An exploration and systematic approach to the temporal and compositional structures in Berio's *Sequenza VII* for oboe

By Olivier Barrier
Student number 20175443

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Department of Music
Faculty of the Humanities

Dr. Clorinda Panebianco

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Abstract

Berio's *Sequenza VII* is the most famous piece in the modern repertoire for solo oboe, written in 1969 for the renowned Swiss oboist Heinz Holliger, it retains pole position in sales and performances in its genre. It is a challenging piece to approach, comprehend and perform; not so much because of the technical difficulties involved but more because of the overall form and structure of the composition. Indeed, it mixes two concepts: conventional musical notation, which is easily grasped even if riddled with local micro technical challenges, and large sections in proportional writing. These sections in a different musical notation pose a problem as to the approach needed. There seems to be a tendency, when comparing contemporary and well-established recordings to be rather liberal with the sections that are written in freer notation. Berio gives the interpreter a grid that contains freedom to a limited extent; the freedom lies within the expression of the musical material contained in each bar, but the macro-structure seems set and almost immutable. Immutable in the sense that 1.8 seconds is 1.8 seconds but what happens within can be subject to interpretation, debate or discussion. This study will take as a starting point this idea of an immutable structure and will discuss the micro events within this structure to the finest observational and analytical capabilities. Will be discussed means to arrive at a more than convincing performance/interpretation and derived considerations. The way to reach this goal is through a systematic and indeed systemic approach of the musical text, finding and naming beacons of reference, a somehow hermeneutic approach to the text where taking apart and reassembling in an iterative process yields repetitive insight into the teleology of Berio's composition. This is a living work that will continue to be performed, so all this research is carried through with this central beacon never out of sight: how to interpret Berio's *Sequenza VII* being as close as possible to the composer's intent, where knowledge gained is knowledge applied as a performer and offered to others, be it to an audience or to a fellow oboist grappling with the same difficulties that have led me to devise this method.

Keywords

Oboe solo
Modern technique
Berio’s *Sequenza VII*
Compositional structure
Temporal structure
Analysis
Auto ethnographic
Practice-based research
‘Absolute’ performance

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Chapter 1

Background to the study

> 'Anyone worth calling a virtuoso these days has to be a musician capable of moving within a broad historical perspective and of resolving the tension between the creativity of yesterday and today. My own *Sequenzas* are always written with this sort of interpreter in mind, whose virtuosity is, above all, a virtuosity of knowledge.'[1]

1.1 Introduction

Luciano Berio (1925-2003) was born into a family of musicians in Oneglia, a Ligurian port on Italy's north western coast. Both his father and grandfather were working as organists there, so Berio received a consequent musical training at home. He entered the Milan conservatory in 1945, after the war, in composition and not as a pianist due to a hand injury sustained. There, he would go through a rapid initiation of the various styles of the times through assimilation by imitation. In 1950 he was the accompanist for Cathy Berberian, the American singer who was on an exchange bursary and the two were married that year. This collaboration gave rise to Berio's most famous *Sequenza*: number three for solo voice, which is mentioned in most if not all music history introduction classes. After his 1952 trip to Tanglewood in the United States, Berio made more and more acquaintances and friends within the avant-garde scene of the time, not only in music but also in fine arts, linguistics, literature and poetry. This marked the beginning of a long friendship with Umberto Eco, the famed Italian linguist, author and semiotician; indeed, as noted by Osmond-Smith (in Sadie, 2001: 351) 'Berio's unusual delight in using the intellectual adventures of his contemporaries as an imaginative springboard has never left him'. The onset of the Sequenza cycle in 1958 'made explicit Berio's fascination with virtuosity, understood not merely as technical dexterity, but as a manifestation of an agile musical intelligence that relishes the challenge of complexity'. Up until the late 1960's, Berio's output was still infused with the structuralist tradition particularly as reinterpreted by semiotics, the study of symbols and their perceived meaning. This is the period of interest for the research undertaken here.

[1] Osmond-Smith (1985: 91).

Luciano Berio's highly virtuosic *Sequenza* cycle represents a creative process spanning forty-four years. The first of the series, *Sequenza I* for flute, was written in 1958 for Severino Gazzelloni and the last, *Sequenza XIV* for cello, in 2002 for Rohan de Saram. All the *Sequenzas*[2] are written for a specific performer as it usually was a personal meeting and/or friendship between the composer and a musician that gave rise to a particular *Sequenza* (Stoïanova, 1985: 392). There are also several compositional offshoots; *Sequenza VIIb* for soprano saxophone stemming from the original *Sequenza VII*. *Sequenza IX* (1980) for clarinet was reworked as *Sequenza IXb* for alto saxophone and as *IXc* for bass clarinet. *Sequenza XIV* was adapted in 2004, after Berio's death, by Stefano Scodanibbio and is now *Sequenza XIVb* for double bass. Berio also composed the *Chemins* series, which is an extrapolation, or proliferation as he likes to say, on the *Sequenzas*. *Sequenza II* for harp (1963) becomes *Chemins I* (1965); *Sequenza VI* for viola (1967) transforms into *Chemins II* (1967), *Chemins IIb* (1970), *Chemins IIc* (1972) and *Chemins III* (1968); *Sequenza VII* for oboe (1969) develops into *Chemins IV* (1975); *Sequenza XI* for guitar (1987) morphs into *Chemins V* (1992); *Chemins VI* (1996) is derived from *Sequenza X* for trumpet (1984) and is also known as *Kol Od*; and, *Sequenza IXb* (1981) leads to *Récit* or *Chemins VII* (1996). Finally, *Sequenza VIII* for violin (1976), not part of the *Chemins* series but demonstrating the same principal, namely a commentary on the *Sequenza*[3], was modified to become *Corale* (1981). When all of these pieces are taken into account, it is indeed a very large cycle.

In the year 1969 *Sequenza VII* was written for and dedicated to the famous Swiss oboist, composer and conductor Heinz Holliger who premiered the work in Basel, Switzerland[4]. As an illustration of Berio's personalization of his works for particular performers, Albera (in Bosseur & Michel, 2007: 267) notices that the letter H corresponds to the drone pitch B natural heard throughout the piece. Furthermore, the total number of letters in the dedicatee's name is thirteen, which mirrors the presentation of the score in a grid containing thirteen lines and a similar number of columns. It is a great challenge to learn and perform Berio's *Sequenza VII* and an even greater one to try and be as true as possible to the composer's intent with regards to the temporal structure that contains unusual time increments. Indeed, the score is not written in conventional meter but rather assigns durations in seconds and

[2] The grammatically correct plural would be *Sequenze*, however, all the scholars, except for Michel (2007), use the term *Sequenzas* as does Berio himself.
[3] Roberts (2007: 117) mentions that 'in no instance was a *Chemins* composed before its associated *Sequenza*'.
[4] Heinz Holliger is the oboist who, more than any others of the 20th century, has being a driving force of the expansion of the oboe's repertoire and technique. There are more works dedicated to him than any other oboist.

decimals to each column. In addition, there are two forms of musical notation: conventional and proportional where it is only the graphic positioning of the stemless note head in the bar that informs the performer on where to place it. These unusual time spans and duality of musical notation are the structural and conceptual difficulties in approaching the learning and performance of this composition. There are many reasons that an oboist in today's musical landscape would take up the study of *Sequenza VII*: be it for an international competition, postgraduate recital, research project, recording, or for the sheer love of the inherent challenges that this music offers the performer. This piece is part of the canon of modern solo oboe repertoire; for the standard oboist, this work represents one of the few instances that this musical language will be ventured into, as it is a set prescribed repertoire work for many competitions and postgraduate auditions. Berio's *Sequenza* remains the most important work in the oboe's modern repertoire. Few works will challenge the performer's abilities and technique as this one.

My first encounter with *Sequenza VII* started on the day that Luciano Berio passed away in 2003. The news was relayed over the radio. I took out the score of *Sequenza VII*, which I had owned for a few years already, from my bookshelf but had never had the courage to take on the work. Just looking at it overwhelmed me. The oversized score from Universal Editions is printed on a single large sheet measuring 66.5 cm by 51.5 cm, this in itself poses a problem as to how to balance the music on a stand. The most common practice is to use clothes pegs or small magnets to affix the top border of the page to the music stand. This method is satisfactory yet it does present the inconvenience that the performer does end up `hiding` behind the score. For one of my performances, I split the score horizontally across the middle and placed it on two stands on each side of me. Although this opened me up to the view of the public it did break the overall matrix and denatured the score.

Furthermore, even though Berio is not specific about what the sound source should be there is an indication for a continuous drone pitch B natural that should sound throughout the piece. The intensity should be kept to a minimum with slight variations. He does suggest an oscillator, a clarinet or a pre-taped oboe and mentions that the sound source should preferably not be visible. I usually use my chromatic tuner, which can produce tones. When I perform this piece alone, I need to switch on the sound source simultaneously with the first note of the composition. This is visibly conspicuous and a little inconvenient because I am unable to manipulate the intensity of the tone once it has started. I have found that it is better to have an ‘accomplice’ for performances. The drone B natural should give the impression of lending a slight resonance to the oboe[5]. The utmost importance of this pitch is thus highlighted; in addition, the composer asks the performer to become fluent in the use of difficult timbre changes using alternate fingerings on this B throughout the piece to have six differently sounding B pitches. I decided to perform the piece at an upcoming summer camp, six weeks after picking up the score for the first time. I did not realize the amplitude of the task. I set about ‘wrapping my head and fingers’ around the technical aspects of the score, namely multiphonics, timbre changes on the B natural pitch and other notes requiring this technique, bursts of double and triple tonguing (or a combination of both), dynamic control, and so forth. Basically, all the detail of the content of the work. However, while studying the score, what baffled me was the matrix, the container, the visible duality within the score between the metered sections and those in proportional/stemless notation. I did not find a way to express the composer’s suggested time increments satisfactorily. My best guess was to approximate the values, as I moved through the piece in an excessively linear manner. I then decided to listen to a recording of Heinz Holliger’s version[6] of the *Sequenza* in loop and play along to get a feel for the structure. I quickly noticed that Holliger is sometimes very liberal in his interpretation and rendition of the units with time-spans containing decimals; so, I did not explore the matter further. After the first performance I felt pleased with the audience’s response and the way that I had handled the composition in a six weeks’ time-frame, however, some issues felt unresolved. The visible duality in the two notations did not feel clear enough in performance, as was the rendering of the temporal layout of the composition. Furthermore, it bothered me that I did not manage to incorporate or embody *Sequenza VII*, which I did not interpret, but merely played through. In retrospect, I understand that it is because what I was lacking in intellectual virtuosity, I camouflaged in surface technique. What I did not contextualize, I rushed through.

Ten years later, taking the piece up again for a few more performances, I approached the work with a completely different level of maturity, confidence and musicianship. I had not worked on the piece in the meantime and did not have a recording of the first performance to analyse and notice the evolution. However, this time I did not need to rely on a commercial recording, the structure felt more secure and I was more confident in the phrasing and

[5] Footnote on the Universal Edition UE31263, London.
[6] Philips, 1990. CD 426 662-2. Germany. This was the version in my CD collection.

musicality but it still felt as if something was amiss. The temporal structure of the work was still approximated, based on feeling and not consistent. In my quest for exploring ways to improve my performance of the temporal issues inherent in the work, I considered a previous scholarly approach. In the year 2000, Berio gave his permission for the publication of Dr. Jaqueline Leclair's interpretation known as *Sequenza VIIa*. In this version, Leclair rewrote the score using a pulse of 60bpm (i.e. one second), and for the columns containing time-spans with decimals used portions of the pulse, for example: 11/16 for 2.7″ or 7/16 for 1.8″. This metered version[7] is a valuable step in the direction of a just interpretation and Patricia Alessandrini (2007: 73) remarks that, through this personal method, Leclair aimed to express the time increments as accurately as possible. However, she continues, *Sequenza VIIa* does not offer an exact calculation of rhythms made by measuring the physical spaces between note heads in the sections written in proportional notation. Herein lies my interest in the work. The impetus of this study was driven by a need to find a method of performing the unusual time increments to be as close as possible to the composer's intent *vis-à-vis* the temporal grid, which underscores the overall structure of the piece. The objective of this study is to explore the physical spaces between the note-heads in the sections exhibiting proportional writing. I wondered if one could approach the work using combinations of pulses to express both the temporal structure and the positioning of the notes within the bars written in proportional notation. I decided to explore this matter further by placing maximum fidelity on the graphic notation of the composer and strong emphasis on the phrasing and note groupings within these bars. Aiming to perform the work more in the near future, it deserves to be taken once again to another level of understanding and embodiment.

1.2 Statement of the research problem and research objectives

From a performer's standpoint, every oboist I have spoken to who has studied and performed *Sequenza VII* finds it challenging to be consistent in the accurate expression of the time increments, and to comprehend the structure given the visible duality between the conventional notation sections in the score, and those in proportional writing. This explains the wide variety of total performance durations for the piece found in commercial and internet recordings. Berio's *Sequenza VII* has a definite designated total duration of six

[7] Berio's *Sequenza I* for flute was also written with proportional notation yet Berio was dissatisfied with some performances, which he calls 'piratical', Osmond-Smith (1985: 99). He subsequently published a metered version of this *Sequenza*.

minutes and thirty seconds, as can be calculated when meticulously analysing the temporal grid (see chapter 4.5, p.50). So, achieving the unusual time increments and bars in proportional notation correctly would be a *sine qua non* for a true rendition of the piece. There are thirteen lines of musical text and thirteen columns of time durations as seen in Table 1 below. Each line thus follows an acceleration progression/temporal compression. There is a mixture of conventional metered music notation and unconventional notation, spatial or proportional writing where the notes do not contain stems. It is only the graphic representation and positioning in the bar that informs the performer about how to place the notes within the required time span. The difficulties of this work, apart from its intrinsic virtuoso character, are therefore to be as close as possible to the written temporal structure and to express the musical gestures within, with utmost accuracy. This study may offer a way of overcoming these difficulties and present an 'absolute' interpretation within a broader context of the structure of the piece.

Table 1: Temporal structure of each of the thirteen lines in Berio's *Sequenza VII*

A	B	C	D	E	F	G	H	I	J	K	L	M
3″	2.7″	2″	2″	2″	2″	1.8″	1.5″	1.3″	1.3″	1″	1″	1″

The main objective of the research is to engage with the learning process of Berio's *Sequenza VII* with the aim of achieving optimal accuracy in the temporal organisations and to be as close as possible to the composer's intent. To this effect, this study will bring a novel approach in conceptualizing the major difficulties in Berio's *Sequenza VII*, namely, the units in proportional writing and time increments containing decimals. This study will be approached from an original perspective in that I intend to go beyond Leclair's published interpretation of writing in pulse 60 bpm, but rather, will use a variety of pulse combinations to achieve the desired outcome. Furthermore, I aim to categorize all the bars in *Sequenza VII* into sets and groupings in order to gain insight into the structure of the composition, which will provide valuable knowledge for a reflective performance.

1.3 Research questions

The main research question guiding this study is:

In what ways can a practice-based research approach to the temporal and compositional structures of Berio's *Sequenza VII* for oboe best reflect the composer's notation?

Secondary research questions related to the main research question are:

- How could an alternate temporal grid be calculated and created using the concept of pulse combinations?
- How would an 'absolute' interpretation of the temporal grid and musical events within the work using the novel method of pulse combinations, aid the practice and performance of *Sequenza VII*?
- In what way would this approach lead to a broader comprehension of the compositional structure of the piece aimed at a just interpretation?

1.4 Rationale and value of the study

It is a great challenge to learn and perform Berio's *Sequenza VII* for solo oboe and an even greater one to try and be as true as possible to the composer's intent with regards to the temporal grid. This study offers an interpretative guide of the difficulties in this work. It is worthwhile because I believe this research can help other performers in their comprehension of the piece aimed at a high-level performance. Furthermore, the idea of expressing a given time increment with a combination of pulsations is original in the context of *Sequenza VII* and is not found in the literature. No researcher, of whom I am aware, has measured the physical spaces between the note heads in the sections written in proportional notation.

1.5 Thesis statement

Berio's *Sequenza VII* for oboe needs to be intellectualized (dismembered and reassembled) according to hermeneutic principles of the whole to the part and back to the whole followed by an iterative process of score interpretation and practice/performance. Thus, all the bars will be categorized, with special attention to those in decimal time increments and those containing proportional writing. Furthermore, expressing the decimal time increments with a combination of pulsations is the truest method for a faithful interpretation of Berio's *Sequenza VII* for oboe.

1.6 Delineations and limitations

Even though practice information will be given throughout this essay, it should not be seen as a practice guide. The concept of an 'absolute' interpretation is one of the foundations of this document, 'absolute' is always used with quotation marks and should in no way be seen as derogatory towards the scholarly works and performances undertaken by others. The concept acted as a beacon and goal of a personal endeavour and as such, this is a suggestive interpretation and by no means a conclusive one. Each interpreter is encouraged to come up with their own ideas and vision.

1.7 Notes to the reader. The following concepts and symbols will be used throughout the dissertation:

- In this dissertation, *interpreter* is used to mean a performer; furthermore, performer in relation to a score and the method used to approach it.
- Visually the score is set up as a grid imparting a vertical component to the linearly performed music. Therefore, I will not be referring to bars (incidentally, Berio does not provide bar numbers) but throughout this essay *unit* will be used to delineate such a musical object. Furthermore, since there are thirteen lines and thirteen columns, they will be labelled columns A to M and lines 1 to 13, and then referenced in a simple grid-like manner i.e.: unit 3A or unit B12. Almost exclusively the line will be cited first except in cases when dealing with structures in a specific column.
- The word *matrix* will be used to signify a grid.
- In this musical context, *diphthong* is taken to mean two units that are linked by prolonged sound with no articulation of the second unit.
- *bpm* = beats per minute
- *nps* = notes per second
- In the text, *pulse* or *pulsation* or *beat* are used interchangeably and have the same meaning with a direct reference to a value in *bpm*.
- Time increments in seconds are expressed with the symbol ″; for example: 3″ signifies three seconds.

- Throughout the document, the reader will be referred to tables and graphs used to illustrate certain aspects of the composition; lists (of units analysed), equations (used to calculate values of pulse combinations) and musical examples.
- The study includes four appendices: the listing of all the pulse combinations used; calculations with reference to the golden mean; how to make the click track and the last appendix shows a possible application of pulse combinations with the complex notation of nested tuplets.

Throughout this document, the following mathematical symbols are used with their respective conventional meanings:

- the symbol .X° will be used to denote the recurring nature of the number (X) after the decimal comma
- the symbol $\in$ means *belongs to*
- the symbol $\therefore$ means *therefore*
- the symbols $<$ and $>$ mean respectively *smaller than* and *greater than*
- the symbols $\leq$ and $\geq$ mean respectively *smaller than or equal to* and *greater than or equal to*
- the symbol Δ means the numerological difference between two values

1.8 Chapter overview

Chapter one is introductory. The second chapter is the literature review for this study. The review focuses on interviews with Berio and writings specifically about *Sequenza VII*. Of importance also are the two documents written by performers about this composition. Various scores are discussed: the proto-version and the published successive versions finishing with Leclair’s published interpretation.

Chapter three contains the methodology and includes the research approach and design, as well as a set of rules and axioms that were devised for this interpretation. Then the auto ethnographic element in this study is explained together with the iterative learning process used. Finally, the measuring instruments and method employed for this process are elaborated upon.

The fourth chapter includes the results of the approach used and contains a large volume of calculations with regards to the combination of pulses that could be used for this interpretation. All possible pulse combinations are shown even though only a few are useable and useful when applied to the score. Furthermore, a demonstration of the manner in which these solutions can be applied and the implications for phrasing and musical gesture is included. This chapter provides the results of a precise calculation of the empirical and true duration of Berio's composition.

In chapter five all the units are placed into sets and layers, and pulsations assigned to those units in proportional writing. The sets will be constructed in an entropic[8] way, from the most straightforward to the more complex and interpretative. From the deterministic units that can be played 'only one way' to more obscure categorizations like 'proximity events with the drone'. Overlap between layers will happen as they are not mutually exclusive and hermetic; the goal being to gain insight into the structure of *Sequenza VII* while striving to be as true as possible to the temporal layout. Practice and performance indications will regularly be interspersed stemming directly from my own experience of the piece. Furthermore, graphs will be plotted aimed at understanding some of the compositional traits and structures of the composition. A gradual complexification of the overall *Sequenza VII* system will be demonstrated using measurements such as note density charts, pitch distributions and graphics of selected events, such as fermatas and other criteria.

The penultimate sixth chapter includes the auto ethnographic element of this study. The meticulous temporal analysis of past performances is carried out and measures of inaccuracy are calculated. This leads to the application of the prescriptive interpretation devised in the previous chapter over a four-week period. After this step, another recording shall be made and analysed in the same manner with the goal being to prove the validity of the learning method. The iterative process then follows.

Chapter seven, the final chapter presents conclusions made during the process of researching Berio's *Sequenza VII* and answers the research question and sub questions and verifies the thesis statement.

[8] A system is said to undergo entropy when it gradually gains disorder or complexity over time.

Chapter 2

Literature review

2.1 Introduction

In this chapter, the literature review focuses on literature related to the *Sequenzas* in general as well as literature focused specifically on *Sequenza VII*. There are four informative interviews with Berio ranging between 1968 and 1985. These interviews present a good overview of Berio's thoughts and compositional traits. The first two interviews are general whereas the last two provide information about the *Sequenzas*, and particularly Berio's specific thoughts about *Sequenza VII*. Literature covering all the major analytical explorations and questions relating to *Sequenza VII* is included. The chapter contains views of renowned oboists who have regularly performed this composition, as well as a discussion of the scores in question.

2.2 The interviews

There are four noteworthy interviews with Berio conducted between 1968 and 1985 presented below:

1. Philippot, M. 1968. *Entretien Luciano Berio*.
2. Bornoff, J. 1973. *Music, Musicians and Communication*.
3. Osmond-Smith, D. trans. and ed. 1985. *Luciano Berio: Two Interviews with Rossana Dalmonte and Bálint András Varga*
4. Stoïanova, I. 1985. *Luciano Berio – Chemins en Musique*

The first interview by Philippot is worthwhile since it was done at the end of 1968 so *Sequenza VII* was probably already drafted, even if at least in an embryonic stage. *Studie zu Sequenza VII* (Berio, 1973) was surely already written even if it was first published after *Sequenza VII*. Berio explains that the common element of the music of those days centres on the power/ability of the composer to transform musical material and that what is called 'musical opus' is indeed focused on the process of transformation (very palpable in the

Sequenzas). He quotes André Souris and explains that what matters is not the given form of an object/concept but the formation/generation of said construct. Berio (1973) explains that he does not believe in random chance, indemonstrable and no guarantor of liberty; that everything done in this life is governed by an idea. In music, he says, reference is made to an ensemble of 'codes' (Berio names this '*Poétique*'), one of the most superficial being the musical notation. When Berio's musical notation underwent modification to accommodate new technical and sonorous performance potential, it led some reviewers to talk of indeterminacy, which it is not. The new notation was rather a necessary metamorphosis to accommodate a certain sounding result inextricably linked to an idea. Philippot surmises that Berio's vision of musical composition is that of a useful activity that serves both the public, as a means of self-awareness, and the composer as a means of communication. Berio agrees by explaining that change is the essence of music, that it is a social act *par excellence*. Social act even more so when put into the historical context of teaching and transmitting to the younger generation, thus continuing to keep and strengthen music as a living practice.

Bornoff's interview with Berio was conducted in July 1972 and contains interesting insight into the composer's vision of the mass-media tools of the time and how he envisages himself and his role within them. In this interview Berio reiterates his will to situate himself and his music in a socio-historical context, mentioning that the promotion of music as a commodity is irrelevant unless ideas about music are promoted as well; which take on many forms depending on the societal context. He continues to explain that mundane success has little to do with the scope and content of what is successful. Labelling has a big part to do with this as Berio explains that the label often does not correspond to the reality of the content that needs to be experienced as a process, a transformation and not a fixed form. Labelling music as 'post this, neo that' reminds of the Roman idea of *divide et impera* to apply control and marketability. Here again Berio concludes with the didactic qualities inherent in music, naming it an intellectual tool aimed at building relations, even those that are abstract, amongst things. A tool for people to use to invent and relate, not separate.

In the interview translated and edited by Osmond-Smith in 1985 Berio again emphasizes his disdain for superficial analysis that focuses on the general form, 'the wrapping' to the detriment of the transformational relationships that may be realized within music. Virtuosity is a holistic concept for Berio, one part of which is the surface virtuosity, the mastering of the instrumental techniques that consummate performers have attained. However, there are deeper layers: according to Berio the substance of the musical idea is superseded by a 'concern for technique and stereotyped musical gestures', then it is inanimate surface virtuosity. Intellectual virtuosity, on the other hand, is characterized by the performer's ability to situate himself and his performances in a historical and socio-cultural framework, in a bid towards 'resolving the tension between the creativity of yesterday and today'. Berio mentions that all of his *Sequenzas* are written for a performer whose virtuosity is primarily one of knowledge. The transformation of instruments and their associated technique over the centuries is important to Berio and he explains that this is why, in the *Sequenzas*, the instrument is never denatured or used against its own nature. All the *Sequenzas* for solo instruments intend to melodically lay out an essentially harmonic discourse and propose a polyphonic way of listening to a monodic instrument. Almost all the *Sequenzas* are built from a sequence of harmonic fields that provides the foundation from which extrapolation and proliferation of musical material can occur. Control of the resultant densification of melody and development of harmony is a feature common to all of the *Sequenzas*. Berio concludes that everything can be transformed, even the idea of transformation itself. However, although a transformational process always signifies something, it is not guaranteed to hold an expressive meaning.

In the Stoïanova interview with Berio in 1985, the composer explains that the origin of sequences is in the IXth century and that they were long vocal melismas without words whose function it was to prolong the Alleluia in Gregorian liturgy. These melismas were divided into several sections with stereotyped cadential formulas (as in his *Sequenzas*). Berio remarks that all the *Sequenzas* are dedicated to a virtuoso whom he knew personally, that the act of composing for someone consecrates a particular rapport and acts as testimony to a human relationship. Berio continues to say that instrumental virtuosity is intimately linked to physical behaviours, and that body language during the execution of the music amplifies the intrinsic theatrical aspect of a performance. 'Nothing is ever finished', as even a completed composition is a commentary of what has come before and of things to come. A question should not bring an answer, but rather a commentary, followed by another question. That is why the *Chemins* series can be seen as a description and analysis of the associated *Sequenza.*

Speaking specifically about *Sequenza VII*, Berio (1985) mentions that the drone note B initiates a spatialisation of the musical discourse through the permanent reference to a centralizing pivot. This drone should be seen as a 'tonic' and as a foundation for the proliferation found in the solo part, as well as giving perspective to the rather complex musical structures. It is a polyphonic and harmonic perspective that contributes towards a subtler analytical perception of the various phases of transformation. The drone is a beacon of stability and helps to render perceptible the timbre modifications on the note B, with the various fingerings that have different colours and almost imperceptible pitch variations. Berio mentions that in *Sequenza VII* he created a proposition of twelve pitches, some fixed in register, others not. The twelve pitches of the chosen series are not treated as pitches of a dodecaphonic series. Rather, they define only the horizontal motion; the importance is the order of appearance of the pitches in the progressive filling up of the space-time of the musical discourse. When the vertical dimension of the piece culminates in the appearance of the last pitch (G6), articulated around the golden section (see appendix 2, p.131), the composition starts to unwind with a gradual rarefaction of musical events. Berio mentions that *Sequenza VII* is a kind of kaleidoscope of the oboe's sounds, and thus, also seeks to 'degrade' sound with the use of overblowing and multiphonics—the effects that gravitate around the 'clean' sound. In the interview Berio concludes that *Sequenza VII* should suggest two ways of listening: an objective one, which follows the musical events in the order of their appearance, and an analytical ear following timbral, harmonic and polyphonic developments. He insists on the importance of understanding relations, the hidden polyphonies, the spatial perspective centred around the drone pitch B4. Berio reiterates the concept that *Sequenza VII* has the same function *vis-à-vis* the drone pitch B as *Chemins IV* has towards *Sequenza VII*, namely an analysis and a new commentary. There is an interesting quote in which Berio remarks that *Sequenza VII* is linked to an early memory of hearing the english horn solo in the third act of Wagner's *Tristan und Isolde* (composed 1857-9, premiered 10 June 1865), which his father would play to him on the piano when he was a child. *Sequenza VII* contains parts of this beautiful melody.

2.3 Literature about *Sequenza VII*

The following section contains works that encapsulate key literature about Berio's *Sequenza VII*. Four articles and three dissertations ranging from 1989 to 2012 are included. In these documents, all the major structural and analytical aspects of the composition are shown and discussed in varying levels of detail. This group of literature is key to a broader and also very detailed comprehension of Berio's *Sequenza VII*.

In 1989 Schaub wrote a dissertation about the 'Transformational Process, Harmonic Fields and Pitch Hierarchy in Berio's *Sequenza I* to *X*'. At the time there were as yet only ten *Sequenzas*, and the author systematically analyses each one. He explains that in the 1960's many of the figureheads of late modernist composition began to turn away from serial procedures of composition, and adds that Berio, Pousseur and Ligeti are most representative of post-serial late European modernism. Furthermore, Berio is perhaps the most successful with regards to public acceptance, commissions, recordings and performances. Schaub lists the *Sequenzas* and dedicatees and notes that *Sequenza IX* for clarinet is the only one not written for a specific virtuoso. In his dissertation, Schaub defines and categorizes Berio's compositional methodologies as components of either process or redundancy, and he adds that these are the primary force behind Berio's creative work. Schaub notes that the later *Sequenzas* (*V* through *X*) all employ hierarchical pitch relationships whereas *Sequenzas I* to I*V* display an experimental stage of development. Processes such as repetition of certain pitches, recurrent musical gestures, registral invariance on important pitches and their presence at major structural divisions are examples of redundancy. Multiphonics, present in all the woodwind *Sequenzas* are another feature, as an evolving sound process. These compositional traits become more refined and are used with greater consistency in the later *Sequenzas*. Schaub concludes his introduction by explaining that his work emphasizes pitch relationships and is the development of a consistent and original analytical language: 'For this reason, established nomenclature, such as Allen Forte's for pitch-class sets or the serial vocabulary of Milton Babbit and others, do not seem appropriate to this task'.

In his chapter specific to *Sequenza VII*, Schaub (1989) mentions that the alternate fingerings for B4 produce variety in timbre and slight variations in pitch. Schaub calls the drone pitch pc 11^4 in a mixture of pitch class nomenclature with the invariable C0 and SPN (scientific pitch notation) where middle C is C4. Schaub divides the composition into five major sections: beginning to 2F (in his text it is 2+6), 2F to 4B, 4B to 8A, 8B to 10 D and 10D to the end. The author does not list the enharmonic equivalencies or the octave displacement of certain pitches in what he presents as the series of *Sequenza VII*. However, talking about evolving/expanding pitch fields in the composition, Schaub notices that it is a process which extends over the whole piece, as even before the exposition of the complete series, octave displacements and enharmonic spellings occur. Furthermore, by the end of the composition, such proliferation of this process has happened that almost all the notes of the oboe's range have been stated. The formal archetype of build-up—climax—resolution is seen as straightforward for Schaub and he cites, amongst other factors, the gradual increase in rhythmic activity in the opening phases, countered by a relaxation of rhythmic motion towards the end. The middle section shows evidence of gradual transformation with a continual sense of digression and return to the drone pitch pc 11^4 even though these returns are becoming progressively truncated. There are small, rather illegible tables which explain the pitch registers and the number of pitch iterations per line[9]. Schaub does not believe that pc 0^5 (C5) should have value as an independent pitch but should rather be seen as pitch fluctuations on pc 11^4 (B4). I differ in that, even though the first three iterations of this pitch are indeed a stretching of the drone pitch B4 through the use of the only three *glissandi* found in the composition, the subsequent four iterations are as independent pitches. Overall, the dissertation presents a very sensible analysis which would influence subsequent scholars in their approach to analysing *Sequenza VII.* Indeed, other scholars agree with most of Schaub's observations yet, interestingly, none have felt it necessary to use pitch class notation. Even though the work certainly has serially derived origins it is not dodecaphonic in nature.

