guitarists turning away from composers, exclusively composing their own guitarist composer works. It is my ambition that this study will serve to improve the match between guitar, guitarist and composer as a body of knowledge on the scoring potential of the guitar.

## Chapter 5 Plucked Sounds

**Contents**

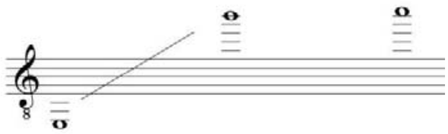
# Chapter 5 Plucked Sounds

Plucked sounds are perhaps the most quintessential guitar sound – they surely are the sound most used in the guitar repertoire. It is because of these sounds that the guitar has earned its designation as a "plucked instrument" alongside the harp, the mandolin and the banjo. For this reason, the discussion of the different categories of sound-cell-texture chains starts with the plucked sounds. This chapter shows ways in which the composer can handle the characteristics of the plucked sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 5.1 Sound

### 5.1.1 Pitch range

*Figure 5.1 Plucked note range*



The range of plucked notes is displayed in Figure 5.1. Concert guitars usually reach up to the high c, while non-concert models reach up to the high b. The guitar is a transposing instrument; notes sound an octave lower than notated. A transposing treble clef is used for the notation of guitar music (Figure 5.1). Standard noteheads are used for the notation of plucked notes. Notes in the higher range, starting from the third open string, are usually plucked with finger a,m or i, while notes in the lower range, up to and including the fourth string, are usually plucked with finger p.[23]

### 5.1.2 Timbre possibilities

Each note a guitarist plays contains a certain timbre, regardless of timbre indications for individual notes or groups of notes in a score. Timbre is not a parameter that can be turned on or off, but is always present. Different performers have a different palette of timbres they consciously or unconsciously apply to their playing. It is, however, possible for composers to prescribe a particular timbre in their scores. The following account describes the elements influencing timbre and provides information on how these elements can consciously be used in the scoring process.

[23] Finger p: see *Reading Guide.*

## Attack

*Figure 5.2 Tirando attack*[24]

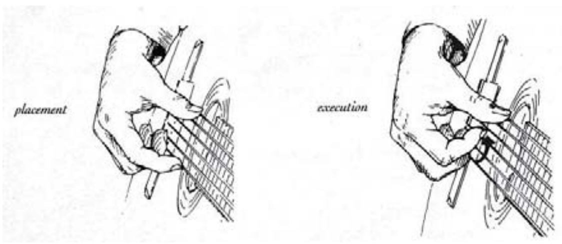
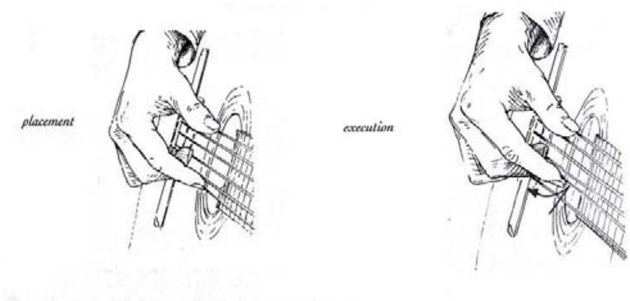
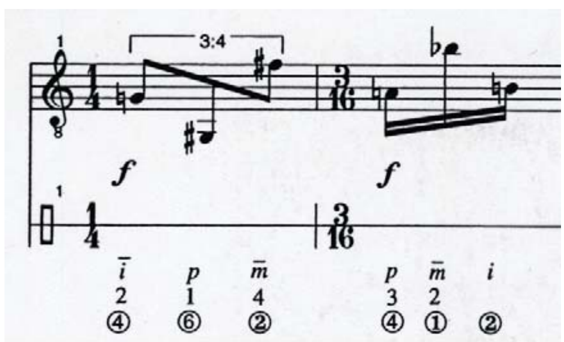



*Figure 5.3 Apoyando attack*




Regular plucked notes are performed by the right hand with a tirando or apoyando attack. In the tirando attack, the string is plucked, and the plucking finger subsequently released in the direction of the hand palm (Figure 5.2). The apoyando attack, on the other hand, pushes the string into the direction of the guitar top[25] and lets the finger rest on the lower adjacent string, creating a more powerful sound than the tirando attack (Figure 5.3). The apoyando attack is normally used to emphasize a note or a sequence of notes, particularly in single lines, scales and sometimes for the top note of an arpeggio. The tirando attack is primarily used for the performance of arpeggio and tremolo figures, as well as for the performance of vertical cells. It is not always possible to use an apoyando attack; arpeggios and tremolo figures at moderate to rapid speeds can only be performed tirando, and the same is true for vertical cells at any speed. In the guitar literature, the prescription of tirando versus apoyando attacks is relatively rare, but without good reason. Variation in attack is a powerful timbral tool in guitar scoring, and composers should indicate their preference for a particular type of attack when they see fit. The prescription of an apoyando or tirando attack is done through the use of a symbol that is specified in a legend, or with a verbal instruction in the score.

*Figure 5.4 Apoyando notation*




(PERCUSSION STUDY NO.1, KAMPELA)

[24] The drawings in Figure 5.2 and Figure 5.3 originate from *Pumping Nylon* by Tennant (1995).
[25] For guitar top: see *Reading Guide.*

Kampela, for instance, prescribes apoyando attacks by using a straight line above the right hand fingerings (Figure 5.4).

*Figure 5.5 Left hand plucking*


(SEQUENZA XI, BERIO)

More rarely, notes are plucked with a finger of the left hand instead of the right hand. This leads to a more mellow sound color, as the notes plucked with the left hand are plucked with the flesh, instead of the nail attack that is usual for notes plucked with the right hand. In addition, the mellow sound color is caused by the fact that the attack with the left hand is usually over the fingerboard, which suppresses the higher overtones. Left hand attacks are prescribed with a symbol or a verbal instruction in the score. Berio uses a "+" sign for notes that are to be plucked with the left hand in his *Sequenza XI* (Figure 5.5). The "+" sign comes from conventional notation of the left hand pizzicato in violin scoring (Adler, 1989, p. 39). Using this sign is an acceptable way to prescribe left hand plucking as long as it is explained in a legend, which is the case in the *Sequenza XI*.

*Figure 5.6 Nail vs. flesh sound*

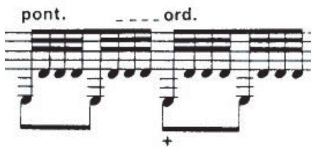

When scoring notes that are plucked with the fingers of the right hand, it is possible to ask for one or more notes to be plucked with the flesh instead of the nail. Such notes have a mellower and less direct sound. Notes played with the flesh are plucked with the thumb, as attacking the string with the thumb allows the performer to avoid having the nail touching the string, which is much more difficult to achieve when plucking with another finger. Since the performer plays with only one finger in such cases, passages played with the flesh should be scored at slow to moderate speeds. The indication of a flesh sound is done with a verbal instruction in the score (Figure 5.6).

## Sound color and playing position indications

*Figure 5.7 Plucked note tone colors*


It is possible to assign timbre indications to individual notes or groups of notes by specifying the desired sound, for instance 'metallic', 'sharp', 'mellow', 'dark'. The performer can then find a fingering and a way of attacking the string that is in accordance with the tone color description (Figure 5.7).

*Figure 5.8 Ponticello to ordinario sound change*




(SEQUENZA XI, BERIO)

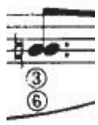
The other option for assigning timbre indications is by suggesting a position where the string should be attacked. There are three basic playing positions: tasto (close to the fretboard), ordinario (regular playing position) and ponticello (close to the bridge). A playing position indication is a kind of action notation (Karkoshka, 1966, p. 3), as it does not specify a particular timbre but rather an action. Playing positions refer to a position where the performer should pluck the string, with the expectation that this will create a particular timbre. Tasto is expected to sound round, dark and warm because of the reduced amount of high harmonics near the fretboard while ponticello is expected to sound sharp and bright because of the reduced amount of lower harmonics (Grove Music Online, 2012f; Grove Music Online, 2012e). The composer asks for a tasto, ordinario or ponticello sound by including a verbal indication to this effect in the score (Figure 5.8).

*Figure 5.9 Low and high range tasto on string 1*


A curious phenomenon occurs when we pluck the string in the tasto area while the left hand is stopping notes in a high position (second measure of Figure 5.9). The higher we play, the less dark, round and warm the notes sound, and the more they start to sound like ponticello notes. This is because the left hand functions like a second bridge: it creates an area of increased tension close to the point where the string is depressed, leading to a ponticello-like sound. It is the responsibility of the guitarist to create a tasto-like sound in the case a composer prescribes a tasto sound for high notes. The guitarist can manage to create a tasto sound in such cases by selecting a playing position halfway between the stopping position of the left hand and the bridge.

## Stopping position

*Figure 5.10 High position fingering of middle range note*



(Sequenza XI, Berio)

Playing a note from the middle or high range in a high position on a low string greatly alters its sound quality. When the composer wishes to score notes with a particular timbre that is the result of its stopping position, an indication of the fingering for the left hand should be provided. Figure 5.10 displays an example from the *Sequenza XI* where Berio fingers the g from the middle range in a high position of the sixth string, changing the sound quality of the g, in unison with a g played on the third string.

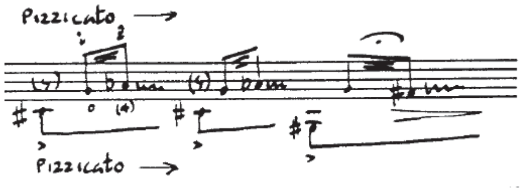
## Nodal point plucking

*Figure 5.11 Strike at nodal points*


When the guitarist plucks the string at the nodal point where the octave harmonic is produced, a particular sound color emerges. This sound has variously been referred to as a flautando, clarinet-like or harp-like (Schneider, 1985, pp. 112-113). The nodal point of any pitch is found twelve frets above the point where the note is fingered. The first note, the low a, in Figure 5.11 is played as a fifth open string; the nodal point is found on the twelfth fret of that string. The second note, a low c, is played in the third fret of the fifth string; the nodal point is found on the fifteenth fret of the fifth string. When the composer wishes to score notes that are plucked at the nodal point, a verbal indication to that effect should be given in the score (Figure 5.11).

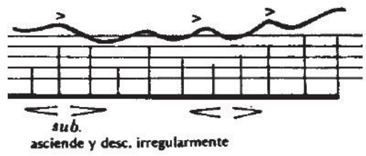
## Etouffé

*Figure 5.12 Right hand etouffé*




(PARABOLA, BROUWER)

*Figure 5.13 Left hand etouffé*



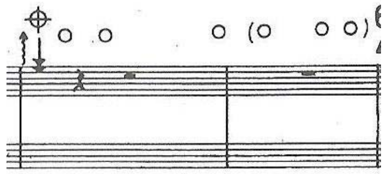

• nota de entonación apagada-indeterminada lograda apoyando los dedos de la mano izq. ligeramente sin llegar a la trastiera. Pulsar normalmente la derecha. Se logra mejor sonoridad apoyando el borde de la uña (m.izq.).

(LA ESPIRAL ETERNA, BROUWER)

The timbre of plucked sounds can be changed by muffling the string, or in other words, etouffé. Etouffé notes are notes that are plucked, strummed, or struck with rasgueado on non-nodal points, while one of the hands simultaneously slightly damps the string. Etouffé plucked sounds are performed by plucking a note and simultaneously slightly damping it with the side of the right hand (Figure 5.12) or by lightly touching the string with the left hand (Figure 5.13). The most widely used is the first of these two possibilities. Muting with the right hand near the bridge creates a light damping, through which the original pitches are still audible, as well as a degree of resonance. Muting with the left hand, however, causes the original open string pitches to be inaudible; a purely muted string is heard with a slightly audible high pitch caused by this muting and virtually no resonance. In the latter cause, the high pitch caused by the string muting changes according to the muting position of the left hand; such pitch changes occur in Figure 5.13. Because the right hand is involved in damping the notes, the etouffé writing is most effective for single line writing and vertical cell sequences. For etouffé notes that are damped with the left hand, all types of horizontal cells described in section 5.3 can be applied. Sounds scored etouffé have a reduced dynamic range and reduced resonance. The composer scores etouffé notes with a verbal indication in the score, and should clearly prescribe for how long the etouffé should last, and with which hand it should be performed.

This timbre is referred to as pizzicato in some scores (Figure 5.12), however, this designation is confusing as all plucked notes on the guitar are played pizzicato. “Etouffé” would be a clearer indication.

*Figure 5.14 Alternation of damping and release*



(SALUT FÜR CAUDWELL, LACHENMANN)

Figure 5.14 displays how Lachenmann uses an alternation of “damping and releasing the strings very close to the bridge” of notes plucked with a plectrum (Lachenmann, 1985), changing the sound color during the resonance of the strings.

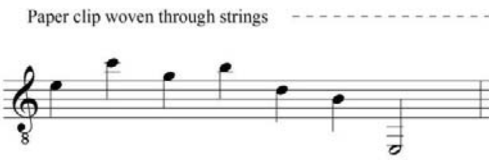
*Figure 5.15 Little finger muting*


(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela uses the little finger of the right hand to mute the open e string, while the remaining fingers of the right hand pluck the string. The pinky moves along the string, thus causing the pitch of the damped string to go up and down (Figure 5.15).

## Prepared guitar

*Figure 5.16 Paper clip preparation*[26]




The timbre of plucked sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar. Objects attached to the string muffle the string when it is attacked, creating a buzzing, gamelan-like sound in the case of metal objects like a paper clip (Figure 5.16), and a dry, dull sound in the case of wooden objects. Passages that are to be played with a prepared guitar should be provided with a verbal indication in the score (Figure 5.16) or a legend. Because the same note may be played in different positions on the guitar, the composer can alternatively use tablature notation to clearly indicate the fingering of each note to ensure the desired effect is reached (Yates & Elgart, 1990).

[26] There is a virtually endless range of external objects that one could attach to the guitar in order to change its sound. In all chapters of this study, a paper clip is used for the discussion of string preparation, as this preparation does very little to hinder the dynamic range of the sound. In addition, the paper clip is used in all chapters in order to demonstrate the range of sonic outcomes that can be achieved with one type of string preparation.

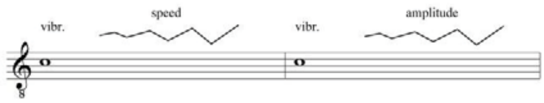
### 5.1.3 Dynamic range

The dynamic range of regular plucked notes is wide (see Appendix C). Plucked notes can be performed at very soft dynamic levels, particularly with the tirando attack, as well as at loud dynamic levels, particularly with the apoyando attack.

### 5.1.4 Vibrato

*Figure 5.17 Lateral and vertical vibrato*


*Figure 5.18 Increasing speed and amplitude*

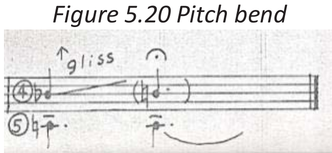



All notes that are stopped with a finger of the left hand on the string can be performed with a vibrato. There are two types of vibratos: lateral vibrato and vertical vibrato. In lateral vibrato, the stopping finger is moved sideways by wiggling the finger along the length of the string while continuing to stop the string, creating a small pitch amplitude around the original note. This is the standard method of performing vibrato used by classical guitarists. In a vertical vibrato, the finger is moved perpendicularly to the string, creating a larger pitch amplitude above the original note. The pitch amplitude in a vertical vibrato is larger than that of a lateral vibrato (Lunn, 2010, p. 17). The latter method is primarily used in blues and rock guitar styles. In order to ask for a vibrato the composer should use a verbal indication such as 'vibr.', use a dotted line or brackets to indicate the duration, and, if desired, a wavy line to indicate the amplitude or speed of the vibrato.

### 5.1.5 Pitch bends and microtones

*Figure 5.19 Pitch bend*


*Figure 5.20 Pitch bend*



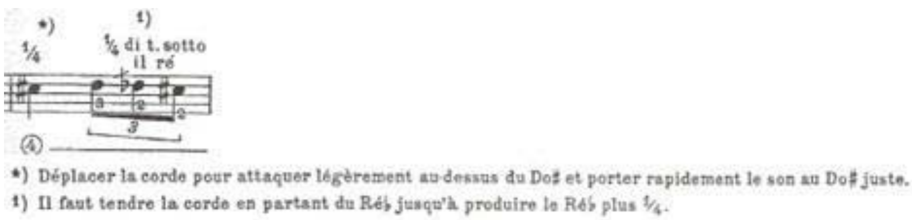

(FOLIOS, TAKEMITSU)

Pitch bends are stopped notes that are bent out of tune above the pitch of the original note. With a pitch bend, a maximum interval of a major second can be reached. The guitarist performs the pitch bend by vertically bending the stopped note upward or downward, in the same way a lateral vibrato is initiated. In order to prescribe a pitch bend, the composer indicates the original pitch and an upward bend sign

(Figure 5.19), or notate both the original pitch and the destination pitch (Figure 5.20; the string bend is confusingly described here as an " ↑ glissando").

Microtones are created by the guitarist either by using a microtonal scordatura (see Appendix D) or by using a pitch bend. A microtonal scordatura can greatly improve ease of reading, as the performer can relate printed notes to known locations on the fretboard. In contrast to bowed strings instruments without frets, the guitar cannot produce microtones by finger placement on the fingerboard, but only by bending the string out of its regular tuning. This means that for each microtone, the guitarist needs a short moment to bend the string before the microtone can be produced. The composer should score a microtone by indicating the pitch of the microtone, and should take into account, in case no microtonal scordatura is used to attain the microtonal pitch, that the performer needs to first bend the string to the desired pitch before it can be performed.

*Figure 5.21 Microtones*




(TIENTO, OHANA)

Ohana uses pitch bends to produce microtones in *Tiento*; in his directions, Ohana describes how the guitarist should bend the string to reach the prescribed microtones (Figure 5.21). The first note of the example is performed by first pulling the string up to above the c sharp and then quickly moving the finger back to the normal stopping position, dropping the pitch to c sharp. For the production of the second note of the triplet, the pitch of d flat is pulled up so that the pitch rises to a quarter tone above d flat.

## 5.2 Vertical cells

When creating vertical cells of plucked sounds, up to six notes can be plucked simultaneously. In order to see which notes can be combined, Appendix A may be consulted. Notes can be combined on adjacent and non-adjacent strings.

### 5.2.1 Two-note combinations

A wide variety of two-note combinations are possible on the guitar, ranging from unisons to intervals spanning over multiple octaves. The available interval options are described in Appendix A.

## 5.2.2 Sympathetic ringing

*Figure 5.22 Sympathetic ringing*


(SONATA, DAVIES)

Sympathetic ringing is the resonance of a pitch on one string produced by the plucking of the same pitch on another string. When one of the notes is plucked, the other begins to resonate. The composer should prescribe sympathetic ringing by indicating the string and pitch that should set the resonance in motion, as well as the string and pitch that is to start resonating as a result. Davies uses sympathetic ringing in the opening of his guitar *Sonata* (Figure 5.22). The b on the second open string is set into vibration by plucking the same pitch located on string four. Davies emphasizes the resonating of the second string by asking for a staccato articulation on the attacked note on the fourth string.

## 5.2.3 Vertical cell spacings

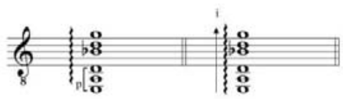
*Figure 5.23 Chord spacings*


Vertical cells of more than two notes can be scored using narrow spacings, wide spacings or combinations thereof that are, in consequence, mixed spacings. The first measure of Figure 5.23 consists of narrow spacings, the second measure of wide spacings and the third measure of mixed spacings. In addition, three-note clusters can be built around open strings (see the fourth measure and Appendix A). Note combinations may also include unison doublings: the first two note combinations of the last measure contain unisons over two strings, while the last combination contains a unison scored over three strings.

Chords scored over the metal-wound strings only, such as the first chord in Figure 5.23, have a more metal-like sound than chords scored over all nylon strings[27], such as the second and third chord of the same figure. Due to their larger intervals, wide spaced chords are often scored over metal-wound as well as nylon strings and consequently contain sonic characteristics of both string types. Because of the low pitches the guitar reaches in its lower register, narrow spacing in the lowest register of the guitar can sound rather heavy (see, for instance, Figure 5.24). Compared to triads of which all notes are stopped, clusters often have good resonance because they include an open string. Guitar clusters are not immediately associated with the typical open string sound by the listener because of the dense spacing of the pitch materials. Unisons that are part of a larger chord function as a way to make the chord more sonorous, and enhance the doubled pitch.

Chords of up to four notes are plucked with fingers p, a,m and i[28], with one finger assigned to a single string. In the case of five- and six-note chords, one finger plucks two or three notes simultaneously.

*Figure 5.24 Performance of six note chords*



In the case of arpeggiated chords, the notes are plucked in rapid succession. In the case of arpeggiated chords of more than four notes, one finger is used for multiple strings, or the chord is simply strummed (Figure 5.24, see Chapter 8 for strummed sounds). Plucked chords scored over non-adjacent strings are performed without difficulty by placing fingers of the right hand on the appropriate strings. Strummed chords are most effective when they are scored over adjacent strings (see section 8.2.2).

## 5.3 Horizontal cells

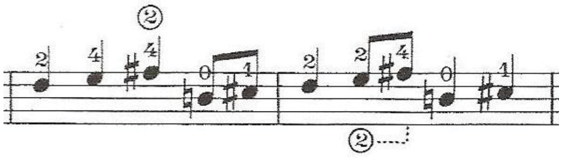
Regular plucked sounds can be used to create a variety of horizontal cells: single line horizontal cells, arpeggio horizontal cells, vertical cell sequences and multiple part horizontal cells.

[27] For nylon versus metal-wound strings: see *Reading Guide*.
[28] Fingers p,a,m,i: see *Reading Guide.*

### 5.3.1 Single lines

#### Design

*Figure 5.25 Single line with small intervals*



(Sonata III, Ponce)

A single line horizontal cell is a succession of notes without accompaniment (Figure 5.25).

*Figure 5.26 Single line tremolo*

(Estudi de concert núm. 7, Gasull i Altisent)

Apart from single lines in which each note is plucked once (Figure 5.25), a single line can also be constructed with notes that are performed with the tremolo technique[29] (Figure 5.26).

#### Resonance

*Figure 5.27 Single line with large intervals*

(Sequenza XI, Berio)

[29] Tremolo technique in guitar is the rapid performance of a p,a,m,i fingering, in which fingers a,m, and i pluck the same string.

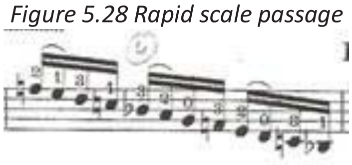
Single line horizontal cells of plucked sounds can be scored either with or without resonance.
The first possibility is for such cells to be scored in such a way that notes **do not** ring on into the temporal space of subsequent notes. This is possible when the single line is scored at a slow to moderate speed, when the intervals are relatively small, when both conditions are fulfilled (Figure 5.25), or when staccato articulation is used. In contrast, single line horizontal cells of plucked sounds can also be made to sound in such a way that notes **do** ring on into the temporal space of subsequent notes. This is possible when the line is scored over multiple strings, at moderate and high speeds, or when both conditions are fulfilled (Figure 5.27). In Figure 5.27, Berio does not explicitly specify that this ringing on should take place, but the notes do ring on as they are scored over multiple strings and at a high speed. In order to explicitly prescribe ringing on of notes, the composer should use ties or a verbal indication such as l.v. (let vibrate). When single lines are scored in such a way that all or most notes are located on a different string, they are in fact arpeggios and are performed with the arpeggio technique[30] (Figure 5.27).

### Harmonic possibilities

Single lines have a very broad range of harmonic possibilities, because the performer only has to be concerned with the performance of one line. The complaint sometimes made that the guitar suffers from the "tyranny of its tuning" (Wade, 1980, p. 172) is not applicable in single line writing. It sometimes is in other types of cells, as we will see later on in this chapter. Because of the wide range of possibilities to combine pitches, single lines lend themselves well to writing in keys not directly associated with the pitches of the open strings, as well as for twelve-tone and serial writing.

### Speed

*Figure 5.28 Rapid scale passage*



(SONATA III, PONCE)

*Figure 5.29 Rapid single line passage*

(SEQUENZA XI, BERIO)

Single line horizontal cells of plucked sounds can be performed slowly, but also at considerable speed. When scored as scale passages, they depend on the maximum scale speed of the performer, which in the case of professional guitarists is approximately four sixteenth notes per beat at a quarter note speed of 120 BPM. Fast passages in which each note is scored over a different string (Figure 5.29) are easier to perform at high speeds than scale passages (Figure 5.28). Tremolo passages of single lines can be performed at a maximum speed of approximately four sixteenth notes per beat at a quarter note speed of 130-160 BPM.

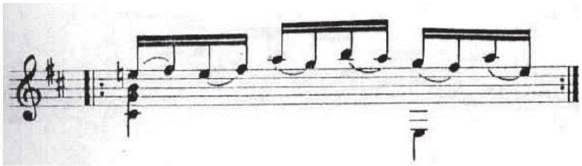
[30] Arpeggio technique: see 5.3.2.

## Articulation

Single lines can be scored with a variety of articulations, such as slurs, legato, accents, staccato, and glissando.

### *Slurs*

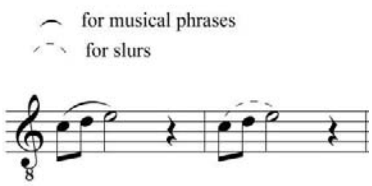
*Figure 5.30 Ascending and descending slurs*



(ETUDE III, VILLA-LOBOS)

Slurs are articulations that connect notes in a single line and tie them together, creating a legato sound. The notes that are connected by the slur must lie within the left-hand range of a given position for them to be playable (see Appendix A). There are two types of slurs, descending and ascending slurs, both of which are performed with the left hand. Descending slurs are performed by plucking the string with a finger of the left hand, directly after the finger has been used as a stopping finger. The sound of descending slurs differs from the right hand attack, because slurs are performed with the flesh instead of the nail[31] and are therefore mellower and less direct in their sound. Ascending slurs are performed by hammering the finger onto the fretboard. Ascending slurs have a somewhat percussive sound quality because of the hammering motion. The guitarist can control the amount of percussiveness in the sound of the ascending slur; it is generally considered good practice to reduce the percussiveness of the ascending slur as much as possible in order to distinguish the slur from a hammered note. Standard notation for slurs is to use a slur mark drawn with a normal line to connect two or more notes, which indicates that after the first plucked note, subsequent notes are to be slurred.

*Figure 5.31 Slur marks versus musical phrase marks*




The similarity in appearance between slur marks and musical phrase marks can sometimes lead to confusion as to which of the two is intended. When a composer makes use of slur marks and musical phrase signs in the same composition, it is best to avoid confusion and make a distinction between the

[31] This is because guitarists, while cultivating the nails of the fingers of the right hand, keep their fingernails on the left hand trimmed in order to allow the fingers to properly depress the strings without nails hindering this action.

two in notation. In the *Nocturnal* (Figure 5.32), Britten uses dotted lines for slurs and normal lines for musical phrase marks (Britten, 1965). When a different notation is used for musical phrase marks and slurs, this should be specified in a legend (Figure 5.31).

### *Legato*

*Figure 5.32 Phrase marks*

(Nocturnal, Britten)

Legato articulation connects a group of notes in such a way that no interruptions are heard in the transitions from note to note. The performer can play notes in a legato manner by avoiding premature decay of notes and avoiding interruptions caused by placing attacking fingers on resonating strings. The composer scores a legato by using phrase marks, as Britten appropriately does in Figure 5.32.

### *Accents*

*Figure 5.33 Strong accent*

(Sonata III, Ponce)

The performer executes a dynamic accent by plucking the marked note louder than the surrounding notes. Accented notes, either strong accents or regular accents, can be used in single lines and are prescribed with accent marks (Figure 5.33). In the guitar repertoire, the horizontal accent mark (Figure 5.45, bass part) is more commonly used than the vertical accent mark pictured in Figure 5.33.

### *Staccato*

*Figure 5.34 Staccato*

(SONATA III, PONCE)

Staccato articulation can be used in the scoring of single lines (Figure 5.34). At low and moderate speeds, the staccato can be performed convincingly, while at high speeds, a row of staccato notes may be less convincing as it demands an extra damping movement for each note. The guitarist performs the staccato either by lifting the finger off the fretboard after attack, or damping the string with a left or right hand finger. Staccato should be notated by placing a staccato mark above or below the affected note or group of notes.

## *Glissando*

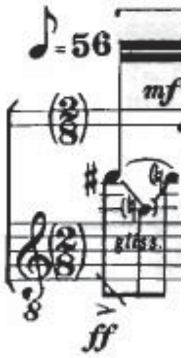
*Figure 5.35 Literal glissando*

*Figure 5.36 Glissando illusion*

(SEQUENZA XI, BERIO)

Glissando can be used to connect notes in a single line. This can be done literally, by prescribing a literal glissando between two notes, or more as an illusion, in which a partial glissando between notes suggests that the two notes are connected by the glissando. This second type of glissando is primarily used when glissandos are prescribed over distant pitches that cannot be connected on one string. Glissando should be notated with a line that connects the note of departure to the note of arrival.

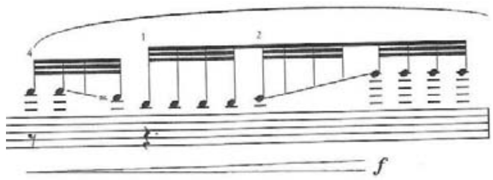
*Figure 5.37 Glissando to connect multiple notes*




(Kurze Schatten II, Ferneyhough)

A glissando can also be used to connect multiple notes, without attacking the string after each point of arrival. Such glissandi are notated with a combination of glissando signs between the notes that are to be connected and a phrase mark for the group of notes that is performed with this glissando (Figure 5.37).

*Figure 5.38 Tremolo glissando*




(Estudi de concert núm. 7, Gasull i Altisent)

When using tremolo, a glissando can be performed during the execution of the tremolo (Figure 5.38). The composer should notate a tremolo glissando by specifying the number of attacks during the glissando, and by drawing a glissando line between the pitch of departure and the pitch of arrival (Figure 5.38). In addition, a glissando can be scored by using the tuning keys. The range of such a glissando is a major second up and as far as desired in downward direction. The composer should score a tuning key glissando by specifying pitch of departure and arrival, accompanied by a verbal indication in the score or a symbol specified in the legend that indicates a tuning key glissando is to be used.

*Figure 5.39 Tuning key glissando*


(Sequenza XI, Berio)

Berio scores a glissando between an open string and a fingered note without indicating the type of glissando that is to be used. A glissando between an open string and a fingered note only a minor second above does not become sufficiently audible as a glissando, as no actual sliding from one fret to another takes place. The solution for the performer in this case is to use a tuning key glissando.

## Embellishment

*Figure 5.40 Unison trill over two strings performed with the right hand*


(CANTICUM, BROUWER)

*Figure 5.41 Trill over three strings performed with the right hand*


(SEQUENZA XI, BERIO)

*Figure 5.42 Trill performed with left hand*


(SEQUENZA XI, BERIO)

A variety of trills and shorter embellishments can be scored for single line horizontal cells of plucked sounds. We distinguish two types of trills according to their performance: right hand trills and left hand trills. Trills are either performed with the right hand over multiple strings (Figure 5.40 and Figure 5.41) or with the left hand on one string (Figure 5.42). In both cases, trills can be performed at very high speeds. Right hand trills can be scored over two or three strings, using a minimum of one (Figure 5.40) and a maximum of three pitches (Figure 5.41). Left hand trills are performed on one string, and can include a minimum of two and a maximum of four notes. Figure 5.42 shows a left hand trill over three pitches. Trills can be short, or continue as a continuous trill for longer stretches of time.[32]

## Non-functional writing

*Figure 5.43 Non-functional single line writing[33]*


Examples of non-functional writing in single lines are:

- Rapid alternations between successions of notes that lie outside the hand span (Figure 5.43)
- Legato phrases over successions of notes that lie outside the hand span

[32] In Chapter 11, trills that consist of a combination of plucked sounds and hammered sounds are discussed.
[33] The examples of non-functional writing in this study are not included as video files.

## 5.3.2 Arpeggios

### Design

*Figure 5.44 Full chord arpeggio*

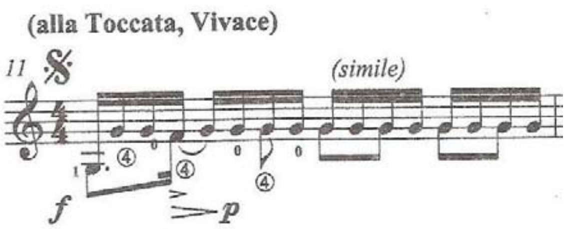

(ETUDE 1, VILLA-LOBOS)

In musical terms, an arpeggio is the "sounding of the notes of a chord in succession rather than simultaneously" (Grove Music Online, 2012a). A guitar arpeggio differs from this standard definition of an arpeggio:

- Because the individual notes that make up a chord on the guitar are spread over multiple strings, a technical guitar arpeggio is a succession of notes scored over multiple strings.
- The sounding of notes in succession of a vertical cell made up of two pitches is also considered and arpeggio because they are similar in sound and technique to chord arpeggios.
- Arpeggios can be scored as successions of notes that make up full chords (Figure 5.44) or partial chords. The smallest technical arpeggio unit is an alternation of two notes on different strings (Figure 5.45).

In much guitar music, arpeggios are notated as two different voices: one voice for the bass line, and one for the higher notes (Figure 5.44 and Figure 5.45).

*Figure 5.45 Arpeggio containing two-note alternation*




(PAISAJE CUBANO CON FIESTA, BROUWER)

## Resonance

*Figure 5.46 Arpeggio resonance*

*Figure 5.47 Resonance with indicated duration*


(ALL IN TWILIGHT, TAKEMITSU)

Characteristic for arpeggio horizontal cells of plucked sounds is that most notes ring on beyond their notated value (Figure 5.46), unless it is explicitly specified that they should be damped after their notated value, or if the resonance of a string ends because it is damped as the result of the fingering. When an arpeggio is notated as two distinctive parts, as in Figure 5.44, the value of the bass line is typically notated correctly, while for higher pitches, only the instant of plucking is notated. When writing arpeggio horizontal cells of plucked sounds, it is not necessary and even impractical to notate the exact note duration of each note during its resonance. Kachian argued, fittingly, that it is “pointless and cluttered to use webs of ties and clusters of rests in an attempt to track the decay of each individual tone on any string” (Kachian, 2006, p. 10). However, if the composer wishes to create an intricate web of sounds, in which certain notes ring on while other notes are damped, this is possible. Figure 5.47 shows an example of such a case; the c sharp in the second measure, for instance, is not supposed to ring on, unlike the preceding f natural and the e flat that follows it.

## Harmonic possibilities

The harmonic possibilities of the arpeggio are derived from the possibilities to create vertical cells and are therefore slightly more limited than single lines. The consequence of scoring arpeggio passages in higher registers is that a more limited amount of bass notes is available.

*Figure 5.48 Arpeggio chord progression*


(ETUDE 1, VILLA-LOBOS)

*Figure 5.49 Arpeggio over relatively narrow chord spacings*

(ORFEUNISM, TITRE)

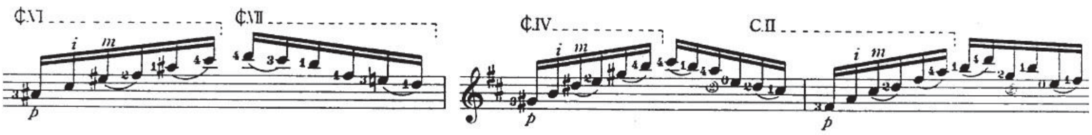
Arpeggios that contain open strings are often considered to be idiomatic, as particular chord progressions typical for the guitar become possible (Figure 5.48; a chord is moved a semitone down while the open strings pitches remain the same), and notes in close intervals may be played as an arpeggio, making it possible for the performer to play them at great speed (Figure 5.49).

*Figure 5.50 Unison arpeggio*[34]


(ETUDE 11, VILLA-LOBOS)

Arpeggios can also include unisons scored over multiple strings (Figure 5.50).

*Figure 5.51 Bar chord arpeggios*




(LA CATEDRAL, BARRIOS)

By using bar chords in higher positions, it becomes possible to reach tonalities not directly associated with the open string pitches (Figure 5.51). In order to make optimal use of the possibilities of such bar chords, refer to Appendix A.

## Speed

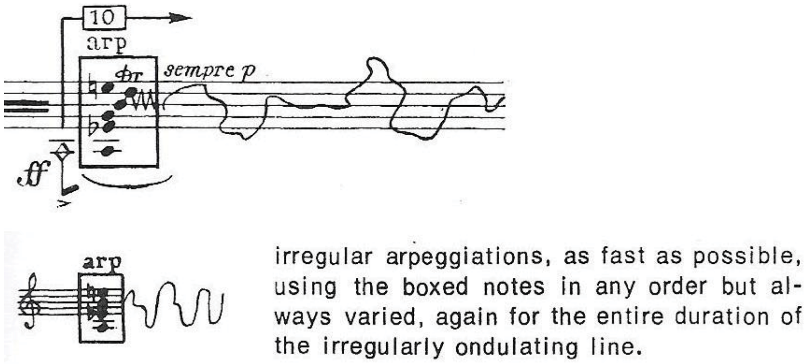
Arpeggios are among the fastest note combinations possible on the guitar. The combination of the thumb with finger i,m or a can be performed at high speeds. The arpeggios in Figure 5.44 and Figure 5.45 can be performed by professional guitarists at an approximate quarter note speed of 130-160 BPM.

[34] In this example, Villa-Lobos uses the antiquated practice of indicating strings with circled pitch names instead of string numbers. For clear and understandable notation, circled string numbers should be used (see *Reading Guide*).

## Rhythmic possibilities

Because of the high speed that can be reached with arpeggio horizontal cells of plucked sounds, they lend themselves well to acceleration and deceleration, as well as to a wide range of rhythms.

*Figure 5.52 Irregular arpeggio*




(TELLUR, MURAIL)

Figure 5.52 shows how Murail uses an “irregularly ondulating line” to indicate that the boxed notes are to be played as irregular arpeggios (Murail, 1978).

## Articulation

Arpeggios can be scored with a variety of articulations, such as slurs, legato, accents, staccato, and glissando.

### *Slurs*

*Figure 5.53 Slur in arpeggio*


(INVOCACIÓN Y DANZA, RODRIGO)

A slur can be used in an arpeggio to connect notes that have been scored on the same string (Figure 5.53).

### *Legato*

*Figure 5.54 Legato arpeggio*


(PAISAJE CUBANO CON FIESTA, BROUWER)

As arpeggios are scored over multiple strings, they lend themselves well to legato scoring. Arpeggios that contain open strings make it possible to connect arpeggios located on different positions on the fretboard in a legato manner, because the open strings can ring on during position shifts. The composer should use a phrase mark to indicate that a succession of arpeggiated notes is to be played legato, as Brouwer appropriately does in Figure 5.54.

### *Accents*

Accents can be scored in arpeggio horizontal cells of plucked sounds to bring out a particular note in the sequence (Figure 5.45).

### *Staccato*

*Figure 5.55 Staccato*

(SEQUENZA XI, BERIO)

Staccato articulations for arpeggios are particularly effective when scored for alternations of two notes (Figure 5.55). In larger arpeggios, staccato works well when applied to a small number of notes or at the end of a passage; this is because each staccato note requires an additional damping or lifting move of the performer, which is difficult to perform when other notes are simultaneously attacked.

### *Glissando*

Arpeggio cells can be scored with literal glissando, partial glissando, simultaneous glissando and plucking, and tuning key glissando. Glissando can also be used to connect two vertical cells that are performed as arpeggios.

## Embellishment

*Figure 5.56 Embellishment in arpeggio*

(INVOCACIÓN Y DANZA, RODRIGO)

Embellishments can be used in arpeggio figures: they are most easily performed by the guitarist when the embellishment can be finished before a following note of the arpeggio (Figure 5.56).

### Non-functional writing

*Figure 5.57 Non-functional arpeggio writing*


Examples of non-functional arpeggio writing:

- Rapid arpeggios that contain combinations of notes that lie outside the hand span
- Rapid arpeggios that contain long successions of staccato notes (Figure 5.57)

## 5.3.3 Vertical cell sequences

### Design

*Figure 5.58 Repeated vertical cells*


(ETUDE 4, VILLA-LOBOS)

Vertical cell sequences of plucked sounds consist of sequences or repetitions of vertical note combinations ranging from two to six notes (Figure 5.58 displays vertical cells of four notes).

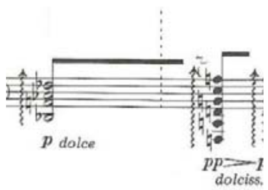
## Resonance

*Figure 5.59 Resonance due to string change*

(ETUDE 4, VILLA-LOBOS)

Individual vertical cells in vertical cell sequences of plucked sounds usually do not last beyond their notated value, unless a large interval change is made, which leaves a string unoccupied by the right hand, allowing it to ring on (Figure 5.59). When vertical cells contain open strings, the degree of resonance increases.

*Figure 5.60 Visual representation of chord duration*




(TOWARD THE SEA, TAKEMITSU)

Takemitsu uses a horizontal bar to indicate the length of the resonance of a chord (Figure 5.60), an effective way to visually represent the duration of resonance.

## Harmonic possibilities

The options for pitch combinations can be examined in Appendix A. When a succession of vertical cells is scored with fewer notes, it is easier to be flexible in the choice of different pitches and keys than is the case with vertical cells containing many notes.

## Speed

Most successions of vertical cells are repeatedly plucked with the same finger, which makes it difficult to play them at high speeds. A speed of quarter note equals 80 BPM for repeated plucked vertical cells in sixteenths is approximately the upper speed limit for a passage such as the one pictured in Figure 5.58.

When chords are strummed or played as rasgueados they can be played at much higher speeds; for more details refer to the appropriate chapters.

*Figure 5.61 Vertical cells performed with a,m,i fingering*

(Etude 12, Villa-Lobos)

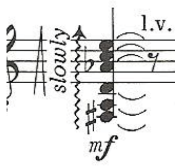
In contrast, vertical cells consisting of two notes scored over two adjacent strings can be played at high speeds (Figure 5.61). This is because both notes in the vertical cell may be plucked at once with one finger. The vertical cell successions in Figure 5.61 are performed with the right hand, using an a,m,i fingering pattern.

## Articulation

Vertical cell sequences of plucked sounds can be scored with a variety of articulations, such as arpeggiated attack, slurs, legato, accents, staccato, and glissando.

### *Arpeggiated attack*

*Figure 5.62 Upward arpeggio*




(Toward the Sea, Takemitsu)

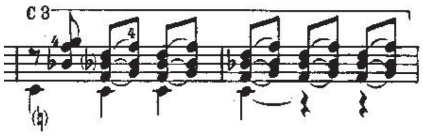
*Figure 5.63 Downward arpeggio*

(Sequenza XI, Berio)

Chords can be plucked in an arpeggiated manner: the arpeggiated attack can be executed in an upward (Figure 5.62) or downward (Figure 5.63) direction. The composer should use a wavy line next to the chord to indicate that the chord is to be arpeggiated, accompanied by a downward arrow in the case of a downward arpeggiation. An upward arrow can also be attached to a wavy line to indicate an upward arpeggiation (Figure 5.62). When a wavy line without an arrow is used, this means anyhow that the arpeggiation is performed in the upward direction. In Figure 5.62, a vertical decrescendo mark is used to prescribe a decrescendo that is to be executed during the performance of the chord, which is a clear way to notate such a gesture.

### *Slurs*

*Figure 5.64 Slurs in vertical cell sequence*




(ETUDE 19, BROUWER)

One or more notes in a vertical cell sequence can be connected to a subsequent chord by means of a slur (Figure 5.64).

### *Legato*

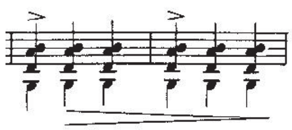
*Figure 5.65 Legato in vertical cell sequence*


(SEQUENZA XI, BERIO)

Sequences of different vertical cells that are located close by on the fretboard are easier to perform with a legato articulation than vertical cells that are further apart. Vertical cells that contain an open string (such as the chords in Figure 5.65) are easier to connect in a legato manner than those not containing open strings, because the open strings can ring on during position changes.

### *Accents*

*Figure 5.66 Accented chords*



(ETUDE 19, BROUWER)

The composer can provide vertical cells with accents to make them stand out (Figure 5.66).

*Figure 5.67 Accents on selected notes*

It is also possible to specify that only a specific note from the vertical cell must be accented (Figure 5.67). To this effect, the accented note should be scored with a separate stem, if possible in a direction different from the rest of the vertical cell, with an accent mark attached.

### *Staccato*

*Figure 5.68 Staccato chords*

(ETUDE CAPRICHE, DODGSON)

The performer executes the staccato by quickly damping the strings affected by the staccato with the right hand, or, in the case of stopped notes, by lifting the stopping fingers after attack (Figure 5.68).

*Figure 5.69 Staccato on selected notes*

As is the case with accents, it is possible to have only one note from a vertical cell performed with staccato articulation (Figure 5.69). The staccato note should then be notated with a separate stem, preferably in a different direction than the rest of the vertical cell, with a staccato mark attached.

### *Glissando*

*Figure 5.70 Unspecified glissando destination*


(CINCO PIEZAS, PIAZZOLLA)

*Figure 5.71 Vertical cell glissando*

(CONCERTO DE VOLOS, BROUWER)

Vertical cells sequences of plucked sounds can be scored with literal glissando, partial glissando, simultaneous glissando and plucking, and tuning key glissando. When scoring vertical cells with tuning key glissandos, only one string can be detuned at a time. Literal glissandos of vertical cells are most effective when they are scored with the same left hand fingering; changing fingerings during the course of such glissandos reduces the clarity of the glissando. Piazzolla uses a downward glissando after a chord with unspecified destination (Figure 5.70). Brouwer uses literal glissandos to connect two vertical cells (first measure of Figure 5.71) and to connect three vertical cells without right hand attacks interrupting the glissandos (second measure of Figure 5.71).

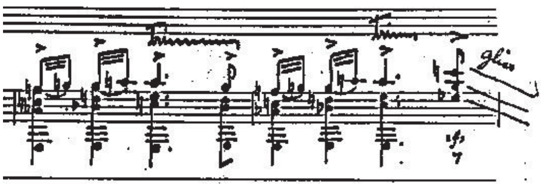
*Figure 5.72 Vertical cells connected with glissando*


(ETUDE 12, VILLA-LOBOS)

Villa-Lobos' *Etude 12* principally consists of sequences of chords that are connected with glissando articulation (Figure 5.72).

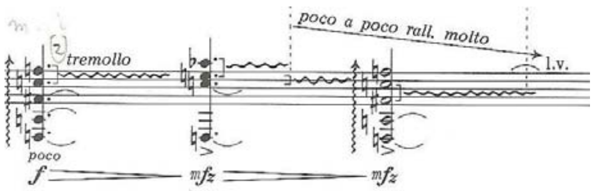
## Embellishment

*Figure 5.73 Trills on top of vertical cell*



(ETUDE 7, VILLA-LOBOS)

*Figure 5.74 Trills inside vertical cell*

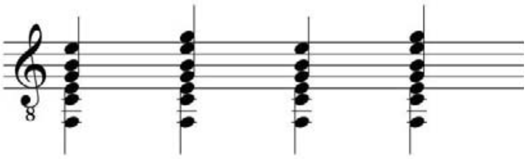



(TOWARD THE SEA, TAKEMITSU)

Vertical cells can be scored with embellishments: they can be located anywhere in the cell, for instance on top (Figure 5.73). It is also possible to create a trill (marked here as *tremollo* by Takemitsu) over selected notes from a vertical cell (Figure 5.74).

### Non-functional writing

*Figure 5.75 Non-functional vertical cell writing*



Examples of non-functional writing for vertical cell sequences of plucked sounds:

- Long and rapid successions of bar chords
- Long stretches of legato five- or six-note chords without open strings in any of the chords
- Chords containing more than six notes (Figure 5.75)

## 5.3.4 Multiple parts

### Design

*Figure 5.76 Two-part writing*

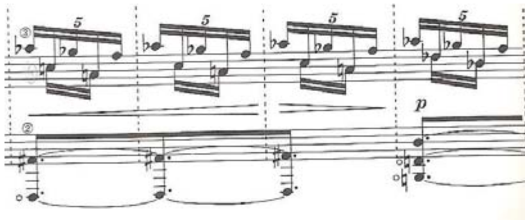
(ETUDE 18, CARCASSI)

*Figure 5.77 Three-part writing*

(SONATA III, PONCE)

Multiple-part writing consists of multiple individual voices that are notated on the staff as separate voices. In the guitar repertoire, the most common amount of voices is two (Figure 5.76), but three-part writing also appears occasionally (Figure 5.77). Two part writing poses fewer restrictions on possible note combinations than is the case in three-part writing, and allows for more fluent performance. Bream, fittingly, declared that although two-part writing may seem limited, “two parts played on the guitar have an effect of peculiar fullness and completion” (Bream, 1957, p. 6). Three-part writing is at its most effective if one of the parts consists of a relatively static part, such as a slow bass part, and at slower speeds (Figure 5.77).

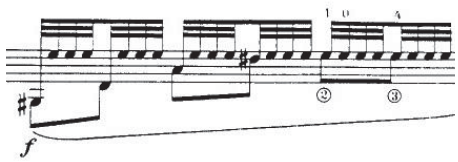
*Figure 5.78 Two-staff notation*



(TOWARD THE SEA, TAKEMITSU)

When notation of all parts on one staff would make a cluttered impression, or when the composer wishes to emphasizes the distinct characteristics of the parts, it is best to use two staves to represent three different parts in order to achieve notational clarity (Figure 5.78).

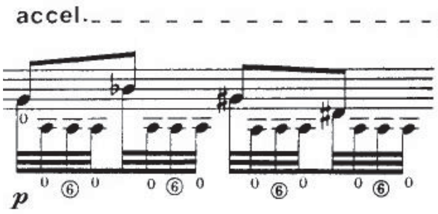
*Figure 5.79 Tremolo sequence*



(SEQUENZA XI, BERIO)

A two-part horizontal cell that is typical for the guitar is a tremolo sequence: a bass note followed by three repeated notes in a higher register. The technique used to perform these sequences is referred to as “tremolo” technique by guitarists; the bass note is played with the thumb, while the repeated notes are played in by fingers a,m and i.

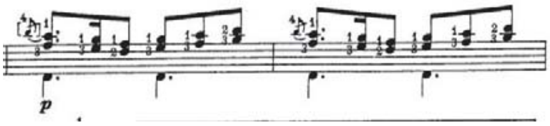
*Figure 5.80 Inverted tremolo*




(SEQUENZA XI, BERIO)

Tremolo sequences can also be inverted in such a way that the initial note is scored higher than the repeated notes (Figure 5.80). In this case, instead of using the tremolo technique, the guitarist makes an i,p,i combination for the repeated notes. The repeated notes in this example are scored over two strings, the fifth and sixth string, where finger p plucks the sixth string and finger i the fifth string.

*Figure 5.81 Melody in thirds*



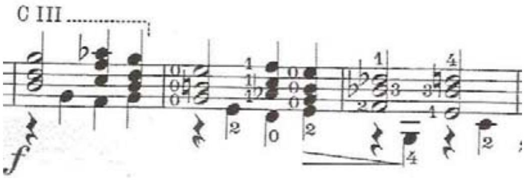
(Quintet G448 for Guitar and String Quintet, Boccherini)

*Figure 5.82 Melody in sixths*

(Grand Solo op. 14, Sor)

The melodic part in two-part writing is often reinforced with an additional note that adds harmony and sonority to the passage. In the classical repertoire, this often manifests itself in melodies in thirds (Figure 5.81) and in sixths (Figure 5.82).

*Figure 5.83 Chord-melody sequence*




(Sonata III, Ponce)

*Figure 5.84 Bass line reinforcement*

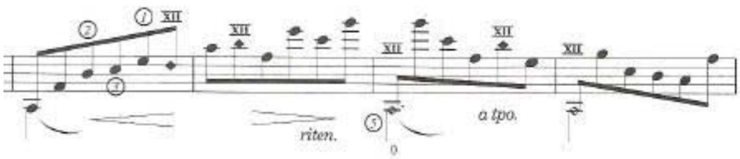
(Allegro Brillante, Aguado)

A melodic line or bass line can also be reinforced with two additional notes, creating a chord melody (Figure 5.83) or chord bass (Figure 5.84).

## Resonance

In multiple-part writing, the degree of resonance depends on the way the individual parts are scored. If a multiple part passage contains an arpeggio, for instance, the notes in the arpeggio will ring on beyond their notated value. If a multiple part passage contains a bass line and a melodic part scored in relatively small intervals, notes last as long as they are notated.

*Figure 5.85 Resonance in two-part scoring*




(Sonata, Brouwer)

Brouwer creates a horizontal cell containing a high degree of resonance by scoring a sequence of notes on various strings (Figure 5.85).

## Harmonic possibilities

Two-part writing for the guitar, particularly in the first position, provides enormous flexibility in pitch choice, while at the same time allowing for guitar writing that is more typical for the guitar repertoire than single part writing.

*Figure 5.86 Two-part writing*


(Prelude from Nouvelles Decouvertes pour la Guitare, Campion, transcr. Marlon Titre)

In the music of François Campion, a high degree of pitch flexibility is attained, not just through the use of scordatura tunings, which alters the pitch choice possibilities but does not necessarily widen them, but also through the use of first position two-part writing (Figure 5.86, top line depicts scordatura positions, while bottom line represents the sounding pitches).

## Speed

When one of the parts, such as a bass line, is relatively simple, it is possible to perform faster voices on top of this line. The speed of these voices can then be scored at the same speed as a single line. Given the fact that bass lines are usually plucked with one finger alone (the thumb), the note values of bass lines in multi-part writing should be scored with relatively long note values. The more complex the multi-part writing, the more difficult it becomes to perform passages at high speeds. Tremolo passages can be performed at high speeds, particularly if the repeated notes are scored on a higher string than the first note of the pattern, allowing the performer to use the tremolo technique. Professional guitarists are able to play tremolo passages of sixteenth notes at an approximate quarter note speed of 130-160 BPM.

## Articulation

Multiple-part writing can be provided with a variety of articulations, such as slurs, legato, accents, staccato, and glissando.

### *Slurs*

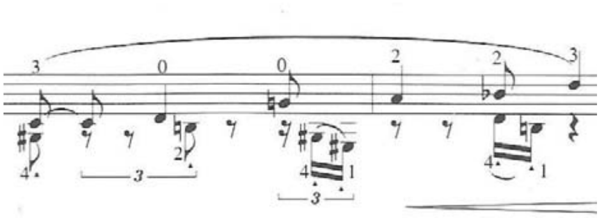
*Figure 5.87 Slurs in two-part writing*

(ETUDE 10, VILLA-LOBOS)

Slurs are effective when they are scored in one part alone (Figure 5.87), or alternatingly between parts.

### *Legato*

*Figure 5.88 Multiple articulations in two-part writing*



(SONATA, DAVIES)

Multiple parts can be scored legato, or one part may be scored legato, while the other is scored with another articulation (Figure 5.88).

### *Accents*

Accents can be used in multiple parts or in one part while the other is scored with a different articulation (Figure 5.87).

### *Staccato*

Staccato articulations can be used in multiple parts or in one part while the other is scored with another articulation (Figure 5.88).

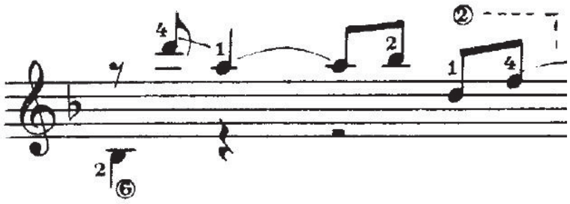
### *Glissando*

*Figure 5.89 Glissando during tremolo*

(SEQUENZA XI, BERIO)

Two-part horizontal cells of plucked sounds can be scored with literal glissando, partial glissando, simultaneous glissando and plucking (Figure 5.89) and tuning key glissando. When scoring vertical cells with tuning key glissandos, only one string can be detuned at a time.

*Figure 5.90 Glissando in two-part writing*

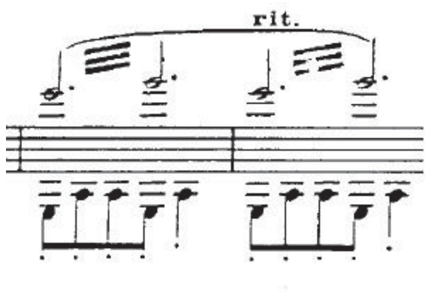


(SONATA III, PONCE)

Glissando writing in two-part cells is most effective when scored in one part at a time (Figure 5.90).

## Embellishment

*Figure 5.91 Left-hand trill in top voice*




(DANZA DEL ALTIPLANO, BROUWER)

Embellishments in multiple-part scoring are most effective when they appear in one part at a time (Figure 5.91).

## Non-functional writing

*Figure 5.92 Non-functional multiple-part writing*

Examples of non-functional writing in multiple-part horizontal cells of plucked sounds:

- High tempos in three part scoring with three highly individual parts
- Note combinations spread over parts that lie outside the hand span
- Request to let notes ring on that cannot be held because they lie outside the hand span (second half of Figure 5.92)

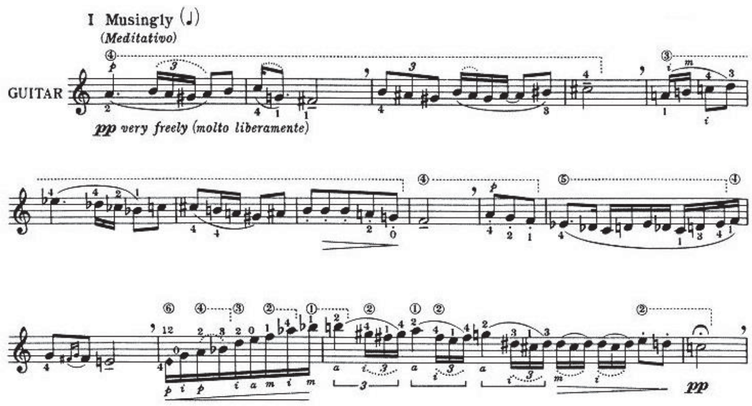
# 5.4 Textures

Plucked sounds can be scored into a variety of textures; these textures can be continuations of horizontal cells over a longer period of time, or combinations of different horizontal cells. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 5.4.1 Textures as continuations of horizontal cells

### Monophonic texture

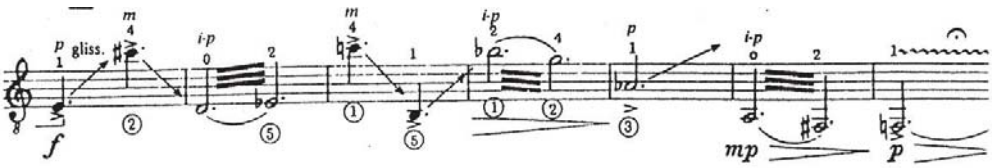
*Figure 5.93 Monophonic texture*




(NOCTURNAL, BRITTEN)

A single line passage may continue on for many measures, creating a monophonic texture. An example of such writing can be seen in Figure 5.93, which shows the opening of Britten's *Nocturnal*. In monophonic textures, the guitarist is in an ideal position to perform the various indications of dynamics, articulation and tempo with undivided attention, as she is only concerned with the performance of one single line. As a result, such textures, especially when they are scored at relatively slow speeds and with fluctuations in dynamics, range and articulation, can create a very meditative atmosphere, as is the case in this Britten example.

*Figure 5.94 Monophonic texture with glissando, trills and quarter tone vibrato*

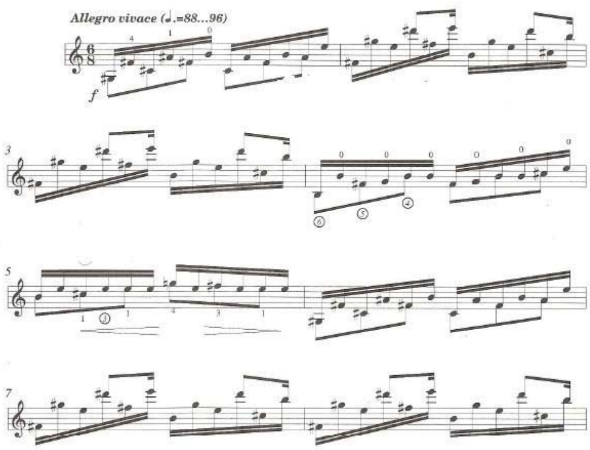



(SONATA, GINASTERA)

Ginastera creates a monophonic texture containing glissando articulations, trills and quarter tone vibrato in his *Sonata* (Figure 5.94). Ginastera here effectively makes use of the possibility to score non-literal glissandos, such as in the first measure, where a glissando starting on the fourth string reaches its destination at a high positioned note on the second string. The first trill and the third trill include open strings, facilitating position changes without interruptions in sound.

## Arpeggio texture

*Figure 5.95 Arpeggio texture*




(SONATA, BROUWER)

Similarly, sequences of arpeggios can continue on for many measures, creating an arpeggio texture (Figure 5.95). In the above passage, Brouwer scores arpeggios that, over a period of multiple measures, form a texture. In the second and third measure, Brouwer uses double stems on the highest notes of the arpeggio, which is an appropriate way to indicate that these notes should be considered as separate voices and are to be performed accordingly. Brouwer realizes a fruitful marriage of virtuosity and playability by constructing the arpeggios with great care; left hand positions are maintained for at least a full measure, which facilitates rapid performance without interruptions caused by excessive amounts of left hand changes.

## Two-part texture

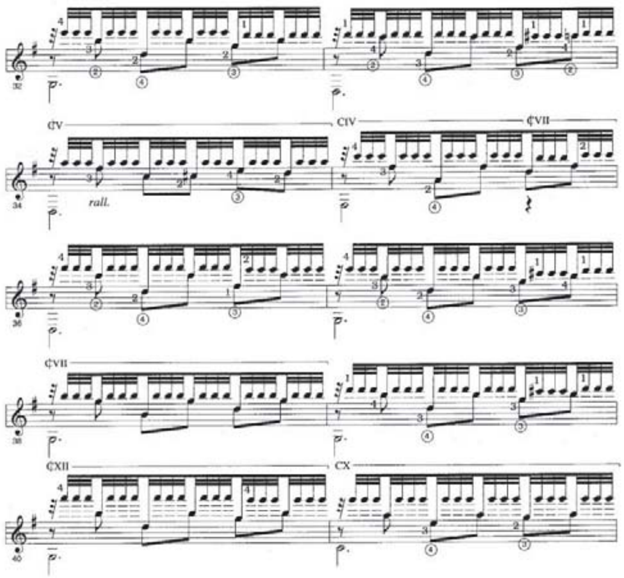
*Figure 5.96 Two-part texture*

(Bourrée BWV 996, Bach (originally for lute), transcribed and edited by Frank Koonce)

A two-part texture can continue on for many measures, creating a two-part texture (Figure 5.96). This texture is particularly suited for contrapuntal music, music containing many modulations or for atonal music, especially when scored in the first position.

## Tremolo texture

*Figure 5.97 Tremolo texture*




(Un sueño en la floresta, Barrios)

A tremolo cell can continue on for many measures, creating a tremolo texture (Figure 5.97). Tremolo textures are well suited for music containing modulations and keys not associated with the open string pitches, particularly when used in conjunction with arpeggios of chords formed with the left hand barré. Barrios creates an intense passage by scoring a tremolo in the highest range of the guitar, here reaching the high a on the first string (last line, first measure). The enormous amount of ledger lines in this passage also demonstrates that, when scoring on one staff in treble clef, the employed range of the guitar both in its high and low range can exceed the pitch range that is convenient for score reading. When scoring large amounts of notes in extremely high ranges, the composer should use an *8va* mark for the high pitched notes if this improves readability.

## Chordal texture

*Figure 5.98 Chordal texture*


(SONATA III, PONCE)

A vertical cell sequence of plucked sounds can continue for many measures, creating a chordal texture (Figure 5.98). The fewer the amount of notes included in the vertical cells, the more possibilities there are for modulations and keys not associated with the open strings. This is because the density of vertical cells limits the amount of fingering options, making fluent changes between vertical cells more difficult. In the above passage, frequent left hand position changes are necessary for its performance. At the same time, few open strings are used, which creates the risk of interruptions between vertical cells as a result of position shifts. Most position changes in Figure 5.98 take place while progressing between vertical cells consisting of three pitches; the more pitches that appear in the vertical cell that is to be arrived at through a position change, the more difficult it is to perform the position change without interruptions of sound.

## 5.4.2 Textures as combinations of horizontal cells

Rather than being continuations of one type of horizontal cell, most textures we find in guitar compositions are combinations of different types of cells. Provided that proper use is made of notation and scoring of the sounds and cells that make up the texture, the composer is free in the choice of the sounds and cells she combines into a texture.

### Melody and accompaniment texture

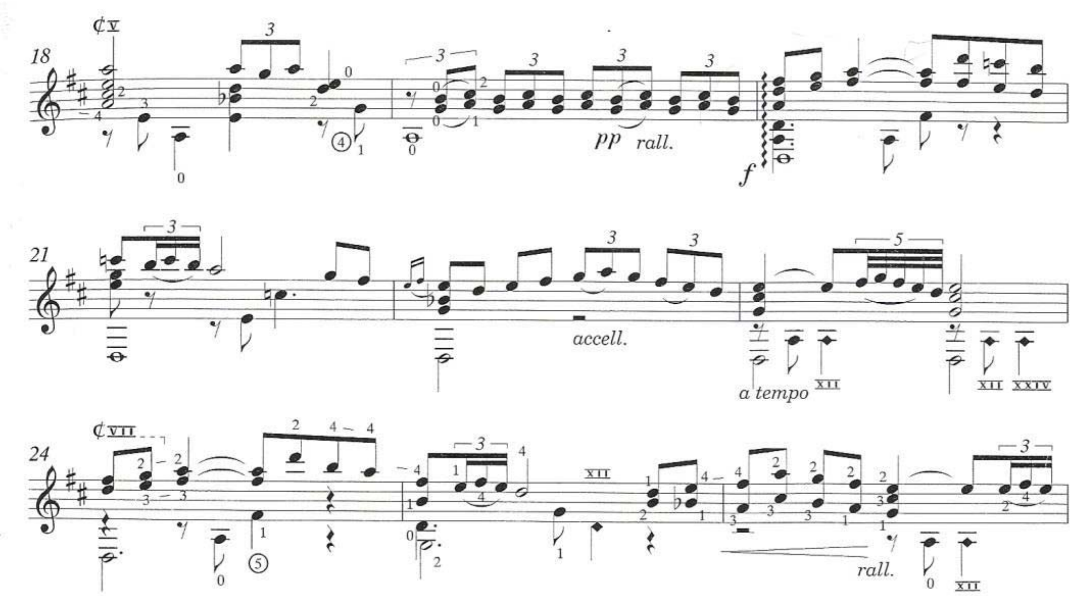
*Figure 5.99 Melody and accompaniment texture*


(CAPRICHO ÁRABE, TÁRREGA)

When the composer adds two- or three-note vertical cells in between a bass line and a melody in the high register, the result is a melody and accompaniment texture (Figure 5.99). Typical for much guitar repertoire is that the middle part of a melody and accompaniment texture is not consistently present; it rather appears, disappears and reappears again when the composer desires. As a consequence, three-part notation is not always consistently continued throughout the measure (Gilardino, 1990, pp. 106-107), as is also the case in Figure 5.99. As long as the note values can be deduced from the score, this should not create problems for a rhythmically correct performance of the score by the performer.

