A Portfolio of Compositions Expanding the Role of the Electric Bass Guitar in Contemporary Western Art Music

Samuel C Roberts (2013)

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Samuel Christian Roberts

Commentary

A portfolio of compositions and accompanying commentary submitted in partial fulfilment of the requirements of the award of Doctor of Philosophy to Oxford Brookes University

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Abstract

My original contribution to knowledge is a portfolio of work that, through composition, improvisation and performance, expands the role of the electric bass guitar in contemporary Western art music. More specifically, these works address three areas that were hitherto underexplored in existing repertoire:

- Works for solo bass guitar and electronics.
- Works for bass guitar and ensemble that incorporate the instrument as an equal and important part of an overall sound.
- The use of the bass guitar in sonic arts idioms.

This research, as well as challenging the role of the bass guitar, also aims to expand the sonic and technical palette of the instrument whilst demonstrating its potential to be a valued part of the modern composer's instrumental resource.

This project comprises: a compositional portfolio of solo and ensemble works; eight CDs, containing recordings of both improvised and scored works; an accompanying written commentary (original musical scores are included as an appendix in the commentary).

Preface

This portfolio of compositions and the accompanying commentary are the result of a lifelong musical journey. Having been born into a family where both parents were professional musicians, I have always been exposed to a wide range of music. At home, I would always hear practice regimes and recordings of music, whilst my parent's babysitting routine would usually involve me reluctantly sitting backstage through rehearsals, concerts and recording sessions. This musical background is reflected in my education. Alongside formal music education in school and at university, I have been classically trained as a cellist and pianist and have also undertaken formal training in music theory and composition. It is the bass guitar, however, that has provided the most direction in my musical life. Having become interested in popular and jazz idioms as a teenager, I took up the instrument in order to play in bands with friends. Since then, I have played professionally in a wide variety of settings, performing across Europe with pop groups and singer/songwriters, function and wedding bands, contemporary art music ensembles, avant-garde jazz groups, free improvisation collectives and as a soloist. It is this experience that has not only inspired this research, but has also offered genuine focus to my work as a composer.

As discussed in this commentary, I have been frustrated with the lack of challenging and expansive bass guitar repertoire in contemporary art music and also the perception that many modern composers and ensembles have of the instrument. Therefore, this PhD is a response to my musical journey so far. It is a body of work that aims to expand the role of the bass guitar and to begin to realise the potential of an instrument that, in my view, has unique characteristics and a lot to offer within contemporary Western art music.

List of Summative Works

Deconstructed Bass for improvising bass guitar and '*Deconstructor'* device (2012)

Performed by Samuel C. Roberts at Audiograft Festival, Oxford, February 2013

(CD 5 Track 5) **12'42**

Starship for improvising bass guitar (2013)

Performed and recorded by Samuel C. Roberts, Birmingham 2013

(CD 6 Track 1) **32'36**

Celestial for improvising bass guitar (2013) (see p.54)

Performed and recorded by Samuel C. Roberts, Birmingham, 2013

(CD 5 Track 3) **8'56**

Kairos for 5-string bass guitar and electronics (2013)

Performed and recorded by Samuel C. Roberts, Birmingham, March 2013

(CD 6 Track 2) **22'32**

Go! for soprano and tenor saxophones, trumpet, trombone, electric guitar and electric bass guitar (2012)

(score only) **8'30**

Graceful Ascent for 5-string bass guitar, percussion and brass (2013)

Performed by Samuel C. Roberts and the Royal Academy of Music Aarhus Brass Ensemble at the RAMA Festival, Aarhus, Denmark, April 2013.

(CD 6 Track 3) **12'21**

Total Duration – 97'37

1. Introduction

This research project focuses on the composition of a series of works that expand the role of the electric bass guitar within contemporary Western art music. For the purposes of discussion, throughout this commentary I define 'contemporary Western art music' as musical works created outside the generally accepted genres of popular and commercial music since 1960. As a bass guitarist and composer, I have been frustrated by the lack of art music written for bass guitar, especially considering the plethora of expansive works within popular idioms. The bass guitar has the potential to be an important part of modern orchestration due to its flexibility, versatility and compatibility with electronics. Modern advances in technology have also reduced the issues associated with balancing electronic and acoustic instruments. The range of the modern instrument has also been increased in recent years, with extended range instruments featuring extra strings and long scale necks that span over two octaves per string. The array of timbres and tones the instrument can produce is also exceptional. Multiple combinations of on-board and external electronics (pickups, EQ, effects pedals etc.), paired with a vast range of extended techniques (such as two-hand tapping, slapping, palm muting etc.) permit the bass guitar to prosper in a multitude of musical applications.

This portfolio of compositions and accompanying commentary represents an original contribution to knowledge, as this is a sparsely populated field when viewed alongside the practice and literature for other instruments. Current works within contemporary Western art music are limited and do not realise the full potential of the instrument. Whilst undertaking a thorough literature survey, it became clear that there were certain areas that had received more attention than others. Works for bass guitar and ensemble were relatively abundant, but tended to fall into one of two areas: works that use the bass as a novelty or for one particular sound without timbral development, for example, *Hoketus* by

Louis Andriessen, *The Mask of Orpheus* by Harrison Birtwistle or *Principia* by Steve Martland; and concerto form works or ensemble commissions from groups that feature the bass guitar, such as *Concerto for Bass Guitar (four imaginary views of the Sagrada Familia)* by Florian Magnus-Maier, *Sub Merge* by Colin Riley, *Atomic UFO Saves the Day (Again)* by Giel Vleggaar or *Trance* by Michael Gordon. Works within experimental music, sonic art and free improvisation tended to feature the electric guitar or double bass as opposed to the bass guitar. Groups such as *[rout]*, O*rkest de Volharding* and *Mopomoso* appear to prefer the resonant acoustic chamber of the double bass, and there are several guitarists who implement instrument preparations and unconventional performance methods (such as Keith Rowe, Thurston Moore (along with Lee Ranaldo in *Sonic Youth*) and Derek Bailey), but there is an absence of thorough exploration from bass guitarists. The most striking find, however, was the lack of works for solo bass guitar outside of a small selection that can be found in a similar academic study by Simon Lesley, entitled *The Bass Guitar in Contemporary Art Music: exploring its potential through composition*[1].

Lesley's thesis and accompanying compositions mark the first endeavour into thorough academic research of the bass guitar within contemporary art music. His research (solo pieces, ensemble works, concertinas and concertos) provided a platform from which my own work greatly benefitted, as, in order to achieve the goals set out in my research questions, it was vital to obtain a detailed understanding of directly related peers and studies. However, when comparing my research with Lesley's, there is a clear distinction between the two bodies of work. For example, my work explores improvisation, the use of electronics and sonic art practices alongside more traditional composition, and often approaches methodology from the perspective of a performer, as opposed to a composer (during the 'sound object' works or throughout *Starship*, for example). Lesley's work, on

[1] Lesley, S. (2012) *The Bass Guitar in Contemporary Art Music: Exploring its potential through composition.* Ph.D. Thesis, Birmingham City University, U.K.

the other hand, takes a more conventional compositional approach, with scored solo, ensemble and concerto pieces providing the summation of his practical research.

Consequently, I identified three areas within contemporary Western art music where bass guitar performance could be expanded. The first was the composition of an expansive solo work that integrated electronics into performance. The second was the application of sonic art practices, techniques and methods using the bass guitar. The third was the composition of pieces for bass guitar and ensemble that incorporate the bass as an equal part of an ensemble. These works should also be accessible to the average bass guitarist, so as to expand the impact of the instrument and challenge the current perception of the bass in contemporary Western art music.

This project will also address the following research questions.

- How effective can the bass be as a frontline and solo instrument in contemporary Western art music?
- How is the bass guitar currently used by contemporary composers?
- To what degree can new techniques and sounds be created using the bass guitar?
- How can the bass guitar be used in a sonic arts environment?

Regardless of method and aesthetic, the fundamental aim of this research project is the expansion of bass guitar performance in contemporary Western art music with regards to its musical role and sonic and technical palette. Whilst all the work within this portfolio was created to achieve this aim, it is important to make a distinction between the summative works listed at the beginning of this commentary and other formative works and studies discussed throughout. The summative works represent the pinnacle of this research. In other words, they are the final results of my work and thoroughly display what was learned

throughout the investigation. In contrast, the summative studies offer insight into the development of methodologies and practices and also detail the processes behind the journey that this research embodies. This research also has an ultimate goal that may not be achieved during this programme of research, which is the complete integration of the bass guitar into the instrumental arsenal of the modern composer and the realisation of the potential that the bass guitar has to be an important, flexible and versatile instrument within contemporary art music as a whole.

2. Initial Improvisation Studies

During the early stages of my research, I undertook a reflective analysis of my own compositional methods. From this, it became clear that improvisation is an important aspect of my creative process. I use improvisation during composition as either an open, creative method to initially mould ideas, or as a developmental process to encourage more intuitive musical decisions within stricter compositional parameters (structure, harmony, tonality etc.). Whilst I am aware of the problems that this process can cause (for example, there is a danger of repeating the same material and subconsciously returning to learned patterns and styles), it is a personally cathartic process, as it liberates the mind from what may be perceived as rigid or methodical techniques. I do believe, however, that there is a distinct difference between my use of improvisation as a composer and as a performer. When composing scored works, I prefer to retain as rigorous a control over the musical interpretation as possible. The biggest issue with improvisation in composition is retaining that control. As Derek Bailey writes in his book, *Improvisation: its nature and practice in music*:

'The unique experience for a composer in the use of improvisation must be the relinquishing of control over at least some of the music and, even more critically for the composer, passing over that control not to 'chance' but to other musicians.'[2]

Although I have experimented with the integration of improvisation into scored works in the past, the unpredictability of relying on other musicians to combine notated and improvised material is not something I have found to be successful. Improvisation, therefore, is not something that I include in my scored works, but use as a tool for the creation of new ideas, colours and organic development of material (which I discuss in

[2] from page 70 of *Improvisation: its nature and practise in music* by Derek Bailey, Da Capo Press, USA, 1992.

more detail in later chapters). I may improvise and experiment with material whilst composing for others, but the results are always notated in a detailed fashion.

When performing works written by others as a bass guitarist, I tend to approach improvisation in a conventional manner, improvising around specific chord sequences, modes or other groups of pitches. The processes revealed during initial improvisation studies led to the adoption of a contrasting approach when performing my own work. A focus on the exploration of sound and texture took precedent, especially during the 'bass guitar as a sound object' pieces (discussed in detail in chapter three). Indeed, improvisation took on a much greater role than I had originally anticipated and the results of the studies inspired more emphasis on the exploration and creation of new bass guitar sounds and the technical set-ups used for solo bass performance.

Initially, I produced a series of ten, three-minute improvisations comprised of three layers of audio. Recording techniques used by bassist Jaco Pastorius on his 1981 album, *Word of Mouth*[3], inspired the method for this set of studies. Having recorded the bass guitar part for *Crisis* (the opening track of the album), Pastorius invited each musician into the studio alone to record improvised parts whilst listening to only the recorded bass and drum tracks. This removed the interaction between individual musicians and allowed each part to be developed solely from the bass guitar line. In the 'Three Minute Studies', I took a slightly different approach. Each layer was recorded separately and without playback of the previous audio so as to completely remove the aural interaction that usually exists between musicians or, in this case, recorded passages of audio. I also left at least three hours before recording each layer in an attempt to remove as much subconscious memory of previous layers as possible. Although I expected a degree of unity between the layers (because of the subconscious remembering certain points of performance), they were more cohesive than expected and often all three independent layers would arrive at

[3] *Word of Mouth* by Jaco Pastorius, Warner Bros., 1981

climactic points simultaneously. For example, between 0:28 and 0:30 of 'Three Minute Study No.7'[4], all three layers combine to produce a very clear and unified cadence, despite not having real-time aural interaction during recording. A similar occurrence appears at 0:52 of 'Three Minute Study No.3'[5], where all three layers pause simultaneously before a distinct change in timbre and atmosphere.

For the next set of studies, I limited the pitches used during improvisation. Using the same method as with the 'Three Minute Improvisations', I extended the duration to five minutes and produced four studies, each focusing on a set of three pitches. 'Limited Pitch Improvisation No.1' used only C, D flat and A, No.2 used B, D and E, No.3 B flat, F sharp and G and No.4 E flat, F and G sharp. During this set of studies, I also began to experiment with different note attacks, with a specific focus on producing sounds that were not obviously bass guitar centred. For example, the use of slow volume pedal swells or very long, sustained notes. These studies mark quite a departure from initial investigations. Whereas the 'Three Minute Studies' relied on rapid recycling of pitches as the basis for material (resulting in a very busy sound, even during sparse sections), the process of limiting pitches concentrated attempts at producing new sounds from the bass guitar. The range of sounds created throughout the four limited pitch studies is quite narrow, but the results on the whole mark a good progression. For example, the sustained pitches and volume swells found between 1:33 and 2:17 of 'Limited Pitch Improvisation No.3'[6] are a stark contrast to the aesthetic of the three-minute improvisations. The tremolo (or pulsing) sounds heard between 3:23 and 4:30 of 'Limited Pitch Improvisation No.4'[7] are also a contrast to the previous studies. Cohesion between each layer of recording was again evident. Although the focus on producing specific sounds naturally aided the gelling of the independent layers, pauses (between 3:30 and 3:35 of 'Limited Pitch Improvisation

[4] Track 7 on 'Initial Improvisation Studies CD 1'
[5] Track 3 on 'Initial Improvisation Studies CD 1'
[6] Track 13 on 'Initial Improvisation Studies CD 1'
[7] Track 14 on 'Initial Improvisation Studies CD 1'

No.4' for example) and changes in timbre (for example, at 4:08 in 'Limited Pitch Improvisation No.3) were again surprisingly unified.

A further series of improvisation studies focused on the methodology of creating multiple layer, detailed improvisations without the use of overdubs. In other words, to investigate the practices involved with live solo performance and the techniques and technology available for the bass guitar. The first issue I encountered was the technical set-up required to perform or record this type of improvisation without overdubs. This became a key part of my investigation, as the set-ups developed during these improvisation studies formed the basis of all equipment set-ups used for solo works (both improvised and scored).

I began by recording an improvisation ('Live Improvisation No.1'[8]) using infinite delays and reverb to produce long, sustained sounds that built on the results of the 'Limited Pitch Improvisations'. For this study, I only used software plug-ins (from *Logic Pro*) and controls on the instrument itself to create sounds. The infinite sustain, soft attack and slow pulsing (produced by the superimposed, sustained notes) was a big step towards creating new sounds, but the lack of control over volume swells, modulation and plug-in parameters was an issue for live performance (one hand has to be free to manipulate control knobs or adjust software parameters, so it is harder to control playing techniques). The most obvious way to retain full control over playing techniques was to use foot-controlled pedals. As the most effective (both sonically and practically) aspects of 'Live Improvisation No.1' were the layered textures and volume swells, I decided to introduce volume and loop pedals into my set-up for the remaining 'Live Improvisation' studies. The volume pedal allowed volume swells and note attack to be manipulated by foot, whilst the loop pedal allowed much more control over the layering of sound. Although the infinite delays used in 'Live Improvisation No.1' were effective, it was very hard to regulate the level and

[8] Track 1 on 'Initial Improvisation Studies CD 2'

feedback of the repeats and it was impossible to edit the delay sounds during performance. For example, to create a new set of layers without the loop pedal, it was necessary to manually fade out the delay channel volume at 4:10 (the bass signal was sent through one 'wet' channel with delay and reverb, and another 'dry' channel that only used reverb) and allow the repeats to decay whilst muted. After a passage of quiet, single layer improvisation, the delay was re-introduced at 5:15. Although variation in texture and moments of silence are very desirable and effective, I wanted to maintain full control of texture and dynamics, and not have performance decisions dictated by specific effects, plug-ins or other pieces of technology. The loop pedal made it possible to stop and start playback easily, as well as adding the ability to punch in and out of recording at will and delete previous layers of recording. It also made it possible to play over the top of recorded material (and adjust the volume of loop playback) without affecting loop playback, something made difficult when using delay to create layers.

The added control was immediately evident during the opening (up to 1:15) of 'Live Improvisation No.2'[9]. Volume swells were executed with more precise articulation, the timbral subtleties of the instrument were preserved (as both hands were free to concentrate on playing techniques) and I was able to exert full control over loop playback. The loop pedal also allowed for much clearer and quicker layering of sound. For example, between 2:48 and 3:38, it was possible to record several layers whilst retaining absolute clarity of sound in material played on top of loop playback. The changes in technical set-up did, however, prove to be somewhat of a distraction and some of the emphasis on creating new sounds (specifically sounds that were not obviously bass guitar based) was lost. To re-focus, I limited the pitches used in the third and fourth 'Live Improvisations' in a similar manner to the restrictions used in the 'Limited Pitch Improvisations'. As the durations of the 'Live Improvisation' studies were longer (approximately eight minutes each), I allowed for six pitches per improvisation (with No.3 using C#, A, D, G#, E and F#,

[9] Track 2 on 'Initial Improvisation Studies CD 2'

and No.4 C, Eb, F, G, Bb and B). The limitation process again worked well. The layered, sustained sounds in 'Live Improvisation No.3'[10] were successful and the use of volume and loop pedals marked a distinct improvement on the technology in 'Live Improvisation No.1'. The pulsing sounds heard between 5:22 and 5:56 (during No.3) were particularly effective, and inspired the focus of the last two 'Live Improvisations'.

Having settled on the simple, yet effective, equipment set-up of volume and loop pedals with reverb, the final two 'Live Improvisations' focused on building layers using varying speed of tremolo (or volume pedal swells) and *glissandi* (string bends or *scordatura* (de-tuning the string using tuning pegs)). 'Live Improvisation No.4'[11], concentrated solely on tremolo sounds, whilst 'Live Improvisation No.5'[12] also focused on *glissandi* techniques. These sounds built on the pulsing heard in 'Live Improvisation No.3' and also the natural beating (that occurs between different waves of frequency) found in several of the previous improvisation studies. The tremolo technique provided rhythmic contrast to the sustained sounds and responded well to different note attacks and playing techniques. For example, between 1:34 and 1:39 of No.4, the tremolo technique in conjunction with an aggressive, hard attack sounded similar to audio that had been reversed through processing tools or effects. Between 6:43 and 6:46 of No.4, a string scraping technique added harmonic overtones to the sound that, along with the volume pedal tremolo (or swell), provided further sonic contrast. During No.5 (between 6:28 and 6:36), the tremolo also added variety to harmonics, creating a modulation-like effect. The *glissandi* produced further pulsing and timbral diversity, especially when used with harmonics. Evidence of the pulsing can be heard between 0:39 and 0:52 of No.5, as well as between 1:13 and 1:27, where different speed *glissandi* intersect one another to produce beating effects.

[10] Track 3 on 'Initial Improvisation Studies CD 2'
[11] Track 4 on 'Initial Improvisation Studies CD 2'
[12] Track 5 on 'Initial Improvisation Studies CD 2'

The last of the initial improvisation studies ('E-Bow Fretless Improvisation'[13]) proved to be most important with regards to 'sound object' works. This is largely because of the use of the fretless bass guitar and the E-Bow, two pieces of equipment that I used extensively throughout my research into the 'bass as a sound object' and that were vital to my explorations into the bass guitar in a sonic arts environment. Whilst frets allow the performer to play almost perfectly in-tune, execute extended playing techniques with ease (for example, two-handed tapping is more straightforward with frets than without) and add depth to percussive sounds (the nickel or stainless steel used for frets naturally increases the metallic sounds of percussive slap or tapping techniques), they do restrict some aspects of performance. For example, *glissandi* are not as smooth on fretted instruments, microtonal pitches are very difficult to perform, vibrato can become stifled and the natural resonance of the bass can occasionally be somewhat suppressed. The fretless bass liberated performance from these restrictions and aided the development of unconventional performance techniques and new sounds (discussed further in chapter three). The E-Bow is "a hand-held electronic bow for guitar"[14], which is essentially an electromagnet that produces infinite sustain on instruments that use metal core strings. Whilst it proved particularly useful for producing infinite sustain, the rich harmonic overtones it generated were also vital to 'bass as a sound object' works and research into unconventional playing techniques.

'E-Bow Fretless Improvisation' was the final part of the initial improvisation studies and also a first attempt at combining the E-Bow and fretless bass with other parts of the developed technical set-up (volume and loop pedals, reverb etc.). The absence of natural note decay (created by the E-Bow infinite sustain) fortified the loop pedal layering process, and the consistent sustain enhanced the pulsing effects (heard, for example, between 2:05 and 2:45, and 3:14 and 3:33) developed in previous studies. The E-Bow

[13] Track 6 on 'Initial Improvisation Studies CD 2'
[14] from http://www.ebow.com/home.php (link correct as of September 2013)

and fretless bass combination also delivered a blooming tonal character, quite a contrast to many of the sounds produced on the fretted instrument. Use of the E-Bow also created more complex harmonic overtones, an example of which can be heard between 0:45 and 0:50 of the study, where a harmonic blossomed from the beginnings of a normally played note.

As discussed in the following chapter, the methods, techniques and technology explored during these initial improvisation studies form the basis of almost all 'bass as a sound object' pieces. Although the extensive use of improvisation was not originally anticipated, it provided the ideal foundation from which to create these works and expanded the range of the investigation as a whole. The improvisation research also proved to be important for scored works, with playing techniques and equipment set-ups developed in these studies found in later pieces, *Kairos* and *Graceful Ascent* (both of which are discussed in later chapters of this commentary).

3. The Bass as a Sound Object

Following on directly from my initial improvisation studies, these works focus on the use of the bass guitar as a sound object. This includes the development of performance techniques, the creation of new bass guitar sounds and the use of the instrument in a sonic arts environment. For the purposes of this investigation, I define 'sonic art' as a paradigm for the exploration or organisation of sound, specifically focusing on timbral development without, as far as possible, reference to pitch or rhythm-defined material. I also define a 'sound object' as an instrument or item that is used to produce aural results within the above model of 'sonic art'. This classification uses the definition of a 'sound object' by R. Murray Schafer[15] as a foundation. From my initial literature survey, it became clear that the guitar (electric and acoustic) and double bass are often used as types of sound object, but the bass guitar is often overlooked. Contemporary groups from within a variety of styles (such as the *Bang on a Can All-Stars*, *[Rout]* or *Mopomoso*) appear to prefer to use the resonant acoustic chamber of the double bass, whilst performers and composers who explore the practices of prepared guitar and laying the instrument flat (for example, guitarists Keith Rowe, Marc Ribot and Fred Frith, or groups such as *Sonic Youth*) favour the guitar over the bass guitar. Whilst there are some examples of prepared bass guitar use (for instance, German bassist, Jonathan Robinson[16], has explored bass guitar preparations to produce percussive effects), there was significant room for experimentation with regards to the use of the bass guitar within sonic art works.

Some of the approaches investigated throughout this chapter are not unique to the bass guitar, but the application of these processes onto the bass is an area of contemporary Western art music that has not been thoroughly explored. For example, the practice of

[15] p.49 to 55 of *The New Soundscape* by R. Murray Schafer, Bernadol Music Limited, Ontario, 1969.

[16] http://www.jonathanrobinson.de/index.html and http://www.youtube.com/watch?v=e3FJtfrHzNA (links correct as of September 2013)

laying an instrument flat for performance has been employed by many guitarists (Keith Rowe and Fred Frith, for instance) but has not been explored thoroughly with regards to the bass guitar. Therefore, these pieces focus on the following:

- The application of the bass guitar in sonic arts.
- Unconventional performance methods (such as laying the instrument down for performance or the use of non-musical items (coins, pieces of wood etc.)).
- Guitar and amplifier preparations.
- The use of spatial sounds of the instrument and field recordings.

With regards to improvisation, these works use approaches that specifically focus on the timbral qualities of sound as a foundation for experimentation, as opposed to the use of pitch and rhythm-based material, which is the foundation of the 'pitch-based' improvisations discussed in chapter four.

I began research into the sound-based works with a series of studies that explored a variety of unconventional playing techniques and approaches to performance. Having produced a large number of works, I selected four pieces for discussion, which are compiled examples containing material from across the range of investigations. The first of these, 'Foreign Currency' and 'Rolling', explored the use of non-musical objects and the practice of laying the instrument flat during performance. I chose to record these studies using the magnetic pickups installed in the bass guitar, a contact microphone attached to the instrument (placed in a variety of positions) and a condenser microphone to record ambient sounds of objects coming into contact with the bass (see fig.1). This was done in order to record a complete sonic picture of the bass guitar. After completing each study, I reviewed each signal path separately and used a combination of the results to produce the recordings heard on the appendix CDs.

(Fig.1 - Photo of recording set-up for initial sound-based studies)

The contact microphone (not pictured) was attached to the headstock of the instrument to begin with, but was moved to several positions during the investigations to record a wide range of sounds. I also dampened and raised the strings near the bridge of the bass (using cardboard, as seen in fig.1, or stiff foam material) in order to reduce string vibration and, to a certain extent, remove the implications of tonality that the open strings may have suggested.

During 'Foreign Currency'[17] I used a class set of items (see fig.2) to produce sounds from the bass guitar. By rolling, scraping, dropping and sliding coins and banknotes across the strings, pickups, neck and body of the bass, I was able to create some unusual sounds.

(Fig.2 – examples of performance materials used during 'Foreign Currency')

[17] Track 1 of 'Sound Object and Deconstructor Studies CD'

The reasoning behind using currency was purely practical. I wanted to investigate the sounds produced by metallic items during the exploration of non-musical performance objects and coins were perfectly machined items that were abundant. There were no sharp or rough edges to damage the instrument and the round shape made them easy to manipulate (with regards to rolling, sliding etc.). Although any item made of metal or paper would have produced similar sounds to the objects I used, the variation in weight and size of the coins expanded the range of sounds. The banknotes proved to be less valuable, but combining the notes with coins yielded interesting results, particularly between 0:15 and 0:22 of the recording, where coins were dropped and rolled across banknotes that were placed on the bass guitar strings. The paper material dampened both the strings and the metallic impact of the coins and augmented the overall sound with a dull thudding noise.

The range of methods used produced a variety of sounds. Between 0:29 and 0:32 or 1:12 and 1:13 for example, the process of scraping and sliding coins across the strings produced a very metallic sound not dissimilar to a plectrum slide, a more traditional technique employed by guitarists and bass guitarists involving the scraping of a plectrum

along the length of the string. The higher mass and hardness of the coins, however, produced a much heavier timbre than a plectrum, which is typically made of plastic. Rolling coins along the length of the fingerboard produced a rhythmic sound, heard between 1:24 and 1:38. Indeed, the sounds heard throughout 'Foreign Currency' are very physical and rhythmic in nature. The dragging sounds heard between 0:40 and 1:07, the process of dropping coins onto the body of the bass between 1:42 and 1:55 and the combination of techniques heard from 3:02 to the end of the recording produced a range of physical, metallic timbres that would not be easy to replicate when playing the bass in a traditional manner.

The next work, 'Rolling'[18], explored the sounds produced by rolling objects across the bass guitar, with a specific focus on the use of rubber and plastic items (squash balls, table tennis balls, rubber bouncy balls, plastic ball-bearings, erasers, plectrums etc.). I used a wider range of objects compared to 'Foreign Currency', but did not employ as varied an approach with regards to processes. All objects were rolled up or down the instrument, starting from either the bridge or nut (top of the neck). Because of the narrower range of techniques applied, I also began to investigate how electronic manipulation and processing could expand the sounds created by unconventional performance methods. The recorded material gradually received more electronic treatment and processing as the piece developed, with sounds eventually becoming far removed from their origin. Overall, 'Rolling' did not prove as useful as other studies, but electronic manipulation proved to be important during later 'Deconstructor' performances.

'Beyond the Neck'[19] explored the sonic possibilities of the bass guitar without the use of the neck and fingerboard. To record this work, I used the signal from the magnetic pickups and a contact microphone placed on the underside of the body of the instrument. Having

[18] Track 2 of 'Sound Object and Deconstructor Studies CD'
[19] Track 3 of 'Sound Object and Deconstructor Studies CD'

recorded several passages of varying length, I combined three layers of audio in a similar manner to the 'Three Minute Improvisations' discussed in chapter two. The strings were dampened and raised from the base of the neck and at the bridge (using stiff foam) to isolate a section of the instrument where the strings run over the body and pickups. This created a portion of the bass that was harp-like in design, with no fingerboard to change the length (and therefore the pitch) of the strings. In terms of technique, the majority of material was produced using relatively simple methods that were similar to playing techniques used on the harp, lap steel guitar or zither style instruments. The left hand would touch the string (usually with slightly more pressure than one would use to sound a harmonic on a string instrument) and the right hand would pluck in a normal manner, using fingers or a plectrum. The result was a fairly dead, yet metallic and physical timbre that was often very similar in nature to the sounds produced by the *kalimba* (or thumb piano), as can be heard during the opening ten seconds of the piece. Scraping sounds were also produced throughout using plectrum (heard between 0:08 and 0:10, for example) and fingernail slides (heard in the background between 0:31 and 0:33). Sweeping the hand across the strings created a variation of the scraping timbre (which can be heard clearly between 1:06 and 1:07), whilst a variety of plucking techniques created a wide range of percussive sounds that are heard throughout the work. Although there are several percussive bass guitar performance techniques (slapping and popping or two-handed tapping, for example), the unusual methods used throughout 'Beyond the Neck' produced a range of physical timbres that were original and in contrast to the usual bass guitar sounds.

The next study investigated the sounds the E-Bow could produce on an unamplified, fretted five-string bass guitar. During 'Double E-Bow Session'[20], two E-Bows were used simultaneously on a bass laid flat. The sounds were recorded using only a contact microphone, which was moved to various positions during the exploration (the contact

[20] Track 4 on 'Sound Object and Deconstructor Studies CD'

microphone was moved between tuning pegs, the back of the neck and headstock, the rear of the body, the scratch-plate and the bridge of the instrument). As with the other studies discussed in this chapter so far, the final recording of 'Double E-Bow Session' is a combination of several sounds and is the collaborative result of many short experiments undertaken during the project. Throughout this work, one E-Bow was placed on the strings (generally on the E, A or D strings, as it was harder to balance the E-Bow on the edges of the neck) to create a drone, whilst the other was moved to different positions. The focus of this study was to create sustained sounds without the use of any traditional techniques or the electronics found on-board the instrument. Recording the bass in this manner accentuated the harmonic overtones that the E-bow produces. Although this effect is present throughout the work, it was particularly evident during the opening thirty seconds of the study and between 2:44 and 3:25. The most interesting sounds created during 'Double E-Bow Session', however, were the rattling noises. Musicians who play fretted instruments (and, indeed, unfretted instruments) or those who repair and maintain them spend a lot of time preventing rattles and buzzes from occurring, as they are usually undesirable sounds that are side effects of a damaged or unmaintained instrument. During this study, the production of these sounds was encouraged and the results (which were occasionally unintentional) were effective.

One method used to create a rattling sound was to allow the string to vibrate against the plastic casing of the E-Bow. This is clearly heard between 1:58 and 2:02 and proved to be a particularly important technique that I developed extensively during 'Starship', a work that is discussed later in this chapter. The rattling heard between 0:30 and 0:45 was produced using a slightly different method. While the stationary E-Bow (used to create the drone) was active on the A string, the other was placed on the D string, which was supporting one side of the drone E-Bow. This caused the stationary E-Bow to vibrate, producing a subtle rattling noise that was quite different in timbre to those created using other techniques. Loose screws, frets or electronic connections on the instrument

generated other unintentional rattling and buzzing sounds. For instance, the quiet rattling heard in the background between 1:42 and 1:54 was the result of the E-Bow being placed directly above a slightly loose fret, which faintly vibrated in its slot. The sounds produced and techniques developed during 'Double E-Bow Session' were particularly important with regards to the approaches taken whilst investigating the use of 'Deconstructor' preparations (see below) and during preparation and performance of one of my summative works, 'Starship'. The raw, unprocessed nature of the sounds and originality of the timbres produced (specifically with regards to the creation of new bass guitar sounds) was an important step forward and was vital to much of the work undertaken throughout the these investigations.

Whilst some of these unusual methods may not be regularly used during performances, the results of these studies inspired the direction of further research into the creation of new sounds. This is most evident with regards to the development of the 'Deconstructor' amplifier preparations. Having spent a significant amount of time exploring the possibilities of the bass guitar itself, I felt that it was important to research how the amplifier could be adapted to expand the sonic palette of the instrument. Although the preparation of speakers is not unique to this project (for example, installations such as *Infinite Spring* by John Pigott[21] make use of prepared speakers), the literature survey showed that there was a gap in existing contemporary Western art music with regards to a device such as the 'Deconstructor', which can be used without damaging or disassembling the amplifier it is applied to. Indeed, one of the most important aspects of the 'Deconstructor' concept was not to damage, disassemble or physically alter the original amplifier in any permanent way.

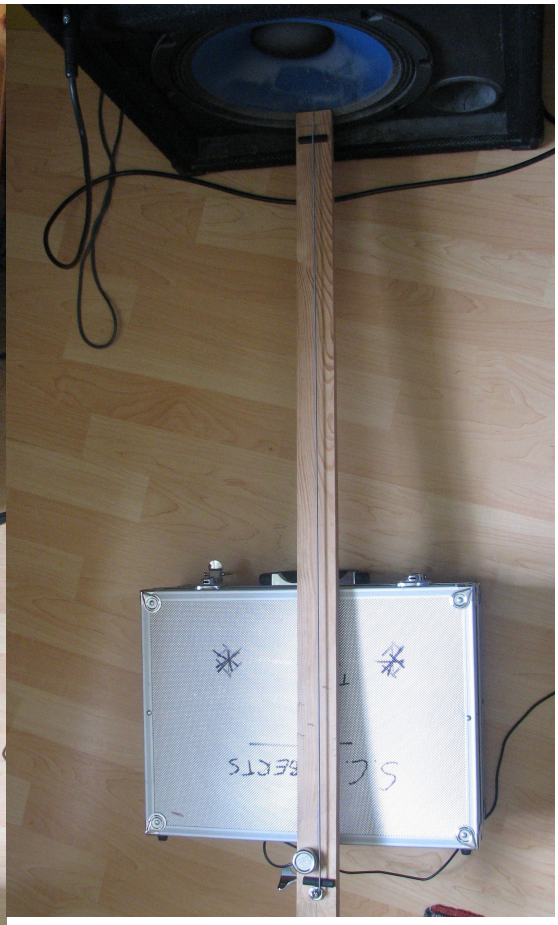
The original concept of the 'Deconstructor' was to manufacture a set of sympathetic strings that could be activated by the vibrations of a speaker cone and, in turn, be

[21] http://www.sonicmarbles.co.uk/ (correct as of September 2013)

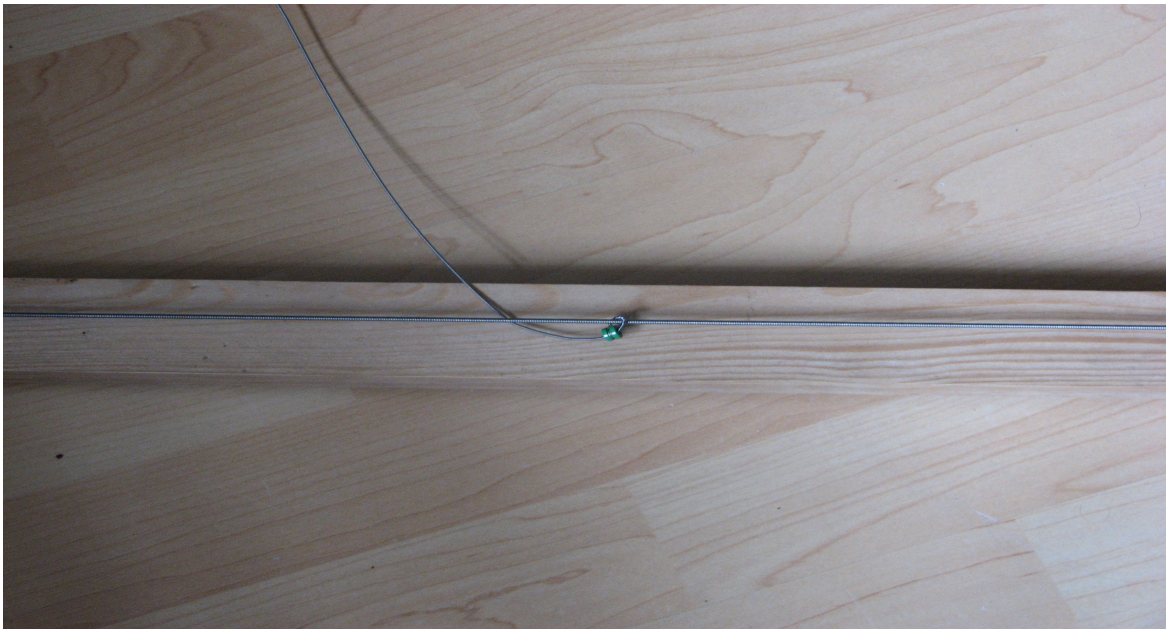
amplified and manipulated using contact microphones and a further set of speakers. Initially, I created a single ‘Deconstructor’ element (consisting of one string, strung across a piece of wood) to test the practicalities of the concept. This was placed against a bass amplifier speaker cone and recorded using a single contact microphone (see fig.3 below). The results were not satisfactory, as the amplifier had to be at very high volume levels to produce any audible sympathetic vibration in the ‘Deconstructor’ at all. Another issue when using it in this way was that the sound created by the single element did not offer any real contrast to the source material being played through the amplifier. In fact, the element acted simply as a conduit for the source audio, producing a subdued, metallic and thin version of the amplified sounds.

In an attempt to increase the levels of sympathetic vibration and variety of sound, I attached a single bass guitar string (a narrow gauge G string) to the ‘Deconstructor’ element and, in turn, touched the other end of the string on to the speaker cone itself (see fig.4). This offered an extra channel for the speaker vibrations to reach the element and produced a distinct rattling sound.

(Fig.3 – two photographs of single element ‘Deconstructor’ test)



(Fig.4 – two photographs of single element ‘Deconstructor’ developments)



During the initial experiments, I placed the contact string against the speaker cone of a hi-fi speaker that was playing back a recording of 'Double E-Bow Session'. The resulting study ('Deconstructor E-Bow Hi-Fi'[22]) revealed some interesting rattling noises, which were a continuation of the sounds developed during earlier studies. During 'Deconstructor E-Bow Hi-Fi', three distinct types of rattling were produced. The first (heard between 0:12 and 0:50 of recording) was a heavy, percussive and rhythmic rattling, which pulsed extensively with the variety in vibration form the speaker. The second (heard between 1:17 and 1:54) was much grainier in timbre, did not have as much rhythmic variation as the first example but was distinctly different in timbre. The third type of rattling (heard between 2:24 and 3:06) was very similar to the rattles and buzzes heard during 'Double E-Bow Session' and was much higher pitched and resonant than the others. These rattling sounds were a marked improvement on the results produced by the initial 'Deconstructor' (fig.3), but the clarity of the source sound was often lost amongst the other noises. Although this was not necessarily undesirable, I wanted the 'Deconstructor' to better reproduce the sounds that were creating the sympathetic vibrations whilst still adding its own contrasting timbres.

In order to expand the results, I manufactured a set of four 'Deconstructor' elements (fig.5) that were strung according to traditional bass guitar tuning (one element for each string (E, A, D, G)). The whole device was raised up on blocks of wood so that it could more easily be put into contact with the amplifier speaker cone and a contact microphone was fitted to each element, which can be clearly seen in figure six. The signal from each microphone was then sent into a small mixer, which enabled easy recording, manipulation or blending of sounds.

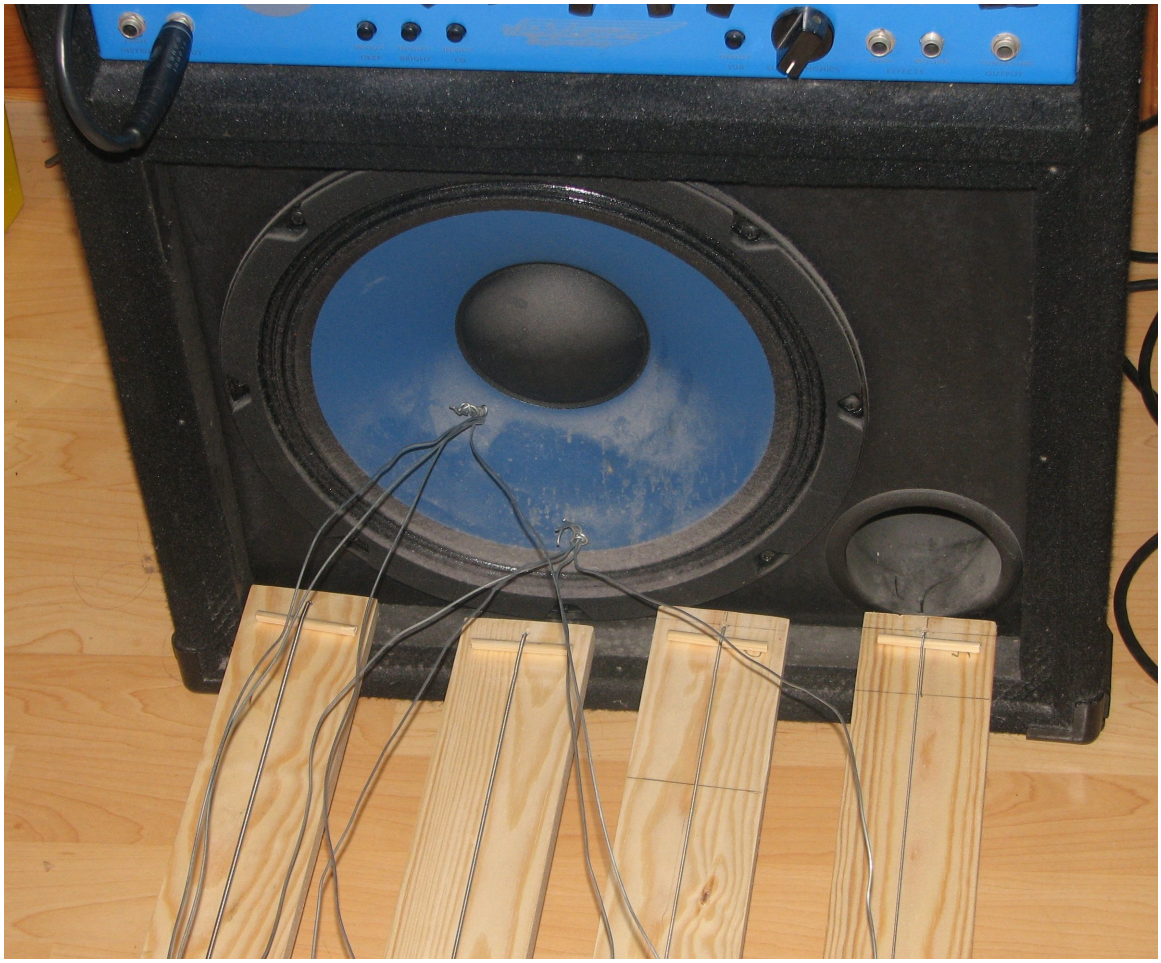
[22] Track 5 of 'Sound Object and Deconstructor Studies CD'

(Fig.5 – photograph of four ‘Deconstructor’ elements before installation of microphones and contact wires)

(Fig.6 – photograph of four ‘Deconstructor’ elements, with contact microphones and contact wire, set-up with amplifier.)

Instead of using a bass guitar string to connect each element to the speaker (as seen in fig.4), I used metal wire (see fig.6 and 7). This material was much easier to work with (the wire was easy to bend into shape, but stiff enough to successfully transmit vibrations) and produced more volume with regards to rattling and buzzing sounds.

(Fig.7 – photograph of metal contact wire from four element 'Deconstructor' touching amplifier speaker cone)



To test these developments, I produced two studies that used two different sets of contact microphones, 'Deconstructor Test 1'[23] and 'Deconstructor Test 2'[24]. 'Test 1' used four 'Schaller Oyster'[25] contact microphones (a microphone designed for use on acoustic

[23] Track 6 of 'Sound Object and Deconstructor Studies CD'
[24] Track 7 of 'Sound Object and Deconstructor Studies CD'
[25] Schaller Oyster pickup information: http://guitar-pickups.biz/hp135250/Oyster-Pickup.htm?ITServ=C71842826X140c02e2317XY7876 (link correct as of September 2013)

instruments, an example of which can be seen in fig.3) whilst ‘Test 2’ used a set of four unbranded, inexpensive Chinese made contact microphones (which can be seen in fig.6). The Schaller set produced a clear, yet particularly dark sound, whereas the Chinese made set had an exceptionally bright, almost microphonic tone that I found to be an excellent contrast to the source sounds played through the amplifier (which were always produced by a bass guitar and of high audio quality). They also picked up a greater deal of variation in sound when compared to the Schaller ‘Oysters’. Because of this, I chose to use the Chinese made microphones for future ‘Deconstructor’ performances and recordings.

The metal contact wire produced a much wider range of rattling sounds compared with the initial ‘Deconstructor’ tests. Throughout ‘Test 1’, the metal wire in combination with the Schaller microphones produced a grinding sound with metallic pulsing, which can be heard clearly between 3:25 and 3:47 of the recording. Overall, however, the Chinese made microphones recorded a wider array of sounds. For example, between 0:08 and 0:38 of ‘Test 2’, the wire vibrations created complex harmonic overtones. Between 1:25 and 1:36 and also 2:24 and 2:38, the wire produced loud percussive sounds that were markedly different to similar noises created in other studies. The metal wire and Chinese microphone combination also produced more consistent sounds that reacted well to changes in volume and timbre from the source audio (as can be heard between 3:04 and 3:47, and 4:13 and 4:44). This variation in sound was also present in a further study entitled ‘Fretless Deconstructor’[26], which used ‘E-Bow Fretless Improvisation’ (track 6 of ‘Initial Improvisation Studies CD 2’) as source audio. The range of rattling sounds was again present, with harmonic overtones present at 1:26 and a range of different sounds clearly heard between 2:52 and 4:23.

The clarity of the source audio, however, was still not present. Although I had intended to use the ‘Deconstructor’ as a device that could easily be added or removed to an amplifier

[26] Track 8 of ‘Sound Object and Deconstructor Studies CD’

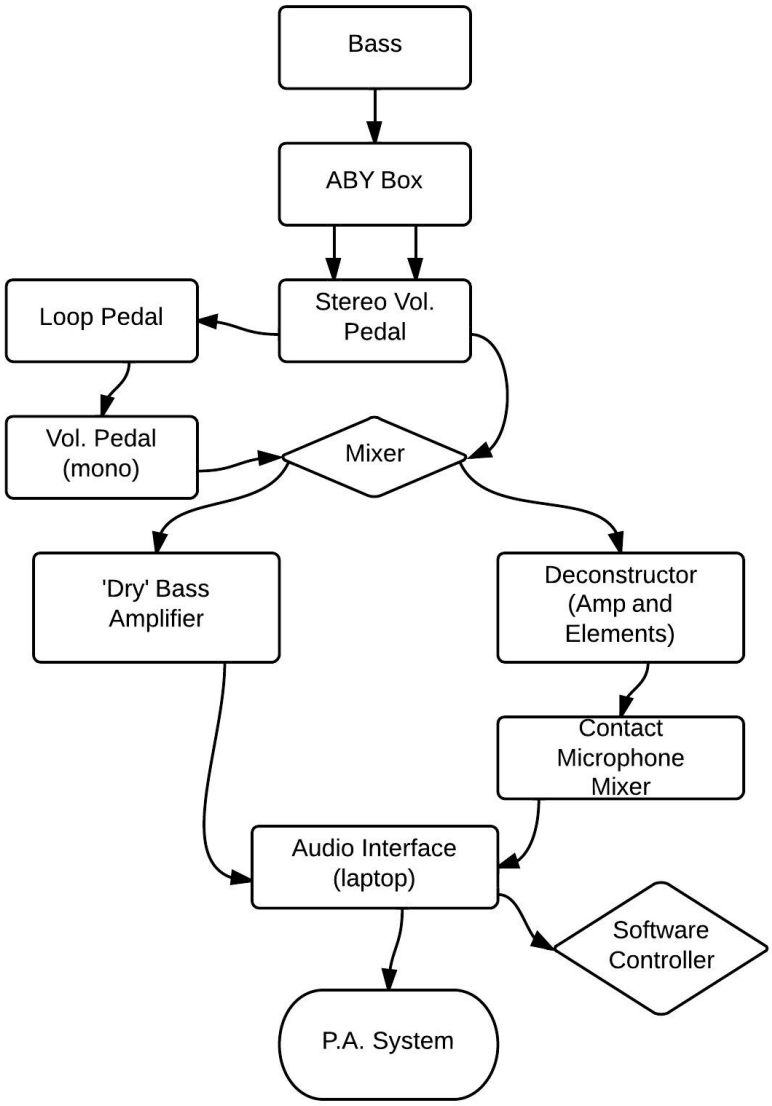
during performance, the results of the 'Deconstructor Test' and 'Fretless Deconstructor' studies formed a change in concept. Instead, the 'Deconstructor' would use its own amplifier and the bass guitar signal would be split between a 'dry' amplifier and the 'Deconstructor' itself. In other words, the device as a whole would consist of the 'Deconstructor' elements, contact microphones, a mixer and an amplifier. In order to use the device during performance, it was necessary to create an intuitive set-up that integrated the techniques, technology and methods developed during improvisation and solo performance works, as well as approaches researched throughout investigations into the bass as a sound object. As the set-up developed during the improvisation studies (volume, loop and reverb pedals with E-Bow and fretless bass guitar) was so effective, I decided to use this as a starting point. I also included software plug-ins (using a laptop running 'MainStage' and 'Logic Pro') and a USB software controller (an Akai LPD8) to add more scope for manipulation, especially with regards to the 'Deconstructor' sounds. The software controller also allowed simple blending of bass guitar sounds and the noises produced by the 'Deconstructor', with assigned knobs controlling volume, plug-in parameters and plug-in selection. To maintain clarity of sound throughout performance, I used a stereo PA system to amplify the blended sounds, a bass guitar amplifier for the straight bass sounds and the 'Deconstructor' amplifier as normal.

Deconstructed Bass

The diagram below (fig.8) shows the signal path used during a performance (at *Audiograft Festival*, Oxford, on the 28th February 2013) of 'Deconstructed Bass'[27], an important improvised piece and one of the summative works of this research project.

[27] Track 1 of 'Summative Works CD 1'

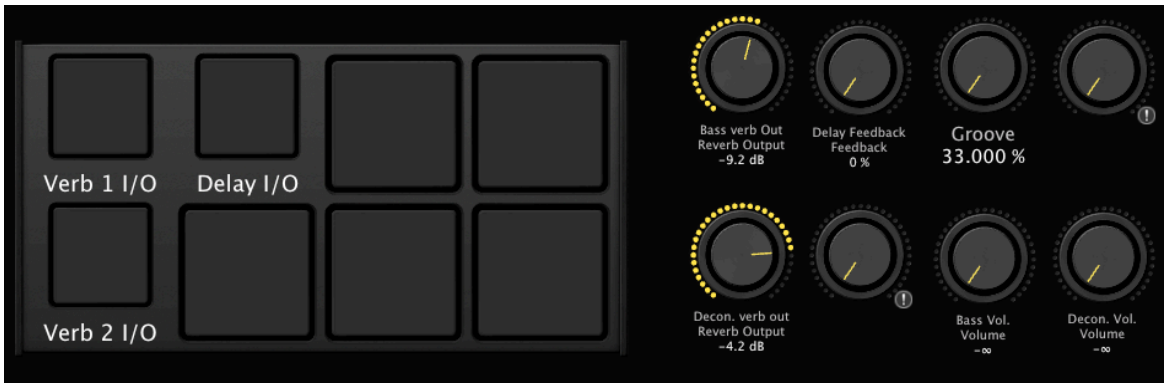
(Fig.8 – diagram of signal path from *Audiograft* performance of ‘Deconstructed Bass’)



This set-up allowed all elements of performance to be controlled easily, whilst retaining a high quality of audio signal throughout. By running two channels of bass guitar signal into a mixer, it was possible to maintain a strong and clean bass sound whilst blending recorded loop playback with real-time performance. The software controller was primarily set-up to control the output volume of the ‘Deconstructor’ and ‘dry’ bass amplifiers. During performance, it was not necessary to constantly have both sounds active, so the controller allowed simple blending or muting of sounds. It also added control over software plug-in

parameters. One of the most important aspects of ‘Deconstructed Bass’ was the creation of sounds by the bass guitar and, of course, the ‘Deconstructor’. As such, I chose to use plug-ins that did not hugely alter the original sounds, with reverb and delay being preferred to more obvious modulation or filter effects. This provided a good deal of sonic variation without masking the pure bass and ‘Deconstructor’ sounds. Using a program called ‘MainStage’, I assigned the knobs and pressure pads on the controller to different plug-in parameters using midi, as shown in figure nine below.

