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Toward Perpetual Peace

A dissertation submitted to the University of Dublin for the degree of Doctor of Philosophy

Nélida Béjar

2012

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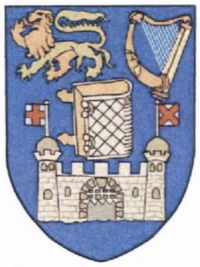

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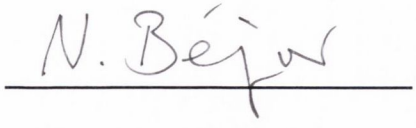

Nélida Béjar

Summary

This is a thesis for the degree of Doctor of Philosophy in music composition. In the opening part (A), I comment on my musical background, environment and influences, including a shorter comment on the orchestra piece *Kilter* as an example for an earlier, non-staged, instrumental piece. The main part (B) consists of the comment and analysis of the music theatre *Toward Perpetual Peace* (original German title: *Zum Ewigen Frieden - Ein Abgesang*), a "staged requiem" written and performed in 2010.

In the first section of this main part, I explain the subject of the performance, as well as its general premises. In the second section, I speak about the external factors of the production, the practical challenges, and the creative process. These are important elements for the music theatre piece itself due to the fact that the unusual external conditions were artistically justified, having an essential influence on the final product.

In this project, the music and the scenography are intimately related to each other, aesthetically as well as in terms of the content, making each of these two elements incomprehensible without the other. This is why, in the third section, I describe the different elements of the theatrical part of the piece, including a paraphrase of the action on stage.

The fourth and longest section of the main part is dedicated to the music of the performance. After describing the handling of the various sound sources – the instrumental ensemble, the children's choir and the sounds produced by the actors – I conduct a detailed analysis of the harmonic system. The different influences and reflexions for the creation of the harmonic system are treated, and the system created for *Toward Perpetual Peace* is described. This is followed by a motivic analysis of the piece. The last two sections of the musical part are about the rhythmics and the electronic processing. Finally, I treat the formal structure of the piece, the correspondence between music and scenography, and make a general comment on the piece's aesthetics.

In the conclusion (C), I try to define and contextualise the musical style of my most recent work, on the base of the preceding analysis.

Acknowledgements

I am very grateful to my teacher Donnacha Dennehy for having opened to me a whole new and refreshing musical world.

I thank Linda Buckley, who has been a great support during the years at Trinity College.

I thank Björn Potulski, with whom I am developing a common vision. It is thanks to him that I am composing music theatre. With his unbelievable stamina and his endless ideas, he makes the most impossible projects, such as *Perpetual Peace*, really happen.

Finally, I thank my parents for all their help.

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Figures 2 - 29 and 34: Photo courtesy of Pascal Ehrhardt

List of Enclosed Material

The following material is enclosed to this thesis:

- *Toward Perpetual Peace*, DVD (video recording of one full performance).

- CD containing the Pd-patch programmed for *Toward Perpetual Peace* and a MIDI mock-up of *Kilter*.

A. Introduction

I. Personal musical background and aesthetic position

Composing music has been an important occupation of mine for as long as I can remember. As a child, I used to write down little pieces that I invented on a child's metallophone. They were comparable to children songs, with the level of originality varying. When I started playing piano, I wrote piano pieces, and, in some cases, even pieces for a larger instrumentation, copying the styles of pieces I played. At the beginning, of course, I had not been in contact with contemporary music and, as a child, I never saw a link between style and the sense of belonging to one specific period of time: as far as I could see, we in our times seemed to regard every style as ours, at least when it came to the matter of musical interpretation. Nevertheless, I soon became very interested in the classical modern period, the compositions of Bartók, Stravinsky, and Prokofiev in particular. When I first came into contact with contemporary music – probably in secondary school – I hated it: my impression was that the music was most often completely incomprehensible, and that this was deliberately and artificially intended. I also missed the sense of pulse and rhythm. In addition, I sensed within this music scene a great arrogance towards all kind of music labelled "popular", an attitude with which I have never sympathised.

The idea that certain musical styles are inherently superior to others, shared by an important contingent of classical composers in the 1990s – illustrated, for instance, by Sockhausen's advice to Aphex Twin: 'I think it would be very helpful if he listens to my work [...]. Because he would then immediately stop with all these post-African repetitions, and he would look for changing tempi and changing rhythms, and he would not allow to repeat any rhythm [...]'[1] – is something from which I suffered during that period of time. It has always been my belief that there cannot be a hierarchy among musical styles: as jazz musician and composer Steve Coleman states, every musical style is the expression of a culture and, since no one culture is superior to another, the same applies to musical styles. Stylistic predilections should be seen as a subjective choice, not as an objective value:

[1] D. Witts / N. Young, 'Advice to Clever Children', *The Wire*, November 1995.

'There is only the perspective of the person experiencing the music and what this person hears is largely shaped by his/her own experience.'[2]

These struggles strengthened my conviction not to study composition, although this had always been what I wanted to do. I started general music studies (a solid, wide-ranging course, in reality intended to educate future secondary school music teachers, which I never wanted to become) at the Munich Musikhochschule, and continued writing music, just for fun and for my friends, in various styles – most of them comparable to music of the early modern period. My music was characterised by extended, dissonance-enriched tonality and driving polyrhythms. Finally, after two years, encouraged by some of my conservatory teachers, I decided to give composition studies a try after all.

I came to Wilfried Hiller, an uncommon composer who did not much appreciate orthodox academic stylistic guidelines, and who was potentially open to every kind of music. For the rest of the environment, though, it soon became clear that there were clear rules that had to be followed if one hoped to be taken seriously as a composer, rules that I would subsume under the following criterium: contemporary music should not be emotionally accessible. German composer Heiner Goebbels gets to the heart of the problem that I felt when he says: 'It often puts me off when I get the feeling that a composer is trying to tell me with every note of a piece: "You won't be able to understand this at the first time." This is exactly the kind of arrogance with which I reproach a great part of Modernism.'[3]

I became interested in the style of contemporary music coming from the Anglo-Saxon world, and in this context I would also count the Netherlands. The sort of composers I have here in mind include Louis Andriessen and Michael Gordon. The great energy inherent to this music, this sort of "European" post-minimalism, was what most fascinated me. In this period, I also started dealing with non-classical electronic music.

When I later moved to Paris after having finished my studies in Munich, I wanted to gain insight into the local new music world. I took classes with composer Philip Leroux. There of course, the contemporary music that attracts the most attention stands in a clear French

---

[2] Steve Coleman, 'What M-base is', at his homepage http://www.m-base.com/mbase_explanation.html (accessed 6/8/2011).

[3] Martin, Christopher, interview with Heiner Goebbels about the theatre "Schwarz- Weiß", in *Heiner Goebbels- Texte und Interviews*, Alexander-Verlag, 1999 (translation from German: N. Béjar).

spectralist tradition. Although spectralist harmonical approaches interest me very much, I found the social context of contemporary music in Paris quite similar to that in Germany: again, I felt a sort of arrogance towards every kind of music outside of this niche. The IRCAM seemed almost like a temple, and Western European intellectual heritage a heavy burden to carry.

In 2006, I attended the 12th Young Composers Meeting in Apeldoorn (The Netherlands), where Donnacha Dennehy and Richard Ayres, amongst others, where teaching. I was glad to see that a different new music landscape existed. First of all, there was a freshness, an open-mindedness and lack of bias that I found very sympathetic. Also, I became a fan of Dennehy's energetic, not so consonant, post-minimalist music. I was glad to get the chance to study with him at Trinity College. During the period of time before my studies in Dublin, I had written various pieces for mixed ensembles, always searching among the very different stylistics that I had been in touch with. Then, around 2005, I moved towards a less classical direction and started using samples, "found sounds", and learning how to process sounds and instruments electronically. During the first years, I used ready-made plug-ins and various software programmes to do this. It was only around 2008 that I started programming myself in the Pure Data environment.

The semantic / verbal aspect is something I have always missed when writing purely musical works. I find it regrettable that concrete thoughts, ideas and experiences, which occupy a central place in our lives, are not translatable into music. This is why I was interested in using texts, integrating film elements, and making music for theatre.

In 2007, I started composing stage music for theatre projects of director Björn Potulski. With the performance piece *EXODUS*, with which we toured around Europe in 2008, the music became a central element of the theatre, almost converting it into a sort of spoken opera. We thus decided to continue our cooperation, and to develop our own personal music theatre style.

With the founding of the *undercoverfiction ensemble* for new music and music theatre in 2009, we established a foundation stone for future work: starting with a group of interested, professional, very young musicians, we intend to develop an increasingly stable, well working team over the coming years. The aim of the ensemble is to become a new music band familiar with things such as staged concerts, music theatre, improvisation and

the use of electronics and amplification, in order to work on a non-academic, style-crossing modern aesthetics.

II. Aims and methodology

The aim of this thesis is to present my compositional work in the form of a large scale piece, in order to examine the composition techniques applied and their influence on the stylistic and to analyse and define the principal personal characteristics of the music I write and to contextualise them.

Before I concentrate on the main composition of this thesis, the music theatre *Toward Perpetual Peace* which I composed in 2010, I will shortly present *Kilter*, an orchestra piece written in 2006, as an example of previous work (section A.III).

Kiter is an instrumental piece in which I explored a new way of composition, creating a very complex orchestral texture in a purely rational-mathematical way, and then working with this mass like a sculptor would work with a piece of stone, removing parts to reveal a certain shape, instead of composing in an additive way, as would be the more common approach. This composition had an influence on the way I wrote the pieces that came after.

As opposed to *Kilter*, in *Toward Perpetual Peace* the music is necessarily linked to a semantic, visual content. The working process comprised many more elements than just the composition of the music, elements that, in turn, certainly had a great influence on the musical ideas and on the stylistic and aesthetical result. For that reason, I will first write about the preparation of the piece, the rehearsal process, and the people involved (section B.II). The following part (B.III) treats the visual / theatrical part of the performance.

In the section dealing with the music (B.IV), I conduct a detailed analysis of the musical material, especially of the harmonics of the piece. Through this analysis, I try to find a stylistic position for my music, which is one of the things I find most difficult as a composer. I am influenced by very different types of music: a (of course not exhaustive) list of my preferred composers and musicians would include J.S. Bach, Franz Schubert, Igor Stravinsky, Pink Floyd, Morphine, Camarón de la Isla, György Ligeti, George Crumb, Fausto Romitelli, Louis Andriessen. Like many other contemporary composers, I try to

develop a personal sound, more than following one particular tradition. A close description of the musical working methods, as opposed to formulating aesthetical ideals, will be the best way to describe the type of music I write.

III. Example for precedent work: *Kilter*, for orchestra

1. Instrumentation and motivation

Kilter is a piece for orchestra composed in 2006. The instrumentation is:

2 Flutes
2 Oboes
2 Clarinets in Bb
Bass Clarinet (the player switches to Clarinet in Bb in some sections)
2 Bassoons
4 Horns
2 Trumpets in Bb
2 Tenor Trombones
Bass Trombone
Tuba
Percussion (drum kit and a classical bass drum)
22 Violins
7 Violas
6 Cellos
4 Double basses

It was clear from the beginning that every single player, including the strings, should play an individual line. This was in part motivated by the political conviction of preserving each musician's individuality, an idea that usually gets lost in orchestra practice. The aesthetic intention, the visual inspiration of this piece, was to create an odd, distant atmosphere, an empty landscape, a foreign, deserted world. The images that I associated with the music contradict the concept of individuality that I formulated in connection with the use of soloistic voices: the "sound clouds" created in *Kilter* are rather an expression of collective

anonymity. I wrote the piece in memory of my grandmother, and a driving idea was the transition she had witnessed during her life: from the rural, "primitive" world of her childhood into an alienating modern time, in which she got lost and, in my interpretation, under which she perished.

2. Short analysis

Kilter uses the material of an older piece, *Der Mond* (see score in the appendix), one of the *13 pieces for two violins*, that I wrote in 2001. *Der Mond* is a three minute piece: a slow diatonic melody with two almost homorhythmic voices. This melody is composed of short phrases with rests between them. It has a ternary rhythm in dotted crotchets.

I started *Kilter* with the idea of dividing the single phrases of the violin duo into the single orchestra strings, so that each of the strings plays one of the short motives as a loop, all of them starting simultaneously. At the beginning, everything is pizzicato. Since the phrases (and therefore the loops) have different lengths, the global sound is constantly moving. In order to make the rhythm more divided I took one quaver away from the rest at the end of every looped phrase; this way the loops no longer fit into dotted crotchet units, the accents of one voice in relation to another shift progressively, and after some time there is an almost equal amount of strings playing on every quaver. Only at the very beginning (bar 1 - 26) do the phrases have the original length, and only the notes on the beat are played, so that all the strings play a same constant beat of dotted crotchets, with accelerated interjections in crotchets.

This very systematic material was the starting point – I worked with it in a non-systematic way. After giving one phrase of the violin duo to each string player, starting with the high strings, there were still some violas and all the cellos and basses left. The same procedure was repeated as before for the remaining violas and the violoncellos, but choosing only the most low-pitched phrases of the violin duo, and transposing them one octave lower. The notes out of the range of the instruments were erased. This group of strings starts later, at bar 45.

The wind instruments play long notes, repeated notes, or repeated short motives. Only in some cases, on the brass, are these motives taken from the loop material. They play from

time to time, one to four players together, infrequently and briefly at the beginning and then more and more often and densely.

The basses and the percussion provide the beat. In the case of the basses it is done with note repetitions or with extracts of the loops in pizzicato.

The loops of the two string groups are manipulated in different ways throughout the piece, following a global but not linear development from the rhythmic, almost percussive, quiet initial sound towards a more dense, flat and loud mass with arco strings. The variations within the loops are the following:

1. Transpositions up or down a fifth, such as at bar 46 (down a fifth) or at bar 68 (up a fifth). Sometimes only one of the two string groups transposes its material, such as at bar 68, where the lower strings remain at the same pitch. The transposition can arrive progressively: each voice starts transposing when it comes to the end of its phrase, as is the case at bar 46, or at once, like at bar 68.

2. Metre shifts from 3:2 : the dotted crotchets become crotchets and the quavers triplet quavers, such as in bar 9 or bar 21. At bar 278 this process happens for the second time without having been inverted in between, so that the proportions between the rhythmic units at the beginning of the piece and the new rhythmic unit at bar 279 become 9:4. Here, before the process is repeated for the second time, a conversion of the note values takes place (the old crotchets being then notated as dotted crotchets), in order to simplify the notation. There is also the inversion of the shift 2:3, such as at bar 13, 28 or 322.

3. Tempo reduction to the half (bar 340).

4. Transitions to arco: the progressive appearance of single arco notes (first one note in every loop is bowed, later two, three etc. until all notes are bowed, such as at bar 168 et seq.), or abrupt changes back to pizzicato only (bar 244), and the other way around.

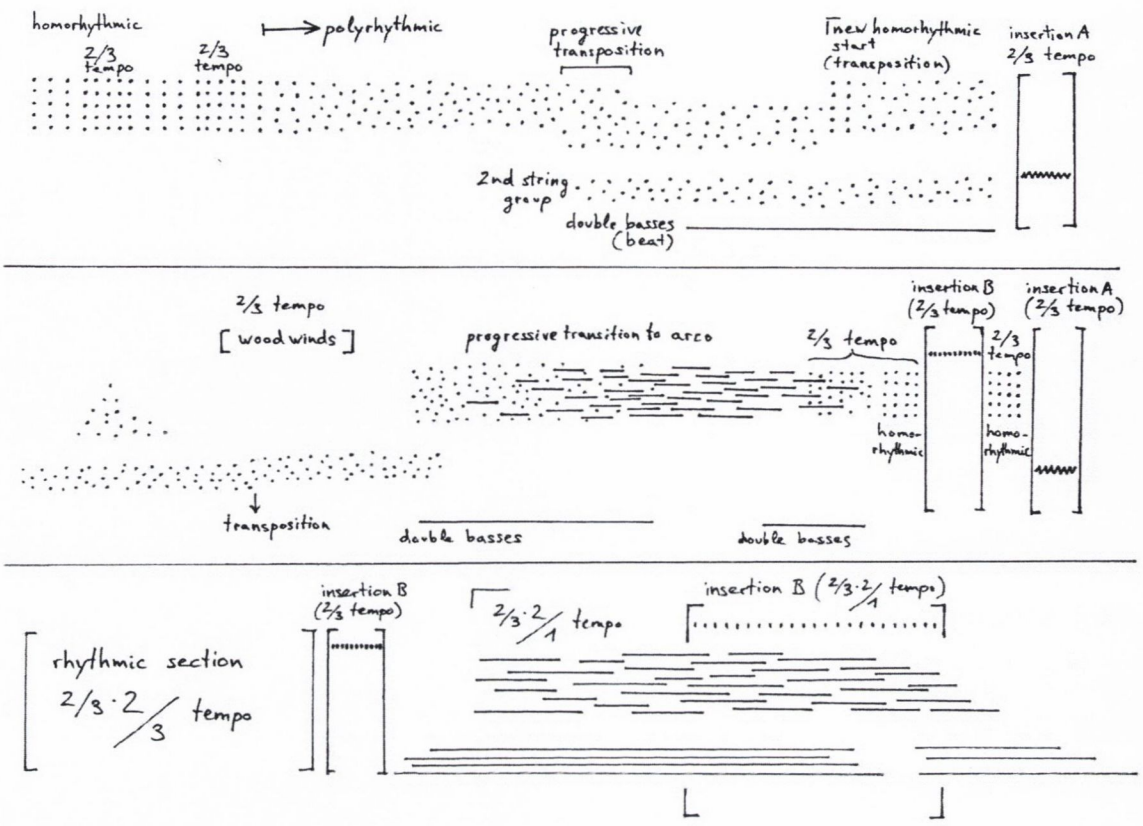


Fig. 1 Structure of Kilter

Most of my earlier pieces are written in a purely intuitive way, searching for sounds by hearing without many previously conceived principles. With this piece I tried for the first time a more global, constructive way of composing. Once the basic material was found as described, I worked with it in the way I would have worked in earlier pieces with a much smaller musical cell. This large-scale material allowed me to write a piece for a large instrumentation without losing track. Since the piece was drafted with the assistance of a sequencer program, my approach to it was a very graphical one, cutting or adding material sometimes in regard to the shapes on the screen, such as, for instance, a composed fade out in which the strings come to an end one after the other. For other parts, like the wind instruments, I returned to my usual, intuitive way of working, trying to find what would fit to the string sound and accentuate it in an almost improvisatory way.

This more global way of working has opened up a new musical perspective to me, and I used a similar approach in later pieces, such as for instance in the piece for piano and tape recording *that it was good*, or in the main piece discussed in this thesis, *Toward Perpetual Peace*.

IV. Kilter and Toward Perpetual Peace: stylistic connections

The departing line for the entire orchestra piece *Kilter* is a quite concise, pregnant melody in two voices, the violin duo. Split into short slices and processed in the way described, this initially very personal musical material transforms into a complex sound grid in which the individuality gets lost.

The loss of the individuality into a collective sound mass explored in *Kilter* is something that influenced my later work. This idea also paved the way for the music theatre *Toward Perpetual Peace*.

A great part of the musical material in this music theatre is derived from the principle of building a dense grid of sound layers (in the following analysis, I entitled this type of musical material "interlaced chord progressions", see Section B.IV.5.1). Since the instrumental ensemble in *Toward Perpetual Peace* is only comprised of seven musicians, the sound mass effect is often increased through the use of electronic processing (see Section B.IV.5.3 "electronic rhythms" and B.IV.7.1 "creating rhythms from pitched sounds"). In these parts of the score, the single voices do not play an individual role, but rather only make sense musically in their sum.

This aesthetics fits the theme of the performance, war. During wars, and especially in the memory of past wars, it is hard to see individuals. Instead, we think of collectives: armies, groups of refugees, opposing parties.

In *Toward Perpetual Peace*, I wanted to oppose these two aspects: there are scenes in which, in the music as well as in the theatrics, there is only a collective, a mass of sounds. As a contrast, other scenes bring the individuals to the fore, visually or musically. The individual scenes from a visual perspective are obviously in particular the ones where only two actors are on stage, the two protagonists. The rather "individualistic" parts in the music in turn are those which do not follow the sound mass principle; those which have a more concrete material and make use of individual melodic lines. One example for this type of material are the "quintuplets" (see Section B.IV.5.2) or the "canon" (see Section B.IV.5.5).

B. *Toward Perpetual Peace*, a staged requiem

by Nélida Béjar (music) and Björn Potulski (theatrics)
with texts by Immanuel Kant
2010

I. General aspects

1. Initial idea, motivation

The initial idea that motivated *Toward Perpetual Peace* was to make music theatre with very old men and women and very young children. This very general, almost abstract image, the possibilities of its dialectic, dramatic development and realisation, constituted the inspirational germ of the performance. During intense research of the possible semantic contents of this image, of the subject of age and youth, different approaches arose: the subject of the demographic development in western societies and the problems related to it; the idea of having a group of persons on stage who are not the principle agents of our world, who no longer or do not yet have the various ambitions that drive our actions, like power, money, career, attractiveness, etc. We investigated the most distinctive differences between old people and young children and, at some point, after a number of conversations with elderly persons in Germany, we realised that the childhood of all of them had been crucially shaped by the war.

2. Theme, actors

The themes of the musical and choreographic performance are childhood and lost childhood, security and vulnerability, war and peace, age and youth.

There are no professional actors or singers involved. Instead, 14 children aged five to nine and nine elderly people born between 1922 and 1943 are on stage, along with an ensemble of seven musicians: clarinet, bassoon, violin, viola, violoncello, electric bass guitar and piano, with live electronic processing. The children of today reflect the old people who, at that time, during the war, were young and witnessed the nights of bombing, the absence of

the father, flight and expulsion. The children function as a mirror of the old people who lost their childhood and youth.

3. Instrumentation

The choice of the instruments was motivated by two criteria: first, I wanted a mixed timbre, instruments that would not "melt" together, inspired perhaps by the sobriety of a baroque sound (in contrast, for instance, to sound of the romantic period). That is why I initially planned the combination of strings (violin, viola violoncello), a woodwind instrument (clarinet), a brass instrument (trombone), and electric bass. Second, I aimed to realise a flexible intonation that goes beyond equal tuning, see Section B.IV.4.2.3. For that reason, the wind instruments chosen, clarinet and trombone, were the ones that have the greatest freedom of intonation within their instrument families. Later, the trombone had to be replaced by a bassoon due to the trivial reason that we could not find a trombone player.

4. The stage as a source of sounds

Toward Perpetual Peace is not music theatre in the conventional sense: there is no solo singing, the actors on stage even remain mostly silent. Nevertheless, it is comparable to an opera not only for the reason that there is live music throughout the full duration of the performance, but also because some of the actions that can be seen on stage also become a source of musical sounds: piezoelectric contact microphones pick up the sounds from the stage floor. In some parts these are made audible through direct amplification, and in others they feed the electronics.

Through this technique, the stage itself becomes a large musical instrument and the actors, (the old people and the children) play on it through their exactly choreographed actions, becoming a part of the musical ensemble. These actions are simple and rather minimalist in their execution; only through the electronics and by the interaction with the instrumental music they do become a part of the musical unit.

5. Text, genre

The text of the sung sections is constituted by short excerpts of a script by Immanuel Kant, *Perpetual Peace, A Philosophical Essay*, which also provides the title for the performance.

In this book, Immanuel Kant develops the foundation of our modern concept of peace. His work represents in an exemplary form an idealism which relies on mutual trust between people and between nations for the shaping of the future. It formulates the necessary conditions for perpetual world peace, an ideal vindicated again and again by every new young generation for its future.[4] This ideal, though, has never, and will probably never, become real.

As a genre for the music theatre *Toward Perpetual Peace*, I chose the denomination "staged requiem": the performance is thought of as a requiem for the idealistic idea of "perpetual peace". Its original title in German is *Zum Ewigen Frieden - Ein Abgesang*, which literally translated means *Toward Perpetual Peace - A Swan Song*. Since I do not like the sound of the subtitle in its English version ("Swan Song" sounds to me too romantic, too rich in imagery for this context), in the following text I will call this piece of music theatre only *Perpetual Peace*.

The parts of Kant's script sung by the children are the six *Preliminary Articles for Perpetual Peace among States*, which define the basic terms of this idealistic Treaty for World Peace. Considering the background of the old people, in our performance this does not remain without ironic distance:

> *1. No treaty of peace shall be regarded as valid if made with the secret reservation of material for a future war.*
>
> *2. No state having an independent existence – whether it be large or small – shall be acquired by another through inheritance, exchange, purchase or donation.*
>
> *3. Standing armies (miles perpetuus) shall be abolished in course of time.*
>
> *4. No national debts shall be contracted in connection with the external affairs of the state.*

[4] Immanuel Kant: *Perpetual Peace, A Philosophical Essay*, Cosimo Books, 2010.

5. No state shall violently interfere with the constitution and administration of another.

6. No state at war with another shall countenance such modes of hostility as would make mutual confidence impossible in a subsequent state of peace: such are the employment of assassins (percussores) or of poisoners (venefici), the violation of articles of surrender, and the instigation of treason (perduellio) in the hostile state.[5]

6. The performed actions

The scenes are based on simple choreographies, inspired by the memories of the old and the ideas of the children (see Section B.II.4).

The actors do not speak. Only the children form a choir in some scenes, and sing short sections.

7. Stage setting - the principle of mirroring

The situation on the stage is one of mirroring: a large square of a semitransparent fabric (gauze) divides the stage into two equal halves. The gauze is, depending on the lighting, sometimes transparent, sometimes opaque.

Fig. 2 Empty stage with the gauze raised

The spectators sit divided into two blocks, on both sides of the stage, such that each half of the audience is facing the other half through the gauze, the action taking place in between them. In this way, the visual perception of the two halves of the audience cannot be identical at any time – just like the experiences and perception of war can never be

[5] Ibid., pp. 3 – 7.

identical. The actors on the stage, the children and the old people, perform on both sides of the dividing gauze, but the actions always correspond with each other, they are perceived as two parts of a whole unit. From the perspective of the individual spectator, the side of the stage lying next to him will give him a direct and clear impression, while the opposite side can be only seen in a distant way: depending on the lighting it can appear blurred, transfigured, or even only as a shadow seen through the gauze.

This setting corresponds with the two separated, mirroring time levels of past (of the old people's childhood) versus present reality, memory versus projection, etc.

II. Preparation

1. Previous experiences working with non-actors

The idea of making music theatre with people who have never performed on stage before, whom we would not expect to be there, and who are personally and directly involved in the theme of the representation, developed over the last few years of work with theatre director Björn Potulski.

The first theatre project that was based entirely on this idea was *EXODUS*, shown in Malta, Catania, Vienna and Munich in 2008. The music, live-processed and looped solo violin, was played live by myself on stage. This was also the project for which I programmed the first Pure Data based interface, which already contained some of the effects used in *Perpetual Peace*, like the "filtered noise" and the "false FFT-filter".

EXODUS was a theatre performance about the idea of Promised Lands and what people do to reach or protect them. There were four "actors" on stage: one of them is a veteran of the Kosovo War, a former member of the UÇK ("Kosovo Liberation Army"). Another is a young Congolese who emigrated, crossing almost the entire African continent to finally join the so called "boat people" setting sail from Libyan shores. Having run out of fuel, food and water, he and his fellow travellers experienced distress at sea but were finally rescued by the Maltese navy. They were put into a detention camp, where he had to spend 18 months before he could start a precarious life as a tolerated illegal immigrant on the island. Another member of the cast is one of the soldiers of the Maltese navy, whose

principal task during the summer months is to be on the lookout for "boat people". The fourth actor is a member of the Greek minority in Southern Italy, vestige of an ancient Greek settlement dating from the times of Magna Graecia.

2. The actors: casting and interviews

The first practical task we fulfilled within the preparations of *Perpetual Peace* was casting children. This part was not such a big challenge, since we could obtain a nursery and "after-school care club" as a cooperation partner.

In order to obtain the first contact with potential contemporary witnesses interested in participating in *Perpetual Peace*, we made contact with a municipal service centre for elderly people, presenting the idea in front of various groups. Here, we obtained mixed reactions, from almost fearful to extremely enthusiastic. We also made an announcement in a newspaper, which had the consequence of a vast number of phone calls of very interested people.

Later, we decided to include Polish contemporary witnesses in the team. With the help of the Polish Consulate General in Munich, we cast three women. One of them would later become our soloist, the protagonist of the performance: there were several scenes in which she would be alone on stage, together with one girl, getting out of the collective to become an "individual". She told us, among other things, that the first words she had ever heard in German, as a child during the German occupation of Warsaw, were the orders "Stop!" and "Hands up!"

Later again, during the rehearsal process, we thought of the possibility of also including in the performance children who had experienced war themselves. These we found in a residency for asylum-seekers in Munich; they were four boys, two pairs of brothers from Iraq. Unfortunately, one of the two pairs turned out to be impossible to integrate – they spoke barely any German and were extremely nervous. Nevertheless, they told us powerful stories about their lives in Iraq, without being asked to. The others, aged five and nine, stayed with us until the end and turned out to be two of the most responsible and capable children.

The second step before the start of rehearsals was the arrangement of about 15 individual interviews with people aged between 75 and 87, in which they told us their stories in greater or lesser detail: some of the interviews were short and more general, some lasted for more than three hours and were very intense and upsetting. We realised in the course of this phase of the project that those with the most adventurous and traumatising stories had never or almost never related them. The urge to do so was therefore always intense. The weeks filled with this task were very moving, and the stories, related first-hand, developed an emotional strain that cannot be achieved through the reading of journals, books, or through watching a documentary film; they literally followed us into nightmares. The challenge thus became to transform these experiences into non-verbal music theatre.

3. Working process: the musical and the choreographic composition

The working process for the theatrics consisted at the beginning of an exhaustive investigation of historical sources on the Second World War, specifically those related to children's common experiences, as well as in an evaluation of the interviews. In the course of this work, appropriate associative images for the utilisation on stage where found, such as, for instance, the zinc buckets, the boots, the strips of paper – already or not yet embedded in concrete scenes.

The handling of a stage divided in two parts, with children on one side and old people on the other, led to the development of the formal idea of a symmetrical structure (see Section B.V).

For the composition of the music, I started with motives and short study pieces that were inspired by different elements, sometimes only by moods and atmospheres, drawn from the narrations of the old people and other sources about the subject (see Section B.IV.5). Two of these study pieces / sketches are included in the appendix: the double bass piece *Holz* as a study for the material "quintuplets" and a part of the handwritten, original version of the material "interlaced chord progressions".

As soon as the abstract structure was filled with the associative images, following dramatic principles of tension and development, the musical elements and motives were put into this structure as well, and I started the actual composition, considering the respective order of

the scenes and the transitions between them, using contrasting elements or gradual developments. This structure was to be reviewed a number of times, until just a few weeks prior to the performance: the lengths of musical passages and even the assignment of scenes were changed several times in the course of the rehearsals. Many elements were deleted, including, for instance, the singing in the second half of the piece, which, from a dramatic point of view and considering the oppressive character of the long ending of the performance, was ultimately considered completely inappropriate and redundant.

4. Rehearsing period and collaborative process

Rehearsals took six months. In the beginning, the most important task was to inspire the children. We showed them a steel plate equipped with a contact microphone, a model for our stage, and let them play on it, which was a good starting point. Every week we spent a good part of the rehearsal time playing games, making them familiar with the idea of playing contemporary theatre, and so on.

For the contemporary witnesses, the first big challenge was getting the Germans and the Polish participants together, since we did not know what the reaction would be. Fortunately, in the medium of theatre, this went very well (today, they are still in touch with each other). Nonetheless, this subject was difficult for the older Polish participants but had, at the same time, as our "protagonist" told us once, a "cathartic effect".

Ideas for some of the scenes were found through experimenting and improvising: we asked the participants what sort of actions, movements or postures would come to their mind when they thought of certain situations. Results were, for instance, the idea of lighting a candle in order to remember someone (scene 17), which was the suggestion of a child, or the idea of the "red sky" after an anecdote of one elderly woman (see Section B.III.2, scene 21 - 22).

Other scenes had been planned beforehand, inspired by the study of historical sources, and the participants were simply instructed on what to do. In some cases, these scenes had to be modified during rehearsals, as an interaction with the contemporary witnesses. One example of a concrete change in the scenography that emerged due to the contribution of the contemporary witnesses was scene 5, where the old people were supposed to enter the

stage looking upward, signalling that something threatening was fearfully expected from above. While the German contemporary witnesses confirmed this image as one of their memories, one of the Polish contemporary witnesses, who had experienced the German occupation in Warsaw, told us that she would never have looked up, since the threat was of a different nature there (there were bomb attacks, but not low-flying planes, as in rural parts of Germany). Due to the high buildings, she said, if one could have seen anything it would have been much too late. Instead, she remembered that she used to listen carefully to any suspect sounds. Therefore the scene was changed: the Polish actress entered first, while a threatening noise (processed electric bass) emerged. Only then did the remaining actors and actresses enter, looking upward.

III. Theatrics

The old people on the one side and the children on the other interact with each other following one of three principles:

- The old people perform a certain action and are observed by the children from the other side, through the gauze, or vice-versa.

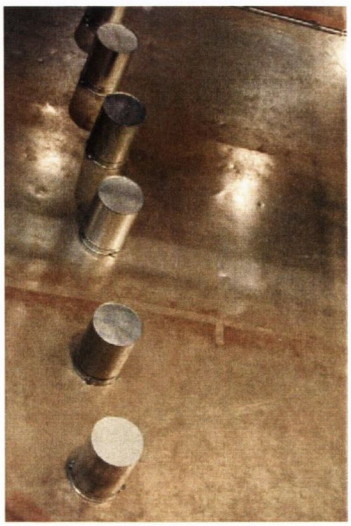
- The children have left their traces on one side of the scene, such as, for instance, the destroyed cups. Then, after a side change, the old people are confronted with the children's traces and have to handle them (or vice versa).

- The old people on one side and the children on the other perform two different actions that are related to the same motive, for instance the motive of "grieve" in scene 17: while the old bury photographs on one side, the children try light candles on the other.

1. The props

The props used in the performance are the following:

Buckets



Zinc buckets were used in German cities during the Second World War to collect the corpses after bombing attacks.

Fig. 3 Buckets

Cups

The cups function, on one side, as a symbol for parental or grandparental care and security, a normality for children, the ideal character predominating the atmosphere in the relationship between old and young. This image is created with typical but abstracted scenes: a grandmother or a grandfather calmly offers a cup (of cocoa, we could suppose) to their grandchildren. This image is confronted by its polar opposite: Dresden, the German city that suffered the worst air bombing raids, being completely destroyed, had been well-known since the 18th century for its renowned porcelain manufacture. The cups, therefore also a symbol for Dresden, are in a later scene brutally destroyed by the children – this, in turn combined with their first function as a symbol for care, also stands for the destruction of love and care during war.

Boots

The boots of dead soldiers and also of civilians were coveted goods during the war. The boots are on the one hand symbols for the absence of the father, and on the other hand clumsy military boots are also a symbol of brutality and power.

Fig. 4 Boots

Slips of paper

Little slips of paper are used on stage and could be associated with various historical facts:

During the war, slips of tinfoil were dropped by the allied air-forces in order to confuse the German's radar. Civilians mostly did not know their purpose and were scared and rattled by this mysterious, visually certainly impressive act.

Otherwise, writing notes on slips of paper and pinning them on walls, trees, etc., was a common, desperate way of trying to communicate with lost family members, neighbours or friends, used, for example, when someone wanted to leave a note before moving to another place. Names, addresses and questions were written on these slips.

Photos

The photos represent the remembrance of something lost: a person lost during the war (father, brother), the house one had to leave, a city that was destroyed, etc.

Candles

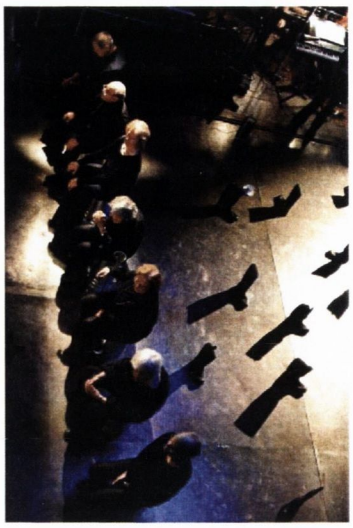
Candles are lit in remembrance of something lost. In the scene in which they appear, they cannot be lit since the lighters do not work, so this aim is abandoned.

2. The single scenes

The performance is composed of 28 single scenes. Because of the division of the stage into two different sides by way of the gauze, for each scene we often have to consider two different streams of action. Only at the beginning and at the end of the performance is there no separating gauze on the stage.

The following provides a detailed description of what happens in each scene. **The scene numbers coincide with the rehearsal marks on the score.**

Scene 0. *Admission*



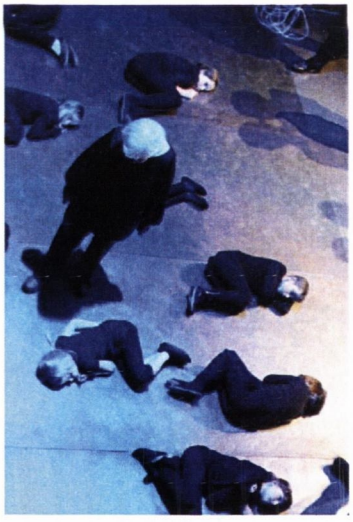
During the audience's admission the old people are sitting on large inverted zinc buckets, in a row, facing one side of the audience. The children are told to rollick about, on the stage as well as amongst the audience. Then, the lights dim. Once the hall is completely darkened, the children go on to the stage and lie down, on the side of the stage opposite the old people.

Fig. 5 Scene 0

Scene 1. *Blackout*

The music starts.

Scene 2. *Children's field* / Scene 3. *Preliminary Article 1*



After a few minutes, the lights start to rise. The old people are sitting with heads bowed. They start to raise their heads, stand up, go a few steps towards the audience and turn around to face the children. One old woman goes towards them and starts slowly stepping between them. The others follow her. At one point, the children start knocking on the floor; the sound is picked up by the contact microphones and rhythmically quantized. As a reaction, frightened, the old people pause for a moment, then continue walking, now a bit slower.

Fig. 6 Scene 2

The knocking is sparse at the beginning, but then gets faster – the children are told to knock once, then count to ten in their heads, knock again, count until nine, and so on; since every child counts at its own speed, the result is a sound that steadily becomes more and more dense. Once the sequence of counting is finished, they start continuously knocking,

now directly amplified (instead of processed), a much louder sound. At this moment, the old people turn away and rush to the empty side of the stage. The children start singing the 1st Preliminary Article, which leads the old to hoist the gauze as a separating, protecting barrier.

Scene 4. *Hands – 1st solo*

Fig. 7 Scene 4

The children stand up and exit, the old people take their respective bucket and exit as well, forming a row. Only one girl on one side, and one woman on the other side, the two "protagonists", stay on stage.

They start cautiously fumbling in the gauze for the other's hands.

The cup as a symbol for love and care is introduced: after a while, the old woman picks up a cup from the floor and stretches her arms out, offering it to the child, who reaches out for it. This action happens, though, in a twisted manner: the two persons are turning their backs to each other. The woman lets the saucer fall, an anticipation of what will happen in a later scene.

Scene 5. *Air-strike*

The protagonist woman seems to hear something frightening, a sound that does not cease. The other old people enter the stage one after the other looking upward, holding cups in their hands.

The children enter the scene on the other side, also looking upward.

At bar 163 (with the clarinet solo as a cue), the old people stretch the arms offering the cups in the direction of their part of the audience, then they put them down to the floor, form a row and walk towards the gauze. The children sit down on the floor, looking to their part of the audience, and reach for the cups with both hands. Then they stand up and move in a row towards the gauze.

Fig. 8 Scene 5

Scene 6. *Past - future*

The old people and the children are facing each other, separated only by the gauze. The old people bring their faces to the gauze, looking through it with their eyes wide open. They turn, in a wave from the right to the left, their heads to the left, then to the right, they put their hands on the gauze to both sides of their face.

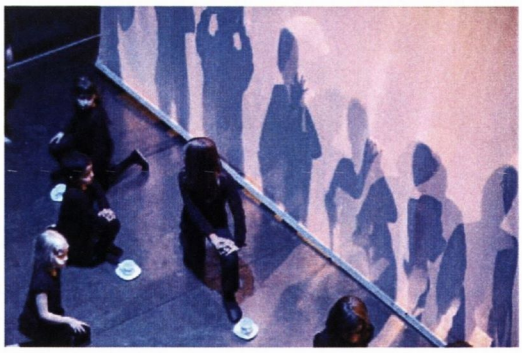
Fig. 9 Scene 6

The children on the other side turn around and walk (still in one row) extremely slowly towards the audience, as well with their eyes wide open.

Scene 7. *Street scene*

The old people continue looking through the gauze; they let their hands fall.

One half of the children's row disappears to the left, the other half to the right. They start walking or running through the stage from the left to the right or from the right to the left, at different speeds, like passersby in a street.



After a while they start taking one cup after another from backstage and putting it down on the scene as they walk through. By the end, the cups are standing spread over the whole stage floor.

Fig. 10 Scene 7

Scene 8. *Preliminary Article 2*

Once all the saucers are distributed around the floor, the children again form a row beside the gauze, turn right, and start walking along it. Half of them turn around the gauze, changing to the other side of the stage, the other half make their exit.

Fig. 11 Scene 8

The old people also change to the other side of the gauze. They are still in a row close to the gauze, but now on the other side, looking towards the audience. Their heads are lowered.

The children (half of the total number) on their new side of the stage lay down, each in front of one of the cups that had been put on the floor by the old people. They sing the 2nd Preliminary Article.

The old people raise their heads.

Scene 9. *Expulsion* / Scene 10. *Boots*

When the music changes (bar 235), the rest of the children enters the stage: they appear one after another, carrying pairs of boots which they hold in a decided and demonstrative way in front of their bodies. While walking towards it extremely slowly, they fix their gaze on one of the children on the floor.

Fig. 12 Scene 9

Reaching the child, they place the boots in front of it firmly. The child stands up and steps backwards slowly to exit the stage.

The old people – first one woman, then, slowly, the others – abandon the row and start walking around the cups on their side of the stage, which had been put there by the children during scene 10, exploring the terrain.

Scene 11. *Trampling cups*

The children walk around the cups left there by the fled children, looking at them. Then, they step into the boots and go on walking, still looking at the cups. As soon as the music changes in bar 289, one boy stops in front of one cup, and smashes it with one foot. The others look at him, startled. He continues going around, smashing further cups; the others start doing the same. The trampling becomes more and more dense.

Fig. 13 Scene 11

After a while, the old people build three rows perpendicular to the gauze: One in the middle and one on each side of the stage. The person closest to the gauze in each row looks through it to the children on the other side. Each of the three rows slowly rotates in such a way that everyone gets a turn to look through the gauze.

Scene 12. *Fear*

In bar 305, a siren-like sound starts, the only acoustically illustrating, "onomatopoeic" moment of the piece (together with the falling cups in scene 16, which could be seen as an illustration of a bombing attack). Hearing this sound, the children suddenly stop trampling the cups, pause, and morph back into normal children. Overlooking all the broken cups, the children step out of the boots and, sweeping away the cup shards with their feet to clear themselves a way through, exit the stage.

At the time, the old people dissolve their rows, walk quickly around each other and exit the stage.

Fig. 14 Scene 12

Scene 13. *Stage floor – 2nd solo*

The protagonist child and the protagonist woman remain alone on stage. The child gathers up the shards of the cup that the protagonist woman had let fall in a previous scene, and changes sides with the woman. Here, the only sounds are the processed noises produced by the two of them on the stage.

Fig. 15 Scene 13

Here, a new side change has taken place: in the following scenes, the stage side assignment of the old and the children will be reverse to the one in the last scenes.

Scene 14. *The clean-up* / Scene 15. *Preliminary Article 3*

The old people enter and walk around and between the broken cups. One woman pauses for a moment, looking over the entire field of destruction. She bends down to pick up a

shard. The others imitate her and start picking up shards; they try to find fitting parts, comparing them with each other. The parts never fit, so they put them back down, forming a strip of shards on the stage's edge. This scene is a clear association with the image of the so-called "rubble women" who worked to rebuild the cities after the war.

The children enter the stage and form a row at the gauze, observing through it the old people's cleaning up scene. After a while, they sing the 3rd Preliminary Article.

Fig. 16 Scene 14

When the stage is entirely cleaned up, the old build a row at the gauze, looking to it. The children turn around. Each one of them chooses one cup and lies down in front of it. The protagonist child sits down by the shards it brought in during the previous scene and plays with them, trying to reassemble them.

Scene 16. *Pile of boots 1 / Falling cups*

The old people turn around. They are now standing with their back to the gauze. Only the boots, left there by the children, are now spread over the floor. An old woman walks around, looking for the "right" pair of boots. As soon as she finds it, she takes both boots in her arms as if they were something loved and precious and carefully puts them down close to the gauze, at the middle of the stage. All the others follow her: they find the "right" pair of boots, carefully putting them on top of the others, building a pile of boots by the gauze.

The protagonist child stands up holding the shards before letting them fall again. The other children look up to it and imitate it: they stand up and, synchronized to single chords in the music, drop their saucers, which break on the floor, in a prearranged order (each child has memorised his/her place in the sequence).

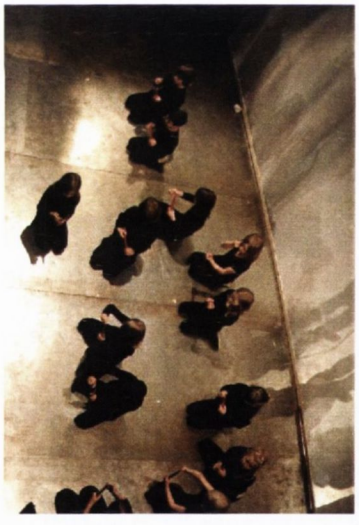
Scene 17. *Photos / Candles*

One after the other, from left to right, the old people take an old photograph out of their respective inside pocket, reach out the hand holding the photograph in order to look at it, walk towards the edge of the stage still looking at the photograph with arms stretched, and then put it down on the floor, in a row on top of the strip of shards.

Then, they take a handful of earth out of their trousers' pocket and, again one after the other, from left to right, spread it over their respective photograph. They go a few steps back and lie down, spread around the floor.

Fig. 17 Scene 17 (old people)

The protagonist child takes a broom and starts sweeping away all the shards, disturbing the other children, who have sat down and are trying to fit the shards together.



Consequently, they take a red candle out of their pocket, put it on the floor in front of them and try to light it. Their lighters do not work. They sing the 5th Preliminary Article, and then exit, one after the other.

Fig. 18 Scene 17 (children)

Scene 18. *Canon*

The old people are still lying on the floor.

The children enter the stage wearing the boots, in three rows, marching in a half note rhythm. At the same time they sing the 6th Preliminary Article, which is a canon: first one

row enters singing the first voice, then the second row, singing the second voice, then the third row with the third voice. The members of the rows fall to the floor at specific places: the first row on the first third of the stage, making the other two rows march between the lying bodies, the second row falls on the middle, making the third row also march between them, and finally the third row falls, on the last third of the stage.

The old people join in, singing the fourth voice. This is the only moment in the entire performance at which they sing. At the end, everybody is lying on the floor, the children well ordered in three rows, the old disordered.

Fig. 19 Scene 18

Scene 19. *Anger*

The old people slowly stand up.

The children do the same, but coordinated through a close choreography: they all roll to the left to lie on their backs raising the left legs, they take off their left boots whilst sitting upright, and finally they take off their right boots and stand up. Then they walk slowly in a row towards the audience with an exaggeratedly angry expression on their faces.

Scene 20. *Pile of boots 2*

The old people walk quickly and chaotically; then, one after the other, they exit.

The children dissolve their row and quickly pile up the boots that were left at their place before. This new pile of boots is build close to the old people's pile on the other side of the stage, with only the gauze between the two.

Fig. 20 Scene 20

After having done this, they again form a row at the gauze, looking through it. Finally they start walking quickly and chaotically, just like the old had done, and exit the stage, one after another.

Scene 21 and 22. *Empty stage*

The stage remains empty. The colour of the gauze starts slowly changing: from violet blue, through different colours, to a strong red.

Fig. 21 Scene 21

This was inspired by an interview with one of the old participants, who told us an anecdote she remembered from being a child: she was living in a little village in the Bavarian Forest, very close to the Czech border. One day in 1941, the sky turned "blood-red". Her nurse, who had witnessed the Franco-German war of 1870/71 as well as the First World War, said to her: 'This is the writing on the wall'. A day later, she remembered, the German troops began the invasion of the Soviet Union.

Scene 23. *Hands – 3rd solo*

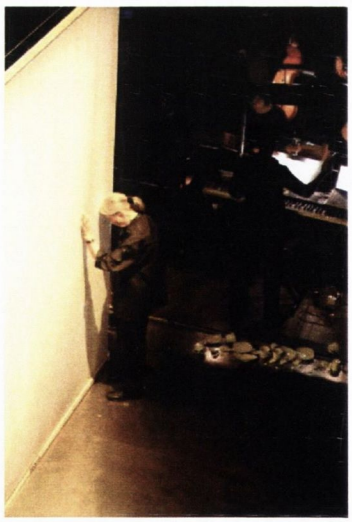


Fig. 22 Scene 23

The protagonist child and the protagonist woman enter the stage. As in the first solo scene, they search for each other's hand on the gauze. In this short scene, they come together without showing the fear and distrust of the first time.

Then the old and the children, on opposite sides of the gauze, enter the stage. The children put their hand on the gauze, each of the old tries to put his or her hand on a child's hand. The scene looks like a gentle game.

Scene 24. *Circles*

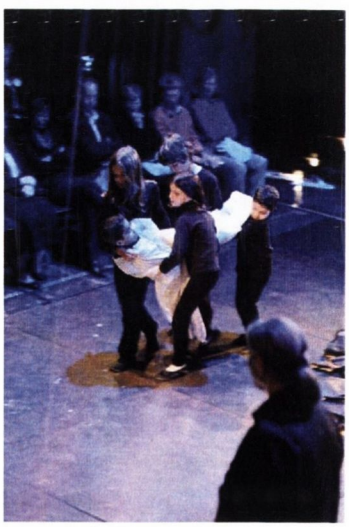
The protagonist child and the protagonist woman raise the gauze. As soon as the two groups can see each other, the old and the children walk a few steps back, turn around and walk until they reach the respective edges of the stage.

The two protagonists start walking around the pile of boots, placed in the middle of the stage, circling around it from opposite sides, looking at the pile and at each other. The children's and the old people's row, until this point standing back to back at the edges of the stage, now turn around in order to look at the protagonists.

Fig. 23 Scene 24

In pairs of one child and one old person, they start doing the same: one pair after the other slowly circles around the pile of boots approaching from opposite sides. After having finished their circle, the children exit, while the old stay on stage.