## Two-part texture with added chords

*Figure 5.100 Two-part texture with added chords*[35]




(SONATINA, MORENO-TORROBA)

A much used texture in guitar literature is the two-part texture to which notes have been added on some of the beats. Such textures are characterized by the sound of chords followed by melodies. This type of texture offers the composer the possibility of writing music that is rich in harmonic detail when she places full chords on strategic places in the score, thus avoiding passages that are excessively dense or unplayable. In traditional repertoire, such chords are mostly positioned on heavy beats (Figure 5.100). The frequent use of the open string basses and natural harmonics on the bass strings in Figure 5.100 allows for a high degree of scoring freedom in the higher playing positions (as can be deduced from both pitch range and the Roman numerals[36] above the score), while the notes on the bass strings can still continue to resonate. The scordatura in the *Sonatina*, which prescribes a detuning of the sixth string down to d, allows Torroba to comfortably score in the key of d major.

[35] In this example, the composer does not indicate the sounding pitch of natural harmonics, but instead notates the open string pitch and indicates the position in which the finger should touch the nodal point. This notation can be confusing for the performer. Therefore, the composer should notate the sounding pitch instead, and use diamond shaped noteheads to signal that the note is a harmonic (see section 6.1.1).

[36] For the use of Roman numerals: see *Reading Guide*.

*Figure 5.101 Two-part texture with occasional added chords*


(SONATA III, PONCE)

The composer can use a combination of chords at some points, while at other times falling back to two-part scoring without added chords (Figure 5.101). At some places in Figure 5.101, the melodic line has been spaced over relatively large intervals and over multiple strings (second line, fourth and fifth measure; third line, third and fourth measure), which makes them into arpeggios. Ponce uses the variations within this texture to score musical material in various ways; the first two measures are rescored as arpeggios in the fourth and fifth measure of the second line. The use of non-open string basses in Figure 5.101 allows for an active bass line, a high number of different bass note pitches as well as full-range encompassing chord progressions and modulations. The downside of such scoring is that the level of bass note resonance decreases in accordance with the amount of non-open string basses employed.

## Texture of contrasting or alternating cells

*Figure 5.102 Contrasting texture*


(SEQUENZA XI, BERIO)

The composer can also create a texture that juxtaposes different contrasting cells; Figure 5.102 shows how Berio contrasts a slow single line texture of repeated notes with tremolo, arpeggio cells, as well as harmonics and rasgueados sounds. The overall texture takes on its characteristics from the alternation of different types of cells present in this passage. The passage above is a section where Berio gives the guitarist the opportunity to re-adjust the tuning of the guitar. Harmonics are used in the first and second line as coloristic variations of the same pitch played as a regular plucked note.

At the end of this chapter on the sound-cell-texture chain most employed in the guitar literature, the sound-cell-texture chain of plucked sounds, the appearance of harmonics and rasgueado sounds in Figure 5.102 points us ahead to the upcoming chapters where sound-cell-texture chains formed by other sounds are examined.

## Chapter 6 Harmonics

**Contents**

# Chapter 6 Harmonics

Harmonics[37] emerge when the string is plucked and simultaneously touched at a nodal point, creating an overtone. This chapter shows ways in which the composer can handle the characteristics of harmonics, use them to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 6.1 Sound

### 6.1.1 Pitch range

*Figure 6.1 Guitar harmonics range*

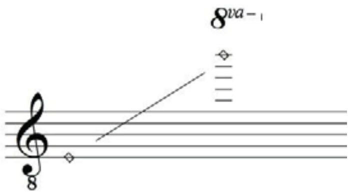
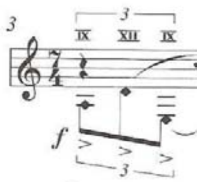



Figure 6.1 lists the range of harmonics available on the guitar, including both natural and artificial harmonics. Higher harmonics are playable, but are hardly audible without amplification. Harmonics are performed in various ways, depending on the type of harmonic (see section 6.1.2).

The notation of harmonics has often been the source of confusion, because of the widely divergent notations used by composers when writing for the guitar. Not only guitar scores suffer from inconsistencies in the notation of harmonics; it is a general problem in contemporary music, particularly for bowed instruments (Warfield, 1973-1974).

*Figure 6.2 Action notation of harmonics*




(SONATA, BROUWER)

[37] The term "harmonics" is preferred here over "harmonic sounds", in order to avoid confusion with the musical concept of harmony that the latter term may cause.

The confusion surrounding the notation of guitar harmonics is brought about by the fact that some composers use some type of action notation (for instance in Figure 6.2, which does not indicate the sounding pitches), notating the action that has to be performed to bring about a harmonic, while other composers use result notation, notating the desired resulting pitch of the harmonic (Figure 6.1). A solution to this issue is to always indicate the sounding pitch of the harmonic. An emphasis on pitch accuracy makes for a concise and unequivocal stream of information toward the performer (Kachian, 2006, p. 53). A correct notation of pitches allows the performer to, first, understand the pitch materials provided by the composer and, second, search for a method of producing these pitches in the form of harmonics. Using a legend to give an overview of the harmonics used as well as their notation is a way to facilitate correct interpretation by the guitarist.

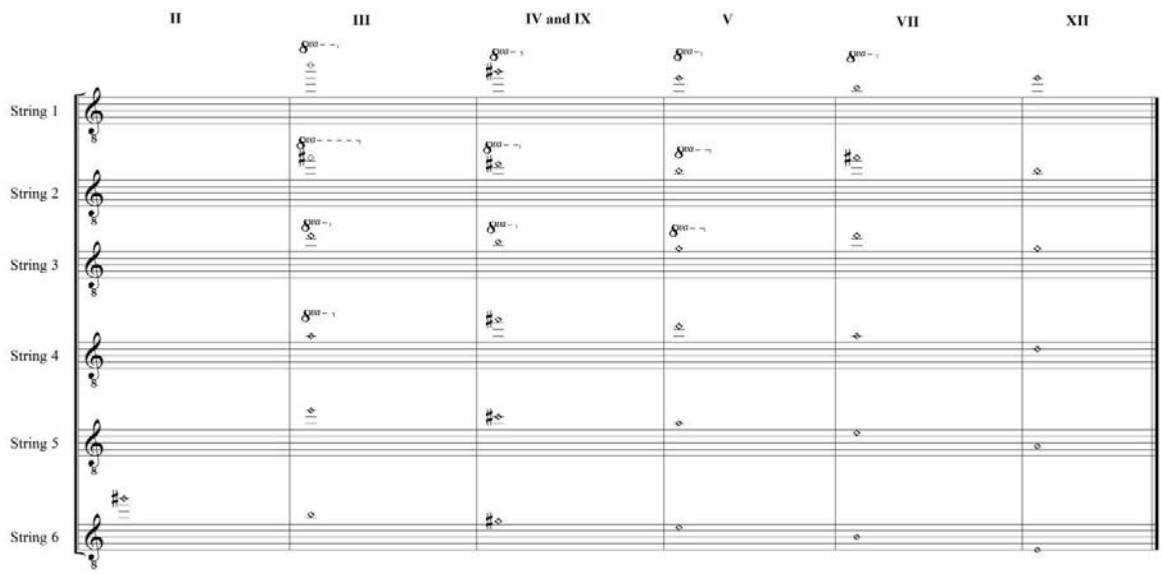
A clear method of notating harmonics is to use diamond shaped noteheads and to display the sounding pitch, as in Figure 6.1. If a specific fingering is desired for the harmonic, this can be indicated with the use of string numbers (string number in a circle), finger indications (a letter for the right hand, a number for the left hand) and position indications (Roman numerals). Non-standard artificial harmonics should be notated by showing the fingered note as well as the pitch of the position where the string should be lightly touched in parentheses. This is in accordance with the suggestion Gould makes for the notation of such harmonics in her work on music notation (Gould, 2011, p. 388).

## 6.1.2 Types of harmonics

There are two types of harmonics on the guitar: natural harmonics and artificial harmonics.

### Natural harmonics

*Figure 6.3 Overview of natural harmonics*[38]




[38] For the use of Roman numerals in this example: see *Reading Guide.*

Natural harmonics are found at nodal points on the open strings. The performance of a natural harmonic is as follows; first, the nodal point is lightly touched with a finger of the left or right hand. The string is then plucked with a finger of the right hand while the nodal point is still lightly touched. At this point, the overtone sounds. Immediately after the overtone starts to sound, the finger that lightly touches the nodal point is immediately lifted from the string in order not to damp the vibrations. Natural harmonics generally have longer resonance than artificial harmonics because they are produced on an open string. The most commonly used natural harmonics are those in positions V, VII and XII. Harmonics in positions II and III are hardly audible or not audible on the nylon strings. The harmonics in positions V and XII are the only harmonics that are "perfectly in tune" (Kachian, 2006, p. 54). For a chart of the fingerings of natural harmonics, see Appendix B.

## Artificial harmonics

Artificial harmonics are created by stopping[39] a note and lightly touching the nodal point that is found by moving the nodal point up in accordance with the distance between the stopped note and the open string. The guitarist performs artificial harmonics by stopping a note with a finger of the left hand, lightly touching the nodal point with a finger of the right hand and plucking the string with a finger of the right hand. Immediately after the sounding of the overtone, the finger that lightly touches the string leaves the string in order not to damp the vibrations. Artificial harmonics cover the full range of the harmonics range pictured in Figure 6.1, except for the low e, which can only be produced as a natural harmonic.

*Figure 6.4 Artificial octave harmonic*

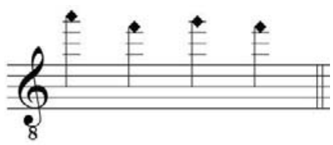
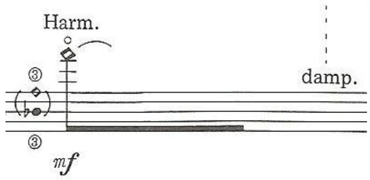


*Figure 6.5 Artificial octave+fifth harmonic*




(TOWARD THE SEA, TAKEMITSU)

The most common type of artificial harmonic is the octave harmonic (Figure 6.4). The harmonics pictured in Figure 6.4 are produced by stopping the pitches one octave below the sounding harmonics with the left hand, while lightly touching the pitches twelve frets higher and plucking them, thus causing the harmonics to sound an octave higher than their stopping position. In the notation of artificial non-octave harmonics, the composer should ideally show the fingered note and the pitch of the position between brackets (Figure 6.5).

[39] On string instruments, "stopping" refers to pressing down the string on the fingerboard to produce a desired pitch (Free Dictionary by Farlex, 2013).

*Figure 6.6 Harmonics notation*


(DUE CANZONI LIDIE, D'ANGELO)

D'Angelo makes a practical distinction between the notation of natural and artificial harmonics by using diamond shaped noteheads for natural harmonics and rhomboid shaped noteheads for artificial harmonics, both at their sounding pitch. This notation is particularly useful when many different types of harmonics are used in a composition.

## 6.1.3 Timbre possibilities

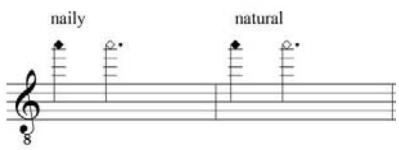
### Attack

When a natural harmonic is touched lightly with the left hand and plucked with the right hand, it can be plucked with either the apoyando or tirando attack. Just as is the case with regular plucked notes, the apoyando has a more projecting sound than the tirando. Artificial harmonics and natural harmonics that are lightly touched with the right hand instead of the left hand are typically plucked with the tirando attack. This is because it is awkward for the performer to execute an apoyando attack with a finger of the right hand while another finger of the right hand touches the string and subsequently leaves the string. The prescription of an apoyando or tirando attack for a harmonic is achieved through the use of a symbol that is specified in a legend, or with a verbal instruction in the score (see section 5.1.2 under "Attack").

### Sound color and playing position indications

It is possible to assign a sound color to natural harmonics; the performer can then find a way to play the harmonic in a manner consistent with the indication in the score.

*Figure 6.7 Artificial harmonics sound color*

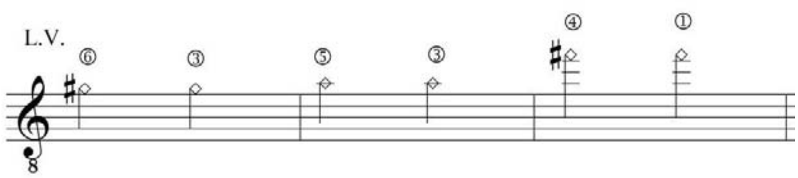


The sound color of artificial harmonics can only slightly be changed, because of the limitations to different plucking angles and positions the technique of producing harmonics poses. However, it is possible to prescribe a more "naily" sound for an artificial harmonic, or a more "natural" sound with a verbal instruction (Figure 6.7).

The playing position for natural harmonics can be changed; it is possible to assign playing positions ranging from ponticello to tasto. The playing position of artificial harmonics cannot be altered; the light touching and plucking are performed with the same hand, which confines the plucking finger to a position close to the nodal point.

## Fingering

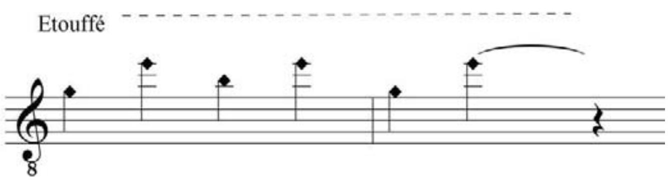
*Figure 6.8 Harmonics fingerings*[40]




The fingering of a harmonic influences its sound. Differences in sound can particularly be appreciated when one compares a harmonic plucked on a metal-wound string versus a nylon string (Figure 6.8)

## Etouffé

*Figure 6.9 Harmonics etouffé*

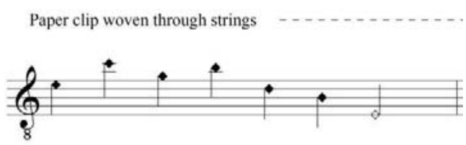



The timbre of harmonics can be changed by muffling (Figure 6.9). Etouffé harmonics are performed by plucking a note and simultaneously slightly damping it with the side of the right hand. Because the right hand is involved in damping the notes, etouffé writing for harmonics is most effective for single line writing, and for natural harmonics. Sounds scored etouffé have a reduced dynamic range and resonance.

40 For the use of circled numbers in this example: see *Reading Guide*. In this example, each measure contains two instances of the same note; string indications refer to the string on which the notes are to be played.

## Prepared guitar

*Figure 6.10 Paper clip preparation*




When the guitar is prepared with an object, such as in Figure 6.10, the timbre of harmonics is affected. As a result of weaving a paper clip through the strings, the harmonic takes on a gamelan-like timbre. When the paper clip is lightly woven through the strings, as in the video example of Figure 6.10, the duration of the resonance is close to that of the resonance of a normal harmonic. When, on the other hand, the paper clip is woven tightly around the strings, it restricts the space for string vibration and consequently shortens the resonance time.

## 6.1.4 Dynamic range

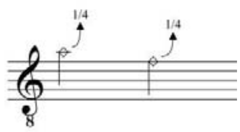
Due to the characteristics of their production, through light nodal touching and plucking, harmonics have a more limited dynamic reach when compared to regular plucked notes. Harmonics sound particularly well in the *pp-mp* dynamic range. Octave harmonics are the lowest pitched harmonics and are relatively the loudest, while the dynamic range of harmonics becomes smaller when their pitch is higher. Harmonics in the highest pitch range have a small dynamic range around *pp*, particularly in the highest octave.

## 6.1.5 Vibrato

All artificial harmonics can be performed with vertical or lateral vibrato because they are stopped with a finger of the left hand. The same types of vibratos that are possible for regular plucked notes can also be used for artificial harmonics. Natural harmonics are not stopped with a finger of the left hand; vibrato is therefore not possible for such notes.

## 6.1.6 Pitch bends and microtones

*Figure 6.11 Harmonics bend*



The pitch of an artificial harmonic can be bent up (Figure 6.11) in the same way a regular plucked note can be.

*Figure 6.12 Harmonics quarter tones*

Microtones of harmonics can be created either by using a microtonal scordatura (see Appendix D) or by using a pitch bend (Figure 6.12). In contrast to bowed strings instruments without frets, the guitar cannot produce microtones by finger placement on the fingerboard, but only by bending the string out of its regular tuning, and this also true for harmonics. This means that for each harmonic microtone, the guitarist needs a short moment the bend the string before the microtone can be produced.

## 6.2 Vertical cells

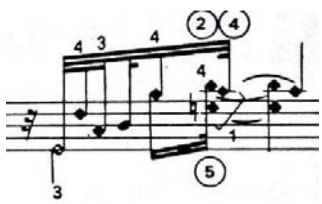
When creating vertical combinations of harmonics, up to six harmonics can be produced simultaneously. In order to see which notes may be combined, Appendix B should be consulted. Harmonics can be combined on adjacent and non-adjacent strings.

### 6.2.1 Harmonics combinations

*Figure 6.13 Vertical harmonics cell*

(SEQUENZA XI, BERIO)

*Figure 6.14 Vertical harmonics cell*



(DUE CANZONI LIDIE, D'ANGELO)

When writing vertical combinations containing many natural harmonics, the most effective combinations consist of harmonics in the same position (Figure 6.13). For vertical combinations of harmonics, the natural harmonics found in positions V, VII and XII are much more sonorous than those found in other positions. When scoring smaller combinations of two or three notes, the natural harmonics from nearby positions can be combined, for instance from position V and VII, or position VII and XII (Figure 6.14). In all of these cases, the guitarist uses the left hand to touch the nodal points and the right hand to pluck the strings.

Artificial harmonics can only be combined vertically in an arpeggiated manner; they are therefore discussed in the horizontal cell section.

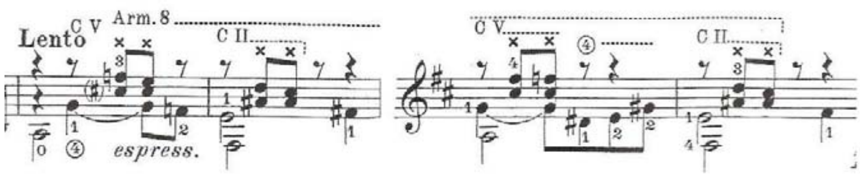
## 6.2.2 Combinations of harmonics and regular plucked sounds

*Figure 6.15 Harmonics in position XII and regular note*


(DUE CANZONI LIDIE, D'ANGELO)

Both natural and artificial harmonics can be combined with regular plucked sounds. When scoring a vertical cell of natural harmonics and regular plucked sounds, the most effective combinations consist of up to three harmonics and one regular note. For such combinations, natural harmonics in position XII work best because of their more sonorous character (Figure 6.15).

*Figure 6.16 Harmonics combined with regular notes*[41]




(SONATA III, PONCE)

When scoring combinations of non-12th position natural harmonics and regular plucked sounds, or of artificial harmonics and regular plucked sounds, effective combinations are composed of a regular note and not more than one harmonic. In these cases, the guitarist uses the right hand to pluck the string and touch the nodal point, or uses the left hand to touch the nodal point and the right hand to pluck the string.

[41] Ponce uses crosses and the indication "Arm. 8" to indicate that octave harmonics should be played. This notation can be confusing for the performer. Therefore, the composer should notate the sounding pitch instead, and use diamond shaped noteheads to signal that the note is a harmonic (see section 6.1.1).

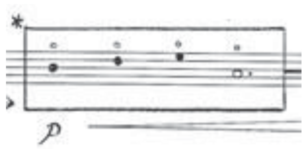
# 6.3 Horizontal cells

In this section, the various horizontal cells that can be created with harmonics are discussed. Because harmonics are typically scored in combination with regular plucked notes, special attention is given to combinations of these two sound categories.

## 6.3.1 Single lines

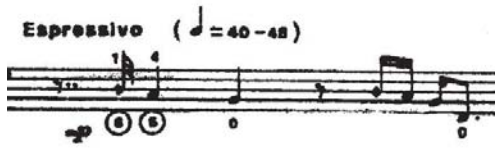
### Design

*Figure 6.17 Single line harmonics*



(So-Ri, Oh)

*Figure 6.18 Regular notes and harmonics*



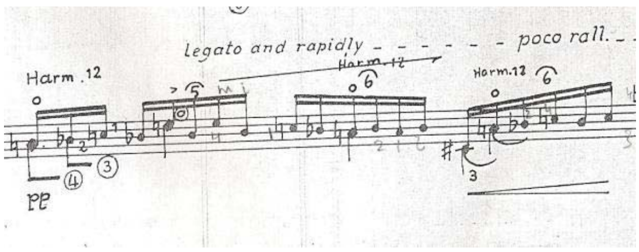

(Due Canzoni Lidie, D' Angelo)

Single line horizontal cells of harmonics can consist of harmonics alone (Figure 6.17) or of a horizontal combination of harmonics with other sounds. A common horizontal combination of sounds is that of harmonics and regular plucked notes (Figure 6.18).

### Resonance

Single line horizontal cells of harmonics can be scored either with or without resonance. The first option is for such cells to be made to sound in a way that the notes **do not** ring on into the temporal space of subsequent notes. This is possible when the line is scored at a slow speed, when the intervals are relatively small, when both conditions are fulfilled, or when a staccato articulation is used. Artificial harmonics work particularly well for such lines, because their resonance stops as soon as the stopping finger is lifted, so that no additional damping action has to be performed with the right hand.

*Figure 6.19 Single line scoring with resonating harmonics*




(Folios, Takemitsu)

In contrast, single lines containing harmonics can also be made to sound in such a way that notes **do** ring on into the temporal space of subsequent notes. This kind of scoring works particularly well for natural harmonics, as they have better resonance. Moreover, it is not necessary for a finger of the left hand to continue stopping a string for it to resonate. This type of scoring is encountered in many 20th century works (Figure 6.17, Figure 6.18, Figure 6.19).

## Harmonic possibilities

The pitch choice possibilities are very wide when writing single line horizontal cells containing harmonics, because the performer only has to be concerned with playing one line. The availability of many pitches as natural harmonics (Figure 6.3) makes it possible for the performer to connect the various notes in a horizontal cell of regular plucked sounds more easily in a legato way when one or more regular plucked notes are scored as harmonics instead.

## Speed

*Figure 6.20 Rapid single line passage containing natural harmonics*


(DUE CANZONI LIDIE, D'ANGELO)

The speed at which a single line horizontal cell containing harmonics can be scored depends on the type of harmonics used. If natural harmonics are used, the line can be scored at high speeds, especially when it is scored over multiple strings (Figure 6.20). Single lines containing artificial harmonics can only be scored at slow or moderate speeds, because each repeated artificial harmonic is plucked with the same finger of the right hand, thus limiting speed.

## Articulation

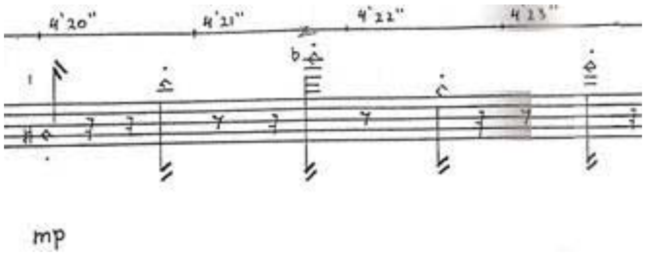
Single lines containing harmonics can be scored with a variety of articulations, such as legato, accents, staccato and glissando.

### *Legato*

The performer can ensure that transitions between notes are performed in a legato manner by avoiding premature decay of notes and avoiding interruptions caused by placing attacking fingers on resonating strings. The composer should use phrase marks to indicate that a passage is to be played in this manner.

### Staccato

*Figure 6.21 Staccato harmonics*

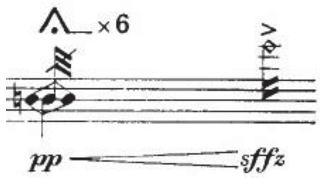



(Auburn, v/d Aa)

Single lines containing harmonics can be scored staccato (Figure 6.21). The staccato is performed by lifting the finger of the left hand immediately after stopping the string in the case of artificial harmonics, or by damping the string with the right or left hand in the case of natural harmonics. Staccato is prescribed with a staccato mark attached to the note.

### Accents

*Figure 6.22 Harmonics accent*[42]

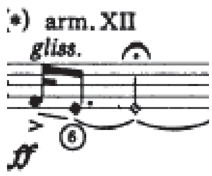



(Sequenza XI, Berio)

Despite of the limited dynamic range of harmonics, it is possible to score accents for harmonics. Such accents are particularly effective when scored at a very resonant nodal point, such as the nodal point in position XII (Figure 6.22). An accent is prescribed with an accent mark attached to the note.

### Glissando

*Figure 6.23 Tuning key harmonics glissando*



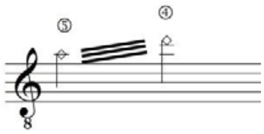

[42] In the *Sequenza XI*, Berio uses open diamond shaped noteheads to notate harmonics, even for eighth notes and sixteenth notes. This can lead to confusion concerning the note values of the harmonics. For harmonics shorter than a half note, closed noteheads should be used.

(Paiasaje cubana con campanas, Brouwer)

Although not used very often, glissandi can be used to create an upward or downward travelling pitch of a harmonic. Horizontal cells of harmonics can be scored with literal glissando, partial glissando, simultaneous glissando and plucking, and tuning key glissando. Tuning key glissandos can be scored with artificial or natural harmonics (Figure 6.23). In this example, the sixth string is tuned to f, and the initial note is played as a natural harmonic in position XII. After the sounding of the harmonic, a sounding f, it is tuned down to e with a tuning key glissando. Non-tuning key glissandos are only possible for artificial harmonics. Since slurs are not available for harmonics, harmonics glissandi may be used as an alternative. The glissando is prescribed with a line connecting the notes in question.

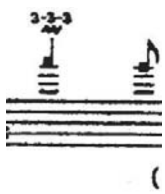
## Embellishment

*Figure 6.24 Natural harmonics trill*



Embellishments of harmonics can be prescribed by scoring natural harmonics over two adjacent strings, for instance as a trill (Figure 6.24). The continuous positioning of the fingers on the nodal point diminishes some of the resonance of the harmonic, as the finger that lightly touches the string is normally, and ideally, immediately lifted after the note has been plucked. For this reason, natural harmonics that are part of a trill are ideally located on nodal point in position V, VII or XII, being the most resonant nodal points. Trills over a regular plucked note and a natural harmonic are also possible when scored over adjacent strings; in this case the regular plucked note will sound louder than the harmonic.

*Figure 6.25 Glissando trill*



(Due Canzoni Lidie, D'Angelo)

The other possibility is to use glissando to create embellishments, for instance by creating a trill with the help of an ascending and descending glissando, as on the first note in Figure 6.25.

### Non-functional writing

*Figure 6.26 Non-functional single-line writing*


Examples of non-functional writing of single lines of harmonics:

- Rapid successions of artificial harmonics (Figure 6.26)
- Legato phrasing on notes that lie outside the hand span
- Rapid succession of notes that lie outside the hand span

## 6.3.2 Arpeggio

### Design

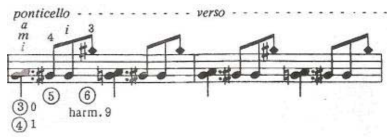
*Figure 6.27 Harmonics sequence in an arpeggio*[43]


(Etude 1, Villa-Lobos)

*Figure 6.28 Arpeggio containing multiple harmonics*

(Five Bagatelles, Walton)

*Figure 6.29 Arpeggio containing one harmonic*




(Sonata, Ginastera)

It is possible to include harmonics in an arpeggio; the arpeggio can contain a sequence of only harmonics (Figure 6.27), multiple harmonics as well as regular plucked notes (Figure 6.28), or one harmonic in the midst of regular plucked notes (Figure 6.29). For all of these arpeggios containing harmonics, natural harmonics are most effective, as they allow the right hand to execute the arpeggio in the same way as when the hand executes arpeggios of regular plucked notes. Arpeggios of artificial harmonics are also possible, but less common due to the slow maximum speed of such arpeggios.

### Resonance

A characteristic feature of arpeggio horizontal cells containing harmonics is that most notes ring on beyond their notated value, unless it is explicitly specified that they should be damped after their notated value, or if the resonance of a string ends because it is damped as the result of the fingering. As

[43] In this example, Villa-Lobos uses the antiquated practice of indicating strings with circled pitch names instead of string numbers. In addition, the harmonics are not notated at their sounding pitch, which can be confusing for the performer.

is the case with arpeggios of regular plucked notes, it is not necessary and even impractical to notate the exact note duration for each note.

### Harmonic possibilities

The harmonic possibilities of arpeggio horizontal cells containing natural harmonics are limited to the available natural harmonic pitches and the regular notes within the hand span around the nodal points of natural harmonic. The harmonic possibilities of arpeggios containing artificial harmonics are much broader: the full range of harmonics can be used, as long as they fit within the hand span of the left hand.

### Speed

Arpeggios of natural harmonics can be performed with considerable speed (Figure 6.28). Arpeggios of artificial harmonics can only be performed at slow speeds, as each artificial harmonic is played with the same finger of the right hand and each harmonic requires careful coordination between left and right hand. However, when artificial harmonics in a sequence are all scored in the same fret, they can be performed at the same speed as natural harmonics, as the left hand does not have to reposition during the performance of the artificial harmonics.

### Articulation

Arpeggio horizontal cells containing harmonics can be scored with a variety of articulations, such as legato, accents, staccato and glissando.

#### *Legato*
Legato is a very natural articulation for arpeggio horizontal cells containing natural harmonics, as natural harmonics usually ring on after their attack. The composer should indicate that a particular arpeggio is to be played legato with a phrase mark (Figure 6.28).

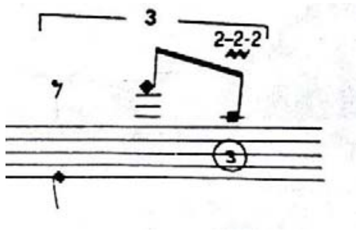
#### *Accents*
Accents can be used in arpeggio horizontal cells containing harmonics to bring out a particular note in the arpeggio. To this end, an accent mark should be attached to the note.

#### *Staccato*
Staccato articulations for arpeggio horizontal cells containing harmonics are particularly effective when scored for alternations of two notes. As is the case with arpeggios of regular plucked notes, staccato in larger arpeggios containing harmonics works well when applied to a small number of notes or at end of a passage; this is because each staccato note requires an additional damping or lifting move of the performer, which is difficult to perform when other notes are simultaneously performed.

#### *Glissando*
Glissando articulations to connect notes arpeggio horizontal cells containing harmonics are only possible for artificial harmonics. The composer should use a line between notes to indicate that these notes are to be performed glissando.

## Embellishment

*Figure 6.30 Embellishment in arpeggio*

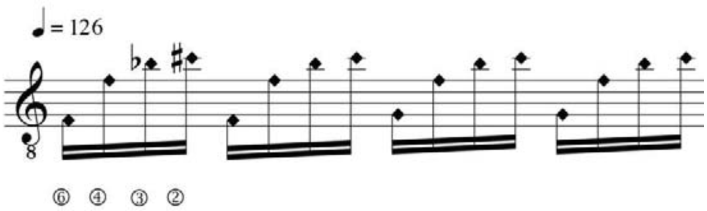



(DUE CANZONI LIDIE, D'ANGELO)

Embellishments in arpeggios containing harmonics can be scored by using trills of natural harmonics over adjacent strings or by using a glissando trill in a slow arpeggio containing artificial harmonics, such as on the last note of Figure 6.30. In this figure, all harmonics are notated as sounding pitches.

## Non-functional writing

*Figure 6.31 Non-functional writing*



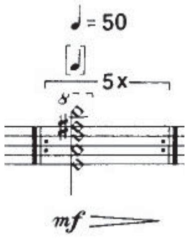

Examples of non-functional writing for arpeggio horizontal cells containing harmonics:

- Rapid arpeggios of artificial harmonics (Figure 6.31)
- Staccato articulation for rapid arpeggios of natural harmonics.

# 6.3.3 Vertical cell sequences

## Design

*Figure 6.32 Vertical cell sequence of harmonics*




(Sequenza XI, Berio)

*Figure 6.33 Vertical cell sequence of harmonics and regular plucked notes*[44]


(Cordoba, Albéniz arr. Williams)

Vertical cell sequences containing harmonics can consist of harmonics alone (Figure 6.32), or of harmonics as well as regular plucked notes (Figure 6.33). Vertical cell sequences consisting of harmonics alone are usually comprised of only natural harmonics, while in the case of vertical cell sequences containing harmonics as well as plucked notes, artificial as well as natural harmonics are used.

## Resonance

Vertical cell sequences of harmonics usually do not last beyond their initial value, since each time a vertical cell is plucked, one or more strings from the previous attack are damped. Vertical cell sequences containing artificial harmonics have less resonance than those containing natural harmonics.

## Harmonic possibilities

The harmonic possibilities of vertical cell sequences consisting of natural harmonics are limited to the vertical combinations possible around the nodal points (see also Appendix B). Harmonic possibilities of vertical cell sequences containing artificial harmonics are not limited by such restrictions: the full regular note and artificial harmonics range can be used.

## Speed

Vertical cell sequences consisting of natural harmonics alone can be scored at moderate speeds. Vertical cell sequences containing artificial harmonics can be scored at slow speeds, as each artificial harmonic requires careful coordination by the performer. Artificial harmonics in the highest pitch range particularly impede speed, as there are little visual clues available to the player to ascertain the correctness of the finger touching the nodal point (Figure 6.33; the top notes of the vertical cells in this image are all played as artificial harmonics).

[44] In this example, Albéniz uses circles to indicate harmonics. The use of circles above notes to indicate harmonics is not ideal, as the circles can be confused for open string fingerings. Moreover, it does not become clear in this example whether the circles are intended for all notes of the vertical cell, some notes, or just one.

## Articulation

Vertical cell sequences containing harmonics can be provided with a variety of articulations, such as arpeggiated attack, legato, accents, staccato, and glissando.

### *Arpeggiated attack*

*Figure 6.34 Arpeggiated chord with harmonic*


(SEQUENZA XI, BERIO)

Vertical cells containing harmonics can be arpeggiated in the same way a vertical cell of regular plucked notes is; in upward (Figure 6.34) or downward direction. The composer should provide a wavy line to indicate that an arpeggiated attack is to be used, accompanied by an arrow in the case of a downward arpeggiation.

### *Legato*

*Figure 6.35 Legato in vertical cell containing harmonics*


(SEQUENZA XI, BERIO)

Vertical cells of natural harmonics can effectively be connected with legato articulation, as such cells give the performer freedom to move along the fretboard without having to stop the string with the left hand, as opposed to vertical cells that contain artificial harmonics. Sequences of different vertical cells containing harmonics that are located close by on the fretboard are easier to perform with legato articulation than vertical cells that are further apart. The composer should use a phrase mark to indicate that vertical cells containing harmonics are to be performed in this manner, as Berio does in Figure 6.35.

### *Accents*

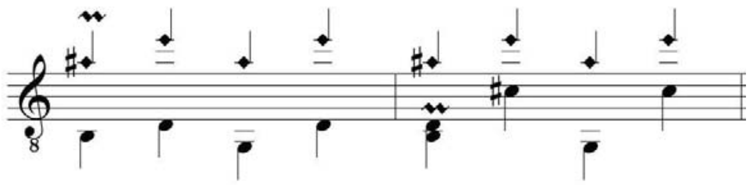
The composer can use accents for vertical cells to make them stand out. When an accent is prescribed for a vertical cell that contains harmonics as well as regular plucked notes, the regular plucked notes will sound louder than the harmonic. The composer should attach an accent mark to a note to prescribe an accent.

### *Glissando*

The composer can prescribe glissando for vertical cells containing artificial harmonics or a combination of artificial harmonics and stopped notes. To this end, a line should be used to connect the notes that are to be performed in this manner.

## Embellishment

*Figure 6.36 Embellishment in vertical cell sequence*



Embellishments of vertical cells can be scored by using a glissando embellishment on an artificial harmonic (first measure of Figure 6.36) or by using an embellishment on a regular plucked note (second measure of Figure 6.36). For the sake of playability, it is most effective to keep the vertical cells relatively thin, as in Figure 6.36.

## Non-functional writing

*Figure 6.37 Non-functional writing*


An example of non-functional writing for vertical cell sequences

- Rapid sequences of vertical cells containing artificial harmonics (Figure 6.37)

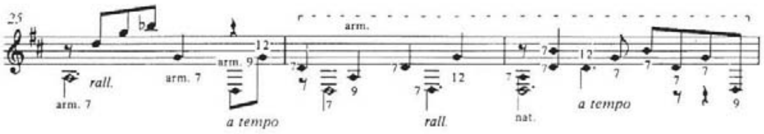
## 6.3.4 Multiple lines

### Design

*Figure 6.38 Harmonics in one voice*

(DUE CANZONI LIDIE, D'ANGELO)

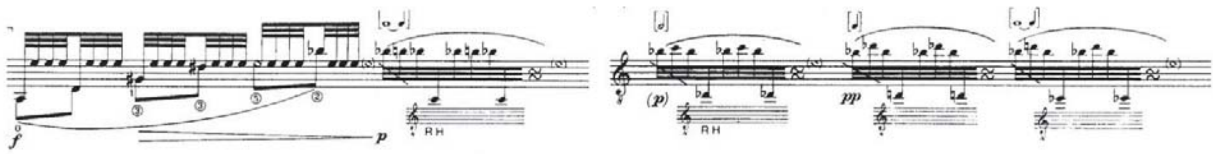
*Figure 6.39 Harmonics in two voices*[45]




(CANÇO DEL LLADRE, LLOBET)

It is possible to create multiple lines when using harmonics. The composer can score harmonics in one voice (Figure 6.38), or in different voices (Figure 6.39). Natural and artificial harmonics work well for the first type, but when the scoring is more complex and harmonics are dispersed over two voices, natural harmonics are most effective. When scoring multiple voices, the composer should clearly notate these as separate voices.

*Figure 6.40 Tremolo and tapping with harmonic resonance*




(SEQUENZA XI, BERIO)

A two-part tremolo horizontal cell of plucked sounds can contain harmonics: Berio uses a harmonic on the resonating, initial note of the p,a,m,i tremolo pattern (Figure 6.40). In a tremolo pattern, the harmonic works best on the note that rings on, which the initial note plucked with p usually does, rather than on the repeated note; this last option would require the finger to continue touching the string lightly on the nodal point, hampering its resonance. It is worth noting that Berio lets the natural harmonic in Figure 6.40 ring on for a total of fourteen beats, while the left hand and right hand are playing a variety of trills (these trills, which include right hand hammering, are discussed in more detail in the chapter on hammered sounds). The example shows the duration potential of natural harmonics even when other actions are simultaneously performed.

[45] See comment on Figure 5.100.

*Figure 6.41 Reinforced harmonics line*[46]


(VARIACIONES SOBRE EL CARNAVAL DE VENECIA, TÁRREGA)

The melodic part of harmonics can be reinforced with an additional note which is played as a regular plucked note (Figure 6.41). Melodic parts consisting of two simultaneously plucked harmonics are only possible when both harmonics are natural harmonics, or when they are artificial harmonics located on adjacent strings with the harmonics sharing the same stopping position of the left hand and the same nodal point. In Figure 6.41, only the notes that are located on top of the melody in thirds are played as harmonics, while the notes that are notated a third below are played as regular plucked notes. The notes all fit within the range of the left hand, and the right hand is used to produce the artificial harmonics.

## Resonance

In multiple-part writing with harmonics, the resonance depends on the way the individual parts are scored. Natural harmonics have longer resonance than artificial harmonics, and do not depend on a finger of the left hand to stop them. Therefore, scoring that contains many artificial harmonics tends to have less notes ringing on beyond their notated value than scoring containing many natural harmonics.

## Harmonic possibilities

Two-part horizontal cells containing harmonics provide much flexibility in pitch choice, particularly in two-part horizontal cells without many additional notes that reinforce one of the parts. The denser the scoring is, the more limited the harmonic possibilities are.

## Speed

When scoring with harmonics, there are two additional elements in comparison to multiple-part writing for regular plucked notes that hamper speed: additional notes that are attached to one or more of the parts, and artificial harmonics. The more these elements are present in scoring, the lower the range of speed. In order to write fast multiple-part passages with harmonics, it is most effective to primarily use natural harmonics and avoid attaching additional notes to the parts, such as the additional notes in Figure 6.41. Tremolo passages that contain harmonics can still be scored at high speeds, if the harmonic is scored as part of the line performed with the thumb, such as in Figure 6.40.

[46] In this example, the composer indicates that the marked pitches should be performed as harmonics, sounding one octave higher. This notation can be confusing for the performer.

## Articulation

Multiple-part horizontal cells containing harmonics can be provided with a variety of articulations, such as legato, accents, staccato and glissando.

### *Legato*

Multiple parts can be scored legato, or one part alone may be scored legato while the other part is not (Figure 6.38).

### *Accents*

Accents can be used in multiple parts or in one part while the other is scored with a different articulation. Note that if a harmonic and a regular plucked note are simultaneously performed with an accent, the regular plucked note will sound much louder.

### *Staccato*

Staccato articulations can be used in multiple parts or in one part while the other is scored with another articulation.

### *Glissando*

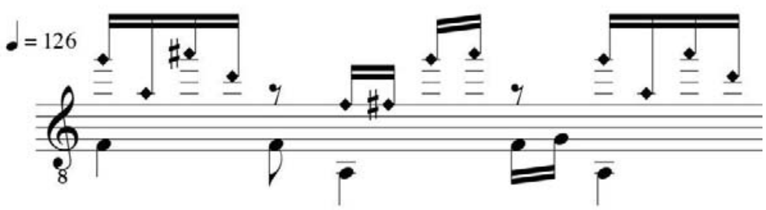
Glissando articulations can be used in multiple parts or in one part while the other is scored with another articulation.

## Embellishment

Embellishments containing harmonics can only be scored as cross-string embellishments, because slurs are not available for harmonics. If an embellishment such as the one pictured in Figure 6.38 is scored, the performance of this embellishment takes up many or all of the fingers of the right hand, depending on the right hand pattern that is used. Therefore, if one uses an embellishment in two-part scoring, it is best to silence one of the parts for the duration of the embellishment that is performed in the other part.

## Non-functional writing

*Figure 6.42 Non-functional writing*




Examples of non-functional writing in multiple-part horizontal cells containing harmonics:

- Rapid passages containing artificial harmonics (Figure 6.42)
- Rapid passages containing additional notes attached to one or more of the parts

- Tremolo passages in which harmonics are scored as repeated notes

# 6.4 Textures

Many of the textures containing natural and artificial harmonics found in the guitar repertoire are combinations of different types of horizontal cells. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 6.4.1 Textures as combinations of horizontal cells

### Melody and accompaniment texture

*Figure 6.43 Melody and accompaniment texture with harmonics*[47]

(EL TESTAMENT D'AMELIA, LLOBET)

An effective texture on the guitar is a melody and accompaniment texture in which the notes in the top melody are scored as harmonics (Figure 6.43). Pieces that contain a melody and accompaniment texture of which the melody is scored in the lower playing positions (the melody of Figure 6.43, for instance, is scored in lower positions; position I to III) lend themselves well to such scoring, as the artificial harmonics can be located by the performer with relative ease. In *El testament d'Amelia*, the composition this texture example originates from, the melody is first scored with regular plucked notes, and later echoed in harmonics. The composer can thus use the alternation of regular plucked notes and harmonics as a structural tool in a composition. Instead of scoring the melody on top, it is also possible to create a texture in which the harmonics melody is located on lower strings. In such case it is still worthwhile to keep the melody scored in the lower positions, as this will facilitate performance. For melody and accompaniment textures containing harmonics in the melody, it is best to keep the bass and accompaniment relatively thin, in order for them not to compete in volume with the melody of harmonics.

[47] See comment on Figure 6.41.

## Texture of contrasting or alternating cells

*Figure 6.44 Two part texture with harmonics alternated with arpeggio*[48]


(INVOCACIÓN Y DANZA, RODRIGO)

In *Invocación y Danza*, Rodrigo alternates a two-part horizontal cell with natural and artificial harmonics in the top voice and regular plucked notes in the bass with arpeggio horizontal cells and embellished vertical cells of regular plucked sounds (Figure 6.44). The harmonics in the top voice are a combination of natural and artificial harmonics. The harmonics motive is scored within the range of the left hand span and in a low position, which makes the correct performance of the artificial harmonics easier to achieve for the guitarist. As the natural harmonics ring on after attack and do not depend on a finger of the left hand to ensure their resonance, the opening measures of this passage are characterized by lush resonance of harmonics. The syncopation of the regular plucked bass notes in the opening measures ensures that the basses do not hinder the sound of the harmonics, as they are played in between the attacks of the harmonics. The *forte* basses of the arpeggios that follow represent a break from the etheric, *pianissimo* sound of resonant melodies of harmonics; Rodrigo does not only create contrast between the sound of harmonics and regular plucked notes, but also uses their differing harmonic potential. After two arpeggiated vertical cells that conclude the intermezzo, the soft-spoken melody of

[48] The use of circles above notes to indicate harmonics is not ideal, as the circles can be confused for open string fingerings. In addition, harmonics are not scored at their sounding pitch in this example.

harmonics returns. This score example demonstrates how the composer can use dynamically appropriate sounds to enhance dynamic contrasts, which in this case means that harmonics are used for soft sections, and regular plucked notes for loud sections.

*Figure 6.45 Mixed texture containing harmonics*


(ALL IN TWILIGHT, TAKEMITSU)

Takemitsu, who makes frequent and widespread use of harmonics in his guitar works, uses a texture in *All in twilight* that alternates arpeggios of harmonics and regular plucked sounds with vertical cell sequences and two-part scoring of plucked sounds (Figure 6.45). In this texture, harmonics are not so much used for creating contrast, but rather as an inherent and natural component of a rich sound world that is intimate, resonant and rapidly fluctuating dynamically between soft and moderately loud. In contrast to the textures of Llobet and Rodrigo that were described earlier, the harmonics do not particularly stand out; regular plucked notes and harmonics are alternated so rapidly, that it is the sound of their entanglement that becomes characteristic for this texture. On the first two lines, harmonics are frequently used to create smooth decrescendos. The *forte* harmonic at the end of the second line is one of the guitar harmonics with the largest dynamic potential: the e in position XII on the sixth string. A frequent occurrence in this texture is the use of vertical cells consisting of both regular plucked notes and harmonics, creating a mixture of the two sounds. In order for such vertical cells to have a balanced sound in terms of dynamics, Takemitsu, appropriately, scores these harmonics in position XII.

*Figure 6.46 Mixed texture containing harmonics*


(DUE CANZONI LIDIE, D'ANGELO)

In the opening page of *Due Canzoni Lidie*, D'Angelo combines two-part writing of harmonics and plucked sounds with vertical cells and single line writing of harmonics and plucked sounds scored over multiple strings (Figure 6.46). Both natural harmonics (diamond shaped notes) and artificial harmonics (rhomboid shaped notes) appear in this example. A scordatura is used: the sixth string is tuned a semitone down to e flat, while the second string is tuned down a semitone to b flat. The scordatura allows D'Angelo to score pitches as natural harmonics that could not have been produced as natural harmonics in standard tuning; the opening b flat, played as a harmonic in position VII on the sixth string, is an example of such a pitch. The frequent use of natural harmonics and regular plucked notes on open strings in combination with the scordatura creates a sonorous sound world characterized by resonance and unusual pitch combinations. Harmonics are dominant in the high range of this score passage, such as on the fourth line of Figure 6.46, where a voice consisting of natural and artificial harmonics sounds against the backdrop of the detuned e flat plucked "*polpastrello*"; with the flesh. At other times, D'Angelo achieves rapid braiding of natural harmonics and regular plucked notes, such as on the opening of the fifth line, where open strings are braided with natural harmonics in position XII. The scoring of all the harmonics in the septuplet on the last line in one position, in this case position XII, facilitates rapid execution by the performer.

## Textures with harmonics as coloristic effect or providers of resonance

See Chapter 5 (Figure 5.100 and Figure 5.102).

## Chapter 7 Rasgueado Sounds

**Contents**

# Chapter 7 Rasgueado Sounds

*Rasgueado* is the designation for a collection of techniques in which the fingers of the right hand make outward movements in addition to inward movements. Although primarily used in flamenco music, rasgueado sounds are also a common feature in classical guitar music, ranging from Baroque guitar music to 21st century compositions. This chapter shows ways in which the composer can handle the characteristics of the rasgueado sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 7.1 Sound

### 7.1.1 Pitch range

For rasgueado sounds, the full range of the guitar can be used (as presented in the chapter on regular plucked sounds), as well as all natural harmonics. In all registers of the rasgueado range, notes are struck with an outward or inward motion of the fingers of the right hand. Unlike plucked sounds, the little finger of the right hand is also used in the performance of rasgueado sounds. In order to indicate that one or more notes are to be played as rasgueados, a verbal instruction should be used, such as “Rasgueado” or “Rasg.”, in addition to arrows designating the direction of attack. If the composer has a particular right hand fingering in mind, this fingering can be provided by using the designation of the individual fingers (c,a,m,i and p).

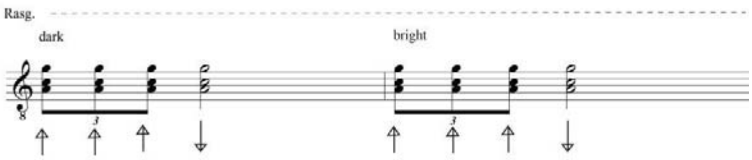
### 7.1.2 Timbre possibilities

#### Attack

The rasgueado sound is in essence a mixture of two sounds: that of the sharp attack of the string with the nail of the right hand, followed by a subsequent ringing of the string. The initial sound of a rasgueados is very sharp, much sharper than that of a regular plucked note, because the fingers of the right hand strike the string with the nail alone and with considerable speed. The outward attack can be performed with more ferocity than the inward attack, as it is a more explosive movement and strikes the string with a greater nail surface.

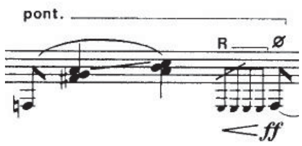
#### Sound color and playing position indications

*Figure 7.1 Rasgueado tone colors*




With the rasgueado sound, it is possible to create different sound colors: when it is performed near the fretboard, the sound is dark and mellow, when it is performed close to the bridge, it has a sharp, bright sound (Figure 7.1).

*Figure 7.2 Ponticello rasgueado*




(SEQUENZA XI, BERIO)

Berio makes use of a ponticello rasgueado in the *Sequenza XI* (Figure 7.2).

## Stopping position

As is the case with regular plucked notes, playing a note from the middle or high range in a high position on a low string changes its sound quality. The composer can specify fingerings if she wishes a note to be performed on a particular string.

## Etouffé

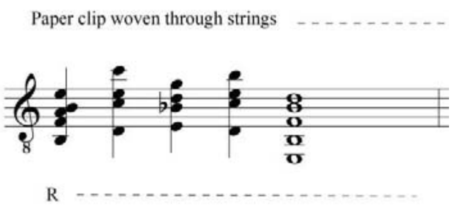
*Figure 7.3 Etouffé rasgueado*


(CINCO PIEZAS, PIAZZOLLA)

The timbre of rasgueado sounds can be changed by muffling. Etouffé rasgueado sounds are performed by striking the strings and simultaneously slightly damping them with the side of the right hand, or by striking the strings with the right hand and damping the strings with the left hand. The second type of etouffé is most effective for rasgueado scoring, as it does not hinder the right hand in performing the rasgueado attacks (Figure 7.3). Sounds scored etouffé have a reduced dynamic range and reduced resonance. Etouffé is indicated with a symbol specified in a legend, or a verbal instruction.

### Prepared guitar

*Figure 7.4 Paper clip preparation*




The timbre of rasgueado sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 7.4). The tighter the object is attached to the strings, the more its vibration is hampered, the more the pitches that are stopped with the fingers of the left hand are changed by the object, and the less clearly the pitch structure of vertical cells can be heard. In the video example of Figure 7.4, the paper clip is tightly woven through the strings. As a result, resonance is short, sounding pitches are lower than those stopped by the left hand, and the pitch structure of the vertical cells cannot be perceived clearly.

## 7.1.3 Dynamic range

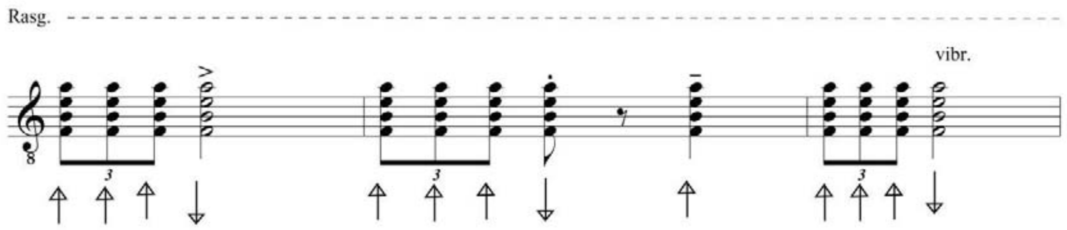
*Figure 7.5 Rasgueado dynamics*


(SEQUENZA XI, BERIO)

Rasgueado chords are among the dynamically strongest sounds that can be performed on the guitar. Due to the speed and force with which the nails strike the string, the rasgueado can reach a high dynamic level, higher than is possible for regular plucked notes. On the other hand, the rasgueado can also be performed at a *pianissimo* level: its dynamic range is thus very wide (Figure 7.5). The more notes present in the vertical rasgueado cell, the larger its dynamic potential.

### 7.1.4 Vibrato

*Figure 7.6 Rasgueado vibrato and articulation*




All rasgueado notes that are stopped with a finger of the left hand can be performed with lateral or vertical vibrato (Figure 7.6).

### 7.1.5 Pitch bends and microtones

Pitch bends for rasgueado notes should be prescribed in the same manner as for regular plucked notes (see section 5.1.5). Microtones can also be prescribed in the same manner: they can be attained through a microtonal scordatura or through bending the string.

## 7.2 Vertical cells

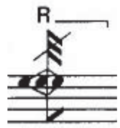
Rasgueado sounds are typically performed as vertical cells, usually as chords consisting of four- to six-note (Figure 7.5, first example), but rasgueado sounds may also consist vertical cells of, for instance, two notes (Figure 7.5, second example). The c sharp unison in the second example of Figure 7.5 is simultaneously performed on the first and the second string.

### 7.2.1 Two-note combinations

When scoring rasgueados, the most effective two-note combinations are those scored on two adjacent strings (Figure 7.5), as they avoid additional noises that are caused by striking damped strings. Because of the large striking motion of the rasgueado technique, the technique is particularly suited to strike multiple notes at once. When performing rasgueados, the guitarist is much less able to discriminate between strings that should be struck and those that should not be struck, when compared to performing regular plucked sounds. Therefore, two-note rasgueados are most effective when scored on either the highest two strings or the lowest two strings, as the risk of striking unwanted strings is lowest there.

### 7.2.2 Vertical cell spacings

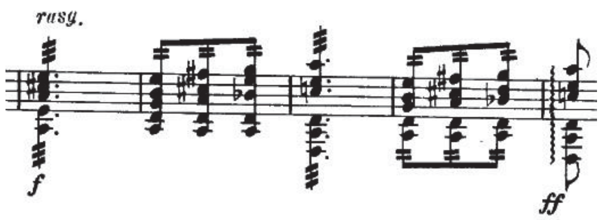
*Figure 7.7 Unison rasgueado cluster*




(SEQUENZA XI, BERIO)

Vertical cells can be scored using narrow spacings, wide spacings, mixed spacings as well as with unisons (Figure 7.7) and clusters.

*Figure 7.8 Rasgueado chord spacings on adjacent strings*




(SONATA, TURINA)

As is the case with two-note combinations, the most effective vertical cell combinations are those scored over adjacent strings (Figure 7.8).

# 7.3 Horizontal cells

Horizontal cells of rasgueado sounds are usually scored as vertical cell sequences, but single line horizontal cells can also be scored. Both types of horizontal cells are discussed in this section.

## 7.3.1 Vertical cell sequences

### Design

Vertical cell sequences of rasgueados are sequences or repetitions of note combinations, usually consisting of three to six notes on adjacent strings (Figure 7.8).

*Figure 7.9 Two staff notation*

(Sevillana, Turina)

In order to allow for space to prescribe a fingering, two staff notation is sometimes used (Figure 7.9). In this example, the top staff is used for the right hand fingering, while the bottom staff is used for pitch notation.

## Resonance

Vertical cells in vertical cells sequences of rasgueados usually do not last beyond their notated value, unless a large interval change is made, which leaves a string unoccupied by the right hand, allowing it to ring on. When vertical cells contain open strings, the degree of resonance increases.

## Harmonic possibilities

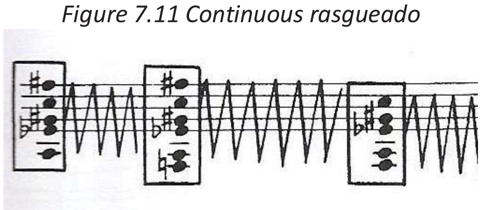
The options for pitch combinations can be examined in Appendix A. As is the case with vertical cell sequences of plucked notes, when a succession of vertical cells of rasgueados is scored with fewer notes, there is more flexibility in the choice possibilities of different pitches and keys than is the case with vertical cells containing many notes. Additionally, since vertical cells of rasgueados are most effective when scored over adjacent strings, having to score vertical cells over adjacent strings limits the options.

## Speed

*Figure 7.10 Continuous rasgueado*

(Sequenza XI, Berio)

*Figure 7.11 Continuous rasgueado*



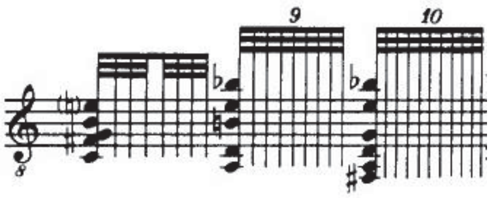
(Tellur, Murail)

Rasgueado cells can be performed at considerable speed, and are among the fastest note sequences possible on the guitar. The continuous striking of the strings with a rasgueado can be performed at such high speeds that it sounds like a continuous, rustling sound (Figure 7.10). Murail uses wavy lines to indicate the relative duration of vertical cells performed with continuous rasgueado (Figure 7.11), an effective way to visually represent the duration of these cells.

## Rhythmic possibilities

Due in part to the percussive quality rasgueado cells derive from the speed and force with which the strings are struck, rasgueados lend themselves well to the performance of a variety of rhythmic patterns.

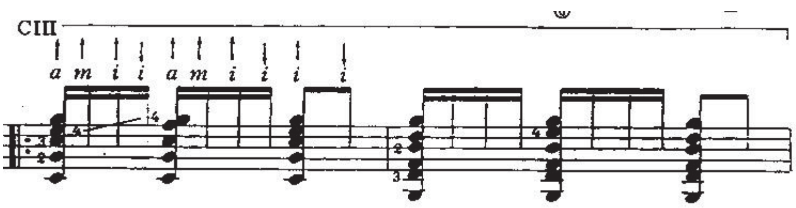
*Figure 7.12 Varying amounts of attacks per beat*




(SEQUENZA XI, BERIO)

The rasgueado can be performed with five fingers of the right hand, which can be used for outward and inward movements. The composer is free in the choice of the amount of times a certain vertical cell should be struck. The performer can strike the vertical cell continuously, and the amount of times per beat that a vertical cell is struck can be varied (Figure 7.12).

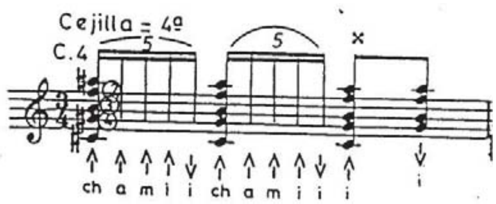
*Figure 7.13 Sixteenth note patterns*




(PIROPO A LA SOLEA, MERENCIANO AND ESCUDERO)

A typical rhythmical pattern used in flamenco is that of sixteenth notes followed by eight notes (Figure 7.13).

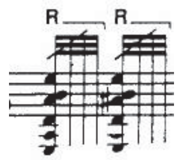
*Figure 7.14 Quintuplet pattern*




(A LA PERLA DE CADIZ, DE LUCÍA)

Such patterns are also effective when scored in triplets (Figure 7.6) or quintuplets (Figure 7.14).

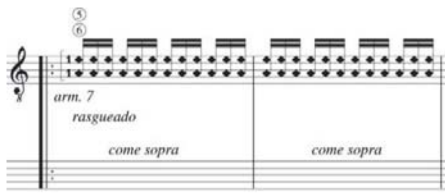
*Figure 7.15 Rapid, short bursts*




(SEQUENZA XI, BERIO)

Vertical cell sequences of rasgueados can also be scored to be performed in a continuous manner (Figure 7.10), or as rapid, short bursts (Figure 7.15).

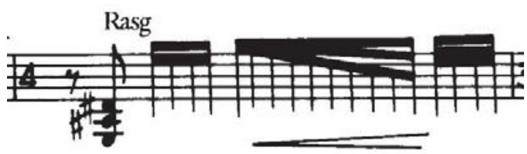
*Figure 7.16 Continuous harmonics rasgueado*




(KOYUNBABA, DOMENICONI)

Domeniconi scores continuous rasgueados of natural harmonics in *Koyunbaba* (Figure 7.16)

*Figure 7.17 Accelerating rasgueado*




(3 PRELUDES POUR "FATUM", CHAYNES)

Because of the high speed that can be reached with the rasgueado, vertical cell sequences of rasgueados lend themselves well to rhythmic acceleration (Figure 7.17) and deceleration.

## Articulation

Vertical cell sequences of rasgueados can be scored with a variety of articulations, such as slurs, legato, accents, staccato and glissando.

### *Slurs*

One or more notes in a vertical sequence of rasgueados can be connected to a subsequent chord or note by means of a slur.

### *Legato*

As is the case with regular plucked notes, sequences of different vertical cells that are located close by on the fretboard are easier to perform legato than vertical cells that are further apart.

### *Accents*

Because of the wide dynamic range of rasgueado, the composer can effectively make a vertical cell stand out with an accent (Figure 7.6). In contrast to vertical cells of plucked notes, it is not possible to make only a specific note from the vertical cell stand out, as the complete cell is struck with the same finger or combination of fingers.

### *Staccato*

A vertical cell sequence can be scored with staccato articulation. In the case of rasgueado, the performer executes the staccato by quickly damping the strings affected by the staccato with the right palm or, in the case of stopped notes, by lifting the fingers after attack (Figure 7.6).

### *Glissando*

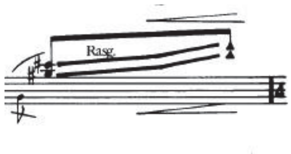
A vertical cell sequence can be scored with three types of glissando. The first type is the glissando that is performed after striking the vertical cell, in the same way a glissando may be performed after a note or vertical cell is plucked in the case of regular plucked notes.

*Figure 7.18 Rasgueado glissando*


(SEQUENZA XI, BERIO)

The second type of glissando is performed while the rasgueado is still being executed (Figure 7.18).

*Figure 7.19 Ascending rasgueado glissando to undefined pitches*




(3 PRELUDES POUR "FATUM", CHAYNES)

Chaynes scores an ascending rasgueado glissando of a two-note vertical cell to two high, undefined pitches (Figure 7.19).

Additionally, vertical cell sequences of rasgueado notes can be scored with a tuning key glissando. With such a glissando, only one string can be detuned at a time.

## Embellishment

Embellishments can be employed in vertical cell sequences of rasgueado sounds by attaching a left hand trill to one of the notes in a vertical cell. The rasgueado, which is performed with the right hand, can continue while the left hand performs the embellishment.

## Non-functional writing

*Figure 7.20 Non-functional writing*


Examples of non-functional writing in vertical cell sequences of rasgueado sounds:

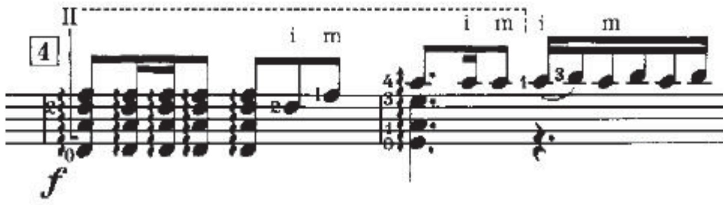
- Sequences of vertical cells scored over non-adjacent strings (Figure 7.20)
- Sequences of vertical cells that contain vertical cells that lie outside the hand span

## Combinations with other sounds

In the classical guitar literature, vertical cell sequences of rasgueado sounds are often scored in close conjunction with other sounds. In this section, common combinations from the literature are discussed.

*Vertical rasgueado cell sequence alternated with single line of regular plucked sounds*

*Figure 7.21 Rasgueado and single line of plucked notes*

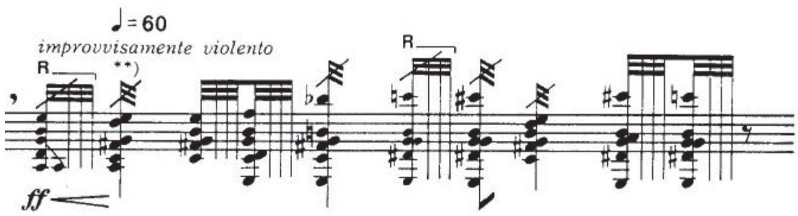



(CONCIERTO DE ARANJUEZ, RODRIGO)

Vertical rasgueado cell sequences and single plucked lines can be connected and alternated at a moderately high speed, as the above example shows (Figure 7.21). This example also demonstrates the approximate maximum speed at which these two sounds can be alternated.