The first article from 2003 by Roberts simply called 'On Luciano Berio's *Sequenza VII* for Oboe' is clear and every word is really useful. It contains insight not found in any other sources (Roberts was Berio's assistant for fourteen years). The author starts by stating that in the case of *Sequenza VII* it is futile to expect that a traditional analysis of the work could rightly interpret or give due justice to the piece. In short, there is no way to show how the piece mechanically adds up, even though it contains serially derived origins. This difficulty in understanding the musical text has led some commentators to look elsewhere for a starting point, he adds. Roberts then mentions what he considers to be speculation on the part of some scholars: that the note B (H in German) would be linked to the initials of the dedicatee, Heinz Holliger[10] or that the first four notes of the series happen to be a permutation of B-A-C-H. The author explains that the answer is much more practical and is directly linked to the instrument itself; this pitch (B4) can be played with a multitude of fingerings all having slightly varied timbres and intensities[11]. When played against the omnipresent and

[9] The versions of his text available online seem to be missing a page of these tables as they are of a bigger page format than the rest of the text and are consequently folded.
[10] Roberts does not mention the thirteen letters in the name which would link to the grid of thirteen lines and columns.
[11] Roberts does not mention pitch fluctuations with the alternate fingerings. Furthermore, the pitch C5 has almost as many alternative fingerings producing similar effects. *Sequenza VII* could have been written 'in C'.

independent[12] drone these timbral differences can be well perceived and constitute the fundamental generative ingredient for the ulterior proliferation of sound ideas and affects. This pitch is also the fundament of the formal arch type construction of *Sequenza VII* as it is both the first and last pitch stated and thus acts as a dominant perspective for the developing musical discourse. Roberts mentions that 'all commentators agree that the piece falls into two main sections', the first part being completed at the golden mean, which he places on the arrival of the G^6 sustained moment in unit 10F, for it is the last pitch stated (later there are new enharmonic pitches and pitches in a different register) and the highest one in the 'series'. In the second part of the piece, Roberts says that the *B* drone which was previously seen as an axis now becomes more of a root. He is the only scholar (with Leclair, 2010) to name the pitches which are totally absent from *Sequenza VII*: these are C4, F4, G5 and D6. The author points out that this technique of inclusion and exclusion can be frequently observed in Berio's music. Finally, Roberts explains that the visual presentation of the score in a grid is not meant to imply any conclusive rigid formal structure, rather, it is for the benefit of the performer, who within a controlled freedom, always renews the interpretation even though the essence and character of the piece will remain the same.

In the subsequent article, 'The *Chemins* Series', by Roberts published in 2007, the author affirms that no study of Berio's *Sequenzas* would be complete without discussing the *Chemins* series, the complementary group of works that evolved in parallel. The *Chemins* imply the transformation of an existing *Sequenza* into a completely different instrumental work, where the solo material is treated in a concerto-like manner. Roberts is adamant that the *Sequenza* always precedes its associated *Chemins*[13] and explains that these systematic metamorphoses have no real precedent in the history of western music. The *Chemins* series was Berio's way of analysing his *Sequenzas*, and study of the two associated scores provides a reciprocal process of understanding. Berio reintroduces proportional notation for the last time in the series of compositions with *Sequenza VII*. The composer was previously dissatisfied with performances from proportionally notated scores as he found that some

[12] It is interesting to note that Roberts adds a comment about the drone that is not echoed in other sources: 'The invisible, permanent sustaining of the note B (which constantly varies in intensity independently from the soloist)'. In a footnote on the score of *Sequenza VII* it is mentioned that the preferably invisible drone producer must take care to keep the intensity to a minimum, with quite small variations. As a performer, I always assumed that the intensity fluctuations in the drone were to match those of the shapes played by the solo line.
[13] Yet, in Osmond-Smith (1985: 90) talking about how a *Sequenza* becomes a *Chemins*, Berio says '… or else, moving in the opposite direction, *Chemins V* to *Sequenza IX*'; furthermore, it is the only *Sequenza* to not have a dedicatee.

interpreters would then take too much freedom, hence the republishing of *Sequenza I* for flute in conventional metered notation. Roberts mentions that the original unpublished version of *Sequenza VII* is also written totally in conventional notation[14], and that the use of a drone, which he also names pedal, for the entire duration of the piece is very rare in Berio's compositional output[15]. The author concludes that when taking the whole corpus of compositions, adding the *Chemins* series to the fourteen *Sequenzas*, it is representative of the most important compositional techniques and preoccupations of Luciano Berio.

Michel's 2007 article, 'Luciano Berio, *Sequenza VII* pour hautbois solo (1969, révisée en 2000)'[16] is the only document where the term *Sequenze* is used, the grammatically correct plural of *Sequenza* in Italian. The author agrees with other scholars that the *Sequenzas,* often based on a series of twelve tones, are not treated dodecaphonically but rather concentrate on melodic and harmonic entities. The order of succession of pitches should be seen as a framework within which musical events are freely mobile. Michel notices the correlation between the dedicatees name and the drone pitch and adds the reference of thirteen letters, lines and columns. He also mentions the pitch fluctuations obtained with the various alternate fingerings on the drone pitch. As other scholars, Michel agrees that the statement of the last pitch in the series, namely G6, marks the beginning of the final phase of the composition. This last pitch should be seen as a sort of pillar around which two distinct paths emerge and the last section is where the author situates Berio's souvenir of the english horn solo from the third act of Wagner's *Tristan und Isolde*. The unfolding of *Sequenza VII* is punctuated by caesuras or suspensions (silence or sustained sound) and the author thus considers the musical discourse to be separated into six propositions, the last of which can be separated in two. This division goes from: beginning to 2F, 2F to 4B, 4B to 6F, 6G to 8A, 8B to 10 D, 10D to the end with an extra division at 11E. Michel talks about the directionality of musical form and considers the first four phrases to be the zone of introduction of the musical variables, pitch, timbre and other effects. The fifth phrase puts into place an as yet unstable phraseology: disjoined quick motion—held final note (or multiphonic); this could also be

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[14] No other scholars mention this original version and it cannot be the 'Study to *Sequenza VII*' (ESV) as this version was published in 1973.

[15] Roberts names the other three compositions where this technique is used: *Agnus* (1971), *There is no tune* (1993) and *Altra Voce* (1999). Therefore, *Sequenza VII* was the first work to make use of this compositional idea.

[16] Luciano Berio, *Sequenza VII* for solo oboe (1969, revised in 2000)

called antecedent—consequent. Below is a succinct summary of his analysis of the musical divisions:

1, 2, 3: statement of the first eleven pitches and of almost all the effects
4: B section (slightly different characteristics) or transition
5: appearance of the last pitch (G6)
6: definitive establishment of the antecedent—consequent model

The next two documents are by Alessandrini, an article and a dissertation. The first, published in 2007, 'A Dress or a Straightjacket? Facing the Problems of Structure and Periodicity Posed by the Notation of Berio's *Sequenza VII* for Oboe' is a very interesting document as the author had frequent conversations with Leclair about her renotation for the supplementary edition. She mentions that the work done by Leclair began as her own personal method to be as true as possible to the temporal layout of the grid and not as an exact calculation of rhythms made by measuring the spaces between the note-heads in the sections using spatial notation. Leclair justifies this choice of not attempting a systematic determination of the spatially notated rhythms by stating that the grid does not precisely relate time and space; for instance, the one second regions are not equal in size and are not a third the physical length of the three second region. Leclair explains that articulating the overall structure of the piece via a strict adherence to the temporal grid is more important than preserving the spatial-temporal relationships between the individual notes. Leclair sent her renotation to Holliger in 1997, and he responded that although her work was accurate, he did not see the need for it, as he considers the oboe part of *Chemins IV* to be Berio's own metered version. Quoting Holliger (Alessandrini, 2007: 75):

> 'I like very much Berio's clever notation: mixing normal and spatial notation. It gives the right balance between precision and spontaneity. It is very precise where it needs to be and leaves some freedom where it has to… [it is a] very appropriate and imaginative notation, which is a very exact image of the isometric structure of the piece'.

Hadady is also sceptical of her renotation for the same reasons as Holliger and since he worked with Berio on the recording of *Chemins IV*, he views it as the official measured version of the composition. Alessandrini mentions that this development in the life of

Sequenza VII prompted her to think about the function of the original notation and investigate the temporal results of its durational plan in performance. She mentions that in *Sequenza VII*, the score is not proportionally notated in the sense of space consistently representing time as can be seen in *Sequenza I*, and she wonders if the visual organization of the score would be more informative if it reflected the overall temporal proportions including the fermatas. The author suggests that the performer should think of the fermatas as stopped time, exterior to the directionality of the piece. As a consequence of this idea, she claims that the given length of the individual fermatas is not vital to the structure of the work and can be interpreted somewhat freely by the performer. I differ inasmuch as the goal of this study, in an idealized performance, is 'absolute' fidelity to Berio's temporal layout. As other scholars, Alessandrini places a lot of importance on pitch fields and their succession throughout the piece, she counts the total number of measures and duration in seconds of the successive pitch fields. The author notes that the grid encourages a traditional interpretation of form as related to the western classical construct of having a single climax located at approximately the three-quarter point. As other scholars, she places the climax of the composition on the G6 *ff* in unit 10F and notices that it is after this moment that the bulk of the fermatas happen. According to her, this encourages the interpretation of the section after the climax as being in a slower tempo and having a *ritardando*, and this prompts her to view the last pitch field, which is very drawn out, as being similar to a coda. Starting with the premise that the total duration of *Sequenza VII* is 414.8 seconds, she compares two virtuoso recordings[17] and relates their timings with the major structural demarcations of the piece according to Leclair[18]. It is interesting to note that she calculates that lines containing more proportionally notated music are less accurate in both recordings. Alessandrini makes a note on Berio's idea of a new virtuosity, an intellectual virtuosity, and relates Holliger's and Leclair's analytical efforts aimed at an accurate performance of the piece. She goes as far as to say that it could be seen as a failure of the piece and more specifically, its notation that performers have to go through the process of analysis and renotation in order to be as close as possible to the temporal layout. This is, according to Leclair, the *raison d'être* of the supplementary edition, as she explained to Holliger in 1997 (In Alessandrini, 2007: 77-8):

[17] Holliger (1976), Hadady (1995)
[18] Leclair divides the piece in three phrases, 1A-8A, 8B-10D, 10D-13M.

‘I believe that the oboist will have greater confidence and focus working from this version, a result of his improved rhythmic orientation; and moreover, he will execute ALL aspects of the work (dynamics, articulation and phrasing) with better artistry and virtuosity, since these elements are all intimately tied with the musician’s rhythmic concept’.

Alessandrini concludes by asking the question whether, for a performer, Leclair’s metered version could deliver a performance which is both more secure and relaxed or whether the original notation with its fluidity and variety would be denatured by the artificial metric divisions. Her last thoughts are about an unconstricted performer who would realize Berio’s wish to ‘wear the music as a dress, not a straightjacket’.

Alessandrini’s 2008 dissertation, ‘Temporal Problematics Raised by Two Metric Versions of Luciano Berio’s *Sequenza VII*: A Computer-Assisted Analysis and its Implications for Computer-Aided Composition’ is rather complex and there are only two chapters which were useful in this research. Starting in the same way as the article she wrote the previous year she explains the difficulties faced by Leclair and Holliger. Their necessary process of analysis and engagement with the composition, raising the temporal issues in relation to notation and perception. A performer, she says, is expected to follow scrupulously the instructions on the score, while giving a personal reading and interpretation of the signs on the page. Alessandrini mentions that Berio’s notation can be seen in terms of the sociological construct of structure and agency, and she mentions that Berio’s experiments with the *opera aperta* (in addition to his theoretical contributions in this area) significantly contributed to the post-war evolution of the role of the performer. The author then discusses the concept of agency with regards to the two metered versions of *Sequenza VII*[19]. She postulates that in this case there may be some simulation of agency, since the rhythms are strictly notated yet are meant to convey a sense of temporal freedom, as was the case with the original spatial notation. Alessandrini then explains her process of analysing recordings and says that it is the reverse process of renotation used by Berio and Leclair (Alessandrini, 2008: 17):

‘The computer aided compositional process in question consists of: (1) analysing several recordings of the same work in order to determine the duration of each note in

[19] Berio’s solo part to *Chemins IV* and Leclair’s renotation.

> each version; (2) using this information to time-stretch each recording note by note so that each note in each recording has the same length; (3) combining the time-stretched versions by superposing them to form an electro-acoustic '*maquette*'; (4) performing a sonogram analysis on the *maquette*; and (5) using the data from the analysis of the *maquette* to compose the instrumental parts and the electronics'.

This process brings into play the agency of the performer and unites the acts of analysis, composition and interpretation. Alessandrini calls the new work created a representation of the original work: 'executed by the means of the analysis, transformation, reconstitution, and re-analysis of this latter'[20].

In the third chapter, she compares the rhythms of the two metric versions of *Sequenza VII* to temporal grids created by a process programmed in the 'Open Music environment and Common Lisp (CL)'. This is an algorithm that, within a given series of frequencies, finds the smallest common denominator known as the fundamental unit. Thus, Alessandrini is able to investigate the extent to which the rhythms and meters written in the metered renotations are perceptible, in terms of periodicity, or if they are made ambiguous by avoiding it. As a general rhythmic plan of *Sequenza VII*, she explains that the more the piece progresses, the more rhythmic musical material can be seen along with an ever-growing diversification of the quarter note subdivisions[21]. Alessandrini concludes by explaining that a solo work like Leclair's renotation does not have the same constraints and practical considerations as Berio's renotation in *Chemins IV*, which is a conducted ensemble piece. Therefore, she is not surprised to find that the supplementary edition (JLV) is more complex on both the metric and rhythmic levels.

The last document is the 2012 dissertation by Strum, 'Luciano Berio's *Sequenza VII*: Temporal Multiplicity and Alternative Conceptions of Form'. The author starts by placing *Sequenza VII* within the traditional formal archetype of build-up—climax—resolution, as have other scholars, and she mentions that the available analyses of the piece rely on the aggregate-completing pitch of a fixed register pitch series which outline the climactic area. Strum also mentions the articulation around the golden mean dividing the piece into two

[20] See chapter seven for the relevance to my work.
[21] Similar to the categorization of the first set and subset found in this document.

temporally proportionally balanced main sections. However, she continues, this view of the composition does not address important formal aspects that would place *Sequenza VII* more prominently in a postmodern context. Strum explains that a characteristic of postmodern musical works is the multivalence of temporal organizations present in the piece. Throughout her work, she shows that *Sequenza VII* exhibits multiple simultaneous temporal structures that she categorizes as linear, partially linear or spatial. The author mentions that Berio calls these organizations temporal phases and that throughout the composition, a particular phase may become more prominent depending on a performer's interpretation, or a listener's perspective. Here is another trait of postmodern musical works: the possibility that the temporal structure can reside in the listener, and this is relevant in this case when considering a spatial conception of form. Strum continues by explaining that the different temporal organizations are unified by the most important pitches in the series and that their multiple roles create the relationships between the various temporal layers. She uses this multivalent interpretation of temporality and form to justify Berio's claim that he cannot conceive of time in a univocal way, and also to emphasize *Sequenza VII*'s important place in the postmodern musical repertoire. The author identifies (Strum, 2012: 3-4) five distinct but interrelated linear and non-linear temporal organizations:

1) Typical linear archetype of build-up—climax—resolution.
2) The grid and its timed durations supply an absolute linear conception of time, a framework against which to measure the actual time in performance.
3) The gradual formation of global, sweeping musical gestures, such as through the process of introduction of new pitches, and the process of increasing rhythmic complexity suggest a global linear temporal conception. Strum introduces the concept of 'pitch freshness' determined by pitch repetition and the quality of newness of a pitch. She gives a possibility for *Sequenza VII*'s 'temporal dynamic form, a kind of form that arises through the measuring of the flux of intensity of a particular property'[22].
4) The presence of a continuous, incessant drone on the pitch B4 creates a sense of timelessness, as it defeats directionality according to the author. Furthermore, the

[22] Strum cites the work of Mailman (2010) with regards to temporal dynamic form and dynamism theory. 'A dynamism theory (or analysis) is one that asserts motion, change, process or energy (potential motion, change or process) as existing in the course of piece or performance, as it elapses'. His rationale for this type of analysis of form is linked to cognitive, psychological, and phenomenological perspectives on how we hear and respond to music.

pitch B4 has an organizational role in pitch space, the vertical continuum of pitches from lowest to highest, allowing for symmetrical pitch structures to form. This leads to a spatial temporal organization, or, put another way, the understanding of the whole piece in an instant.

5) Strum identifies two series, which she identifies as primary and secondary and links them to two temporal branches that overlap within the piece's temporal directedness, or linear path through time. This forms the basis of her double branched interpretation of *Sequenza VII* where the temporal reversal occurs after the climax.

Strum adds that this metaphorical temporal reversal is corroborated by the positions of the first pitch in the secondary series D#5 and the last pitch of the primary series G6 and points out that there are temporally balanced and parallel durations between the outer boundaries of the composition and these important structural pitches. Strum relies almost exclusively on the order of pitches exposed and the two distinct series which she devised during her study and points out a host of symmetrical relationships in the intervals created to further strengthen her double branched interpretation of *Sequenza VII*'s form. Starting with the premise that the total duration of the composition is 414.8 seconds, she compares five virtuoso recordings[23] and compares their timings with the major structural demarcations of the piece according to her interpretation[24].

2.4 Articles by oboe virtuosos about their approach to *Sequenza VII*

The article authored by Redgate (2007a) 'Performing *Sequenza VII*' contains valuable information about the available scores of *Sequenza VII*, the OV (original version), the RV (revised version), the JLV (Jaqueline Leclair version), the ESV (study for *Sequenza VII*) and the SV (saxophone version). Redgate covers the major differences between these scores and more precisely, points out the discrepancies between the RV and JLV with regards to the microtonally altered multiphonics which are not found in the ESV or OV. The author explains that Roberts, who worked extensively on the RV and JLV with Berio suggests that the latter should be taken as the most reliable version. Redgate, through personal

[23] Holliger (1976), Delangle (1994), Hadady (1999), Leclair (2006) and Redgate (2006)

[24] In seconds durations she compares values for D#5 to end, beginning toG6 entrance, beginning to G6 in 10D, beginning to G6 in 10 F and in percentages D#5 to end and beginning to G6 in 9E.

communication with Roberts, reveals that Berio had a preference for the saxophone version of this *Sequenza VII* since the multiphonics and all the other specific timbral effects work much better on the saxophone, which is a more versatile instrument. Roberts continues by praising Berio's use of two distinct notations saying that it is for the benefit of the performer, who within a controlled freedom, will never play the piece as another performer, even though the content and character of the piece will remain unchanged. The author then remarks that this duality of notation creates a tension within *Sequenza VII* between the free and the strict, and that this tension should be practiced and not lost in performance. He points out that the spatial notation only gives very limited freedom as the graphic positioning of the note-heads is quite clear. Redgate thinks that the various alternate fingerings to produce timbral variety on the foundation pitch B4 should not offer microtonal difference and thus a lot of fingerings can be eliminated[25]. Talking about the multiphonics in the piece, Redgate mentions that the renotation containing microtones was recognition by Berio that, on the oboe, perfect fifths do not sound quite perfect. The quarter tones should be understood as margins of error as the oboist tries to get as close as possible to the ideal perfect fifths. There are some interesting remarks about the sonorities obtained by overblowing and Redgate sees no reason why the oboist could not also add a 'growl' as saxophonists can do rather easily, it remains in the spirit of the music, he says. The author makes valid comments about his views on vibrato in this composition which he suggests keeping to a minimum. Redgate, as other scholars, places the climax of the composition on the G6*ff* in unit 10F before the gradual unwinding and says that this arch shape should be rendered very clearly in performance.

The article written by Leclair in 2010 is important for the fact that her published renotation and name are now indelibly associated with *Sequenza VII*, and also because her personal communication with Berio lends her consequent credibility. Leclair explains that her analysis is from a performer's standpoint and refers to explorations of this composition by other scholars that go into great detail. However, she mentions that her view is that the overall form, harmonic landscape and character should have primacy over the specifics. Leclair mentions that *Sequenza VII* is often thought of as a 'gauntlet for oboists to run' but reminds them that it is an 'imaginative, beautifully written work that fits the oboe like a glove'. The author uses reassuring terms when talking about the composition such as an elegant and

[25] I personally do not mind if there is some pitch fluctuation in the alternate fingerings especially when there are dramatic dynamic changes. Berio also mentions possible pitch fluctuations on these colourings of B4.

simple form, containing humour within musicality calling the work an engaging, charming and fun composition. She briefly goes over what she calls the extended techniques[26] that were quite novel in 1969: alternate fingerings, overblowing effects, multiphonics and so forth. Leclair then explains the division of the composition in three sections articulated around the two fermatas over silences found in the piece. This sectioning divides *Sequenza VII* in three large propositions worth 45%, 15% and 40% of the total duration and Leclair mentions that whether a performance is on the faster or slower side, the macrocosmic proportions should be rendered accurately. She then adds that on the microcosmic level the proportions are equally important, suggesting that held notes and fermatas should be given their full value if not more, to emphasize the contrast between the rapidly unfolding musical events and the moments of stasis. Leclair explains that her renotation cannot replace the original as it does away with the two contrasting rhythmic styles, free and strict, which need to be rendered clearly. The author does not speak of series of pitches but rather categorizes them as primary, secondary and tertiary with regards to their importance in the composition. She is the only scholar to speak of the importance of the dyad B4-C6 in the third section of the piece and also the only one to speak about palindromes or suggested palindromes present throughout the composition. She continues by explaining that the first section should sound mainly improvisatory and contains the simplest harmonic vocabulary of the three sections. The short second section can be seen, according to Leclair as a condensed presentation of *Sequenza VII*'s ideas: it starts and ends as does the entire piece and is also constructed as an arch form with an increase in the density of flutter tongues, multiphonics and metered rhythmic material. The author concludes by saying that the final section could be seen as the opposite of the first one in that it is primarily in strict rhythmic character, the motion being frequently paused with the recurrence of fermatas. Furthermore, it is the section containing the most pitches and multiphonics with lend it a much greater sonic richness than the two previous sections.

2.5 The scores relating to *Sequenza VII*

In this section, three scores will be briefly discussed: the study written prior to *Sequenza VII* (ESV), the revised version (RV) from which I learnt the piece and *Chemins IV*. I did not have

[26] While I was studying at McGill University in Montréal, Dr. Leclair and I agreed that all these explorations of additional technical possibilities of the instrument should no longer be referred to as 'extended' as, by now, they should simply be called 'oboe technique'.

access to the original version (OV) or the saxophone version (SV) during the course of this study. However, the edition of *Chemins IV* contains as an appendix, the saxophone version, where can be seen slight differences as noted by Redgate (2007a) who compiled a valuable list of discrepancies between the existing versions of *Sequenza VII*.

The first score to be looked at is Berio's '*Studie zu Sequenza VII'* (ESV). This piece was also written in 1969 (published in 1973) and is likewise dedicated to Heinz Holliger. The piece is a first jest of *Sequenza VII* aimed at familiarizing the interpreter with the range of required alternate fingerings on the B natural, double harmonics and other extended techniques. It does not contain the presentation in a matrix and it is read and performed linearly. It is written exclusively in conventional metered notation. Interestingly, Berio gives a tempo indication of quarter note equals 62. There is no drone pitch throughout and the writing is generally easier to grasp than the subsequent versions. There is also a table presenting performance suggestions by Heinz Holliger with only slight fingering differences compared to the final version. Holliger suggest using a double staccato for the repeated notes but not the marcato 32^{nd} notes. In addition, there is a note from the publisher mentioning that this version is only for practice purposes and that performing this version is not allowed without the express permission of Universal Editions.

The next score is the most known one, Berio's 2000 revised version: '*Sequenza VII per oboe'*. In this edition Berio presents the musical material in a matrix like all the subsequent editions. The revised edition contains slight changes that are mainly microtonal inflections.

Lastly, Berio's, '*Chemins IV (su Sequenza VII) per oboe (o saxofono soprano) e 11 archi*' published in 1975 is briefly presented. This composition is an extrapolation or proliferation on the musical material of *Sequenza VII*. The piece is entirely written in conventional notation and is scored for solo oboe and eleven strings, reminiscent of Krzysztof Penderecki's *Capriccio* written ten years earlier. The duality of the notation is lost; however, extra temporal and harmonic spaces are created by the addition of the ensemble. The drone sonority does not lose its pivotal importance even though the duality of drone/soloist is also compromised. Static spaces have a potential to become more active and musical ideas have a space to proliferate and reinvent (comment) on themselves.

2.6 Leclair's published interpretation: *Sequenza VIIa*

Leclair's interpretation, available as an addendum when buying the RV, is divided for the thirteen columns of the temporal grid in various metrics. Firstly, a 3/4, then 11/16, then four units under a 2/4 metric, followed by 7/16, 3/8, two units worth four eighth triplets and finally three units in 1/4 time signature. This is really accurate but not totally precise. For example: 11/16 is logically worth 2.75 seconds rather than 2.7 seconds, and 7/16 is worth 1.75 seconds and not 1.8 as prescribed. The total duration of Leclair's line is thus worth 22.6° seconds instead of 22.6 seconds making the total duration of the core structure of the piece, not taking into account the fermatas, 0.86 seconds slower than intended. This is a really small difference over the course of the whole piece and can be considered negligible yet this interpretation insists on absolute fidelity to the time structure prescribed by Berio. It was Leclair who suggested to Berio the microtonal inflections found in the double harmonics as they are indeed almost impossible to get as originally written, he agreed to add the amendment. She also mentions that her interpretation is meant as a study with the goal of rendering the core structure faithfully, but performance should be done from the original. In Table 2 below are presented three metric versions of *Sequenza VII*: the first line is Berio's temporal prescriptions, the second is Leclair's interpretation and lastly, the third line is Berio's temporal layout as found in *Chemins IV*.

Table 2: Temporal structure of Leclair's interpretation grid

A	B	C	D	E	F	G	H	I	J	K	L	M
3″	2.7″	2″	2″	2″	2″	1.8″	1.5″	1.3″	1.3″	1″	1″	1″
3/4	11/16	2/4	2/4	2/4	2/4	7/16	3/8	4/trip	4/trip	1/4	1/4	1/4
3/4	5/8	4/8	4/8	4/8	4/8	7/16	3/8	5/16	5/16	2/8	2/8	2/8

Temporal grid as found in *Chemins IV*

Leclair's renotation has positive points as it is a very accurate grid, a good study guide, and it was vetted by Berio himself. There are also a few subjective negative points: it is not an absolute grid, it adds layers of rhythmic complexity and inevitably one starts to feel a pulse when studying her interpretation, so this study will take pulsations as the starting point.

2.7 Conclusion

This chapter presented a selection of the literature used for this study. The interviews give useful insight into Berio's personality and his views on music and society, as well as his compositional style. The literature specific about *Sequenza VII* was very valuable to gain knowledge of what research had been previously conducted. In addition, the two documents by renowned performers of this composition proved to be useful to inform my own approach to the work. All the literature presented in this chapter has become essential in my understanding of *Sequenza VII*, both from a performer's standpoint and from that of an explorer of the structures found in the composition. The following chapter discusses the methodology followed during the course of this study.

Chapter 3

Methodology

3.1 Introduction

The purpose of the study is to devise a reliable method aimed at a performance that would be as close as possible to the written text with regards to the temporal layout, while gaining insight into the compositional structures of Berio's *Sequenza VII*. These considerations lead to a broader comprehension of the overall structure of *Sequenza VII*. This chapter presents an explanation of the methodology applied during the course of this study.

3.2 Research approach and design

A mixed method approach is used to explore Berio's *Sequenza VII* and the relationship between myself as a performer and the content analysis of the score. The research situates itself within practice-based research in as much as it relates to an artefact, a musical score. There are also practice-led elements since this document focuses on a renewed approach with goal-oriented practice strategies, geared towards a performance. Although the overall paradigm is qualitative, there are quantitative elements evident in the structural and temporal analysis of the score. Thus, the study assumes a post-positivist perspective as a pragmatic and useful paradigm/design incorporating some aspects of positivism balanced with interpretivist concerns around subjectivity and meaning (Seale, in Maree, 2007: 65). These concerns about intent and meaning leads me to believe in the possibility of achieving a single correct interpretation of Berio's *Sequenza VII,* according to the criteria of structural and temporal layout. As Schleiermacher and Dilthey (in Maree, 2007: 59) note:

> '... consider understanding to be a process of psychological reconstruction, whereby the reader reconstructs the original intentions of the author. In this view, the text is the expression of the thoughts of its author, and interpreters must attempt to put themselves within the author's horizon in order to reconstruct the intended meaning of the text'.

Furthermore, the study includes elements of action research with its iterative process because an auto-ethnographic approach was used over the course of the study. This multi-pronged research approach provides an appropriate and novel method of exploring and expressing the unusual time increments containing decimals, with absolute accuracy, and the musical gestures within these structures. The iterative process relates to hermeneutics, which has a philosophical grounding in interpretivism (Gadamer, 1986. In Maree, 2007: 59). Heidegger (1962) writes that hermeneutics approaches text from the whole to the part and back to the whole, and that it aims to decipher the hidden meaning in the apparent meaning (in Maree, 2007: 59). Since the end result of this study is a musical performance, all the numerical data related to timing will be used in order to be interpreted in the qualitative sphere of a musical performance. In other words, the quantitative informs the qualitative.

3.3 Data sources

The study relies on primary and secondary sources. The most important primary sources are the two musical scores. Firstly, Berio's original version of *Sequenza VII,* and secondly Leclair's later published interpretation (JLV)[27]. Further primary sources include recordings of my own performances of the work. Secondary sources which focus on Berio and more specifically his *Sequenza VII* include the literature presented in the review, in addition to the bibliography and recordings from other performers.

3.4 Data analysis and interpretation

The method chosen will be to work using Berio's score exclusively (the RV) until all the units are categorized according to various traits and criteria. The reason for this is not to be influenced by the JLV while tackling the bulk of the units in proportional writing. A corollary to this reason is that, if done in this order, when one looks into Leclair's published interpretation it will be with knowledge and experience of one's own, enabling a more critical appreciation of her vision of Berio's text. Furthermore, the novel method of assigning a combination of pulsations for the time-increments containing decimals was devised to both express the time-increment with absolute accuracy and to place the musical gesture within the unit so as to best fit the graphics in proportional notation. Recordings of my past

[27] Of secondary importance are the ESV, SV and *Chemins IV*.

performances will be analysed and given an inaccuracy value, subsequent practice with this new method is expected to prove its validity by being more accurate. I realized that a hybrid methodology would need to be followed to explore this study. The approach is quantitative and musicological in that it would involve an in-depth structural analysis of the work. Elements of action research will be implemented with an auto ethnographic approach. This will provide a novel way of realizing and expressing the unusual time increments containing decimals with absolute accuracy, and the musical gestures within these structures.

The recordings from two of my performances dating to September 2013 of *Sequenza VII* will be analysed using the program Garage Band[28]. The program offers a visual track of the recording, offering a precise view of musical events; it has an operative accuracy of 1000th of a second. Each unit will be cropped to the 100th of a second, and I aim to reach an accuracy within this boundary while measuring the time increments. In the recording that contains a portion not analysable with the computer program, I will use a manual stopwatch and make enough measurements of each unit to ensure that I will conserve a precision inferior to three hundredth of a second. Values of inaccuracy of these performances will then be calculated; for the total length, line by line and for individual units.

Calculations of pulse combinations will be made for all the time increments present in the score, not only those containing a decimal. The reason for this is that if a unit displays a musical event that is better represented graphically with a pulse combination rather than the 60 bpm core pulsation, then this option is to be followed. The pulse combination calculations will be done by applying a simple formula which yields the desired results (see chapter 4, p.36). In the sections containing proportional music writing, a ruler will be used to measure the physical spaces between the notes that will then be converted into percentages/proportions of space and time. Comparing the results with the options for pulse combinations found with the equation will lead to the assignment of the best solution for pulse combinations. All the pulse combinations used for all the units in the score are visible in appendix 1 (p.130).

[28] A 2006 version of this software was used. This programme is by no means a professional Digital Audio Workstation, but for the purposes of this research, it is a sufficient tool.

While delineating sets and layers, I will try to follow the principles of dynamism theory briefly mentioned in a footnote in the previous chapter (p.23) where the rate of evolution of events, or flux, informs a broader view of the temporal dynamic form of *Sequenza VII*. As Berio mentioned (in Osmond-Smith, 1985: 97), it is the qualitative control of density which is important.