Scene 25. *Mummies*



Four children enter the stage; they are carrying a "mummy", a child entirely wrapped in a white tissue. They put it down on the floor. The "mummy" starts rolling and unwrapping itself; by doing so, it leaves a strip of white tissue behind it and reveals multiple slips of paper that appear on top of the tissue. At the opposite end of this strip of tissue, another child lies down and starts wrapping itself in the tissue. Between the unwrapping and the wrapping child, only about two meters of tissue are left over.

Fig. 24 Scene 25 (entering with the first "mummy")

The protagonist woman kneels down on this tissue and frantically starts swiping the slips of paper to the side, off the tissue, so as to save them from being wrapped again, moving along the tissue with the two "mummies", and almost being pushed by the wrapping child.

Fig. 25 Scene 25 (unwrapping, swiping the slips of paper)

Finally, the now totally unwrapped child stands up and joins the four carrier children. They lift the entirely wrapped child and exit the stage with it. The old people have followed the entire process, walking at the side of the rolling children and watching them, seemingly disturbed.

After the exit of this first team of children, the whole situation repeats with a second team, four children carrying a "mummy" coming in from the opposite side. An old man kneels down this time to recover all the paper slips. Once the unwrapping and wrapping process has ended, they again exit the scene, again carrying the "mummy" with them.

Scene 26. *Slips of paper*

The old people are left alone on stage, the floor is covered with slips of paper.

As indicated above, the inspiration for this scene was the following: during WWII and its aftermath, all forms of long-distance communication such as the mail service having collapsed, people used to leave questions or information (names, places) on slips of paper. These slips where pinned on trees or on houses, somewhere where the people thought that their friends or relatives could find them.

The old people start searching among the slips of paper. They pick some of them up, read them, show them to each other, as if they were asking whether the counterpart knows something about what is written on it, keeping all the slips they gather in their hands. They continue doing so for a while, becoming quicker and more and more driven the longer they go on, confronted by the almost impossible task of handling all of them.

Fig. 26 Scene 26

When they seem to have finished with all of the slips, a well-defined square of light appears. They abandon the slips and turn around to stare at this light, seemingly banned.

This scene is related to scene 12, where the old people tidy the porcelain shards from the stage. In this first scene, they succeed, in the second they have to give up: it is possible to physically clean up the debris, but the memories of the loss will stay.

Scene 27. *Light square*

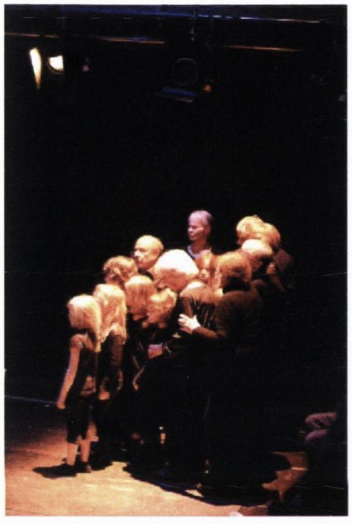
A little time after the square of light appears on the stage, the children enter in a row, carrying the zinc buckets the old were sitting on at the beginning of the performance. They put the buckets on the floor; the old turn around to look at them.

The protagonist child goes to the pile of boots and starts searching among them. She chooses one or two, and walks with them between the old people, looking at them as if she is searching for the "right" person.

Fig. 27 Beginning of scene 27

She finally finds the protagonist woman and takes her by the hand, still carrying the boots in the other hand. She takes the woman to one of the buckets and puts the boots into it. The

woman puts the slips of paper, which she still is holding, into the bucket as well. Then the child takes the woman by the hand and pulls her, along with herself, into the square of light, where they remain standing. Meanwhile, two of the other children, who were carrying a bucket together (there are less buckets than children, so some were carried by two of them), have started doing the same as the protagonist child: they pick up some boots from the pile and then go to one of the old persons. They take him or her by the hand and walk to a bucket, in order to put the boots and slips inside it. Finally, they take the old person with them into the light. One after another, all the children do the same, until everybody is standing in the square of light.



There, they remain for a while. Twice, all actors move in different directions inside the square of light, giving the impression of a "boiling pot".

The inspiration for this scene was the image of deportation trains, where people were jammed together.

Fig. 28 Ending of scene 27

Scene 28. *End*

The light is turned off, the children quickly empty the buckets and turn them around, still leaving them in a row. They arrange the boots all over the floor and exit.

As soon as the children have left, the old go to sit down on the buckets, with their heads down, as they were sitting at the beginning of the performance, but now looking to the other side of the audience. The light goes on, they lift their heads.

Fig. 29 Scene 28

3. Notes on the recorded performance

Perpetual Peace was performed on four evenings. The video recording was done on the last evening, the 21st of June 2010. Since it was the last performance, and since their confidence had grown over the previous three days, the children were very motivated to give their best. In scenes 11 and 16, where cups get destroyed, they tried to commit themselves as much as possible, putting enormous energy into their actions. Doing so, they forgot some of the security measures they had learned during the rehearsals and successfully applied in the three first performances. For the scene 11, we had taught them and practiced with them how to pretend to trample down the saucers with full energy, but stopping the rapid movement of the foot just before it reaches the cup. Because nothing had ever happened, the children seemed to have grown too confident with this action: during the last performance this scene got a little out of control, and the shards were flying further than intended. Still, everything went well in this scene.

During scene 16 we had to again observe the same effect: they smashed the saucers on the floor with a considerable force, they fell apart in smaller shards than during the rehearsals and the first performances. In the following scene 17, where the children are sitting while the protagonist child sweeps away the shards, one shard was swept under a girl's foot, and she got cut. After a while, she left the stage. Backstage, after the children's next exit, they took notice of this little accident and became very excited – something normal, considering that most of them were younger than seven years old. Due to this excitement, the following scene 18, in which they sing the canon, completely failed. It was one of the most difficult scenes for everyone because of the complex singing combined with a complex action, and probably the scene we had to practice most. In the first three performances, it was one of the most impressive and successful scenes. In the last performance, however, they did not appear on stage at the right time, being occupied backstage with the girl that had a little cut on her foot. They were then so nervous that they did not find the boots. I, as conductor, had to improvise a looping of the long bassoon note, waiting for the children to enter. Then, again because of their nerves, they started singing faster and faster and I gave them more attention than usual, trying to get them back to the right tempo. Due to this chaos, I could not give the entry for the fourth voice: the bass started at the wrong moment and continued playing incorrectly for the course of the entire canon; the old people, who were supposed to sing the fourth voice along with the bass (which had worked very well on the first

evenings), did not sing at all.

IV. Music

1. Sounds

Four of the six instruments of the ensemble are amplified: the three strings violin, viola and violoncello, and of course the electric bass. The sound of these four instruments is also fed into the electronics. The music is thus composed of three elements: the direct, (in part) amplified sound of the instruments, the equally direct, amplified sound of the stage floor (the sound of actions performed by the children and the old), and the electronics which create a fusion between the two first mentioned elements, and which are generated in real-time during the performance. These three elements are not used at the same time throughout the whole performance. In some sections only one of them appears (only the instruments, for instance), whilst other sections have two of these elements (for example stage floor sounds and electronics, with no instrumental music) or all three. In addition, the balance of these elements changes: sometimes the electronics create a background noise while the instruments play the actual music, while at other moments the instruments only play a few notes, while the sounds of the stage and/or the electronics are in the foreground. The parts sung by the children's (and, in one case, also by the old people's) choir can be seen as a fourth musical element, and they constitute a climax at different moments of the performance.

A tubular bell in D is played to solemnly announce these five Preliminary Articles. Its use, however, also has a practical dimension, giving the children their entrance in a distinctive way, as well as the tone: D is the tonal centre of most of the children's songs.

2. The children's choir

Our intention was to have a choir of authentic young children voices rather than a professional, well-trained children choir, even though we were perfectly aware of the musical-technical limitations that this choice would imply: the melodies would have to be more or less tonal, easy to memorise, with intervals of not too large a size and a limited

range. The instrumental accompaniment would have to fit the sung line harmonically and in some cases an instrumental doubling of the singing would be inevitable.

The fact that Kant's text excerpts are not lyrical in the slightest – they are by no means divided in equal measures, they have of course no rhymes – created the additional challenge of finding an appropriate rhythmical fragmentation that could respect the spoken form of pronunciation.

3. The stage sound

The idea to use the stage as a source of sounds that would be processed in the music arose a few years ago. Many concrete means of the application of this idea, in several projects that were never realised, were contemplated over these years, without exactly knowing whether the idea would work in practice.

3.1. Development of the idea

Usually, the element that conveys the semantic element of an opera is the script or "libretto" sung by the actors or singers (together with the actions on stage). At the same time, being sung, the text constitutes an important element of the purely musical part, creating a link between theatre and music – the link that could be considered the basis of the opera genre. Instead of a text, I aimed to use concrete sounds and noises, also semantically charged: the sound created by the actions on stage. These sounds should take the place of (sung) words, linking the theatrical element to the music.

Certain actions performed on stage should generate sounds which, amplified or electronically processed, would become part of the music. In order to pick up only specific, intended sounds as a part of the music, and not the voices or other sounds that are audible at the same time, I thought of piezoelectric contact microphones. At the beginning, the idea was to have several objects integrated into the stage design equipped with piezos, different materials to generate different sounds and timbres.

3.2. Usage in the performance

When the stage setting of *Perpetual Peace* became clear, I had to discard the possibility of using different types of sound sources: since there were no static objects in the stage design, only the stage floor was suitable for the realisation. Although the initial idea was to use a wooden stage floor, since wood has a pleasant percussive sound, this had to be discarded as well, for practical reasons: in order to make wood resonate in an adequate way, a hollow construction would have been necessary, which exceeded our possibilities of construction in regard to the available resources. We thus decided to make the stage floor out of metal, a material with a high acoustic resonance and a good sound transmission. Another reason was its "cold" character and the association with war machinery, which fitted our visual conception for the performance.

We decided to cover a square seven metres wide and six metres long with sheet metal. Four weeks prior to the premiere, we procured ten sheet metal plates of 3 m x 1.5 m and started the test period. Since the radius of steel around each piezo microphone that assured a good sound transmission was too small, because of the metal being damped by the contact with the floor, we lifted the plates using a grid made of thin strips of cork. Then, placing the piezo on the overlapping joint between two plates, it could transmit the sound from both plates without a remarkable loss of volume or frequencies over the distance of the total three meters.

Unfortunately, the test period for the technical possibilities of this steel floor was too short and, most of all, too long after to the period of the musical composition. This resulted in a number of shortcomings:

I only had time to program one additional effect specifically for this device, the "shuffling" (see Section B.IV.7.3).

Some of the designed applications of the stage floor sound did not work exactly as imagined: the amplification and live processing of loud sounds like the trampling of cups almost disappeared under the very loud original acoustic sound. Other applications that proved to work well, such as, for example, the playback of live recorded sounds in scene 21 / 22, had to be almost improvised.

The original amplification of very quiet sounds – much more effective than that of loud sounds – proved to be hard to achieve: as their "instrument" (the steel plates) was lying on the floor, it was very hard for a crowd of children and old people, whose body control is less sophisticated than that of, for instance, young musicians, to remain so still enough that only the intended, musical sounds were produced.

Another peculiarity in *Perpetual Peace* that made the stage floor device hard to use was the great number of persons standing on the stage. This "musical instrument" would be easier to deploy if it were played by only a few actors, and if the actors had a good sense of rhythm and musicality.

The scenes with the most prominent presence of stage sounds are:

- Scene 2, in which the children knock on the floor while they are lying down. Here, the sound is first processed by the "quantization" effect, and later directly amplified.

- Scene 5, in which the protagonist woman lets fall a single cup, processed with the "shuffling".

- Scene 11, trampling the saucers, processed by a combination of the "false FFT-filter", the "filtered noise" and a delay.

- Scene 13, in which the instruments pause, and the stage sounds are the only sounds heard, also processed by a combination of the "false FFT-filter", the "filtered noise" and a delay, this time in a different balance and with different settings, plus the original amplified sound.

- Scene 16, where the children let the cups fall, and where consequently the shards are swept away, processed with the "filtered noise" plus the original amplified sound.

- Scenes 21 and 22, in which the recorded (processed) sound of the trampling is played again.

4. Harmonic system

4.1. Preliminary reflexions

The occupation with music theory, the analytical understanding of "how music works", has been an important aspect of my work. While spoken language conveys semantic meaning, even though the relation between these semantics and the syntax in which they are dressed can be an interesting subject for analysis, music does not transport anything that has a concrete significance, anything that could be construed in "other words". Its syntax is at the same time the form *and* the actual content of music. Of course, in the same way that it is possible to understand a spoken sentence without knowing what is a substantive and what is a verb, or what is a subject and what is an object, it is possible to "understand" the emotional "content" of music without knowing anything about music theory.

A "tone system", listening coordinates, is necessary to make any piece of music function, to make it emotionally understandable. This may be created consciously by the composer or not. In order to make music comprehensible, there has to be some kind of order underlying it in the form of a more or less strict harmonic system through which the auditor's expectations can be structured, and thus fulfilled or contradicted. Such is a system in which the musical experience can turn every moment in one or another direction, playing with musical memories and associations, with moments of surprise, with tension. Most often, this order is probably not intended or even recognised by the composer himself, and emerges in an intuitive, auditive way.

The intended "recognition" of a harmonic system by the hearer as well works most often only in an unconscious way, and only specialists would be able to describe and verbalise it: in a euphoric and dramatic ending of a Beethoven symphony, for instance, where the dominant chord preceding the resolution to the tonic at the end of a movement is repeated and accentuated over many bars, only musically educated listeners would be able to label or analyse this effect, while most of the audiences in the Western world would nevertheless perceive the same effect of a "dramatic" expression.

An important question for the development of tone organisation systems is whether their comprehensibility resides in the hearer's perception, being an extrinsic property of the tone system, or whether it inheres the system itself, as an intrinsic property. Both of these

positions have been espoused by different music theorists. In his essay 'How do we experience music?', music theorist Alexander Becker writes: "other than for Riemann, for Adorno the *logic* of hearing is not part of the hearer, but of the work itself, and can therefore be different between one work and another".[6] This could be part of the explanation of why Adorno was such an adamant assertor of the musical avant-garde: after him, every system, regardless how abstract or whether or not it has something to do with our experience, habit and education, can be understood.

In the first case – the comprehensibility residing in the hearer's perception – the efficacy of a tone organisation would be directly linked to our individual learning and socialisation process. In the second case – the comprehensibility being a characteristic of the tone system itself – we can again ask whether the system has only to follow abstract, mathematical rules, as assumed by Adorno, or whether these rules have to respect anthropologically given criteria, the way human perception of music functions. Here again, several approaches could be followed. I will later speak about one of these: our perception of musical sounds from a *physical* point of view.

In the case of tonal music, the individual learning process is one obvious reason for its comprehensibility. We grow up with tonal music as we grow up with our mother language: nobody has to teach it to us, the learning happens in the course of an automatic process. From nursery rhymes to classical music, pop, rock, etc. – the large majority of the music we listen to during our life is based on a tonal scale, using here the term *tonality* in its widest sense: a compound of laws and characteristics common to music from 1700 until the present within the most various musical styles; the use of a scale based on octave divisions with mostly diatonic steps; musical phrases that achieve their resting point when they arrive to the attended tonal centre.

If we accept the learning process in the course of the individual socialisation as one important requirement for comprehensibility, we are still leaving the question as to whether this "habituation" is applicable to any kind of music open: is the understanding of any musical system only a question of habituation and education, concluding that persons "educated" in contemporary music are able to understand atonal works, as claimed by

[6] Alexander Becker, Wie erfahren wie Musik? in *Musikalischer Sinn*, Suhrkamp, 2007, p. 270 (translation from German: N. Béjar).

Stockhausen (which brought him to the extreme belief that in a few hundred years the all of humanity would have finally learned "atonal music" and would communicate through it)? Personally, I believe that only certain kinds of deliberate pitch organisation can function to ensure comprehensibility: if we use only abstract rules, following some kind of mathematical principle, lacking of any link to the characteristics of our musical perception, this system will almost certainly not be recognisable by hearing; it would only be known by the composer, or it could be found by a thoughtful analyser of the work. Examples of this are serialist works written in the 1950s and 60s that deliberately avoid any relatedness to "laws" and phenomena known from music history, and to which nobody or only very few people are likely to have emotional access.

So, is accessible atonal music maybe not as "atonal" as we believe, and do we hence achieve our understanding of this music through our tonal "knowledge"? What other examples of working, comprehensible music systems in the sense explained above can we find? How do atonal compositions of the last 100 years work, and are there commonalities among them? Could we construct a more or less universally applicable "atonal harmonic" independently from styles and schools?

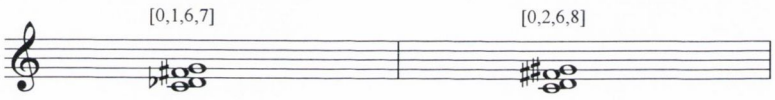
George Crumb states that

> When we come to a discussion of the role of pitch in New Music, we enter an arena of widely conflicting opinions. In general, I feel that the more rationalistic approaches to pitch-organization, including specifically serial technique, have given way, largely, to a more intuitive approach. There seems to be a growing feeling that we must somehow evolve a new kind of tonality. Probably the ideal solution, anticipated, it seems to me, by Bartók, is to combine the possibilities of our chromatic language – which is so rich and expressive in its own right – with a sense of strong tonal focus.
>
> An interesting practice in music since the atonal period of the Viennese composers has been the widespread use of a few tiny pitch cells. One such cell, which pervades the music of Anton Webern and Bartók, is the combined major-minor third: C-E-Eb; another such universally used cell is the perfect fourth flanked by tritones: C-F#-B-F; another is the chromatic cluster: C-C#-D. These three cells, in various permutations, together with a

few other basic types, are astonishingly prevalent in contemporary music of whatever style.[7]

A practical tool with which to track the existence of such new "pitch cells" is pitch class set analysis, allowing us to concentrate on the nature of a chord, its basic intervals, leaving out the particular transposition of the chord and its doublings.[8]

Music theorist Prof. Richard Bass applies pitch class set analysis to music of the 20th century from Scriabin to Stravinsky. He extends the number of "pitch cells" described by Crumb, and assigns them to three different types of scales: the whole-tone scale, the octatonic scale, composed of the alternate succession of major and minor seconds, and the pentatonic scale. Very popular examples, common to many composers within various musical styles, turn out to be, for example, pitch class sets built symmetrically on a tritone interval, as [0;1;6;7] and [0;2;6;8]: [9]



This leads to the conclusion that there is a certain number of types of chords that sound satisfyingly "atonal". Thereafter, atonal sound would not be merely the lack of tonality, a negative definition, but have a positively defined, characteristic sound. It is thus likely that "modern", "atonal" harmonics are rarely arbitrary, as even composers often tend to believe, but have also a tradition, a complex derivation from music history, from tonal music. To find the origin of such pitch cells would go beyond the scope of this thesis, but the presumption that they have developed in the course of the late 19th and early 20th century as a product of extended tonality seems a safe one.

Musical education plays an even more important role, if we consider that the concept of the "tonal system", in contrast to most of the deliberately invented, contemporary tone organisation systems, does not only imply a determined scale, a certain amount of pitches from which to chose, but also, and probably more importantly, implies certain rules,

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[7] George Crumb, 'Music: does it have a future?', *The Kenyon Review*, Summer 1980.

[8] Allen Forte, *The Structure of Atonal Music*, Yale University Press, 1973.

[9] Richard Bass, 'Models of Octatonic and Whole-Tone Interaction, George Crumb and his Predecessors', *Journal of Music Theory*, 38, 1994.

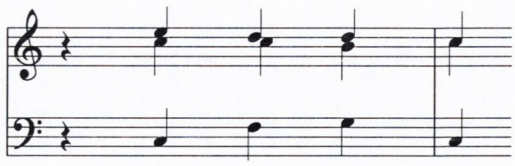
returning motives, and typical ways of tone interaction. Of course these "rules" are very variable, depending on styles, genres etc. Nevertheless, when we attain a certain degree of abstraction in the analysis, we can find common elements. We as music hearers learn these "rules" without taking notice, just as we do the grammar of our mother language. It is likely that in contemporary music we use more of these elements of musical grammar that have emerged and developed in the course of history than we are even aware of.

As an example, and because of its particular relevance for *Perpetual Peace*, I would like to take a look at one of these elements:

For the analysis of tonal pieces from the late renaissance to the late romantic period, a great number of tools, methods and theories have emerged, in part depending from the respective music style, in part from differing fundamental paradigms. While the function theory is probably the most common way of reducing pieces of music to certain harmonic laws, I have always been interested in counterpoint as an alternative to a vertical harmony theory for the analysis of harmony, even within music styles in which the harmony is considered to be principally vertical. As a basic nucleus of this way of thinking we could consider the simple movement of a two-voice dissonance resolution, where the first voice, "agens" (Latin for the "doer"), creates a dissonance of a major or a minor second, and the second voice, "patiens", afterwards evades this dissonance, resolving it by a downward movement.[10]

Using an extended version of this simple nucleus, it is possible to analyse the tonal cadence, the basis for much tonal music, through the movement of single voices in respect to each other. This derivation is even more stringent than a functional analysis chord by chord:

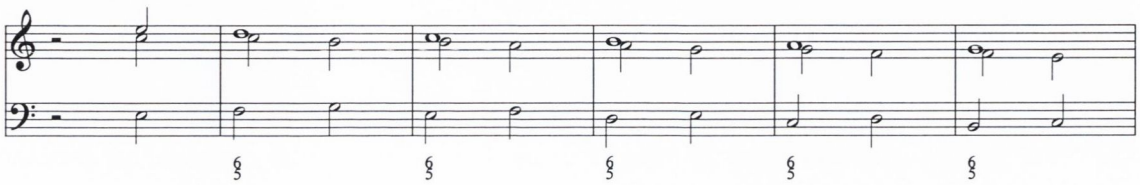
cadence



[10] Ulrich Kaiser, *Gehörbildung, Satzlehre - Improvisation - Höranalyse, Grundkurs*, Bärenreiter, 1998, pp. 142 et seq.

From this point, various types of chord progressions can be formed, the basis of modulations from one tonal key to another. Examples of this are the falling fifth or the falling third chord progressions, as they are used in baroque, classic and romantic music. From a counterpunctal point of view, in these chord progressions there is often one pitch held throughout two chords, while other voices move in such a way that they first create a dissonance against the held voice. This voice resolves the dissonance in the next chord through a falling motion:

falling fifth progression



These kinds of movements are most often directed downward, and can be regarded as typical tonal cells. One possibility of abstracting and extending this way of analysis to whole pieces or movements is Schenker analysis, in which pieces can be reduced to a structure of linear, mostly stepwise, and mostly downward movements of voices.[11]

The derivation of a tone system from physical characteristics of sound

But the question remains – is the tonal system really so much dependent on socialisation, on learning? Could people understand tonal music if they had never listened to any music of this kind before? Or could the comprehensibility of this system reside in the specific functioning of human auditive perception, in the way we construct a musical context departing from an abstract physical input? Julian Anderson states that the attempt to relate music to 'natural laws of acoustics has been a mainstay of musical theory since the time of the Greeks.'[12]

A good first step to start answering this question is to consider the physical properties of sound, the harmonic series: the octave as the closest relative to a tone, the first partial (1:2), the doubling of a frequency, is in our tonal system the fundamental division, the pitches in octave intervals having the same name in our scales. The circle of fifths, the base of the

[11] Heinrich Schenker, *Neue musikalische Theorien und Phantasien*, Stuttgart: Cotta'sche Verlagsbuchhandlung 1935.

[12] Julian Anderson, 'A Provisional History of Spectral Music', *Contemporary Music Review*, 2000.

tonal system, a map of tonalities and modulations, is based on the second closest overtone, the frequency proportions 1:3. Our equally tempered tuning system can be seen as an arrangement, a compromise to fit these two principles, the octave and the fifth (the Pythagorean Comma is an expression of their discrepancy), limiting the number of different pitches in the tonal scale to the realistically distinguishable amount of 12, and at the same time making all the 12 intervals equal.

The logarithmical relations of the frequencies within the scale are indeed destroyed through this compromise, but the hypothesis that in our perception we more or less construct the "right" intervals departing from their approximations could nevertheless be sustainable. In addition, it may be hard to judge how "equally tempered" we usually really play, if we take out instruments like the piano or harp, where we do not have the freedom of intonation: many string players are proud consciously to play some key intervals in natural tuning, and even when the choice is not taken consciously, I am not sure that the predominating intonation among wind and string instrument players or singers is the theoretical system of equal temperament.

Starting from there, the complex rules of the tonal system could be developed and explained, for example: the handling of dissonances and their dissolving into consonances could be put down to the fact that consonances, in relation to dissonances, are the more closely swinging intervals in the natural harmonic series.

The tonal system definitely has a relation to natural properties of sound; it did not surge deliberately out of an amount of hazards. That could be another part of the reason why it is comprehensible. But how could it be possible to create another system following similar, physical rules, if we regard the overwhelming complexity of the tonal model? Should we find alternative systems that are "nature-given", as spectral composers seem to intend?[13]

In the stylistic of spectralism, in a different context, this purely harmonic element is isolated from the syntax described above. This often creates a very slowly moving music, which completely lacks musical figures and dialogical action. Although I find spectralist reflexions fascinating for the named reasons, I sometimes – within the more strict and dogmatical pieces – miss musical elements that are for me necessary, such as rhythmic

[13] Ibid.

motion, quicker harmonic changes, small musical units that interact with each other, and so on.

4.2. The harmonic system of *Perpetual Peace*

Some of the theoretical reflexions mentioned: the existence and the usage of common "harmonies" that appear in many pieces of the last 90 years, as shown above with George Crumb's examples; the idea of the construction of harmonic syntax from a horizontal, contrapuntal point of view, and the derivation of harmonies from physical characteristics of sound, led to a deliberate harmonic organisation, in some way a tone-system experiment, used in a great part of the composition of *Perpetual Peace*. With only the exception of the motivic elements in the parts motivically related to the "canon", the entire piece's harmonic material is strictly related, shaped within the same harmonic system. This system comprises a number of different chords, and different types of chord progressions.

4.2.1. Chords

The first inspiration source was the derivation of harmonies and harmonic successions from the purely physical properties of sound, keeping the tonal model in mind as a reference.

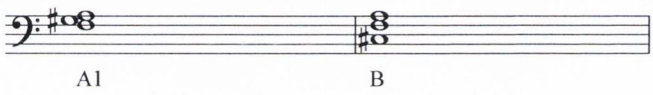
The transition between the concepts "tone" and "chord", or "timbre" and "harmony" could be seen as a smooth one: when we hear a single tone, we are hearing a "chord" composed of the various partials in their respective intensity. When we perceive a certain "timbre", we are speaking of the specific distribution of the respective partials' intensity. By choosing a number of pitches in the same order in which they can be found in the harmonic series, we create a chord that could also be considered an artificial kind of "timbre". As a foundation for the harmonic system of *Perpetual Peace*, I decided to create a number of chords, each of them constituted by pitches that can be found in the harmonic series in the same combination and in the same order as in the respective chord.

For the exact choice of the partials in order to build these basic chords, I was influenced by the types of chords described above (section B.IV.4.1), the chords common to many compositions of the 20th and 21st century, chords that, as a composer, I was familiar with

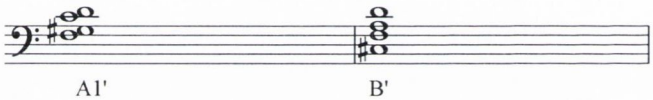
unconsciously, even before the mentioned pitch class set studies (composing in an improvisatory, intuitive way I have often found harmonies based on minor seconds plus minor or major thirds, fitting the octatonic scale, or whole-tone scale based harmonies composed of major seconds and tritones).

The basic cell of the harmonic system of *Perpetual Peace* is the succession of two chords: chord A (in the versions A1, A1‘ and A1’’ or A2) and chord B (in the versions B or B’). This succession appears in different combinations.

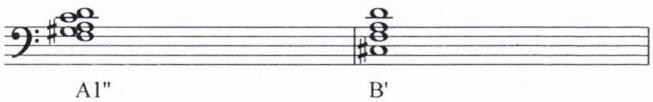
The basic combination is the succession of chord A1 and B:



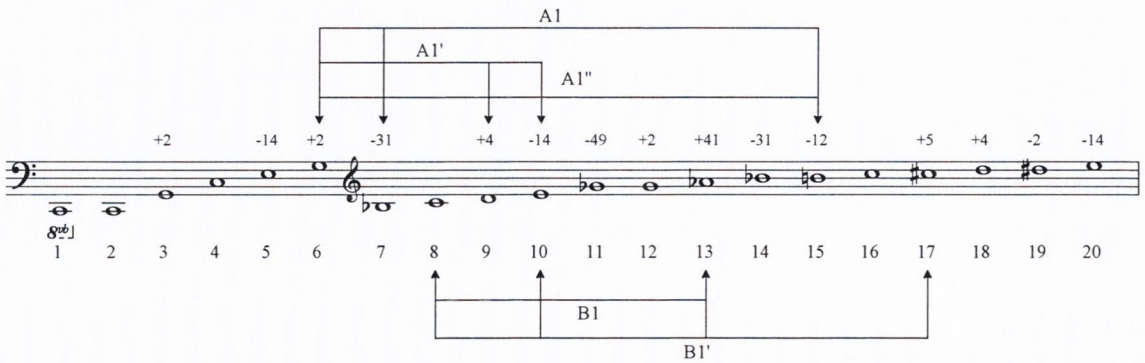
The first variation is formed by chords A1’ and B’:



As a fusion of these two versions, representing a harmonic escalation, a second variant of the two-chord-succession appears, with chords A1’’ and B’:

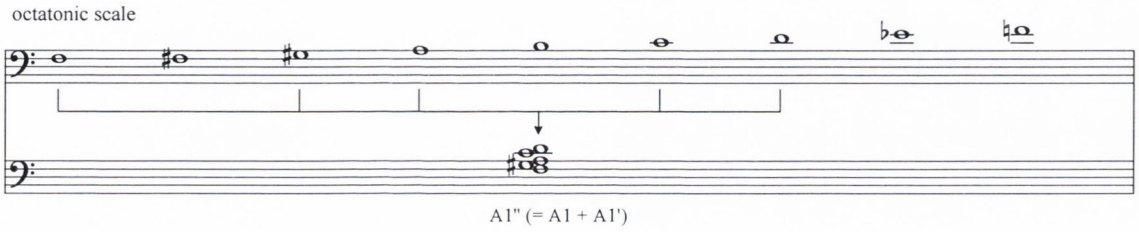


All these chords are constituted of pitches that can be found in the harmonic series in the same order as in the respective chord:



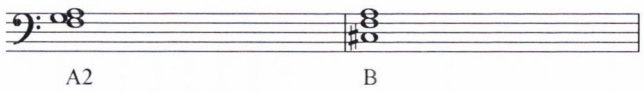
The chords A1 and B are used here in a similar way as chords with complementary harmonic functions in tonal music. While the first chords in each version, A1, A1' and A1'', have the fifth grade of the harmonic series as a bass note, the bass note of the other two, B and B', is the fundamental tone of the harmonic series, the first grade. The two different chords B and A1 could thus be compared, in a very broad sense, to the 1st and 5th scale degree respectively, the tonic and the dominant. In the analysis below, in order to determine what the pitch of the respective "tonal" centre of each sequence is, I will choose the lowest note of the chord B, the "1st scale degree", the fundamental tone of the harmonic series.

Further, the chords A1, A1' and A1'' can be seen as part of an octatonic scale:



Although the B-chords are composed of whole-tones and would thus not fit into this scale, this octatonic, through the combination with the B-chords chromatic mode, defines the character of the tone material described above.

In a few sections of the piece, another variation of this chord material is used; chords A2 and B. This version, in contrast, is limited to the more simple whole-tone scale and does not use any chromatic elements. This variation is created simply lowering the middle note of chord A1 by one semitone:



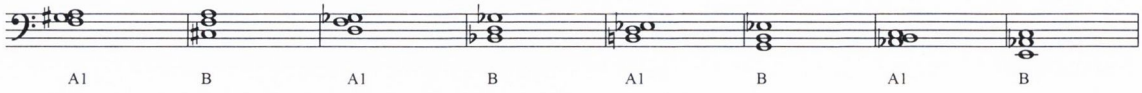
The two modes 1 (with chords A1, A1', A1'', B and B') and 2 (with chords A2 and B) have in the composition similar implications as the modes "minor" and "major" in tonal music.

4.2.2. Chord progressions

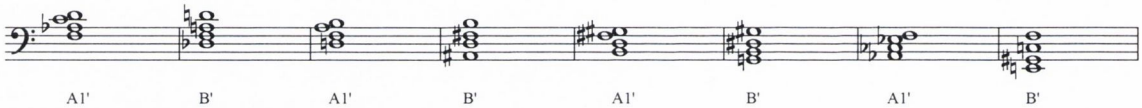
Another inspiration for the harmonic system of *Perpetual Peace* was to regard harmonic progressions as horizontal, contrapuntal movements of voices interacting with each other.

In an analogous way to the classical agens-patiens progressions described above, I drew a harmonic progression departing from contrapuntal movements, alternating the chords A1 and B, respectively A1' and B' or finally A1'' and B'.

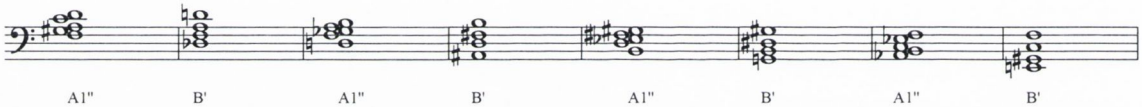
chord progression 1



chord progression 1'



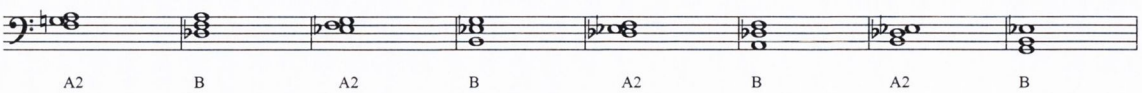
chord progression 1"



Within these chord progressions, in the transition from any variant of chord B to any variant of chord A the second highest note is always common to both chords, while the highest voice (agens) moves down to create a minor second interval with the second voice. In the next step of the progression (the transition from any variant of chord A to any variant of chord B), this dissonance is resolved by a downward movement of the second voice while the highest voice remains at the same pitch. In these three chord progressions (1, 1' and 1''), the bass note moves downward in minor thirds.

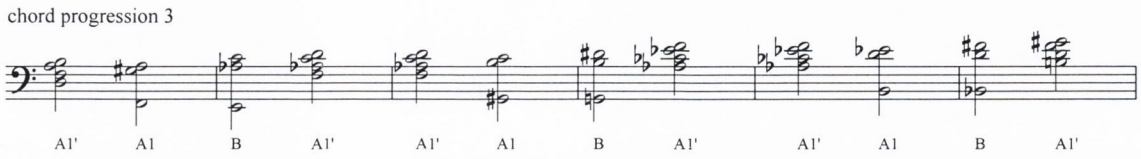
In the second mode, the chord progression 2 from A2 and B is done as follows:

chord progression 2 (whole-tone)



The common notes in the transitions from chord A to B and from B to the next A are the same as in the first mode. In this mode, though, the bass note moves downward in major thirds, according to its whole-tone properties.

Last, there is in the first mode also a new, completely different type of chord progression, moving upwards this time, using the chords A1' - A1 - B - A1':



4.2.3. The tuning system, an unrealised project

The instrumentation of the piece was, at the beginning, in part motivated by the choice of instruments which are more or less free in the exact intonation of single pitches: the strings are obviously not attached to any particular intonation. The clarinet has a greater facility of expanding the twelve tone, chromatic, equal tempered scale than most of the other woodwind instruments. The (alto) trombone, initially planned to be the sixth instrument, is the only brass instrument completely flexible in intonation, due to its slide technique. It was, however, later replaced by the bassoon, as pointed out above, for the simple reason that we could not find an alto trombone player for the performances.

The fusion of the two described principles of harmonic thinking, the physical / spectral approach and the idea of contrapuntal voice movements, led to the harmonic basis of the piece: chord progressions that are based on the horizontal movement of single voices, the different voices reacting to each other, following the principle of resolutions of dissonances in consonances – a dissonance being an interval with a higher common multiple in the overtone series than a consonance. At the same time, the vertical harmonies created at each time are composed by a series of frequencies that can be found in the harmonic series, without having to use overly high overtones. Now, if we tried to use, for the exact intonation of each pitch, of each interval within a chord, the same "natural" tuning as they have in the harmonic series, this system would, due to its constant harmonic

progressions, automatically lead to a conflict of tuning systems, or to non-static way of tuning that I will call "dynamic just intonation":

With every step of the chord progression, the frequency of the harmonic series used as a reference will be a different one; we will thus never find a common scale where every note of the piece can be found, but we will have to modulate between different scales. That of course involves practical difficulties for the players (although here again, to relativise these difficulties, I would like to take up the idea that, very often, consciously or not, the tuning used in classical music, the intonation of harmonies, does not correspond to our theory of equal temperament). The exact way to realise this "modulation" between two consecutively used harmonic series that are built on two different frequencies can be determined by the following rule: one common pitch of the two consecutive chords shall remain at the exact same frequency for both of them. Departing from that pitch, the following chord is built according to the intonation of the new harmonic series, which is to be established departing from the new position in the harmonic series of the common pitch.

Example:

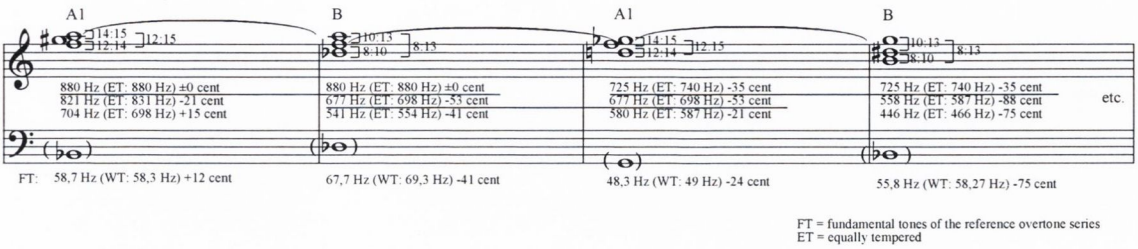
The four chords that appear in chord progression 1 and chord progression 1' have the following interval proportions:

Chord A1	Chord B	Chord A1'	Chord B'
6 (12) : 7 (14) : 15	8 : 10 : 13	6 : 7 : 9 : 10	8 : 10 : 13 : 17

In chord progression 1, there are two notes in common in the transition from chord A1 to chord B: the pitch of chord A1 which represents the 6th (or 12th) overtone is the same as the pitch of chord B which represents the 10th overtone. At the same time, the 15th overtone in chord A1 is the same pitch as the 13th in chord B. We choose for the common frequency the upper voice of the chord, which is the second pitch mentioned above – the 15th overtone becomes the 13th. Now, the second common pitch does not have the same intonation in both chords anymore: the 10th overtone in chord B will be a bit lower than the 12th in the precedent chord A1, since the proportion 15:12 is a bit bigger than 13:10.

In the transition from chord B to chord A1 in chord progression 1, the common note is the 10th overtone of chord B and the 7th (or 14th) of chord A1.

In the following image, four steps of chord progression 1 are represented. The departing frequency is 880 Hz for the upper voice of the first chord, the pitch A5. From there, the resulting frequencies in this "dynamic just intonation" are noted, together with the corresponding frequencies in the equally tempered system, in brackets. The frequency difference between the two tuning systems was calculated for each note, in cents.



As the progression goes on, the frequency differences between this "dynamic just intonation" and equally tempered intonation become bigger. After only six steps, the resulting bass note is a semitone below its equally tempered equivalent.

Through this system, with every new chord of a chord progression there is a new fundamental tone of the harmonic series which determines the intonation of the chord. This could be seen as a modulation between different fundamental tones. The intervals between the fundamental tones in chord progression 1 are the following:

Chord A1 : Chord B	Chord B : Chord A1
6 : 5	5 : 7

This series of proportions 6 : 5, 5 : 7, 6 : 5, 5 : 7, etc. corresponds to the motion of fundamental tones in the alternating intervals *rising minor third - falling tritone*. Given the fact that the chord A1 is built on the fifth of the harmonic series, this motion of fundamental tones results in the motion of bass notes *falling major third, rising minor second, falling major third, rising minor second, etc.*, – the bass line of the chord progression.

5. Motivic material

The motivic material of the piece can be categorised in five types: 1 "interlaced chord progressions", 2 "songs", 3 "quintuplets", 4 "electronic rhythms", 5 "canon".

The harmonic system described above is applied in the first four of these five motivically different types of material.

5.1. Material 1 "interlaced chord progressions" and material 2 "songs"

The two first types of motivic material, the "interlaced chord progressions" (ICP) and the "songs" (S) are, in the structure of the piece, linked to each other in a way that makes it meaningless to treat them independently: most of the time, a sequence of the material ICP leads to a sequence of material S. These materials, together, were the first way of processing the invented harmonic system of *Perpetual Peace* in the course of the composition process.

In material ICP, the chord progressions are kept in their original form, in a very slow succession, stretched in time – with approximately five bars in four-four time, the crotchet at 60 BPM, per chord – creating a vaguely pulsating texture with the pitches of the respective chords. Each chord remains unchanged for several measures. At some point, one instrument after the other changes to the next tone, until the next chord is reached, the transition in the bass being always the most important moment, at which the listener has the impression of a harmony change. Since the instruments change to their next tone one after another, "transitory" chords emerge. For this reason, the property "interlaced" can be found in two different senses: the purely motivic interlacement in the interaction of the instruments, and the harmonic chord interlacement within the chord progression.

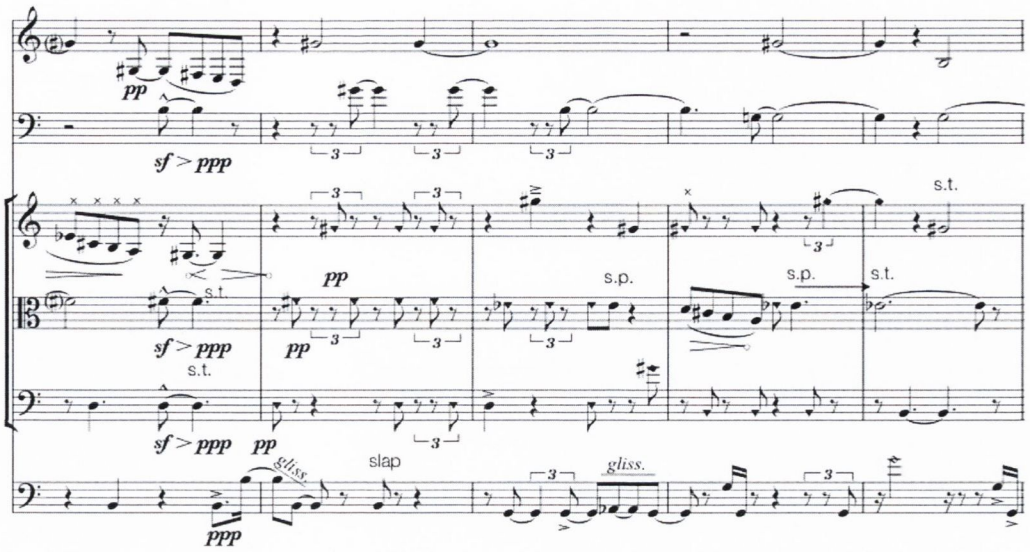


Fig. 30 Example for the ICP material: bars 92 - 96 of *Perpetual Peace*

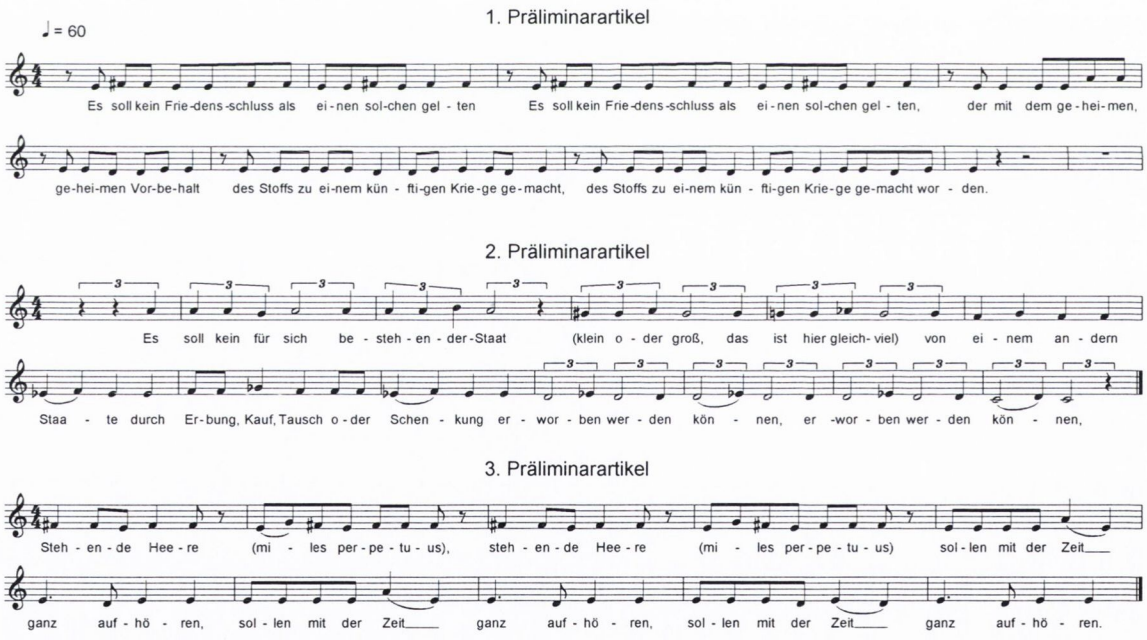
The aesthetic idea behind these parts was to create a texture of pulsating sounds of continuously varying timbres that slowly and almost imperceptibly moves from one harmony to the next, following the chord progressions described above. All instruments play mainly short notes, pizzicato or staccato, interspersed with breaks. These are the notes that form the chords, the dominant harmonies. They have changing timbres, changing playing techniques: the pizzicato notes are occasionally halfway damped, the staccato notes are sometimes played sul ponticello, sul tasto, etc. In a non systematic way, they form a sort of "hoquetus" – only a sort of, since the complete construct does not build up to any pregnant melody or rhythm or anything else, but should simply give a vague feeling of pulse and harmonic texture. At several points, scale segments appear, upwards or downwards, always decreasing in volume, sometimes down to silence, sometimes played as a glissando. In other moments, there are long notes, played with a crescendo or a decrescendo, or both. These elements are not intended to be substantial parts of the music, but just small interferences, filling textural elements, like – to use a cheesy image – the foliage in a bouquet. Therefore, it is not important what exact pitches are included in these short scales.

This material was written by hand (see the sketch included in the appendix), without the help of any kind of computer simulation, in order not to lose the freedom of using different playing techniques and in order to keep a free sense of pulse, not dominated by strict subdivisions of beats, but still playable and vaguely rhythmical.

The material "songs" is constituted by three different sections: the scoring of the Preliminary Articles 1 (S1), 2 (S2) and 3 (S3). While S1 and S3 can be considered two variations of the same song, S2 is quite different from a strictly motivic point of view. They still belong together, though, due to their common role and position in the global structure, as well as to the fact of sharing a harmonic structure built on elements of the harmonic system described above, as opposed to the scoring of the Preliminary Articles 5 and 6.

The Preliminary Articles 1 (S1) and 3 (S3) not only have a very similar melody but are also based on almost the same harmonies: for S1, it is a pendulum between two A1'-chords at a minor third interval; for S3 the same, but with A1-chords. The melody of both is doubled in quart intervals. In S1, the children sing the upper voice, in S3, in contrast, the lower.

The second Preliminary Article (S2), is based on the harmonies of chord progression 2.



At the beginning of the composition progress, as a "working prototype", a full, coherent piece was created using these two motivic material types. Sections of the pulsating, textural material "interlaced chord progressions" (ICP) alternate with contrasting sections of children's choirs – the "songs" (S): the first ICP-part of about three minutes duration is followed by a children's choir with the first Preliminary Article of about one minute, again followed by a two minute-long second ICP-part, a second children's choir with the second

Preliminary Article of another minute's length, then a third ICP-part of two minutes followed by the third children's choir, again one minute long, with the third Preliminary Article, and finally the fourth and longest ICP-part, with a duration of over four minutes:

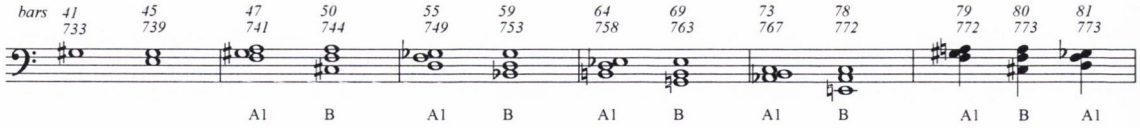
ICP1 2'45	S1 1'	ICP2 2'	S2 1'	ICP3 2'15	S3 1'	ICP4 4'30

Since the third choir (S3) is a variation of the first one (S1), the global structure of this "working prototype" is almost symmetrical.

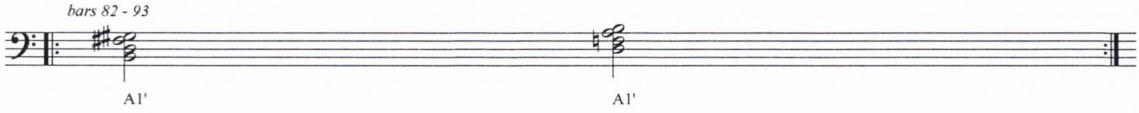
The four ICP-parts gradually become more and more dense; the third and fourth part (ICP3 and ICP4), also become more and more rhythmic.

The harmonic structure of this "working prototype" is based on the following sequence of harmonies, using the chord progressions described above. The very first chord in the first part (ICP1) is built departing from a single pitch, G#. This tone, in different octaves, is played over and over during the entire ICP material, as a sort of high pedal tone, independently from the prevailing chord.