*Vertical rasgueado cell sequence alternated with strummed sounds*

*Figure 7.22 Rasgueado and strumming*

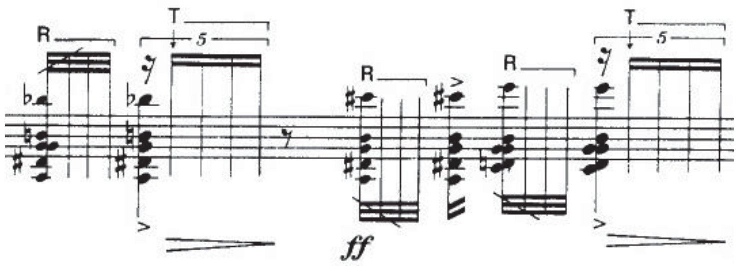



(SEQUENZA XI, BERIO)

Vertical rasgueado cell sequences and vertical strummed cell sequences can be connected at high speeds with virtually no time necessary in alternating between these two sounds (Figure 7.22).

*Vertical rasgueado cell sequence alternated with tambora sounds*

*Figure 7.23 Rasgueado and tambora*




(SEQUENZA XI, BERIO)

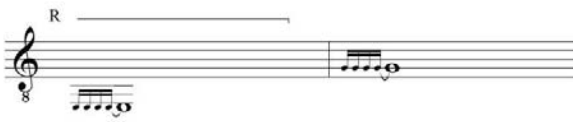
Vertical rasgueado cell sequences and vertical tambora[49] cell sequences can be connected at high speeds with little time necessary in alternating between the two sounds (Figure 7.23). This example demonstrates the approximate maximum playable speed for such an alternation.

## 7.3.2 Single lines

### Design

A single line horizontal rasgueado cell is a succession of single rasgueado notes. Because of the large movement that is used to produce a rasgueado, it takes a high degree of coordination to perform a single line rasgueado. Single line rasgueados are easiest to perform on the sixth string, while much more difficult to perform effectively on other strings. This is because there are no strings below the sixth string that make an accurate attack difficult to achieve.

*Figure 7.24 Single line rasgueado and tremolo*




When the composer wishes to score a rasgueado on another string, it is more effective to opt for a tremolo instead, as the resulting sound is quite similar (Figure 7.24). Single line rasgueados are relatively rare in the guitar repertoire.

### Resonance

Passages of single line horizontal cells of rasgueado sounds scored on the sixth string do not ring on after their notated value when followed by another note, as they are scored on the same string.

[49] Tambora sounds emerge when the strings are struck in a percussive manner. Tambora sounds are discussed in more detail in Chapter 10.

## Harmonic possibilities

The pitch choice possibilities of single line horizontal cells of rasgueado sounds scored on the sixth string are limited to the pitches on the sixth string.

## Speed

As is the case with vertical rasgueado cell sequences, single line horizontal cells of rasgueado sounds can be performed at considerable speed.

## Rhythmical possibilities, Articulation, Embellishment

See appropriate section in "vertical cell sequences".

## Non-functional writing

*Figure 7.25 Non-functional writing*


Example of non-functional writing:

- Single line rasgueados scored on strings other than the sixth string (Figure 7.25)

## Combinations with other sounds

*Figure 7.26 Rasgueado followed by Bartok pizzicato*


(SEQUENZA XI, BERIO)

In the *Sequenza XI*, Berio uses a single line rasgueado followed by a Bartok pizzicato. The change from a single line rasgueado to a Bartok pizzicato on the same string can be performed at a high speed and virtually without delay (Figure 7.26).

# 7.4 Textures

Many of the textures containing rasgueado sounds found in the guitar repertoire are combinations of different types of horizontal cells. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 7.4.1 Textures as combinations of horizontal cells

### Rasgueado and strumming texture

*Figure 7.27 Rasgueado and strumming*


(Tres Piezas Españolas, Rodrigo)

Rodrigo uses a rasgueado and strumming texture in the second movement of his *Tres Piezas Españolas* (Figure 7.27). The percussive quality of the rasgueado is used here to create a rhythmical flow, and the rasgueado is ideally suited for the performance of the rapid vertical cell repetitions in 32nd notes and in triplets of 16th notes. As one of the loudest guitar sounds, the rasgueado helps to reinforce the *fortissimo* dynamics of the passage. The direction in which the rasgueado should be performed and the manner in which rasgueado and strumming are to be alternated, are not indicated in the score, leaving the execution to the discretion of the performer. It is advisable to specify how rasgueados are to be performed, either in the score or outlined in a performance note preceding the score, in order to clearly inform the performer of the composer's intentions.

### Rasgueado, strumming and single line plucking texture

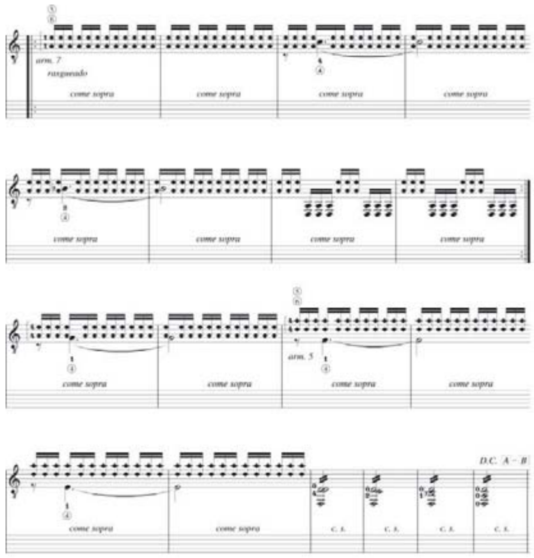
*Figure 7.28 Rasgueado, strumming and single line plucking in Berio*


(SEQUENZA XI, BERIO)

Berio combines rasgueado patterns and alternates them with a variety of strumming patterns and single line plucking (Figure 7.28). The rasgueado is employed here as an aggressive and, through its irregular rhythmic values, unpredictable force. The use of open strings in the vertical cells, as well as the dense and dissonant spacing against stopped notes, makes very loud performance of these rasgueados possible. The rasgueado sections are contrasted with more gentle passages of single line regular plucking. Rasgueado and regular plucking are juxtaposed in terms of color, dynamics and character. Although the direction of each rasgueado is not specified in the score, Berio does include instructions on the fingering of rasgueados in the performance notes of the piece.

## Harmonics rasgueado and regular note rasgueado texture

*Figure 7.29 Harmonics and regular note rasgueado*




(KOYUNBABA, DOMENICONI)

Domeniconi uses a texture that includes harmonics rasgueado, combined with regular rasgueado notes that ring on, and vertical cell sequences of regular note rasgueados (Figure 7.29). The harmonics are here, unusually, used as a continuous, rustling sound; the fact that the left hand continuously damps the harmonics gives this section its characteristic, faintly muffled sound. The temporary extension of the vertical cell of two natural harmonics with a third, non-harmonic note in the third measure (as well as at later occasions in the example) results in a clever combination of colors, especially because this note continues to ring on as the harmonic rasgueado continues. Further adding to the diversity of tone colors is the alternation of harmonics and regular notes. These alternations are easily performed by the player, as they consist of harmonics in position XII and open strings.

## Chapter 8 Strummed Sounds

**Contents**

# Chapter 8 Strummed Sounds

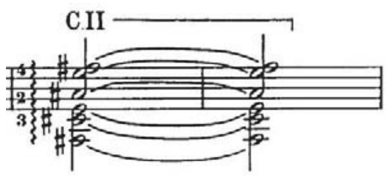
Strummed sounds materialize when one or more strings are struck in an outward motion or in a combination of an outward and inward motion with one or more fingers of the right hand. During the outward motion, the strings are stuck with the nail of the finger, while during the inward motion the strings are struck with a combination of the nail and the flesh. Strummed sounds are similar to rasgueado sounds, but are less percussive. This chapter shows ways in which the composer can handle the characteristics of the strummed sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 8.1 Sound

### 8.1.1 Pitch range

For strummed sounds, the full range of the guitar can be used, as well as all natural harmonics. In all registers of the strummed sounds range, notes are struck with an outward or inward motion of the fingers of the right hand, usually finger i or p.

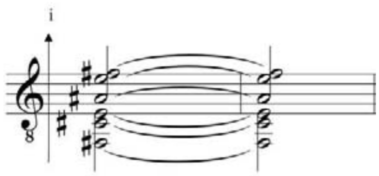
*Figure 8.1 Arpeggiated chord*




(SONATA, JOSÉ)

Guitarists often use the strumming of a chord as an alternative for a plucked attack or a plucked arpeggiated attack, usually when the notes that make up the chord are scored over adjacent strings. In practice, therefore, Figure 8.1 may thus be performed as a strummed chord or a plucked arpeggiated chord, depending on the preferences of the performer.

*Figure 8.2 Strummed chord notation*



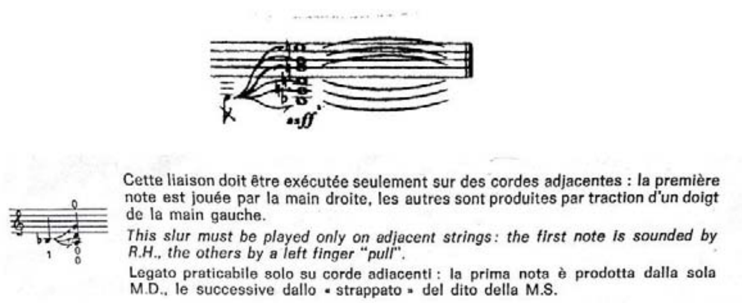
When the composer wishes to have a chord performed in a strummed manner, an arrow indicating the direction of the strum should be used (Figure 8.2), or a verbal instruction such as "strumming", ideally accompanied by arrows indicating the direction of attack. In many scores, strumming is not explicitly prescribed by the composer, but rather used by the performer as a way to play vertical cells with more dynamic emphasis (Figure 8.40), as way to be able to play rapid and loud successions of vertical cell sequences, and to perform extremely fast sequences of notes that are scored over adjacent strings (Figure 8.38).

## 8.1.2 Timbre possibilities

### Attack

The sound of strummed notes or chords is characterized by the combination of the nails of the fingers clicking against the strings and the resonance of the strings. The sound is quite similar to that of the rasgueado, as in both cases outward and inward strokes of the right hand are alternated. The clicking sound is discernible in outward and inward strokes, and is more audible when the attack is executed with force. In strumming, the alternation of two strumming directions is always discernible; in rasgueado the strumming directions do not always have to alternate because of the amount of fingers that are available for striking the strings. Furthermore, strummed attacks generally sound less percussive than rasgueado attacks.

*Figure 8.3 Left hand strumming*

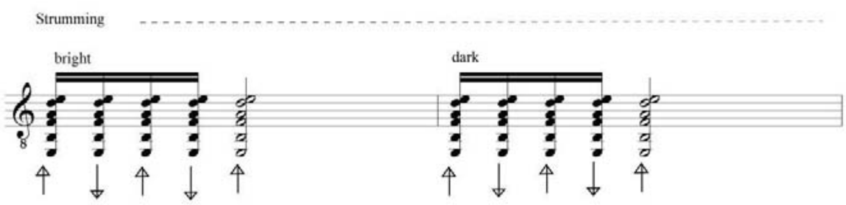



(DUE CANZONI LIDIE, D'ANGELO)

On rare occasions, the strings are strummed with a finger of the left hand, creating a more mellow sound as the strings are attacked with the flesh. In this case, a vertical cell of adjacent open strings is usually scored (Figure 8.3), as it is difficult to strum and stop strings with the left hand alone at the same time.

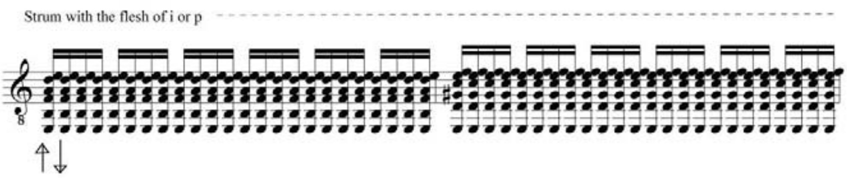
### Sound color and playing position indications

*Figure 8.4 Strummed sound tone colors*




It is possible to change the tone color of strummed notes by plucking them in the ponticello area or the tasto area (Figure 8.4).

*Figure 8.5 Strumming with the flesh*



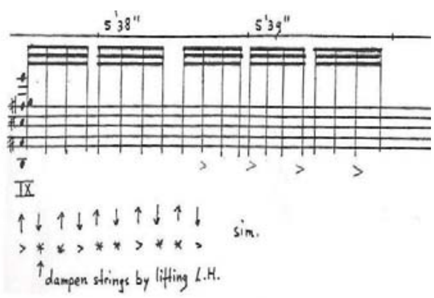

The tone color of strummed sounds can also be changed by asking for a flesh sound. In this case, the performer strums the chord with the flesh of the thumb or the index finger alone, creating a soft and dark sound (Figure 8.5).

## Stopping position

As is the case with regular plucked notes, stopping a note from the middle or high range in a high position on a low string while strumming changes its sound quality. The composer should specify fingerings if she wishes a note to be performed on a particular string.

## Etouffé

*Figure 8.6 Etouffé strumming*

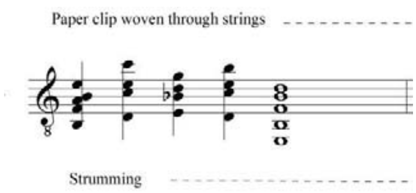



(AUBURN, V/D AA)

The timbre of strummed sounds can be changed by muffling. Etouffé strummed sounds are performed by striking the strings and simultaneously slightly damping the strings with the side of the right hand, or by striking the strings with the right hand and damping the strings with the left hand. The second type of etouffé is most effective when scoring strummed sounds, as it does not hinder the right hand in making the strummed attacks (Figure 8.6). Sounds scored etouffé have a reduced dynamic range and reduced resonance.

### Prepared guitar

*Figure 8.7 Paper clip preparation*



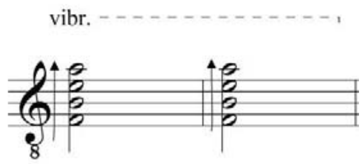

The timbre of strummed sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 8.7). A paper clip, for instance, can be woven through the strings in such a way that some strings are more closely restrained by the paper clip than other strings. This is the case in the video example of Figure 8.7. Those strings that are more restrained by the paper clip are less audible and more transformed in sound color and pitch. Strings that are not touched as closely by the paper clip, on the other hand, are somewhat muffled by the paper clip, but are less transformed by the object and remain closer to their original, non-prepared tone color and pitch.

## 8.1.3 Dynamic range

Strummed vertical cells are among the dynamically strongest sounds that can be performed on the guitar. Because of the speed of the strumming movement and the possibility to push the string far into the direction of the soundboard, strummed notes can reach a high dynamic level, higher than is possible for regular plucked notes. Strummed chords can also be performed at *pianissimo* levels, which is particularly effective if performed with the flesh. This is the case for both inward and outward strumming. The dynamic range of strummed sounds is thus very wide. The more notes present in the vertical strummed cell, the larger its dynamic potential.

## 8.1.4 Vibrato

*Figure 8.8 Vibrato*




All strummed notes that are stopped with a finger of the left hand can be performed with lateral or vertical vibrato (Figure 8.8).

### 8.1.5 Pitch bends and microtones

Pitch bends for strummed notes are to be prescribed in the same manner as for regular plucked notes. Microtones are also prescribed in the same manner: they are attained through a microtonal scordatura or through bending the string.

## 8.2 Vertical cells

Strummed sounds are typically performed as vertical cells, usually as chords consisting of four-to six notes. Two- and three-note combinations are also possible.

### 8.2.1 Two-note combinations

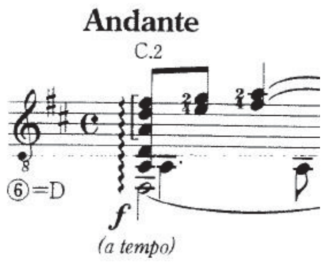
*Figure 8.9 Two-note vertical cells on adjacent strings*


(INTRODUCTION, PASSACAGLIA AND FUGUE, BOGDANOVIĆ)

When scoring strummed sounds, the most effective two-note combinations are those scored on two adjacent strings (Figure 8.9), as they avoid additional noises caused by striking damped strings. More so than the rasgueado technique, the strumming technique allows the performer to have good coordination over strings other than the highest and the lowest two strings; two-note combinations can therefore be scored effectively over all adjacent string combinations.

## 8.2.2 Chord spacings

*Figure 8.10 Vertical six-note cell*




(SONATINA, MORENO-TORROBA)

Vertical cells can be scored using narrow spacings, wide spacings, mixed spacings, as well as with unisons and clusters. As is the case with two-note combinations, the most effective vertical cell combinations are those scored over adjacent strings (Figure 8.10). Figure 8.10 is an example of a vertical cell for which strumming is not specified, but is often used in practice instead of a plucked attack, as it allows the performer the create a particularly smooth attack over six strings.

# 8.3 Horizontal cells

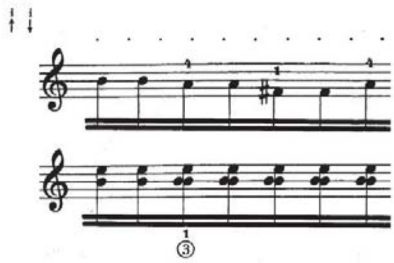
Strummed sounds can be scored into three types of horizontal cells: vertical cell sequences, arpeggiated strums and single string strumming. In this section, these three types are discussed.

## 8.3.1 Vertical cell sequences

### Design

Vertical cell sequences of strummed sounds are sequences or repetitions of note combinations, usually consisting of two to six notes on adjacent strings.

*Figure 8.11 Two-staff notation*



(INTRODUCTION, PASSACAGLIA AND FUGUE, BOGDANOVIĆ)

Two-staff notation is a useful way to demonstrate the distinction between the different voices present in a vertical cell sequence (Figure 8.11).

## Resonance

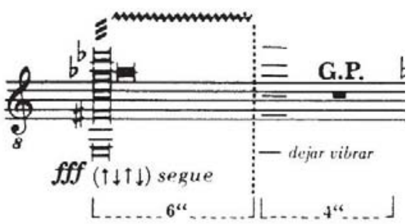
Vertical cells in strummed vertical cell sequences usually do not last beyond their notated value, unless a large interval change is made, which leaves a string unoccupied by the right hand, allowing it to ring on. When vertical cells contain open strings, the degree of resonance increases.

## Harmonic possibilities

The options for pitch combinations can be examined in Appendix A. As is the case with vertical cell sequences of plucked sounds and rasgueado sounds, when a succession of vertical cells of strummed sounds is scored with fewer notes, the choice possibilities of different pitches and keys is greater than is the case with vertical cells containing many notes. Additionally, as vertical cells of strummed sounds are most effective when scored over adjacent strings, having to score vertical cells over adjacent strings limits the options.

## Speed

*Figure 8.12 Strummed vertical cell speed*




(CANTICUM, BROUWER)

Strummed cells can be performed at considerable speeds, and are among the fastest note sequences possible on the guitar. Professional guitarists are able to play vertical cell sequences of strummed sounds of sixteenth notes at an approximate maximum quarter note speed of 140-170 BPM.

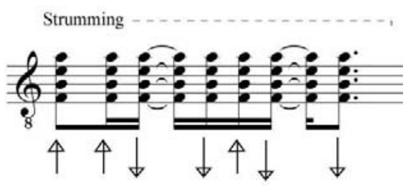
## Rhythmic possibilities

*Figure 8.13 Upward and downward strumming*


(SEQUENZA XI, BERIO)

When using upward and downward strumming, the rhythm of the strumming sequence is characterized by an alternation of the two different strumming directions (Figure 8.13). In comparison, rasgueado offers more possibilities for rhythmic variation in the strumming pattern, as it allows for attack with multiple fingers, rather than two alternating strumming directions.

*Figure 8.14 Syncopated strumming*




Scoring syncopated patterns of strummed vertical cell sequences evades the clear impression of up-and-down strumming, as syncopates rhythms can be performed in a way that makes up-and-down strums alternate with strums in the same direction (Figure 8.14). As is the case for vertical cell sequences of rasgueado sounds, vertical cell sequences of strummed sounds lend themselves well to rhythmic acceleration because of the high speed that can be reached with strumming.

## Articulation

Vertical cell sequences of strummed sounds can be scored with a variety of articulations, such as slurs, legato, accents, staccato and glissando.

### *Slurs*

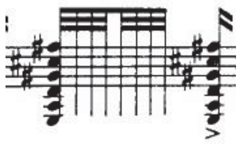
One or more notes in a vertical sequence of strummed sounds can be connected to a subsequent chord or note by means of a slur. The condition here is that the slurred notes lie within the left hand span.

### *Legato*

As is the case with regular plucked notes and rasgueados, sequences of different vertical cells that are located close by on the fretboard are easier to perform legato than vertical cells that are further apart. The composer should use a phrase mark to indicate that vertical cells are to be performed legato.

### *Accents*

*Figure 8.15 Accented strummed chord*

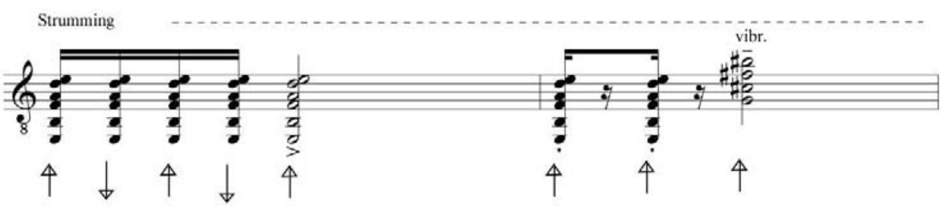


(Sequenza XI, Berio)

Because of the wide dynamic range of strummed sounds, the composer can effectively make a vertical cell stand out with an accent (Figure 8.15). In contrast to vertical cells of plucked notes, it is not possible to make only a specific note from the vertical cell stand out, as the complete cell is struck with the same finger.

### *Staccato*

*Figure 8.16 Vertical cell articulation*




Vertical cells sequences can be scored with staccato articulation. In the case of strumming, the performer executes these by quickly damping the strings affected by the staccato with the right palm (Figure 8.16) or, in the case of stopped notes, by lifting the fingers after attack.

### *Glissando*

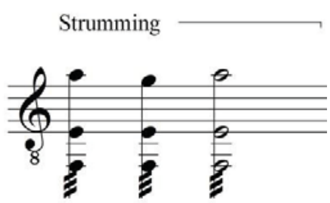
Vertical cell sequences of strummed sounds can be scored with three types of glissando. The first type is the glissando that is performed after striking the vertical cell, in the same way a glissando can be performed after a note or vertical cell is plucked in the case of regular plucked notes. The second type is a glissando that is performed while the strumming is still being executed. Additionally, vertical cell sequences of strummed notes can be scored with a tuning key glissando. With such a glissando, only one string can be detuned at a time.

## Embellishment

Embellishments can be employed in vertical cell sequences by attaching a left hand trill to one of the notes in a vertical cell. The strumming, which is performed with the right hand, can continue while the left hand performs the embellishment.

## Non-functional writing

*Figure 8.17 Non-functional writing*




Examples of non-functional writing in vertical cell sequences of strummed sounds:

- Sequences of vertical cells scored over non-adjacent strings (Figure 8.17)
- Sequences of vertical cells that contain vertical cells that lie outside the hand span

## Combinations with other sounds

In the classical guitar literature, vertical cell sequences of strummed sounds are often scored in close conjunction with other sounds. In this section, common combinations from the literature are discussed.

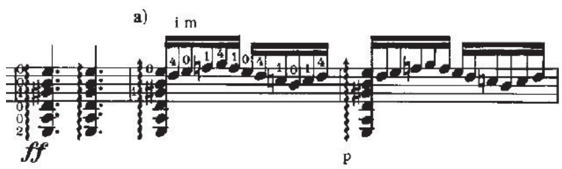
### *Vertical cell alternated with single line of plucked notes*

*Figure 8.18 Strumming and plucked single line*


(SONATINA MERIDIONAL, PONCE)

A cell combination that often appears in the repertoire is that of strummed vertical cell sequences alternated with single line horizontal cells of plucked sounds (Figure 8.18). Figure 8.18 is an example of a vertical cell for which strumming is not prescribed, but is often used in practice instead of a plucking. In this case, the advantage of using strummed chords instead of plucked chords is that strumming can be performed at a higher dynamic level.

*Figure 8.19 Strumming rapidly alternated with single line plucking*




(CONCIERTO DE ARANJUEZ, RODRIGO)

The performer needs some time to change from strumming to playing; Figure 8.18 demonstrates the approximate maximum speed for such an alternation.

### *Vertical rasgueado cell sequence alternated with strumming*

See Chapter 7

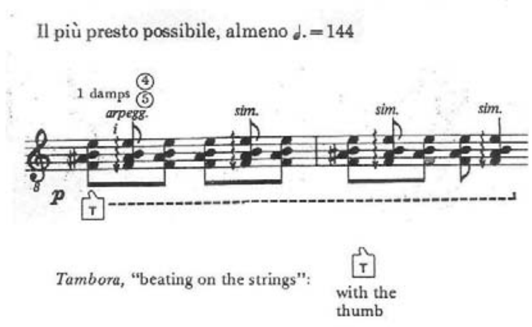
### *Vertical strummed sound sequence alternated with tambora*

*Figure 8.20 Strumming and tambora*

(SEQUENZA XI, BERIO)

Vertical cell sequences of strummed sounds and vertical tambora cell sequences can be connected at high speeds with little time necessary in alternating between these two sounds (Figure 8.20).

*Figure 8.21 Strumming and tambora*



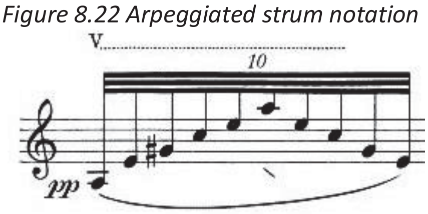

(SONATA, GINASTERA)

Figure 8.21 demonstrates the approximate maximum playable speed for such an alternation.

## 8.3.2 Arpeggiated strums

### Design

*Figure 8.22 Arpeggiated strum notation*




(TRES PIEZAS ESPAÑOLAS, RODRIGO)

*Figure 8.23 Arpeggiated strum notation*


(CUEVA DEL GATO, DE LUCÍA)

Arpeggiated strums are vertical cells that are arpeggiated by strumming the cell in upward and/or downward direction. Although strums in fact always arpeggiate a vertical cell at very high speeds, this arpeggiation is often hardly audible, or not audible at all because of its high speed. When the speed of the arpeggiated strum is lowered, the succession of notes that are arpeggiated becomes apparent. The arpeggiated strum is usually performed by strumming in an upward direction with one finger, and in a downward direction with another finger. Alternatively, the upward direction can be performed as an arpeggiated plucked chord, and the downward direction as a strummed chord. The arpeggiated strum is usually performed over five or six strings (Figure 8.22, Figure 8.23).

*Figure 8.24 Arpeggiated strum of natural harmonics*[50]


(HOMENAJE, FALLA)

An arpeggiated strum can also be performed over natural harmonics, in upward direction, downward direction (Figure 8.24) or both. If performed only in downward direction, an arpeggio strum of natural harmonics can be performed with the right hand alone, leaving the left hand free to produce other sounds, for instance a percussive sound or a left hand hammered sound.
The arpeggiated strum should be written out rhythmically (Figure 8.22) or indicated with a symbol, such as the arrow in Figure 8.23.

## Resonance

Arpeggiated strums are similar to plucked arpeggios in the sense that most notes ring on beyond their notated value, unless it is explicitly specified that notes should be damped after plucking. Because of the high speed at which an arpeggiated strum may be performed, the notes in the arpeggiated strum, as in Figure 8.22 for instance, can only be damped at the end of the strum.

## Harmonic possibilities

The harmonic possibilities of arpeggiated strums are derived from the possibilities to form vertical cells. Scoring arpeggiated strums in higher registers has as its consequence that a more limited amount of bass notes is available.

## Speed

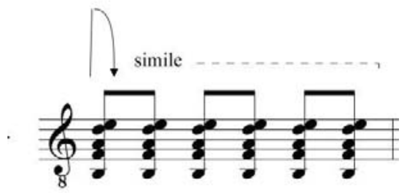
*Figure 8.25 Rapid arpeggiated strum*


(SEQUENZA XI, BERIO)

[50] In this example, the composer does not indicate the sounding pitch of natural harmonics, but instead notates the open string pitch and indicates the position in which the finger should touch the nodal point. This notation can be confusing for the performer. Therefore, the composer should notate the sounding pitch instead, and use diamond shaped noteheads to signal that the note is a harmonic (see section 6.1.1).

When one considers the potential speed with which notes that make up the vertical cell follow one another, the arpeggiated strum can be performed at very high speeds. This speed becomes most apparent in the notation used in Figure 8.22 and Figure 8.25. The use of an arpeggiated strum is not explicitly specified in Figure 8.25. However, Berio wants the notes to be performed as fast as possible, and the arpeggiated strum allows for the fastest performance if this passage.

*Figure 8.26 Vertical cell sequence of arpeggiated strums*




When one considers a vertical cell sequence of arpeggiated strums, the notes which make up the vertical cells follow one another at high speeds, but the vertical cells themselves consequently can only follow one another at a lower speed level, as the arpeggiated strum first has to be completed before the next vertical cell can be performed (Figure 8.26).

## Rhythmic possibilities

*Figure 8.27 Acceleration and deceleration*


The advantage of the arpeggiated strum over arpeggios is that it can be performed not only at higher speeds, but also that the speed with which the arpeggiated strum is performed can easily be controlled and altered. For this reason, arpeggiated strums lend themselves well to rhythmic acceleration and deceleration (Figure 8.27).

## Articulation

Arpeggiated strums can be scored with a variety of articulations, such as slurs, legato, accents, staccato and glissando.

### Slurs

*Figure 8.28 Slur in arpeggiated strum*

One or more notes in an arpeggiated strum can be connected to a subsequent chord or note by means of a slur (Figure 8.28). Due to the speed of the strum, the performance of Figure 8.28 in practice results in the sounding of the slur during the strumming of notes that follow the slur.

### Legato

As is the case with regular plucked notes, sequences of different vertical cells that are located close by on the fretboard are easier to perform with legato articulation than vertical cells that are further apart. The composer should use a phrase mark to indicate that a succession of arpeggiated strums is to be performed legato.

### Accents

Because of the wide dynamic range of strummed sounds, the composer can effectively make an arpeggiated strum stand out from other arpeggiated strums with an accent.

*Figure 8.29 Accent in arpeggiated strum*

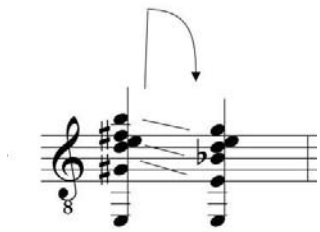
Additionally, it is possible to accent specific notes in the arpeggiated strum itself. This works well when applied to either the pitch on the lowest string or the highest string (Figure 8.29) of the arpeggiated strum, as these can be most effectively and distinctively accented by the performer using the strumming movement, without mistakenly applying the accent to other strings.

### Staccato

Because arpeggiated attacks stretch the length of a vertical cell rather than shortening it, staccato is not possible for the arpeggiated strum as a whole. It is, however, possible for the last note of the strum.

### *Glissando*

*Figure 8.30 Glissando in arpeggiated strum*



Arpeggiated strums can be scored with three types of glissando. The first type is the glissando that is performed after executing the strum. The second type of glissando consists of a glissando that is performed while the arpeggiated strum is still being performed (Figure 8.30). Additionally, arpeggiated strums notes can be scored with a tuning key glissando. With such a glissando, only one string can be detuned at a time.

### Embellishment

Embellishments can be employed in arpeggiated strums by attaching a left hand trill to one of the notes in a vertical cell. As strumming is performed with the right hand, this raises the possibility to have the left hand perform embellishments.

### Non-functional writing

*Figure 8.31 Non-functional writing*


Examples of non-functional writing in arpeggiated strums:

- Using staccato articulations on individual notes inside a rapid arpeggiated strum (Figure 8.31)
- Arpeggiated strums of notes that lie outside the hand span

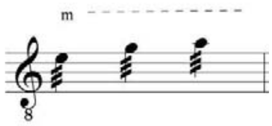
### Combinations with other sounds

Arpeggiated strums are often used in a longer sequence of strums, as will be described in the texture section of this chapter, or as a special way of performing a vertical cell. When the arpeggiated strum comes after plucked sounds, it can be switched to at a relatively high speed, as it is easy to bring the hand into strumming position (Figure 8.23). The other way around, when the plucked sounds follow the arpeggiated strum, some preparation time is needed, as the arpeggiated strum brings the hand outside of its regular plucking position.

### 8.3.3 Single string strumming

#### Design

*Figure 8.32 Single string strumming*




When applied to a single string, strumming is an alternation of an outward attack and an inward, plucked attack. Rather than the sound of nails clicking against the strings that is characteristic for strummed vertical cells, single string strumming rather sounds like a quick note succession. Single note strums should be notated as single tremolo lines with a verbal indication as to how they are to be performed. Single string strums are relatively rare in the repertoire, as they are difficult to coordinate. An alternative for single string strumming are single string tremolos.

#### Resonance

Sounds in a single string horizontal cell of strummed sounds usually do not ring on beyond their notated value when scored on the same string or when they jump to an adjacent string, because the strumming finger can easily touch the previous string, damping its resonance. In the case of larger interval jumps to a non-adjacent string, the strummed notes can ring on beyond their notated value when the previous string is left unoccupied.

#### Speed

The strumming motion on one string is a rapid movement: notes in single string strumming can thus be performed at high speeds (Figure 8.32).

#### Rhythmical possibilities

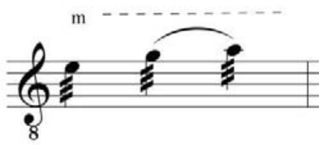
When using upward and downward strumming, the rhythm of the strumming sequence is characterized by an alternation of the two different strumming directions, as is the case when strumming vertical cell sequences. Because of the high speeds that may be reached with this technique, single string strumming lends itself well to acceleration and deceleration.

## Articulation

Single lines of strummed sounds can be scored with a variety of articulations, such as slurs, legato, accents, staccato and glissando.

### *Slurs*

*Figure 8.33 Slur in single string strumming*



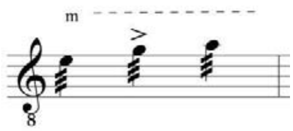

One or more notes in a sequence of single string strums can be connected to a subsequent note by means of a slur (Figure 8.33). Condition is that the connected notes lie within the hand span.

### *Legato*

As is the case with regular plucked notes, sequences of single line strumming of notes that are located close by on the fretboard are easier to perform legato than sequences of notes that are further apart. The composer should use a phrase mark to indicate that a sequence of single line strumming is to be performed legato.

### *Accents*

*Figure 8.34 Accent in single string strumming*




Because of the wide dynamic range of strumming, the composer can effectively make a note in single line of strummed sounds stand out with and accent (Figure 8.34).

### *Staccato*

Single string strumming can be scored with staccato articulation. The performer executes the staccato by quickly damping the strings affected by the staccato with the right palm or, in the case of a stopped note, by lifting the stopping finger after attack.

### *Glissando*

Vertical cells can be scored with three types of glissando. The first type is the glissando that is performed after striking the note. The second type is a glissando that is performed while the strumming is still being performed. Additionally, single lines of strummed notes can be scored with a tuning key glissando. With such a glissando, only one string can be detuned at a time.

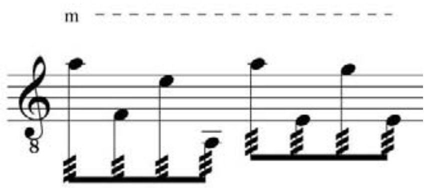
## Embellishment

*Figure 8.35 Single string strum with left hand trill*


Embellishments can be employed in vertical cell sequences by attaching a left hand trill to one of the notes in a vertical cell (Figure 8.35). In the case of a string change, the left hand can continue performing an embellishment on the initial string, while the right hand performs the strumming attack on another string.

## Non-functional writing

*Figure 8.36 Non-functional writing*

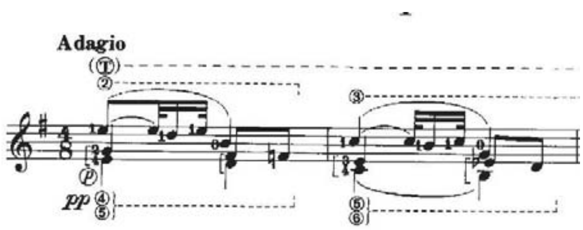



An example of non-functional writing for single string strumming:

- Rapid jumps from one string to another string (Figure 8.36)

## Combinations with other sounds

*Figure 8.37 Single string strumming*




(From the new world, Dvořák arr. Yamashita)

Single string strumming can be combined with plucked bass notes and accompaniment. This type of writing is effective, but difficult for the performer when it is involves simultaneous performance of a vertical plucked cells and single line strumming (Figure 8.37).

# 8.4 Textures

In the guitar repertoire both continuations and combinations of different horizontal cells containing strummed sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 8.4.1 Textures as continuations of horizontal cells

### Arpeggiated strum texture

*Figure 8.38 Arpeggiated strum texture*

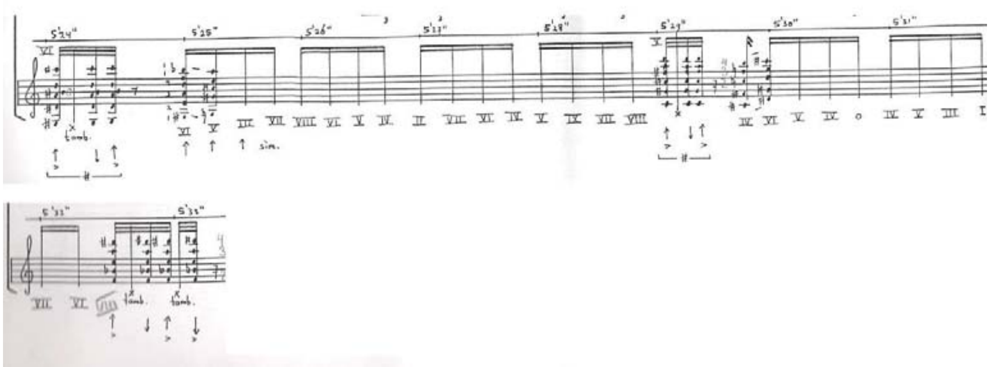

(CONCIERTO DE ARANJUEZ, RODRIGO)

In the Cadenza of the *Concierto de Aranjuez*, Rodrigo uses an arpeggiated strum texture (Figure 8.38). Strumming is not specified in the score, but guitarists use the arpeggiated strumming technique to perform this passage at the speed indicated in the score. The strumming motion, performed at a high speed, has as its advantage that it can easily be performed for a longer period of time without leading to fatigue in the right hand. The top note is appropriately chosen as the note to be emphasized with an accent, as only the top and bottom notes of rapid arpeggiated strums are accented without difficulty. The left hand is subject to various position changes, as the Roman numerals above the score suggest, but these position changes only take place on the highest four strings. The two lowest bass strings, on the other hand, are not affected by the position change. The resonance of these bass strings alleviates the small interruptions of sound caused by position changes of the left hand.

## 8.4.2 Textures as combinations of horizontal cells

### Power strum texture

*Figure 8.39 Power strum texture*

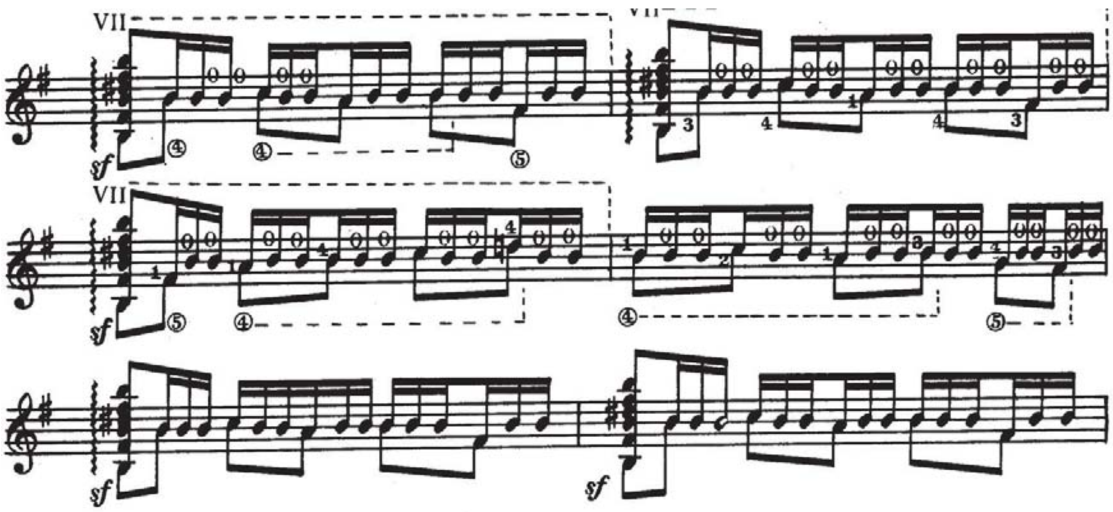


(AUBURN, V/D AA)

In *Auburn*, van der Aa uses a texture that consists of powerful strums in upward pitch direction, reminiscent of pick strumming on the electric guitar (Figure 8.39). The rapid position changes of the left hand, which are more difficult to perform in higher positions, lead to a staccato sound on the vertical cells. The monotony thus caused is further enhanced by the fact that the vertical cells are strummed in the same direction. Variety is provided through the alternation with cells that combine upward and downward strums with guitar body percussion.

## Asturias texture

*Figure 8.40 Asturias texture*

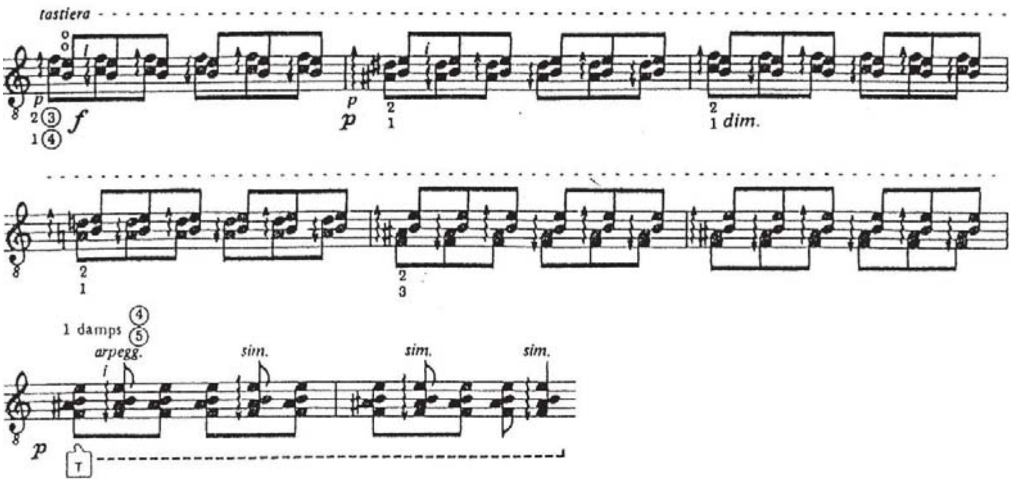


(ASTURIAS, ALBÉNIZ ARR. SEGOVIA)

In Segovia's transcription of *Asturias*, an accented strummed vertical cell is alternated with arpeggio cells (Figure 8.40). This example shows an effective way in which strumming can be used to create dynamic contrast. The performer strums the vertical cell with force, while the ensuing arpeggio is performed at a lower dynamic level, due to the dynamic characteristics of the regular plucked note and the necessity to play the arpeggio at a relatively low dynamic level in order to reach the desired speed. The open second string used in the arpeggio provides a persistently resonating pitch of b throughout the section, which is enhanced by the appearance of the same pitch in the melody, scored on the fourth string. The resonance of the open second string also ensures that possible interruptions of sound are diminished in their audibility when the left hand reaches for the vertical cell at the start of each measure.

## Strumming and pitched tambora texture

*Figure 8.41 Strumming and tambora texture*

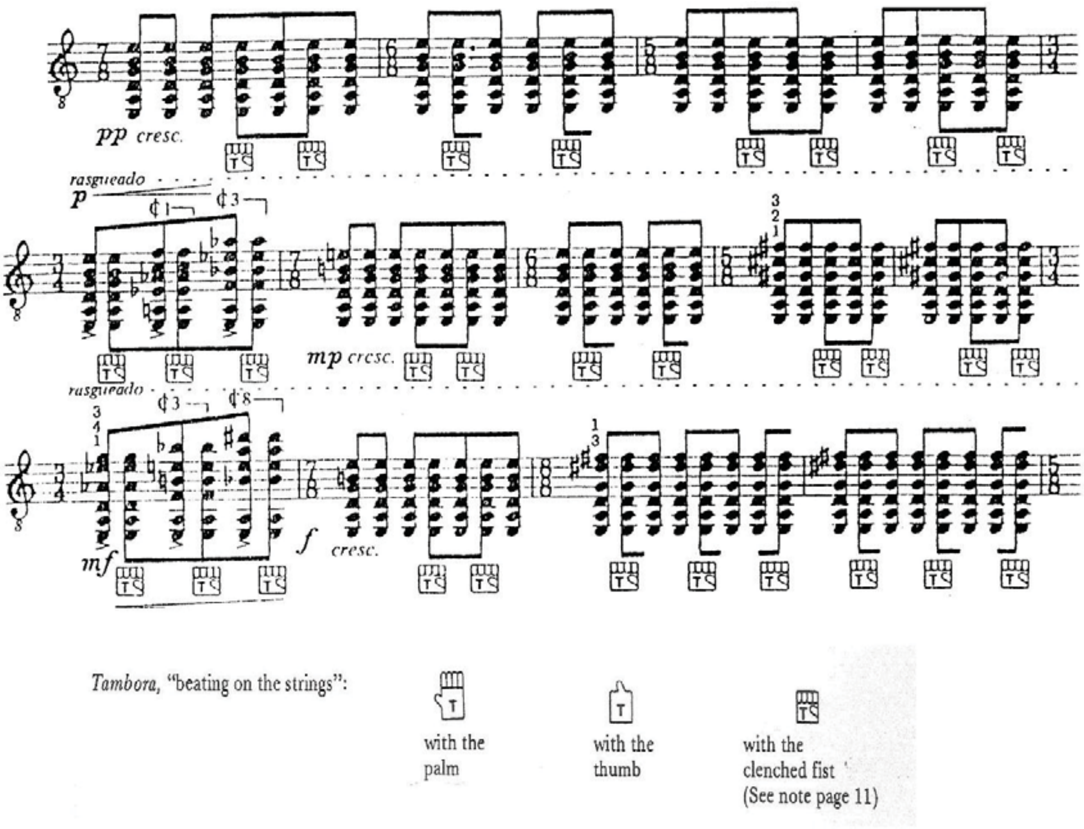



(SONATA, GINASTERA)

Ginastera uses a texture that includes upward and downward strummed vertical cell sequences and rapid alternations with tambora sounds (Figure 8.41). Two open strings are scored in combination with stopped notes on the third and fourth string; this allows for the scoring of dense vertical cells.

## Strumming and percussive tambora texture

*Figure 8.42 Strumming, rasgueado and percussive tambora*




(SONATA, GINASTERA)

In the same composition, Ginastera uses a texture that alternates between strumming and percussive tambora sounds (Figure 8.42). In this texture, a percussive flavor is added to the syncopated rhythm of the strummed six-string vertical cells. Although the tambora notation seems to suggest that pitches can be heard, this is not the case and the instances of tambora in this example sound like percussive slaps when performed in the manner prescribed by Ginastera. For more details on tambora and its notation, refer to Chapter 10.

# Chapter 9 Percussion Sounds

## Contents

# Chapter 9 Percussion Sounds

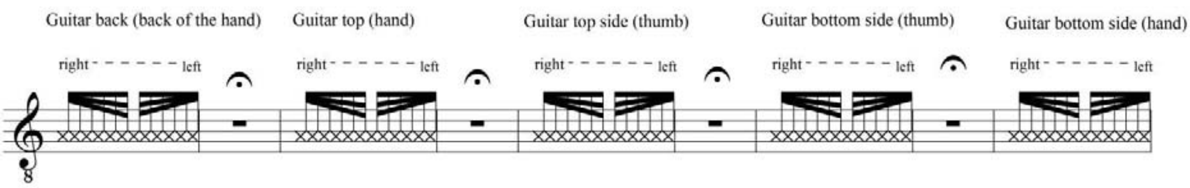
Percussion sounds emerge when the performer strikes a part of the guitar in a percussive manner. In this chapter, percussion of the guitar body is discussed. Percussive striking of the strings is discussed in the chapter on tambora sounds. This chapter shows ways in which the composer can handle the characteristics of the percussion sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 9.1 Sound

### 9.1.1 Percussion range

The full surface of the guitar can be used as a percussion object. Most commonly, guitar percussion is performed on the body of the instrument; such percussion sounds are dynamically stronger than the rest of the guitar surface due to the resonant properties of the guitar body.

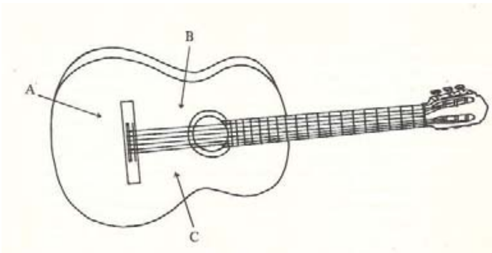
*Figure 9.1 Guitar body percussion*




The parts of the guitar body that provide the most sonorous percussion sounds are the top, back, and sides of the guitar body (Figure 9.1)[51]. Percussion sounds can be produced with either hand, with the tip of the fingers, palm of the hand, back of the hand and the nails. The disadvantage of using nails on the guitar is that they can damage the body. Some guitarists play on instruments with very thin and fragile guitar tops, such as the guitars by Greg Smallman that John Williams uses, making guitar top percussion impossible on such guitars as this would destroy the guitar top. Percussion sounds are notated in various ways; apart from a general preference in the guitar repertoire for percussion noteheads, there is no standardized notation. It is recommended here that percussion sounds are notated with percussion noteheads and a verbal indication as to where the percussion sound is to be produced, and, if this indication is desired, with which part of the hand. In pieces where percussion is widely used it is wise to include a detailed legend. When using individual fingers of the right hand in percussion, the usual indications (p,c,a,m and i) are to be used (Figure 9.3).

[51] For the locations of the various parts of the guitar: see *Reading Guide*.

*Figure 9.2 Image of percussion locations*




(ROYAL WINTER MUSIC SONATA, HENZE)

Kampela uses pictures explaining the way in which the percussion sounds are to be performed (Kampela, 1993a), while Henze uses drawings to identify the various playing locations used for percussion sounds in his first *Royal winter music sonata* (Figure 9.2).

*Figure 9.3 Two-staff notation*


(PERCUSSION STUDY NO. 1, KAMPELA)

When the percussion sounds are used alongside other sounds, it is helpful for notational clarity to use two staves to distinguish the percussion sounds from pitched sounds. If one staff is reserved for percussion only, a percussion clef and stave are ideally used for that staff (Figure 9.3).

## 9.1.2 Timbre possibilities

The timbre of percussion sounds can be altered by changing the playing location and the playing method.

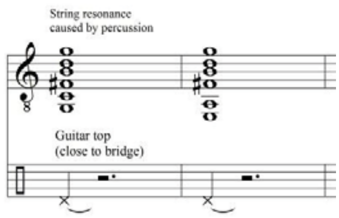
### Playing location

#### *String resonance*

*Figure 9.4 String resonance*

All percussion sounds produce string resonance when the strings are not intentionally damped. Percussion sounds performed on the guitar top close to the bridge produce the highest degree of string resonance. Percussion sounds performed closer to the edges of the guitar top produce a lower degree of string resonance, percussion sounds produced at the back of the guitar an even lower degree of string resonance, while percussion sounds produced on the sides of the guitar produce the lowest amount of string resonance (Figure 9.4).

*Figure 9.5 Determined pitches of string resonance*




When the composer wishes to choose a pitch combination for the vertical cell of string resonance, it is helpful for notational clarity to use an additional staff to specify the pitches (Figure 9.5).

### *Pitch*

*Figure 9.6 Percussion with the finger tips and the hand palm*


The location where the percussion sound is produced in part determines its pitch, together with the playing method (see following section). When notated in relative pitch heights, the pitch of the percussion sound rises when first played close to the bridge, then at the back of the guitar, subsequently at the edges of the guitar top and finally on the side of the guitar (Figure 9.6).

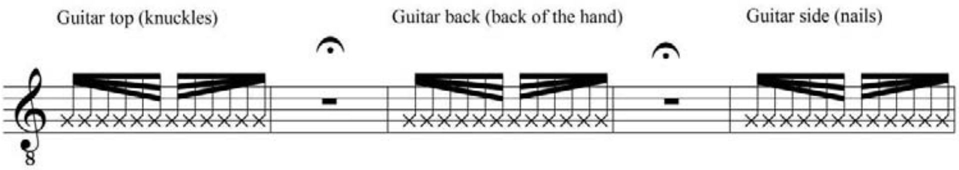
## Playing method

Percussion sounds can be produced with the finger tips, the palm, the back of the hand, the nails or the knuckles.

*Figure 9.7 Finger tips and hand palm percussion*


Percussion sounds produced with the tip of the fingers have a round sound quality, while sounds produced with the palm of the hand have a round sound quality with a more bass-like undertone (Figure 9.7). Percussion produced with the fingertips and the hand palm can be used on all parts of the guitar body.

*Figure 9.8 Percussion with the knuckles, back of the hand and nails*



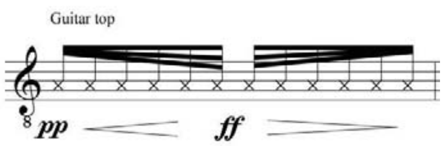

Percussion sounds produced with the knuckles and back of the hand have a sharper sound, as in both cases the knuckles of the fingers strike the wood. Percussion sounds produced with the nails have a brittle, clicking sound quality (Figure 9.8).

Finger tips, the palm of the hand and the nails work particularly well on the guitar top and sides. The back of the guitar is not so easy to perform on with these parts of the hand, as this requires a large movement of the arm or a change of position of the instrument in order to make the guitar lean forward and expose its back.

The back of the hand works particularly well for the back of the guitar, as this part of the guitar is easy to reach with the back of the hand. It is not so easy to perform on the guitar top with the back of the hand, as this requires large movement of the arm or a change of position of the instrument in order to make the guitar lean backward to allow the back of the hand to strike the top with more ease.

## 9.1.3 Dynamic range

*Figure 9.9 Percussion dynamics*



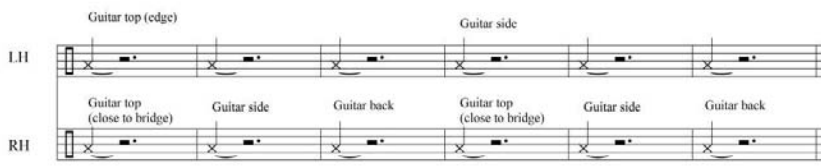
Percussion sounds can be performed at very low as well as high dynamic levels, and can be scored from *pp* to about *ff-fff* (Figure 9.9). High dynamic levels for percussion sounds are used with caution by guitarists, as they can damage the instrument, particularly when performing on the guitar top. The thumb, combined fingers, hand palm and knuckles are able to produce sounds up to *ff-fff*, while the nails and individual finger tips have a more limited dynamic range; they go up to about *mf*.

# 9.2 Vertical cells

Percussion sounds can be combined into vertical cells when two hands are used for the performance of the percussion sounds.

## 9.2.1 Two-hand percussion combinations

*Figure 9.10 Vertical percussion cells*




When scoring for two percussion sounds at the same time, the guitarist will play each sound with a different hand. The left hand can easily reach the edge of the guitar top and the side of the guitar, while the right hand can reach the area around the bridge on the guitar top, the side and the back. Two staves are ideally used in order to achieve notational clarity; one for the left hand and one for the right hand (Figure 9.10).

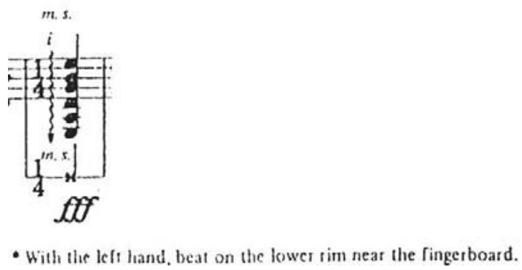
## 9.2.2 Combinations with other sounds

### Right hand percussion

When scoring percussion sounds for the right hand, it is possible to create vertical cells of percussion sounds combined with other sounds performed with the left hand alone. Sounds that can be performed with the left hand alone in such combinations are plucked open strings, natural harmonics, strummed open strings, open string and natural harmonics tambora, percussion tambora, hammered sounds, open string Bartok pizzicato sounds, buzzing string sounds, scratched string sounds, and sounds produced by plucking behind the nut.

### Left hand percussion

*Figure 9.11 Left hand percussion with right hand strumming*




(SONATA, GINASTERA)

When scoring percussion sounds for the left hand, it is possible to create vertical cells of percussion sounds combined with other sounds performed with the right hand alone. Sounds that can be performed with the right hand alone are plucked open strings, natural harmonics, open string rasgueados, strummed open strings (Figure 9.11), open string tambora, percussion tambora hammered sounds, open string Bartok pizzicato, scratching string sounds and sounds produced by plucking behind the nut.

# 9.3 Horizontal cells

Percussion sounds can be scored into two types of horizontal cells: one-hand percussion horizontal cells and two-hand percussion horizontal cells. In this section, these two types are discussed.

## 9.3.1 One-hand percussion

### Design

A one-hand percussion horizontal cell is a succession of single line notes performed with one hand.

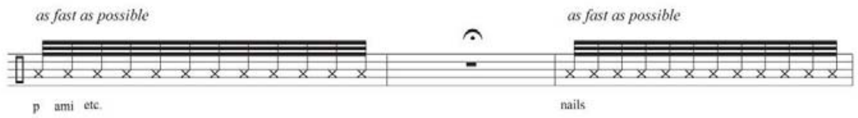
### Resonance

*Figure 9.12 Damped string resonance*


All percussion sounds produce string resonance when the strings are not intentionally damped (Figure 9.12). The percussion sounds themselves have short resonance.

### Speed

*Figure 9.13 Speed*




Horizontal one-hand percussion cells can be performed at very high speeds, particularly when they are performed as an alternation of the thumb and the combined fingers or with the nails (Figure 9.13).

## Rhythmic possibilities

When scoring a horizontal cell of percussion sounds that is to be performed with the same part of the hand or the nails, it is possible to create rhythmic patterns that have a consistent timbre throughout the pattern. When scoring a horizontal cell of percussion sounds that is to be performed with an alternation of the thumb and the combined fingers, the rhythmical shape is characterized by a combination of two alternating sounds (Figure 9.13).

Scoring syncopated patterns in horizontal cells of percussion sounds evades the clear impression of the two alternating percussion sounds, as syncopated rhythms can be performed in a way that makes thumb and finger strokes alternate with more strokes in the same direction.

*Figure 9.14 Rhythm patterns performed with the nails*


When scoring cells that are to be performed with the nails, a wide variety of patterns can be created, for instance patterns of four or five strokes (Figure 9.14).

Horizontal cells of percussion sounds lend themselves well to rhythmic acceleration because of the high speed that can be reached.

## Articulation

Horizontal cells of percussion sounds can be scored with a variety of articulations, such as accents, staccato and glissando.

### *Accents*

*Figure 9.15 Accent*

Because of the wide dynamic range of percussion sounds, the composer can make the percussion sound effectively stand out with an accent (Figure 9.15), particularly with playing methods and at playing locations that have most dynamic potential.

### *Staccato*

Horizontal cells of percussion sounds can be scored with staccato articulation; the performer executes the staccato by performing a short stroke. In the case of percussion sounds that create much string resonance, the performer executes the staccato by performing a short stroke while damping the strings with the hand.

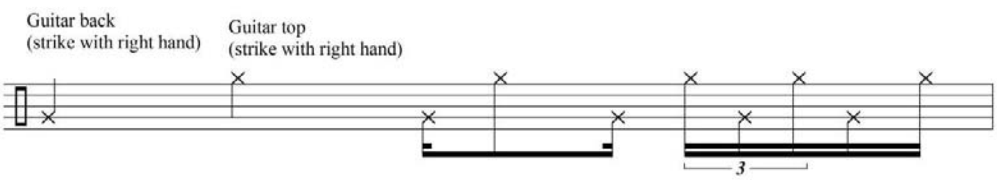
### *Glissando*

*Figure 9.16 Glissando*


Horizontal cells of percussion sounds can be scored with glissando: the glissando can be used either to connect percussion strokes, or as a glissando sound by itself not used to connect percussion strokes. The glissando is performed by sliding with a part of the hand or the nail over the guitar body (Figure 9.16). Both types of glissando should be prescribed with a verbal instruction in the score, or a symbol that is specified in a legend.

## Non-functional writing

*Figure 9.17 Non-functional writing*




Examples of non-functional writing in one-hand horizontal cells of percussion sounds:

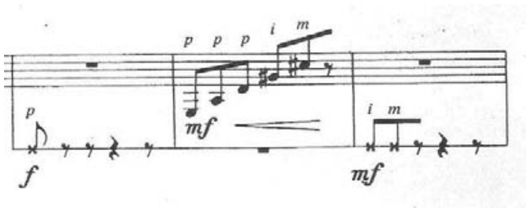
- Rapid changes of playing location, particularly when changing from the guitar top to the back of the guitar (Figure 9.17)
- Rapid changes of playing method, particularly when changing from the inside of the hand to the back of the hand

## Combinations with other sounds

One-hand horizontal cells of percussion sounds are often scored in close conjunction with other sounds in the classical guitar repertoire. In this section, common combinations from the literature are discussed.

### *One-hand percussion alternated with regular plucked notes*

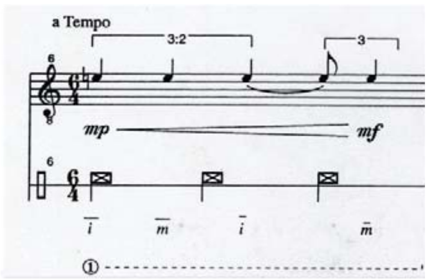
*Figure 9.18 Alternation with regular plucked notes*

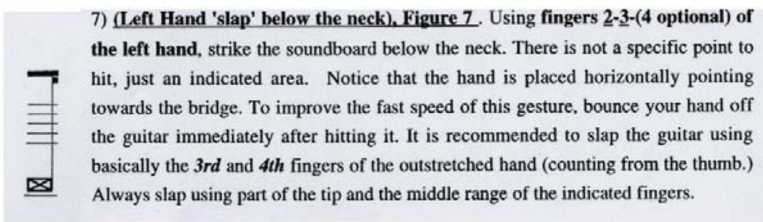



(SONATA, GINASTERA)

Ginastera uses an alternation between regular plucked notes and percussion sounds in his sonata (Figure 9.18). These two sounds can be connected at very high speeds if each sound is performed with a different hand, while the alternation takes more time when performed with the same hand as the hand has to reposition after each alternation.

*Figure 9.19 Right hand plucks regular notes, left hand plays percussion*





7) **Left Hand 'slap' below the neck), Figure 7**. Using **fingers 2-3-(4 optional) of the left hand**, strike the soundboard below the neck. There is not a specific point to hit, just an indicated area. Notice that the hand is placed horizontally pointing towards the bridge. To improve the fast speed of this gesture, bounce your hand off the guitar immediately after hitting it. It is recommended to slap the guitar using basically the ***3rd*** and ***4th*** fingers of the outstretched hand (counting from the thumb.) Always slap using part of the tip and the middle range of the indicated fingers.

(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela uses the right and left hand at the same time, where the right hand plucks regular notes and the left hand plays guitar top percussion (Figure 9.19).

### *One-hand percussion alternated with tambora*

*Figure 9.20 Alternation with tambora*

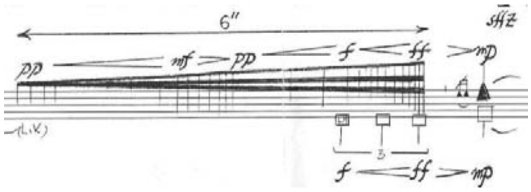
(ROYAL WINTER MUSIC SONATA, HENZE)

Henze uses an alternation between tambora chords and percussion (Figure 9.20). These two sounds can be connected at very high speeds if each sound is performed with a different hand, while the alternation takes more time when performed with the same hand as the hand has to reposition after each alternation. Compared to alternations of percussion sounds and regular plucked sounds, alternations of percussion sounds with tambora performed with the same hand can be performed at higher speeds, as both techniques are performed in a percussive manner and in the same area on the guitar.

## 9.3.2 Two-hand percussion

### Design

*Figure 9.21 Two-hand percussion*




(SO RI, OH)

A two-hand horizontal cell of percussion sounds is a succession of two separate percussion lines performed with two hands (Figure 9.21). These types of cells are particularly effective when performed on the edge of the guitar top with the left hand, and on the guitar top and the sides with the right hand, as this allows for the playing position to remain stable without position shifts to the instrument.

### Resonance

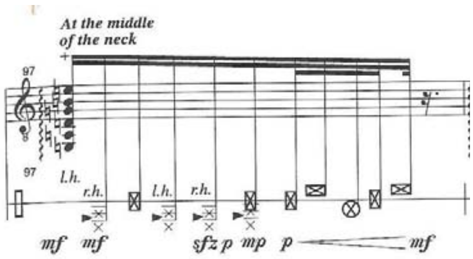
When scoring two-hand horizontal cells of percussion sounds, there tends to be a high degree of string resonance as both hands are involved in producing percussion sounds, as opposed to one hand performing percussion sounds and the other damping the strings.

### Speed

Two-hand horizontal cells of percussion sounds can be performed at high speeds; the speed can be particularly high when both hands are performing an alternation of the thumb and the combined fingers, or when they perform a pattern with the nails.

## Rhythmic possibilities

*Figure 9.22 Two-hand percussion with strumming and percussion tambora*




(PERCUSSION STUDY NO. 1, KAMPELA)

The rhythmic possibilities of two-hand horizontal cells of percussion sounds are very broad, as the guitarist is in a position to perform on the guitar body in the same manner a percussionist may perform on a drum; with two hands. This makes it possible to create fluent rhythms in which two hands cooperate in a percussive manner (Figure 9.22).

## Articulation

As is the case with one-hand horizontal cells of percussion sounds, two-hand horizontal cells can be scored with a variety of articulations, such as accents, staccato and glissando.

### *Accents, staccato and glissando*

Accents, staccato and glissando are performed in the same manner as with one-hand horizontal cells of percussion sounds.