3.5 Iterative learning process

Once the method of categorizing all the units and pulse combinations is clear and devised, the next step is to apply it. All the pulse combinations will be written into the score and practiced. The 'click track' will provide the fundamental temporal structure. Recordings will follow and analysis will take place to judge where the method needs to be refined. Once again, practice will take place and recordings done. I suggest that one such iteration will be sufficient to prove the validity of this learning method aimed at a just and precise performance.

3.6 Rules and axioms

The following set of rules and axioms were created as a guide to inform the ideal interpretation which this study has set out to construct:

- Berio's writing is very clear and explicit and to stray from it would be an interpretative mistake. Indeed, Berio himself remarks that when the interpreter is given too much freedom, he denatures the piece[29].
- The aim is absolute fidelity to Berio's written temporal structure.
- Another goal is to express the musical gestures within each unit as accurately as possible.
- The exploration will move from the simplest to the most complex, so the work progresses in the direction of entropy, a method that will be applied throughout this interpretation.
- There are no graphically displaced downbeats; each unit has either sound or a written rest in conventional notation. Therefore, there are not many diphthongs in this piece.

[29] Osmond-Smith, 1985: 99.

- It is important to be consistent in the learning of *Sequenza VII*. One *mf* should always equal another *mf*.
- All the grace-note figurations should be executed as quickly as possible, none of them contain an acceleration or deceleration indication, and all of the figurations have 'a bar through them' (acciaccatura) signifying the utmost celerity.
- The upper limit for single tongue events is set at 10 nps.
- One should strive for 14-16 nps in double or triple tongued grace note non-sustained moments.
- The performer should aim to execute all the technical figures using a single tongue leaving double and triple tonguing for the grace note figurations. This implies that for short bursts, the performer should be able to articulate at ten notes-per-second (nps). This will be set as a theoretical upper limit for events of non-sustained tonguing lasting less than a second. This is desirable because the effect will be much clearer percussive effects and accents as well as being more able to mark the difference between quintuplets, quartuplets etc. Overall, it will be more coherent and intelligible in addition to greatly augmenting technical abilities.
- The ground pulsation of 60 bpm is to be used as much as possible since it is the core of the temporal structure. 'Foreign' pulsations will be used to express more complex time increments but are to be used as sparingly as possible.
- When working on structural analysis, be it the time increments or the grouping of the units into categories, each task undertaken must be done so as to shed some light on the piece. The groupings should be done according to practice initiatives and goals but also according to musical lines.
- It is to note that within the second set, the layers might overlap with each other and the layers in the first set, as some units may contain more than one of the criteria for groupings.
- Even if my interpretation of individual units within layers is subjective, I strive for all my categories to be themselves objective.
- It is necessary to plot the units in a bare matrix to spot trends and develop new ideas.
- When the graphic aspect seems a little skewed with the assigned pulsations, if this division has the advantage (of the utmost importance actually) that it present is the musical gesture in a comprehensive and logical way, then it is to be accepted.
- A 5% discrepancy with the graphics is the maximum tolerable delta.

- All options must be carried through to their logical conclusion before being kept or discarded.
- Measurements of percentage of space filled by musical gestures are done from the unit line (bar line) and not the first note-head. Instances where the composer clearly shows an intended rhythm and the unit line measurement confuses this, then the event shall be measured from the note-head.

3.7 Conclusion

This chapter demonstrated that the study follows a mixed method hybrid methodology with elements of practice-based/led research. These considerations will lead to a broader comprehension of the overall compositional and temporal structure of *Sequenza VII.* Through an analysis of recordings, the learning method will be practiced, refined, applied, recorded, and once again analysed. With this process, I hope to prove the validity of the proposed learning approach to this composition.

Chapter 4

Results of pulse combinations and duration calculations

4.1 Introduction

The fourth chapter includes the results of the approach used to calculate solutions to the complex time increments. It contains a large volume of calculations with regards to the combination of pulses that could be used for this interpretation. All possible pulse combinations will be shown even though only a few are useable and useful when applied to the score. Furthermore, this chapter will briefly touch on the compositional structure of *Sequenza VII* by providing a precise calculation of the empirical and true duration of Berio's composition.

4.2 Dealing with time increment measurements

Upon first glance at the score, a musician can understandably feel a little overwhelmed as there is a lot of information and the time structures feel awkward; although, if the piece were written linearly and not as a matrix[30], it would be even more complex. How to deal with these time increment measurements can be done in various ways: a) approximation with reference to the ground pulsation of 60 bpm based on the 'feeling' of a performer, b) fractional writing and the playing of portions of pulses as is the case in Leclair's (2000) interpretation, or, c) through a combination of pulses that will give an exact duration and hopefully also bring insight into the graphic positioning of Berio's note-heads.

a) Approximation

Approximation based on a performer's feeling with reference to a pulse at 60 bpm (beats per minute) will always have a tendency to 'overshoot', i.e. be longer than required; maybe this in part explains the noticeably too long durations of available recordings. Approximating the durations will also distort the entire matrix making one of the goals of hearing the core

[30] As in *Studie zu Sequenza VII* (1969)

structure very hard indeed. At best, this is a technique that can be used once all the notes, gestures, phrases and structural elements are indelibly fixed in the mind and body and the piece has been performed at least a dozen times. Then by doing this, the performer can truly return its *lettres de noblesse* to the spatial/proportional writing.

b) Fractional writing and the playing of portions of pulses

Approximation based on fractional writing and the subsequent playing of portions of pulses is sometimes dead-on, as illustrated by examples in columns G and H of 1.8 seconds and 1.5 seconds respectively, but the columns at 2.7 seconds (B) and those at 1.3 seconds (I and J) pose a bigger problem. For instance: 1.3 seconds can be expressed as a quarter note plus three 16^{th} notes of a decuplet (two quintuplets) in pulse quarter = 60 bpm or an eighth note plus four eighth notes of a quintuplet also in pulse quarter = 60 bpm. These are all adequate but there are two main reasons why I will not adopt this method. Firstly, because the exhaustive list of possibilities is small when you compare it to the list that combining pulsations offers, I prefer a wider variety (although the rule of limiting the number of foreign pulsations is paramount), secondly, just for the sheer pleasure of the inherent mathematical aspect. A third reason is that Leclair (2000) followed this method.

c) Pulse combinations

Once the piece is learnt with Leclair's method, the performer necessarily starts feeling and playing a pulse, therefore, this study starts with the pulsation step. This is the method that is used in this interpretation. I discuss combining pulsations in a rational and goal orientated way; the goal being, as stated, limiting 'foreign' pulsations (other than quarter = 60 bpm, the core), absolute fidelity to the time increments and insight into the graphic positioning of the notes in the score.

4.3 The temporal structure - calculating useable pulse combinations

This section includes all the results of the calculations of pulse combinations for each time increment found in the score of *Sequenza VII.* For all the results presented in this section, I have rounded off the numbers to the nearest 2^{nd} decimal place. Most of the values have recurring decimal patterns but for the sake of clarity, there is little meaning in presenting the numerous decimals.

4.3.1 The case of 1" - a demonstration

The most obvious way of stating a one second time increment is 60 bpm, i.e. one beat per second, a value also known as 1 Hertz (Hz). This also comprises all the isometric multiples: two pulses at 120 bpm, three at 180 bpm, and so forth, which is in itself an infinite list. Even though pulsations of billions, and indeed trillions of Hz's, are commonplace in nature, for the limited human understanding and even more limited perception counting will stop at 600 bpm as it is perceivable and important in the piece. This is important to this study because tonguing at ten notes per second (nps), the theoretical upper limit or playing at ten nps (or ten Hz) equates to individual notes at six hundred bpm. However, a pulse at 600 bpm is not helpful in constructing a structure within a time increment for it is too fleeting. So, regarding this, a top speed of two hundred bpm, or 0.3 seconds, will be the practical upper limit. Even though three hundred bpm or 0.2 seconds is audible and feasible, it does not seem to add much to the comprehension of the score or ability to play it. Furthermore, the pulsation of 240 bpm, which is one 16th note at 60 bpm, is used occasionally.

What follows is an exhaustive list of all the two-pulse combinations theoretically useable to express a one second time-increment. This is a list used to demonstrate the theory behind this interpretation but most of the solutions have little or no applicable value. It will be compiled by looking for solutions to Equation 1 below:

Equation 1: Yielding solutions to 1″

$$60/x + 60/y = 1''$$
$$\therefore y = 60 \div (1 - 60/x)$$
$$x, y \in \mathbb{N} \text{ and } x, y > 60 \text{ (because } 60/1 = 60)$$

For example: $60/120 + 60/120 = 0.5 + 0.5 = 1$
i.e. two pulses at 120 bpm = 1 second
Conversely: $60 \div (1 - 60/120) = 60/0.5 = 120$

$\therefore y = 60 \div (1 - 60/x)$

$y = 60 \div (1 - 60/61)$

$y = 3660$ bpm

∴ 1 pulse at 61 bpm + 1 pulse at 3660 bpm, translates as 0.983606…" + 0.016393…", which gives a ratio of 1/60, implying a division of space in 61 parts ∴ in percentage 98.36…% and 1.63…%.

Similarly, by adding 1 to the value of x at each calculation, the list continues as follows in Table 3 below and includes a large list of results. There are twenty-three examples of two pulse combinations which add up to one second, however, there are only four highlighted combinations which are potentially useful. The combinations highlighted only in the left column are more or less useful. The combination with the asterisk, 90 bpm plus 180 bpm is actually derived from the only useful three pulse isometric combination i.e. three pulses at 180 give a one second time increment.

Table 3: List of two pulse combinations to express a 1″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**Useful**
1	61	3660	0.98 + 0.02	1/60	61 parts	98.36 + 1.64	no
2	62	1860	0.97 + 0.03	1/30	31 parts	96.77 + 3.23	no
3	63	1260	0.95 + 0.05	1/20	21 parts	95.24 + 4.76	no
4	64	960	0.94 + 0.06	1/15	16 parts	93.75 + 6.25	no
5	65	780	0.92 + 0.08	1/12	13 parts	92.31 + 7.69	no
6	66	660	0.91 + 0.09	1/10	11 parts	90.91 + 9.09	no
7	68	510	0.88 + 0.12	1/7.5	8.5 (17)	88.24 + 11.76	no
8	69	460	0.87 + 0.13	1/6.6°	7.6° (23)	86.96 + 13.04	no
9	70	420	0.86 + 0.14	1/6	7 parts	85.71 + 14.29	no
10	72	360	0.83 + 0.17	1/5	6 parts	83.33 + 16.67	no
11	75	300	0.8 + 0.2	1/4	5 parts	80 + 20	±
12	76	285	0.79 + 0.21	1/375	4.75 (19)	78.95 + 21.05	no
13	78	260	0.77 + 0.23	1/3.3°	4.3° (13)	76.92 + 23.08	no

14	80	240	0.75 + 0.25	1/3	4 parts	75 + 25	yes
15	84	210	0.71 + 0.29	1/2.5	3.5(7)	71.43 + 28.57	±
16	85	204	0.71 + 0.29	1/2.4	3.4 (17)	70.59 + 29.41	±
17	90	180	0.67 + 0.33	1/2	3 parts	66.67 + 33.33	yes*
18	96	160	0.625 + 0.375	1/1.6°	2.6° (8)	62.5 + 37.5	±
19	100	150	0.6 + 0.4	1/1.5	2.5 (5)	60 + 40	yes
20	105	140	0.57 + 0.43	1/1.3°	2.3° (7)	57.14 + 42.86	±
21	108	135	0.56 + 0.44	1/1.25	2.25 (9)	55.56 + 44.44	±
22	110	132	0.55 + 0.45	1/1.2	2.2 (11)	54.55 +45.45	±
23	120	120	0.5 + 0.5	1/1	2 parts	50 +50	yes

Realistically, most of these results represent a theoretical potential but are impractical to apply. Understandably, the one second interval will rarely be subdivided, as the ground pulsation of 60 bpm needs to be kept as often as possible. When the division of space does not yield a whole number of parts, the correlating number of equal parts is added in brackets.

4.3.2 Pulse combinations - 1.3"

The same method used in the subheading for 1 second above is followed with the time interval of 1.3 seconds by applying Equation 2:

Equation 2: Yielding solutions to 1.3″

$60/x + 60/y = 1.3''$

$\therefore y = 60 \div (1.3 - 60/x)$

$x, y \in \mathbb{N}$ and $x, y \geq 47$ (because $60/1.3 = 46.153846..$)

These two-pulse solutions to Equation 2 are presented overleaf in Table 4:

Table 4: List of two pulse combinations to express a 1.3″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		Translates in seconds	Ratio	Division of space	Stated in %	Useful
1	48	1200	1.25 + 0.05	1/25	26 parts	96.15 + 3.85	no
2	50	600	1.2 + 0.1	1/12	13 parts	92.31 + 7.69	no
3	60	200	1 + 0.3	1/3.3°	4.3° (13)	76.92 + 23.08	yes
4	75	120	0.8 + 0.5	1/1.6	2.6 (13)	61.54 + 38.46	yes

Out of the four solutions, there are only two useable ways of combining two pulses 60 bpm + 200 bpm, and 75 bpm + 120 bpm. Both are very interesting as they contain a reference to the 'ground pulsation' of 60 bpm.

4.3.3 Pulse combinations - 1.5"

The simplest, most effective and useful pulsation combination for this time increment is a permutation of 60 bpm and 120 bpm, or a single pulse at 40 bpm. However, for the sake of exploration and being exhaustive, here are the other two-pulse combinations yielding a 1.5" increment calculated with Equation 3:

Equation 3: Yielding solutions to 1.5″

$$60/x + 60/y = 1.5''$$
$$\therefore y = 60 \div (1.5 - 60/x)$$
$$x, y \in \mathbb{N} \text{ and } x, y > 40 \text{ (because } 60/1.5 = 40)$$

The results of these calculations are presented in Table 5 on the next page:

Table 5: List of two pulse combinations to express a 1.5″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		Translates in seconds	Ratio	Division of space	Stated in %	Useful
1	41	1640	1.46 + 0.04	1/40	41 parts	97.56 + 2.44	no
2	42	840	1.43 + 0.07	1/20	21 parts	95.24 + 4.76	no
3	44	440	1.36 + 0.14	1/10	11 parts	90.91 + 9.09	no
4	45	360	1.33 + 0.17	1/8	9 parts	88.89 + 11.11	no
5	48	240	1.25 + 0.25	1/5	6 parts	83.33 + 16.67	±
6	50	200	1.2 + 0.3	1/4	5 parts	80 + 20	yes
7	60	120	1 + 0.5	1/2	3 parts	66.67 + 33.33	yes*
8	65	104	0.92 + 0.58	1/1.6	2.6 (13)	61.54 + 38.46	±
9	72	90	0.83 + 0.67	1/1.25	2.25 (9)	55.56 + 44.44	±
10	80	80	0.75 + 0.75	1/1	2 parts	50 + 50	yes

*This solution is the only isometric three pulse combination: three beats at 120 bpm give a 1.5″ increment.

There are ten solutions and three useable two-pulse combinations. The three solutions that are more or less applicable provide more choice.

4.3.4 Pulse combinations - 1.8"

Similarly, the calculations continue for this time increment with Equation 4 that follows:

Equation 4: Yielding solutions to 1.8″

$$60/x + 60/y = 1.8''$$
$$\therefore y = 60 \div (1.8 - 60/x)$$
$x, y \in \mathbb{N}$ and $x, y \geq 34$ (because $60/1.8 = 33.3°$)

The results of these calculations are presented in Table 6 overleaf:

Table 6: List of two pulse combinations to express a 1.8″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		Translates in seconds	Ratio	Division of space	Stated in %	Useful
1	34	1700	1.76 + 0.04	1/50	51 parts	98.04 + 1.96	no
2	35	700	1.71 + 0.09	1/20	21 parts	95.24 + 4.76	no
3	36	450	1.67 + 0.13	1/12.5	13.5 (27)	92.59 + 7.41	no
4	40	200	1.5 + 0.3	1/5	6 parts	83.33 + 16.67	yes
5	50	100	1.2 + 0.6	1/2	3 parts	66.67 + 33.33	yes*
6	60	75	1 + 0.8	1/1.25	2.25 (9)	55.56 + 44.44	yes

*This solution is the only isometric three pulse combination: three beats at 100 bpm give a 1.8″ increment.

There is a total of six solutions and three useable two-pulse combinations for this time increment. Number six contains a useful reference to the core pulsation of 60 bpm.

4.3.5 Pulse combinations - 2"

As with the time increment of one second, it is logical that the best solution to express this two second duration will be the use of two pulsations at 60 bpm or one at 30 bpm. However, in the interest of being exhaustive, here are the other options of two-pulse combinations yielding a 2" increment calculated with Equation 5.

Equation 5: Yielding solutions for 2″

$$60/x + 60/y = 2''$$
$$\therefore y = 60 \div (2 - 60/x)$$
$$x, y \in \mathbb{N} \text{ and } x, y > 30 \text{ (because } 60/2 = 30)$$

Table 7 overleaf contains the results of these calculations:

Table 7: List of two pulse combinations to express a 2″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**Useful**
1	31	930	1.94 + 0.06	1/30	31 parts	96.77 + 3.23	no
2	32	480	1.875 + 0.125	1/15	16 parts	93.75 + 6.25	no
3	33	330	1.82 + 0.18	1/10	11 parts	90.91 + 9.09	no
4	34	255	1.76 + 0.24	1/7.5	8.5 (17)	88.24 + 11.76	no
5	35	210	1.71 + 0.29	1/6	7 parts	85.71 + 14.29	no
6	36	180	1.67 + 0.33	1/5	6 parts	83.33 + 16.67	no
7	39	130	1.54 + 0.46	1/3.3°	4.3° (13)	76.92 + 23.08	no
8	40	120	1.5 + 0.5	1/3	4 parts	75 + 25	yes
9	42	105	1.43 + 0.57	1/2.5	3.5 (7)	71.43 + 28.57	±
10	45	90	1.33 + 0.67	1/2	3 parts	66.67 + 33.33	yes*
11	48	80	1.25 + 0.75	1/1.6°	2.6° (8)	62.5 + 37.5	±
12	50	75	1.2 + 0.8	1/1.5	2.5 (5)	60 + 40	yes
13	55	66	1.09 + 0.91	1/1.2	2.2 (11)	54.55 + 45.45	±

*This solution is the only isometric three pulse combination: three beats at 90 bpm give a 2″ increment.

Out of the thirteen solutions there are only three useable two-pulse combinations and three more or less useable.

4.3.6 Pulse combinations - 2.7"

This time increment, along with the 1.3 seconds duration, is the most complex of them all and likewise undergoes calculations to find two pulse solutions with Equation 6 below:

Equation 6: Yielding solutions to 2.7″

$$60/x + 60/y = 2.7"$$
$$\therefore y = 60 \div (2.7 - 60/x)$$
$$x, y \in \mathbb{N} \text{ and } x, y \geq 23 \text{ (because } 60/2.7 = 22.2°\text{)}$$

The results of these calculations are presented in the Table 8 below:

Table 8: List of two pulse combinations to express a 2.7″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**Useful**
1	24	300	2.5 + 0.2	1/12.5	13.5 (27)	92.59 + 7.41	no
2	25	200	2.4 + 0.3	1/8	9 parts	88.89 + 11.11	no
3	40	50	1.5 + 1.2	1/1.25	2.25 (9)	55.56 + 44.44	yes

It is apparent that there is only one useful two-pulse combination to express 2.7 seconds successfully, so it will most likely be combinations containing some amount of pulses at 60 bpm. This is explained in the section on hybrid solutions in subsection 4.3.8.

4.3.7 Pulse combinations - 3"

Following the set of rules laid out in the first chapter, the ground pulsation of 60 bpm is to be used as often as possible. Here are nonetheless the other options to express this time increment using a combination of two pulsations calculated with the Equation 7 below:

Equation 7: Yielding solutions to 3″

$$60/x + 60/y = 3"$$
$$\therefore y = 60 \div (3 - 60/x)$$
$$x, y \in \mathbb{N} \text{ and } x, y > 20 \text{ (because } 60/3 = 20\text{)}$$

The results of these calculations are presented in Table 9 which follows:

Table 9: List of two pulse combinations to express a 3″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**Useful**
1	21	420	2.86 + 0.14	1/20	21 parts	95.24 + 4.76	no
2	22	220	2.73 + 0.27	1/10	11 parts	90.91 + 9.09	no
3	24	120	2.5 + 0.5	1/5	6 parts	83.33 + 16.67	no
4	25	100	2.4 + 0.6	1.4	5 parts	80 + 20	±
5	28	70	2.14 + 0.86	1/2.5	3.5 (7)	71.43 + 28.57	no
6	30	60	2 + 1	1/2	3 parts	66.67 + 33.33	yes*
7	36	45	1.67 + 1.33	1/1.25	2.25 (9)	55.56 + 44.44	±
8	40	40	1.5 + 1.5	1/1	2 parts	50 + 50	yes

*Derived from the basic way of expressing a 3 second time increment namely three pulses at 60 bpm.

There are two useful pulse combinations and two that are more or less useable to express this time increment. Solution 8 is valuable if some units in column A have a clear midpoint.

4.3.8 Hybrid solutions to the 2.7″ time increment

Hybrid solutions will be those containing pulsation(s) at 60 bpm plus another two-pulse combination to fill in the remainder. This concept is used sparingly and only in the column lasting for 2.7". Since, according to the method above, there is only one useful two-pulse solution for this time increment, namely: one pulse at 50 bpm added to one pulse at 40 bpm. This limited choice leads to the necessity of calculating two-pulse solutions for a) 0.7" and b) 1.7"; thus:

a) Pulse combinations - 0.7″

Similar to what has been done with all the previous time increments, Equation 8 will yield two-pulse solutions to this small duration:

Equation 8: Yielding solutions to 0.7″

$60/x + 60/y = 0.7"$
$\therefore y = 60 \div (0.7 - 60/x)$
$x, y \in \mathbb{N}$ and $x, y \geq 86$ (because $60/0.7 = 85.714285..$)

These solutions are presented in Table 10 below:

Table 10: List of two pulse combinations to express a 0.7″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**useful**
1	86	25800	0.698 + 0.002	1/300	301	99.67 + 0.33	no
2	87	5800	0.69 + 0.01	1/66.6°	67.6° (200)	98.52 + 1.48	no
3	88	3300	0.68 + 0.02	1/37.5	38.5 (77)	97.4 + 2.6	no
4	90	1800	0.67 + 0.03	1/20	21	95.24 + 4.76	no
5	100	600	0.6 + 0.1	1/6	7	85.71 + 14.29	no
6	120	300	0.5 + 0.2	1/2.5	3.5	71.43 + 28.57	±
7	150	200	0.4 + 0.3	1/1.3°	2.3° (7)	57.14 + 42.86	yes
8	168	175	0.36 + 0.34	1/1.0416°	2.0416° (49)	51.02 + 48.98	±

There are not many options available, there is only one useable solution and two which are more or less interesting. Solution 6 is dubious because 300 bpm is probably too quick to be useful.

b) **Pulse combinations - 1.7″**

Equation 9 provides the results for this time increment which is the last pulsation combination calculation in this chapter:

Equation 9: Yielding solutions to 1.7″

$$60/x + 60/y = 1.7''$$
$$\therefore y = 60 \div (1.7 - 60/x)$$
$x, y \in \mathbb{N}$ and $x, y \geq 36$ (because $60/1.7 = 35.294117..$)

The results of the calculations are presented in Table 11:

Table 11: List of two pulse combinations to express a 1.7″ time increment

	1 pulse at *x* in bpm + 1 pulse at *y* in bpm		**Translates in seconds**	**Ratio**	**Division of space**	**Stated in %**	**Useful**
1	36	1800	1.67 + 0.03	1/50	51	98.04 + 1.96	no
2	40	300	1.5 + 0.2	1/7.5	8.5 (17)	88.24 + 11.76	±
3	50	120	1.2 + 0.5	1/2.4	3.4 (12)	70.59 + 29.41	yes

There is only one useful and one more or less useable solution.

4.3.9 Combinations of three pulses

Combinations of more than two pulses are very tricky, firstly to calculate, secondly to apply; unless they are isometric pulses, three of the same or two of the same and one other which will be the only acceptable three pulse combinations[31]. A pulse combination with too many individual pulsations is like adding rhythmic layers to conventional writing as can be seen in some musical languages (Brian Ferneyhough and the ‘new complexity’ movement for example. See appendix 4, p.138 on nested tuplets). When layers of rhythmic complexity are

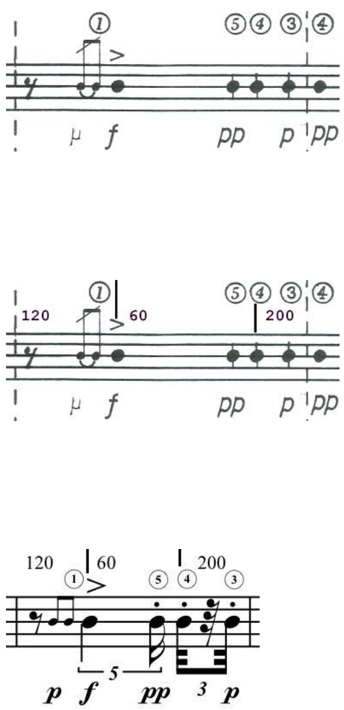
[31] In the 2.7″ column, there will be more complex pulse combinations as was shown in the ‘hybrid solutions’.

added it does get really arduous. The aim of these calculations could be to inspire performers to think about time increments and methods of dealing with them, to make apparent the structure of Berio's *Sequenza VII*. It is necessary to test these combinations out regularly by taking the instrument; it is, after all, about performing this work.

4.4 Applying these pulse combinations to the score

Linking pulsation combinations to the percentage of space that they occupy in a unit leads to the next step in this interpretation. The most important criteria in this respect is the groupings of notes and the contextual musical phrase. Assigning pulsations in abstract yields the correct time increment but it must necessarily be accompanied by linear aesthetic considerations. This is achieved by physically measuring the position of the notes in the unit and transposing these values into percentages to match with the pulsation combinations that are the most appropriate. The duration of the Example 1 below is 1.8″.

Example 1: unit 1G, an application of pulse combination and renotation



This unit contains a rest in conventional notation worth 0.5″ as it cannot be interpreted in a different pulsation other than 60 bpm. Therefore, the only combination that could work would be one containing a pulse at 60 bpm, i.e. 60 bpm + 75 bpm (see Table 6, p.43). This does not fit the graphics well so the preferred solution would be to place a pulse on the rest making the rest of the unit worth 1.3″. In this way, the solution chosen is a combination of 60 bpm and 200 bpm (see table 4, p.41). All the pulse combinations used for this interpretation are listed in appendix 1 (p.130).

4.5 Calculating the empirical duration of *Sequenza VII*

When looking at the score of Luciano Berio's *Sequenza VII* for solo oboe it appears clear that all the musical phrases, and thus, the whole piece happens within a strict and definite temporal space. Indeed, the score is presented as a matrix or grid with thirteen lines and columns. Each line undergoes a temporal compression, in other words, the first column is worth three seconds and the last, one second. The basic length of each line is thus 22.6 seconds, added to the fact that there are many fermatas in the work, each one having a definite prescribed duration. If the piece has an absolute duration intended by Berio, the question arises as to how the myriad of total lengths found in recordings of this piece can be justified? Interpretation certainly gives the performer some leeway but surely not to the extent of 40% longer than intended. This section gives a precise calculation of the predetermined total duration of *Sequenza VII* and refines the results of previous explorations of this subject by other scholars.

From a phenomenological standpoint, every oboist I have spoken to that has learnt and performed *Sequenza VII* finds it challenging to be accurate in the expression of the unusual time increments and even more so, consistently accurate. Estimating these durations by 'feeling' always tends to 'overshoot' the required time-span as stated earlier in this document. This explains the wide variety of total durations for the piece found in commercial and internet platform recordings. In fact, Berio's *Sequenza VII* has an absolute and definite intended duration as can be understood when scrutinizing the score. Therefore, calculating the total unequivocal duration of *Sequenza VII* serves as one of the landmarks, the columns and lines being the structural guidelines, aimed at a performance as close as possible to the composer's intent. There are two methods used to calculate the total duration of the composition: the first method below gives the result of the sum of the core structural length of the matrix without the fermatas added to the total duration of all the fermatas. The subsequent second method proceeds similarly and then subtracts the lengths over which the fermatas are placed.

4.5.1 First method of duration calculation

Firstly, calculating the intrinsic length of the matrix without taking into account the numerous fermatas will be done. As stated earlier, the piece contains thirteen lines (1-13) and thirteen columns (A-M) as seen in Table 1 (p.6) and one could calculate the duration by a) adding columns, or by b) adding lines.

a) $^{A}(13 \times 3) + {}^{B}(13 \times 2.7) + {}^{C\text{-}F}4(13 \times 2) + {}^{G}(13 \times 1.8) + {}^{H}(13 \times 1.5) + {}^{I\text{-}J}2(13 \times 1.3) + {}^{K\text{-}M}3(13 \times 1)$
$= 39 + 35.1 + 104 + 23.4 + 19.5 + 33.8 + 39$
$= 293.8''$

b) $^{1\text{-}13}13(3 + 2.7 + 4 \times 2 + 1.8 + 1.5 + 2 \times 1.3 + 3 \times 1)$
$= 13 \times 22.6$
$= 293.8''$

Adding lines is a simpler calculation since each line has the same duration in this matrix (without the fermatas), whereas the columns undergo a compression/acceleration. It is necessary to notice this structural indication. Already it should be taken into consideration that the core structure of 293.8″ or 4 minutes and 53.8 seconds is very rapid/paced indeed.

Secondly, a recalculation of the duration adding the fermatas follows. There are twenty-six units containing fermatas and it is worthwhile to notice, as further structural information, that every column contains at least one but not every line does. On line thirteen, units B, E, H and J each contain two fermatas making a grand total of thirty presented in List 1 below:

List 1: Units containing fermatas

A8 ; B4,12,13 ; C13 ; D10,12 ; E8,11,12,13 ; F2,6,12 ; G12,13 ; H13 ; I11,13 ; J13 ; K11,12 ; L12,13 ; M11,13.

Adding the length of each fermata to the core structure gives:

core structure 293.8 + fermatas $[^{\text{column A}}(5) + {}^{B}(6 + 3 + 4 + 3) + {}^{C}(2) + {}^{D}(5 + 3) + {}^{E}(5 + 5 + 2 + 3 + 4) + {}^{F}(6 + 4 + 5) + {}^{G}(4 + 2) + {}^{H}(3 + 5) + {}^{I}(4 + 2) + {}^{J}(4 + 2) + {}^{K}(3 + 5) + {}^{L}(6 + 5) + {}^{M}(5 + 6)]$

= 293.8 + 121

= 414.8″

Therefore, the total duration of *Sequenza VII* using the first calculation method is 414.8″ which is equivalent to 6 minutes and 54.8 seconds. Interestingly, this approximate duration is cited by other researchers: Alessandrini (2007: 71; 2008: 60) uses this exact result to calculate a line by line calculation of discrepancy/accuracy with regards to recordings by Heinz Holliger and László Hadady[32]; Strum (2008: 60) uses this exact same result; Redgate (2007: 226) writes that ‘the work is about seven minutes long’ and mentions, interestingly, that ‘the publisher states 10 minutes as the duration on the Universal Edition website’; Roberts (2003: 39) writes about a total duration of 6 minutes and 53 seconds but does not elaborate on how he devised this result. Leclair, (2010: 103) approximates the length of the piece at 7 minutes and 46 seconds. It can be seen that this is a very quick and moving piece yet there seems to be something lacking in this calculation and result. This first method implies that the note or rest over which is placed the fermata still contributes its nominal duration value to the calculation. Since the fermatas are placed over a portion of the total duration of the unit, trumping its value, and thus shortening the unit’s intrinsic length, it can be realized that this calculation is overshooting and that there should be some seconds, indeed dozens, shaved off this time. The second calculation method will take this correction into consideration and present a more accurate calculation of the total duration.