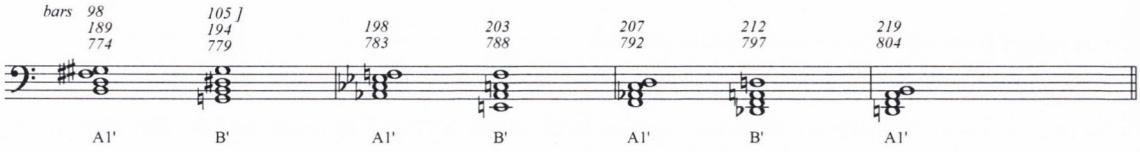
ICP1 - chord progression 1



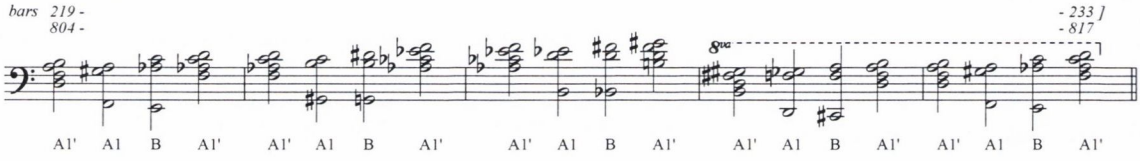
S1 - A1' chord pendulum



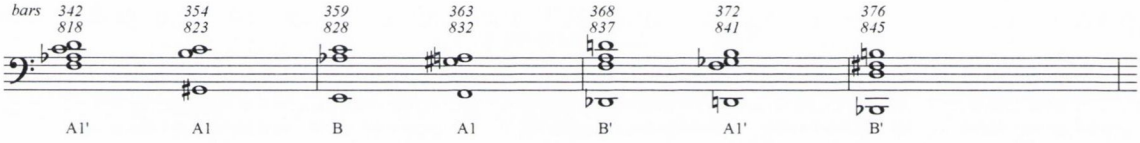
ICP2 - chord progression 1'



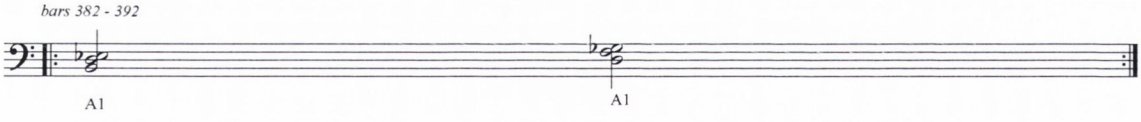
S2 - chord progression 3



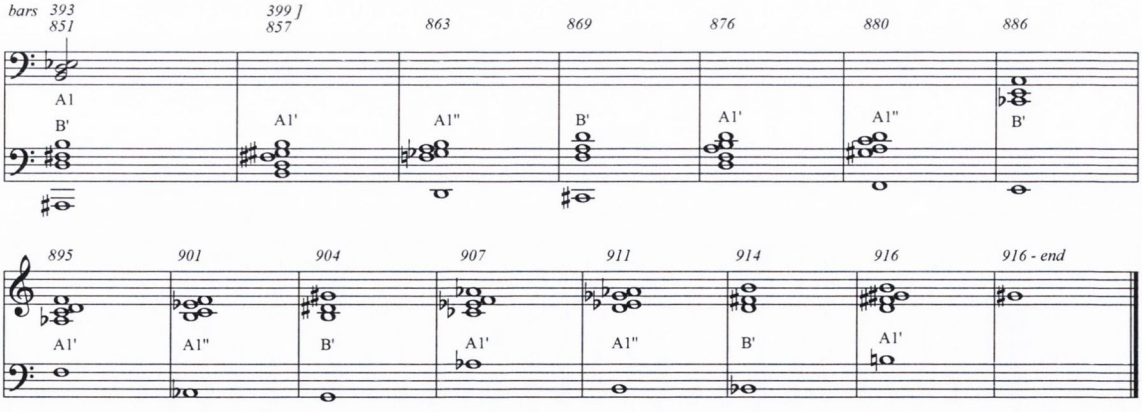
ICP3 - chord progression 1 / chord progression 1'



S3 - A1 chord pendulum



ICP4 - chord progression 1"



Different appearances of the ICP and S material in the piece:

This "working prototype" is never played in this complete working version, but appears primarily in two different adaptations:

Version 1: Bars 41 to 106; 180 to 234; 342 to 399

In the first version, spread over the first half of the performance, the "working prototype" is divided in three parts, each of them ending with one of the children's songs S1 to S3, respectively: the first part is ICP1-S1 from bar 41 to 106, the second ICP2-S2 from bar 180 to 234, the third ICP3-S3 from bar 342 to 399. ICP4 does not appear here. This first version is thus interrupted by various other scenes.

Version 2: Bars 735 to 925

At the end of the performance, from bar 735 to the end of the score, the material is played in its totality as a consecutive piece of music, without interruptions, so that it could be seen as one single coherent piece of music. The total duration here is 15 minutes. The children's choirs S1 and S3 from the "working prototype" were supposed to be inverted in their order in this version. Finally, however, I removed them, for two reasons: in order to achieve a greater fluency, without interruptions, and because the positive, naive singing turned out not to fit the character of the last part of *Perpetual Peace* anymore. Only the second choir appears, in an only instrumental version, without singing, processed with the alienating "false FFT-filter".

As an important addition, this material is here accompanied by rhythms coming from the electronics, the same rhythms that in other parts of the piece, when they come to the foreground instead of being an accompaniment, constitute the material 4 "electronic rhythms". Their creation is described below, see Section B. IV. 7.1. Here, the sampled notes triggered in these electronic rhythms are always components of the chords that form the chord progressions; the electronics therefore function like a harmonic accompaniment. In this section, the electronic rhythms stay in the background, a merging element for the single, continuously varying instrumental sounds, an additional source of steady pulsing sounds which fuse together to one harmony.

In bar 884 during ICP4, close to the end of the piece, after a more rhythmical section the instruments stop playing, and the "electronic rhythms" become dominant, coming to the foreground. This section stands in analogy to scene 21 / 22, and will be discussed below (see Section B.IV.5.5).

Other fragments

At other parts of the performance, such as for instance in bar 673, only small segments of this material appear, most often at the beginning of the material, with the repeated G#, as little remembrances.

5.2. Material 3 "quintuplets"

The material "interlaced chord progressions" only functions through the sum of all instruments, as already mentioned, as in a hoquetus. There is no discrete solo voice, there is no melody, no actual musical figure. In contast to this, I wanted to find a second type of material where all these elements can be found. It is for this purpose that I started a piece for double bass solo as a study for the development of motivic material for *Perpetual Peace*. The parts described below, all the material types subsumed under the name "quintuplets", are based on this piece, *Holz* (see score in the appendix).

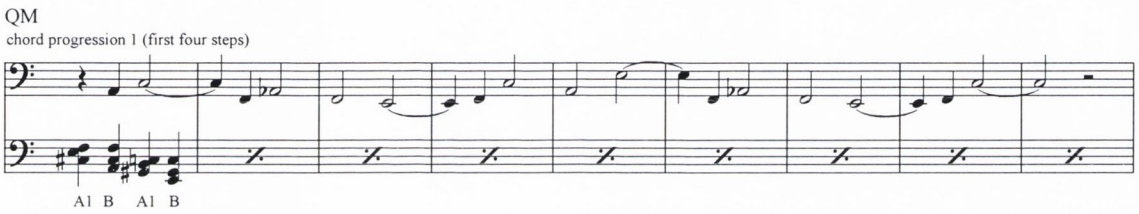
The solo piece was written in an intuitive way, using the piano, but keeping in mind the harmonic material that I wanted to use. A goal here was to use only few different motivic materials per time unit, and so to exhaust the options of this limited amount of material.

The solo piece uses the material of the harmonic series in the same way as the "interlaced chord progressions" do: the chords A1-B, A1'-B' or A1''-B', the chord progressions 1, 1', 1'' and 3, but adapted for a solo voice and in a more flexible, varied and intuitive way. One inspiration for this piece were baroque solo pieces, such as the partitas for solo violin by J.S. Bach, where complex harmonies are presented linearly within one soloistic line. Later, I adapted this solo piece for the six instruments of *Perpetual Peace*, cut it into different parts, made some parts longer than they were in the solo piece, and so the different sequences used in the performance were formed. Due to the origin of this material, the electric bass often plays an especially important, soloistic role in its ensemble adaption.

The "quintuplets" material is not homogeneous, but is rather a compound of several different motives. Apart from the fact that they are all part of the same solo piece, they all have in common their horizontality and their musical pregnancy, the fact of being "motives" in a classical sense. I will here describe the different elements of this material. In order to facilitate ease of reference later, each is assigned a two-letter-code starting with Q (from "quintuplets"):

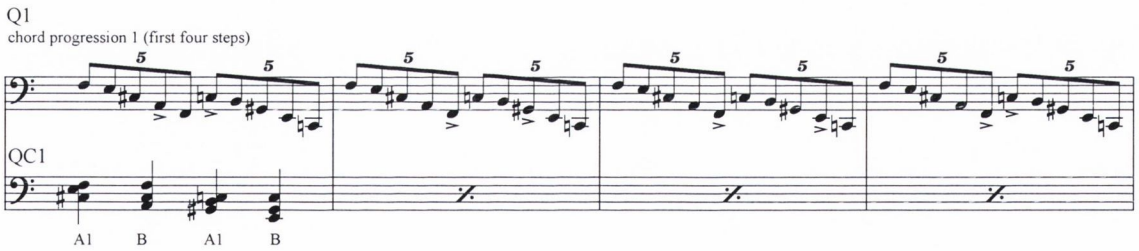
Melody (QM)

The core of this material is the following melodic line:



Quintuplets (Q1, Q2), chords (QC1, QC2)

The melody above emerges through the accentuation of changing single notes in a passage composed by the alternate repetition of two descending quintuplets:



The harmonies of these quintuplets represent a similar pendulum motion as in material S3: A1-chords moving up and down in a minor third interval, but here with the corresponding B-chord inserted between them – in other words, the four first harmonies of chord progression 1. The first three notes of each quintuplet form the A1-chord, the last three the B-chord. The middle note is the common pitch to both chords.

In the adaptation for ensemble, these chords (QC1) are the accompaniment for the melody QM, as is the case at the very beginning of *Perpetual Peace* (bar 9 to 21).

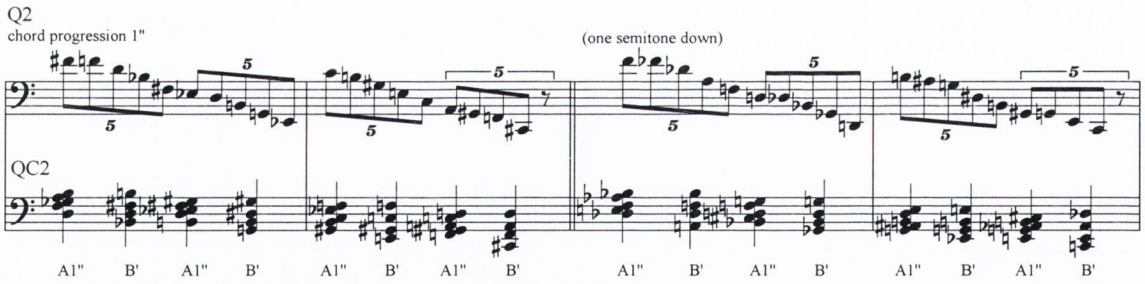
The quintuplets Q1 are often played in unison by the strings, all notes played pizzicato except the accentuated notes that form the melodic line, which are played arco. Meanwhile, the wind instruments play the melody in long notes (bar 22).

In a variation of Q1, the accentuated notes (the melody) are put at the first place of each quintuplet, as in bar 27.

Yet another variation is the quintuplets motive being accompanied by chords (QC1), as in bar 312, 504 or 729. In this version only one instrument – often the bass – plays the quintuplets, while the rest of the instruments play the chords, this time with the extended chord version A1''-B'. Here, transposing single chord components by octaves up or down, each instrument plays large intervals from one note to the next, creating widely spread chords with changing inversions in the instrumentation.

In Q1 / QC1, the harmonies remain static, only moving from the upper to the lower quint, without going further than the four first chords of the chord progression 1. But the complete chord progression is played in later segments (Q2) with the correspondent chords (QC2), such as, for instance, in bar 312.

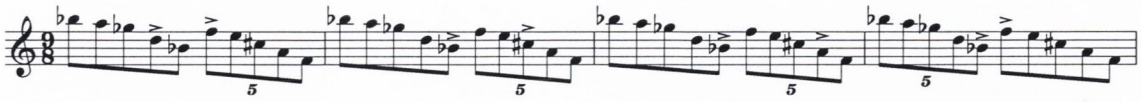
Q2 / QC2, here represented in a compact chord inversion:



The accompaniment QC1, the wide-spread chords A1''-B', also appear alone, without the quintuplets, both in the harmonically static version (QC1) and in the modulating, chord progression version (QC2), e.g. in bar 249 (QC1), bar 311 (QC2), or bar 471 (QC2).

Later in the piece (e.g. bar 462), the quintuplets appear again in the harmonically static version Q1, with one important rhythmic difference: while the first quintuplet of each bar is played unmodified, the second one is accelerated at 5:4. For the notation, a tempo change was necessary. The original quintuplets at tempo 40 are now notated as regular

quavers in tempo 50. The second, accelerated group is now a quintuplet in tempo 50. Altogether, the two groups, the first five and the second one four quavers long, add up to a full 9/8 bar.

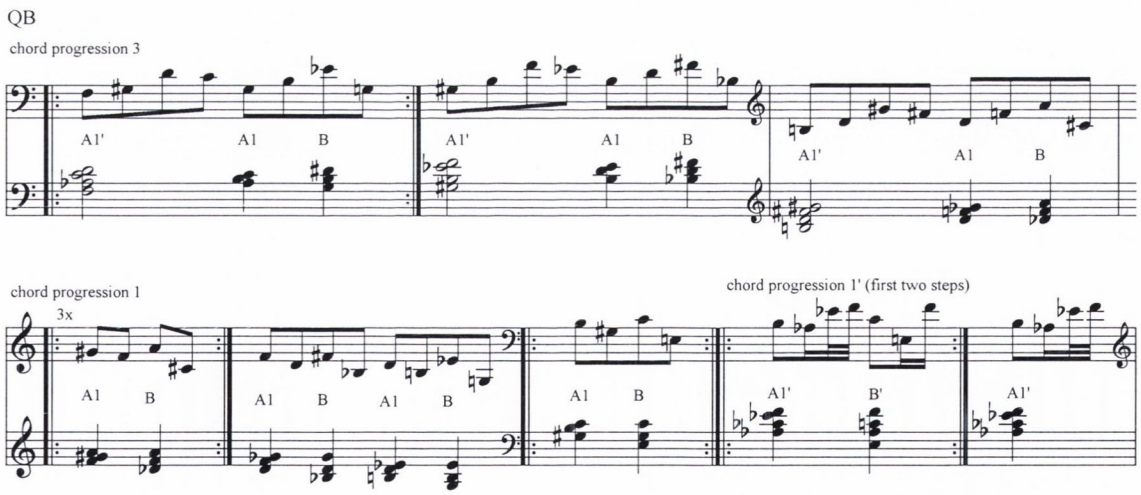


These type of unusual, but still "rhythmical" tempo shifts (their rhythmic proportions can still just be felt as having a common metrical root) are an element that I have used in various pieces over the last years, and that also emerges in the orchestra piece *Kilter*, described above (see Section A.III.2).

In bar 254, the unison quintuplets are played in a retrograde inversion.

Broken chord progressions (QB)

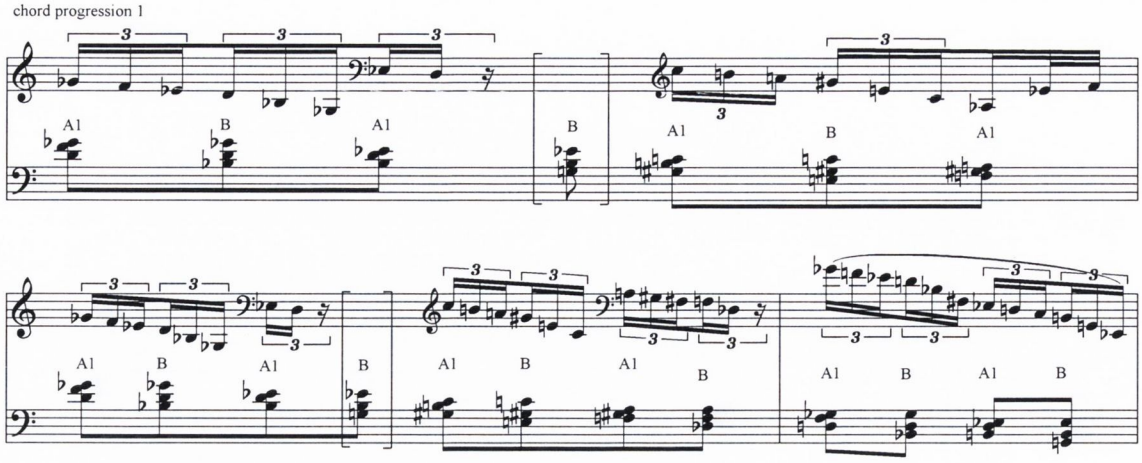
In a second segment of the double bass piece *Holz*, the chord progression 3 is first processed, followed by the chord progression 1 / 1'. In the further text, I call these segments "broken chord progressions" (QB):



Triplets (QT)

The broken chord progressions always lead to a passage of descending semiquaver triplets reminiscent of the descending quintuplets, and that are based on the same harmonies: again the chord progression 1.

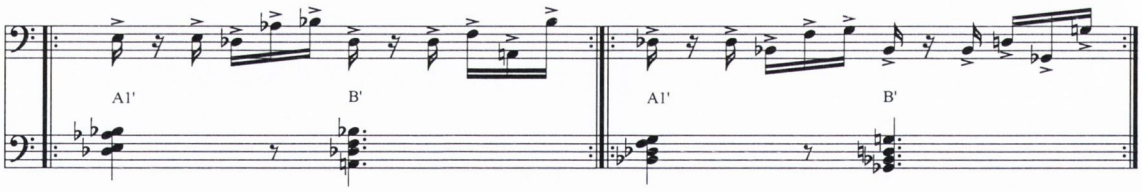
QT
chord progression 1



Fast part (QF)

Finally, a last segment appears, fast and aggressive, with a base of sextuplets played by the electric bass. In the adaption for ensemble I avoided a straight pulse by contrasting the sextuplets with quintuplets and duplets, in order to create a chaotic and driving sound. This segment appears three times during the performance, becoming longer each time: the first time at bar 173 to 178, the second at bar 316 to 332, the third at bar 508 to 588.

QF
chord progression 1' (first four steps)



The harmonies processed here are constituted by the minor third pendulum of A1'-chords, as in (S1), with the B' chord inserted between them or, in other words, the four first harmonies of chord progression 1' – in an analogous way to the quintuplets, which represent the four first harmonies of chord progression 1. At the second and third appearance of this material (bar 316 to 332 and bar 508 to 588), other motivic elements, different accelerated motives from the "quintuplets" material, are interwoven with the original QF material. The development of this material was created in large part at the piano, in an intuitive way. Hence, only the basis for the material QF (see the image above) is based on the first four steps of chord progression 1', while the further elements have in part differing harmonies and will not be analysed in detail.

The material "interlaced chord progressions" not only has a very determined harmonic evolution in its modulations from one harmony to another, always strictly following the chord progressions within one segment of appearance, but it also always appears, every time it is restarted, at the harmony where it stopped at the last segment. The material "quintuplets" in contrast is much more flexible in its global harmonic development: sometimes it remains harmonically static, only going back and forth from one harmony to another in a chord pendulum, at other times it modulates quite fast, mixing different types of chord progressions. In contrast to the material ICP, it appears in different tones. In the following table, I show the "tonal centres" of the different appearances of the "quintuplets" material. These centres are determined as explained in section B.IV.4.2.1.

Scene	Bar	Motive	Harmonic Progression	Tone
1	1	QM		A
	22	Q1		A
	31	QM		E
5	153	QB		A
	155		Chord progression 3	A → F#
	159		Chord progression 1	F# → A
	163	QT	Chord progression 1	Eb → C
	166	QB		A
	169	QT	Chord progression 1	Eb → C
6	173	QF	Chord progression 1'	A - Gb- Eb - C
9	249	QC1		D
	254	Q1		A
	259	QM		E
	267	Q1		E
	271	Q1		A
10	275	QB		E
	277		Chord progression 3	E → C#
	281		Chord progression 1	C# → E
	285	QT	Chord progression 1	Bb → G
11	304	QC1		Bb
	312	QC2	Chord progression 1'	Bb → C#
	314	QC2	Chord progression 1'	A → C
12	316	QF		A - F - C - A
17	462	Q1		D
	471	QC2	Chord progression 1'	D → F
	475	QC2	Chord progression 1'	A → C
	477	QC2	Chord progression 1'	Ab→ B
18	504	QC2	Chord progression 1'	D → F
	506	QC2	Chord progression 1'	A → C
19	508	QF		A - F#
	512	QF		F – C - A
20	530	Q1 (double tempo)		C#
	581	Q2 (double tempo)	Chord progression 1	C# → E
	585	Q2 (double tempo)	Chord progression 1	C → D#
24	729	QC2	Chord progression 1'	D → F
	731	QC2	Chord progression 1'	A → C

5.3. Material 4 "electronic rhythms"

The "electronic rhythms" (ER) are in the foreground, constituting a musical material of its own, in scene 4 and 16.

The electronic processing explained under section B.IV.7.1 is deployed in these two scenes in the most basic way: the instruments play short chords which get sampled, and at the same time, a rhythmical playback of these just recorded samples is released. Along with this rhythm, the musicians sometimes play the sampled chord again, as an accent, a real, acoustic reinforcement of the notes played by the electronics. At other times, the musicians play new chords, contrasting harmonies, while the notes in the electronic rhythm remain the same. Eventually, the contrasting new chord gets sampled in turn, renewing the samples and consequently the harmonies played by the electronics (sometimes the samples of all instruments are renewed at once, sometimes one after another).

At the beginning of these two scenes, the pitches are played pizzicato. Later, the strings switch to arco, which creates a musical climax. In this more confused sounding part, the players start sampling the new notes of the respective next chord one after the other, creating a similar interlacement of chords as in the material "interlaced chord progressions".

The harmonies processed in this type of material are the chord progression 1 and – this being the only type of material using it – the whole-tone chord progression 2 (as at bar 126).

The "electronic rhythms" appear also in the scenes 21 / 22 and 25 / 26 / 27 / 28. Here though they remain in the background most of the time, as an addition to another, more dominating material (see Section B.IV.5.5 Mixed material).

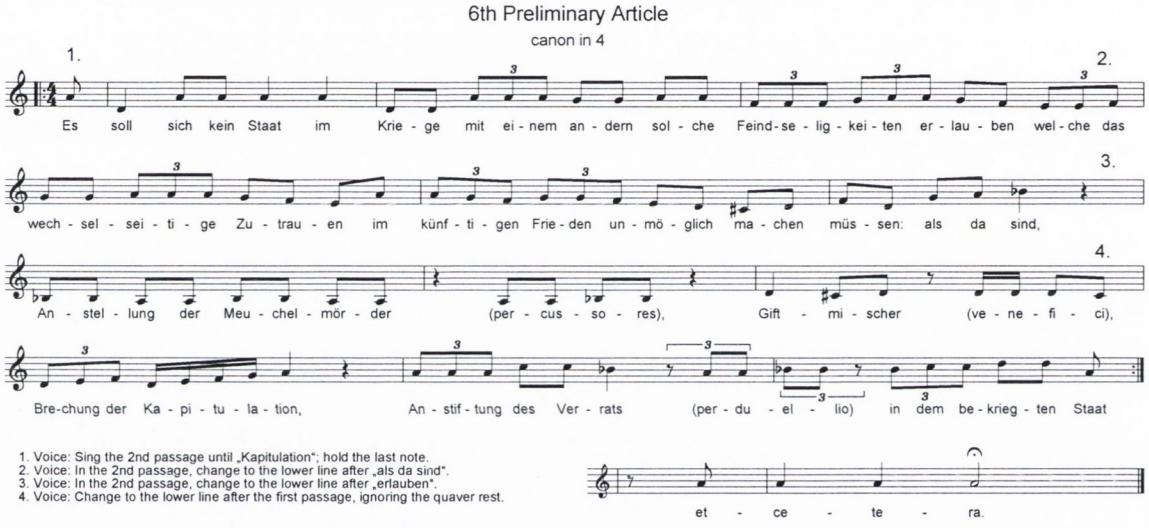
5.4. Material 5 "canon"

This material constitutes the only parts in the performance created with other harmonics than the systems of chord progressions described. It is composed of different related elements, as it is the case for the material "quintuplets". These elements will also get a two-letter-code for later reference.

6th Preliminary Article (C6)

The origin of this material was the idea of making a canon out of the 6th Preliminary Article. The text of this Preliminary Article is by far the longest. It also contains words that I perceived as sounding amusing from today's point of view, such as "Meuchelmörder" (treacherous assassins) or "Giftmischer" (poisoners, literary translated "poison mixers") – I concluded that this effect would be enhanced if one could hear these words jumbled together, as it would be in a canon.

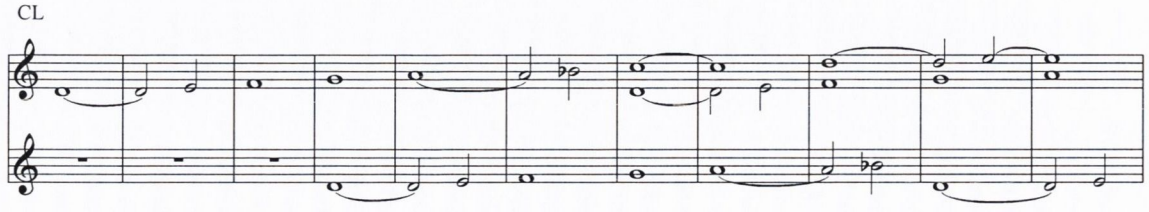
C6



The limited technical possibilities of an untrained children's choir made it imperative to let one instrument play each vocal line respectively.

Line (CL)

As an accompaniment for this canon, I set a very simple rising line (CL), a three voice counterpoint:

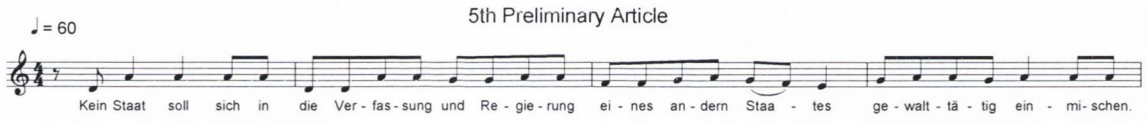


This line is an important element of this material and also appears alone, such as in bar 235, 334, 437, 651, in different variations, sometimes in combination with other material types (e.g. with ICP in bar 651), but always starting at the same pitch D.

5th Preliminary Article (C5)

As a preparatory forerunner of the proper canon (the 6th Preliminary Article C6), the much shorter 5th Preliminary Article is presented, made of very similar musical motives: the rising line CL as an accompaniment is the same, and the sung melody is very related to the beginning of the canon.

C5



Fugato (CF)

Towards the end of the performance, at scene 24, the "canon" material is played in an instrumental version, but now each voice starting at a different pitch, as a sort of fugato (CF).

5.5. Mixed material

Scenes 21 / 22

One important musical climax of the performance is reached after the canon, after scene 18: the stage remains empty for a few minutes and the third, longest version of the aggressive QF material is played (scene 19 / 20), which is the musical passage with the most, fastest, and loudest notes. After this part, there is a calm section in which many of the previous types of musical material are mixed together, in a way comparable to the "musical development" in the classical sonata form:

The base is formed by the "electronic rhythms". This time though, the sampled notes are long, played arco, in such a way that we do not hear clear rhythms coming from the electronics but rather a rhythmically textured sound space. The harmony is constituted by chord progression 3 (bar 591 to 628). Over this sound, first, in scene 21, the melody of the 5th Preliminary Article (C5) is played by the clarinet, while a counterpoint is set by the bassoon, which plays simultaneously the melodic line from the "quintuplets", QM. By scene 22 (bar 608), the harmonic texture becomes a bit more dense: the strings play, as contrasting harmonies to the sampled chord progression 1 that still comes from the electronics, the chords from the whole-tone chord progression 2. These chords are played as high flageolet notes. We thus have two parallel, simultaneous harmonic streams; one constituted by the lower chords, which get sampled each time, becoming a part of the electronics (chord progression 1), and one by the repeated high flageolet notes (chord progression 2). At the same time, the clarinet plays the melody from the 2nd Preliminary Article (S2), in a very slow version.

At bar 630, while the "electronic rhythms" go on, the instruments start playing a polyrhythmic texture derived from the ICP material, but in a rhythmically straighter, more squared variation, continuing with the harmonies from chord progression 2. These played rhythms, at first extremely quiet, fit or perhaps even merge into the electronic rhythms, although still representing a contrasting element. During the first few bars of this new part, the electronics fade out, and the played rhythms come to the fore, to go on for around one minute.

End of the piece

The scene 22 described above is analogous to the end of the piece: the transition from the electronic to the actually played rhythms appears again at bar 871 et seq. The rhythms here are the same, while the harmonies consist of the chord progression 1'', instead of the chord progression 2 at the analogue section (scene 22). Now, the played rhythms are loud, and the passage with the played rhythms is largely extended. At bar 884, the played rhythms are interrupted with homophonic, sampled chords that produce the "electronic rhythms" material in its original form. The actually played rhythms restart in forte at bar 907, becoming more and more quiet and sparse, and finally centering on a G#.

5.6. Harmonic centres

Two tones determine the harmonic centres of *Perpetual Peace*:

A very important element of the ICP material is the departing point **G#**. From this starting pitch, the chord progression 1 is developed. The G# stays, as a sort of pedal point, during the whole ICP passages – played again and again, in different octaves and articulations, by different instruments. These are some examples: bassoon in bar 55; violin in bar 65/66; clarinet, violin, viola and violoncello in bar 215; clarinet and bassoon in bar 368; violin, viola and violoncello in bar 827; bass in bars 863 to 867. This G# is one of two fixed reference tones, one important "tonal" centre. The second, derived from the motivic materials "songs" and "canon", is a **D**, at a tritone of the first one – tonally seen, the furthest interval. This D is the tonal centre of all the six Preliminary Articles (S1, S2, S3, C5 and C6). It is the starting point of the line that accompanies the canon material (CL). Lastly, it is the pitch of the tubular bell, which is played as a signal and as a help for the singing entrances.

6. Rhythms

The rhythmical element of music is extremely important to me. Rhythms create force, attach the listener, give energy. Years ago, inspired by music from the early modern period – pieces like Stravinsky's *The Rite of Spring* – and later on by post-minimalist pieces like Andriessen's *De Snelheid* amongst others, by jazz music (Steve Coleman and Five Elements, for instance), by funk, rock, electronic and other non-academic music, I developed a predilection for driving rhythms, rhythms that may be complex but are still pulsating. Although *Perpetual Peace* is one of the less rhythmical pieces I have written in recent times, due to the heaviness and, derived from that, the feel of slower motion that I associated with the subject of the performance, this affinity can still be observed.

6.1. Rhythmical features

Notable rhythmical elements in *Perpetual Peace* are:

- Metrical shifts, such as in the "quintuplets", when they are played in an alternation of two rhythmical versions with the proportion of speeds 4:5 and 5:4 (e.g. bar 267).

- Polyrhythms. They appear in two different motives: first, within the QF parts in the scenes 6, 12, 19 and 20 (see Section B.IV.5.2), where the proportions of 2:5 (bar 581 et seq) or 4:5:6 (bar 316 et seq.) can be observed within simultaneous voices. Second, in the "mixed material" of scene 22 and at the end of the piece (see Section B.IV.5.5): when the pulsating instrumental texture starts at bar 630 and bar 871, respectively, at the beginning quaver triplets are dominant. The simultaneously played semiquavers, at first occurring very seldom, begin to occur more and more, finally coming out on top in bar 635 and 874, respectively. Consequently, semiquaver triplets start being played on top of the regular semiquavers and become in turn predominant after a few bars (at bar 645 and 913, respectively). In this way, a ternary rhythm first merges with a binary (more exactly: quaternary) one, which then merges again into a ternary rhythm with the double speed of the original one.

- Uneven metrical units (like the quintuplet motives Q1 and Q2), as well as units of mixed lengths and mixed meters, as in the QF parts. An example of the latter is bar 514 and the following, which include groups of 3+3+4 semiquavers, sequences of 5/8 and 6/8 time signatures, and the like.

- The pushing "electronic rhythms", the aggressiveness of which is enforced by the interspersed accents played by the musicians, as in scenes 4 and 16, and which are generated following a principle explained in the next section.

6.2. Rhythms derived from sound-waves

Many approaches have emerged in the 20th and 21st century to renew and revolutionise harmony, the melodic constructions, and the formal structures of musical compositions. Much less has been thought and done concerning a new rhythmical approach:

Our rhythms consist of successions of different rhythmic values, these values have whole-number proportions. The binary proportions 1:2, 1:4, 1:8, etc., are the most common, then come the ternary ones such as 1:3, 2:3, 1:6, etc., then the x-tuplets that introduce proportions like 1:5, 1:7, etc., and finally, used more rarely, more complex proportions like 2:5, 3:5, 2:7, etc.

During the preparation of *Perpetual Peace*, I was interested in creating rhythms that are built on proportions other than whole-number. I had the idea of investigating how the periodical swinging of a sound frequency would sound, if it was slowed down and translated into a pulse:

The specificity of a pitched sound, the attribute that makes of it a defined pitch, is the regularity of its wave form. While a sinus tone or another simple type of pitched sound would only consist of a repetition of peaks in a velocity defined by the hertz number of the frequency – the peaks representing the moments with the highest density of air pressure when the sound is transmitted through the air –, a more complex sound like the tone of an instrument is a series of more or less high peaks following a regular pattern. The velocity in which this pattern repeats determines the fundamental frequency of the pitch, while the kind of pattern determines the timbre of the sound.

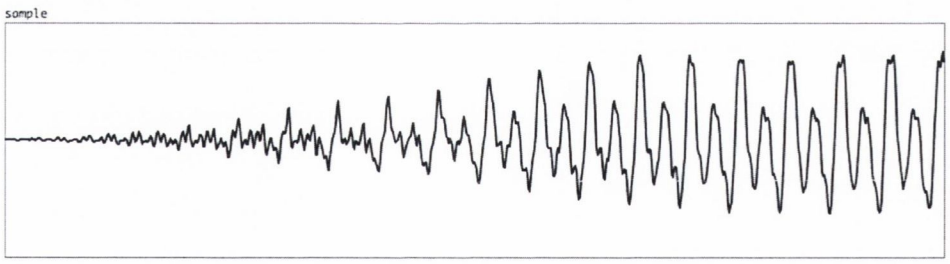


Fig. 31 Sound-wave of a saxophone tone visualised in Pure Data

If we compare the waveform of a pitched single tone with that of a chord, we see that the difference is only gradual: whether the single harmonies of the sound are only perceived as partial tones of one pitch or whether they are perceived as pitches that are part of one chord depends on the volume of the single partials.

Considering that the wave of a stable pitch will be defined by the following function, where x is the fundamental frequency of the pitch and a, b, c, d, etc., are the factors of the

volume proportions of the respective overtones – the factors that define the timbre of the sound,

$f(x) = \sin(x) + a\cdot\sin(2x) + b\cdot\sin(3x) + c\cdot\sin(4x) + d\cdot\sin(5x) + e\cdot\sin(6x) + f\cdot\sin(7x) + g\cdot\sin(8x)$ ...etc.

it becomes clear that the rhythmical values of such a rhythm can never have a whole-tone proportion: the speed of the basic, largest rhythmical unit will always be the fundamental frequency x, while the rhythmical divisions within this unit slightly slide to one side or another of our time axis, depending on the timbre, which means, on the respective accentuation of one overtone or another, on the factors a, b, c, d etc.

Of course, such rhythms are probably impossible to notate, and difficult to play. For these reasons, in *Perpetual Peace*, I used this element only in the electronics. The method used to achieve these kinds of rhythms is explained in section B.IV.7.1.

7. Electronic processing

The approach to the electronic processing used in *Perpetual Peace* is rather unconventional. The four instruments (the three strings and the bass) and the sounds of the stage floor are processed using patches that I programmed entirely by myself using the Pure Data environment, a skill I acquired in an auto-didactic manner. The patches involve rationally conceived processes, achieved through rationally conceived arithmetical operations. I do not use very complex processes usual in contemporary electronic music such as, for instance, granulation, for two reasons. The first, more practical of these is that I am not familiar with their realisation. The second is that I aimed to produce a type of live processing that would be traceable for the hearer: I wanted the acoustic source to be clearly related to the resulting processed sound in the live electronics.

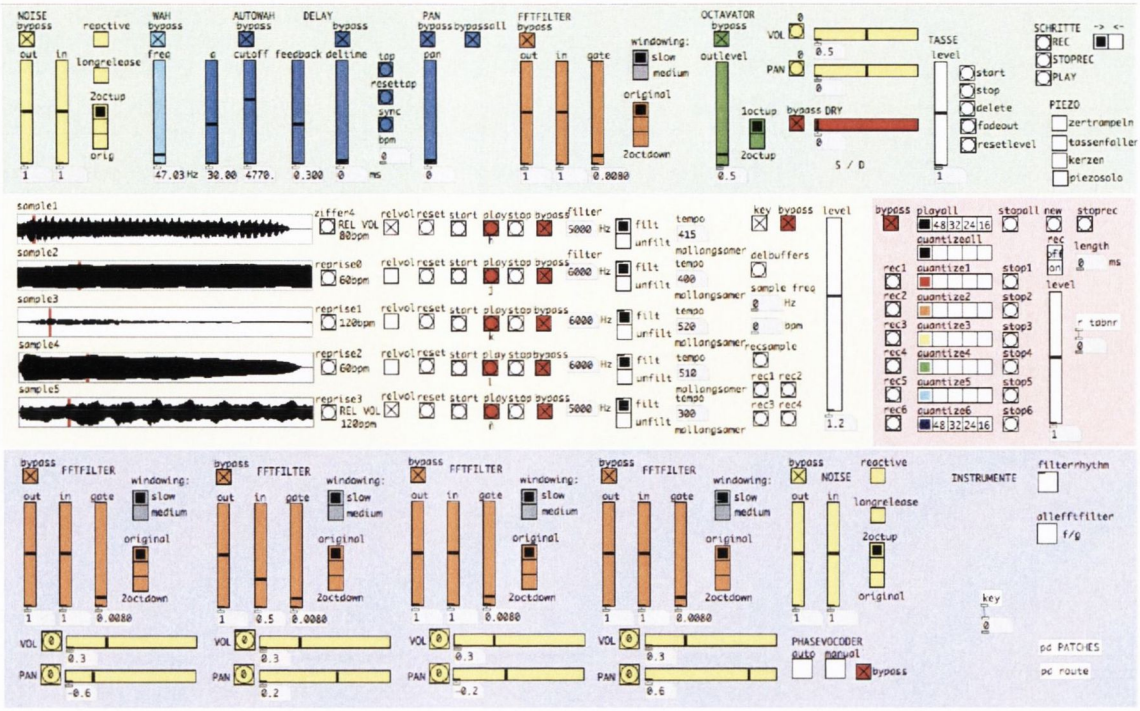


Fig. 32 Pure Data interface designed for *Perpetual Peace*

7.1. Pd-patch 1: Creating rhythms from pitched sounds

The idea of this patch is to transform the wave form of a pitched sound into a rhythm, as I explained above (see Section B.IV.6).

Five different, previously chosen sound-waves are used in the patch to create these rhythms. The loudest moments of these sound-waves, slowed down by a factor of between 200 and 800, trigger samples. These triggered samples are recorded live by the musicians themselves using a simple foot switch (I manufactured these switches myself using a de-mounted USB number pad). The notes to be sampled are indicated in the score with arrows. Each musician records his own samples, with one exception: where arrows with white arrow heads appear in the score, one of the musicians (in our performances it was the violin player) pushes an extra foot switch which triggers four recordings of the four processed instruments at the same time.

The global pitch of the sound-wave, in combination with the factor by which this sound-wave is slowed down, yields the basic pulse of the resulting rhythm, while the different harmonic components yield the rhythm itself within this pulse: a G4 for instance, with the

frequency 400 Hz, reproduced 400 times slower, will produce a rhythm of 60 BPM. If the sound only contains the fundamental pitch, the rhythm will only be a series of crotchets. If the octave is very present, it will be a simple series of quavers. But with more complex sounds or even chords, very complex rhythms can be produced. These rhythms can slowly change over time, just as a sound's timbre changes over time depending on the way it is played, on the kind of attack, the kind of release, etc.

In order to decide what the loudest moments in a waveform are, those which should trigger the samples, a simple physical observation will suffice: it is not the highest density of the air on the peaks of a waveform that will sound loudest, but the greatest changes of air density, that is, not the extrema (the peaks), but the inflection points of the curve. In order to determine these inflection points, in this patch, the sound-wave that produces the rhythm is converted into its first, then into its second derivative. In the first derivative, the initial inflection points will be represented by the peaks; in the second, by the zero points. The patch uses these zero points to trigger the samples, and the peaks of the first derivative to decide about the volume of these triggered samples: a stronger inflection point, a louder moment of the sound-wave, will have a higher peak in the first derivative. In this patch, I made stronger inflection points trigger the corresponding samples at a higher volume than weaker ones.

Further, the single notes of the generated rhythms are assigned to trigger *one* of the four different samples that were recorded by the four respective instruments, distributing the rhythm between the four instruments. In order to make this distribution, the volume of the peaks in the second derivative is again decisive: the loudest peaks trigger the e-bass samples, the second loudest the violoncello samples, the second softest the viola samples, and finally the softest peaks trigger the violin samples.

Depending on the kind of sounds sampled by the instruments, the electronic rhythms can be more rhythmic or more textural: percussive sounds like pizzicato notes produce a clearly rhythmic result, while long arco notes can produce continuous sound spaces, where the rhythmical way the samples are triggered only creates a sense of texture.

The tempo of the electronic rhythms is always synchronised to the tempo of the respective instrumental section in which they appear.

7.2. Pd-patch 2: Live quantization of samples

For *Perpetual Peace*, one goal was to use percussive, rhythmic elements without having any percussion instruments, only with the stage floor. These "concrete sounds" should replace the use of proper percussion. This is in part achieved through the following electronic processing.

Quantization applied to MIDI events is a well-known process, for instance in sequencer software: MIDI events, typically notes, are latched into a metrical grid of a width defined by the user (quavers, semiquavers, triplets or other) in such a way that every note starts at the closest of the chosen divisions.

With this Pd-patch, I aimed to apply the same principle of quantization to audio samples. However, as opposed to the MIDI versions, it is not destined to make rhythmic structures more exact, but to rhythmise randomly generated noises. In *Perpetual Peace*, it is applied to sounds produced on the stage floor. Short samples are recorded and consequently played back quantized, as a loop. Meanwhile, the recording goes on, adding more and more layers to this loop.

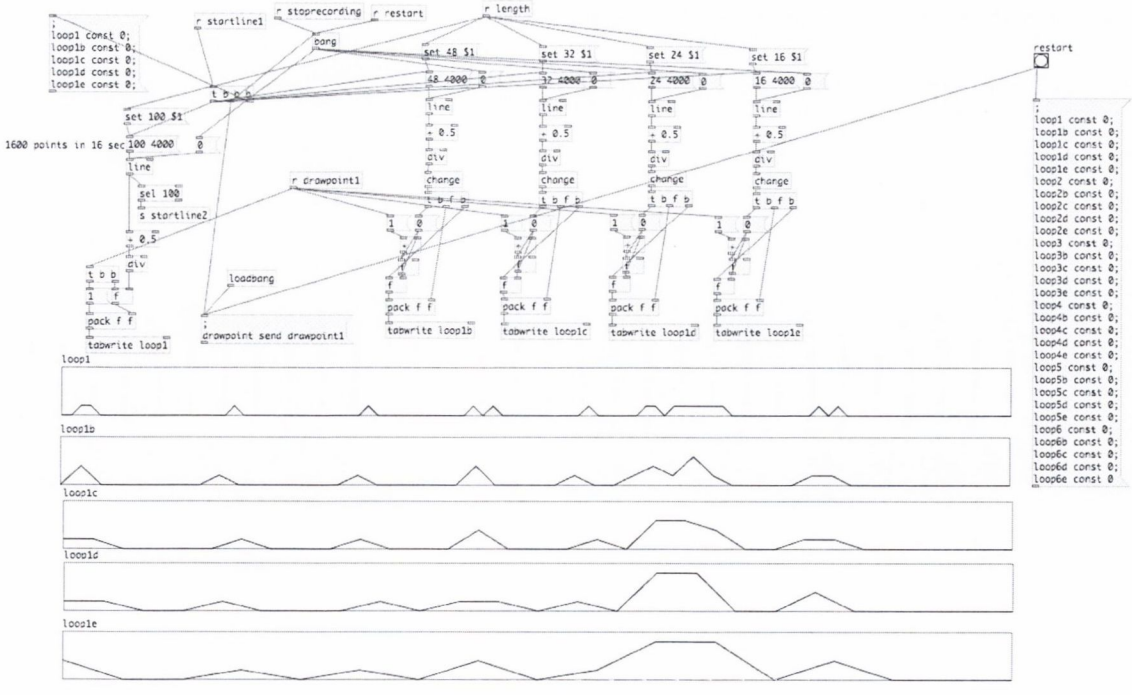


Fig. 33 Pd-patch for the quantization of samples

More in detail: each time the volume of the sound captured by the piezo microphones rises beyond a previously defined level threshold, a recording is automatically started. This recording lasts until the volume falls below the threshold again. In this way, every single percussive sound is stored in an individual recording. At the same time, several arrays store the time intervals between the single sounds (see Fig. 33): one array with a resolution high enough to reproduce the exact time intervals, and four more arrays with a resolution of 48, 32, 24 and 16 points each. The duration of these arrays is chosen at the beginning of the processing, and leads to the length of the loop in which the recorded sounds will be played again. There are six of each of the mentioned arrays; the recording is repeated six times consecutively, resulting in a 6-layer loop. The playback of the respective layer is started immediately after the last sample of the layer is recorded.

For the playback, it is possible to choose between the different quantization resolutions, which means choosing between no quantization, if the array with the high resolution is used for the playback, a quantization of the loop in 48 equal divisions, if the array with a resolution of 48 is chosen, etc. This choice can be taken separately for each layer, allowing the production of a rhythm of 2 against 3, or 2 against 3 against 4, etc.

This patch functions best with repeated but sparse percussive sounds: the sounds should appear separately from each other, not overlapping too often, and the noises should be of short duration and percussive.

This effect is used in scene 2, from bar 59 on, where the children knock on the floor with a cigarette lighter – the directly amplified sound is not audible here. The rhythm becomes more and more dense, since the children knock more and more quickly, and is then at once substituted by the much louder, directly amplified sound at bar 78.

The same effect appears also, in a quieter variation, processing the noise of the falling shards in scene 14, where the old clean up the shards, comparing them at the beginning and letting them fall on the floor.

The tempo of the quantized rhythms is, as for the electronic rhythms, always synchronised to the tempo of the respective instrumental section that they accompany.

7.3. Various effects

Filtered noise

For this effect, the frequency of a sound played by an instrument is analysed through the 'fiddle' object. This frequency is used to filter a generated white noise through a band pass filter of this very same frequency, or an octave lower or higher. This filtered white noise is added to the instrumental sound. The result is a sound similar to the noise of wind, howling upwards and downwards. The pitch analysis can be made more or less frequent, making the adjustment of the noise frequency more or less reactive.

This effect was finally only used for the electric bass, primarily connected to the motive QM, such as for instance at the beginning of the performance. It was also used to process the stage floor sound, like in the scene 13, where there is no instrumental music, together with a delay and the "false FFT-filter" (see below).

False FFT-filter

Experimenting with the possibilities of Fast Fourier Transform (FFT) – a complex algorithm that allows one to transform a window of a certain length, a section of the digital sound wave, into a wave that represents the frequency spectrum on the x-axis, and the respective intensity of each frequency in the y-axis, making it possible to manipulate this spectral analysis in order to then re-synthesise it back to a sound – I programmed a filter that would work like a low pass filter. Through some originally unintended errors in the programming of the re-synthesis, the processed sound had a peculiar metallic timbre.

This effect is used, among other things, for the processing of the stage floor sounds, notably the trampling of the cups. Also, during the preparation of this scene (at bar 289 to 303), as a previous announcement, this filter is applied to all the processed instruments (the strings and the electric bass).

The instrumental version of the 2nd Preliminary Article S2 in scene 27, which is the only S-part that was not removed at the end sequence of the piece (ICP1-ICP2-S2-ICP3-ICP4), is processed with this filter in order to make it sound like a distant and unreal reminder of the more tonal and melodic musical world of the first two thirds of the piece.

"Shuffling" effect

This effect was programmed for one specific moment of the performance, scene 5, bar 148. After the protagonist woman lets fall a saucer, a longer noise should emerge. For that, I made an effect similar to the one known as "shuffling":

When the effect is activated, the trespassing of a certain threshold in the sound level triggers a 20,000 samples-long (about half a second) recording. This should be about as long as the real noise of the saucer falling is significantly loud. Immediately after being recorded, this sample starts getting played by 30 different "players" simultaneously, each of them following individual random criteria for various parameters: the starting point of the reproduction can be somewhere between the first and the 19,000th sample; the length of the played segment can be between 100 samples and the full length (until the end of the recording). After the reproduction is completed, there is a delay between 0 and 500 ms long until the same "player" starts playing again. This shuffled playback can last as long as desired; I programmed an automatic fade-out to end it.

Reproduction of recorded sounds

Every sound processed with the Pure Data interface can be recorded and played back at any later moment, in definable, dynamic panorama versions (such as moving from the left to the right, etc.). During the performance, I used to record the processed (!) sound of the cup trampling scene, and play it back one or two times during the scenes 21 / 22.

7.4. Practical challenges during the performance

During the four performances, I was in charge of the control of the electronics. At the same time, I conducted the ensemble, gave some directions to the children and played the piano and the tubular bell. Due to this purely practical challenge (unfortunately, having more people for all those tasks would have represented a financial problem), some of the electronic processes had to be reduced. Every single control and every single change in the electronics, including even progressive volume transitions, was programmed to be triggered using shortcuts – the single capital letters or key-names (such as "ENTER") in the score.

Fig. 34 The musicians during a performance of *Perpetual Peace*

V. Global structure

From the mirroring principle with the gauze, separating the old people on one side from the children on the other, we derived an ideal musical and visual structure of the performance: in order to allow both parts of the audience have the same visual experience, most of the scenes should be presented twice, in two variants. What for one part of the audience appeared clearly and directly in front of them, while it was dimly seen from behind for the other part of the audience, is later shown in reverse constellation. The peculiar tension between the two layers should be reinforced by the recognition of the scene.

This yielded a theoretical, strictly interlocking, symmetrical visual and musical structure:

A 10'	G' 3'	B 3'	F' 3'	C 10'	E' 4'	D 4'	D' 4'	E 4'	C' 10'	F 3'	B' 3'	G 3'	A' 10'

A to G and A' to G' were seven pairs of corresponding scenes, where A' is the mirror of A and vice-versa. The maximum visual, dramatic and musical tension can be found here

between the parts A and A' – the scene introduced at the beginning would only be completely resolved at the end – while the interval between the introduction of an aspect and its resolution would be shortened in the middle section, where the pace and density are increased.

The projected structure was a variation of the compound ternary form A B A - C D C - A B A like it is often used in older classical music. This scheme was a theoretical conceptual guideline, to be developed organically.

The practical realisation took a life of its own during the months of theatrical rehearsals and musical composition, and developed into something quite different, but still keeping several elements of the initial idea: the material ICP, for instance, appears principally at the beginning and at the end, corresponding to the sections A and C, C' and A' of the initially planned structure.