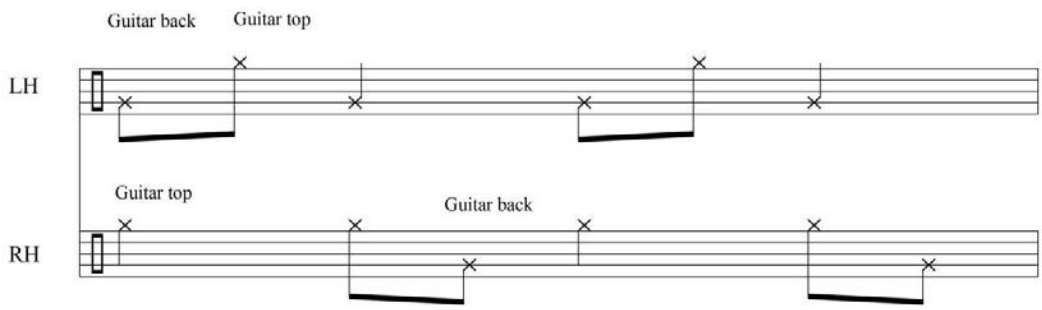
### *Combination of articulations*

*Figure 9.23 Combined articulation*


It is possible to combine articulations; the left hand performs one articulation while the right hand performs another (Figure 9.23).

## Non-functional writing

*Figure 9.24 Non-functional writing*




Examples of non-functional writing in two-hand horizontal cells of percussion sounds:

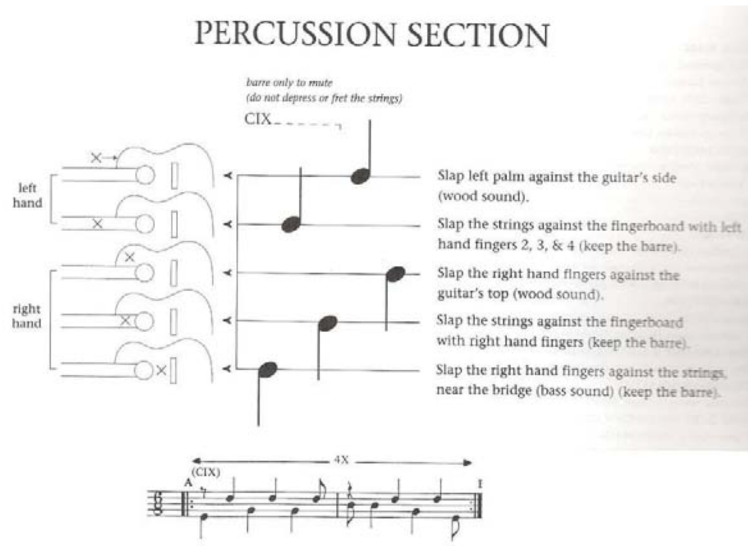
- Rapid changes of playing location, for instance when changing from the guitar top to the back of the guitar. Particularly when scoring percussion sounds for two hands, rapid changes in playing location can physically bring the guitar out of balance as the performer has no hand available to hold or support the instrument (Figure 9.24)
- Rapid changes of playing method, particularly when changing from the inside of the hand to the back of the hand.

## Combinations with other sounds

In the classical guitar literature, two-hand horizontal cells of percussion sounds are often scored in close conjunction with other sounds. This means that one or both hands are not only involved in guitar body percussion but in the performance of other sounds as well. In this section, common combinations from the repertoire are discussed.

### *Horizontal percussion cells alternated with tambora sounds*

*Figure 9.25 Percussion and tambora*

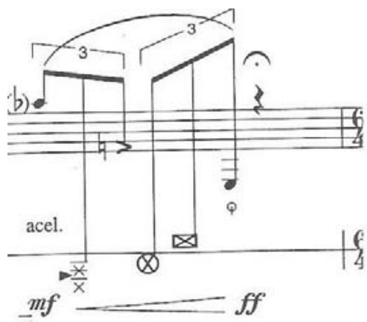



(JONGO, BELLINATI)

Bellinati uses two-hand percussion in which both hands perform percussion sounds as well as tambora sounds (Figure 9.25).

*Horizontal percussion cells alternated with multiple other sounds*

*Figure 9.26 Combination with multiple other sounds*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela combines two-hand percussion with a regular plucked note, tambora, a hammered note and Bartok pizzicato (Figure 9.26).

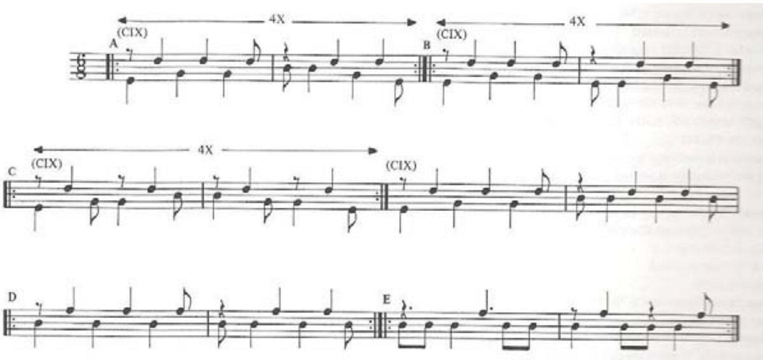
## 9.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing percussion sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 9.4.1 Textures as continuations of horizontal cells

### Percussion/tambora texture

*Figure 9.27 Percussion/tambora texture*




(JONGO, BELLINATI)

Bellinati continues the combination of two hand percussion and tambora for many bars, creating a percussion/tambora texture (Figure 9.27). This example demonstrates how the guitar can be used to create and sustain a texture that exclusively consists of percussive (i.e. percussion and tambora) sounds. The score of *Jongo* comes with a well-specified legend (see Figure 9.25), greatly facilitating reading and performance. The makeup of each pattern is written with consideration for practical performance; the patterns can be performed with ease. When scoring musical patterns that largely consist of percussive sounds, it is advised that the composer try to play the percussive passage herself, in order to test its playability.

## 9.4.2 Textures as combinations of horizontal cells

### Plucked/strummed chord, tambora and percussion texture

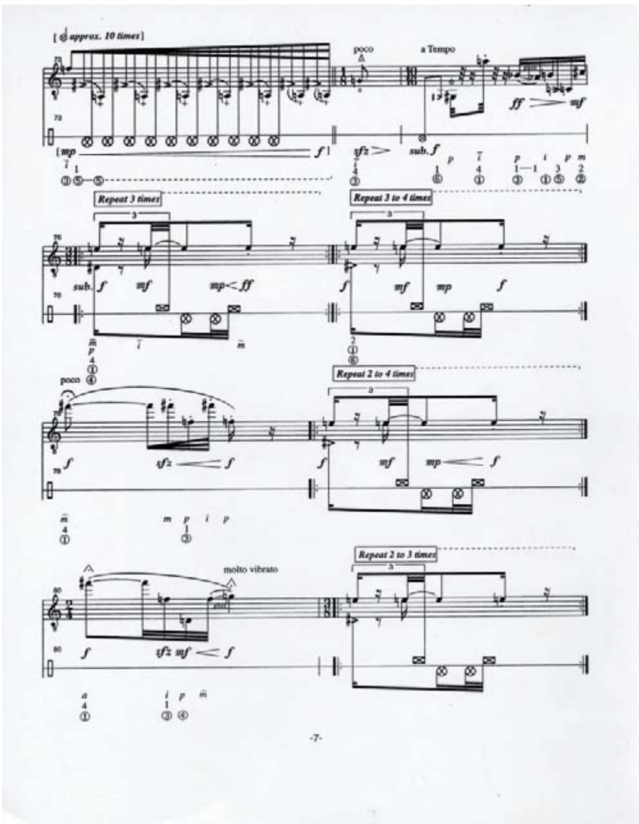
*Figure 9.28 Chord, tambora and percussion texture*


(ROYAL WINTER MUSIC SONATA, HENZE)

Henze scores a texture of strummed/plucked chords, tambora and percussion (Figure 9.28). In this texture, Henze creates a rich and mysterious sound world, which includes features rarely encountered such as extremely wide spacing of vertical cells, and percussion sounds scored *piano*. Where composers often use percussion sounds to create dynamically compelling spectacles, Henze instead employs guitar body percussion sounds as soft, dark and introverted events in the first two lines of Figure 9.28. A similar reversal of the usual dynamic employment of sounds is seen in the third and fourth lines, where pitch tambora, often reserved for soft and introverted passages or single accents, is continuously scored *fff*. Strumming is not explicitly prescribed in the score, but is a way for the guitarist to perform the chords marked *fff* and the additional accents in the prescribed way and without arpeggiation. Plucking six strings with four fingers of the right hand would, after all, necessitate a degree of arpeggiation, coordinated between four fingers. Strumming, on the other hand, allows for a more rapid and more dynamically potent attack. The score comes accompanied with a clear, visual legend for percussion sounds, pictured in Figure 9.2, facilitating reading and performance.

## Texture of plucked sounds, hammered sounds, percussion sounds and Bartok pizzicato sounds

*Figure 9.29 Rapid braiding of pitched and percussion sounds*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates a texture that braids plucked sounds, hammered sounds, left- and right hand percussion sounds, and Bartok pizzicato sounds together at high speeds (Figure 9.29). The texture is hyper-rich in sounds, hyper-functional and hyper-rhythmic at the same time. The passage includes a great number of different sounds in a short span of time. Despite its complexity, it is written with great consideration for playability. In addition, it employs a wide range of rhythmic devices (acceleration, rapid and irregular patterns, coordinated between the two hands) in a short span of time, scored in great detail.

## Chapter 10 Tambora Sounds

**Contents**

# Chapter 10 Tambora Sounds

Tambora sounds come into existence when the strings are struck in a percussive manner, creating a pitched or an unpitched sound, depending on the manner of performance. This chapter shows ways in which the composer can handle the characteristics of the tambora sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 10.1 Sound

There are two types of tambora sounds: pitched and percussive tambora sounds. In this section, each of these types is discussed separately.

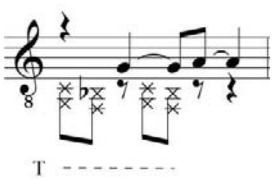
### 10.1.1 Pitched tambora: pitch range

*Figure 10.1 Six-note tambora*


(SEQUENZA XI, BERIO)

For pitched tambora, the full range of the guitar can be used, as well as all natural harmonics. In all ranges, the tambora sound is a percussive sound produced by striking the strings with the right hand or the left hand. Pitched tambora sounds are usually scored for vertical cells of six notes (Figure 10.1), but vertical combinations of fewer notes are possible (Figure 10.2).

*Figure 10.2 Tambora notation*




In its usual form, the pitched tambora is produced by striking the inside of the thumb and the part of the hand directly near the thumb on the strings near the bridge, and immediately lifting the hand again in order to release the sound. There are variations on this technique, for instance by using the thumb, the full palm of the hand or with the use of an external object such as a pencil. In all cases, the mechanics of the production of the sound is essentially the same: a body part or object strikes the strings, then immediately bounces off the string in order to release the sound. If tambora chords are scored over non-adjacent strings, the performer can damp the unused string with a finger of the left hand.

*Figure 10.3 Harmonics tambora performed with two hands*

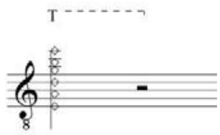



*Figure 10.4 Harmonics tambora performed with one hand*

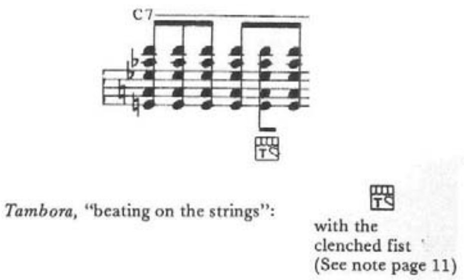

(SO RI, OH)

Tambora sounds of natural harmonics can be performed with two hands or with one hand alone. A two-hand harmonics tambora is performed by touching the strings with the left hand at the nodal point, while striking the strings close to the bridge (Figure 10.3). A one-hand harmonics tambora is created by striking the strings directly at a nodal point (Figure 10.4).

There is no standardized notation for tambora in guitar notation. A verbal description is sufficiently clear in many circumstances. When various types of sounds are used within a short span of time, changing the noteheads is favorable for readability (Figure 10.2) in order to avoid a myriad of verbal descriptions in the score.

## 10.1.2 Percussive tambora: percussive range

*Figure 10.5 Clenched fist tambora*[52]




(SONATA, GINASTERA)

[52] In this example, only the slamming of the fist onto the strings can be heard, and not the notated pitches. Therefore, the composer should use percussive noteheads for the notation of a percussive tambora like the one pictured here.

Tambora sounds can also be performed by slamming the strings onto the fretboard, in which case two or three bass strings are usually struck against the fretboard. The composer can score the percussive tambora with or without pitches; if the performer lifts the hand after slamming the strings, string resonance ensues, but if the hand stays on the string, there will be no string resonance. Usually, a percussive tambora is performed without string resonance, as the presence of string resonance would make it a loud pitched tambora. When performed with the left hand, percussive tambora sounds are usually performed with the fingertips. When performed with the right hand, percussive tambora sounds are usually performed with the hand, fist (Figure 10.5) or thumb. The chord in Figure 10.5 is not audible; only the slamming of the fist onto the strings is heard.

## 10.1.3 Timbre possibilities

### Pitched tambora

#### *Attack*

The pitched tambora sound is a mixture of two different sounds: it is a combination of a percussive bounce, which constitutes the drum-like aspect of the sound, mixed with a sympathetic ringing of the strings that are struck. In the case of a harmonics tambora performed with one hand, the drum-like sound that emerges as a result of slamming the thumb on the fretboard has a higher pitch than a tambora near the bridge. Tambora harmonics on lower strings can be heard more clearly than on higher strings, while natural harmonics in positions XII and VII can be heard more clearly than natural harmonics in positions V and IV/IX.

*Figure 10.6 Thumbnail tambora*

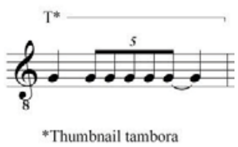
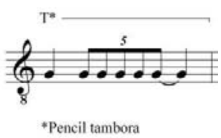


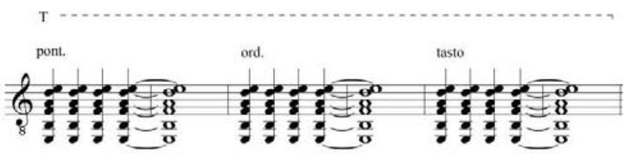

*Figure 10.7 Pencil tambora*




When the guitarist performs the tambora sound with the nail or an object, such as a pencil, the sound is sharper than a regular tambora and contains less of the low drum-like sound (Figure 10.6 and Figure 10.7).

#### *Sound color and playing indications*

*Figure 10.8 Tambora sound color*



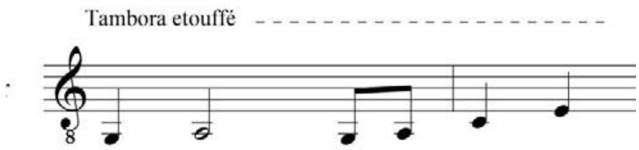

The degree to which the tambora sound includes the drum-like sound can be varied by changing the playing position (Figure 10.8). When the tambora is performed close to the bridge, the sound contains a low drum bounce. When the tambora is performed in regular playing position, the sound contains much less of the drum bounce. When performed in tasto position, the sound contains a slapping sound caused by the thumb striking the fretboard, which makes it a percussive tambora.

### *Stopping position*

As is the case with regular plucked notes, playing a note from the middle or high range in a high position on a low string changes its timbre. The composer should specify fingerings if she wishes a note to be performed on particular string.

### *Etouffé*

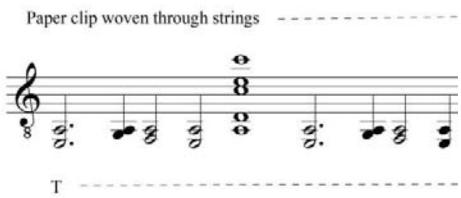
*Figure 10.9 Tambora etouffé*




Single tambora sounds can be scored with etouffé; the etouffé is performed by striking a note and simultaneously slightly damping it with the side of the right hand. Tambora sounds scored etouffé have a greatly reduced resonance and dynamic range, because the etouffé position of the right hand prevents a large striking movement (Figure 10.9). As a result, the tambora attack has a low maximum dynamic level.

### *Prepared guitar*

*Figure 10.10 Paper clip preparation*



The timbre of tambora sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 10.10). Due to the combination of paper clip preparation and tambora, the vertical cell pictured in Figure 10.10 takes on a gong-like quality.

### Percussive tambora

#### *Attack and playing location*

*Figure 10.11 Percussive tambora*


(PERCUSSION STUDY NO. 1, KAMPELA)

The percussive tambora sound is caused by the strings striking the fretboard, accompanied by the sound of the hand striking onto the strings as well, in case the tambora is performed directly onto the fretboard (Figure 10.11). Performing the percussive tambora with the nail instead of the hand or thumb does not fundamentally change its sonic characteristics, as the sound is primarily caused by the strings touching the fretboard.

#### *Strings*

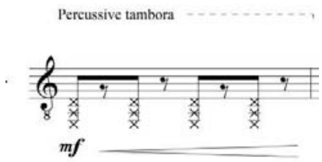
Due to the different characteristics of metal and nylon strings, percussive tambora sounds performed on the metal-wound strings sound much sharper and brighter than those performed on the nylon strings.

## 10.1.4 Dynamic range

*Figure 10.12 Pitched tambora dynamic range*


Pitched tambora sounds can be performed at very low as well as high dynamic levels, and can be scored from *pp* to about *f* (Figure 10.12).

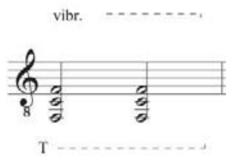
*Figure 10.13 Percussive tambora dynamic range*




Percussive tambora sounds can be performed at high dynamic levels from about *mf* to *ff* (Figure 10.13). When performed at low dynamic levels, percussive tambora sounds are no longer tambora sounds but rather hammered sounds.

### 10.1.5 Vibrato

*Figure 10.14 Tambora vibrato*




Pitched tambora sounds that are stopped by a finger of the left hand can be scored with lateral or vertical vibrato (Figure 10.14).

### 10.1.6 Pitch bends and microtones

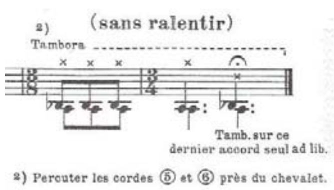
Pitch bends for pitched tambora sounds are to be prescribed in the same manner as for regular plucked notes. Microtones are also prescribed in the same manner: they can be attained through a microtonal scordatura or through bending the string.

## 10.2 Vertical cells

Tambora sounds are typically performed as vertical cells, usually as chords consisting of four-to six notes; however, smaller vertical cells can also be scored.

### 10.2.1 Two-note combinations of pitched tambora sounds

*Figure 10.15 Two-string tambora*

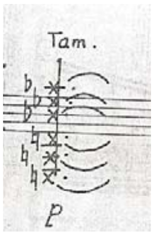


(TIENTO, OHANA)

When scoring pitched tambora sounds, the most effective two-note combinations are those scored on two adjacent strings (Figure 10.15), as they avoid additional noises that are caused by striking damped strings.

### 10.2.2 Chord spacings of pitched tambora sounds

*Figure 10.16 Six-string tambora*

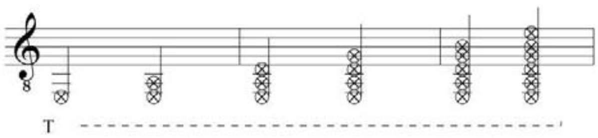



(FOLIOS, TAKEMITSU)

Vertical cells can be scored using narrow spacings, wide spacings, mixed spacings as well as with unisons and clusters. As is the case with two-note combinations, the most effective vertical cell combinations are those scored over adjacent strings (Figure 10.16).

### 10.2.3 Vertical combinations of percussive tambora sounds

*Figure 10.17 Vertical percussive tambora cell*




Percussive tambora sounds can be combined vertically by creating vertical combinations of various strings. Changing the striking position of the left hand does not influence the sound of the percussive tambora, as the sound is caused by the strings slamming onto the fretboard. As the percussive tambora is performed with the thumb or a large surface of the hand, vertical combinations can only be scored over adjacent strings (Figure 10.17).

## 10.3 Horizontal cells

Pitched tambora sounds can be scored into two types of horizontal cells: vertical cell sequences and single line horizontal cells. Percussive tambora sounds can be scored into horizontal cells of percussive tambora sounds. In this section, these three types of horizontal cells are discussed.

## 10.3.1 Vertical cell sequences of pitched tambora sounds

### Design

Vertical cell sequences of pitched tambora sounds are sequences or repetitions of note combinations, usually consisting of two to six notes on adjacent strings.

### Resonance

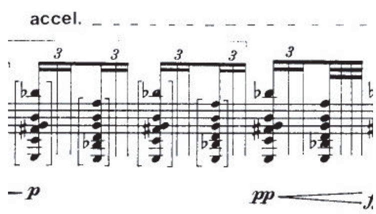
Individual vertical cells in vertical cell sequences of pitched tambora sounds usually do not last beyond their notated value, unless a large interval change is made, which leaves a string unoccupied by the right hand, allowing it to ring on. When vertical cells contain open strings, the degree of resonance increases.

### Harmonic possibilities

The options for pitch combinations can be examined in Appendix A. As is the case with vertical cell sequences of plucked sounds, rasgueados and strummed sounds, successions of vertical cells of rasgueados scored with fewer notes increase the choice possibilities of different pitches and keys when compared to successions of vertical cells containing many notes. Additionally, as vertical cells of pitched tambora sounds are most effective when scored over adjacent strings, having to score vertical cells over adjacent strings limits the options.

### Speed

*Figure 10.18 Tambora speed*




(SEQUENZA XI, BERIO)

Vertical cell sequences of pitched tambora sounds can be performed at moderate speeds, as they rely on a repeated striking with one hand. Figure 10.18 displays an approximate maximum speed for vertical cell sequences of tambora.

## Articulation

Vertical cell sequences of pitched tambora sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato, and glissando.

### *Slurs*

*Figure 10.19 Tambora slurs*


(THE LAST DISCO, RAK)

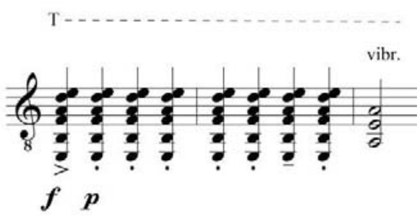
One or more notes in a vertical sequence of pitched tambora sounds can be connected to a subsequent vertical cell or note by means of a slur (Figure 10.19). The vertical cell or note thus produced does not share the sonic characteristics of the tambora as it is produced by performing an ascending or descending slur after the tambora.

### *Legato*

As is the case with regular plucked sounds, sequences of different vertical cells that are located close by on the fretboard are easier to perform legato than vertical cells that are further apart. The composer should include a phrase mark to indicate that vertical cells are to be performed legato.

### *Accents*

*Figure 10.20 Tambora articulation*




Because of the relatively wide dynamic range of tambora, the composer can make a vertical cell effectively stand out with an accent (Figure 10.20). In contrast to vertical cells of plucked notes, it is not possible to make only a specific note from the vertical cell stand out, as the complete cell is struck with the thumb or a large surface of the hand.

### *Staccato*

Vertical cell sequences of tambora sounds can be scored with staccato articulation. The performer executes these by quickly damping the strings affected by the staccato with the right palm (Figure 10.20) or, in the case of stopped notes, by lifting the fingers after attack.

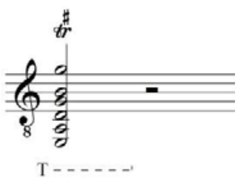
### *Glissando*

*Figure 10.21 Tambora glissando*


Vertical cell sequences of tambora sounds can be scored with a glissando articulation that is performed after striking the vertical cell. As is the case with glissandos of vertical cells of plucked sounds, literal glissandos of vertical cells sequences of pitched tambora sounds are most effective when they are scored with the same left hand fingering (Figure 10.21); changing fingerings during the course of such glissandos reduces the clarity of the glissando. Additionally, vertical cell sequences of tambora sounds can be scored with a tuning key glissando. With such a glissando, only one string can be detuned at a time.

## Embellishment

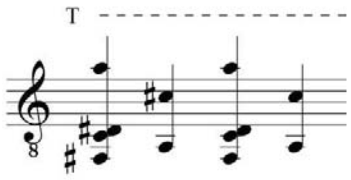
*Figure 10.22 Tambora embellishment*




Embellishments can be used in vertical cell sequences by attaching a left hand trill to one of the notes in a vertical cell (Figure 10.22). This embellishment can continue to be performed with the left hand while the right hand engages in the production of additional tambora attacks.

## Non-functional writing

*Figure 10.23 Non-functional writing*




Examples of non-functional writing for vertical sequences of pitched tambora sounds:

- Sequences of vertical tambora cells scored over non-adjacent strings (Figure 10.23)
- Rapid sequences of vertical tambora cells

## Combinations with other sounds

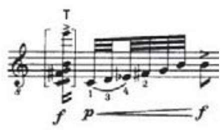
In the classical guitar repertoire, vertical cell sequences of pitched tambora sounds are often scored in close conjunction with other sounds. In this section, common combinations from the repertoire are discussed.

### *Vertical cell sequences of pitched tambora sounds alternated with regular plucked sounds*

*Figure 10.24 Tambora and plucked/strummed vertical cells*


(SEQUENZA XI, BERIO)

*Figure 10.25 Tambora and plucked single line*




(SEQUENZA XI, BERIO)

Berio alternates vertical tambora cells with plucked and strummed vertical cells (Figure 10.24) and single lines of plucked sounds (Figure 10.25). Both alternations can be connected at relatively high speeds, but the transition to the single line is easiest to perform at high speeds. Figure 10.24 displays the approximate maximum speed for such a transition.

### *Vertical strummed sound sequence alternated with tambora*
See Chapter 8

### *Vertical rasgueado cell sequence alternated with tambora*
See Chapter 7

### *One-hand percussion alternated with tambora*
See Chapter 9

## 10.3.2 Single line horizontal cells of pitched tambora sounds

### Design

A single line horizontal cell of tambora sounds is a succession of single tambora sounds. Because of the large movement that is used to produce a tambora, it takes a relatively high degree of coordination to perform a single line tambora. Single line tamboras are easiest to perform on the sixth string, while more difficult to perform well on other strings. When the performer uses the nail, or an object such as a pencil, a single string tambora on a string other than the sixth can also be produced more accurately. Single line horizontal cells of pitched tambora sounds are relatively rare in the guitar repertoire.

### Resonance

*Figure 10.26 Single line tambora*


As is the case with single lines of regular plucked notes, single line horizontal cells of pitched tambora sounds can be made to sound in such a way that notes **do not** ring on into the temporal space of subsequent notes. This is possible when the line is scored at a slow to moderate speed, when the intervals are relatively small, when both conditions are fulfilled, or when staccato articulation is used.

Single lines horizontal cells of pitched tambora sounds can also be made to sound in such a way that notes **do** ring on into the temporal space of subsequent notes. This is possible when the line is scored over multiple strings, at moderate and high speeds, or when both conditions are fulfilled (Figure 10.26). The composer should use ties or a l.v. (let vibrate) indication to prescribe a ringing on of notes in single lines.

### Speed

Single lines of pitched tambora sounds can be performed at moderate speeds, as they rely on a repeated striking with one finger or object. The maximum speed is lower than that of vertical cell sequences of pitched tambora sounds, as playing on single strings requires more coordination on the part of the performer.

### Articulation

Single line horizontal cells of pitched tambora sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

### *Slurs*

One or more notes in a sequence of single line tambora sounds can be connected to a subsequent note by means of a slur (Figure 10.26). Because of the manner in which slurs are performed, slurs played after a tambora sound possess the characteristics of an ascending or descending slur, rather than the characteristics of a tambora sound.

### *Legato*

As is the case with regular plucked notes, sequences of notes that are located close by on the fretboard are easier to perform legato than sequences of notes that are further apart. The composer should use a phrase mark to indicate that a sequence of single line tambora sounds is to be performed in this manner.

### *Accents*

*Figure 10.27 Single line tambora articulation*


Single line horizontal cells of pitched tambora sounds have a more limited dynamic range than the vertical cell sequences of tambora, but it is still possible to make a note stand out with an accent (Figure 10.27).

### *Staccato*

Single lines can be scored using a staccato articulation. At low and moderate speeds (the maximum speed of a single line horizontal cell of pitched tambora sounds), the staccato can be performed convincingly. The guitarist performs the staccato either by lifting the finger off the fretboard after attack in the case of stopped notes, or damping the string with a left or right hand finger (Figure 10.27).

### *Glissando*

Glissando can be used to connect notes in a single line. As is the case with single line sequences of plucked sounds, the glissando can be performed literally, as literal glissando between two notes, or as a partial glissando. This second type of glissando is primarily used when glissandos are prescribed over distant pitches that cannot be connected on one string. Additionally, single line vertical cells of pitched tambora sounds can be scored with a tuning key glissando.

## Embellishment

Embellishments can be employed in single line sequences by attaching a left hand trill to a note in the sequence. An embellishment performed with the left hand alone can continue as the right hand engages in other actions such as tambora or percussion.

## Non-functional writing

*Figure 10.28 Non-functional writing*


Examples of non-functional writing for single line horizontal cells of pitched tambora sounds:

- Rapid string changes, particularly when strings are far apart
- High dynamic levels for pitched single string tambora (Figure 10.28)

## Combinations with other sounds

Single line horizontal cells of pitched tambora sounds have the same possibilities for combinations with other sounds as vertical cell sequences of pitched tambora sounds (see applicable section in this chapter). The maximum connection speed between single lines of pitched tambora sounds and other sounds is slower, because of the coordination required for a single line tambora.

# 10.3.3 Horizontal cells of percussive tambora sounds

## Design

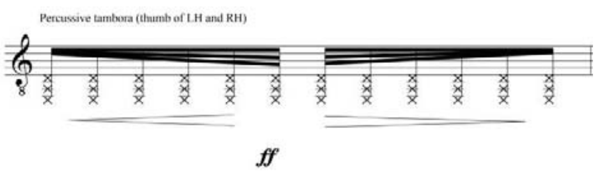
A horizontal cell of percussive tambora sounds is a succession of percussive tambora sounds. Such a cell can be performed with the left hand, the right hand or a combination of both hands.

## Resonance

A percussive tambora sound is usually performed without string resonance, which makes the amount of resonance in a horizontal cell of percussive tambora sounds very low (Figure 10.17).

## Speed

*Figure 10.29 Two-hand percussive tambora*



When performed with one hand, a horizontal cell of percussive tambora sounds has the same maximum speed as a vertical cell sequence of pitched tambora sounds. When performed with two hands, it can be performed at much higher speeds, in the same manner as a two-hand percussion sequence (Figure 10.29).

## Rhythmic possibilities

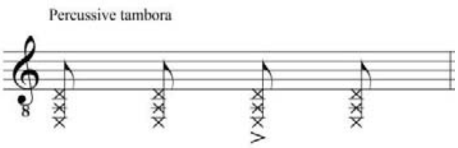
When performed with two hands, the rhythmic possibilities of horizontal two hand percussion cells are very broad, as the guitarist is in a position to perform on the guitar body in the same manner a percussionist performs on a drum; with two hands. As is the case with sequences of two-hand percussion, it is possible to create fluent rhythms in which two hands cooperate in a percussive manner (Figure 10.29).

## Articulation

Horizontal cells of percussive tambora sounds can be scored with a variety of articulations, such as accents, staccato and glissando.

### *Accents*

*Figure 10.30 Percussive tambora accent*



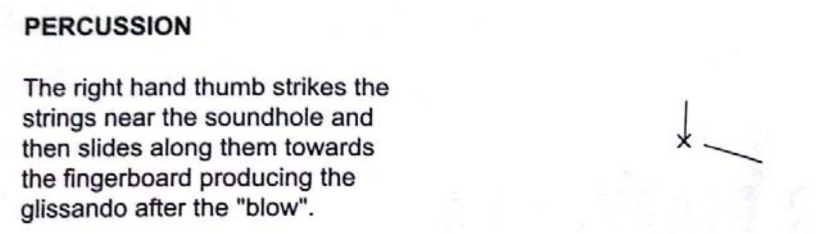

Because of the wide dynamic range of percussive tambora sounds, the composer can make a percussive tambora sound effectively stand out with an accent (Figure 10.30).

### *Staccato*

Horizontal cells of percussive tambora sounds are by nature staccato, as they are usually immediately damped by resting the thumb or hand on the strings after attack.

### *Glissando*

*Figure 10.31 Percussive tambora glissando*

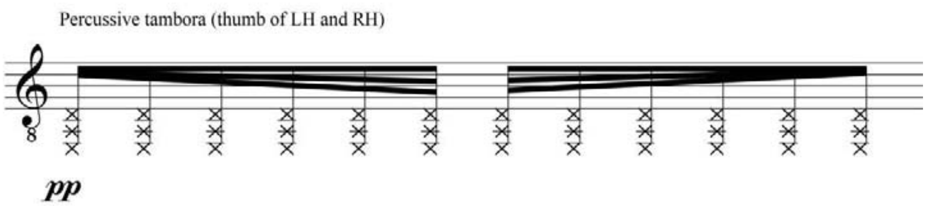



(LA MUERTE DEL ANGEL, PIAZZOLLA ARR. BENITEZ)

Horizontal cells of percussive tambora sounds can be scored with glissando; the glissando is then performed after the strings are struck on the fretboard (Figure 10.31).

## Non-functional writing

*Figure 10.32 Non-functional writing*




Examples of non-functional writing for horizontal cells of percussive tambora sounds:

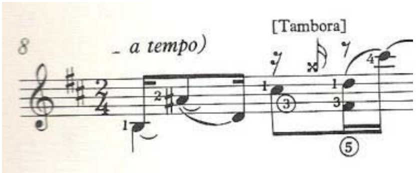
- Legato articulation for percussive tambora sounds
- *Pianissimo* dynamics for percussive tambora sounds (Figure 10.32)

## Combinations with other sounds

Percussive tambora sounds are often used as a percussive effect in between plucked or strummed sounds.

### *Percussive tambora sounds alternated with plucked sounds*

*Figure 10.33 Percussive tambora and plucked sounds*

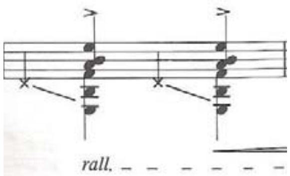



(FIVE BAGATELLES, WALTON)

Walton alternates plucked sounds with tambora sounds (Figure 10.33). This alternation can be scored at moderate speeds, as the performer needs some time to reposition the hand to pluck again after performing the tambora sound.

*Percussive tambora sounds alternated with strummed sounds*

*Figure 10.34 Percussive tambora glissando alternated with strummed/plucked chord*




(LA MUERTE DEL ANGEL, PIAZZOLLA ARR. BENITEZ)

Piazzolla (Figure 10.34) and Ginastera (Figure 10.5) alternate percussive tambora sounds with strummed sounds; this alternation can be performed at high speeds as they are performed in the same area of the guitar and are both performed with a large movement.

## 10.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing tambora sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

### 10.4.1 Textures as continuations of horizontal cells

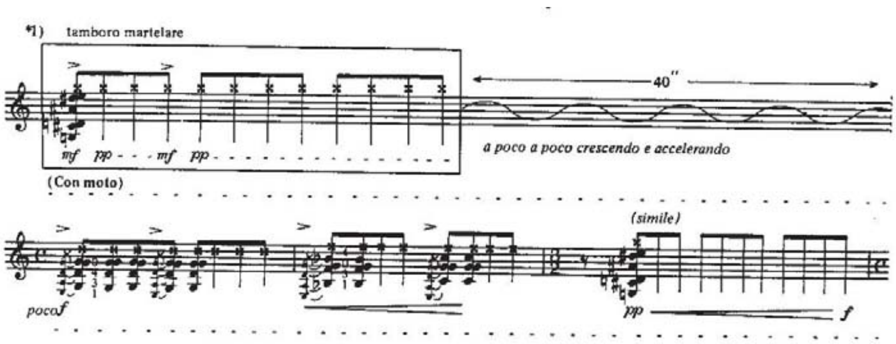
#### Chordal tambora texture

*Figure 10.35 Chordal tambora texture*


(GRAN JOTA DE CONCIERTO, TÁRREGA)

Tárrega continues a sequence of vertical cells of pitched tambora sounds for many measures, creating a chordal tambora texture (Figure 10.35). In the *Gran Jota*, the tambora is used to score a variation on the main theme with an altered sound. The tambora sound also contrasts dynamically with the variation that precedes it (consisting of strummed vertical cells) and the variation that follows it (harmonics and plucked vertical cells), as the tambora is situated at a lower dynamic level.

*Figure 10.36 Chordal tambora texture with slurs*

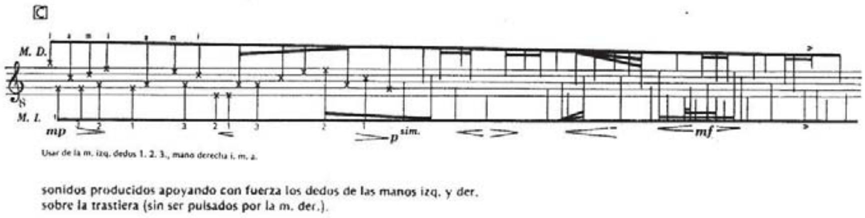



(THE LAST DISCO, RAK)

Rak creates a chordal tambora texture that includes slurs connecting various four-note vertical cells (Figure 10.36). The opening of the passage evokes a mysterious atmosphere through the resonance of the dissonant vertical cell, the irregular dynamic alternations and the increasing acceleration. The inclusion of two open strings enhances the resonance of the tambora. This passage is a good example of what can be accomplished within the dynamic range of the pitched tambora.

### Two-hand percussive tambora texture

*Figure 10.37 Two-hand percussive tambora*



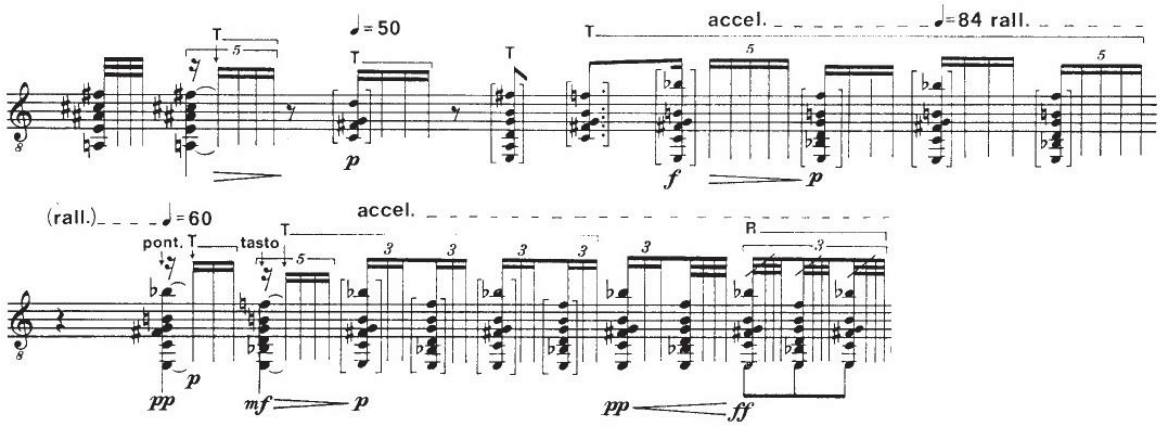

(LA ESPIRAL ETERNA, BROUWER)

Brouwer creates a two-hand percussive tambora texture in *La Espiral Eterna* (Figure 10.37). The texture has a percussive quality that is mixed with irregular pitches produced by slamming the strings onto the fretboard. The irregular character of pitch and rhythm in this passage is further highlighted, and aided, by the graphic notation that Brouwer here, fittingly, employs.

## 10.4.2 Textures as combinations of horizontal cells

### Texture of tambora, rasgueado and strumming

*Figure 10.38 Texture containing tambora, rasgueado and strumming*




(SEQUENZA XI, BERIO)

Berio creates a texture that alternates vertical sequences of tambora sounds, strummed vertical cell sequences, and rasgueado vertical cell sequences (Figure 10.38). This passage demonstrates how the composer can treat a set of vertical cells with a variety of sounds, and use each sound for a different dynamic range. At the softer end of the dynamic spectrum, tambora is mostly used here, strumming is mainly used in the middle range, while rasgueado is employed at the louder end. The strumming sound is varied through the use of ponticello and tasto timbre changes. The multiple open strings enhance the resonant properties of this passage and facilitate position changes without interruptions of sound in the transitions between the vertical cells.

## Texture of plucked sounds, tambora, Bartok pizzicato, percussion and hammering

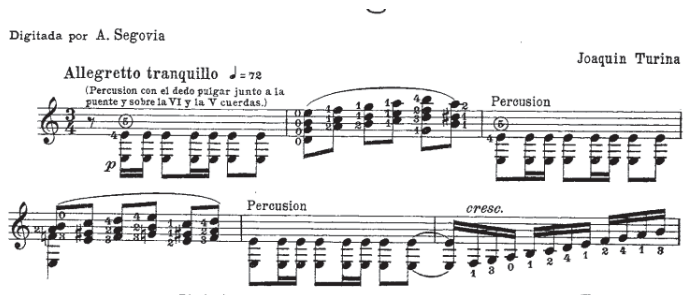
*Figure 10.39 Braiding of multiple sounds*


(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates a texture that braids together plucked sounds, percussive tambora sounds, Bartok pizzicato sounds, left-and right hand percussion sounds and hammered sounds (Figure 10.39). Just as in Figure 9.29, the texture pictured here is hyper-rich in sounds, hyper-functional and hyper-rhythmic. A characteristic feature of this texture is the relative absence of resonance; the shortness and rapid sequences of the plucked notes match the short resonance of the percussive sounds and their employment in rapid sequences. Together with the extremely fast alternations and transitions between sounds, this matching of characteristics between different sounds enhances the braiding character. Because of this rapid braiding, distinguishing individual sounds and the transitions between them becomes very difficult for the listener. As a result, the texture leaves the impression of the various sounds as being continuously present.

## Texture of tambora and plucking

*Figure 10.40 Texture containing tambora, plucked vertical cell sequences and plucked single line*




(FANDANGUILLO, TURINA)

The idea that the composer can score for the classical guitar with orchestral instruments in mind, and the attempt to imitate these instruments was first, and eloquently, described by Sor (1831, pp. 15-19) and further sustained in the apocryphal quote that "the guitar is a miniature orchestra in itself!"[53]. In the texture pictured in Figure 10.40 from Turina's *Fandanguillo*, such orchestral thinking appears to have informed its scoring. Turina, an orchestral composer himself, creates a texture that combines two-string tambora, plucked vertical cells and a single line of plucked sounds. The octave tamboras in the opening measure are reminiscent of a soft, low, pitched and resonant drumming sound, such as that of the timpani. The subsequent measure of plucked legato vertical cells is evocative of a divisi string section, while the last measure of single line scoring in the low to medium range can be imagined in scoring for pizzicato strings doubled with bassoon.

[53] See footnote 1.

## Chapter 11 Hammered Sounds

**Contents**

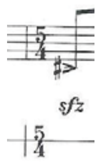
# Chapter 11 Hammered Sounds

Hammered sounds come into existence when a non-ringing string is hammered upon on the fretboard with a finger of the right or left hand. This chapter shows ways in which the composer can handle the characteristics of the hammered sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 11.1 Sound

### 11.1.1 Pitch range

*Figure 11.1 Hammered sound notation*



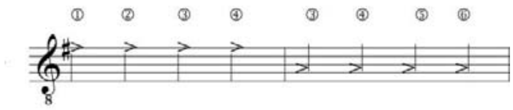

(PERCUSSION STUDY NO. 1, KAMPELA)

The complete guitar range can be used when scoring hammered sounds, except for the open sixth string. In all ranges, the hammered sound is produced by making a hammering movement with one or more fingers onto the fretboard and may involve a movement of the arm in order to make the note louder. This movement is usually performed by the left hand, but may also be performed by the right hand. A significant characteristic of hammered sounds is that each note is performed by one hand alone, leaving the other hand free to produce other sounds, if desired. There is no standard notation for hammered sounds; Kampela uses an accent symbol as a notehead to indicate hammered notes in his score (Figure 11.1). Brouwer uses a regular notehead with a cross on the stem (Figure 11.12), while Berio uses a separate staff for notes that are hammered with the right hand (Figure 11.18). All these types of notation are clear to the performer. The composer can choose whether to use a verbal indication, symbol or a different notehead.

### 11.1.2 Timbre possibilities

## Stopping position

*Figure 11.2 Stopping position changes*



The timbre of hammered notes can be altered by changing the stopping position (Figure 11.2). The plucking position of hammered sounds cannot be varied, as hammered sounds are produced with a hammering move of one hand.

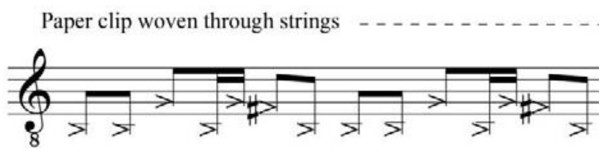
## Etouffé

*Figure 11.3 Etouffé hammered sounds*


Etouffé hammered sounds are performed by hammering a note with the left hand and simultaneously slightly damping it with the side of the right hand (Figure 11.3). Sounds scored etouffé have a reduced resonance and dynamic range.

## Prepared guitar

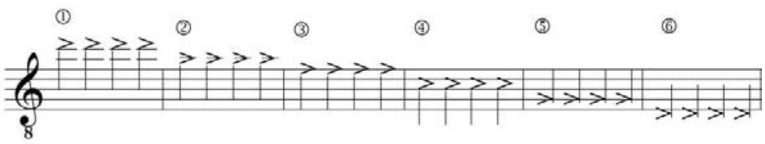
*Figure 11.4 Paper clip preparation*




The timbre of hammered sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 11.4). The initial sound of a hammered note prepared with a paper clip is very similar to that of a non-prepared hammered note. However, during the ensuing resonance of the note, the effect of the paper clip preparation becomes apparent, turning the tone color into a gamelan-like sound. The sound of the paper clip preparation therefore becomes more audible on longer notes than on shorter notes.

### Bi-tones

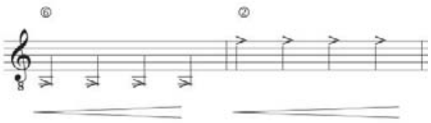
*Figure 11.5 Bi-tones created by hammering on fretboard*



The percussiveness of the right hand tapping leads to an additional pitched sound, termed as a *bi-tone* by Schneider (1985, pp. 126-130). Depending on the string and the position in which it is produced, the bi-tone has different dynamic levels and degrees of clarity, but is always at a much lower dynamic level than the hammered tone. The bi-tone is difficult to hear on the high strings, but is more audible on the lower strings.

## 11.1.3 Dynamic range

*Figure 11.6 Hammered note dynamics*



The dynamic range of hammered sounds is relatively wide on the metal-wound strings, but much less so on the nylon strings (Figure 11.6).

## 11.1.4 Vibrato

*Figure 11.7 Hammered sound vibrato*


All hammered sounds can be scored with lateral or vertical vibrato (Figure 11.7). The performer can initiate the vibrato immediately following the hammering of the note.

## 11.1.5 Pitch bends and microtones

*Figure 11.8 Hammered pitch bending*

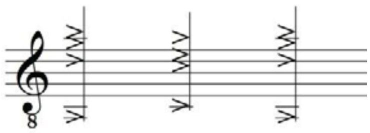

Pitch bends for hammered sounds can be prescribed in the same manner as for regular plucked notes. Microtones can also be prescribed in the same manner: they are attained through a microtonal scordatura or through bending the string. Hammered notes can be scored as microtones, but are always preceded by the non-microtonal hammered pitch that sets off the sound (Figure 11.8).

## 11.2 Vertical cells

Hammered sounds can be scored as vertical cells, or in combination with other sounds.

### 11.2.1 Combinations of two to six notes

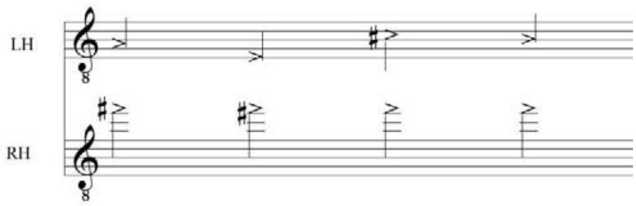
*Figure 11.9 Four-note vertical cells*



When scoring vertical cells of hammered notes, it is possible to combine up to four notes. Various spacings are possible, as long as they fit within the hand span of the position in question. It is not necessary to score these vertical cells on adjacent strings, as each note is produced with a single finger (Figure 11.9). Additionally, it is possible to use hammered bar chords, which makes it possible to create six-note hammered chords.

### 11.2.2 Combinations of two notes on distant locations on the fretboard

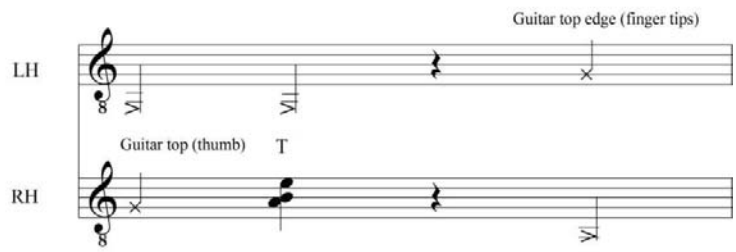
*Figure 11.10 Hammered note combinations on distant locations*



It is possible to score note combinations that are to be hammered with two hands: in such cases, two-note combinations are most effective as combinations of more notes are less audible. When scoring hammered notes that are to be performed with two hands, note combinations that cannot be covered by the hand span of one hand can now be scored (Figure 11.10).

### 11.2.3 Combinations with other sounds

*Figure 11.11 Hammered note combinations with other sounds*




When scoring hammered sounds that are performed with the left hand, it is possible to create vertical cells of hammered sounds combined with other sounds performed with the right hand alone. Sounds that can be performed by the right hand alone in such a combination are plucked sounds, natural and artificial harmonics, strummed sounds, rasgueado sounds, right hand percussion, pitched and natural harmonics tambora (Figure 11.11), percussive tambora, Bartok pizzicato sounds, buzzing string sounds, scratching string sounds, and inverted stopping sounds.

When scoring hammered sounds that are performed with the right hand, it is possible to create vertical cells of hammered sounds combined with other sounds performed with the left hand alone. Sounds that can be performed with the left hand alone in such a combination are plucked sounds, open string strumming, left hand percussion (Figure 11.11), percussive tambora, open string Bartok pizzicato sounds, scratching string sounds, and sounds produced by plucking behind the nut.

## 11.3 Horizontal cells

Hammered sounds can be scored into two types of horizontal cells: single line horizontal cells and vertical cell sequences. In this section, both types are discussed.

### 11.3.1 Single lines of hammered sounds

#### Design

*Figure 11.12 Two-hand hammering*


(PAISAJE CUBANO CON CAMPANAS, BROUWER)

A single line horizontal cell of hammered sounds is a succession of single hammered notes. The horizontal cell can be scored for one hand or for two hands (Figure 11.12).

*Figure 11.13 Delayed ascending slur*


(PERCUSSION STUDY NO. 2, KAMPELA)

Kampela also uses the notation of hammered notes for delayed ascending slurs to avoid confusion as to the status of the intermediary note(s) that are performed as plucked notes (Figure 11.13). This is a useful and clear notation for such situations, but the notes scored with alternative noteheads are not in fact hammered sounds.

## Resonance

*Figure 11.14 Resonance*

Horizontal cells of hammered sounds can be scored in such a way that they sound on into the temporal space of subsequent notes; this is possible when they are scored within one left-hand position (Figure 11.14). In order to produce notes that do not ring on, the performer can easily end the resonance by lifting the finger that produced the hammered note in question.

## Harmonic possibilities

As is the case for single lines of plucked sounds, single line horizontal cells of hammered sounds have a very broad range of harmonic possibilities, because the performer only has to be concerned with one line. Because of the wide range of possibilities to combine pitches, single lines horizontal cells of hammered sounds lend themselves well to writing in keys not directly associated with the pitches of the open strings, as well as for twelve-tone and serial writing. This is particularly the case when the single line horizontal cells of hammered sounds are performed with two hands.

## Speed

*Figure 11.15 Rapid hammered note sequence*

Single line horizontal cells of hammered sounds performed with one hand can be scored at relatively high speeds, especially when they consist of a small number of alternating notes or a row of consecutive notes, and when they are scored with legato articulation. Rapid sequences have a more limited dynamic range, as they give the performer little time to prepare for a powerful hammering action onto the fretboard (Figure 11.15).

*Figure 11.16 Rapid two-hand hammering sequence*

(PAISAJE CUBANO CON CAMPANAS, BROUWER)

When performed with two hands, slightly higher speeds can be scored (Figure 11.16).

## Articulation

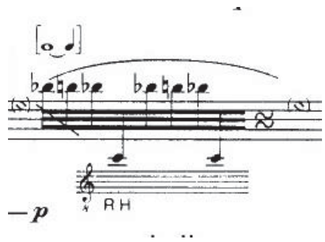
Single line horizontal cells of hammered sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

### *Slurs*

*Figure 11.17 Slur in hammered note sequence*

One or more notes in a sequence of single line hammered sounds can be connected to a subsequent note by means of a slur (Figure 11.17). It is a prerequisite for the slurred note to be located within the hand span.

*Figure 11.18 Right hand hammering and slurs*




(Sequenza XI, Berio)

Berio combines right hand hammering with ascending and descending slurs performed with the right hand and the left hand (Figure 11.18). In order to avoid confusion between slurs and hammered notes, the notation used here by Berio, with the slurred notes on the top staff and the hammered notes on a temporary second staff, is clear and easily decipherable for the performer.

### *Legato*

*Figure 11.19 Hammered note legato*

Because of the percussive quality of hammered notes, the performer can create a legato articulation by mixing hammered notes with slurs (Figure 11.19). Notes that are located on the same string as the initial hammered note on the string in question are then performed as slurs, rather than hammered notes.

### *Accents*

*Figure 11.20 Articulation of hammered notes*

Single line horizontal cells of hammered sounds can be scored with accents (Figure 11.20). The accent is performed by hammering on the fret in question with more force than surrounding notes. Hammered notes have a sufficient dynamic range for these accents to stand out dynamically, particularly on the metal-wound strings.

### *Staccato*

Single line horizontal cells of hammered sounds can be scored with staccato articulation. The guitarist performs the staccato either by lifting the finger off the fretboard after attack (Figure 11.20), or damping the string with the left hand or right hand.

### *Glissando*

*Figure 11.21 Hammered note glissando*

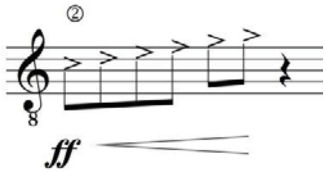

Glissando can be used to connect notes in a single line. The glissando can be performed literally, when the composer prescribes a literal glissando between two notes (Figure 11.21), or as a partial glissando. Additionally, single lines of hammered sounds can be scored with a tuning key glissando.

## Embellishment

Embellishments can be employed in single line horizontal cells of hammered notes by attaching a left hand trill to a note in the sequence. When the left hand is performing the embellishment, the right hand can perform hammered notes or other sounds.

## Non-functional writing

*Figure 11.22 Non-functional writing*




An example of non-functional writing for single line horizontal cells of hammered notes:

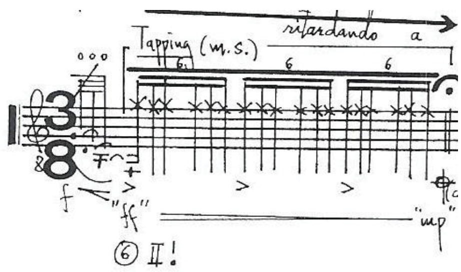
- *Fortissimo* scoring for hammered notes on nylon strings (Figure 11.22)

## Combinations with other sounds

Single line horizontal cells of hammered notes are sometimes scored in close conjunction with other sounds. In this section, combinations from the repertoire are discussed.

### *Hammered sounds combined with plucked sounds*

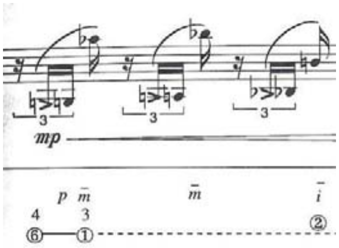
*Figure 11.23 Hammered sounds combined with plucked sounds*




(CUADERNO DE FRIEDENAU, SÁNCHEZ-VERDÚ)

Sánchez-Verdú combines hammered sounds with plucked sounds: a plucked arpeggio of open strings is used to create the resonance in which the hammered sounds are performed (Figure 11.23). These two sounds can be connected at high speeds, as the plucking is performed with the right hand, while the hammering is performed with the left hand.

*Figure 11.24 Hammered sounds combined with plucked sounds*




(Percussion Study No. 1, Kampela)

Kampela creates rapid sequences of hammered sounds and plucked sounds by having them performed at the same pitch (Figure 11.24).

### *Hammered sounds alternated with strummed sounds*

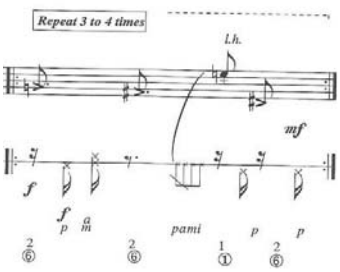
*Figure 11.25 Hammered sounds alternated with strummed sounds*


(Paisaje cubano con campanas, Brouwer)

Brouwer alternates single hammered sounds with chords that are strummed downward (Figure 11.25). These two sounds can be connected at high speeds, as the hammering is performed with the left hand, while the strumming is performed with the right hand.

### *Hammered sounds alternated with percussion sounds*

*Figure 11.26 Hammered sounds alternated with percussion sounds*

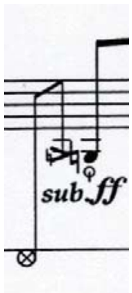



(Percussion Study No. 1, Kampela)

Kampela alternates hammered sounds with nail percussion and left hand plucking (Figure 11.26). These two sounds can be connected at high speeds, as the hammering is performed with the left hand, while the percussive sounds are performed with the right hand.

### *Hammered sound sequenced with Bartok pizzicato and a percussion sound*

*Figure 11.27 Rapid sequence including hammered sound*

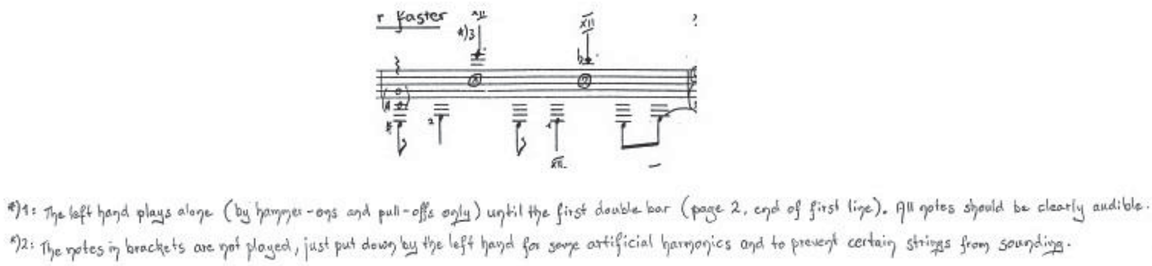



(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela frequently uses a sequence of a right-hand guitar top percussion sound and a left-hand hammered sound followed by a Bartok pizzicato on the same pitch (Figure 11.27). This sequence can be scored at very high speeds, as this horizontal cell is performed with a right-hand move, followed by a left-hand move and finished with another right hand move, while the left finger stays in the same position.

### *Hammered sounds alternated with harmonics*

*Figure 11.28 Hammered sounds alternated with natural harmonics*




(CRYSTAL VERMIN, MAIER)

Maier creates two-part cells in which the bass line is performed with the left hand alone and consists of hammered notes and pull-offs, while the right hand performs natural harmonics. The connection speed between these sounds is very high, as the bass line is performed with the left hand alone, while the natural harmonics are performed with the right hand alone (Figure 11.28).

## 11.3.2 Vertical cell sequences of hammered sounds

### Design

A vertical cell sequence of hammered sounds is a succession of vertical cells of hammered sounds. The horizontal cell can be scored for one hand or for two hands. Vertical cell sequences scored for two hands are quite unusual in the guitar repertoire.

### Resonance

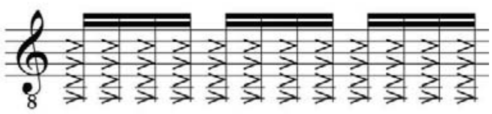
Vertical cell sequences of hammered sounds usually do not ring on into the temporal space of subsequent notes, as the left hand fingers are lifted when moving from one fingering to the next, thus ending the resonance.

### Harmonic possibilities

The harmonic possibilities of vertical cell sequences of hammered sounds are more limited than those of single line horizontal cells: the options depend on the left-hand span of a given position. When a succession of vertical cells is scored with fewer notes, there are more possibilities for choosing pitches and keys than is the case with vertical cells containing many notes.

### Speed

*Figure 11.29 Rapid hammered vertical cell sequence*



Sequences of hammered vertical cells can be scored at moderate speeds. When such sequences contain repetitions of a vertical cell (Figure 11.29) they can be scored at higher speeds than when the structure or the playing position of the vertical cell changes frequently.

### Articulation

Vertical cell sequences of hammered sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

### *Slurs*

One or more notes in a vertical cell sequence of hammered sounds can be connected to a subsequent note or vertical cell by means of a slur. The slurred notes, as a rule, should fit within the left-hand span of the position in question.

### *Legato*

*Figure 11.30 Legato and glissando in hammered vertical cell sequence*


Sequences of different vertical cells that are located close by on the fretboard are easier to perform legato than vertical cells that are further apart. Because of the percussive quality of hammered sounds, the performer creates a legato articulation by performing the vertical cell sequence in such a way that the hammered notes do not sound overly percussive, and by striving to avoid interruptions of sound in the transition between the vertical cells (Figure 11.30).

### *Accents*

The composer can make one or more vertical cells in a sequence stand out by using an accent. Such accents work particularly well if the vertical cell is scored over metal-wound strings, due to their broader dynamic range when compared to hammered notes on nylon strings.

### *Staccato*

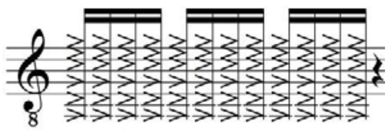
Vertical cell sequences of hammered sounds can be scored using a staccato articulation. The guitarist performs the staccato by either lifting the finger off the fretboard after attack or damping the string with the left or right hand.

### *Glissando*

Vertical cells sequences of hammered sounds can be scored with literal glissando, partial glissando or tuning key glissando. Literal glissandos of vertical cells of hammered sounds are most effective when they are scored with the same left hand fingering (Figure 11.30); changing fingerings during the course of such glissandos reduces the clarity of the glissando. When scoring vertical cells with tuning key glissandos, only one string can be detuned at a time.

### Non-functional writing

*Figure 11.31 Non-functional writing*



Examples of non-functional writing for vertical cell sequences of hammered sounds:

- Six note vertical cell sequences that cannot be hammered with a bar (Figure 11.31)
- *Fortissimo* scoring on the nylon strings

### Combinations with other sounds

When scoring vertical cell sequences of hammered sounds, the same sound combinations are possible as in the case of single lines of hammered sounds. This is because in both cases only one hand is involved in creating the hammered sounds, while the other hand is free to perform other types of sounds.

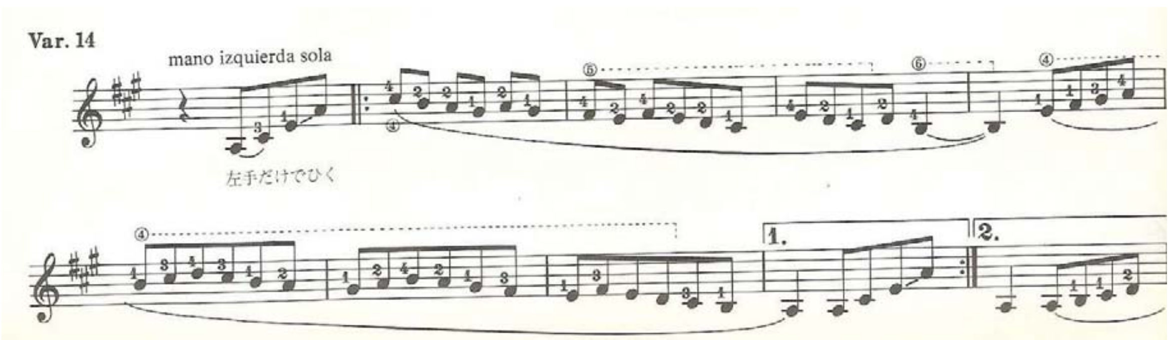
# 11.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing hammered sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 11.4.1 Textures as continuations of horizontal cells

### Left hand alone texture

*Figure 11.32 Left hand alone texture*

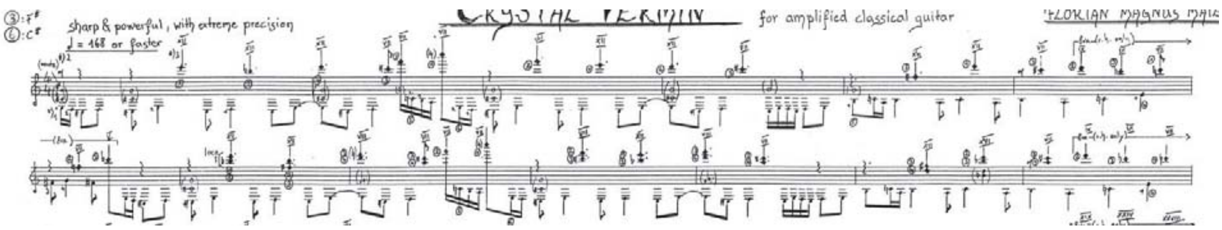



(GRAN JOTA DE CONCIERTO, TÁRREGA)

Tárrega scores a single line of sounds that are hammered and slurred, creating a left-hand alone texture (Figure 11.32). In the *Gran Jota*, the left-hand alone texture is used to score a variation on the main theme with an altered sound. Due to the relatively low dynamic level of the hammers and slurs, as well as the various position changes, the scratching noises on the metal-wound strings caused by these position changes is an audible component of this passage.

## Two-part texture of hammered notes and harmonics

*Figure 11.33 Two-part texture of hammered notes and harmonics*




(Crystal Vermin, Maier)

Maier continues a sequence of two-part scoring in which the bass line is performed with the left hand alone and the top notes are natural harmonics, while the right hand performs natural harmonics for many measures, creating a texture that consists of the combination of these sounds (Figure 11.33). The hammered notes are appropriately scored on the lower strings, in order for them to be as audible as possible. A scordatura is used: the third string is tuned a semitone down to f sharp, while the sixth string is tuned down a minor third to c sharp. This allows Maier to score the unusually low bass line, as well as pitch combinations of natural harmonics other than those used in regular tuning.