4.5.2 Second method of duration calculation

For a true and accurate calculation of the total prescribed duration of *Sequenza VII* it must be realized that each unit containing a fermata does not follow the pattern of unit length added to fermata length. Therefore, as a first step, the duration of the core structure omitting all the units which contain a fermata needs to be calculated:

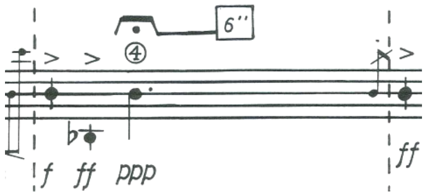
[32] When using the refined result presented below, these interpreter’s inaccuracies becomes even greater. See Table 35 p.110

Core structure 293.8 - duration of units containing fermatas [$^{\text{column A}}$(3) + $^{\text{B}}$(3 × 2.7) + $^{\text{C-F}}$ 2(13 × 4 - 10) + $^{\text{G}}$(2 × 1.8) + $^{\text{H}}$(1 × 1.5) + $^{\text{I-J}}$1.3(13 × 2 - 3) + $^{\text{K-M}}$(13 × 3 - 6)]
= 293.8 - 46.1
= 247.7

Therefore, the duration of the core structure omitting units containing fermatas is 247.7″ which equates to 4 minutes and 7.7 seconds. To this total is subsequently added the precise duration of each of the units containing fermatas:

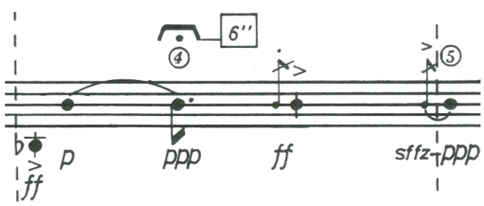
As an illustration with Example 2 below, the first two fermatas found in the composition, namely units 2F and 4B will be analysed:

Example 2: Unit 2F, intrinsic duration of 2″



The intrinsic duration of this unit is 2 seconds; however, it should be noticed that the fermata is placed over a dotted quarter at 60 bpm with a duration of 1.5 seconds. Therefore, the 'non-fermata' portion left in the unit is 0.5 seconds. Added to this is the value of the fermata marked as 6 seconds, making a total duration for unit 2F of 6.5 seconds and not 8 seconds as the first calculation method would yield. It is important to note that, in this calculation, the B4 grace note at the end of the unit will follow conventional musical practice and be played as a *vorschlag*/anacrusis thus slightly shortening the six second fermata. The quantity is negligible (inferior to one tenth of a second) and the phrasing is respected.

Example 3: Unit 4B, intrinsic duration of 2.7″



The structural duration of this unit is 2.7 seconds. Since the fermata is placed above a dotted eighth note lasting 0.75 seconds in intrinsic duration, it follows that the rest of the unit lasts 1.95 seconds. Adding a six second fermata gives an exact duration for unit 4B of 7.95 seconds. This sounds a bit complicated, but it is true and follows the axioms and ideals of my interpretation. In this instance, the B grace note can be played on the metrically strong beat as with this notation, Berio indicates that the B's should be played as close together as possible.

Most of the calculations are straightforward and Berio does write enough indications to be able to compute the exact intended duration of practically all the units. What follows in List 2 is a computation of all these units containing fermatas in such a precise way to calculate the true and intended duration of *Sequenza VII* according to the score.

List 2: Duration of units containing fermatas

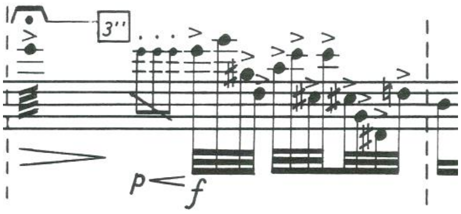
2F = 6.5 ; 4B = 7.95 ; 6F = 5 ; 8A = 7.5 ; 8E = 6.5 ; 10D = 6.5 ; 11E = 6.25 ; 11I = 4 ; 11K = see below ; 11M = 5.5 ; 12B = see below ; 12D = 4 ; 12E = 3 ; 12F = 6 ; 12G = 4.5 ; 12K = 5 ; 12L = 6 ; 13B = 7.7 ; 13C = 3 ; 13E = 8 ; 13G = 3.25 ; 13H = 8 ; 13I = see below ; 13J = 6 ; 13L = 5.5 ; 13M = see below

Adding all these durations give a total of 125.65 seconds for the straightforward units containing fermatas. The more complex or 'interpretative' units are 11K, 12B, 13I and 13M. These four will be discussed individually in Examples 4-7 below as they contain added difficulties when calculating their intended duration:

Example 4: Unit 11K, intrinsic duration of 1″

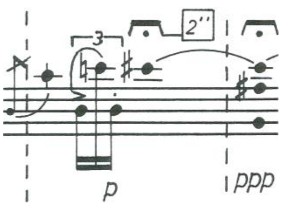
When interpreting this unit, which has an intrinsic duration of 1 second, the sound should not be broken between the fermata and the grace note. Consequently, the grace note shall be played as close to the beat as possible making the whole unit worth 3.375 seconds instead of 3.5 seconds had there been a 32nd rest. Once again, this result may seem complicated because one can perceive and visualize an increment of one hundredth of a second but certainly not one thousandth. The gesture in 32nd notes is thus executed with a pulsation at 160 bpm.

Example 5: Unit 12B, intrinsic duration of 2.7″



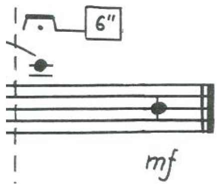
This unit has an intrinsic duration of 2.7". The grace notes are played before the beat if conventional music practice is followed. However, in this instance, the fermata would be truncated by about 2 tenths of a second. One could add a pulsation of 300 bpm on the grace notes to make the unit worth 4.7″ or be consistent in the judgment of the grace notes as upbeats to calculate the duration of the unit at 4.5″. My preference lies with the latter option. This unit and the following ones to be discussed are the only three in the piece that contain interpretation and not certainty in the calculation of their intended duration.

Example 6: Unit 13I, intrinsic duration of 1.3″



For this unit that has a structural length of 1.3″, although it could be interpreted otherwise, it is best to keep it in line with one of the recurrent pulsations and time increments found in this interpretation, i.e.: 0.25 seconds or one pulsation at 240 bpm, which is a sixteenth note at 60 bpm. This fits in well with the graphic positioning of the note head. Therefore, the total duration of the unit is 2.75 seconds.

Example 7: Unit 13M, intrinsic duration of 1″



The last unit of *Sequenza VII* is actually straightforward and should last exactly six seconds since the last B4 natural demarcates the six seconds and is played on the beat and as short as possible having theoretically no duration. However, since sound still has to be emitted, it works well to round off the grand total if it is taken to last 6.025 seconds to cancel the five thousandth of a second found in unit 11K.

Therefore, adding these four values shows that the total length of the litigious units is 16.65 seconds, making the grand total:

247.7 + 125.65 + 16.65 = 390″

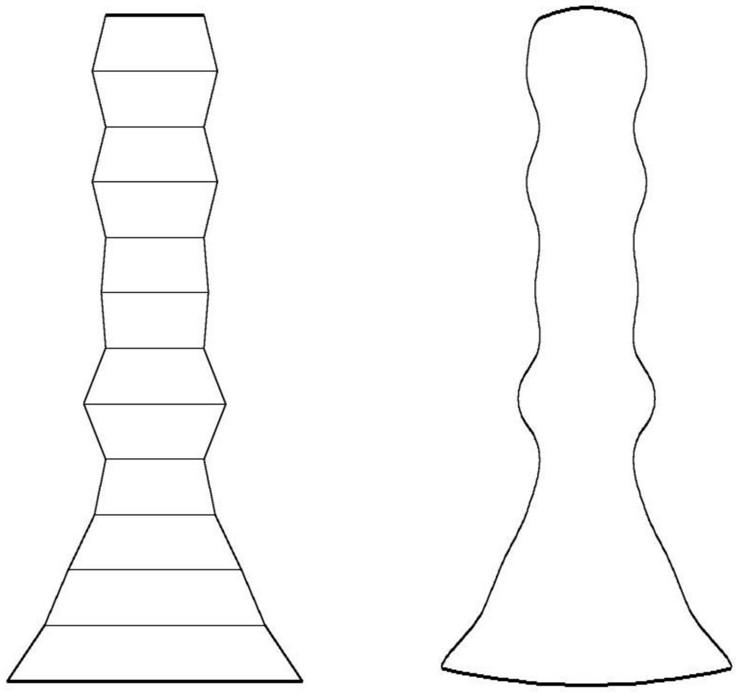
Therefore, the most accurate total duration calculation of Berio's *Sequenza VII* is 390 seconds which equates to six minutes and thirty seconds.

4.5.3 Shape of *Sequenza VII*

As a humorous and possibly unplanned consequence of these fermatas on the lengths of lines one to thirteen, it can be seen that one of the many shapes of *Sequenza VII* presented in Figure 1 is:

Figure 1: shape of *Sequenza VII*

Line 1 = 22.6
Line 2 = 27.1
Line 3 = 22.6
Line 4 = 27.85
Line 5 = 22.6
Line 6 = 25.6
Line 7 = 22.6
Line 8 = 31.6
Line 9 = 22.6
Line 10 = 27.1
Line 11 = 36.425
Line 12 = 43.1
Line 13 = 58.225



A gradual dilatation of the overall temporal structure can be seen; after successive returns to the core duration (the temporal drone) of 22.6″, an exponential expansion can be noticed. This shape is quite similar to a baroque oboe, musette or bombarde, to the least, some kind of oboe ancestor with a flared bell.

4.6 Conclusion

Chapter four included a listing of all possible useable pulse combinations needed to approach *Sequenza VII* in this novel way aimed at being true to the temporal layout and shed insight into the positions of notes and phrasing. The next chapter will apply these results to the score. This chapter also demonstrated the method of calculating the intended duration of the piece found to be six minutes and thirty seconds. This is much quicker than any of the recordings readily available of this piece, without needing to listen to their interpretations, one can just verify the durations, and the closest is Heinz Holliger who plays one of his versions in seven minutes and one second[33]. Some recordings are almost nine minutes long. As stated in the rules and axioms of this interpretation, being as close as possible to the composer's intent

[33] Ermitage ERM 164-2, 1995

when it comes to the overall total duration is one of the goals. The next step will be to invent a method to reach this goal and be consistent during performances.

Chapter 5

Implication of the results

‘The common theme of all my *Sequenzas* is virtuosity, but virtuosity as a consequence of musical thought’[34].

5.1 Introduction

In this chapter, the solutions to the problem of pulse combinations worked out in the previous chapter are applied to the score. All one hundred and sixty-nine units of the composition undergo a process of physical measurement attempting to match the musical gesture within with a fitting combination of pulsations. Furthermore, all the units are placed in sets and layers according to various criteria so as to lay the foundation for the understanding, practicing, interpreting and performing of Berio’s *Sequenza VII*. This eases the workload by creating smaller work batches and allows the performer to start gaining insight into the structure of the composition. The sets and layers are constructed in an entropic way, going from the most straightforward, containing only conventional notation, to the more complex and interpretative. From the deterministic units that can be played ‘only one way’ to more obscure categorizations like ‘moments of stasis on pitches other than B’. Overlap between layers happens as they are not meant to be mutually exclusive and hermetic. This is a performance-based approach and as such, knowledge gained must necessarily inform the practice and performance of the piece. Knowledge builds upon previous knowledge so it does make sense, in the categorization of the units, to move from the most determinate, the most ‘objective’, it could be said, towards the more ‘subjective’ or interpretative. This is a very challenging piece and to get around and indeed through the many difficulties that it poses, one has to imagine a systemic and systematic approach; this leads to the practice sessions being goal oriented and efficient. Each subsection of this chapter focuses on one layer, the relevant units are listed and plotted onto a matrix to spot trends and gain information. A few noteworthy units are shown as musical examples and a pulse combination solution from the previous chapter is applied before discussing the unit. There are three main sets that are

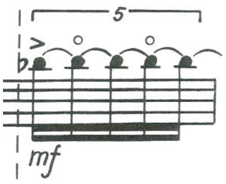
[34] ‘Le thème commun de toutes mes *Sequenzas* est la virtuosité. Mais la virtuosité en tant que conséquence de la pensée musicale.’ Stoïanova (1985: 392), translation mine.

presented and once all the units have been categorized, a few more layers bringing structural information are discussed. Even though less than a third of the units of the composition are shown, a complete summary of pulse combinations is given in appendix 1 (p.130).

5.2 Instructions for the first Set, the deterministic units

The first set contains all the units that can be played correctly only one way or can only be played one way: correctly! An example of ‘can only be played one way’ (implying no interpretation) is, in Example 8, unit 5M:

Example 8: Set 1, Unit 5M



A quintuplet of sixteenth notes at 60 bpm on a B*b*5 with an accent on the downbeat and *bisbigliando*[35] timbre alternations all played *mf*. There is only one execution possible. The only noticeable difference between various performers will be their judgment of the dynamic indication *mf* which highlights the importance of consistency in the learning of *Sequenza VII*. In this kind of composition, in my opinion, *mf* should always be equal to *mf*. What follows in List 3 is a presentation of all the units fitting this criterion:

List 3: Units making up Set 1

1JKLM ; 2CJ ; 3AFHIM ; 4AM ; 5CDEIM ; 6BDEFM ; 7AJ ; 8DEKLM ; 9AIJKLM ; 10AGLM ; 11ACDEIKLM ; 12ABCDEFGKLM ; 13ACDEFGHJKLM

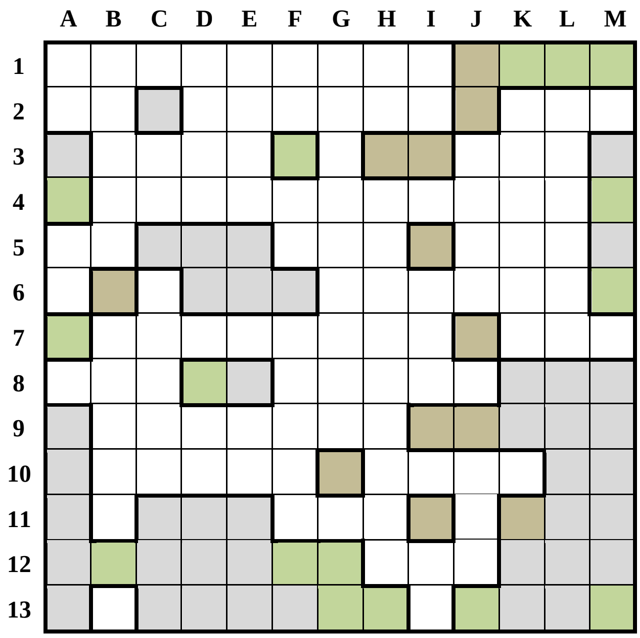
[35] This is the term that I have found in scores and is originally a harp technique. Redgate (2007a: 222) also uses this term. Burgess and Haynes (2004: 270) mention the terms: ‘timbral trill, colour trill, enharmonic trill, unison tremolo, *bariolage* and pedal key’.

Furthermore, this set is divided into three layers to help create a more thorough and controlled work environment and to aid in the practice approach of the piece, according to the following criteria:

- Layer one: units written in conventional notation in the context of quarter note equals 60 bpm.
- Layer two: units showing a mixture of conventional notation and/or notes without stems (proportional/spatial) in the same square pulsation context of 60 bpm.
- Layer three: same criteria as layer two but this time in a context other than 60 bpm (i.e. requiring pulsation combination).

Note: layers two and three may contain only stemless notation but are still playable ‘only one way’. Furthermore, some units in layers one and two may be in the columns containing decimals i.e. columns BGHIJ but are ‘trumped by fermatas’ into a context of 60 bpm. Below is the table plotting the positions of the first set units in the compositional grid of the piece.

Table 12: Plotting of the first set



Set 1, layer 1
Set 1, layer 2
Set 1, layer 3

Clearly, the more the piece progresses, the more there are fixed/pre-determined units. It could be said that since the motion goes from the more spatial/proportional to the more fixed/determinate, the freer to the more rigid, that some order is created out of chaos, this rhythmic parameter is one of the many present in the piece. There are seventy units in the first set and this already represents a considerable amount of work (41.42% of the composition) and the great advantage is that they can be played 'only one way'. Following this, the layers are discussed individually.

5.2.1 Layer one: units containing writing in conventional notation at 60 bpm

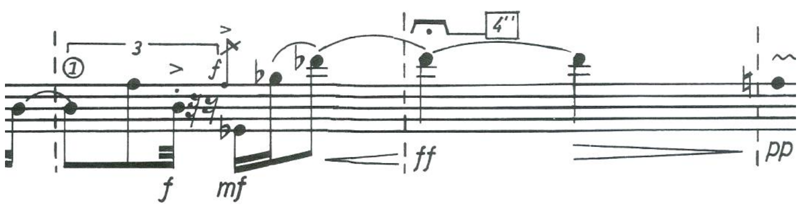
This layer is the first to be noticed when a potential performer looks at the score, and it is oftentimes the first part of the composition that will be practiced. These units are presented in List 4 below:

List 4: Units making up Set 1, Layer 1

2C ; 3AM ; 5CDEM ; 6DEF ; 8KLM ; 9AKLM ; 10ALM ; 11ACDL ; 12ACDEKLM ; 13ACDEFHK

These thirty-eight units are rather self-explanatory as they require to be practiced with the constant core pulsation of 60 bpm and the only difficulties lie in the finger technique, alternate fingerings, speed and dynamics. However, there are a few units worth mentioning presented in examples 9-13:

Example 9: Set 1, Layer 1, Units 6EF, intrinsic duration of 2″ each

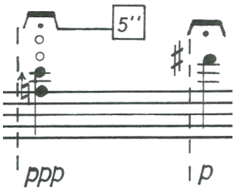


The arrival on the fortissimo could be seen as demarcating the unit, and since it comes from a metered previous unit, this demarcation is clear. However, in my opinion, these units should be grouped as one of the rare diphthongs in the composition[36], even though the metric environment makes it clear to the performer where the border of the units lies, to the unknowing ear it sounds as one event. The sound should not stop between the fermata and subsequent section. Furthermore, this unit displays the first event of a fermata placed over a note other than B creating a long stasis on this diminished tenth with the drone.

Example 10: Set 1, Layer 1, Unit 12A, intrinsic duration of 3″

This is an excessively difficult unit and performers should start to familiarize themselves with it from the onset. Berio always uses brackets and the ƶ symbol to signify the overblown effects[37]. Variants from player to player should only reside in the sound effect of the saturation but for all intents and purposes, this unit can be played 'only one way'. This is not considered to be the climax of the piece but I consider it to be the climax of the penultimate phrase. Either way, it is the most obstreperous unit in the whole composition.

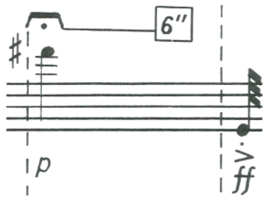
Example 11: Set 1, Layer 1, Unit 12K, intrinsic duration of 1″



[36] Diphthongs are rare according with the first axioms. Other instances of diphthongs are found in units 4KL and 2LM. These units will be analysed as diphthongs even if their parts could fit in a certain category, the whole is more important.
[37] Holliger, in the preface of *Sequenza VII*, suggests some fingerings for this effect. I like to add a guttural flutter tongue, almost a growl with a very loose embouchure.

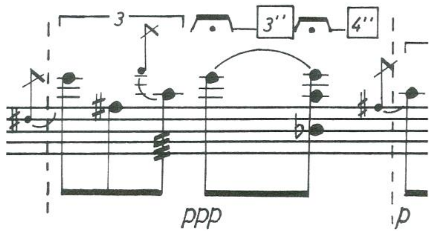
This unit contains a multiphonic[38], 12K also contains one of the very few events of written microtonal inflection[39], requiring an F natural quarter tone sharp in the dyad. This creates an interesting chord with the drone B natural and a high C natural. Other events of microtonal inflection also occur in units 4K; 12G; 13BG. They can all be played only one way (belong to set 1) except for 13B and 4K (see next layer) where there is a little interpretation possible. Redgate (2007a: 224) lists the discrepancies found when comparing the different versions but does not mention this unit. In the JLV, it is the C6 which is inflected and not the F, likewise in *Chemins IV*, therefore it can be assumed that the inflected F is a printing mistake. Redgate, through personal communication, mentions (2007: 220) that Roberts who had worked extensively with Berio on the RV and JLV, told him that the JLV 'should be taken as the most reliable version'.

Example 12: Set 1, Layer 1, Unit 12L, intrinsic duration of 1″



Interestingly, this is the least dense bar of *Sequenza VII* at 0.16° nps with the second being the last unit of the composition at 0.3° nps. This compound fifth with the drone is a strong cadential point before the last phrase and is a noteworthy marker for the interpretation of the last line as being similar to a *coda*.

Example 13: Set 1, Layer 1, Unit 13E, intrinsic duration of 2″



[38] It is highly important to practice all (and more) of the multiphonics and timbral changes on all the pitches that require them 'in abstract' before including them in the overall structure. The performer should become fluent in these effects, invent different exercises and combinations and make sure that the required pitches are matched.
[39] Microtonal inflections appear only in the RV, JLV, SV and *Chemins IV* and were a suggestion by Leclair, ratified by Berio.

This unit is very important as it contains the only instance in the whole *Sequenza* where a B*b* semitone from the drone is found, albeit in a chordal context: this pitch otherwise only occurs an octave below or above and are rather plentiful. There is also a unique fleeting A# in unit 11D; however, 13E's B*b* is sustained for four seconds[40].

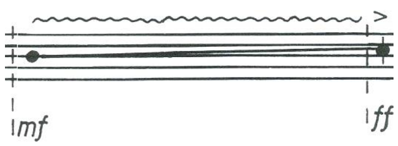
5.2.2 Layer two: units containing a mixture of notations also in a pulsation at 60 bpm

Thirteen new units fit the criteria for this layer as presented in the following list. Once again, they are mostly straight forward, with a few worth mentioning.

List 5: Units making up Set 1, Layer 2

1KLM ; 3F ; 4AM ; 6M ; 7A ; 8D ; 11I ; 12F ; 13JM

Example 14: Set 1, Layer 2, Unit 3F, intrinsic duration of 2″



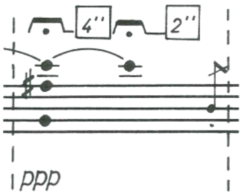
This unit is interesting because it contains a glissando within two seconds and spanning a semi-tone all in a microtonal trill texture[41]. This specific glissando is the only one present in the *Sequenza* and is found in units 3FK; 5B[42]. The C natural a semi-tone away from the drone is very rare and is only found (without the glissando context) in units 8HJ; 9E and 10B.

[40] Very exiting chord to perform and great care should be taken to try and get the right pitches especially the minor second with the drone.

[41] Burgess and Haynes (2004: 270) mention that timbral and microtonal trills are the twentieth century equivalent of the Baroque *flattement*.

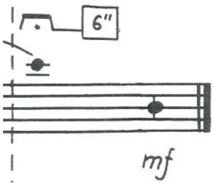
[42] In Mosch (2012: 76) there is an interesting manuscript table by Heinz Holliger with inscriptions by Luciano Berio. It is noteworthy that Berio limited this composition to a small amount of the performance possibilities proposed by Holliger with regards to extended range, double trills, double harmonics, glissandi and so forth. Holliger is one of the very few oboe experts who can glissando throughout almost the entire range of the instrument. *Sequenza VII* is, as many scholars have noticed, idiomatic to the oboe.

Example 15: Set 1, Layer 2, Unit 13J, intrinsic duration of 1.3″



This unit is excessively difficult and is very effective and mystical placed thus at the end of the piece. Diligence in obtaining the right pitches is paramount as this is the only instance in the whole of line thirteen (i.e. 58.225 seconds) where a pitch below the drone B4 can be found.

Example 16: Set 1, Layer 2, Unit 13M, intrinsic duration of 1″



In this closing unit of the composition is found another example of a six seconds fermata and the B should really be placed square on the beat with ostensible gestural finality, the *mf* being in stark contrast to the preceding eleven seconds of *ppp*.

5.2.3 Layer three: same criteria as layer two but this time in a context other than 60 bpm

The rest of the units in set one are, by definition, all within time-spans containing decimals. It is the hardest layer both conceptually and in its performance. This is a slightly larger layer with eighteen new units, shown in List 6 below:

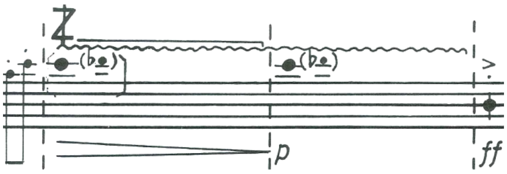
List 6: Units making up Set 1, Layer 3

1J ; 2J ; 3HI ; 5I ; 6B ; 7J ; 8E ; 9IJ ; 10G ; 11EKM ; 12BG ; 13GL

The units worth mentioning, Examples 17-21, will be dealt with according to their order of appearance in the composition:

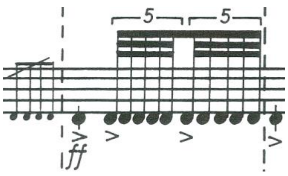
Example 17: Set 1, Layer 3, Units 3HI

3H 1.5″ 3I 1.3″



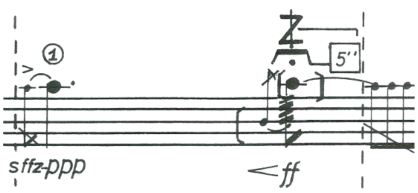
These two units should be seen as a quasi-diphthong and interpreted as such. The decrescendo on the saturated sound is very tricky. Unit 3H is interpreted with one beat at 40 bpm. For unit 3I, a pulse combination of 60 bpm followed by 200 bpm is effective to prepare the next part of the phrase.

Example 18: Set 1, Layer 3, Unit 5I, intrinsic duration of 1.3″



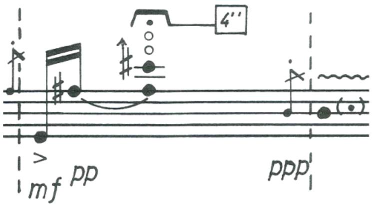
This unit is noteworthy for it is the only instance in the piece where the quintuplets are on a strong metric leading to an articulated downbeat meaning eleven strokes of the tongue at 10 nps in a rather difficult range. The only option here is a pulse combination of 200 bpm + 60 bpm.

Example 19: Set 1, Layer 3, Unit 8E, intrinsic duration of 2″



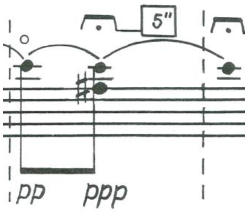
The saturated sound should start on the offbeat of the second beat at 60 bpm or alternatively, one pulsation at 40 bpm before the fermata**.** The grace note B is before the beat for the subsequent fermata in 60 bpm. Justifiably, Leclair (2000) does not include the B in the bracket.

Example 20: Set 1, Layer 3, Unit 12G, intrinsic duration of 1.8″



This unit contains a pulsation shift from one beat at 120 bpm then fermata at 60 bpm. There should once again be continuous sound with the following unit. The JLV does not have a microtonal inflection on the C♯6 in this unit, and Redgate (2007a: 224) mentions that this is probably a printing error in the JLV since the microtone can be seen in both the RV and SV, yet *Chemins IV* has a C#.

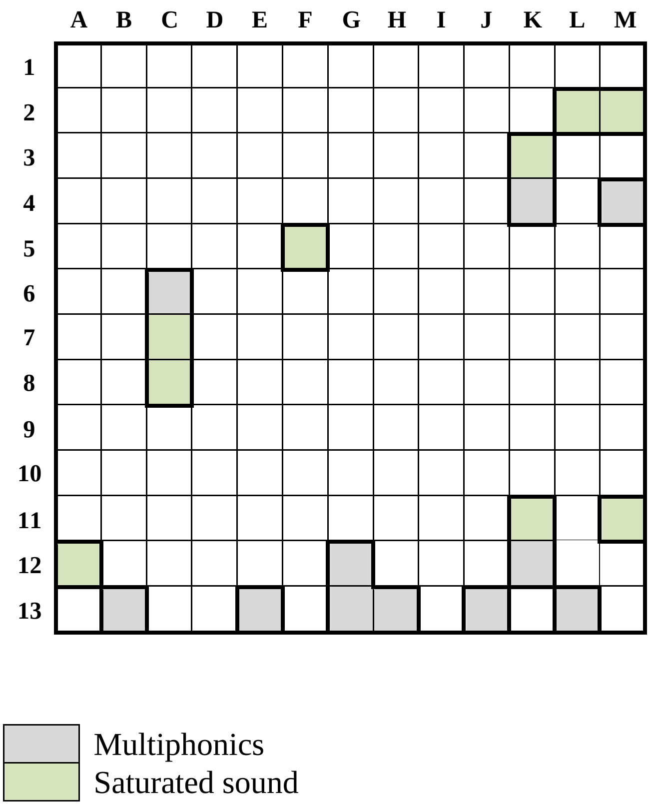
Example 21: Set 1, Layer 3, Unit 13L, intrinsic duration of 1″



This is the last multiphonic in *Sequenza VII* and this specific one is not found anywhere else in the work. It is straightforward with a combination of one pulse at 120 bpm followed by 60 bpm. Multiphonics start appearing in the fourth line as trills with micro-intervals but in their ‘pure’ form, it is only in the twelfth line with two occasions and then in the last line with eight occasions. It can be inferred that this transformation of the musical material has to do with the final phase in the development and conclusion of *Sequenza VII*.

The following Table 13 plots events of sound saturation and multiphonics on the compositional grid. It is interesting to note that the saturation events outnumber the multiphonics three to one before disappearing completely in line twelve.

Table 13: Multiphonic and saturation events.



These events can be seen as sound transformations, at first rather unpredictable and rash in the saturations, evolving, through the repeated use of the same multiphonic trill with micro-intervals in 4KM and 6C, into the ‘pure’ multiphonic textures found from line twelve onwards. In a way, it could be said that this represents a ‘domestication’ of the possibilities of the oboe’s (intrinsically monophonic) heterophonic possibilities. Here, as with the units in set one, an organizational process within a generally entropic musical universe can be seen.

5.3 Subset one: units containing conventional notation in a non-deterministic environment, links to the next set

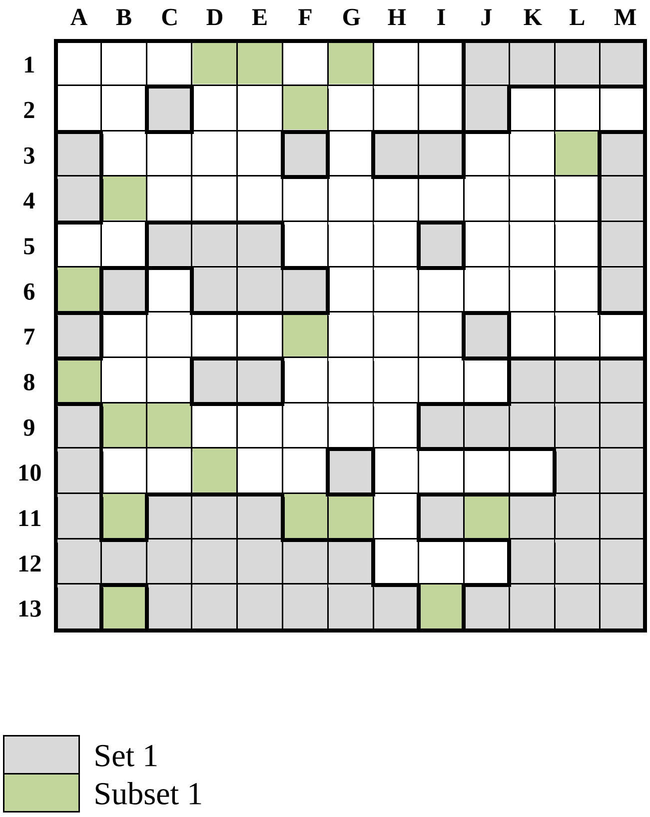
Units containing some conventional notation seems like a logical follow-up from the first set. The following units are categorized as a subset because they are not necessarily playable only one way yet create an interesting link with the next sets which will not contain any more conventional notation. Furthermore, since there is no overlap with the previously delineated units I have made it part of the realm of set 1. There are eighteen units in this layer presented in List 7 below and those which contain rests as only expression of conventional notation are included:

List 7: Units making up Subset 1

1DEG ; 2F ; 3L ; 4B ; 6A ; 7F ; 8A ; 9BC ; 10D ; 11BFGJ ; 13BI .