In the following table, the correlation between the different types of material and the single scenes is shown. **The time code in the table below refers to the DVD, not to the score. The scene numbers are noted on the score as rehearsal marks.**

Scene	Actions	Musical material	Time code
1	Blackout	QM	0'
2	Children' field	ICP1	4'
3	Preliminary Article 1	S1	6'30''
4	Hands – 1st solo	ER	8'20''
5	Air-strike	QB – QT	10'40''
6	Past – future	QF	12'35''
7	Street scene	ICP2	13'10''
8	Preliminary Article 2	S2	15'30''
9	Expulsion	CL – QC1 – Q1 – QM – Q1	16'30''
10	Boots	QB – QT	19'45''
11	Trampling cups	Q1 – QC2	21'
12	Fear	QF	22'50''
13	Stage floor – 2nd solo	-	23'30''
14	The clean-up	CL – ICP3	24'10''
15	Preliminary Article 3	S3	27'
16	Pile of boots 1 / Falling cups	ER	28'15''
17	Photos / candles	CL-C5-Q1-QC2	30'10''
18	Canon	C6-QC2	33'30''
19	Anger	QF	35'40''
20	Pile of boots 2	QC1 / Q1 / Q2 (double tempo)	36'30''
21	Empty stage	ER / mixed	38'40''
22	Empty stage	ER / mixed	40'
23	Hand – 3rd solo	CL – ICP1 (segment) – C5	42'50''
24	Circles	CF – QC2	46'25''
25	Mummies	ICP1 (ER)	48'20''
26	Slips of paper	ICP2 (ER)	51'
27	Light square	S2	52'40''
28	End	ICP3-ICP4 (ER)	53'45''

The interwoven, rondo-like series of different musical material types during the first third of the performance (scene 1 to 10) function as an exposition, and at the same time, as a preparation for a series of different natured culminations at the second third of the piece (scene 11 to 22). These culminations are:

- From the perspective of the aggression potential, scene 11, trampling the saucers.

- As a renewal of this scene 11, the later scene 16, the falling cups.

- With regard to the theatrical aspect and to the semantic contents, scene 18, the canon: everyone, old and young, has "fallen" and is now lying on the floor, singing a tonal music with a moralist text that does not seem to make sense anymore.

- Then, as a musical culmination, the long and fast QF, and the subsequent accelerated Q1 / Q2 passages in scenes 19 / 20, as well as the following empty stage scenes 21 / 22. Although this last named scene has a rather quiet and calm character, the shuffling of the different material together with the unreal electronic soundscape for me represents the actual musical climax of the second third of the piece.

This second third of *Perpetual Peace*, the scenes 11 to 22, constitutes a sort of rational, musically as well as theatrically accessible, dramatic, "logical" development, with smaller and bigger culminations as described above. But the real dramatic apogee of the representation lies in the ending, the development from scene 23 to 28, after the gauze is lifted, introduced by the last tonal part of the performance, the fugato.

From now on, the more accessible, motivically traditional material in the music – the "quintuplets", as well as the "songs" and the "canon" – does again not appear. The entire ending (about 15 minutes), is constituted by the "interlaced chord progressions", a "less human" type of music, without melodies – the only exception is S2, but this time it is processed with the alienating FFT-filter. This ending is inexorably and merciless in progressive motion, on top of that now accompanied by the "electronic rhythms", making the whole even more unreal, and going on for a long time; it is the longest congruent section of the performance. On the stage, this corresponds to the dissolution of the separation between old and young, past and present/future, reality and memory. No more children's singing; all the cups, the symbol for care and security, are already destroyed, the candles did not function, the photographs were buried, a reconstruction of the broken things proved to be impossible, the names on the slips of paper could not be traced. The actions become now more cryptic (see for instance the mummies), the separations between single successive scenes more fluent.

VI. Correspondence between the music and the theatrics

While investigating possible correspondences between the scenes and their musical counterparts, I had to think of a scene of the film *Koyaanisqatsi* by Philip Glass, a scene in which a rocket shot into the air suddenly explodes and falls, inflamed. The dramatic effect of the pictures are, in my opinion, intensified by the attitude of complete ignorance of this dramatic moment in the music. Bertold Brecht called this lack of illustrating character of the diverse media in theatre with regard to the action stream a "separation of elements".[14] Heiner Goebbels states that, through this separation of elements, the audience becomes able to associate these elements with each other in a free, non-predetermined way, the observer elaborates his own personal unit, the theatre becomes "democratic".[15] I believe that such separated treatment of music and action may accentuate the dramatic aspect of each single element.

One concrete example of this non-correspondence is the contrast between dynamic scenes and static music, or vice versa, as is the case in scene 6, where the old people approach the gauze looking through it, while the children on the other side step slowly towards the audience with their eyes wide open. This and other similar scenes, where there is very little movement, have some of the fastest and most aggressive musical parts.

In turn, one (in a rather abstract way) correlative assignment of musical material to visual parts are the sections of "interlaced chord progressions", which are mostly destined to scenes where the actors walk around, and where this walking around seems confused and has no clear destination, as in the beginning of scene 2, in which the old people walk between the lying children, scene 7, in which the children cross the stage again and again in a confused way, scene 14, in which the old people walk around cleaning up the shards, or the analogue scene 26, in which they search among the slips of paper. The vaguely pulsating rhythm, the constant note repetitions of these musical parts were inspired by the image of steps, of undetermined walking.

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[14] Lucchesi, Joachim and Ronald K. Shull, *Musik bei Brecht*, Suhrkamp, 1988.

[15] Heiner Goebbels, 'Im Rätsel der Zeichen', Laudatio for Robert Wilson in *Theater der Zeit*, June 2009, pp. 32 et seq.

VII. Aesthetic interpretation of the musical material

The musical aesthetics of the motivic material "interlaced chord progressions", whether with (at the end) or without electronics (at the beginning), is intended to be similar to that of repetitive music, so-called minimal music, but without actually being repetitive. The numerous events in each instrumental part should not be perceived as single expressive gestures that are followed by the hearer in an exact and concentrated way, throwing him from one impression to another in seconds of time. All of these events should rather be seen as more or less random sounds – although they are composed in a musical, not in an aleatory way – that "witness the time passing", so to say. The sound should be enveloping, the electronics being a helpful element for that goal at the final section (scenes 25 to 28); the perceived musical units should be very large.

In contrast, the "canon" material is clearly tonal, as well as the "songs" material, although the later is accompanied by less tonal chords (see Section B.IV.5.1). The limitations caused by the fact of having "normal people" on stage led technically to tonal music – since they had to be able to sing these parts –, but in a more hidden way also aesthetically: I believe that, almost unconsciously, it seemed odd to me to let someone sing and act to music I know they cannot access aesthetically. In order to interpret a piece of art, the performer (in this case the elderly people and the children) has somehow to be able to identify himself with it.

To break the idealistic, romantic atmosphere of these tonal parts, to almost throw an ironic or sarcastic view at them, the "quintuplets" often appear immediately after the "canon" material, such as, for instance, at bar number 504.

The "electronic rhythms", as already mentioned, should make an impact through their sheer rhythmic, electronically aggressive energy and force.

C. Conclusion

I. Critical reflexion

One year after the creation of *Perpetual Peace*, many critical aspects occur to me when I go through the score or when I see / hear the recording.

The first thing that I would list in this concern is the limitation of musical material and of variations of this material, although this resulted from a deliberate choice. In past compositions, I tended toward the opposite: I seldom exhausted the full potential of one kind of musical material, but instead often brought it too quickly to an end. With *Perpetual Peace*, I wanted to force myself to stick to figures and motives and fully explore their possibilities. I also made conscious use of repetitions of sections, although mostly with variations. This was in part motivated by the symmetrical stage setting, linked to the formal principle of repeating each scene (in a varied version) with the two stage sides exchanged. Also, the use of repetitions may have been reinforced by the idea that music written for theatre should move to the background to some extent in order to make room for the visual part. Such is usual in film music, where the use of leitmotifs and repeating themes helps the listener to "lean back" and concentrate on the whole, instead of overstraining his perception. Now, though, I have the impression that there are too many repetitions of some parts, for instance of the material "quintuplets".

The second critical point concerns dealing with realistic feasibility of the future performance while composing. Many aspects of *Perpetual Peace* as they were planned had to be reduced or ignored due to a lack of rehearsal time or other resources: the use of the stage floor sounds, as well as the use of electronic processing, were limited (see Section and B.IV.3.2 and B.IV.7.4). Some parts of the singing did not work during the recorded performance (see Section B.III.3). The idea of a non-equal tuning system had to be abandoned, which at least became clear in a very early phase (see Section B.IV.4.2.3). For my future work, I will try to keep a more realistic view of the practical challenges of the performance from the beginning of the composition process.

II. Personal features in the music

In the course of the preceding musical analysis, some musical elements and processes shaped up as particularly relevant features for the music theatre *Perpetual Peace*, and more generally, for my recent work:

1. Harmonic organisations

As shown in section B.IV.4.2, selecting certain types of chords and arranging them in various kinds of chord progressions was an important principle for the harmonic organisation of *Perpetual Peace*. The single chords chosen in this tone system are not tonal; they show interval constellations that are typical for the modern period (see Section B.IV.4.1). The precise selection of chords on the other hand is based on a principle that shows a spectral influence: the chords are made out of tone subsets of the harmonic series (the term "spectral" is used here in the broader sense, since for spectral composers the harmonic series is only *one* kind of "spectrum").[16]

The connections between chords are, in contrast, organised following traditional classical, indeed tonal principles of dissonance and resolution, of classical contrapuntal rules, of downward movements of voices.

This well-considered mixture of atonal and classical tonal elements in the reflexions concerning harmonics is a characteristic not only of *Perpetual Peace*, but also of the composition style of all my recent pieces.

The harmonic system is the element that holds the stylistically very different material of *Perpetual Peace* together. The "interlaced chord progressions", the "songs", the "quintuplets" are motivically quite disparate, but they share the same underlying chords and chord progressions. This is why for me harmonic organisations are one central element while composing. Merging aspects from different musical traditions within the harmonics, they become a sort of initial "clay", out of which I can then form the most different shapes and motives without falling into arbitrariness, since these shapes are all made out of the

[16] Joshua Fineberg, interview with David Dominique, *The Boston Musical Intelligencer*, 20/03/2011.

same original matter.

2. The idea of a dynamic tuning system

The option of playing the harmonic material invented for *Perpetual Peace* in a "dynamic just intonation", as originally planned (see Section B.IV.4.2.3), is surely a big challenge; but this remains a principle that I would like to follow up and, although unrealised, an important personal characteristic of this work. In the forefront of the project, I had already thought of some possible ways of its concrete realisation. One was to notate the score (or the parts of the score concerned) in an approximation up to quarter tones. A mock-up of the harmonies in the target intonation would be a help to then practice the exact tuning departing from this approximative notation. After this practice, the tuning should be realised by hearing.

Another realistic way is to use this kind of intonation only in the electronics – for this, previously produced recordings of the single notes in the target intonation would be required. Even though I haven't made concrete experiments in this direction yet, Donnacha Dennehy's idea of changing the tuning of recorded sounds, as in *Stainless Staining*, has been a great inspiration. Although he integrates spectralist reflexions in the processes applied for the tuning, the resulting aesthetics do not have the volatile sound of many spectral compositions; the sound is rather direct, percussive, which I find a very interesting combination.

A third possibility would be to find a new kind of notation able to reflect these kinds of scale systems. In order to achieve a notation system where pitches with a constantly changing reference overtone series can be notated, a *relative* representation of pitches would be necessary, instead of our absolute system, where one line of the stave represents a fixed frequency.

To find a solution to this problem, either making a compromise within the ideas and using the conventional notation, or finding an alternative notation form, is one goal for my future work.

An inspiration for this tuning system was Harry Partch's scales, oriented on "natural" intervals, as they appear in the overtone series.[17] The crucial difference between such scales and the system I want to create is that these scales contain a limited series of pitches; they are not "dynamic", whereas my goal is a "modulating" tuning system. This choice is motivated by an ideal also shared by spectral composers: while most pieces that are based on reflexions about the harmonic series and overtones, like Harry Partch's or James Tenny's music, are harmonically more or less static, for spectral composers, who explore all kind of spectra and do not concentrate on the overtone series, the transitions and the harmonic changes are determining elements.[18] I would certainly not define myself as a spectralist, but I still see this as a common point: although the system invented for *Perpetual Peace,* just like Harry Partch's systems, is only about overtones and does not explore other than this natural spectrum, through its constant modulation from one reference series to another it is all about transitions in the sense of spectral music, about harmonic change, which is what I am interested in.

3. Working with rhythms

In *Perpetual Peace*, I followed an idea that was for me completely new: the creation of rhythms derived from sound-waves, whose metrical proportions cannot be expressed in whole-numbers (see Section B.IV.6.2).

The notation problem described in section C.II.3 for the intonation system appears in a similar way in regard to this type of rhythm: the grid used to arrange the frequencies in the first, and the rhythmic values in the second case, is not working anymore. The different possibilities of realisations are analogous too: the first option would be to notate the rhythms in an approximative way, which would probably destroy their singularity; the second is to imitate them by hearing. A third possibility is the way chosen for *Perpetual Peace*: to have these kinds of rhythms only played in the electronics. A fourth theoretical possibility would imply a new way of rhythmical notation.

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[17] Harry Partch, *Genesis of a Music*, Da Capo Press 1974, pp. 158 et seq.

[18] Joshua Fineberg in an interview with David Dominique, *The Boston Musical Intelligencer*, 2011.

For the moment, I do not see a realistic possibility of an alternative, new notation for these rhythms, since their peculiarity resides in their specific displacement of beats, slightly not fitting into time intervals with whole-number proportions. Hence, in the future I will rather experiment with improvisation and the imitation of electronic tape recordings: I can imagine that interesting, slightly off-kilter rhythms could be played, without exactly following the principle described above – the time intervals between peaks of sound-waves – as a direct orientation, but only as an *inspiration*. That would not be, in fact, something new: we know this kind of phenomenon from various kinds of music, like the notorious, very slight retardation of the second beat in Viennese waltzes; or like the two almost, but not really, equal beats in North American Indian drumming.

More generally, there are some rhythmical elements within *Perpetual Peace* which turn out to be recurrent in my recent pieces, see Section B.IV.6.1. Irregular, complex and mixed meters and especially metrical shifts: the succession of often similar figures played in different tempi with rhythmic proportions, such as in the orchestra piece *Kilter* the accelerations or slowdowns by 2:3 or 3:2, or in *Perpetual Peace* the quaver quintuplets preceded by five ordinary quavers like in bar 267 or 462, are features that seem to be characteristic for my music.

The aim of creating rhythms derived from sound-waves was for me a stringent, logical development of these more classical elements, and arose from the urge to find a new rhythmical sound.

4. Aesthetics of the electronics

Many of the contemporary compositions that use live processing electronics, as opposed to tape recordings, follow a rather modernistic approach. Numerous composers who have studied at the IRCAM dispose live generated electronics, mostly using Max/MSP. The resulting sound is very often principally "textural": soft noises, long sounds with complex, modulating timbres, as for instance in the piece *Speakings* by Jonathan Harvey or in *13 couleurs du soleil couchant* by Tristan Murail. In contrast to that, the type of electronic sounds that I want to achieve corresponds to a much rawer, "industrial" aesthetics. Good examples for this type of sound include early Musique concrète pieces of the 1950s, such as *Cinq Études de Bruits* or *Symphonie pour un homme seul* by Pierre Schaeffer. More

recent compositions with electronics that I find inspiring are for instance Donnacha Dennehy's *Glamour Sleeper* or Fausto Romitelli's *Professor Bad Trip Lesson I.* I am also interested in non-academic electronic music, such as that by Aphex Twin, for instance, by Autechre, or Boards of Canada. As Fausto Romitelli says for his own compositions, 'increasing importance is given to the sonorities of non-academic derivation and to the sullied, violent sound of a prevalently metallic origin of certain rock and techno music.'[19] This kind of influence is reflected in the parts "electronic rhythms" of *Perpetual Peace*. In order to achieve a more electric sound, I used piezo pickups for the three strings, with can be perceived best in those scenes where the sampled sounds gain a life on their own, where the direct sound of the instruments cannot be heard.

My aim is to create such a "non-academic" type of sound in real time, through live processing. The aspect of being live fascinates me for the same reason that instrumental music played in real time by musicians is more exciting that playing a recording for an audience: a greater energy arising from the spontaneity and the physical presence of the performers inheres.

The fact that I invent the effects in an unbiased way and that I rely on a very direct, logical-mathematical access to programming (since I have never had any systematic or professional instruction in programming but have learned it auto-didactically, as I wrote in section B.IV.7), leads almost involuntarily in the intended less academic direction, the resulting sounds being rather simple, raw, and striking, as opposed to very elaborate and refined sounds that can result from electronic processing designed by a specialised programmer.

III. Personal features in the music theatre

Perpetual Peace was a pilot project; within it I tested different important elements for my future work in the field of music theatre:

[19] Fausto Romitelli at the homepage of Casa Ricordi, http://www.ricordi.it/composers/r/fausto-romitelli (accessed 28/7/11).

1. Musicalisation of theatre through interactive electronics

In his work 'Postdramatisches Theater', H.-T. Lehmann describes the "musicalisation" of all theatrical elements – that is, considering theatre as music[20] – as one possible approach to shaping a theatre performance. Here, musical parameters and concepts like rhythm, melody, dissonance and consonance are applied to elements like the text, the language, the lighting, the dramatic progression.

In *Perpetual Peace*, one tool to achieve such musicalisation of the action stream in a very literal way was the usage of the stage as a musical instrument, the utilisation of concrete sounds produced by the actors, picked up by piezoelectric contact microphones, amplified and / or electronically processed. Some uses of this device worked very well, others did not (see Section B.IV.3.2). In future projects, I want to deploy this device in a more effective and more prominent way, considering all the things I learned in the course of *Perpetual Peace*.

I am also interested in other interactive devices that can be used to influence the live electronics through the action on stage. Recently, I have been experimenting with the possibilities of controlling different parameters of the electronic processing with sensory data, in particular with using ultrasonic sensors that measure the distance to objects, connected to the computer with an Arduino board as an interface.

2. Alternative and mixed genres

I called *Perpetual Peace* a staged requiem. This label was inspired by the kind of concepts Heiner Goebbels (amongst others) chooses for genres, such as "staged concert" (used for pieces like *Eislermaterial* or *Industry and Idleness*). Another example is Fausto Romitelli's "video opera" *An Index of Metals*. In general, I sympathise with ambiguous, not easily classifiable types of performances that are open to various genres: mixtures between opera and concert, between speech and melodrama, or between theatre and film, for instance.

[20] Hans-Thies Lehmann, Postdramatisches Theater, Verlag der Autoren 1999, pp. 177 et seq.

3. "Real people" on stage and the influence of semantic content

One important characteristic of the music theatre I want to make is putting "real people" on stage, people who are directly concerned by the theme of the performance. While working on *Perpetual Peace*, this has been an inspiring principle: the emotional and semantic authenticity of the stories is a very refreshing experience compared to the effect of roles played by actors, the music composed for those stories does not care about stylistic obligations; self-referential rules of the contemporary scene are automatically abolished.

Through the participation of non-professionals, the role of the cultural institutions is relativised, since these institutions usually handle the professionalism of every aspect of arts as an absolute value, a value on its own. As a consequence of this ignoring of institutional "seriousness" an energy and spontaneousness arises, in a way that can be observed in productions such as *Seniors Rocking* by Anna Halprin. The political commitment of such productions becomes directly appreciable, without using any spoken words in the performance, the backgrounds of the actors, the fact of "who they are" being incorporated into the theatre as an important aspect of the performance.

A certain commitment to relevant themes is very important for me. I do not intend to make politically committed theatre in a traditional sense; making political statements and using slogans is not something I find interesting. As Robert Wilson once said, 'The reason to work as an artist is to ask questions, the reason to work is to say "What is it?"—and not to say what it is.'[21] A quote to which H. Goebbels adds: 'And if we ever were able to answer the question of what it is, then we should not do it, then it will not be necessary anymore.'[22]

As a theoretical background to the idea here described, I would reference Hans-Thies Lehmann's "politics of perception"[23]: changing the perception about things as a political action in arts.

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[21] Robert Wilson, lecture "1. HAVE YOU BEEN HERE BEFORE" "2. NO THIS IS THE FIRST TIME" at Stanford University, October 2008.

[22] Heiner Goebbels, 'Im Rätsel der Zeichen', Laudatio for Robert Wilson in *Theater der Zeit*, June 2009, pp. 32 et seq. (translation from German: N. Béjar).

[23] Hans-Thies Lehmann, Postdramatisches Theater, Verlag der Autoren 1999, pp. 449 et seq.

So instead of answering questions, the goal for me is also to create a different perception of things I care about on stage. A good way to achieve this has been to put people on stage who are not supposed to be there, and so to highlight the exterior, "real" aspects of the performance as a part of the artistic work. Another idea is to avoid the institutional infrastructures of performing arts and create new structures instead: in future projects, I aim to abandon the classical theatre location and put the performance into alternative spaces, as a part of a work that aims to imply its environment and provide a platform for it.

IV. Contextualisation within the contemporary music landscape

> I follow my natural passions and think to have found my own style [...]. We live in times of pluralism with many different ideological tendencies. One leading ideology that could be seen as the only one doesn't exist anymore. The spectral school has certainly done a lot to increase the importance of the timbre. I think this was the last tendency, together with the American minimalism, that has reached a really new level. And new technologies have surely created many new possibilities. But at the moment there are so many different layers in New Music, that none of them can be dominant [...].[24]

In this interview for the German newspaper *Die Zeit*, Erkki-Sven Tüür states the lack of large-scale musical tendencies in recent times. In regard to the difficulty of finding a fitting style label for my own music as a composer, at least I do not seem to be alone.

As I wrote in the introduction, I am interested in music coming from very different stylistic directions and cultural backgrounds, without being able to identify one particular, "favorite" type of music. Generally, I have always been more attracted to composers with particular, individual styles who are hard to classify, than to those who clearly belong to one school or one well defined stylistic. My first composition teacher, Wilfried Hiller, is one of them. His almost naif sense of poetry in music, his unprejudiced curiosity for almost everything audible, his way of being deeply inspired by simple things, has certainly influenced me. More examples of such "singular" individuals who have been particularly important for me are George Crumb or Heiner Goebbels. In my opinion, there are some things these very different composers have in common: they show a certain stylistic

[24] Burkhard Schäfer, 'Künstler sollten politisch sein', interview with Erki-Sven Tüür in *Die Zeit*, 21/11/2008 (translation from German: N. Béjar).

pluralism, allow tonal elements to take a certain place in their music, and are not dismissive of non-academic music: rock, folk, popular music *are* facets of our musical vocabulary. They do not pretend to fit a contemporary fashion but, although their music does not deny a long musical tradition, it still could not have been written in that way decades earlier. Finally, they are not afraid of a sense of poetry and inspiration in music, concepts that have become unfashionable. Parts of *Perpetual Peace* such as the children's singing or tonal parts like the "fugato" reflect the influence of this heritage: giving a place to musical quotes from a past time is something both H. Goebbels and G. Crumb do, no matter whether these quotes are real, as in Goebbels' *Eislermaterial*, or invented, like some passages in Crumb's *Star Child*, for instance the 'Hymn for the Nativity of the Star Child' in *The Advent*. The latter would be the case for *Perpetual Peace*, since all musical parts that can remind one of quotes are invented.

Another important influence, although to my understanding coming from an opposite, more hard-edged direction, has been my teacher Donnacha Dennehy, and other stylistically related composers: the Bang on a Can composers and Louis Andriessen. This kind of influence can be observed in parts of *Perpetual Peace* like the "electronic rhythms", and more generally, in the electronics. Dennehy's energetic aesthetics, the amplified sounds, the sound of his electronics, on the other side, his very beautiful soundscapes like in *Grá Agus Bás*, his personal kind of post-minimalism integrating spectral approaches, are all aspects that have inspired me much. More generally, minimal music surely has an influence on the way I write. Some parts of *Perpetual Peace* show this in a direct way, like one of the components of the "mixed material" (see Section B.IV.5.5), the pulsating texture starting at bar 630 and bar 871 of scene 22 and the end of the piece, respectively. Other parts show this influence in a more indirect way, like the "interlaced chord sequences", whose aesthetical intention is related to minimal music (see Section B.VII).

In the past, while composing, I have often switched between very different music styles, never having the impression that I was consciously copying. I have written romantic pieces, pieces that sound quite close to the early modern period, expressionist pieces with short and dense expressive gestures, post-minimalist music, pop songs, sample music using recorded noises, or music with improvised electronics, processing and looping myself while playing.

Today, I think it stands out that my compositions, at least the more recent ones, show notable similarities. My composition style is still determined by a musical eclecticism, meaning the use of the various "musical languages" that I have assimilated during my life, but retaining some common, personal elements. One of them is the use of certain types of atonal harmonies that have developed from extended tonality, in the case of *Perpetual Peace* integrating some spectral reflexions, and their organisation following quite traditional rules, using principles derived from tonal music as described in section B.IV.4.2. Another common aspect is the use of energetic, complex rhythms, as the "electronic rhythms" or the scenes 19 / 20 of *Perpetual Peace*, and metrical shifts, as they appear in *Kilter* or in the "quintuplet" parts of *Perpetual Peace* (see Section B.IV.6). Further, a technique common to both pieces presented in this thesis is the appearance of gestural, individual, expressive material, in the case of *Perpetual Peace* with modernistic influences, but used in a way that it becomes subordinated to an opposite aesthetic, this material losing its individuality to melt into a sound mass with a rather minimalist effect, a technique perhaps in part unconsciously inspired by Györgi Ligeti's large compositions like *Atmosphères*. Examples of this are the entire piece *Kilter* or the "interlaced chord progressions" in *Perpetual Peace*. Finally, I would mention an intuitive approach to electronics, experimenting with different possibilities: programming invented effects and trying various hardware devices to control them in an interactive way. A more general, not properly musical aspect that is important for my more recent work is a political commitment in a very broad sense, the interest for mixed genres in the field of music theatre, the aim to exit a purely academic, elitist musical world and, arising from that, the idea of working with "non-professionals", but with an artistic, not pedagogical motivation.

The stylistic pluralism which characterises my compositions is after all typical for the postmodern period. I would though join the criticism of H. Goebbels and E.-S. Tüür, who even coincide in the words they use when they say that the concept "postmodern" could be used for composers for which 'anything goes'. [25, 26] I believe that a certain stylistic coherence, avoided in the label "postmodern", is indispensable for a composition, and I agree with H. Goebbels that 'criteria of an artistic choice and reflexion are more important than ever'.[27] This coherence however does not have to rely on the fact of being clearly

[25] Ibid.

[26] Heiner Goebbels, interview with Andrea Ravagnan, *Il Giornale della Musica*, November 2008.

[27] Ibid.

classifiable into one stereotype stylistic category. The consistent harmonic system of *Perpetual Peace*, for instance, is for me a feature that creates such a coherence within the, from a motivic point of view, stylistically diverse composition.

This concept of musical eclecticism in the sense I would like to apply to my music is well defined in the following statement by H. Goebbels, one of my favourite composers when it comes to talking about music:

> Eclecticism does not have to be an insult anymore, if it doesn't mean arbitrary combinations and self-service in the musical supermarket, but if it's the question of a reflected action, used with caution, taste and consciousness of history, that furthers our ways of perception and at the same time accounts for our memories, until the composers will master the whole of the music that has been created in the past, through which now something new and exact can be spoken. It might sound arrogant, but I assume that really a different generation of composers must arise that grows up and gets educated beyond classically separated values and that feels everywhere at home, because no musical home exists anymore.[28]

This statement is now 23-years old. One could ask if the here re-vindicated handling of eclecticism has become normal today. I personally have the impression that the answer is 'no': up to a certain degree, as a "classical" composer one still has to defend one's stylistic choices, instead of the quality of the music, which I find regrettable. As stated in the introduction, every musical style is the expression of a culture, and its perception depends on the experience of each individual. In times of not only geographical globalisation, but also of simultaneousness of historical cultural goods, our experience as music consumers is extremely diverse. I want to develop a musical language that includes and integrates as many various cultural facets as may intuitively come to my mind, as far as these facets are an authentic part of the musical vocabulary I have acquired in the course of my life.

[28] Heiner Goebbels, 'Prince and the Revolution', speech at the Kasseler Musiktage 1988, in *Revolution in der Musik. Avantgarde von 1200 bis 2000*, ed. by Albrecht Riethmüller (Kassel/Basel: Bärenreiter-Verlag, 1989), p. 111 (translation from German: N. Béjar).

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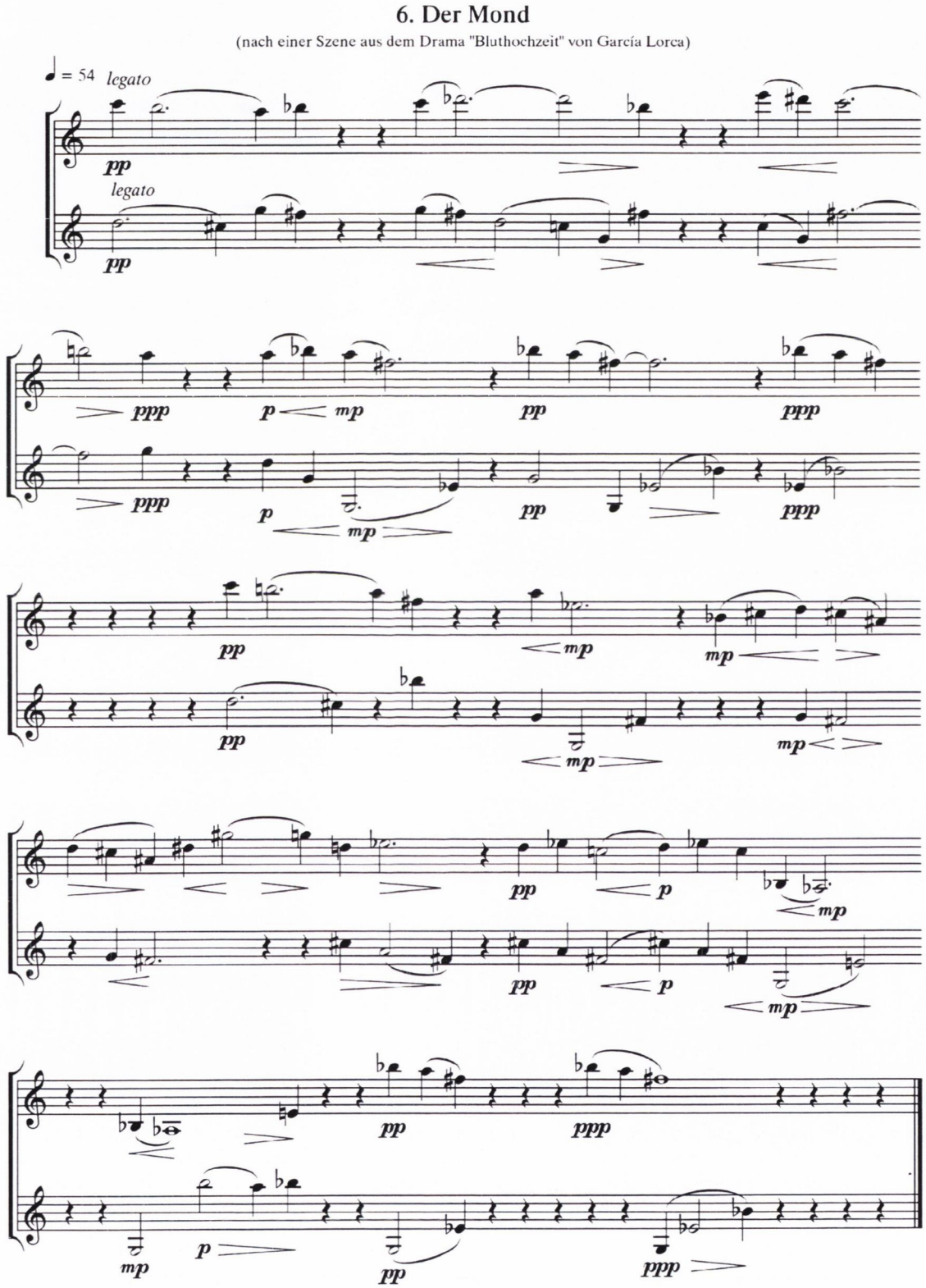
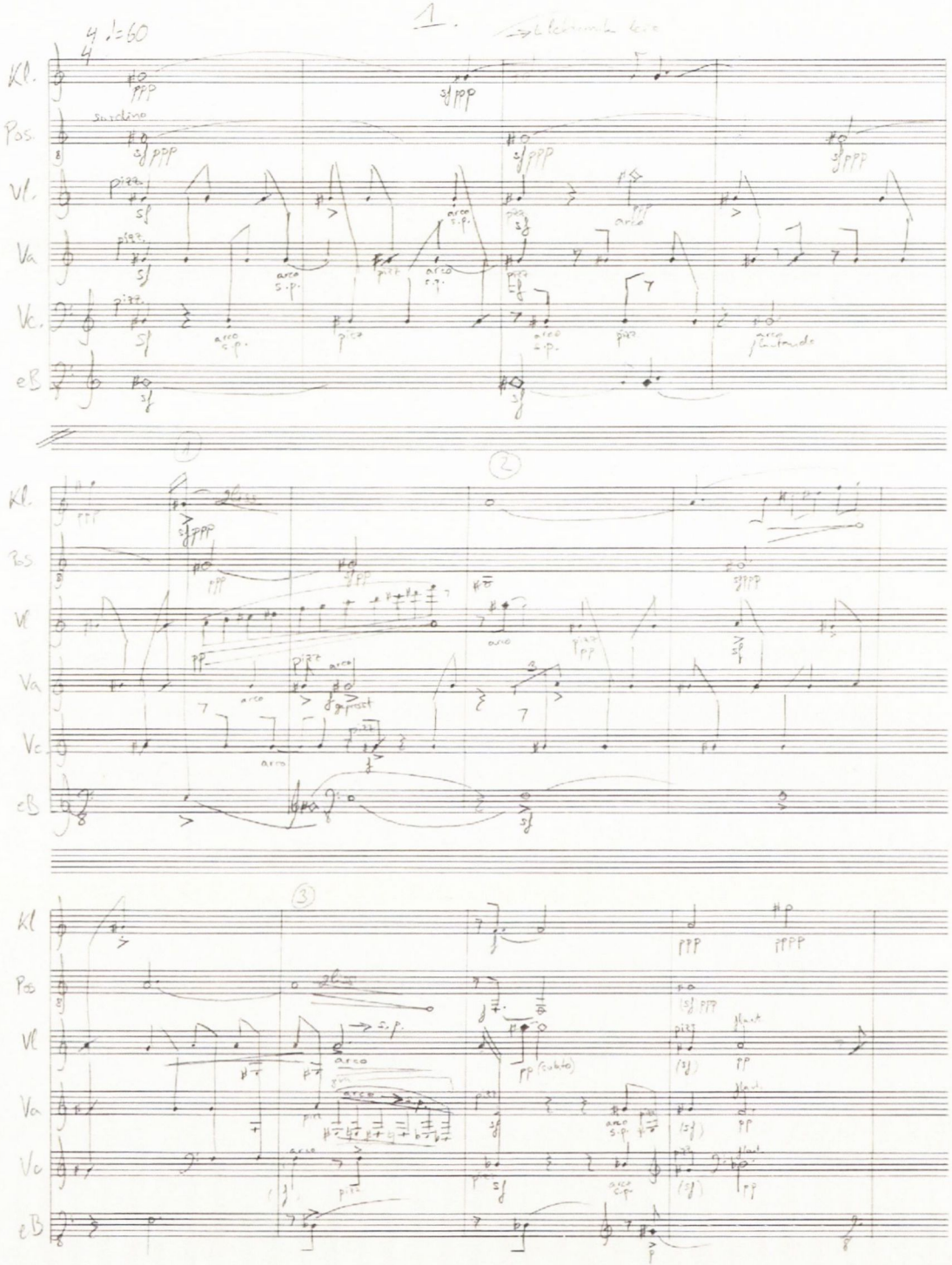
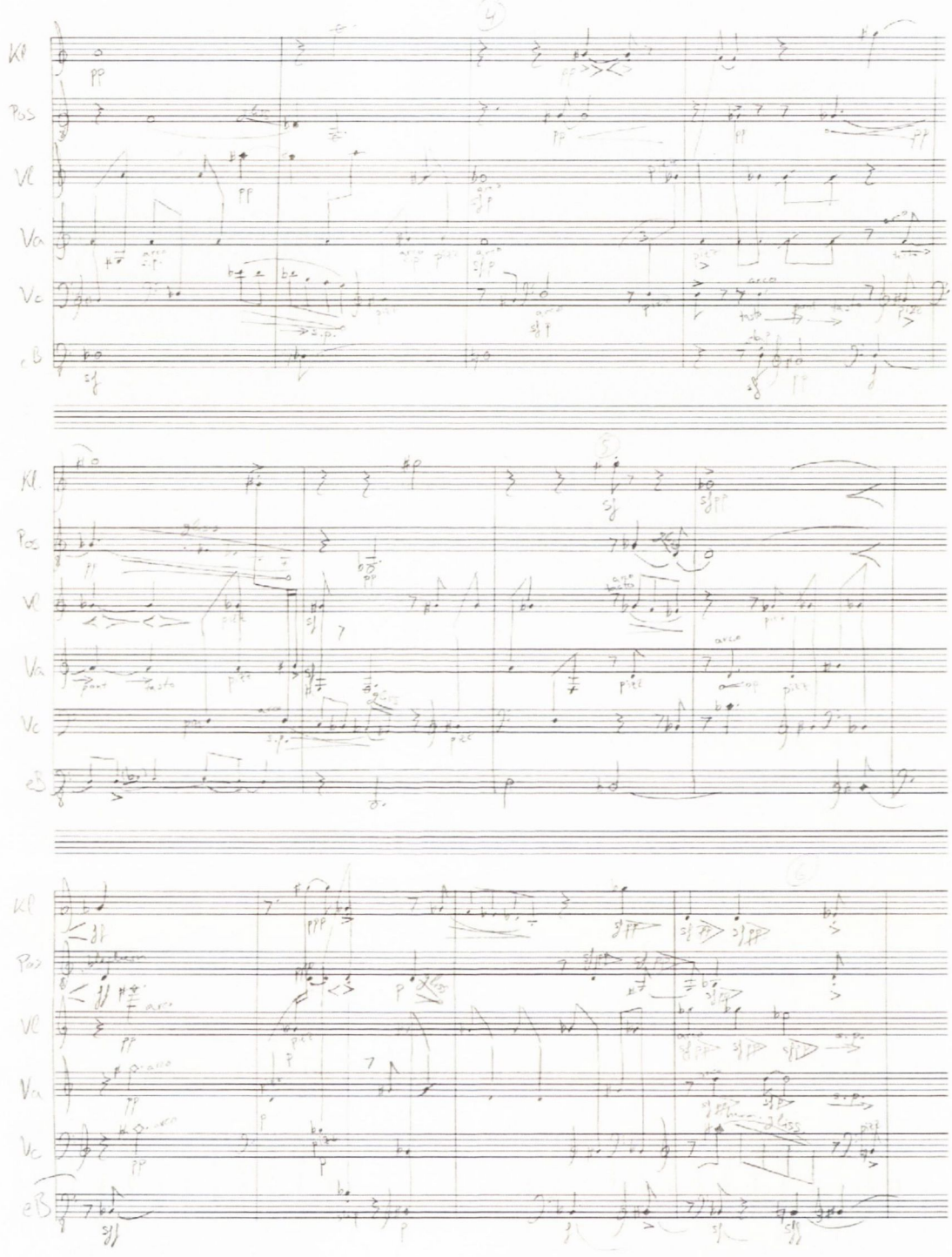
Appendix

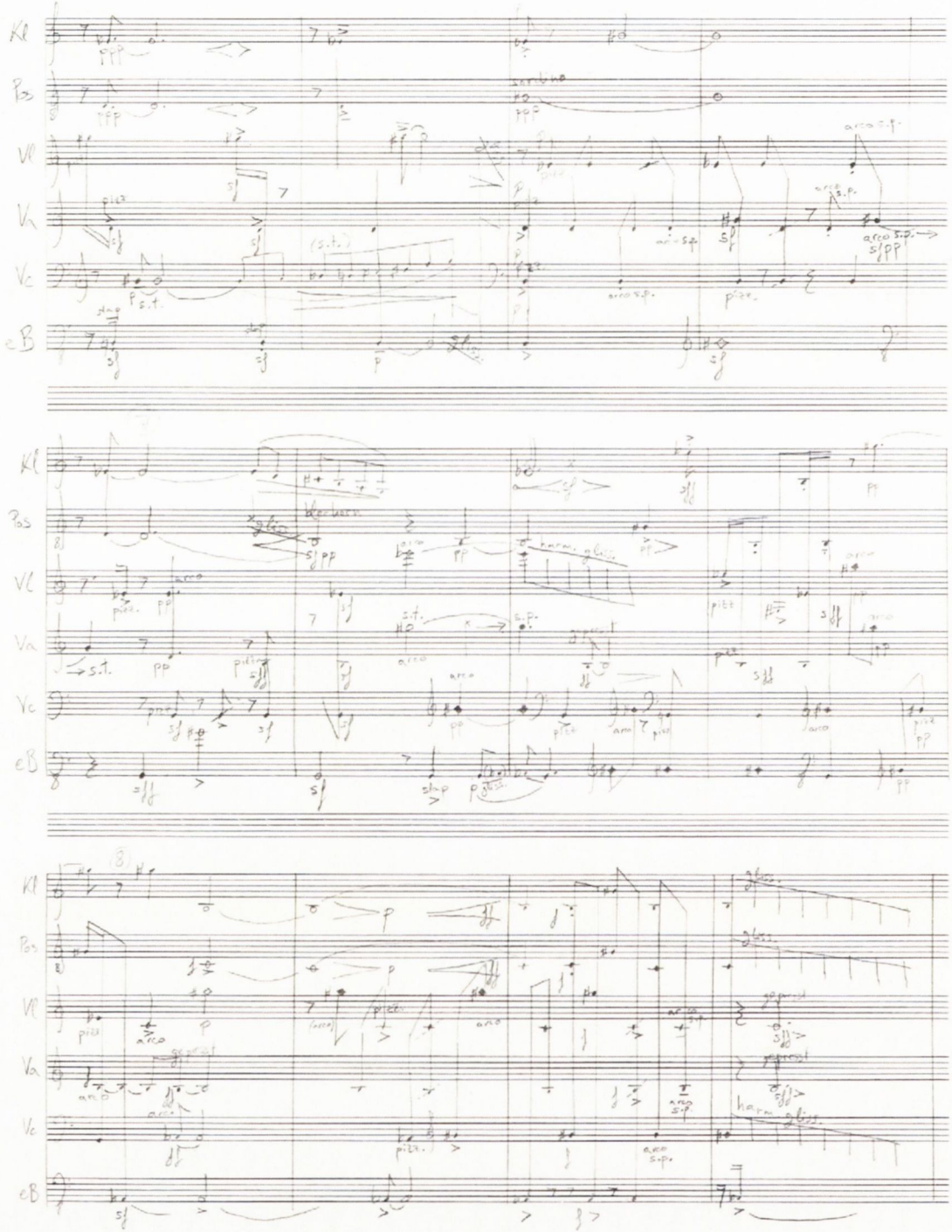
1. *Der Mond*, for two violins (2001)



2. Sketches of the "interlaced chord progressions" in *Perpetual Peace*




Kl
Pos
Vl
Va
Vc
eB


Kl
Pos
Vl
Va
Vc
eB
arco s.p.
pizz.
s.t.
harm. gliss.

3. *Holz*, for double bass (2009)

Performance Notes:

pizz / arco:

Triangular noteheads, as at the beginning of the piece, are always played pizzicato

Usual (round) noteheads are always played con arco.

s.p.: sul ponticello.

ord. cancels the instruction s.p.

Flageolets:

A diamond-shaped notehead designates the flageolet note that should be played; the round notehead below the string on which it should be played; the notehead in brackets the resulting pitch.

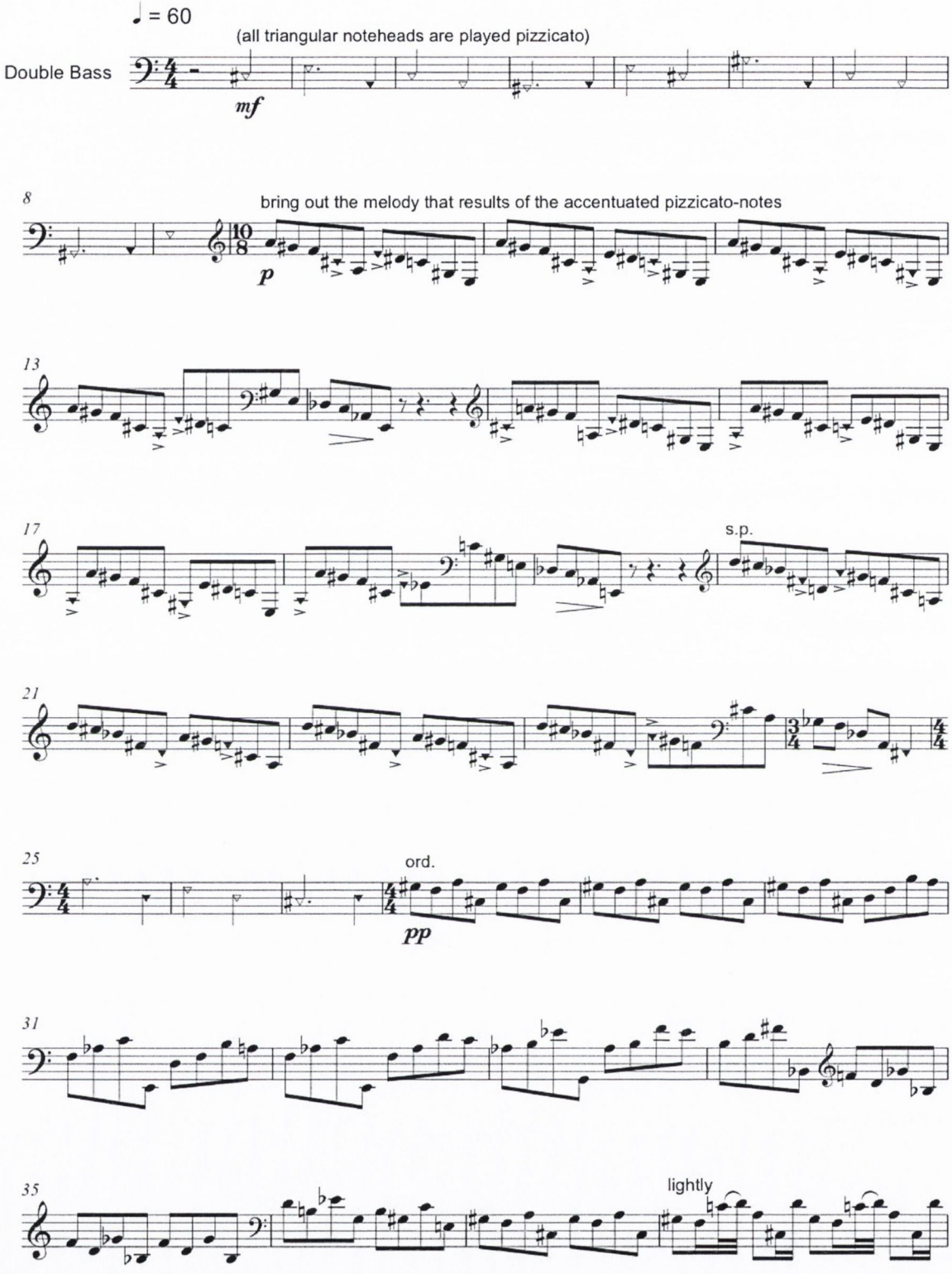
If a flageolet-note is to be plucked, this is indicated explicitly ('pizz'). In all other cases, flageolets are bowed.