(Fig.9 – software controller parameter assignments from ‘MainStage’ edit screen)



Not all knobs and pads were assigned, but the set-up used provided adequate control without over complication, which could have hindered performance. The pads (on the left of fig.9) were used to quickly turn the reverb and delay effects on and off, whilst the knobs controlled other parameters, which are described in figure nine (the ‘groove’ knob controlled the delay length). The fretless bass guitar was used to create all live source audio throughout ‘Deconstructed Bass’ and the E-Bow was again used extensively to produce infinite sustain.

‘Deconstructed Bass’ was recorded at the 2013 Oxford *Audiograft* Festival and is the summative example of the work exploring the ‘Deconstructor’ device. It is an improvised work, which explores the sounds that the ‘Deconstructor’ produces in conjunction with approaches to performance developed during initial improvisation studies and

investigations into the bass as a sound object. With regards to bass guitar performance, I decided to focus on using playing techniques that produced long, smooth, sustained sounds, which would offer both contrast to the percussive 'Deconstructor' noises and also generate prolonged speaker vibrations. This aided the creation of a range of rattling and buzzing sounds, as well as reinforcing research into the expansion of the sonic palette of the bass guitar. Aside from the focus on specific sounds and the use of the 'Deconstructor', the only restriction placed on this piece was the time constraint of the *Audiograft* programme, which meant the duration could not exceed fifteen minutes.

Structurally, 'Deconstructed Bass' was very free, with an organic form created through improvisation. Although there is a clear climactic point between 7:10 and 7:30, the focus on long, sustained sounds produced a subtle framework, with sections defined by contrasting layered loops. The opening 2:45 of the piece is characterised by a loop created from long *glissandi* that are performed in the middle and low registers of the bass. This gives way to a quiet passage of high-pitched sounds that continue until approximately 3:30, where sporadic *glissandi* are superimposed along with the first 'Deconstructor' sounds heard in the piece. The *glissandi* idea is continued from 4:00 and layered with 'Deconstructor sounds, as well as 'strangled' bass guitar sounds, which are discussed in detail below. At 5:50, high-pitched material is re-introduced and looped over a short duration, resulting in a very repetitive, yet trance-like passage that is layered with 'Deconstructor' noises and long, sustained sounds up to the climactic point between 7:10 and 7:30. The penultimate section, heard between 7:50 and 11:30, focused on quiet, high-pitched and percussive sounds, some of which were created by manually moving the 'Deconstructor' contact wires and individual elements, a technique discussed in detail below. The final section (from 11:30 to the end) again concentrated on long *glissandi* sounds in conjunction with layers of metallic 'Deconstructor' noise. This free structure and the absence of instruction was effective, as it allowed improvised sounds and specific

techniques to define the direction of the work, which aided the more spontaneous exploration of the 'Deconstructor'.

As mentioned above, the majority of the sounds produced during 'Deconstructed Bass' were created using *glissandi* and E-Bow sustaining techniques. These are evident throughout the work, but are clearly heard during the opening, where the E-Bow is used to create sustained, slow *glissandi*. The 'high frequency mode' of the E-Bow also aided the production of high frequency and harmonic *glissandi*, which sounded remarkably similar to whale song when combined with reverb (heard between 8:27 and 9:00). The E-Bow was also used in an unconventional manner to create pulsing harmonics and the 'strangled' sounds mentioned above. These 'strangled' sounds (heard clearly between 3:08 and 3:20, and 4:16 and 4:24) are a variation of the E-Bow rattling technique first developed during 'Double E-Bow Session'. To create these sounds, I pressed the E-Bow against the string so that it could still vibrate, but was catching and rattling on the plastic casing of the device ('strangling' the string). The result was an effect that alternates between a percussive timbre and the usual E-Bowed bass sound and was used extensively during 'Starship'. The pulsing harmonics technique created an oscillating effect, which is heard between 2:38 and 2:58. Here, a harmonic was sounded as usual (with the left hand touching the string) using the E-Bow. I then gently depressed the string without touching the fingerboard, which created the wobbling or oscillation. The use of very short duration loops, heard between 6:15 and 7:30, also created a different effect. These short, repetitive phrases (often consisting of only part of a note) produced a pulsing, trance-like ambience that was a good contrast to the smooth *glissandi* and percussive 'Deconstructor'. The delay length knob (or 'groove' as it is described in the controller diagram fig.9) on the software controller was occasionally used to create a tape 'flutter' sounds, which is most clearly heard between 12:21 and 12:24. Volume pedal swells, changes in reverb level and general volume levels (changed using the software controller) were present throughout the work and were executed as normal.

For the most part, the ‘Deconstructor’ device was used in a similar manner during ‘Deconstructed Bass’ as it was during the explorative studies. This involved sending some or all of the clean bass and loop pedal material to the ‘Deconstructor’ amplifier and blending or manipulating the signal that was received from the contact microphones using the software controller. During the penultimate section (between 7:50 and 11:30) of the work, however, I experimented by moving, scraping and hitting the contact wires and individual wooden elements manually, instead of relying solely on speaker vibrations. The results, heard clearly between 9:04 and 9:30 for example, were a contrast to the other ‘Deconstructor’ sounds. The tapping, slow scraping and subtle vibrating noises were particularly effective during that quiet and sparse section of the work and also added a further, physical dimension to the performance itself. The usual speaker vibration method of producing sound using the ‘Deconstructor’ was first heard between 2:13 and 2:41 of the recording. Here, the slow *glissandi* created rattles and buzzes that were different to those produced using sustained bass sounds. Although there was plenty of variation in the rattling when using sustained sound (with the sound remaining on one frequency or pitch), the gradual change in pitch produced by the *glissandi,* in conjunction with the fluctuating volume, created subtle alterations in speaker vibration. These variations produced two distinct sounds. One was a high frequency metallic buzzing (an example of which can be heard clearly between 2:27 and 2:35), whilst the other was a ‘grinding’ rattle that occurred when mid-range frequencies were most prominent (for example, between 2:14 and 2:27). When superimposed, these two sounds created an effective layer of ‘Deconstructor’ noise that was evident throughout the performance.

Between 3:43 and 5:50 of ‘Deconstructed Bass’, rattling punctuated the sporadic bass entries, before *glissandi* and sustained sounds once again produced a mid-range and high frequency layered drone at 4:30. At 4:50, reverb was blended into the ‘Deconstructor’ signal, which highlighted high frequencies and also enlarged the sound overall. The

‘Deconstructor’ was particularly effective at the climactic point of the work (at 7:10), where it added an extra boost of volume and sound that provided additional impact to this high point. The sudden and sustained rattling was the loudest ‘Deconstructor’ use and the percussive, metallic sounds marked the high point of the work.

Overall, the ‘Deconstructor’ was most effectively used as a stark sonic contrast to the technique or tone-defined sounds produced by the bass guitar. Its use emphasised peaks in volume and change in timbre whilst also adding a level of complexity to the overall sonic picture. Whereas works such as ‘Starship’ (discussed below) focused on the sounds that could be coaxed out of the bass guitar itself, ‘Deconstructed Bass’ concentrated on incorporating and exploring what many (especially the majority of bass guitarists) would consider undesirable noises. The metallic rattles and buzzes are a direct opposite to sounds created by a fully functioning bass guitar and performer, yet they effectively blended with more unconventional performance techniques to produce a work that I consider to be successful. Although the ‘Deconstructor’ device was not originally devised to create the sounds that it has done, its overall development and presence in ‘Deconstructed Bass’ as both a sonic antithesis and as a technical extension or amplifier preparation has certainly expanded the sonic palette of the bass guitar. The unique, non-pitch-defined sounds that it produced also began to prove that the bass guitar could be effective within the sonic arts idiom, which is defined at the beginning of this chapter. ‘Deconstructed Bass’ also consolidated approaches to improvisation, with the methods devised during initial improvisation studies and further works proving successful throughout the piece.

Starship

The final work in this area is ‘Starship’, which can be considered one of the summative works of this research project. The inspiration and concept of the piece originated from a

free-improvisation workshop[28] that I attended at the University of Birmingham in April 2013, run by *Mopomoso* guitarist, John Russell. During the workshop, participants took part in a short performance of 'Spacecraft' (a work created originally by the free-improvisation group, *Musica Elettronica Viva*[29]), which John Russell described as an improvised performance during which members of the group imagine and create sounds that depict the noises and atmosphere of a spacecraft and crew in deep space. The original *Musica Elettronica Viva* concept may not have been exactly as Russell described, but the idea of representing the abstract sounds of a spacecraft through improvisation was particularly appealing, especially using only the bass guitar as a source of sound. *MEV*'s original concept was, in fact, more of a means to an end or a structure that could be used as a framework for improvisation. This is explained in an extract of the liner notes from the album, *MEV 40* by *Musica Elettronica Viva,* where Frederic Rzewski's (a founder member of *MEV*) concept for 'Spacecraft' is briefly discussed:

"Rzewski described one approach to free collective improvisation in his 'Plan for SPACECRAFT', an essay on MEV's first major group improvisation:

'Each performer considers his own situation as a sort of labyrinth. Each begins by making music in the way in which he knows how, with his own rhythms, his own choice of materials, et cetera, setting up some kind of simple ensemble situation, without particular regard for the others. This primitive ensemble, however, is superficial, and has nothing to do with the fundamental unity, which is the final goal of the improvisation. The secret of the labyrinth is that the way out is not forward or backwards, to the left or to the

[28] John Russell free-improvisation workshop, Elgar Concert Hall, University of Birmingham, 23rd April 2013

[29] 'Spacecraft' is track 1 of disc 1 from *MEV 40* by *Musica Elettronica Viva*, New World Records, New York, 2008

right, but up. To go up it is necessary to fly… If the magic takes over, and the music happens, the entire space and everything in it will be transformed.'"[30]

The approach I took toward developing the 'Starship' concept was similar to this idea, with the concept providing framework, inspiration and direction for improvisation.

'Starship'[31] was developed as an improvised piece for solo bass guitar that focused on the creation of a work using exclusively non-pitch-defined material (as far as possible), techniques and processes developed during previous studies and bass guitar specific sounds that did not require post-recording electronic processing or treatment. These techniques and approaches would specifically concentrate on the abstract concept of an astronaut undertaking a solo voyage into outer space, with the bass guitar producing the sounds of the spaceship or spacecraft, machinery, celestial objects and phenomena and also the thoughts and mind-set of the astronaut.

Structurally, 'Starship' is made up of three sections, with each focusing on a specific event, atmosphere or abstract idea. Below are brief descriptions and timings for each section:

Launch – this opening section of the work (the first ten minutes of recording) depicts the preparations and launch of the spacecraft. The focus of this section was to build an atmosphere of tension and expectation, with sounds focusing on engines warming up, countdowns ticking down and finally the brash, almost violent launch of the craft itself, which ends with the sudden silence and stark stillness of space. The 'Deconstructor' was also used during this section to add percussive rattling and buzzing sounds.

[30] From liner notes of digital version of *MEV 40* by *Musica Elettronica Viva*, New World Records, New York, 2008. Also available at http://www.dramonline.org/albums/mev-40-1967-2007/notes (correct as of September 2013)
[31] Track 2 from 'Summative Works CD 1'

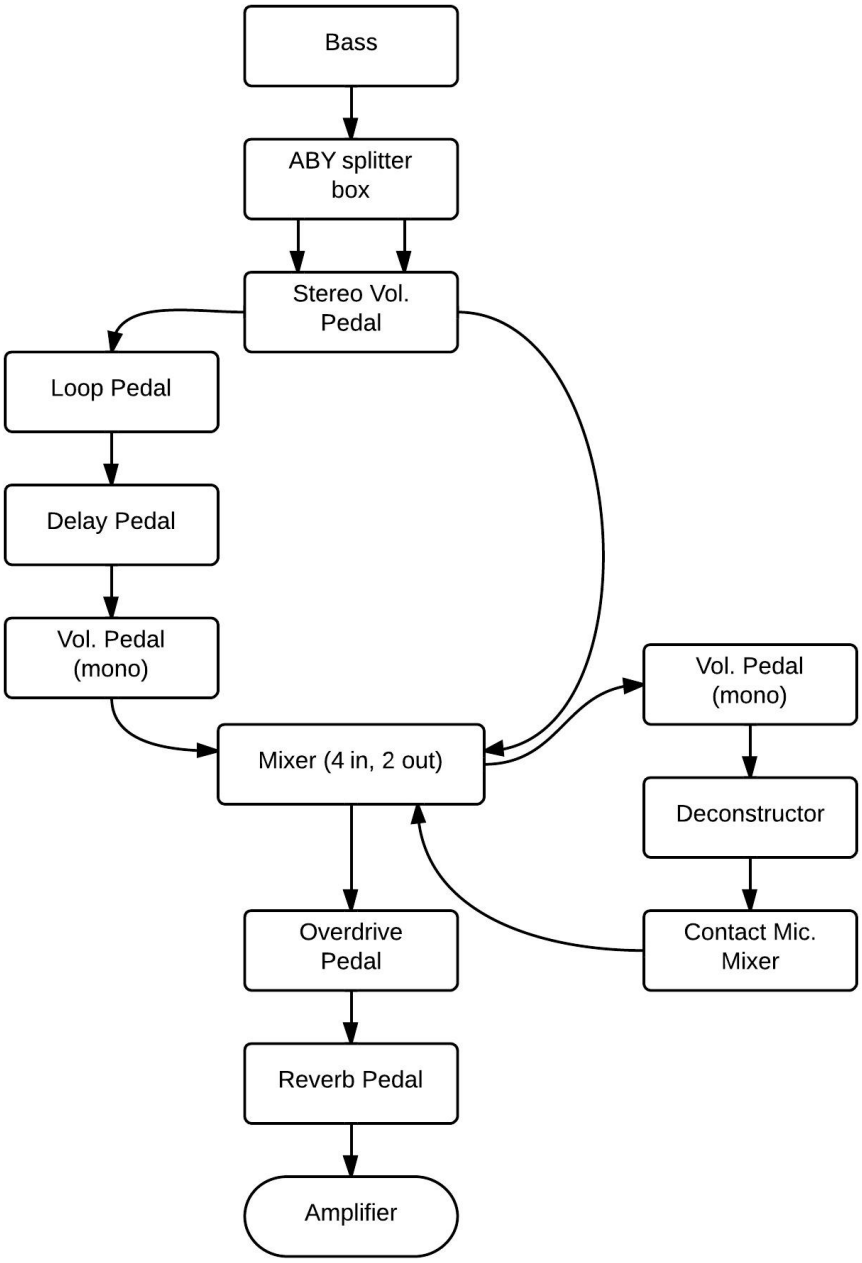
Solitude – the middle section of 'Starship' (heard between approximately 10:00 and 23:00) was intended to portray the intense solitude that an astronaut could experience whilst alone on-board a ship in outer space. Sounds focus on the repetitive, mechanical sounds of the spacecraft and the claustrophobic atmosphere of being confined inside the ship. Some ethereal sounds are also introduced, which are intended to represent both astronomical phenomena outside the craft and the isolated mentality of the astronaut.

Void – the final section of the piece (heard from approximately 23:00 to the end) depicts the deterioration of the mental state of the astronaut. The sounds heard in the previous section were developed into more haunting and uncertain incarnations, which were intended to represent the madness that can be developed through solitude. Higher pitch sounds, repetitive scraping and rattling noises and a subtle use of delay produced a otherworldly atmosphere that was intended to reflect the uncertainty and enormity of the void of outer space.

Although these descriptions inspired improvisational decisions and the atmosphere of the piece on the whole, the structure is not a literal journey, but an abstract concept devised to aid the unification of ideas.

Aside from some overdrive and 'Deconstructor' use during *Launch* and some subtle delay sounds in *Void*, all sounds were produced using a fretless four-string bass guitar, one E-Bow and loop, volume and reverb pedals. The signal path used during recording is shown below in figure ten.

(Fig.10 – ‘Starship’ signal path)



The overdrive and reverb pedals are positioned to affect the dry bass guitar, loop pedal and ‘Deconstructor’ signals, whereas the delay pedal was placed to only alter the signal from the loop pedal itself. The ‘Deconstructor’ amplifier received a line from the mixer, which was consequently controlled by a volume pedal that allowed easy blending or muting of ‘Deconstructor’ sounds. The delay pedal position allowed the dry bass guitar

signal to remain unaltered by the effect if desired and also freed the performers hands to manipulate the pedal when required (as the loop pedal constantly provided recorded playback to the delay when active). For recording purposes, a direct line was taken from the amplifier to an audio interface.

As mentioned above, the opening section of the work, *Launch*, portrays the pre-launch preparation of the spacecraft and lift-off into space. With regards to sounds and technique, the focus of this section was on the building of tension using layered loops of sustained sound, which eventually resulted in overdriven 'Deconstructor' noises that are combined with loop playback and physical, percussive playing techniques. The sustained sounds (which were always produced using the E-Bow in 'Starship') heard in this section predominately focused on superimposed low frequencies that produced a range of pulsing sounds (similar to those explored in previous studies). Although this effect is heard throughout the section as more layers are added, it can be clearly heard in the opening 1:30 of the piece. The pulsing low frequency sounds create an atmosphere of unease, which adds to the overall building of tension throughout the work. Whilst the sustained sounds make up the foundation of this section, the slow upwards *glissandi* that are introduced at 3:06 increase the tension and pressure and are intended portray the spacecraft engines warming up for lift-off. Some of the *glissandi* also make use of the E-Bow rattling technique, which is also applied to sustained sounds from 1:30. This technique was used in several pieces discussed in this chapter and involves letting the vibrating string hit against the plastic casting of the E-Bow. The result is a percussive rattling that is used throughout 'Starship'. This technique can also be altered to produce the 'strangled' sounds heard in 'Deconstructed Bass', which are employed during later sections of the work. Combining the E-Bow rattling with tuning peg *glissandi* (otherwise known as de-tuning or *scordatura*) produced a range of timbres. This is evident at 1:50 of the recording, where several layers of E-Bow rattling are combined with de-tuning to

produce a constantly changing texture within the overall sound. Again, these sounds were intended to portray the mechanical noises of the spacecraft preparing for launch.

Other percussive sounds were used throughout the work to reflect other aspects of machinery and equipment. Strings were occasionally struck with the E-Bow, which is heard, for example, at 0:59. Another percussive sound was produced by slightly reducing left hand pressure on the string, resulting in a buzzing noise as the string vibrated against the fingerboard (examples of which can be heard at 3:57 and 4:26). The most obvious percussive sounds, however, were produced by the 'Deconstructor', which is introduced at 4:45 to represent the spacecraft beginning to lift-off. The device is brought into the foreground at 5:53 to gradually add volume and impact to the climactic point of *Launch*, which occurs shortly after at 6:36. Although the loudest section of *Launch* ends at approximately 7:32 (at which point the 'Deconstructor' is muted), the 'Deconstructor' was used sporadically and subtly between 7:41 and 10:07, where it added a quiet metallic rattling to the background. The most physical percussive technique found in 'Starship' was used at 6:00, where the body and neck of the bass were struck hard with the hand. The signal from the bass was faded in using the volume pedal, which created the lurching sound that was intended to represent the spacecraft leaving the ground for the first time.

Between 4:56 and 5:35, placing the E-Bow directly on one of the bass pickups produced a distorted sound that was intended to produce an effect similar to a countdown or warning siren, announcing the imminent launch of the spacecraft. The E-Bow high frequency setting was used between 6:27 and 6:36, 6:51 and 6:59, and also after 7:32 to produce moments of stillness and a thinner texture. The first of these was intended as a moment of stillness before the explosive, overdriven launch that occurs at 6:36, whilst the second represented the overwhelming physical effects that the conceptual astronaut could experience during lift-off. This concept was repeated with the sudden drop in volume at 6:51 and the abrupt re-introduction of the overdriven launch sounds at 6:59, which were

intended to portray a brief blackout. The third moment of stillness (at 7:32) symbolises the moment the spacecraft reaches outer space, with harmonic *glissandi*, high frequency sounds and a longer reverb time reflecting the vast enormity of space and the sudden realisation of solitude.

During the second part of the work, *Solitude* (heard between 10:07 and 23:00), similar techniques were used, but with a focus on the creation of a repetitive atmosphere that reflected the abstract concept of this section (discussed above). The texture throughout *Solitude* is relatively constant, but it was important to maintain a sense of movement within the somewhat static atmosphere. This was mainly achieved through the use of the variety of sustaining techniques first heard during *Launch*. Again, the superimposition of different, sustained frequencies produced a pulsing effect, which was emphasised by the addition of volume pedal swells. This is clearly heard from the beginning of the section at 10:07, where the layering process that forms the foundation of *Solitude* was started, but it is also found throughout the work. Volume swells were also combined with slow *glissandi* to add a sense of movement to the sustained sounds. The combination of normal and tuning peg (*scordatura) glissandi* with volume swells can be clearly heard at 12:35 and 16:00, where it was particularly effective with low frequency sounds. A slow, wide vibrato technique also emphasised the pulsing and sense of movement. This technique is first heard at 10:50 and was achieved through the use of a particularly wide style of normal vibrato that varied in speed. At 14:12 and 15:00, mid-range frequency drones and *glissandi* were added, which accentuated the pulsing effect.

The E-Bow rattling technique again proved to be effective and was introduced from 12:42. The sounds it produced in *Solitude* were a contrast to the more metallic rattling noises heard in *Launch*. In the first section of the work, the rattles were intended to represent the building pressure and tension of launch preparation and lift-off, with the sounds used to portray the spacecraft at its physical limits. During *Solitude*, however, the E-Bow

technique was used to enhance the sense of movement within the relatively static section. The rattling was intended to represent the vibrations of the spacecraft engines and other parts as it moved through space, whilst the consistency of the sounds portrayed the repetitive nature of mechanical parts, such as cooling fans, pumps or air conditioning units. In the final moments of this section, other percussive techniques are employed. Dampened plucking techniques, similar to those used in 'Beyond the Neck', were used to produce the sounds heard at 21:20. The neck was muted at the base of the neck using the left hand, whilst the right hand plucked as normal. The result was dead, percussive thudding sounds that portray sudden, unknown noises from within the spacecraft.

Higher frequency sounds were again used to portray celestial phenomena and the deteriorating mind-set of the astronaut. Sporadic harmonic *glissandi* and high-pitched volume swells are found from 15:23 and 19:31, as well as the 'strangled' sounds that were used in previous works. To produce these sounds, the E-Bow was pressed on to the fingerboard so that the string had less room to vibrate. This created the choked metallic noises heard at 18:30, 19:11 and 21:50. These metallic effects also link the slow moving *Solitude* material to the more haunting and ethereal sounds heard in the third section of the work, *Void.*

During this final section (from 23:00 to the end of recording), the focus was on the production of sounds that were a departure from the static, repetitive texture of *Solitude*. Although repetition was still present and the sounds were produced from the same techniques as the rest of the work, the sonic development throughout *Void* represents a fall into madness and paranoia, with the familiar spacecraft noises (produced using the same techniques as during previous sections) morphing into new and unfamiliar guises. The overall texture throughout the final section is much sparser in contrast to the rest of the work, which was intended to mark the paranoia that the conceptual astronaut felt after the realisation of solitude. Sonically, *Void* focuses on high frequency sounds that are a

distinct contrast to the low-pitched material found throughout earlier parts of ‘Starship’. The ‘strangled’ E-Bow technique was used throughout the section to produce sustained, metallic sounds that combine with much longer reverb length to add to the uncertain atmosphere.

Overall, I was pleased with the effectiveness and success of ‘Starship’. The concept worked well as a framework for performance and the sounds produced from the bass guitar certainly represented an expansion of the sonic palette of the instrument. The overriding aim of the work was to prove that the bass guitar had the potential to produce a complex sonic picture that featured new, and hitherto unexplored, bass sounds, and it that respect it was successful. Indeed, all the works discussed in this chapter have contributed to the furthering of bass performance and demonstrate its potential as a platform for sound-based improvisation and sonic arts work. The experimental nature of the works discussed in this chapter may lie closer to the realm of performance as opposed to composition, but these pieces, in combination with initial improvisation studies, have proven the worth and potential of the instrument, both with regards to its application in non-pitch-defined music and with regards to the potential for technical and sonic expansion of the bass guitar on the whole.

4. Pitch-Based Improvisations and Scored Solo Works

This chapter discusses improvised and scored works for solo bass guitar and electronics. The scored solo works are of particular importance, due to the lack of existing repertoire for unaccompanied bass guitar in current contemporary Western art music. Aside from some works by composer Simon Lesley (*Sequenza* for bass guitar, for example) there remains scope for significant development in this area.

The absence of creative solo works for bass guitar in contemporary art music is surprising considering the abundance of expansive solo performances within popular genres. Since the 1960s, there have been a number of virtuoso bass guitarists who have revolutionised approaches to performance within jazz, funk, pop and rock idioms. Players as diverse as Les Claypool of *Primus*, Flea of the *Red Hot Chili Peppers* and John Entwistle of *The Who* have taken on leading roles within respective popular groups, and session musicians such as James Jamerson (who worked extensively for the Motown Record company, playing on records by Marvin Gaye, *The Supremes*, Stevie Wonder and countless others) and Anthony Jackson (Chick Corea, Chaka Khan, Pat Metheny, *Steely Dan* and many others) have revolutionised technique and approach to bass performance from behind the scenes. Jackson is also widely considered the pioneer of the contrabass guitar[32] (extended range 5 and 6-string basses). It is the work of virtuoso soloists that is particularly relevant, however.

Slap techniques originally pioneered by bassists such as Stanley Clarke, Larry Graham and Marcus Miller have been vastly expanded. This is particularly evident in the playing of Victor Wooten, who developed both slap and two-handed tapping. His ‘double thumbing’

[32] Jisi, C. 2008. Contrabass Conception: Anthony Jackson's Journey To 6-String Supremacy. *Bass Player Magazine*, Iss. 90301.

technique, which essentially utilises the thumb as a plectrum, sounding notes with up and down strokes, has been adopted by many and his solo bass guitar arrangements of popular songs (such as 'Norwegian Wood', originally by *The Beatles*) have expanded what is possible both technically and sonically from the instrument through integration of two-handed tapping. These techniques are demonstrated clearly in a DVD entitled *Victor Wooten Live at Bass Day 1998* and also in several online videos (such as *Victor Wooten Bass Technique* (http://www.youtube.com/watch?v=U-N54p2YlQg (correct as of October 2013) for example). Jaco Pastorius pioneered fretless bass performance and the integration of harmonics into both leading and supporting musical roles. His self-titled album, *Jaco Pastorius*, revolutionised modern bass guitar performance, with tracks such as 'Portrait of Tracy' and 'Donna Lee' demonstrating what was possible from the solo bass guitar, especially with regards to the use of harmonics in bass guitar performance. Many others have also expanded the technical palette of the bass guitar. Performers such as Matthew Garrison, Michael Manring, Richard Bona and Trip Walmsley, amongst many others, have challenged the way in which performers approach the instrument and, especially within jazz styles, have produced true virtuoso solo perfornances ('Selene' by Michael Manring, 'Duet' by Matthew Garrison and 'Mr. Pastorius' by Marcus Miller being particularly poignant examples).

Other bass guitarists have explored the use of electronics. For example, Gary Willis, Reed Mathis (of *Jacob Fred Jazz Odyssey*) and Tom Jenkinson (*Squarepusher*) all utilise effects pedals and electronic processing to produce new bass guitar sounds. Reed Mathis makes particular use of the *Digitech* 'whammy' pedal (a pedal also pioneered by bassist, Doug Wimbish), a foot-pedal controlled pitch-shifter, to produce high-pitched melodic lines, which can be heard throughout *There is No Method*[33] by *Jacob Fred Jazz Odyssey*. Tom Jenkinson and Gary Willis both produce electronic music that features the bass

[33] Track 4 of *All is One – Live in New York City* by *Jacob Fred Jazz Odyssey*, Knitting Factory Works, 2002.

guitar as a leading instrument or foundation for sound. For example, *Actual Fiction*, an album by Gary Willis, utilises a range of effects and processing whilst *Squarepusher Plays* and *Hello Everything* by *Squarepusher* features the bass guitar as the driving force behind various 'drum and bass' and electronic tracks. Jenkinson also released an album of works for solo electric bass guitar, entitled *Solo Electric Bass 1*, that features a range of solo works that utilise a 6-string bass guitar, tuned to standard guitar tuning (E, A, D, G, B, E).

Bass guitar technology has also progressed significantly. Advances in extended range bass guitars (5 to 12-string instruments with long scale necks) have increased both the range of the instrument and the performance possibilities with regards to fingerboard positions and chord voicings. On-board EQ controls allow performers to quickly and easily alter the sound of the instrument, aiding the production of a wider range of timbres and techniques (for example, harmonics can be enhanced by simply increasing the high frequency control on the instrument). Some performers have also made significant alterations to the instrument to aid performance. For example, Michael Manring developed an instrument in conjunction with *Zon* guitars (the 'Hyperbass') that integrated harp-like tuning mechanisms in both the bridge and tuning pegs. These mechanisms allow Manring to tune each string up or down a whole tone (in tone or semi-tone increments) mid-performance, expanding the range of harmonic voicings the instrument can produce. This is demonstrated throughout the album *Soliloquy* by Michael Manring, but is particularly evident during *Selene*, where the system is used to expand the range and application of natural harmonics. The 'Hyperbass' system is also explained by Manring himself in an online video, which can be seen here: http://www.youtube.com/watch?v=LWPHrRwQqVE (link correct as of October 2013).

Amplification has also undergone significant development. A new breed of lightweight and portable amplifiers (made by manufacturers such as *TC Electronic, Genz-Benz* and *Mark Bass*) has expanded the possibilities for bass performance. Bass guitarists are now able

to clearly, accurately and powerfully replicate the sounds of their instruments without the complex, large speaker and amplifier configurations that were previously used. For example, John Entwistle (*The Who)*) and Chris Squire (*Yes)* used to split their bass signal into guitar (for high frequencies) and bass (for low frequencies) amplifiers for added clarity of tone, whereas most modern amplifiers are now able to replicate this clarity without complication.

Therefore, the pieces discussed in this chapter were created to address the lack of solo bass guitar works within contemporary Western art music. By combining approaches developed in popular idioms with contemporary approaches to composition and performance, these works also explored the production of new sounds and techniques, as well as the application of methods used in popular music (such as loop technology, extended playing techniques etc.).

The improvised solo works concentrated on the creation of ambient atmospheres that were produced using pitch and rhythm-defined material, extended techniques that could be employed whilst playing the instrument in a traditional manner and electronics. With regards to method, a similar approach to 'Starship' was used, with improvisation and conceptual frameworks providing the basis for material. Ambient works such as *Apollo* and *Music for Airports* (both composed by Brian Eno, Daniel Lanois and Roger Eno), *Trance Drone* (from Trance) by Michael Gordon and certain works from popular idioms (for example, *I* by Aphex Twin, *Sequent C* by Tangerine Dream and *Ronny#1* by Octurn) inspired the concepts used for these works. It was *Apollo,* however, that particularly inspired these pieces. Brian Eno originally wrote the work as the soundtrack for a film entitled *For All Mankind* (directed by Al Reinert and released in 1989), that documented the NASA Apollo missions. The atmospheres formed by the music in the absence of

narration[34] were profound and inspired the decision to explore the potential of the bass guitar with regards to the creation of ambient, pitch-based improvisations. A 2012 version of *Apollo,* arranged by Woojun Lee and recorded by the group *Icebreaker* with guitarist BJ Cole, further inspired these works, principally due to the use of bass guitar, which is played by Pete Wilson. The pitch-based improvisations also act as a bridge between the sound-based works discussed in the previous chapter and the scored compositions for solo bass guitar.

The first of these works, 'Go Back to Sleep'[35] and 'Trepidation'[36], focused on how electronics could expand the sounds produced by the bass guitar. The pitch material used throughout was improvised, but the majority of electronic processing was applied retrospectively. 'Go Back to Sleep' features passages of recorded bass guitar, which were improvised over atmospheric material created from exclusively bass sourced material. The sustained, droning sounds that make up the texture were produced using a variety of delay and reverb effects that were applied to different bass guitar sounds (normally fretted notes, harmonics, slapped or popped sounds etc.). Conceptually, this work was intended to aurally represent the sensation of waking from a medically induced sleep and it is this abstract idea that was used as inspiration for material. Static, sustained passages represent the drowsiness of waking, whilst several interspersed busier improvised passages portray the uncertainty of returning to reality from sleep. 'Trepidation' focused on the electronic development of a simple melodic passage, which is heard in a relatively untreated manner during the first 0:32 of the recording. Using a variety of effects and modification of waveforms, the original passage was altered to produce a dark atmosphere that explored the sonic potential of bass guitar sounds. Although these studies did not expand the technical palette of the instrument (traditional playing

[34] The original version of *For All Mankind* (which was initially entitled *Apollo*) did not feature any narration, only the *Apollo* soundtrack.
[35] Track 1 of 'Pitch-Based Improvisation Works CD'
[36] Track 2 of 'Pitch-Based Improvisation Works CD'

techniques were used for the most part), the exploration of electronic processing proved useful with regards to both expanding the nature of bass guitar sounds and the use of electronics during performance.

I then produced a series of six pieces that shared a similar concept and aesthetic. These works focused on the potential of the bass guitar to produce unique ambient sounds and as such, no post-recording editing or electronic treatments were applied. A simple technical set-up was employed, with a fretless bass guitar and E-Bow, plus volume, loop and reverb pedals used throughout. Each work focused on a broad concept that was defined in the title of the piece. For example, 'Cold Outside' suggests wintery conditions and cold climate, but also implies that the performer could be inside and looking out into a cold landscape. The concepts for each of the six pieces are as follows:

'Dream of Distant Shores' (track 4 of 'Pitch-Based Improvisation Works CD') – this piece uses a dream of far away places as a conceptual framework. This simple concept resulted in a raga-like work, with elaborate melodic lines improvised over simple droning figures.

'Cold Outside' (track 5 of 'Pitch-Based Improvisation Works CD') – as mentioned above, this title suggests wintery conditions and cold climate, but also implies that the performer could be inside and looking out at a cold landscape. Long reverb lengths and high-pitched sounds produce a haunting atmosphere that also implies longing. The phonetic sound of the title also provided the rhythm for the motif that is repeated throughout.

'Mountain Reflections' (track 6 of 'Pitch-Based Improvisation Works CD') – conceptually, this work focused on the image of a gradual ascent of a mountain, eventually resulting in a beautiful vista. This piece also uses short, repeated motifs as a foundation for material and again, a long reverb produced a vast space for the work.

'Cotton Wool' (track 5 of 'Pitch-Based Improvisation Works CD') – this concept was intended to represent a feeling of safety and comfort. A short reverb and warm overall tone combined with generally consonant intervals and repeated material depicts the concept of calm security.

'Reveal' (track 8 of 'Pitch-Based Improvisation Works CD') – the concept behind this work was the revealing light or a sunrise setting. The sonic focus of the work was the creation of sounds that blossomed from contrasting timbres or volumes. This work made particularly good use of a technique that involves switching the E-Bow between 'normal' and 'harmonic' frequency modes mid-vibration (discussed below).

'Celestial' (track 1 of 'Summative Works CD 2') – this work was created in memory of a friend who passed away. It is intended to portray an otherworldly cathedral that appears vast, yet comforting. Layered repeated motifs are again used to produce an atmospheric texture.

With regards to techniques, the approach taken throughout these works was fairly uniform. Most sounds were produced using E-Bow sustained pitches and volume pedal swells, which were then layered using the loop pedal. Reverb was added after the loop pedal to create a sense of space for each work. There were some extended techniques developed during this series, however. Between 0:53 and 0:55 of 'Cold Outside', one pitch appeared to morph into another without changing position of the right or left hand. This was achieved using the 'harmonic' mode on the E-Bow, which "causes the string to vibrate with rich upper harmonics"[37]. When this mode is selected, the E-Bow produces the harmonic series of the fretted note. If the device is placed in a certain position (it appeared to be most effective when placed just over an octave higher than the fretted note, but was successful in other positions), the note fluctuates from one harmonic to another, causing

[37] from http://www.ebow.com/translate/index.php (link correct as of September 2013)

the effect heard in ‘Cold Outside’. Another extended technique was the changing of E-Bow mode during performance of a note. This is clearly heard in the opening 0:28 of ‘Reveal’. The note was sounded using the ‘harmonic’ mode and as it sustained, the E-Bow was switched to ‘normal’ mode, creating a change in timbre and a ‘revealing’ of the pitch.

I also produced an improvisation that combined both pitch and sound-based approaches. ‘Subterraneans’[38] focused on the concept of sounds created by organisms and creatures underground. Techniques that were developed during ‘Beyond the Neck’ and ‘Starship’ (such as metallic scraping sounds and non-pitched percussive plucking) were combined with the pitch-based approach used throughout the solo works discussed above, which resulted in an effective contrasting texture that was a successful combination of sound and pitch-based approaches to improvisation.

The loop pedal laying technique that has been used throughout this project again proved to be successful, with repeated motifs and sustained sounds aiding the creation of atmospheric textures. Although the sonic and technical focus of these works was not as expansive as some of the sound-based investigations, I feel that they represent an area of bass guitar performance that is yet to have its potential fully realised. There are some bass guitarists, such as Juan Alderete[39], that do produce ambient atmospheric and heavily modulated sounds using the bass guitar and effects pedals, but their work always appears within popular music or commercial and film composition. The pitch-based improvisations discussed in this chapter focused on the potential of the instrument itself, as opposed to the sonic possibilities of different combinations of effects pedals, which a lot of the popular and commercial based music concentrates on. I have also begun to explore the application of both sound and pitch-based techniques and approaches in a

[38] Track 3 from ‘Pitch-Based Improvisation Works CD’
[39] session bass guitarist who has performed and recorded with *The Mars Volta* and *Racer X* (also uses the pseudonym *Vato Negro*).

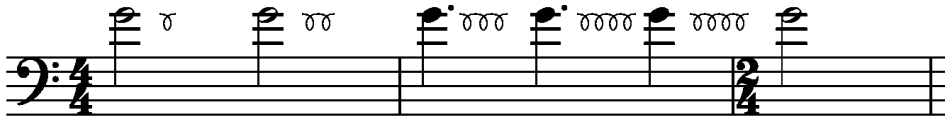
duo named *Slow Matter Duo* alongside Oxford based sound artist and guitarist, Lee Riley. A three-part work, entitled 'From the Basement, the Sky is so Blue…', is included as an appendix CD and is an example of another application of the role that I have developed throughout this research into solo improvisation. Whilst these improvisations are important works in their own right (with 'Celestial' and 'Cold Outside' being summative examples of the pitch-based works), they also acted as explorative studies and a link between improvised work and the scored pieces that are also discussed in this chapter.

The scored works for solo bass guitar can be considered an integral part of this research project. Although the majority of work in this area is focused on one summative piece, 'Kairos', the lack of solo repertoire for the bass guitar within contemporary Western art music highlights it as a hitherto unexplored area of composition. This work also explores approaches to notation, something that is discussed in more detail in chapter five.

Slip Sliding (Parts I & II) is an extended, two-part study that explores the sounds and techniques produced by the electric fretless bass guitar. Although this piece is not a key work in my investigation, I felt that this study required more in-depth discussion because of the investigation into fretless-specific writing. The first part of the piece is written for solo fretless bass and utilises several extended techniques unique to the fretless instrument such as *glissandi* of natural and false harmonics, variations of *tremolo* and wide vibrato, and other percussive sounds created from playing the bass in unorthodox fashion. The pitch material in *Part I* is derived from a simple set of twelve-tone rows. As the work is relatively short (less than five minutes), I felt there was no need for a great deal of rotation or development of the source pitch material and, although the work mainly features serialised pitch rows, some areas of the piece are less strict to accommodate investigation into technical possibilities. This work also explores the use of traditional notation with regards to harmonics, an area that was expanded upon during the composition of 'Kairos' and 'Graceful Ascent' (discussed in chapter five).

The first example of the use of extended fretless bass technique in *Part I* is found in the opening bars of the work (see appendix 3 for score). The technique is based around very wide vibrato (see fig.11). The player begins by applying normal, expressive vibrato to the sounded note. The width and rate of the vibrato are gradually increased so that they are transformed into fast *glissandi*. This technique is indicated in the score by circular motion symbols that show the increasing intensity of the vibrato.

(Fig.11 Wide vibrato/*glissandi* technique and notation from bars 1-3)



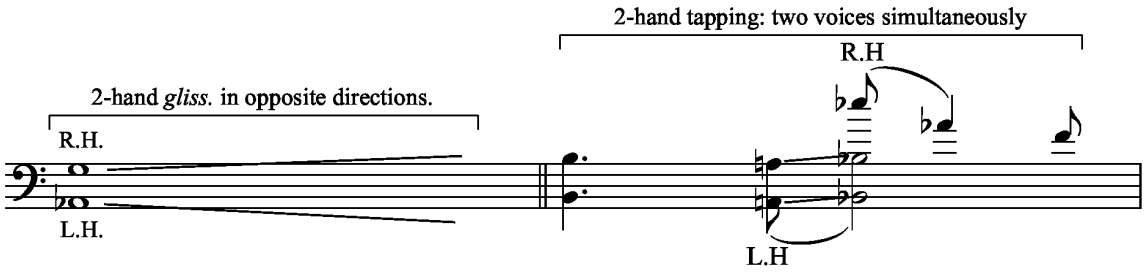
The second unusual technique is characterised by natural harmonic *glissandi* (see bars 40 and 70). Whilst it is possible to perform *glissandi* using false harmonics on string instruments it is not generally practised using natural harmonics. The technique is achieved by playing the natural harmonic whilst depressing the string in the same place as the harmonic was pitched without removing the finger from contact with the string. This then allows the player to *glissando* as if it were a normal, fretted note. This technique is particularly useful when performing *glissando* harmonic chords. As the bass guitar features an almost flat radius fingerboard, the harmonic *glissando* technique can be used on chords containing two to four notes, creating a wide range of tonal variations.

The fretless bass also allows for *glissandi* on false (or pinched) harmonics. Whilst the principle of this technique is the same as *glissandi* on natural harmonics, false harmonics can be produced from any position on the neck, presenting the player with a wider range of pitches that can be manipulated.

Another unusual technique produces percussive sounds on the bass. Whilst percussive techniques are not restricted to the fretless bass guitar, the example found in *Slip Sliding* utilises aspects unique to the fretless instrument. At bar 68, the player is asked to hit the top of the neck with the right palm and quickly *glissando* downwards (indicated by x note-heads). This produces a non-pitched, percussive 'thud' that provides contrast to the smoother *glissandi* found throughout *Part I*.

Finally, there are three other extended techniques that are not unique to the fretless bass, but add to the wide range of sounds produced in *Slip Sliding*. Two-handed tapping is a technique solely used on the guitar and bass guitar. Essentially, the player uses both hands to fret notes in a manner similar to playing a keyboard or piano. This allows for wider ranged chords, the ability to play more than one line of music on one instrument and, in the case of the fretless bass, *glissandi* in both directions simultaneously (see figure 12 below for examples).

(Fig.12 Examples of two-hand tapping.)



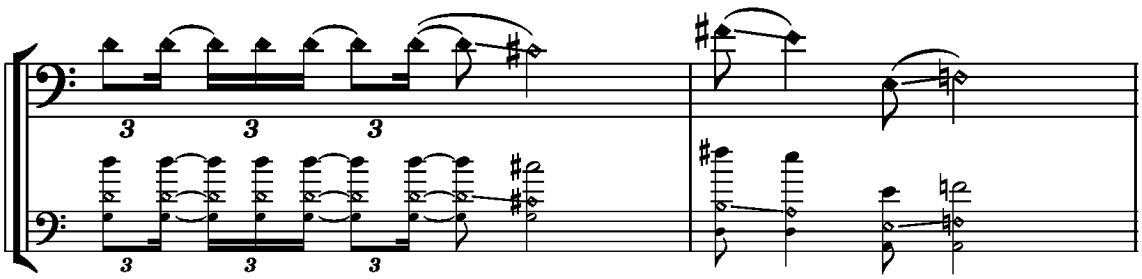
Another technique unique to guitars and basses is the use of the fingernail to produce a tremolo. This is essentially a variation on the flamenco guitar *rasgueado*, where the player uses combinations of fingernail, fingers and thumb to create complex strumming patterns. The example found in *Slip Sliding* is a much simpler method where the player moves the fingernail and finger back and forth to create a tremolo that has uneven tonal

characteristics. In this work, it is used in combination with the false harmonic *glissando*, which creates added overtones due to the uneven nature of the tremolo technique.

The last special effect to discuss is the quartertone *glissando.* This technique is utilised throughout modern classical music on many instruments, but it is easiest to produce on string instruments that have no frets. Whilst not uncommon it does help extend the pitch material in *Slip Sliding* and combines well with the *glissandi* harmonics used throughout.

Harmonics are notated using both diamond note heads and traditional harmonic notation (with note heads indicating where the string should be depressed and touched, as well as showing the sounding pitch) in an ossia staff (see fig.13). Although this method is clear when reading or practising the score, it is not immediately obvious during performance. As such, alternative means for notating harmonics were developed during later works, 'Kairos' and 'Graceful Ascent'.

(Fig.13 – harmonic notation during *Slip Sliding (Part I)* (from bars 70-71))



Slip Sliding (Part II) is an electro-acoustic reflection on the material and techniques found in *Part I*. This electronic piece uses motivic and rhythmic ideas found in *Part I* in combination with other recorded fretless bass material to expand on the varying techniques and sonorities produced by the fretless instrument. The majority of the recorded material used for *Part II* is made up of various *glissandi*. As these slides are the

main characteristic of the fretless bass, I thought it best to explore the sonic qualities of that specific sound. This piece is intended as an accompaniment to *Part I* and, ideally, should be played following the first work, although the two pieces can be played separately.

Kairos

The summation of my work for solo bass guitar is 'Kairos', a piece for five-string bass guitar and electronics. Kairos is a Greek word meaning 'a propitious moment for decision or action'. This was an apt title as the structure of the piece is based around the events, actions and thoughts of a person and the surrounding environment during different periods of one day. The form is broken down into the following sections:

Arise (from the opening electronic section to bar 16 of the score) – this section depicts awakening from a dream to the sounds of early morning. The slow, reflective bass guitar material based on harmonics portrays the person rising, whilst the electronic section represents the sounds of early morning and the atmosphere of the dream.

Morning (bars 17 to 31 plus electronic section two) – here the bass material gains some momentum, reflecting the actions of morning (breakfast, getting dressed etc.). The electronic section reflects upon the slow moving opening of the work.

Grind (bars 32 to 100 plus electronic section three) – the third part of the work portrays the repetitive nature of a stereotypical office job. The person has moments of daydream and escape (reflected in soloistic, improvisatory like passages), but the looped 5/8 section ties the bass material down.

Escape (bars 102 to 212) – this section depicts the escape from work. Repetitive phrases and rhythmic material, combined with a busy and complex textured electronic section portray an overly dramatic getaway and, eventually, relief at a successful escape. Unstable, repetitive rhythms create an edgy atmosphere that also reflects the tension of this section.

Night (bars 213 to 259) – this fifth section portrays the freedom of the evening, with thoughts of the person slowly moving away from work. This is represented through development of the original 5/8 section, which represents the separation from work.

Rest (electronic section five plus bars 261 to 285) – this part of the work depicts the person unwinding and relaxing. The electronic section conveys comforting sounds of rain and a fireplace, whilst the slowing bass material reflects rest.

Still (electronic section six plus bar 287 to the end) – this section represents sleep and the return to dreams. The slow bass guitar returns to material heard in the opening of the work and gradually fades to nothing as the day ends.

This form was inspired by a work called *The Book of Hours*[40], written and recorded by saxophonist Patrick Zimmerli and a Belgian group named *Octurn*. The work is presented as eleven tracks on an album, with each part named after a time of day (Dawn, Afternoon, Dusk etc.). Although the piece itself is not musically similar to 'Kairos', the structural concept and the instrumental line-up of *Octurn* (two bass guitars are used throughout the work) were particularly inspiring. The combination of electronics and scored material was also inspired by another work named *Book of* Hours by Julian Anderson, during which instrumental material is juxtaposed by striking electronic sections. What was inspiring about this work was that the sections combined very well throughout, despite being very

[40] *The Book of Hours* by Patrick Zimmerli and Octurn, Songlines, 2002.

different in their aesthetic. This was a contributing factor that led to the use of heavily processed electronic material during ‘Kairos’.

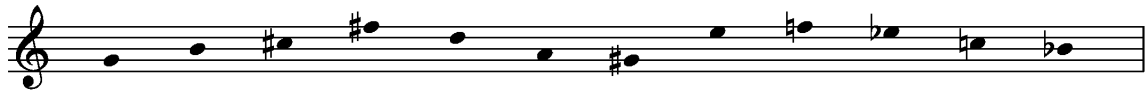
Throughout ‘Kairos’ the bass guitar represents the actions, thoughts and reactions of a person throughout one day, whilst the electronic material represents the environment and subconscious thoughts and interactions between the person and others. All the electronic material was created from bass guitar material (specifically material from the ‘Kairos’ bass part) and recorded sounds from relevant parts of the day (dawn sounds for *Arise*, evening sounds for *Night* etc.). Each electronic section either pre-echoes or reflects upon the bass guitar material that precedes or follows it. For example, the opening electronic section used pitches and sounds heard in the opening bars of the bass part as a source for the processed material, whilst electronic section three features heavily processed versions of the 5/8 passage found between bars 32 and 41. Another example is the use of the theme notes (discussed below) to produce the sixth electronic section. The theme is first heard in unaltered format in the final section of work and the preceding electronic section pre-echoes this melody in a manner that is similar to the chorus in ancient Greek theatre. The recorded field sounds were also layered into the electronic sections to ease playback during performance. Processed sounds of whispering voices are also present throughout the electronic sections. Although the meanings of the words are not vital conceptually to the work, all the whispers are sayings relating to the concept of time (‘no time like the present’, ‘there’s not enough time’, ‘time to go’ etc.). This represents the thoughts of the person portrayed in the piece, with time, or lack thereof, being such a focus of modern life.

The use of field recordings was inspired by studies I undertook that explored the spatial sounds of bass guitar performance. During investigations researching the bass as a sound object, I explored the process of recording the following: unamplified sounds of the bass; physical sounds of effects pedals and playing techniques; sounds of bass performance from other locations (for example, recording performance from another

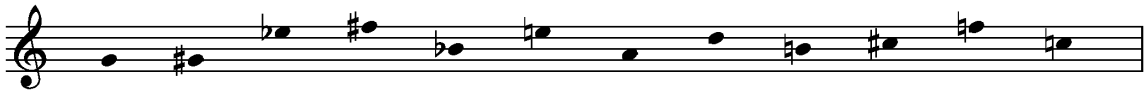
room). ‘Under Desk Field Recording’[41] explored the unamplified sounds of the bass and effects pedals by placing a field recorder next under a desk in the room I was working, whilst ‘Field Recording No.1’[42] and ‘Field Recording No.2’[43] investigated the process of recording performance from another room. Although the processes used in these studies were not employed during other works, the presence of ambient and spatial sounds during recording inspired the use of ‘field’ sounds throughout ‘Kairos’.