### Two-hand hammering texture

*Figure 11.34 Two-hand hammering texture*


(PAISAJE CUBANO CON CAMPANAS, BROUWER)

Brouwer creates a texture of notes hammered by the left and right hands (Figure 11.34). The use of two hands for hammering makes it possible to use large intervals, as well as large and rapid interval jumps, which are not possible with one hand or with regular plucking, as the intervals do not fit within the hand span. This passage requires a type of finger coordination on the part of the guitarist that is not often trained, as it does not commonly appear in compositions. In order to ensure playability, Brouwer appropriately uses a limited set of hammering positions.

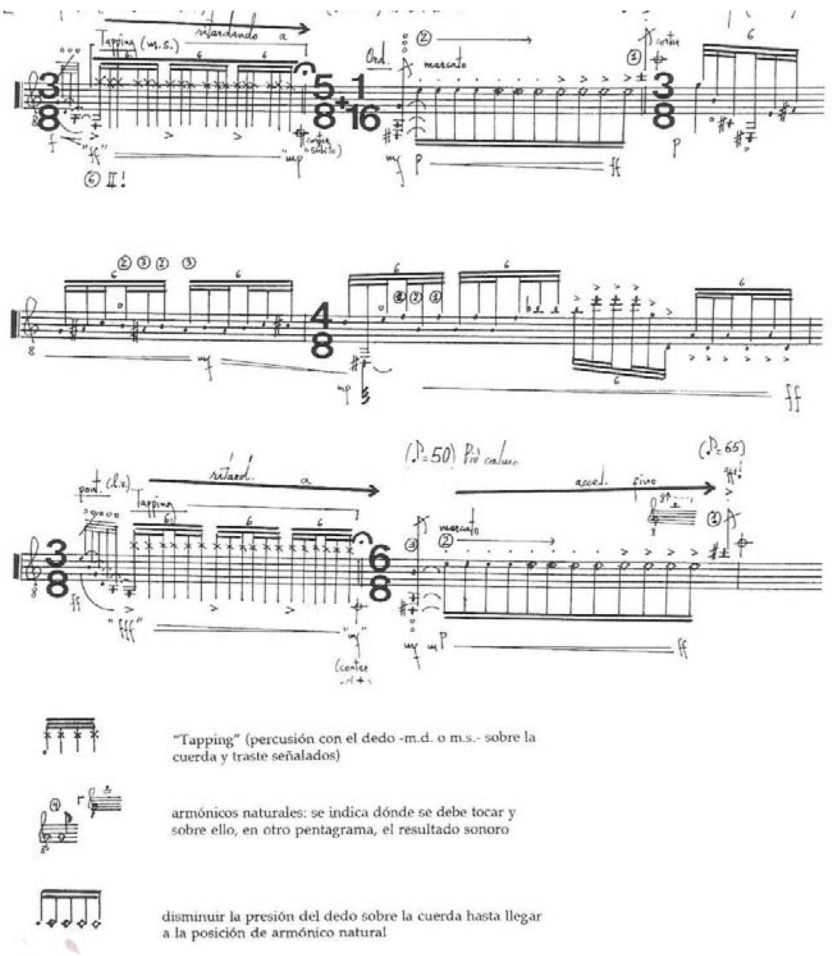
## 11.4.2 Textures as combinations of horizontal cells

### Texture of plucked sounds, hammered sounds, percussion sounds and Bartok pizzicato sounds

Kampela creates textures that braid plucked notes, hammered notes, left- and right hand percussion, Bartok pizzicato together at high speeds (See Chapter 9 and 10).

### Texture of hammered sounds, plucked sounds and etouffé plucked sounds

*Figure 11.35 Mixed texture*




(CUADERNO DE FRIEDENAU, SÁNCHEZ-VERDÚ)

Sánchez-Verdú creates a texture that alternates hammered sounds, plucked sounds and etouffé plucked sounds (Figure 11.35). Hammering is used here in an inventive manner; the hammered notes accompany the natural decay of the arpeggiated chord resonance. The use of open strings in this chord enhances the resonance, while the scordatura creates an open string resonance that differs from open string resonance in standard tuning. Another example of creative scoring appears in the second measure of the first line and the second measure of the third line, where a fingered note is slowly released to transform the regular plucked sound into a muffled sound, and finally into a natural harmonic. In order to score such a transformation, the composer should look for a fret that has an audible nodal point in the corresponding position.

# Chapter 12 Bartok Pizzicato Sounds

## Contents

# Chapter 12 Bartok Pizzicato Sounds

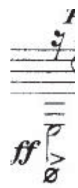
Bartok pizzicato sounds materialize when the string is pulled away from the guitar and released to bounce back to its original position. The sound is sometimes also referred to as snap pizzicato (Schneider, 1985, p. 124). This chapter shows ways in which the composer can handle the characteristics of the Bartok pizzicato sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 12.1 Sound

### 12.1.1 Pitch range

The full guitar range can be used for Bartok pizzicato sounds, as well as natural harmonics. Bartok pizzicato sounds can be used for single notes or for two open strings at the same time.

*Figure 12.1 Bartok pizzicato*




(SEQUENZA XI, BERIO)

In all ranges, the Bartok pizzicato sound is performed by lifting the string and releasing it, causing it to snap back onto the fretboard (Lunn, 2010, p. 24). The string is lifted a few centimeters above its normal position with the thumb alone or in combination with another finger and subsequently released. On the sixth string, it is easy to perform a Bartok pizzicato with the thumb alone, because there is no string that complicates the ease with which the thumb can get under the string to anticipate the lift. On the other strings, it is easier to perform a Bartok pizzicato by gripping the string with fingers p and i.

Bartok pizzicato notes are notated as regular notes, accompanied by a symbol of a circle with a vertical line or diagonal line (Figure 12.1).

### 12.1.2 Timbre possibilities

#### Attack

When the string is released in the performance of the Bartok pizzicato, it snaps back onto the fretboard with great speed, causing a high-pitched, percussive sound. Out of this noise, the resonating pitch of the string emerges. The Bartok pizzicato sound is thus a mix of the percussive snap of the strings and the subsequent resonating of the string.

#### Sound color and playing position

Bartok pizzicato sounds are rather immune to differences in playing position, because the initial impulse of the sound is caused by the strings rattling onto the fretboard, rather than the position in which the string is lifted.

#### Stopping position

As is the case with all stopped sounds, playing a note from the middle or high range in a high position on a low string changes its timbre. The composer should specify in a fingering where she wishes a particular note to be performed in order for it to have a particular sound color.

#### Etouffé

*Figure 12.2 Etouffé Bartok pizzicato sounds*


The timbre of Bartok pizzicato sounds can be changed by muffling. Etouffé Bartok pizzicato sounds are performed by attacking a note and simultaneously slightly damping it with the side of the right hand or by lightly touching a string with the left hand. Sounds scored etouffé have a reduced resonance and dynamic range.

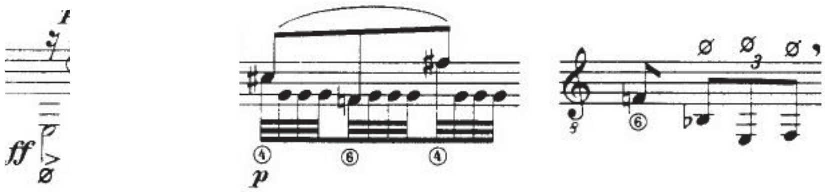
#### Prepared guitar

*Figure 12.3 Paper clip preparation*


The timbre of Bartok pizzicato sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 12.3). The initial sound of a Bartok pizzicato note prepared with a paper clip is very similar to that of a non-prepared Bartok pizzicato note, as the impulse of the sound is caused by the snapping of the string onto the fretboard. In the subsequent resonance, the effect of the paper clip preparation becomes apparent, turning the tone color into a gamelan-like sound. In the video example of Figure 12.3, the effect of the paper clip preparation is only audible for a short moment per note, due to the small note values in the score.

## 12.1.3 Dynamic range

*Figure 12.4 Bartok pizzicato dynamics*

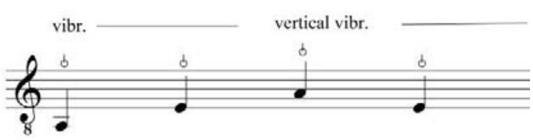



(SEQUENZA XI, BERIO)

A Bartok pizzicato has a dynamic range that is positioned at a high dynamic level and this range is relatively limited. It can be performed at a dynamic level louder than a regular note due to the dynamic force of the snapping of the string onto the fretboard, but it is not possible to play a soft Bartok pizzicato; if the string is not lifted high enough, the snapping sound that is characteristic for the Bartok pizzicato sound cannot be heard. When the string is lifted higher and the snapping sound can be heard, the dynamic level is already high (Figure 12.4).

## 12.1.4 Vibrato

*Figure 12.5 Bartok pizzicato vibrato*



Vibrato is possible on stopped notes, as the finger of the left hand that stops the note performs the vibrato (Figure 12.5). As with all stopped notes, both lateral and vertical vibrato can be scored.

### 12.1.5 Pitch bends and microtones

*Figure 12.6 Bartok pizzicato pitch bends*


Pitch bends for strummed notes are to be prescribed in the same manner as for regular plucked notes. Microtones are also be prescribed in the same manner: they can be attained through a microtonal scordatura or through bending the string.

## 12.2 Vertical cells

*Figure 12.7 Concurrent performance of two Bartok pizzicato notes*


*Figure 12.8 Two-note vertical Bartok pizzicato cell*


(Trois Graphiques, Ohana)

The possibilities of combining Bartok pizzicato sounds into vertical cells are limited to combinations of open strings (Figure 12.7) and of stopped and/or open string notes on adjacent strings (Figure 12.8). In the first case, the performer uses the right hand to lift and release one string, while the left hand is simultaneously used to lift and release the other string. In the second case, the performer pulls two instead of one string up and lets both strings snap back onto the fretboard.

## 12.3 Horizontal cells

Bartok pizzicato sounds can be scored into two types of horizontal cells: single lines and vertical cell sequences. Since the possibilities of vertical cell sequences are limited to vertical combinations of two open strings, only single line horizontal cells are discussed here.

### 12.3.1 Single lines

#### Design

A single line Bartok pizzicato horizontal cell is a succession of single Bartok pizzicato sounds.

#### Resonance

It is possible to score Bartok pizzicato sounds in such a way that they **do not** ring on; this happens when the intervals are relatively small, or when staccato articulation is used. In order to stop the resonance of the string, the performer damps the string with the left or right hand or lifts the stopping finger. Horizontal cells of Bartok pizzicato sounds can also be scored in such a way that they **do** sound on into the temporal space of subsequent notes; this is possible when they are scored within one left-hand position or with open strings that ring on after position changes. To this effect, ties or a verbal instruction such as l.v. (let vibrate) should be used.

#### Harmonic possibilities

As is the case for single line horizontal cells of plucked sounds, single line horizontal cells of Bartok pizzicato sounds have a very broad range of harmonic possibilities, because the performer only has to be concerned with the performance of one line. Because of the wide range of possibilities to combine pitches, single lines lend themselves well to writing in keys not directly associated with the pitches of the open strings, as well as for twelve-tone and serial writing.

#### Speed

Single line horizontal cells of Bartok pizzicato sounds can be scored at low to moderate speeds. Because each sound has to be prepared by moving one or more fingers under the string, higher speeds are excluded. The speed of the Bartok pizzicato sequence in Figure 12.4 is the approximate maximum speed for consecutive Bartok pizzicato sounds.

#### Articulation

Single line horizontal cells of Bartok pizzicato sounds can be scored with a variety of articulations, including slurs, accents, staccato and glissando. Because of the percussive qualities of the Bartok pizzicato, legato articulation of Bartok pizzicato sounds is not very effective; legato articulation is best achieved with sounds other than Bartok pizzicato sounds, such as plucked sounds and harmonics.

### *Slurs*

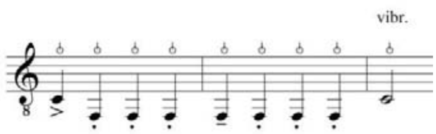
*Figure 12.9 Bartok pizzicato slurs*


(Kurze Schatten II, Ferneyhough)

One or more notes in a sequence of single line horizontal cells of Bartok pizzicato sounds can be connected to a subsequent note by means of a slur (Figure 12.9). The slurred note should fit within the hand span. Due to the way the ascending or descending slur is performed, the sound characteristics of the slurred note differ from that of the Bartok pizzicato sound.

### *Accents*

*Figure 12.10 Bartok pizzicato articulation*




Because of the wide dynamic range of Bartok pizzicato sounds, the composer can effectively make a Bartok pizzicato sound stand out with an accent (Figure 12.10).

### *Staccato*

Single line horizontal cells of Bartok pizzicato sounds can be scored with staccato articulation. The guitarist performs the staccato either by lifting the stopping finger off the fretboard after attack (Figure 12.10), or by damping the string with the left or right hand.

### *Glissando*

*Figure 12.11 Bartok pizzicato with glissando*


(PAISAJE CUBANO CON CAMPANAS, BROUWER)

Glissando can be used to connect notes in a single line. As is the case with single line sequences of plucked sounds, this can be done literally, by prescribing a literal glissando between two notes (Figure 12.11), or as a partial glissando. Additionally, single line horizontal cells of Bartok pizzicato sounds can be scored with a tuning key glissando.

## Embellishment

Embellishments can be employed in single line horizontal cells of Bartok pizzicato sounds by attaching a left hand trill to a note in the sequence. The trill can continue to be performed with the left hand, while the right hand alone engages in the performance of Bartok pizzicato sounds or other sounds.

## Non-functional writing

*Figure 12.12 Non-functional writing*


Examples of non-functional writing in single line horizontal cells of Bartok pizzicato sounds:

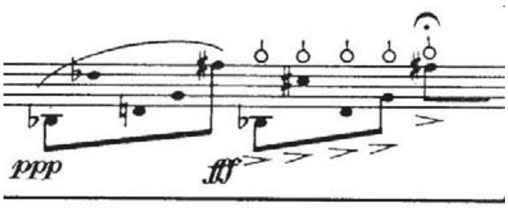
- Rapid successions of Bartok pizzicato notes
- *Pianissimo* scoring of Bartok pizzicato notes (Figure 12.12)

## Combinations with other sounds

Single line horizontal cells of Bartok pizzicato sounds are often scored in close conjunction with other sounds. In this section, combinations from the repertoire are discussed.

### *Bartok pizzicato sounds combined with plucked sounds*

*Figure 12.13 Bartok pizzicato sounds after plucked sounds*




(TARANTOS, BROUWER)

Brouwer lets a sequence of Bartok pizzicato sounds follow a sequence of regular plucked sounds (Figure 12.13). These two sounds can be connected at moderately high speeds: the performer needs some time to shift the hand position to change from one sound to the other.

### *Bartok pizzicato sounds combined with strummed vertical cells*

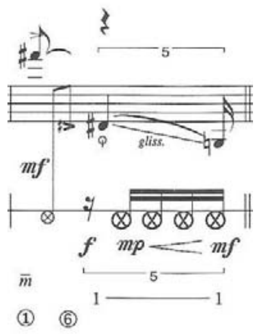
*Figure 12.14 Bartok pizzicato after arpeggiated strum*

(ORFEUNISM, TITRE)

Titre places a Bartok pizzicato sound at the end of an arpeggiated strum (Figure 12.14). These sounds can be connected at high speeds when the final note of the arpeggiated strum is located on the same string as the Bartok pizzicato sound. If the final note of the arpeggiated strum is located on another string than the Bartok pizzicato sound, the composer will need a short moment to change the hand position and prepare the finger for the performance of the Bartok pizzicato.

### *Bartok pizzicato sounds combined with percussion*

*Figure 12.15 Bartok pizzicato sounds combined with percussion*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela scores a Bartok pizzicato glissando that is performed with the right hand while the right hand performs percussion sounds (Figure 12.15)

*Bartok pizzicato sounds combined with one-string rasgueado*
See Chapter 7

*Hammered sound sequenced with Bartok pizzicato and a percussion sound*
See Chapter 11

# 12.4 Textures

Textures containing Bartok pizzicato are usually scored in combination with other cells. The composer may be completely free in the choice of the cells she combines into a texture; the following examples are presented primarily for the purpose of illustrating how some textures in repertoire pieces have been put together.

## 12.4.1 Textures as combinations of horizontal cells

### Texture of Bartok pizzicato sounds, plucked sounds, rasgueado and strumming

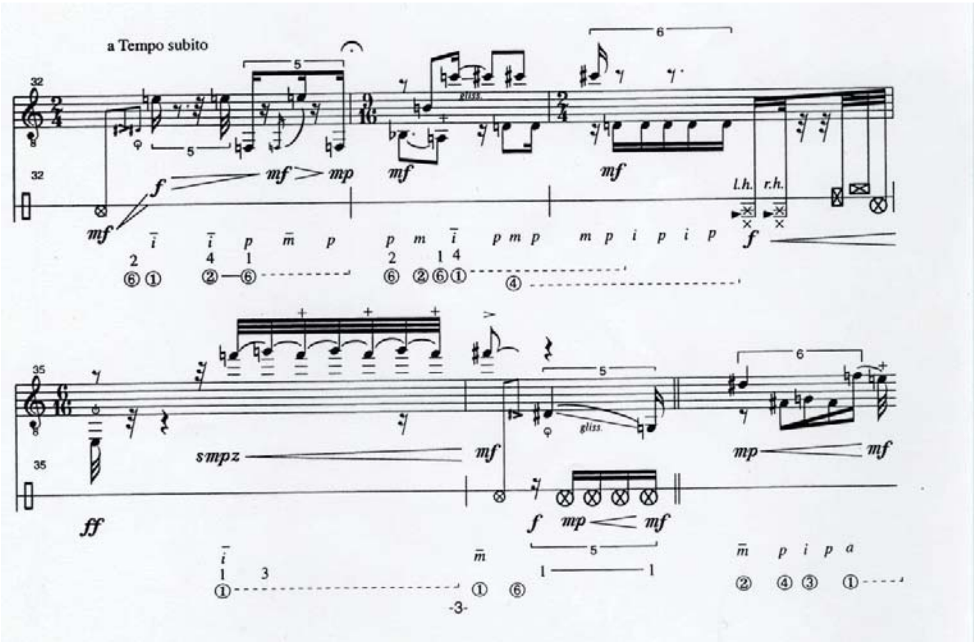
*Figure 12.16 Mixed texture containing Bartok pizzicato sounds*

(SEQUENZA XI, BERIO)

Berio creates a texture in which two-part horizontal cells of plucked sounds, two hand hammering, arpeggio horizontal cells of plucked sounds, rasgueado and arpeggio strums are combined, and where the Bartok pizzicato sound emphasizes the accented quality of the notes it is attached to (Figure 12.16). When scoring Bartok pizzicatos in this passage, Berio primarily uses open strings, which ensures long resonance on these notes. The use of open string basses also makes scoring with a broad pitch range possible, as the low basses ring on while plucking continues in higher positions. The Bartok pizzicato is used here as a coloristic tool for single notes, and the accented Bartok pizzicato notes are presented as louder cousins of their accented and plucked single note counterparts (such as the plucked c sharp in the first half of line one, and the plucked open d string in the first half of the second line). Bartok pizzicato is also used as a dynamic effect: sometimes as the outcome of a crescendo (second line), or as a sudden *forte* (third line). Subsequent notes succeed Bartok pizzicato notes no faster than a sixteenth note after, which allows the guitarist to move the hand back into plucking position after performing the Bartok pizzicato. Despite the many position changes in this passage, they are not difficult to perform, due to the abundant use of open strings, which in turn also promote resonance.

## Texture of Bartok pizzicato sounds, plucked sounds, percussion sounds and percussive tambora

*Figure 12.17 Mixed texture containing Bartok pizzicato sounds*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates a texture in which Bartok pizzicato sounds are alternated with plucked sounds, percussion sounds and percussive tambora sounds (Figure 12.17). Apart from adding sound color to this passage, Bartok pizzicato sounds boost the dynamic range; they are the loudest sounds of the passage, and are placed at the end (second line) or toward the end of a crescendo (first measure of Figure 12.17). In the penultimate measure, Kampela scores an inventive simultaneous combination of sounds; the right hand performs the Bartok pizzicato and subsequently performs body percussion on the guitar top. Meanwhile, the left hand makes a downward glissando on the sixth string, which is resonating from the Bartok pizzicato attack. The result is, as often in Kampela's guitar scores, rapid braiding and mixtures of sounds, made possible by simultaneously using the left and right hand for the production of different sounds.

## Chapter 13 Buzzing String Sounds

**Contents**

# Chapter 13 Buzzing String Sounds

Buzzing string sounds emerge when the guitarist plucks a string that is pulled off the neck, or plucks two crossed strings. This chapter shows ways in which the composer can handle the characteristics of the buzzing string sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 13.1 Sound

There are two types of buzzing string sounds: buzzing string sounds created by pulling the string off the neck, and those created by crossing two strings.

### 13.1.1 Pitch range

*Figure 13.1 String off neck range*

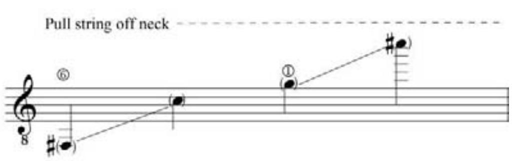
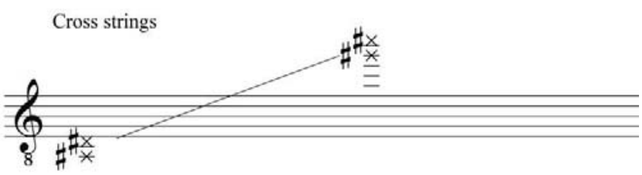


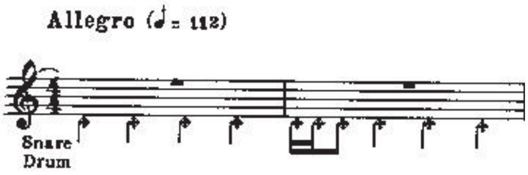

*Figure 13.2 Crossed strings range*




The range of buzzing string sounds that are created by pulling the string off the neck is displayed in Figure 13.1. The range of buzzing string sounds created by crossing two strings is displayed in Figure 13.2. The pitches displayed in both figures are approximate pitches, as the exact pitch created by pulling the strings off the neck or crossing them is not perfectly in tune; it depends on the degree to which the string is moved from its original position. When scoring buzzing string sounds by crossing the third and second string, the interval is approximately a major third instead of a fourth, as this is the interval between the third and second string. Buzzing string sounds created by pulling the string off the neck are performed by pulling the first or the sixth string off the neck, plucking or striking the string in inward or outward movement, and by moving the left hand finger in the off-the neck area according to the prescribed left hand position. Buzzing string sounds created by crossing two strings are performed by moving one string over the other, stopping the crossing point on the fretboard, and moving the finger that holds the crossing point up and down the neck, thus moving the crossing point.

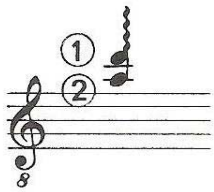
There is no standardized notation for either type of buzzing string sound; Kampela uses parentheses for sounds that are pulled off the neck, as the notation used in Figure 13.1, while for cross-string buzzing, percussive noteheads are often used, due to its similarity in sound to a snare drum. These ways of notating buzzing string sounds are all acceptable, as long as they are properly explained in a legend or performance note.

*Figure 13.3 Crossed strings notation*




(FANTASY, ARNOLD)

*Figure 13.4 Crossed strings notation*



(TRES CANTIGAS NEGRAS, CORDERO)

In the case of cross-string buzzing, composers sometimes only prescribe the crossing of the string, without specifying the pitch (Figure 13.3), or prescribe the position in which the strings are to be crossed without specifying the sounding pitch (Figure 13.4). It is recommended that for buzzing sounds created by pulling the string off the neck, notes are scored in parentheses at the pitch of the stopping position in which they are pulled off the neck accompanied by a verbal instruction. For the scoring of cross-string buzzing, composers should use percussive noteheads scored at the pitch of the stopping position accompanied by a verbal instruction.

## 13.1.2 Timbre possibilities

### Attack

Buzzing string sounds are a mixture of two different sounds: the noise created by the vibration of the string against the frets or another string, which constitutes the percussive element of the sound, mixed with a sympathetic ringing of a pitch or pitches created by stopping the string in a position on the fretboard or off the neck. The crossed strings, or the string that is pulled off the neck, can be attacked by plucking, strumming or outward rasgueado; the rasgueado is the most percussive and powerful attack of the three, while plucking is the least percussive and softest attack.

### Sound color and playing position

*Figure 13.5 String in off-the-neck playing position*

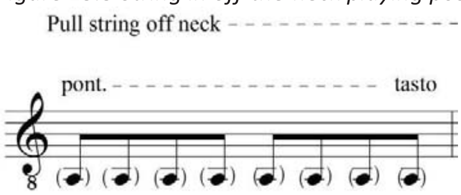
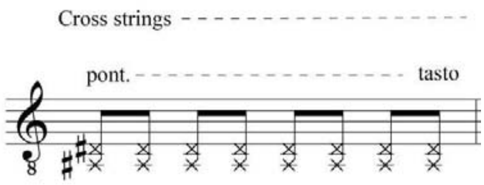



*Figure 13.6 Crossed string playing position*



The degree to which buzzing occurs in both types of string buzzing can be varied by changing the plucking position (Figure 13.5 and Figure 13.6). When the attack is performed close the fretboard, the buzzing increases.

### Stopping position

The stopping position of crossed string sounds can be changed; as is the case with regular plucked notes, playing a note from the middle or high range in a high position on a low string changes its timbre. The composer should specify fingerings if she wishes a note to be performed on a particular string.

### Etouffé

The timbre of buzzing string sounds can be changed by muffling. Etouffé buzzing string sounds are performed by attacking a note and simultaneously slightly damping it with the side of the right hand. Sounds scored etouffé have a reduced resonance and dynamic range.

## 13.1.3 Dynamic range

*Figure 13.7 String off-the-neck dynamics*

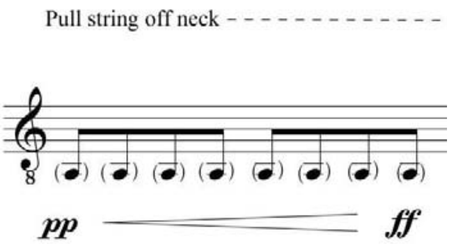
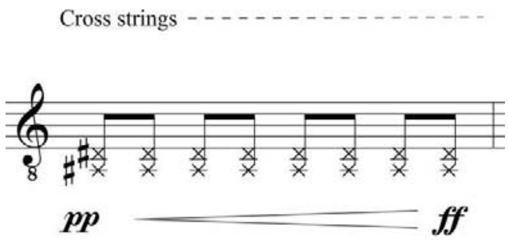



*Figure 13.8 Crossed strings dynamics*




The dynamic range of buzzing string sounds is moderate (Figure 13.7 and Figure 13.8). Buzzing string sounds can be scored from *pp* to about *mf*; when scoring *ff* for buzzing string sounds, it is similar to *mf* for rasgueado chords, for instance (see also Appendix C). The potential to reach a high dynamic level is higher on the metal-wound strings than on the nylon strings, and higher for crossed string sounds than for sounds created by pulling the string off the neck. The highest dynamic levels can be reached by using a rasgueado to attack the strings.

## 13.1.4 Vibrato

Scoring vibrato on buzzing string sounds is not very effective, as it harbors the danger that the string slides back to its normal position, or that the crossing point is released. Moreover, vibrato on buzzing string sound is not very audible.

### 13.1.5 Pitch bends and microtones

Pitch bends for crossed string buzzing sounds should be prescribed in the same manner as for regular plucked notes. Microtones should also be prescribed in the same manner: they can be attained through a microtonal scordatura or through bending the string. For buzzing string sounds created by pulling the string off the neck, microtones can be prescribed; they are attained by changing the off-the-fret stopping position.

## 13.2 Vertical cells

Vertical cells of buzzing string sounds are only possible when combined with non-buzzing sounds.

### 13.2.1 Combinations with other sounds

*Figure 13.9 Vertical combinations with off-the-neck buzzing string sounds*

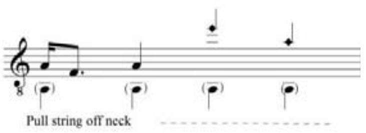
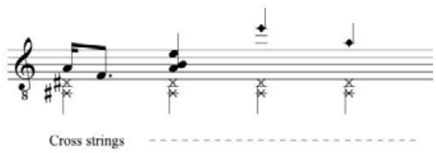



*Figure 13.10 Vertical combinations with crossed-string buzzing*




Buzzing string sounds can be combined with plucked sounds, natural and artificial harmonics (Figure 13.9 and Figure 13.10), strummed sounds and rasgueado sounds. In order to see which note combinations are possible, refer to Appendix A. When creating vertical plucked cells on top of or below buzzing string sounds, up to three notes can be used. When creating vertical strummed or rasgueado cells on top of or below buzzing string sounds, up to five notes can be used. The most effective combinations of strummed and rasgueado vertical cells combined with buzzing string noises are those scored over adjacent strings.

## 13.3 Horizontal cells

Buzzing string sounds can be scored into single line horizontal cells. In this section, single line horizontal cells of buzzing string sounds are discussed.

## 13.3.1 Single line buzzing

### Design

A single line horizontal cell of buzzing string sounds is a succession of single buzzing sounds or cross-string sounds.

### Resonance

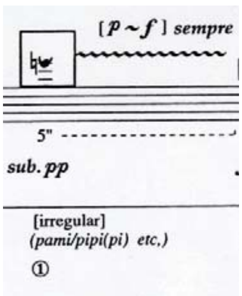
Single line horizontal cells of buzzing sounds do not ring on after their notated value; as soon as the previous note is abandoned its resonance ends.

### Harmonic possibilities

The harmonic possibilities of single line horizontal cells of buzzing sounds are limited; the choices are constrained by the limited options the pitch range offers, and the speed constraints on changing strings (see following section). Composers usually use buzzing sounds as a percussive sound without taking into consideration the pitches that ring during the performance of the buzzing (Figure 13.3), or limit their use of pitches to those reachable on one string (see Kampela examples later in the chapter).

### Speed

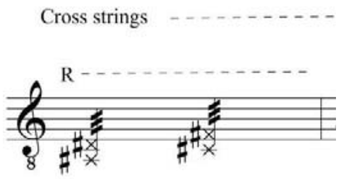
*Figure 13.11 Single line horizontal cell of off-the-neck buzzing sound with tremolo*




(Percussion Study No. 1, Kampela)

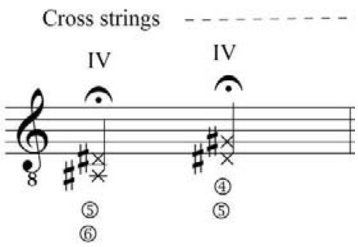
Single line horizontal cells of off-the-neck buzzing sounds can be performed at high speeds when performed with rasgueado or tremolo and when performed on one string (Figure 13.11). Changing pitches on the string is most effectively done by moving one finger in a glissando manner from one note to the next. It is risky to change from one left hand stopping finger to another while playing off the neck, as this might easily inadvertently release the string back to its normal position. Changing from the first string to the sixth string is possible, but requires time as the performer first has to pull the string off the neck.

*Figure 13.12 Single line horizontal cell of crossed strings buzzing sound with rasgueado*




Single line horizontal cells of crossed string buzzing sounds can be performed at high speeds when performed with rasgueado and when performed on one string (Figure 13.12). As is the case for single line horizontal cells of off-the-neck buzzing sounds, changing pitches is done most effectively with a one-finger glissando. It is risky to change the stopping finger while playing crossed string notes, as the strings might accidentally snap back to their normal position.

*Figure 13.13 Crossed strings string change*



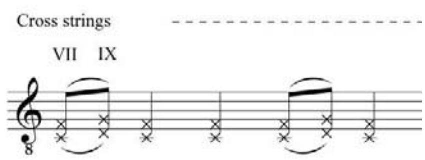

Changing from the first string to the sixth string is possible, but requires quite some time as the performer first has to cross a new pair of strings (Figure 13.13).

## Articulation

Single line horizontal cells of buzzing sounds can be scored with a variety of articulations, including slurs, legato, accents, staccato and glissando.

### *Slurs*

*Figure 13.14 Crossed string slurs*



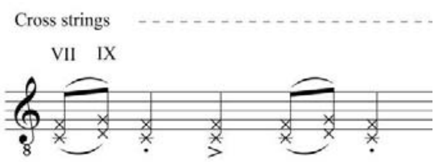

Slurs can be scored for single line horizontal cells of off-the-neck buzzing sounds and of crossed string buzzing sounds. In the case of off-the-neck buzzing sounds on the first string and crossed string buzzing sounds in all ranges, slurs work well from position VII; in lower positions there is a danger that the string is released to the normal position because of the tension on the string. Slurs can only be scored within a minor third range, as in larger slurs there is the risk the string is released to its normal position.

### *Legato*

Legato should only be scored for crossed string sounds in positions higher than position VII, using intervals within a minor third range; in all other cases, glissando is to be used instead.

### *Accents*

*Figure 13.15 Crossed string articulation*



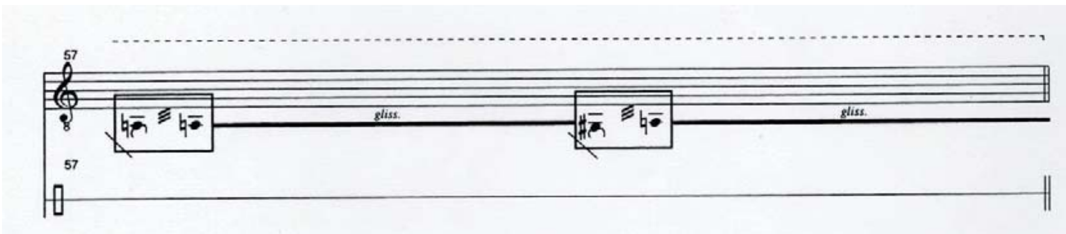

Because of the relatively wide dynamic range of buzzing sounds, single line horizontal cells of buzzing sounds can be scored with accents (Figure 13.15). The accent is created by playing the buzzing sound with more dynamic emphasis.

### *Staccato*

Single line horizontal cells of buzzing sounds can also be scored with staccato articulation (Figure 13.15). The guitarist performs the staccato by damping the string with the left or right hand.

### *Glissando*

*Figure 13.16 Buzzing string glissando*

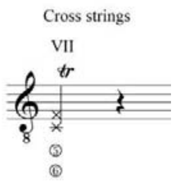



(Percussion Study No. 1, Kampela)

Glissando can be used to connect notes in a single line, and is the standard way of connecting buzzing notes (Figure 13.16). The composer can use literal glissando or a tuning key glissando.

## Embellishment

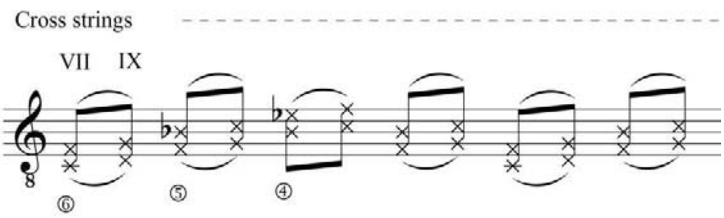
*Figure 13.17 Crossed string trill*




Embellishments can be employed in single line horizontal cells of buzzing sounds by attaching a left hand trill to a note in the sequence. While the trill is performed, the right hand can simultaneously engage in the production of other sounds.

## Non-functional writing

*Figure 13.18 Non-functional writing*




Examples of non-functional writing for single line horizontal cells of buzzing string sounds:

- Rapid string changes when scoring for crossed strings (Figure 13.18)
- Legato scoring when using intervals larger than a minor third
- Non-glissando note changes in positions lower than VII
- Rapid pitch changes

## Combinations with other sounds

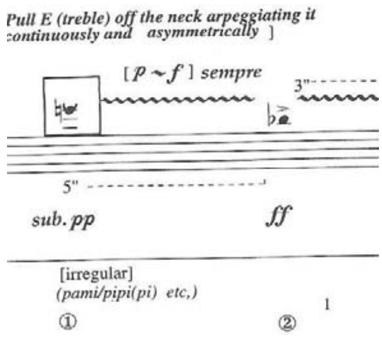
Single line horizontal cells of buzzing string sounds can be combined with other sounds. In this section, literature examples are discussed.

### *Rasgueado buzzing sounds combined with regular string rasgueado*

Kampela creates a sound combination in which the right hand performs a rasgueado over two adjacent strings, in which the bottom note is a buzzing off-the-neck sound on the sixth string, while the top note is a regular open string note (Figure 13.16). These two sounds can be performed simultaneously, as the regular plucked note is not stopped and is easy to strike along with the sixth string.

### *Tremolo buzzing sounds combined with regular plucked sounds*

*Figure 13.19 Combination with regular plucked sounds*




(PERCUSSION STUDY NO. 1, KAMPELA)

In the same composition, Kampela creates a sound combination in which the right hand performs a tremolo attack on a buzzing off-the-neck sound on the first string, while the thumb performs regular plucked notes on the lower adjacent string (Figure 13.19). The two sounds can be connected at high speeds, as the plucked notes are performed with another finger of the right hand and both notes are stopped within the hand span of the left hand.

### *Buzzing string sounds combined with harmonics*

*Figure 13.20 Buzzing string sounds combined with harmonics*


(TRES CANTIGAS NEGRAS, CORDERO)

Cordero creates a sound combination in which a single line horizontal cell of crossed string buzzing sounds is combined with harmonics sounds (Figure 13.20). The two sounds can be played simultaneously, as the crossed strings are stopped within the hand span of the natural harmonics.

### *Crossed string buzzing sounds combined with single lines and vertical cells sequences of plucked sounds*

*Figure 13.21 Crossed string buzzing sounds combined with single lines and vertical cells sequences of plucked sounds*


(FANTASY, ARNOLD)

Arnold creates sound combinations in which crossed strings buzzing sounds are combined with single lines and vertical cell sequences of plucked sounds (Figure 13.21). The two sounds can be played simultaneously, as the crossed strings are stopped within the hand span of the regular plucked sounds, and all other right hand fingers except the thumb are free to pluck the regular notes.

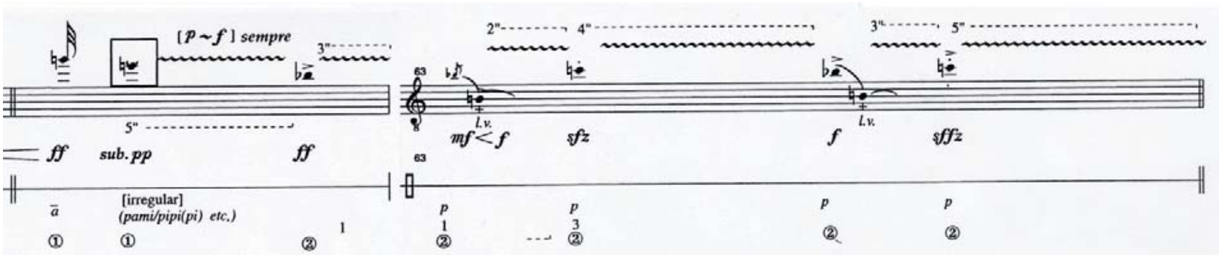
# 13.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing buzzing string sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 13.4.1 Textures as continuations of horizontal cells

### High buzz with interruptions texture

*Figure 13.22 High buzz with interruptions texture*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates a texture in which high buzzing sounds are combined with plucked sounds and slurs on the second string (Figure 13.22). The effective counterpoint of noise and pitches is achieved here with relatively simple means: fingers a,m,i and p perform the buzzing sound on the first string, while finger p occasionally jumps to the second string to pluck the pitched note.

### Buzzing bass texture

*Figure 13.23 Buzzing bass texture*

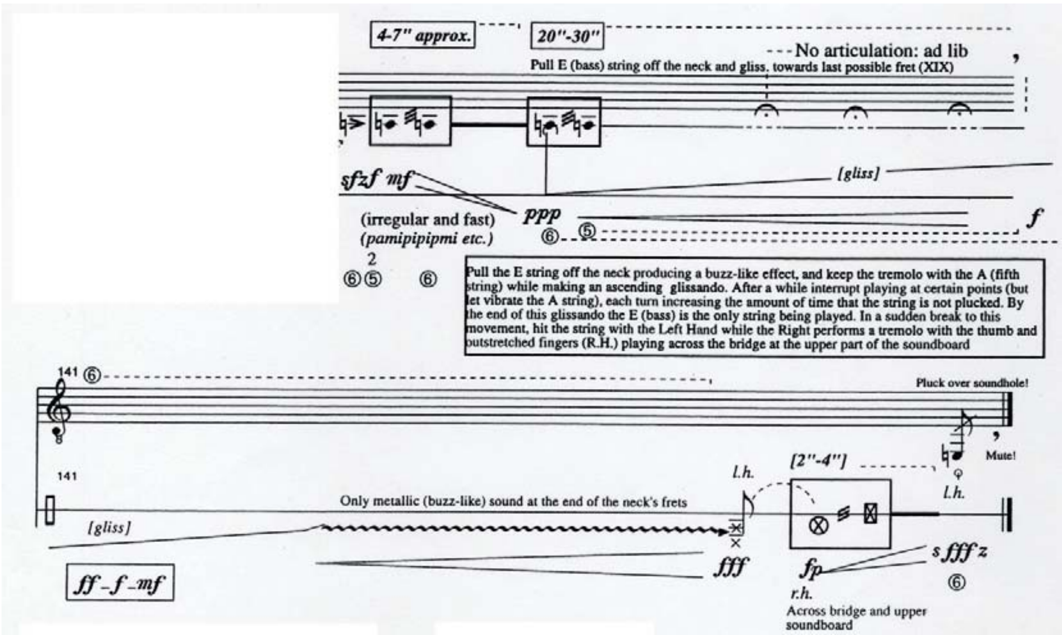

(FANTASY, ARNOLD)

Arnold continues his sound combinations in which a single line horizontal cell of crossed string buzzing sounds is combined with single lines and vertical cell sequences of plucked sounds for many measures, creating a buzzing bass texture (Figure 13.23). The combination of the crossed string sounds, imitating the snare drum, and the plucked vertical cells into the marching rhythm accomplishes a good imitation of a marching band. The composer must always take great care in selecting playable sequences of vertical cells, particularly when combining vertical cells with other sounds, and Arnold has indeed done so. In this score passage, the strings are crossed in the same position as the plucked vertical cells, allowing the guitarist to play both sounds simultaneously. No position changes are made, which reduces the risk of the crossed strings snapping out of their crossed position. Even when scoring the melody in a middle voice (starting from the fourth line, second measure), Arnold carefully manages to keep the left hand in the same stopping position.

## 13.4.2 Textures as combinations of horizontal cells

### Texture of buzzing string sounds, percussion and Bartok pizzicato

*Figure 13.24 Buzzing with percussion and Bartok pizzicato texture*




(PERCUSSION STUDY NO. 1, KAMPELA)

Kampela creates a texture in which a buzzing string texture ends with percussion and a Bartok pizzicato (Figure 13.24). Kampela lays out a rich dynamic playing field, and demonstrates the wide dynamic range of the buzzing string sound. The crescendo of the buzzing string sound is sustained for over thirty seconds, while irregular dynamic undulations occur within this crescendo. The dynamic buildup is successfully completed with body percussion, and concluded with one of its loudest sounds: a heavily accented Bartok pizzicato. Kampela safeguards the playability of this passage by keeping all off-the-neck buzzing sounds on the same string. The pitch on the sixth string rises as the result of the upward glissando, which allows the guitarist to perform the off-the-neck buzzing sounds with one stopping finger, reducing the risk of the string snapping back to its normal position.

## Chapter 14 Scratching String Sounds

### Contents

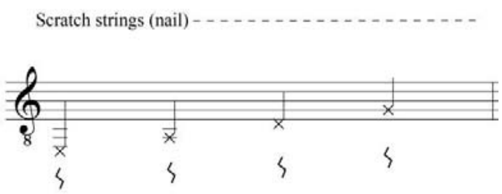
# Chapter 14 Scratching String Sounds

Scratching string sounds come into existence when hands, nails or objects slide over the strings. The sound is often unwanted, and performers try to avoid such scratching sounds, described as "unwanted string noises" (Sauter, 1993) when performing. However, string scratches are sometimes intentionally scored by the composer. This chapter shows ways in which the composer can handle the characteristics of the scratching string sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 14.1 Sound

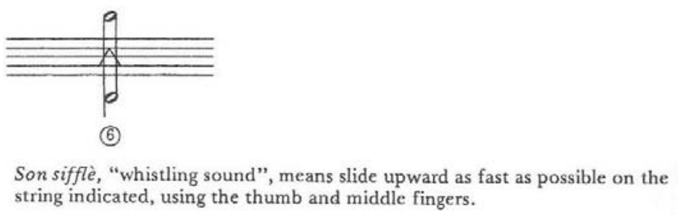
### 14.1.1 Noise range

*Figure 14.1 Scratching sounds*




For the production of scratching string sounds, the full string surface of the guitar can be used. The scratch is performed by moving a finger, nail or hand along the strings, creating a sliding or scratching sound. There is no standardized notation for scratching string sounds; a verbal notation such as "scratch" should be used, or a symbol such as the one used in Figure 14.1, and a percussive notehead to indicate that the string does not have to be plucked at the end of the scratch.

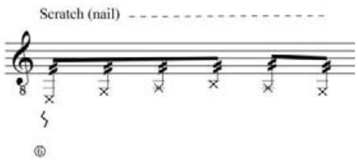
*Figure 14.2 Scratching string notation*




(SONATA, GINASTERA)

Ginastera uses a symbol specified in a legend, and indicates the number of the string on which the scratch should be performed. The scratch is performed with "the thumb and middle fingers". Ginastera calls this sound a "whistling sound" (Ginastera, 1984).

*Figure 14.3 Pitch changes in scratching string sounds*




When performing scratching string sounds with the nail of the thumb on the metal- wound strings, stopping a string changes the pitch of the scratching sound (Figure 14.3).

## 14.1.2 Timbre possibilities

### String

Scratching string sounds on the metal-wound strings sound much clearer than on the nylon strings (Figure 14.1).

### Attack

*Figure 14.4 Scratching with nail and flesh*

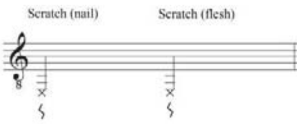
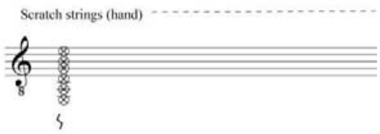
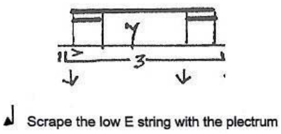



*Figure 14.5 Scratching with the hand*




The scratching string sound can be performed with the nail, the flesh of the finger, an object, or the hand. Scratching the string with the nail does not affect the sound in nylon strings. The performance with the nail on the metal-wound strings thus leads to more of a scratching sound, while performance with the flesh or the hand on any string leads to more of a whistling sound (Figure 14.4 and Figure 14.5).

*Figure 14.6 Plectrum scratch*




(Akephale, Bartlett)

The string can also be scratched with an object, for instance a plectrum (Figure 14.6). This makes it possible to create a more powerful sound on the metal-wound strings when compared to the finger, nail or hand.

### 14.1.3 Dynamic range

*Figure 14.7 Nail scratch dynamics*

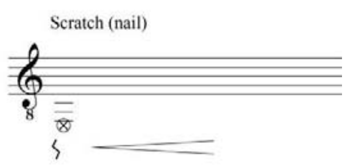
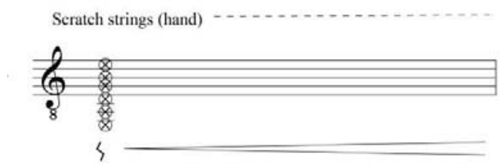



*Figure 14.8 Hand scratch dynamics*



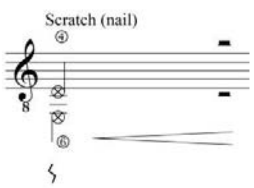

The dynamic range of scratching string sounds is limited. The dynamic range of scratching string sounds attacked with the nail or a plectrum is much wider than that of scratching string sounds attacked with the flesh or the hand (Figure 14.7 and Figure 14.8)

## 14.2 Vertical cells

Scratching string sounds can be scored over multiple strings, or in combination with other sounds.

### 14.2.1 Multiple string combinations

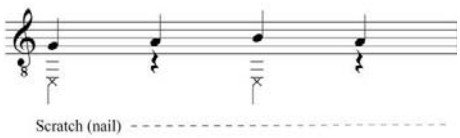
*Figure 14.9 Vertical cell of scratching string sound*




It is possible to score vertical cells of scratching string sounds; the performer executes these by either using the whole hand (Figure 14.8), or by using multiple fingers of the right hand to scratch multiple strings (Figure 14.9). The difference between single scratching string sounds and vertical cells of scratching string sounds is small in terms of sound and technique. Vertical cells of scratching strings sounds are an enhancement of an already present scratching sound, rather than a vertical stacking of various sounds.

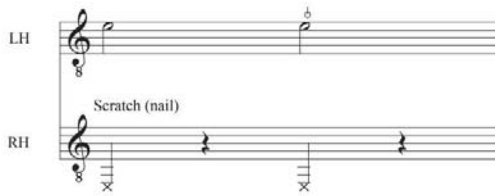
### 14.2.2 Combinations with other sounds

*Figure 14.10 Scratching string sound combined with regular plucked sound*




When scoring scratching string sounds that are performed with the left hand, it is possible to create vertical cells of scratching string sounds combined with other sounds performed with the right hand alone. Sounds that can be performed by the right hand alone in such a combination are plucked sounds, natural and artificial harmonics, strummed sounds, rasgueado sounds, right hand percussion, pitched and natural harmonics tambora percussive tambora, Bartok pizzicato sounds, buzzing string sounds, scratching string sounds, and inverted stopping sounds. In addition, it is possible to pluck stopped strings with fingers a,m and i while the thumb produces scratching string sounds (Figure 14.10).

*Figure 14.11 Vertical combinations with left hand plucking and Bartok pizzicato*




When scoring scratching string sounds that are performed with the right hand, it is possible to create vertical cells of scratching string sounds combined with other sounds performed with the left hand alone. Sounds that can be performed with the left hand alone in such a combination are plucked sounds (Figure 14.11), open string strumming, left hand percussion, percussive tambora, open string Bartok pizzicato sounds (Figure 14.11), and sounds produced by plucking behind the nut.

## 14.3 Horizontal cells

As pointed out above, there is little difference in sound and technique between single scratching string sounds and vertical cells of scratching string sounds. Therefore, only single line sequences of single lines are discussed in this section.

## 14.3.1 Single lines of scratching string sounds

### Design

A single line horizontal cell of scratching string sounds is a succession of single scratching string sounds.

### Resonance

The resonance of scratching string sounds is small: the resonance ends as soon as the scratching movement ends. However, it is possible to create a continuous scratching sound without decay after the initial attack by scoring repeated long scratching notes (Figure 14.7).

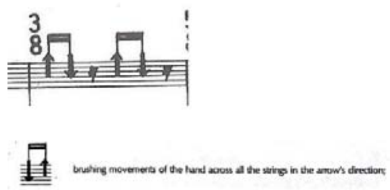
### Speed

Scratching string sounds can be scored at high speeds (Figure 14.3). If string scratching has to be performed at a high speed, it should be played by scratching up and down.

### Rhythmic possibilities

The rhythmic possibilities of scratching string sounds are wide because of the wide speed range of scratching string sounds. It is, for example, possible to create tremolo-like patterns (Figure 14.3), rhythms of scratches interrupted with rests (Figure 14.6) or long or continuous scratches (Figure 14.7).

*Figure 14.12 Rhythmic notation for upward and downward scratching*




(SALUT FÜR CAUDWELL, LACHENMANN)

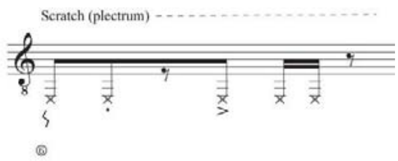
Lachenmann uses a notation with upward and downward arrows, explained in a legend, to indicate the direction and rhythm of string scratching with the hand (Figure 14.12).

### Articulation

Single line horizontal cells of scratching string sounds can be scored with a variety of articulations, including accents and staccato.

### *Accents*

*Figure 14.13 Scratching string articulation*



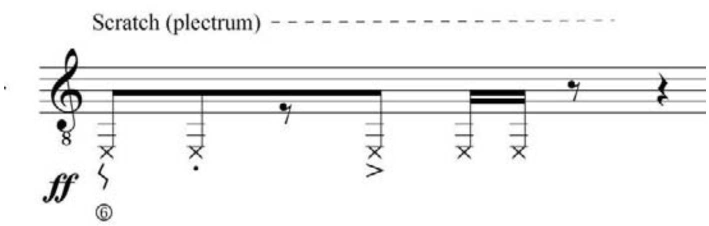

Single line horizontal cells of scratching string sounds can be scored with accents. Such accents are particularly effective when scored for a nail or plectrum, as these are able to provide the widest dynamic range (Figure 14.13).

### *Staccato*

Single line horizontal cells of scratching string sounds can also be scored with staccato articulation (Figure 14.13). The guitarist performs the staccato by damping the string after attack with the left or right hand, or by scratching only a small surface of the string.

## Non-functional writing

*Figure 14.14 Non-functional writing*




An example of non-functional writing for single line horizontal cells of scratching string sounds:

- *Fortissimo* scoring of scratching string sounds (Figure 14.14)

## Combinations with other sounds

Single line horizontal cells of scratching string sounds can be combined with other sounds. In this section, literature examples are discussed.

### *String scratching with regular plucked notes*

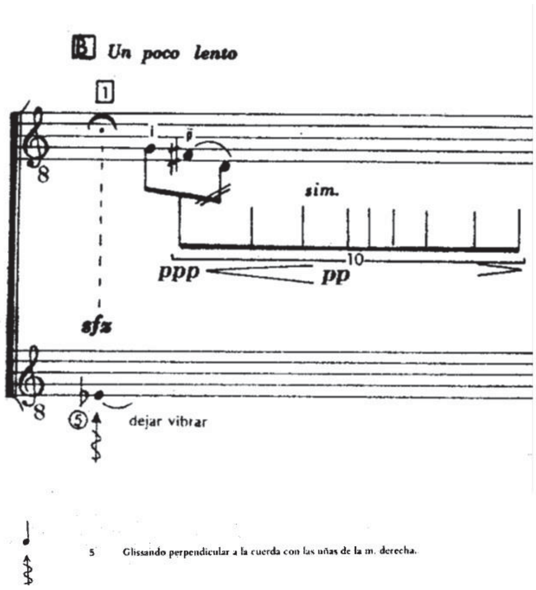
*Figure 14.15 String scratching combined with regular plucked notes*


(TANGOLEADA, CARDOSO)

Cardoso combines a scratching sound, performed with the thumbnail on the sixth string, with vertical cells of plucked sounds (Figure 14.15). In order to make the simultaneous performance of the vertical cell possible, the fourth string is plucked by the left index finger.

### *String scratch followed by plucking, combined with etouffé plucked sounds*

*Figure 14.16 String scratch followed by plucking, combined with etouffé plucked sounds*




(LA ESPIRAL ETERNA, BROUWER)

Brouwer uses a scratching string sound at the end of which the string is plucked. This scratch is combined with etouffé regular plucked sounds (Figure 14.16). The two sounds can be connected at moderate speeds: the performer needs some time to get back into position after the string scratch followed by plucking, and the etouffé action requires some preparation time as the side of the hand needs to be rested on the strings.

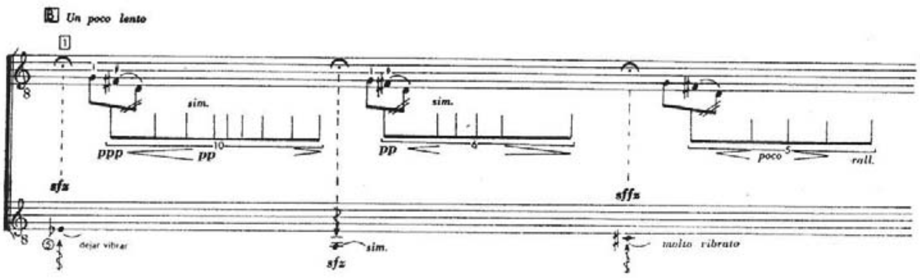
## 14.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing scratching string sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

### 14.4.1 Textures as continuations of horizontal cells

#### Texture of pitched scratching and etouffé plucking

*Figure 14.17 Texture combining pitched scratching and etouffé plucking*



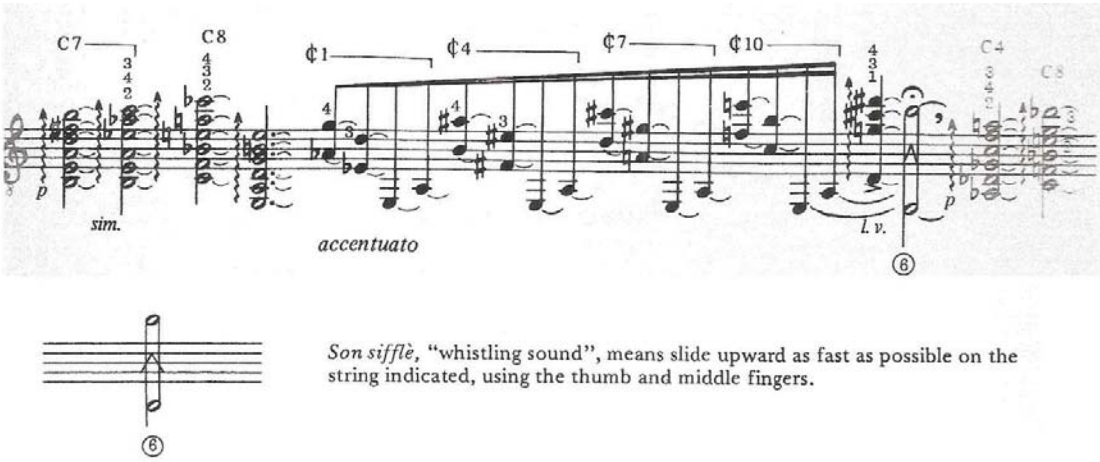

(LA ESPIRAL ETERNA, BROUWER)

Brouwer continues the horizontal cell that combines string scratching followed by plucking and etouffé plucked notes over a longer period of time, creating a texture (Figure 14.17). The string scratch, accumulating in a plucked note, is used as a dynamic effect to contrast with the softly scored, muffled notes. The fermatas on the scratched notes allow the guitarist to return the right hand to the normal playing position and prepare the hand for the performance of muffled notes.

### 14.4.2 Textures as combinations of horizontal cells

#### Chordal and arpeggio texture containing scratching string sound

*Figure 14.18 Scratching sound in chordal and arpeggio texture*




(SONATA, GINASTERA)

Ginastera uses the scratching sound in the midst of a chordal and arpeggio texture of plucked and strummed sounds (Figure 14.18). The whistling sound, employed here by Ginastera toward the end of the line, is rarely encountered in the guitar repertoire. The oddness of the whistling sound at the height of the accelerating note buildup creates a memorable and surprising moment in the *Sonata*. Ginastera leaves the performer sufficient time to both prepare the execution of the scratch and return the right hand to the customary playing position afterwards.

## Chapter 15 Inverted Stopping Sounds

**Contents**

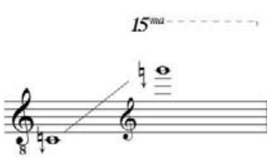
# Chapter 15 Inverted Stopping Sounds

Inverted stopping sounds emerge when the string is plucked behind the stopping position or behind the nut. This chapter shows ways in which the composer can handle the characteristics of the inverted stopping sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 15.1 Sound

### 15.1.1 Pitch range

*Figure 15.1 Inverted stopping sound range*

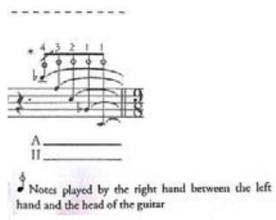



The range of inverted stopping sounds is pictured in Figure 15.1.

*Figure 15.2 Pitches on the sixth string in inverted stopping position*


When playing inverted stopping sounds, the pitches are not tuned to tempered pitches as a consequence of the fact that the sequence of decreasing fret widths as the pitch goes up for regular stopping positions is also inverted. In Figure 15.2, the pitches on the sixth string are listed with indications above the staff as to which position they can be found in (counting down from position XIX to position II). The pitches on the other strings can be derived from Figure 15.2 based on the interval relationship the string has to the sixth string.

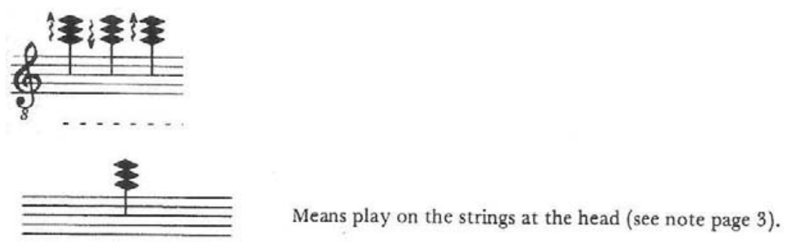
*Figure 15.3 Inverted stopping notation*




(ESTUDI DE CONCERT NÚM. 7, GASULL)

Inverted plucked sounds are performed by stopping a string and plucking the string behind the stopping position. Usually, the performer reaches with the right hand over the left hand in order to produce inverted plucked sounds, but the string can also be plucked with the left hand instead. Inverted stopping sounds are usually notated with the pitches that would sound if the string were to be plucked in regular position, accompanied by a verbal indication or a symbol (Figure 15.3). In addition to the notation of pitches that would sound if they were plucked in regular position, Gasull uses circles attached to the stems to indicate inverted stopping sounds. When inverted stopping sounds are notated with the pitches that would sound if the string were to be plucked in regular position, it is important to indicate the string on which the stopped note should be held, as identical pitches on different strings lead to different inverted stopping pitches.

*Figure 15.4 Playing behind the nut*




(SONATA, GINASTERA)

A variation on this sound is to play, pluck or strum behind the nut (Figure 15.4). The string length between the nut and the tuning key roller differs each time the guitar is restrung; for this reason, standard pitches for sounds that are played behind the nut cannot be given. Notes played behind the nut should therefore be notated with alternative noteheads specified in a legend, as in Figure 15.4.

## 15.1.2 Timbre possibilities

### Attack

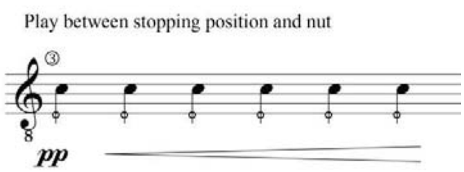
As is the case for regular plucked notes, the sound quality of inverted stopping sounds can be varied by the way they are attacked. Scoring an inverted stopping sound with the flesh of the thumb leads to a mellower sound as compared to the standard attack with the nail, while an apoyando attack is dynamically more powerful than a tirando attack.

### Stopping position

As is the case for regular plucked notes, playing an inverted stopping note from the middle or high range in a high position on a low string changes its timbre. It is important to keep in mind that pitches on different strings that are identical in normal playing position have non-identical pitches when they are played as inverted stopping sounds.

## 15.1.3 Dynamic range

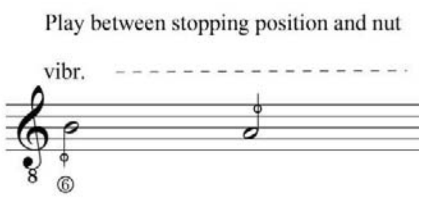
*Figure 15.5 Dynamics*




The dynamic range of inverted stopping sound is very limited. This is due to the fact that these sounds do not benefit much from the amplification the guitar body provides to other sounds, as the string does not vibrate above the sound hole during the performance of inverted stopping sounds.

## 15.1.4 Vibrato

*Figure 15.6 Vibrato*




All inverted stopping sounds can be scored with lateral or vertical vibrato (Figure 15.6). The audibility of a vibrato depends on the dynamic power of the string resonance, which in the case of inverted stopping sounds is very limited. The vibrato is therefore only audible for a short moment immediately following string attack.

### 15.1.5 Pitch bends and microtones

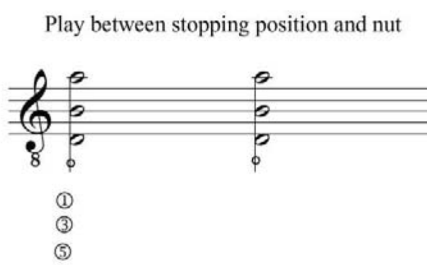
Pitch bends for inverted stopping sounds are to be prescribed in the same manner as for regular plucked notes. Microtones are prescribed in the same manner: they can be attained through a microtonal scordatura, through bending the string, or through one of the many pitches that are already microtones in inverted stopping positions (Figure 15.2).

## 15.2 Vertical cells

Inverted stopping sounds can be scored as vertical cells of inverted stopping sounds alone, or in combination with other sounds.

### 15.2.1 Vertical cells of inverted stopping sounds

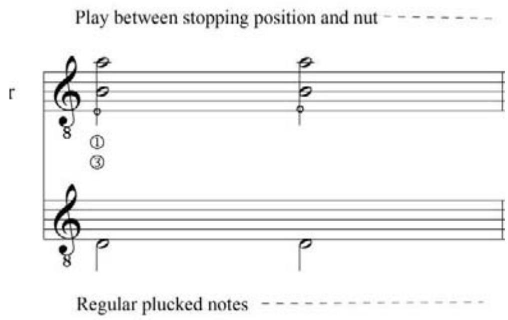
*Figure 15.7 Vertical cell*




When scoring vertical cells of inverted stopping sounds, it is possible to combine up to four inverted notes, or six when a barré is used. Various spacings are possible, as long as they fit within the hand span of the position in question. It is not necessary to score these vertical cells on adjacent strings, as the performer can perform each string with a different finger of the right hand (Figure 15.7). It is helpful to realize that position changes which do not take place between the leftmost stopping position and the nut on a given string do not cause pitch changes.

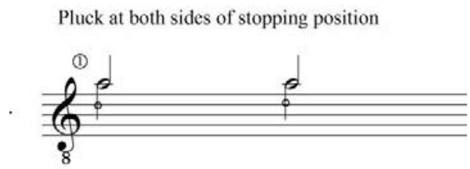
### 15.2.2 Vertical cell combinations with other sounds

*Figure 15.8 Vertical cell of inverted stopping sound combined with regular plucked sound*



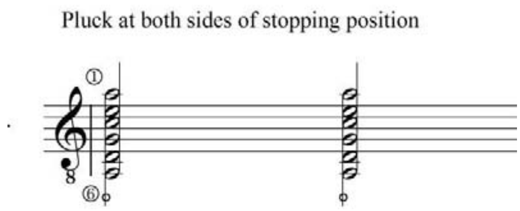

Inverted stopping sounds can be combined with regular plucked sounds, creating a combined vertical cell (Figure 15.8). As is the case with vertical cells of inverted stopping sounds, it is not necessary to score these vertical cells on adjacent strings.