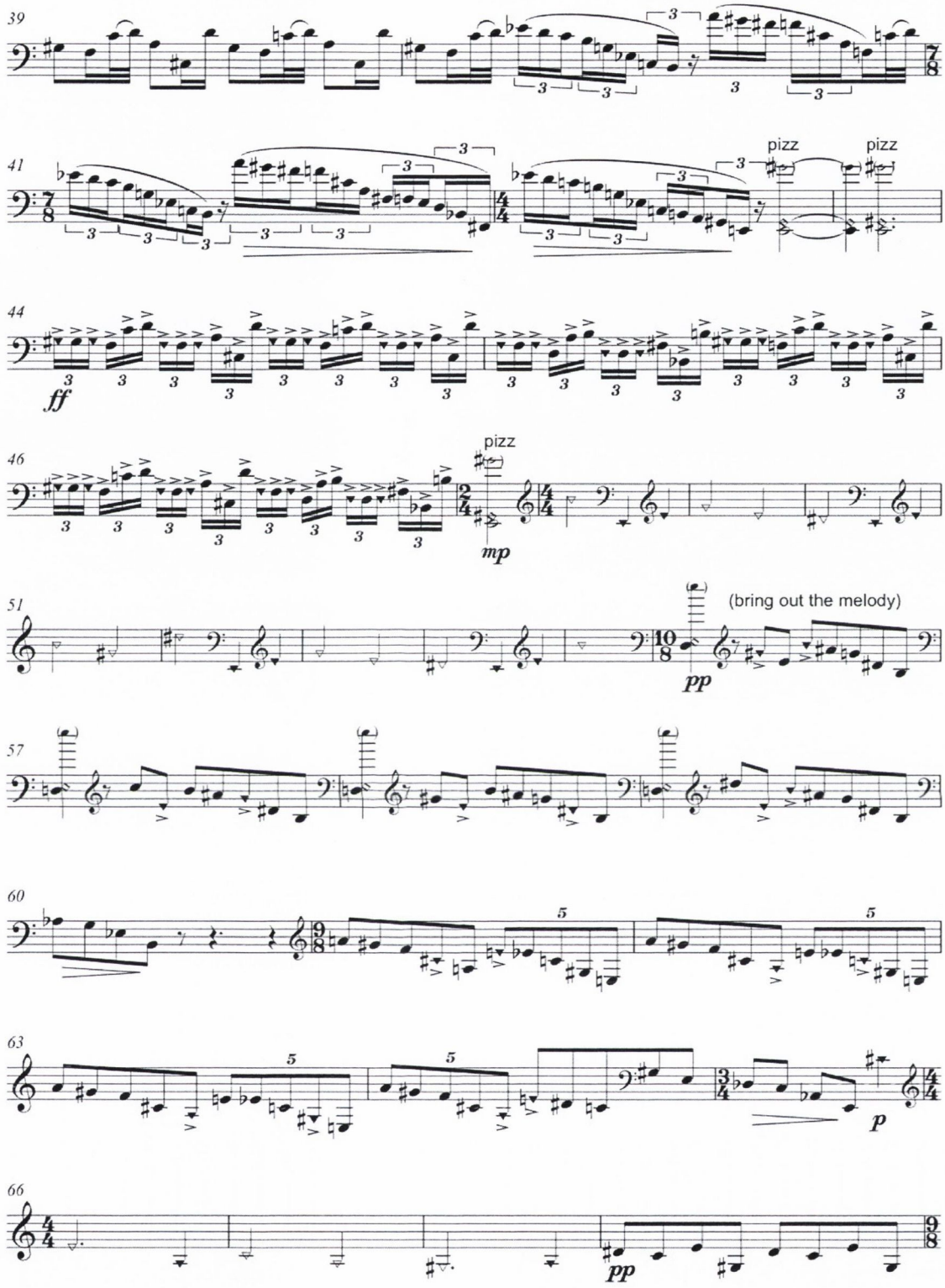
Metric modulations:

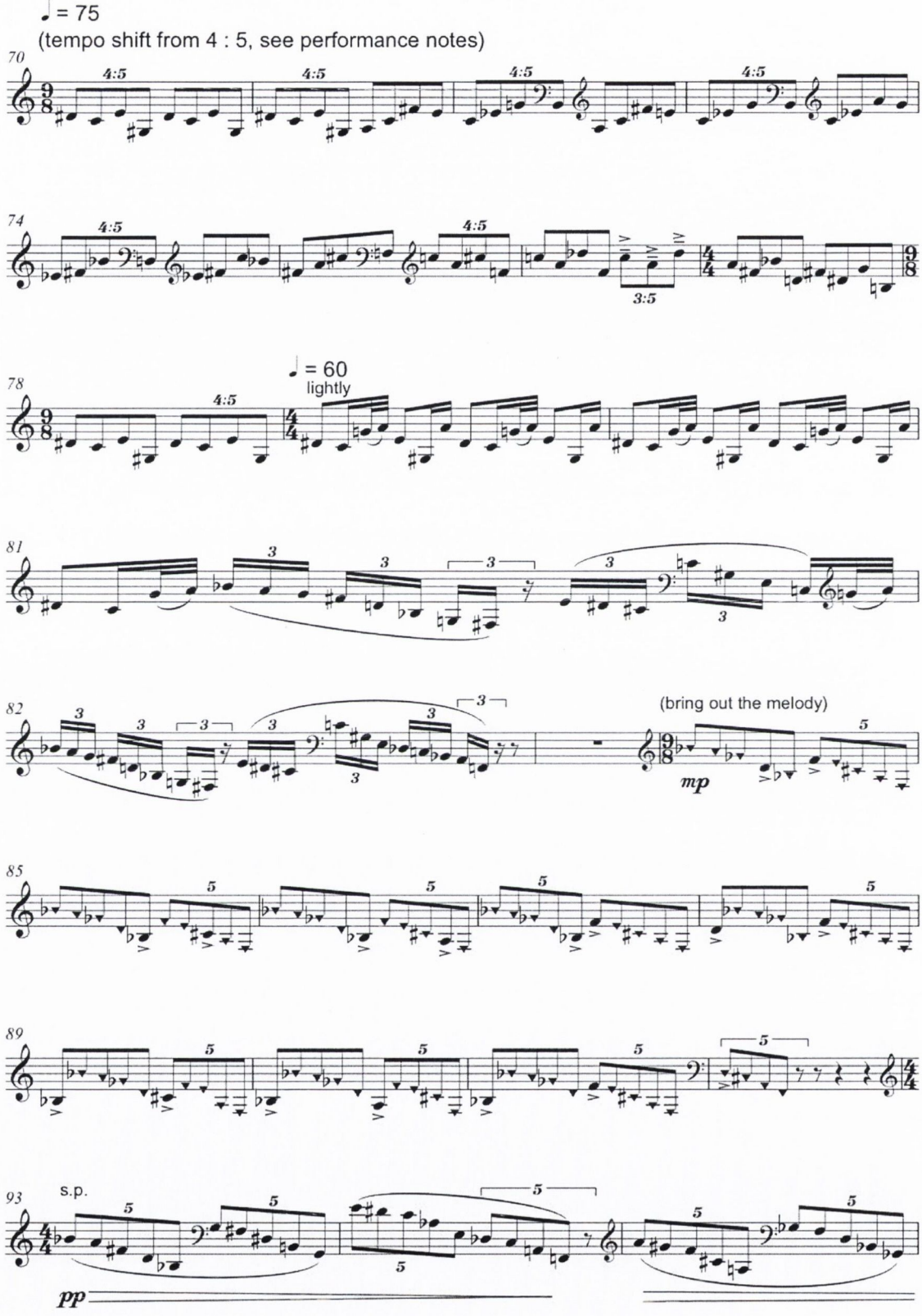
The change from tempo q = 60 to q = 75 should be seen as a metric modulation: the quavers in the new tempo correspond to the quintuplet-quavers in the old one, while the quadruplet-quavers in the new tempo correspond to the old quavers. (Or vice-versa at the change from tempo q = 75 to q = 60)

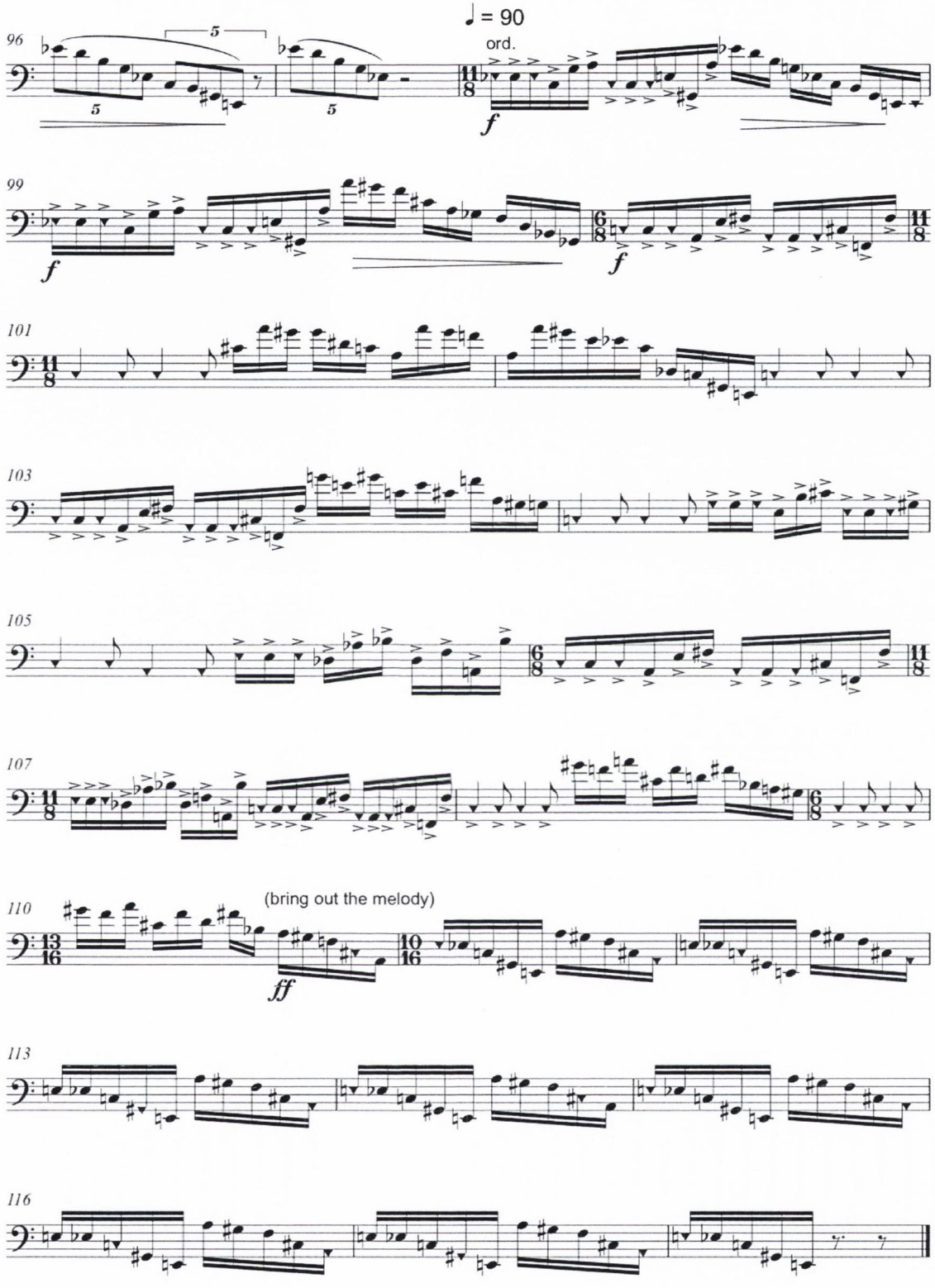
Electric amplification:

If possible, this piece should be played with electric amplification and a slight compression.


♩ = 60
(all triangular noteheads are played pizzicato)
Double Bass
mf
8
bring out the melody that results of the accentuated pizzicato-notes
p
13
17
s.p.
21
25
ord.
pp
31
35
lightly


39
41
pizz
pizz
44
ff
46
pizz
mp
51
(bring out the melody)
pp
57
60
63
p
66
pp


♩ = 75
(tempo shift from 4 : 5, see performance notes)
70
4:5
4:5
4:5
4:5
74
4:5
4:5
3:5
78
4:5
♩ = 60
lightly
81
3
3
3
3
3
82
3
3
3
3
3
3
(bring out the melody)
mp
85
5
5
5
5
89
5
5
5
5
5
93
s.p.
5
5
5
5
5
5
pp


♩ = 90
96
ord.
f
99
f
f
101
103
105
107
110
(bring out the melody)
ff
113
116

SCORES

KILTER

for Orchestra
2006

Nélida Béjar

Scoring:

2 Flutes (one of them plays also piccolo flute)

2 Oboes

2 Clarinets in B ♭

1 Bass clarinet (plays also clarinet in B ♭)

2 Bassoons

4 Horns

2 Trumpets in B ♭

2 Tenor Trombones

1 Bass Trombones

1 Tuba

Percussion (1 player)

22 Violins (which would correspond to 12 first and 10 second violins)

7 Violas

6 Violoncellos

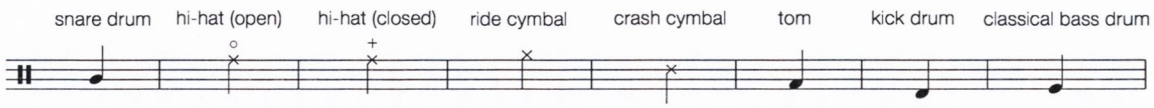
4 Double basses

In this piece every player - including the strings - has an individual part. Exceptions, in which two players should play the same part, are marked in the score with the indication "à 2".

The single strings play mostly loops; but since these loops have different lengths for the different parts, the overall construct is constantly shifting. The changes of the time signature are orientated on the metrical accent of the global sound.

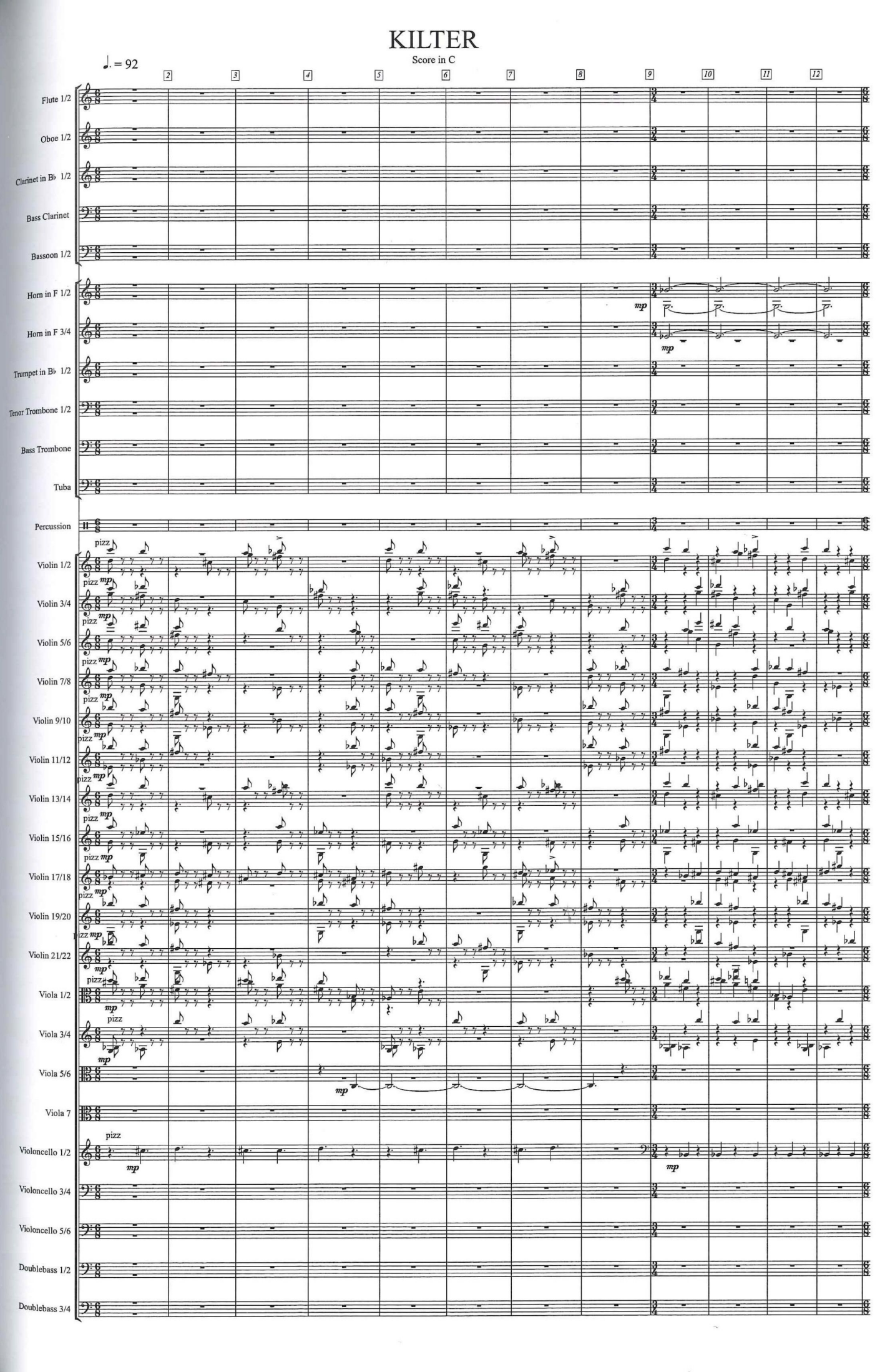
During a long period of time the strings play only pizzicato. In the section from bar 168 to bar 240, in which there is a frequent shift between pizzicato and arco, all the pizzicato notes are indicated through the triangular note heads:  (this is also explained in the score).

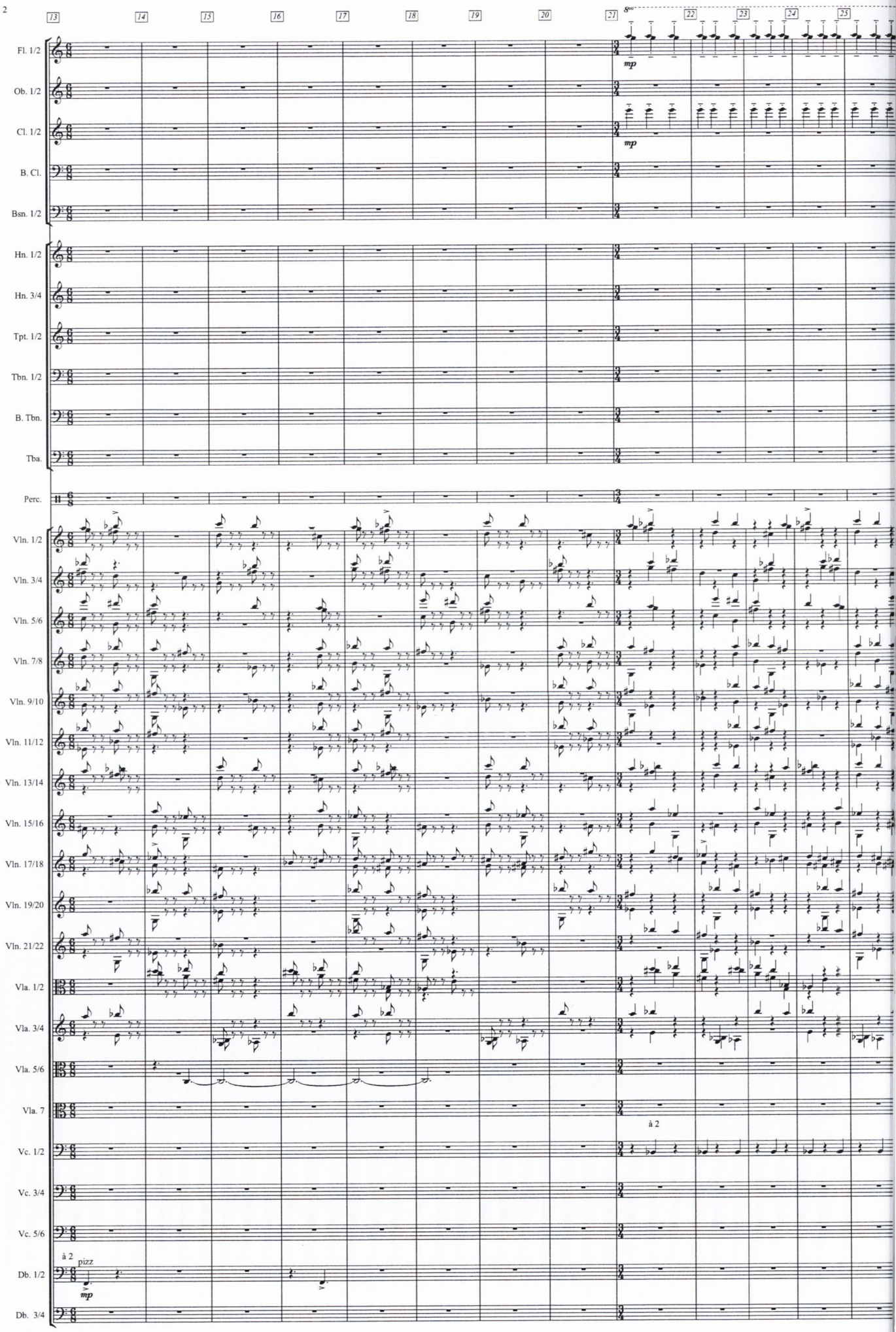
The percussionist plays a drum kit (snare drum, hi-hat, ride cymbal, crash cymbal, tom, kick drum) and a classical bass drum. The notation is as follows:

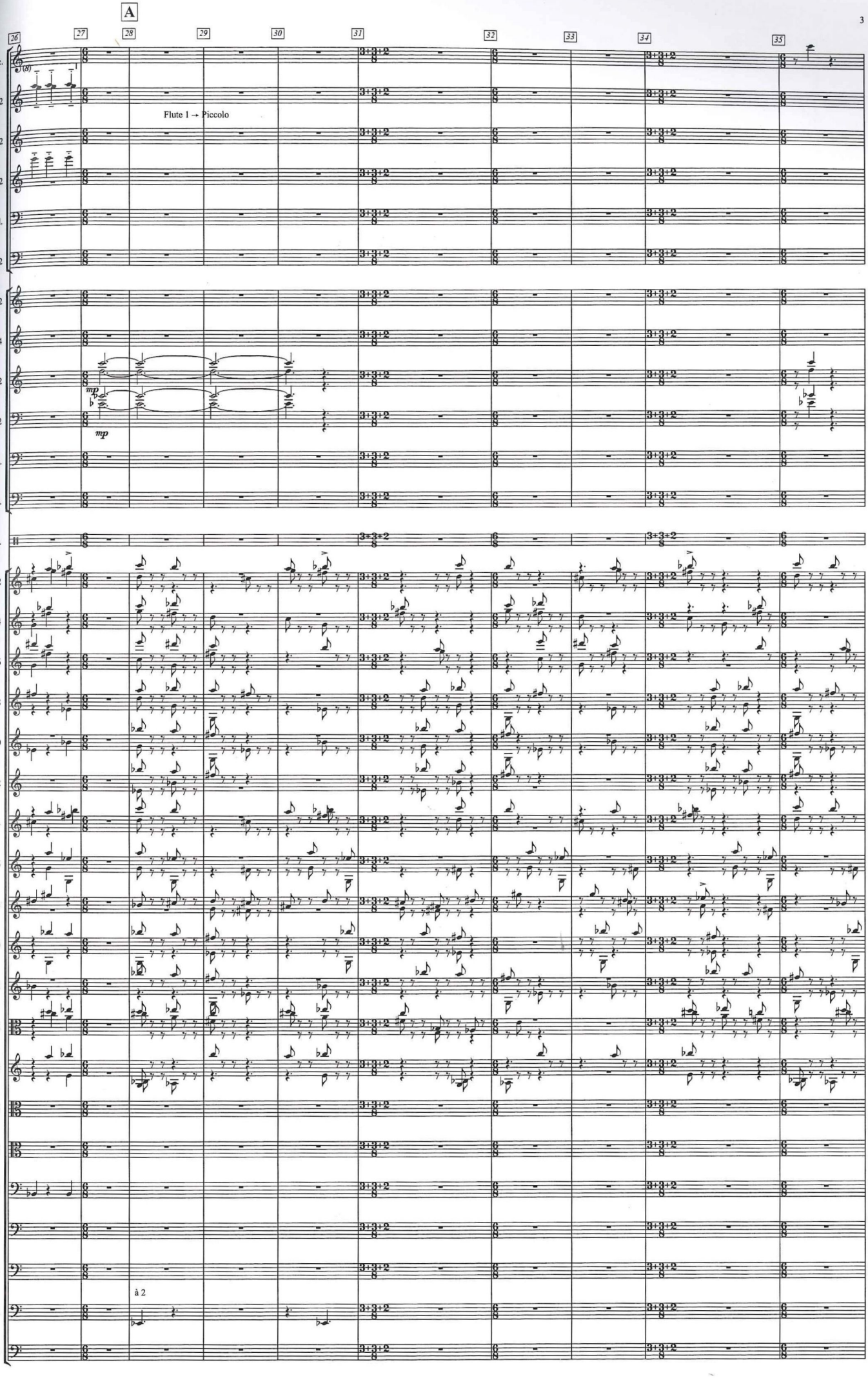


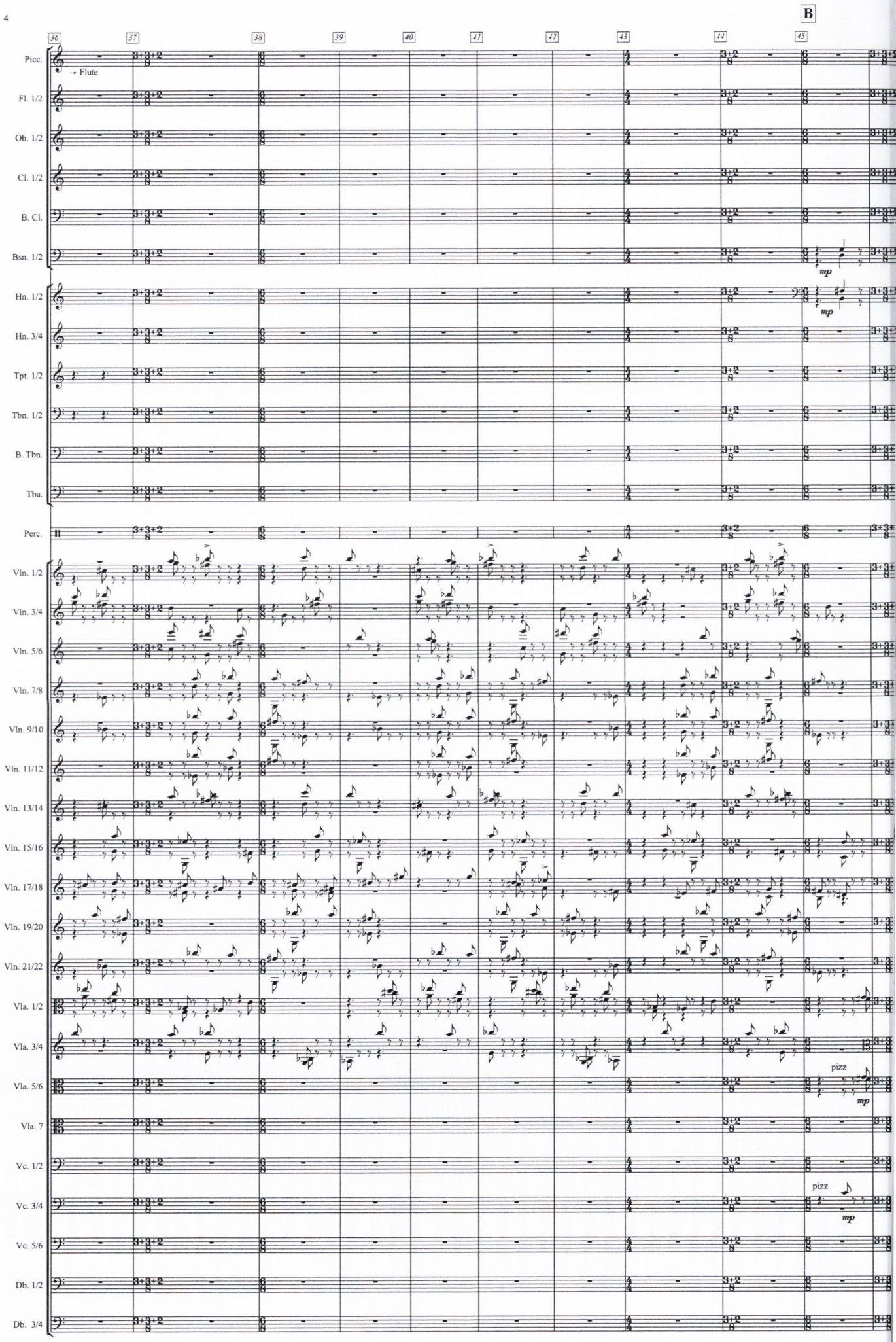
KILTER

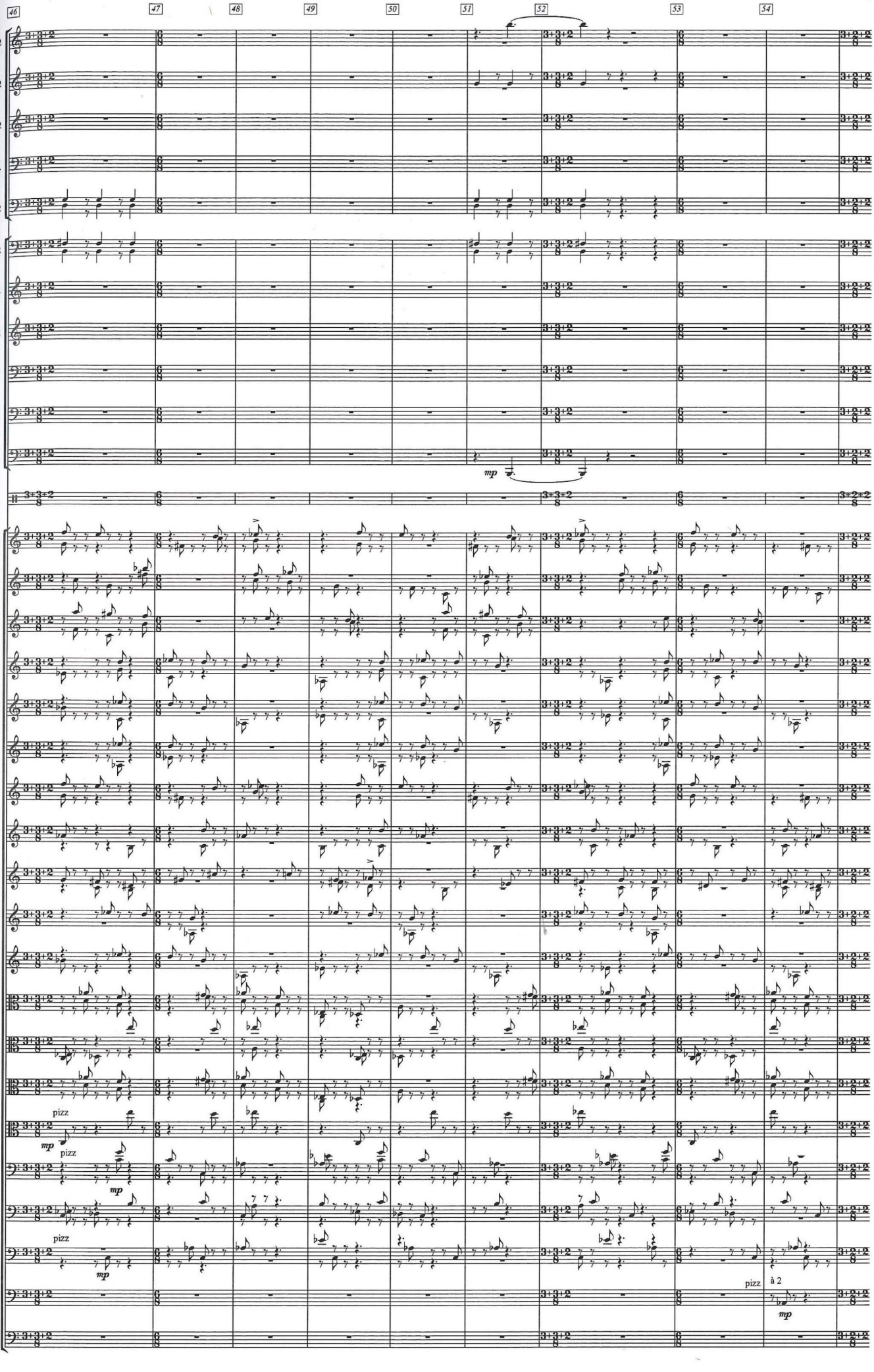
Score in C

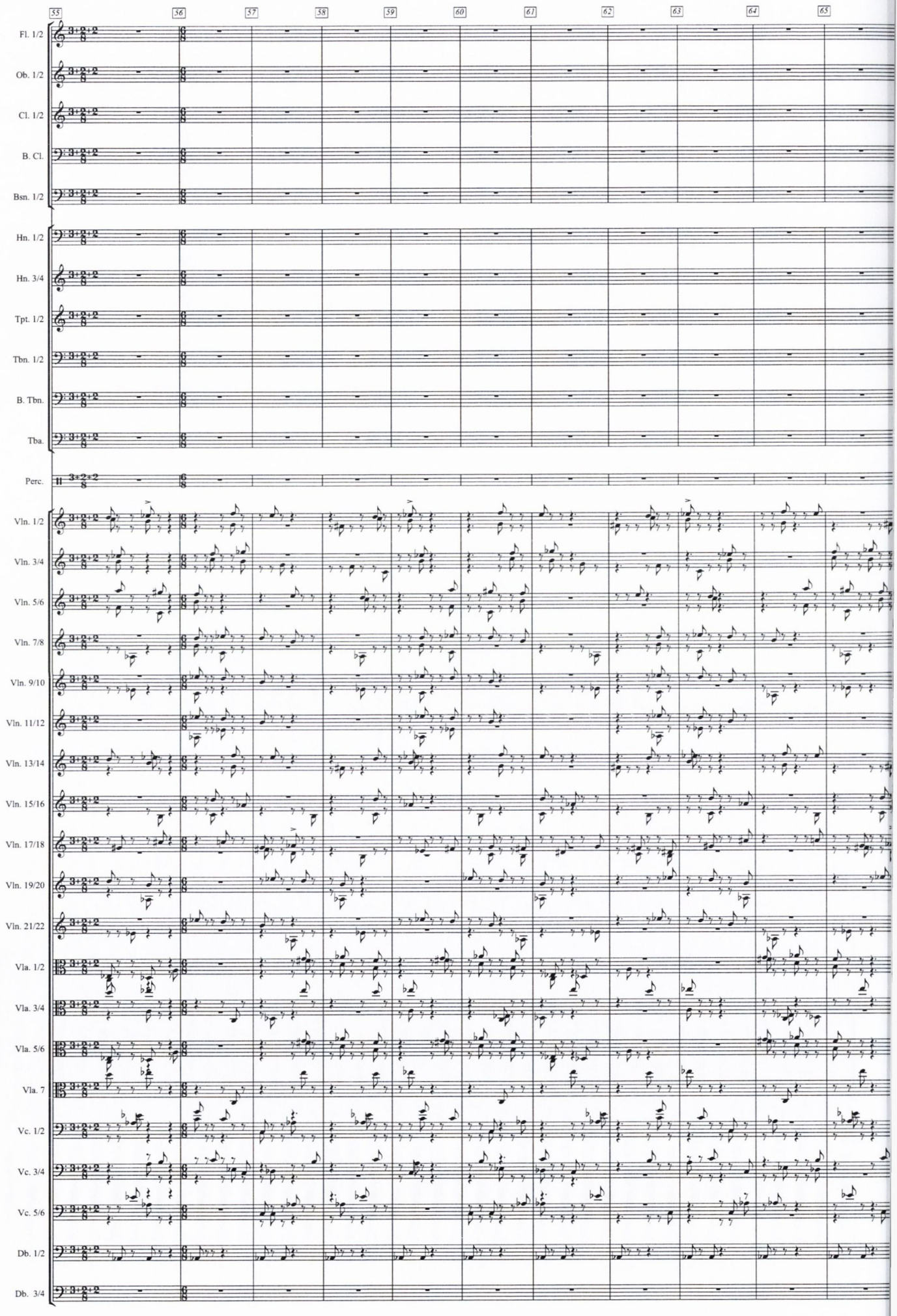


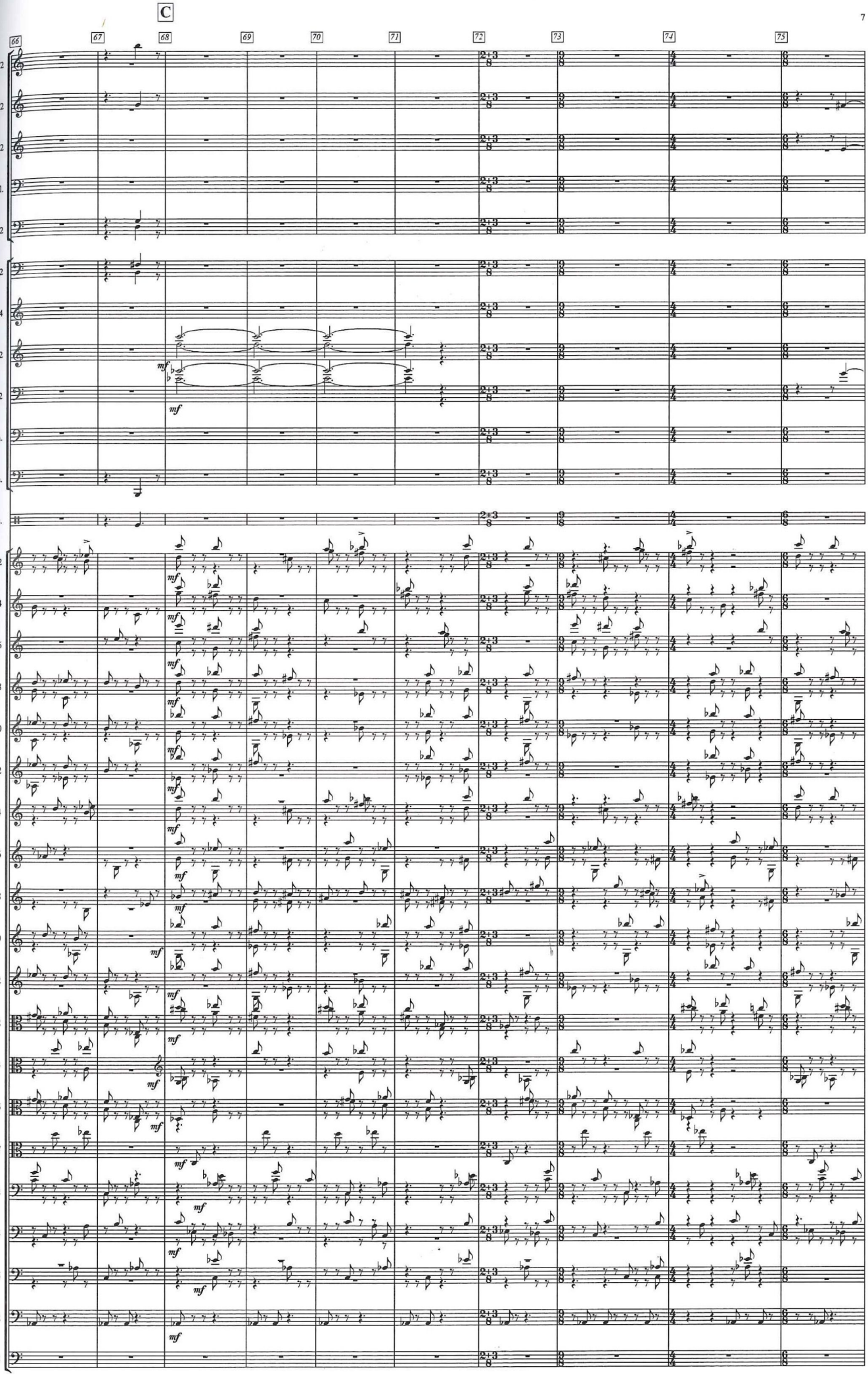

13
14
15
16
17
18
19
20
21
22
23
24
25
8va
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
mp
mp
à 2
à 2
pizz
mp

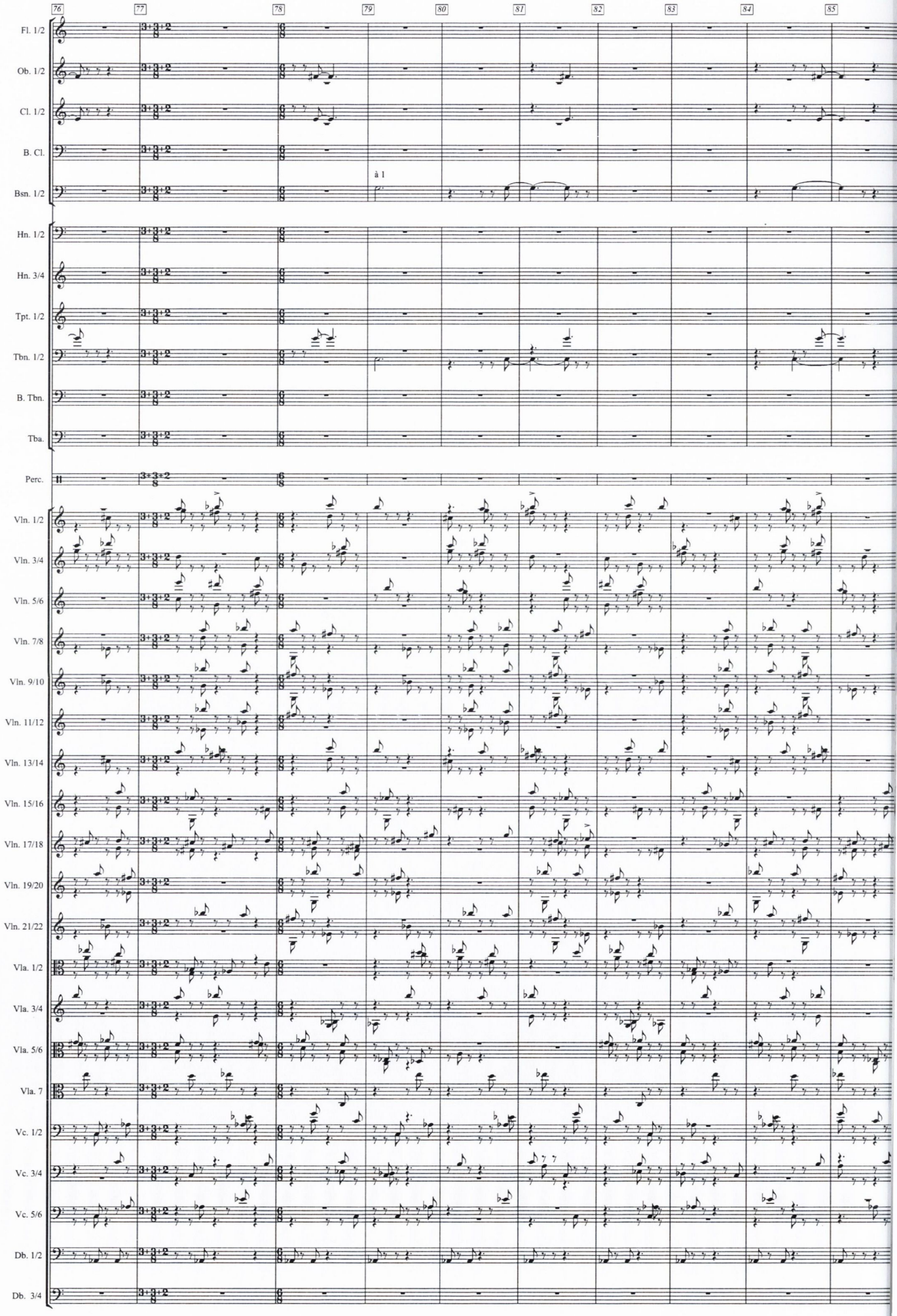

A
26
27
28
29
30
31
32
33
34
35
Picc.
Fl. 1/2
Flute 1 → Piccolo
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
mp
Tbn. 1/2
mp
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
à 2
Db. 1/2
Db. 3/4

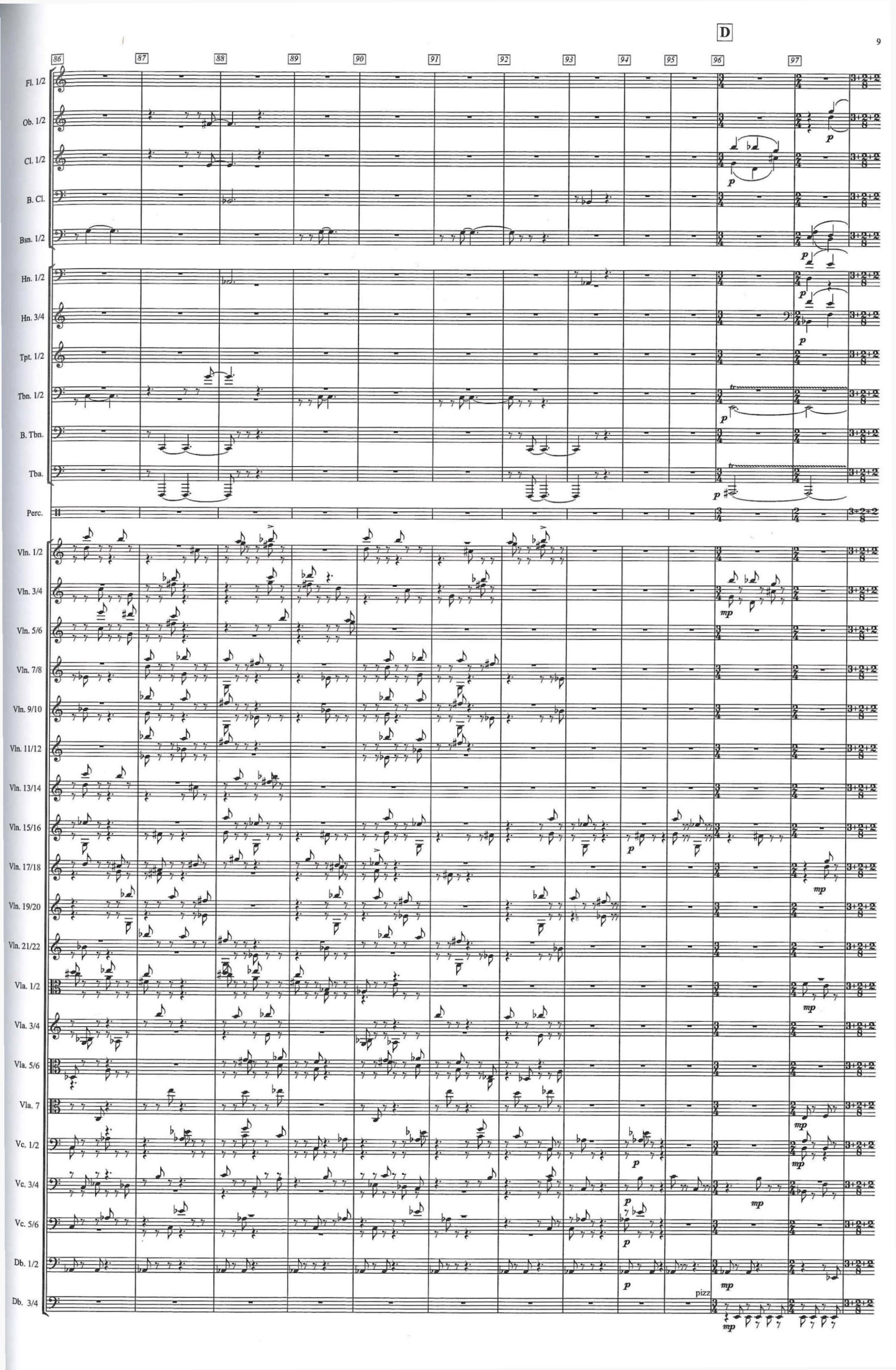

B
36
37
38
39
40
41
42
43
44
45
Picc.
→ Flute
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
mp
Hn. 1/2
mp
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
pizz
mp
Vla. 7
Vc. 1/2
Vc. 3/4
pizz
mp
Vc. 5/6
Db. 1/2
Db. 3/4

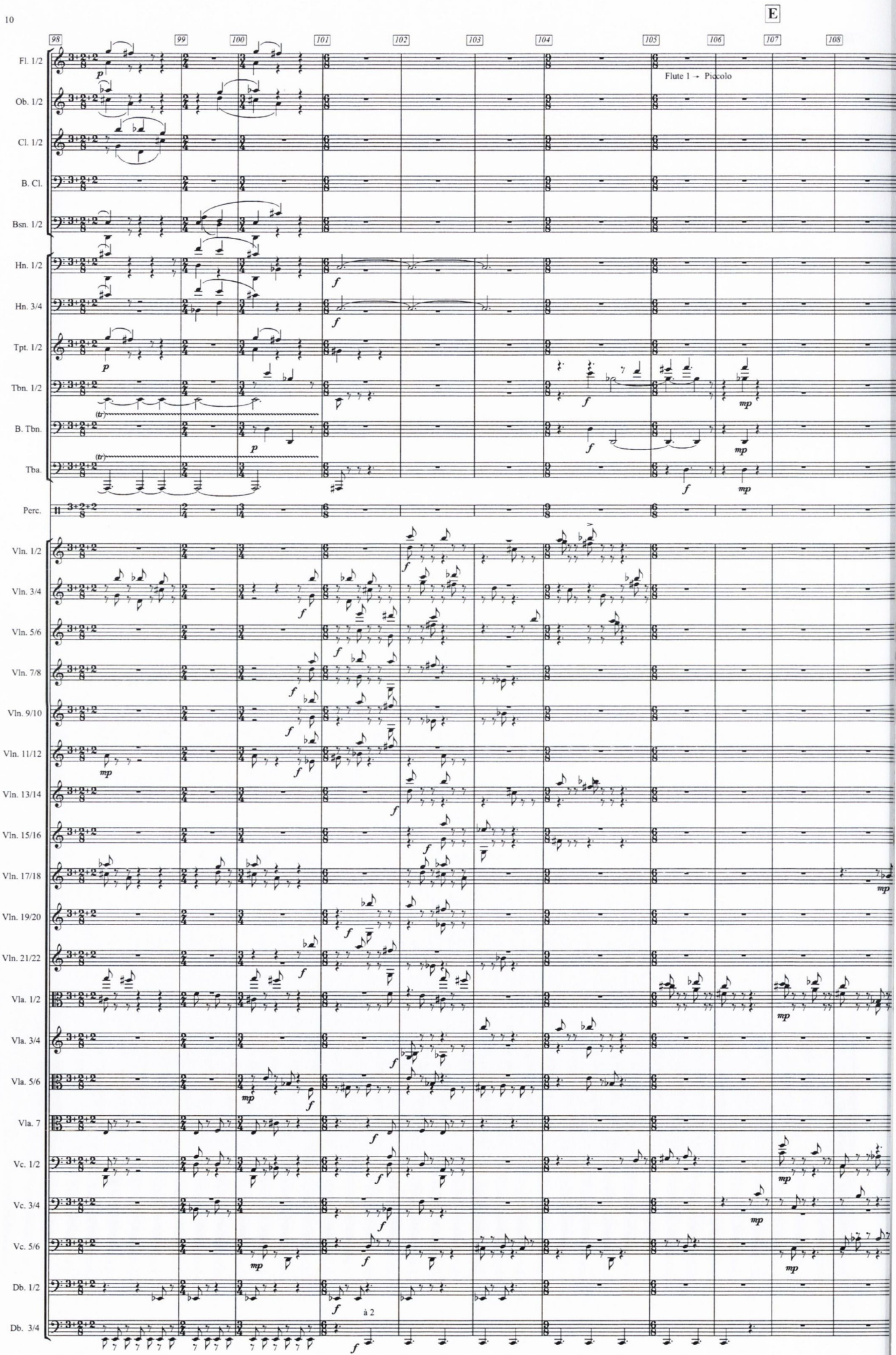

46
47
48
49
50
51
52
53
54
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
mp
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
pizz
Vla. 7
mp
pizz
Vc. 1/2
mp
Vc. 3/4
pizz
Vc. 5/6
mp
pizz
à 2
Db. 1/2
mp
Db. 3/4