Pitch material throughout ‘Kairos’ is derived from two sets of tone rows, of which the prime versions are shown below in figures 14 and 15.

(Fig.14 – prime version of first set of twelve-tone rows from ‘Kairos’)



(Fig.15 – prime version of second set of twelve-tone rows from ‘Kairos’)



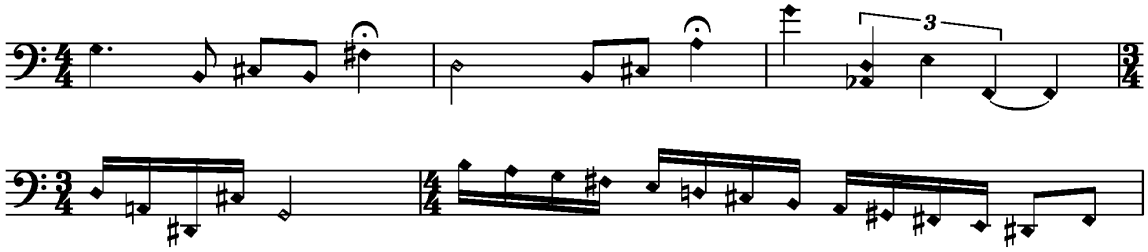
The first set of rows was used in sections of the work that were more relaxed in approach to pitch structure, for instance during the *Arise* or *Rest* sections. These rows were also used to create the soloistic material that is performed over looped sections. For example, the melodic line played between bars 66 and 90 uses the first set of rows as a basis for material, but does not follow the order strictly in order to produce an impression of improvisation. The second set was used to create passages that were stricter in method,

[41] Tracks 1 and 2 of ‘Field Recording Studies plus 'Slip Sliding (Part 2)' CD’
[42] Track 3 of ‘Field Recording Studies plus 'Slip Sliding (Part 2)' CD’
[43] Track 4 of ‘Field Recording Studies plus 'Slip Sliding (Part 2)''

such as the *Grind* and *Escape* sections. This set of rows also aided the representation of actions, thoughts or environments that were more restrictive. For example, stricter pitch order was used between bars 32 and 41 to reflect the idea of being stuck inside an office. Both sets of pitches were transformed to create inverted, retrograde and inverted retrograde versions. As two sets of rows were produced, no further rotations of transformations were applied.

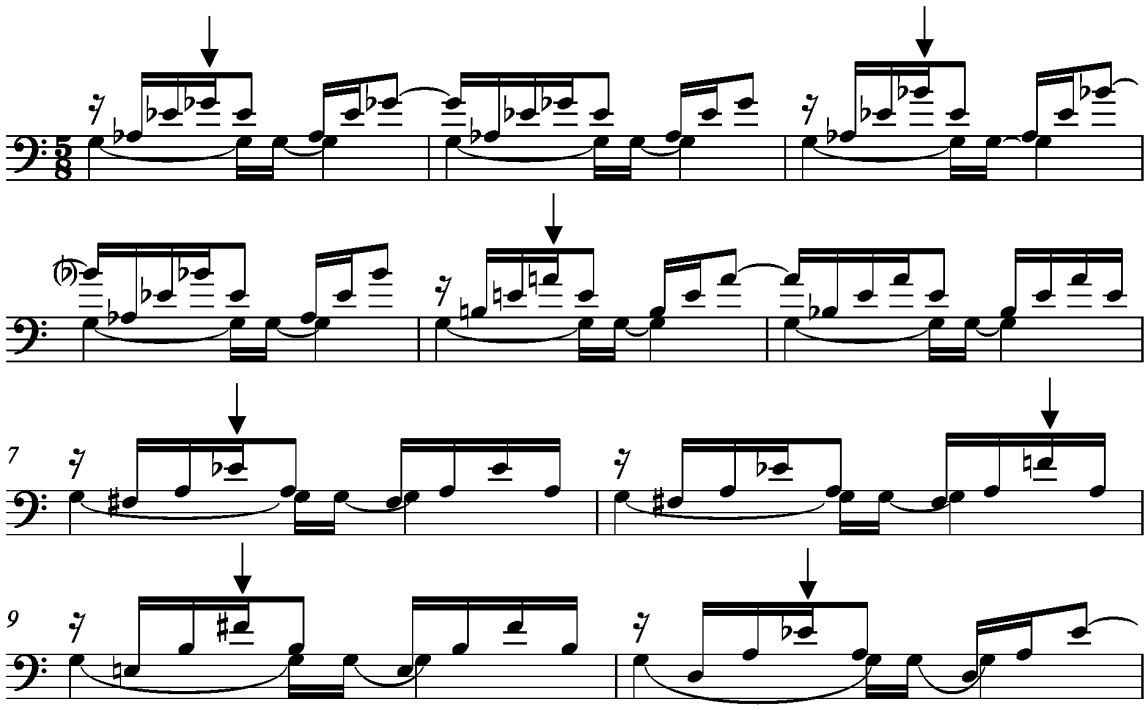
Another example of the freer approach to pitch structure can be seen in the first 16 bars of the work. Here, the pre-composed order of the pitches was largely ignored to make full use of natural and false harmonics. This aided the exploration of the instrument and allowed harmonics to ring out without interruption of other elements of performance.

(Fig.16 – pitches from bars 2 to 6 from 'Kairos')



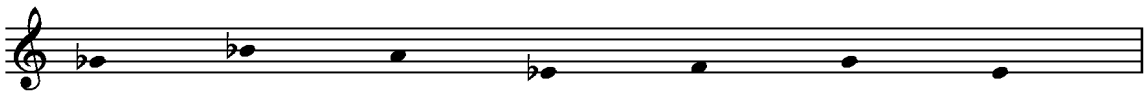
The second set of rows was used to compose the more repetitive and strictly ordered material that is predominately found in the *Grind* and *Escape* sections. These rows were also used to write the passage of material found between bars 32 and 41 (fig.17). This passage is structurally very important to the work as a whole, as much of the rhythmic and melodic material developed throughout 'Kairos' originates form it. This is most obvious with regards to the 3+2 rhythm that is heard throughout 5/8 sections of the piece, which is used extensively between bars 145 and 256 for example. As shown in figures 17 and 18, a melodic theme was also created from this passage.

(Fig.17 – bars 23 to 41 from ‘Kairos’)



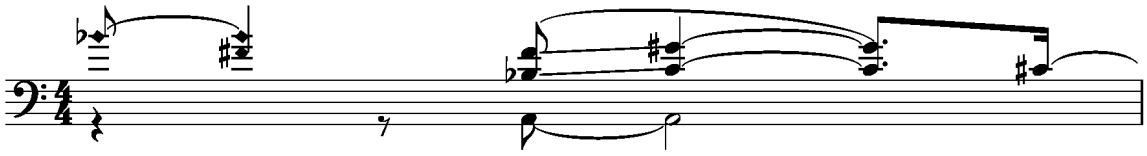
The top note from each phrase within the section shown above was taken and a theme (shown in figure 18) was created.

(Fig.18 – theme created form 5/8 section)



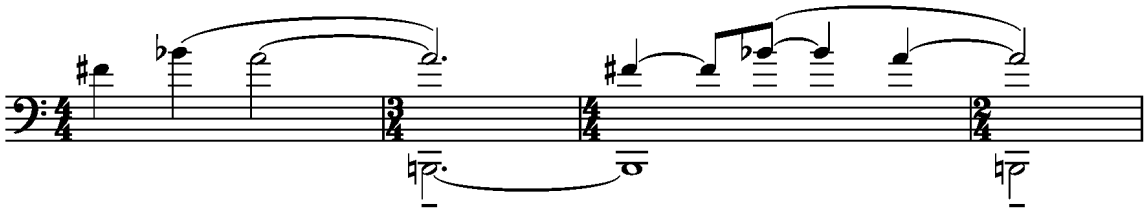
This is present throughout the work in various forms. It is first heard at bar 17 of the work (fig.19), where three of the theme notes are used. The melodic direction and intervallic content of the motif were altered to fit within this phrase.

(Fig.19 – first use of theme notes in ‘Kairos’ (bar 17))



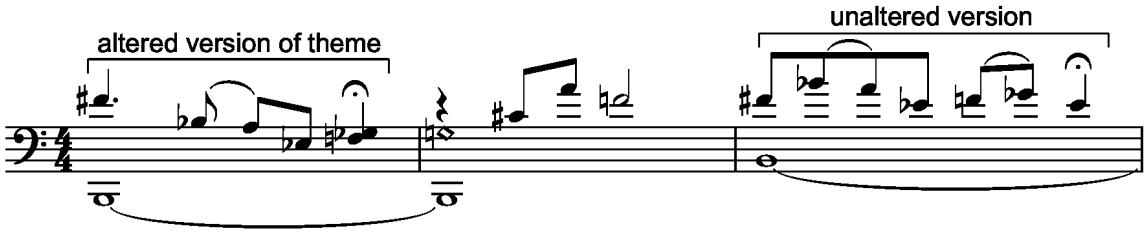
The theme is also clearly sounded between bar 22 and 25, where the first three notes of are repeated.

(Fig.20 – use of theme notes at bar 22 to 25 of ‘Kairos’)



The only point where the theme is presented in unaltered form is during the final section of the work. Between bars 287 and 289 (fig.21), a developed version of the theme gives way to a clear, unchanged version in bar 289.

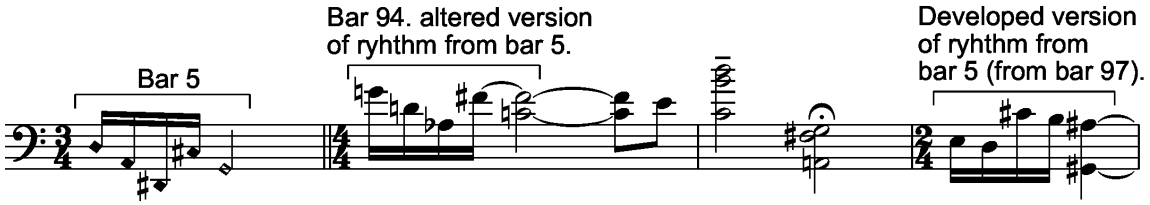
(Fig.21 – unaltered theme from between bars 287 and 289 of ‘Kairos’)



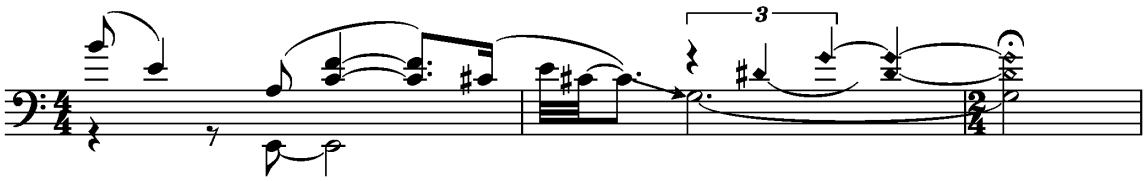
Other melodic and rhythmic development was essentially based around the 5/8 passages found between bars 32 and 41, and the opening 21 bars of the work. For instance, bars 91 to 100 were developed from the opening of the work. Rhythms seen in bars 92, 94 and 97 are developed versions of those found in bars 5 and 17 (see fig.22) and the string bend in bar 99 is an echo of that heard in bar 15. Similar developments can be found

between bars 261 and 285, with the section from bar 275 and 282 an altered version of material at bars 17 to 18 and bars 26 to 30 (see figures 23 and 24). The harmonics passage and slow material at the end of the work (bars 283 to the end) is also a clear development of the opening section of 'Kairos', with similar intervals, rhythms and pitch material used.

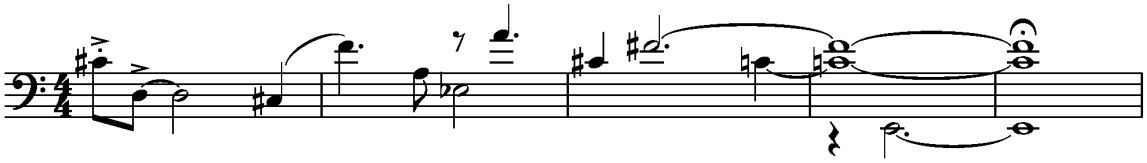
(Fig.22 – examples of motivic development of opening section)



(Fig.23 – developed version (from bars 275 – 277) of material from bars 17-18)

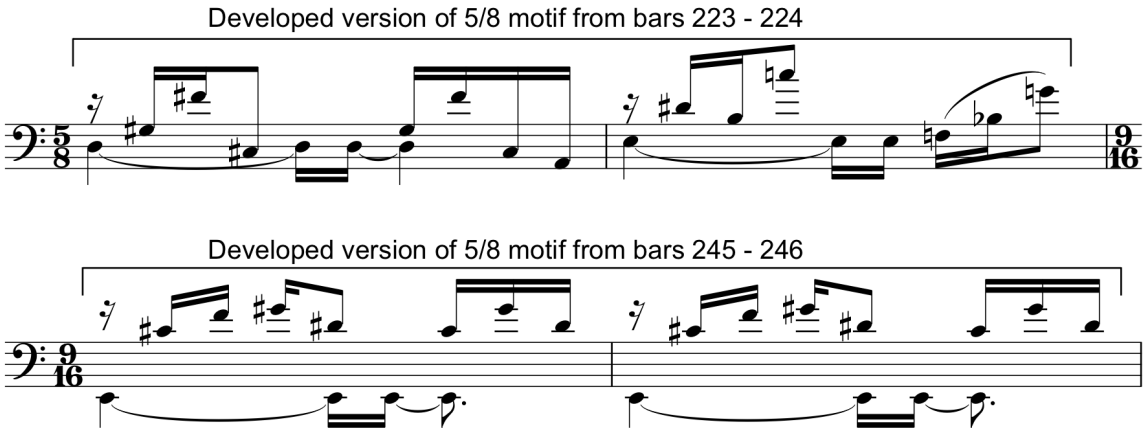


(Fig.24 – developed version (from bars 278 – 282) of material from bars 26 – 30)

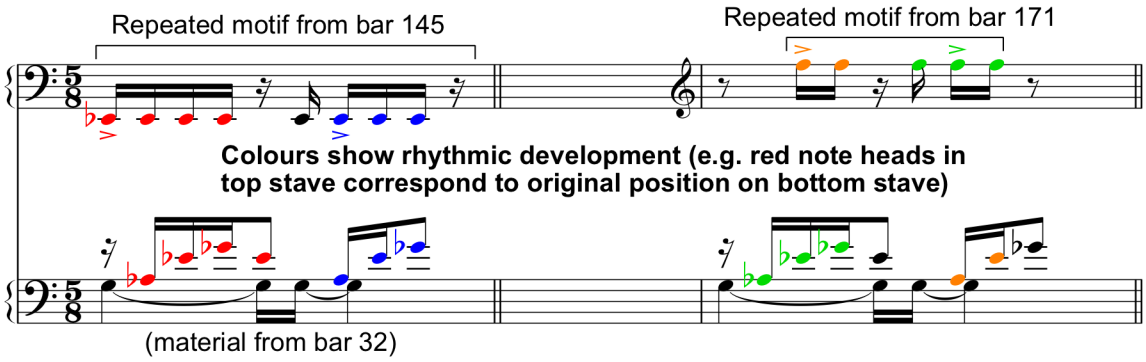


All the material found between bars 213 and 259 was developed from the original 5/8 passage, first seen between bars 32 and 41. The whole section is essentially an extended and version of the original material and is made up of various developed incarnations of the 5/8 motifs (see fig.25). The original 5/8 section was also used as the basis for all looped passages. This is most obvious from bar 145 (see fig.26), where the juxtaposed rhythmic motifs all make use of the rhythms first seen between bars 32 and 41.

(Fig.25 – examples of 5/8 motif development from bars 213 – 259)

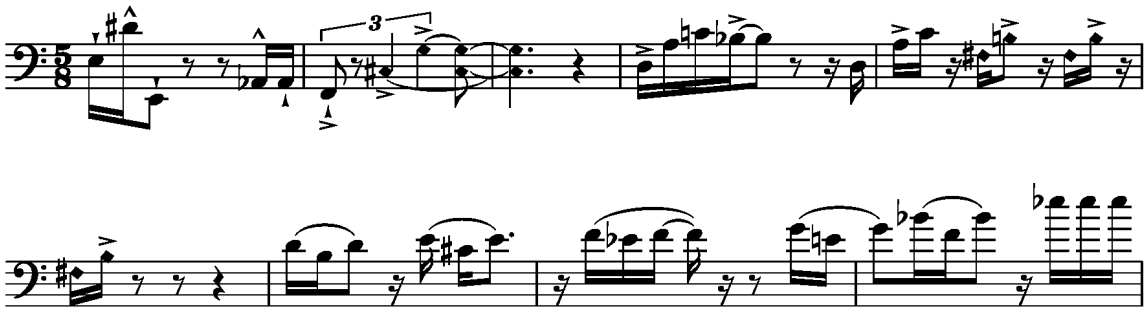


(Fig.26 – rhythmic development of 5/8 passage)



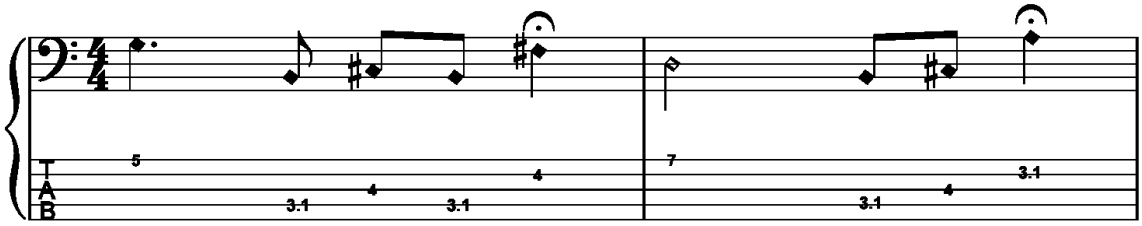
Some material found in ‘Kairos’ is developed with an improvisatory aesthetic in mind. Although the material still uses pitch rows and established rhythmic motifs as a basis, the melodic lines that are juxtaposed onto the layered loop sections (top stave between bars 66 to 89, 114 to 143 and 179 to 212) all take an open approach to pitch order to achieve an impression of freedom (see fig.26).

(Fig.26 – example of free approach to pitch order from bars 187 to 195 (top stave))



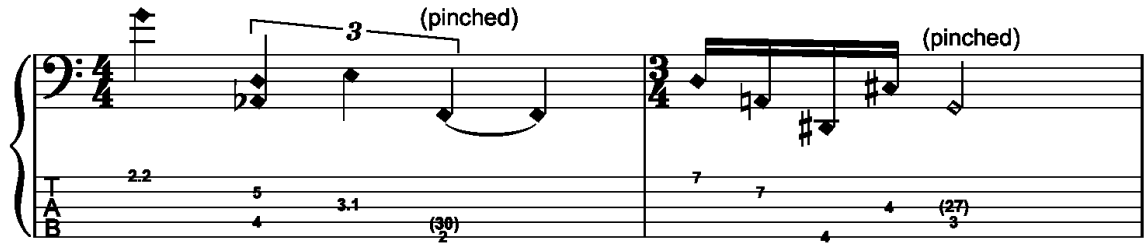
One of the key aspects of ‘Kairos’ was the notation of bass guitar material. Although this work does not feature a plethora of extended playing techniques, it was important to be as clear as possible with regards to how certain passages of the piece should be performed. This is most obvious with regards to the notation of harmonics. In contrast to the traditional method used in ‘Slip Sliding (Part I)’, a combination of traditional notation and tablature was applied. Tablature is a simplified, guitar-specific notation that indicates the string and fret number of the desired note. When used in tandem with traditional notation, it was possible to clearly indicate the sounding pitch and where the harmonic should be performed. The tablature also allowed specific positions of natural harmonics to be indicated. For example in the bar 2 of the work, the score indicates that the performer should play a natural harmonic by touching the E-string at fret position ‘3.1’, which is the position of the sixth in the harmonic series (sounding a perfect fifth higher than the fundamental pitch). Throughout ‘Kairos’, a diamond note head indicates a harmonic sounding two octaves higher than the written pitch. This is shown clearly in the opening bars of the work, along with the notation of the fret-specific locations of natural harmonics (fig.27).

(Fig.27 – example of natural harmonics notation from bars 2 - 3 of ‘Kairos’)



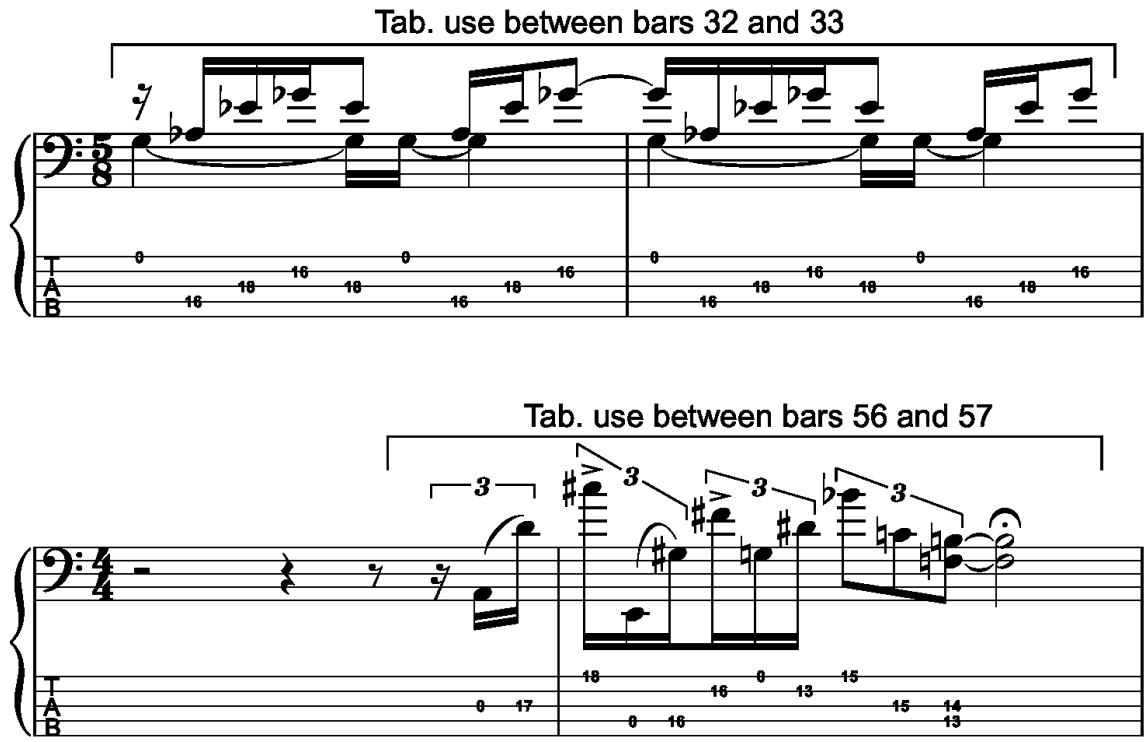
A slightly different method was used to notate false (or pinched) harmonics. When writing for guitar or bass guitar, it is common to use the term ‘pinched’ harmonic in place of ‘false’ harmonic. This is because of the technique used. When performing a false harmonic on a string instrument (the cello for example), the performer would depress the string using the left hand at the location of the fundamental pitch, touch the string with another finger of the left hand and sound the note using the bow or fingers of the right hand. Whilst the concept is identical when playing the guitar or bass guitar, the technique is often somewhat different. It is more common for the performer to depress the string with the left hand as normal, but use the thumb of the right hand to touch the string and the index or second finger (or a plectrum) of the right hand to sound the note, creating a pinching motion (hence ‘pinched’ harmonics). This is notated in a similar manner to the natural harmonics, but a second fret number is included in brackets in the tablature staff. This indicates where the performer should touch the string with the right hand thumb. This is clearly shown in figure 28, where the word ‘pinched’ is also included for clarity.

(Fig.28 – notation of false (or pinched) harmonics from bars 4 – 5)



Tablature was also used in sections of ‘Kairos’ where there is only one way of performing a particular phrase correctly. This is clearly seen between bars 32 and 33 or between bars 56 and 57 (see fig.29). The tablature staff can also be considered as a suggestion, should the performer feel there is a more efficient method of performance.

(Fig.29 – use of tablature to indicate correct performance)

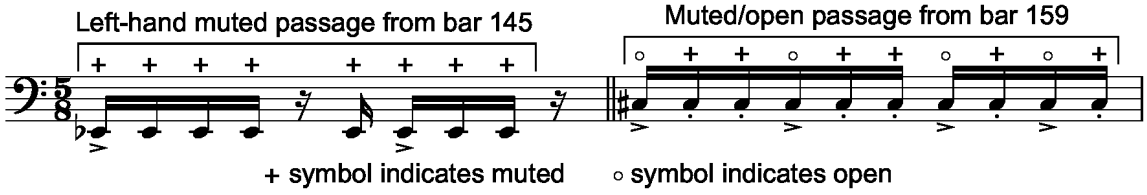


Slurs throughout ‘Kairos’ indicate the use of ‘hammer-on’ and ‘pull-off’ techniques, as well as traditional phrasing. A ‘hammer-on’ is the sounding of a note without using the right

hand. The performer strikes the note with the left finger in a hammer motion, hence ‘hammer-on’. A ‘pull-off’ is essentially a left hand *pizzicato* technique. Combinations of these two techniques produces legato passages and can also aid the performance of particularly fast sections. Although not an advanced technique, it is the method used by guitarists and bass guitarists to perform legato phrases.

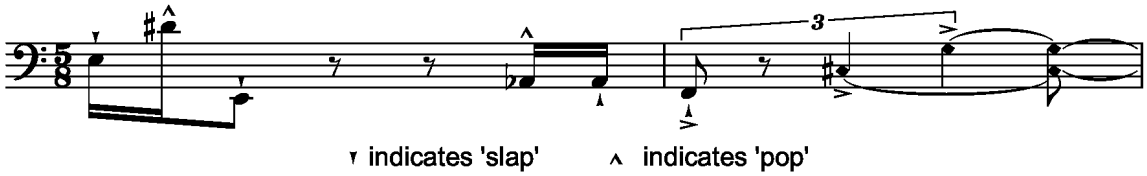
A further technique used in ‘Kairos’ was left-hand muting. This is heard from bar 145 to 212 and is indicated using crosses and circles in a manner similar to that used to denote the open and stopped bell techniques employed on the French horn. This muting technique allowed muted notes, which would normally be dampened using the right hand ‘palm muting’ technique (where the fleshy, flat side of the right hand is placed across the strings near the bridge to produce a deadened sound), to be performed in quick succession, something that can be hindered with ‘palm muting’. The combination of open and muted notes also enhanced rhythmic patterns, as can be seen from bar 155. This technique is indicated using the methods shown below in figure 30.

(Fig.30 – examples left hand muting notation)



The common ‘slapping’ and ‘popping’ technique was occasionally used in ‘Kairos’, at bar 187 for example. This creates a percussive timbre that is achieved by ‘slapping’ (or striking) the string with the right thumb and ‘popping’ (‘Bartok *pizzicato’*) with the right fingers. It is indicated in the score using the notation shown in figure 31, with a ‘*staccatissimo’* symbol indicating a ‘slap’ and a ‘*marcato’* symbol indicating a ‘pop’.

(Fig.31 – ‘slap and pop’ notation from bar 187 – 188)



Other techniques, such as left hand *pizzicato* and string bends, are found throughout the work and are indicated clearly in the score. These methods are fairly straightforward and do not require in-depth discussion.

Another aspect of notation that was developed during ‘Kairos’ was the scoring of the layered loop sections. In order to provide a point of reference for the performer during loop playback, the layered material is displayed in an ossia staff below the main bass guitar line in a similar fashion to the tablature stave. Loop pedal use (recording, playback etc.) was indicated using simple arrows and brackets. Although this was not an incredibly detailed method of indication, it offered clear and intuitive information to the performer in a straightforward fashion. This notation is clearly visible between bars 102 and 143, as well as between bars 159 and 212. A similar approach was taken with regards to electronic section playback. Ideally, the performer would have the means to stop and start playback using a foot controller (which can be linked to a simple sampler or sample software), but it is perfectly acceptable to control playback using other means, such as a CD player or a second person. Timings are given for each electronic section so that the performer can easily gauge playback control and bass guitar entries.

Aside from control of electronic sections and the use of the loop pedal, the technology used throughout ‘Kairos’ was straightforward. The five-string bass guitar provided increased range with the added low B string and a 24-fret, two-octave neck. The on-board EQ also allowed quick and easy alteration of tone, with high frequencies boosted during performance of harmonics to increase clarity for example. Choice of amplifier was

important. Many bass guitar amplifiers (such as the popular *Ampeg*, *Marshall* and *Mark Bass* brands) colour the sound of the instrument, resulting in a tone that is often not as clear and precise as it should be. Of course, a degree of warmth is required to produce a useable, musical sound, but too much tonal colouration can affect the overall impact of the written material. As such, I used a *Genz-Benz Shuttle 6.2* amplifier with a matched 12-inch speaker cabinet (12 inches being the size of the speaker, not the cabinet) during performance and recording of 'Kairos'. This amplifier consistently replicated the subtle nuances and changes in timbre produced by the variety of techniques and also retained the natural sound of the instrument throughout.

Overall, the composition of 'Kairos' has placed the bass guitar within a role that was, according to my literature survey, hitherto unexplored in contemporary Western art music. Although the instrument features in several modern works, the use of the bass and electronics to produce a solo work is, in many ways, a new endeavour. By merging performance methods pioneered by modern virtuoso bass guitarists (such as Victor Wooten, Matthew Garrison and Gary Willis) with aesthetics and approaches that are prevalent in contemporary Western art music (such as the serialisation of pitch, detailed scoring and atonality), I have realised some of the potential that the instrument has with regards to expansion of the role and sonic and technical palette of the bass. I believe that, with the right exposure, 'Kairos' and future works like it can challenge the perception of the bass guitar and go some way to incorporating it into the regular instrumental arsenal of the modern composer.

5. The Bass Guitar with Ensemble

This chapter discusses scored works for bass guitar and ensemble. The focus for these pieces is the integration of the bass into more familiar contemporary instrumentation and the composition of parts that move towards establishing the bass guitar as an equal to acknowledged orchestral instruments. I have not approached these works as concertos or virtuoso displays, rather as works that aim to incorporate the bass into instrumental line-ups as an equal and as an important part of the overall sound.

Although use of the bass guitar as part of an ensemble is an area that has been explored within contemporary Western art music, the instrument has still not had its potential fully realised. It is often used as a novelty or for one particular sound, and individual parts are frequently devoid of the detailed technical information (with regards to extended techniques, timbral subtleties etc.) one would expect from works within contemporary art music. For example, Harrison Birtwistle uses the bass guitar in his opera, *The Mask of Orpheus.* The instrument fills the low frequencies in the absence of a string section and is used almost like an electric harp, punctuating chords with punchy sounds. Although it is effective, one cannot help but notice the lack of development with regards to the bass part itself. Similar instances occur in works such as *Hoketus* by Louis Andriessen and *Principia* by Steve Martland. Although it is clear that the instrument is used for a specific sound or effect (specifically the punchy attack synonymous with the bass) and that development of the bass guitar is not a focus of these works, the bass still parts remain relatively undeveloped with regards to technique and timbre.

Other works, however, do use the bass guitar more creatively. *Sub Merge* by Colin Riley, *Atomic UFO Saves the Day (Again)* by Giel Vleggaar and *dB* by Sam Hayden all feature more expansive bass parts for example. The issue with these works is that, with the

exception of *dB*, they are all concertos of some form. Whilst this is not a negative, it highlights the fact that there is a significant lack of bass guitar repertoire that features the instrument as an equal and important part of an ensemble. Often, the works that do integrate the bass in a more complete fashion do so because the bass guitar is an important part of an ensemble that has commissioned the piece. For example, *Yo Shakespeare* and *Trance* by Michael Gordon were both commissioned by *Icebreaker*, an ensemble that incorporates the bass guitar as a vital part of its sound. These works are written to the strengths of the ensemble (as one would expect from a commission) and feature the bass guitar as a driving force behind a minimalist aesthetic. A similar point can be made about *Atomic UFO Saves the Day* and *Sub Merge*. Both were written with a specific bass guitarist in mind (Mark Haanstra in the case of the Vleggaar piece, and Pete Wilson with regards to the Riley) and, as such, feature stylistic and technical aspects that are most likely encouraged by the specific performers. Although the relationship between composer and performer, especially with regards to concerto format pieces, is vital, it does not necessarily result in works that are accessible to all players. Concertos by their nature are virtuosic displays and this is not conducive to the creation of works that integrate the instrument as fully as possible into an instrumental line-up.

Another issue highlighted by the initial literature survey was the lack of a consistent notation convention for bass guitar. From the cross section of works analysed, there is a variety of approaches. One is to notate the bass part in the same traditional manner as other established instruments, as can be seen in *Atomic UFO Saves the Day (Again)* by Giel Vleggaar and *dB* by Sam Hayden. The bass guitar part throughout *dB* is complex with regards to both rhythmic and melodic material, but everything is notated in a very clear and traditional fashion (see appendix example a). Although the part is not obviously a bass guitar part from first glance, it is idiomatic of the instrument. There is, however, room for interpretation in the score. For example, Hayden specifies '+ distortion/compressor' at bar 2 of the work and occasionally simply indicates that the

performer should ‘improvise’ (bar 1 and 7 for example). In the performance note, he adds more detail, stating that the compressor is to be used for ‘sustained sections’ whilst the distortion should be ‘metal distortion (for heavy rock section)’. Whilst the effects he desires are quite clear from the description, it is not necessarily as detailed as it could be. This room for interpretation, however, is largely due to the piece being commissioned by progressive rock trio, *Steamboat Switzerland*. One particularly useful instruction with regards to bass guitar performance is indicated at bar 883. Here, Hayden specifies ‘re: attack. If bass stops sounding al fine: morph in sound with volume pedal’. Although this instruction could be applied to any instrument that uses a volume pedal, it demonstrates awareness of potential bass guitar performance issues.

Atomic UFO Saves the Day (Again) features a similar traditional approach to notation (appendix example b). The bass part is consistent throughout and there is no real need for any bass guitar specific notation. Colin Riley, however, takes a slightly different approach (appendix example c). Harmonics are notated using a combination of the traditional harmonic symbol (a small circle above the note head), specific fret positions and the letter of the sounding pitch (for example, ‘3.8 (E)’ found in the opening bar of the first movement of *Sub Merge*). Occasionally, Riley adds a second staff to the bass part, for instance in the opening bars of the third movement, *Soft Pentiments*. This allows the harmonics to be clearly notated in a treble clef stave, whilst sustained low register notes are written in bass clef. Other extended techniques and effects use are indicated in the same manner as found in *dB,* with simple instructions written above the staff, for example ‘neck wobble ad lib’ at bar 28 or ‘with discreet delay/reverb’ in the first bar of the work.

A different problem with regards to notation arises when the composer is also the bass guitarist. Parts can occasionally be over detailed with regards to extended techniques, which is seen, for example, throughout *Concerto for Bass Guitar (Four Imaginary View of the Sagrada Familia)* by Florian Magnus-Maier (appendix example d). Between bars 36

and 58 of the first movement, Magus-Maier notates an incredibly detailed 2-handed tapping passage that is almost incompressible. There is a similar occurrence from bar 8 in the second movement (appendix example e), where the bass guitar part is scored over three staves, with the top line indicating the sounding note and the others giving right and left hand positions for the creation of artificial harmonics. Whilst this offers an absolute method of notation, it is not simple to read and could hinder performance. These issues can create problems when performers other that the composer play the work. Even if the execution is not as complex as the part may suggest, psychologically the performer may easily be put off.

Whilst it is the composers right to use any instrument in any role and to write parts that they feel are correct for any given work, I am of the opinion that there is significant room for expansion of awareness with regards to the potential of the bass guitar. Therefore, I composed two works that aim to be accessible to any bass guitarist within contemporary art music. This aim is true both with regards to the construction of parts with bass-specific information, and also with regards to the use of practically accessible instrumentation and durations to maximise the possibility and ease of performance. As such, I did not set out to place the bass guitar in every instrumental combination possible. This would have been impractical and overly time consuming with regards to the time limit placed on this research project. Instead, these works explore more conventional use of the instrument and the potential for more expansive roles within chamber and ensemble music.

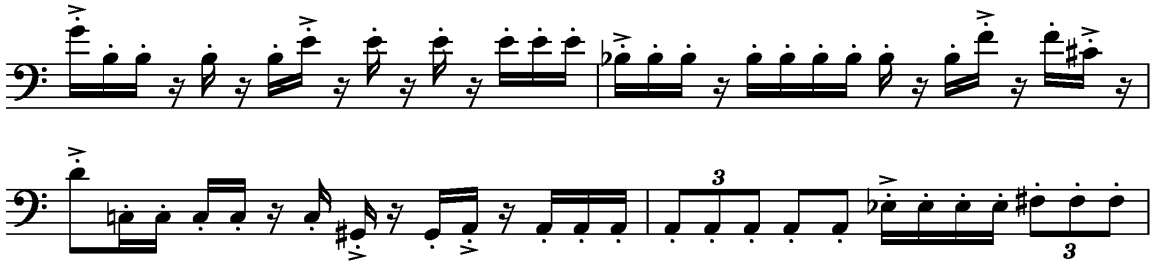
Go!

The first of these two pieces is *Go!*, a work for bass guitar, electric guitar, trumpet, trombone and tenor and soprano saxophone. This work was written with elements of jazz and improvisation in mind and, as such, features motivic and rhythmic ideas adapted from popular genres. Whilst *Go!* is not an improvised piece it contains a greater amount of

freedom in the way pitch rows are treated. The derived motifs contain freely repeated notes combined with elements of rhythms characteristic of popular music. The improvisatory aesthetic also pays homage to the bass guitar's roots in popular styles of music, as well as my own compositional methods, which (as discussed in chapter two) regularly incorporate improvisation as a developmental tool.

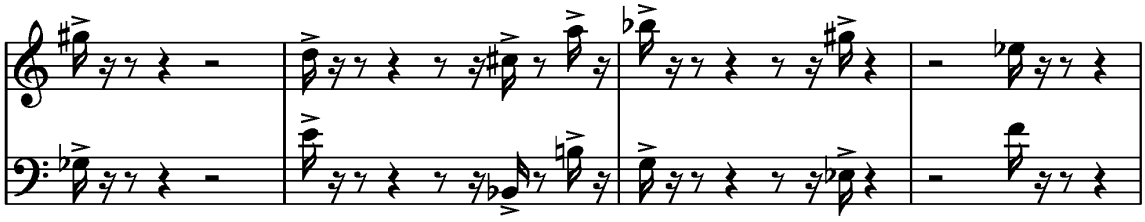
The main motif found throughout *Go!* in various developed forms is first heard in the opening of the piece (fig.32). This idea is characterised by repetition of rhythmic cells, which provide the rhythmic foundation for the majority of the work.

(Fig.32 Main motif from bass guitar part bars 1-4)

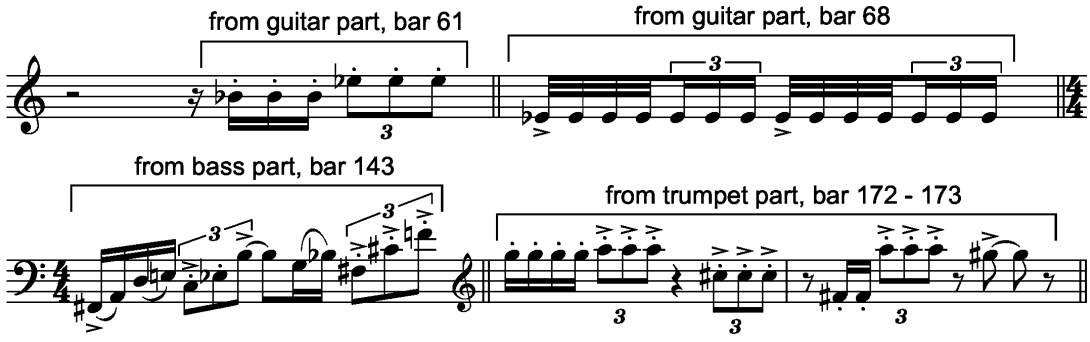


The accented notes provide rhythmic material for ‘stabs’ in the wind instruments as typically found in big band jazz genres (fig.33), whilst the rhythms seen in figure 32 are present throughout the work in various, fragmented forms. This is shown in figure 34, where examples of rhythmic development of the main motif are displayed.

(Fig.33 ‘Stabs’ from trumpet and trombone parts bar 1-4)



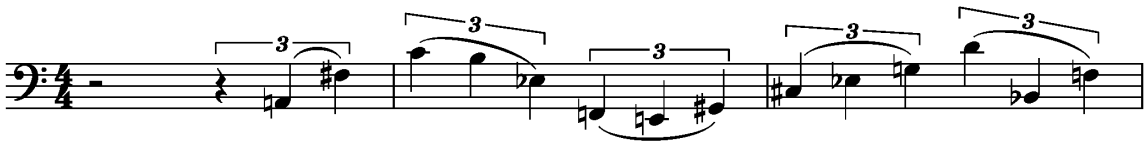
(Fig.34 – rhythmic development from original motif)



To offer some contrast to the rhythmic main motif, a legato passage was introduced in the bass part at bar 33 (fig.35). It can be found during the work in both triplet and straight crotchet format (bar 130 to 135 for example) and provided rhythmic contrast throughout,

especially when superimposed with the original motif, which can be seen at bars 114 to 117 for instance.

(Fig. 35 – contrasting *legato* motif from bass part (bars 33 – 35))



This combination of rhythms, repeated note motifs and concise development, in conjunction with other pre-composed elements (twelve-tone rows etc.), creates a tonality that sits between atonality and jazz-like modality.

The structure of *Go!* reflects the comparative freedom of its content. In popular music variations of strophic form are often employed and so I chose to use this in my work. *Go!* essentially alternates between passages that utilise the fast repetitive motif shown in figure 32 and slower fragmented material, such as in the passage found between bars 23 and 40. Although there is a great deal of development of material as the piece goes on, the form follows this alternating framework throughout. The work does move away from this structural skeleton at its climactic point, but this is also intended as a reflection on the improvisatory aesthetic.

As ‘Go!’ is fairly simple, concise work, I decided to use a traditional approach to notation and technique with regards to the bass guitar part. Aside from some ‘palm muting’ and *sul tasto*, no extended techniques were applied. Because of the absence of complex techniques and passages that require specific information (unlike some passages found in ‘Kairos’, for example, where tablature or extra notation was required to indicate proper performance), traditional notation was used throughout. This reflects both the straightforward approach of the work as a whole and also the role that the bass plays

during ‘Go!’. The role of the bass in this work is not a traditional supporting role, nor a virtuoso, expansive performance. The piece places the instrument in a ‘normal’ setting, whereby it can take on background and foreground responsibilities with equal comfort and I am confident that ‘Go!’ goes some way towards proving the flexibility and value of the bass guitar in contemporary Western art music.

Graceful Ascent

(Fig.36 – *Graceful Ascent* by Wassily Kandinsky)

The summation of the work within this area is *Graceful Ascent,* a composition for five-string electric bass guitar, percussion and brass dectet. *Graceful Ascent* uses Wassily Kandinsky's painting (see fig.36) of the same name as a basis for structure and the creation of material. This builds on techniques I used to compose a previous work entitled *Several Circles* (composed in 2010), whereby shapes, shades of colour and dimensions of a different Kandinsky painting dictate various musical elements. The piece is not simply inspired by the painting, rather the artwork is used as a framework or blueprint for compositional decisions.

(Fig.37 – *Exercise for color-theory course taught by Vasily Kandinsky* by Eugen Batz)

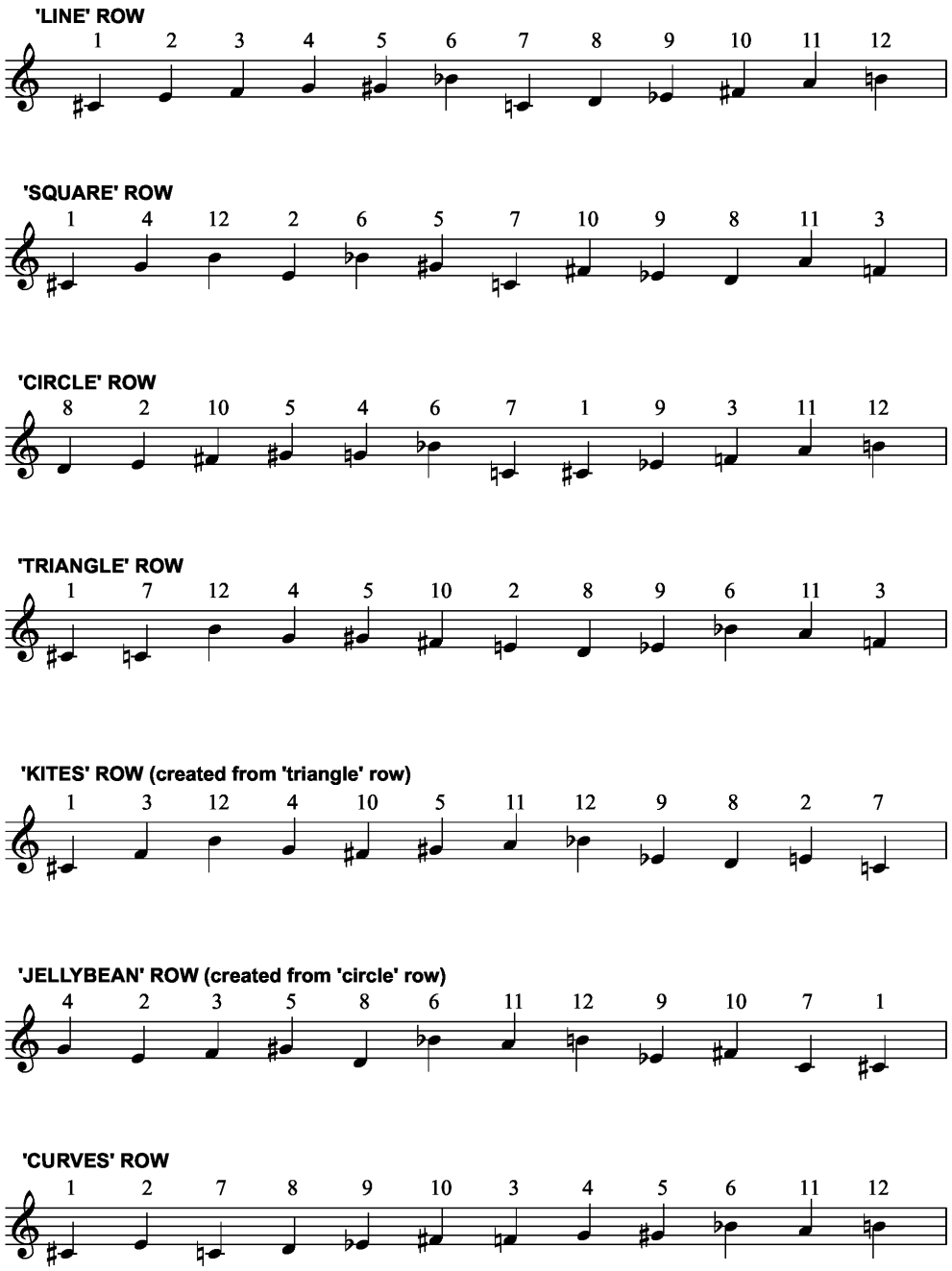
Kandinsky believed that certain colours corresponded particularly well with certain shapes and, with this in mind, the character of motifs and pitch rows was determined by the nature of each colour. Kandinsky stated that, "sharp colours have a stronger sound in sharp forms (e.g. yellow in a triangle)[44]". Therefore, material representing Kandinsky's yellow "sound" comprises wide intervallic leaps and provides material with a highly contrasting range of pitch and tessitura. In other words, the 'yellow' motif is a musical representation of the sharp, triangle form. In contrast to this, the 'blue' motif comprises scalic material and features closer intervals with its phrases tending to move in the same linear direction. This is a reflection of Kandinsky's statement that "the effect of deeper colours is emphasised by round forms (e.g. blue in a circle)". Finally, the 'red' motif is a representation of the square form. This features aspects of both the 'yellow' and 'blue' motifs since it is perceived to have more variations in shade than the other primary colour forms (dark, middle and light red). Whilst 'red' still has the sharper points (or corners) of the triangle form, it also has very strong lines that have more in common with the rounded forms (circles etc.). Therefore, the 'red' motif features some wide intervallic leaps in

[44] From page 144 in *Wassily Kandinsky – The Journey to Abstraction* by Ulrike Becks-Malorny (Taschen, Köln, Germany: 2007)

combination with scalic material and phrases that travel in both directions, albeit with less unpredictability than the ‘yellow’ material.

To musically represent the variety of shape found in the painting, I produced a set of twelve-tone rows for each general type of shape, with ‘line’ rows of the basis for all material (as most of the shapes appear to be created from combinations of drawn or painted lines). Below are figures displaying the pitch rotations used to produce each set of rows. As can be seen from the figure below, the ‘jellybean’ material was derived from ‘circle’ rows and ‘kites’ are created from ‘triangle’ rows. This was because the ‘jellybean’ shapes appeared to be created from circular shapes and kites created from triangles, as opposed to the lines used for the majority of shapes seen in *Graceful Ascent*. Each set of rotations was applied in order to develop material that was concurrent with Kandinsky’s colour theory. As such, the circle rows feature more scalic material, triangle rows feature wider intervallic leaps and square rows feature some wide intervallic leaps in combination with scalic material. The more complex shapes (kites, curves and jellybeans) are made up of a combination of relevant characteristics. For example, the jellybean material features a combination of circle and line rows, as the shape itself is made up of the same mixture.