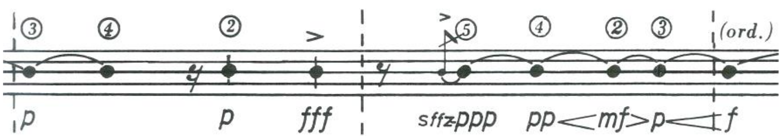
These units are plotted in the next table and one can learn from this layering that all of them, except 1DEG and 9C, are adjacent to the first set units, if not linearly then vertically or both. Their density increases towards the end as they seem to fill the gaps and thus, could be seen as anticipations or suspensions of the deterministic structure, validating its status as a sub-layer of the first set. The four aforementioned units provide the only examples in *Sequenza VII* of written rests on ‘downbeats’ in proportional writing texture. These units are plotted in Table 14 overleaf:

Table 14: Set 1 outlined and subset 1



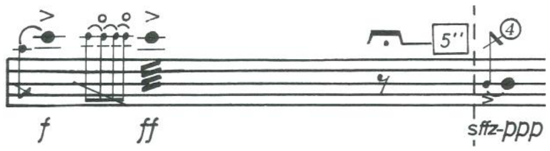
As with the previous layers, there are a few units that are worthwhile to look at presented in Examples 22-25:

Example 22: Subset 1, Units 1DE, intrinsic duration of 2″ each



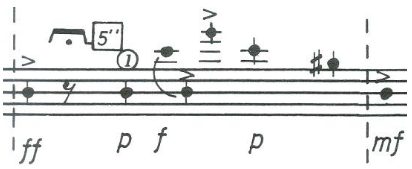
These two units are rather straightforward with pulsation of 60 bpm, have visible midpoints with a negligible graphic discrepancy inferior to 5% and can be easily interpreted using 8th and 16th notes. For 1E, the grace note is the beat of second 8th note followed by 8th and two 16th's. These units contain the first instance of conventional notation in the composition and are part of the opening musical line which Burgess and Haynes (2004: 270) appropriately call a *Klangfarbenmelodie*[43]. Berio's notation shows the various instances when he requires the performer to alter the timbre of the pitch B4 by means of alternative fingerings.

Example 23: Subset 1, Unit 8A, intrinsic duration of 3″



Unit 8A contains and anticipated second quarter note. It would be even closer to the graphic notation if 'anticipated quarter' were interpreted as one and seven of a septuplet at 60 bpm. This would be followed by one pulse at 40 bpm with the sustained flutter tongue[44] before the fermata at 60 bpm. This fermata on a silence signifies the end of the first phrase of the composition according to Leclair (2010: 98). The next such phrase demarcation is found in unit 10D presented below:

Example 24: Subset 1, Unit 10D, intrinsic duration of 2″

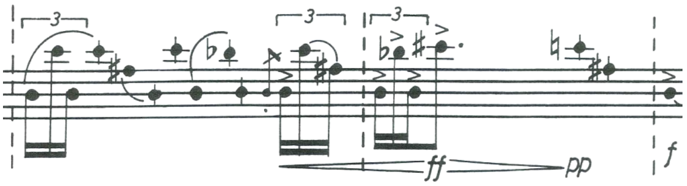


This unit is rather subjective and could have many solutions. A way that fits my ideas is one pulse at 200 bpm, fermata, then one pulse at 50 bpm worth 1.2 seconds divided into four 32nd notes plus three 16th triplets playing one and three (or sextuplet: one, two and six are well placed, two, three, four and five are compressed and show a micro deceleration event).

[43] Translated literally as 'sound-colour-melody', meaning that it is based on varying timbres rather than pitches.
[44] A note on flutter tonguing: I have always personally preferred flutter tonguing at the back of the mouth using the rear of the tongue and soft palate as the fluttering valve over the technique which uses the tip of the tongue as in the 'rolled R' effect. The reason for this is much greater control over dynamics and speed of flutter (the performer should be able to effortlessly, consciously and in a calculated manner speed up and slow down the fluttering). However, the frontal flutter is a great effect as it is rash, boisterous and sometimes even ugly making it very useful as well, so the performer needs to be well rehearsed with this technique. Leclair pointed out to me that there is also all the space in between! Indeed, the performer should practice from rear flutter tonguing to frontal and notice and cultivate all the sounds in between.

Example 25: Subset 1, Units 11FG

11F 2″ 11G 1.8″



Unit 11F does not leave much room for interpretation but for a septuplet in the remaining unmetered second, therefore 120 bpm, 60 bpm and 120bpm.
Unit 11G can be considered quite simple when written as one pulse at 60 bpm + one pulse at 75 bpm divided in 16th notes with the first held over and the fourth silent. This works well but is a compromise on length of dot (interpretation really)[45], therefore the dot will be interpreted in a new pulsation of 75 bpm as a quintuplet playing 3 and 4.

This concludes the subset with units containing some conventional notation. A total of eighteen new units not all on the same conceptual difficulty level, but that is good since after the determinism of the first set it is an apt introduction to what lies ahead.

5.4 Instructions for the second set, the more interpretative units

One of the points of the methodology is that when working on structural analysis, be it the time increments or the grouping of the units into categories, one must not forget that each task undertaken must be done to shed some light on the composition. The groupings should be done according to practice initiatives and goals but also according to musical lines. The first set represents such a grouping and since the deterministic units have exhaustively been dealt with, logically the rest is more subjective. Within the second set, the layers might overlap with each other and the layers in the first set as some units may contain more than one of the criteria for groupings. Here are the options of layering chosen for the second set:

[45] For a 'true' interpretation of the dot in context of 60 bpm, i.e. 0.25 seconds, one would have to divide each 16th note value into four therefore sixteen 64th 'notes' (spaces) in that pulse at 75 bpm, the first five would be the held-over C#, syncopating the figure and making the last rest last maybe only three 64th spaces. Sounds and indeed is awkward, so I would rather interpret the dot already in a new pulsation.

- units introducing new pitches (all scholars speak of this);
- units showing moments of stasis or zones of stasis on pitches other than B (time points other than fermatas);
- units containing acceleration/deceleration events (useful phrasing indication).

5.4.1 Set two, layer one: units introducing new pitches

For the next layer, units which introduce new pitches will be looked at. In setting up this layer, three pitch introduction processes are considered. The first is to look at the first instance of a new pitch, even if it is a grace note or in a trill; the second, also delineates those units which contain an already stated pitch but introduced this time as an enharmonic; thirdly, with restatements in different octaves. There are twenty-five units in *Sequenza VII* which introduce a new pitch according to these criteria (some units contain more than one new pitch). There is significant overlap: eleven units overlap with set one therefore giving a total of fourteen new units. The order of the introduction of pitches according to the methods explained above is presented in Examples 26-28 below:

Example 26: Primary series, order of appearance of pitches

Example 27: Order of appearance of pitches with enharmonics

Example 28: Order of appearance of pitches and restatements in various octaves

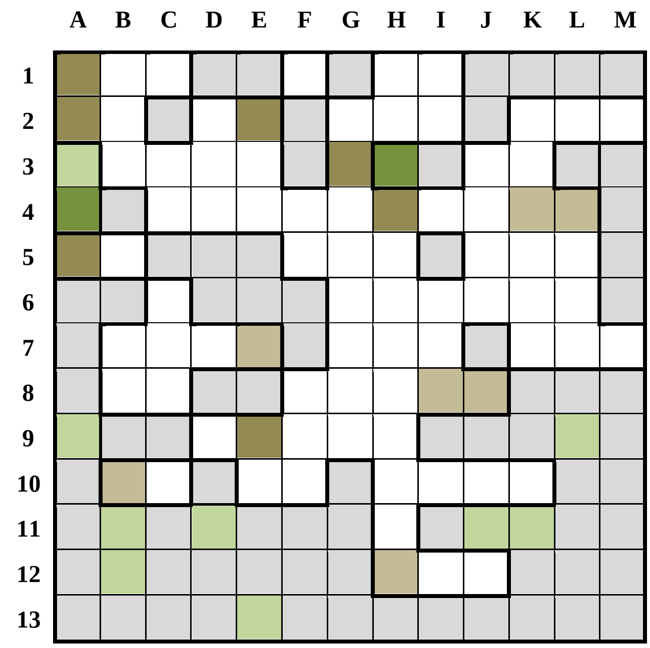
The pitches stated earlier in the *Sequenza* will have the most repetitions throughout the piece, yet I do not think that Berio meant for some kind of twelve note structure apart from having all the pitches and their simple enharmonic equivalents (no double sharps or double flats, so, simple chromaticism). Berio does however mention that once the last pitch of the primary series is stated, the composition starts to unwind and aims for the conclusion. Redgate (2003: 38), Schaub (1989: 146) and Bosseur & Michel (2007: 268) have this exact same primary series (Example 26 above), however, Strum (2012: 11) adds the pitch B*b*5 to the primary series due its structural importance and places the G# before the D*b* as this pitch (D*b*) is first stated in a trill and she does not count that. Stoïanova (1985: 438) does likewise but interestingly writes C# rather than D*b* and is the only scholar who presents the primary series this way. There are fourteen new units in this layer and in List 8 below, the units that are bracketed are the ones that overlap with layers in the previous set:

List 8: Units making up Set 2, Layer 1

Units 1A ; 2AE ; 3(A)G(H) ; 4(A)HKL ; 5A ; 7E ; 8IJ ; 9(A)E(L) ; 10B ; 11(B)(D)(J)(K) ; 12(B)H ; 13(E)

These units, once plotted as in the Table 15 on the following page, show the distribution of the introduction of new pitches according to the criteria mentioned earlier. The units are plotted with the boxed units that are those making up the first set and subset. The primary series and the rest of the units exhibiting enharmonic writing or a registral shift: a restatement in a different octave are highlighted. The colour scheme for the primary series follows the same organisation as the rest of the units just in a darker hue.

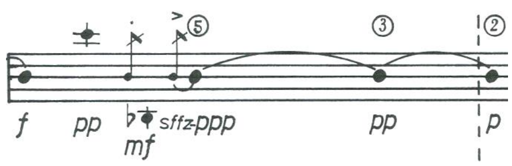
Table 15: Introduction of new pitches and overlap with set 1 and subset 1



Set 1 and subset 1
New units
Overlap
Primary series

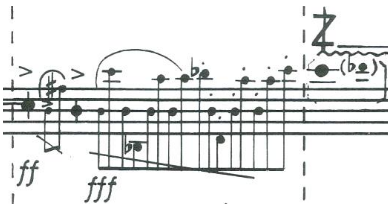
From this table, it can be seen that while the overall distribution of new pitches is somewhat homogeneous, the primary series is quickly developed and the wait for the final pitch is quite consequent, from 5A to 9E. It is interesting to note that it is precisely within this section, which roughly coincides with the division of the composition in three phrases, that is found the highest amount of rhythmic material in the piece, and also the overall highest density of events in the composition meriting its status as a 'development section'. From this layer, a few units will be discussed in order of their appearance with Examples 29-31 below:

Example 29: Set 2, Layer 1, Unit 2A, intrinsic duration of 3″



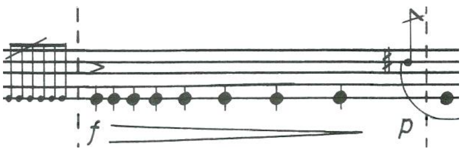
In this example, the quarter note equals 60 bpm and the beat falls on the second B natural grace-note. The measurements are not perfect but it could be considered close enough so as not to overcomplicate the interpretation. If the second grace note B is on the beat (1.75 % discrepancy with graphics) then a sextuplet would work sounding 1, 4 and 6. The second gesture could then be a triplet omitting 2 over a 2″ time-span. The intervals introduced are symmetrical minor 9th's (augmented octave in case of Bb).

Example 30: Set 2, Layer 1, Unit 3G, intrinsic duration of 1.8″



This unit really depends on each oboist's personal abilities in the grace-note whirlwind, it could vary significantly. This is an instance where the graphic notation does not bring much information as there is not much physical space to write all those notes. If the graphic is followed, they look like they span about 1.3 seconds, which would imply 12.3 nps. Surely this can be bettered, given that they need to be played as quickly as possible, So, a pulse combination of 75 bpm played as a duplet then 60 bpm for 16 nps works well[46]. In addition, this unit contains the highest density of musical events in the composition at 11.11 nps.

Example 31: Set 2, Layer 1, Unit 7E, intrinsic duration of 2″



This unit contains one of the accelerating/decelerating events in the piece, and it works most satisfactorily using a single pulsation at 30 bpm for phrasing reasons.

[46] Dynamic indication adds difficulty, one must be very free in embouchure, body and mind to get it just right.

5.4.2 Set two, layer two: units showing moments of stasis or zones of stasis on pitches other than B

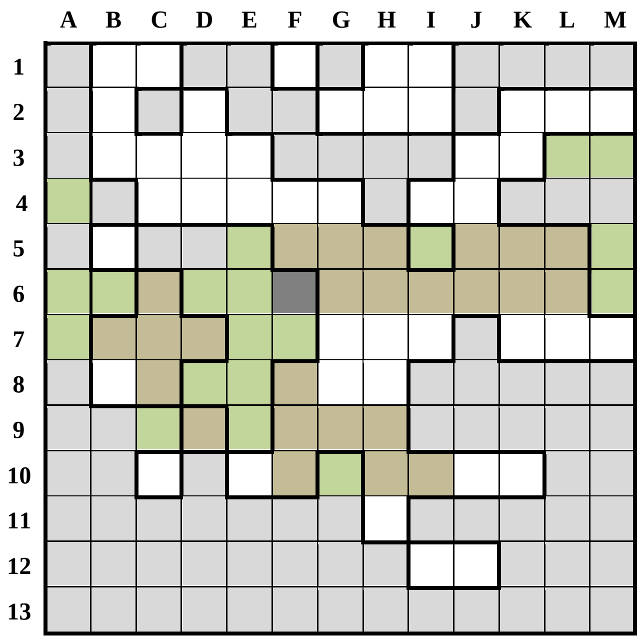
In *Sequenza VII* Berio uses not only fermatas to highlight certain pitches and/or harmonies but he also uses what Leclair refers to as time-points (2010: 99), which are an emphasis on certain pitches without the fermata context. This is usually done through the repetition of the pitch and/or sustaining throughout the entire unit. These units are presented in List 9 as follows:

List 9: Units making up Set 2, Layer 2

3(L)(M)4(A) ; 5(E)FGH(I)JKL(M) ; 6(A)(B)C(D)(E)GHIJKL(M)7(A)BCD(E)(F) ; 8C(D)(E)F ; 9(C)D(E)FGH ; 10F(G)HI

There are forty-four units in this category therefore it is an important structural indication. Bracketed are those units which overlap with the preceding layers, so twenty-five new units plotted in Table 16 that follows:

Table 16: Moments/zones of stasis on pitches other than B and overlap with all previous layers

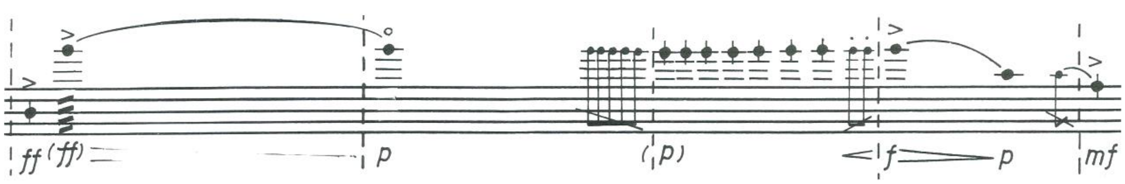


New units
Overlap
Unit 6F, see below

This layer is very centralized in the composition and is situated at the end of the first phrase and the developmental middle section. It is interesting to note that almost all the pitches of the primary series go through a moment of stasis or time point, except for B*b*3 and G#5. This explains why Strum (2012: 11) adds the pitch B*b*5 to the primary series as this pitch goes through a time point in 5LM and 6A and is therefore structurally more important than B*b*3. It is also interesting to note that Leclair (2010: 99) adds D*b*6 to the list of units not having a time point. However, this pitch found in unit 6F, highlighted in the table above, is sustained by a fermata. It is the first fermata on a pitch other than B4 and is the articulation between the third and fourth proposition of the first phrase. The following two fermatas are the silences demarcating the three sections of the composition; therefore, I feel it necessary to place unit 6F in this category. Furthermore, this fermata could be seen as the first idea of a static time point which will henceforth become more and more common in the composition. The last instance of a time point without a fermata is situated, all scholars agree, at the climax of the piece with the repetition of the last pitch in the primary series and articulates the overall form defined by the golden ratio (see appendix 2, p.131). The sustaining on G6 is shown in Example 32 below:

Example 32: Set 2, Layer 2, Unit 10F-I

10F 2″ (10G 1.8″) 10H 1.5″ 10I 1.3″



Unit 10F is straightforward, one and two of triplet 8th's at 60 bpm and is a very enjoyable unit to play. However, linking to next unit is excessively difficult, great care should be taken to find the right fingering for the harmonic and to make the dynamic contrast as marked as possible[47].

Unit 10H works well with one pulse at 40 bpm.

Unit 10I can be executed with one pulse at 75 bpm plus one pulse at 120 bpm on A5 as the beat. There is an acceptably small discrepancy with the measurements.

5.4.3 Set two, layer three: acceleration/deceleration category

The next layer contains those units which exhibit an acceleration or deceleration event as can be seen in unit 10H of Example 32 above. Sometimes, these events last only for one unit and other times they span a few consecutive units as can be seen in List 10 and Table 17 below:

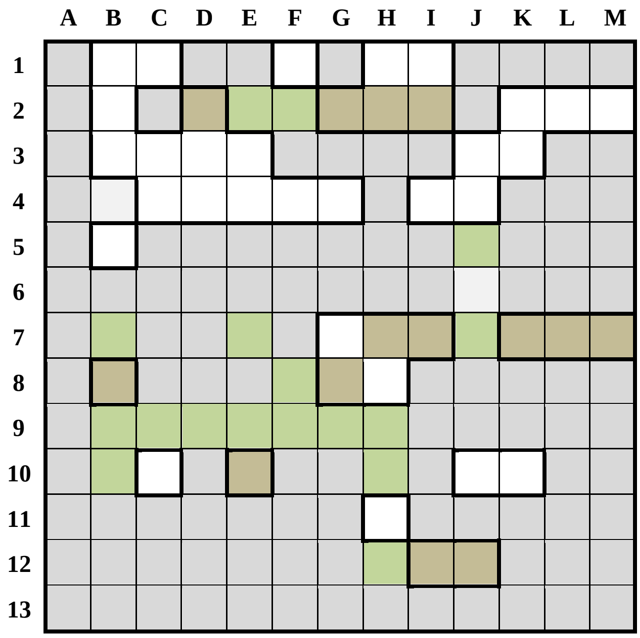
List 10: Units making up Set 2, Layer 3

2D(E)(F)GHI ; 7HI(J)KLM ; 8(A)B(F)G ; 10(B)E(H) ; 12IJ

Plotting these units in the following table shows the overlap with all the preceding layers and the gradual filling up of the matrix.

[47] Redgate (2007a: 229) talking about units 10F and 10G mentions that the OV does not have a tie, diminuendo or the harmonic symbol on the second G but preserves the flutter tongue texture. Furthermore, the SV has an overblowing indication rather than a flutter tongue and no diminuendo. Redgate suggests that the diminuendo is a good way to deal with this difficulty but that a sudden dynamic drop over the bar line might be Berio’s ideal.

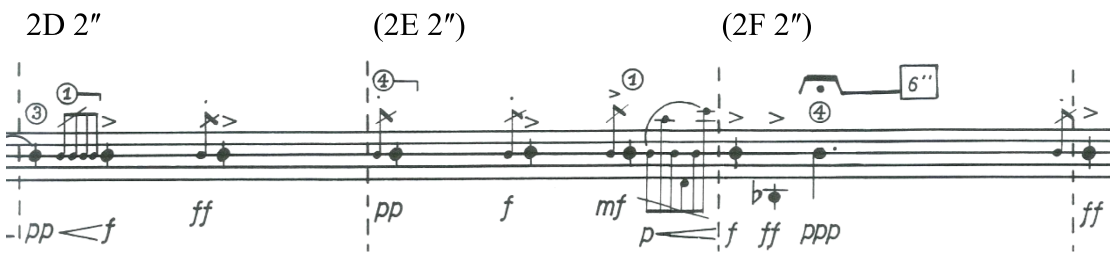
Table 17: Acceleration/deceleration events: Set 2 Layer 3, and overlap with all previous layers

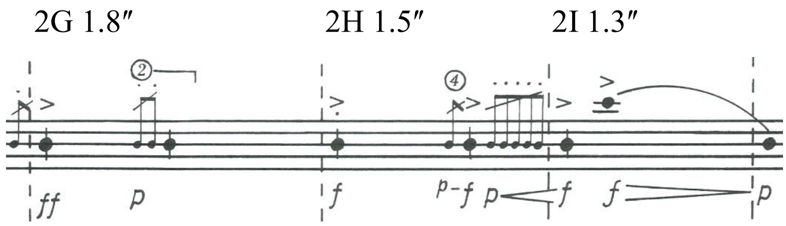


New units
Overlap

There are thirty-one units in this category with seventeen overlapping, therefore fourteen new units. One relevant example containing six consecutive units will be looked at and discussed. Example 33 contains a macro acceleration/deceleration event as it spans a few units compared to what can be seen in unit 10H in Example 32 above where the event is limited to only one unit.

Example 33: Set 2, Layer 3, Units 2D-I





The example above clearly shows the compression and dilatation of the space between the real note B's. Phrasing these events in a way that avoids rhythmic periodicity is necessary to convey the nature of the spatial notation.

Unit 2D is rather straightforward, 60 bpm, two 8th's, second beat is on the grace-note and a quick and big crescendo is seen. There is a small and acceptable 2% discrepancy with the graphics.

Unit 2G does not have a clear midpoint and, indeed, the unit divides itself readily into a pulse combination of one at 75 bpm plus one at 60 bpm; the 'downbeat' falling either on the 'real' note b or the grace-note just preceding (graphically, it seems to lie in between those two notes).

Unit 2H works well with one pulse at 60 bpm followed by one at 120 bpm (or triplet with pulse at 40 bpm). The beat is on the forte, subdivided into a triplet for a tonguing speed of fifteen nps.

Unit 2I is best interpreted with one pulse at 200 bpm plus one pulse at 60 bpm. Less graphic discrepancy would be 1 pulse at 75 sounding one and two of triplet then pulse 120, but this is not as satisfying for phrasing.

5.5 Instructions for the third set

The third and final set contains the rest of the units not yet categorized. It will contain only two layers for the twenty-nine remaining units.

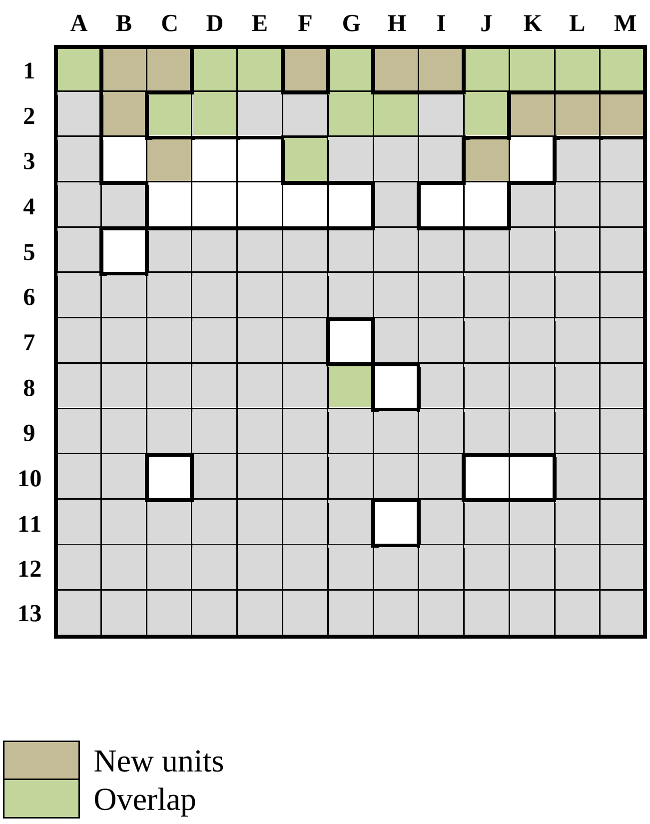
5.5.1 Set three, layer one: units displaying stasis on B

There are eleven new units in this category and they are all, except for one, contained in the first three lines. The first line is only the *Klangfahrben* melody and as the first new pitches arrive in unit 2A and then 2E, the musical discourse starts to transform itself and take on a more spatial dimension. It is interesting to note that the only other unit fitting this criterion is unit 8G and it is located at precisely the temporal centre of the composition (see appendix 2, Table 44 p.134) preceded by a very long time point on the pitch A5. This makes its function as the start of a new subphrase very clear. These units are listed and plotted below in List 11 and Table 18:

List 11: Units making up Set 3, Layer 1

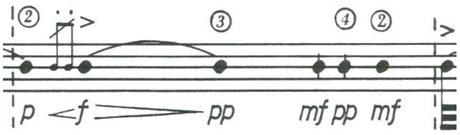
1(A)BC(D)(E)F(G)HI(J)(K)(L)(M) ; 2B(C)(D)(G)(H)(J)KLM ; 3C(F)J ; 8(G)

Table18: Units displaying stasis on B, set 3, layer 1 and overlap



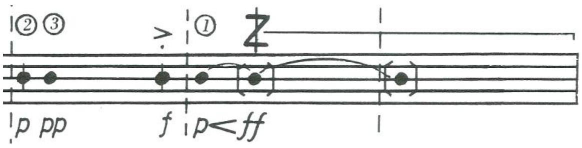
Of these eleven units, two are discussed on the following page in Examples 34 and 35:

Example 34: Set 3, Layer 1, Unit 2B, intrinsic duration of 2.7″



This unit is complicated but it works well with one pulse at 200 bpm plus one pulse at 60 bpm, beat on accented forte B giving a 1.3 seconds section. The second section starting on the first B *pp* worth 1.4 seconds is divided in one pulse at 150 bpm plus one at 100 bpm. The beat is on the first mezzo forte for a 0.8 seconds bit which can be played as 16th notes with an 'early' 2nd or quintuplet playing one, two and four.

Example 35: Set 3, Layer 1, Units 2KLM, intrinsic duration of 1″ each



Unit 2K looks like a clear-cut quintuplet at 60 bpm sounding one, two and five.
Unit 2L works nicely when interpreted as a triplet with two held-over. The instant and massive crescendo into saturated sound requires practice and a very easy reed, great acceleration in tone and equally great liberation in sound is needed.
Unit 2M is the second part of one of the rare diphthongs and requires one pulse at 60 bpm.

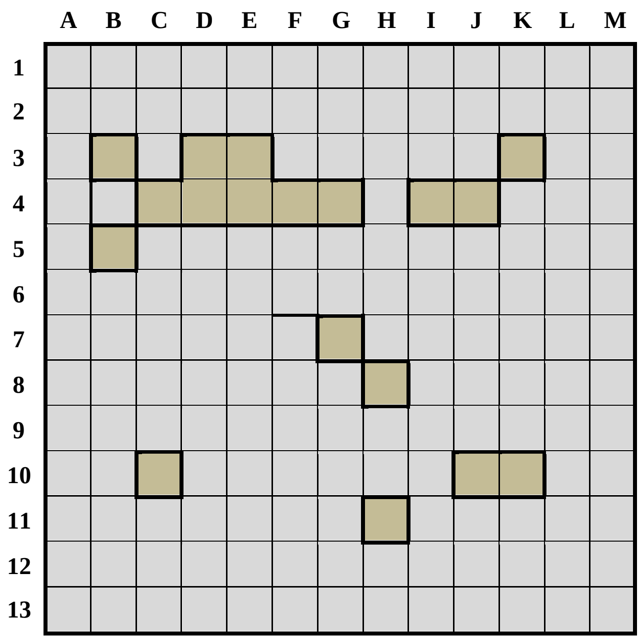
5.5.2 Set three, layer two: the rest of the units presented chronologically

There are eighteen units in this final layer presented in List 12 and plotted overleaf in Table 19 and logically, there is no overlap. The units in lines three and four present mainly motion circulating around the drone pitch B4 which remains very present. There are still indications for various alternative fingerings to colour this pitch although these indications get sparser as the piece progresses. The rest of the units do not have unifying factors.

List 12: Units making up Set 3, Layer 2

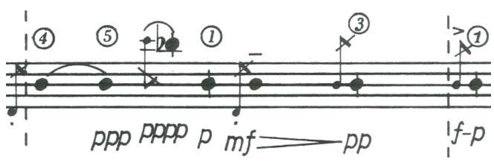
3BDEK ; 4CDEFGIJ ; 5B ; 7G ; 8H ; 10CJK ; 11H

Table 19: The remaining units, set 3, layer 2



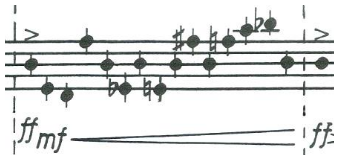
Three of the units in this category will be shown in Examples 36-38 below:

Example 36: Set 3, Layer 2, Unit 3B, intrinsic duration of 2.7″



This unit works well with a pulse combination of 40 bpm plus 50 bpm with the beat on the fourth real note B. The first gesture is an acceleration event which works well for phrasing and the second is 8th notes with a small graphic discrepancy. The *pppp* squeak is the softest dynamic in the entire piece; it should almost not be heard, like an unnoticed glitch on the drone pitch reached in the previous dynamic.

Example 37: Set 3, Layer 2, Unit 7G, intrinsic duration of 1.8″



This is a very enjoyable unit to play having three pulses at 100 bpm with quintuplets on each beat. This amounts to 8.3 nps and is rather tough, as single tonguing is obligatory according to the rules and axioms of this interpretation. This is a rare case where the musical event is not measured from the bar line, as it is graphically quite clear what the composer intends.

Example 38: Set 3, Layer 2, Unit 10C, intrinsic duration of 2″

It is pertinent in this context, after the acceleration event in 10B to have a marcato, almost martellato effect, culminating in a flutter tongue scream; drone B - minor 9th up - drone B4 (most important dyad in the composition) to conclude the second section on accented B fortissimo in unit 10D. This unit works well using a combination of one pulse at 120 bpm followed by one at 40 bpm, the first B grace note being the beat.

All the units have now been placed in sets and layers, and all the pulse combinations have been measured and notated as can be seen in the table of appendix 1 (p.130). When looking at this table, one notices the prevalence of uneven beat subdivisions (triplets and quintuplets outnumber eighth and sixteenth notes) which help to portray the spatial notation more satisfactorily. Furthermore, the reason that I favour quintuplets over triplets is that in the measured and deterministic units can be seen a prevalence of them over other forms of subdividing the beat. In *Sequenza VII*, there are thirty-nine groups of five notes and twenty-seven groups of three notes. The three note groups get more numerous towards the end whereas groups of five seem more evenly distributed. Following these considerations, alternative layerings are discussed to try and gain some structural information about *Sequenza VII*.

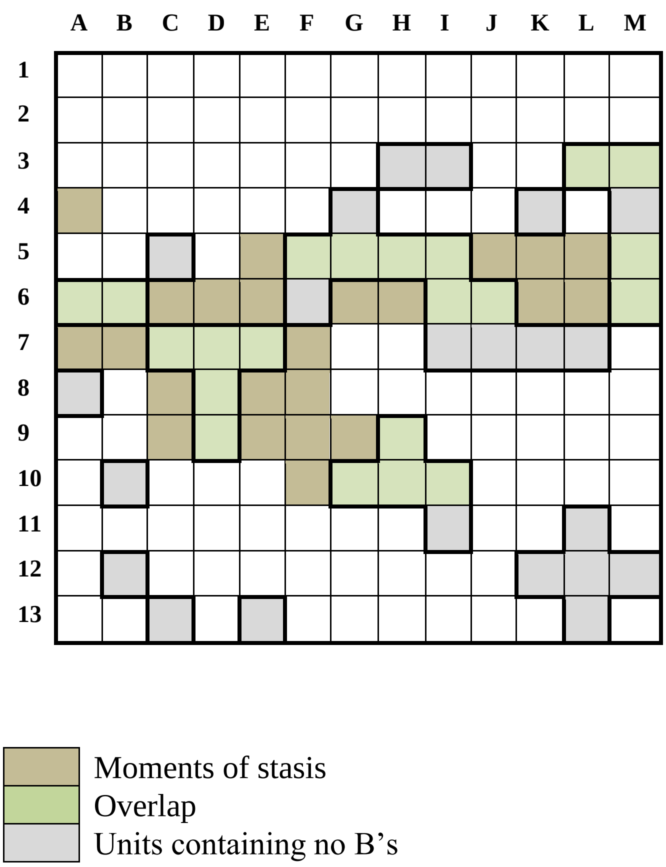
5.6 Other structural indications with layering

This section deals with alternative layers that highlight certain structural aspects of *Sequenza VII*. As in the previous layers, criteria are chosen and their evolution over the course of the composition is plotted and briefly discussed.