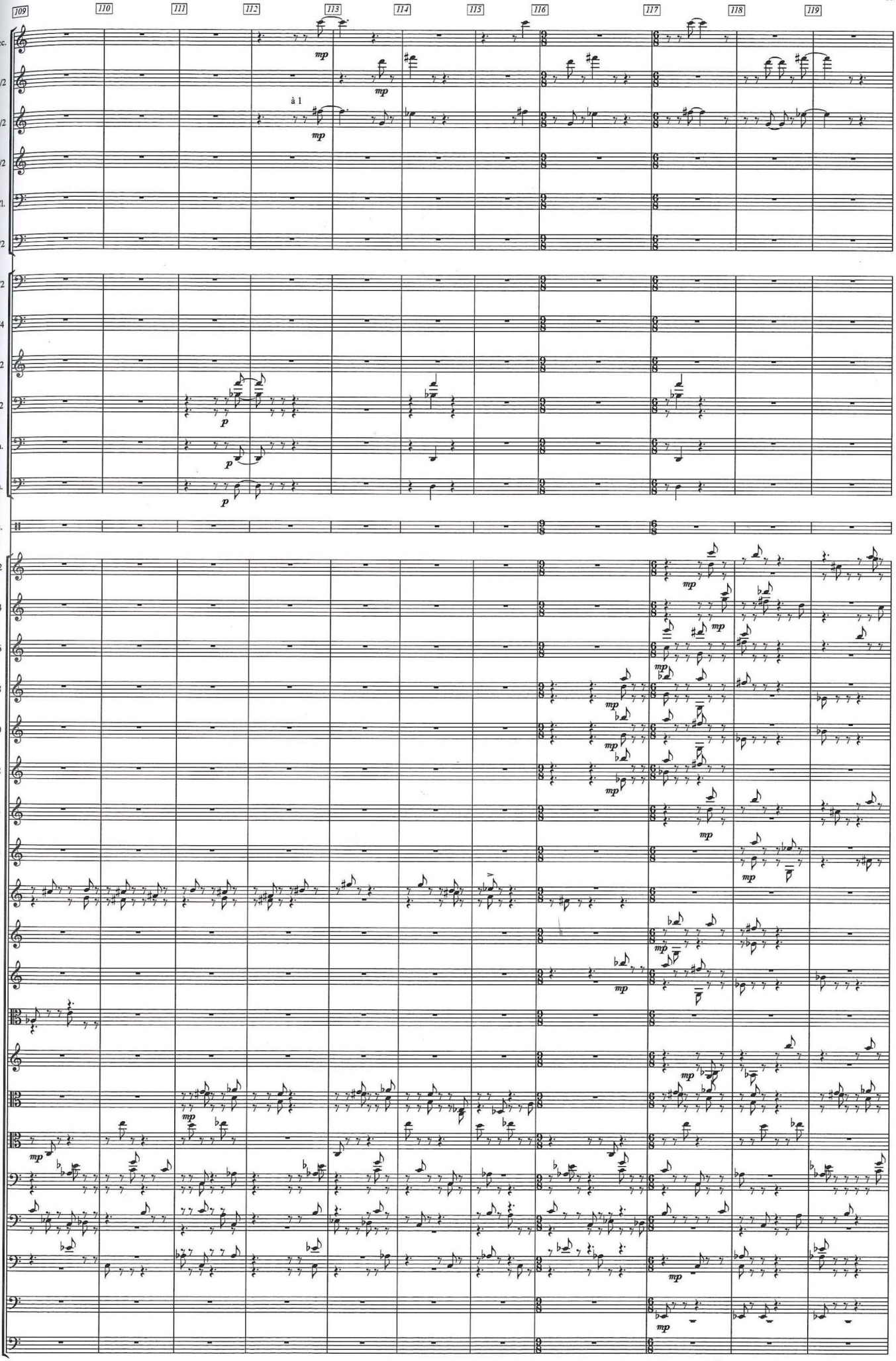

55
56
57
58
59
60
61
62
63
64
65
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

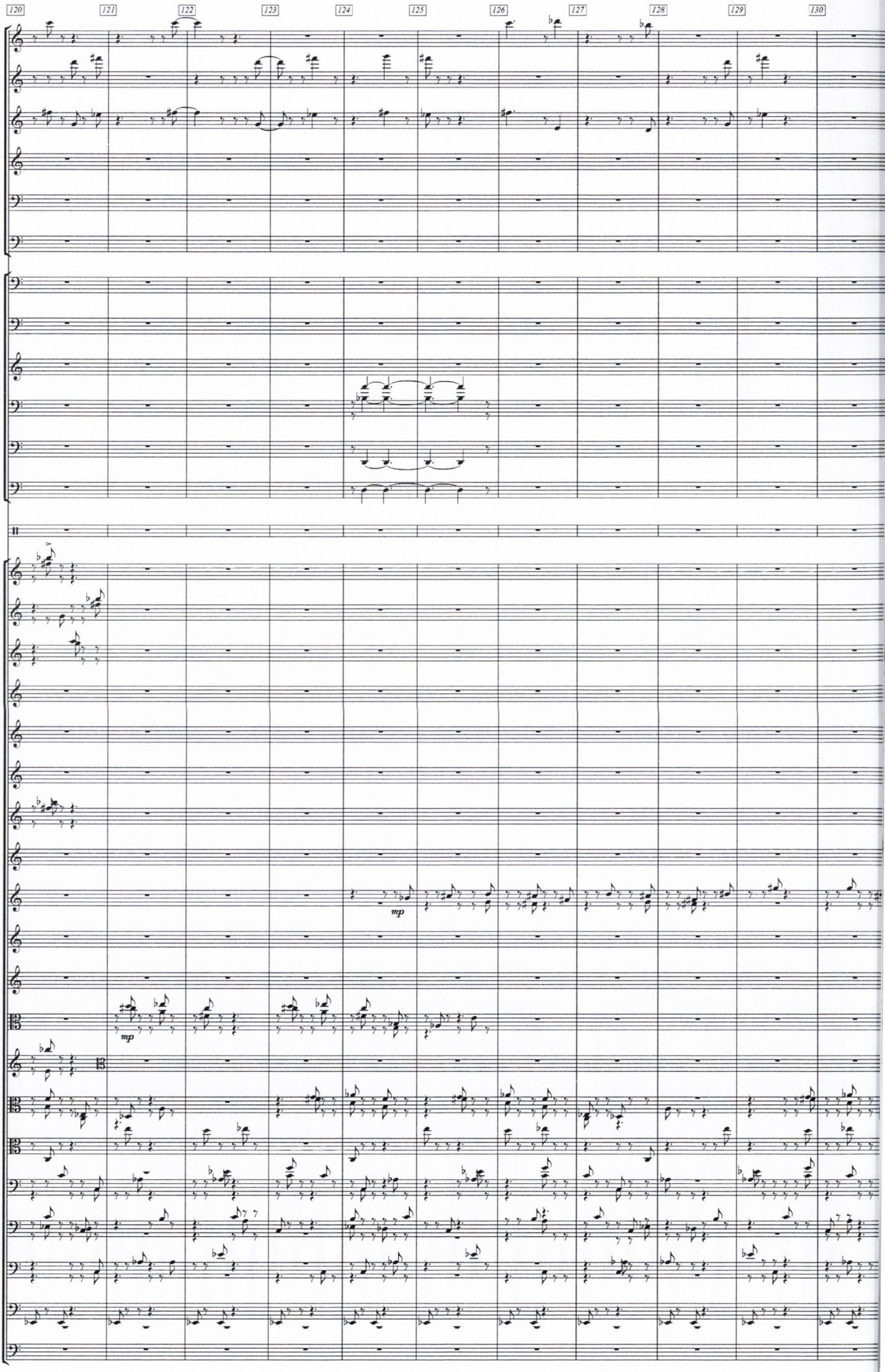

C
66
67
68
69
70
71
72
73
74
75
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

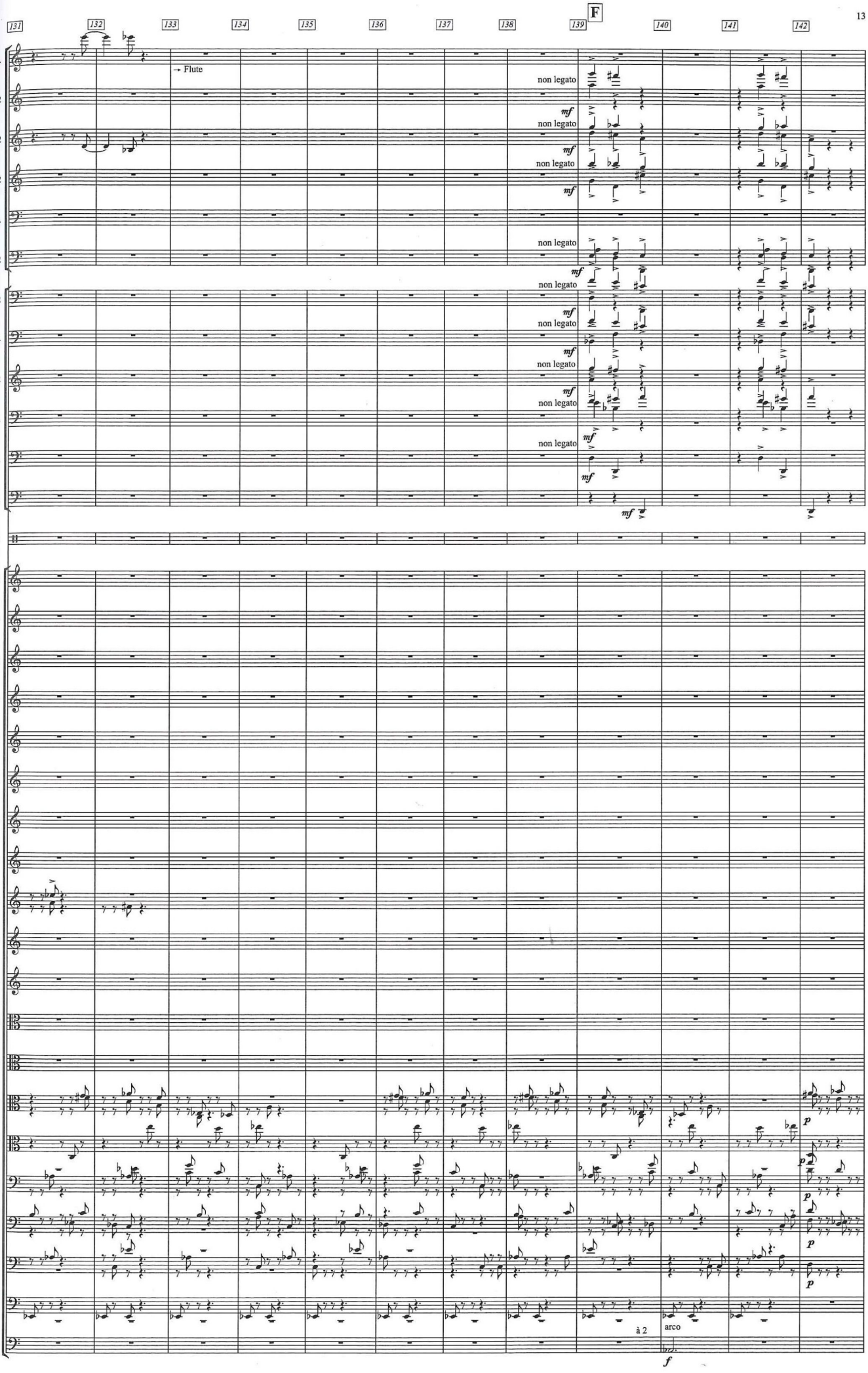

76
77
78
79
80
81
82
83
84
85
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
à 1
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

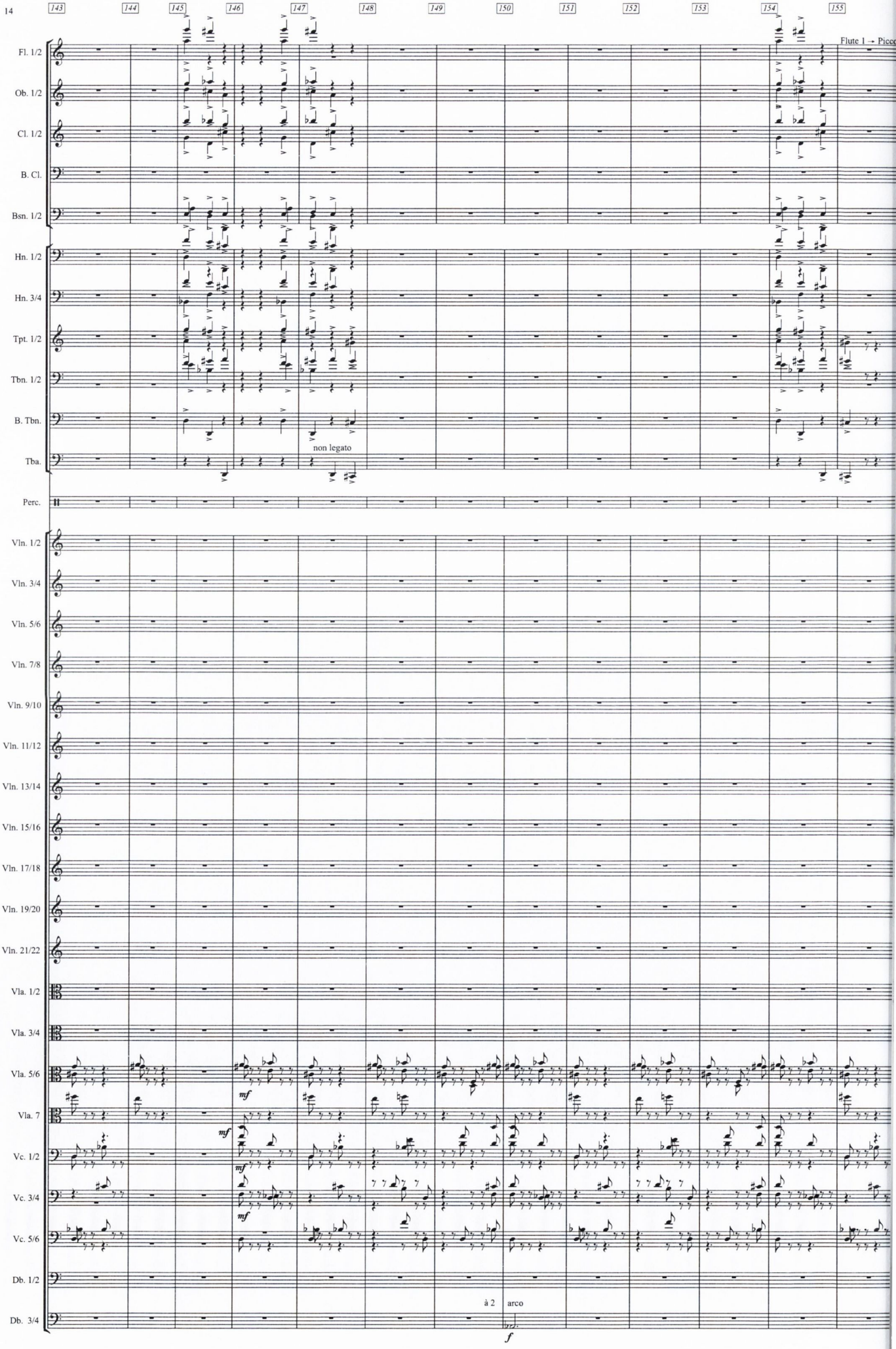

D
86
87
88
89
90
91
92
93
94
95
96
97
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
pizz.

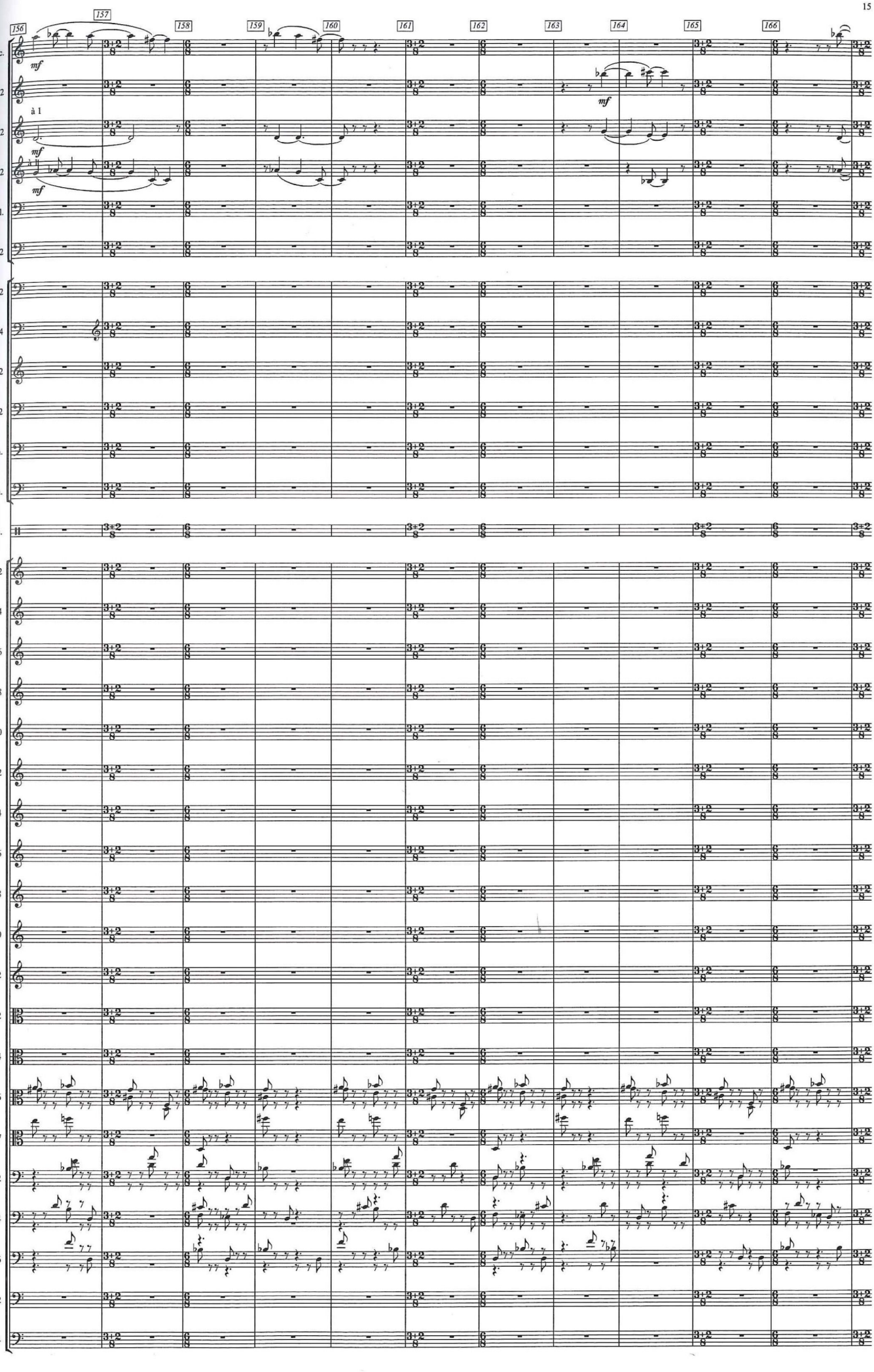

E
98
99
100
101
102
103
104
105
106
107
108
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
Flute 1 → Piccolo
à 2

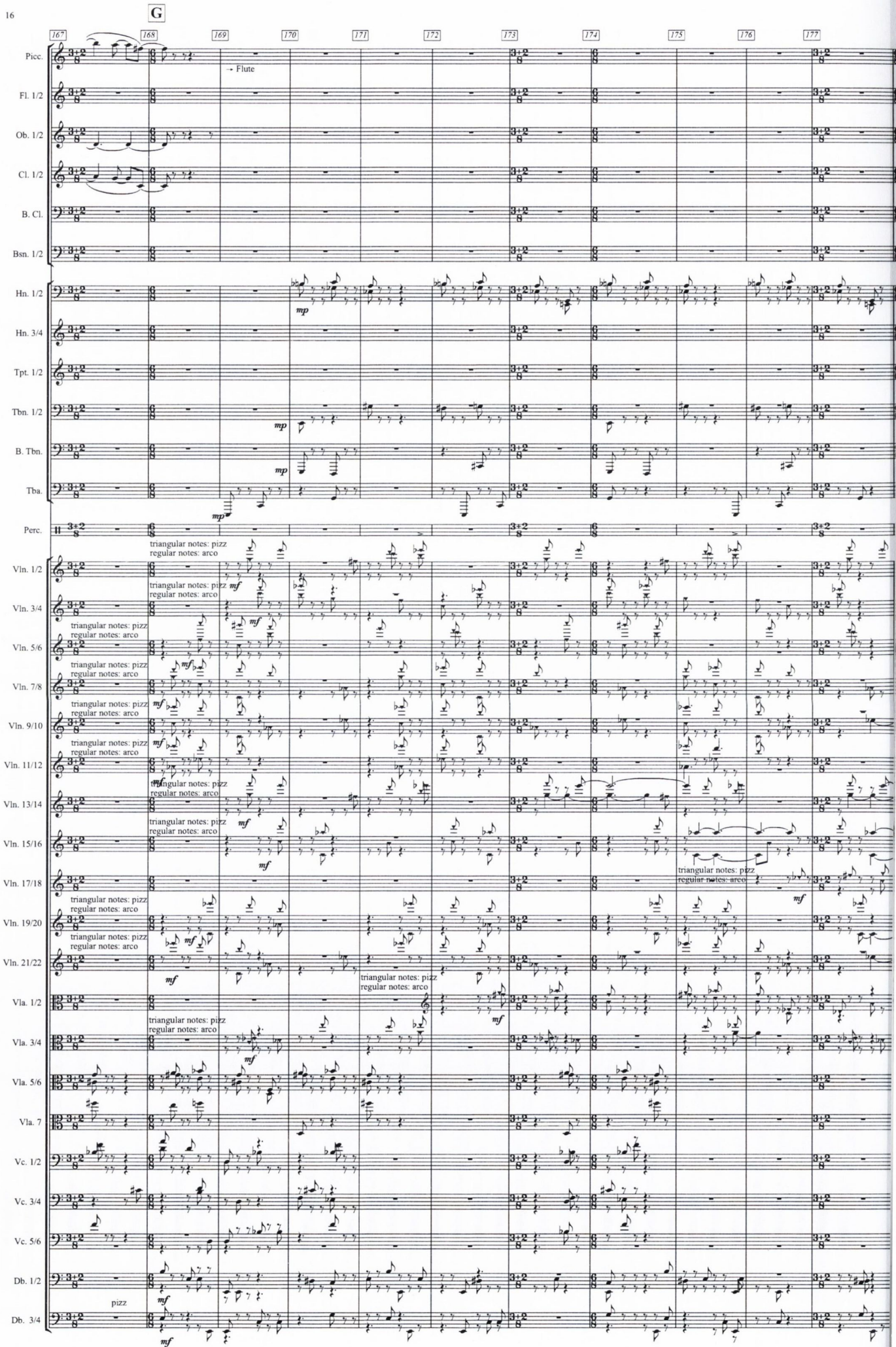

109
110
111
112
113
114
115
116
117
118
119
Picc.
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
à 1
mp
p

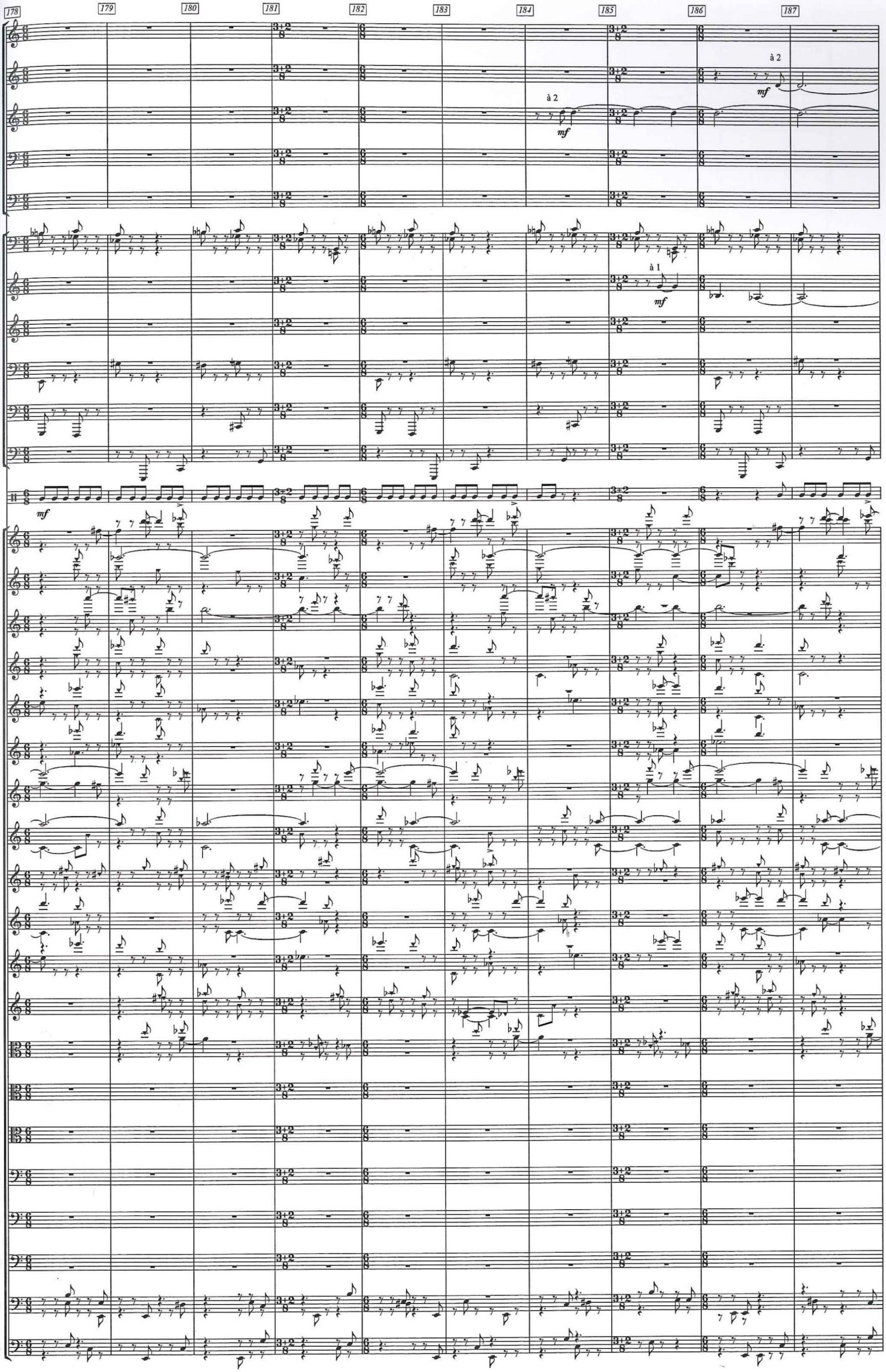

120
121
122
123
124
125
126
127
128
129
130
Picc.
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
mp
mp

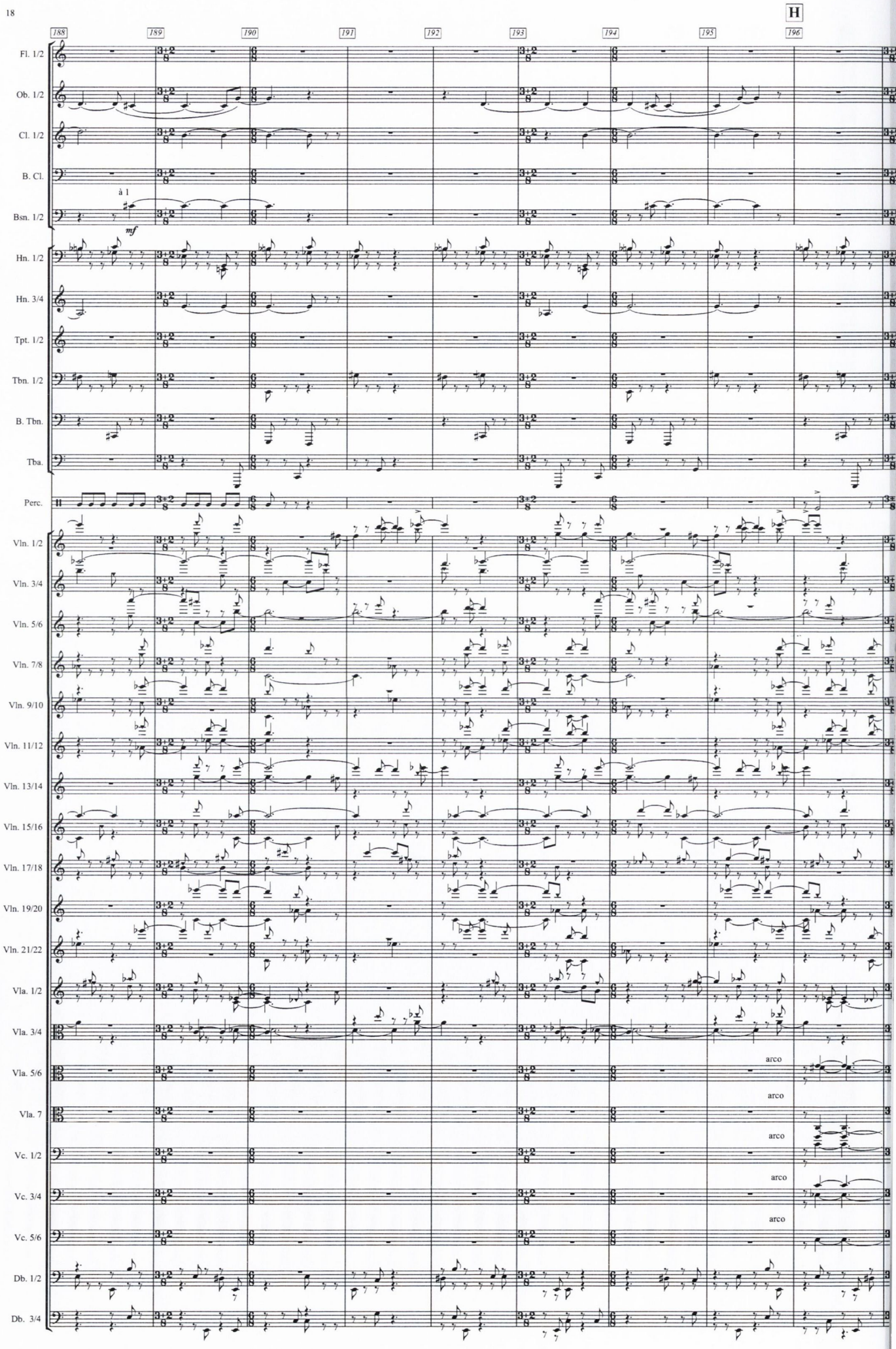

131
132
133
134
135
136
137
138
F
139
140
141
142
Picc.
→ Flute
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
non legato
mf
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
p
à 2
arco
f

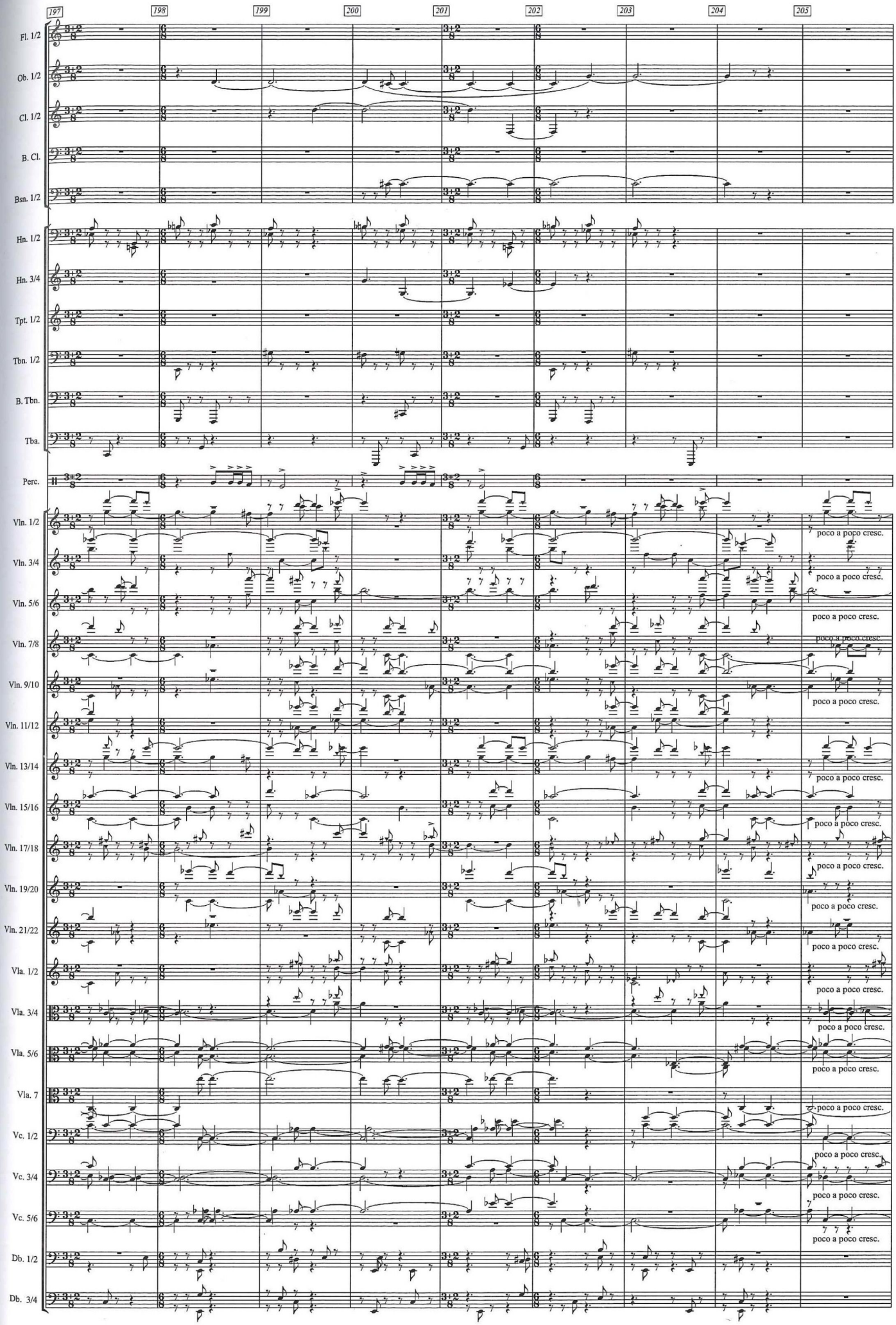

143
144
145
146
147
148
149
150
151
152
153
154
155
Flute 1 → Picc
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
non legato
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
mf
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
à 2
arco
f

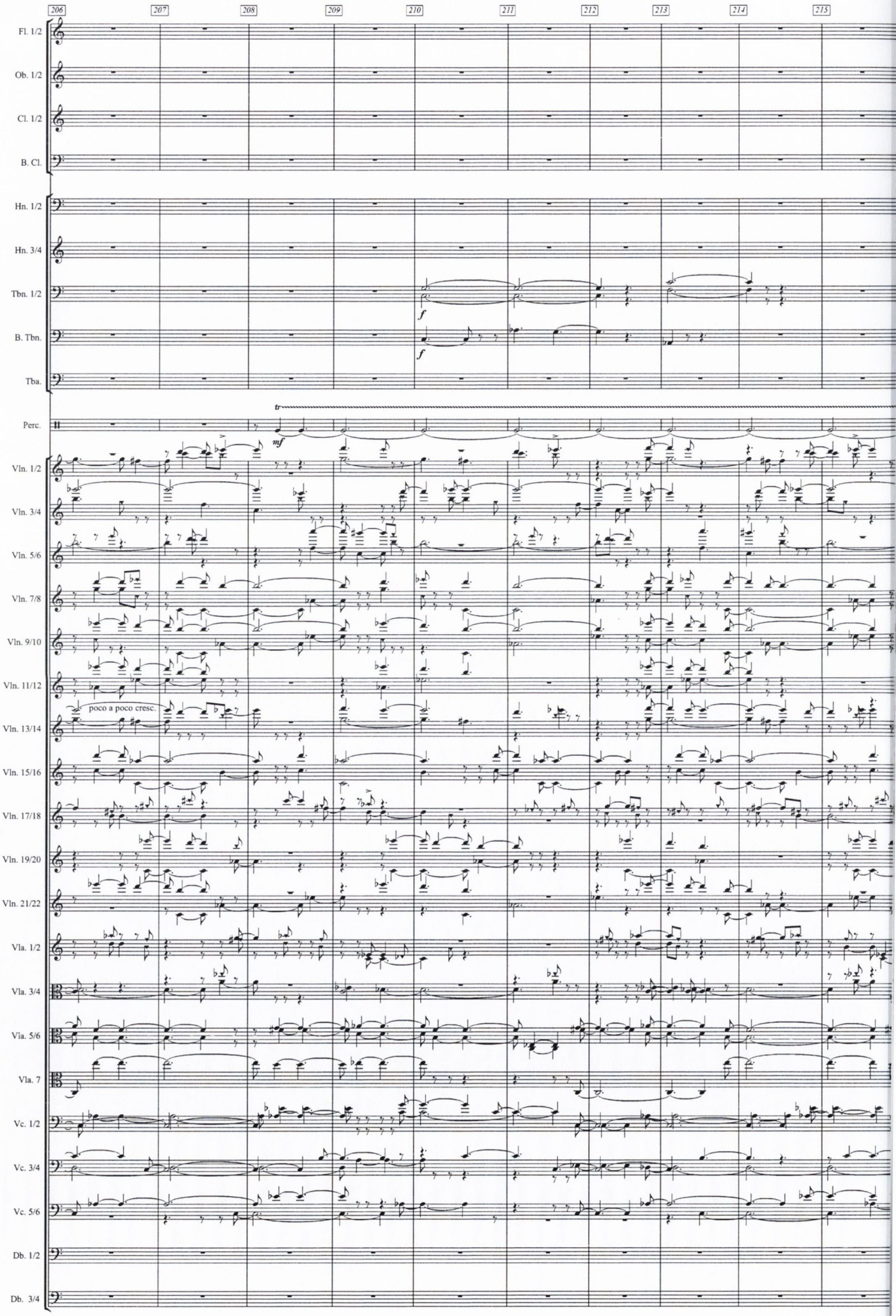

156
157
158
159
160
161
162
163
164
165
166
Picc.
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
mf
à 1

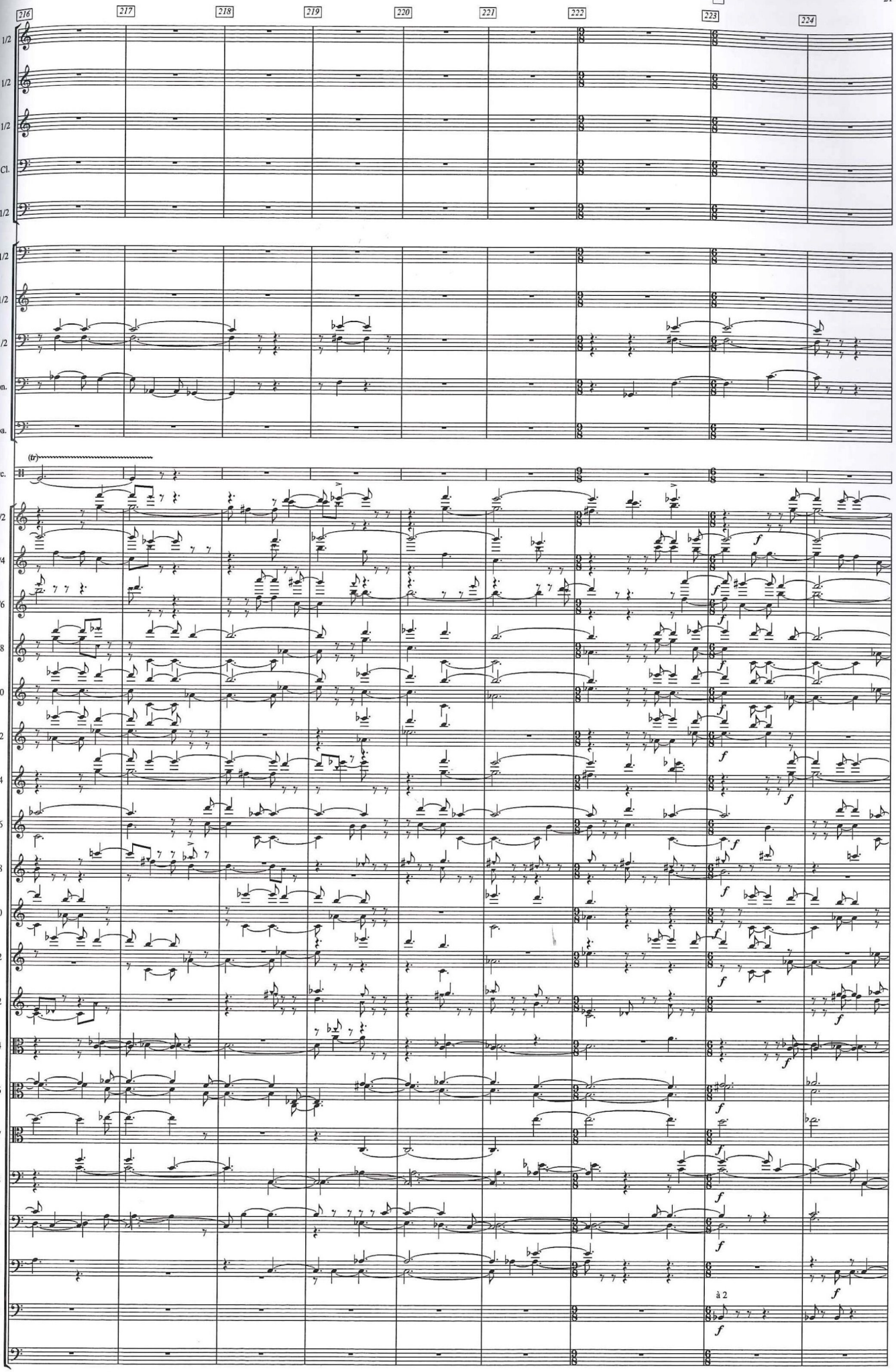

G
167
168
169
170
171
172
173
174
175
176
177
Picc.
→ Flute
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
mp
mf
triangular notes: pizz
regular notes: arco
pizz

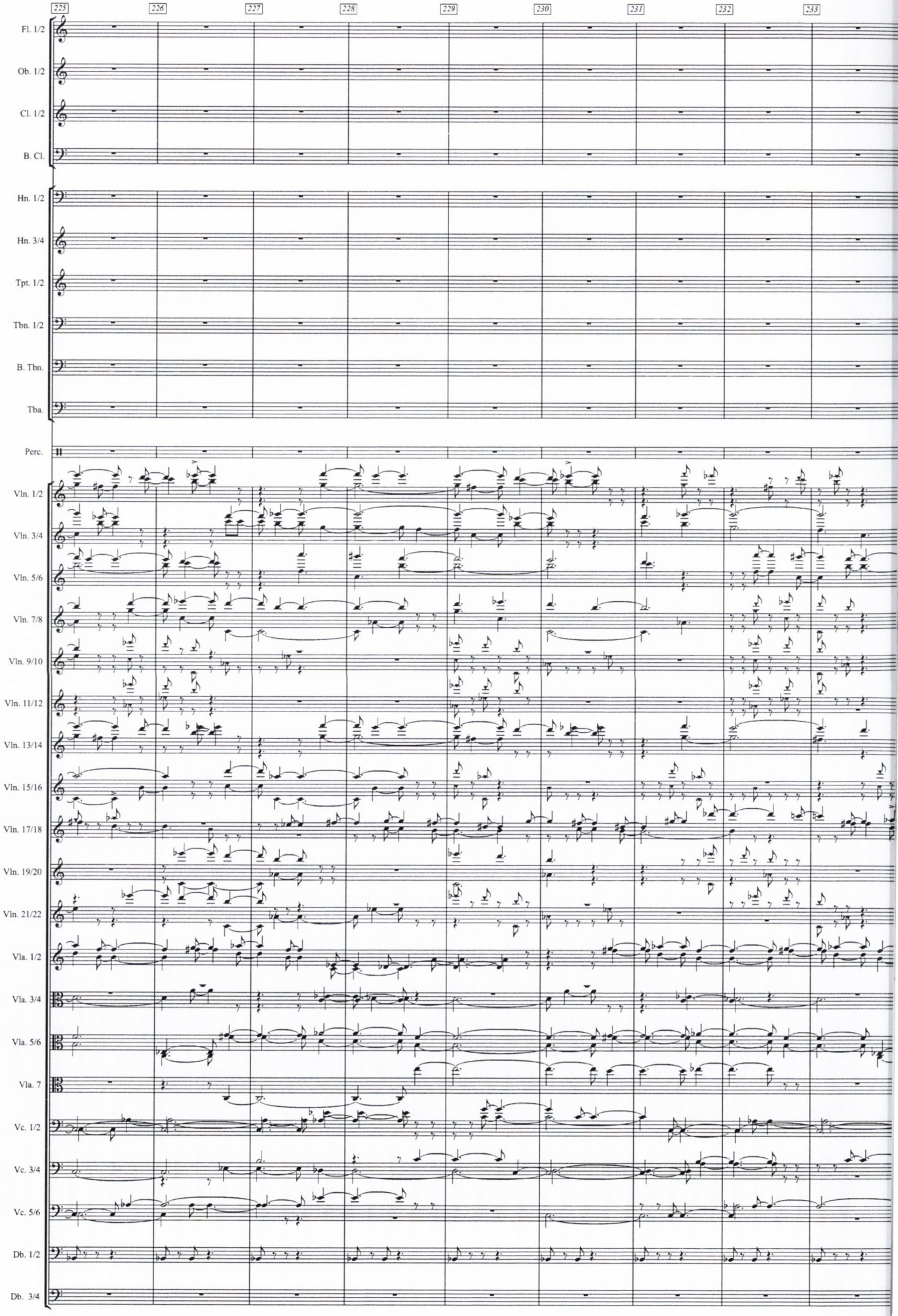

178
179
180
181
182
183
184
185
186
187
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
à 2
mf
à 2
mf
à 1
mf
mf

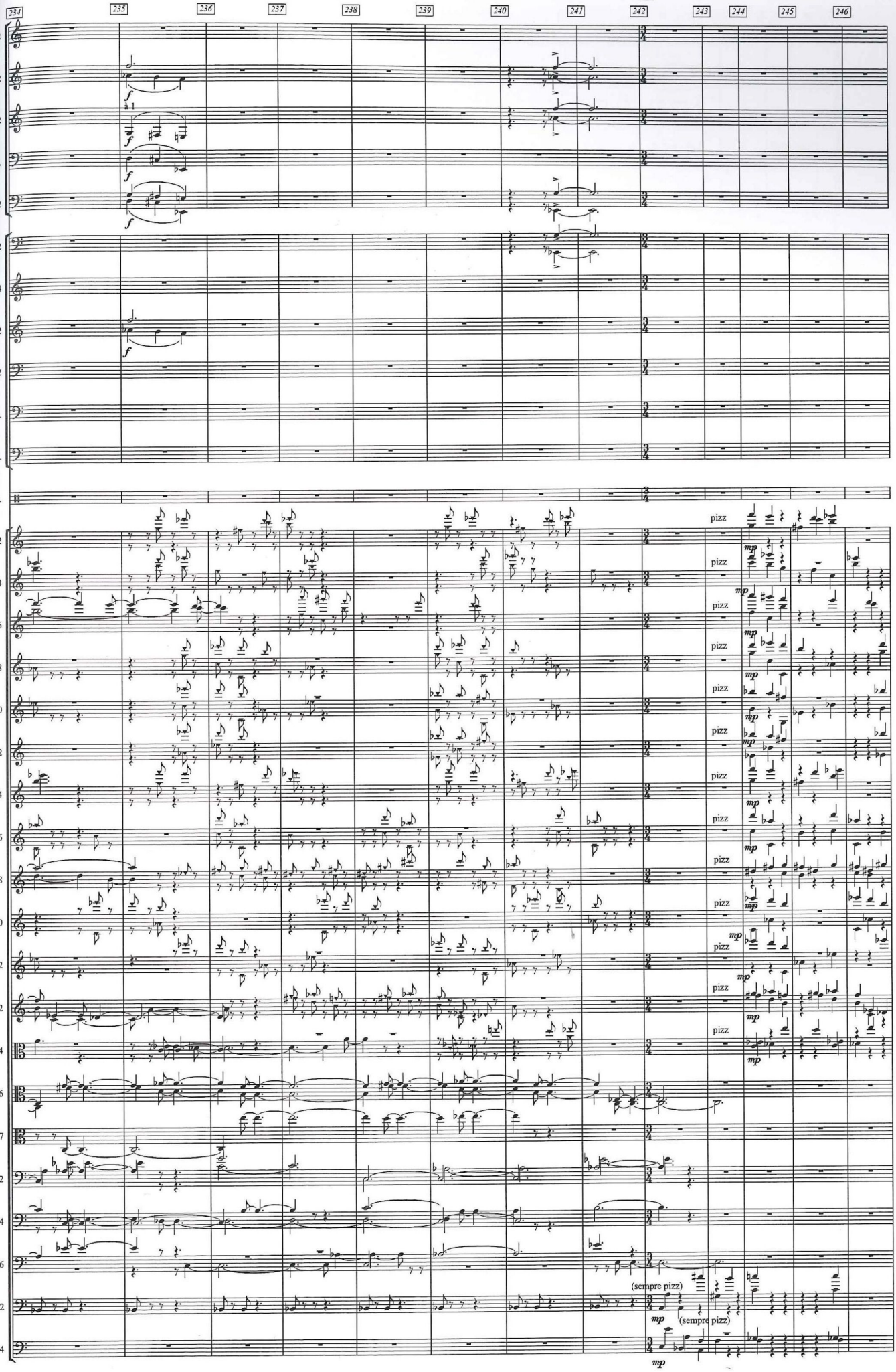

H
188
189
190
191
192
193
194
195
196
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
à 1
Bsn. 1/2
mf
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
arco
Vla. 7
arco
Vc. 1/2
arco
Vc. 3/4
arco
Vc. 5/6
Db. 1/2
Db. 3/4

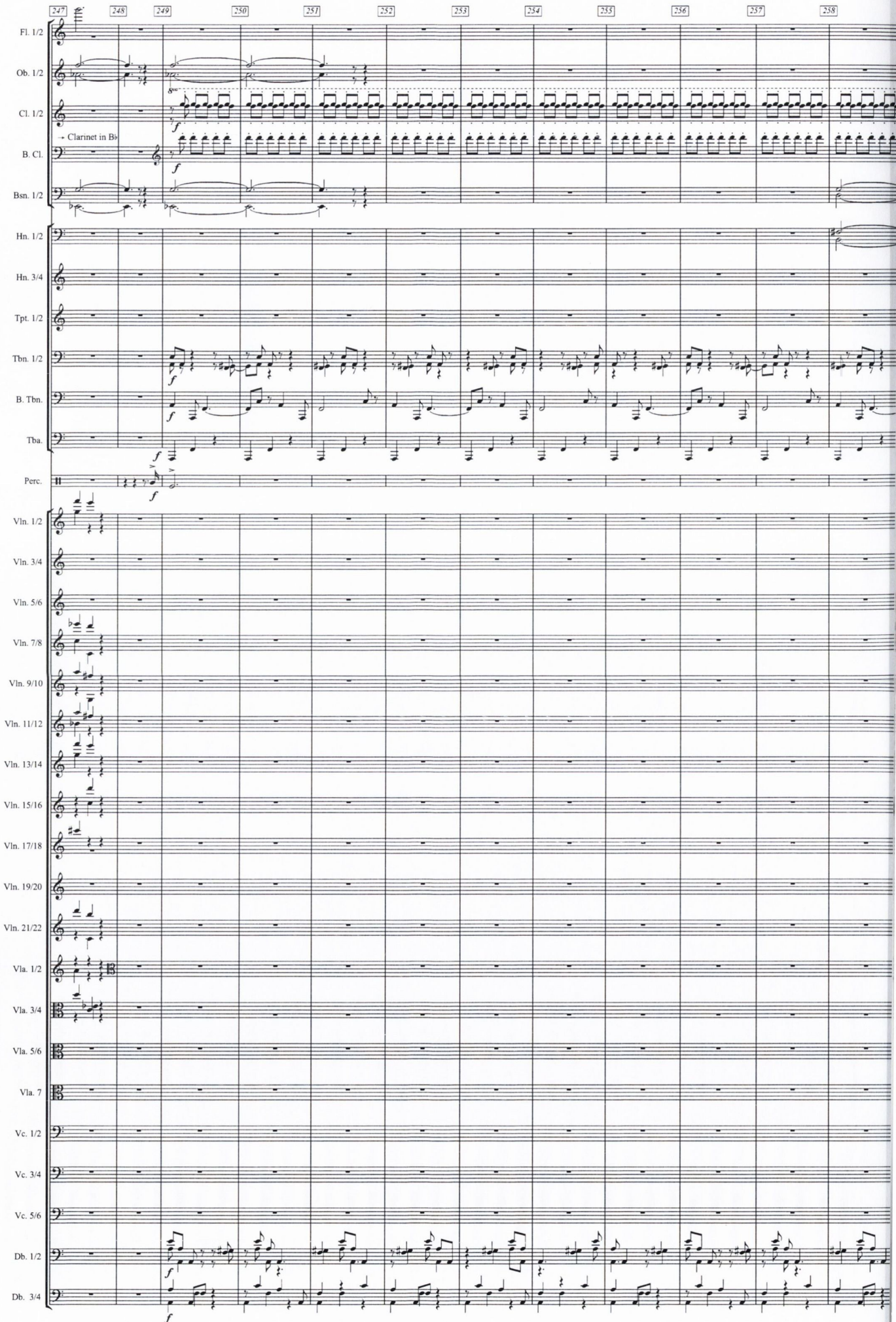

197
198
199
200
201
202
203
204
205
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
poco a poco cresc.