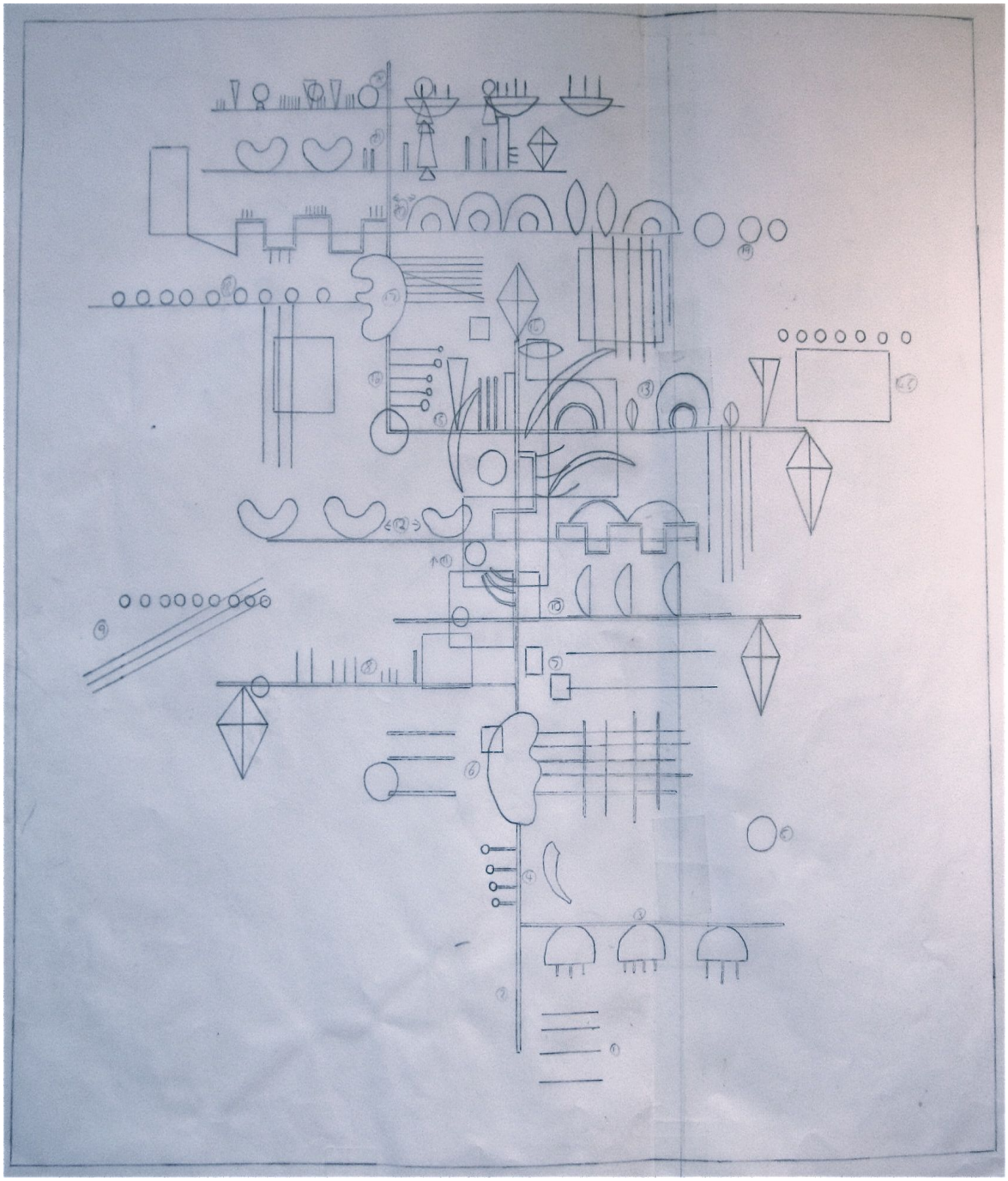
(Fig. 38 – ‘Graceful Ascent’ shape rows)



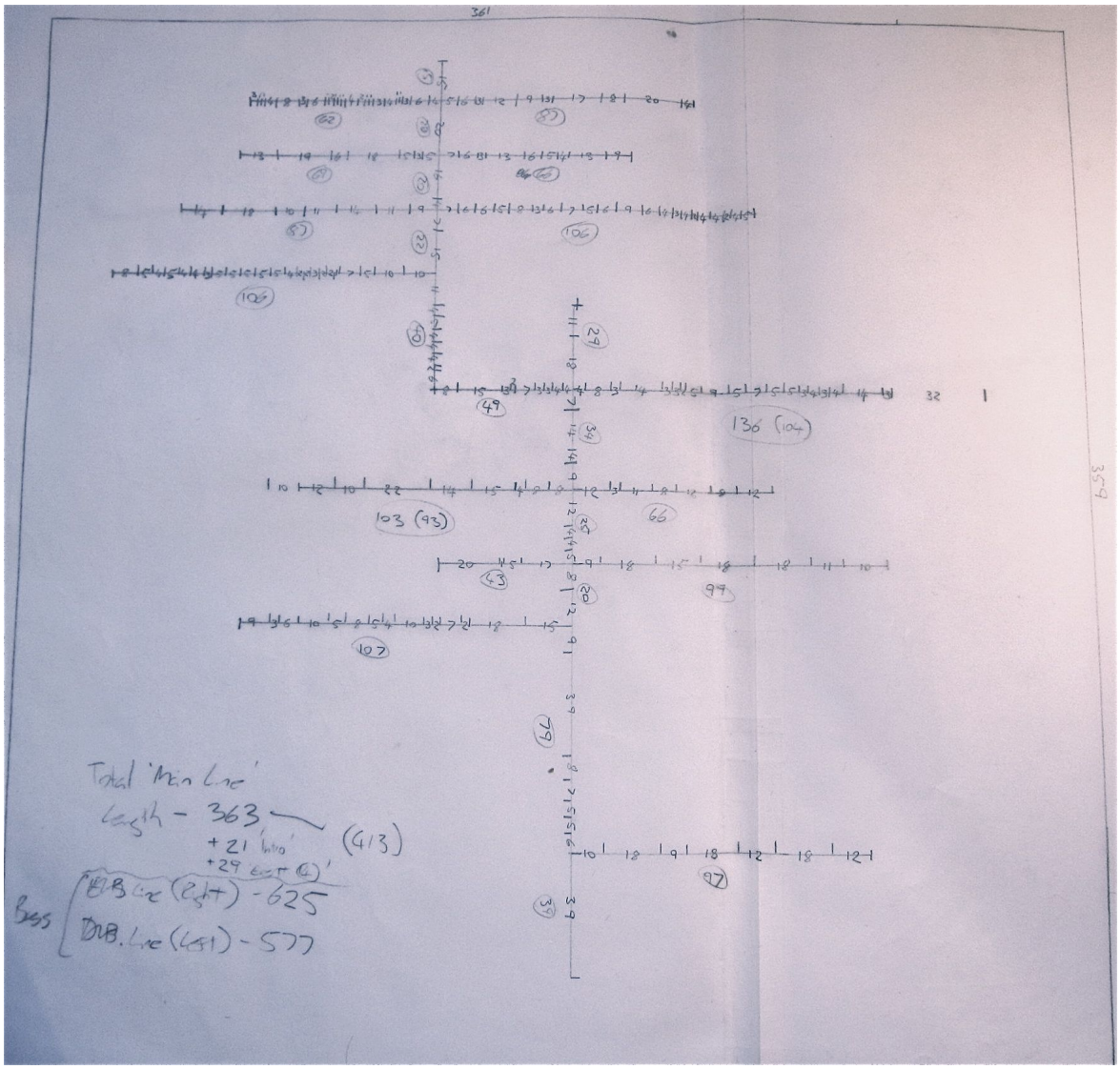
The numbers in figure 38 show the process of rotation used on each individual row. After these rotations were applied, inverted, retrograde and inverted retrograde versions of each row were created.

To produce a structure that was representative of the painting, I copied the lines and shapes onto tracing paper (see fig.39a). I then took measurement of the different dimensions of the painting to obtain as much information as possible form the original (fig.39b). The measurements and shape content were used to produce a series of sections, or events (which can be seen labelled in fig.39a), that would make up different parts of the work. Measurements from each event would then dictate the duration and content. For example, ‘event 2’ is made up of lines only and is 39mm in length. Therefore that event would use ‘line’ rows for pitch material and would be 39 bars in length. Similarly, ‘event 9’ features lines and circles and therefore uses ‘line’ and ‘circle’ rows for pitch material. Initially, I had intended to use these measurements as literally as possible. This, however, did not produce a work that would be musically successful or viable. The duration (calculated by adding the length of all lines) would have been well over 50 minutes (not practically accessible for most performers and very difficult for brass players to perform) and the material was unbalanced. I had originally intended to use separate events for bass and ensemble (see fig.39d and 39e), but there was significantly more bass material than ensemble material and, therefore, the literal representation concept was dropped for an approach that allowed the production of a musical work that was pragmatic and effective.

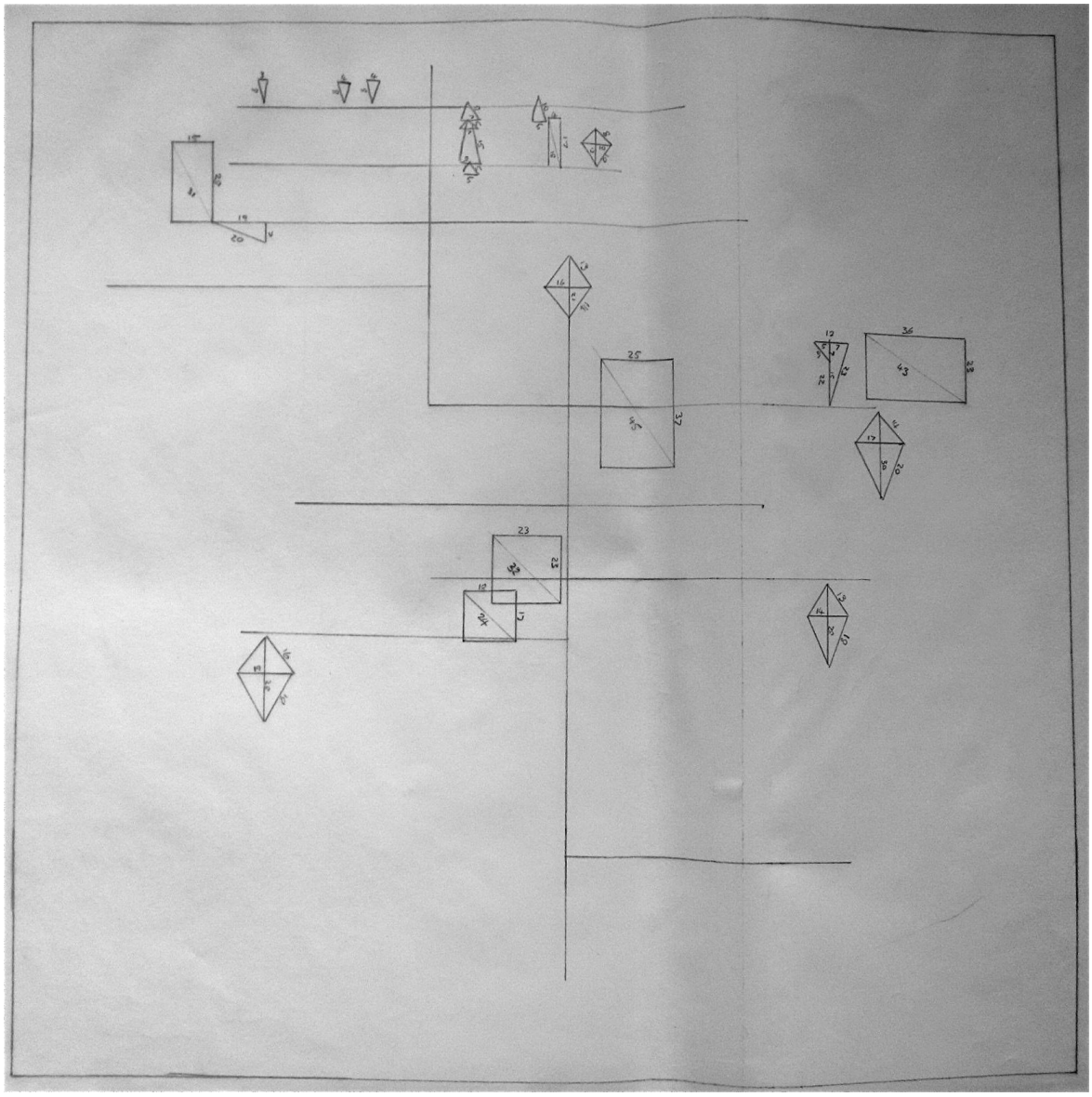
(Fig.39a – original tracing and labelling of events)



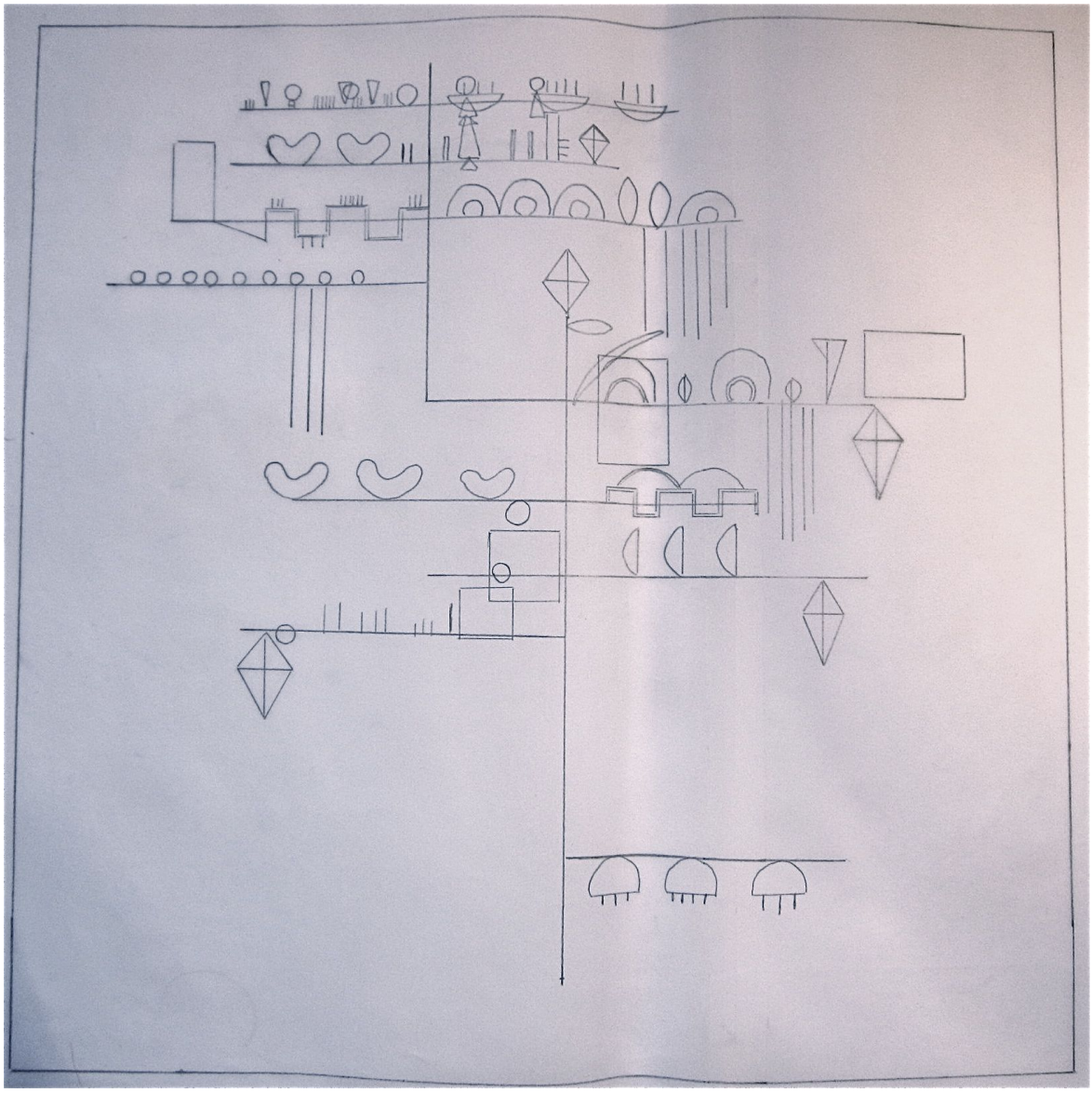
(Fig.39b – line measurements)



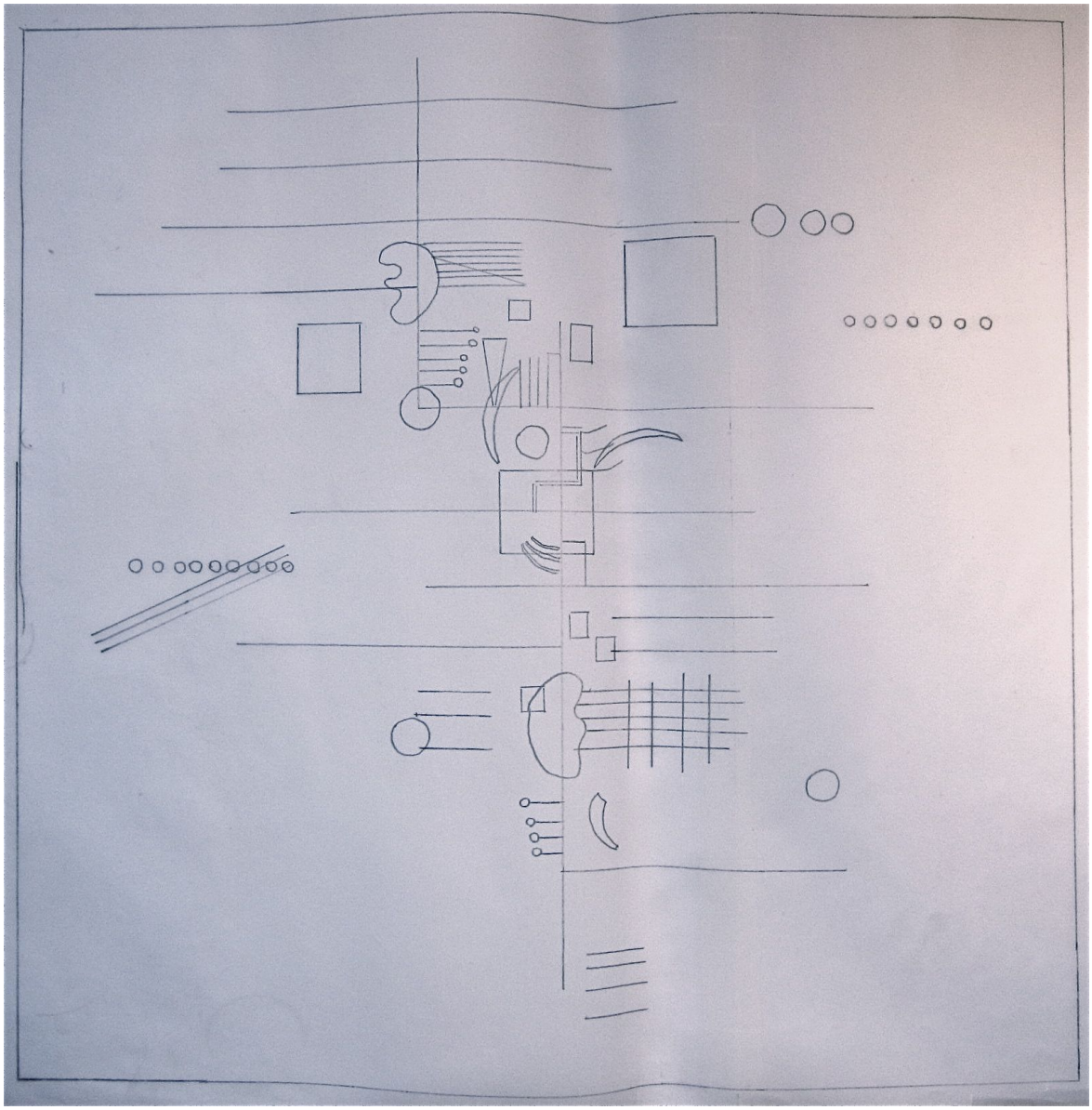
(Fig.39c – example of shape measurements (kites and squares))



(Fig.39d – ‘bass events’)

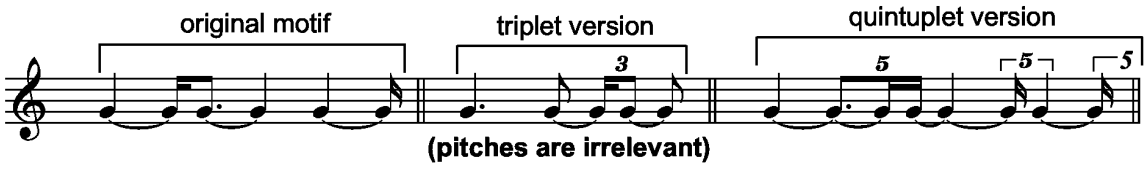


(Fig.39e – ‘ensemble events’)



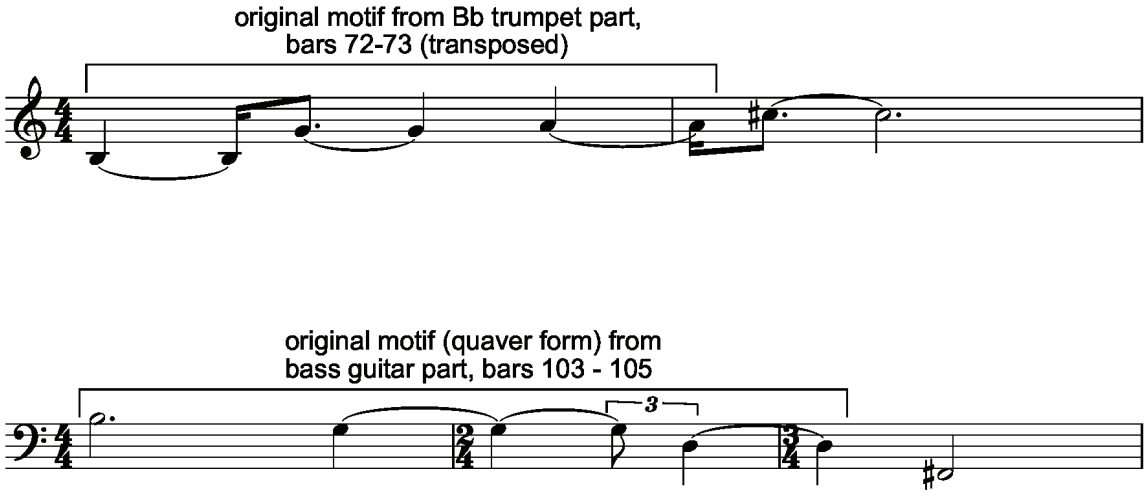
Rhythmic material for ‘Graceful Ascent’ was created using the measured distances between the four lines found at the bottom of the painting (‘event 1’ from fig.39a). These distances (9mm, 7mm and 5mm) were used to produce a simple motif (fig.40) that was used in various developed forms throughout the piece. The original motif was applied to triplets and quintuplets to create three ideas shown below and measurements were used to determine note length. During the examples shown below, 5, 7 and 9 semiquavers are used, corresponding to the 5mm, 7mm and 9mm measurements, but this idea was also applied to quavers and crotchets, producing longer variations of the motifs shown in figure 40.

(Fig.40 – original rhythmic motifs)



These motifs are prevalent throughout ‘Graceful Ascent’, but can be seen in unaltered form (see fig.41) at bars 72 to 73 (trumpet 1) or between bars 103 and 105 (bass guitar part), for example.

(Fig.41 – examples of original rhythmic motifs from bars 72- 73 (trumpet 1) and bars 103-105 (bass guitar))



Variations of this motif can be found throughout the work. For example, the rhythms used in the opening 3 bars of the work and material heard in the brass parts from bar 159 are variations on the original rhythmic idea.

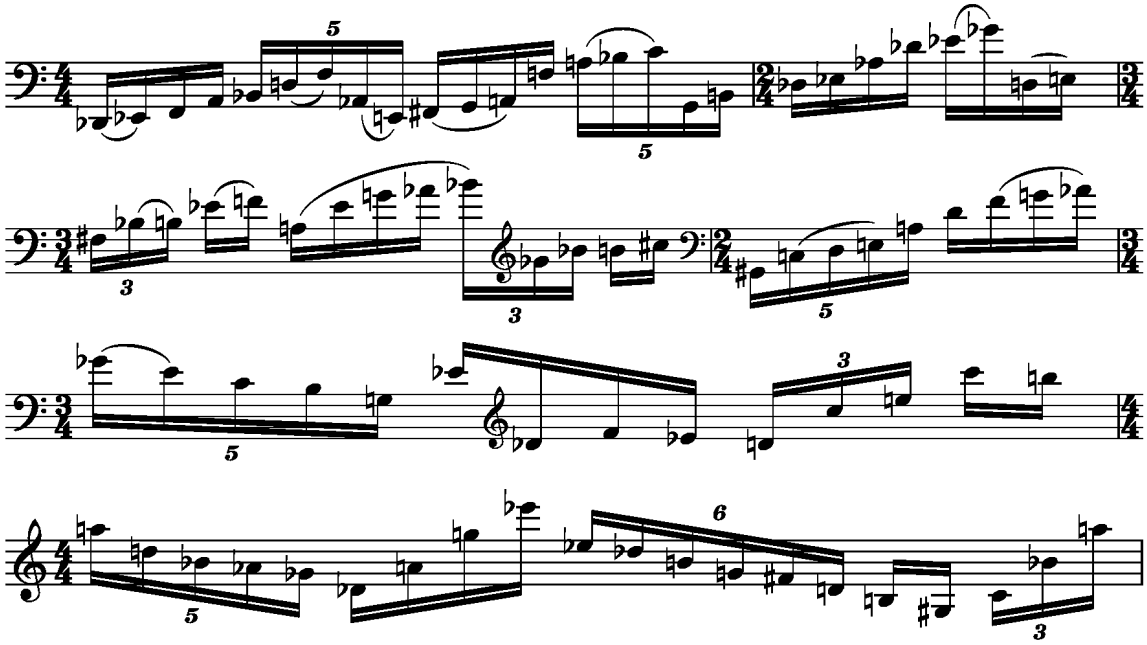
Other material found throughout ‘Graceful Ascent’ was created from a set of numbers. Using a combination of improvisation and the measured dimensions of the painting, a series of 21 numbers was produced. The numbers were then split into sections of 9, 7 and 5 to represent the underlying ratio of the rhythmic motifs and the original line measurements taken from the painting. This set of numbers was as follows:

9	7	5
4 5 4 5 8 3 2 4 3	2 5 4 5 4 3 2	5 4 6 2 3

Using these numbers, I created the passage found in the bass guitar and marimba parts between bars 80 and 85 (see fig.42). This passage was further developed to produce the

material heard between bars 80 and 96, where the number set was used for duration of sustained notes and for rhythmic content.

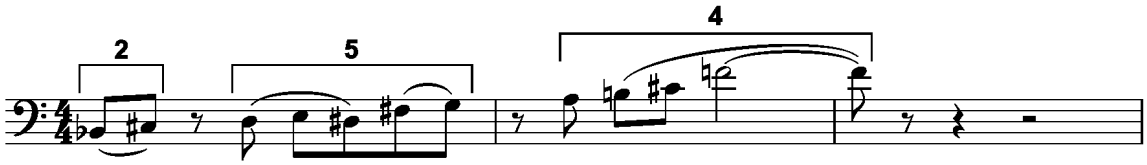
(Fig.42 – combined passage from bass guitar and marimba parts (bars 80 – 85))



Each number from the series shown above dictated the rhythmic content of each beat. For example, the first four numbers (4, 5, 4, 5) can be seen in the first bar of figure 42, where four semiquavers are followed by five that are contained in a tuplet with the ratio of 5:4. This pattern is repeated to produce a musical realisation of the first four numbers of the series. Occasionally, this process was flaunted slightly to create more rhythmic interest. This can be seen, for example, in the first five notes of the third bar of figure 42. Here, the numbers 3 and 2 are fitted into one beat to add variation.

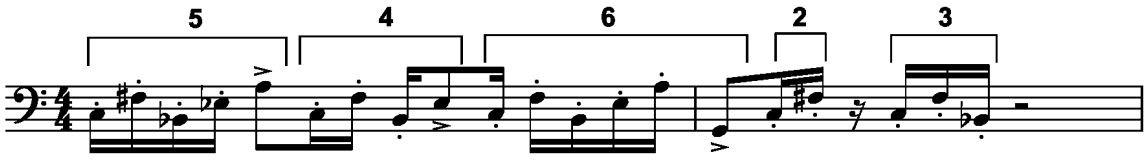
The number series is used in a similar manner at bar 137 to 139. Here, the bass guitar plays a melodic passage that uses part of the series (the ‘7’ section) to dictate rhythm (see fig.43). The number series is indicated in figure 43.

(Fig.43 – development of rhythm through number series (bass part bars 137 – 139))



On this occasion, a quaver rest separates each number in the sequence. Again, this series is used to develop material throughout the following section (from bar 137 to bar 158). This method of applying the number series was used extensively during the final sections of the work (bar 137 to bar 232). The last section of the series (the '5' section) was used to compose the motif (fig.44) that makes up the majority of material heard throughout the section.

(Fig.44 – number series use in final section motif)



This motif is used extensively throughout the last section, with either a semiquaver rest or quaver (as seen in the final notes of the '5', '4' and '6' segments of figure 44) used to separate each number. The superimposition of this motif created a rhythmic conclusion to the work, which was particularly effective in comparison to the sparser, sustained material heard throughout the work.

Structurally, 'Graceful Ascent' does not follow the painting literally, but rather takes the overall picture as a basis for form. As the title of the painting suggests an ascent, the piece starts at the bottom of the image and works up to the top. As the painting expands along new lines and the frequency of shapes increases, the music expands in terms of material, tempo and atmosphere. Whilst the opening and middle sections of the work are thinner in texture, with sparse melodic and chordal passages, the material near the end of

work gains momentum as it moves towards to the final 'ascent' section that begins at bar 159. Pitch and rhythm material is treated with more freedom as the work moves forward and the piece reaches its climax at the very end of proceedings. This represents the increasing clutter of shapes and the overall direction of the work, which is always reaching upwards towards the conceptual ascent, which is portrayed by the final, ethereal coda.

In comparison to 'Go!', the 'Graceful Ascent' bass guitar part is more complex, both with regards to the material itself and the notation of extended techniques and intricate passages. Most of the material throughout the work is notated in the same manner as in 'Kairos'. Harmonics (both natural and false) are again notated using a combination of diamond note heads and a tablature staff, and complex passages (for example, between bars 80 and 95) also utilise tablature to indicate the most effective method of performance. 'Slapping', 'popping' and 'hammer-on'/'pull-off' techniques are also notated using the same symbols as found in 'Kairos'. At bar 9, an E-Bow is used to sustain a C# through to bar 16. During a performance of 'Graceful Ascent' at the *RAMA Festival* in Aarhus, Denmark[45], the E-Bow produced unintended harmonic overtones. Although this was not the original intention of the technique, it proved effective, so a performance note was added to the score explaining that accidental overtones should not be corrected during performance, should they occur. The '*pimac'* system (each letter indicates a finger on the right hand: p=thumb, i=index finger, m=middle finger, a=ring finger and c=little finger) for right hand fingering was also used at bar 132 to indicate a specific manner of performance. This added definition to the fast arpeggio pattern that is notated.

'Graceful Ascent' also demonstrates the potential that the bass guitar has for performance of intricate, atonal music. The simple technical set-up (bass guitar, amplifier and E-Bow) is simple to balance with the ensemble and the material itself is conveyed perfectly by the instrument. As a bass guitarist myself, I made a conscious effort to not compose this work

[45] This performance was recorded and can be heard on track 3 of 'Summative Works CD 2'.

with the bass guitar at hand. Although I am aware of the intricacies of bass performance, this work was intended as proof that the instrument can take on a leading role within a contemporary instrumental line-up without being deliberately and forcefully placed into an ensemble. The bass guitar part still retains an inherent difficulty despite not being a soloistic or virtuoso piece, but it does not sound out of place or, indeed, sonically out of its depth. It is obvious that there is a bass guitar in the ensemble, but I feel the contrasting timbres of the brass dectet, percussion and bass enhance the work overall. Although not a concerto, the bass guitar appeared comfortable as a leading part of medium sized ensemble, and whilst there remains scope for further research into the application of the bass in chamber and ensemble music, this work proves that it at least has the potential to provide a new range of sounds to contemporary Western art music.

6. Conclusions

My original contribution to knowledge is a portfolio of works that expand the role, application and sonic and technical palette of the electric bass guitar in contemporary Western art music. A literature survey and research into how current composers use the bass guitar revealed that the existing repertoire for the bass guitar does not offer a wealth of creative or expansive performance opportunities and, although there are some exceptions, works tend to focus on virtuoso, concerto style aesthetics.

This study has engaged with the bass guitar as a solo instrument (as demonstrated throughout 'Kairos' and the pitch-based improvisations) and as an important and integrated member of an ensemble comprised of acoustic instruments ('Go!' and 'Graceful Ascent) and the works produced demonstrate the effectiveness and potential that the bass guitar has to be a frontline and solo instrument within contemporary Western art music. Improvisation and 'sound object' works demonstrated that the instrument could be effective as a platform for the creation of sound within sonic arts idioms and improvised music, whilst the innovative application of techniques and approaches originally developed in popular and experimental styles aided the expansion of the sonic and technical palette of the bass guitar. Indeed, the use of these methods yielded unique results with regards to the sounds produced by the instrument and their application in scored and improvised works. Although a wide range of new sounds were produced throughout the project, there still remains scope for expansion of bass guitar technique within contemporary Western art music, which is discussed below. The reception of the works discussed in this commentary also revealed that carefully and sympathetically written (with regards to bass guitar performance) parts can ignite fresh interest from both listeners and performers alike. Indeed, with proper development, this project has indicated

that the bass guitar could become an important instrument within the arsenal of the modern composer.

Of course, there were shortcomings with regards to this research. Despite significant development of technique, sound and the role of the instrument, relatively broad research questions and the time constraints of the programme of research limited parts of the investigation. Explorations and application of extended techniques, electronics and different roles were not exhaustive. Further research into the complete sonic picture of the instrument would have been desirable, as would the creation of works that addressed a wider range of musical roles (duets, the bass as an accompanist, bass guitar and piano etc.). Practically, it was not possible to research the sonic relationship between the bass guitar and other orchestral instruments either. The integration of the bass into string ensembles, for instance, was not explored.

Consequently, I have highlighted the following of areas to be addressed in future research:

- A thorough and exhaustive exploration into the relationship between the bass guitar and all established orchestral instruments. This could be achieved through a series of studies, workshops and performances that research different combinations of instrumentation.

- A complete investigation and cataloguing of bass guitar sounds with regards to basic and extended techniques, instrument variations (5, 6-string, fretless etc.) and electronics (effects pedals and software processing).

- The composition of works that thoroughly address every established instrumental role (soloist, accompanist, duets, multiple bass guitar works etc.).

- A sociological study that thoroughly investigates why modern composers do not commonly use the bass guitar. This would involve a comprehensive survey of the perception of the instrument and would build upon material discussed by Simon Lesley in his doctoral thesis entitled *The Bass Guitar in Contemporary Art Music: exploring its potential through composition*.

- Further technical development with regards to instruments and amplifiers to aid the balancing of the bass guitar in a variety of contemporary instrumentation.

In the absence of a wider range of existing works and academic studies in this field, the main benefit of this research project is the creation of new bass guitar repertoire that expands the role of the instrument within contemporary Western art music. The works produced throughout the duration of this project have gone some way to realising the potential of the bass guitar with regards to sonic and technical development, and the general application or role of the instrument. These works also challenge its perception and prove the effectivity of the bass guitar when placed within atonal and complex avant-garde music. Despite requiring more exposure, the notation convention developed during 'Kairos' and 'Graceful Ascent' could also increase the impact of complex contemporary art music, making it more accessible to performers who may not have formal musical training.

Finally, the successes of the works in general prove the worth of the bass guitar as a flexible and effective addition to modern instrumentation. Its roots within popular idioms may also generate new interest and repertoire, as bass guitarists begin to recognise that their instrument is being taken seriously within contemporary art music. It is my hope that further interest, exposure and development of the bass guitar will move the instrument closer to my fundamental goal, which is the full integration of the bass guitar into the

instrumental arsenal of the modern composer and the full realisation of the potential that the bass guitar has.

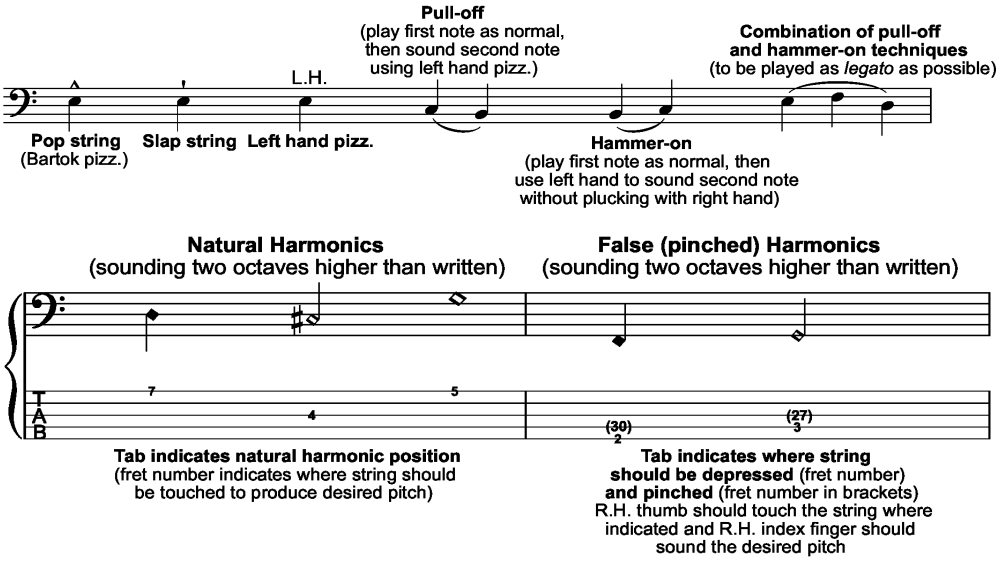
[24,210 words]

Appendix 1 – Original Musical Scores by Samuel Christian Roberts

Information for Bass Guitar Part

This work requires a 5-string bass guitar with a two-octave (24 fret) neck, loop pedal (such as the Boss RC-20XL or Pigtronix Infinity Looper), volume pedal and means of electronic section playback (either software sequencer, CD player or second performer with access to the former devices). Electronic sections (CD enclosed) should ideally be played through a separate stereo set of speakers.

Key to Notation



Very specific fret positions (such as 3.1 or 2.2) indicate the position of natural harmonics. As with other natural harmonics, diamond note heads indicate the sounding pitch, two octaves higher than written. Harmonics notated as quartertone flat (bars 8-10 and 13-14) are not precise quartertones. The indicated F and G quartertone flat notes (played just behind the 3rd fret on the instrument) are 7th harmonics of the G and D harmonic series. As such, they sound 31 cents flat.

Note on loop pedal use: vertical arrows with instructions throughout the score indicate where the loop pedal should be used. An *ossia* staff is used to indicate loop playback. When volume fade out is required (bars 133 and 207), the performer can use either a second volume pedal (placed after the loop pedal) or output control on the pedal or software itself.

Left Hand Muting: Left hand muting is either indicated by 'L.H. muted' (bar 58) or with + (muted) and 0 (open) symbols.

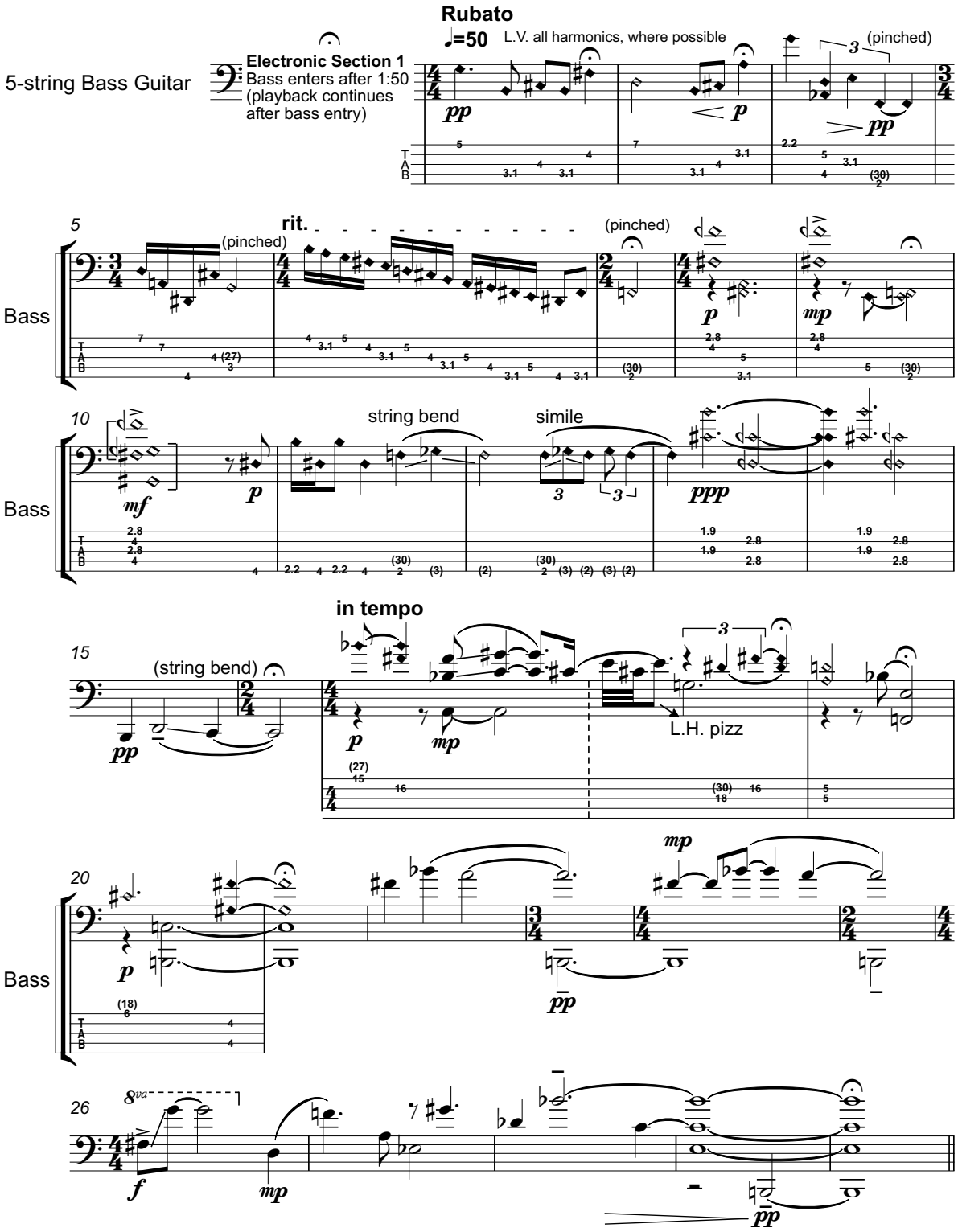
I, II, III, IV, V indicates string number (G to B).

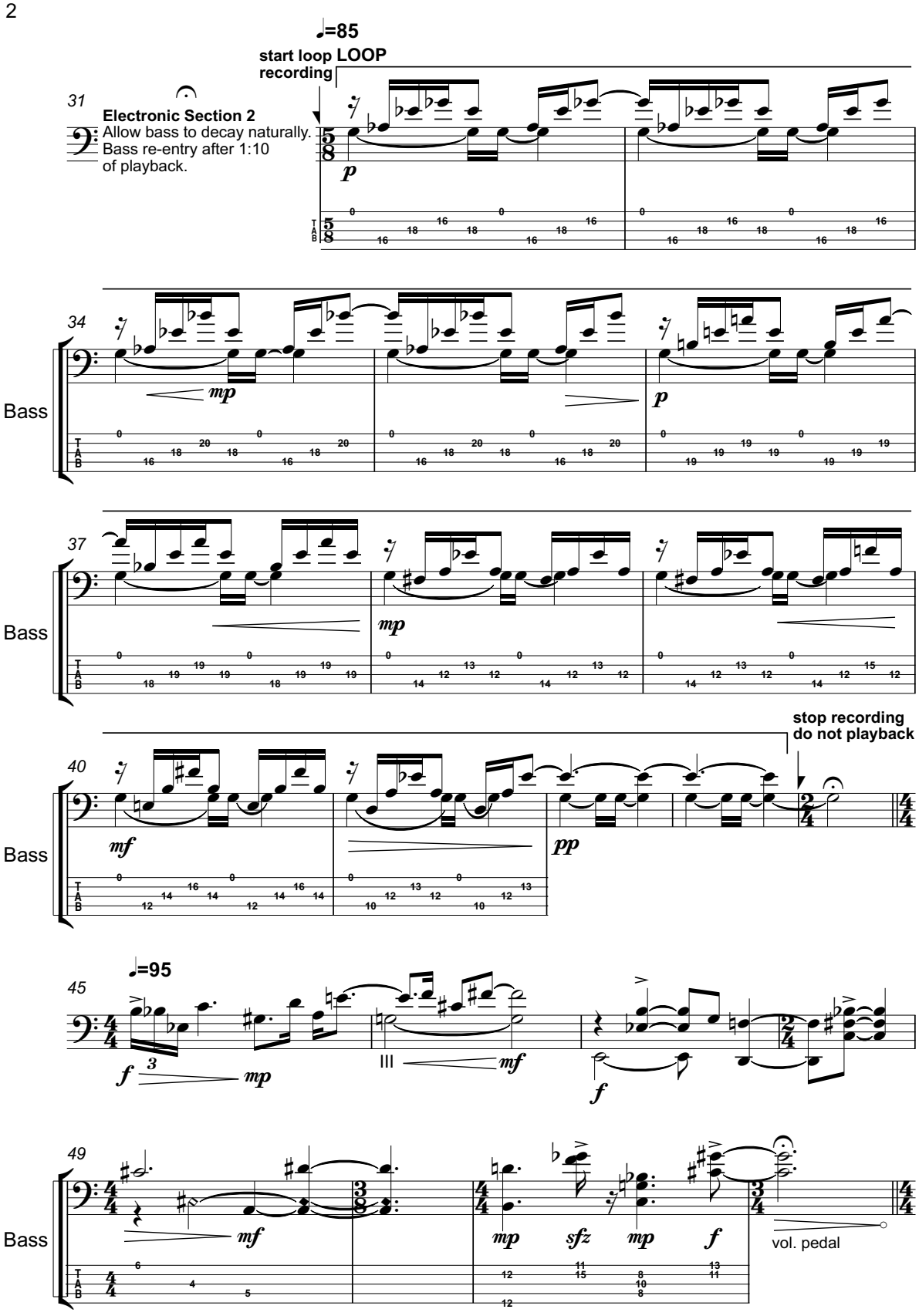
Fret numbers indicated in the Tablature *ossia* staff are to be followed exactly, as the L.H. positions provided allow for optimal phrasing (in conjunction with pull-off and hammer-on techniques). However, the performer can use alternative fingering, provided that the same phrasing and gestures are followed.