5.6.1 Units containing no B's

With the piece being built on a continuous B natural drone, the utmost importance of this pitch throughout the composition is highlighted. Therefore, units without this pitch might shed information. There are 42 units in this category plotted in Table 20 below:

Table 20: Grouping of units containing no B's and units with moments of stasis (set 2, layer 2)

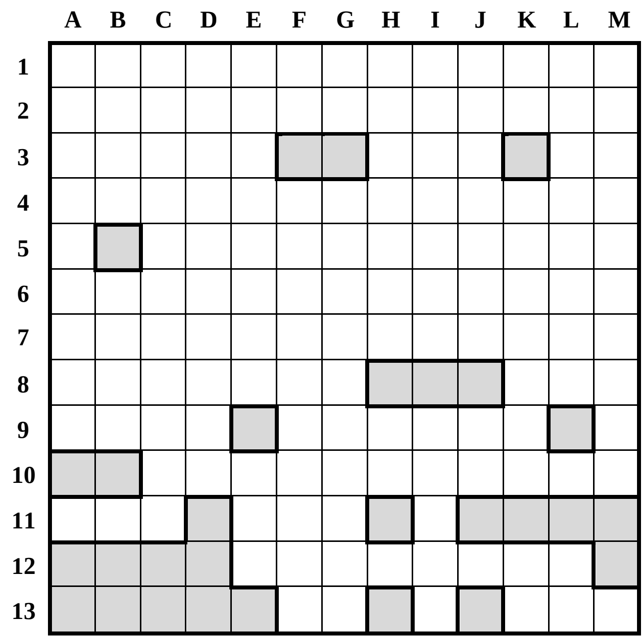


What insight can be gained from this layering on the overall structure of the *Sequenza*? It can be noticed that every column contains at least two such units (and most many more) although not every line does, so it can be thought of as a structural element of the matrix. It is also noticeable that most of these units when in groupings of two or three exhibit moments of 'stasis' on certain tones. Within the zones of stasis on certain pitches are found the time-points of emphasis for certain pitches. It is also interesting to notice that this layering takes care of almost all the micro accelerating/decelerating events (contained within one unit) except for units 5J and 7B where there is only one B natural as a grace-note.

5.6.2 Proximity events with the drone

Notes can be closer to or further away from the drone, the midpoint being the tritone. A note a fifth away from the drone could be expressed as a fourth when changing octaves, therefore any interval smaller than a tritone will be considered a proximity event. These events are plotted in the Table 21 below:

Table 21: Proximity events with the drone



Once more it can be noticed that as the piece progresses the more there are of these units. This is another example of what Berio calls proliferation or how an idea can develop, transform itself to renew and enhance the musical discourse. The musical universe is getting more and more complex as it develops and the musical material finds new ways to reinvent itself. Progressively, the whole range of the instrument is explored. This inevitably leads to a denser world where the rate of happening of events is increasing. The only equalizers are the fermatas, or the vertical dimension of the composition which open/relax the rigid structure of the piece.

5.6.3 Units containing fermatas

There are too many fermatas in this piece to not stop and think seriously about them. Twenty-six units contain fermatas, on line thirteen, units B, E, H and J contain each two fermatas making a grand total of thirty. It can be noticed that units containing two pauses are all on the last line, and that when all these units are plotted in Table 22 below, it is visible that their frequency augments as the environment becomes more and more deterministic and structured.

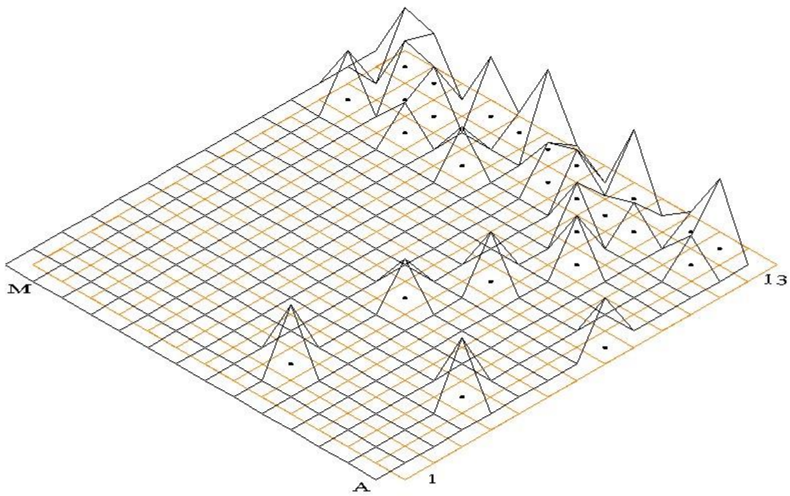
Table 22: Units containing fermatas and durations thereof

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2						6							
3													
4		6											
5													
6						4							
7													
8	5				5								
9													
10				5									
11					5				4		3		5
12		3		3	2	5	4				5	6	
13		7	2		7		2	8	2	6		5	6

Units with 1 fermata
Units with 2 fermatas

The shortest individual fermata is two seconds and the longest is six seconds. Otherwise, in *Sequenza VII*, the longest moment of continuous sound texture without a fermata or a zone of stasis on a certain pitch[48] can be found in units: 3HI as a diphthong that lasts for 2.8 seconds, unit 6B is worth 2.7 seconds, the E*b* in unit 7A is held for 2.5 seconds and unit 8D lasts 2 seconds. Therefore, these non-fermata moments of continuous sound are rare making the function of the fermata quite clear as the static contrast in a mobile environment. The fermatas contain all sorts of variants, ranging from *ppp* to *ff*, microtonal trills, saturated/soft timbre, quarter tones, multiphonics, double trills and so forth. Furthermore, this grid is very orthogonal, containing thirteen lines and thirteen columns. Each line is theoretically worth 22.6 seconds, thus the only way to express a line longer than this time-span is to add a fermata. These moments explode the structure, negate in a way the matricial organization by adding extra linearity (see figure 1 p.57). They could also be viewed as the vertical spaces/extensions or 'the third dimension' in the matrix as represented below.

Figure 2: Fermatas presented as vertical extensions or the third temporal dimension of *Sequenza VII*



The last line of *Sequenza VII* is the only line in the piece that can be played 'only one way' as it is fully determined. It is also the line in the piece with the smallest rate of notes per second at 1.41 nps average density. Comparing to line one, which has the least number of notes at

[48] Zones of stasis are not continuous sound but are rather built on pitch repetition.

only forty-four but no fermatas, over only 22.6 seconds yielding 1.95 nps average density for the line, a notable difference.

5.6.4 Note density, by unit (writing) and by second (absolute)

This section will be exploring measurements of density for *Sequenza VII*. Firstly, the total number of musical events will be tallied and this will give a value for density by unit and by line as in Table 23 below. Secondly, absolute density by second will be calculated by dividing the number of musical events in a unit by its duration. For example, the first unit of the composition contains two B’s over a three second period, therefore the density of unit 1A is a ratio of 2/3, which gives a density of 0.6˚ nps.

Table 23: Note density by unit (writing)

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**t**	d
1	2	4	4	4	5	4	6	3	2	3	1	1	5	44	1.95
2	7	8	13	8	12	4	4	8	2	1	3	2	1	73	2.69
3	19	9	6	10	12	1	20	2	2	8	6	10	8	113	5
4	20	6	7	7	9	10	8	10	6	8	4	7	4	106	3.81
5	14	9	11	7	7	4	2	9	11	8	10	3	5	100	4.42
6	9	2	14	16	7	2	6	6	9	8	8	6	1	94	3.67
7	10	20	11	9	9	14	15	9	9	1	9	6	6	128	5.66
8	7	17	13	1	4	11	4	7	6	8	10	10	10	108	3.42
9	26	10	4	2	7	7	4	3	8	10	7	9	8	105	4.65
10	12	14	14	7	17	2	6	9	3	6	6	9	8	113	4.17
11	21	10	10	14	14	14	6	11	2	10	6	8	5	131	3.6
12	17	16	16	6	11	8	5	7	6	4	2	1	4	103	2.39
13	11	9	5	10	9	7	7	5	5	5	4	3	2	82	1.41
	175	134	128	101	123	88	93	89	71	80	76	75	67	1300	3.33

In this table the unit with the most musical events is unit 9A at twenty-six and belongs to set one, layer one. It is therefore not such a difficult unit but still requires absolute precision. The column (t) states the total number of these events and the column to the right of that one (d) gives the density for the entire line. The total number of written musical events in *Sequenza VII* stands here at one thousand and three hundred. This is an idealised result in that depending on the counting method, this result may vary by as much as five either side of thirteen hundred. The bottom right cell gives the total density of *Sequenza VII* by dividing the total number of written musical events by the total duration of 390 seconds: 3.3˚ nps.

Table 24 presents a visualisation of the absolute density by unit of *Sequenza VII* and is therefore more representative of the true density landscape of the composition. The column (m) contains the values for the average of the thirteen units found in each line. These values differ from the ones found in column (d) in Table 23 above because the average density of a line as a whole does not yield the same result as calculating the average of thirteen values.

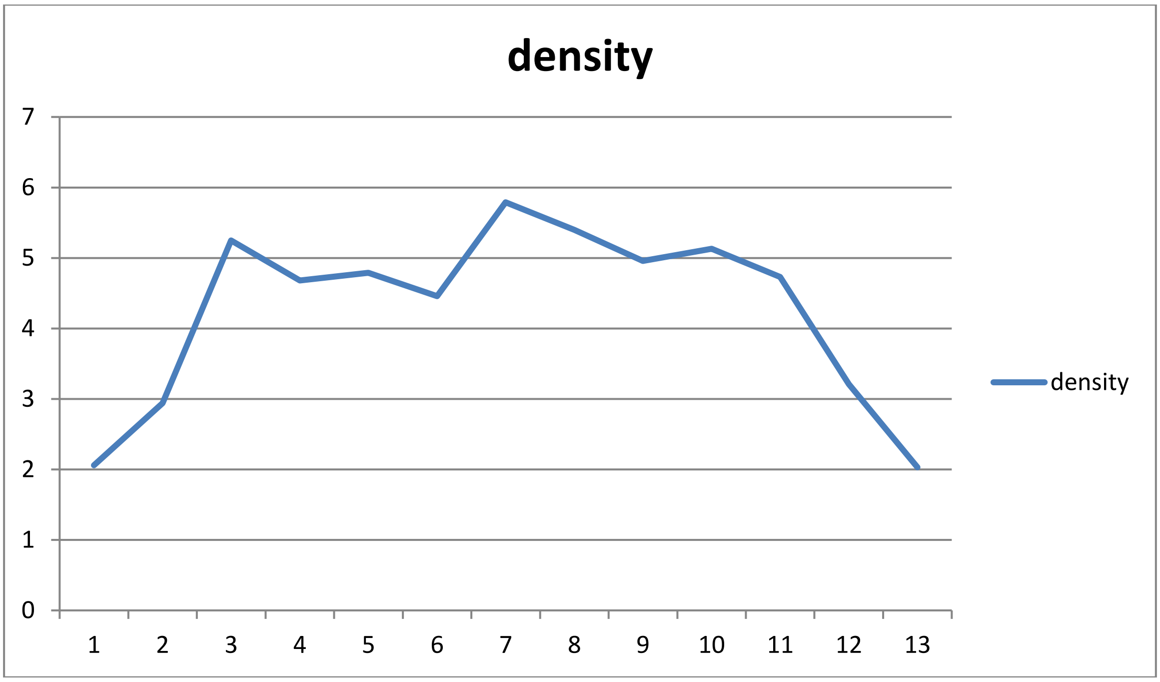
Table 24: Note density by second (absolute)

	A	B	C	D	E	F	G	H	I	J	K	L	M	m
1	0.67	1.48	2	2	2.5	2	3.33	2	1.54	2.31	1	1	5	2.06
2	2.33	2.96	6.5	4	6	0.62*	2.22	5.33	1.54	0.77	3	2	1	2.94
3	6.33	3.33	3	5	6	0.5	11.11	1.33	1.54	6.15	6	10	8	5.25
4	6.67	0.75*	3.5	3.5	4.5	5	4.44	6.67	4.62	6.15	4	7	4	4.68
5	4.67	3.33	5.5	3.5	3.5	2	1.11	6	8.46	6.15	10	3	5	4.79
6	3	0.74	7	8	3.5	0.4*	3.33	4	6.92	6.15	8	6	1	4.46
7	3.33	7.41	5.5	4.5	4.5	7	8.33	6	6.92	0.77	9	6	6	5.79
8	0.93*	6.3	6.5	0.5	0.62*	7	2.22	5.33	4.62	6.15	10	10	10	5.4
9	8.67	3.78	2	1	3.5	3.5	2.22	2	6.15	7.69	7	9	8	4.96
10	4	5.19	7	1.08*	8.5	1	3.33	6	2.31	4.62	6	9	8	5.13
11	7	3.7	5	7	2.24*	7	3.33	7.33	0.5*	7.69	1.78*	8	0.91*	4.73
12	5.67	3.56*	8	1.5*	3.67*	1.33*	1.11*	4.67	4.62	3.08	0.4*	0.17*	4	3.21
13	3.67	1.17*	1.67*	5	1.125*	3.5	2.15*	0.625*	1.82*	0.83*	4	0.55*	0.33*	2.03
	4.38	3.36	4.86	3.58	3.86	3.14	3.71	4.41	3.97	4.5	5.4	5.52	4.71	4.26

This table shows zones of similar density but there does not seem to be a discernible visual pattern apart from the first and last lines being the most homogenous and the pyramid based on the last line. The last four columns are the densest, and the densest units in these belong mostly to the first set. The overall densest unit is 3G (example 30, p.77) at 11.11 nps and it is also one of the loudest units in the piece. The unit following this whirlwind of activity is the first mini time point, although in a trilling texture, and creates an effective contrast before the beginning of a new sub-phrase. The units containing an asterisk are those which have fermatas.

Another way of visualising the evolution of the density of events in *Sequenza VII* is in graph form as below. Graph 1, which shows the line by line evolution of the average density over the course of the composition, clearly depicts one of the aspects of the arch shape of *Sequenza VII*. The horizontal axis represents the thirteen lines of the composition, while the vertical axis represents average note density. The values used are those found in Table 24.

Graph 1: Density evolution of the composition



5.7 Conclusion

In this chapter, all the units were placed into sets and layers and pulsations assigned to those units displaying proportional writing; the goal was to gain insight into the structure of *Sequenza VII* while striving to be as true as possible to the temporal grid. The sets were constructed in an entropic way, from the most straightforward to the more complex and interpretative. This method proved valuable in that it enabled an analytical approach with the added benefit of creating a systematic method to practicing the composition. The first set was the easiest to approach as it contains no temporal interpretation (all these units can 'only be played one way'), and it represents one part of the fundamental notational duality intrinsic to *Sequenza VII* that is metered and proportional. Furthermore, the third layer in this set was an introduction to the concept of pulse combinations. Subset 1 was used for practice as a transition from the metered to the proportional notations, since set two and three contain only proportional writing. These sets, and the subsequent analytical section, were based on the idea of creating layers for analysis according to various criteria. Graphs were plotted aimed at understanding some of the compositional traits and structures of the work. A gradual complexification of the overall *Sequenza VII* system was demonstrated using measurements such as note density charts, pitch distributions and graphics of selected events like fermatas. The archetypal formal structure of build-up—climax—resolution was clearly shown within the general trend of temporal dilatation and proliferation of musical events.

Chapter 6

Autoethnographic performance and analysis process

'What interests me is not the surface virtuosity of a performance, it is the virtuosity in the control of the musical gesture – which is totally different.'[49]

6.1 Introduction

The focus of this chapter is a meticulous temporal analysis of my own past performances of *Sequenza VII*, two of which were official formal performances and the other an informal one at home for research purposes. The first performance was for my final Artist Diploma recital held in Pollack Hall at McGill University in Montréal on the 7th of September 2013, and the second three weeks later was staged at Christ Church in Montréal central on the 28th of September 2013 hosted by the concert series *L'Oasis Musicale*. The three-week proximity of these two performances means that one could expect the results to be quite similar with regards to discrepancies with the score and general musical gestures. The next step was for me to follow the prescriptive method and interpretation that was devised in chapter four and five. All the pulse combinations were written in the score (appendix 1, p.130) and I made a click track (appendix 3, p.135) using Garage Band and Finale[50]. A recording was made (performance three) without the use of the click track and compared to the previous two to prove the validity of the learning method. The analysis method which I used on the recordings will now be discussed.

Firstly, the total length of the performance is measured and compared with the result of the first, less accurate, method of duration calculation yielding a duration of 414.8″ (chapter 4, p.51). This is followed by the second method, the empirical duration, as calculated to be 390″ (chapter 4, p.52). Subsequently, a temporal analysis line by line is presented[51] followed by calculations for each unit. Measurements are done by cropping each unit at the hundredth of a

[49] 'Ce qui m'intéresse ce n'est pas la virtuosité extérieure de la performance, c'est la virtuosité dans le contrôle des gestes instrumentaux – ce qui est tout à fait différent…' Stoïanova (1985: 393) (Translation, mine).
[50] A 2005 version of the software was used.
[51] As in Alessandrini (2007: 76-8) with Holliger and Hadady.

second and all individual derived calculations are rounded off to the closest hundredth of a second. Tables for the visualization of the calculated inaccuracies are also included.

6.2 Performance 1: Pollack Hall, McGill University, Montréal, 07/09/2013

This amateur recording for personal archives was made after six weeks of intense preparation for the recital. I did not benefit from lessons nor the help of my teacher at the time as it was done over the summer break. No commercial recordings were consulted. The *Sequenza VII* was the last piece of a difficult program in which I performed 70 minutes of solo oboe repertoire, and one piece in a duet with Piano, all modern and contemporary. Due to a technical malfunction, two recordings of this concert needed to be used in this analysis. The one made with a digital camera and transferred to Garage Band is missing a thirty second snippet towards the end due to camera problems. The recording from the second device was not sensitive enough to pick up the time-domain representation of audio signal (sound patterns) accurately for this analysis so it relies more on visible musical gesture, but it is nonetheless accurate. The estimated average precision of these measurements is inferior to five hundredth of a second and probably a mean of three hundredth of a second. When measuring the thirty second missing extract, I used a manual stopwatch and relied on both the audio and video of the device. To make sure that the measurements stayed within the same range of accuracy, I took two series of twelve measurements per unit, scraping the shortest and longest in each series; I then ended up with two series of ten measurements, averaged each series and then averaged the two totals. This way, it is sure that the average accuracy lies also at around three hundredths of a second. Table 25 below contains the line by line calculations as compared to both methods of total duration calculation for *Sequenza VII*. Each line of the table lists the general timeline of the performance, the duration of the line, the discrepancy in seconds with the intended duration according to the first and second methods and puts a percentage value on this discrepancy.

Table 25: Duration of lines and derived calculations in performance 1

Line	**Timeline**	**Duration**	**1st method**	**Δ**	**in %**	**2nd method**	**Δ**	**in %**
1	0 – 27.2″	27.2″	22.6″	4.6	20.35	22.6″	same	same

2	27.2″ – 57.59″	30.39″	28.6″	1.79	6.26	27.1″	3.29	12.14
3	57.59″ – 83.99″	26.4″	22.6″	3.8	16.81	22.6″	same	same
4	83.99″ – 117.11″	33.12″	28.6″	4.52	15.8	27.85″	5.27	18.92
5	117.11″ – 142.76″	25.65″	22.6″	3.05	13.5	22.6″	same	same
6	142.76″ – 172.82″	30.06″	26.6″	3.46	13.01	25.6″	4.46	17.42
7	172.82″ – 198.25″	25.43″	22.6″	2.83	12.52	22.6″	same	same
8	198.25″ – 237.79″	39.54″	32.6″	6.94	21.29	31.6″	7.94	25.13
9	237.79″ – 262.32″	24.53″	22.6″	1.93	8.54	22.6″	same	same
10	262.32″ – 294.77″	32.45	27.6″	4.85	17.57	27.1″	5.35	19.74
11	294.77″ – 332.77″	38	39.6″	-1.6	4.04	36.425″	1.575	4.32
12	332.77″ – 374.38″	41.61	50.6″	-8.99	17.77	43.1″	-1.49	3.46
13	374.38″ – 435.7″	61.32	67.6″	-6.28	9.29	58.225	3.095	5.32
mean				4.2	13.6		3.74	13.71
total	435.7″	7′15.7″	414.8″	20.9	5.04	390″	45.7	11.72

From this table it can be noticed that the second method, which is a more refined and exact calculation of the duration of *Sequenza VII* yields an overall higher percentage of inaccuracy: 11.72% discrepancy with the intended total duration compared to 5.04% when applied to the first method. This is because the natural tendency of the interpreter, is to overshoot the intended durations when done according to feeling. Also noticeable is the fact that taking a measurement of the totality of the piece versus line by line shows that when going into more detailed measurements, the percentage of inaccuracy grows. The discrepancy being marginally higher in the calculations made with the second method compared to those with the first. In this first performance, the most accurate lines are the last three and by a consequently wide margin. This is the last section of the composition that contains, proportionally, the most units in conventional metered notation. Line twelve is the most accurate of all and is also the only line that undershoots the intended duration according to the second method. Next, the individual units will be measured in Table 26 overleaf and similarly compared to the results of the second method of duration calculation. As in in Table 25 above, the discrepancy in seconds with the intended duration is given as well as its correlating percentage value:

Table 26: Timing of individual units and derived calculations in performance 1

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
	3″	**2.7″**	**2″**	**2″**	**2″**	**2″**	**1.8″**	**1.5″**	**1.3″**	**1.3″**	**1″**	**1″**	**1″**
1	5.93	3.72	2.85	1.88	1.06	1.71	1.74	1.73	2.02	1.12	1.36	1.31	0.77
Δ	2.93	1.02	0.85	0.12	0.94	0. 29	0.06	0.23	0.72	0.18	0.36	0.31	0.23
%	97.67	37.78	42.5	6	47	14.5	3.33	15.33	55.38	13.85	36	31	23
2	3.66	3.65	2.01	3.21	1.87	6.92	1.97	1.6	1.16	1.55	0.92	1.87	
Δ	0.66	0.95	0.01	1.21	0.13	0.42	0.17	0.1	0.14	0.25	0.08	0.13	
%	22	35.19	0.5	60.5	6.5	6.46	9.44	6.67	10.77	19.23	8	6.5	
3	3.19	3.16	2.15	2.34	2.53	1.49	1.82	1.49	2.08	2.12	1.25	1.31	1.47
Δ	0.19	0.46	0.15	0.34	0.53	0.51	0.02	0.01	0.78	0.82	0.25	0.31	0.47
%	6.33	17.04	7.5	17	26.5	25.5	1.11	0.67	60	63.08	25	31	47
4	4.52	8.5	2.48	2.08	2.05	1.47	1.93	3.44	1.17	1.7	2.35		1.43
Δ	1.52	0.55	0.48	0.08	0.05	0.53	0.13	1.94	0.13	0.4	0.35		0.43
%	50.67	6.92	24	4	2.5	26.5	7.22	129.33	10	30.77	17.5		43
5	3.19	3.27	1.64	1.95	2.05	2.27	1.77	2.01	1.45	2.22	1.33	1.28	0.96
Δ	0.19	0.57	0.36	0.05	0.05	0.27	0.03	0.51	0.15	0.92	0.33	0.28	0.04
%	6.33	21.11	18	2.5	2.5	13.5	1.67	34	11.54	70.77	33	28	4
6	3.51	3.02	2.45	2.22	2.35	4.81	2.37	2.22	2.05	1.39	1.06	1.48	1.13
Δ	0.51	0.32	0.45	0.22	0.35	0.19	0.57	0.72	0.75	0.09	0.06	0.48	0.13
%	17	11.85	22.5	11	17.5	3.8	31.67	48	57.69	6.92	6	48	13
7	2.92	2.83	2.73	2.21	2.6	2.17	1.9	2.21	1.3	1.43	1.19	0.92	1.02
Δ	0.08	0.13	0.73	0.21	0.6	0.17	0.1	0.71	0	0.13	0.19	0.8	0.02
%	2.67	4.81	36.5	10.5	30	8.5	5.56	47.33	0	10	19	8	2
8	10.8	4.94	2.4	2.17	5.19	3.77	1.86	1.85	1.68	1.64	0.96	1.1	1.18
Δ	3.3	2.24	0.4	0.17	1.31	1.77	0.06	0.35	0.38	0.34	0.04	0.1	0.18
%	44	82.96	20	8.5	20.15	88.5	3.33	23.33	29.23	26.15	4	10	18
9	3.14	3.36	3.09	1.36	2.51	2.14	1.77	1.41	1.27	1.4	1.14	0.86	1.08
Δ	0.14	0.66	1.09	0.64	0.51	0.14	0.03	0.09	0.03	0.1	0.14	0.14	0.08
%	4.67	24.44	54.5	32	25.5	7	1.67	6	2.31	7.69	14	14	8
10	4.45	2.38	2.65	6.21	2.56	2.46	2.19	2.78	1.77	1.67	1.08	1.06	1.19
Δ	1.45	0.32	0.65	0.29	0.56	0.46	0.39	1.28	0.47	0.37	0.08	0.06	0.19
%	48.33	11.85	32.5	4.46	28	23	21.67	85.33	36.15	28.46	8	6	19
11	4	4.42	2.08	2.26	6.74	2.23	3.21	1.98	2.94	1.53	2.08	1.18	3.35
Δ	1	1.72	0.08	0.26	0.49	0.23	1.41	0.48	1.06	0.23	1.295	0.18	2.15
%	33.33	63.7	4	13	7.84	11.5	78.33	32	26.5	17.69	38.37	18	39.09
12	2.59	3.51	2.31	4.29	3.86	4.47	5.1	1.83	1.64	1.46	3.9	5.61	1.04
Δ	0.41	0.99	0.31	0.29	0.86	1.53	0.6	0.33	0.34	0.16	1.1	0.39	0.04
%	13.67	22	15.5	7.25	*28.67	*25.5	*13.33	*22	*26.15	*12.31	*22	*6.5	*4
13	3.56	6.28	2.83	2.03	8.57	1.54	5.16	8.73	3.52	5.67	1.68	4.91	6.84
Δ	0.56	1.42	0.17	0.03	0.57	0.46	1.91	0.73	0.77	0.33	0.68	0.59	0.815
%	18.67	18.44	5.67	1.5	7.125	23	58.77	9.125	28	5.5	68	10.73	*13.53

units which undershoot the intended duration
units containing a fermata
units grouped as a ‘diphthong’

*The series of percentage measurements that are preceded by an asterisk: 12E-M and 13M are the parts that were analysed with the stopwatch method and not with Garage Band as mentioned in the introduction.

This table which indicates measurements and derived calculations for every individual unit in performance 1 shows the wide variety of percentages of inaccuracy present ranging from 0% to 129.33%. There does not seem to be any discernible pattern visible apart from the realization that the general trend is to overshoot. In parallel, a larger than average sample of units containing fermatas has the tendency to undershoot the required duration. There are twenty-six units containing fermatas and twelve of those undershoot the intended duration which equates to 46.15%. Whereas, when looking at the total, forty units undershoot out of one hundred and sixty-nine (counting the one undershooting diphthong as two), which gives a percentage value of 23.81%.

The following Table 27 presents these inaccuracy values in a more visual way. The gradients of grey are devised using the customized colour settings in Microsoft Word[52] where two hundred and fifty-five represents full white and zero represents full black. A two-colour point value is assigned to each percentage point, as it yields a more visible difference than just one. This means that any discrepancies beyond 122.5% will be visually the same, yielding a full black coloration. The average discrepancy by line and by column is also included in the table.

[52] The 2016 version was used.

Table 27: Visualization of inaccuracy of the values in table 26, performance 1

	A	B	C	D	E	F	G	H	I	J	K	L	M	mean
1														32.56
2														15.25
3														25.21
4														28.45
5														18.99
6														22.68
7														14.22
8														29.09
9														15.52
10														27.14
11														29.49
12														16.84
13														20.62
mean	28.1	27.55	20.19	13.71	19.21	21.33	18.24	35.32	27.21	24.03	22.99	18.09	18.47	22.77

The visual representation of this performance shows zones of similarity and the odd unit that is totally incongruent. Unit 4H has the highest discrepancy with regards to the intended duration: 129.33%. The obvious ideal is to get a performance that would be as light and as smooth as possible. Following this, the deterministic units, collectively known as set one with its three layers (the units that can be played 'only one way') are compared to the units containing mostly only proportional writing (Subset one and set two & three) in Tables 28 and 29 respectively:

Table 28: Calculation of inaccuracy for the deterministic/metered units (Set 1 exclusively), performance 1

	A	B	C	D	E	F	G	H	I	J	K	L	M
1										13.85	36	31	23
2			0.5							19.23			
3	6.33					25.5		0.67	60				47
4	50.67												43
5			18	2.5	2.5				11.54				4
6		11.85		8	17.5	3.8							13
7	2.67									10			
8				11.5	20.15						4	10	18
9	4.67								2.31	7.69	14	14	8
10	48.33						21.67					6	19
11	33.33		4	13	7.84				26.5		38.37	18	39.09
12	13.67	22	15.5	7.25	28.67	25.5	13.33				22	6.5	4
13	18.67		5.67	1.5	7.125	23	58.77	9.125		5.5	68	10.73	13.53

There can be calculated a 17.85% overall inaccuracy on these seventy deterministic metered units that can only be 'played one way'. The overall coloration is somewhat smooth and there are not too many units that protrude with their inaccuracy, yet it is still a rather large percentage of inexactitude. The next Table 29 provides proof to the intuition that these deterministic units are more accurate than the others.

Table 29: Calculation of inaccuracy in units in proportional writing (Subset 1, Set 2 and 3), performance 1

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	97.67	37.78	42.5	6	47	14.5	3.33	15.33	55.38				
2	22	35.19		60.5	6.5	6.46	9.44	6.67	10.77		8	6.5	6.5
3		17.04	7.5	17	26.5		1.11			63.08	25	31	
4		6.92	24	4	2.5	26.5	7.22	129.33	10	30.77	17.5	17.5	
5	6.33	21.11				13.5	1.67	34		70.77	33	28	
6	17		22.5				31.67	48	57.69	6.92	6	48	
7		4.81	36.5	10.5	30	8.5	5.56	47.33	0		19	8	2
8	44	82.96	20			88.5	3.33	23.33	29.23	26.15			
9		24.44	54.5	32	25.5	7	1.67	6					
10		11.85	32.5	4.46	28	23		85.33	36.15	28.46	8		
11		63.7				11.5	78.33	32		17.69			
12								22	26.15	12.31			
13		18.44							28				

An overall 26.17% inaccuracy can be calculated on these ninety-nine units containing more interpretation, since written mostly in proportional writing. As could have been expected, the mostly deterministic units are more accurate by 8.32%, a notable difference. The visualization in Table 29 above shows a much less-smooth landscape together with units of highest inaccuracy indicated with darker colouring. An ideal learning method would reduce the inexactitude delta between these two different notations, while reducing the overall discrepancies with the intended durations. What is important to note about performance one is: a) the overall discrepancy with the intended duration at 11.72%, b) the average inaccuracy of the lines standing at 13.71%, and c) the percentage value of the average of all the individual units which is 22.77%. In addition to these measurements, the values for the metered units of 17.85% inaccuracy and the 26.17% of the less deterministic units will be compared with the results of the subsequent performances.

6.3 Performance 2: Christ Church, Montréal. 28/09/2013

This performance of *Sequenza VII* was also part of a larger recital of modern and contemporary music featuring Britten, Stockhausen, Berio and Lanza. The concept of the *Oasis musicale* is one of open door concerts where the public may come and go and donate at will. The performers hand out flyers in front of the cathedral half an hour before the concert and hope for a crowd. The tables below follow the same order and logic as in the first performance analysis; firstly, an overall and line by line calculation of inexactitude as in Table 30 below, followed by calculations for the individual units, and finally, visualisations of the inaccuracies. For the presentation of the next two performances, the comparison with the first method of duration calculation for the composition are not included; as the second method yields the correct overall duration of *Sequenza VII*.