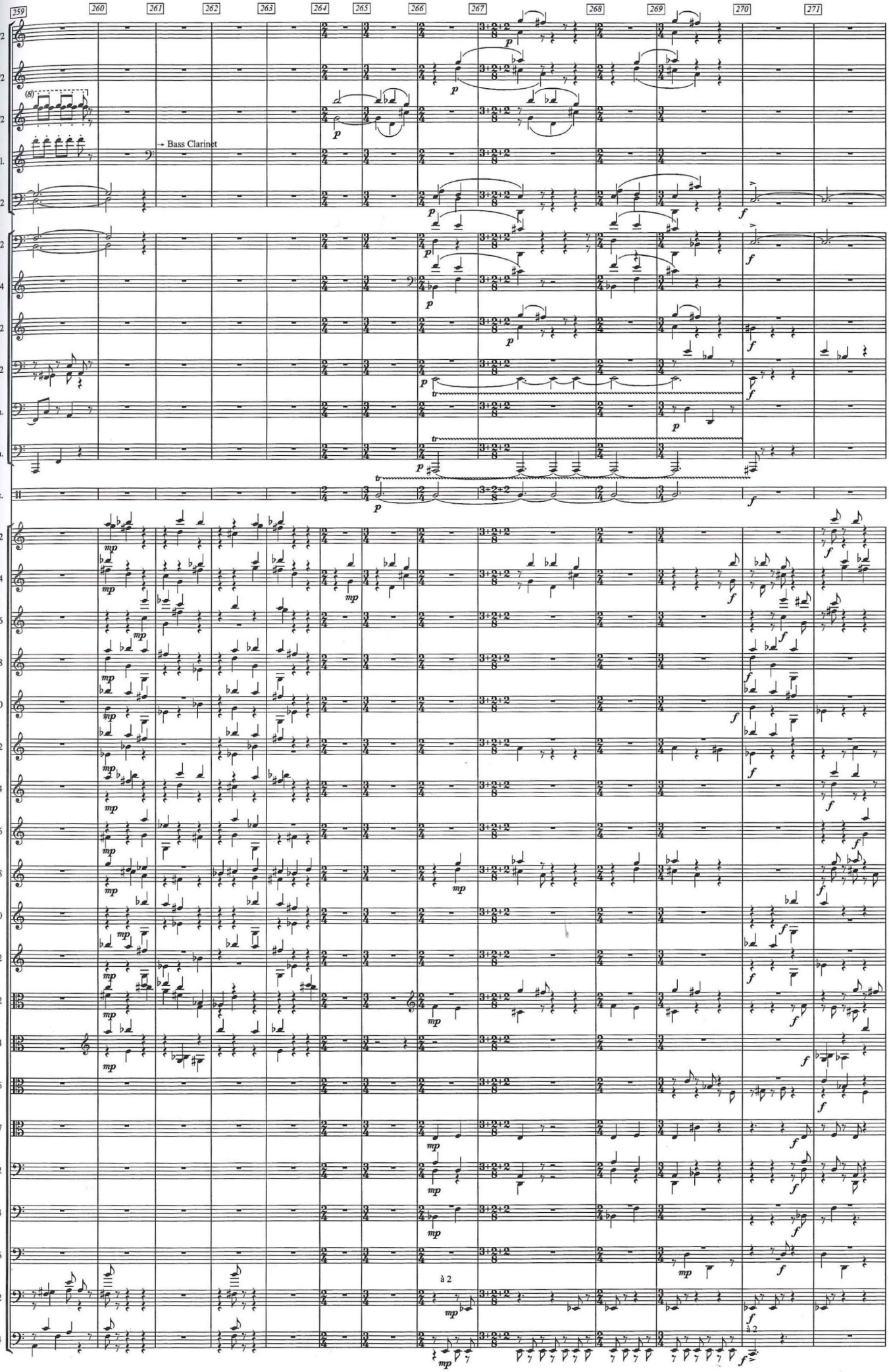

206
207
208
209
210
211
212
213
214
215
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Hn. 1/2
Hn. 3/4
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
f
f
tr
mf
poco a poco cresc.

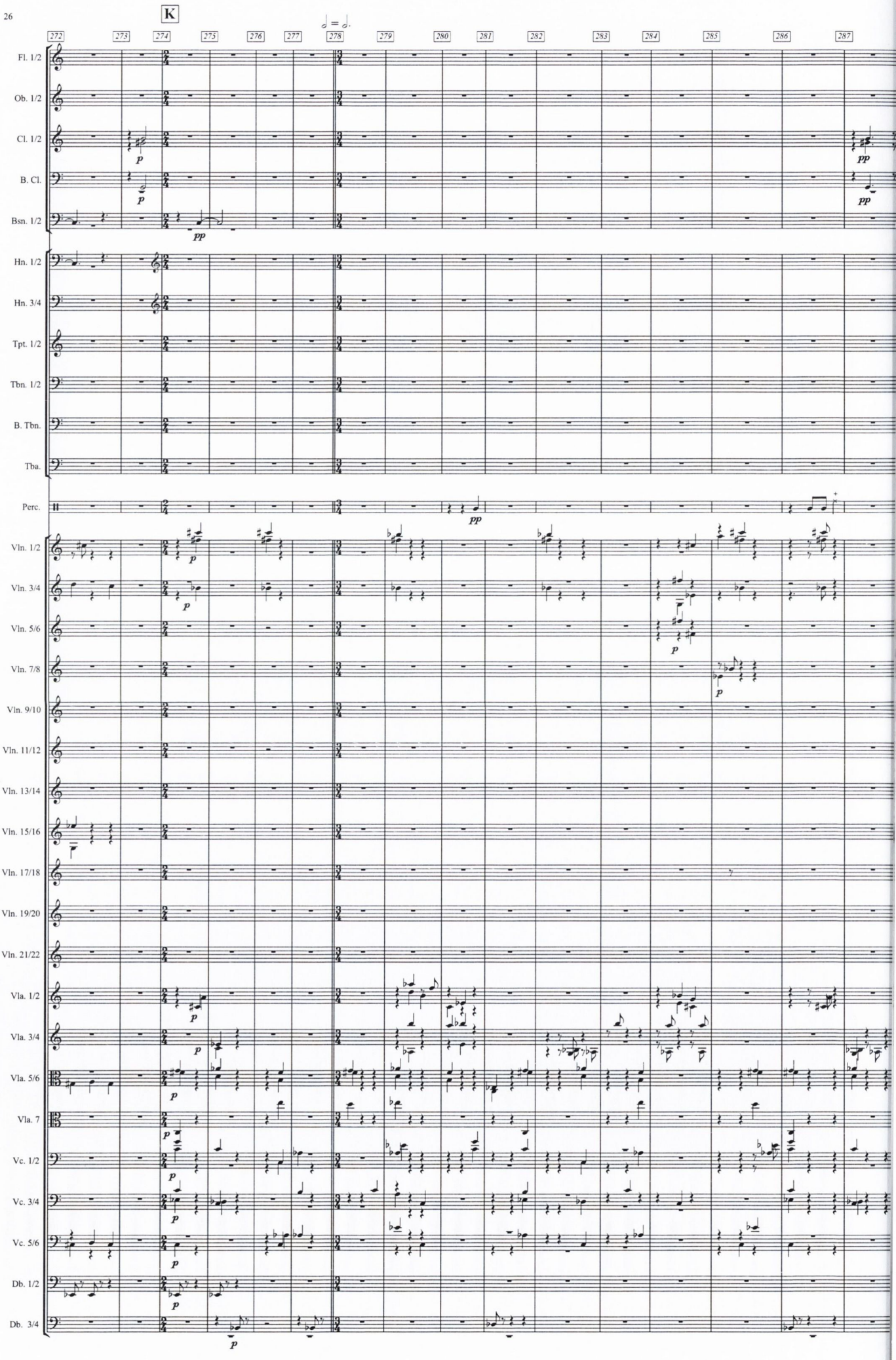

216
217
218
219
220
221
222
223
224
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
(tr)
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
f
à 2

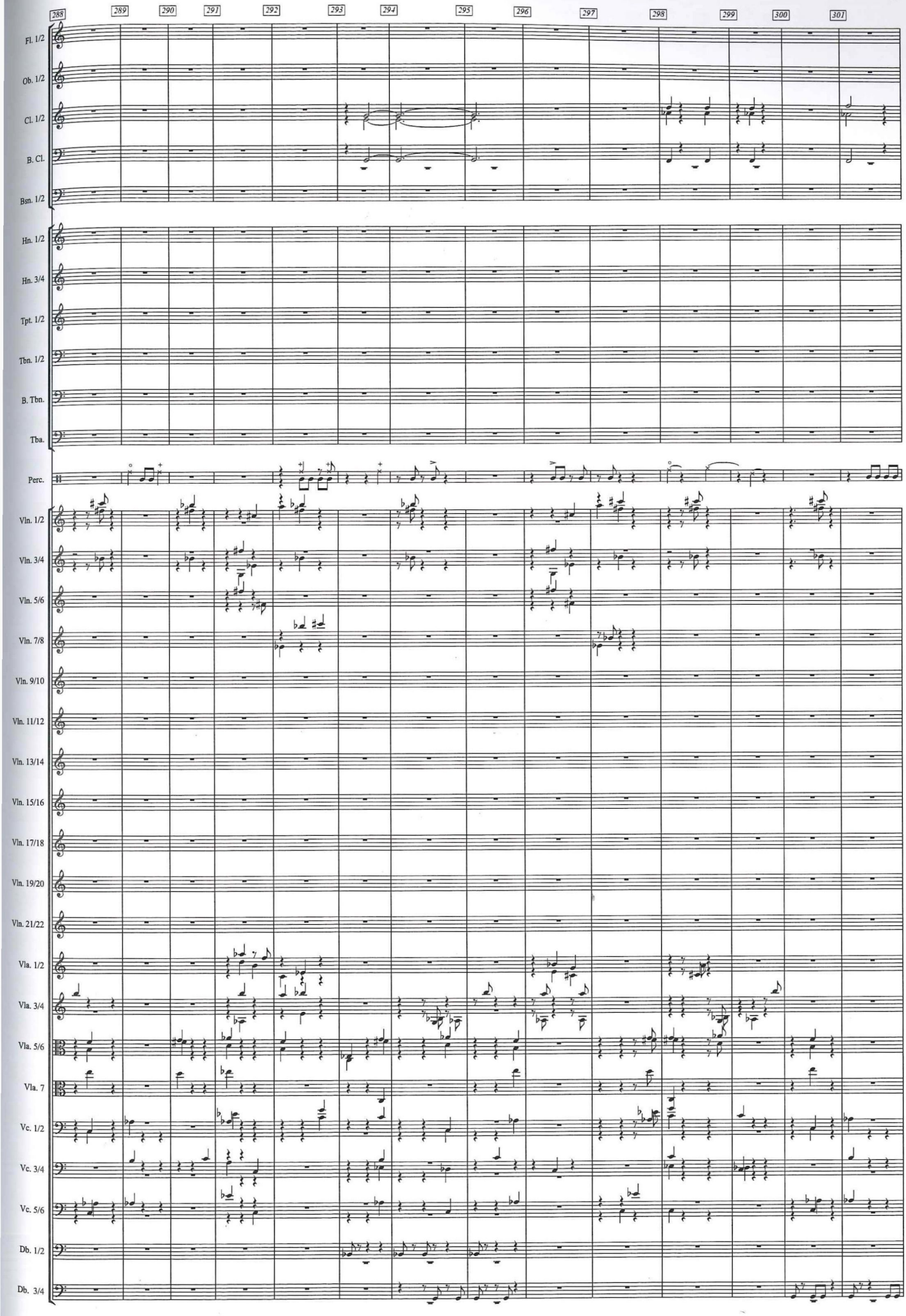

225
226
227
228
229
230
231
232
233
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

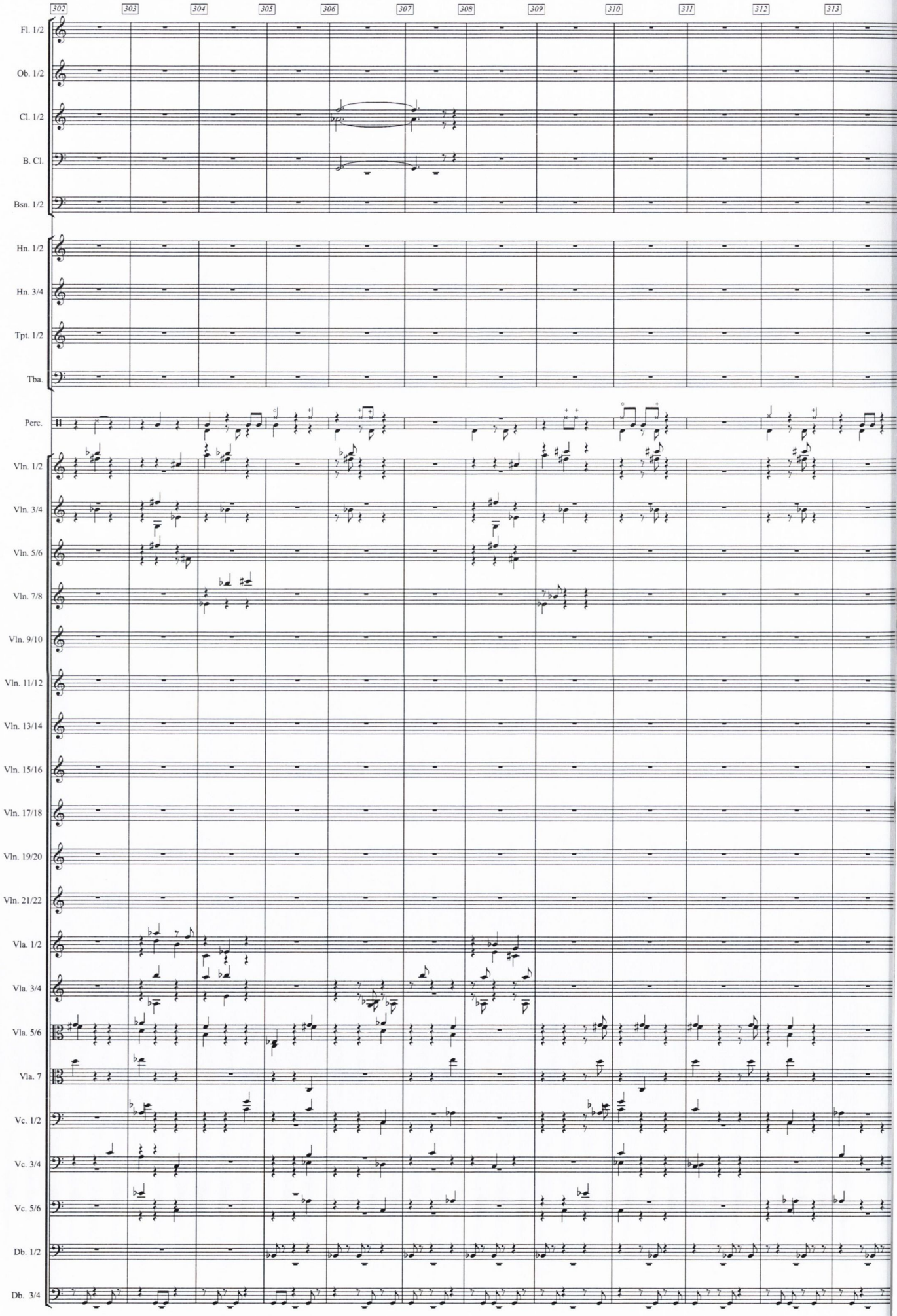

J
234
235
236
237
238
239
240
241
242
243
244
245
246
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
a 1
pizz
(sempre pizz)

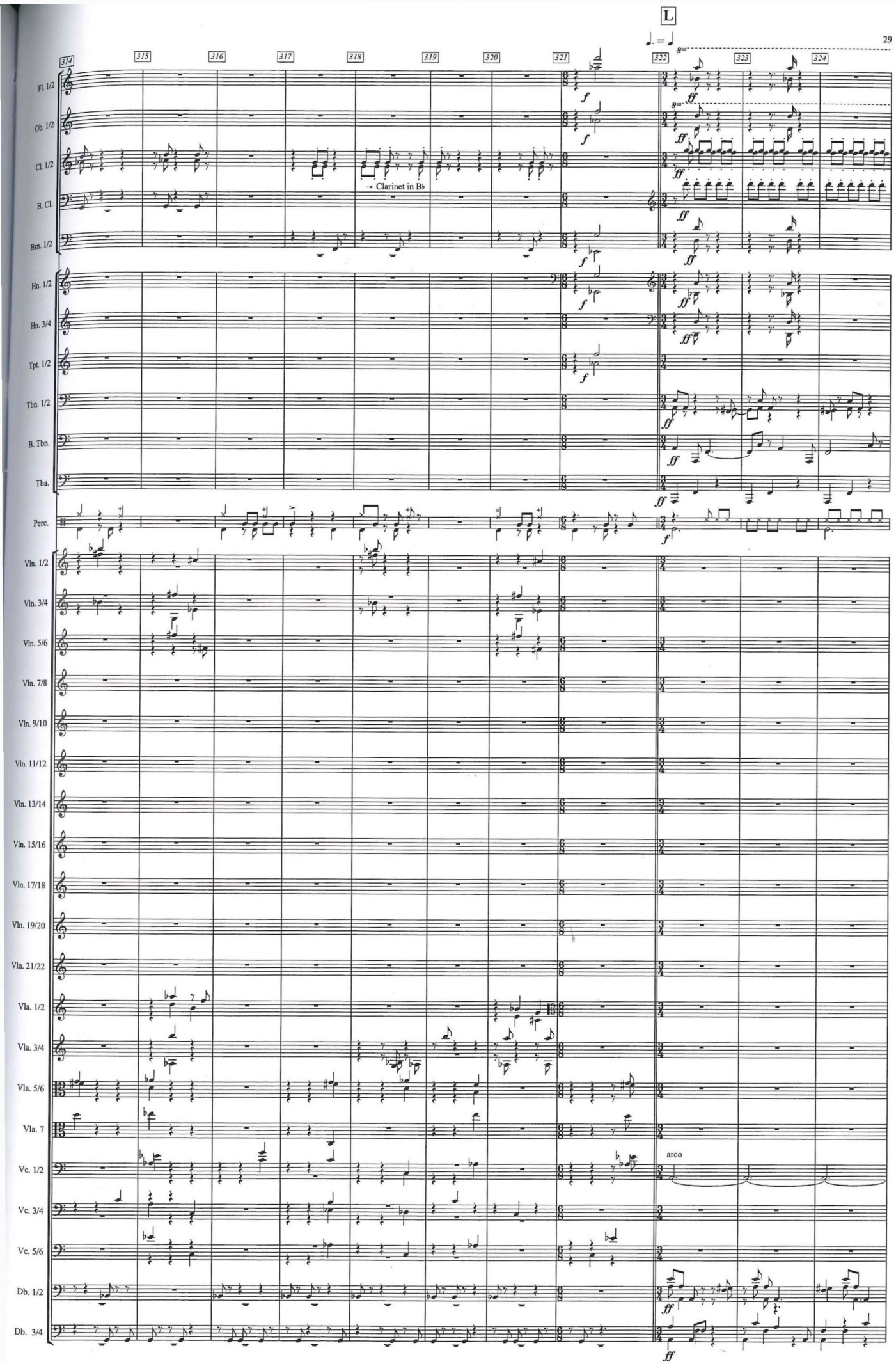

247
248
249
250
251
252
253
254
255
256
257
258
Fl. 1/2
Ob. 1/2
Cl. 1/2
→ Clarinet in B♭
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

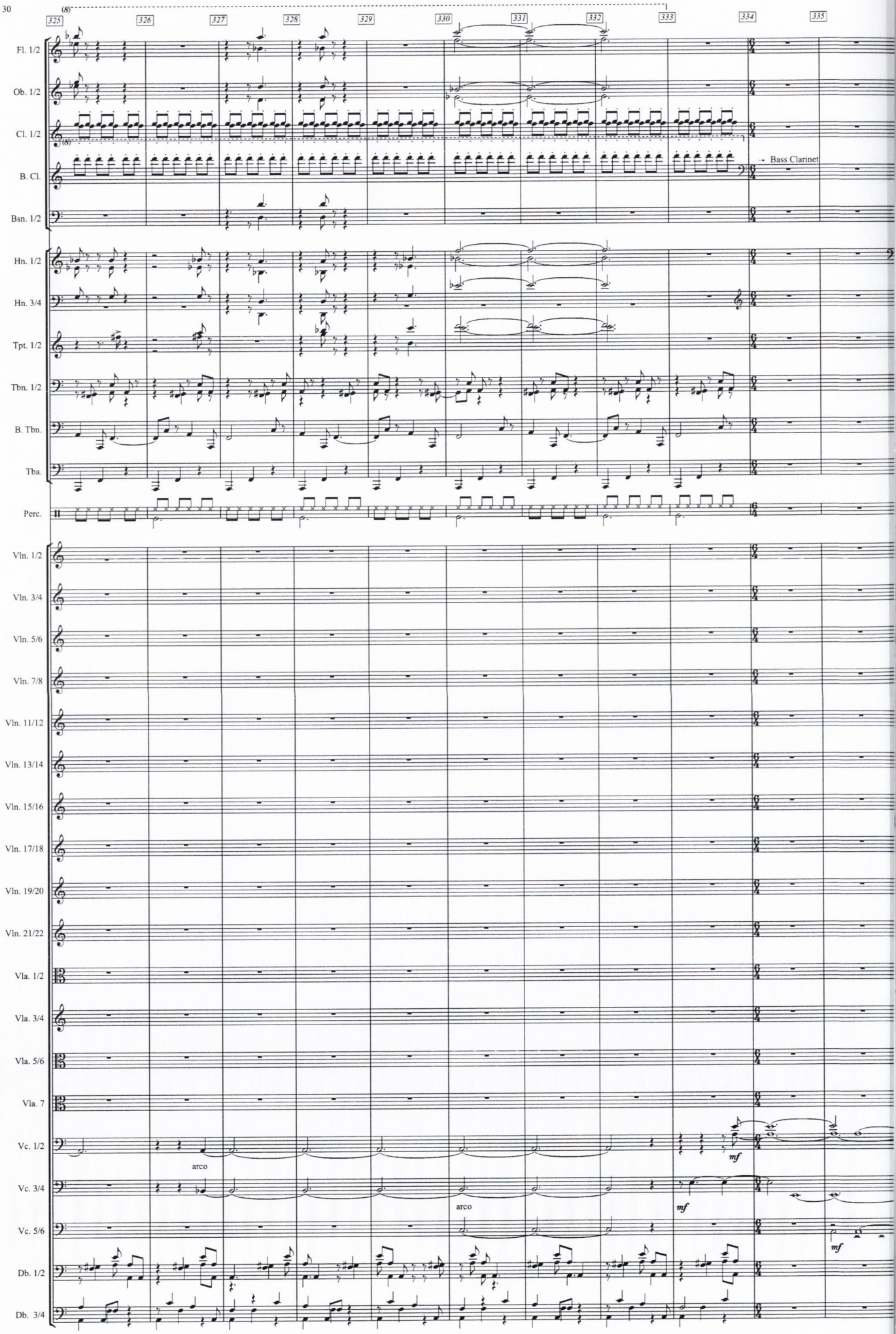

259
260
261
262
263
264
265
266
267
268
269
270
271
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
→ Bass Clarinet
à 2
à 2

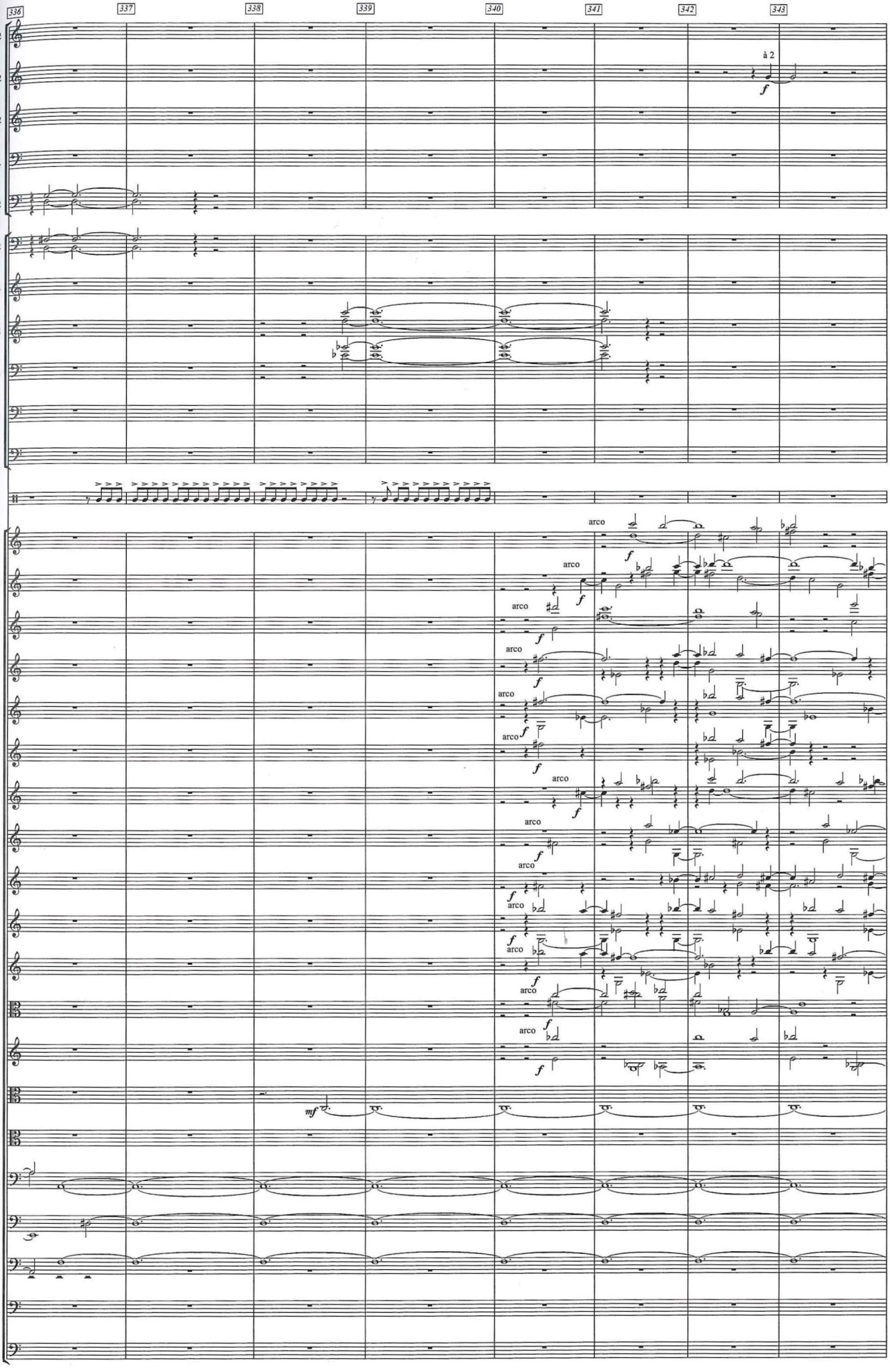

K
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

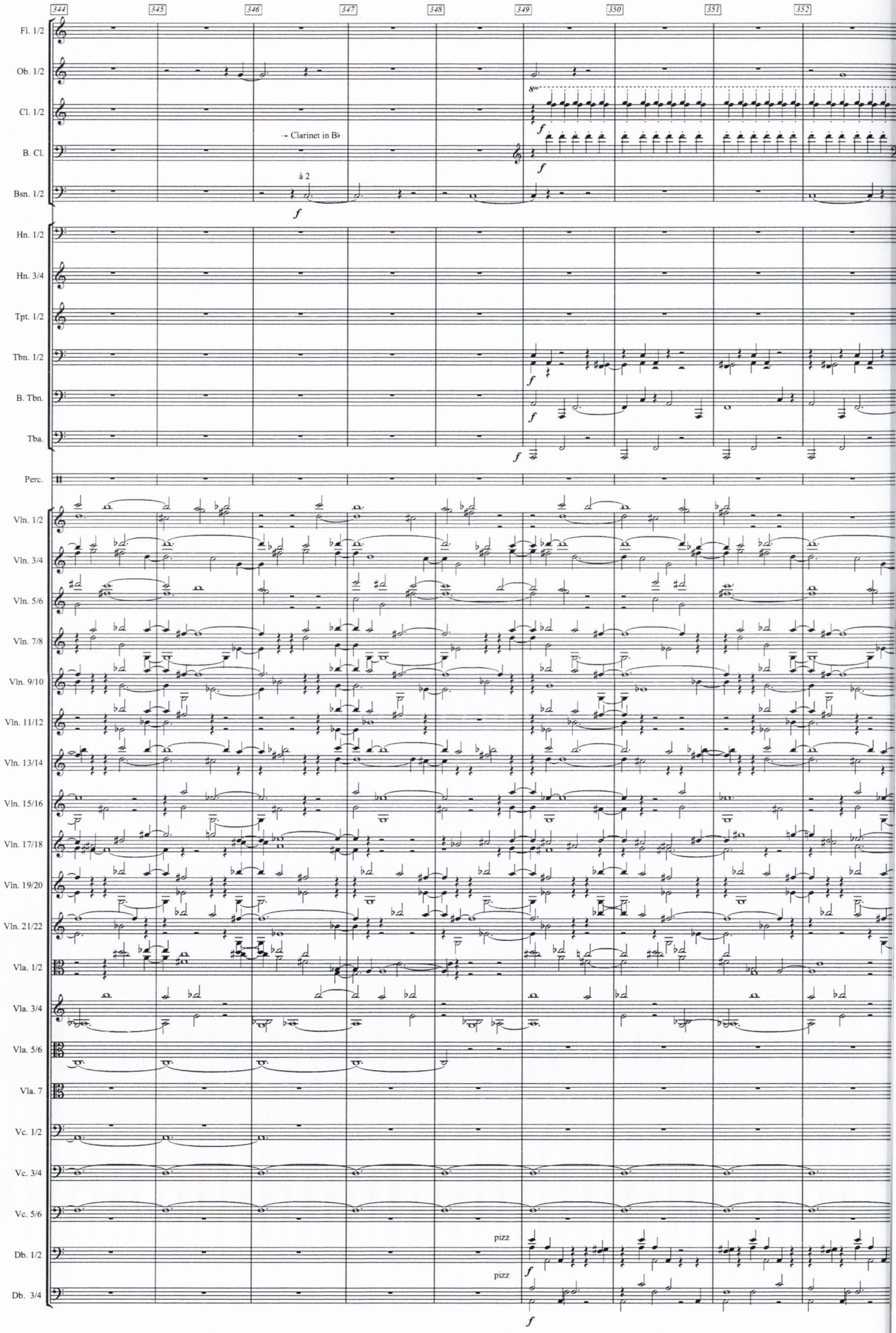

288
289
290
291
292
293
294
295
296
297
298
299
300
301
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

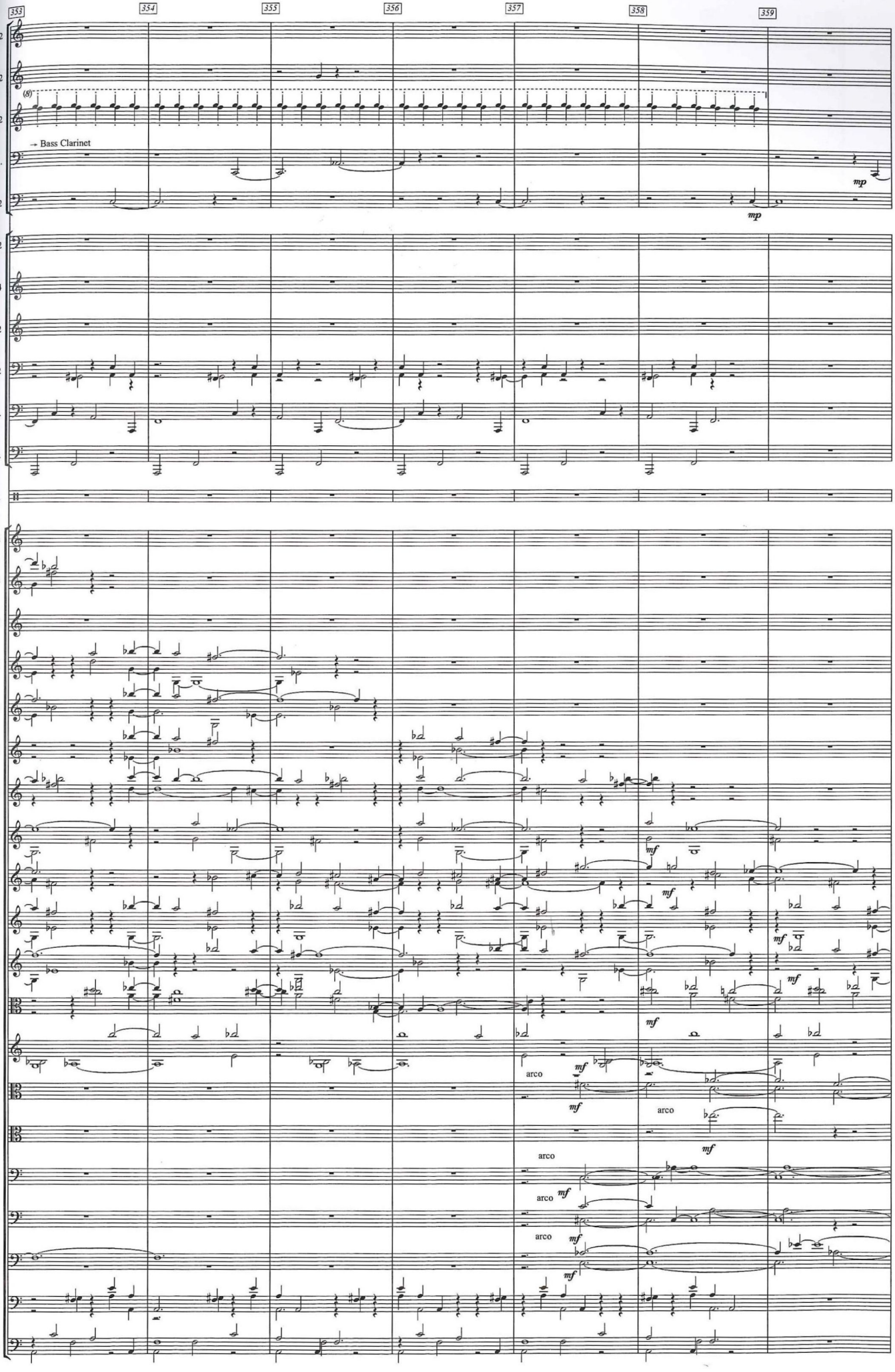

302
303
304
305
306
307
308
309
310
311
312
313
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

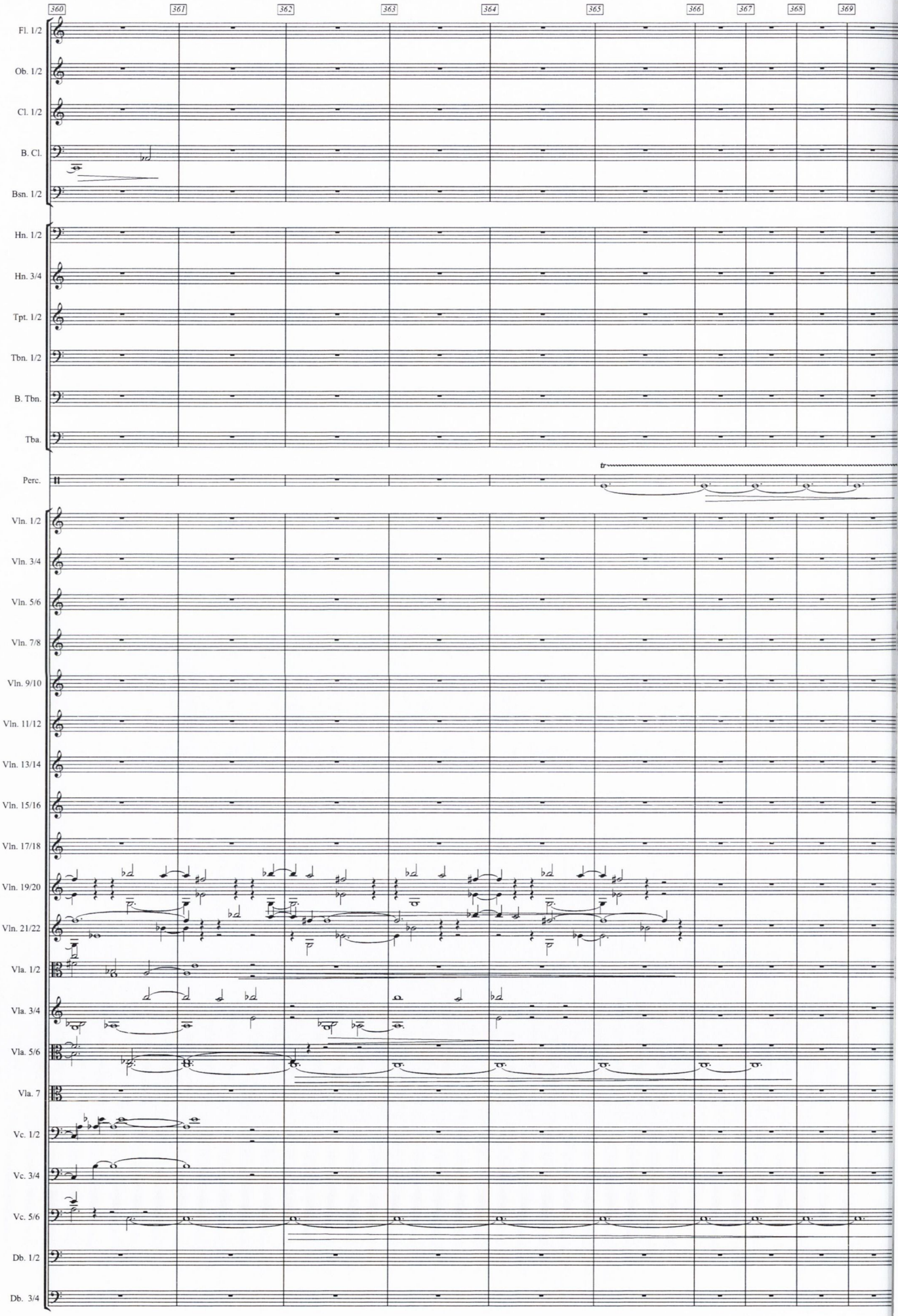

L
314
315
316
317
318
319
320
321
322
323
324
Fl. 1/2
Ob. 1/2
Cl. 1/2
→ Clarinet in B♭
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
arco
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4


325
326
327
328
329
330
331
332
333
334
335
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
→ Bass Clarinet
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
arco
arco
mf
mf
mf


M
336
337
338
339
340
341
342
343
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
à 2
arco
mf


344
345
346
347
348
349
350
351
352
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
→ Clarinet in B♭
à 2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
pizz
pizz


353
354
355
356
357
358
359
Fl. 1/2
Ob. 1/2
Cl. 1/2
→ Bass Clarinet
B. Cl.
Bsn. 1/2
mp
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4
mf
arco


360
361
362
363
364
365
366
367
368
369
Fl. 1/2
Ob. 1/2
Cl. 1/2
B. Cl.
Bsn. 1/2
Hn. 1/2
Hn. 3/4
Tpt. 1/2
Tbn. 1/2
B. Tbn.
Tba.
Perc.
Vln. 1/2
Vln. 3/4
Vln. 5/6
Vln. 7/8
Vln. 9/10
Vln. 11/12
Vln. 13/14
Vln. 15/16
Vln. 17/18
Vln. 19/20
Vln. 21/22
Vla. 1/2
Vla. 3/4
Vla. 5/6
Vla. 7
Vc. 1/2
Vc. 3/4
Vc. 5/6
Db. 1/2
Db. 3/4

Zum Ewigen Frieden - Ein Abgesang

Staged Requiem by

Nélida Béjar (music)

Björn Potulski (theatrics)

with texts by Immanuel Kant

2010

Performance Notes:

General

simple arrow down: press foot switch, a short recording of the own instrument will start.

white arrow down: one of the four string players presses an extra foot switch that triggers tutti-recordings.

Strings

triangular noteheads: pizzicato

diamond-shaped noteheads: flageolet

x above a note: slightly damp the string by reducing the pressure of the left hand

s.p.: sul ponticello

s.t.: sul tasto

arrow to the right: transition from s.t. to s.p. or vice-versa, as indicated

flaut.: flautando (less bow pressure than *sul tasto*)

^ : strong bow pressure, with a slight scratch noise

glissando with quaver stems: while playing the glissando, shortly hold the pitch where a stem is notated