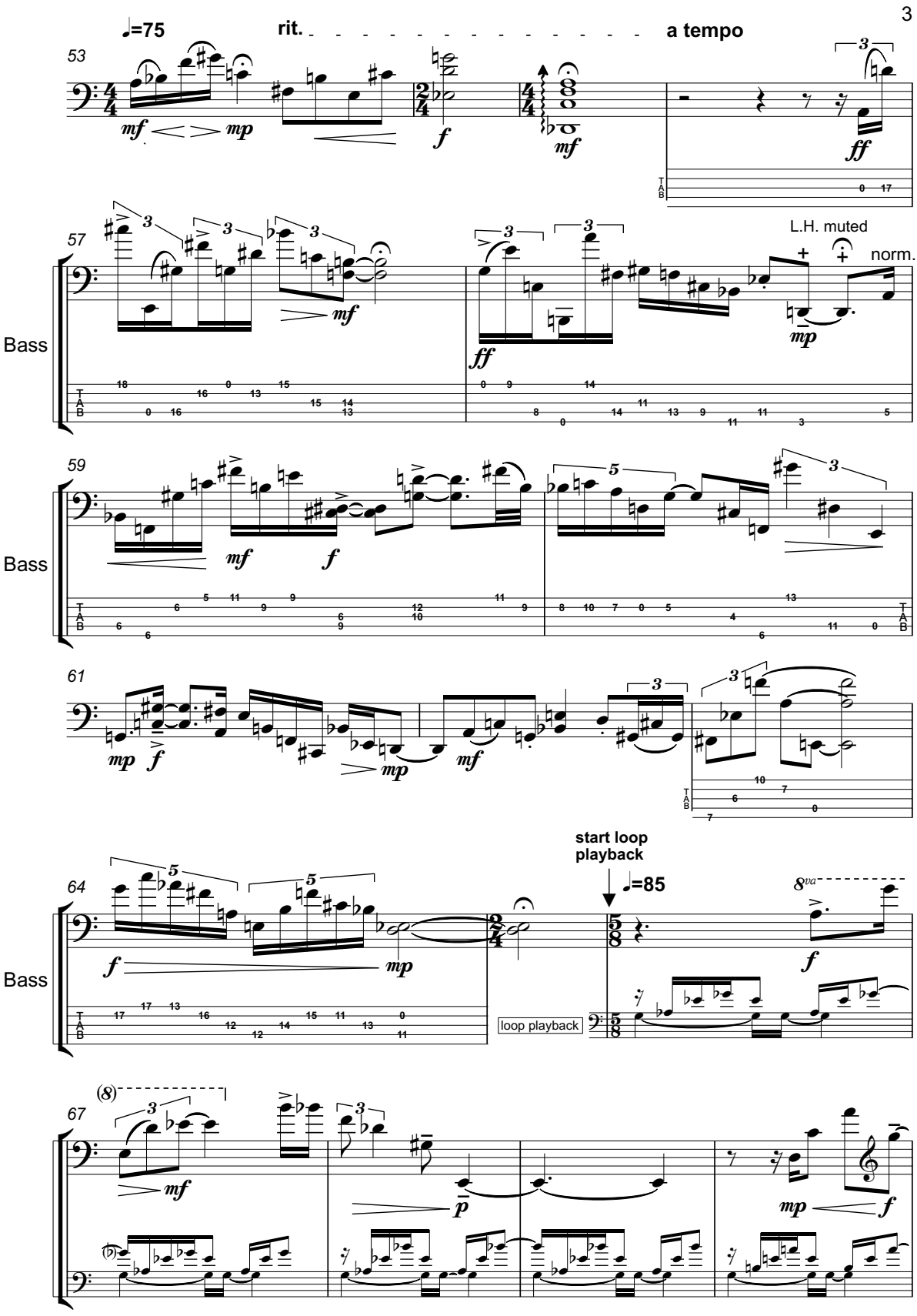
Diamond noteheads
indicate harmonics
sounding two 8va higher

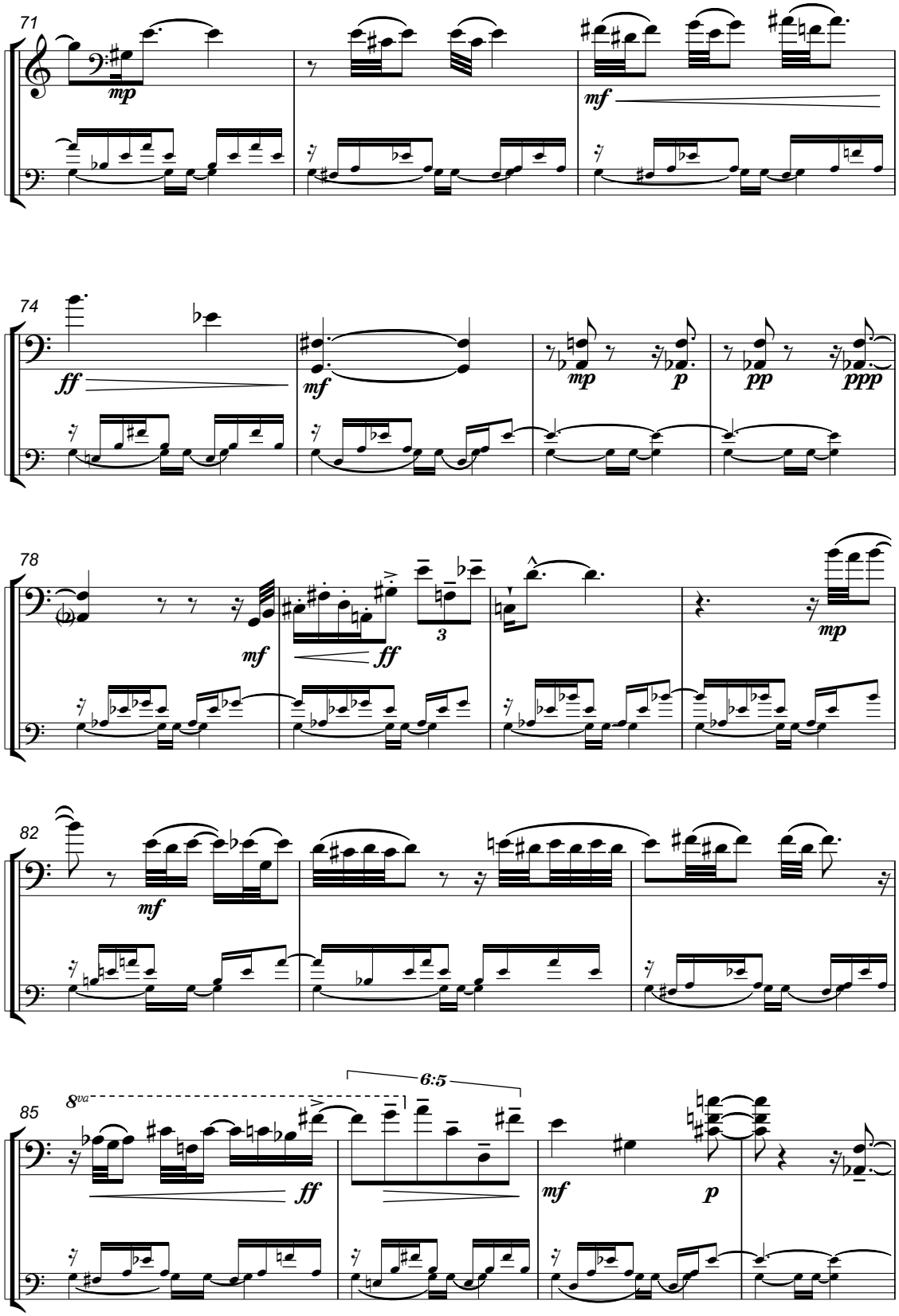
KAIROS

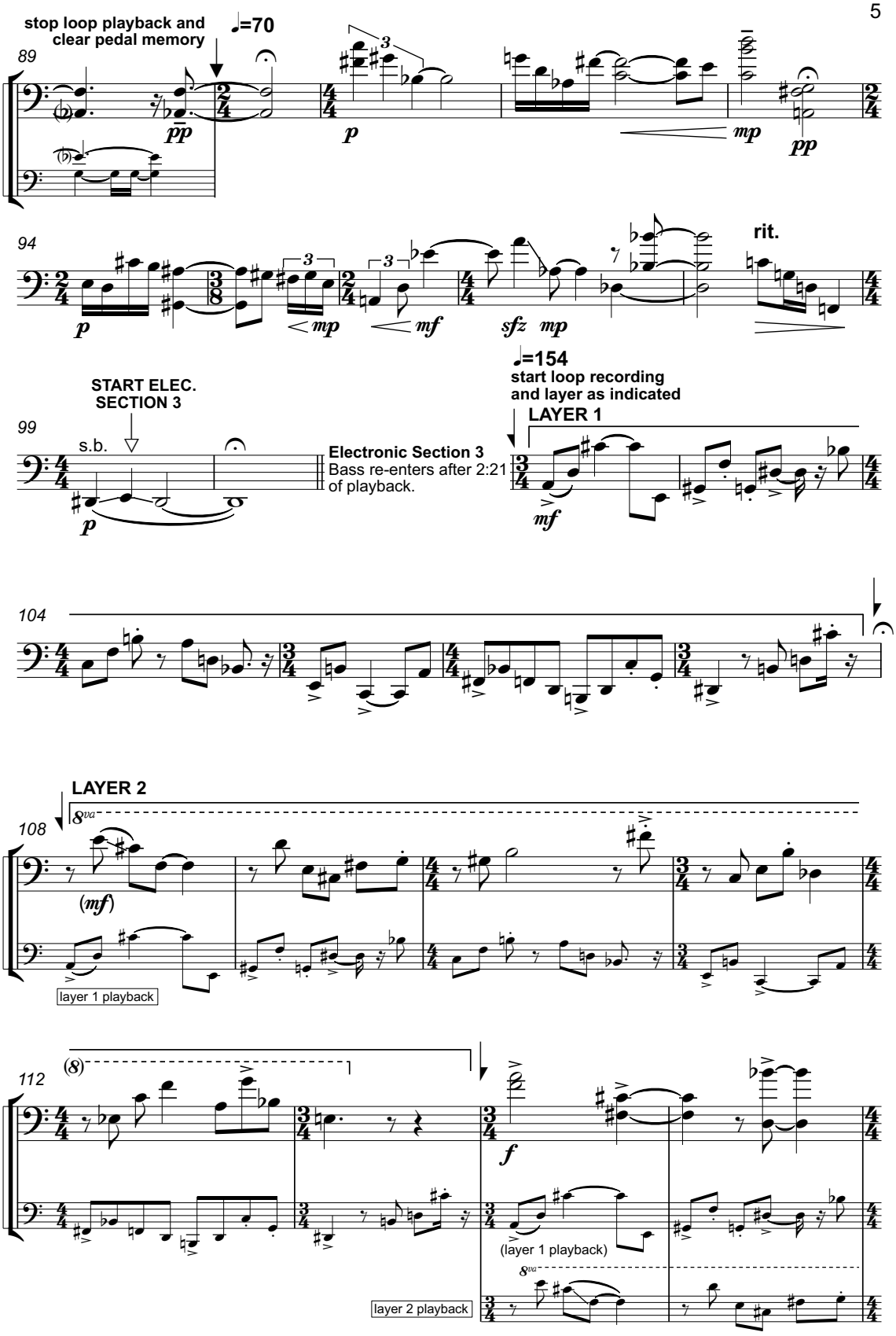
SAMUEL C. ROBERTS




♩=85
start loop recording
LOOP
31
Electronic Section 2
Allow bass to decay naturally.
Bass re-entry after 1:10
of playback.
34
Bass
37
Bass
stop recording
do not playback
40
Bass
♩=95
45
49
Bass
vol. pedal

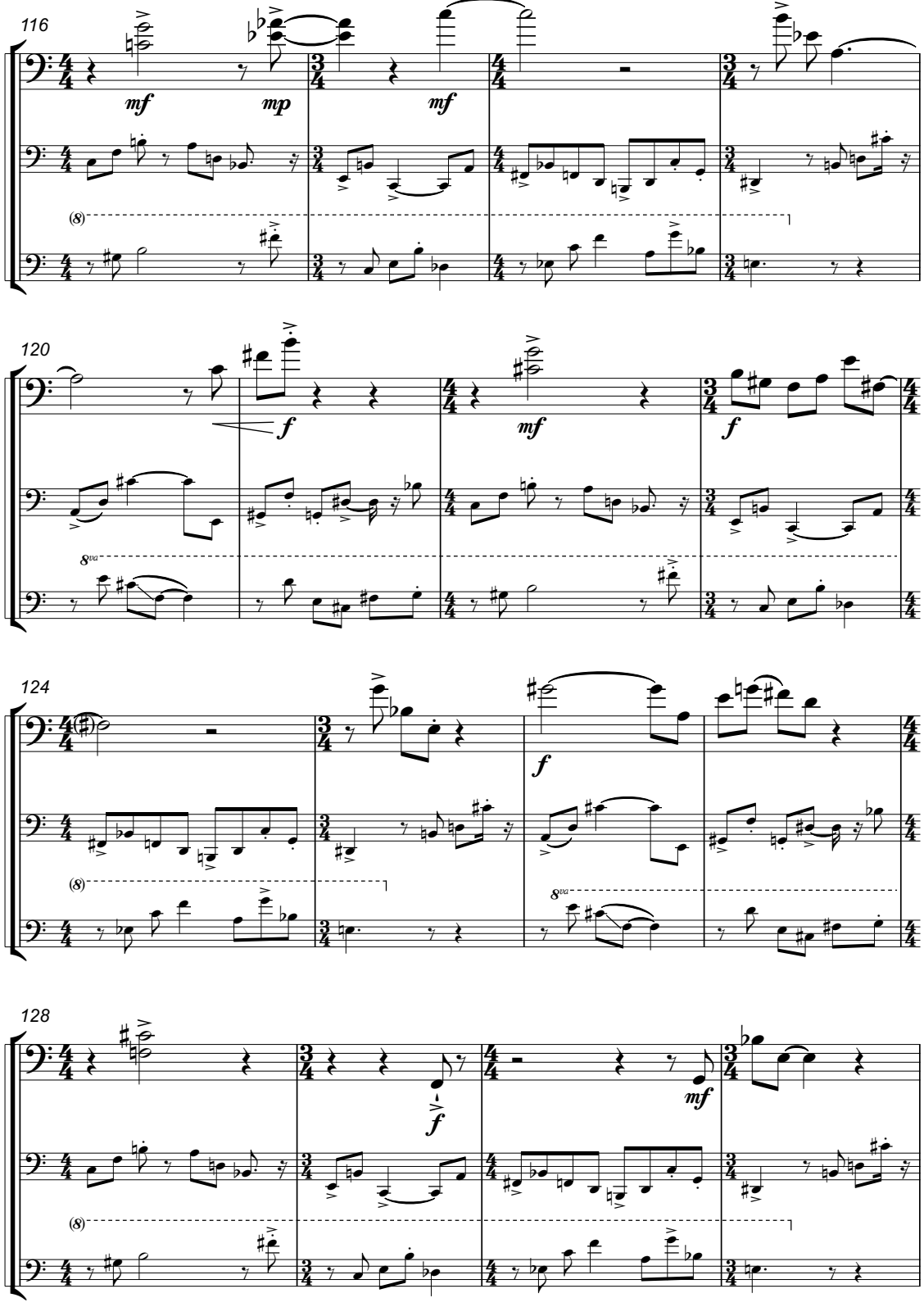

♩=75
rit.
a tempo
53
mf
mp
f
mf
ff
57
Bass
mf
ff
L.H. muted
norm.
mp
59
Bass
mf
f
61
mp
f
mp
mf
64
Bass
f
mp
start loop playback
♩=85
8va
f
loop playback
67
(8)
mf
p
mp
f

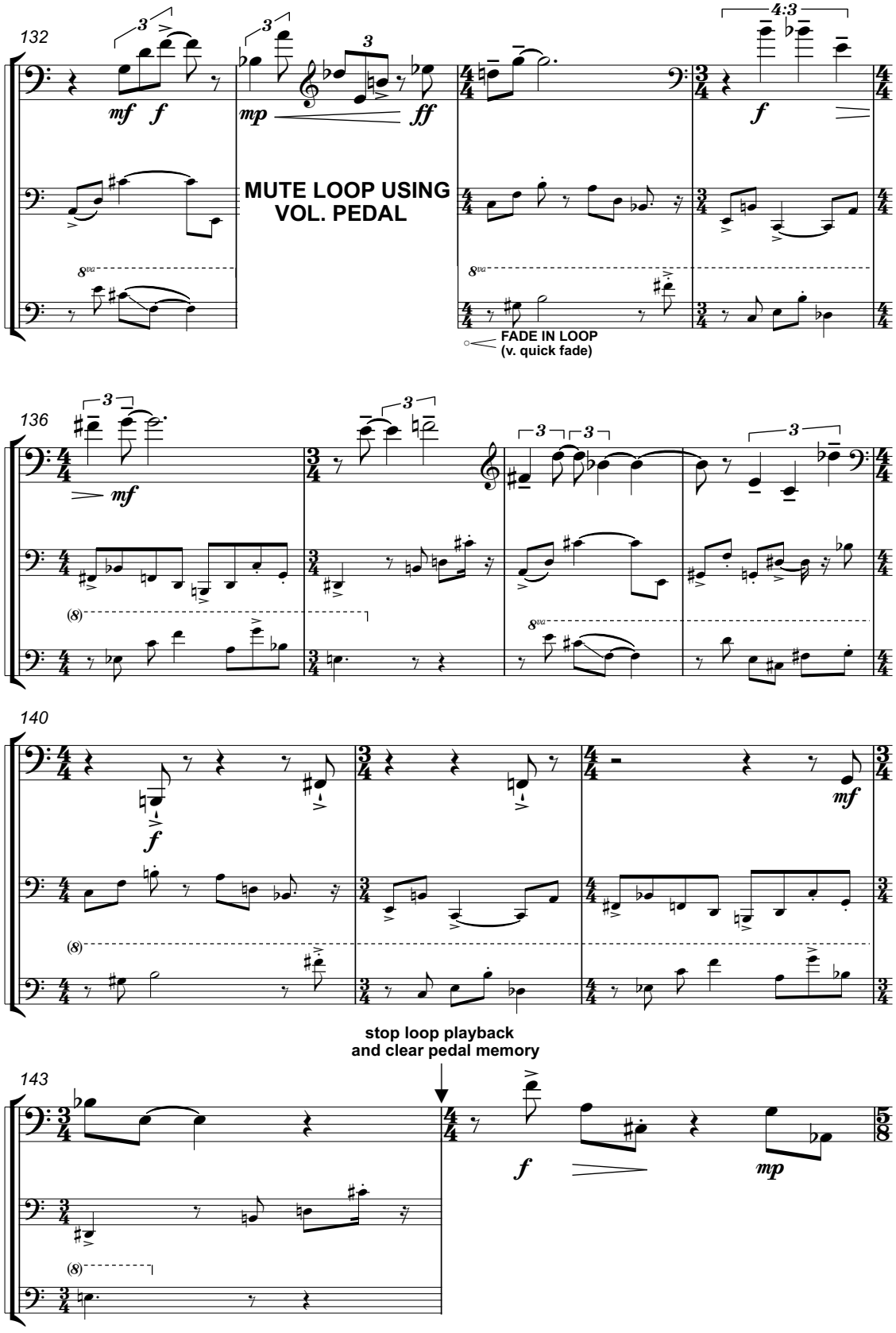

71
mp
mf
74
ff
mf
mp
p
pp
ppp
78
mf
ff
3
mp
82
mf
85
8va
6:5
ff
mf
p


stop loop playback and clear pedal memory
♩=70
89
pp
p
mp
pp
94
p
mp
mf
sfz mp
rit.
START ELEC. SECTION 3
99
s.b.
p
Electronic Section 3
Bass re-enters after 2:21 of playback.
♩=154
start loop recording and layer as indicated
LAYER 1
mf
104
LAYER 2
8va
108
(mf)
layer 1 playback
(8)
112
f
(layer 1 playback)
8va
layer 2 playback

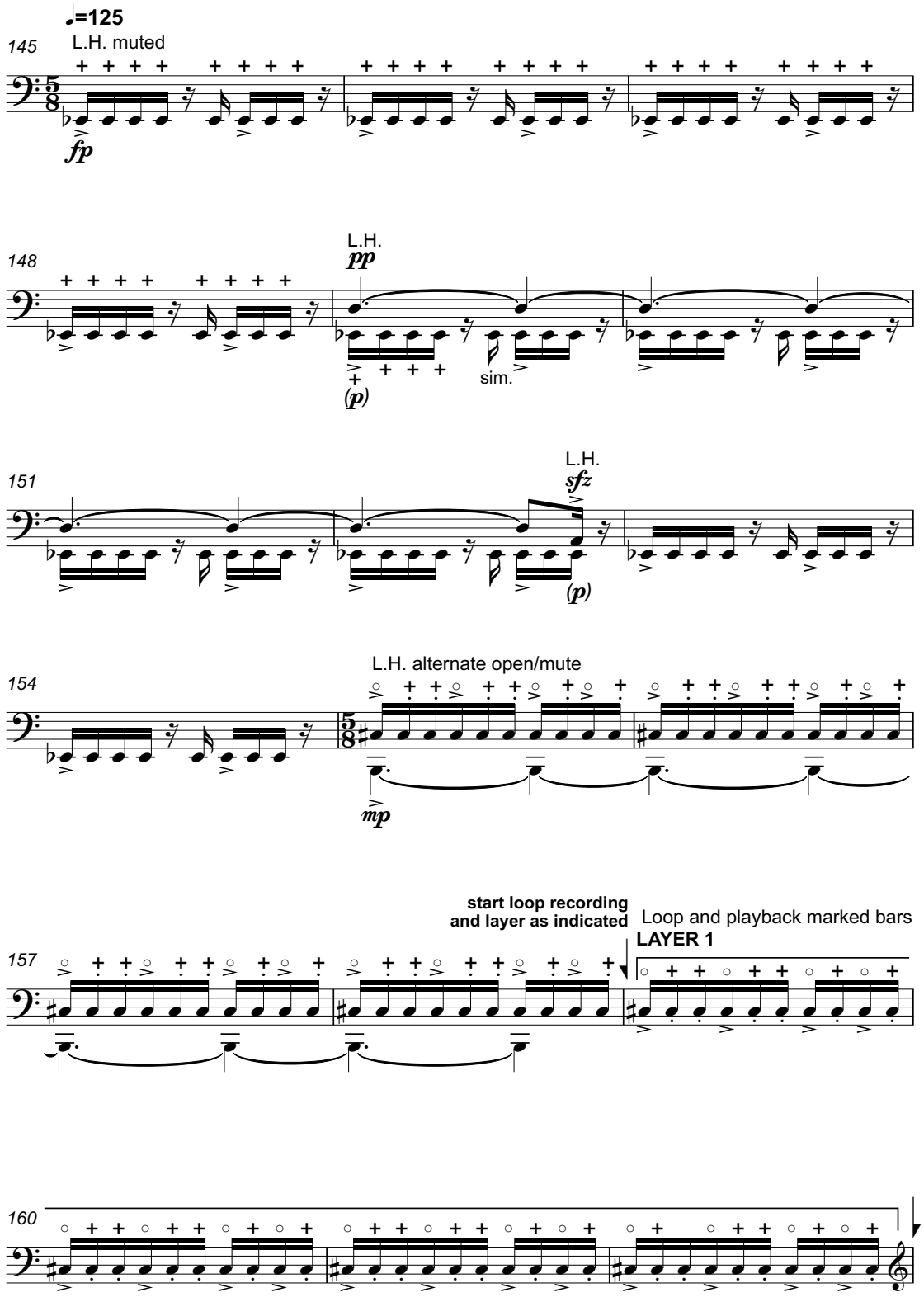
6

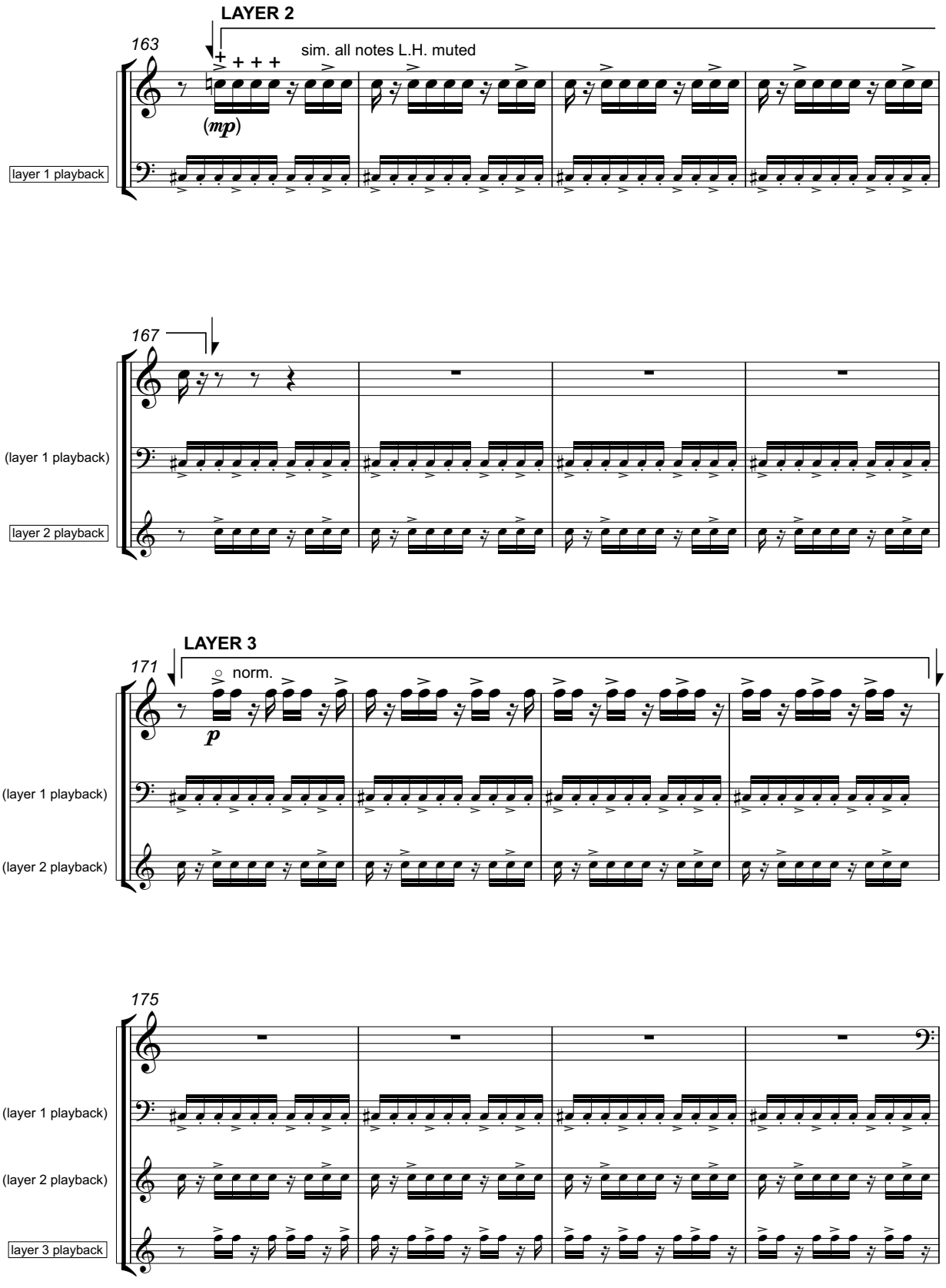
START ELEC. SECTION 4
playback continues for 2:11



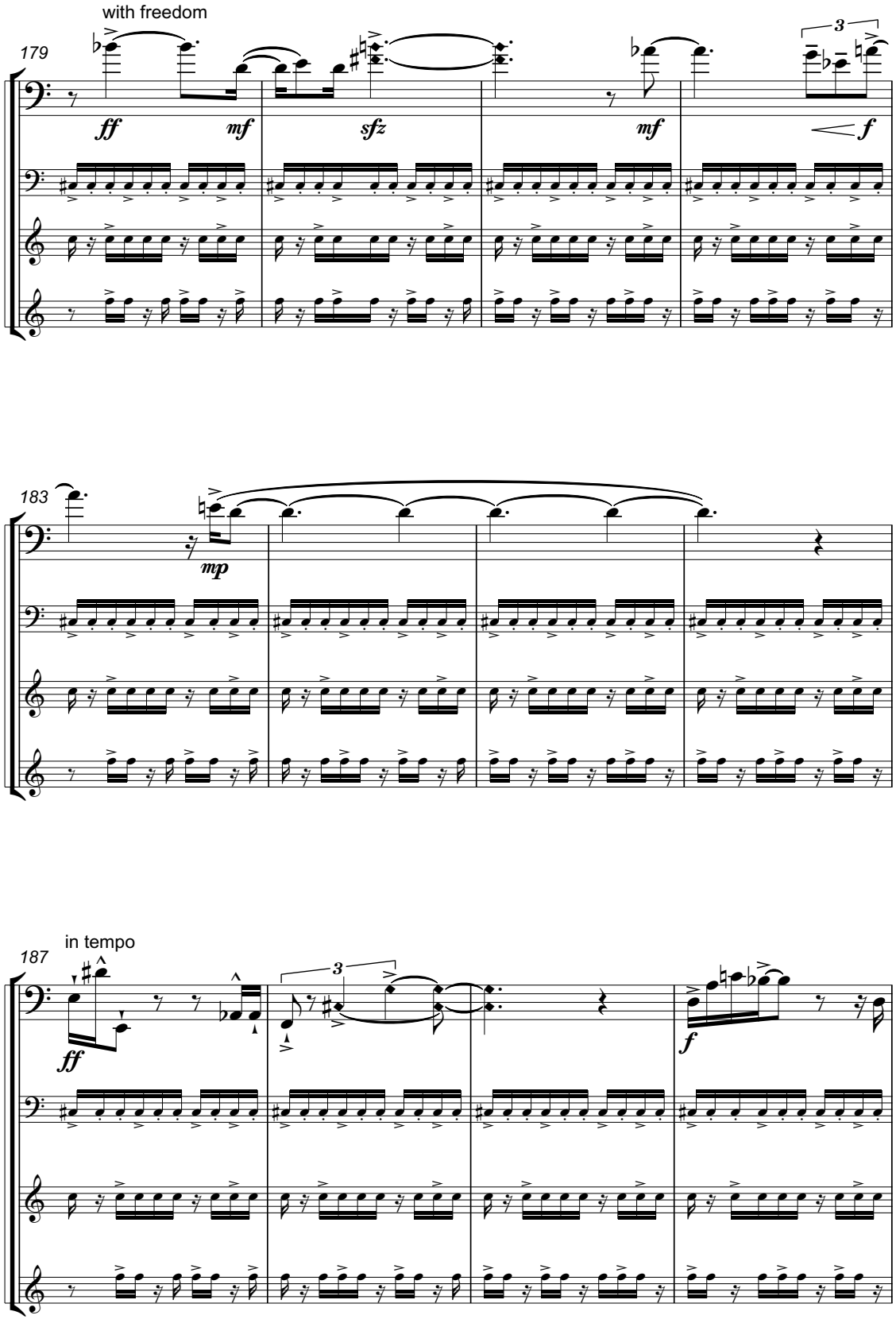

132
MUTE LOOP USING VOL. PEDAL
FADE IN LOOP (v. quick fade)
136
140
stop loop playback and clear pedal memory
143

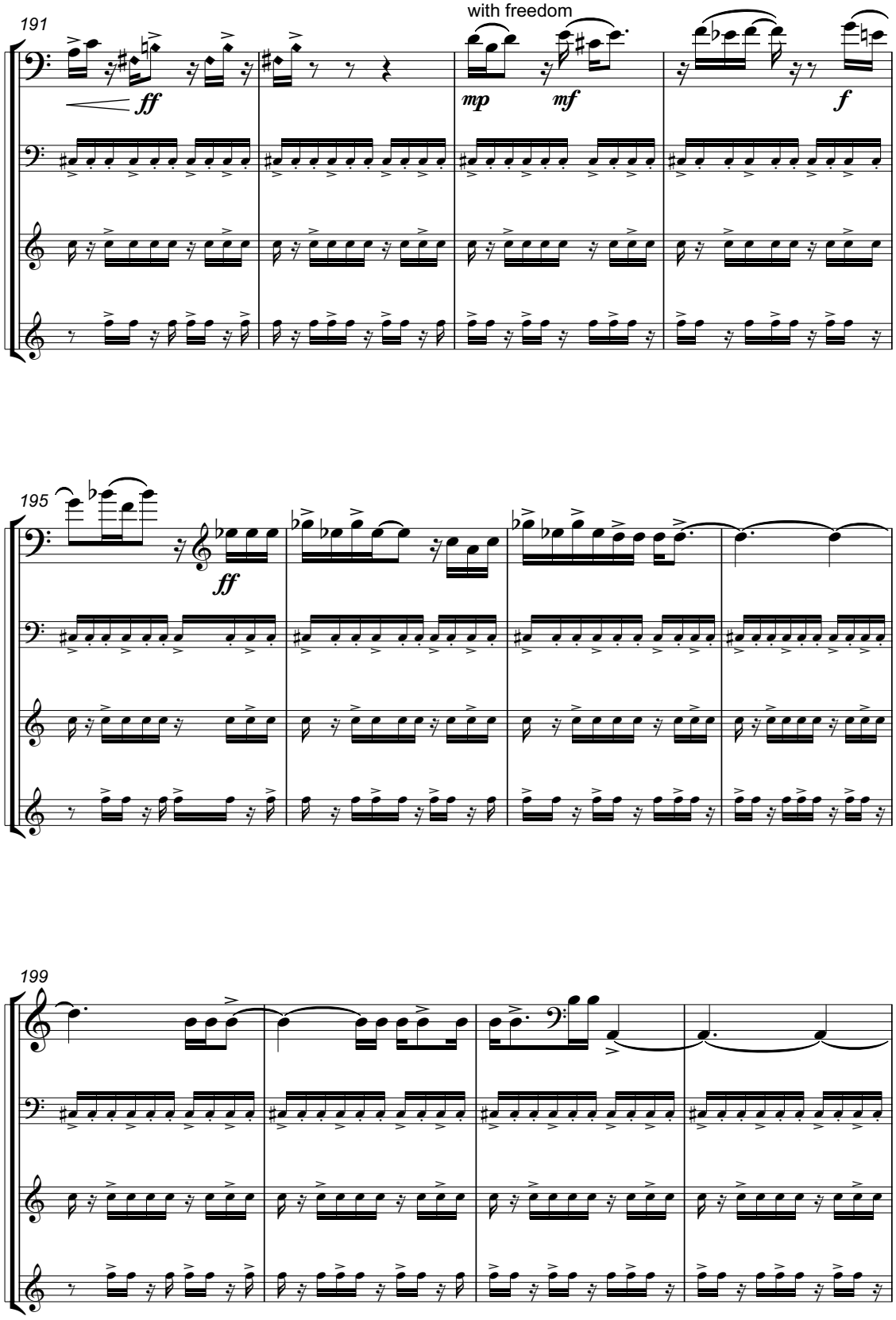
8


♩=125
145
L.H. muted
fp
148
L.H.
pp
sim.
(p)
151
L.H.
sfz
(p)
154
L.H. alternate open/mute
mp
start loop recording
and layer as indicated
Loop and playback marked bars
LAYER 1
157
160

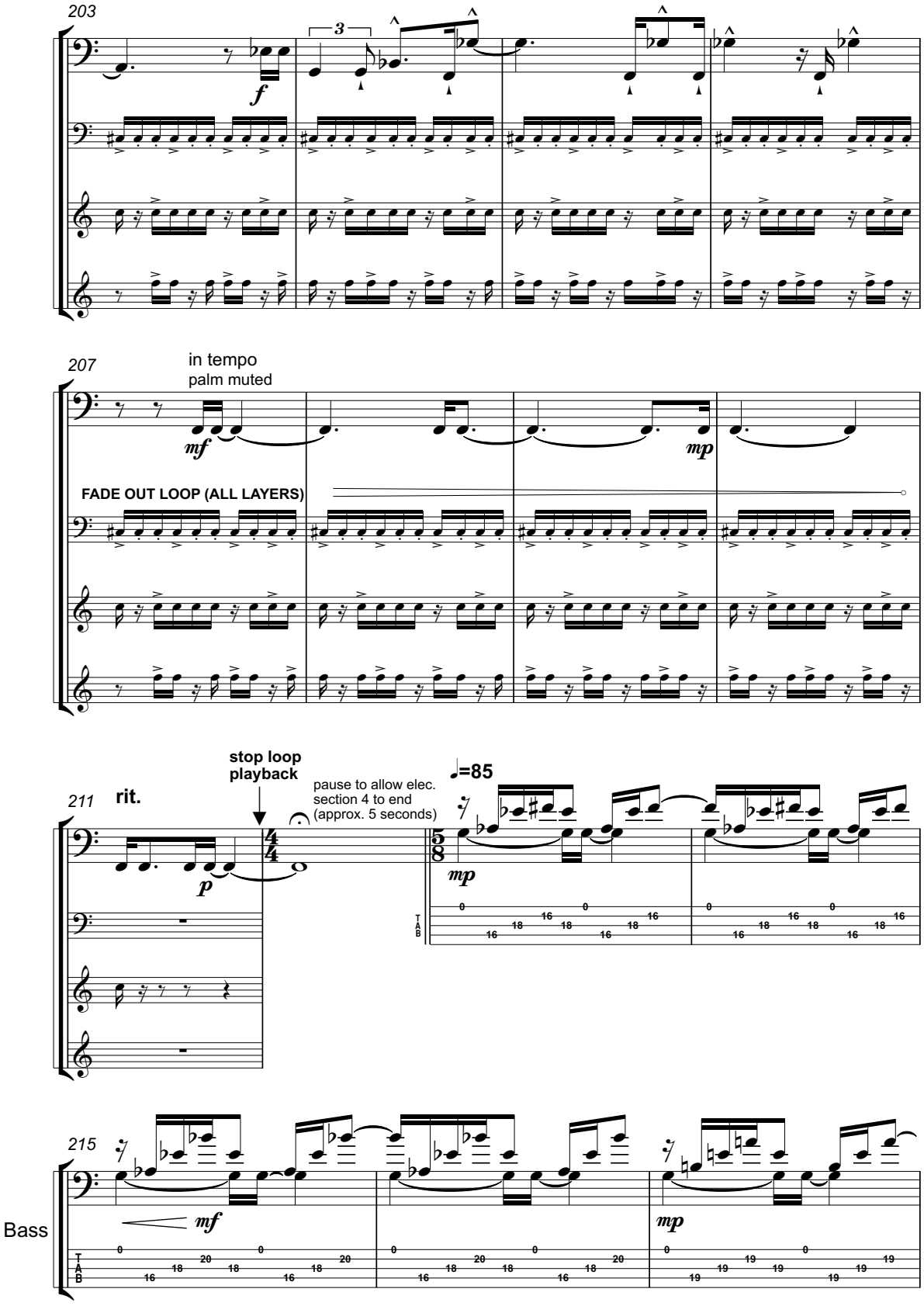

LAYER 2
163
sim. all notes L.H. muted
(mp)
layer 1 playback
167
(layer 1 playback)
layer 2 playback
LAYER 3
171
norm.
p
(layer 1 playback)
(layer 2 playback)
175
(layer 1 playback)
(layer 2 playback)
layer 3 playback

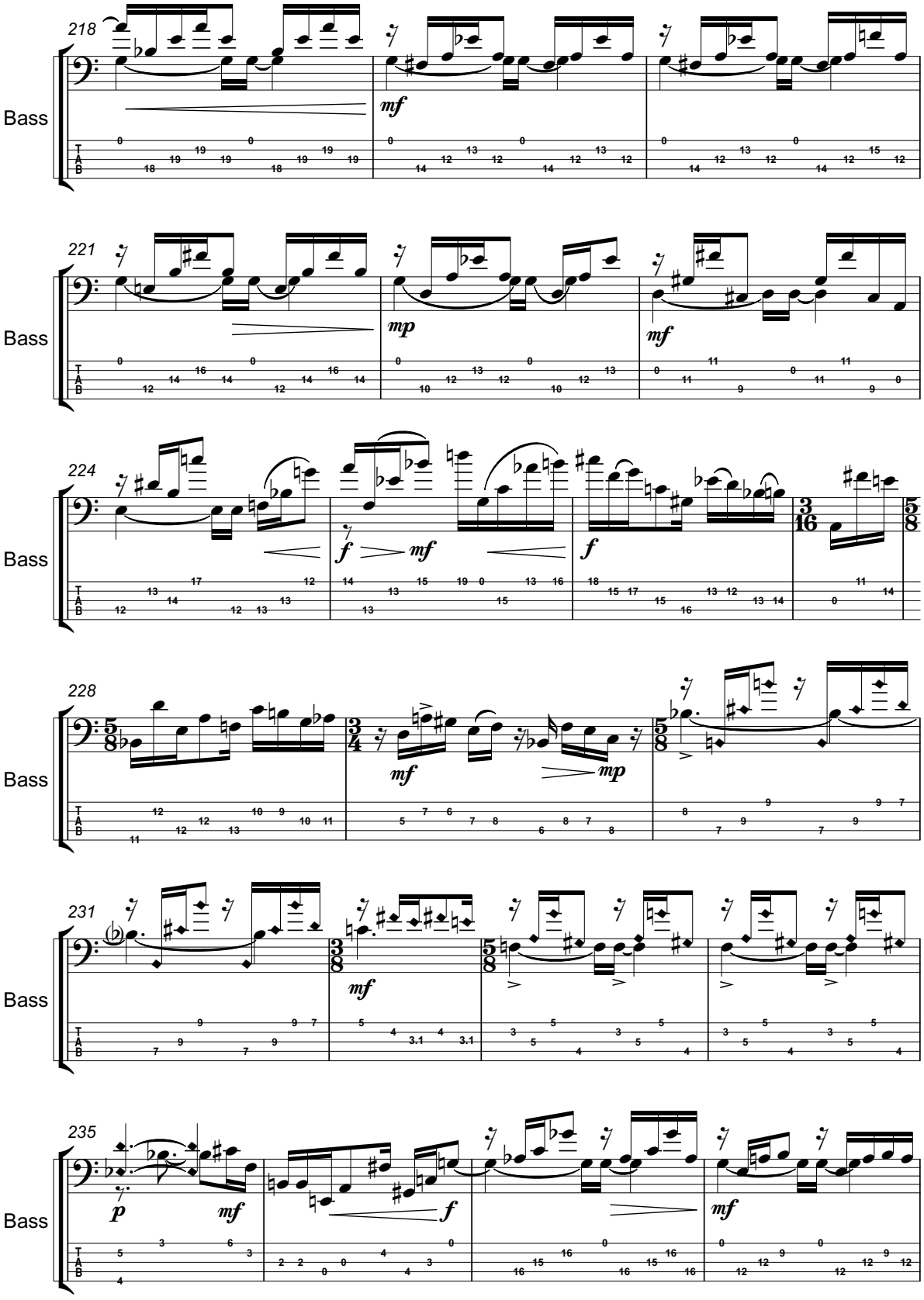
10

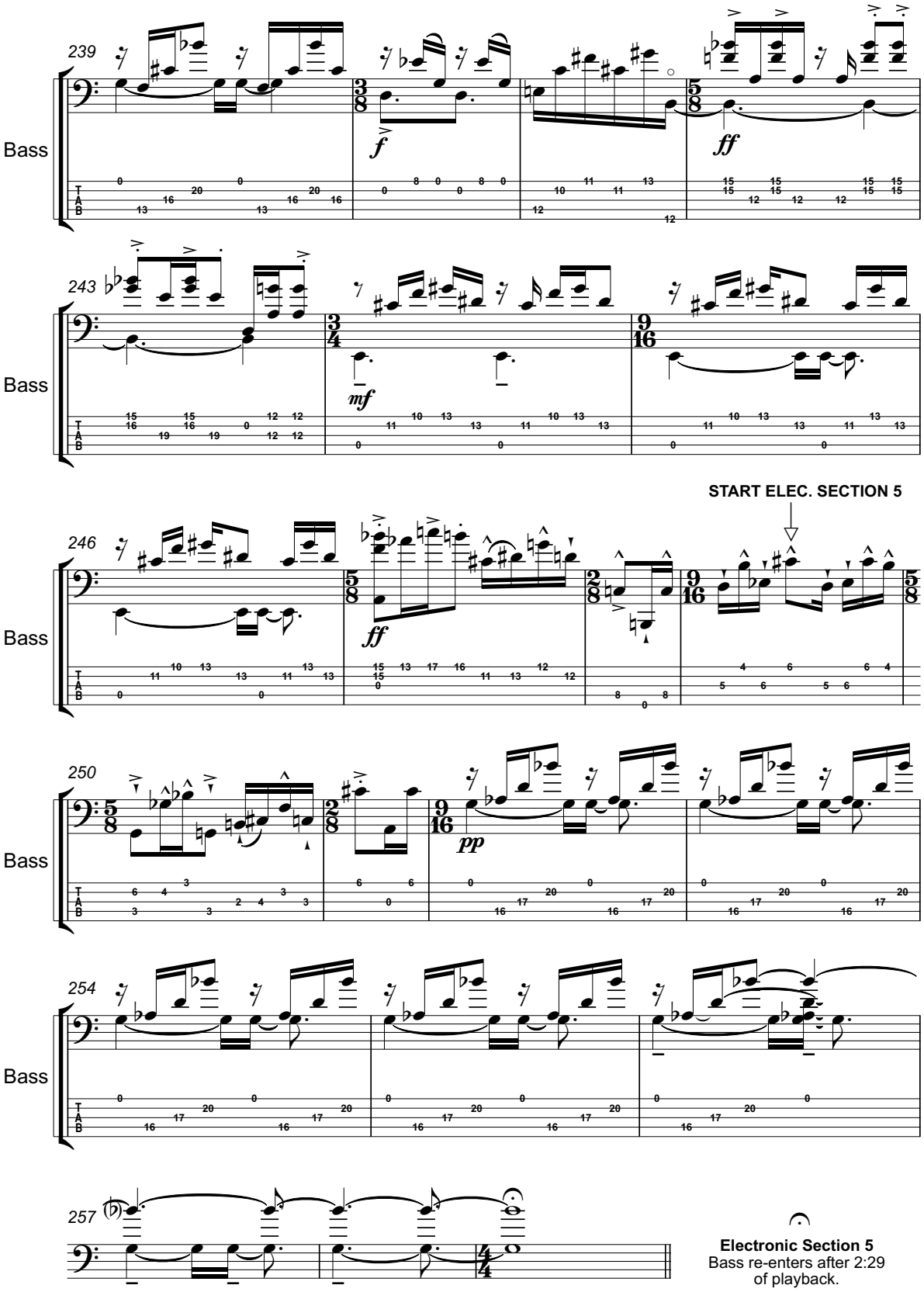


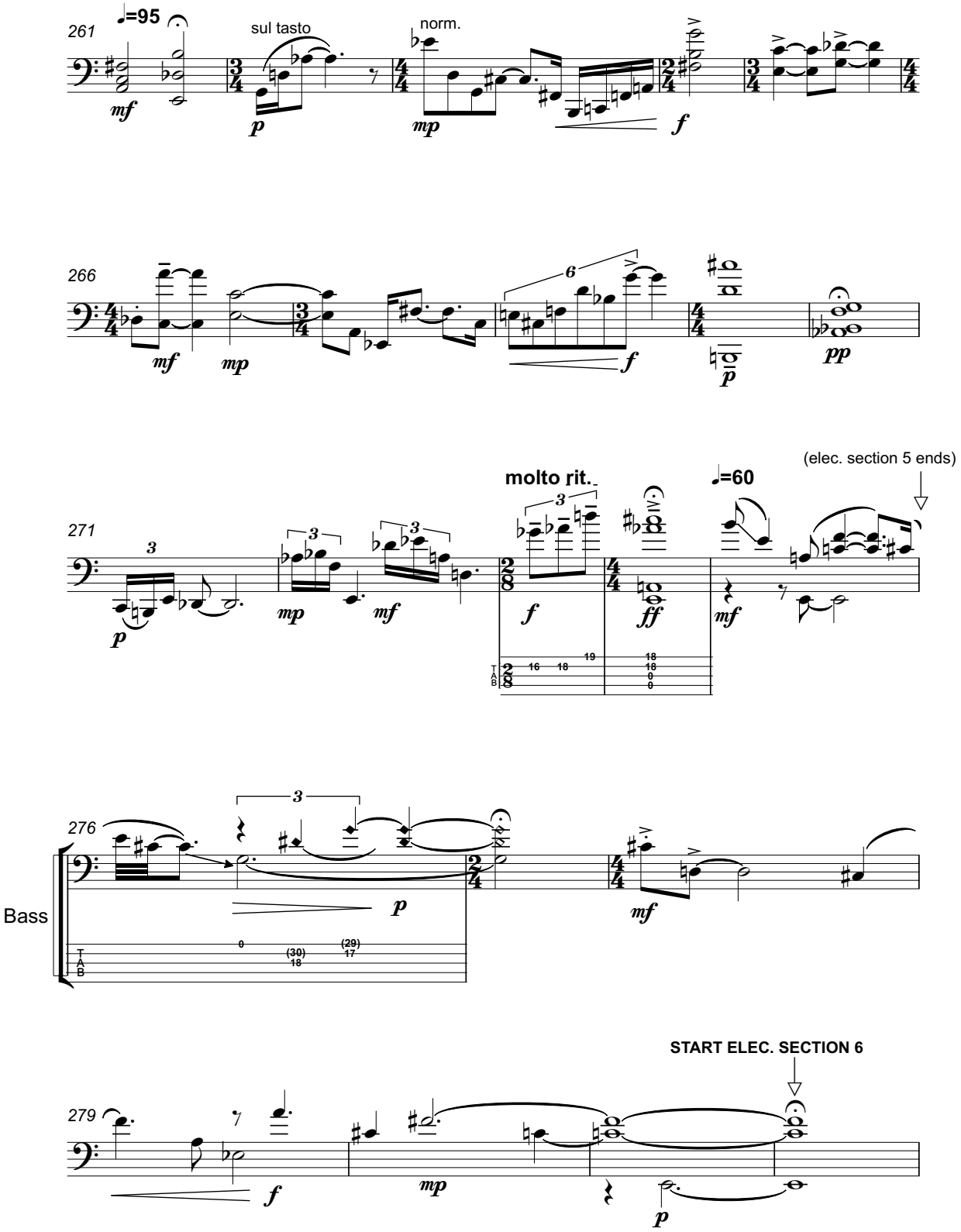

191
with freedom
ff
mp
mf
f
195
ff
199

12

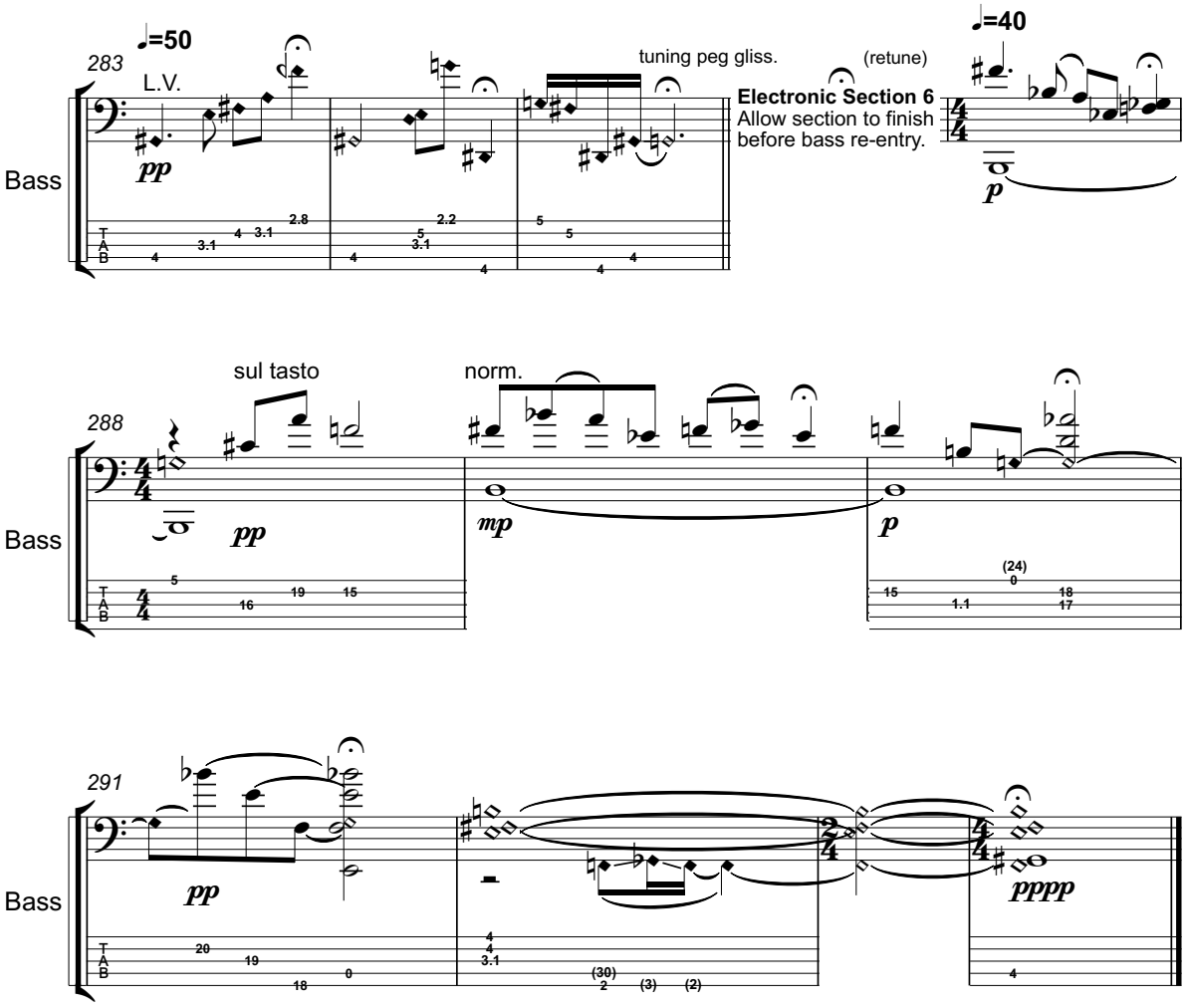

203
f
3
207
in tempo
palm muted
mf
mp
FADE OUT LOOP (ALL LAYERS)
stop loop
playback
pause to allow elec.
section 4 to end
(approx. 5 seconds)
211
rit.
p
♩=85
mp
215
mf
mp
Bass


218
Bass
mf
221
Bass
mp
mf
224
Bass
f
mf
f
228
Bass
mf
mp
231
Bass
mf
235
Bass
p
mf
f
mf


239
Bass
f
ff
243
Bass
mf
START ELEC. SECTION 5
246
Bass
ff
250
Bass
pp
254
Bass
257
Electronic Section 5
Bass re-enters after 2:29
of playback.