*Figure 15.9 Plucking at both sides of stopping position*




The advantage of inverted plucking sounds is that a string can be plucked at both sides of the stopping position at the same time (Figure 15.9). In order to perform such a vertical cell, the left hand plucks the string between the stopping position and the bridge, while the right hand plucks the string between the stopping position and the nut, or vice versa. In order to prescribe plucking at both sides of the plucking position, a verbal indication should be used (Figure 15.9).

*Figure 15.10 Plucking at both sides of stopping position of a bar chord*




When using bar chords, combinations with regular plucked notes make it possible to create vertical cells of up to twelve different pitches (Figure 15.10). Due to the limited dynamic range of inverted stopping sounds, regular plucked sounds are dynamically dominant in such vertical cells.

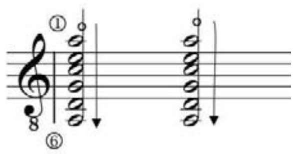
# 15.3 Horizontal cells

It is possible to create a variety of horizontal cells with inverted plucking sounds, such as single lines, arpeggios, vertical cell sequences (plucked, strummed and rasgueado) and multiple parts. The designs of these horizontal cells are the same as for regular plucked sounds, strummed sounds and rasgueado sounds, with the difference that they are now created with inverted stopping sounds. In this section, aspects that are relevant to all these horizontal cells when built with inverted stopping sounds are discussed.

## 15.3.1 Single lines, arpeggios, vertical cell sequences and multiple parts

### Resonance

*Figure 15.11 Downward strumming*



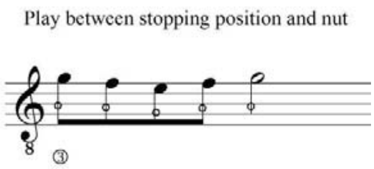

The resonance of inverted stopping sounds is minimal; ringing on of notes into the temporal space of subsequent notes only occurs minimally when writing a rapid sequence, for instance in a rapid downward strum (Figure 15.11). In slower sequences, the ringing into the temporal space of subsequent notes does not occur, due to the short resonance of inverted stopping sounds.

### Harmonic possibilities

The harmonic possibilities of inverted stopping sounds can be derived from Appendix A with the difference that the notes are now plucked between the stopping position and nut, producing other pitches, as demonstrated in Figure 15.2.

### Speed

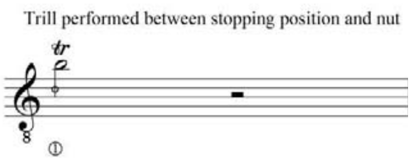
*Figure 15.12 Speed*




It is possible to create high speeds in horizontal cells of inverted stopping sounds, depending on the speed of the type of horizontal cell used. However, horizontal cells of inverted stopping sounds in which position changes take place greatly reduce the maximum speed, as the performer is in an awkward position for coordinating position changes. The most effective rapid changes are scored over one string in a single line horizontal cell of inverted plucked sounds with fingering changes that fit within the hand span (Figure 15.12).

## Embellishment

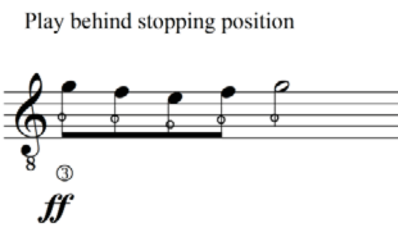
*Figure 15.13 Trill*




Embellishments can be scored by attaching a left hand trill, performed between the stopping position and the nut, to a note in the sequence. In this case, the right hand can continue performing other sounds while the left hand performs the embellishment.

## Non-functional writing

*Figure 15.14 Non-functional writing*



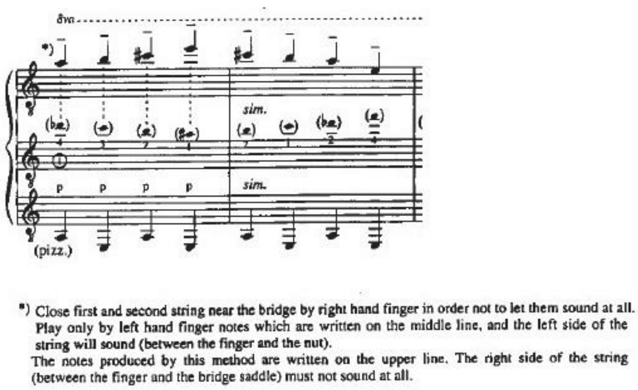

Examples of non-functional writing for horizontal cells of inverted stopping sounds:

- *Fortissimo* scoring of inverted stopping sounds (Figure 15.14)

- Rapid string and position changes

## Combinations with other sounds

*Figure 15.15 Combination with muffled plucked sounds*




(PORCELAIN TOWER, KOSHKIN)

Inverted stopping sounds can be scored with other sounds. An example from the literature is pictured in Figure 15.15, where Koshkin combines muffled plucked sounds with inverted stopping sounds. These two sounds can be performed simultaneously, as the muffled plucked sounds are performed with the right hand alone, whereas the inverted stopping sounds are performed with the left hand.

# 15.4 Textures

In the guitar repertoire, both continuations and combinations of horizontal cells containing inverted stopping sounds are found. The following examples are presented primarily for the purpose of illustrating how textures in repertoire pieces have been put together.

## 15.4.1 Textures as continuations of horizontal cells

## Texture of muffled plucked sounds and inverted stopping sounds

*Figure 15.16 Texture combining plucked sounds and inverted stopping sounds*

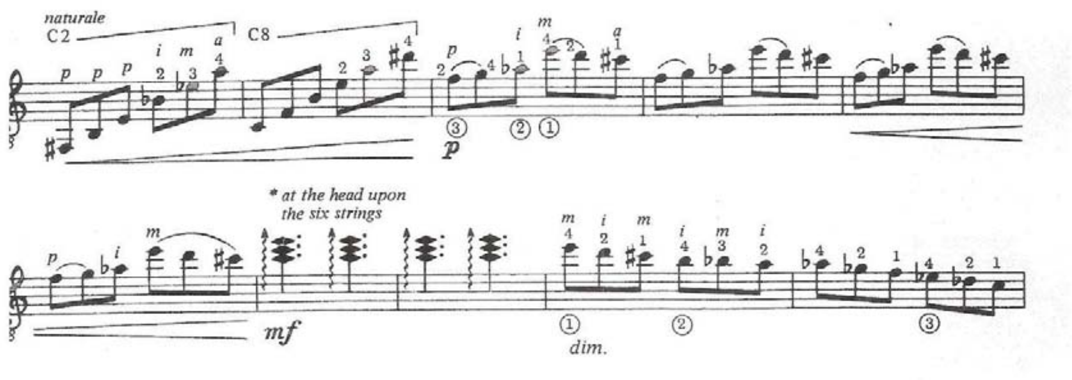

(THE PORCELAIN TOWER, KOSHKIN)

Koshkin continues his combination of plucked sounds and inverted stopping sounds for many measures, creating a texture (Figure 15.16). This innovative texture derives its characteristic sound from the combination of tuned (regular plucked sounds) and untuned pitches (inverted stopping sounds). Koshkin keeps the basses, performed as regular plucked sounds, on open strings in order not to interfere with the performance of the inverted stopping sounds. The scoring of low pitched regular plucked sounds in combination with inverted stopping sounds gives him a very wide pitch range, which is successfully employed in this texture.

## 15.4.2 Textures as combinations of horizontal cells

## Single line/arpeggio texture of plucked sounds interrupted by playing behind the nut

*Figure 15.17 Single line/arpeggio texture with interruption*




(SONATA, GINASTERA)

Ginastera uses vertical cells plucked behind the nut as an effect interrupting a single line/arpeggio horizontal cell of plucked sounds (Figure 15.17). Notes plucked behind the nut do not appear often in the guitar repertoire, and just as the sudden appearance of the whistling sound in Figure 14.18 of the previous chapter, this passage derives its memorability from the oddness of the appearance of plucking behind the nut at the height of a crescendo. Ginastera scores the regular plucked notes immediately preceding the behind-the-nut plucking sounds as descending slurs, thus allowing the performer to move the right hand to the appropriate playing position for these notes.

# Chapter 16 Bottleneck Sounds

## Contents

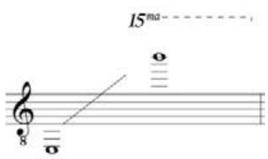
# Chapter 16 Bottleneck Sounds

Bottleneck sounds materialize when a bottleneck or slide is used to play pitches on the guitar. The term bottleneck is preferred here, as it avoids confusion with other practical uses of the word slide (such as glissando, string scratches). This chapter shows ways in which the composer can handle the characteristics of the bottleneck sound, use it to build horizontal as well as vertical cells, and finally, how these cells can be creatively combined to form musical textures playable on the guitar.

## 16.1 Sound

### 16.1.1 Pitch range

*Figure 16.1 Bottleneck range*




For bottleneck sounds, a virtually unlimited upward range is available; the closer the bottleneck is positioned to the bridge, the higher the pitch. The approximate highest pitch that is still audible is pictured in the range overview in Figure 16.1. In all ranges, bottleneck sounds are usually performed by applying the bottleneck to a finger of the left hand, lightly touching the string with the bottleneck while attacking the string with the right hand. This attack can be executed through plucking, strumming, rasgueado or tambora. There is no standard notation for bottleneck sounds; a verbal description should therefore be used, such as “bottleneck”, “slide” or “metal slide”.

### 16.1.2 Timbre possibilities

#### Attack

As is the case for regular plucked notes, the sound quality of bottleneck sounds can be varied through the way they are attacked. Scoring a bottleneck sound with the flesh of the thumb leads to a mellower sound as compared to the standard attack with the nail, while an apoyando attack is more powerful dynamically than a tirando attack.

### Stopping position

As is the case for regular plucked notes, playing a bottleneck sound from the middle or high range in a high position on a low string changes its timbre. If the composer wishes a note to be performed on a particular string, an indication to this effect should be provided in the score.

### Etouffé

*Figure 16.2 Bottleneck etouffé*


The timbre of bottleneck sounds can be changed by muffling the note. Muffled bottleneck sounds are performed by plucking a note and simultaneously slightly damping it with the side of the right hand (Figure 16.2).

### Prepared guitar

*Figure 16.3 Paper clip preparation*

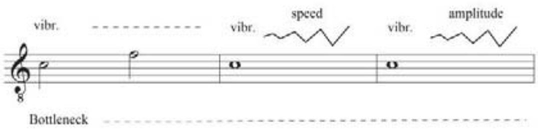

The timbre of bottleneck sounds can be changed by attaching an object to one or more strings, turning the guitar into a prepared guitar (Figure 16.3). Initially, the sound of the bottleneck use is at the forefront, while the paper clip preparation becomes audible during the resonance of the notes. As the paper clip preparation affects the string during resonance, longer note values make the string preparation more audible.

## 16.1.3 Dynamic range

The dynamic range of bottleneck sounds is the same as that of regular plucked notes; they can be performed at very soft dynamic levels, particularly with the tirando attack, as well as at loud dynamic levels, particularly with the apoyando attack. When the bottleneck sound is performed through strumming, rasgueado or tambora, the dynamic range is the same as that of that of method of execution chosen.

### 16.1.4 Vibrato

*Figure 16.4 Bottleneck vibrato*




All notes that are performed with a bottleneck can be scored with vibrato. The bottleneck provides the possibility for vibrato with narrow as well as extremely wide amplitudes (Figure 16.4). The vibrato is performed by moving the slide laterally up and down along the string. The vibrato amplitude is virtually unlimited, because, as explained at the outset of this chapter, the pitch range of the string is virtually unlimited when using the bottleneck.

### 16.1.5 Pitch bends and microtones

*Figure 16.5 Bottleneck microtones*

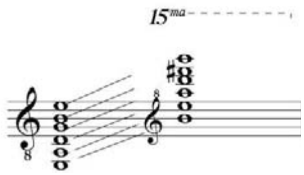

Bottleneck sounds lend themselves very well to scoring with pitch bends and microtones. The use of the bottleneck makes that the performer can escape the equal temperament the frets impose on the guitar's pitch range and makes it possible to intonate any pitch as desired, much in the same way as is possible on bowed string instruments without frets. Other than in the case of stopped notes, bottleneck microtones do not have to be pulled out of tune first in order to produce a microtone (Figure 16.5).

## 16.2 Vertical cells

Bottleneck sounds can be scored as vertical cells of bottleneck sounds alone, or in combination with other sounds.

### 16.2.1 Vertical combinations of bottleneck sounds

*Figure 16.6 Range of vertical cell pitch combinations*



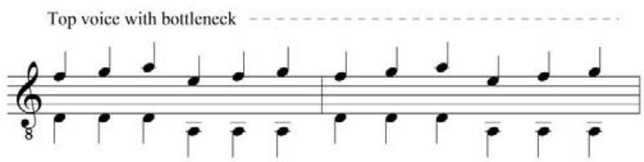

It is possible to score vertical cells of bottleneck sounds of up to six notes. However, due to the vertical position of the bottleneck on the strings, only transpositions of the open string intervals should be scored (Figure 16.6). Between the third and second string, only intervals of a major third should be scored, while between all other adjacent strings only intervals of a perfect fourth should be scored. When a scordatura is used, the interval possibilities change in accordance with the detuning of the strings. It is not necessary to score vertical cells of bottleneck on adjacent strings when they are plucked, as each note is plucked with a single finger.

## 16.2.2 Vertical combinations with other sounds

The most effective vertical combinations of bottleneck sounds are created with regular plucked sounds or harmonics.

### Vertical combinations with regular plucked sounds

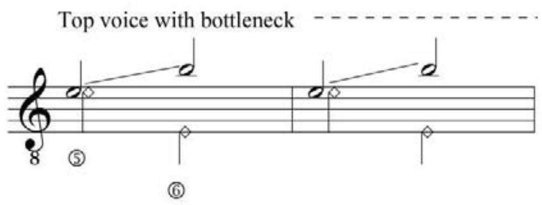
*Figure 16.7 Vertical combinations with regular plucked sounds*




Bottleneck sounds can be effectively combined with regular plucked sounds on a lower string. The lower pitches should either be located on open strings (Figure 16.7) or within the hand span of the bottleneck playing position.

### Vertical combinations with harmonics

*Figure 16.8 Vertical combinations with natural harmonics*




Bottleneck sounds can effectively be combined with natural harmonics on a lower string. The harmonics should lie within the hand span of the bottleneck playing position (Figure 16.8).

# 16.3 Horizontal cells

It is possible to create a variety of horizontal cells with bottleneck sounds, such as single lines, arpeggios, vertical cell sequences (plucked, strummed, rasgueado and tambora) and multiple parts. The designs of these horizontal cells are the same as for regular plucked sounds, strummed sounds, rasgueado sounds and tambora sounds with the difference that they are now created with bottleneck sounds. In this section, aspects that are relevant to all these horizontal cells when built with bottleneck sounds are discussed.

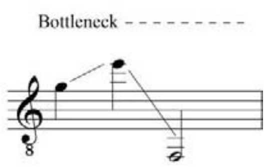
## 16.3.1 Single lines, arpeggios, vertical cell sequences and multiple parts

### Harmonic possibilities

When scoring single lines of bottleneck sounds, the harmonic possibilities are wide as the performer only has to be concerned with the performance of one line. Vertical combinations, arpeggios and multiple parts are more limited in their possibilities, as the intervals must be a transposition of the open string intervals.

### Speed

*Figure 16.9 Remote pitch locations*



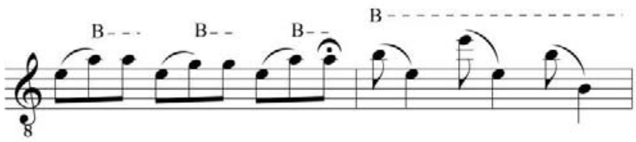

It is possible to create high speeds in horizontal cells of bottleneck sounds, depending on the speed of the type of horizontal cell used. Position changes of bottleneck sounds can be executed faster than position changes of regular plucked notes, broadening the possibilities to score notes at remote locations on the fretboard at relatively high speeds and with glissando articulation (Figure 16.9).

## Articulation

Single line horizontal cells of bottleneck sounds can be scored with a variety of articulations, such as slurs, legato/glissando, accents, and staccato.

### *Slurs*

*Figure 16.10 Bottleneck slurs*

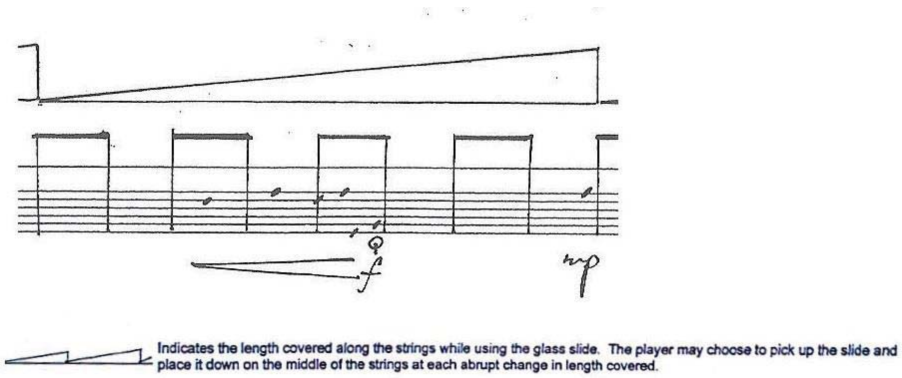



Bottleneck sounds can be scored with ascending and descending slurs (Figure 16.10). An ascending slur starts as a regular plucked note, preferably an open string as this facilitates an accurate execution of the slur. The slur is produced by placing the bottleneck onto the position of the slurred note. A descending slur starts as a bottleneck note; the slur is produced by removing the bottleneck from the string, releasing the sound of the open string.

### *Glissando*

The standard manner of connecting bottleneck sounds is by using the bottleneck to slide from one note to the next (Figure 16.9), creating a glissando articulation. When scoring horizontal cells without glissando, the composer should indicate this with a verbal instruction such as "no glissando".

*Figure 16.11 Bottleneck sounds combined with Bartok pizzicato and regular plucked sounds*




(AKEPHALE, BARTLETT)

Bartlett uses the scratching sound of the lateral motion of the bottleneck on the strings as a rhythmic basis, and inserts plucked and Bartok pizzicato sounds during the scratching process that subsequently resonate with glissando articulation (Figure 16.11). Bartlett uses visual notation for the amplitude of the scratching motion and the rhythmic placement of the plucked and Bartok pizzicato sounds. The strings that are to be plucked are indicated through tablature notation, rather than regular notation.

### *Accents*

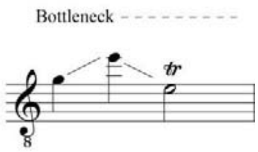
Notes in horizontal cells of bottleneck sounds can be accented. The performer can execute the dynamic accent by plucking the marked note louder than the surrounding notes.

### *Staccato*

Horizontal cells of bottleneck sounds can be scored with staccato articulation. The guitarist performs the staccato by damping the string with the right or left hand.

## Embellishment

*Figure 16.12 Embellishment*




Embellishments can be used by attaching a pitch glissando to a note in the sequence (Figure 16.12). While the left hand performs the embellishment, the right hand can continue to engage in the performance of other sounds.

## Non-functional writing

*Figure 16.13 Non-functional writing*


An example of non-functional writing for horizontal cells of bottleneck sounds:

- Vertical cells that are not transpositions of the open string intervals (Figure 16.13)

## Combinations with other sounds

*Figure 16.14 Bottleneck sounds and hammered sounds in Maier*


(CRYSTAL VERMIN, MAIER)

Bottleneck sounds can be scored with other sounds, such as regular plucked sounds, harmonics, hammered sounds and Bartok pizzicatos. Figure 16.14 displays a literature example in which Maier combines bottleneck sounds produced with the right hand alone with hammered notes produced by the left hand alone. These two sounds can be connected at high speeds and performed simultaneously, because each sound is produced with a separate hand.

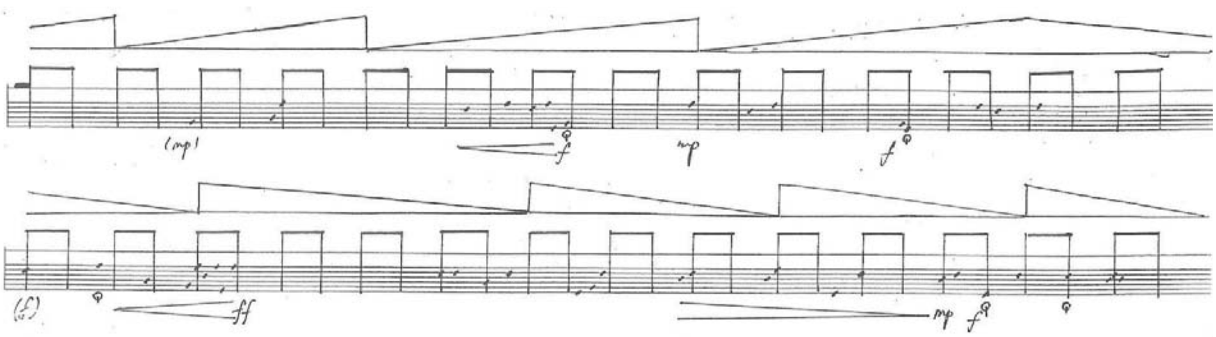
## 16.4 Textures

Textures containing bottleneck sounds are usually scored as continuations of horizontal cells. The following examples are presented primarily for the purpose of illustrating how some textures in repertoire pieces have been put together.

### 16.4.1 Textures as continuations of horizontal cells

#### Texture of scratching and glissando bottleneck sounds

*Figure 16.15 Texture of scratching and glissando bottleneck sounds*



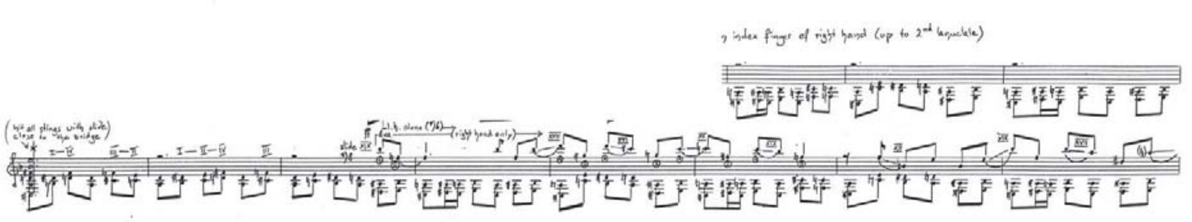
(AKEPHALE, BARTLETT)

Bartlett continues the horizontal cell of scratching bottleneck sounds and resonating glissando bottleneck sounds for many measures, creating a texture (Figure 16.15). The bottleneck is used as a gateway to a cleverly composed texture, in which all sounds are subordinate to the continuous waves of the bottleneck glissando. The Bartok pizzicato sounds are used as dynamic outbursts, contrasting with the inherently softer regular plucked sounds. Bartlett, suitably, uses graphic notation, which allows the performer to visually estimate the moments of attack, and visually relate the attacks to the bottleneck waves and the dynamic markings.

## 16.4.2 Textures as combinations of horizontal cells

### Texture of bottleneck sounds, hammered sounds and object tambora

*Figure 16.16 Texture of bottleneck sounds and hammered sounds*



(CRYSTAL VERMIN, MAIER)

Maier combines hammered sounds with object tambora (performed with the bottleneck) and bottleneck sounds, creating a texture (Figure 16.16). In contrast to the texture of Bartlett, the bottleneck sound is a compartment of the texture, rather than a sound that influences all notes that appear in the texture. A scordatura is used (see Figure 11.33), allowing for unusual intervals on the hammered bass notes. The bottleneck is attached to a finger of the right hand, instead of the left hand. The fact that the bass notes are hammered with the left hand allows the performer to create pitches and simultaneously pluck the strings with the right hand. This complex interplay of actions of the right and left hand makes this unusual texture possible, including its unusual combinations of sounds, as well as the large pitch range in which both the low and high range are very actively employed. At the same time, the texture requires careful coordination on the part of the performer for correct execution, as both hands are engaged in very different and unusual actions.

## Chapter 17 Etudes: Outline and Notes

### Contents

# Chapter 17 Etudes: Outline and Notes

In this chapter, an account is provided of the etudes that were written with the use of the findings of the research trajectory. The outline of the etudes is discussed, followed by a commentary on each of the etudes.

## 17.1 Outline

The outline of the Etudes is described here in terms of its relation to the findings of the dissertation, my goals in composing the etude and an account of inspiration from other sources used in the creative process.

### 17.1.1 Relation to findings

The findings section of the dissertation consists of an account of twelve sound-cell-texture chains. For the composition process, each of the etudes was based on one of the sound-cell-texture chains. This means that each etude has one sound as its focus. For instance, the etude based on inverted stopping sounds contains a large number of inverted stopping sounds, but also regular plucked sounds and harmonics. The findings of the sound-cell-texture chain in question are used in the compositional process in two ways: as structured, written reminders of the potential of the sound category in question, and as normative instructions on the limitations of the sound in question. Most of the etudes have a duration of approximately one minute, although some of the etudes are longer. The title “Etude” is reflective of the fact that these pieces are my studies into the possibilities of the selected sound-cell-texture chain.

### 17.1.2 Goal

My goal in composing the set of etudes is to provide a kaleidoscopic view of the classical guitar potential that is expressive of the wide palette of sonorities that can be scored on the guitar, while drawing on an extended guitar scoring knowledge with the help of the sound-cell-texture chains.

### 17.1.3 Inspiration

The etudes were inspired by chapters, events and characters from the first and second books of Haruki Murakami’s novel 1Q84 (Murakami, 2010). Etudes were named after the chapter, character or event that served as their inspiration.

# 17.2 Notes on etudes

In this section, notes on each of the twelve etudes are provided. Two aspects are considered: the chain the etude is based on, and the scoring aspects that are explored in the etude.

## 17.2.1 Etude I: Die Puppe aus Luft

Etude I is based on the plucked sound-cell-texture chain. The etude explores the use of vertical cells that contain harmonics and regular plucked notes, single line textures, arpeggio textures, chordal textures, multiple part writing and harmonic flexibility.

## 17.2.2 Etude II: Die alte Dame

Etude II is based on the harmonic sound-cell-texture chain. Various aspects pertaining to the use of harmonics are explored in this etude: the use of pitch bends and glissando attached to harmonics, the range of velocities at which harmonics and regular plucked notes may be alternated, the resonance of harmonics during the performance of regular plucked sounds and the simultaneous use of harmonics and crossed-string sounds.

## 17.2.3 Etude III: Tengo

Etude III is based on the rasgueado sound-cell-texture chain. The etude juxtaposes dynamically powerful rasgueado sounds with soft-spoken plucked sounds, which alternate in their timbre between tasto, ordinario and ponticello.

## 17.2.4 Etude IV: Eriko

Etude IV is based on the strumming sound-cell-texture chain. The etude explores the combination of strumming sounds, plucked sounds, glissando articulation in arpeggiated strums, and strumming with the flesh. A scordatura is used, lowering the sixth string to d.

## 17.2.5 Etude V: Die Vorreiter

Etude V is based on the percussion sound-cell-texture chain. In this etude, the possibilities of creating two simultaneous musical lines is explored, one consisting of percussion sounds, the other consisting of tambora sounds, hammered sounds, plucked sounds and harmonics. A scordatura is used on two strings; the fifth string is tuned down to g, while the sixth string is tuned to d.

## 17.2.6 Etude VI: Der Leader

Etude VI is based on the tambora sound-cell-texture chain. It explores possibilities to combine tambora sounds, regular plucked sounds, percussion sounds, single harmonics and vertical cells of harmonics.

### 17.2.7 Etude VII: Zählen

Etude VII is based on the hammered sound-cell-texture chain. This etude uses a paper clip woven through the strings, turning the guitar into a prepared guitar. In this etude, the altered sound that the guitar preparation causes is explored. The piece also includes the simultaneous use of hammering with the left and right hand, and hammering with the left hand simultaneously combined with the production of percussion sounds with the right hand in rhythmical patterns.

### 17.2.8 Etude VIII: Und jetzt beginnt die Geisterstunde

Etude VIII is based on the Bartok pizzicato sound-cell-texture chain. This etude uses a paper clip woven through the strings and a scordatura that detunes the sixth, third and first string. In this etude, the altered sound the guitar preparation causes is explored, its effect on the Bartok pizzicato sound, and the use of natural harmonics in the Bartok pizzicato sound range (for this last possibility, see section 12.1.1).

### 17.2.9 Etude IX: Mäuse herausholen

Etude IX is based on the buzzing string sound-cell-texture chain. It explores the possibility to use two-part writing in which the bottom voice consists of a buzzing string sound, while the top voice consists of harmonics, tambora sounds, regular plucked sounds and inverted stopping sounds.

### 17.2.10 Etude X: Wenn die Daughter erwacht

Etude X is based on the scratching string sound-cell-texture chain. It explores the extremes between noise and pitched sounds that can be created by scratching the strings, the rhythmic evenness with which the scratching can be scored, and contrasts it with similar rhythmic evenness of strummed sounds.

### 17.2.11 Etude XI: Solange es zwei Monde gibt

Etude XI is based on the inverted stopping sound-cell-texture chain. It explores the combination of inverted stopping sounds, regular sounds and harmonics, and the detuned character of the inverted stopping sound pitches.

### 17.2.12 Etude XII: Der Ritt auf dem Tiger/Solange es die Wärme noch gibt

Etude XII is based on the bottleneck sound-cell-texture chain. It explores the combination of bottleneck sounds and regular plucked sounds, glissando articulation for bottleneck sounds, tambora sounds executed with the bottleneck, and the simultaneous use of bottleneck tambora, pitch manipulation with the bottleneck and plucking.

## Chapter 18 Discussion

### Contents

# Chapter 18 Discussion

In the present chapter, the theoretical and artistic outcomes of the research trajectory are discussed. The theoretical outcomes consist of a set of sound-cell-texture chains that may be employed in the composition process, and a set of additional tools, consisting of an overview of the vertical cell range, a harmonics fingering chart, an overview of the relative dynamics, and an overview of the use of various scordaturas. The artistic outcomes consist of a set of guitar etudes created with the help of the tools developed in the research process. This chapter consists of an account of the scope and limitations of the research, an account of the role of tacit and embodied knowledge in the research process and its implications, an evaluation of the sound-cell-texture chain as a theory, an examination of the outcomes with the help of the evaluative framework proposed in *The Artistic turn* (Coessens et al., 2009), and finally, an account of the contribution of the outcomes to the discussion on artistic research.

## 18.1 Scope and limitations

In this section, the scope and limitations of the research are discussed. The following questions concerning scope and limitations are responded to: how may the findings be employed by composers in the creative process? Are the findings intended to inspire, or serve as a technical tool? How were the various sound-cell-textures identified? Are the findings universally relevant for the guitar, or only in the specific guitar community in which the research was conducted? What are the inherent limitations of the research given what has been executed methodologically?

### 18.1.1 Scoring technique and inspiration

One cannot be sure that every composer will be inspired by the technical account of guitar scoring presented in this study. Next to the importance of inspiration in the creative process, there is a long tradition of placing preparation and technique alongside inspiration as an important and essential factor in the creative process, researched and described in detail by the composer Jonathan Harvey (Harvey & Downes, 1999, pp. 15-25; 71-77). It is in the creative project that “the composer’s ‘innate’ inspiration collides with his ‘learned’ technique. Each of these elements in the process makes its own demands on the composer, but it is only if he can satisfy the requirements of both that a truly profound piece can be created” (Harvey & Downes, 1999, p. 71). Technique may even be the most demanding part of this undertaking, as “[f]or many composers, the hard part of their job is not finding the initial idea...but harnessing the technical resources necessary to convert the initial vision into the finished work” (Harvey & Downes, 1999, p. 72). The importance of technical artistic knowledge as a tool in creativity can be compared to the importance for the guitar player to develop her technical skills. After all, the development of technical skills allows her to further her artistry on the guitar. On the other hand, there are examples of influential guitarists (such as Agustin Barrios) and composers (such as John Cage) that developed their artistry without extensive technical instruction, or by defying technical instruction instead. It appears that there is no absolute truth in these matters, and that composing is located on a continuum ranging from intuition on the one hand, to the application of pre-defined theories and techniques on the other hand, leading to wide range of different outcomes. The view professed in this work is that for those composers who wish to write for the guitar, it can be helpful to know more about its scoring potential, and have more intimate knowledge of the possibilities of nuanced use of the guitar's versatility. It is then up to the composer in question to decide whether the information provided in this work is valuable for her individual compositional process.

This study aims to contribute to the development of artistic knowledge. It is not intended as a recipe for successful compositions, as it does not supply musical material or even compositional techniques. The sound-cell-texture chain is a model that emerges out of a re-thinking of the guitar potential. It is one possible approach to the guitar potential, next to others, and one in which the sound-cell-texture chain serves as an adequately layered platform for explicating scoring-technical issues from a large perspective (e.g. textures) down to its intricacies (e.g. sounds). It is at the point where the composer generates the nascent musical idea that this study can guide her in providing this idea with a viable shape that allows effective performance on the guitar.

### 18.1.2 Various points of discussion

The reality of scoring does not easily subject itself to a model. This quickly becomes apparent when one glances in many of the previous studies on guitar scoring. In these studies, writers struggle with ways to present the potential of the guitar, evidenced by the various presentation structures they invent. In some of these structures, various aspects of scoring are so intermixed that they are hard to distinguish, making it difficult to see how they may be used in practice. A case in point of such a confusing presentation structure is the scoring guide by Kachian (Kachian, 2006). The present study is not free from such risks. In the following discussion the nature of these risks will be explained, as is the way in which they have been approached.

#### External objects

There is a wide array of external objects one may use to produce some type of sound on the guitar; in theory the range of external objects is endless. In the present study, the discussion on external objects has been limited to bottleneck sounds and paper clip preparation. Bottleneck sounds are the most widely used external object and, in addition to radically changing range and sonority, offer reliable possibilities for the creation of vertical cells. In a small number of researched pieces, a spoon, greatly resembling the sound of the bottleneck, was used as an external object. There is a degree of overlap between the spoon and the bottleneck in terms of sound, but the spoon does not allow for the creation of a wide range of vertical cells in the same way the bottleneck does. A separate chapter for the sound of the spoon would therefore be an option, but would add very little new information. The range of discussed sounds over the whole is thus limited to sounds that are widely used, sounds that can clearly be distinguished from other sounds and to timbre variations that are derived from a specific sound (for instance prepared guitar rasgueados). These were decisions made in this research trajectory for the abovementioned reasons, and it is therefore not inconceivable that further research in this field identifies more chains.

## Idiomatic scoring

The described field of idiomatic uses in this study is limited to those that are achieved through the use of one or more of the twelve identified sound-cell-texture chains. This could lead to the following questions: is the use of a bottleneck idiomatic? Is the use of percussion sounds idiomatic? Are sound categories that are included in this study by definition suitable and those that are excluded not suitable? These questions cannot be answered on their own terms, as they contain the false assumption that sound categories can be idiomatic or non-idiomatic in their own right. This is not the case. There are ways in which one can use the bottleneck in scoring that, in the hands of a trained guitarist, are idiomatic, and there are ways to use the bottleneck that are not. Likewise, there are ways in which one can score percussion sounds that are idiomatic to perform for a professional guitarist, and there are ways to score percussion sounds that are not idiomatic. It is in their use that sound categories find their idiomatic and non-idiomatic dimension. With the possible identification of additional chains in further research, the description of their idiomatic use can extend the body of knowledge on the potential of idiomatic use of the guitar. Similarly, if new technical means are discovered within the identified sound-cell-texture chains for additional idiomatic use, the body of knowledge of idiomatic use will be extended accordingly.

## Appendices

Not every aspect of guitar scoring is most easily explained in the chapters dedicated to the sound-cell-texture chains, for instance because they are relevant for multiple chains (Appendix A), or because they form an account that compares aspects of various chains (Appendix C). Although presented as an appendix, Appendix A on the vertical cell range is a particularly important component of this study, on the one hand because of the complexity of the matter and its relevance in guitar scoring, and on the other hand due to the fact that this issue has not been addressed in the existing literature.

## Relevance for other guitar communities

The research findings are relevant for the classical guitar community and artists wishing to write for the classical guitar. The differences in technical playing styles between the classical guitar and other guitars, such as the electric guitar and the jazz guitar, are so serious, particularly due to their divergent use of the right hand and the construction of the instrument, that part of the findings of the current research cannot directly be applied to these instruments without further research particularly directed at these types of guitars.

## Benefits for composers

It remains to be seen to which extent composers can benefit from the findings presented in this research. In this respect, it is relevant to note that this study contains a sizeable element of tacit knowledge, notoriously hard to articulate, transferred into explicit knowledge through capturing it in a model. It has been attempted to counter the risk of losing knowledge in this transition by giving artistic practice an important role in the research trajectory, by adding video materials that convey the musical examples in the context of their practice and by linking up with existing models for the explication of scoring potential (for this last aspect, see Theory Chapter). It may now be tested in practice to which extent composers can benefit from the findings of the study.

## 18.2 Tacit and embodied knowledge in the research process

As may be seen in the Methodology Chapter, the role of tacit knowledge and embodied knowledge is a prominent feature of discussions on artistic research. In the following section, the role of tacit and embodied knowledge in this research trajectory is explained. This explication is an especially relevant outcome of the artistic research process, as it demonstrates how tacit knowledge may be articulated, how it may be used hand in hand with explicit knowledge, how research decisions may be based on tacit knowledge and how tacit knowledge may play a role in the development of an artistic model, such as the sound-cell-texture chain and, finally, how tacit knowledge plays an important and binding role between the artistic and theoretical dimensions of the research.

### 18.2.1 Role and examples

Tacit and embodied knowing permeated the research process. The tacit and embodied knowledge applied in hearing, playing, experimenting and searching for cohesion during the process of identifying the various sound-cell-texture chains, played a pivotal and leading role in the research trajectory. The ability to differentiate between sonic characteristics by hearing and playing, to differentiate between technical aspect by playing, feeling and touching, the ability to hierarchically group them, subject them to analysis, code them with the help of newly defined categories on the basis of experience and experiment.

It is difficult, and perhaps impossible, to delineate exactly where my explicit knowledge ended and tacit knowledge began during the research process. However, in many activities carried out during the research, tacit and embodied knowing played a pivotal role. The following examples may serve to illuminate the numerous ways in which this role was fulfilled:

- I engaged my ability to play a wide range of compositions as well as the score samples that were collected and categorized in the research process.
- I engaged my ability to build a chord-interval overview, based on experiential, tacit and embodied knowledge, as well as practical research on the guitar.
- I engaged my ability to create musical examples in order to articulate scoring techniques through scoring as an accompaniment to written explication.

- I approached each sound-cell-texture chain in a general as well as a particular way. The percussion sounds chain required attention to aspects different from the plucked sounds chain: the knowledge of how to approach these chains in different ways was based on my embodied knowledge resulting from years of instrumental training and experience.
- I engaged my experience as composer: through my composing experience, I was at the very least partly and experientially aware of issues relevant to composers in the composing process.
- I engaged my experience as a performer: through my performing experience, I was aware of problematic issues in guitar scoring. Examples of such issues are harmonics notation, harmonic flexibility and vertical cell range. Such aspects were therefore treated with particular attention (for instance in the chapter on harmonics sounds), or separately in an appendix (for instance in Appendix A on the vertical cell range).
- Through previous experience and experiment in the research trajectory, I researched and articulated the speed at which horizontal cells consisting of various sounds can be alternated. Combinations of horizontal cells consisting of various sounds that did not appear in the sound-cell-texture library were researched by trying them out on the instrument, and articulated in the research through language and newly created score examples.
- I used my compositional ability to create new compositions based on findings of the research. Next to my artistic judgment during the composition process, I deployed my playing ability to test and develop the compositions.

## Implications

By granting artistic practice an important role in the research process, it takes on its own dynamic and becomes a natural and complementary actor in the trajectory. It does so by bringing tacit knowledge to the surface and by verifying and completing the theoretical tools developed in the research process. This process works both ways, as the theoretical tools can then be used to explore and develop new instrumental techniques and new strategies for composing. The presence of practice in the research process has allowed the sound-cell-texture model to be grounded in practice, rather than being the product of a detached theoretical discourse on guitar scoring. Artistic practice and the associated tacit and embodied knowledge correct and complement theoretical ideas and help in approaching sound-cell-texture chains in a way that is particular to the chain in question. It allows “asymmetric” deviations of the model if necessary. This is meant to say that even though the general structure of the model may work for the majority of its practical applications, practice leads the research in a direction where it accepts that an accurate account that does justice to the complexity of practice allows for deviations when necessary. This is, for instance, the case in the last two chapters of this study on the sound-cell-texture chain.

The combined use of theoretical and artistic practice is a viable route for research aiming to develop tools that must be distilled from practice. The marriage of the two approaches can lead to knowledge building that is truly “grounded” in artistic practice, and, in turn, valuable as a creative tool within that practice.

### 18.2.2 Communication of tacit and embodied knowledge

The communication of the knowledge acquired through the research trajectory is communicated through written text, musical examples, tables, new compositions for guitar and A/V materials corresponding to the musical examples. The video examples play an important role in this package: in the process of naming the chains, deciding which aspects should be discussed in the chain and which musical examples are to be shown, tacit and embodied knowledge played an important role. In the musical examples, as well as in their performance, tacit and embodied knowledge are incorporated. Language plays a useful role in making explicit the categorization and hierarchy of the various sounds, cells and textures, but the musical event itself, as well as the cohesion and interconnectedness between aspects discussed in the chain, can be communicated through video with preservation of their integrity. This communication can take place without a complex translation of the physical action into language and, in a more broad sense, as a communication that is complementary to the way in which language is necessary to discuss guitar scoring.

#### Implications

There is no one-size-fits-all recipe for the successful communication of tacit and embodied knowledge: artistic researchers have to find creative ways of expressing the artistic and theoretical dimensions of their research in a way that fits to their subject and findings. In this research trajectory, a dissertation, video examples and new compositions were used to communicate tacit and embodied knowledge.

## 18.3 Evaluation of the sound-cell-texture chain as a theory

In this section, the sound-cell-texture chain is evaluated as a theory. Constructs, variables, their utility, and their connectivity are discussed.

### 18.3.1 Constructs and variables

#### Constructs

The constructs identified in the present study are sounds, cells, textures, and their hierarchical connective construct, the chain. These constructs were created during the course of this trajectory, partly based on existing categories, and partly by giving categories observed in data a new designation. In the initial stages of the research, score samples were collected and used for practical experimentation, out of which constructs were created that were consequently made subject to testing. The value of the distinction between the categories lies in making structured and consistent thinking about the guitar potential possible.

### Variables

Each of the constructs has a number of variables assigned to it, which are relevant to the sound the given sound-cell-texture chain is dedicated to. As was outlined in the Theory Chapter, the establishment of the value ranges of variables reported in the Findings Chapters was reached through a triangular method of measurement. In order for fellow researchers to confirm, improve or disprove the statements about construct variables made in this study, the reported values may be verified by performing the music examples provided in this study, by other score examples or by newly composed examples. In all cases, it is good for researchers to keep in mind that potential value range of construct variables depends on the technical skills of individual guitarists. For the present study, the perceived technical proficiency of trained professional players, based on my professional experience, is the point of reference.

### 18.3.2 Utility of constructs, variables and their relationships

The constructs and their related variables in the present study have been developed to cover the range of musical events encountered in literature during the research trajectory. The variables of the study relate to the constructs, while the constructs relate to the domain in question: classical guitar music and performance. The sound-cell-texture chains have explanatory potential in that they can be employed to explain the nature of the scoring of a guitar piece, ideally and most easily when it is notated, but also when listened to. This explanatory power can be witnessed in its full force in the Findings Chapters of this study. The predictive adequacy of the sound-cell-texture chain lies in its ability to predict whether a piece may be playable or not, based on an evaluation of its constructs and variables, rather than a prediction based on probability.

### 18.3.3 Connectivity

This study aims to add to the views propagated in the work on guitar scoring by Kachian (2006), who presented textures as a category of interest[54], with that of contemporary guitar scoring guides that are more concerned with the range of sounds the guitar can provide (Mas, 1986; Schneider, 1985) by making use of separate categories for description in order to make structural thinking of scoring possible (Hijmans, 2008; Adler, 1989). This connective aspect of the present study is discussed in more detail in the Theory Chapter.

## 18.4 Contribution and future research

In this section, the contribution of this study is discussed. First, the contribution will be discussed within the framework of evaluation outcomes for artistic research proposed by Coessens et al. Subsequently,

[54] Despite the shortcomings in the work of Kachian (as discussed in section 3.2.2, 3.2.3 and 18.1.3), his description of the guitar's scoring potential through textures was useful for this research.

the contribution of this study to the academic debate on artistic research will be discussed. In both sections, suggestions for further research will be presented.

### 18.4.1 Artistic content, technical approach and historical value

Coessens et al. propose that the outcomes of artistic research may be assessed on the basis of three aspects: artistic content, technical approach[55] and historical value. Both the artistic and the theoretical content may be critically examined for their value for artists and art. However, both aspects of the research may be interpreted by the research community in diverging ways. According to Coessens et al., "the artist researcher should be aware of the different and/or complementary impact of both dimensions of his or her artistic research: the art manifestation and the research output" (Coessens et al., 2009, p. 73). Leaving the discussion raised by Coessens et al. in its own right (see section 18.4.2), I want to take my own position.

The artistic content of the present research trajectory consists of compositions that were composed with the help of the tools developed during the research phase. As such, it contributes to the body of works composed for the classical guitar and to the variety of techniques that may be used for creating such works. The theoretical content consists of a set of tools, grouped into sound-cell-texture chains that may be used by other composers in their creative process of writing for the guitar, as well as additional tools presented as appendices. This content contributes to the existing theoretical body of knowledge on how to score for the guitar by offering a new and, in terms of the variety of the examined sounds, extensive approach to this phenomenon.

The technical approach of this research trajectory is clarified in the Theory and Methodology Chapters and discussed in the current chapter. In short, the goal of the research is to re-think the guitar potential in order to create new compositions, while the tools developed in the research process are presented in such a way that they may be employed by other composers. The results of the research are communicated in three ways: a written dissertation, in A/V material and in compositions.

As for its historical value, this research relates to other, historical and contemporary, guitar compositions and studies on guitar scoring. The relation of this study to other studies is explained in the Theory Chapter. The intention of the new pieces composed with the help of the tools developed in this research is that they may be characterized by richness of sonority and effective scoring with a wide range of sounds, due to an informed used of the sound-cell-texture chains.

A suggestion for further research is to conduct an experiment with composition students in which they are asked to write guitar compositions with and without the scoring information contained in this study, in order to assess the effectiveness of the method of communication used to articulate the findings of this research, and the effect of the findings of this research on the guitar scoring abilities of composition students. Another suggestion for further research is to conduct a similar research for another solo-

[55] Technical approach refers to clarity to the research trajectory, as well as a "concise, understandable and scientifically acceptable formulation, elaboration and expression of its results" (Coessens et al., 2009, p. 73). For more details, see 1.2.4.

instrument that can perform a variety of horizontal and vertical cells, such as the harp or the organ, and for ensembles, such as string quartet or brass quintet.

### 18.4.2 Academic contribution

In this section, I will discuss my contribution to the discussion on artistic research. First, I will summarize the research process in order to create the context for this contribution. Subsequently, I will discuss whether making a distinction between the various outcomes of artistic research is meaningful, whether artistic researchers should shy away from conducting hypothesis-led research processes, and whether artistic research should only take place in and through art. Finally, I will present my view on the way forward for artistic research.

At the outset of my research project, the questions that needed to be answered were clear, but the course I had to follow to answer them was not. By collecting sounds that I encountered in the repertoire, I started to see possibilities for their categorization. I tested the categorization by analyzing compositions that I had previously performed, which allowed my practical experience to complement and adjust the developing theoretical framework. After identifying a core category, a number of sound categories, and the sound-cell-texture chain, I engaged in practical exploration and experimentation to find out more about the characteristics of the various sound categories. As a result, the theoretical framework was constantly updated and adjusted. Whenever I found a possibility to create a certain sound or cell that was not found in the repertoire, I deployed my creative skills to produce a new score example. After completing my research on the possibilities of the sound categories, I used the sound-cell-texture chain and the findings of the practical research to create new compositions.

The output of my research trajectory is, despite its range of manifestations, anchored in artistic practice. Although we can make a distinction between the various manifestations of the outcomes, they were the result of the same practice-based approach. Therefore, I no longer view a separation of the research outcomes into an academic and an artistic dimension as a meaningful one. The motivation used by Coessens et al. to separate these dimensions of research is that it remains to be seen whether “articulating the artistic research process will alter the reception of the artwork” (Coessens et al., 2009, p. 73). However, this is the case for all art, as it always remains to be seen whether the articulation of the process leading up to its creation or performance alters its reception, and the motivation used by Coessens et al. thus ignores the fact that critical thinking and reflection are also essential components of artistic practice. In my research, it was the constant and simultaneous engagement of critical thinking, practical experimentation and artistic creation that gave rise to all dimensions of the artistic research output. This will remain the case, whether we try to dissect the output and invent designations for its components, or respect its wholeness and appreciate that it is precisely its many-sidedness and coherence that characterizes it as a product of artistic research.

During my research, both hypothesis-led and discovery-led phases took place. The alternation of these phases was a suitable manner to conduct my artistic research, because it allowed for the development of theoretical views that were nurtured by practical experimentation, and, vice versa, helped improve practical techniques that were developed from related theoretical views. Although Borgdorff states that, “as a rule, artistic research is not hypothesis led, but discovery-led” (Borgdorff, 2010, p. 56), I think this view is lacking and unnecessarily limiting artistic researchers to one corner of the range of possibilities to conduct research.

My research had artistic practice at its core, but its objective was also to produce outcomes that are useful for other artists. I believe any artistic research project should have this objective: an autonomous experiment that has no relevance for other artists does not make a sufficient contribution to the body of knowledge. Borgdorff separates “research in the arts” from “research for the arts” (Borgdorff, 2006, p. 6) and claims that only research that is based on “the principle that the research takes place in and through the creation of art” (Borgdorff, 2010, p. 46) qualifies as artistic research. It is my view that the exclusion of research for the arts is inappropriate, as both research in and for the arts should be necessary elements of any artistic research project.

As can be concluded from the above, some scholars struggle to find a position for artistic research. Although methodological pluralism is advocated and encouraged, there still is a paradoxical tendency to suddenly embrace one side of the methodological spectrum at the expense of the other. Usually, this embrace reaches into the direction of practical methodologies, even though artistic research already has artistic practice as its starting point. This tendency is based on the implicit and faulty premise that artistic practice is more about playing and trying, than it is about thinking and analyzing. It can be witnessed in the attempted separation of artistic content and academic content, although one, practice-based process underlies both dimensions. It can be heard in the call to place discovery-led research on a pedestal at the expense of using hypotheses, although hypotheses can be formed on the basis of discovery. It can be seen in the attempt to only qualify research that was conducted in the arts as legitimate artistic research, even though it should also make a meaningful contribution. None of this is necessary or even helpful.

It is time for artistic researchers to realize that the pendulum of artistic knowledge swings both ways: from practice to reflection, and back again. From theorizing to experimenting, and back again. Only when we accept that this premise is essential for the artistic experience, can we engage in research that truly does justice to our practice: artistic research.

## Appendix A Vertical Cell Range

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# Appendix A Vertical Cell Range

One of the challenging issues for composers who wish to score for the guitar is the question of which vertical cells are available on the guitar, an issue that has been referred to as “very puzzling for non-guitar playing composers” (Vassilandonakis, 2004). In this appendix, an account is given of the principles that govern vertical cells scoring, wide ranges, position writing, the possibilities of the capodastro and possibilities to score clusters on the guitar.

## A.1 Principles and range

When writing intervals and chords for the guitar, there are two facts that should be taken into consideration:

- The guitar has six strings
- The guitarist uses four fingers of the left hand for holding down the strings (the left hand thumb is used to support the hand at the back of the neck)

This means that chords consisting of six notes can be written, but these notes would always have to be played with the four fingers of the left hand that the guitarist has at his disposal.

The guitarist has four fingers on the fretboard, each of which, as a point of departure, is assigned a fret. The first fret is assigned to the index finger, second fret to the middle finger, third fret to the ring finger, fourth fret to the little finger.

The barré is a playing technique that allows the guitarist to play more than one fingered note at a time with one finger. For this technique, the guitarist lays her finger flat over a number of strings to depress them all at once. The guitarist can use one finger to cover a fret on two up to six strings at the same time. The first finger[56] of the left hand is most commonly used for this technique.

## A.2 Wide range

### A.2.1 Pitch combination range

[56] For the numbering of the fingers of the left and right hand: see *Reading Guide*.

*Figure A.1 Wide range*

The widest range most guitarists can reach consists of 4 or 5 frets between the index and fourth finger of the left hand when playing in the first position. When moving to a higher position, this distance increases, as the width of the frets decreases. The largest distance between bass note and top note is pictured in Figure A.1. Any interval within the extremity of each mentioned interval is playable.

When using open string basses these extremes in range do not apply, since the bass note would not have to be fingered by the left hand. The largest interval then corresponds to the range of the guitar.

When scoring notes higher than a written e3 (sounding e2), sufficient time in advance should be allowed for the performer to locate the note and afterwards to leave the high position and return to a normal position. Ways to allow for such time is by:

- Making use of rests.
- Letting one or more notes ring on while the performer changes position. As the left hand has to move through the air in order to prepare the high note, this should be a note that is not fingered with the left hand, such as an open string or a natural harmonic that is ringing on.
- Writing the preceding section in a range that is positioned near the note in the extreme range that has to be played.

When the above options are not possible for musical reasons, the sounding result will be such that the note before the note in the extreme range sounds staccato, or the note in the extreme range is played too late.

## A.2.2 Playing possibilities in wide ranges

*Figure A.2 Jumping between notes within hand span*

A guitarist can still perform Figure A.2 with a number of articulations, including legato.

*Figure A.3 Jumping between notes outside hand span*

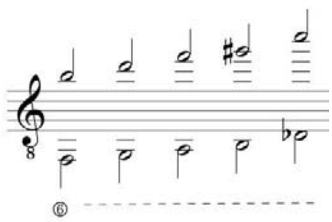
Figure A.3 shows an alternation of two notes that exceed the maximum range between notes that can be held in one position. The example can be played, but not legato.

*Figure A.4 Sounding result of jumping outside hand span*

Because the left hand has to jump, the result will sound as notated in Figure A.4. When the top note is scored even higher, the rests between the notes will, as a consequence of the left hand having to jump further, become longer.

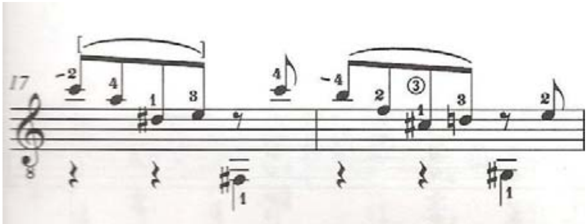
## A.2.3 Left hand thumb on fingerboard

*Figure A.5 Left hand thumb range*



Rarely, the thumb of the left hand is moved away from the back of the neck and used to stop notes on the fretboard, making the interval ranges pictured in Figure A.5 possible.

*Figure A.6 Left hand thumb on fingerboard*



(SARABANDE BWV 995, BACH, EDITED BY FRANK KOONCE)

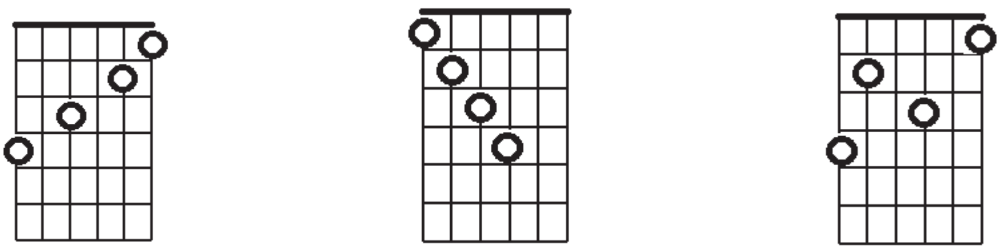
The interval f# on the sixth string and c on the first string can be performed by using the thumb of the left hand for the low f# (Figure A.6). The use of the left hand thumb in this example is not prescribed in the fingering. Koonce suggests the use of finger 1 of the left hand for the performance of the low f#. Because the interval between the low f# and the high c exceeds the left hand range, the solution here is to perform the low f# with the left hand thumb. A left hand thumb fingering should be indicated with a symbol specified in a legend or a short verbal description, as there is not standardized notation for such a fingering.

# A.3 Position writing

## A.3.1 Explanation

A position number on the guitar can be defined as the number of the fret where the leftmost finger of the left hand, normally the index finger, of the left hand is playing. We call the position the first, when the guitarist has its left hand index finger in the first fret, middle finger in the second, ring finger in the third and little finger in the fourth. The second position is the one in which each finger has moved one fret up, meaning that the left hand index finger is now holding down the string in the second fret, middle finger in the third, ring finger in the fourth and little finger in the fifth fret.

*Figure A.7 Examples of possible combinations of four fingered notes*



When scoring for the guitar, one is free to use any combination of four fingered notes and two open strings within a position (Figure A.7).

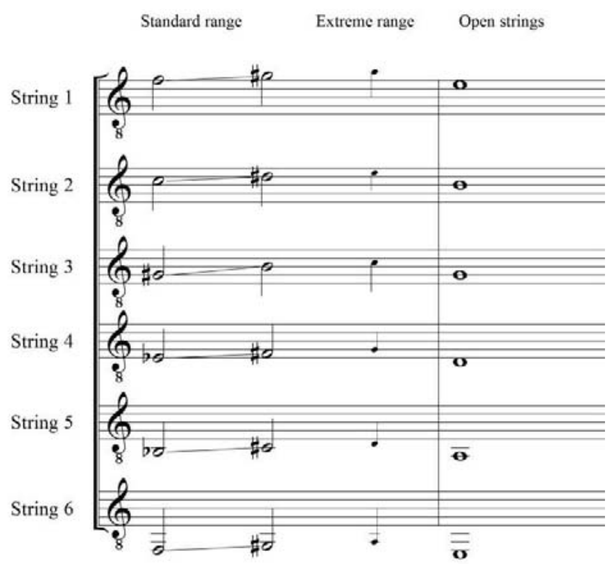
The first position on the guitar is the position that allows least extensions of the left hand, as the frets are at their widest here. The higher the position the guitarist plays in, the narrower the width of the frets. The range of notes that can be reached in the first position is therefore smaller than in higher positions. For this reason, the first, third, fifth, seventh, ninth and eleventh position are separately discussed here. For the positions in between one can make use of the scoring charts, range and rules of the previous position, transposing its range up by a minor second.

## A.3.2 Notation

Positions are notated in Roman numerals, i.e. I for position one, II for position II, III for position 3, etc. When a barré is necessary, a number of notations are used: the most common being the Roman numeral of the position number, sometimes with an added C (meaning Capo), sometimes with a spanning line included for the duration of the barré.

## A.3.3 The first position

*Figure A.8 First position range*




In Figure A.8, the ranges within the first position are explained per string. The minims correspond to frets one to four on each string. It is possible for guitarists to stretch their little finger one fret further: the pitch that is reached in such case has been indicated with a quaver. It is recommended not to use more than two notes from the extreme range.

When writing chords, it is recommended that the composer check the notes within the chord on the fingering chart to estimate whether it is possible to play the written chord. As a general rule, chords that require a distance of more than one fret between the middle and ring finger or the ring and little finger should be avoided, as well as chords including a large string distance between the ring and little finger with the little finger on the lowest string, as they are extremely difficult or impossible to play. When writing notes in the extreme range, special attention should be paid to whether the lateral distance between middle-ring finger and ring-little finger are still within the range of possible distances.

*Figure A.9 First position chords*

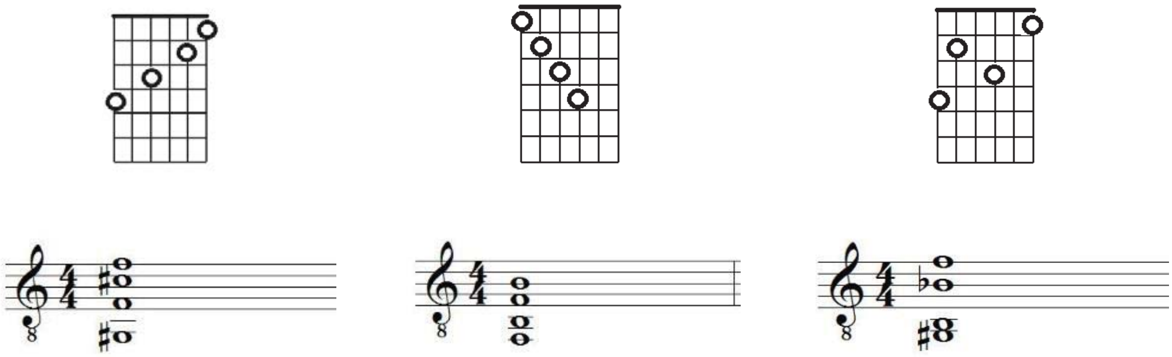
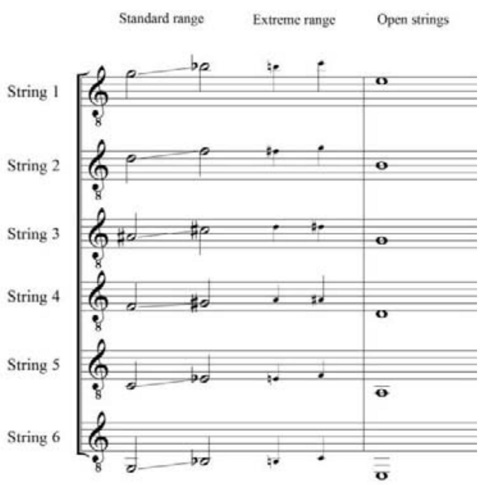


Figure A.9 shows examples of finger combinations in the first position and their sounding result.

## A.3.4 The third position

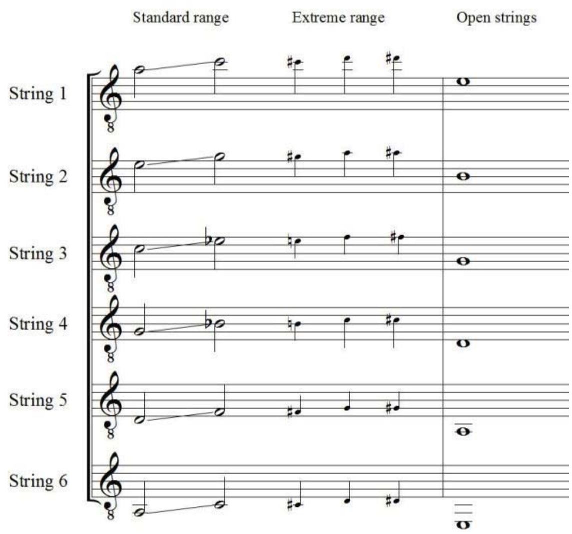
*Figure A.10 Third position range*



In the third position, notes within the standard range correspond to frets one to four in this position, being frets three to six. As we are moving up the fretboard, the frets themselves become narrower and, as a result, more potential for reaching the extreme range arises. The extreme range consists of two notes, of which the first can be reached with ease by many amateurs, while the second can be written when scoring for professional players. It is advised to use no more than two notes from the extreme range of the first quaver, and a maximum of one note from the extreme range of the second quaver.

## A.3.5 The fifth position

*Figure A.11 Fifth position range*




In the fifth position, notes within the standard range correspond to frets one to four in this position, being frets five until eight. Again, more potential for reaching the extreme range arises. The extreme range consists of three notes, of which the first can be reached with ease by many amateur players, while the second and third can be written when scoring for professional players. It is advised to use no more than two notes from the extreme range of the first quaver, and a maximum or one note from the extreme range of the second and third quaver.

## A.3.6 The seventh, ninth and eleventh position

*Figure A.12 Seventh position range*

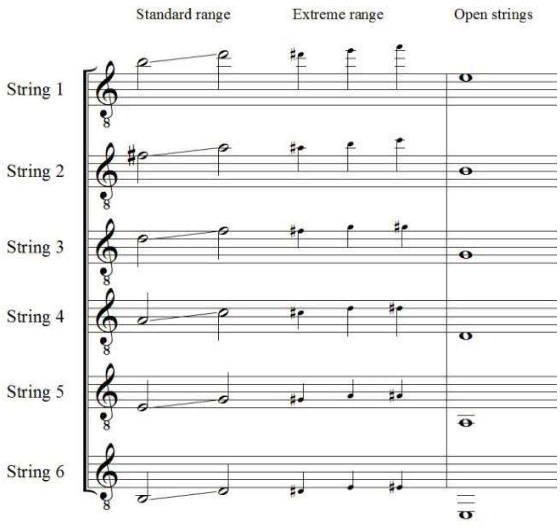



*Figure A.13 Ninth position range*

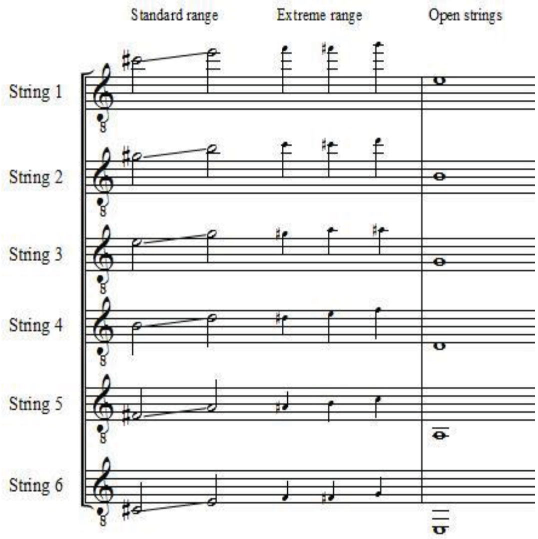
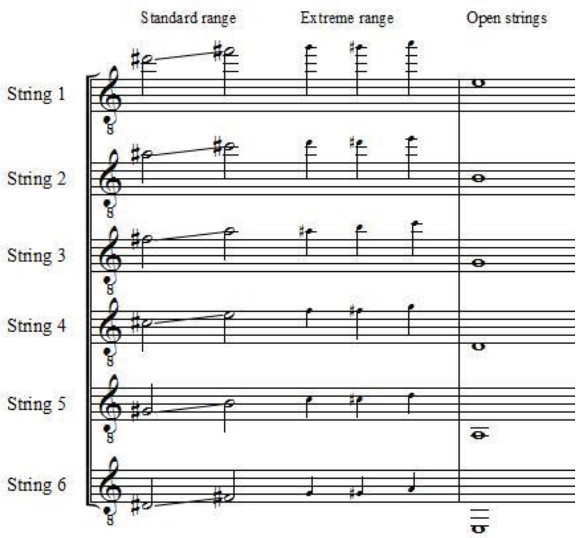



*Figure A.14 Eleventh position range*




In the seventh, ninth and eleventh position it is advised to use no more than two notes from the extreme range of the first quaver or a maximum of one note from the extreme range of the second and third printed quaver.