Table 30: Duration of lines and derived calculations in performance 2

line	timeline	duration	2nd method	Δ	in %
1	0 – 25.75″	25.75″	22.6″	3.15	13.94
2	25.75″ – 55.57″	29.82″	27.1″	2.72	10.04
3	55.57″ – 81.98″	26.41″	22.6″	3.81	16.86
4	81.98″ – 117.26″	35.28″	27.85″	7.43	26.68
5	117.26″ – 146.34″	29.08″	22.6″	6.48	28.67
6	146.34″ – 178.54″	32.2″	25.6″	6.6	25.78
7	178.54″ – 205.65″	27.11″	22.6″	4.51	19.96
8	205.65″ – 243.5″	37.85″	31.6″	6.25	19.78
9	243.5″ – 270.19″	26.69″	22.6″	4.09	18.1
10	270.19″ – 302.99″	32.8″	27.1″	5.7	21.03
11	302.99″ – 342.39″	39.4″	36.425″	2.975	8.17
12	342.39″ – 386.11″	43.72″	43.1″	0.62	1.44
13	386.11″ – 445.83″	59.72″	58.225″	1.495	2.57
mean				4.29	16.39
total	445.83″	7′25.83″	390″	55.83	14.32

It can already be noticed that this is a longer version (by 10.13″) of the composition than in the first performance. Consequently, the inaccuracy when measuring the total duration, and therefore also line by line, is greater than in the first performance, up by 2.6% and 2.68% respectively. As in the first performance, the last three lines of the composition are the most exact, once again, by a large margin and are more accurate in this second performance. Line twelve is the most precise again and this time, does not undershoot the intended duration. Next, as in the previous performance, the individual units are measured in Table 31 below and similarly compared to the results of the second method of duration calculation.

Table 31: Timing of individual units and derived calculations for performance 2

	A 3″	**B 2.7″**	**C 2″**	**D 2″**	**E 2″**	**F 2″**	**G 1.8″**	**H 1.5″**	**I 1.3″**	**J 1.3″**	**K 1″**	**L 1″**	**M 1″**
1	4.8	3.32	2.33	1.95	1.85	1.7	2.4	1.65	1.7	1.35	0.95	0.95	0.8
Δ	1.8	0.62	0.33	0.05	0.15	0.3	0.6	0.15	0.4	0.05	0.05	0.05	0.2
%	60	22.96	16.5	2.5	7.5	15	33.33	10	30.77	3.85	5	5	20
2	3.22	3.98	1.61	2.89	2.3	6.23	1.98	1.86	1.03	1.71	0.92	2.09	
Δ	0.22	1.28	0.39	0.89	0.3	0.27	0.18	0.36	0.27	0.41	0.8	0.09	
%	7.33	47.41	19.5	44.5	15	4.15	10	24	20.77	31.54	8	4.5	
3	3.36	3.04	2.4	2.3	2.62	1.28	2.05	3.13	*	2.07	1.4	1.35	1.41
Δ	0.36	0.34	0.4	0.3	0.62	0.72	0.25	0.33		0.77	0.4	0.35	0.41
%	12	12.59	20	15	31	36	13.89	11.79		59.23	40	35	41
4	5.26	7.21	2.75	2.78	2.2	1.82	1.94	3.83	1.55	1.84	2.65		1.45
Δ	2.26	0.74	0.75	0.78	0.2	0.18	0.14	2.33	0.25	0.54	0.65		0.45
%	75.33	9.31	37.5	39	10	9	7.78	155.33	19.23	41.54	32.5		45
5	4.18	3.44	1.55	2.32	2.13	1.88	1.79	3.01	1.64	2.75	1.72	1.81	0.86
Δ	1.18	0.74	0.45	0.32	0.13	0.12	0.01	1.51	0.34	1.45	0.72	0.81	0.14
%	39.33	27.41	22.5	16	6.5	6	0.56	83.89	26.15	111.54	72	81	14
6	3.83	4.2	2.89	2.17	2.45	4.19	2.37	2.47	2.16	1.6	1.77	1.17	0.93
Δ	0.83	1.5	0.89	0.17	0.45	0.81	0.57	0.97	0.86	0.3	0.77	0.17	0.07
%	27.67	55.56	44.5	8.5	22.5	16.2	31.67	64.67	66.15	23.08	77	17	7
7	2.66	3.33	2.88	2.17	2.89	2.38	2.13	2.67	1.04	1.57	1.36	0.92	1.11
Δ	0.34	0.63	0.88	0.17	0.89	0.38	0.33	1.17	0.26	0.27	0.36	0.08	0.11
%	11.33	23.33	44	8.5	44.5	19	18.33	78	20	20.77	36	8	11
8	7.09	5.27	2.65	2.34	5.05	4.25	1.84	2.05	1.89	2.04	1.06	1.09	1.23
Δ	0.41	2.57	0.65	0.34	1.45	2.25	0.04	0.55	0.59	0.74	0.06	0.09	0.23
%	5.47	95.19	32.5	17	22.31	112.5	2.22	36.67	45.38	56.92	6	9	23
9	3.38	4.32	3.66	0.76	2.7	2.17	1.95	1.51	1.35	1.58	1.2	1.03	1.08
Δ	0.38	1.62	1.66	1.24	0.7	0.17	0.15	0.01	0.05	0.28	0.2	0.03	0.08
%	12.67	60	83	62	35	8.5	8.33	0.67	3.85	21.54	20	3	8
10	3.67	2.64	2.49	7.42	2.98	2.05	2.43	2.15	1.63	1.82	1.33	0.9	1.29
Δ	0.67	0.06	0.49	0.92	0.98	0.05	0.63	0.65	0.33	0.52	0.33	0.1	0.29
%	22.33	2.22	24.5	14.15	49	2.5	35	43.33	25.38	40	33	10	29
11	3.62	4.6	2.48	2.62	7.8	2.55	2.66	2.12	2.31	1.78	2.3	1.07	3.61
Δ	0.62	1.9	0.48	0.62	1.55	0.55	0.86	0.62	1.69	0.48	1.075	0.07	1.89
%	20.67	70.37	24	31	24.8	27.5	47.78	41.33	42.25	36.92	31.85	7	34.36

12	2.65	3.41	2.25	4.24	4.19	4.72	5.79	1.77	1.88	1.85	4.67	5.15	1.15
Δ	0.35	1.09	0.25	0.24	1.19	1.28	1.29	0.03	0.58	0.55	0.33	0.85	0.15
%	11.67	24.22	12.5	6	39.67	21.33	28.67	1.67	44.62	42.31	6.6	14.17	15
13	3.85	6.2	3.42	2.19	9.54	1.84	6.33	8.41	2.82	5.65	1.29	3.8	4.38
Δ	0.85	1.5	0.42	0.19	1.54	0.16	3.08	0.41	0,07	0.35	0.29	1.7	1.645
%	28.33	19.48	14	9.5	19.25	8	94.77	5.125	2.55	5.83	29	30.91	27.3

units which undershoot the intended duration
units containing a fermata
units grouped as a 'diphthong'

*units 3HI are not a diphthong in the score but, in this recording, I did not manage to saturate the sound to mark the demarcation between the units therefore, in this instance, they are measured as such.

As could have once again been expected, the overall tendency is to overshoot the intended durations, as this interpretation was done according to 'feeling' to estimate the required time increments. As in the previous performance, units containing fermatas are prone to undershoot the intended duration: fifteen out of twenty-six units, implying 57.69% containing fermatas, are too short. There are once again forty units which undershoot the intended duration equating to 23.67%. There are twenty-five undershooting units common to both performances. It is important to notice these trends to prepare adapted practice strategies. The following Tables 32-34 expose the visual aspect of these discrepancies:

Table 32: Visualization of inaccuracy of the values in table 31 for performance 2

	A	B	C	D	E	F	G	H	I	J	K	L	M	mean
1														17.87
2														19.8
3														27.3
4														41.63
5														40.28
6														35.49
7														26.36
8														35.7
9														25.11
10														25.41
11														33.83
12														20.65
13														22.62
mean	25.7	36.19	30.38	21.05	25.16	21.98	25.56	42.8	27.61	38.08	30.53	19.78	21.47	28.62

As in performance one, unit 4H is the one containing the highest percentage of inaccuracy with a very large 155.33% discrepancy according to the intended duration. This is because, in both performances, I used this unit as a small breathing and resting point. This unit needs particular attention during practice. The range of inaccuracy is greater than in the previous performance ranging from 0.56% to 155.33%. Similarly, as with the previous section on performance one analysis, the deterministic units are now compared to the units containing mostly proportional writing in Table 33 and Table 34 respectively.

Table 33: Calculation of inaccuracy in deterministic\metered units (Set 1 exclusively), performance 2

	A	B	C	D	E	F	G	H	I	J	K	L	M
1										3.85	5	5	20
2			19.5							31.54			
3	12					36		11.79	11.79				41
4	75.33												45
5			22.5	16	6.5				26.15				14
6		55.56		8.5	22.5	16.2							7
7	11.33									20.77			
8				17	22.31						6	9	23
9	12.67								3.85	21.54	20	3	8
10	22.33						35					10	29
11	20.67		24	31	24.8				42.25		31.85	7	34.36
12	11.67	24.22	12.5	6	39.67	21.33	28.67				6.6	14.7	15
13	28.33		14	9.5	19.25	8	94.77	5.125		5.83	29	30.91	27.3

An overall 21.1% inaccuracy can be seen on these seventy deterministic units, this is larger than in the first performance by 3.25%. The visual landscape is somewhat smooth except for unit 13G which is now 36% more inaccurate than in the first performance. Once again, the following Table 34 on the next page could prove the intuition that these units would be more accurate than the ones in a less deterministic environment:

Table 34: Calculation of inaccuracy in units in proportional writing (Subset 1, Set 2 and 3), performance 2

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
1	60	22.96	16.5	2.5	7.5	15	33.33	10	30.77				
2	7.33	47.41		44.5	15	4.15	10	24	20.77		8	4.5	4.5
3		12.59	20	15	31		13.89			59.23	40	35	
4		9.31	37.5	39	10	9	7.78	155.33	19.33	41.54	32.5	32.5	
5	39.33	27.41				6	0.56	83.89		111.54	72	81	
6	27.67		44.5				31.67	64.67	66.15	23.08	77	17	
7		23.33	44	8.5	44.5	19	18.33	78	20		36	8	11
8	5.47	95.19	32.5			112.5	2.22	36.67	45.38	56.92			
9		60	83	62	35	8.5	8.33	0.67					
10		2.22	24.5	14.15	49	2.5		43.33	25.38	40	33		
11		70.37				27.5	47.78	41.33		36.92			
12								1.67	44.62	42.31			
13		19.48							2.55				

A 33.06% overall inaccuracy is calculated on these ninety-nine more interpretative units which represents an increase of 6.89%, when compared to the first performance. As with performance one, the metered units are more accurate, in this case, by 11.96%. The visualization above shows a more rugged landscape, and it contains the dark units with the highest inaccuracies, similar to the first performance. What is important to note about performance two is: a) the overall discrepancy with the intended duration at 14.32%, b) the average inaccuracy of the lines standing at 16.39% and c) the percentage value of the average of all the individual units which is 28.62 %. In addition to these measurements, the values for the metered units of 21.1% inaccuracy and the 33.06% of the less deterministic units will be compared with the results of the previous and subsequent performances. Before the recording of the third performance, the practice method derived from the information and calculations found in chapters four and five is applied. The learning method used for this autoethnographic part of the study is presented in the following subsection.

6.4 Applying the learning method

A four-week calendar[53] was set up in which I strove to relearn or to refine what had already been learnt. I have a thirteen-year history with *Sequenza VII*, so it is obviously impossible to start the piece afresh. Yet, through a novel approach, it felt as though I was relearning the work. The practice schedule would ideally be:

The first week focuses on the first set, the seventy ‘simpler’ units that can be played ‘only one way’. In addition to these, all the multiphonics are practiced ‘in abstract’ trying to be as close as possible to the written pitches. The microtonal inflections are not mandatory since they are a later addition, although sanctioned by Berio, and are more a consequence of the near impossibility of getting perfect fifth’s. The fluidity between the various timbral variations on the B natural are also practiced. All this is done using a metronome at pulse 60 bpm. Furthermore, practicing is done both by columns and in a linear mode.

The second week deals with the second set, the more interpretative units within their various analytical layers. This week also contains seventy new units including the eighteen from subset one which are worked on. Since there is significant overlap between the units in this set and the previous, it ensures a cohesive growth of performance knowledge. This week of practicing lays the foundation for the embodiment of the structure of *Sequenza VII*. Not only are the units practiced according to analytical considerations but also according to pulsation groupings to ensure, once again, the embodiment of the various pulses used. Here the concept of linear versus column takes second place to the aforementioned groupings. It is taken for granted that I continue to maintain the previous week’s practice through regular revisions of set one.

The third week logically concentrates on set three and the remainder of the twenty-nine units. This is when the linearity of *Sequenza VII* comes to the front and all the work is done incorporating the previous weeks’ work to start getting a feel for the totality and teleology of this work. In addition to this, units are also grouped in pulsation classes to once again work

[53] Ideally four weeks would take literally four weeks yet since there are often unforeseen circumstances, in the context of this research, four weeks of practice will signify twenty-eight days of work over a maximum period of six weeks.

towards embodiment of these pulse combinations as I believe that they truly reveal the phrasing of the piece.

The fourth week concentrates on the revision of all previous materials and run-through's, firstly using the click track and then eventually without. This is the point when the piece must be played in totality keeping in mind the work done towards fidelity to the temporal structure. Furthermore, a feel for the overall compositional structure and the local and overall phrasing needs to be developed.

6.5 New recording: performance 3, after four weeks of practice

This third recording was made at home on the fifteenth of August 2017 after the four weeks of practicing. I recorded directly into the computer and once again analysed the recording using Garage Band. In the following Table 35, the timings are once again, only compared to the second and more accurate method of calculating the total duration of *Sequenza VI*. Furthermore, the timings of recordings by Holliger and Hadady as found in Alessandrini (2007: 76-8) are included, providing both the timings of the individual lines in their performances and the discrepancy in percentage with the intended duration.

Table 35: Duration of lines and derived calculations in performance 3, comparison with Hadady and Holliger

Line	Timeline	Duration	2nd method	Δ	in %	Hadady	Holliger
1	0 – 18.56″	18.56″	22.6″	-4.04	17.88	17.5″ (22.57%)	15.5″ (31.42%)
2	18.56″ – 42.41″	23.85″	27.1″	-3.25	11.99	23.8″ (12.18%)	26″ (4.06%)
3	42.41″ – 65.07″	22.66″	22.6″	0.06	0.27	24. 6″ (8.85%)	21.1″ (6.64%)
4	65.07″ – 91.99″	26.92″	27.85″	-0.93	3.34	27.7″ (0.54%)	28″ (0.54%)
5	91.99″ – 113.44″	21.45″	22.6″	-1.15	5.09	22.6″ (0%)	25.4″ (12.39%)
6	113.44″ – 138.67″	25.23″	25.6″	-0.37	1.45	27.2″ (6.25%)	29.3″ (14.45%)
7	138.67″ – 160.19″	21.52″	22.6″	-1.08	4.78	27.3″ (20.8%)	29.2″ (29.2%)
8	160.19″ – 190.08″	29.89″	31.6″	-1.71	5.41	32.5″ (2.85%)	38.7″ (22.47%)
9	190.08″ – 210.27″	20.19″	22.6″	-2.41	10.66	25.4″ (12.39%)	21.6″ (4.42%)
10	210.27″ – 238.02″	27.75″	27.1″	0.65	2.4	31.3″ (15.5%)	31.2″ (15.13%)

11	238.02″ – 274.64″	36.62″	36.425″	0.195	0.54	37.6″ (3.23%)	39.3″ (7.89%)
12	274.64″ – 316.5″	41.86″	43.1″	-1.24	2.88	47.4″ (9.98%)	48.5″ (12.53%)
13	316.5″ – 375.71″	59.21″	58.225″	0.985	1.69	65.5″ (12.49%)	65.1″ (11.81%)
mean					5.26	9.82%	13.3%
total	375.71″	6′15.71″	390″	-14.29	3.66	410.4″ (5.23%)	418.9″ (7.41%)

It is noteworthy that this performance undershoots the intended duration. This is because I was very conscious of the possibility of overshooting, therefore the performance sounds and is a little rushed. Nine out of the thirteen lines undershoot the intended durations and the last three lines are not the most accurate anymore. Line twelve is not the most exact, lines three, six, ten, eleven and thirteen are now the most precise. This table also shows that Hadady is more precise than Holliger when interpreting the durations and that performance three is more accurate on these criteria. Next, as in the previous performance, the individual units are measured in the Table 36 below and similarly compared to the results of the second method of duration calculation:

Table 36: Timing of individual units and derived calculations for performance 3

	A 3″	**B 2.7″**	**C 2″**	**D 2″**	**E 2″**	**F 2″**	**G 1.8″**	**H 1.5″**	**I 1.3″**	**J 1.3″**	**K 1″**	**L 1″**	**M 1″**
1	3.1	1.99	1.38	1.55	1.57	1.55	1.42	1.31	1.15	0.94	1.02	0.78	0.8
Δ	0.1	0.71	0.62	0.45	0.43	0.45	0.38	0.19	0.15	0.36	0.02	0.22	0.2
%	3.33	26.3	31	22.5	21.5	22.5	21.11	12.67	11.54	27.69	2	22	20
2	2.43	2.19	1.56	2.02	1.54	6.95	1.39	1.12	0.71	0.85	1.27	1.8	
Δ	0.57	0.51	0.44	0.02	0.46	0.45	0.41	0.38	0.59	0.45	0.27	0.2	
%	19	18.89	22	1	23	22.5	22.78	25.33	45.38	34.62	27	10	
3	2.94	2.69	1.64	1.98	2.39	1.83	1.82	1.46	1.28	1.49	0.82	1.3	1.02
Δ	0.06	0.01	0.36	0.02	0.39	0.17	0.02	0.04	0.02	0.19	0.18	0.3	0.02
%	2	0.37	18	1	19.5	8.5	55.56	2.67	1.54	14.62	18	30	2
4	3.05	7.71	1.89	1.94	2	1.6	1.5	2.05	0.98	1.36	1.82		1.02
Δ	0.05	0.24	0.11	0.06	0	0.4	0.3	0.55	0.32	0.06	0.18		0.02
%	1.67	3.02	5.5	3	0	20	16.67	36.67	24.62	4.62	9		2
5	3.24	2.29	1.47	1.86	1.97	1.44	1.16	1.77	1.44	1.56	1.39	1.12	0.74
Δ	0.24	0.41	0.53	0.14	0.03	0.56	0.64	0.27	0.14	0.26	0.39	0.12	0.26
%	8	15.19	11.5	7	1.5	28	35.56	18	10.77	20	39	12	26
6	3.05	2.18	2.28	1.91	2.09	4.72	1.54	1.53	1.56	1.21	1.23	0.89	1.04
Δ	0.05	0.52	0.28	0.09	0.09	0.28	0.26	0.03	0.26	0.09	0.23	0.11	0.04

%	1.67	19.26	14	4.5	4.5	5.6	14.44	2	20	6.92	23	11	4
7	2.38	2.43	1.81	1.77	2.08	2.17	1.79	1.85	1.21	1.37	1.12	0.68	0.86
Δ	0.62	0.27	0.19	0.23	0.08	0.17	0.01	0.35	0.09	0.07	0.12	0.32	0.14
%	20.67	10	9.5	11.5	4	8.5	0.56	23.33	6.92	5.38	12	32	14
8	8.63	3.29	1.79	1.45	4.39	2.05	1.2	1.52	1.3	1.09	0.9	1.09	1.19
Δ	1.13	0.59	0.21	0.55	2.11	0.05	0.6	0.02	0	0.21	0.1	0.09	0.19
%	15.07	21.85	10.5	27.5	32.46	2.5	33.33	1.33	0	16.15	10	9	19
9	3.25	2.73	1.62	1	2.12	1.66	1.42	1.24	1.09	1.34	0.82	0.84	1.06
Δ	0.25	0.03	0.38	1	0.12	0.34	0.38	0.26	0.21	0.04	0.18	0.16	0.06
%	8.33	1.11	19	50	6	17	21.11	17.33	16.15	3.08	18	16	6
10	2.62	2.24	2.43	7.64	2.35	1.65	1.79	1.59	1.07	1.09	1.24	0.99	1.05
Δ	0.38	0.46	0.43	1.14	0.35	0.35	0.01	0.09	0.23	0.21	0.24	0.01	0.05
%	12.67	17.04	21.5	17.54	17.5	17.5	0.56	6	17.69	16.15	24	1	5
11	3.23	2.83	1.81	2.02	7.42	1.87	1.54	1.67	3.87	1.34	3.45	1.15	4.42
Δ	0.23	0.13	0.19	0.02	1.17	0.13	0.26	0.17	0.13	0.04	0.075	0.15	1.08
%	7.67	4.81	9.5	1	18.72	6.5	14.44	11.33	3.25	3.08	2.22	15	19.64
12	2.54	4.29	2.01	4.24	3.33	5.02	4.88	1.66	1.21	1.03	4.7	6.04	0.91
Δ	0.46	0.21	0.01	0.24	0.33	0.98	0.38	0.16	0.09	0.27	0.3	0.04	0.9
%	15.33	4.67	0.5	6	11	16.33	9.5	10.67	6.92	20.77	6	0.67	9
13	2.82	6.69	3.18	1.8	9.9	1.21	4.07	8.72	2.48	5.85	1.07	5.57	5.85
Δ	0.18	1.01	0.18	0.2	1.9	0.79	0.82	0.72	0.27	0.15	0.07	0.07	0.175
%	6	13.12	6	10	23.75	39.5	25.23	9	9.82	2.5	7	1.27	2.9

units which undershoot the intended duration
units containing a fermata
units grouped as a 'diphthong'

In this performance, there are ninety-eight units which undershoot their intended durations, this represents a large increase compared to performances one and two. In performance three, 57.99% of units are too short, an increase of about 34% relative to the first two performances. Out of the twenty-six units containing fermatas, twelve undershoot the correct duration, equating to 46.15%. A reversal of the trend seen in the first two performances has happened: the units containing fermatas is no longer the group of units which undershoots the most. The following Table 37 is a visualization of these inaccuracy values:

Table 37: Visualization of inaccuracy of the values in Table 35 above for performance 3

	A	B	C	D	E	F	G	H	I	J	K	L	M	mean
1														18.78
2														21.65
3														13.37
4														15.55
5														17.89
6														10.07
7														12.18
8														12.98
9														15.32
10														13.4
11														9.01
12														9.03
13														12.01
mean	9.34	11.97	13.73	12.5	14.11	16.53	20.83	13.56	13.43	13.51	15.17	13	10.73	13.72

This visualization presents a much smoother and lighter overall character, which was part of the goal of applying a learning method for a prescriptive interpretation. The range of inaccuracies, from 0% to 55.56%, is much smaller than in the first two performances, possibly attesting to the validity of the method. The most inaccurate unit is no longer 4H but is now unit 3G, this is the densest unit in the whole composition (Table 24, p.92; Example 30, p.77) as it should be played at 11.11 nps average. The following tables will compare the metered units to those in proportional writing in Table 38 and Table 39 respectively:

Table 38: Calculation of inaccuracy in deterministic\metered units (Set 1 exclusively) for performance 3

	A	B	C	D	E	F	G	H	I	J	K	L	M
1										27.69	2	22	20
2			22							34.62			
3	2					8.5		2.67	1.54				2
4	1.67												2
5			11.5	7	1.5				10.77				26
6		19.26		4.5	4.5	5.6							4
7	20.67									5.38			
8				27.5	32.46						10	9	19
9	8.33								16.15	3.08	18	16	6
10	12.67						0.56					1	5
11	7.67		9.5	1	18.72				3.25		2.22	15	19.64
12	15.33	4.67	0.5	6	11	16.33	9.5				6	0.67	9
13	6		6	10	23.75	39.5	25.23	9		2.5	7	1.27	2.9

An overall 10.76% inaccuracy can be calculated in these deterministic units. This signifies a consequent gain of accuracy between performances two and three. The results in the next Table 39 will hopefully show that the difference between the metered and proportional units is getting smaller:

Table 39: Calculation of inaccuracy in units in proportional writing (Subset 1, Set 2 and 3), performance 3

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3.33	26.3	31	22.5	21.5	22.5	21.11	12.67	11.54				
2	19	18.89		1	23	22.5	22.78	25.33	45.38		27	10	10
3		0.37	18	1	19.5		55.56			14.62	18	30	
4		3.02	5.5	3	0	20	16.67	36.67	24.62	4.62	9	9	
5	8	15.19				28	35.56	18		20	39	12	
6	1.67		14				14.44	2	20	6.92	23	11	
7		10	9.5	11.5	4	8.5	0.56	23.33	6.92		12	32	14
8	15.07	21.85	10.5			2.5	33.33	1.33	0	16.15			
9		1.11	19	50	6	17	21.11	17.33					
10		17.04	21.5	17.54	17.5	17.5		6	17.69	16.15	24		
11		4.81				6.5	14.44	11.33		3.08			
12								10.67	6.92	20.77			
13		13.12							9.82				

In this calculation, the overall inaccuracy of the units written in proportional writing can be seen to be 15.82% which is a marked improvement. These units are 5.06% less accurate than the metered ones, also a marked improvement. What is important to note about performance three is: a) the overall discrepancy with the intended duration at 3.66%, b) the average inaccuracy of the lines standing at 5.26% and c) the percentage value of the average of all the individual units which is 13.72%. In addition to these measurements, the values for the metered units of 10.76% inaccuracy and the 15.82% of the less deterministic units will be compared with the results of the previous performances in the next section.

6.6 Comparison of the three performances

All the numerical values calculated and collected through the analysis of the three performances must now be compared to each other to show the validity of the learning method with the concept of pulse combinations. These results are presented in the following Table 40:

Table 40: comparisons of inaccuracies for the three performances.

<table>
<tr><th></th><th>Performance</th><th colspan="2">1</th><th colspan="2">2</th><th colspan="2">3</th></tr>
<tr><td>1</td><td>Overall inaccuracy</td><td colspan="2">11.72%</td><td colspan="2">14.32%</td><td colspan="2">3.66%</td></tr>
<tr><td>2</td><td>Inaccuracy by line</td><td colspan="2">13.71%</td><td colspan="2">16.39%</td><td colspan="2">5.26%</td></tr>
<tr><td>3</td><td>Inaccuracy by unit</td><td colspan="2">22.77%</td><td colspan="2">28.62%</td><td colspan="2">13.72%</td></tr>
<tr><td>4</td><td>Inaccuracy for deterministic units</td><td colspan="2">17.85%</td><td colspan="2">21.1%</td><td colspan="2">10.76%</td></tr>
<tr><td>5</td><td>Inaccuracy for units in proportional notation</td><td colspan="2">26.17%</td><td colspan="2">33.06%</td><td colspan="2">15.82%</td></tr>
<tr><td>6</td><td>Range of inaccuracy</td><td colspan="2">0% - 129.33%</td><td colspan="2">0.56% - 155.33%</td><td colspan="2">0% - 55.56%</td></tr>
<tr><td>7</td><td>Golden mean articulation</td><td colspan="2">7.24%</td><td colspan="2">8.85%</td><td colspan="2">2.26%</td></tr>
<tr><td>8</td><td>Divisions according to Leclair: A/B/C and total innacuracy</td><td>47.98%
15.32%
36.7%</td><td>1.49%</td><td>47.72%
16.26%
36.03%</td><td>1.94%</td><td>44.93%
14.59%
40.48%</td><td>1.03%</td></tr>
</table>

Performance three is evidently a more accurate performance: the overall inaccuracy, when comparing the intended duration with that of the performance is a low 3.66%, which makes it a very accurate performance on that criterion. The next four criteria (two, three, four and five in Table 40 above), also display a marked gain of accuracy. The most important aspect, in my opinion, is the narrowing of the gap in the inaccuracy between the metered and proportional notations. In performance 1, the difference is 8.32%, the delta stands at 11.96% for the second performance, and in the third, it is 5.06%. In my view, the concept of applying combinations of pulses for the proportionally written units did a lot to narrow this gap. Criterion six is equally important as such a dramatic contrast with the first two performances attests to the overall control gained in the execution of the musical gestures. The largest value of 55.56% is still a large inaccuracy; yet it should be noted that the next two most inexact units are at 50% for 9D and 45.38% for 2I. Therefore, there are not that many units at a high level of inaccuracy.

Scholars speak of the importance of articulating the performance around the golden proportion (see appendix 2, p.131) to highlight this primordial macroscopic structural trait of

Sequenza VII. The previous Table 40 lists the inaccuracy values between where the golden proportion is articulated in the performance (taking the total duration of the performance for the calculation) and where it should be in the score (taking the total duration of 390 seconds for the calculation). Once again, performance three is quite accurate. Another macroscopic formal structure is the division of the composition in three sections delineated by the only fermatas on rests in the piece in units 8A and 10D. Leclair (2010: 98) notes that section one constitutes 45% of the piece, section two is worth 15% and the last section occupies 40%. She also notes (2010: 99) that whether a performance be on the slow or fast side, the macroscopic proportions of *Sequenza VII* should be realized accurately. When talking 390 seconds, the true duration, as the premise for the calculations, the three sections represent 45.76%, 15.31% and 38.94%. These are the values used for comparison in line eight of Table 40 where, for all three performances, the left side of the cell gives the percentage of time occupied by each section and the right side, the average of the discrepancies. It seems, when looking at the low percentage values of discrepancy, that these macroscopic proportions articulate themselves quite naturally. In all three performances, the middle section is the most accurate followed by the first and lastly, the third section. Performance three, once again is the most precise.

6.7 Conclusion

The focus of this chapter was the temporal analysis and comparison of three performances. The first two were recorded live in a concert situation and the third was done at home for research purposes after applying for four weeks the learning method described. When looking at the percentage of inaccuracy for the total length of the piece i.e. one measurement, it is not that large. When calculating line by line, it gets bigger, and then when calculating all the individual units, this percentage gets even larger, the deterministic units being more accurate in all three performances. This is just for the accuracy in the expression of the time spans. It could be imagined that a further calculation with regards to the placement of musical events within each unit could be done and would yield an even greater percentage of inaccuracy. It was beyond the scope of this essay to measure the thirteen hundred musical events in *Sequenza VII* and would probably require computer aided analysis. This does not take into account note or phrasing mistakes. So, this analysis method gives insight only on the quantitative aspect of the expression of the time increments with regards to their ideal and intended duration and not on the qualitative aspect of the musical performance in general. It is interesting to note that with this method, the Christ Church performance (perf. two) is the least accurate, yet it is musically a better performance (than perf. one) with fewer note, multiphonic and phrasing mistakes. Performance three is undoubtedly the most accurate with regards to the temporal layout. Because of the process undergone and all the knowledge gained about the structures present in *Sequenza VII*, it is the most solid and satisfying performance in all aspects.

Chapter 7

Conclusion

‘A good analysis is indeed a sort of performance, and the ultimate test for its value is what George Steiner defined as ‘the fourth stage’ of the ‘hermeneutic motion’: the return to the text, the restitution of its original voice after its ‘grammar’ has been attacked, penetrated and appropriated. When such grammar has no pre-established common grounds or rules—like those that govern tonal, modal or strictly serial music—he or she who ‘performs’ the reading needs to construct their own analytical tools in order to penetrate the text according to its nature. This, of course, is a sort of an open-ended hermeneutic circle, but it is precisely within such a circle that a truly creative and insightful interpretation may take shape’[54].

7.1 Introduction

It is undoubtedly challenging, when approaching *Sequenza VII*, apart from the intrinsic virtuosic character, to be consistent in the accurate expression of the time increments and to comprehend the structure given the visible duality between the conventional notation sections, and those in proportional writing. The impetus of this study was driven by a need to find a method of performing these unusual time increments to be as close as possible to the composer’s intent *vis-à-vis* the temporal grid, which underscores the overall structure of the piece. Furthermore, an objective of the research was to explore the physical spaces between the note-heads in the sections exhibiting proportional writing. This study offered a way of overcoming these difficulties and presented an ‘absolute’ interpretation within a broader context of the overall structure of the piece. The research was approached from an original perspective in that it used a variety of pulse combinations to achieve the desired outcome. Furthermore, I aimed to categorize all the bars in *Sequenza VII* into sets and layers in order to gain insight into the structure of the composition, which provides valuable knowledge for a just performance.