261
♩=95
sul tasto
norm.
mf
p
mp
f
266
mf
mp
6
f
p
pp
(elec. section 5 ends)
molto rit.
♩=60
271
3
p
mp
mf
f
ff
mf
TAB
276
Bass
p
mf
TAB
START ELEC. SECTION 6
279
f
mp
p

16

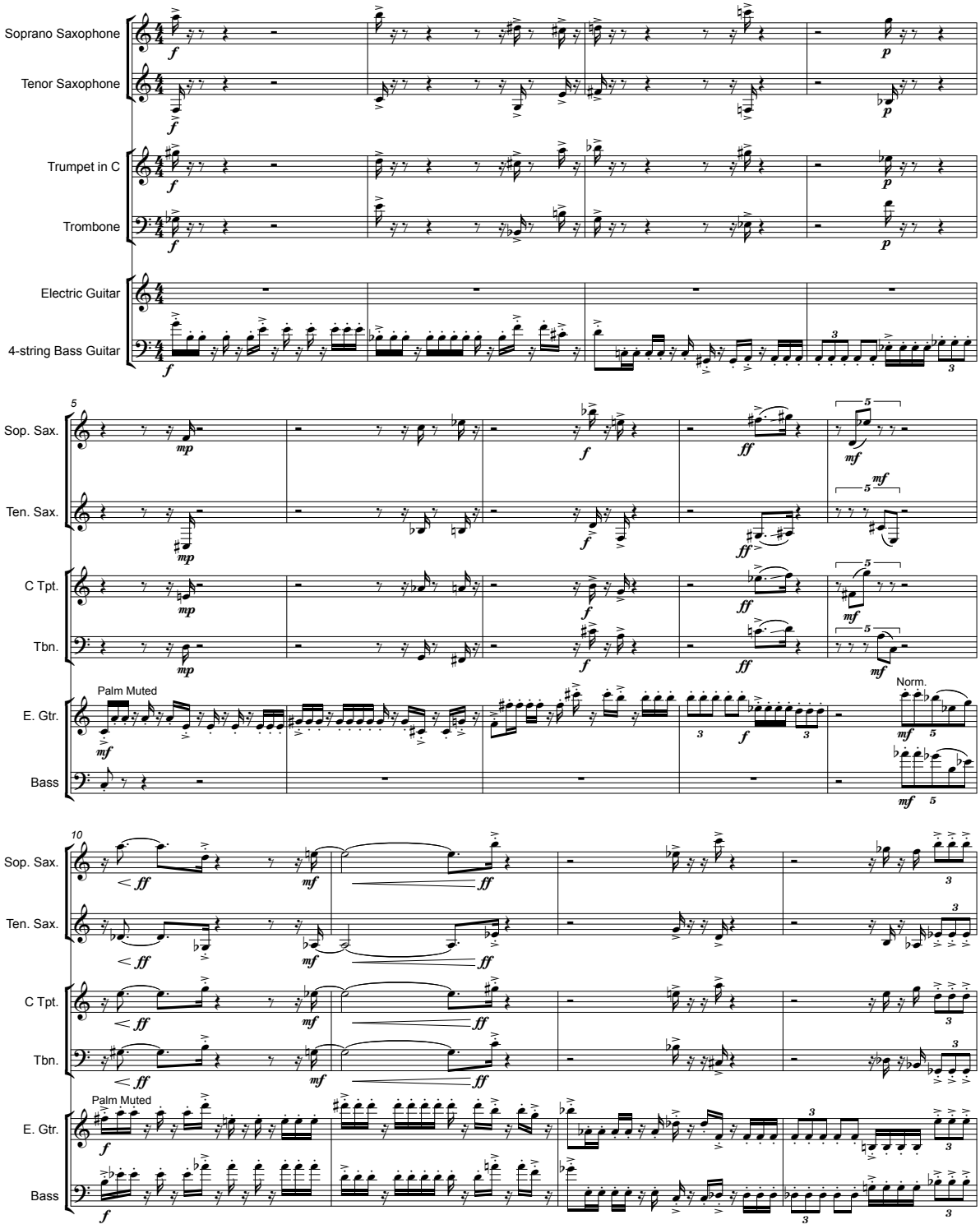

283
♩=50
L.V.
pp
Bass
tuning peg gliss.
(retune)
Electronic Section 6
Allow section to finish
before bass re-entry.
♩=40
p
288
sul tasto
norm.
pp
mp
p
Bass
291
pp
Bass
pppp

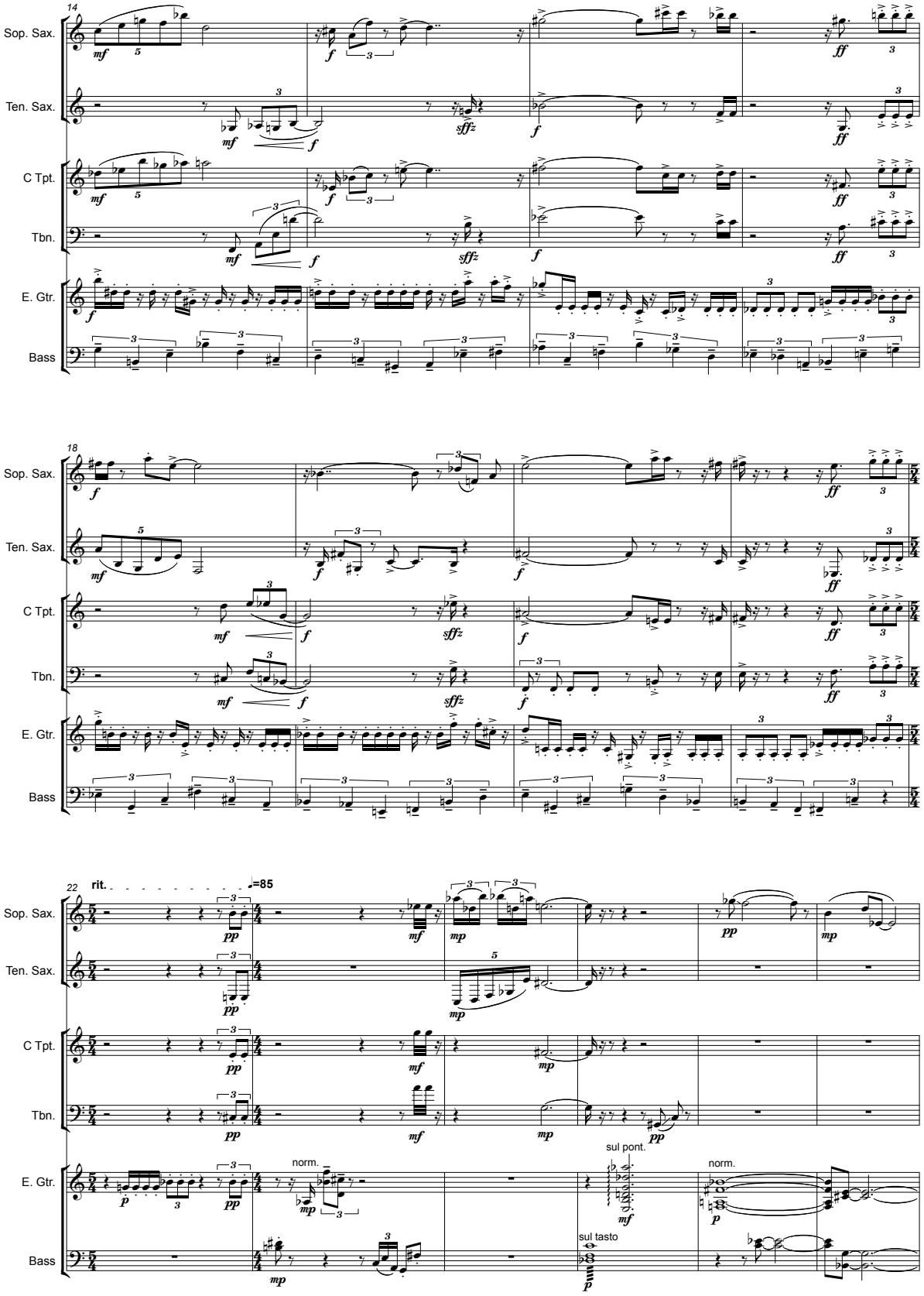
SCORE IN C

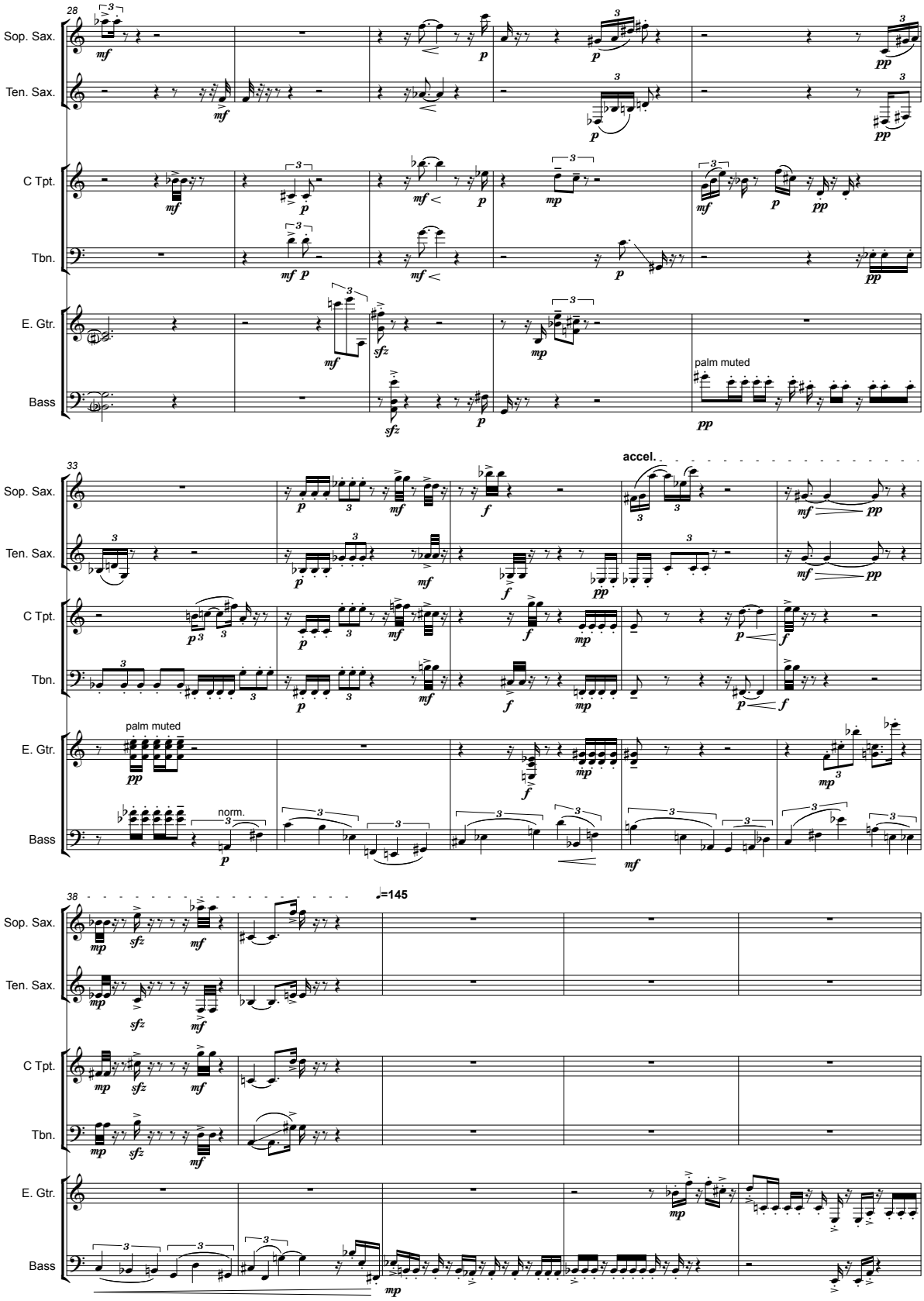
GO!

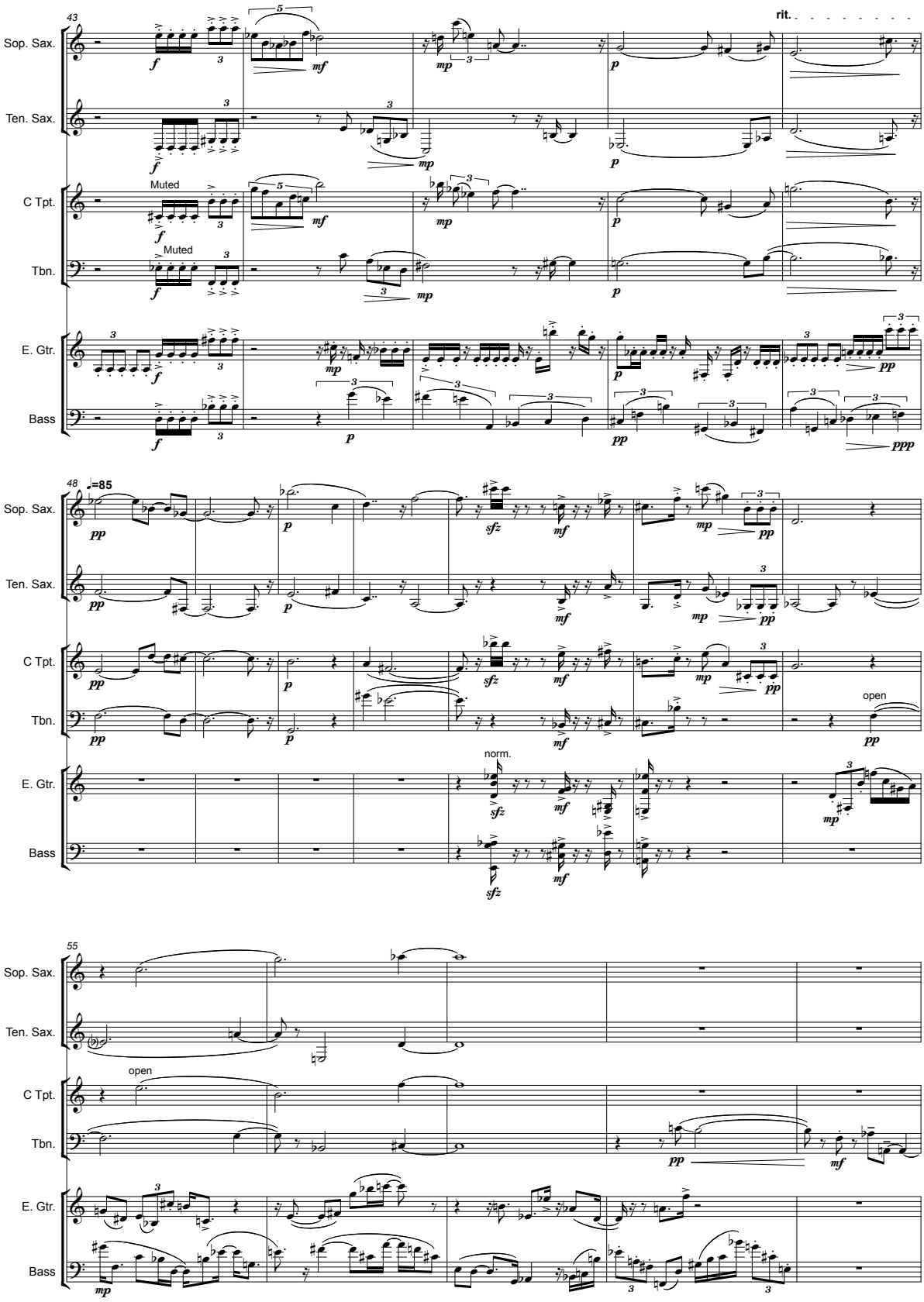
Very Lively and Energetic ♩=145

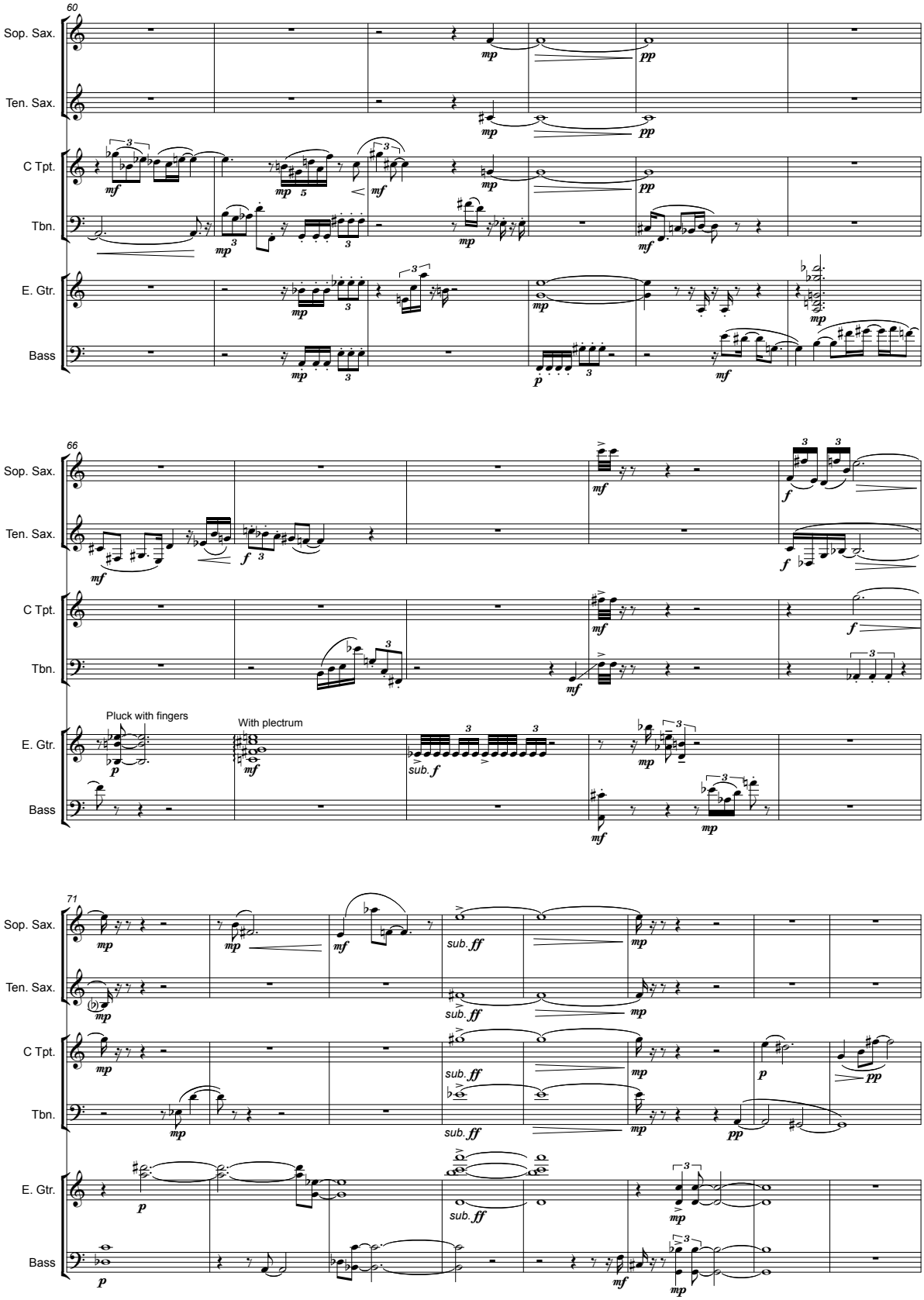
SAMUEL ROBERTS

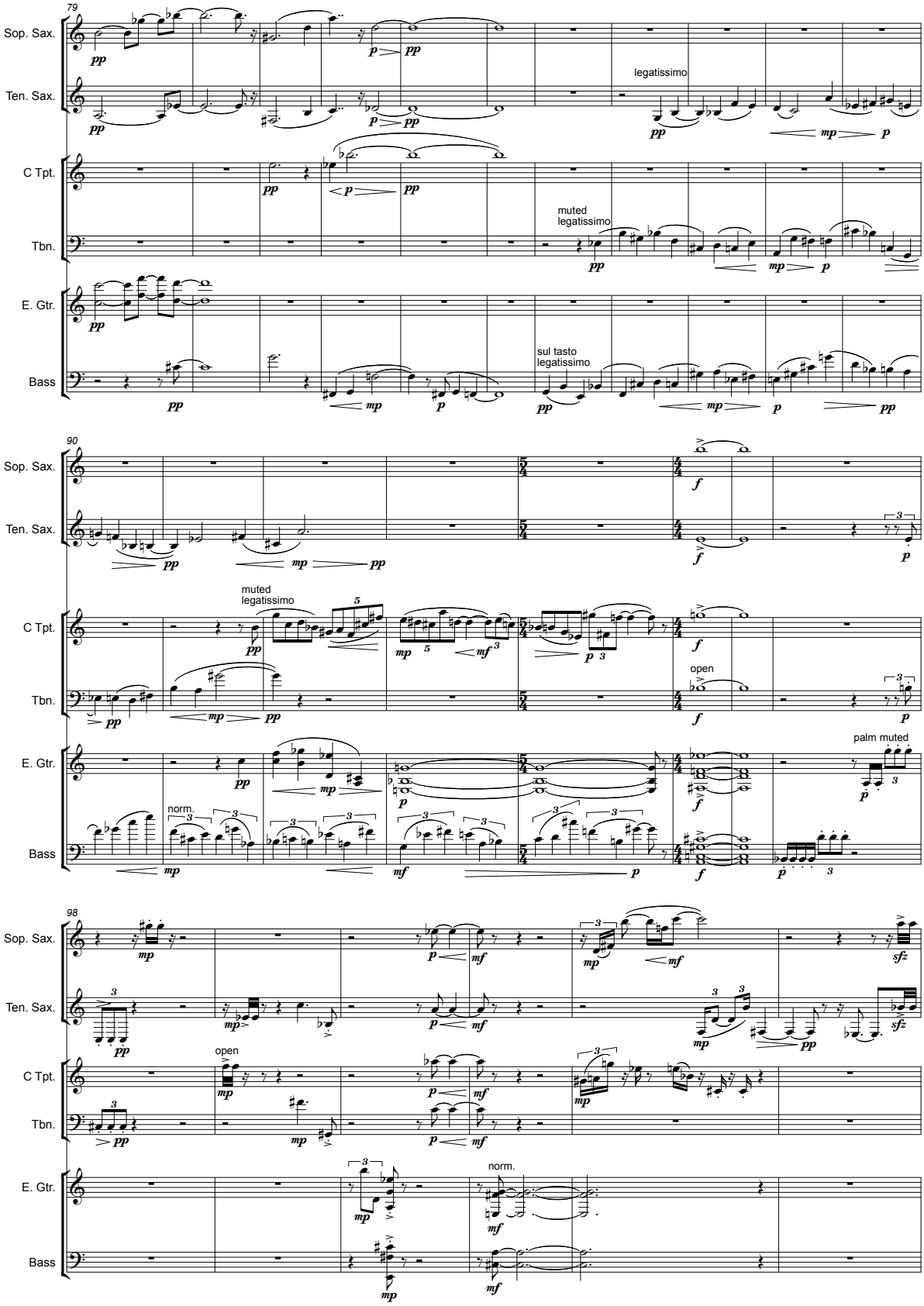


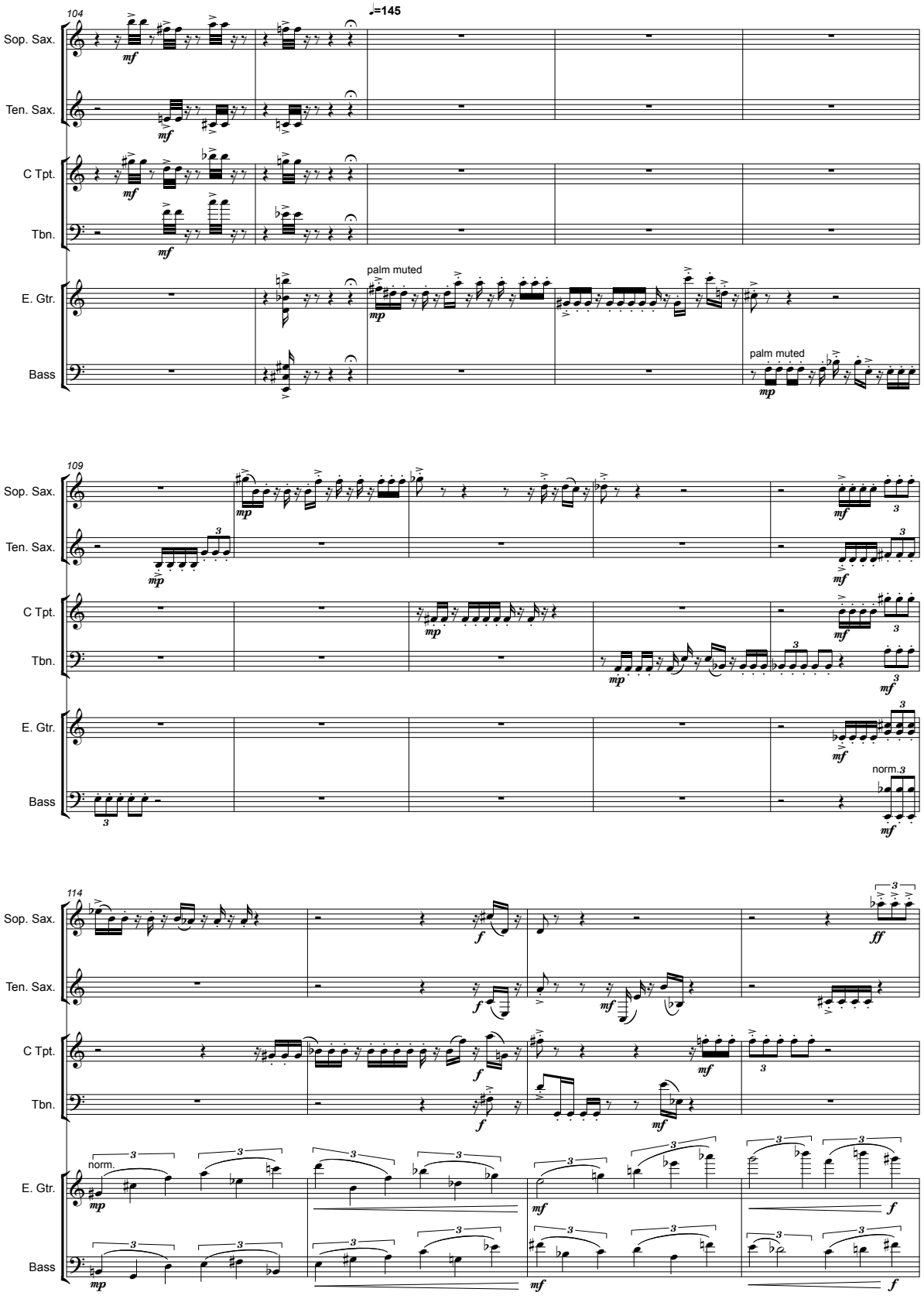

14
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
18
22
rit.
♩=85
norm.
sul pont.
sul tasto

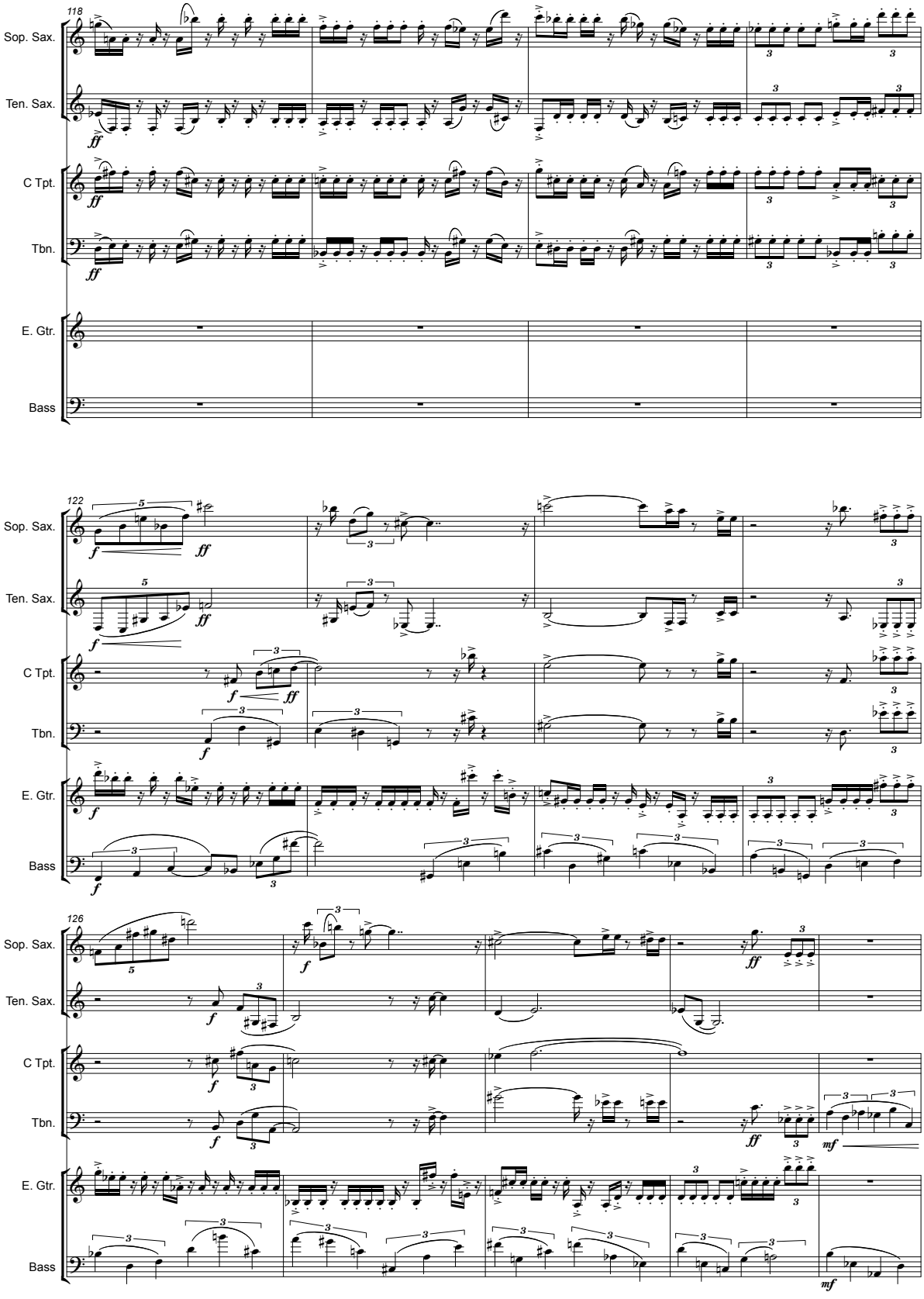

28
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
palm muted
33
accel.
palm muted
norm.
38
♩=145

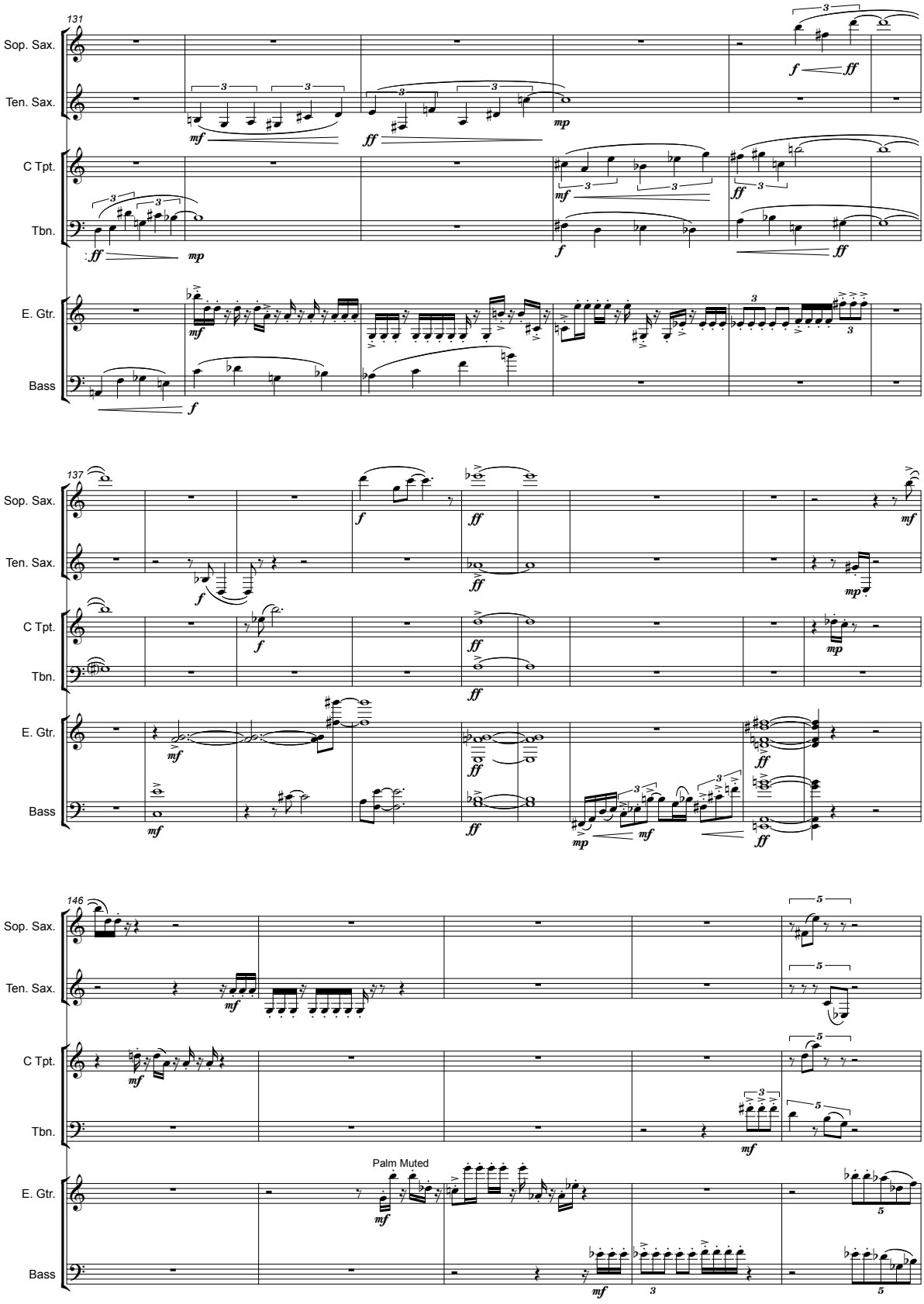

43
rit.
Sop. Sax.
Ten. Sax.
C Tpt.
Muted
Tbn.
Muted
E. Gtr.
Bass
48
♩=85
open
norm.
55
open

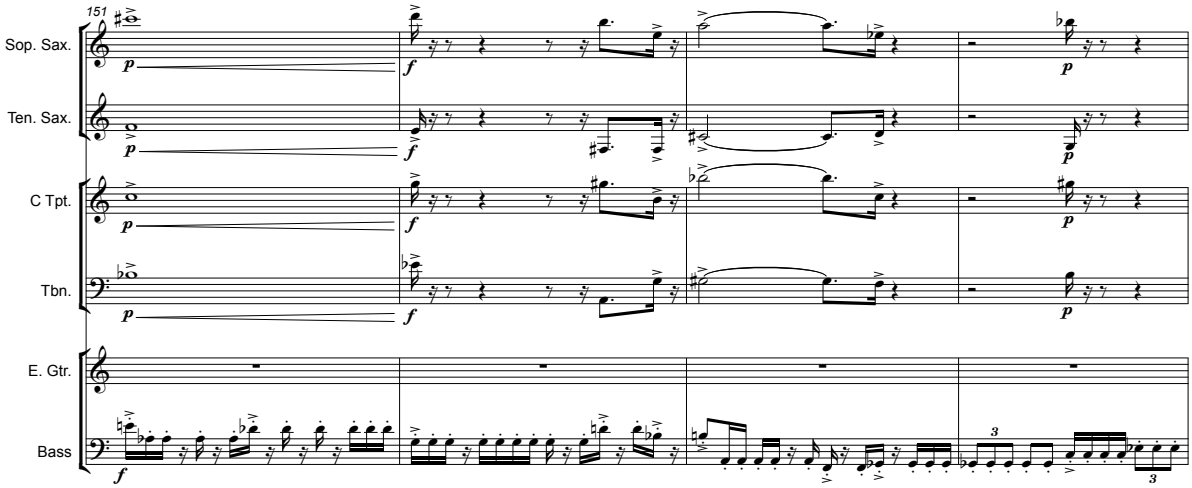

60
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
66
Pluck with fingers
With plectrum
71
sub. ff
sub. f

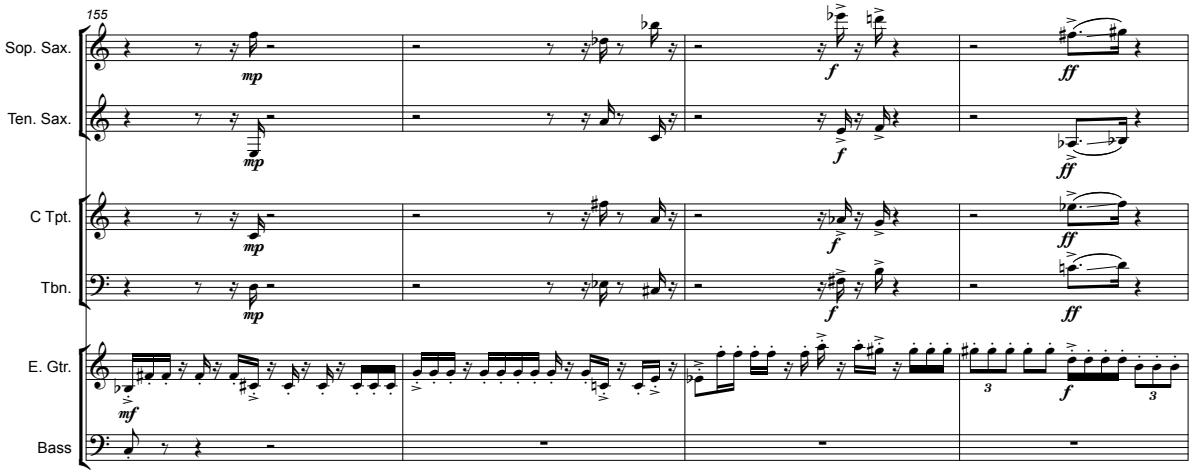

79
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
legatissimo
muted
legatissimo
sul tasto
legatissimo
90
muted
legatissimo
open
norm.
palm muted
98
open
norm.

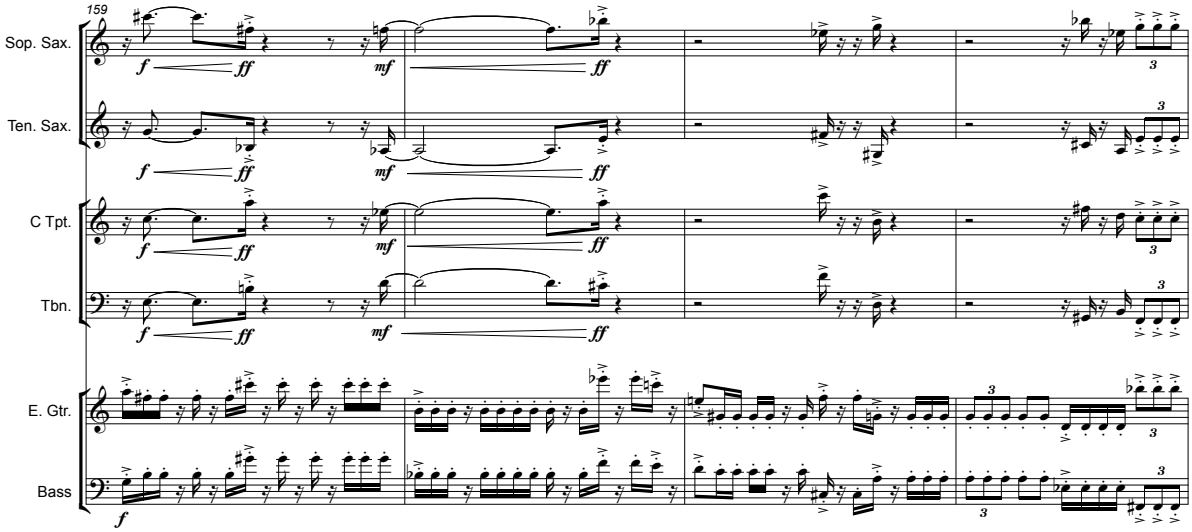

104
♩=145
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
mf
palm muted
mp
palm muted
109
mp
mf
3
norm.
114
f
ff
norm.

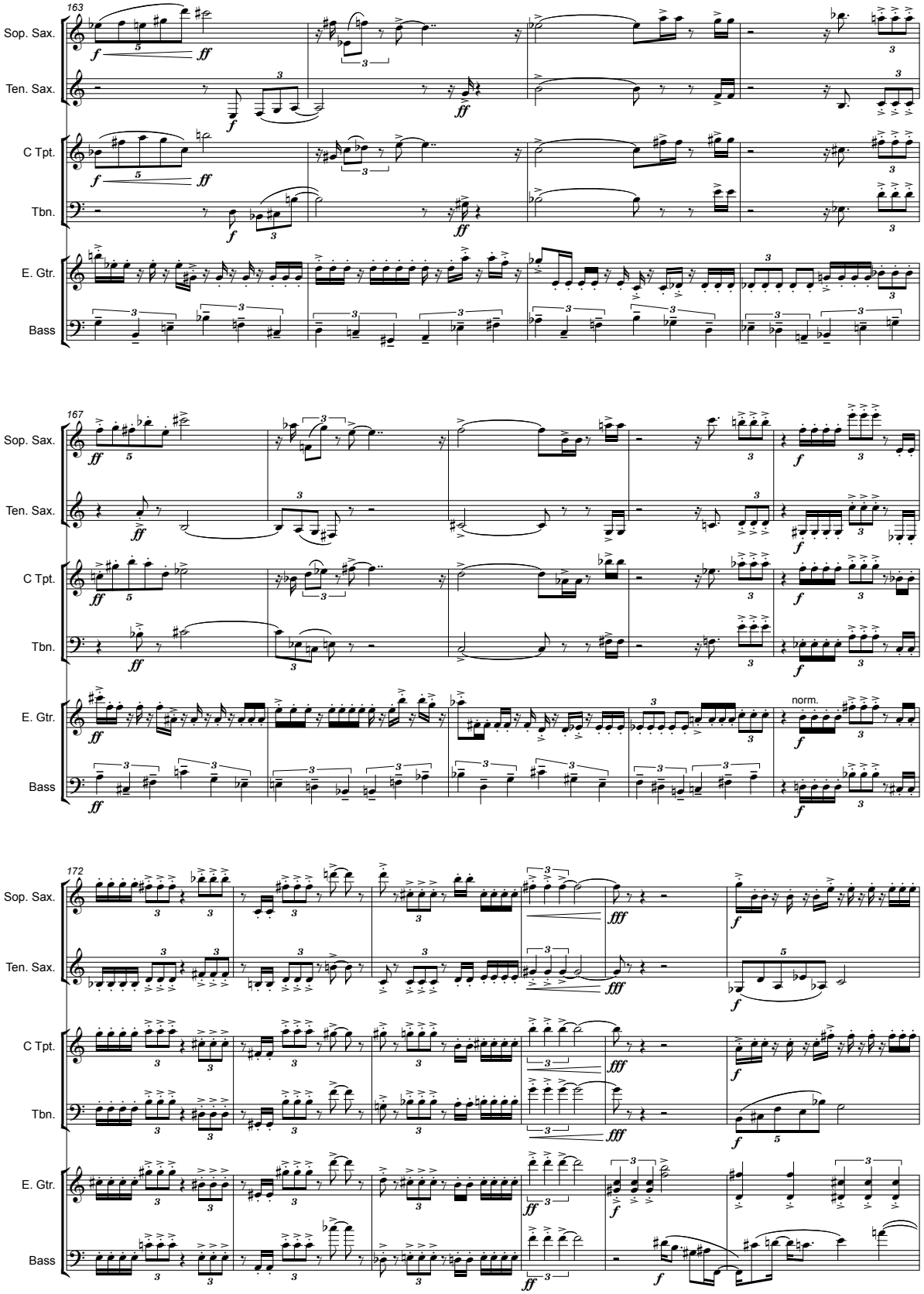

118
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
122
126

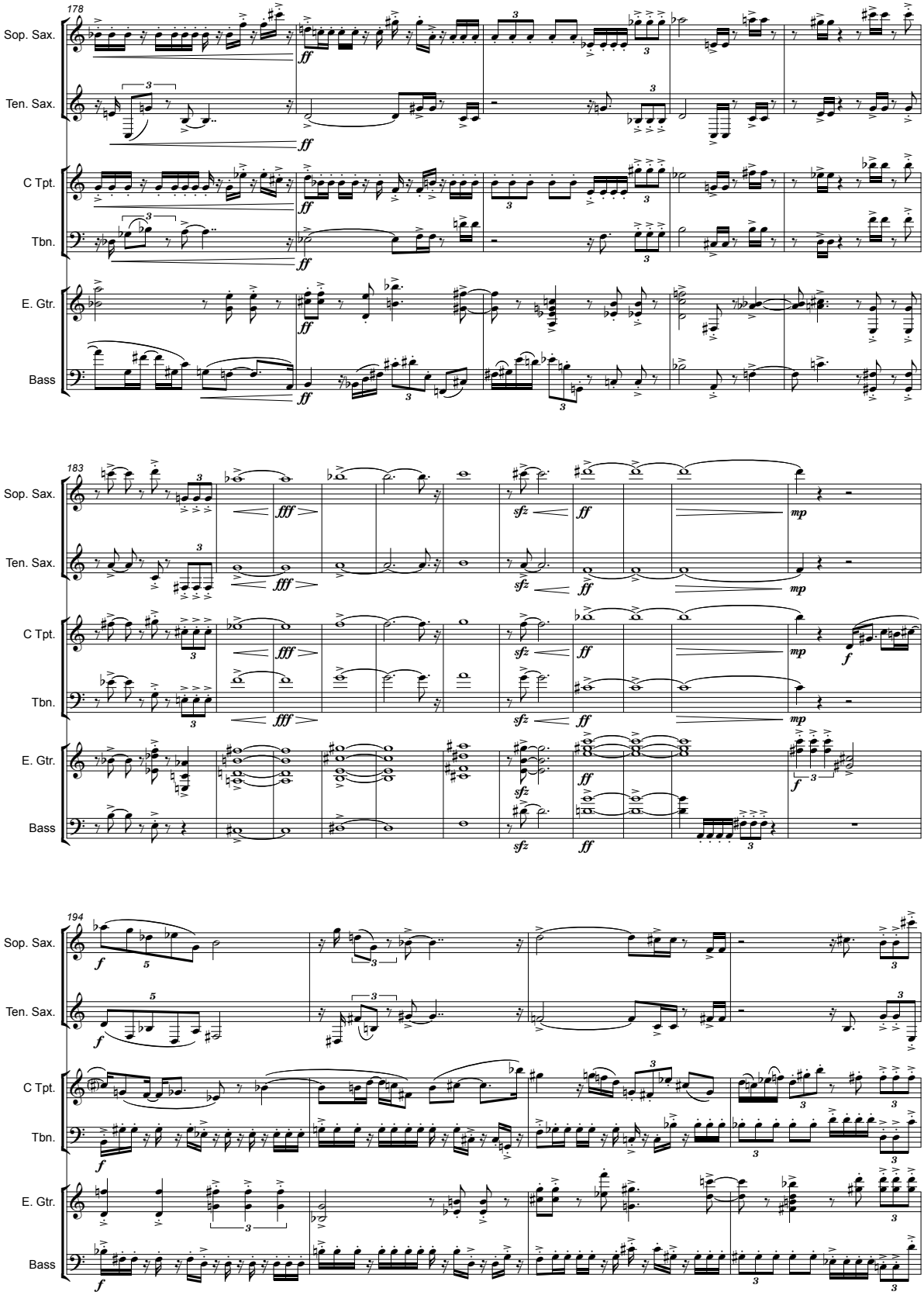

131
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
137
146
Palm Muted

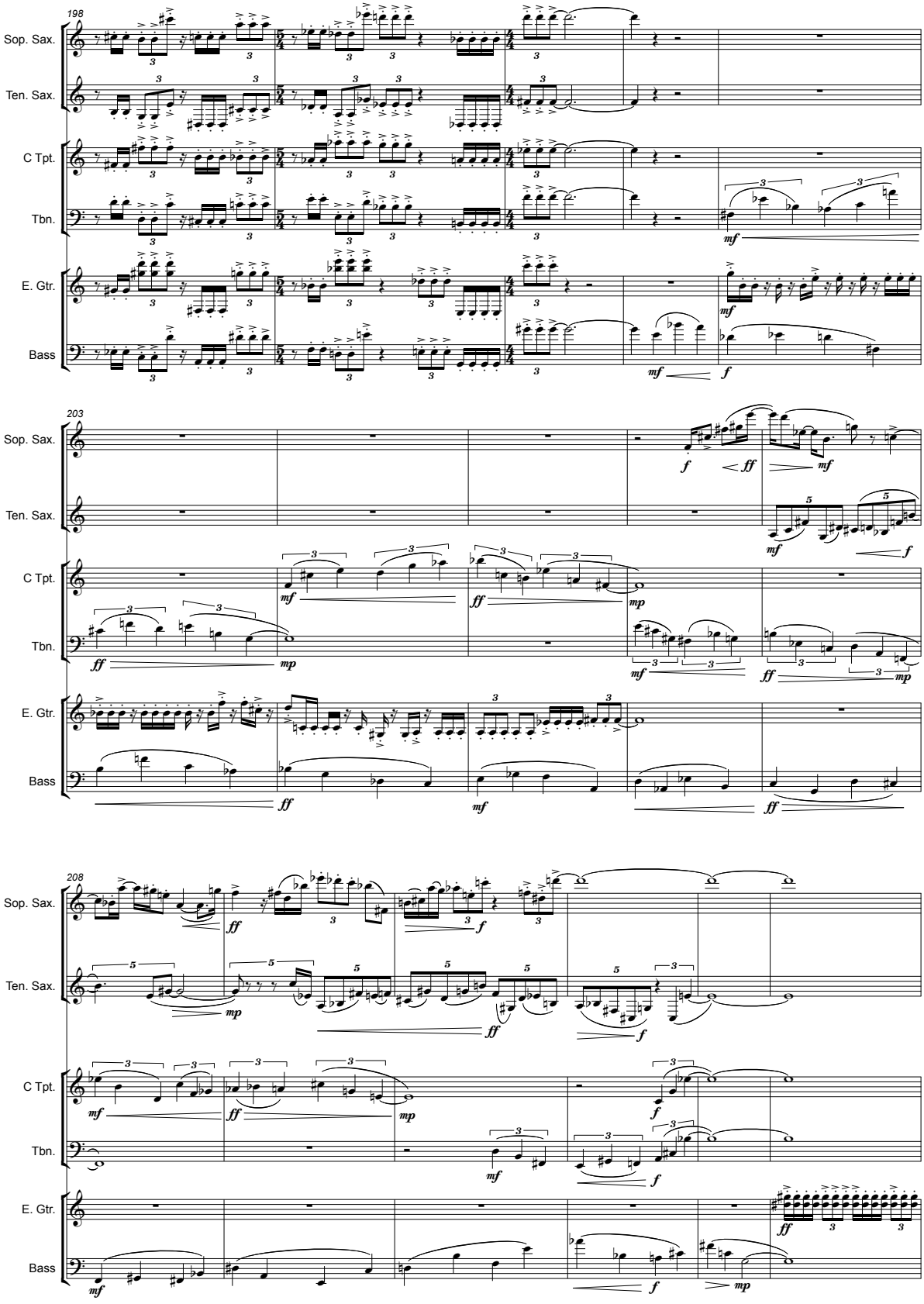

151
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass

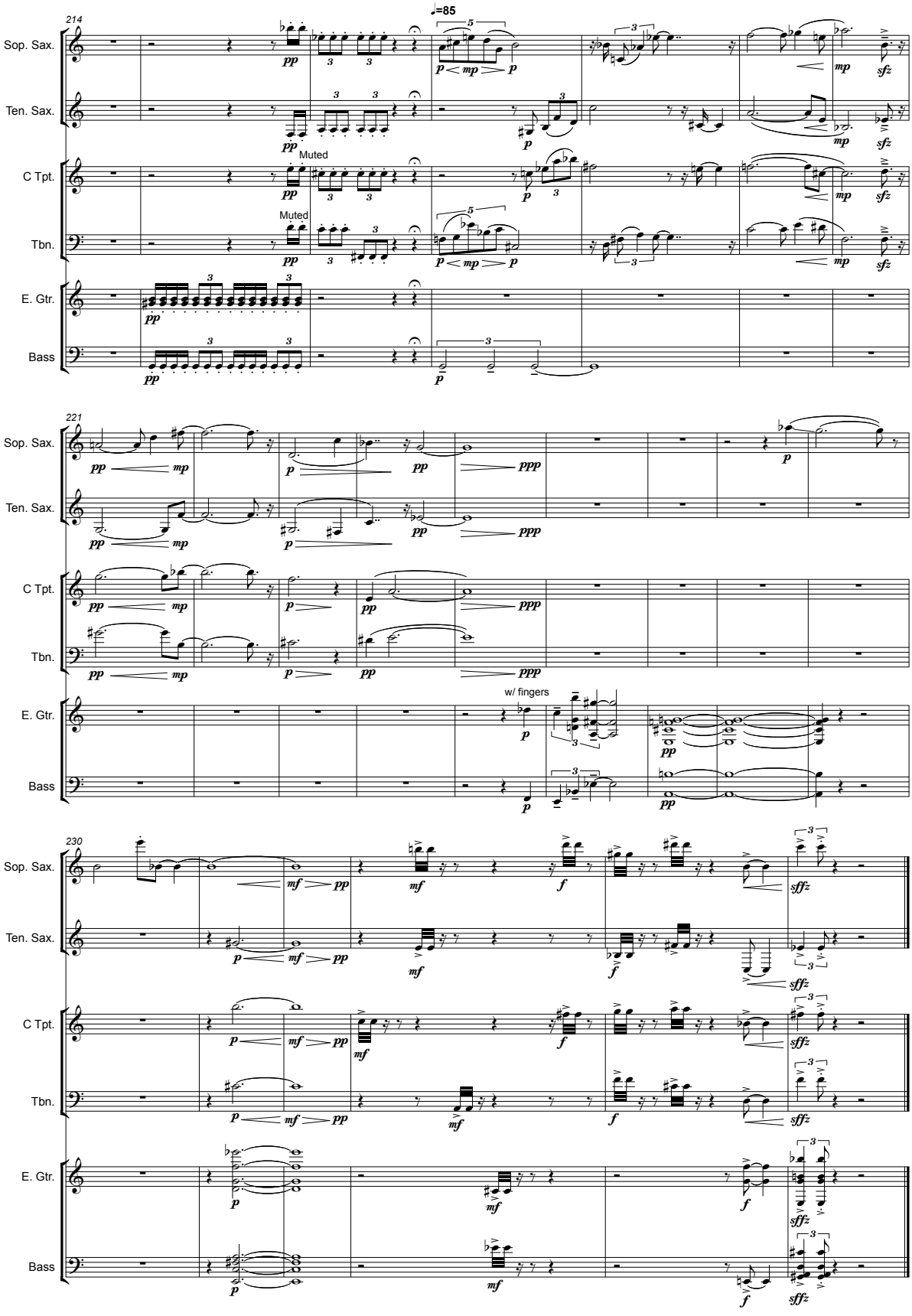

155
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass


159
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass


163
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
167
norm.
172


178
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
183
194


198
Sop. Sax.
Ten. Sax.
C Tpt.
Tbn.
E. Gtr.
Bass
203
208


214
♩=85
Sop. Sax.
Ten. Sax.
C Tpt.
Muted
Tbn.
Muted
E. Gtr.
Bass
221
w/ fingers
230

SAMUEL C. ROBERTS

GRACEFUL ASCENT

FOR 5-STRING BASS GUITAR, PERCUSSION & BRASS

2

Instrumentation

4 Bb Trumpets (1 doubling Piccolo Trumpet)
(harmon, straight-metal and practice mutes required)

Horn in F

3 Tenor Trombones
1 Bass Trombone
(straight-metal and fibre mutes required)

Tuba

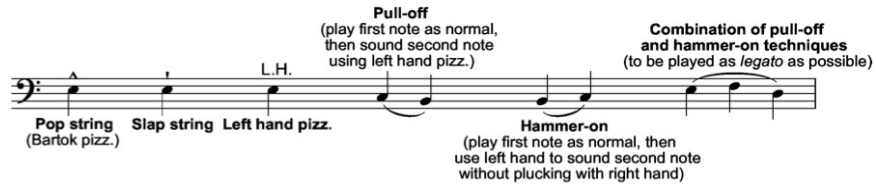
5-string Electric Bass Guitar

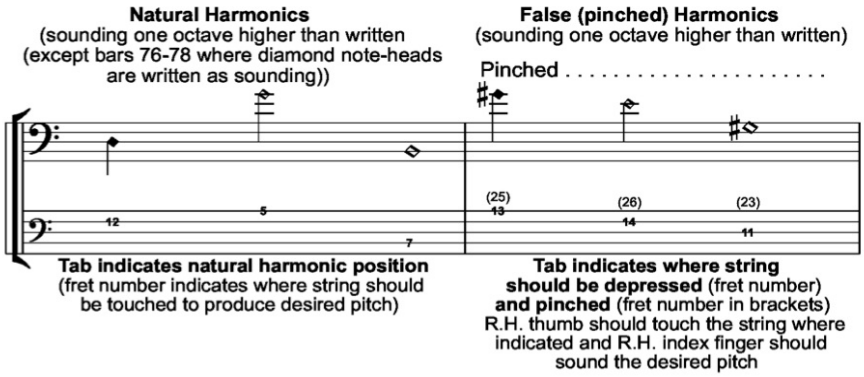
Percussion (1 player) - Marimba and Glockenspiel

Information for Bass Guitar Part

This work requires a 5-string bass guitar with a two-octave (24 fret) neck. Additionally, an E-Bow is desired but not essential. No other electronic effects are required. The performer should use a flat, natural tone (on both instrument and amplifier) that is always dynamically balanced with the ensemble.