## A.3.7 The thirteenth and fifteenth position

*Figure A.15 Thirteenth position range*

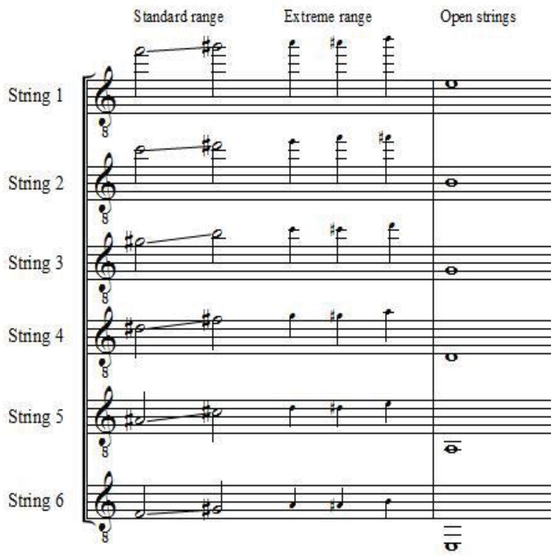
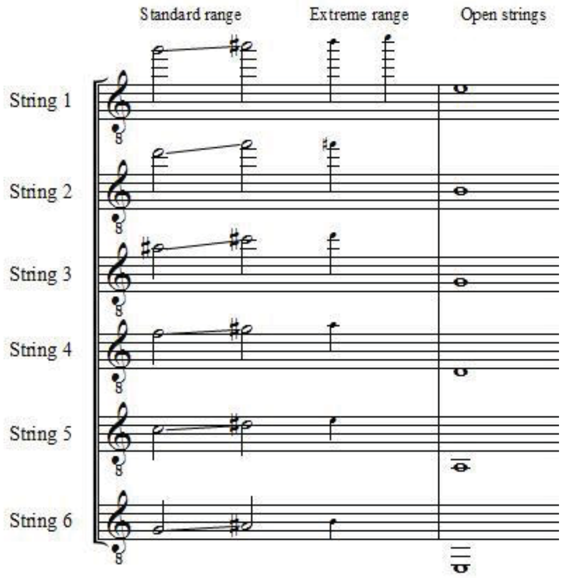


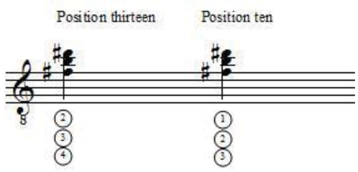

*Figure A.16 Fifteenth position range*




The thirteenth and fifteenth positions represent the highest range of the classical guitar. It is here that the guitarist is playing on the part of the fretboard that is directly connected to the top of the guitar body. This range lends itself well for brilliant passages on the first string, as it is here that we have reached the very top of the instrument's range. It may be noted that the second note of the extreme range is not available on every guitar, but most concert guitarists play guitars that include this high c.

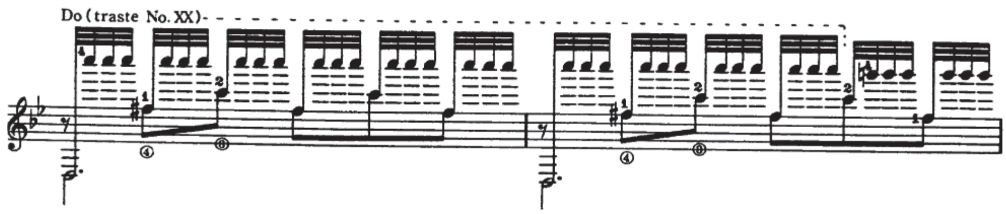
As the fretboard is placed on the top of the guitar body here, the player's left arm is partly blocked by the guitar body. This means that one cannot be as free in writing chords that include large spreads between strings. In the eleventh position, a chord of four notes on strings 1-2-3-4 or 1-2-3-5 is the advised maximum. In the thirteenth and fifteenth position, a chord of three notes on strings 1-2-3, 1-2-4 or 1-2-5 is the advised maximum.

*Figure A.17 Fingering options*




A chord of three notes on strings 2-3-4 is very awkward to play in the thirteenth position, but would be playable a few frets lower on strings 1-2-3 (Figure A.17). Since high range notes are always available in lower positions on a higher string, the high range is mainly used to reach high notes on the first string.

*Figure A.18 High c*



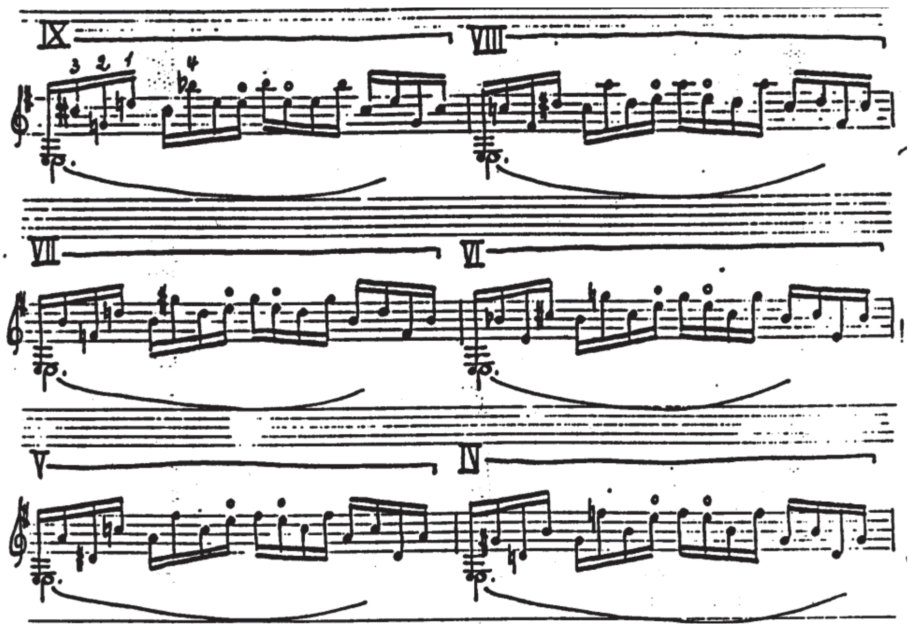

(UN SUEÑO EN LA FLORESTA, BARRIOS)

A famous repertoire example using the high c appears in Barrios' *Un Sueño en la Floresta,* where a continuous c, produced by the tremolo technique, functions as an expressive peak in the piece (Figure A.18).

## A.3.8 Literature examples of position writing combined with open strings

Most guitar literature contains frequent changes in left hand playing position. Position changes extend the range of the first position, allow the performer to reach combinations of notes that are not available in the first position, or assist in attaining a different timbre.

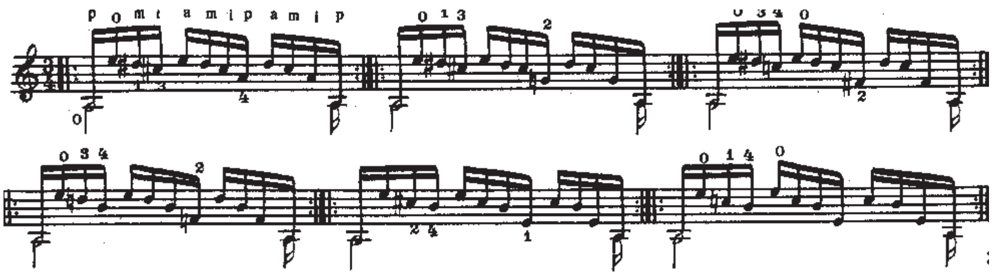
*Figure A.19 Position writing*




(ETUDE 1, VILLA-LOBOS)

A piece often recognized for its inventiveness in guitar scoring, the *Etude No. 1* by Villa-Lobos, exhibits an interesting procedure in writing idiomatic chords on the guitar (Figure A.19). Villa-Lobos takes one chord, starting in the tenth position, consisting of four fingered notes and two open strings. He then continues to move the chord one fret down every following measure, thus changing the chord and its inner voicings, as the pitches of the open strings (the open first en sixth strings) remain unchanged.

*Figure A.20 Position writing*



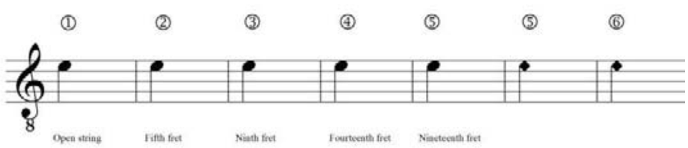
(ETUDE VI, BROUWER)

Brouwer employs a similar procedure in his Etude VI. Against the backdrop of an open 5th and open first string, Brouwer changes the pitches on strings 2,3 and 4 (Figure A.20). These scoring examples demonstrate a distinctive "guitaristic" sound, as the open strings ring on much longer than the fingered notes, taking on a drone-like quality when repeated over longer periods of time.

## A.3.9 Choice of fingering

One of the characteristics of the guitar is that most notes can be played on multiple locations. Except for the open sixth string, the first four frets of the sixth string and the highest positions on the first string, each note can be played in at least two different places. The pitch that sounds when playing the open first string can even be played on five different strings, with additional possibilities of playing it as a harmonic.

*Figure A.21 Fingerings*




The e from the open first string can be played in a number of different places: on the first, second, third, fourth or fifth string (Figure A.21). The last two notes are natural harmonics on the sixth and fifth strings. The first choice for many guitarists would be to play the e from the above example as on open string. If, however, the music requires the left hand to be in a higher position, or the performer prefers the sound of the second or third string for this particular e, the second or third string can be chosen. Playing this note on the fourth or fifth string will happen only rarely, as we are reaching the extreme range up the neck of the guitar. Harmonics are normally only played when explicitly prescribed in the score.

This example can serve not only to make clear how sight reading on the guitar is a complex task, but also how each fingering represents a choice in timbre. For nearly every written note, the performer has to decide where to play it in case no fingering has been specified by the composer. This also means that the composer has an enormous palette of subtle differences in tone color to work with. If the composer is looking for a specific tone color for a section of his music, she should indicate the sounding result she is looking for, so that the guitarist can create that sound through the available tools, or prescribe a specific fingering.

## A.3.8 Additional possibilities of the barré technique

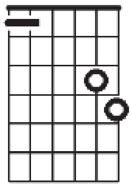
### First finger barré

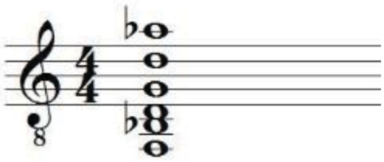
*Figure A.22 Barré chord with three added fingers*

The barré technique allows the composer to score a chord consisting of more than four fingered notes within any position. This barré can be executed by the first finger over all the strings, thus making all notes in the first fret of a given position available at the same time. To these notes, any note within the regular range of the position can be added. This makes it possible to score six fingered notes, achieved by the performer by using one up to four fingers of the left hand (Figure A.22). The possibilities of the barré, however, come at a cost: the open strings are not available anymore, as they are covered by the barré.

A solution that allows open strings to be used anyway is the use of a partial barré that does not cover all strings. One could use a partial barré over two strings, making it possible to score a chord consisting of five fingered notes with an additional open string. Depending on the technical capabilities of the player, it is recommended not to ask for an open string just over the topmost note of a barré as it is often not possible for the finger to avoid touching the next string. Such scoring should only be used for professional guitarists.

*Figure A.23 Partial barré over two strings*

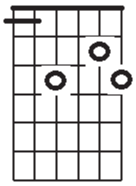


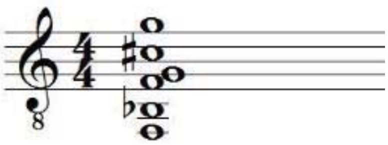


The barré pictured in Figure A.23 is possible for professional players. Amateur players may have trouble avoiding touching the fourth open string.

The danger of the partial barré is that when on the higher neighboring string a note in a lower fret or an open string is scored simultaneously, the finger may touch the next string, so that a buffer zone of one string may be required. That buffer string can be used by writing a note in one of the available frets, provided that it is in a higher position than the barré. If the guitarist touches that string with the first finger there is no problem, as touching the string of a fingered note to the left will have no effect on its sound.

*Figure A.24 Partial barré with buffer string*





The chord pictured in Figure A.24 is playable, as there is one fingered string between the highest note of the barré (string 5) and the open string (string 2).

## Fourth finger barré

The fourth finger is sometimes used for the execution of a barré over two notes, almost without exception over the first and second string.

## Literature example of barré writing

*Figure A.25 Partial barrées*

(GRAND SOLO, SOR)

In Fernando Sor's *Grand Solo* we see how the open strings are still be available when scoring partial barrées, regardless of the position we are in. The fifth string functions as a bass pedal, while chords played with partial barrées are played in various positions (Figure A.25).

## A.4 Additional possibilities of the capodastro

The capodastro is a device that is applied the neck of the guitar and functions like a mechanical barré, leaving the other fingers of the guitarist free to play in higher positions without having to finger notes in a lower position. Applying and moving the capodastro takes some time, so changes in the capodastro position are usually made between movements or pieces. For the possibilities of the capodastro, the various positions discussed in the chapter section on position writing should be consulted. Note that the open string pitches are replaced by the open string pitches transposed to the position the capodastro is placed in. This makes is possible to play transcribed music in its original key, and to create "unusual sonorities" (Marchione, 1998).

*Figure A.26 Capodastro in first position*


(FANTASIA VII, TELEMANN, TRANSCRIBED BY CARLO MARCHIONE)

Marchione prescribes a capodastro in his transcription of violin works by Telemann for the guitar. For the example in Figure A.26, a capo in position one is prescribed. The composer should either notate the sounding result of the capo, or notate the music as if it were played in first position. Marchione use the latter option.

## A.5 Clusters

*Figure A.27 Open string fingerings*

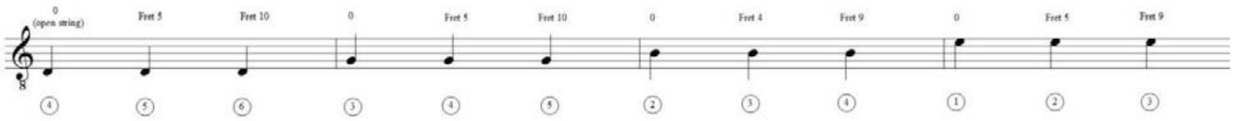



Figure A.27 shows how the same pitch can be played on different locations. If we look at the last measure in the above overview, we see that the e can be played on the first, second and third string. If we play all these notes at once, we have a unison played over three strings.

*Figure A.28 Guitar clusters*


If we would move the e on the second string a semitone up, and the e on the third string a semitone down and play these notes at once, we would have a cluster of three notes: d#, e and f. These pitches can all be reached in the sixth position. By grouping two notes around, above or under an open string, the clusters pictured in Figure A.28 become available to us.

*Figure A.29 Cluster*


(SEQUENZA XI, BERIO)

In Luciano Berio's *Sequenza XI*, a right hand trill technique is used to create a rapid and continuous ringing of a cluster interval. Figure A.29 exhibits a fragment of this technique, while finishing on a simultaneously performed cluster of three notes. Clusters of more than three consecutive minor seconds are not available in standard tuning.

## Appendix B Harmonics Fingering Chart

**Contents**

# Appendix B Harmonics Fingering Chart

## B.1 Chart

*Figure B.1 Harmonics fingering chart*

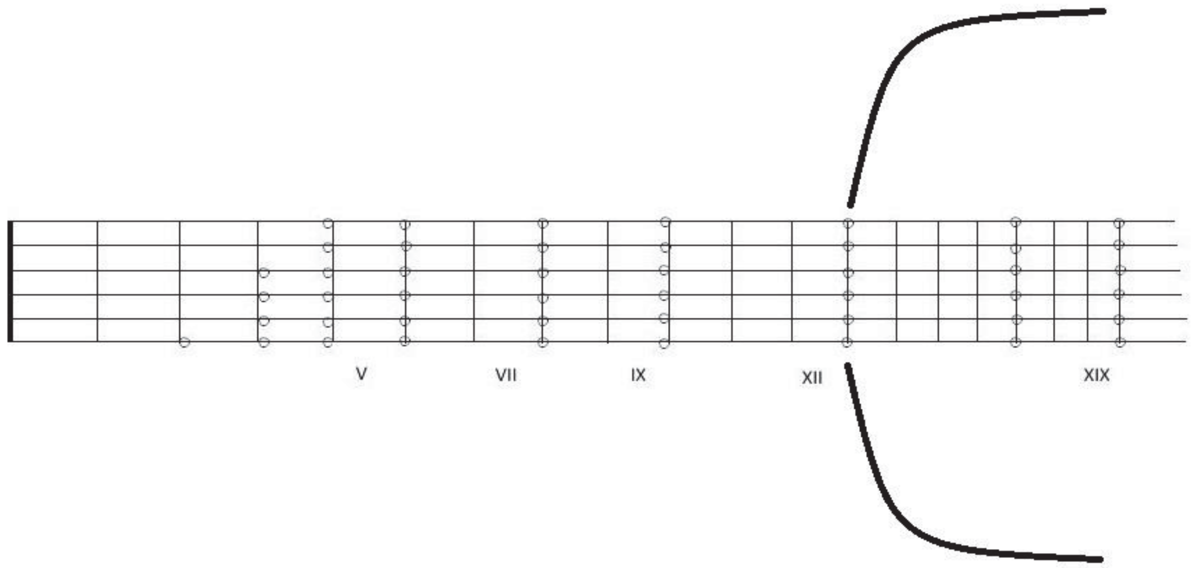



Figure B.1 displays the nodal points that are used to create natural harmonics on the guitar.

## B.2 Nodal point pitches

An overview is listed below of the interval relation between the open string and the natural harmonic at a particular nodal point position:

II: 3 octaves and a major third
III: 2 octaves and a perfect fifth
IV/IX/XVI: 2 octaves and a major third
V: 2 octaves
VII/XIX: 1 octave and a perfect fifth
XII: 1 octave

# B. 3 Vertical combinations

## B.3.1 Two-note combinations

Any combination of two harmonics can be scored within the following position ranges:

- From position II to VII
- From position IV to IX
- From position VII to XII
- From position XII to XIX

## B.3.2 Three- and four-note combinations

The most effective combinations are scored within one of the abovementioned position ranges with one harmonic in the low position and the other two or three in the higher position, or vice versa with one harmonic in the higher position and the other two or three in the lower position. If the fret distance is only two frets or less, any combination can be scored. Any combination of harmonics on the same nodal point can be scored, and any combination of harmonics between position V and IX; in both of these cases, a barré is used.

## B.3.3 Five-and six-note combinations

The most effective combinations are scored within one of the abovementioned position ranges with one, two or three harmonics on adjacent strings in the low position, and the other three, four or five harmonics in the higher position, or with one harmonic in the high position and the other five in a lower position. Additionally, any combination of harmonics on the same nodal point can be scored.

# Appendix C Relative Dynamics Chart

| | | *pppp* | *ppp* | *pp* | *p* | *mp* | *mf* | *f* | *ff* | *fff* | *ffff* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Plucked sounds | | | | | | | | | | | |
| Harmonics | Natural harmonics | | | | | | | | | | |
| | Artificial harmonics | | | | | | | | | | |
| Rasgueado sounds | | | | | | | | | | | |
| Strummed sounds | | | | | | | | | | | |
| Percussion sounds | | | | | | | | | | | |
| Tambora sounds | Pitched tambora | | | | | | | | | | |
| | Percussive tambora | | | | | | | | | | |
| Hammered sounds | | | | | | | | | | | |
| Bartok pizzicato sounds | | | | | | | | | | | |
| Buzzing string sounds | | | | | | | | | | | |
| Scratching string sounds | | | | | | | | | | | |
| Inverted stopping sounds | | | | | | | | | | | |
| Bottleneck guitar sounds | | | | | | | | | | | |

## Appendix D Scordatura

### Contents

# Appendix D Scordatura

## D.1 The scordatura

### D.1.1 Definition, timbre and range

The term scordatura refers to "tunings other than the normal, established one" (Boyden & al., 2012). With the help of a scordatura, the pitch range of the guitar is altered. The most usual detunings ask for strings to be tuned down a maximum of a major second to a minor third, and up to a maximum of a major second (but preferably not more than a minor second). When tuning a string up more than a minor second, there is a risk that the string breaks due to increased tension. Scordaturas detuning on or two strings are relatively common in both the classical and the more contemporary guitar repertoire.

Scordatura alters the timbre of the guitar by changing the tension on the string; in this manner, pitches take on a different timbre. Scordatura is often used to make other keys or note combinations accessible; a common scordatura tunes the sixth string down to a d, making the key of d major and minor more accessible in guitar scoring.

Detuning a string has as its consequence that the range of a string is transposed; when considering the vertical cell range of the guitar, this should be taken into consideration.

### D.1.2 Tuning

Scoring multiple scordaturas in a composition may lead to tuning issues, as it takes some time and re-tuning for a scordatura to settle.

### D.1.3 Notation

For the use of scordatura, one of two possible types of notation can be chosen. In the first type of notation, the score is notated with accurate, sounding pitches. In the second type of notation, the score is notated as if no strings were detuned, usually improving readability. This second type of notation is particularly effective in scordaturas in which multiple strings are detuned. A downside of this type of notation is that if the performer decides to play a note on another string, wrong notes may easily be played as the usual string interval relationships do not apply and the performer cannot directly derive the correct pitch from the score. A remedy to this issue is used in *Koyunbaba*, where a double staff is used, one with the sounding pitches and one with the second type of notation (Domeniconi, 1998).

# D.2 Literature Examples

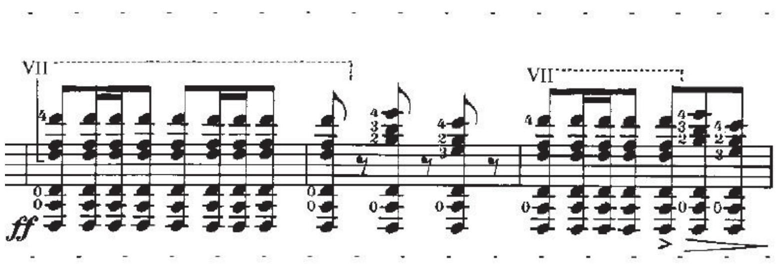
## D.2.1 Regular scordaturas

Most scordaturas used in the repertoire require detuning one or more strings to another tempered pitch. In the following section, common and less common examples of such scordaturas are discussed.

### Common scordaturas

#### *Sixth string to d*

*Figure D.1 Sixth string to d*




(CONCIERTO DE ARANJUEZ, RODRIGO)

By far the most common scordatura in the 19th and 20th century repertoire is the tuning of the 6th string to d. This makes the key of d major and minor more accessible in scoring, and adds two pitches to the range of the guitar (Figure D.1).

#### *Sixth string to d, fifth string to g*

*Figure D.2 Sixth string to d, fifth string to g*


(CHORO DE SAUDADE, BARRIOS)

Another common scordatura tunes the sixth string down to d and the fifth down to g, making the key of g more accessible to guitar scoring: the open fifth string is a g, while the d on the sixth string is the dominant of g.

### *Third string to f#*

*Figure D.3 Third string to f#*


(FANTASIA, MUDARRA)

In transcriptions of lute, vihuela and baroque guitar music, a scordatura with the third string tuned to f# is frequently suggested (Figure D.3). This scordatura is similar to the tunings of the abovementioned instruments, making the rendition on the guitar both more faithful in sound to the original score and technically more playable.

## Less common scordaturas

### *Sixth string down to e flat*

*Figure D.4 Sixth string to e flat*

(THURIS, TITRE)

A less common, but effective scordatura for extending the low range of the guitar by a semitone, appears in Titre (Figure D.4).

### *Sixth string down to e flat, second string down to b flat*

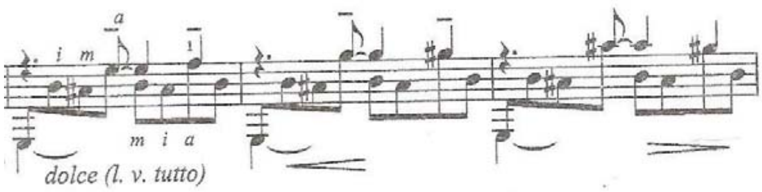
*Figure D.5 Sixth and second string semitone down*

(Due canzoni lidie, D'Angelo)

D'Angelo uses a scordatura in which the sixth string and the second string are tuned town a semitone (Figure D.5).

### *First string down to d sharp*

*Figure D.6 First string down to d sharp*

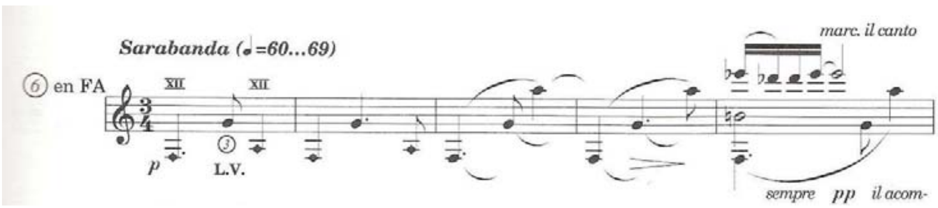



(Paisaje cubano con fiesta, Brouwer)

Brouwer prescribes a scordatura in which the first string is tuned down a semitone, changing the sonority of the higher register (Figure D.6). The score is notated as if the first string were not detuned in order to improve readability.

### *Sixth string up to f*

*Figure D.7 Sixth string to f*




(Sonata, Brouwer)

In the *Sonata*, Brouwer tunes the sixth string up a semitone to f, making the key of f more available for guitar scoring (Figure D.7).

### *Scordatura of all strings*

*Figure D.8 Scordatura of all strings*


(KOYUNBABA, DOMENICONI)

Domeniconi uses a scordatura in which the guitar is tuned to a d minor chord (Figure D.8). In the introductory note, Domeniconi suggests for the guitar to be tuned a semitone lower than the printed d minor chord in the score, creating a scordatura that affects all strings. The score is notated as if the strings were not detuned, in order to improve readability.

## D.2.2 Microtonal scordaturas

### Microtonal scordatura of multiple strings

*Figure D.9 Microtonal scordatura*


(KURZE SCHATTEN II, FERNEYHOUGH)

Ferneyhough uses a range of microtonal scordaturas in *Kurze Schatten II* (Figure D.9). When a string is detuned to a microtonal pitch, this ensures that all stopped notes performed on that string are microtones.

# Appendix E Video Files

## Files

The video files appendix consists of the following files:

- Figure 5.1 – Figure 5.102.wmv ; containing video performances of the image files from the chapter on plucked sounds
- Figure 6.1 – Figure 6.46.wmv ; containing video performances of the image files from the chapter on harmonics
- Figure 7.1 – Figure 7.29.wmv ; containing video performances of the image files from the chapter on rasgueado sounds
- Figure 8.1 – Figure 8.42.wmv ; containing video performances of the image files from the chapter on strummed sounds
- Figure 9.1 – Figure 9.29.wmv ; containing video performances of the image files from the chapter on percussion sounds
- Figure 10.1 – Figure 10.40.wmv ; containing video performances of the image files from the chapter on tambora sounds
- Figure 11.1 – Figure 11.35.wmv ; containing video performances of the image files from the chapter on hammered sounds
- Figure 12.1 – Figure 12.17.wmv ; containing video performances of the image files from the chapter on Bartok pizzicato sounds
- Figure 13.1 – Figure 13.24.wmv ; containing video performances of the image files from the chapter on buzzing string sounds
- Figure 14.1 – Figure 14.18.wmv ; containing video performances of the image files from the chapter on scratching string sounds
- Figure 15.1 – Figure 15.17.wmv ; containing video performances of the image files from the chapter on inverted stopping sounds
- Figure 16.1 – Figure 16.16.wmv ; containing video performances of the image files from the chapter on bottleneck sounds
- Figure A.1 – Figure A.29.wmv ; containing video performances of the image files from Appendix A
- Figure D.1 – Figure D.9.wmv; containing video performances of the image files from Appendix D

The examples of non-functional writing in this dissertation are not included as video files.

## Equipment

Microphone: Neumann KM 184
Audio interface: M-Audio Fast Track
Camera: Logitech C920 HD Pro Webcam

## Recording dates

Video files were recorded in June/July of 2012 and in July of 2013.

# Appendix F Etudes: Scores

# Twelve etudes for guitar

Marlon Titre

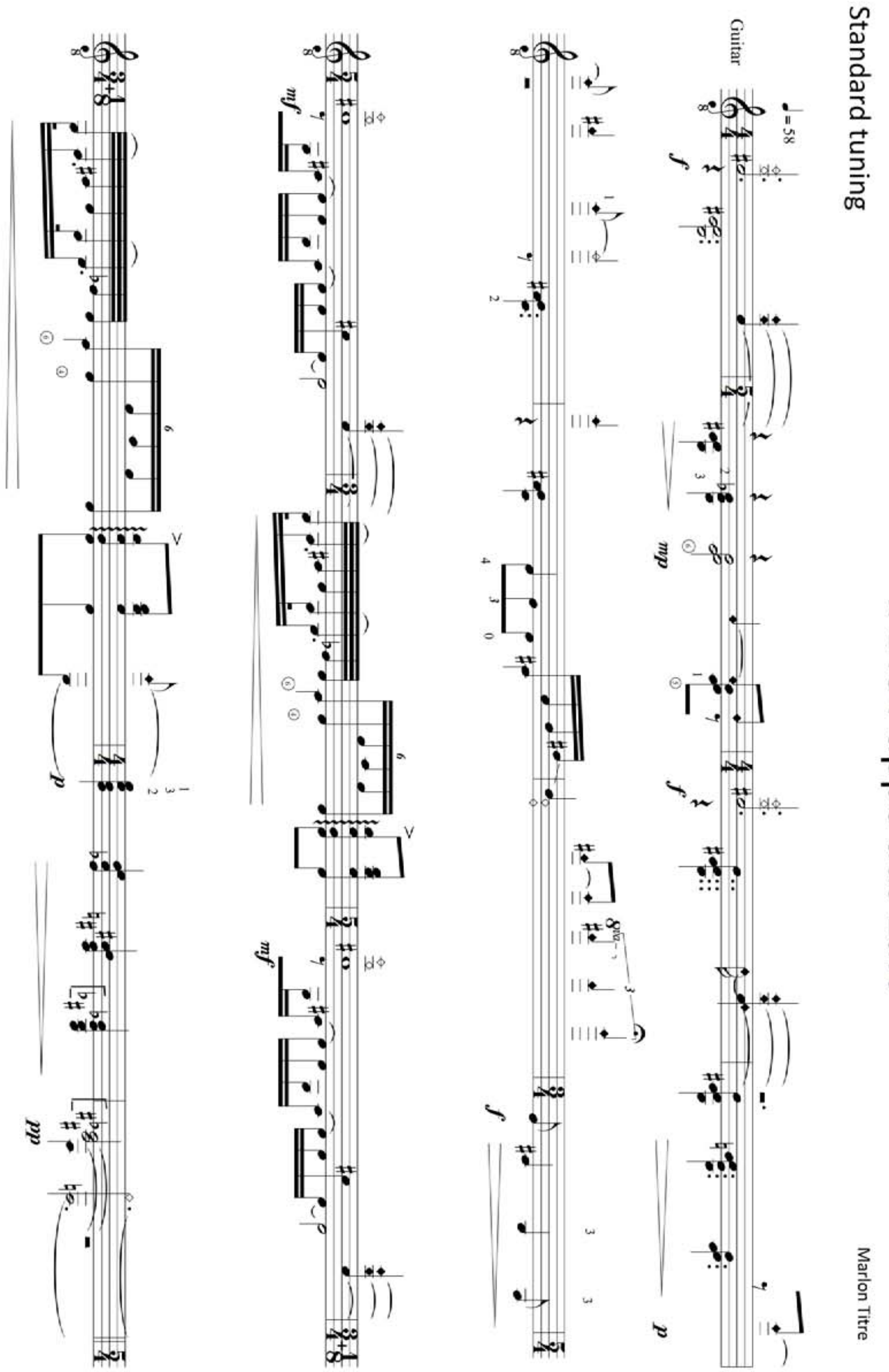
*written with the findings presented in the author's study "Thinking through the guitar: the sound-cell-texture chain"*

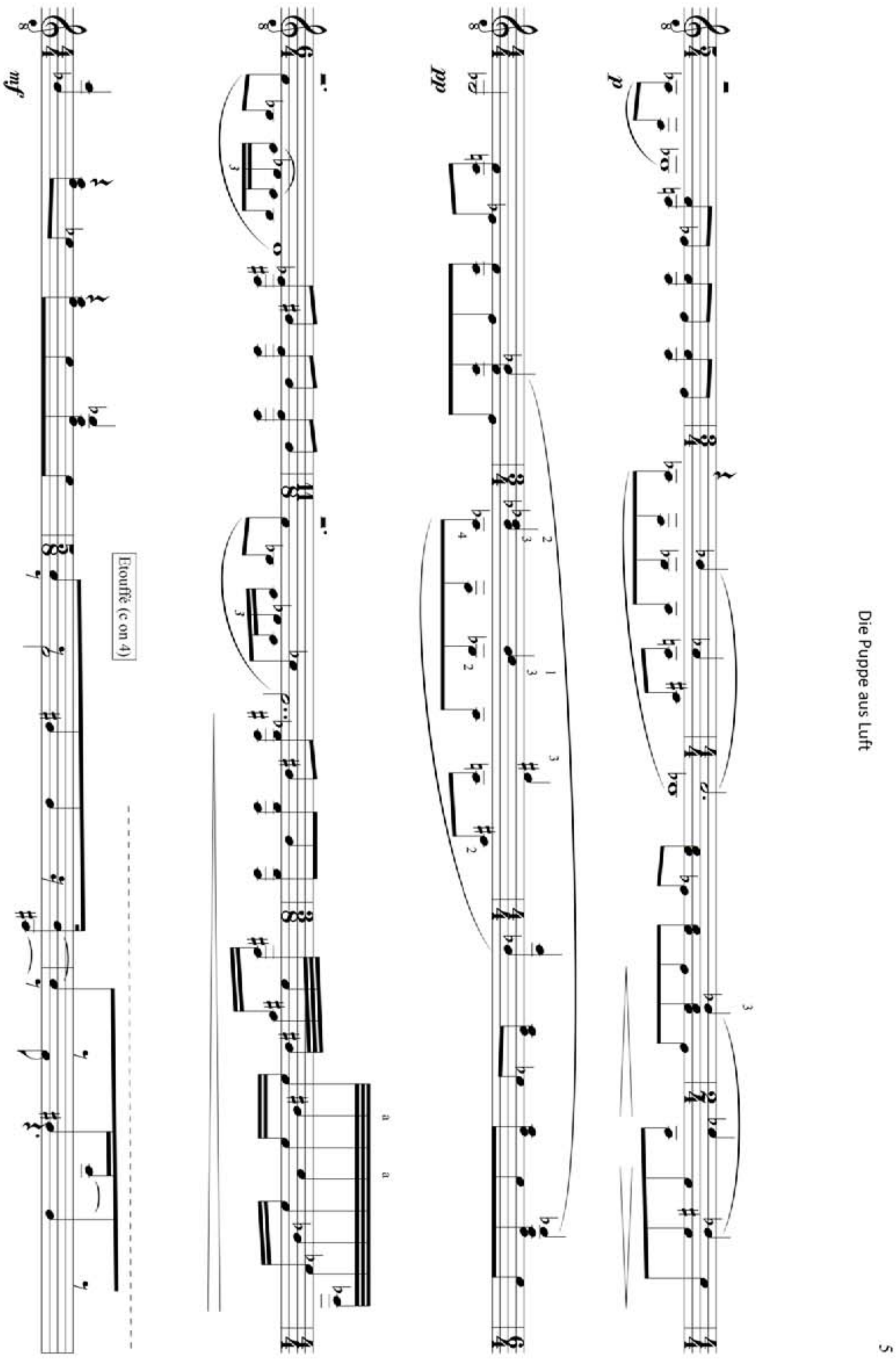
Contents

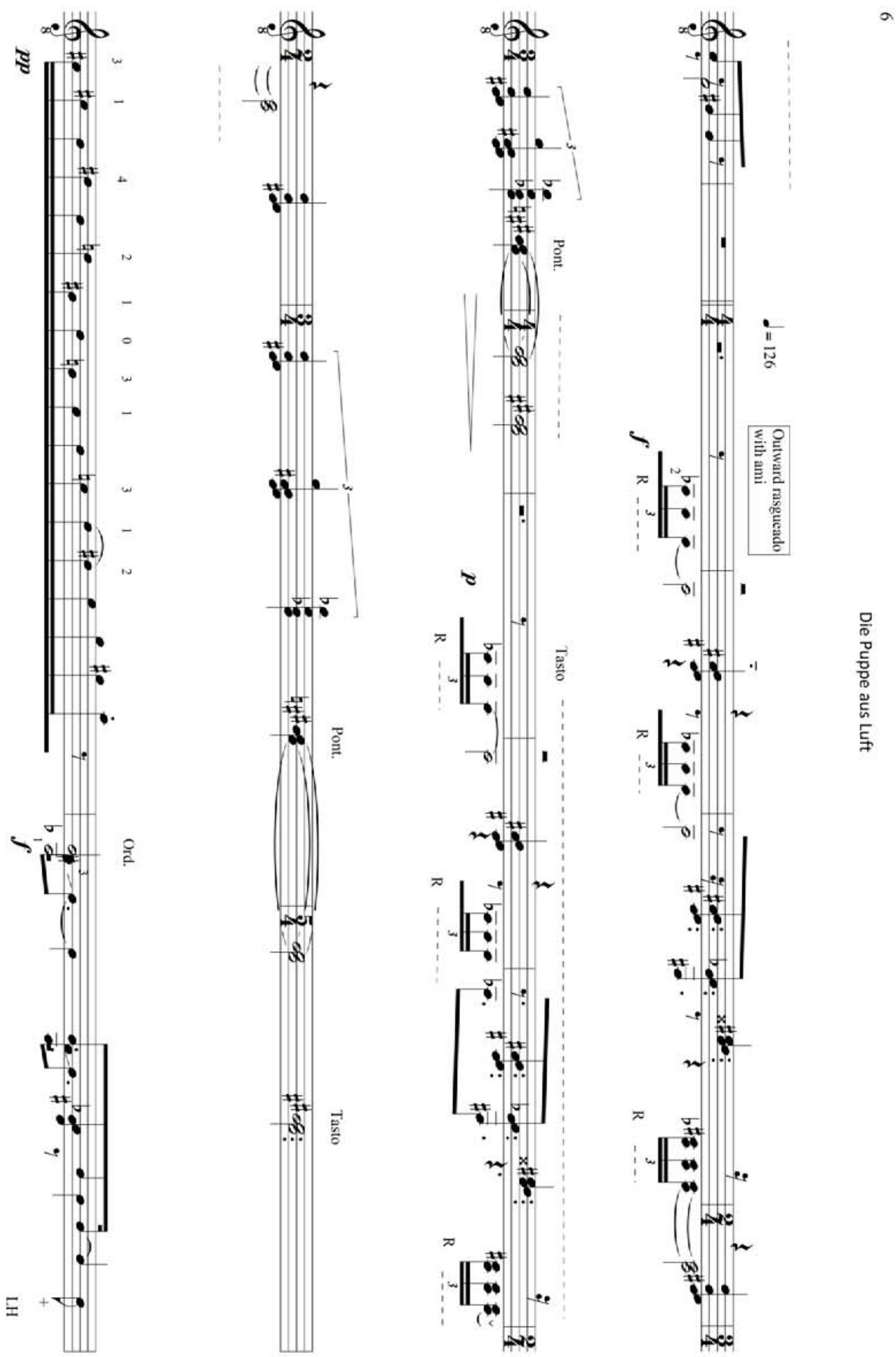
Performance notes for "Die Puppe aus Luft"

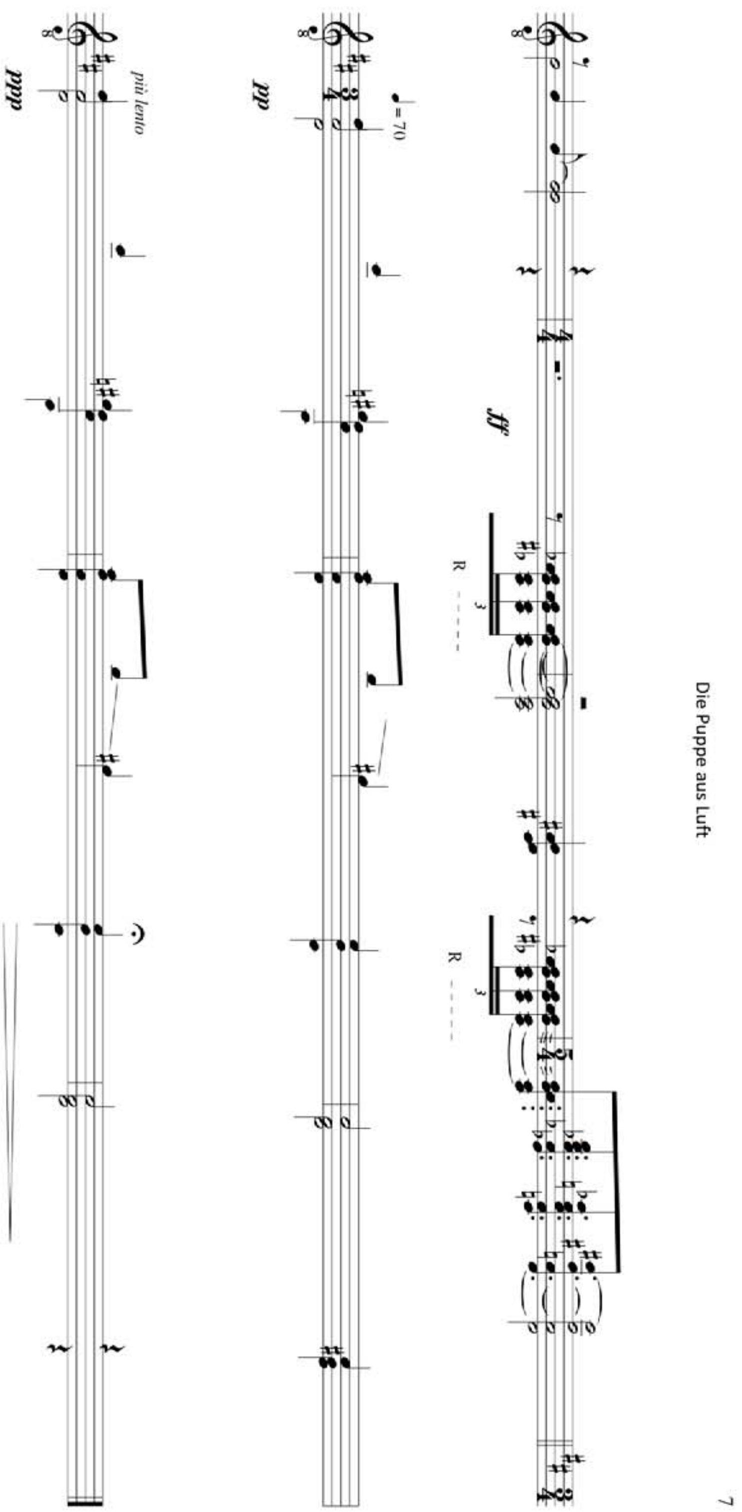
This etude was written with the use of findings presented in the chapter on plucked sounds.
This composition was inspired by the "Air Chrysalis" phenomenon from Haruki Murakami's 1Q84.

R. indicates that a selected region is to be performed ragueado.


Standard tuning
I. Die Puppe aus Luft
Marlon Titre
Guitar
♩=58
©2012


Die Puppe aus Luft
Etouffé (c on 4)

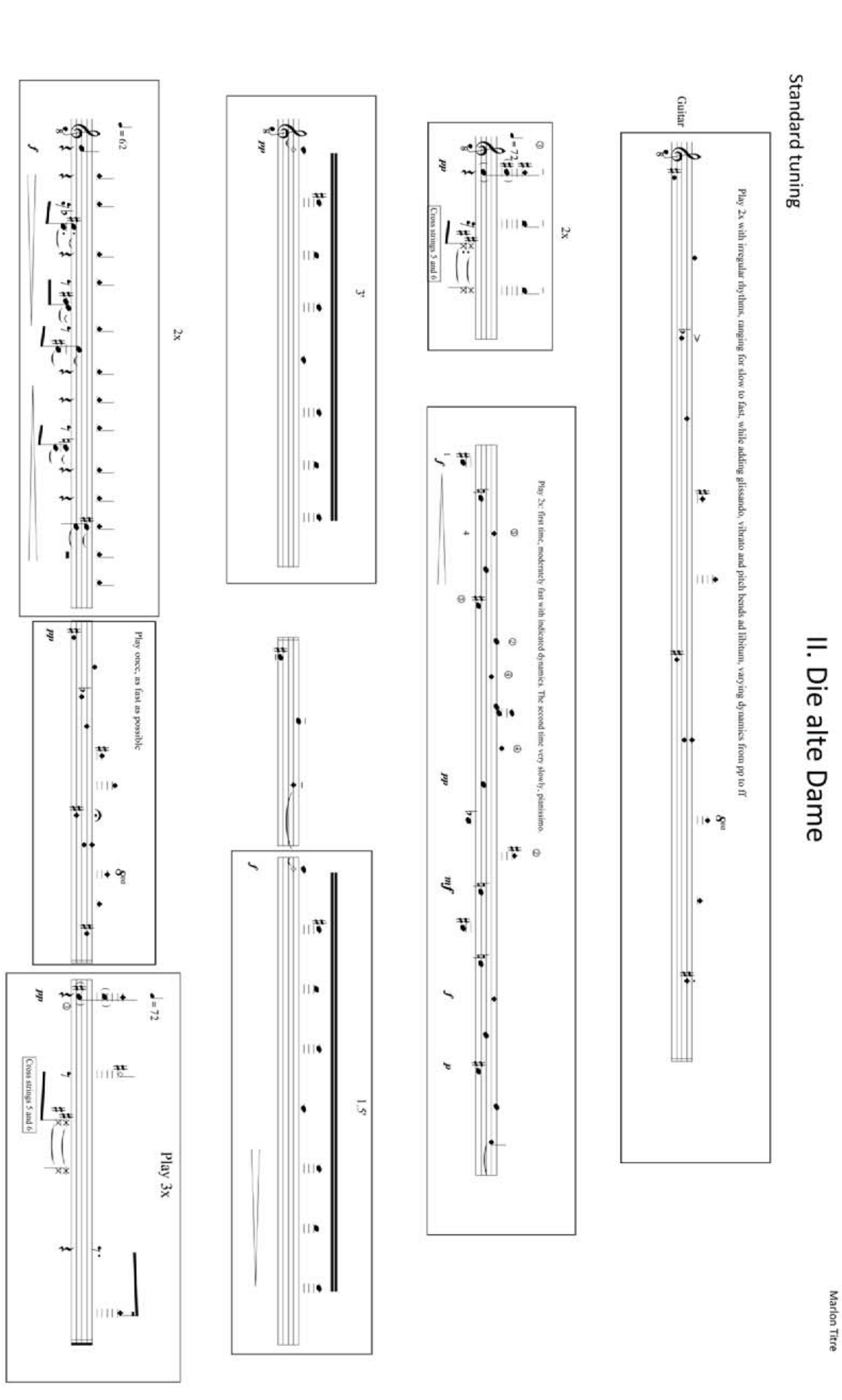

6
Die Puppe aus Luft
♩ = 126
Outward rasgueado with ami
R
Pont.
Tasto
Ord.
LH


Die Puppe aus Luft
7
ff
R
pp
più lento
ppp

Performance notes for "Die alte Dame"

This etude was written with the use of findings presented in the chapter on harmonic sounds.
This composition was inspired by the character "The Dowager" from Haruki Murakami's 1Q84.

Harmonics are notated at their sounding pitch with diamond shaped noteheads. For some harmonics, notes in parentheses are provided to help the performer find the fingering.



II. Die alte Dame
Marlon Titre
Standard tuning
Guitar
Play 2x with irregular rhythms, ranging for slow to fast, while adding glissando, vibrato and pitch bends ad libitum, varying dynamics from pp to ff
2x
♩= 72
pp
Cross strings 5 and 6
Play 2x: first time, moderately fast with indicated dynamics. The second time very slowly, pianissimo.
f
pp
mf
f
p
3'
pp
1.5'
f
2x
♩= 62
f
Play once, as fast as possible
pp
Play 3x
♩= 72
pp
Cross strings 5 and 6
©2012

Performance notes for "Tengo"

This etude was written with the use of findings presented in the chapter on rasgueado sounds.
This composition was inspired by the character "Tengo" from Haruki Murakami's 1Q84.

Sections marked with R. are to be performed with a continuous rasgueado.
The continuous rasgueado sections are to be executed with a finger combination that allows for the performance of a continuous rasgueado, such as pami or pcami.

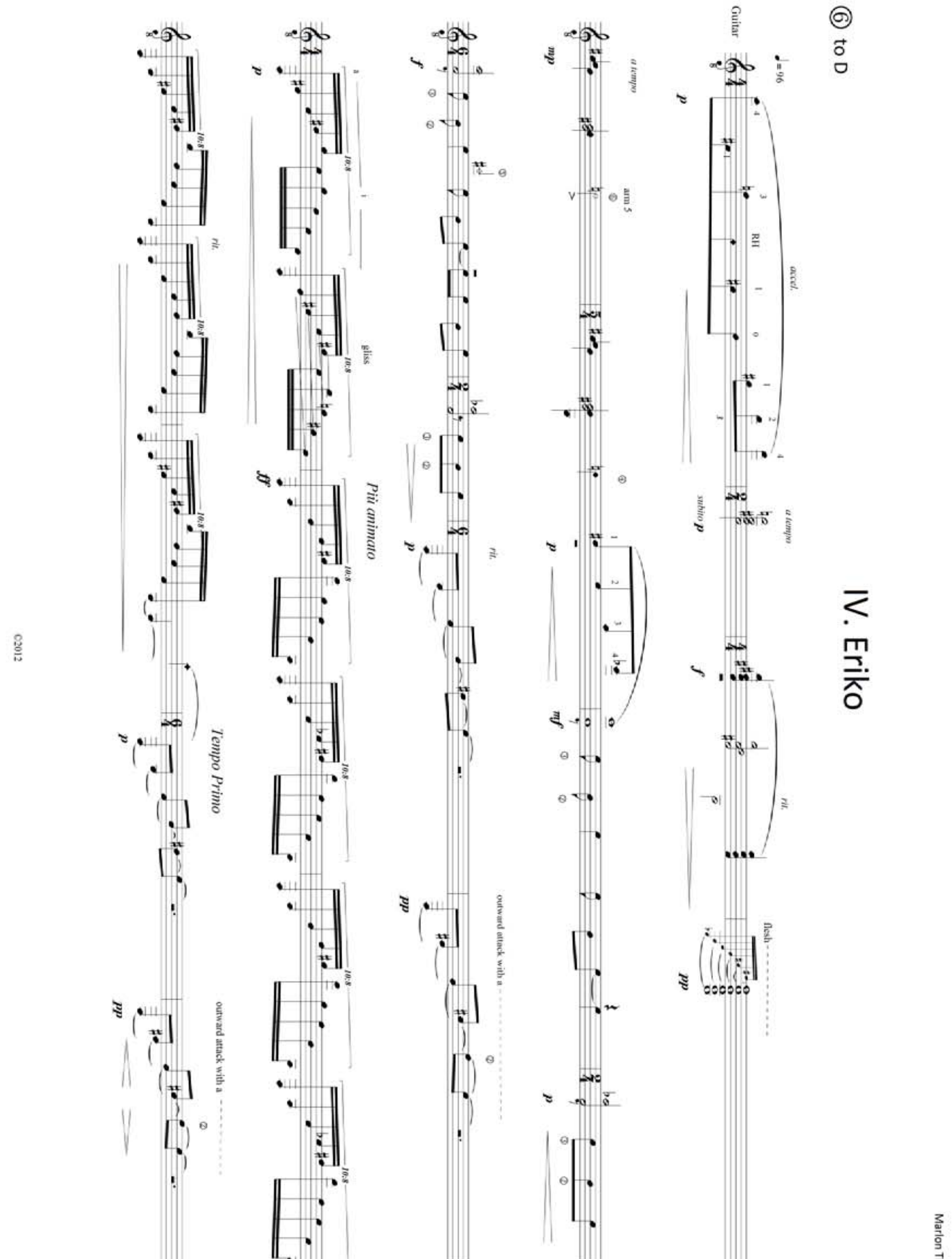

Standard tuning
III. Tengo
Marlon Titre
Guitar
tasto
pont.
ord.
poco rit.
a tempo
Più animato
Tempo primo
Lento
rit.
gliss.
©2012

Performance notes for "Eriko".

This etude was written with the use of findings presented in the chapter on strumming sounds.
This composition was inspired by the character "Eriko" from Haruki Murakami's 1Q84.

Scordatura: 6th string tuned to D.

The arpeggios in the second half of the piece are to be performed with an outward movement of finger a striking the 6th to the 2nd string, followed by an inward movement of finger i over multiple strings.


IV. Eriko
Marlon Titre
⑥ to D
Guitar
♩=96
accel.
a tempo
subito p
rit.
flesh
arm 5
Più animato
gliss.
Tempo Primo
outward attack with a
©2012

Performance notes for "Die Vorreiter".

This etude was written with the use of findings presented in the chapter on tambora sounds.
This composition was inspired by the organization called "Die Vorreiter" in Haruki Murakami's 1Q84.

Scordatura: 6th string tuned to D, 5th string to G. Strings 1-3 are prepared with a paper clip.
Notes marked with a + sign are to be plucked with the left hand.

Notes on the top staff that are scored with crossed noteheads and marked "hammered" are to be played by hammering the indicated pitch on the appropriate position on the fretboard.

Strike the guitar top above the strings (above string 1) with fingers a, m and i simultaneously.

Strike the guitar top below the strings (above string 6). The default performance is with fingers 1, 2 and 3 of the left hand. However, when the letter R appears above the note, it is to be performed with fingers a, m and i of the right hand.

Strike the side of the guitar with the right hand.


⑤ to G
⑥ to D
V. Die Vorreiter
Marlon Titre
Prepared guitar (paper clip through strings 1-2-3)
Guitar
RH
tambora
hammered
vibr.
©2012

Performance notes for "Der Leader"

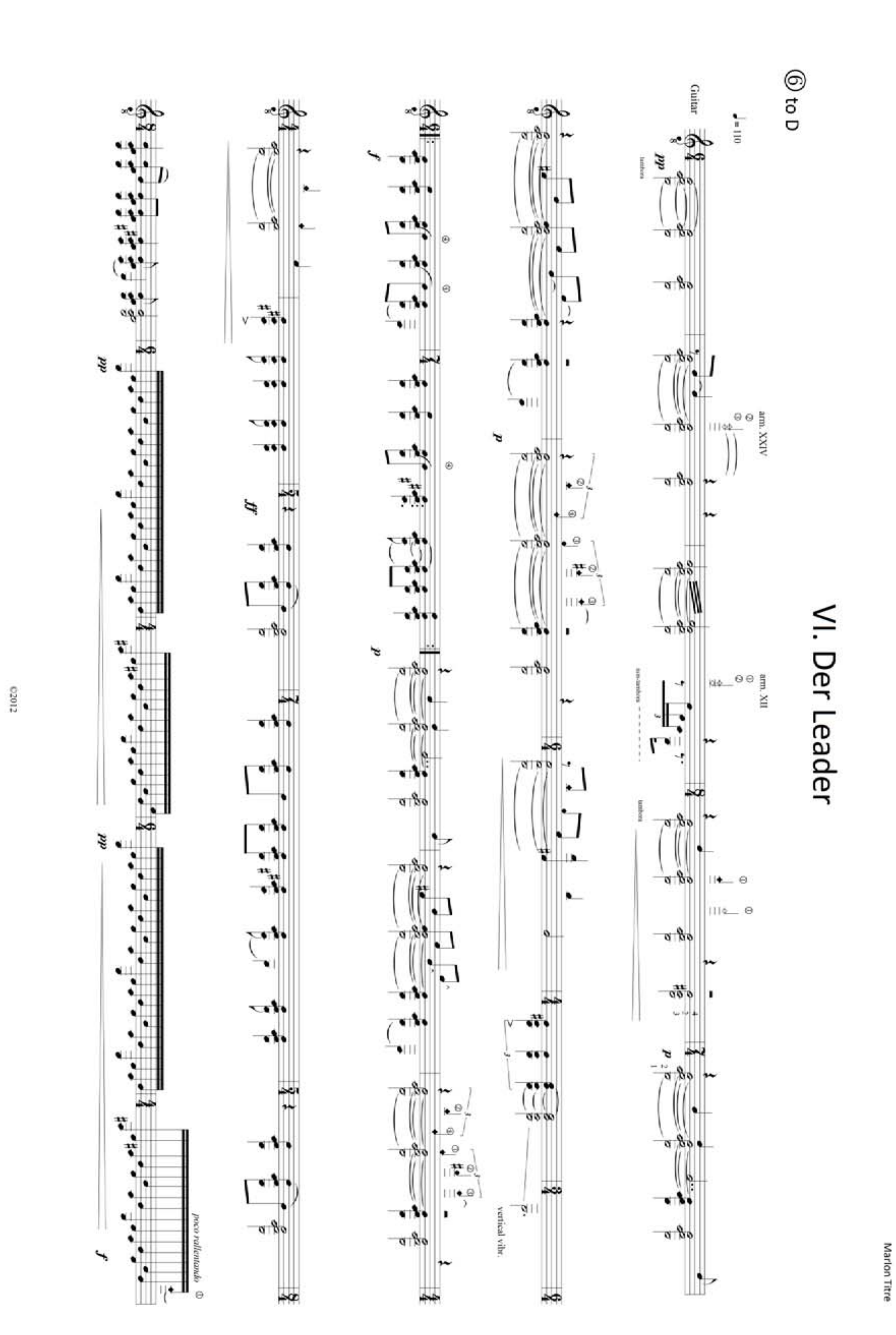
This etude was written with the use of findings presented in the chapter on tambora sounds.
This composition was inspired by the character "Der Leader" from Haruki Murakami's 1Q84.

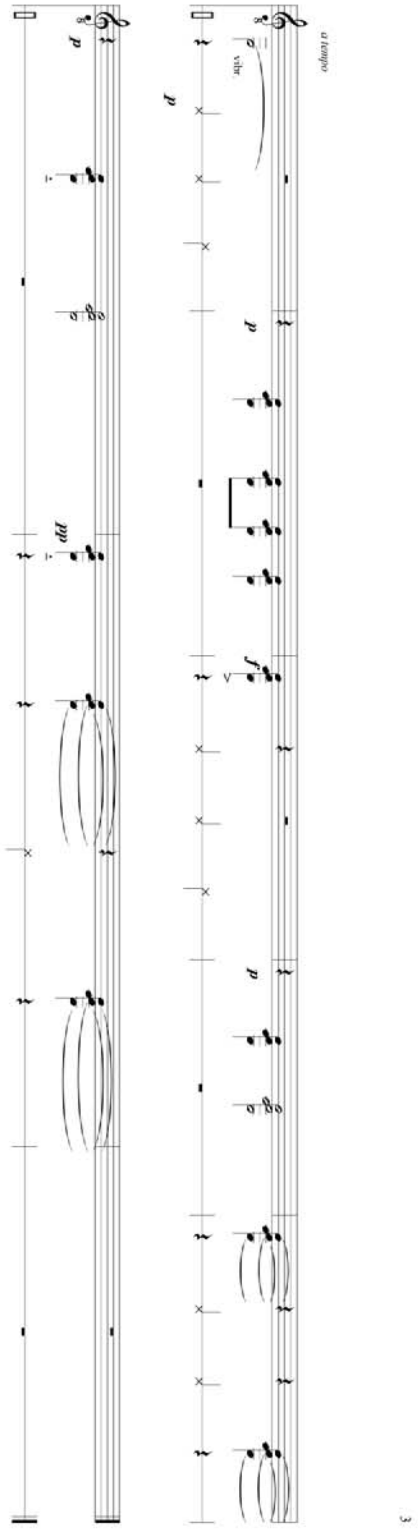
Scordatura: 6th string tuned to D.

All notes in the bottom voice are to be performed as pitch tamboras, unless otherwise indicated.
Pitch tamboras are notated with regular noteheads.

Strike the guitar top below the strings (below string 6) with finger p

Strike the guitar top above the strings (above string 1) with fingers a, m and i simultaneously


VI. Der Leader
⑥ to D
Marlon Titre
Guitar
tambora
arm. XXIV
arm. XII
non-tambora
vertical vibr.
poco rallentando
©2012

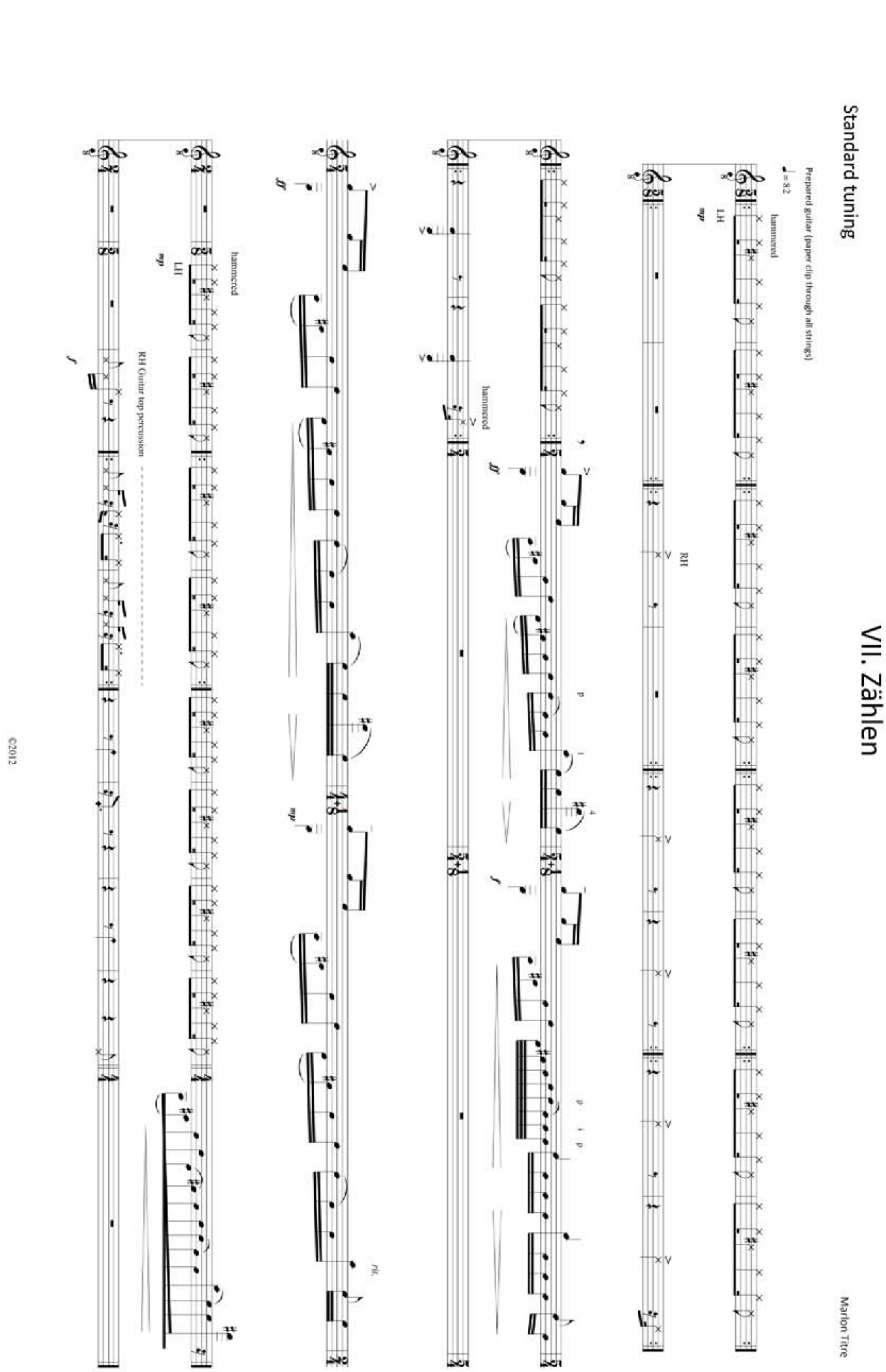

a tempo

Performance notes for "Zählen"

This etude was written with the use of findings presented in the chapter on hammered sounds.
This composition was inspired by chapter 12 in Book 2 Haruki of Murakami's 1Q84.

For this piece, the guitar is prepared with a paper clip. The paper clip is woven through the strings in such a way that it touches all of the strings.

Notes that are scored with crossed noteheads and marked "hammered" are to be played by hammering the indicated pitch on the appropriate position on the fretboard.