[54] Pecker Berio, T. 2007: 149.

7.2 Answering the research questions

Firstly, the secondary research questions are answered followed by the main research question. Secondary research questions related to the main research question are:

- How could an alternate temporal grid be calculated and created using the concept of pulse combinations?

The concept of combining various pulsations to express a variety of temporal increments was imagined as an alternative to the work done by Leclair (2000) in her published renotation of *Sequenza VII*. Her version (*Sequenza VIIa*) does not offer an exact calculation of rhythms made by measuring the physical spaces between note heads in the sections written in proportional notation. Therefore, I chose this alternative as it both yielded absolute precision with regards to the time increments containing decimals and measured these physical spaces. Thus, this method attempted to place the musical gesture within each unit or group of units in a structure of pulsation combinations; the goal was to reach for an ideal, 'absolute' interpretation. All the calculations for combinations of two pulsations were calculated with a simple formula found in chapter four. The musical phrases and gestures were then measured, and combinations of pulsations were assigned.

- How would an 'absolute' interpretation of the temporal grid and musical events within the work using the novel method of pulse combinations, aid the practice and performance of *Sequenza VII*?

The idea of an 'absolute' interpretation helped in my renewed approach of *Sequenza VII* in that it gave me a rigorous frame within which to relearn a familiar piece. This frame was fixed and the leeway very limited, if not non-existent; this austerity was necessary to be able to justify and start feeling a new embodiment of the composition. The concept of using pulse combinations proved very useful as it lent a feel of choreography to the practice and ultimately a new recording of *Sequenza VII* (performance three). Calculating all the possible pulse combinations was a laborious process, as seen in chapter four, but it was necessary to find the best combinations that would most faithfully represent the graphic positioning of the notes in Berio's score. In addition, dividing the workload along structural analytical criteria proved to be a very valuable way to both learn in a controlled environment and to gain insight and knowledge about the compositional structures of *Sequenza VII*. Finally, this method placed a lot of emphasis on the musical gestures within units and groups of adjacent units, thus placing the qualitative aspect of sound rendition in performance above a purely calculated and orthogonal matrix.

- In what way would this approach lead to a broader comprehension of the compositional structure of the piece aimed at a just interpretation?

This practice-based approach was designed with the purpose of dividing the engagement with the composition into smaller work batches. This led to the creation of sets and layers according to the analytical criteria found in chapter five. Approaching the composition in this manner led to rigorous and enjoyable practice sessions, building the whole back from the constituent parts. Furthermore, for each layer, time was taken to plot the units, spot trends and understand the function of the units grouped according to the chosen criteria. Knowledge gained through personal exploration can only benefit the comprehension of one's relation to a given score; and thus, the interpretation and ultimately, the performance of the work.

The main research question guiding this study is:

- In what ways can a practice-based research approach to the temporal and compositional structures of Berio's *Sequenza VII* for oboe best reflect the composer's notation?

In essence, this study situates itself between a group of performances of *Sequenza VII* in 2013 and a recording done in 2017. The main issue was to find a way to create a learning and practice method that would enable a more exact sonorous representation of Berio's notational duality; between sections in conventional metered notation and sections in proportional/spatial writing. This need stemmed from a realization that this duality of musical notations created zones of more or less precision in the interpretation; the metered units feeling and being more secure and accurate. The sections in spatial notation, when done according to feeling, I noticed, would have a tendency to overshoot the intended durations. Furthermore, the understanding that the composition has a finite prescribed duration acted as a beacon to devise a method that would yield a result as close as possible to the composer's notation and intended temporal structure.

7.3 Limitations

As it stands, the method of learning *Sequenza VII* using combinations of pulsations in the sections written in proportional notation has proven to be valid. However, it does feel as though the assigning of pulses does sometimes overcomplicate the desired choreography. For example, some of the columns lasting 1.3 seconds could be approximated with a single pulsation at 46 bpm. One pulse at 46 bpm equates to 1.304 seconds so such a small discrepancy of four thousandth of a second could be considered negligible, even though it goes against the rules of this interpretation. Likewise, the column worth 2.7 seconds can be approximated playing two pulses at 45 bpm (although 2,7 seconds is closer to 44 bpm, 22,2° bpm) it is better to have a slightly quicker pulse as it has been shown that the natural tendency is to slightly overshoot the intended time increments. Two beats at 45 bpm amounts to 2,6° seconds whereas two beats at 44 bpm equals 2,72° seconds. Of course, human error and the sheer smallness of these values makes this quite irrelevant when taking a broader view but it was necessary to push the logical and methodological exploration of my 'absolute' interpretation to its conclusion. Furthermore, within the pulse combinations, when the musical gestures have been rethought as triplets, septuplets and so forth, on many occasions, the pulsation is too fleeting to be able to effectively hear and perform the tuplet figuration. However, this inability to be absolutely precise in the proportional notation ultimately does justice to this notation. This leads to the concept of meaningful inexactitude as proposed by Ferneyhough (In Redgate, 2007b, 145) where the final emphasis should be placed on the qualitative aspects of performance rather than on the empirical and 'absolute' rendition of the temporal structure.

7.4 Future research

Future endeavours with this research would be real-time audio analysis and processing using an appropriate computer program which would be able to analyse the performance in real time and give overall and local inaccuracy values with regards to the temporal structure immediately after the recording. This would enable the performer to remember the feel of the performance while interpreting the quantitative data. Additional future work that needs to be done on my interpretation of *Sequenza VII* would be simplifying the grid as mentioned in the limitations and thus also the click-track. The idea would be to end up playing the piece as a choreography of alternating pulses lending a theatrical aspect to the performance, an ideal that would undoubtedly satisfy the composer. Berio's *Sequenza VII* deserves ultimately to be performed from memory, to liberate the performance and performer from the constraints of the written text and all the semiotics culturally attached to it. This would lead to an interpretation based solely on the musical phrases and gestures; the text and temporal structures having been ingrained. The concept of applying the method of pulse combinations could be used as a tool to approach rhythmically complex music as presented in appendix 4 (p.138) when the writing contains nested tuplets. It could possibly also inspire composers to use the method of having a choreography of pulses which would have the same effect as layers of rhythmic complexity.

7.5 Concluding comments

As a response to the thesis statement of this research; throughout this study, Berio's *Sequenza VII* went through a hermeneutic intellectualization process of dismembering and reassembling. The whole was separated into its constituent parts, analysed and reassembled. This iterative process, through the categorization of all the units and the assigning of pulse combinations, led to a deeper comprehension of the temporal and compositional structures found within the composition. With regards to the opening quote of this chapter, I do not presume that my interpretation of Berio's *Sequenza VII* is truly creative and insightful in a broad sense. However, on a personal level, this was the necessary lens for me to take my performances of the composition to another level of knowledge and embodiment. Furthermore, this study cannot be seen as a prescriptive interpretation as *Sequenza VII* needs to remain in the fluid realm of the duality of notations and performances should always be done from the original score. Lastly, and this is the essence of the research that I undertook; Allesandrini (2007: 77) speaking about the necessary analytical efforts made by Holliger and Leclair in their approach to *Sequenza VII* posits that it could be seen as a failure of the notation that a performer is compelled to go through a process of renotation in order to give an accurate interpretation. I disagree as this process, however long it took, had as a result the transformation of the way in which I engage with a score. All the work done on *Sequenza VII* seems to have been instrumental in my transformation from a passive performer to an active interpreter. This will from now on influence my approach to any score and the interpretative decisions associated with it; this resembles Berio's ideal of a performer, who through the concept of intellectual virtuosity and knowledge, can place himself and his performances in a broader socio-cultural context and learns to transmit. As Griffiths (2005: 9) aptly remarks:

> 'The dialogue in which Berio has his virtuoso engage is much less with note-blackened texts than it is with their instrument and with themselves. The notes are there to activate the instrument and the performing persona, not the other way around'.

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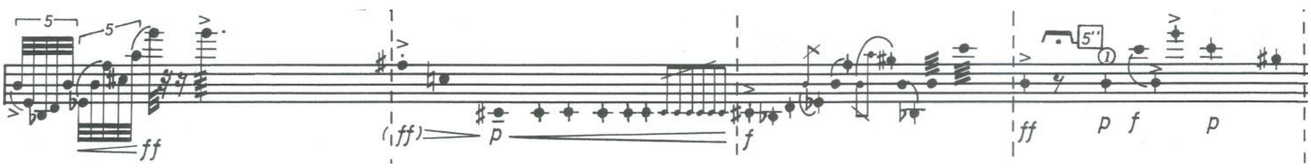
Appendix 1

Summary of pulse combinations

The following Table 41 provides a presentation of all the pulse combinations used for this interpretation and the way that space is divided within each unit. Each cell is split horizontally in three lines, the first line represents the pulse combination used, the second line shows where the beat is located, and the third line places the musical gesture into a rhythm fitting the graphic representation of the note-heads in the score. Divisions of the beat follow a simple progression: trip, quart, quint and so forth; 8plet and 9plet are also found. Grace-notes are abbreviated to *gn* and *rn* signifies real note. Acceleration events are marked with *acc* and *dec* for deceleration moments.

Table 41: Example for demonstration, units 10A-D

	A 3″	**B 2.7″**	**C 2″**	**D 2″**
10	60 (3)	40 + 50	120 + 40	200 + 60 (5) + 50
beat	/	/	1st gn B	rest – B *p*
div.	/	acc	trip – 32nd sext no 4 & quint124	32nd quart & trip 13



Unit 10A is straightforward and uses a pulsation of 60 bpm, the brackets are used exclusively with this pulsation and represent the number of beats, in this case, three. In unit 10B an acceleration event spanning 2.7″ can be seen, the table shows that the beat does not fall on any particular note, so the performer should make the event smooth with the pulse combination of 40 bpm plus 50 bpm. For unit 10C the beat lies on the first grace-note B, this is preceded by a triplet at 120 bpm. The second part of the unit uses one pulse at 40 bpm and is divided into one sextuplet omitting the fourth subdivision followed by a quintuplet sounding only the first, second and fourth subdivision. The last unit in this example has the beats on the rest and the B*p*. This time, the (5) represents the fermata and the table shows that the active part of the unit is divided rhythmically into a quartuplet followed by a triplet omitting the second subdivision. What follows overleaf is a fold-out page containing the complete Table 42:

Table 42: Summary of pulsations used in this interpretation

	A 3″	B 2.7″	C 2″	D 2″	E 2″	F 2″	G 1.8″	H 1.5″	I 1.3″	J 1.3″	K 1″	L 1″	M 1″
1	60 (3)	40 + 50	90 + 45	60 (2)	60 (2)	60 (2)	120 + 60 + 200	80 + 80	200 + 60	60 + 200	60	60	60
beat	/	/	B *pp*	rest	B *pp*	B *ppp*	B *f* – 2^{nd} last B	/	B	/	/	/	/
div.	2 of trip.	trip 13 – quint 2	8^{th}	8^{th} - 16^{th}	8^{th} – 16^{th}	8^{th}	quint – trip	sept 136	/	/	/	/	/
2	60 + 30	200 + 60+ 100+75	60 (2)	60 (2)	75 + 100 + 100	120 + 60 (6)	75 + 60	60 + 120	200 + 60	75 + 120	60	60	60
beat	2^{nd} gn B	B *f* – B *pp* – B *mf*	/	gn B *ff*	gn *f* – gn *mf*	B *ppp*	B	B*f*	C	/	/	/	/
div.	sext 146 – trip 13	quint 124	/	8^{th}	/	8^{th}	/	/	/	/	quint 125	trip 12	/
3	60 (3)	40 + 50	60 (2)	75 + 50	60 (2)	60 (2)	75 + 60	40	60 + 200	200 + 60	60	120 + 120	60
beat	/	B	/	gn C	gn D	/	2^{nd} gn B	/	/	gn B	/	/	/
div.	/	16^{th}(acc) – 8^{th}	trip rn	$8^{th}16^{th}$ – 9^{plet} gn 135 rn 9	quint 1 gn 2 rn 35	/	8^{th} rn	/	/	/	8^{th}	trip 12	/
4	60 (3)	60 + 60 (6) + 63	60 (2)	60 (2)	75 + 50	50 + 75	100 + 50	50 + 200	60 + 200	75 + 120	60	60	60
beat	/	B *ppp* – gn B	gn B	B*ppp*	gn F#	A *p*	2^{nd} rn C	gn F	gn A	F#	/	/	/
div.	/	trip 12	trip 1 G# 3 – 8^{th}	quint 14 – $8^{th}16^{th}$	quint 124	9plet 13	quint 14	8plet	16^{th} 124	16^{th} (acc)	/	16^{th} 4	/
5	72 + 72 + 45	50 + 40	60 (2)	60 (2)	60 (2)	60 (2)	60 + 75	40	200 + 60	120 + 75	100 + 150	60	60
beat	D*b* – 1^{st} E rn	gn B *pp*	/	/	/	/	/	/	/	4^{th} D	rn B *f*	/	/
div.	trip (acc) – 12plet 5 held	9plet 13 gn 47 – 9plet 19	/	/	/	8^{th} – 16^{th}4	8th	quint 123	/	dec	16^{th} (acc)	sext 3 held	/
6	60 (3)	40 + 50	50 + 75	60 (2)	60 (2)	60 (5)	100 + 50	40	60 + 200	60 + 200	60	60	60
beat	/	/	D	/	/	/	1^{st} E*b* *f*	/	last E	gn D	/	/	/
div.	sext 6	/	8^{th} trip 16^{th} – trip	/	/	/	sext 4 held	quint 3 early	trip 13	trip 13	sext 123	trip rn	/
7	60 (3)	40 + 50	30	60 (2)	30	40 + 120	100 + 100 + 100	65 + 104	60 + 200	200 + 60	60	60	96 + 160
beat	/	5^{th} E	/	/	/	B*b*	E*b* – 5^{th} B	C	gn B*b*	/	/	/	rn B
div.	/	quint (acc) – acc	quint rn	quint 123 held	dec	16^{th}	quint	trip	acc	/	acc	8^{th}	/
8	60 + 40 + 60 (5)	40 + 50	60 (2)	60 (2)	40 + 60	30	40 + 200	40	120 + 75	120+75	60	60	60
beat	rn C	1^{st} gn B	2^{nd} rn B	/	2^{nd} rn A	/	gn B	/	gn D	B*b*	/	/	/
div.	/	acc – dec	quint 1345 – 4 32^{nd} & 8^{th}	/	/	dec	8^{th}	quint rn	trip 13 – trip dec	trip13 – trip 12 dec	/	/	/
9	60 (3)	120 + 60 + 50	66 + 55	60 (2)	45 + 90	75 + 50	60 + 75	104 + 65	200 + 60	200 + 60	60	60	60
beat	/	/	gn F#	/	G	gn F#	E*b*	A	/	/	/	/	/
div.	/	16^{th} 124	16^{th} 2	F° is upbeat	sext 134 rn – trip	/	quint 14	/	/	/	/	/	/
10	60 (3)	40 + 50	120 + 40	200 + 60 (5) + 50	120 + 80 + 80	60 (2)	60 + 75	40	75 + 120	75 + 120	60	60	60
beat	/	/	1^{st} gn B	rest – B *p*	1^{st} F# – 1^{st} A	/	/	/	A	gn B	/	/	/
div.	/	acc	trip – 32^{nd} sext no 4 & quint 124	32^{nd} quart & trip 13	quint 134 – 8^{th} & trip 16^{th} – acc	8^{th} trip 12	/	/	/	sext 146 – 8^{th}	sext 1234	/	/
11	60 (3)	60 + 120 + 50	60 (2)	60 (2)	60 + 240 + 60 (5)	120 + 60 + 120	60 + 75	80 + 80	60 (4)	60 + 200	60 (3) + 160	60	60 (5) + 120
beat	/	gn B – B *p*	/	/	/	/	/	2^{nd} C	/	/	/	/	/
div.	/	8^{th} – 8^{th}	/	/	/	sept	quint 34	quint no 2 – sext	/	trip 12	/	/	/
12	60 (3)	60 (3) + 40	60 (2)	60 (4)	60 (3)	60 (6)	120 + 60 (4)	80 + 80	60 + 200	60 + 200	60 (5)	60 (6)	60
beat	/	/	/	/	/	/	/	E*b*	last B	rn F	/	/	/
div.	/	/	/	/	/	/	/	quint	quint	quint14	/	/	/
13	60 (3)	60 (4) + 150 + 200 + 60 (3)	60 (3)	60 (2)	60 (7)	60 (2)	60 + 240 + 60 (2)	60 (8)	240 + 120 + 60 (2)	60 (6)	60	120 + 60 (5)	60 (6)
beat	/	Gn B – F	/	/	/	/	/	/	rn B – C#	/	/	/	/
div.	/	/	/	/	/	/	/	/	/	/	/	/	/

Appendix 2

The golden ratio as applied to *Sequenza VII*

Berio mentions (In Stoïanova, 1985: 436) that the piece is built around the golden mean or divine proportion 'Φ' (Phi, in minuscule φ) found in nature and used extensively in architecture and art since antiquity for its harmonious and aesthetically pleasing qualities. In a linear context this division implies that the articulation of the golden proportion would separate the temporal line in two: section *a* and section *b* where $a > b$. The golden proportion implies that the relation of the whole ($a + b$) to the greater part (a) is the same as that of the greater part (a) to the smaller part (b). The numerical value of this proportion is obtained with $(\sqrt{5}+1)/2$ and is approximately equal to 1.618. Indeed, all the scholars who analysed this piece agree that the statement of the last pitch in the 'series'[55], namely G6 (unit 9E) marks the last phase of development before the climax (unit 10F) and a gradual unwinding of the piece from thereon. From this, they infer the division according to the golden section which they place on the G6 *ff* in unit 10F. The calculation that follows in Equation 10 is done with the total length of the composition being 414.8″, the result the most agreed upon by scholars. This result is obtained by using the first method of calculation as explained in chapter 4 (p.51).

Equation 10: Calculation of the golden section for a total duration of 414.8″

$$\frac{a+b}{a} = \frac{a}{b} = \varphi$$

$$\therefore \frac{414.8}{a} = \frac{1+\sqrt{5}}{2}$$

$$\therefore a = \frac{414.8}{\frac{1+\sqrt{5}}{2}}$$

$$\therefore a$$

$$= 256.3604985$$

[55] Primary series as named by Strum (2012: 11), restatements in different octaves and enharmonics will follow until unit 13E (see chapter 5, p.74)

Therefore, according to this method, the articulation of the golden mean situates itself at the 256.36″ point in the timeline of the composition. Table 43 below will plot this unit and other relevant ones in a matrix lasting 414.8″:

Table 43: Timeline of composition, golden mean and other relevant units

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	0-3	5.7	7.7	9.7	11.7	13.7	15.5	17	18.3	19.6	20.6	21.6	22.6
2	25.6	28.3	30.3	32.3	34.3	42.3	44.1	45.6	46.9	48.2	49.2	50.2	51.2
3	54.2	56.9	58.9	60.9	62.9	64.9	66.7	68.2	69.5	70.8	71.8	72.8	73.8
4	76.8	85.5	87.5	89.5	91.5	93.5	95.3	96.8	98.1	99.4	100.4	101.4	102.4
5	105.4	108.1	110.1	112.1	114.1	116.1	117.9	119.4	120.7	122	123	124	125
6	128	130.7	132.7	134.7	136.7	142.7	144.5	146	147.3	148.6	149.6	150.6	151.6
7	154.6	157.3	159.3	161.3	163.3	165.3	167.1	168.6	169.9	171.2	172.2	173.2	174.2
8	182.2	184.9	186.9	188.9	195.9	197.9	199.7	201.2	202.5	203.8	204.8	205.8	206.8
9	209.8	212.5	214.5	216.5	218.5	220.5	222.3	223.8	225.1	226.4	227.4	228.4	229.4
10	232.4	235.1	237.1	244.1	246.1	248.1	249.9	251.4	252.7	254	255	256	257
11	260	262.7	264.7	266.7	273.7	275.7	277.5	279	284.3	285.6	289.6	290.6	296.6
12	299.6	305.3	307.3	312.3	316.3	323.3	329.1	330.6	331.9	333.2	339.2	346.2	347.2
13	350.2	359.9	363.9	365.9	374.9	376.9	380.7	390.2	393.5	400.8	401.8	407.8	414.8

Statement of G6, last pitch
Climax of composition on G6*ff*
Sustaining of G6
Articulation of golden proportion

Therefore, according to the first method of duration calculation, the golden proportion is articulated one third of a second into unit 10M and not in unit 10F, where is found the agreed upon climax of the composition. According to this timeline it should happen at the 246.35″ mark (10F has a 16th note at 60 bpm before G6); a full ten seconds earlier.

Next, the same process will be followed in Equation 11 using the result of the second and more accurate method of duration calculation of *Sequenza VII* (chapter 4, p.52). This method yielded a total length of 390″ for the piece.

Equation 11: Calculation of the golden section for a total duration of 390″

$$\frac{a+b}{a} = \frac{a}{b} = \varphi$$

$$\therefore \frac{390}{a} = \frac{1+\sqrt{5}}{2}$$

$$\therefore a = \frac{390}{\frac{1+\sqrt{5}}{2}}$$

$$\therefore a = 241.0332556$$

Therefore, the linear articulation of the golden proportion finds itself right at the 241.03″ mark in the timeline of the piece, according to the second and more accurate calculation method. Table 44 overleaf plots the same relevant units as the previous table:

Table 44: Timeline of composition and golden ratio

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	0-3	5.7	7.7	9.7	11.7	13.7	15.5	17	18.3	19.6	20.6	21.6	22.6
2	25.6	28.3	30.3	32.3	34.3	40.8	42.6	44.1	45.4	46.7	47.7	48.7	49.7
3	52.7	55.4	57.4	59.4	61.4	63.4	65.2	66.7	68	69.3	70.3	71.3	72.3
4	75.3	83.25	85.25	87.25	89.25	91.25	93.05	94.55	95.85	97.15	98.15	99.15	100.15
5	103.15	105.85	107.85	109.85	11.85	113.85	115.65	117.15	118.45	119.75	120.75	121.75	122.75
6	125.75	128.45	130.45	132.45	134.45	139.45	141.25	142.75	144.05	145.35	146.35	147.35	148.35
7	151.35	154.05	156.05	158.05	160.05	162.05	163.85	165.35	166.65	167.95	168.95	169.95	170.95
8	178.45	181.15	183.15	185.15	191.65	193.65	195.45	196.95	198.25	199.55	200.55	201.55	202.55
9	205.55	208.25	210.25	212.25	214.25	216.25	218.05	219.55	220.85	222.15	223.15	224.15	225.15
10	228.15	230.85	232.85	239.35	241.35	243.35	245.15	246.65	247.95	249.25	250.25	251.25	252.25
11	255.25	257.95	259.95	261.95	268.2	270.2	272	273.5	277.5	278.8	282.175	283.175	288.675
12	291.675	296.175	298.175	302.175	305.175	311.175	315.675	317.175	318.475	319.775	324.775	330.775	331.775
13	334.775	342.475	345.475	347.475	355.475	357.475	360.725	368.725	371.475	377.475	378.475	383.975	390

Statement of G6, last pitch
Climax of composition on G6 *ff*
Sustaining of G6
Articulation of golden proportion

In this grid it can be seen that the articulation of the golden proportion is almost where it should be, in fact it is just 0.57″ too early. This realization corroborates the fact that the calculation of the total duration of *Sequenza VII* according to the second more accurate method is correct.

Appendix 3

The ‘click track’

The following tables presents and resumes all the time increments required to make a click track according to this prescriptive interpretation. The last numerical value in each cell represents the overall elapsed time since the beginning of the piece and is consequently the beginning time value of the following unit. Table 45 below is an example meant to explain how to interpret these values:

Table 45: Example for demonstration, units 1A-D, using Garage Band

	A 3″	**B 2.7″**	**C 2″**	**D 2″**
1	3	4.5/5.7	6.367/7.7	9.7

Unit 1A naturally spans three seconds from 0-3″ and since there is only one value in the cell it suggests that the core pulsation of 60 bpm is kept throughout. Unit 2B displays two numerical values, therefore it follows that there is a pulsation combination, it lasts from 3″-5.7″ with a beat happening at 4.5″. Therefore, the unit worth intrinsically 2.7″, is divided into a 1.5″ section then one lasting 1.2″; in terms of pulsations this would give 40 bpm and 50 bpm (see Table 42, p.130). Likewise, for unit 1C lasting for 2″ between 5.7″-7.7″, with a beat at the 6.367″ time mark (technically 6.36°″). For the click track, when need be, values are rounded off to the closest thousandth of a second. This can only happen within a unit; the start and end times of each unit are absolute. This implies a pulse combination of 90 bpm and 45 bpm (see Table 42, p.130). The last unit is straightforward and lasts 2″ at 60 bpm.

Another possible way of making a functional ‘click track’ is to use a musical edition program such as Finale and to write a score with one percussion track containing two hundred and eighty-one bars (if following the summary of pulse combinations found in appendix 1). This track will have frequently changing time signatures and each bar needs to be assigned a tempo in bpm manually. Table 46 on the next page is an example to illustrate this method:

Table 46: Example for demonstration, units 1A-D, using Finale

	A 3″	B 2.7″		C 2″		D 2″
1	3/4 60 bpm	1/4 40 bpm	1/4 50 bpm	1/4 90 bpm	1/4 45 bpm	2/4 60 bpm

Table 47 overleaf contains all the necessary timings to make the click track:

Table 47: Summary of timings for ‘click track’

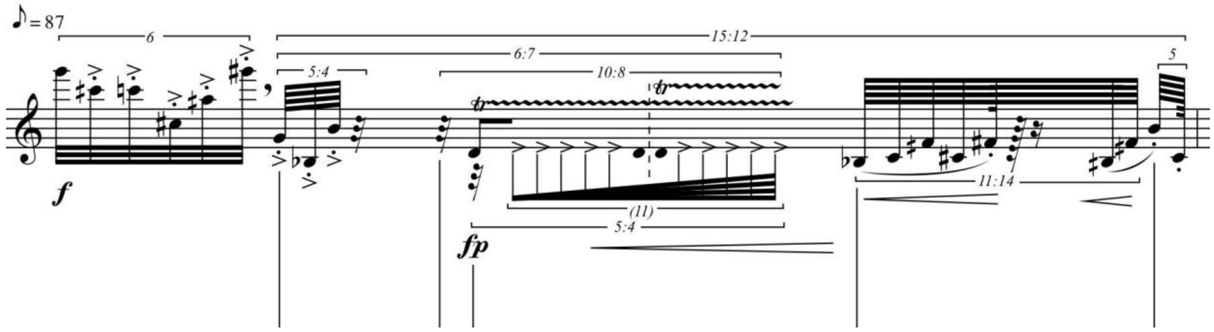
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	3	4.5/5.7	6.367/7.7	9.7	11.7	13.7	14.2/15.2/15.5	16.25/17	17.3/18.3	19.3/19.6	20.6	21.6	22.6
2	23.6/25.6	25.9/26.9/27.5/28.3	30.3	32.3	33.1/33.7/34.3	34.8/40.8	41.6/42.6	43.6/44.1	44.4/45.4	46.2/46.7	47.7	48.7	49.7
3	52.7	54.2/55.4	57.4	58.2/59.4	61.4	63.4	64.2/65.2	66.7	67.7/68	68.3/69.3	70.3	70.8/71.3	72.3
4	75.3	76.3/82.3/83.25	85.25	87.25	88.05/89.25	90.45/91.25	91.85/93.05	94.25/94.55	95.55/95.85	96.65/97.15	98.15	99.15	100.15
5	100.983/101.817/103.15	104.35/105.85	107.85	109.85	111.85	113.85	114.85/115.65	117.15	117.45/118.45	118.95/119.75	120.35/120.75	121.75	122.75
6	125.75	127.25/128.45	129.65/130.45	132.45	134.45	139.45	140.05/141.25	142.75	143.75/144.05	145.05/145.35	146.35	147.35	148.35
7	151.35	152.85/154.05	156.05 (1)	158.05	160.05 (1)	161.55/162.05	162.65/163.25/163.85	164.773/165.35	166.35/166.65	166.95/167.95	168.95	169.95	170.95
8	171.95/173.45/178.45	179.95/181.15	183.15	185.15	186.65/191.65	193.65 (1)	195.15/195.45	196.95	197.45/198.25	198.75/199.55	200.55	201.55	202.55
9	205.55	206.05/207.05/208.25	209.159/210.25	212.25	213.583/214.25	215.05/216.25	217.25/218.05	218.627/219.55	219.85/220.85	221.15/222.15	223.15	224.15	225.15
10	228.15	229.65/230.85	231.35/232.85	233.15/238.15/239.35	239.85/240.6/241.35	243.35	244.35/245.15	246.65	247.45/247.95	248.75/249.25	250.25	251.25	252.25
11	255.25	256.25/256.75/257.95	259.95	261.95	262.95/263.2/268.2	268.7/269.7/270.2	271.2/272	272.75/273.5	277.5	278.5/278.8	281.8/282.175	283.175	288.175/288.675
12	291.675	294.675/296.175	298.175	302.175	305.175	311.175	311.675/315.675	316.425/317.175	318.175/318.475	319.475/319.775	324.775	330.775	331.775
13	334.775	338.775/339.175/339.475/342.475	345.475	347.475	355.475	357.475	358.475/358.725/360.725	368.725	368.975/369.475/371.475	377.475	378.475	378.975/383.975	390(389.975)

Appendix 4

A possible application of pulse combinations: nested tuplets

Some modern composers use complex rhythmic layering in a bid to diffuse the feeling of a recurring pulsation. Each bar has to be meticulously scrutinized and deconstructed to have an idea where the pulse is lying. From the second layer onwards, the original pulse is lost and reference to it seems pointless since it would also not account for the musical gestures present. What would make these gestures take on a coherent shape would be a combination of pulsations that could possibly be useful for performers as a means to deal with this complex rhythmic layering. In Example 39 below, which is particularly complex, the musical events in the bar are delineated with vertical lines:

Example 39: Roger Redgate's *Ausgangspunkte,* bar 5 of page 10[56], the bar is in 4/8 time



<table>
<tr><td>(1) 8^{th} at 87 bpm</td><td colspan="5">(3) 8^{th}'s at 87 bpm divided into (15) 32^{nd} notes in the space of 12</td></tr>
<tr><td></td><td colspan="3">(6) 32^{nd} notes in the space of 7—62 bpm</td><td colspan="2">(8) 32^{nd} notes—55bpm</td></tr>
<tr><td></td><td>(5:4) 64^{th} notes—186 bpm</td><td colspan="2">(10:8) 64^{th} notes—93 bpm</td><td>(11:14) 64^{th} notes—62 bpm</td><td>**</td></tr>
<tr><td></td><td></td><td>*</td><td>(5:4) 32^{nd} notes—116 bpm</td><td colspan="2"></td></tr>
</table>

* (1) 32^{nd}— 466 bpm

** (1) 32^{nd}— 435 bpm

It can be seen that there are four layers of increasing complexity and that it is indeed possible to assign pulsations to the fractions of the original tempo of 8^{th} note at 87 bpm. However,

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56 In Redgate (2007: 146). I have taken this bar from the article with one change: in the penultimate musical gesture, where I have written a 16^{th} note rest, the original has an 8^{th} note rest.

these pulsations are often approximative; as an example, the 6:7 subdivision to which was assigned a pulse of 62 bpm. When doing the calculation, the correct answer is a pulse at 62.142857 bpm, therefore it is rounded to the nearest whole number: 62. Each layer thus adds a measure of temporal inexactitude in this manner, yet I believe that the final discrepancy is marginal and this method is worthwhile.

If I were to play this measure, I would combine the following pulses: 1st 87 bpm followed by 186 bpm, then 93 bpm and the last section would be practiced at 62 bpm for the 11:14 snippet but performed with a pulse at 55 bpm to incorporate the last gesture. The pulsations of 466 bpm and 435 bpm are not useful as they are too fleeting. Using these pulsations would make the total duration of the bar be 2.748″ undershooting the required duration by one hundredth of a second. The amount of work that this type of music requires is staggering when it is realized that the above example lasts a mere 2.758″ and thus has an average speed of 12.2 nps (counting rests as well). The musical gesture on the D with eleven diaphragm accents (slower than tonguing) goes by at an impossible 26.7 nps without the acceleration. Figure 3 below illustrates the relations between the layers and shows that the original beat is quickly lost.

Figure 3: Representation of the position of the beats and subdivisions from the example above