Key to Notation





I, II, III, IV, V indicates string number (G to B).

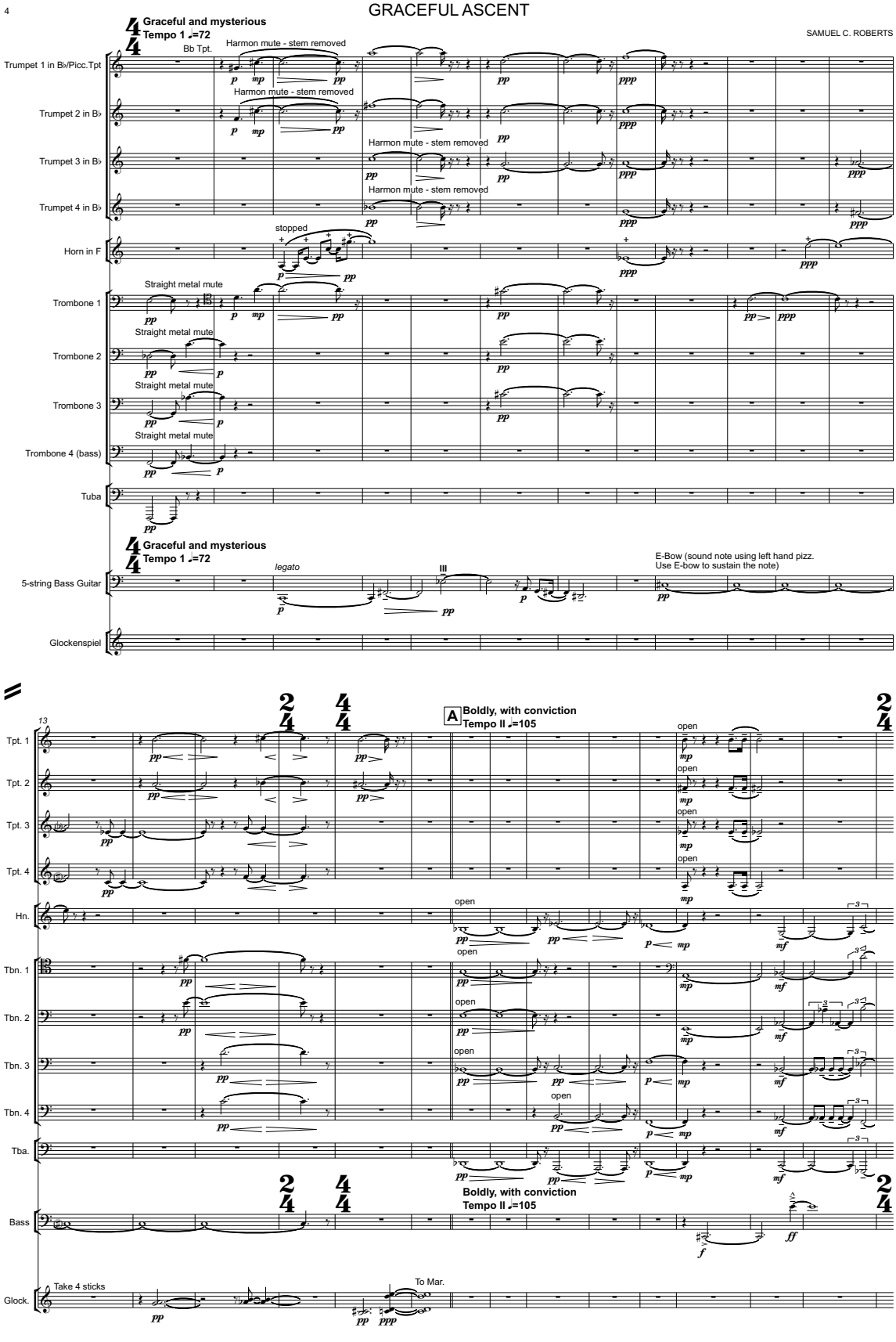
Where 'p i m' is written (bar 132), use 'pimac' system for R.H. fingering (p – R.H. thumb, i – index finger, m – middle finger etc.).

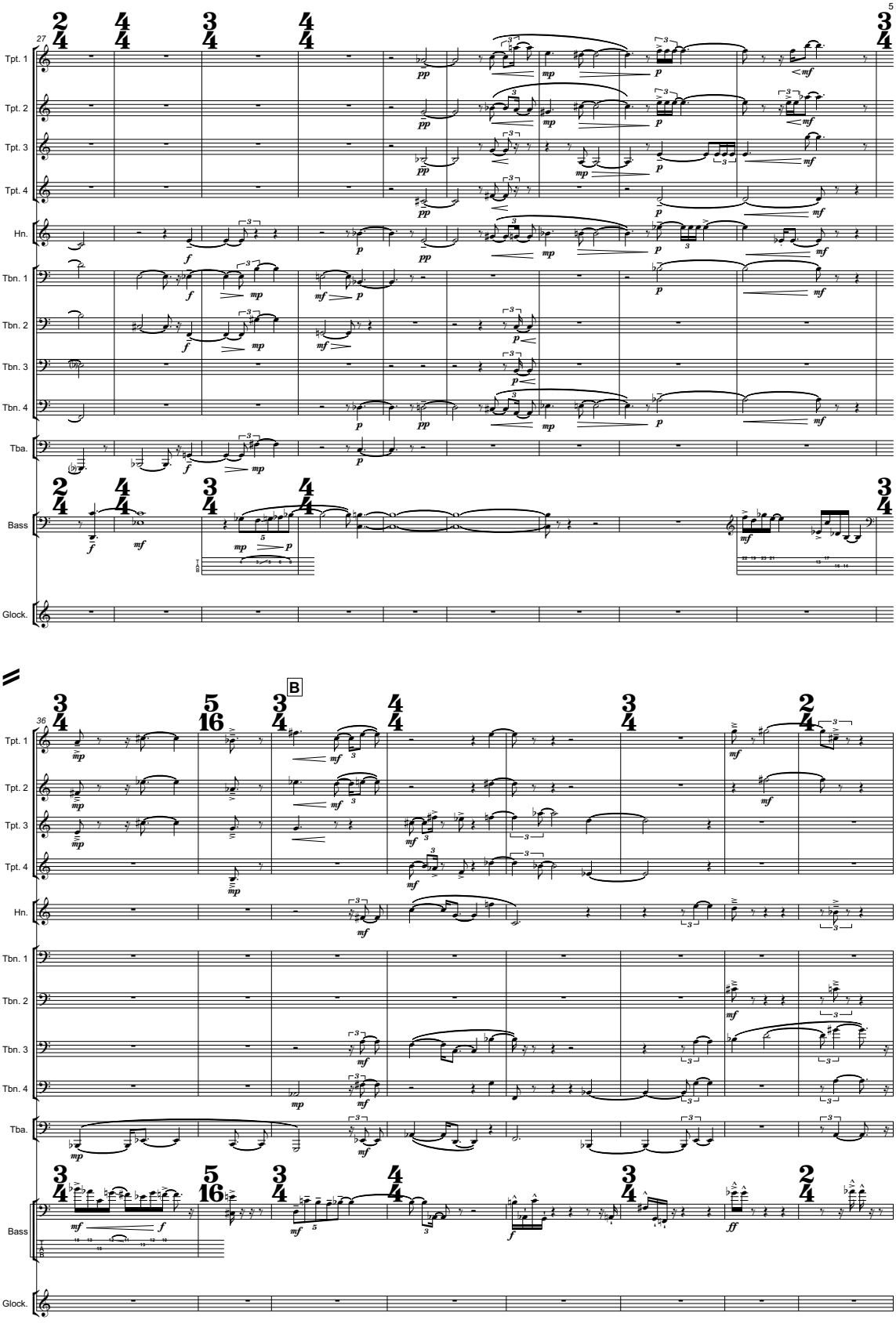
Fret numbers indicated in the Tablature *ossia* staff are to be followed exactly, as the L.H. positions provided allow for optimal phrasing (in conjunction with pull-off and hammer-on techniques). However, the performer can use alternative fingering, provided that the same phrasing and gestures are followed.

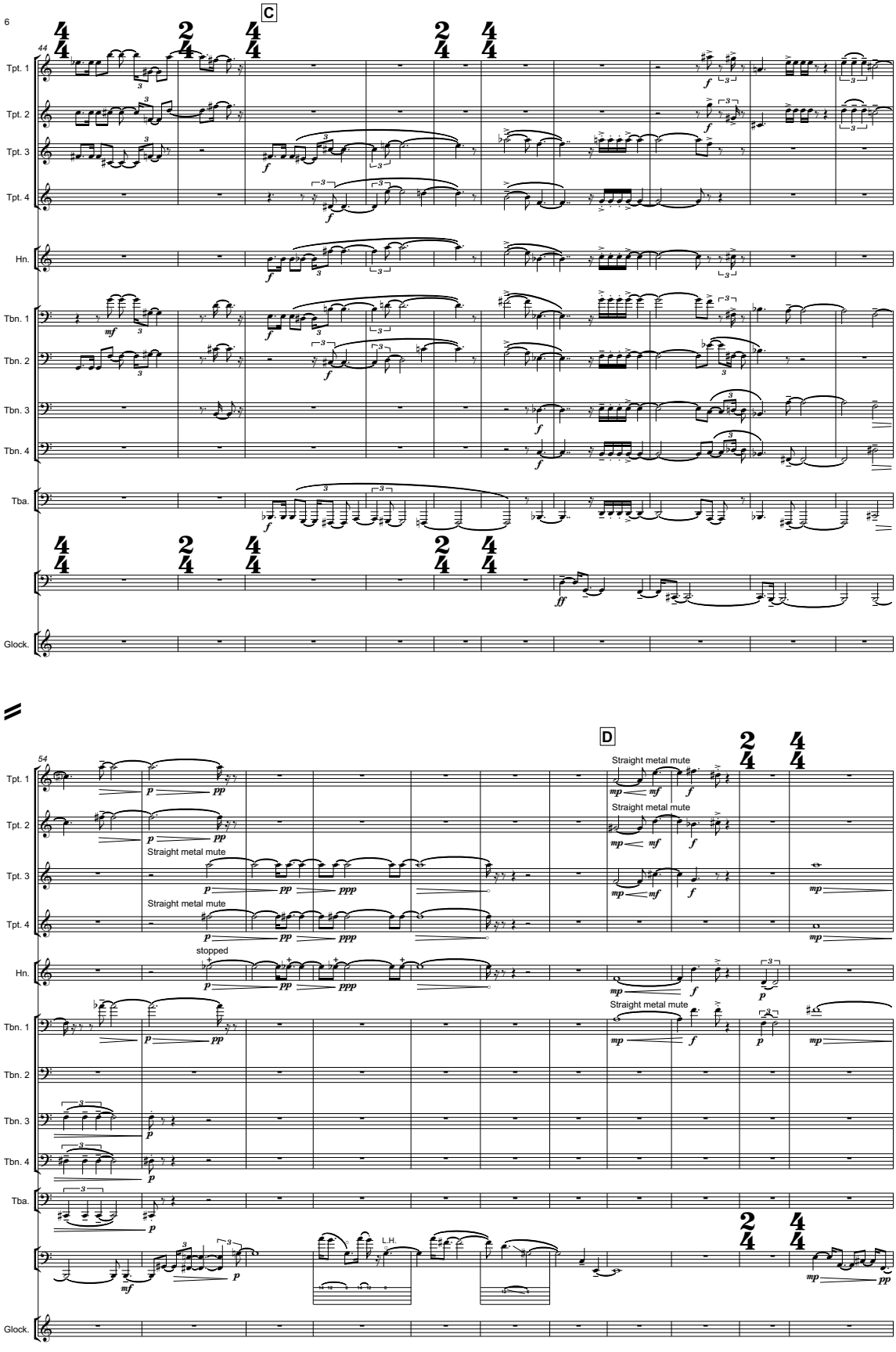
E-Bow (bar 9) – if harmonic overtones occur whilst using the E-Bow, do not re-sound the note: allow the overtones to develop. If an E-Bow is not available, sustain the note as long as possible and allow natural decay.

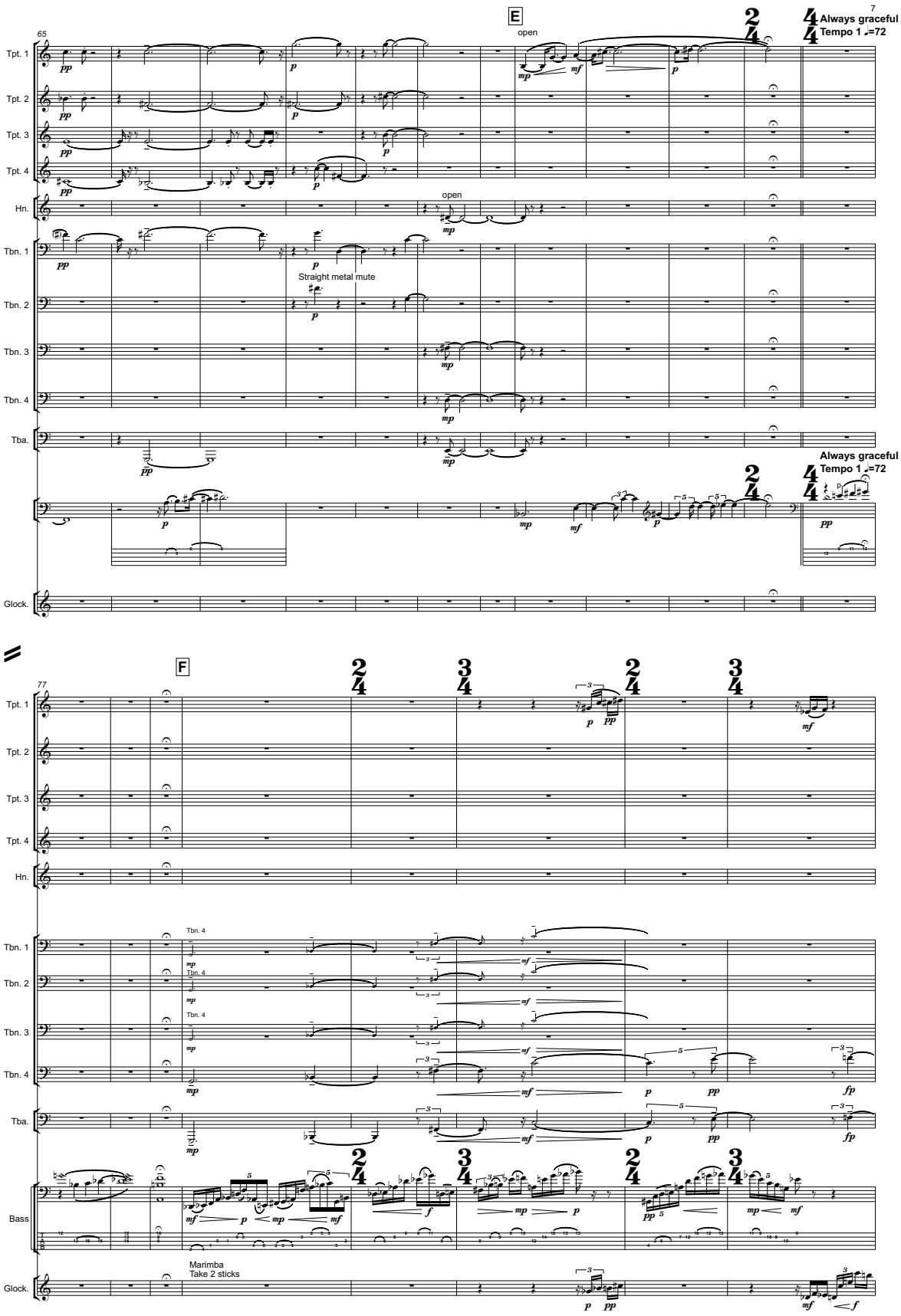
GRACEFUL ASCENT

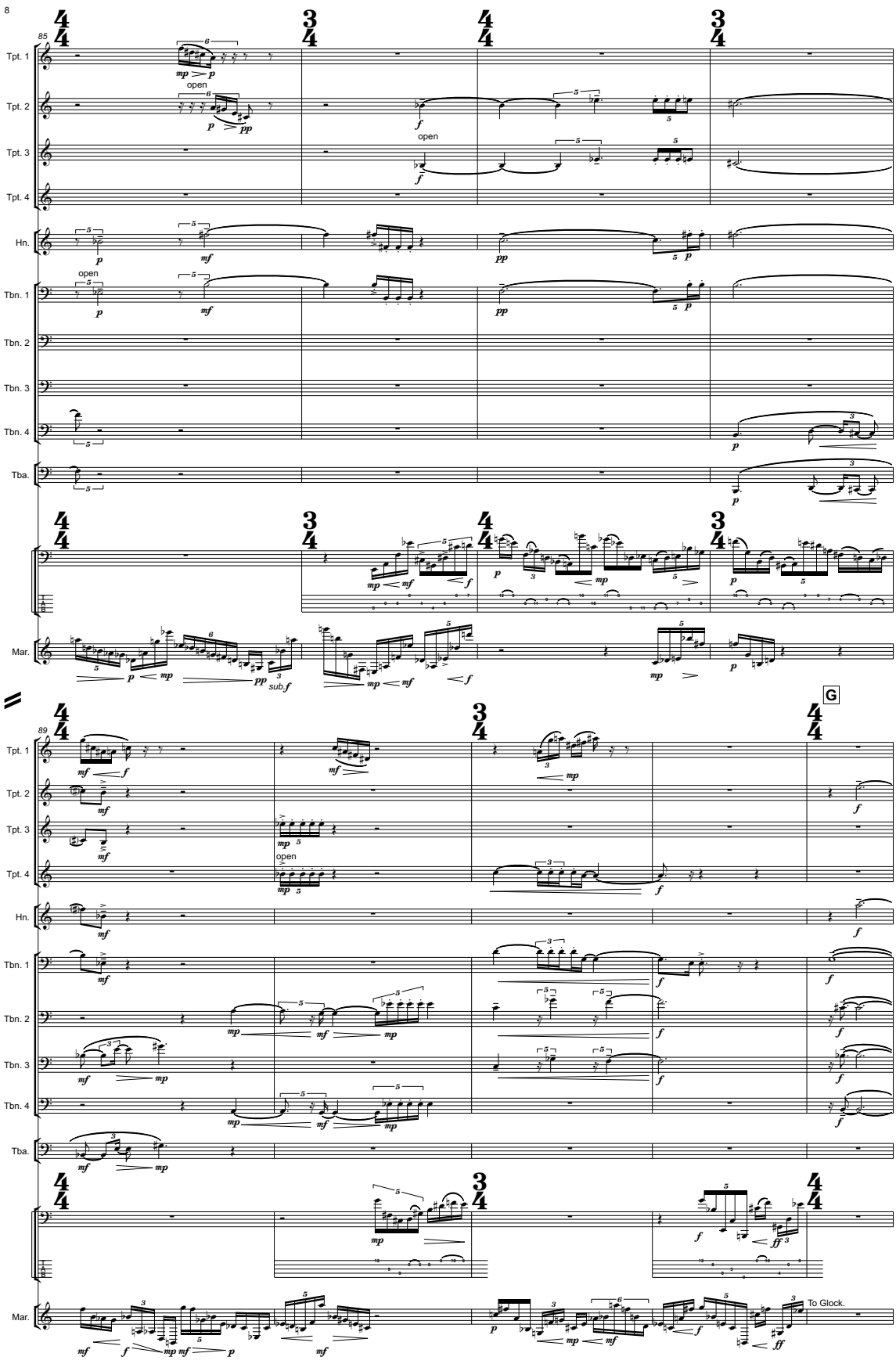
SAMUEL C. ROBERTS

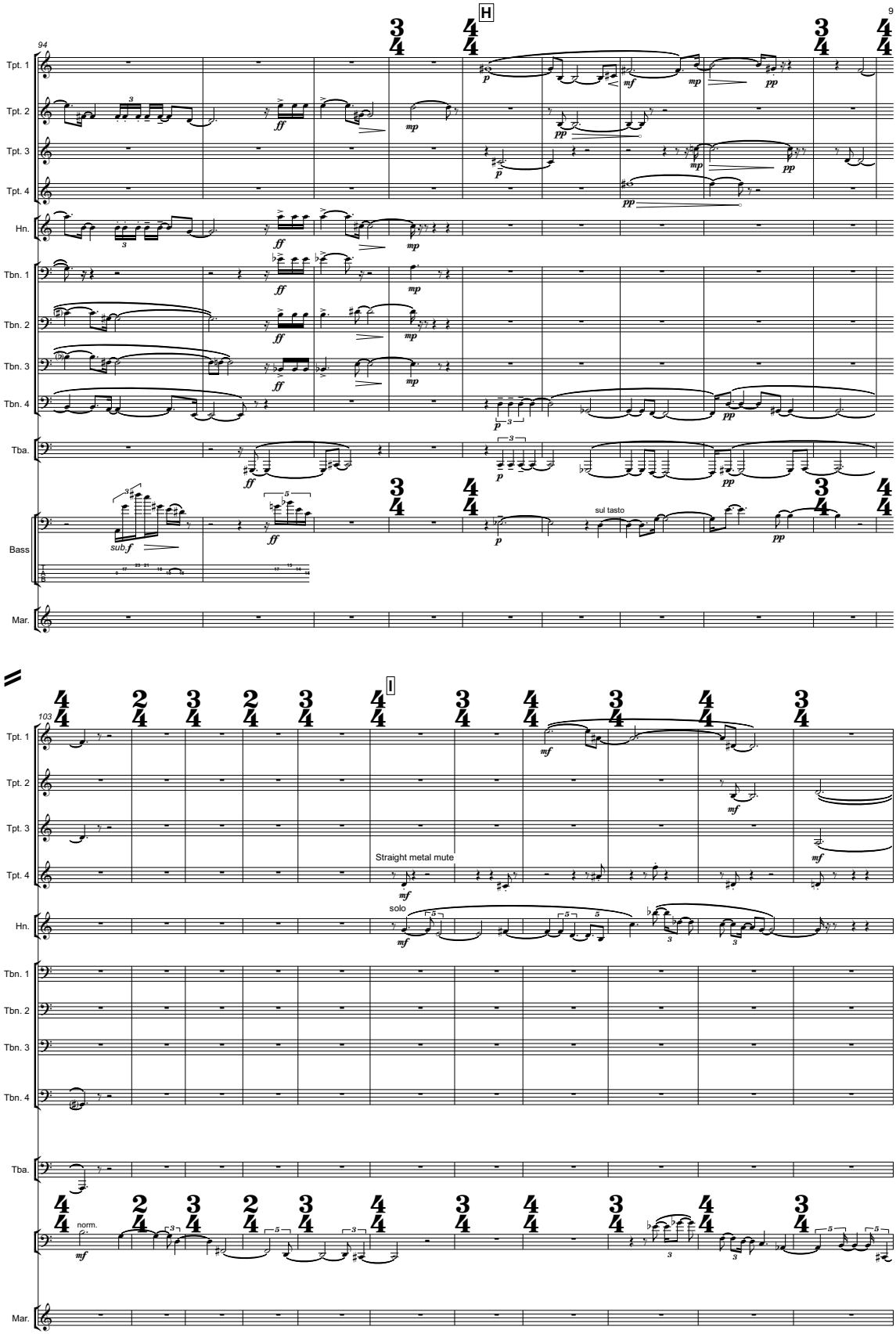


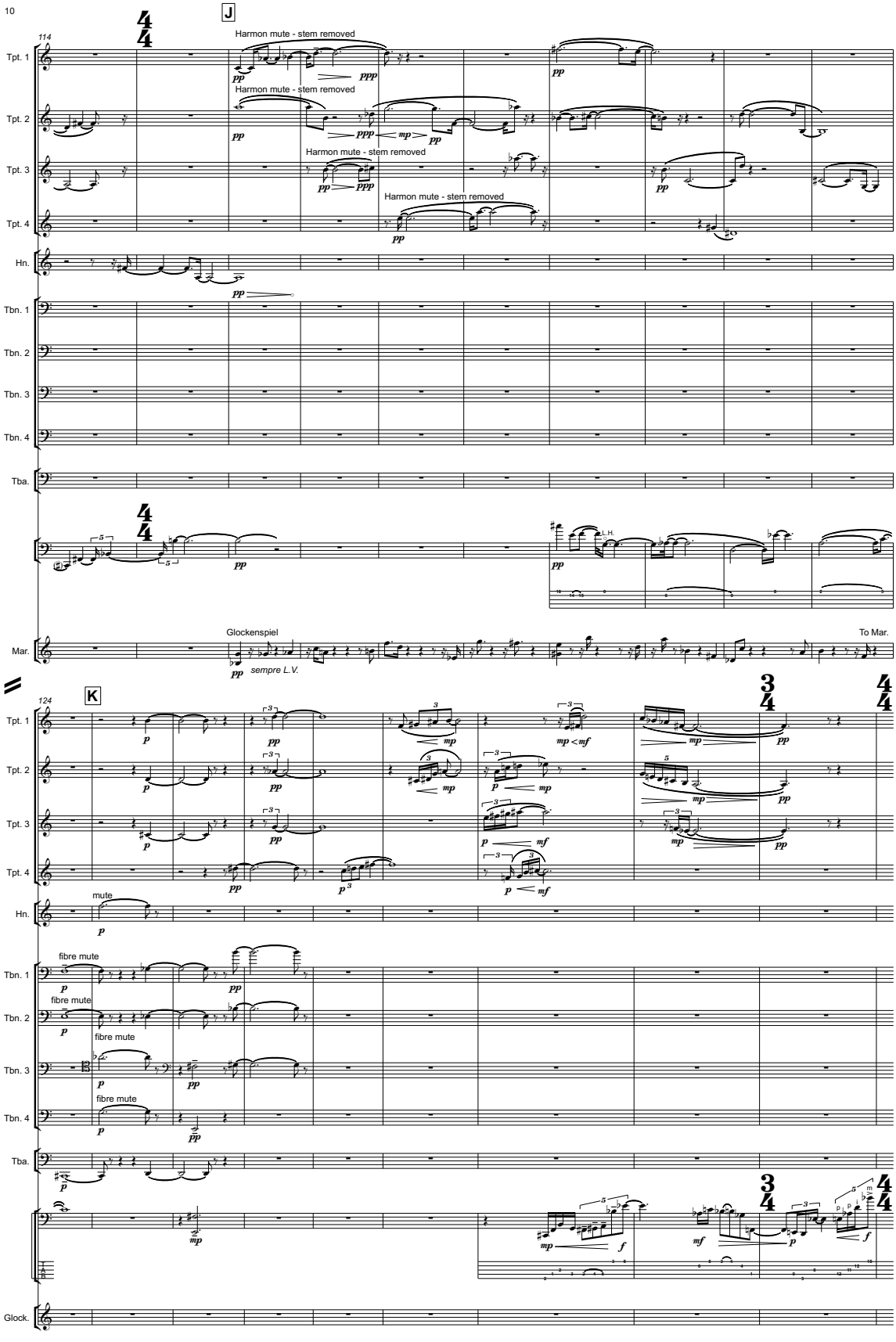

27
5
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Bass
Glock.
36
B

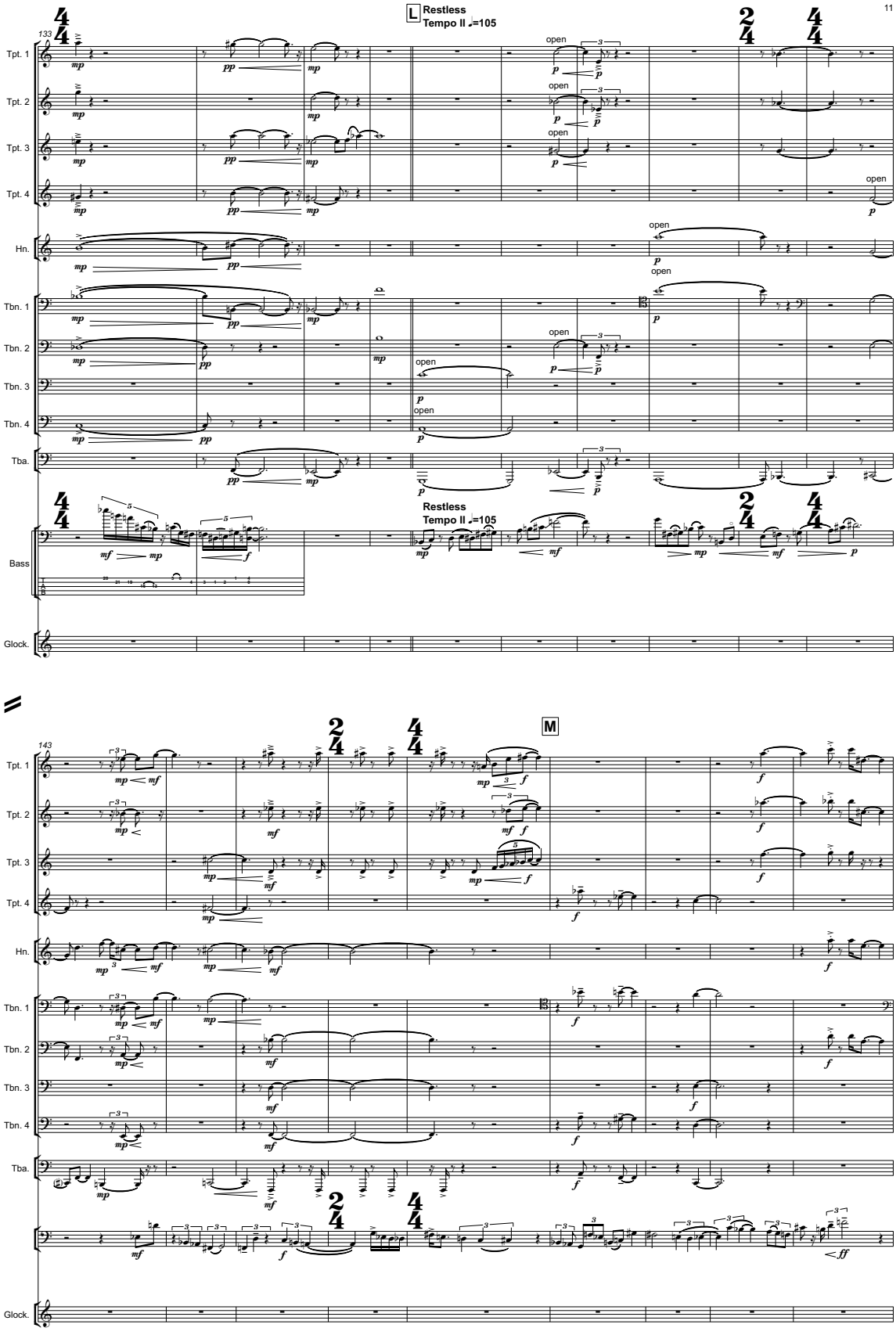

6
44
C
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Glock.
54
D
Straight metal mute
stopped
L.H.

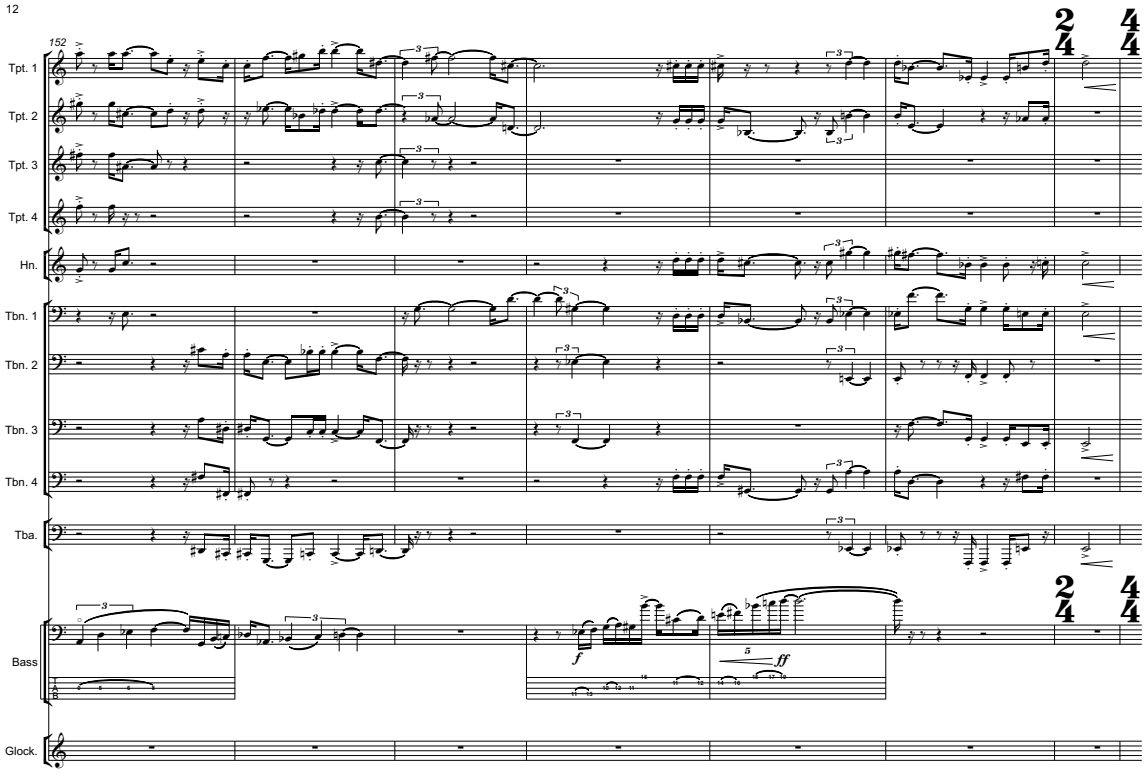

65
E
open
7
Always graceful
Tempo 1 ♩=72
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
open
Tbn. 1
Straight metal mute
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Always graceful
Tempo 1 ♩=72
Glock.
77
F
Tbn. 4
Tbn. 4
Tbn. 4
Bass
Marimba
Take 2 sticks

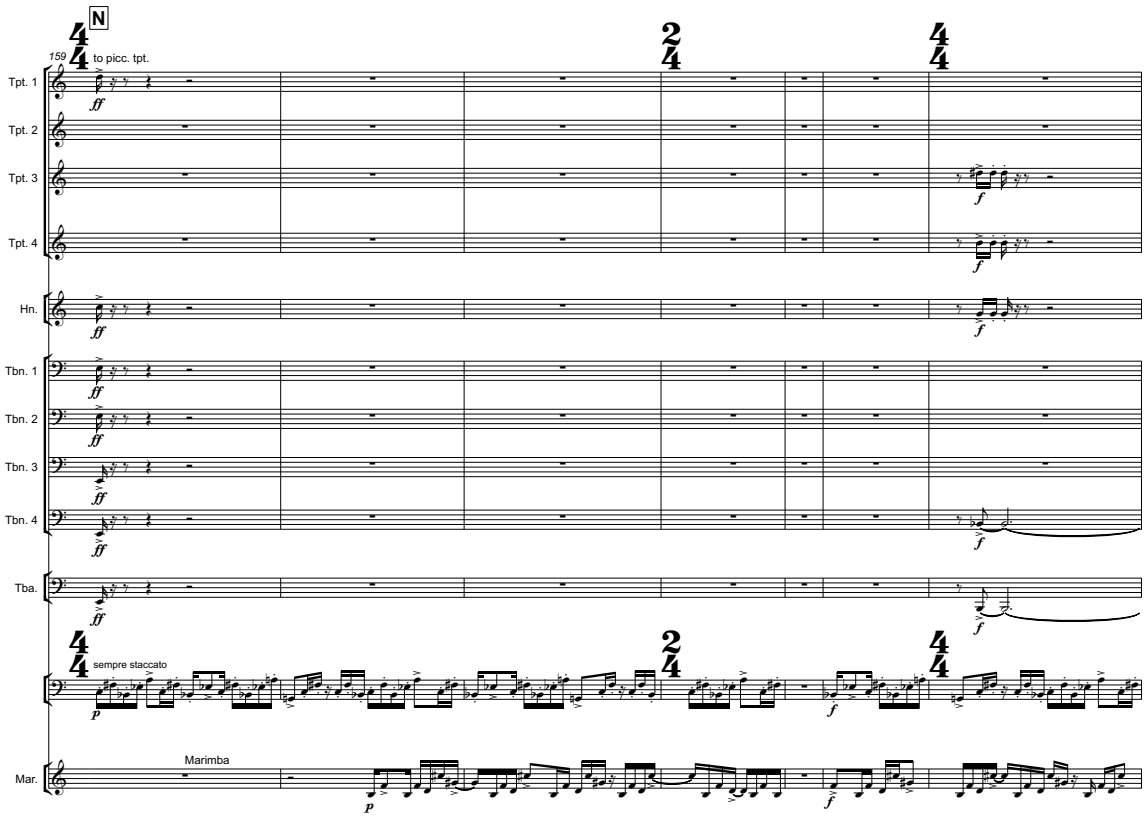

8
85
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.
open
sub.f
G
89
To Glock.

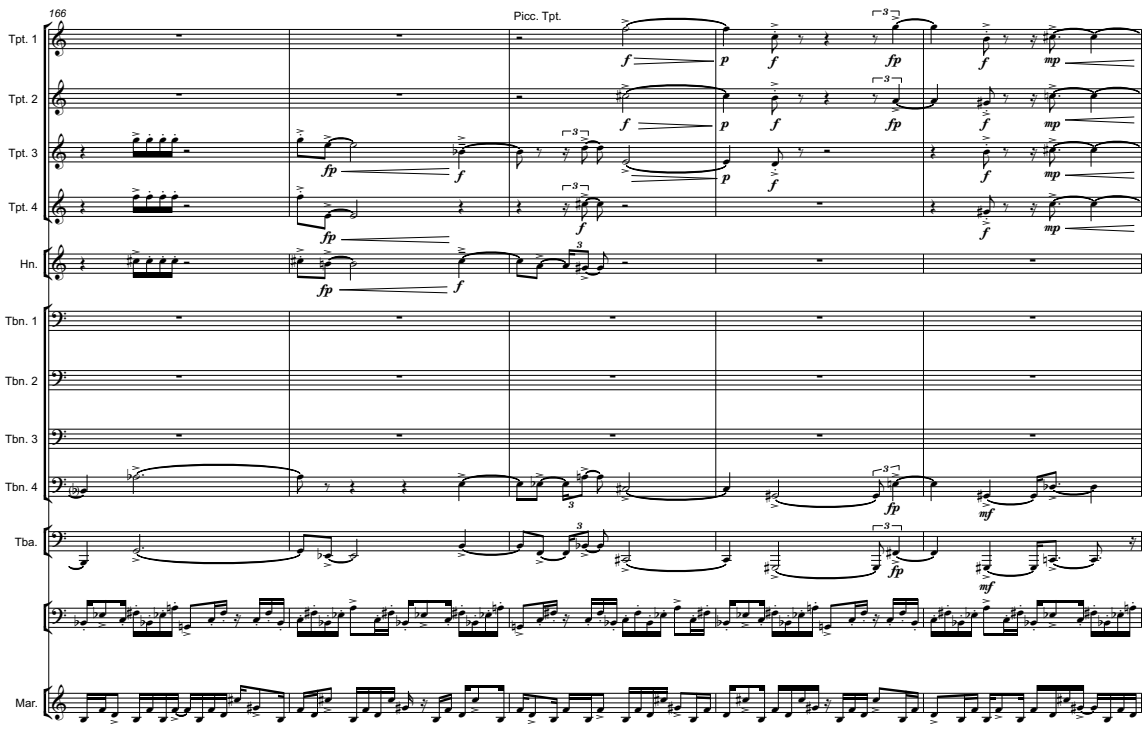

H
I
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Bass
Mar.
sul tasto
Straight metal mute
solo
norm.

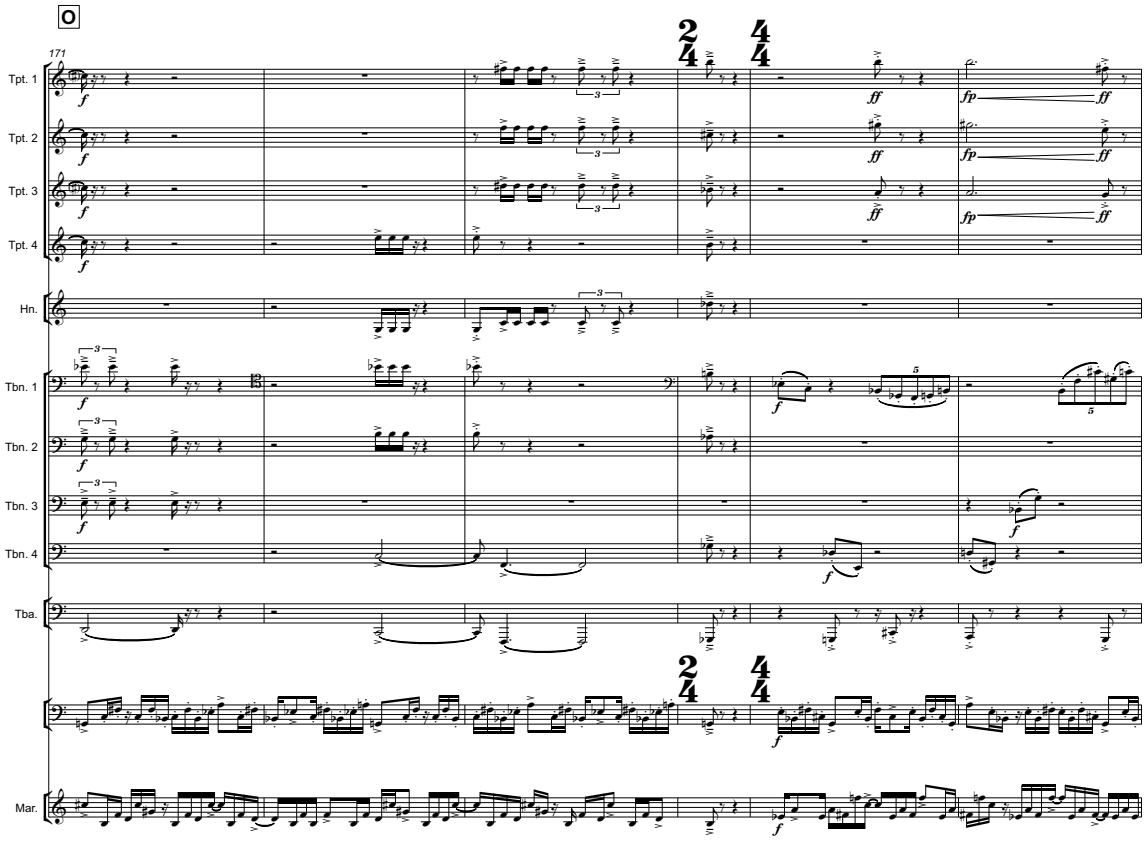

10
114
J
Harmon mute - stem removed
Harmon mute - stem removed
Harmon mute - stem removed
Harmon mute - stem removed
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
L.H.
Glockenspiel
sempre L.V.
To Mar.
Mar.
124
K
mute
fibre mute
fibre mute
fibre mute
fibre mute
Glock.

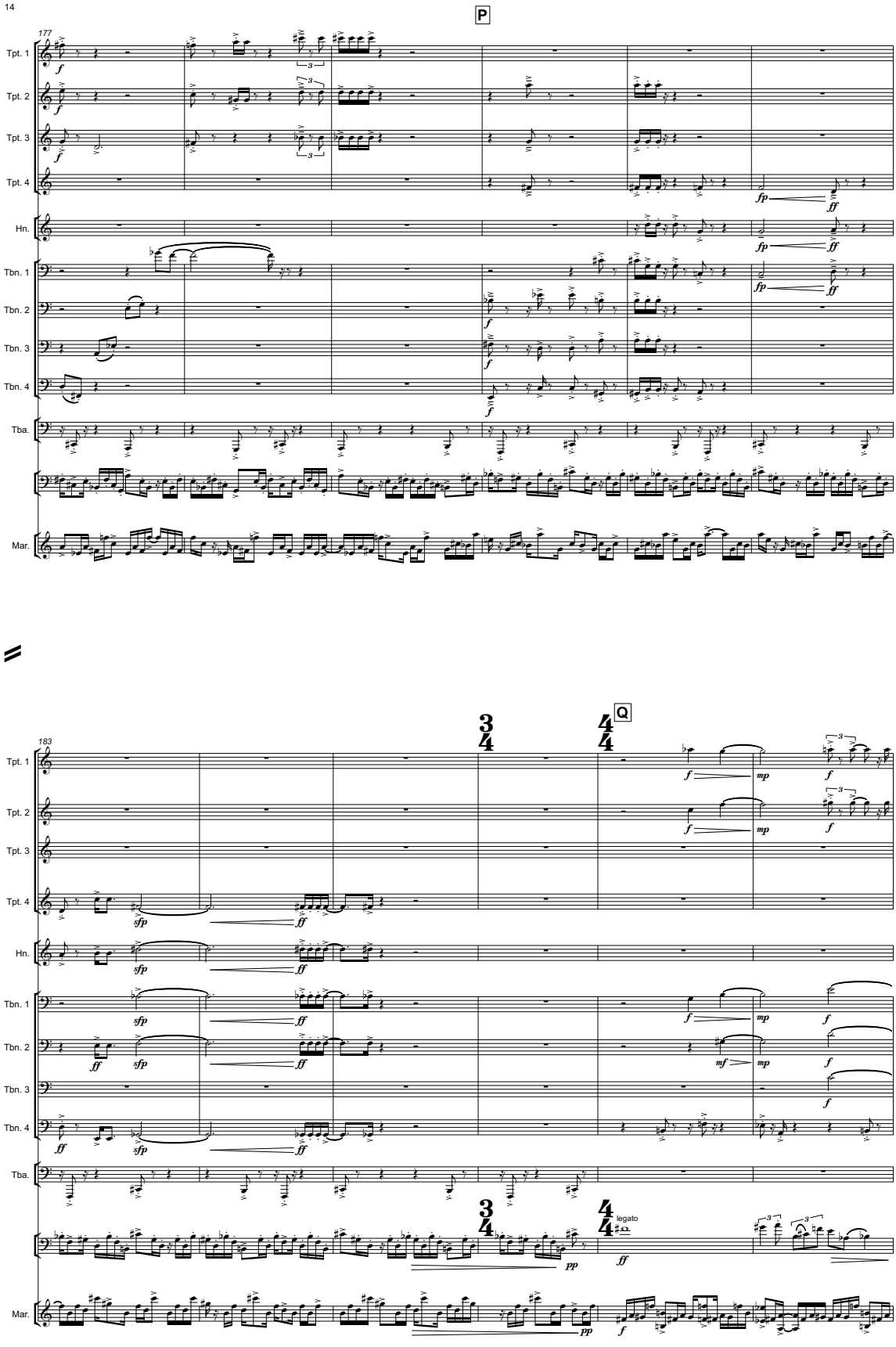

L
Restless
Tempo II ♩=105
11
133
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Bass
Glock.
open
Restless
Tempo II ♩=105
143
M

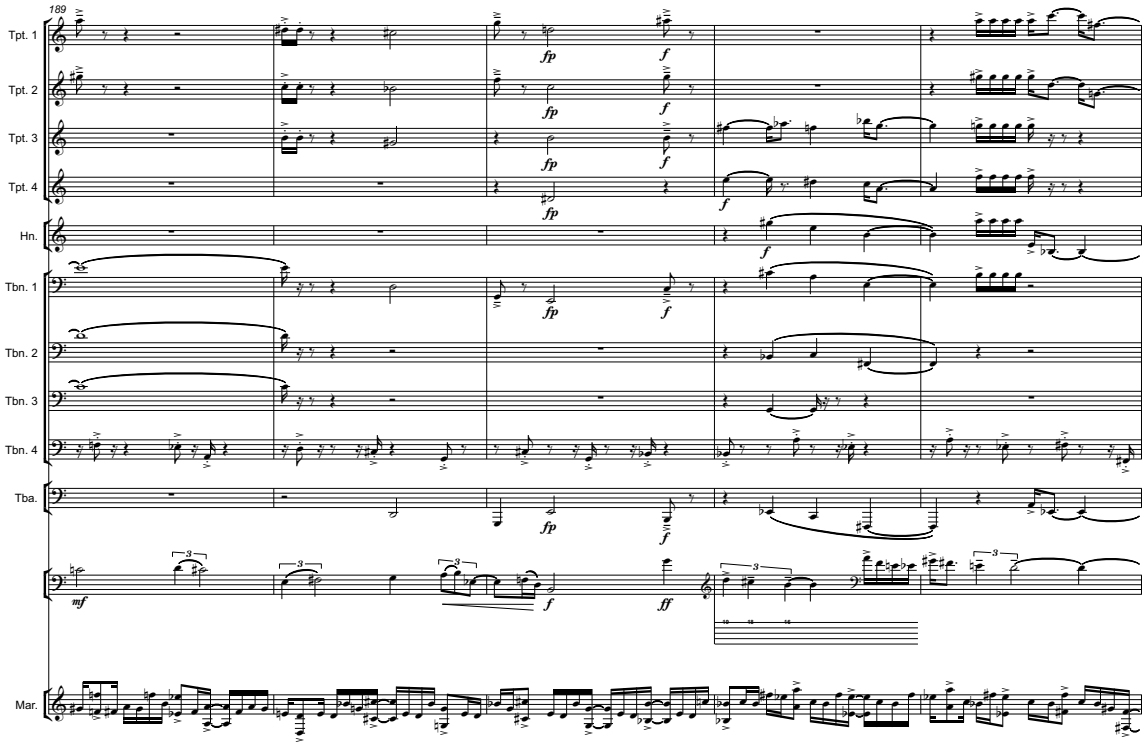

12
152
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Bass
Glock.