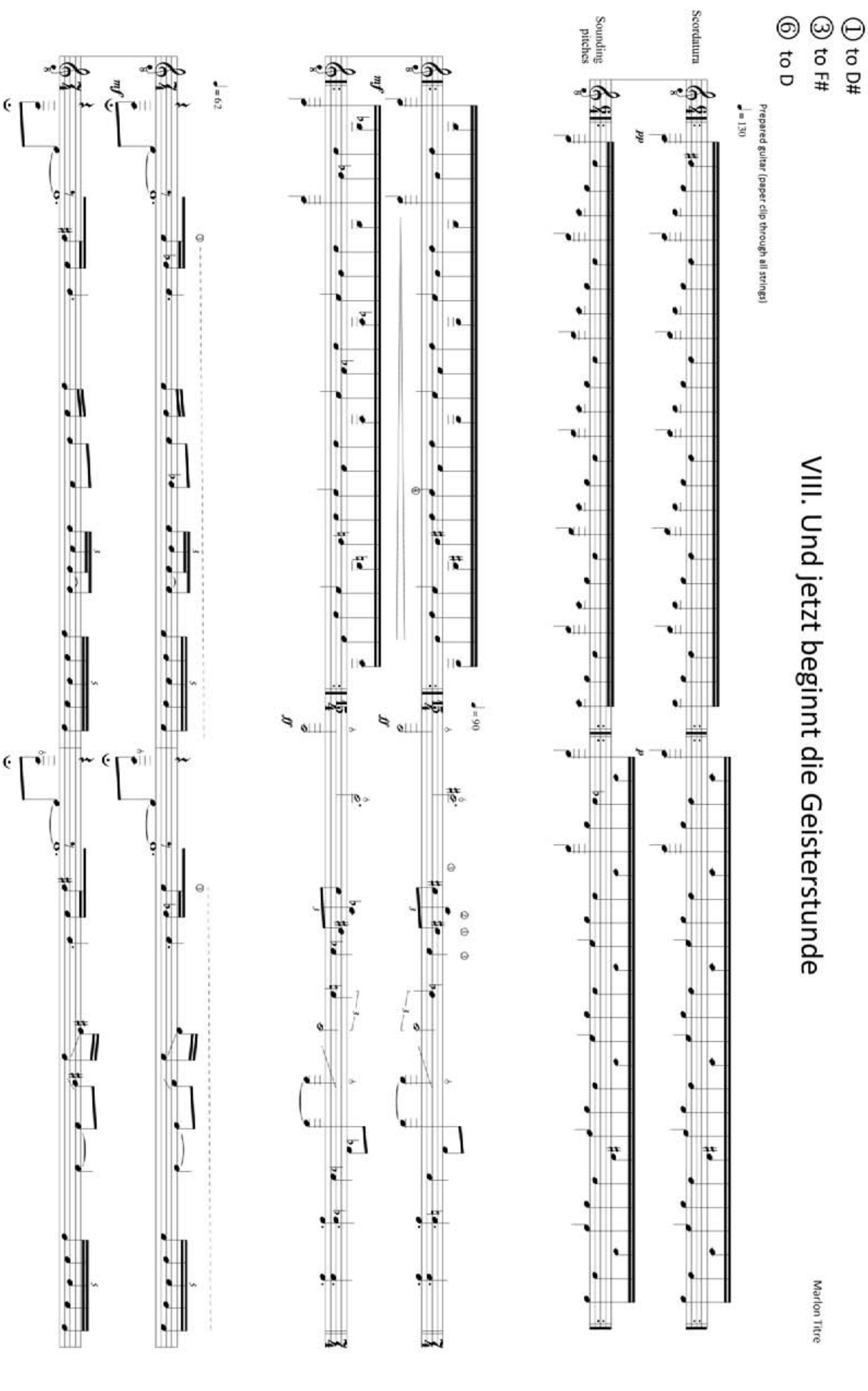

Standard tuning
VII. Zählen
Marlon Titre
Prepared guitar (paper clip through all strings)
♩= 82
hammered
LH
mp
RH
hammered
ff
p
i
f
p i p
rit.
mp
hammered
LH
mp
RH Guitar top percussion
f
©2012

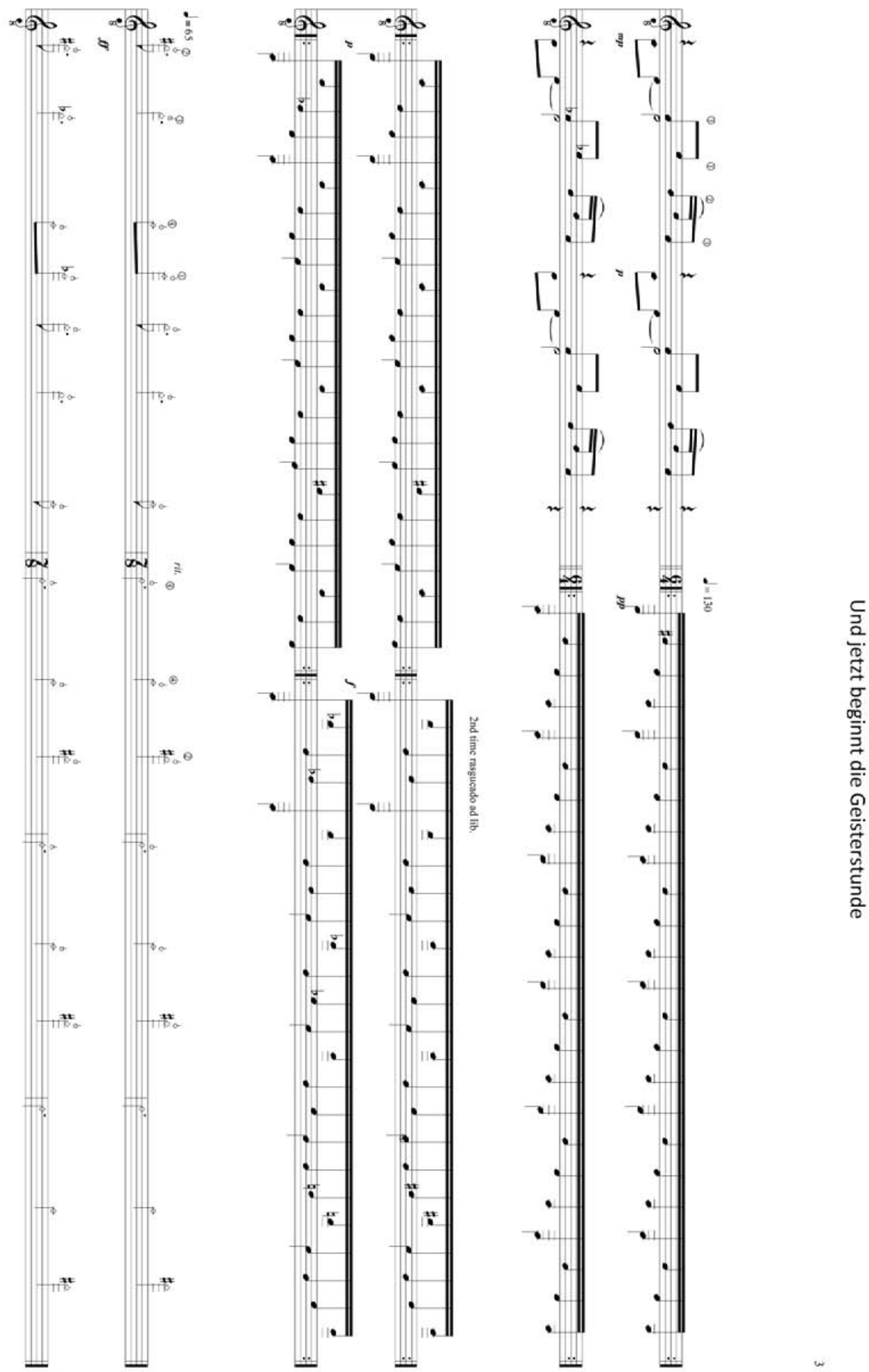
Performance notes for "Und jetzt beginnt die Geisterstunde"

This etude was written with the use of findings presented in the chapter on Bartok Pizzicato sounds.
This composition was inspired by chapter 15 in book 2 of Haruki Murakami's 1Q84.

For this piece, the guitar is prepared with a paper clip. The paper clip is woven through the strings in such a way that it touches all of the strings.

A scordatura is used: the sixth string is tuned to D, the third is tuned to F# and the first string is tuned to D#.
The top staff indicates the pitches that would sound if the guitar were tuned according to its standard tuning with a detuned sixth string (D-A-D-g-b-e) in order to facilitate reading for the performer. On the bottom staff, the sounding pitches are indicated.

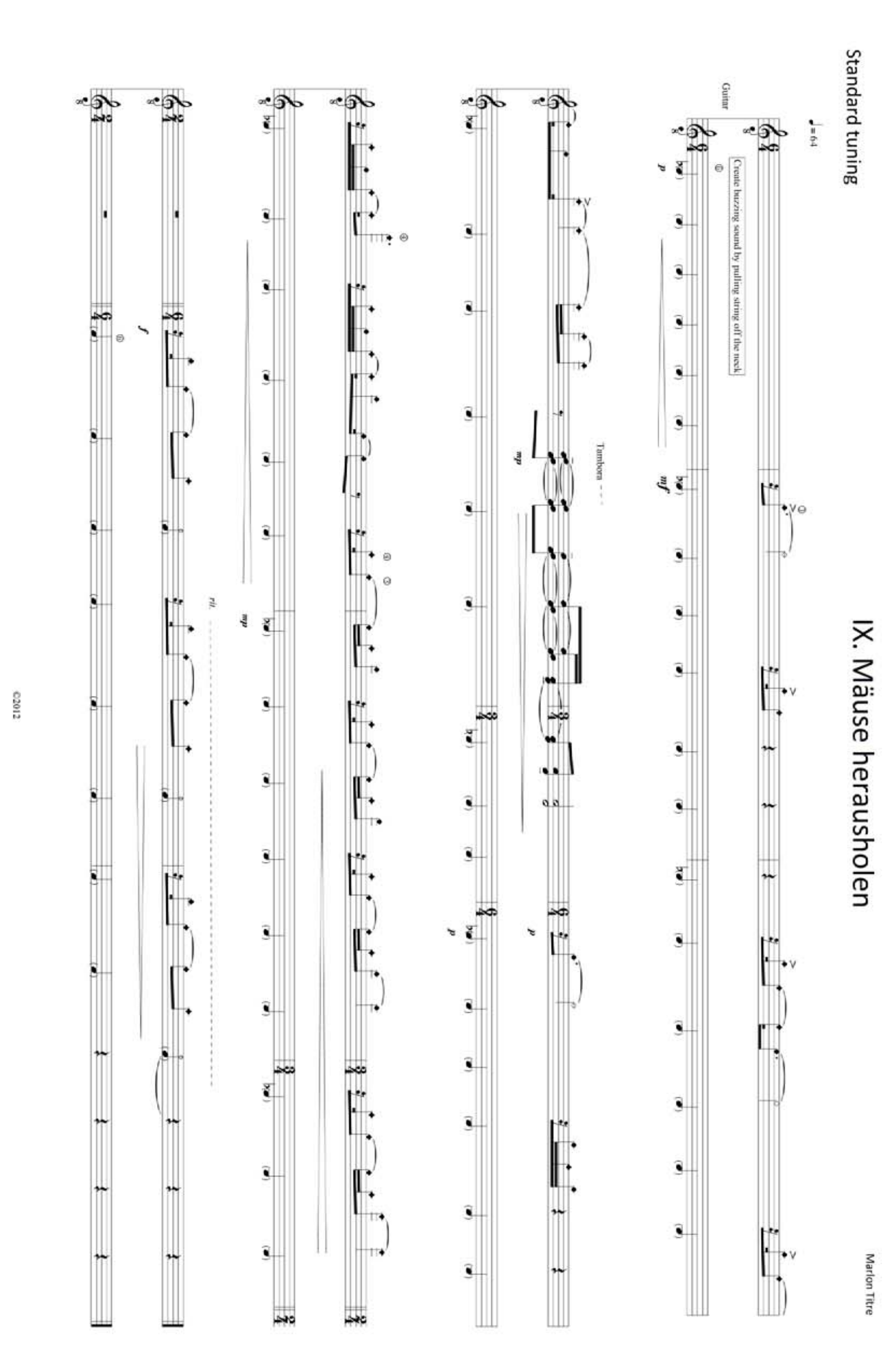

VIII. Und jetzt beginnt die Geisterstunde
Marlon Titre
① to D#
③ to F#
⑥ to D
Scordatura
Sounding pitches
Prepared guitar (paper clip through all strings)
©2012


Und jetzt beginnt die Geisterstunde
♩= 130
pp
mp
p
2nd time rasgueado ad lib.
f
♩= 65
ff
rit.
3

Performance notes for "Mäuse herausholen"

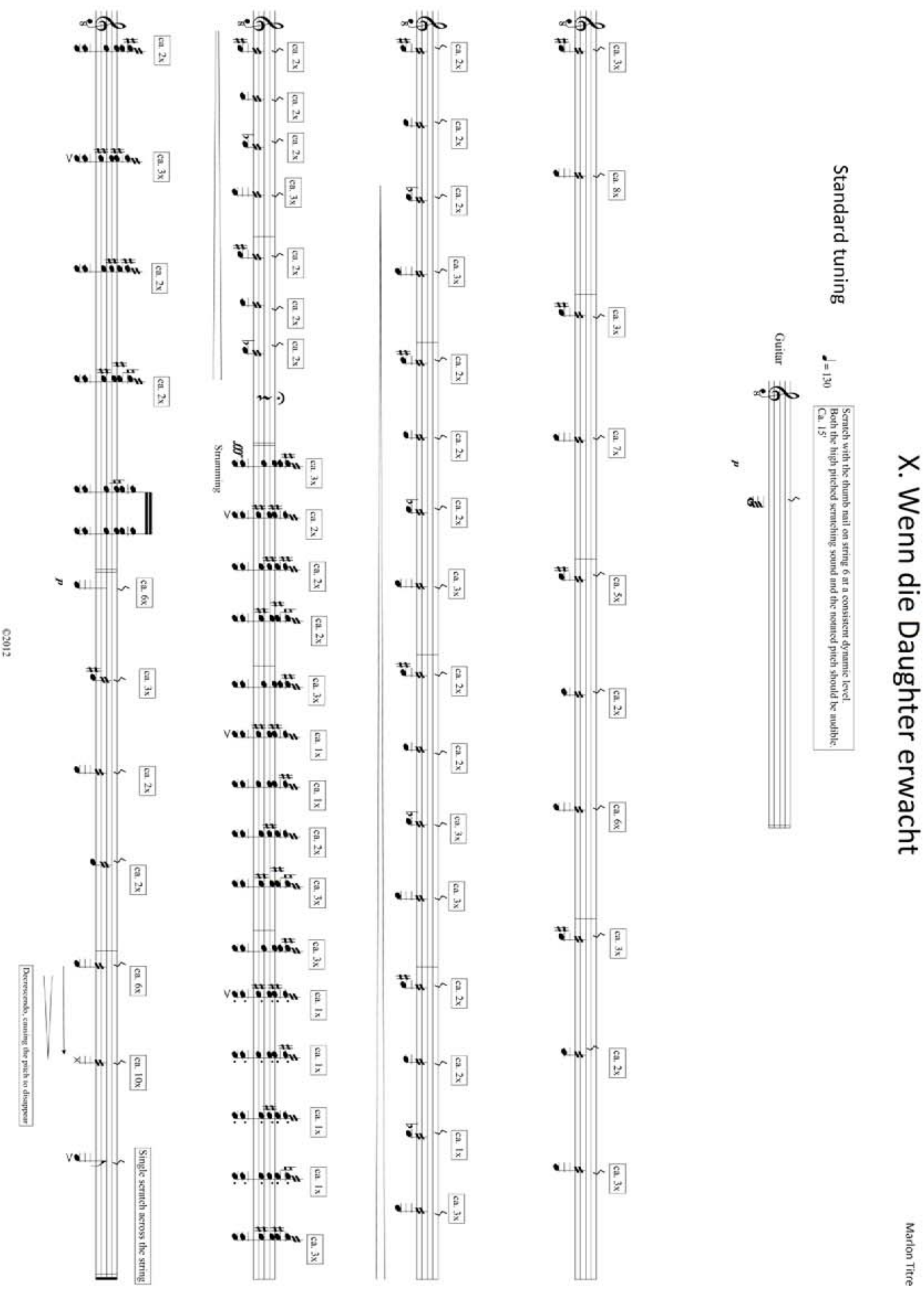
This etude was written with the use of findings presented in the chapter on buzzing string sounds.
This composition was inspired by chapter 17 in book 2 of Haruki Murakami's 1Q84.

The bottom staff is reserved for the notation of buzzing string sounds, while the top staff is used for all other sounds. The inverted stopping sound in the last staff system is notated as if it were plucked as a buzzing sound between the stopping position and the bridge.


Standard tuning
IX. Mäuse herausholen
Marlon Titre
♩= 64
Guitar
Create buzzing sound by pulling string off the neck
Tambora
rit.
©2012

Performance notes for "Wenn die Daughter erwacht"

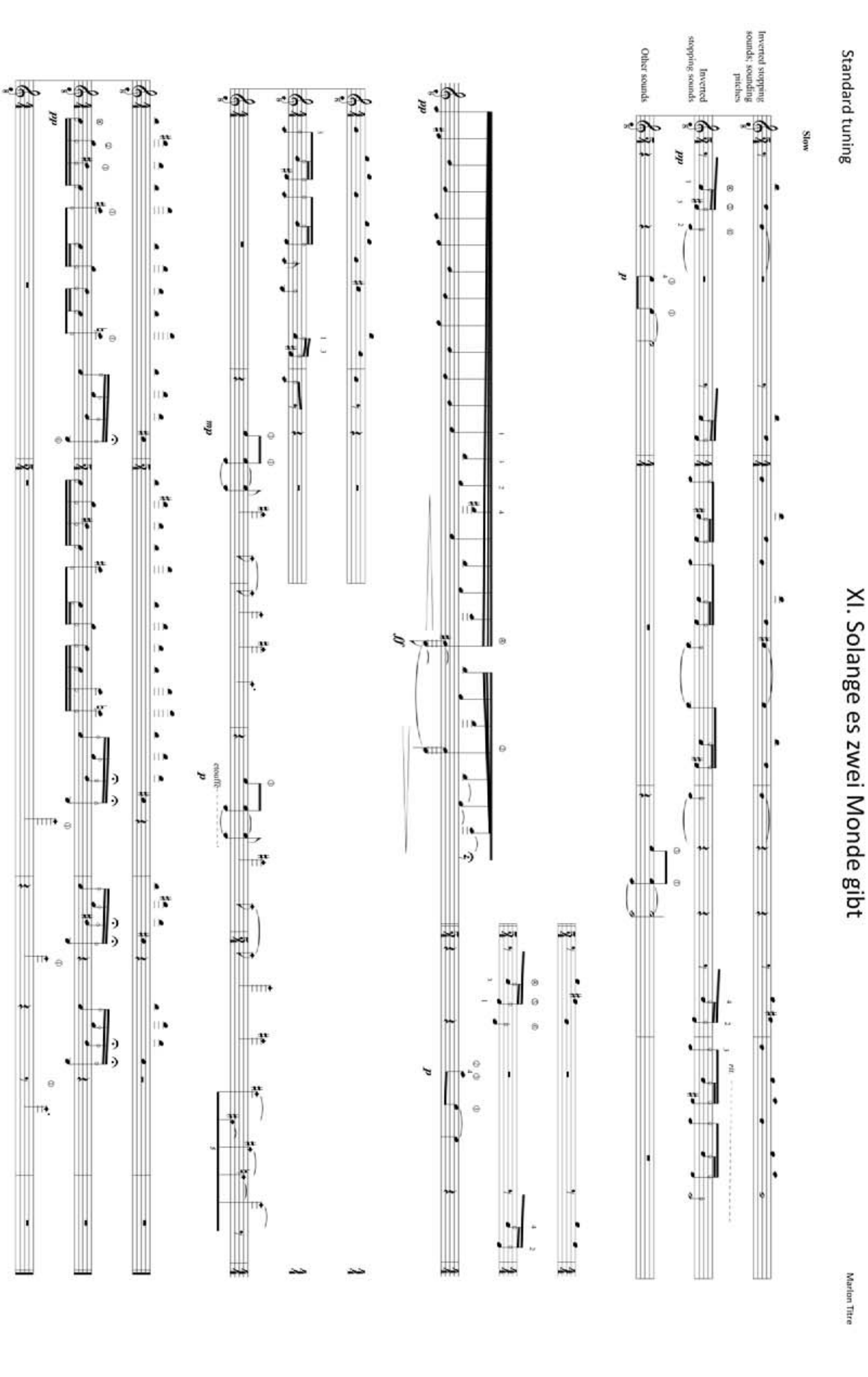
This etude was written with the use of findings presented in the chapter on scratching string sounds.
This composition was inspired by chapter 19 in book 2 of Haruki Murakami's 1Q84.


X. Wenn die Daughter erwacht
Marlon Titre
Standard tuning
Scratch with the thumb nail on string 6 at a consistent dynamic level.
Both the high pitched scratching sound and the notated pitch should be audible.
Ca. 15"
Guitar
Strumming
Single scratch across the string
Decrescendo, causing the pitch to disappear
©2012

Performance notes for "Solange es zwei Monde gibt"

This etude was written with the use of findings presented in the chapter on inverted stopping sounds.
This composition was inspired by chapter 22 in book 2 of Haruki Murakami's 1Q84.

The top line is reserved for the notation of the sounding pitches of inverted stopping sounds. The middle line is used for the notation of the pitches that were to sound if the notes were plucked between stopping position and bridge. Instead, the notes are performed as inverted stopping sounds, which means that the string is plucked with the right hand between the stopping position and the nut. The bottom staff is used for the notation of all other sounds.


XI. Solange es zwei Monde gibt
Standard tuning
Marlon Titre
Slow
Inverted stopping sounds; sounding pitches
Inverted stopping sounds
Other sounds
étouffé
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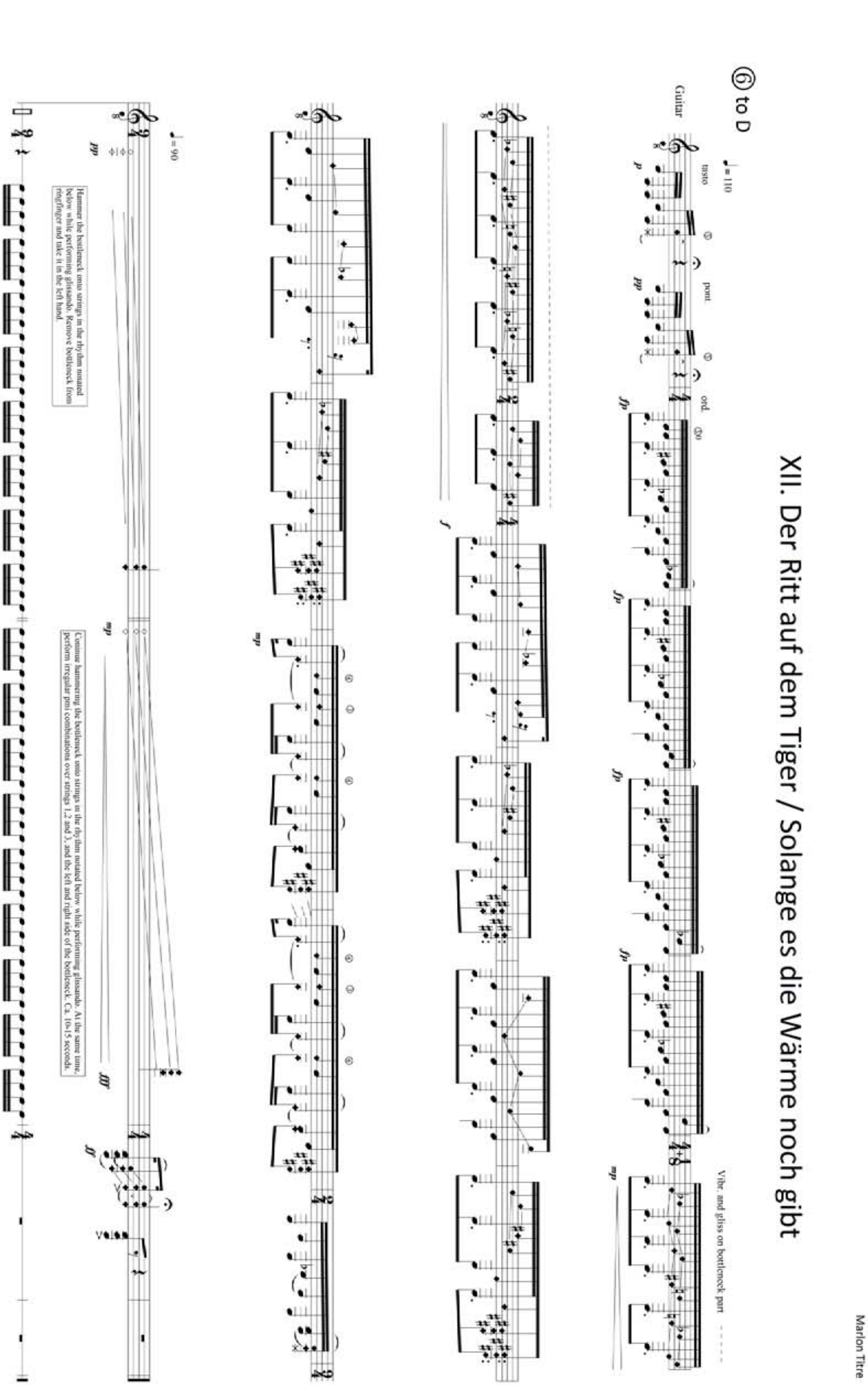
Performance notes for "Der Ritt auf dem Tiger/Solange es die Wärme noch gibt"

This etude was written with the use of findings presented in the chapter on bottleneck sounds.
This composition was inspired by chapter 23 and 24 in book 2 of Haruki Murakami's 1Q84.

Scordatura: 6th string tuned to D

Bottleneck notes are notated with diamond shaped noteheads.
X-shaped notes are bottleneck tamboras.


XII. Der Ritt auf dem Tiger / Solange es die Wärme noch gibt
Marlon Titre
⑥ to D
Guitar
tasto
pont.
ord.
Vibr. and gliss on bottleneck part
Hammer the bottleneck onto strings in the rhythm notated below while performing glissando. Remove bottleneck from ringfinger and take it in the left hand.
Continue hammering the bottleneck onto strings in the rhythm notated below while performing glissando. At the same time, perform irregular pmi combinations over strings 1,2 and 3, and the left and right side of the bottleneck. Ca. 10-15 seconds.
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# Bibliography

*Instrumental idiom.* (2013). Retrieved March 4, 2013, from Wikipedia: http://en.wikipedia.org/wiki/Instrumental_idiom

Aa, M. v. (2000). *Auburn for guitar and tape.* Amsterdam: Donemus.

Adler, S. (1989). *The Study of Orchestration* (2nd ed. ed.). New York: W&M Norton&Company.

Aguado, D. (n.d.). *Allegro Brillante* (Vol. G.A. 302). Mainz: B. Schott's Söhne.

Albéniz, I. (1956). *Asturias.* (A. Segovia, Ed.) New York: Belwin Mills.

Albéniz, I. (1978). *Cordoba from 'Chants d'Espagne'.* (J. Williams, Ed.) London: Boosey & Hawkes.

Allan, G. (2003). A critique of using grounded theory as a research method. *Electronic Gournal of Business Research Methods*, 1-10.

Andia, R. (1983). *How to write for the guitar*. Retrieved June 5, 2012, from http://www.rafaelandia.com: http://www.rafaelandia.com/8commentecrire.html

Andriessen, L. (2002). *Gestolen tijd.* Amsterdam: Querido.

Arnold, M. (1971). *Fantasy for solo guitar.* (J. Bream, Ed.) London: Faber Music.

Bach, J. S. (2002). *The Solo Lute Works* (Second Edition ed.). (F. Koonce, Ed.) San Diego: Neil A. Kjos Music Company.

Bach, J. S., & Pincus, J. (1992). *Mel Bay presents J.S. Bach in tablature.* Pacific: Mel Bay Publications.

Bacharach, S. B. (1989). Organizational Theories: Some Criteria for Evaluation. *The Academy of Management Review*, 496-515.

Balalin, A. (2002, July 31). Guitar solo. Kiev: Pdf file.

Balkema, A., & Slager, H. (Eds.). (2004). *Artistic Research.* Amsterdam: Editions Rodopi.

Barrios Mangore, A. (1979). *Un Sueño en la floresta.* Van Nuys: Alfred.

Barrios, A. (1977). *Choro da saudade.* (J. B. R., Ed.) Zen-On.

Bartenstein, H. (1971). Die frühen Instrumentationslehren bis zu Berlioz. *Archiv für Musikwissenschaft*, 97-118.

Bartlett, K. (2004). Akephale. In Pauwels, *De echo van 't Saluut.* Ghent: unpublished.

Bellinati, P. (1993). *Jongo.* San Francisco: GSP Publications.

Bellingham. (2012). *Tone-colour.* Retrieved June 5, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Berio, L. (1988). *Sequenza XI : per chitarra sola.* Vienna: Universal Edition.

Berio, L. (2006). *Remembering the Future.* Cambridge, Massachusetts: Harvard University Press.

Berlioz, H. (1843?). *Grand traité d'instrumentation et d'orchestration modernes.* Paris: Schonenberger.

Berlioz, H. (2002). *Berlioz's orchestration treatise: a translation and commentary.* (H. Macdonald, Ed.) Cambridge: Cambridge University Press.

Bermudo. (1555). *Declaració de instrumentos musicales.*

Biggs, M., & Karlsson, H. (2010a). Evaluating Quality in Artistic Research. In M. Biggs, & H. Karlsson (Eds.), *The Routledge Companion to Research in the Arts* (pp. 405-424). London: Routledge.

Biggs, M., & Karlsson, H. (Eds.). (2010b). *The Routledge Companion to Research in the Arts.* London: Routledge.

Birks, M., & Mills, J. (2010). *Grounded theory: a practical guide.* London: Sage Publications Inc.

Blatter, A. (1997). *Instrumentation and Orchestration* (2 ed.). New York: Schirmer Books.

Boccherini, L. ([2007?]). *Quintet for guitar and string quartet no. 4 in D major, G448 "Fandango".* Elmsford: Music Minus One.

Bogdanović, D. (1989). *Introduction, passacaglia and fugue.* Ancona: Bèrben.

Borgdorff, H. (2006). *The debate on research in the arts.* Bergen: Bergen National Acedemy of the Arts.

Borgdorff, H. (2010). The production of knowledge in artistic research. In M. Biggs, & H. Karlsson (Eds.), *The Routledge Companion to Research in the Arts* (pp. 44-63). London: Routledge.

Borgdorff, H. (2010). The Production of Knowledge in Artistic Research. In M. Biggs, & H. Karlsson (Eds.), *The Routledge Companion to Research in the Arts* (pp. 44-63). London: Routledge.

Borgdorff, H. (2012). *The conflict of the faculties.* Leiden: Leiden University Press.

Boulez, P. (1971). Sprechen, Singen, Spielen. *Melos*, 453-461.

Boulez, P., & Char, R. (1957). *Le marteau sans maître.* London: Universal Edition.

Boyden, D. D., & al. (2012). *Scordatura.* Retrieved June 7, 2012, from Oxford Music Online: http://www.oxfordmusiconline.com

Bream, J. (1957, March). How to Write for the Guitar. *The Score&I.M.A. Magazine*(19), pp. 19-26.

Brill, H. G. (1994). *Die Gitarre in der Musik des 20. Jahrhunderts.* Köln: Gitarre & Laute Verlagsgesellschaft mbH.

Britten, B. (1965). *Nocturnal after John Dowland for guitar op. 70.* London: Faber and Faber.

Brouwer, L. (1972 and 1983). *Etudes simples.* Paris: Eschig.

Brouwer, L. (1972). *Canticum.* Mainz: B. Schott's Söhne.

Brouwer, L. (1973). *La espiral eterna.* Mainz: B. Schott's Söhne.

Brouwer, L. (1975). *Parabola.* Paris: M. Eschig.

Brouwer, L. (1977). *Tarantos.* Paris: Editions Max Eschig.

Brouwer, L. (1984). *Danza del altiplano.* Paris: Max Eschig.

Brouwer, L. (1988). *Paisaje cubano con campanas.* Milano: Ricordino.

Brouwer, L. (1997). *Concerto de Volos.* Athens: Musical Editions Papagrigoriou-Nakas.

Brouwer, L. (2007). *Paisaje cubano con fiesta.* Havana: Ediciones Espiral Eterna.

Burnard, P. (1999). *Counselling skills for health professionals.* Cheltenham: Stanley Thornes.

Campion, F. (1705). *Nouvelles découvertes Sur la Guitare, Contenantes plusieurs suittes de Pieces sur huit manieres differentes d'accorder.* Paris: Michel Brunet.

Campion, F. (1716). *Traité d'accompagnement et de composition.* Paris: G. Adam.

Carcassi, M. (n.d.). *25 Études mélodiques et progressives, 1re suite de la méthode.* Brussels: Mayence, B. Schott's Söhne.

Cardoso, J. (1986). *Tangoleada.* San Francisco: Guitar Solo Publications.

Carulli, F. (1825). *L'Harmonie Appliquée à la Guitare.* Paris.

Chaynes, C. (1984). *3 Preludes pour "Fatum".* Paris: Editions Musicales Transatlantiques.

Coelho, V. A. (2003). Picking through cultures: a guitarist's music history. In V. A. Coelho (Ed.), *The Cambridge Companion to the Guitar* (pp. 3-12). Cambridge: Cambridge University Press.

Coessens et al. (2009). *The artistic turn.* Ghent: Leuven University Press.

Cordero, E. (1989). *Tres cantigas negras.* Düsseldorf: H. Nogatz.

Cox, J. (2009). Preface by Jeremy Cox. In K. Coessens, D. Crispin, & A. Douglas, *The artistic turn* (pp. 7-10). Ghent: Leuven University Press.

Creswell, J. W. (2003). *Research Design : Qualitative, Quantitative, and Mixed Methods Approaches.* Thousand Oaks: Sage Publications.

D'Angelo, N. (1987). *Due canzoni lidie.* Paris: Max Eschig.

Dausend, G.-M. (1992). *Die Gitarre im 16. bis 18. Jahrhundert.* Duesseldorf: Verlag Hubertus Nogatz.

Davies, P. M. (1990). *Sonata for guitar.* London: Chester.

Dawe, K. (2010). *The New Guitarscape in Critical Theory, Cultural Practice and Musical Performance.* Burlington: Ashgate.

de Visée, R. (1682). *Livre de guittarre.* Paris.

Dean, A. (2009). *The Five-Course Guitar and Seventeenth-Century Harmony: Alfabeto and Italian Song.* Rochester.

Dodgson, S. (1982). *Etude-Caprice.* Québec: Doberman.

Domeniconi, C. (1998). *Koyunbaba.* Berlin: Edition Margaux.

Dvořák, A. (1987). *From the new world: symphony no. 9 in E-minor op. 95.* Tokyo: Gendai Guitar.

Escudero, M. (1976). *Flamenco guitar solos.* (J. Trotter, Ed.) New York: Morro Music.

Evers, R., & Brill, H. G. (1994). Gitarrenmusik zwischen Tradition und Fortschritt - eine Aporie? In *Die Gitarre im Aufbruch* (pp. 167-191). München: G. Ricordi & Co.

Ferneyhough, B. (1989). *Kurze Schatten II.* London: Edition Peters.

Francoeur, L. J. (1772). *Diapason général de tous les instruments à vent.* Paris: Chez le Sr Marchand.

Free Dictionary by Farlex. (2013). *Stop.* Retrieved July 15, 2013, from http://www.thefreedictionary.com/: http://www.thefreedictionary.com/stopping

Gasull i Altisent, F. (2010). *Estudi de concert núm. 7.* Barcelona : Tritó.

Gilardino, A. (1990). La Notazione. In E. R. Allorto, & R. Chiesa (Ed.). Torino: Edizioni di Torino.

Gilardino, A. (1994). *La Grammatica della Chitarra.* Ancona: Edizioni Bèrben.

Ginastera, A. (1984). *Sonata for guitar op. 47.* London: Boosey & Hawkes.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory.* New Brunswick: AldineTransaction.

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory.* New Brunswick: AldineTransaction.

Gould, E. (2011). *Behind Bars, the definitive guide to music notation.* London: Faber Music.

Griffiths, J. (2002). The lute and the polyphonist. *Studi Musicali*(31), 89-108.

Griffiths, J. (2010). Juan Bermudo, self-instruction, and the amateur instrumentalist. In R. E. Murray, S. Forscher Weiss, & C. J. Cyrus (Eds.), *Music eduction in the Middle Ages and the Renaissance* (pp. 126-137). Bloomington: Indiana University Press.

Grove Music Online. (2012a). *Arpeggio.* Retrieved May 2, 2012, from Oxford Music Online: http://www.oxfordmusiconline.com

Grove Music Online. (2012b). *Articulation and Phrasing.* Retrieved May 2, 2012, from Oxford Music Online: http://www.oxfordmusiconline.com

Grove Music Online. (2012c). *Cluster.* Retrieved June 8, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Grove Music Online. (2012d). *Embellishment.* Retrieved May 7, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Grove Music Online. (2012e). *Sul ponticello.* Retrieved February 27, 2012, from Oxford Music Online: http://www.oxfordmusiconline.com

Grove Music Online. (2012f). *Sul tasto.* Retrieved February 27, 2012, from Oxford Music Online: http://www.oxfordmusiconline.com

Grove Music Online. (2012g). *Texture.* Retrieved January 24, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Grove Music Online. (2012h). *Trill.* Retrieved May 2, 2012, from Grove Music Online: www.oxfordmusiconline.com

Hampshire guitar orchestra. (2012). *Other sizes of guitar in the guitar family.* Retrieved January 7, 2013, from Hampshire guitar orchestra (hago): http://www.hago.org.uk/guitars/other/

Hartog, C. (1992). *De "kleine" Gitaarstarter.* Naarden: Alsbach.

Harvey, J., & Downes, M. (1999). *Music and Inspiration.* London: Faber and Faber.

Heck, T. F. (1971). *The Birth of the Classic Guitar and its Cultivation in Vienna.* New Haven.

Hellwig, F. (1974, May). Lute Construction in the Renaissance and the Baroque. *The Galpin Society Journal*, 21-30.

Henze, H. W. (1976). *Royal Winter Music. First Sonata on Shakespearean Characters.* Mainz: Schott.

Hijmans, W. (2008). *The Electric Guitar Instrumentation Guide.* Published by the author.

Hurd, P., & Griffiths, M. (2012). *Orchestration.* (A. Latham, Ed.) Retrieved January 24, 2012, from Oxford Companion to Music: www.oxfordmusiconline.com

José, A. (1990). *Sonata para guitarra.* (A. Gilardino, & R. Iznaola, Eds.) Ancona: Berbèn.

Kachian, C. (2006). *Composer's Desk Reference for the Classic Guitar.* Pacific: Mel Bay.

Kampela, A. (1993a). *Percussion Study No. 1.* unpublished.

Kampela, A. (1993b). *Percussion Study No. 2.* unpublished.

Karkoshka, E. (1966). *Das Schriftbild der Neuen Musik.* Celle: Hermann Moeck Verlag.

Kastner, G. (1837). *Traité géneral d'instrumentation.* Paris: Prillipp.

Koshkin, N. (1998). *The porcelain tower.* Berlin: Verlag Neue Musik, Edition Margaux.

Kozzin, A. (1977). A Modest Proposal: Serious Music for the Electric Guitar. *Music Journal*, 26.

Lachenmann, H. (1985). *Salut für Caudwell.* Wiesbaden: Breitkopf&Härtel.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation.* Cambridge: Cambridge University Press.

Legnani, L. (1822). *36 Capricci per tutti i tuoni maggiori e minori.* Vienna: Artaria et Comp.

Lehner-Wieternik, A. (1991). *Neue Notationsformen, Klangmöglichkeiten und Spieltechniken der Klassischen Gitarre.* Wien : Doblinger.

Llobet, M. (1964a). *Canço del Lladre.* Madrid: Union Music Española.

Llobet, M. (1964b). *El testament d'Amelia.* Madrid: Union Musical Española.

Lowe, M. (1976, May). The Historical Development of the Lute in the 17th Century. *The Galpin Society Journal*, 11-25.

Lucía, P. d. (1993). *La guitarra de Paco de Lucía.* (M. Setta, Ed.) Madrid: Seemsa.

Lunn, R. A. (2010). *Extended Techniques for the Classical Guitar: A Guide for Composers.* Ohio: Ohio State University.

Mackey, S. (2002, December 1). Supplement. (R. Nasveld, Interviewer)

Maier, F. (2001). *Crystal vermin.* Amsterdam: Donemus.

Marchione, C. (1998). Preface. In G. Telemann, *Dodici fantasie.* Milan: Edizioni Zuvini Zerboni.

Marriott, D. F. (1984). *Contemporary Guitar Composition: Experimental and Functional Practices since the Second Viennese School.* San Diego: University of California.

Mas, J.-L. (1986). *Sonorités nouvelles pour guitares.* Paris: Gérard Billaudot Éditeur.

Milán, L. (1535). *Libro de musica de vihuela de mano intitulado El maestro.* Valancia.

Miles, N. F. (2011). *The Baroque Guitar as an Accompaniment Instrument for Song, Dance and Theatre.* Birmingham: University of Birmingham Research Archive.

Montesardo, G. (1606). *Nuova inventione d'intavolature.* Firenze: Appr. Christofano Marescotti.

Morris, A. (2001). *Heinrich Albert and the First Guitar Quartet.* Retrieved January 7, 2013, from Guitar and Lute issues: http://www.guitarandluteissues.com/morris/heinrich.htm

Mudarra, A. (1969). *Fantasia.* Don Mills: BMI Canada Limited.

Murail, T. (1978). *Tellur.* Paris: Editions Transatlantiques.

Murakami. (2010). *1Q84.* (U. Gräfe, Trans.) Köln: Dumont.

Musicians.com. (2010, August 2). *Commissioned Response: Sharon Isbin.* Retrieved May 5, 2012, from http://community.musiciansfriend.com: http://community.musiciansfriend.com/docs/DOC-2458

Newbury, D. (2010). Research Training in the Creative Arts and Design. In M. Biggs, & H. Karlsson (Eds.), *The Routledge Companion to Research in the Arts* (pp. 368-387). London: Routledge.

Oh, S. A. (2001). *So-Ri I for flute and guitar.* Aspen, Colorado: unpublished.

Ohana, M. (1968). *Tiento pour guitare.* Paris: Gerard Billaudot.

Olsen, W. (2004). Triangulation in Social Research: Qualitative and Quantitative Methods Can Really Be Mixed. *Developments in sociology*, 103-118.

Ophee, M. (1998). *The History of Transciptions of Lute Tablature - 1679 to the Present.* Retrieved December 30, 2012, from Guitar and Lute issues: http://www.guitarandluteissues.com/trans/trans.html#FN1

Orff, C. (2013). *Lute.* Retrieved July 10, 2013, from www.reference.com: http://www.reference.com/browse/lute

Oxford Companion to Music. (2012a). *Homophony.* Retrieved May 7, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Oxford Companion to Music. (2012b). *Monophony.* Retrieved June 8, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Oxford Dictionary of Music. (2012a). *Chord.* Retrieved June 8, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Oxford Dictionary of Music. (2012c). *Course.* Retrieved December 18, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Oxford Dictionary of Music. (2012c). *Scoring.* Retrieved January 24, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Päffgen, P. (2002). *Die Gitarre; Geschichte, Spieltechnik, Repertoire* (2. überarbeitete und erweiterte Neuauflage ed.). Mainz: Schott.

Pauwels, T. (2004). *De echo van 't saluut.* Ghent: unpublished.

Perrine. (1679). *Livre de musique pour le lut.* Paris.

Peruffo, M. (1994, May). The mystery of gut bass strings in the 16th and 17th centuries: the role of loaded gut. *Lute society of America Quarterly*, 5-14.

Piazzolla, A. (1981). *Cinco piezas para guitarra.* (A. Gilardino, Ed.) Ancona: Berben.

Piazzolla, A. (1987). *La Muerte del Angel.* Heidelberg: Chanterelle Verlag.

Polanyi, M. (1958). *Personal Knowledge.* Chicago: University of Chicago Press.

Ponce, M. M. (1928). *Sonata III.* Mainz: B. Schott's Söhne.

Ponce, M. M. (1967). *Sonatina Meridional.* Mainz: B. Schott's Söhne.

Rak, S. (1985). *The last disco.* Shaftesbury: Musical New Services.

Rebizzi, P., & Tajè, R. (n.d.). *La Chitarra nella Musica del'900.* Milano: Casa musicale sonzogno di Piero Ostali.

Rimsky-Korsakov, N. (1964). *Principles of orchestration, with musical examples drawn from his own works.* (M. Steinberg, Éd., & E. Agate, Trad.) New York: Dover Publications.

Rodrigo, J. (1959). *Concierto de Aranjuez.* Mainz: Schott.

Rodrigo, J. (1963). *Tres Piezas Españolas.* (A. Segovia, Ed.) Mainz: B. Schott's Söhne.

Rodrigo, J. (1997). *Invocacion y Danza.* (P. Romero, Ed.) Madrid: Ediciones Joaquín Rodrigo.

Roeser, V. (1764). *Essai d'instruction a l'usage de ceux qui composent pour la clarinette et le cor.* Paris: Le Menu [et] Casteaux.

Rushton, J. (2012). *Spacing.* Retrieved June 8, 2012, from Oxford Music Online: www.oxfordmusiconline.com

Sánchez-Verdú, J. M. (1998). *Cuaderno de Friedenau.* unpublished.

Sauter, D. (1993). *Tips from classical guitar master classes*. Retrieved June 6, 2012, from donaldsauter.com: http://www.donaldsauter.com/guitar-master-class.htm

Schmidt, S. (2004). *Classical guitar pieces : 50 easy-to-play pieces in standard musical notation and tablature.* Mainz: Schott.

Schneider, J. (1985). *The Contemporary Guitar.* Berkeley: University of California Press.

Segovia, A. (1989). *The Segovia-Ponce Letters.* (M. Alcázar, Ed., & P. Segal, Trans.) Columbus, OH: Editions Orphée.

Shlomowitz, M. (2004). Serious and Sincere Sentiments about Something. In Pauwels, *De echo van 't saluut* (p. n.p.). Ghent: unpublished.

Solomon, S. Z. (2002). *How to Write for Percussion.* New York: SZSolomon.

Sor, F. (1824?). *Fantaisie op. 7.* Bonn et Cologne: N. Simrock.

Sor, F. (1831). *Methode pour la Guitarre/Guitarre Schule.* Bonn: Simrock.

Sor, F. (n.d.). *Grand Solo für Gitarre op. 14.* Hamburg: Simrock.

Takemitsu, T. (1974). *Folios.* New York: Editions Salabert.

Takemitsu, T. (1982). *Toward the sea.* Mainz: Schott.

Takemitsu, T. (1989). *All in twilight.* Mainz: Schott.

Tanaka, A. (2000). Musical Performance Practice on Sensor-Based Instruments. In M. Wanderley, & M. Battier (Eds.), *Trends in Gestural Control of Music* (pp. 389-406). Paris: Ircam Centre Pompidou.

Tanenbaum, D. (2003). Perspectives on the classical guitar in the twentieth century. In V. A. Coelho (Ed.), *The Cambridge Companion to the Guitar* (pp. 182-206). Cambridge: Cambridge University Press.

Tárrega, F. (1978a). *Gran Jota de Concierto.* Tokyo: Zen-on Music.

Tárrega, F. (1978b). *Variaciones sobre el carnaval de venecia.* Zen-On Music.

Tárrega, F. (n.d.). *Capricho árabe* (Vol. 185). Berlin: Lichterfelde.

Telemann, G. (1998). *Dodici Fantasie.* (C. Marchione, Ed.) Milan: Edizioni Suvini Zerboni.

Tennant, S. (1995). *Pumping Nylon.* USA: Alfred.

Titre, M. (2008). *Orfeunism.* unpublished.

Titre, M. (2010). *Thuris.* unpublished.

Torroba, F. M. (1995). *Sonatina.* Madrid: Opera tres.

Torroba, F. M. (2003). *Sonatina.* Tokyo: Zen On.

Tosone, J. (2000). *Classical guitarists: conversations.* Jefferson: McFarland.

Turina, J. (1932). *Sonata.* Mainz: Schott.

Turina, J. (1954). *Fandanguillo.* Mainz: B. Schott's Söhne.

Turnbull, H. (1976). *The Guitar from the Renaissance to the Present Day.* London: B. T. Batsford Ltd.

Vandenbrock, O. (1793). *Traité général de tous les instruments à vent à l'usage des compositeurs.* Paris: Chez Boyer.

Vassilandonakis, Y. (2004). *Open Strings: Berio's Sequenza XI for guitar.* Retrieved August 27, 2012, from www.suonireali.com: http://www.suonireali.com/BERIO%20gtr%20seq%20paper.pdf

Villa-Lobos, H. (1928). *Etudes pour la Guitarra.* Handwritten manuscript.

Villa-Lobos, H. (1953). *Douze études pour guitare.* Paris: Éditions Max Eschig.

Vowinkel, O. (2008, June). Marlon Talks E-zine, June 2008. (M. Titre, Interviewer)

Wade, G. (1980). *Traditions of The Classical Guitar.* London: Calder.

Walton, W. (1974). *Five bagatelles for guitar.* London: Oxford University Press.

Warfield, G. (1973-1974). The Notation of Harmonics for Bowed String Instruments. *Perspectives of New Music*(12), 331-343.

Webern, A. (1951). *5 Stücke für Orchester, op. 10.* Wien: Universal Edition.

Weiss, A. (2008). *Gobelin Imaginaire.* unpublished.

Wenger et al. (2002). *Cultivating Communities of Practice.* Boston: Harvard Business School Press.

Wynberg, S. (1985). Johann Kaspar Mertz. In J. K. Mertz, *Guitar works, volume VI.* Heidelberg: Chanterelle.

Yates, P., & Elgart, M. (1990). *Prepared Guitar Techniques.* Agoura Hills: California Guitar Archives.

Yu, Z. (2003). Tacit Knowledge/Knowing and the Problem of Articulation. *The Polanyi Society Periodical*(v30 n2), 11-23.

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# Summary

Although the guitar has been part of the classical music tradition for centuries, writing for the guitar remains a formidable challenge for many composers. Where orchestral instruments have a long history of scoring guides that help composers develop their craft, the number of studies dedicated to guitar scoring remains scarce. This has led to a myriad of scoring problems in guitar works written by non-guitarist composers, often evidenced in unplayable passages and underdeveloped textures. The present study aims to fill this gap by establishing and developing guidelines for effective use of the classical guitar's scoring potential. These guidelines are described through the *sound-cell-texture* chain*,* a model introduced in this study that identifies building blocks for guitar scoring that are believed to give the composer access to the scoring potential for the guitar. The second aim of this study is to use the findings of the research to compose a set of new etudes for the guitar.

In Chapter 1, an outline is presented of the methodological dimension of my research trajectory. Rather than preparing and cooking a preconceived methodological recipe from the outset, I spent the initial stage of research looking for a suitable way to find answers to the question of how one writes well for the guitar. The combination of research methods I adopted during and after this period of searching arose in a context of existing methodologies both inside and outside the field of artistic research. The relation between my research methods and these theories are discussed in this chapter. In addition, I list the number and types of music scores examined during the research trajectory, and provide an account of the role of triangulation and reflectivity in the research process. Chapter 2 defines the research context of this study through a description of the social, epistemic and ecological situatedness of the subject of research. In this study, social situatedness refers to the social context in which guitarists and scholars have a shared concern for guitar scoring that is expressed through the exchange of knowledge and contribution to existing knowledge. Epistemic situatedness refers to existing knowledge concerning guitar scoring, while the use of the term ecological situatedness in this study primarily refers to the interaction between performer and instrument. Guitarists form a community of practitioners with a number of shared values; what these values are, and the means through which these values are disseminated, shared and exchanged is the topic of this chapter. In Chapter 3, the reader finds the theoretical framework of the dissertation. This framework is described through a critical review of previous studies, and an account of gaps in current knowledge about guitar scoring, the concepts developed in this study, the way these concepts are intended to fill gaps in current knowledge, and the significance of the notion of idiomatic scoring. The model on which the central section of this study is centered, the *sound-cell-texture* chain, is introduced in this chapter. The *sound* concept captures properties and characteristics of individual notes, the *cell* concept captures idiomatic ways in which sounds can be combined both horizontally and vertically, while the *texture* concept captures the characteristics of the fabric of musical activity over a number of bars. The word *chain* refers to the hierarchical relationship between the first three concepts. The model serves as a layered platform that allows for an explanation of scoring-technical issues from the larger perspective at the texture level, down to the intricacies at the sound level. Chapter 4 traces the historically problematic relationship

between guitar, guitarist and composer. In the first part of this chapter, I look at the characteristics of this relationship for three different eras of the classical guitar's development: the Renaissance and Baroque, from the classical era to the Torres guitar, and the era of the modern classical guitar. The second part of the chapter is dedicated to a reflection on the different and often opposing developments in each of these eras. This reflection serves to inform the answer to the question: to what extent can we speak of a current mismatch in the triangular relationship between guitar, guitarist and composer?

Chapters 5-16 describe the twelve sound categories identified in this study. Furnished with a large number of score examples, these chapters give a detailed overview of the possibilities of the twelve sound categories. All score examples are available on video in order to give readers a more complete impression of the examples, and to demonstrate how they are performed on the guitar. The structure of each chapter in this section follows that of the sound-cell-texture model. At first, possibilities at the sound level are described. Examples of aspects considered at this level are pitch range, timbre, dynamics, vibrato, pitch bends and microtones. For vertical cells, attention is given to the structure of the vertical spacing of sounds and its relation to the sonic outcome. On the horizontal cell level, various types of cells are discussed, such as single lines, vertical cell sequences, arpeggios en multiple parts. For each of these types of horizontal cells, an account is provided of its design, resonance, harmonic possibilities, speed, rhythmic possibilities, articulation and embellishment. In addition, examples are provided of non-functional scoring. The discussion of the texture level is primarily intended to demonstrate, through repertoire examples, how composers use sounds and cells to create textures. On all levels of the chain, I aim to provide insight in aspects of performance, and give suggestions for correct notation. In some cases, the widespread proliferation of ambiguous and inconsistent notation practices in the repertoire required me to give suggestions for unambiguous notation, with the case of harmonics notation being the most compelling one. In cases of more rarely used sounds, such as inverted stopping sounds and hammered sounds, I was often able to point at repertoire examples of effective notation in the hope that composers will adopt these practices. In contrast to earlier guitar scoring guides, techniques and sounds that fall outside the range of common use (e.g. scratching sounds) are discussed in the same manner as more commonly used sounds (e.g. plucked sounds). Complex sound events are described in the chapter on the sound category that sets the initial sound in motion.

In Chapter 17, on the twelve etudes written as part of the research trajectory, I give the reader insight in their relation to the findings, and the literary source that served as inspiration. In addition, I give an account of my goal in writing the etudes.

Chapter 18 gives space to a discussion of the outcomes of the research trajectory. In this chapter, I review the scope and limitations of this study, consider the role of tacit and embodied knowledge in the research process, evaluate the sound-cell-texture chain as a theory, and articulate my contribution to the debate on the nature and status of artistic research. For this latter section, I seize the opportunity to plead for artistic research that acknowledges its intrinsically artistic and reflective nature, and values the interaction between these traits without emphasizing one at the cost of the other.

There are six appendices attached to this dissertation. Appendix A presents an account of the possibilities to create vertical combinations of sounds, one of the most challenging issues for composers wishing to score for the guitar. Appendix B provides a chart for the fingering of harmonics, and indicates how harmonics can be combined vertically. Appendix C compares the dynamic ranges of the twelve sound categories in a relative dynamics chart. The possibilities to change the tuning of the guitar are considered in Appendix D, with suggestions for notation and repertoire examples of common and less common scordaturas. The video files, the recording equipment and the recording dates are listed in Appendix E. The scores of the etudes written with the findings of the research are found in Appendix F.

# Samenvatting

Hoewel de gitaar al eeuwenlang deel uitmaakt van de klassieke muziektraditie blijft het schrijven voor de gitaar voor veel componisten een moeilijke opgave. Terwijl componisten bij het ontwikkelen van hun orkestratievaardigheden voor orkestinstrumenten kunnen putten uit een lange traditie aan relevante literatuur, blijft het aantal studies over het componeren voor de gitaar klein. Dit heeft geleid tot allerlei problemen in gitaarcomposities van de hand van niet-gitaristen, zoals onspeelbare passages en onderontwikkelde texturen. Dit proefschrift beoogt voorgenoemde situatie ten goede te keren door middel van het vastleggen en ontwikkelen van richtlijnen voor effectief gebruik van het klankpotentieel van de klassieke gitaar. Het tweede doel van dit onderzoek is de bevindingen ervan te gebruiken voor het schrijven van een aantal nieuwe gitaaretudes.

In hoofdstuk 1 presenteer ik de methodologische achtergrond van mijn onderzoek. De onderzoeksmethoden lagen niet van tevoren vast: de eerste fase van onderzoek besteedde ik aan het zoeken naar een geschikte manier om antwoorden te vinden op de vraag hoe men goed voor de gitaar schrijft. De combinatie van onderzoeksmethoden die ik uiteindelijk koos, ontstond in de context van bestaande ideeën over methodologie van zowel binnen als buiten het veld van artistiek onderzoek. De relatie tussen mijn onderzoeksmethoden en dergelijke theorieën wordt in dit hoofdstuk besproken. Daarnaast geef ik een overzicht van het soort en aantal partituren dat ik bestudeerde, en verklaar de rol van triangulatie en reflectiviteit in het onderzoek. Hoofdstuk 2 definieert de context van deze studie door middel van een beschrijving van de sociale, epistemologische en ecologische gesitueerdheid van het onderwerp van onderzoek. De sociale gesitueerdheid verwijst in deze studie naar de sociale context waarin het schrijven voor de klassieke gitaar een onderwerp is waarvoor gitaristen en onderzoekers een gemeenschappelijke interesse hebben die tot uiting komt in het uitwisselen en bijdragen van kennis. De epistemologische gesitueerdheid verwijst naar de bestaande kennis op het terrein van het schrijven voor de gitaar, terwijl de ecologische gesitueerdheid in dit onderzoek vooral verwijst naar de interactie tussen speler en instrument. Gitaristen vormen een gemeenschap van beoefenaars die met elkaar zekere waarden delen; wat deze waarden zijn, en de manier waarop deze waarden worden verspreid, gedeeld en uitgewisseld is het onderwerp van dit hoofdstuk. In hoofdstuk 3 vindt de lezer het theoretisch raamwerk van het onderzoek. Dit raamwerk wordt beschreven aan de hand van een kritische bespreking van de bestaande literatuur, en een overzicht van de leemtes in de huidige kennis over het schrijven voor de gitaar, de concepten die in dit onderzoek ontwikkeld worden, de manier waarop deze concepten bedoeld zijn om leemtes in kennis op te vullen, en het belang van de notie van idiomatisch schrijven. Het model waarop het centrale gedeelte van dit proefschrift rust, de *sound-cell-texture chain*, wordt in dit hoofdstuk geïntroduceerd. Het concept *sound* omvat de eigenschappen en karakteristieken van individuele noten, het concept *cell* omvat de idiomatische manieren waarop *sounds* zowel horizontaal als verticaal gecombineerd kunnen worden, terwijl het concept *texture* de karakteristieken omvat van het weefsel van muzikale activiteit gedurende een aantal maten. Het woord *chain* verwijst naar de hiërarchische relatie tussen bovenstaande drie concepten. Het model dient als een gelaagd platform dat een uitleg van schrijf-technische kwesties mogelijk maakt, van een breed perspectief op het *texture*

niveau tot op de kleine details van het *sound* niveau. Hoofdstuk 4 schetst de historisch problematische relatie tussen gitaar, gitarist en componist. In het eerste deel van dit hoofdstuk bekijk ik de karakteristieken van deze relatie voor drie verschillende tijdvakken in de ontwikkeling van de klassieke gitaar: de renaissance en barok, van de klassieke tijd tot de Torres gitaar, en het tijdperk van de moderne klassieke gitaar. Het tweede deel van het hoofdstuk is gewijd aan een reflectie op de verschillende en vaak tegengestelde ontwikkelingen in elk van deze tijdvakken. Deze reflectie dient ter overweging bij het antwoord op de vraag: in hoeverre kunnen we spreken van een nog steeds aanwezige wanverhouding in de driehoeksrelatie tussen gitaar, gitarist en componist?

De hoofdstukken 5-16 beschrijven de twaalf klankcategorieën die in dit onderzoek zijn geïdentificeerd. Met behulp van een groot aantal partituurvoorbeelden geven deze hoofdstukken een gedetailleerd overzicht van de mogelijkheden van de twaalf klankcategorieën. Mijn uitvoering van de partituurvoorbeelden is beschikbaar op video om lezers er een uitgebreide indruk van te geven, en om te demonstreren hoe zij op de gitaar worden uitgevoerd. In dit gedeelte van het proefschrift volgt de structuur van elk hoofdstuk dat van het *sound-cell-texture* model. Eerst worden de mogelijkheden op het *sound* niveau beschreven. Voorbeelden van aspecten die hier worden bekeken zijn bereik, timbre, dynamiek, vibrato, *pitch bends* en microtonen. Bij de verticale *cells* is er aandacht voor de structuur van de verticale ligging van *sounds* en de relatie ervan tot het klinkend resultaat. Op het niveau van de horizontale *cell* worden verschillende typen *cells* besproken, zoals eenstemmige lijnen, reeksen van verticale *cells*, arpeggio's en meerstemmigheid. Voor elk van deze typen van horizontale *cells* wordt een uiteenzetting gegeven over ontwerp, resonantie, harmonische mogelijkheden, snelheid, ritmische mogelijkheden, articulatie en versiering. Bovendien zijn er voorbeelden van het niet-functioneel schrijven voor de horizontale *cell* in kwestie. De discussie van het *texture* niveau is vooral bedoeld om met behulp van repertoirevoorbeelden te verduidelijken hoe componisten *sounds* en *cells* gebruiken om texturen te creëren. Op elk niveau van de *chain* streef ik ernaar inzicht te verschaffen in aspecten van de uitvoeringspraktijk, en geef ik suggesties voor correcte notatie. In sommige gevallen noodzaakte het wijdverspreide gebruik van dubbelzinnige en inconsistente notatiepraktijken in het repertoire me om suggesties te geven voor een ondubbelzinnige notatie, waarbij het oplossen van de heersende verwarring omtrent de notatie van flageoletten het meest dringende was. In het geval van minder vaak gebruikte klanken, zoals *inverted stopping* en gehamerde klanken, kon ik vaak verwijzen naar voorbeelden van effectieve notatie in het repertoire, in de hoop dat componisten deze wijze van noteren zullen overnemen. Technieken en klanken die minder vaak voorkomen (zoals krassende klanken) worden, anders dan in eerdere studies over het schrijven voor gitaar, op dezelfde wijze behandeld als vaker gebruikte klanken (zoals getokkelde klanken). Complexe opeenvolgingen van klanken, zoals een Bartok pizzicato gevolgd door resonantie met een toegevoegd vibrato en een preparatie van de snaren met een paperclip, worden beschreven in het hoofdstuk over de klankcategorie die verantwoordelijk is voor het in gang zetten van het begin van de klank.

Hoofdstuk 17 handelt over de twaalf etudes die ik schreef als onderdeel van het onderzoeksproces. In dit hoofdstuk geef ik de lezer inzicht in de relatie van deze werken tot de bevindingen van het onderzoek, mijn doel met het schrijven van de etudes, en de literaire bron die als inspiratie diende voor deze composities.

Hoofdstuk 18 geeft ruimte voor een discussie over de bevindingen van het onderzoek. In dit hoofdstuk bespreek ik het bereik en de beperkingen van het onderzoek, overweeg de rol van *tacit* en *embodied knowledge* in het onderzoeksproces, evalueer het *sound-cell-texture* model als theorie, en verwoord ik mijn bijdrage tot het debat over de aard en status van artistiek onderzoek. Voor dit laatste onderdeel benut ik de gelegenheid om te pleiten voor artistiek onderzoek dat zijn inherent artistieke en reflectieve aard onderkent, en de interactie tussen deze eigenschappen waardeert zonder de ene eigenschap ten koste van de andere te benadrukken.

Er horen zes appendices bij dit proefschrift. Appendix A expliceert de mogelijkheden voor het maken van verticale combinaties van klanken, één van de grootste valkuilen voor componisten die voor de gitaar schrijven. Appendix B bevat een tabel met de vingerzettingen voor flageoletten, en geeft aan hoe flageoletten verticaal gecombineerd kunnen worden. Appendix C vergelijkt het dynamisch bereik van de twaalf klankcategorieën in een tabel van relatieve dynamiek. De mogelijkheden om de stemming van de gitaar te veranderen worden in Appendix D besproken, waarbij ik ook suggesties doe voor notatie en repertoirevoorbeelden geef van veelgebruikte en minder vaak gebruikte verstemmingen. De videobestanden, de opnameapparatuur en de opnamedata worden opgesomd in Appendix E. De partituren van de etudes die werden geschreven op basis van de bevindingen van het onderzoek vindt de lezer in Appendix F.

# Curriculum Vitae

Marlon Titre (1982) was born in Aruba and grew up in the Netherlands. He studied at the Royal Conservatory of The Hague, where he completed his Bachelor degrees in guitar and composition in 2004. As a student of Zoran Dukic en Enno Voorhorst he received his Master degree in guitar in 2006, graduating with the exceptional mark “10 with distinction”. Marlon continued his guitar studies with Joaquín Clerch at the Robert Schumann Hochschule in Düsseldorf, where he graduated with distinction for the Konzertexamen in 2009.

Marlon won a number of prizes in international guitar competitions:

- 1st Prize, 38th International Competition for Classical Guitar “Michele Pittaluga”, Alessandria (Italy), 2005
- 1st Prize, 34th International Guitar Festival, Zwolle (Netherlands), 2002
- 2nd Prize, 10th International Guitar Competition “Forum Gitarre”, Vienna (Austria), 2005
- 2nd Prize, 6th “Julían Arcas” International Guitar Competition, Almeria (Spain), 2005
- 2nd Prize, European Guitar Competition, Dubrovnik (Croatia), 2004
- 2nd Prize, Alhambra International Guitar Competition, Alkmaar (Netherlands), 2007
- 3rd Prize, “Ciudad de Coria” IX International Guitar Competition, Coria (Spain), 2005
- Contemporary Music Prize, “Andres Segovia” European Competition for Young Guitarists, Velbert (Germany), 2002
- Orchestra Prize, European Guitar Competition, Dubrovnik (Croatia), 2004

In 2005 Marlon played for (then) Queen Beatrix, the Royal Kingdom State representatives, the Dutch Cabinet and all Government Ministers of the previous 25 years at the occasion of the 25-year celebration of her reign. Marlon's performance was broadcast live on Dutch national television. In 2009, Marlon was awarded the Juventus Award for excellent young European musicians in Cambrai, France.

In the past years, Marlon performed in Europe, the United States, China, Russia, Central America, the Middle East and the Caribbean. He played as a soloist with various orchestras, such as the State Hermitage Orchestra St. Petersburg, the Orchestre National de Lille and the Neue Philharmonie Westfalen. Marlon recorded his debut cd with Musicisti Associati Produzioni in Milan in 2006, and recorded a live cd with the Anhaltische Philharmonie Dessau under conductor Antony Hermus in 2010. He also did a series of live performances for Radio France. American composer Steve Reich called Marlon's recording of his multi-track composition *Electric Counterpoint* “the best recording on classical guitar” of this work that he knows. A new solo guitar cd is planned for release in early 2014.

As a composer Marlon is laureate of the Princess Christina Competition. Marlon composed for the Residence Orchestra, the Rotterdam Philharmonic Orchestra and Cello Octet Amsterdam. Marlon wrote two guitar concertos, which he premiered as a soloist: *A Titre Personnel* for classical guitar and ensemble, and *Ficciones* for electric guitar and ensemble. In 2008 he made his debut performance in the Concertgebouw Amsterdam, where he premiered his solo guitar composition *Orfeunism*.

Marlon is currently professor of guitar at Fontys University in Tilburg.