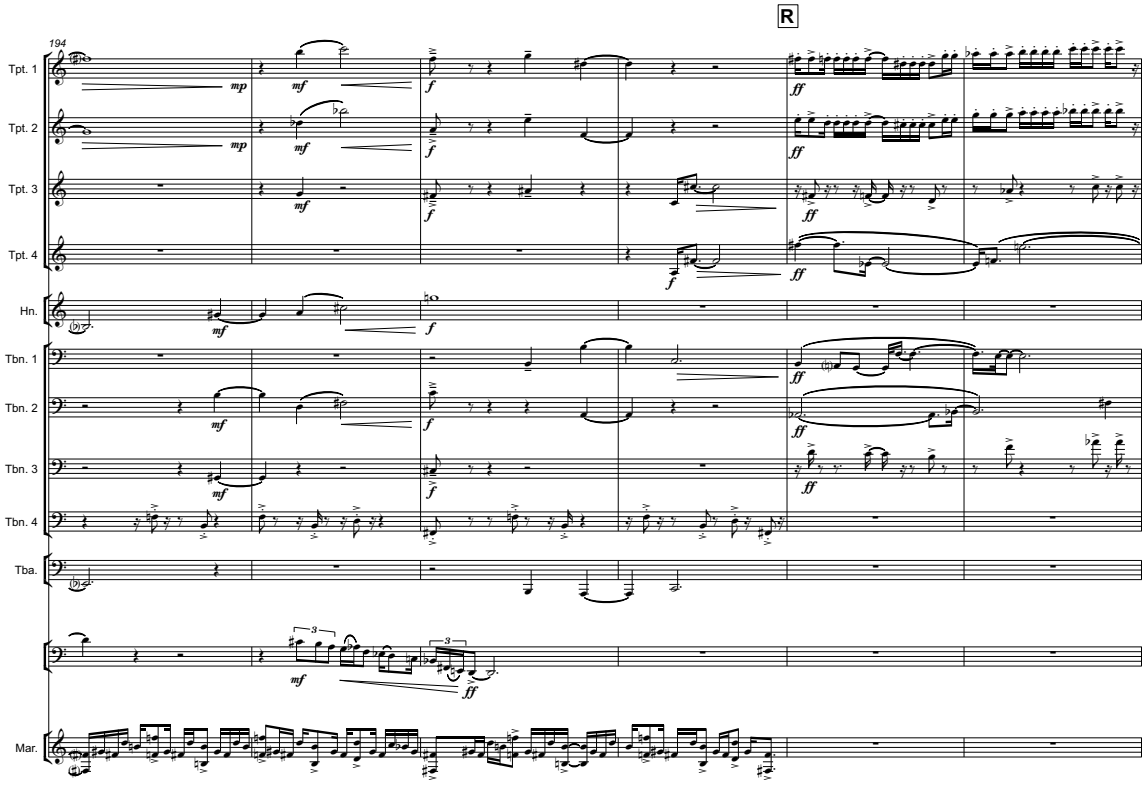

N
159
to picc. tpt.
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
sempre staccato
Marimba
Mar.

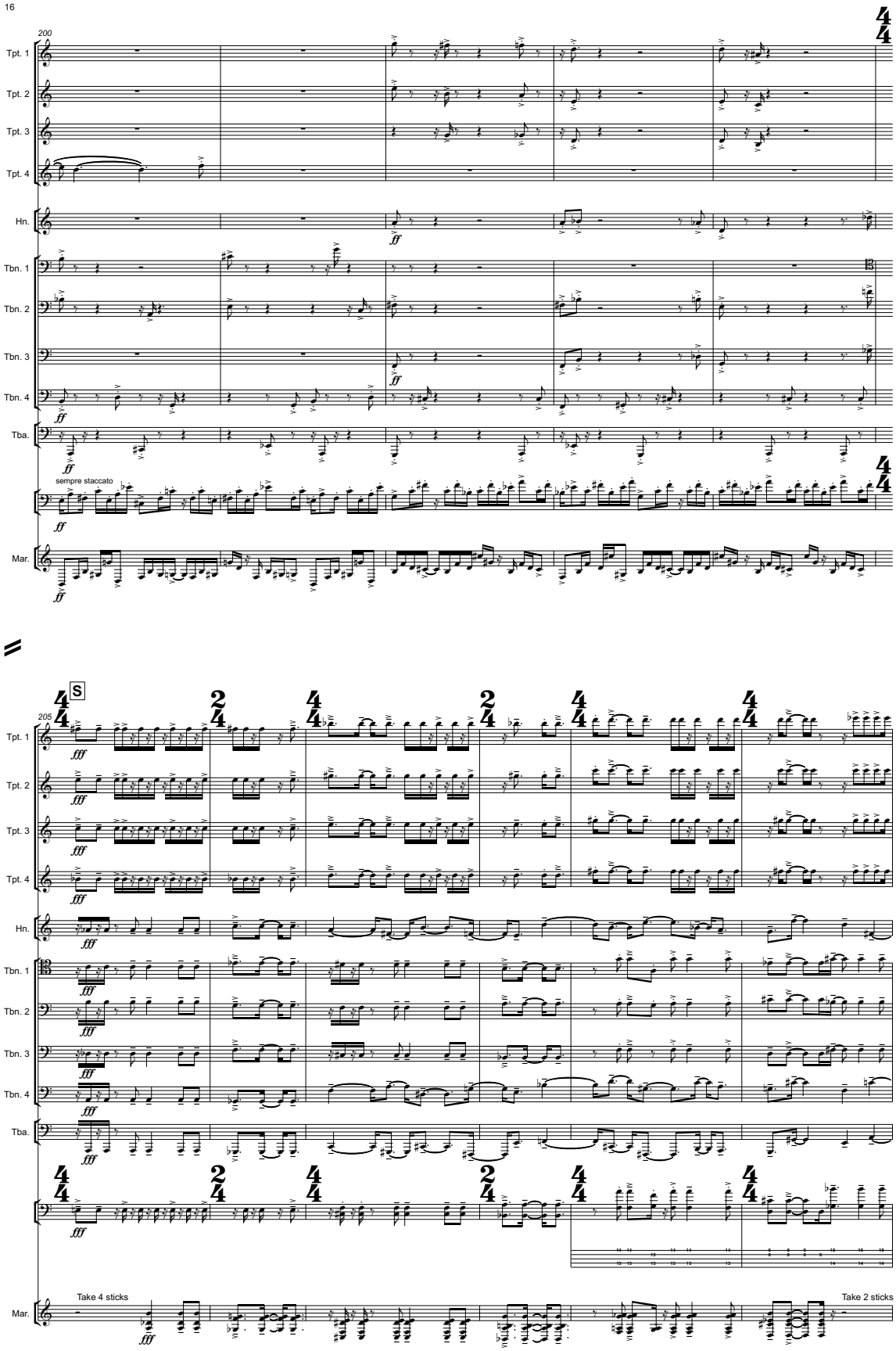

166
Picc. Tpt.
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.

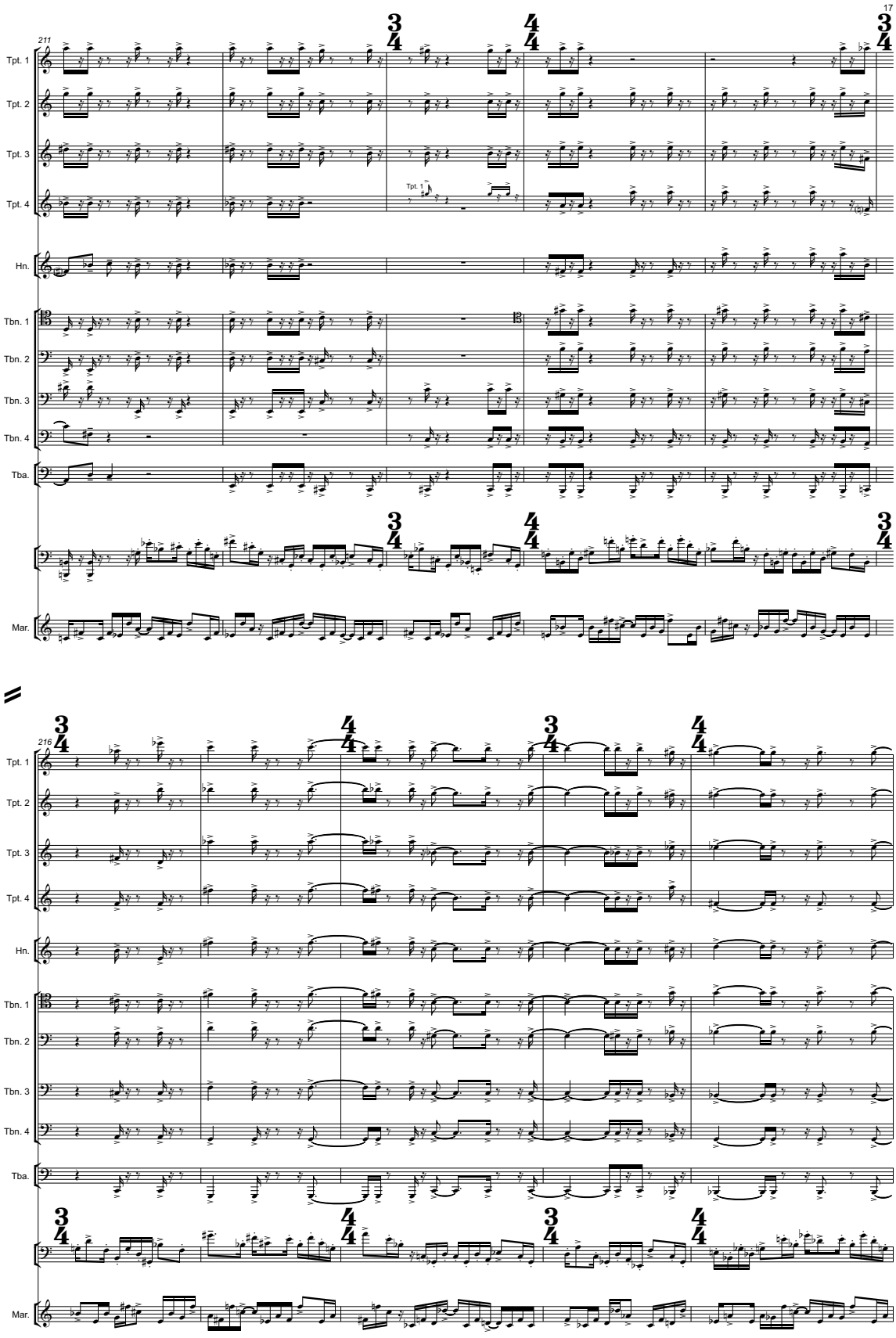

O
171
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.

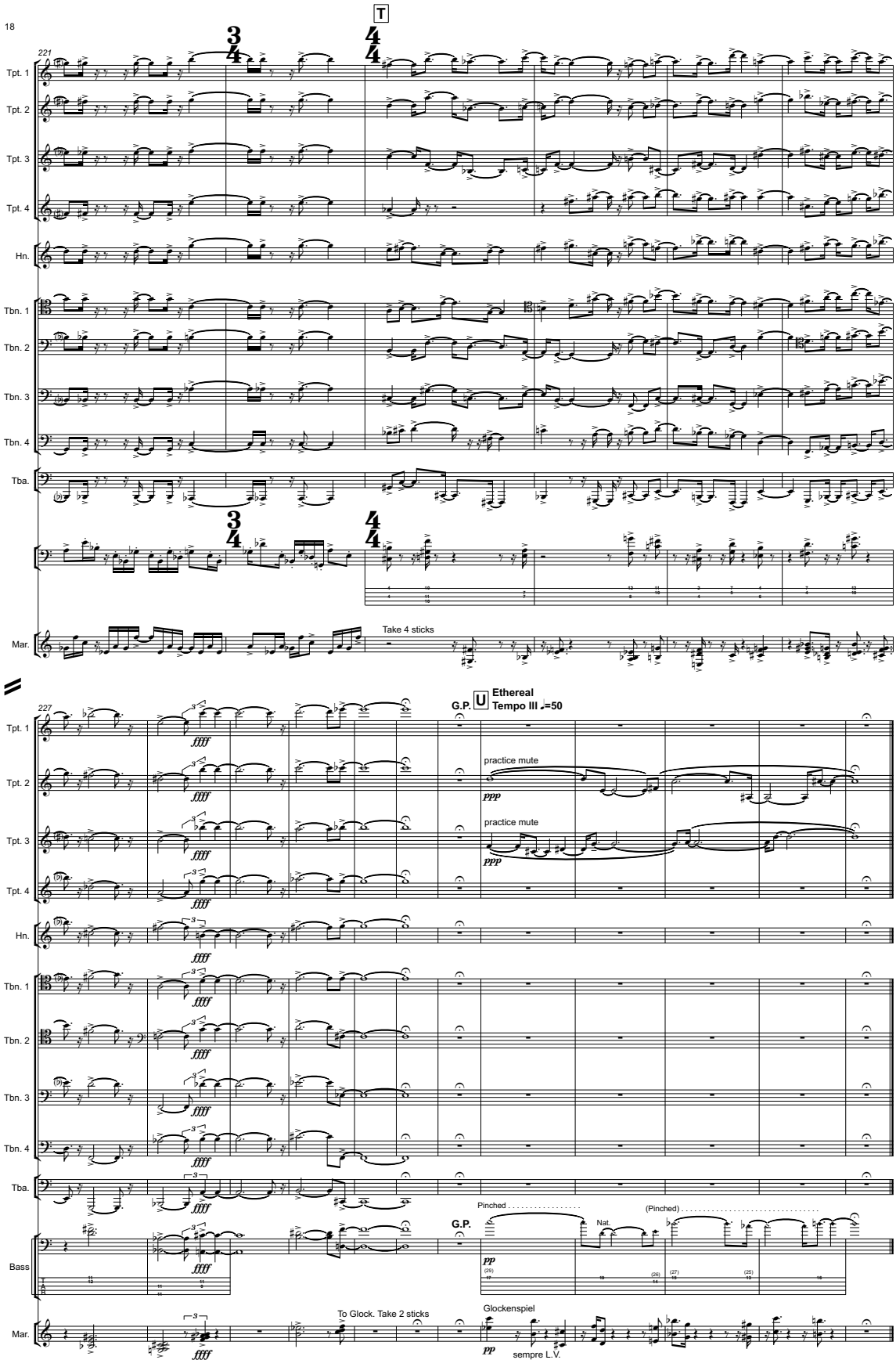

14
177
P
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.
183
Q
legato


189
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.


R
194
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.


16
200
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
sempre staccato
Mar.
S
205
Take 4 sticks
Take 2 sticks


17
211
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.
216


18
T
221
Tpt. 1
Tpt. 2
Tpt. 3
Tpt. 4
Hn.
Tbn. 1
Tbn. 2
Tbn. 3
Tbn. 4
Tba.
Mar.
Take 4 sticks
227
G.P.
U
Ethereal
Tempo III ♩=50
practice mute
practice mute
Bass
Pinched
Nat.
(Pinched)
To Glock. Take 2 sticks
Glockenspiel
sempre L.V.

Appendix 2 - CD Track Listings

Initial Improvisation Studies CD 1 (CD 1 of 8)

1. *Three Minute Study No.1* (3'02)
2. *Three Minute Study No.2* (3'01)
3. *Three Minute Study No.3* (3'01)
4. *Three Minute Study No.4* (3'00)
5. *Three Minute Study No.5* (3'00)
6. *Three Minute Study No.6* (3'01)
7. *Three Minute Study No.7* (3'00)
8. *Three Minute Study No.8* (3'01)
9. *Three Minute Study No.9* (3'01)
10. *Three Minute Study No.10* (3'01)
11. *Limited Pitch Improvisation No.1* (5'08)
12. *Limited Pitch Improvisation No.2* (5'11)
13. *Limited Pitch Improvisation No.3 (*5'15)
14. *Limited Pitch Improvisation No.4* (5'11)

Initial Improvisation Studies CD 2 (CD 2 of 8)

1. *Live Improvisation No.1* (8'10)
2. *Live Improvisation No.2* (7'42)
3. *Live Improvisation No.3* (8'06)
4. *Live Improvisation No.4* (8'19)
5. *Live Improvisation No.5* (8'04)
6. *E-Bow Fretless Improvisation* (7'57)

Sound Object and Deconstructor Studies CD (CD 3 of 8)

1. *Foreign Currency* (3'14)
2. *Rolling* (4'44)
3. *Beyond the Neck* (1'30)
4. *Double E-Bow Session* (3'50)
5. *Deconstructor E-Bow Hi-Fi* (3'53)
6. *Deconstructor Test 1* (4'05)
7. *Deconstructor Test 2* (8'05)
8. *Fretless Deconstructor* (7'54)

Field Recording Studies plus 'Slip Sliding (Part II)' CD (CD 4 of 8)

1. *Under Desk Field Recording (no amplified sound)* (8'43)
2. *Under Desk Field Recording (with amplified sound)* (8'03)
3. *Field Recording No.1* (7'20)
4. *Field Recording No.*2 (9'12)
5. *Slip Sliding (Part II)* (4'20)

Pitch-Based Improvisation Works CD (CD 5 of 8)

1. *Go Back to Sleep* (5'06)
2. *Trepidation* (5'15)
3. *Subterraneans* (11'37)
4. *Dream of Distant Shores* (10'51)
5. *Cold Outside* (12'13)
6. *Mountain Reflections* (9'34)
7. *Cotton Wool* (8'16)
8. *Reveal* (15'01)

Summative Works CD 1 (CD 6 of 8)

1. *Deconstructed Bass* (live recording from Audiograft Festival 2013 (29/2/13)) (12:42)
2. *Starship* (32'36)

Summative Works CD 2 (CD 7 of 8)

1. *Celestial* (8'56)
2. *Kairos* (22'34)
3. *Graceful Ascent* (performed by Samuel C. Roberts and the RAMA Brass, Aarhus, Denmark, April 2013) (12'21)

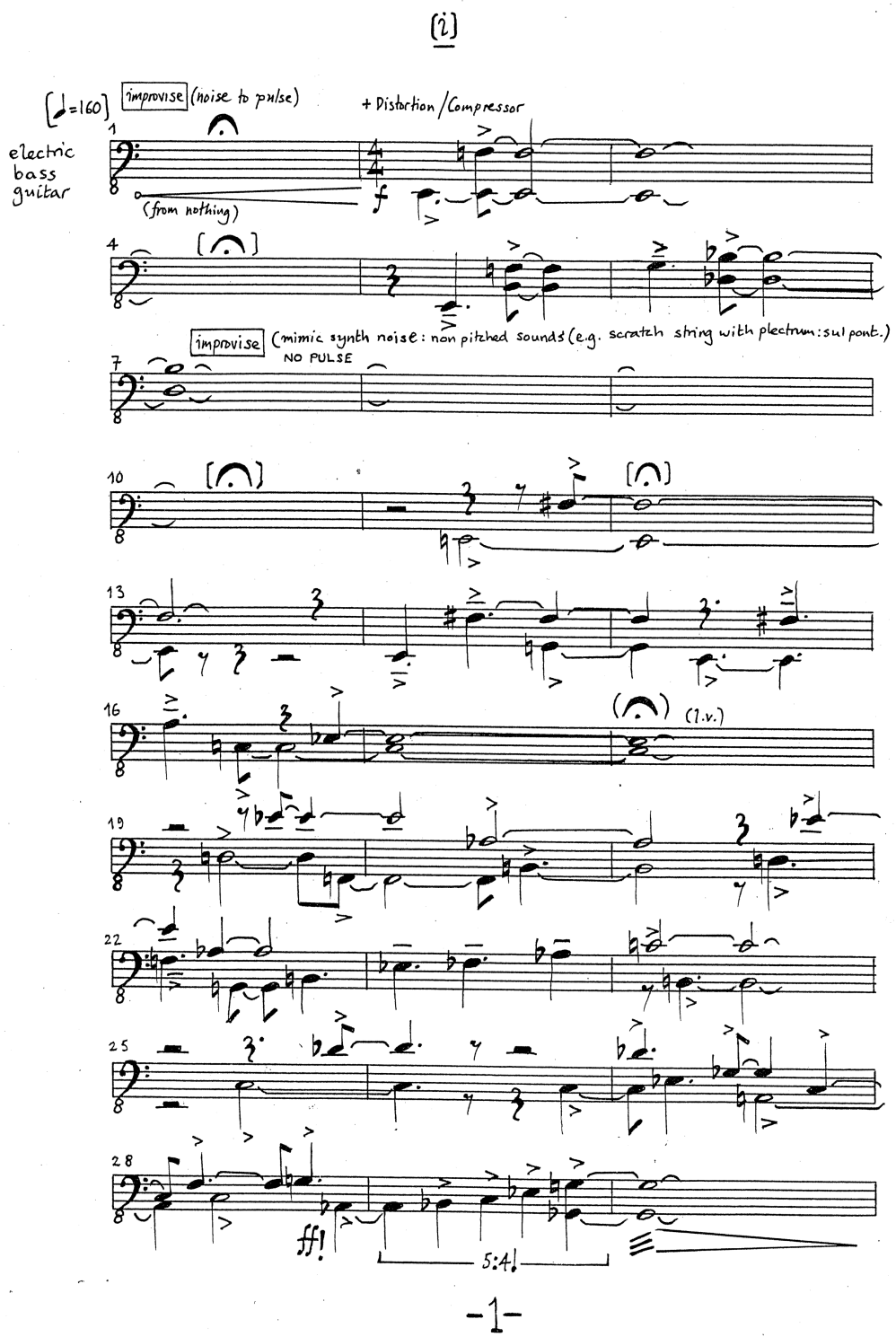
From the Basement, the Sky is so Blue… by *Slow Matter Duo* (performed and recorded by Samuel C. Roberts and Lee Riley, Oxford, July 2013) **(CD 8 of 8)**

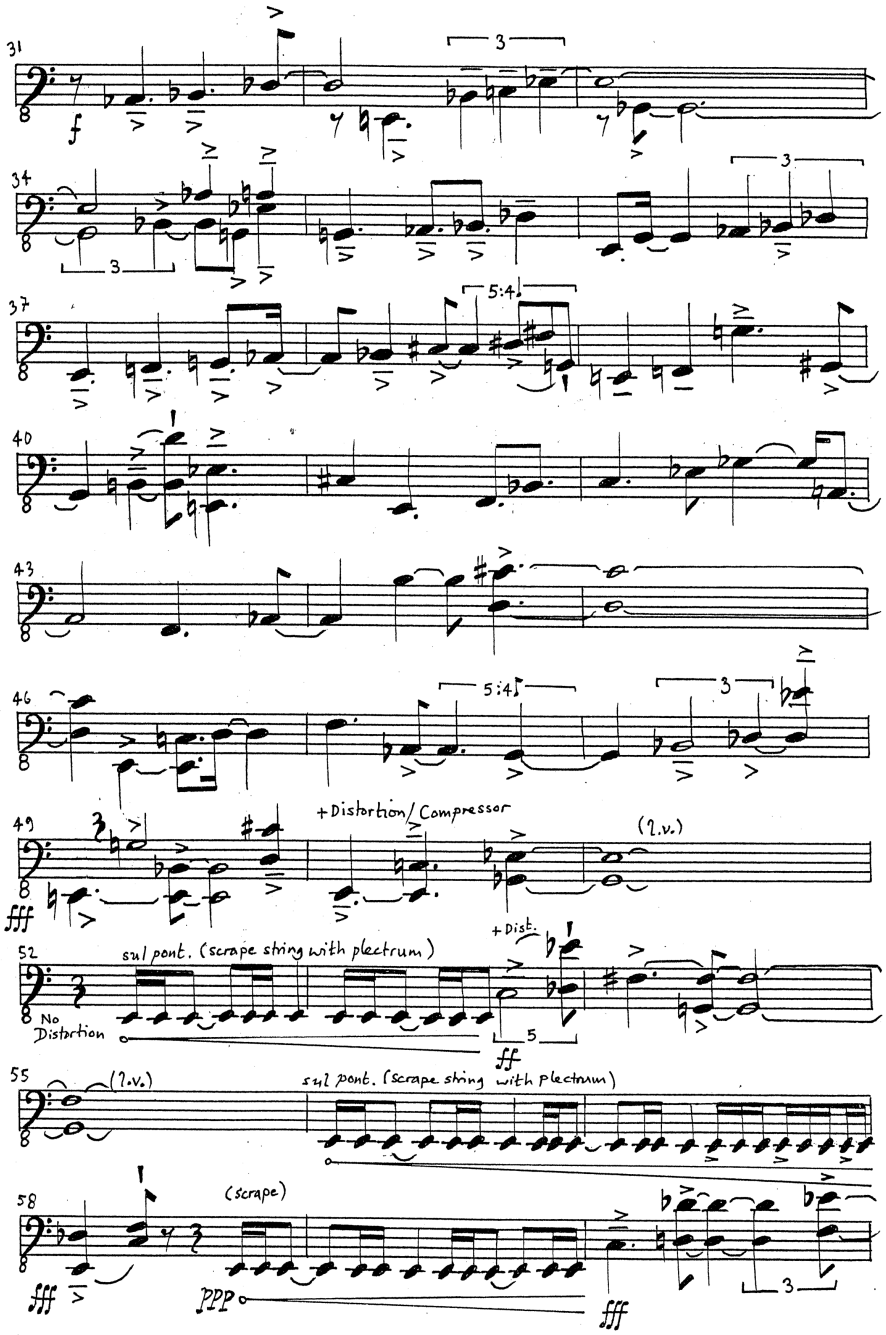
1. *Part I* (17'54)
2. *Part II* (17'54)
3. *Part III* (17'54)

All tracks written, performed and recorded by Samuel C. Roberts unless indicated.

Appendix 3 – Examples of Notation in Existing Works for Bass Guitar and Ensemble

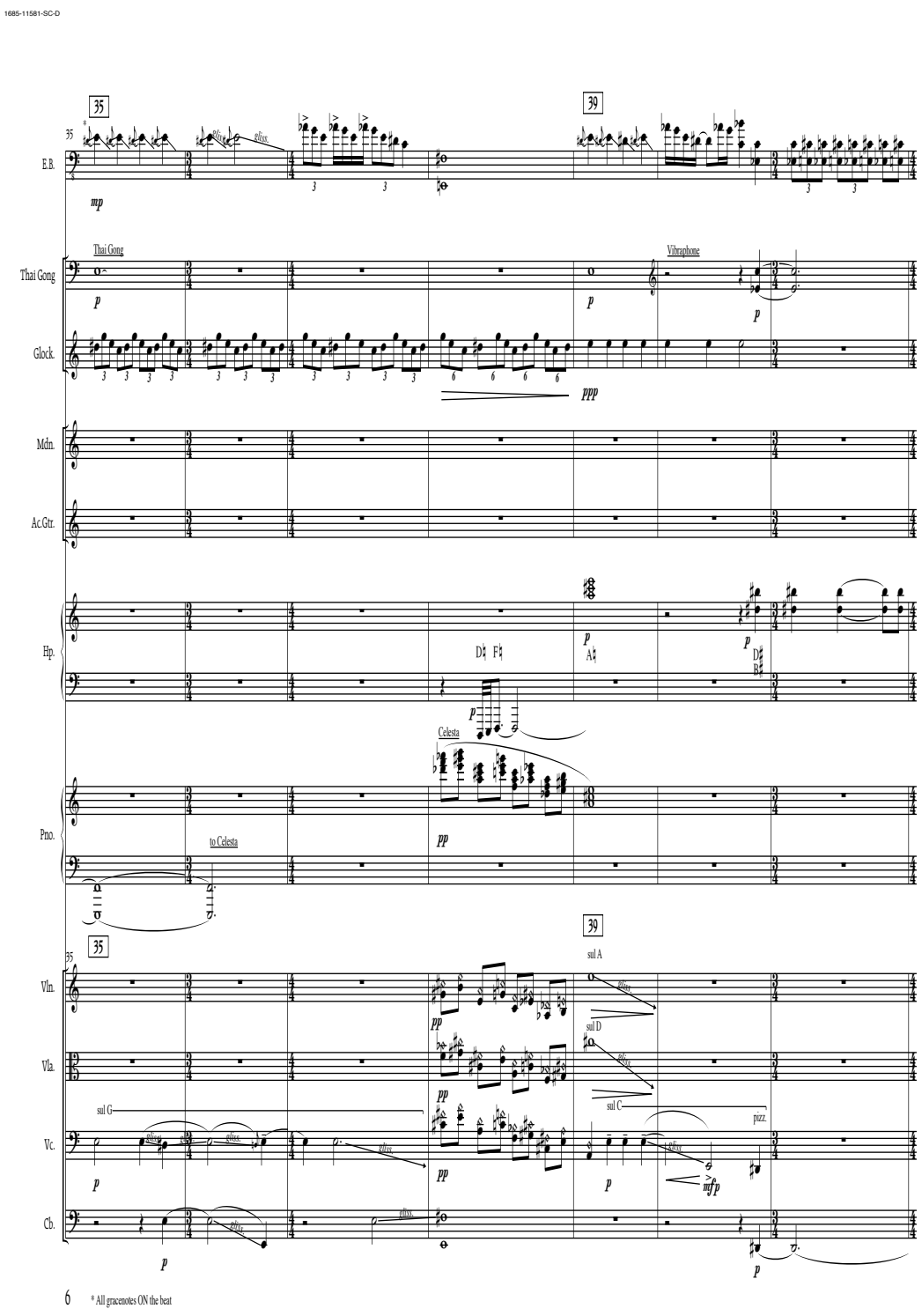
(Ex.a – pages 1 – 2 of first section from *Db* by Sam Hayden)

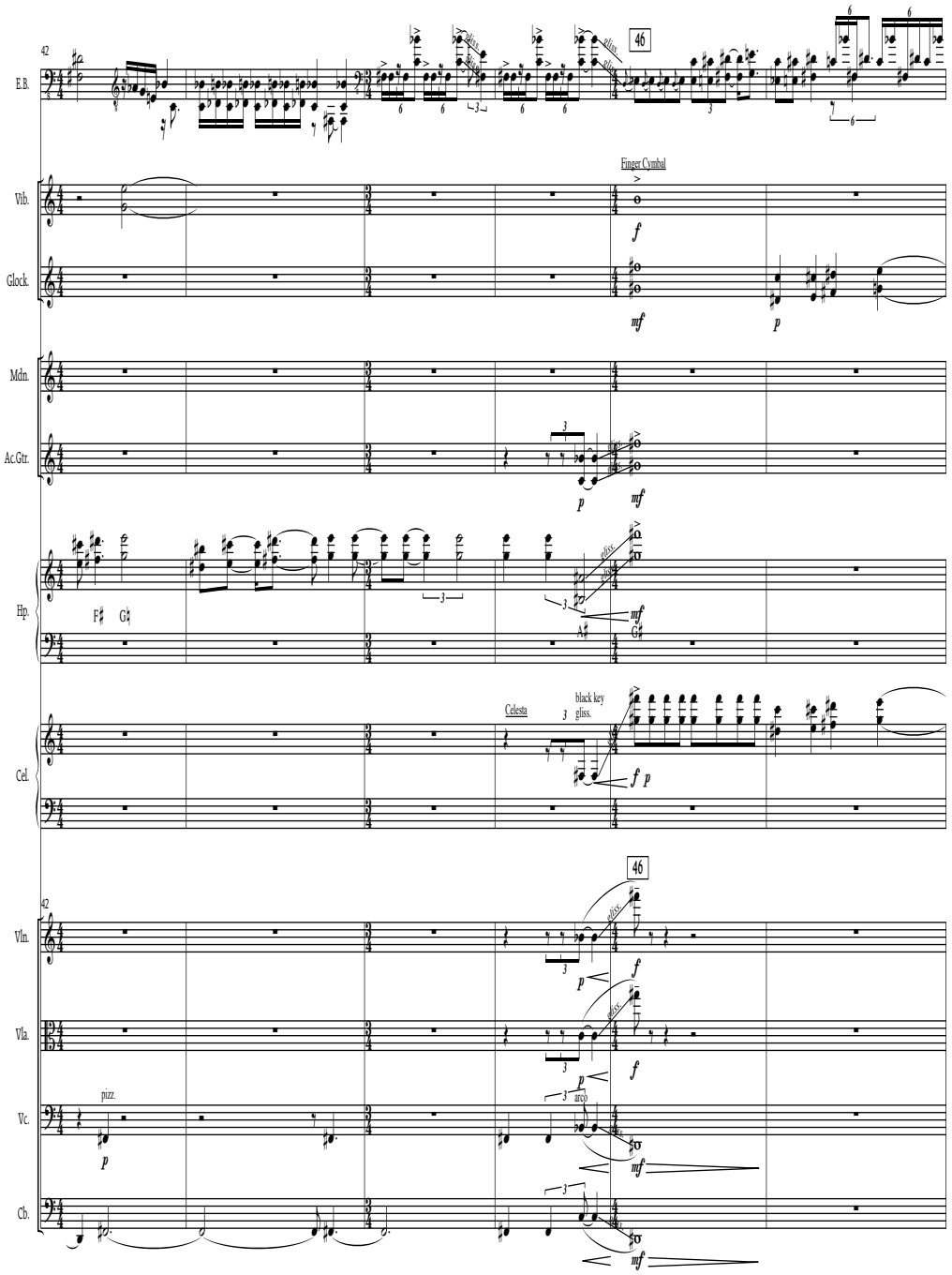



31
f
34
37
5:4
40
43
46
5:4
3
49
+Distortion/Compressor
(l.v.)
fff
52
sul pont. (scrape string with plectrum)
+Dist.
No Distortion
ff
55
(l.v.)
sul pont. (scrape string with plectrum)
58
(scrape)
fff
ppp
fff

-2-

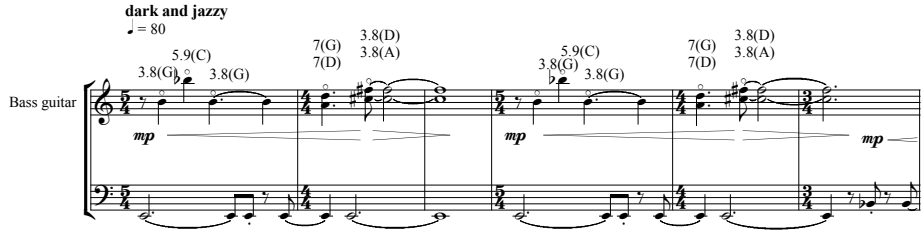
(Ex.b – pages 6 – 7 from *Atomic UFO Saves the Day (Again)* by Giel Vleggaar)

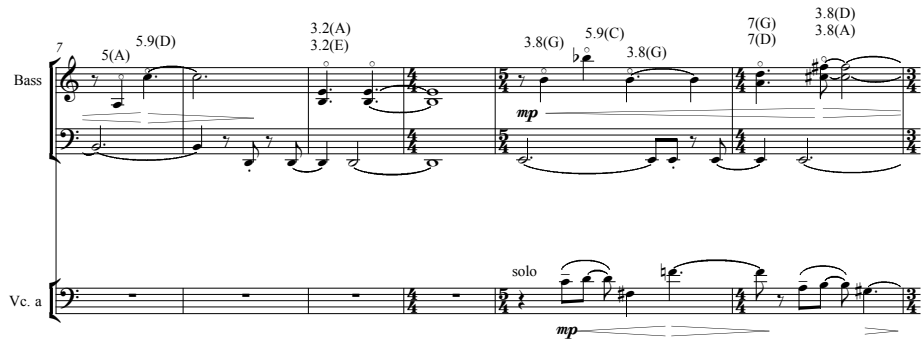



E.B.
Vib.
Finger Cymbal
Glock.
Mdn.
Ac.Gtr.
Hp.
Cel.
Celesta
black key gliss.
Vln.
Vla.
Vc.
pizz.
arco
Cb.
46
42

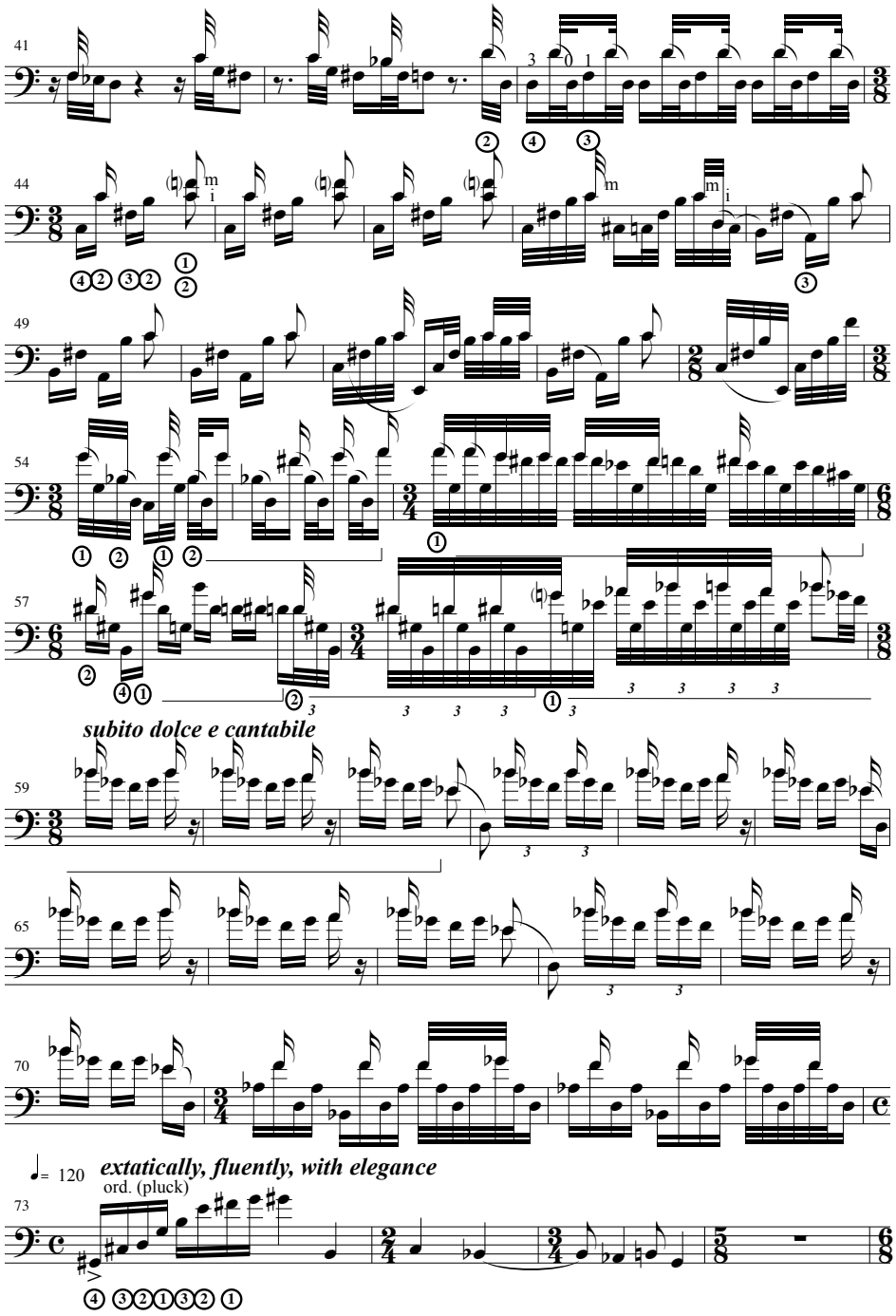
(Ex.c – page 1 of ‘Soft Pentiments’ from *Sub Merge* by Colin Riley)

3: soft pentiments

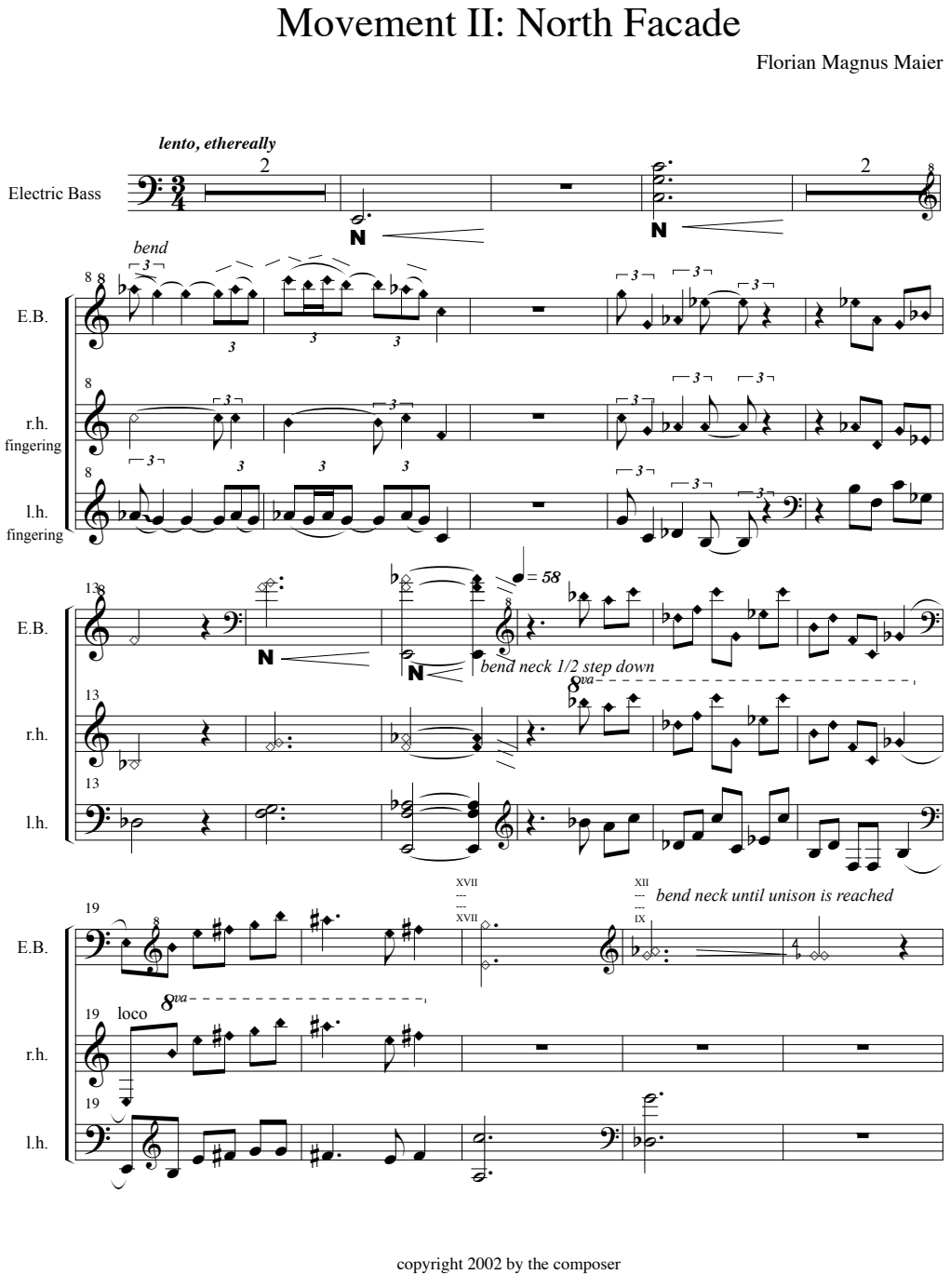




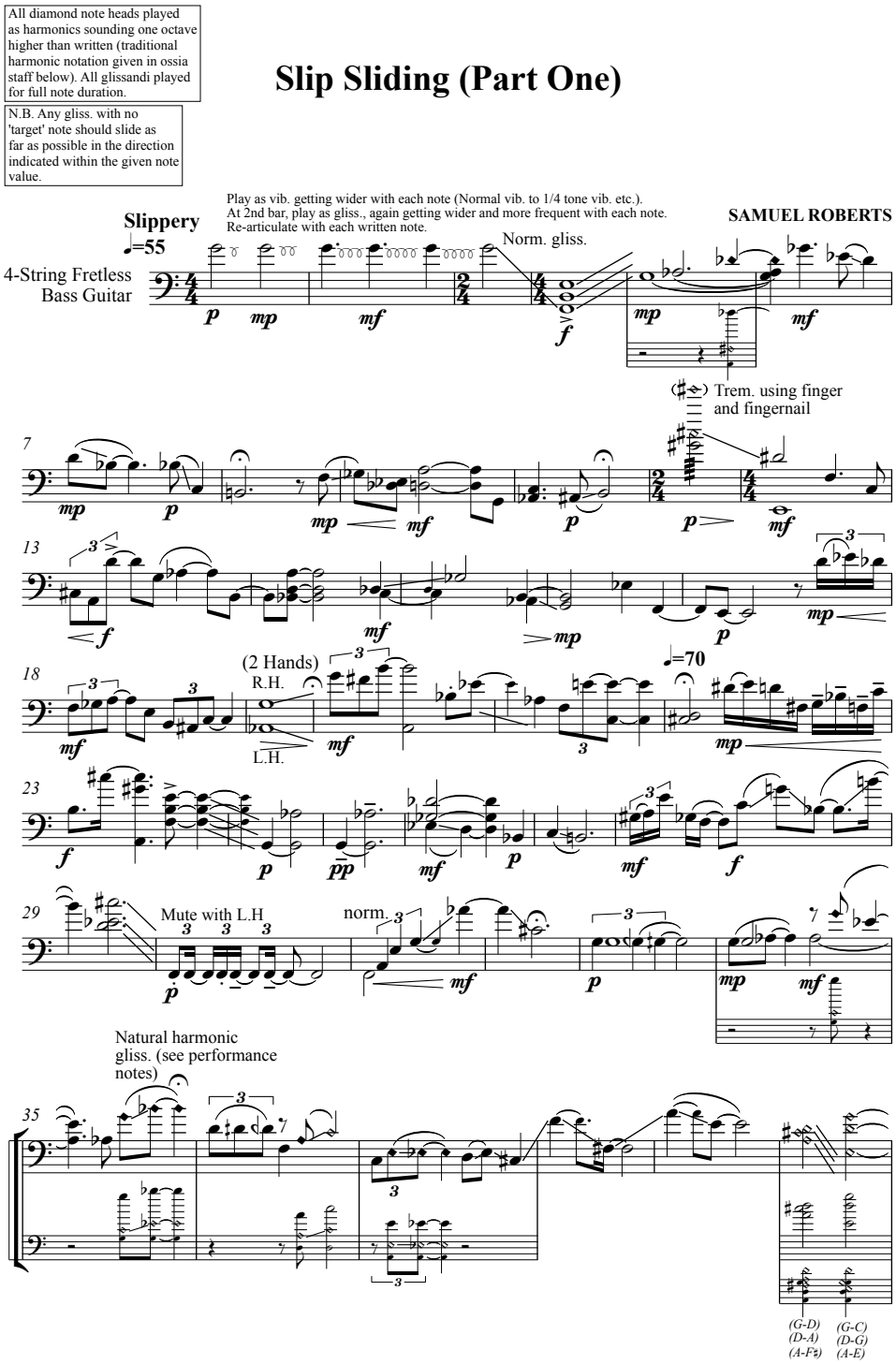
(Ex.d – page 2 of the first movement of *Concerto for Bass Guitar* by Florian Magnus-Maier)

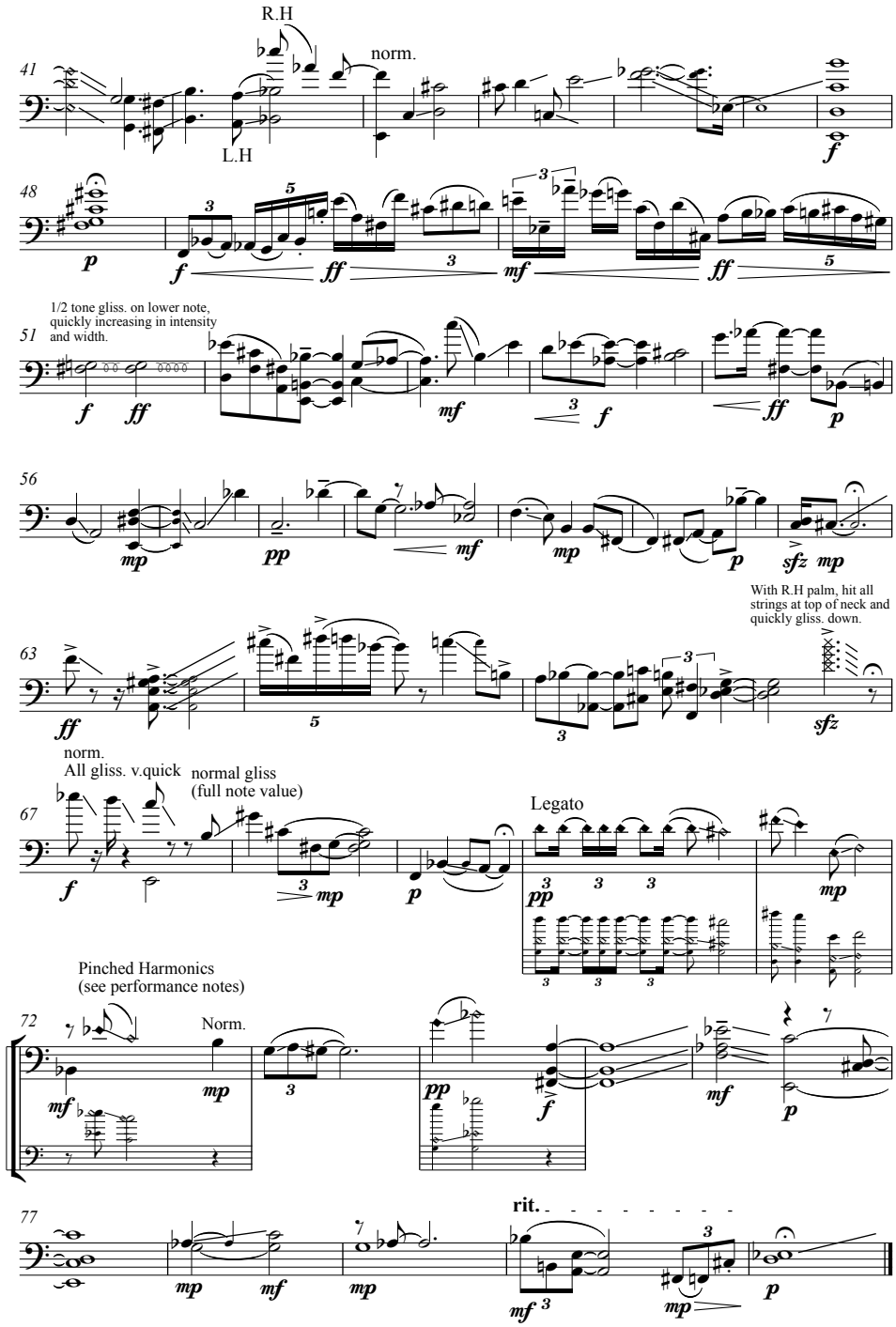


(Ex.e – page 1 from the bass guitar part of the second movement of *Concerto for Bass Guitar* by Florian Magnus-Maier)



Appendix 4 – score of *Slip Sliding (Part I)* by Samuel C. Roberts.




R.H
L.H
norm.
41
48
1/2 tone gliss. on lower note, quickly increasing in intensity and width.
51
56
With R.H palm, hit all strings at top of neck and quickly gliss. down.
63
norm.
All gliss. v.quick
normal gliss
(full note value)
67
Legato
Pinched Harmonics
(see performance notes)
72
Norm.
77
rit.

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