Electric Bass

s: slap

x-shaped noteheads: damped

diamond-shaped noteheads: flageolet

Score in C

Zum Ewigen Frieden - Ein Abgesang

Nélida Béjar

0" ♩ = 40

1 blackout

Electronics

N /N

Stage Floor

Tubular Bell in D

Children's choir

Clarinet in B♭

Bassoon

pp

Violin

Viola

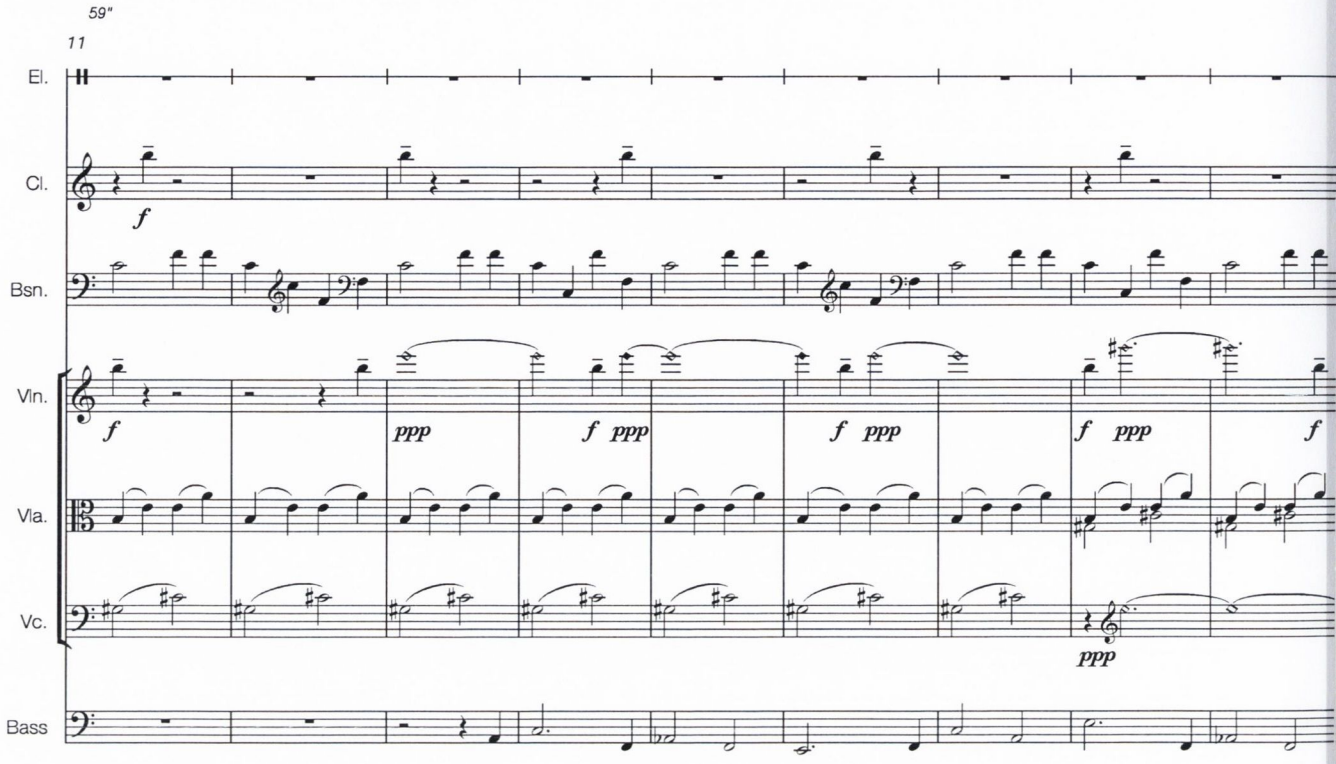
pp

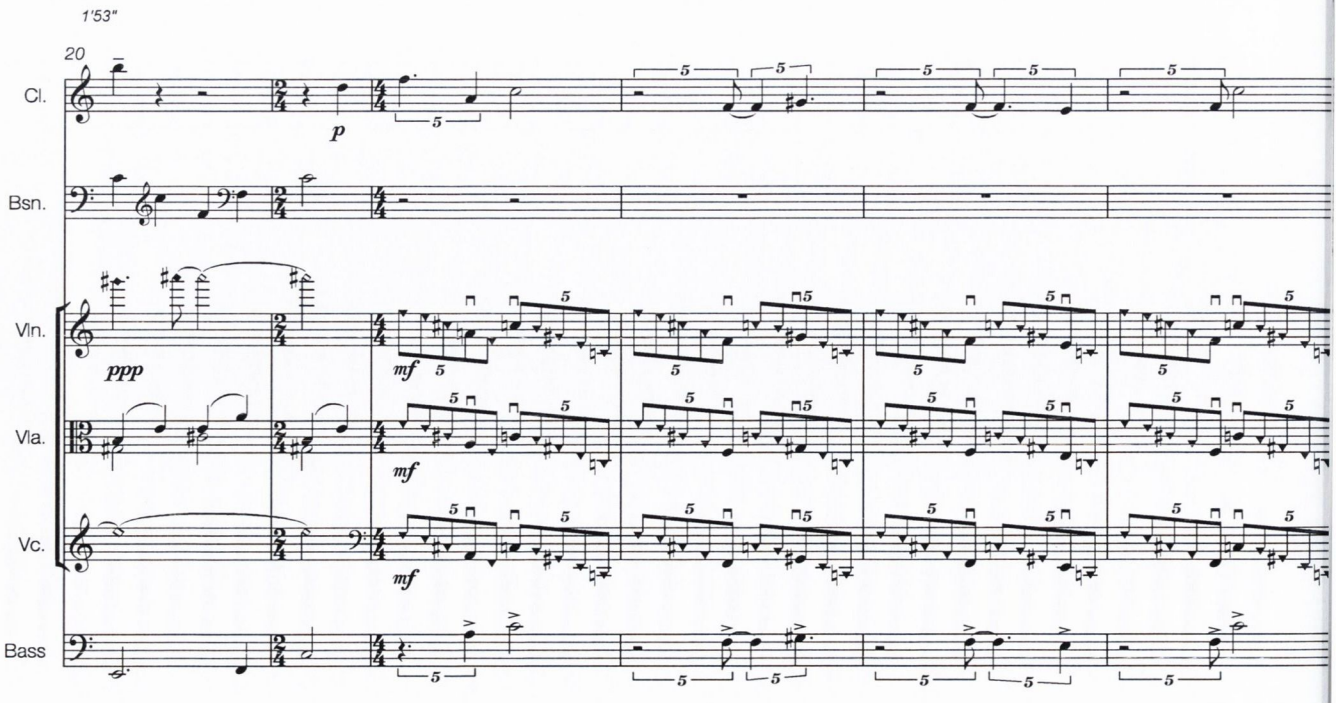
Violoncello

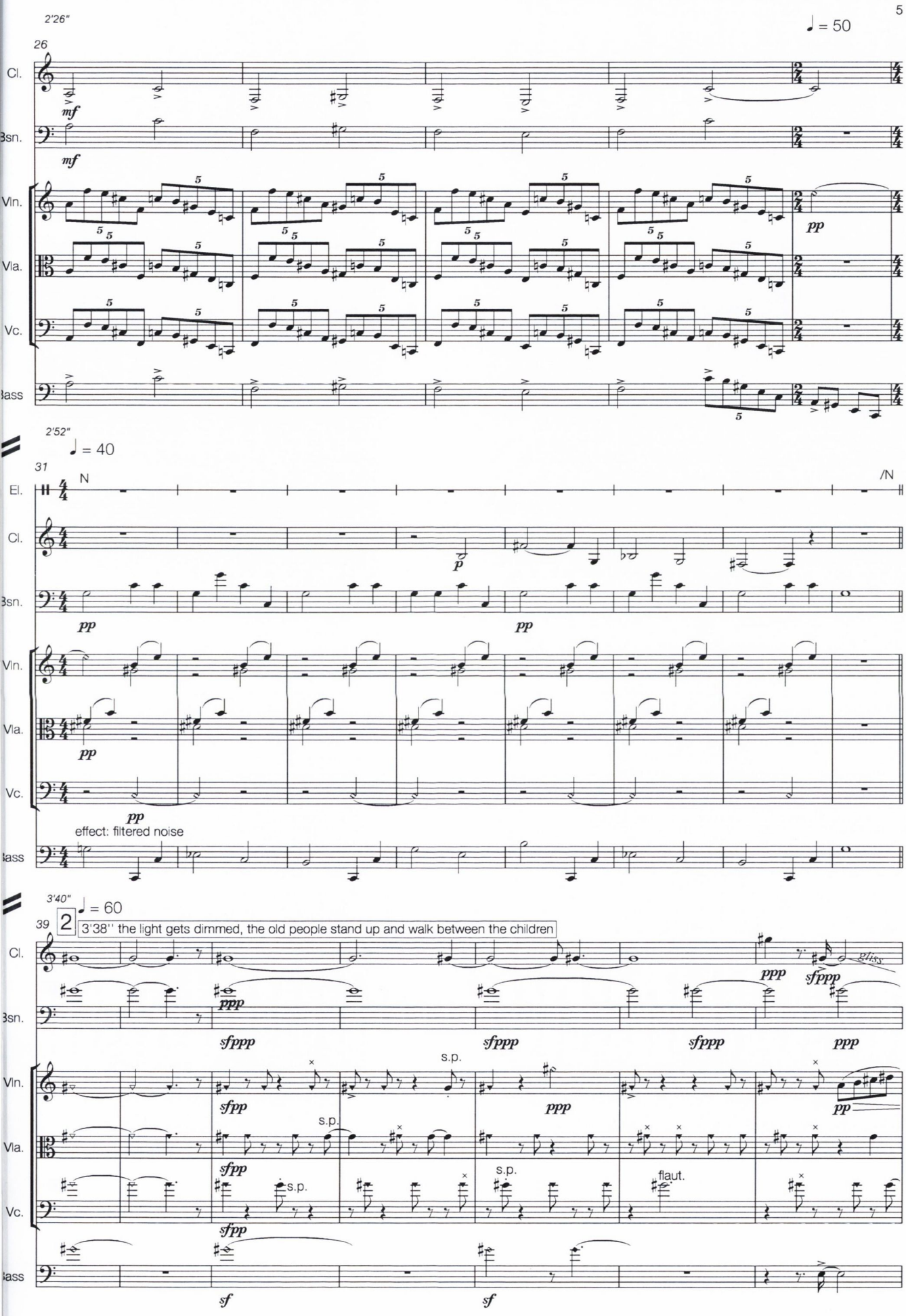
pp

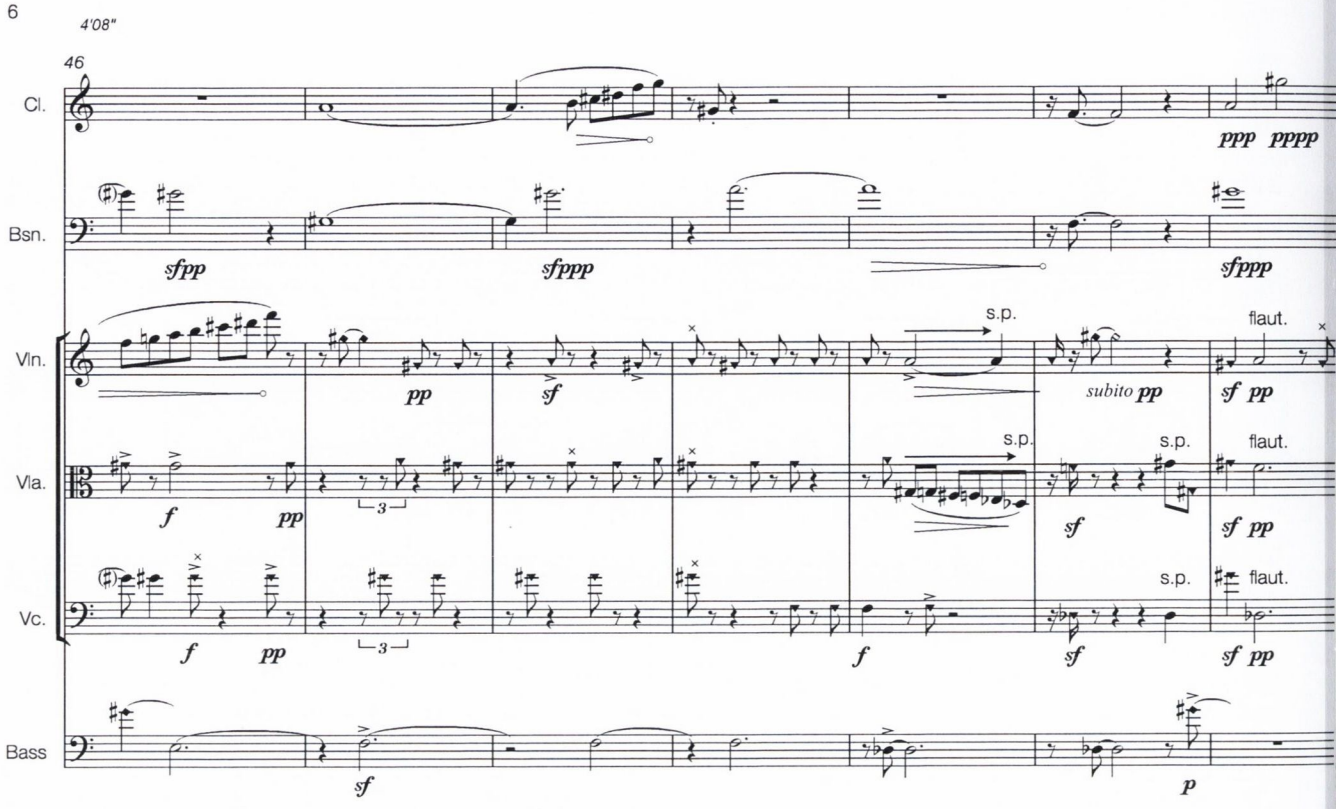
Electric Bass

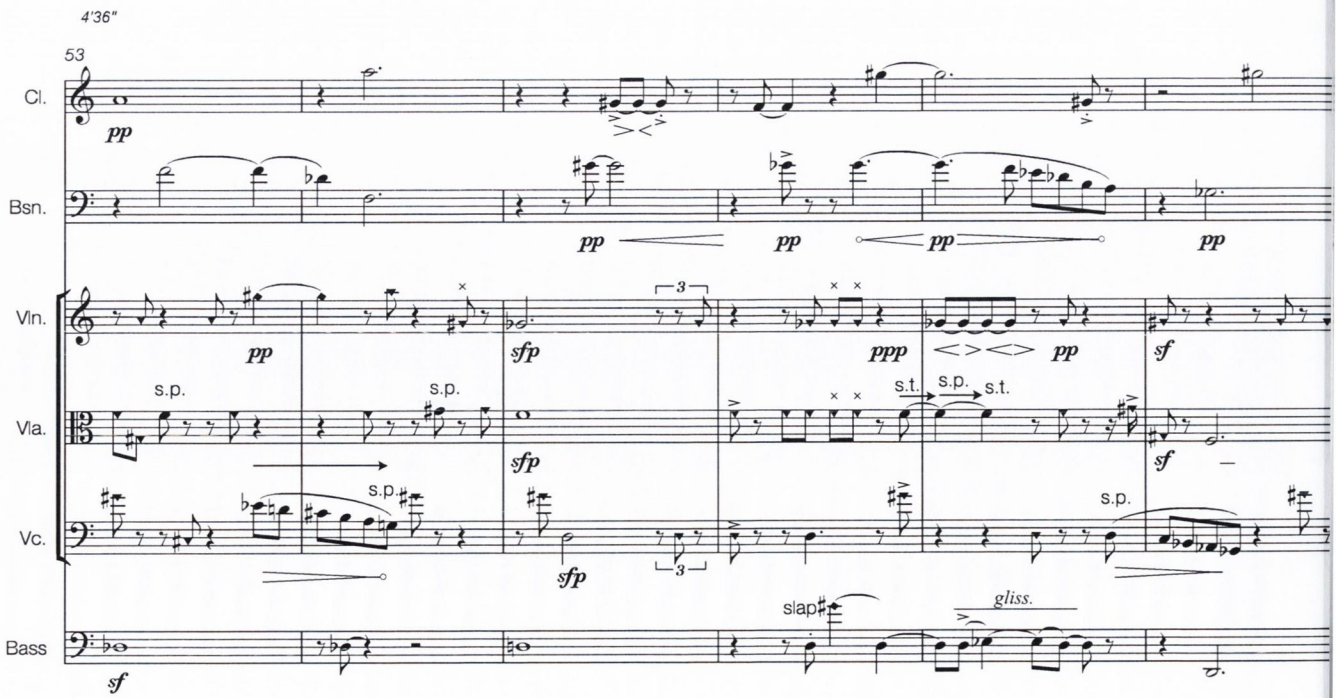
Piano

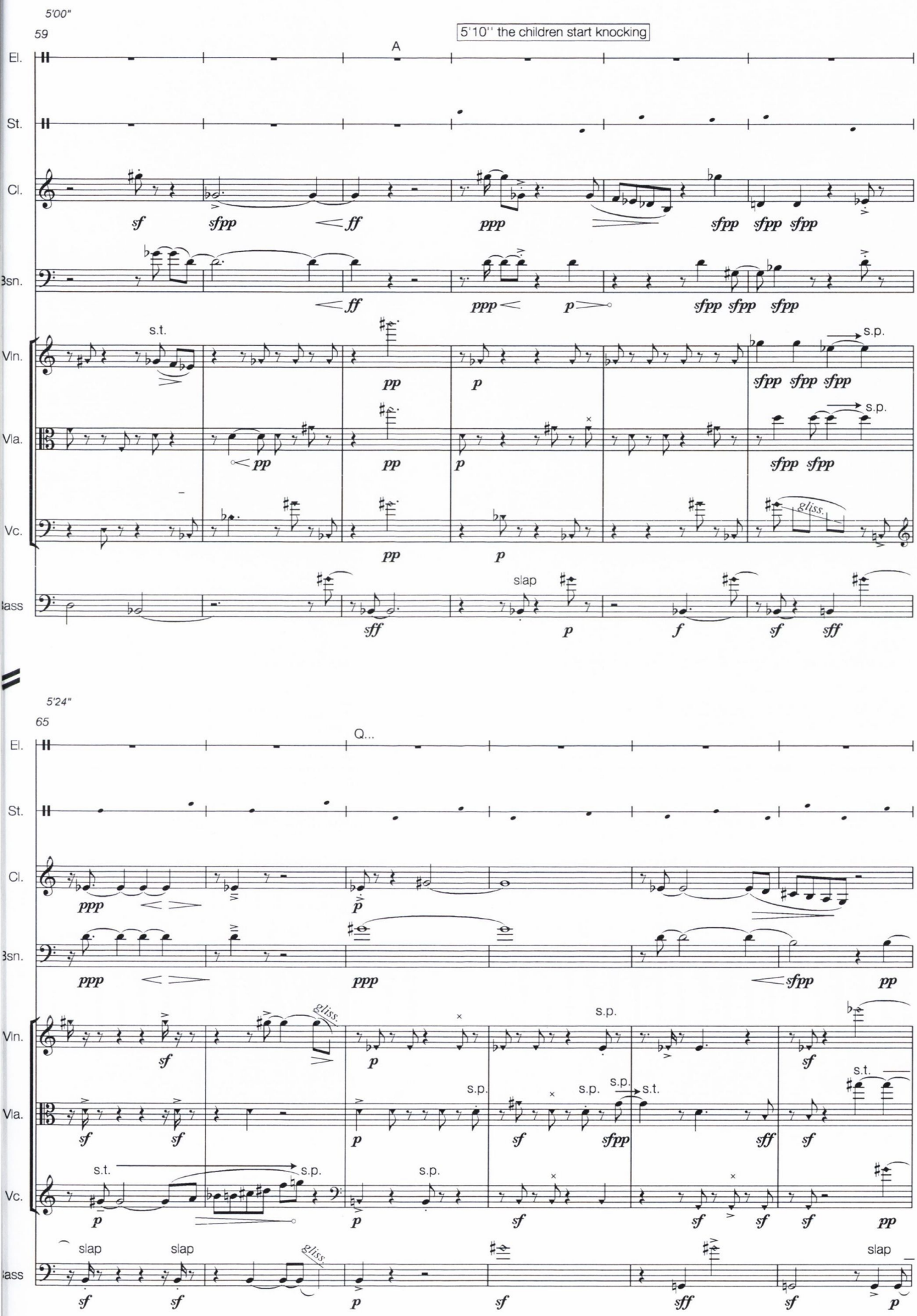

59"
11
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f
ppp
f ppp
f ppp
f ppp
f
ppp

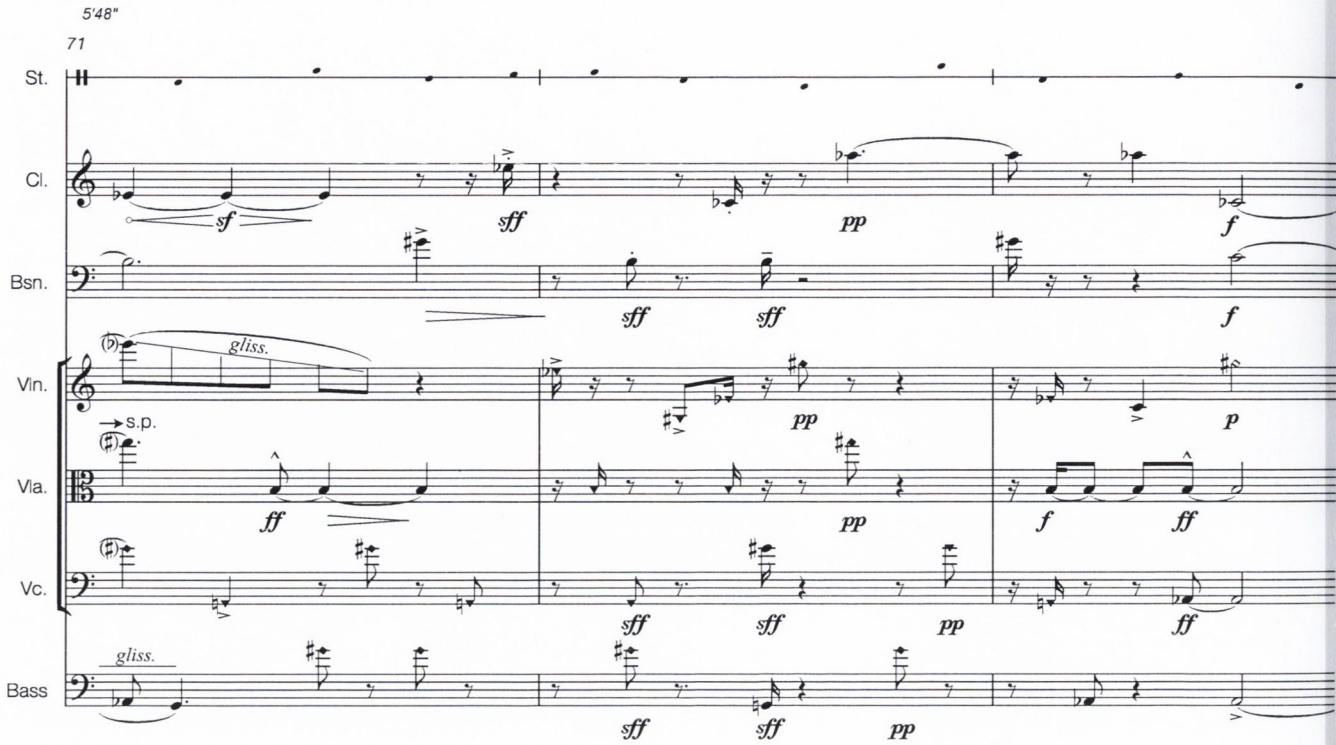

1'53"
20
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
ppp
mf
5

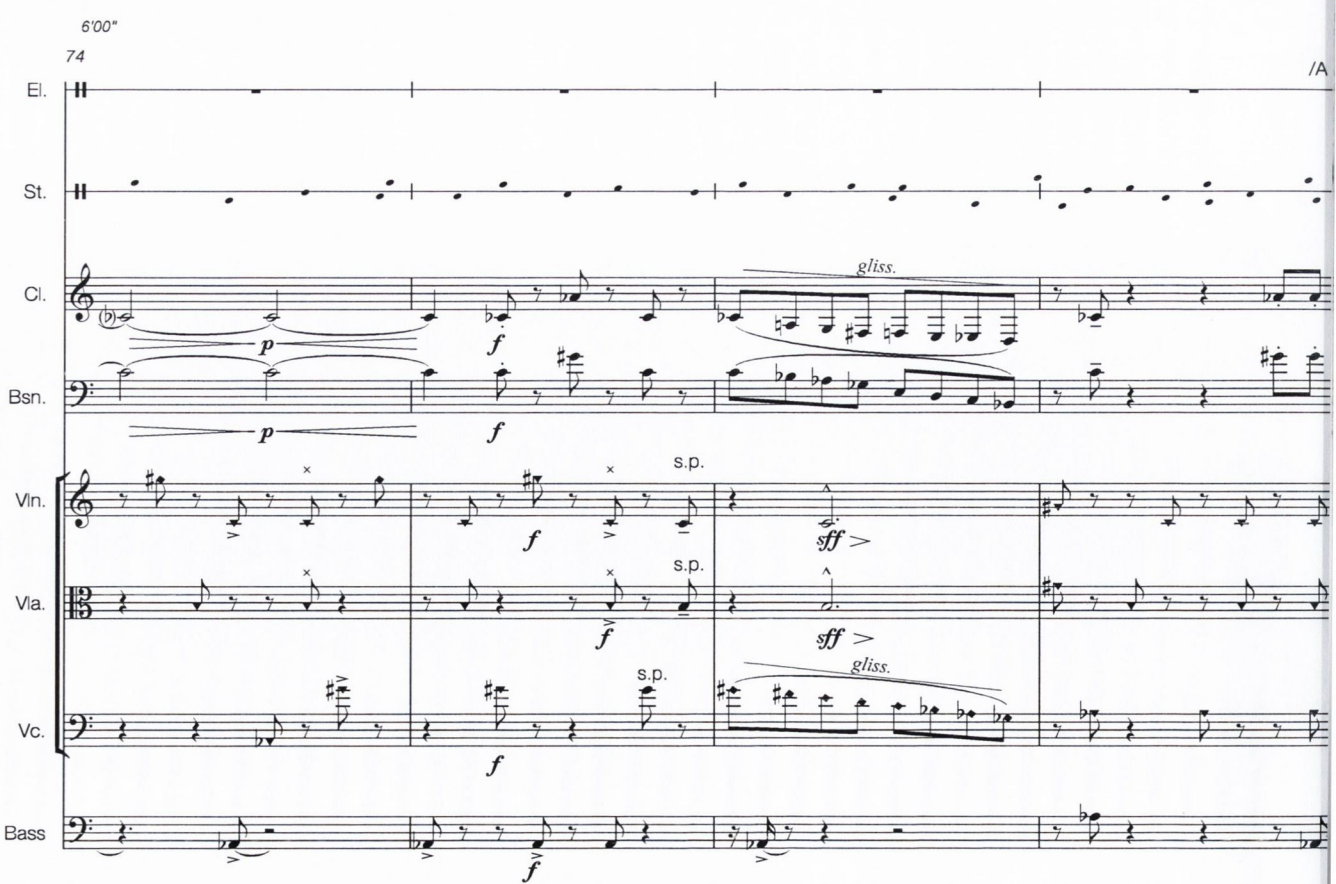

2'26"
♩ = 50
26
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mf
pp
2'52"
♩ = 40
31
El.
N
/N
p
effect: filtered noise
3'40"
♩ = 60
39
2
3'38'' the light gets dimmed, the old people stand up and walk between the children
ppp
sfppp
gliss.
s.p.
sfpp
flaut.
sf

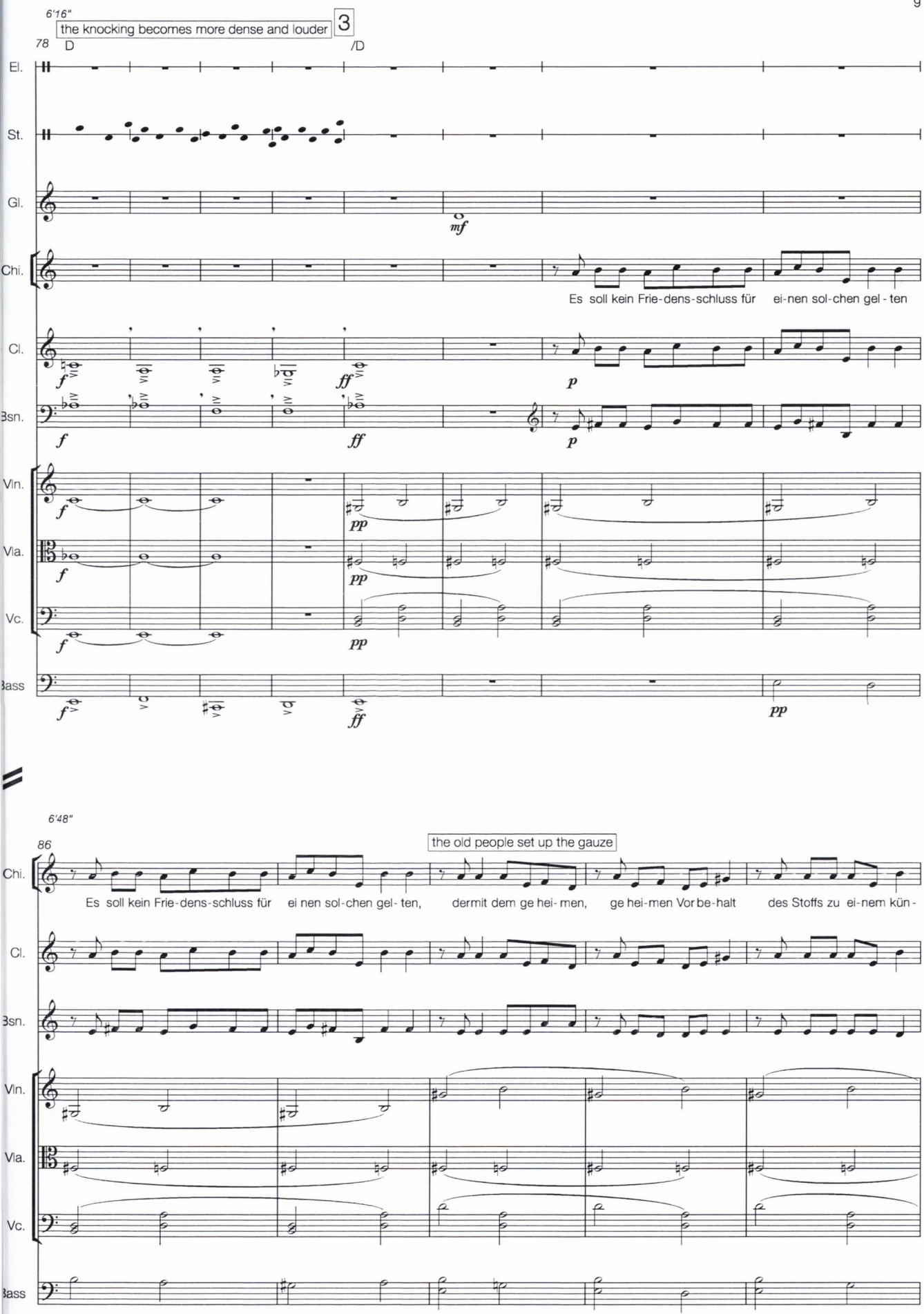

4'08"
46
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp pppp
sfpp
sfppp
sfppp
s.p.
flaut.
pp
sf
subito pp
sf pp
f
3
p

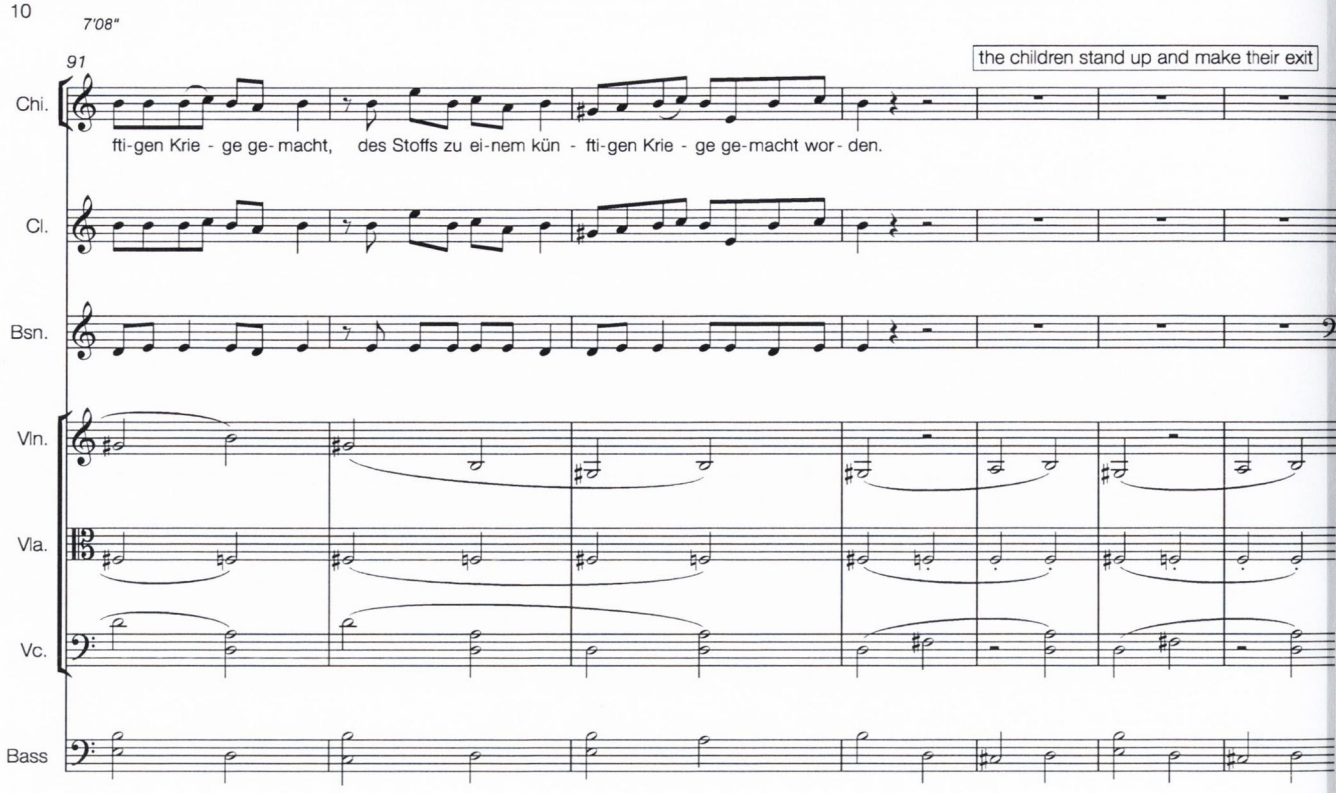

4'36"
53
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
sfp
ppp
sf
s.p.
s.t.
slap
gliss.
3

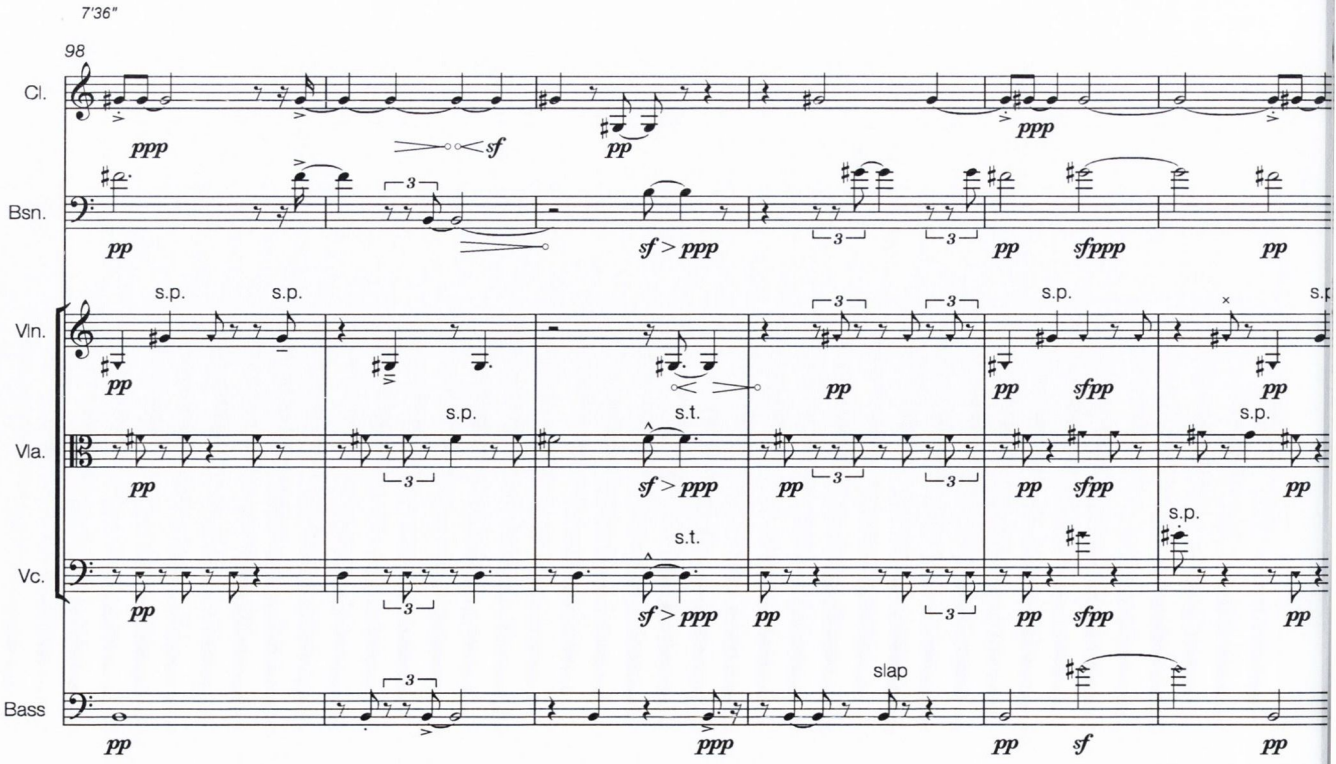

5'00"
59
5'10'' the children start knocking
A
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.t.
s.p.
gliss.
slap
5'24"
65
Q...

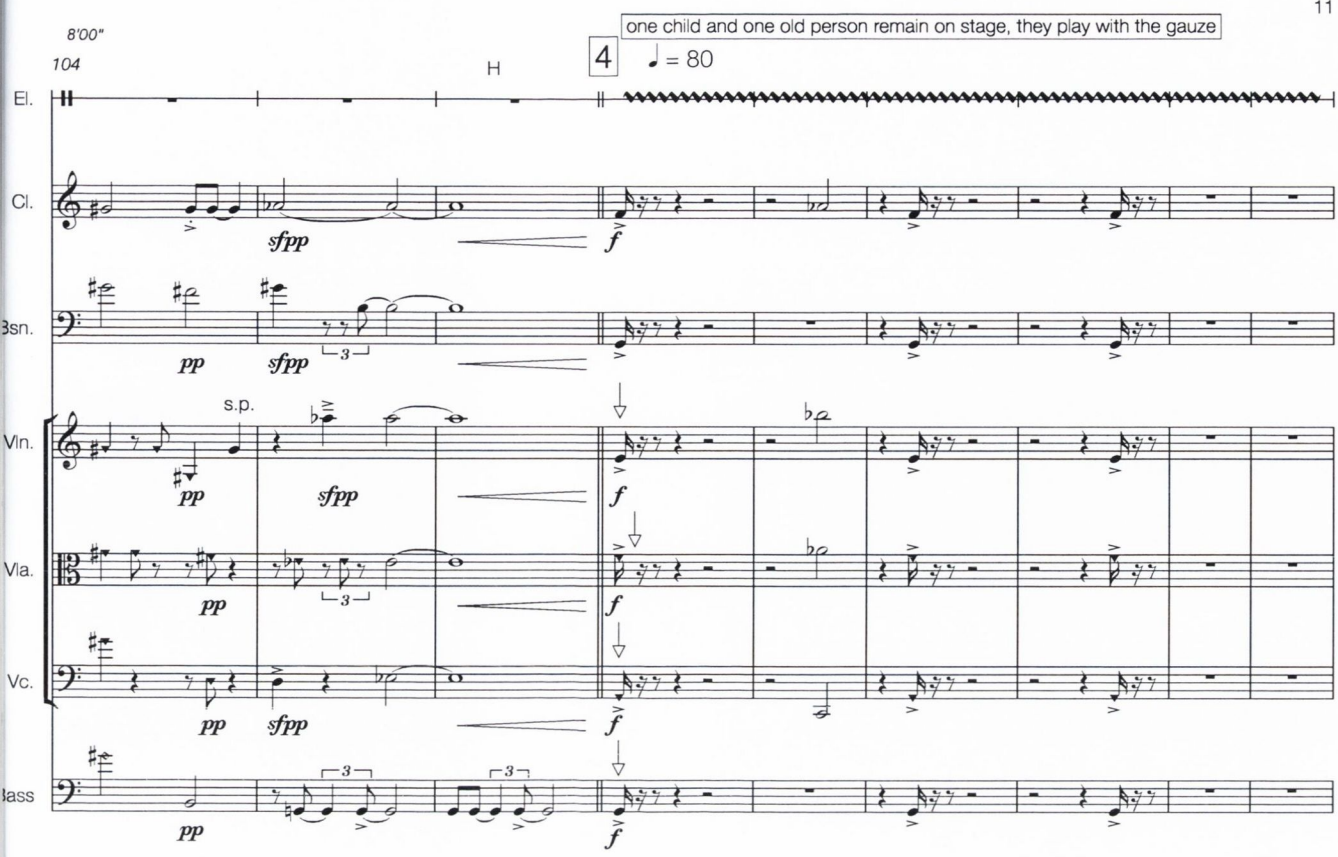

5'48"
71
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.
s.p.
sf
sff
pp
f
p
ff

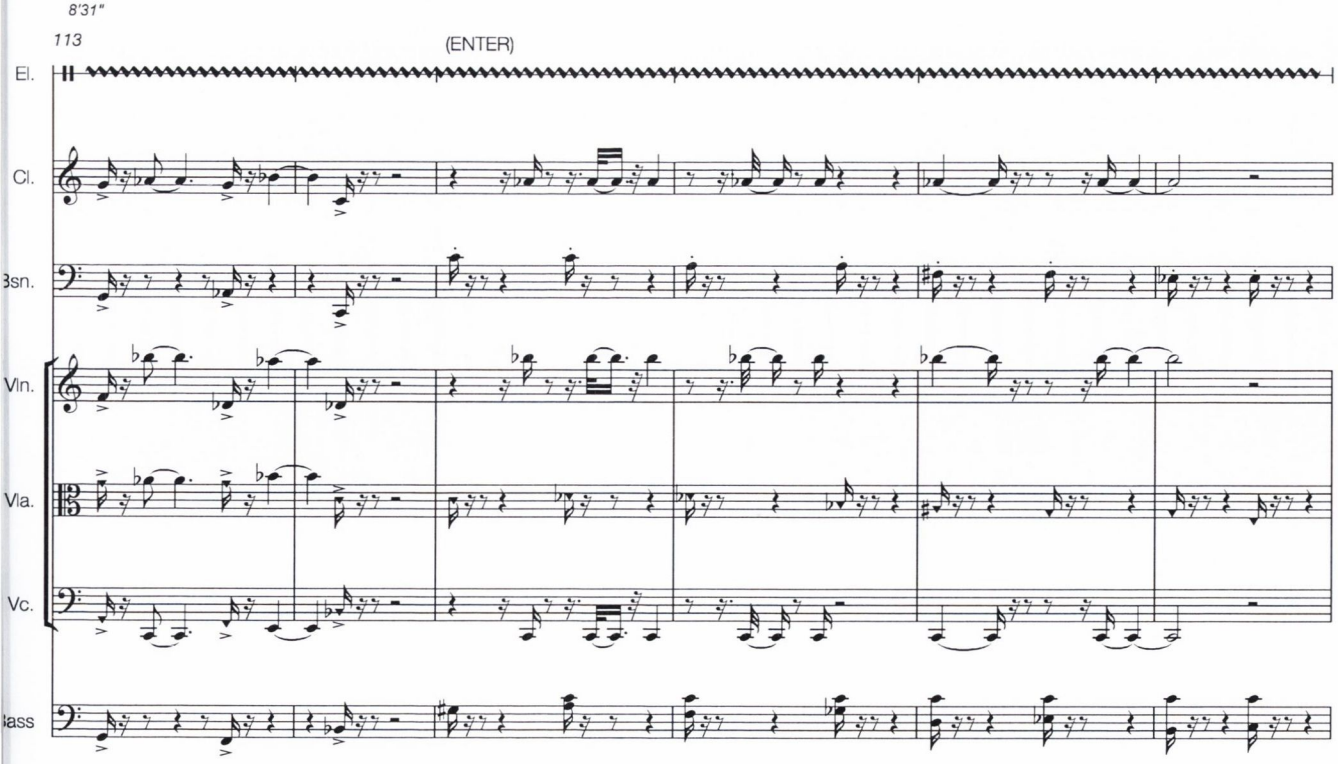

6'00"
74
/A
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.
s.p.
p
f
sff

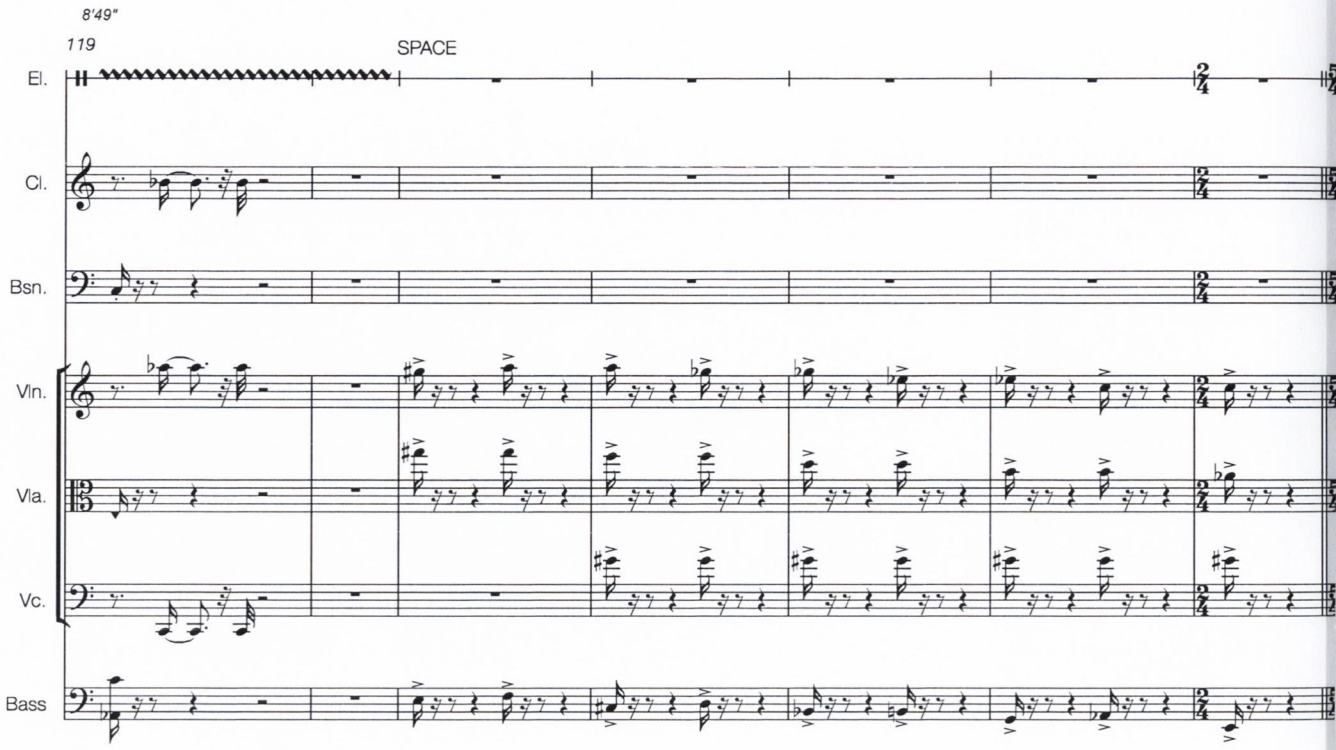

6'16"
the knocking becomes more dense and louder
3
78
D
/D
El.
St.
Gl.
Chi.
Es soll kein Frie-dens-schluss für ei-nen sol-chen gel-ten
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
6'48"
86
the old people set up the gauze
Es soll kein Frie-dens-schluss für ei nen sol-chen gel-ten, dermit dem ge hei-men, ge hei-men Vor be-halt des Stoffs zu ei-nem kün-

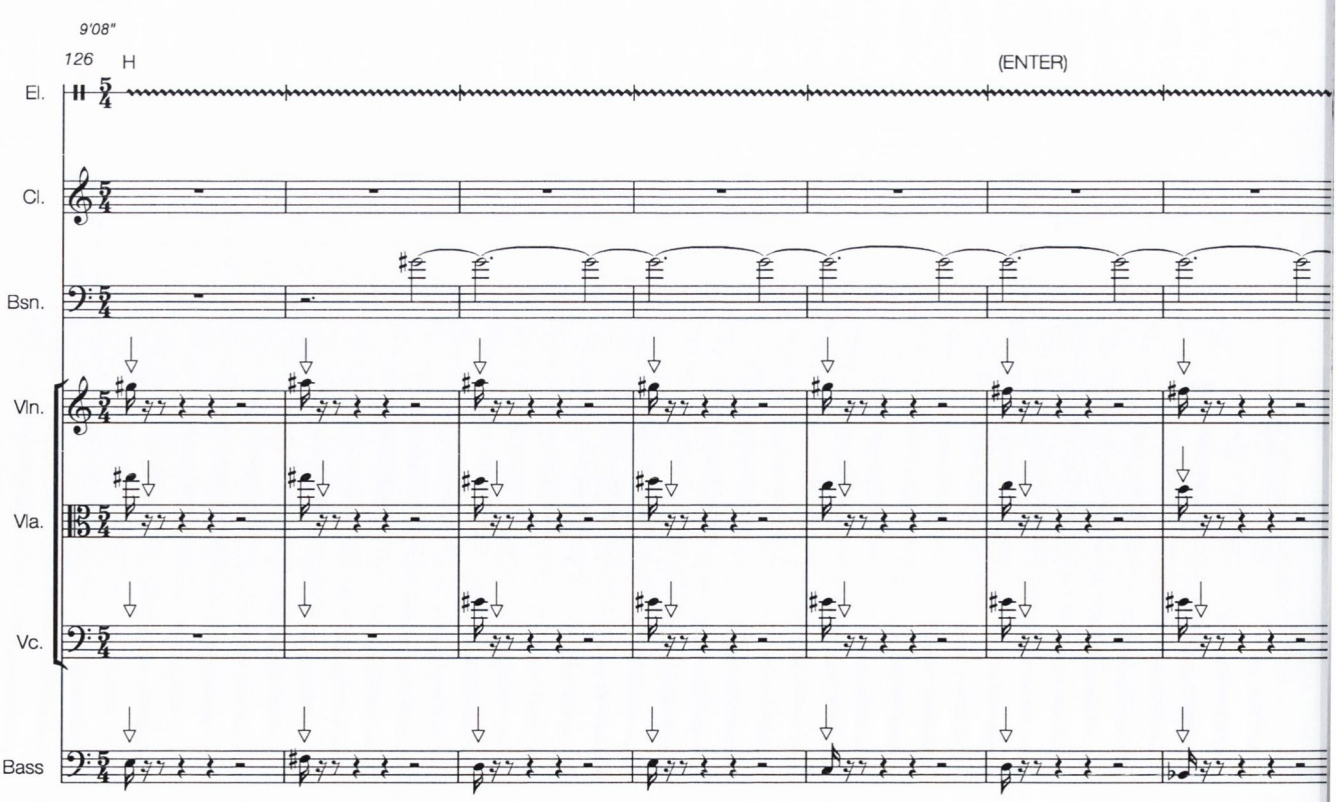

7'08"
91
the children stand up and make their exit
Chi.
fti-gen Krie - ge ge-macht, des Stoffs zu ei-nem kün - fti-gen Krie - ge ge-macht wor-den.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

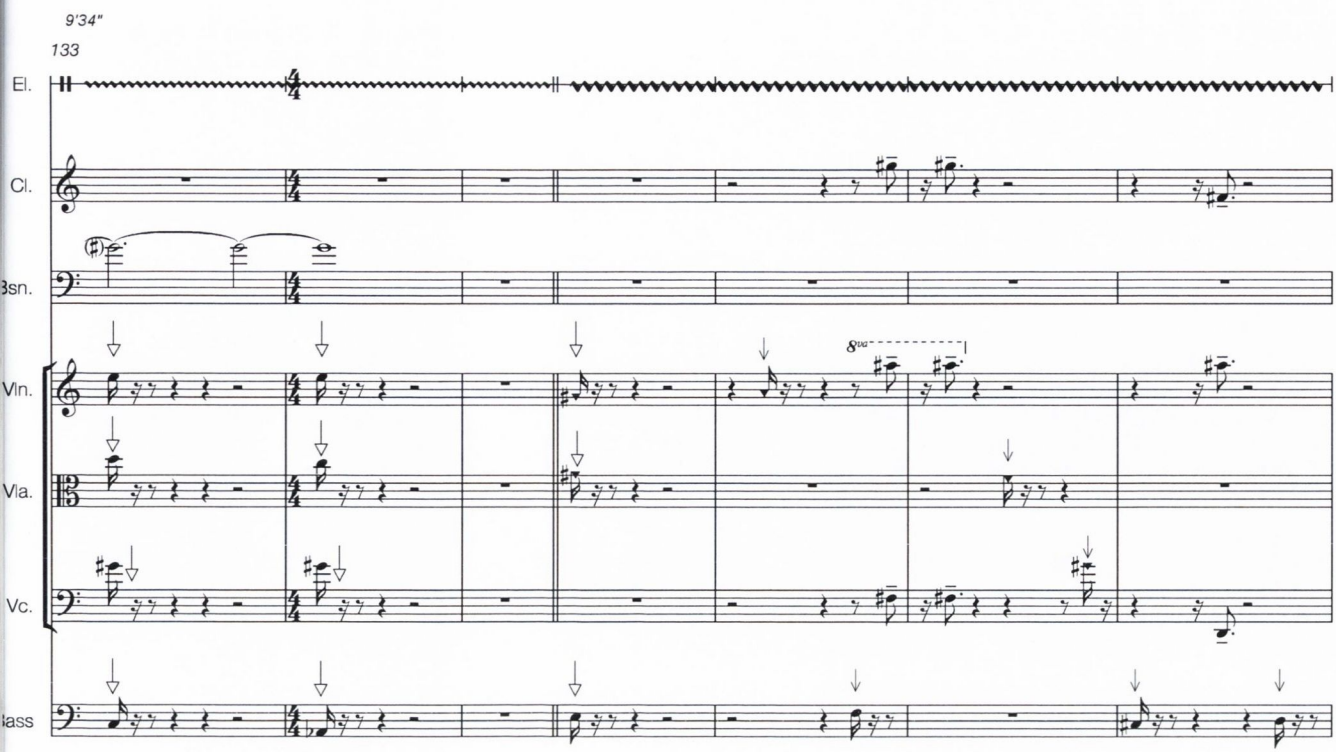

7'36"
98
Cl.
ppp
sf
pp
ppp
Bsn.
pp
sf > ppp
pp
sfppp
pp
Vln.
s.p.
s.p.
pp
pp
s.p.
pp
sfpp
pp
Vla.
s.p.
s.t.
s.p.
pp
sf > ppp
pp
pp
sfpp
pp
Vc.
s.t.
s.p.
pp
sf > ppp
pp
pp
sfpp
pp
Bass
slap
pp
ppp
pp
sf
pp

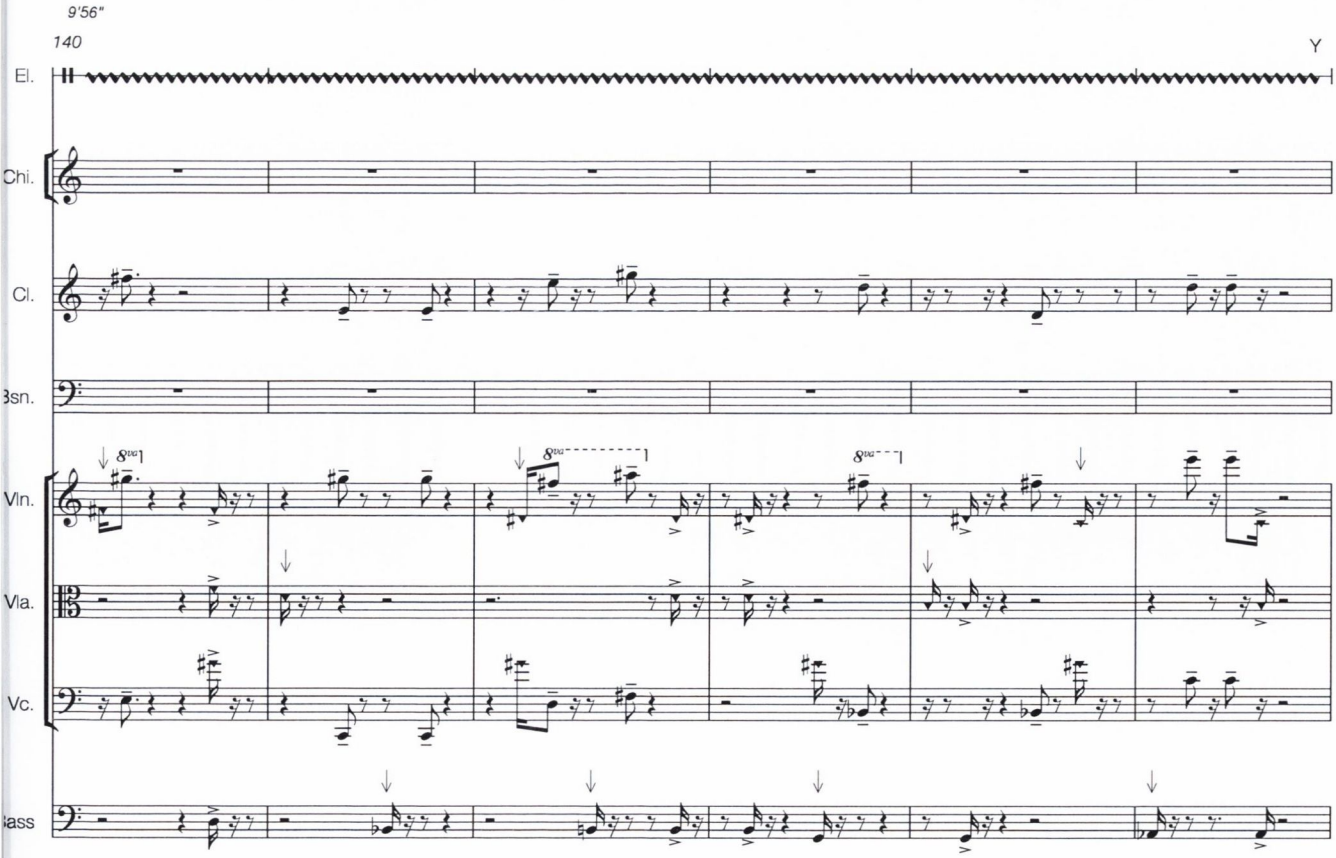

8'00"
104
H
4
one child and one old person remain on stage, they play with the gauze
♩ = 80
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
f
pp
s.p.
3

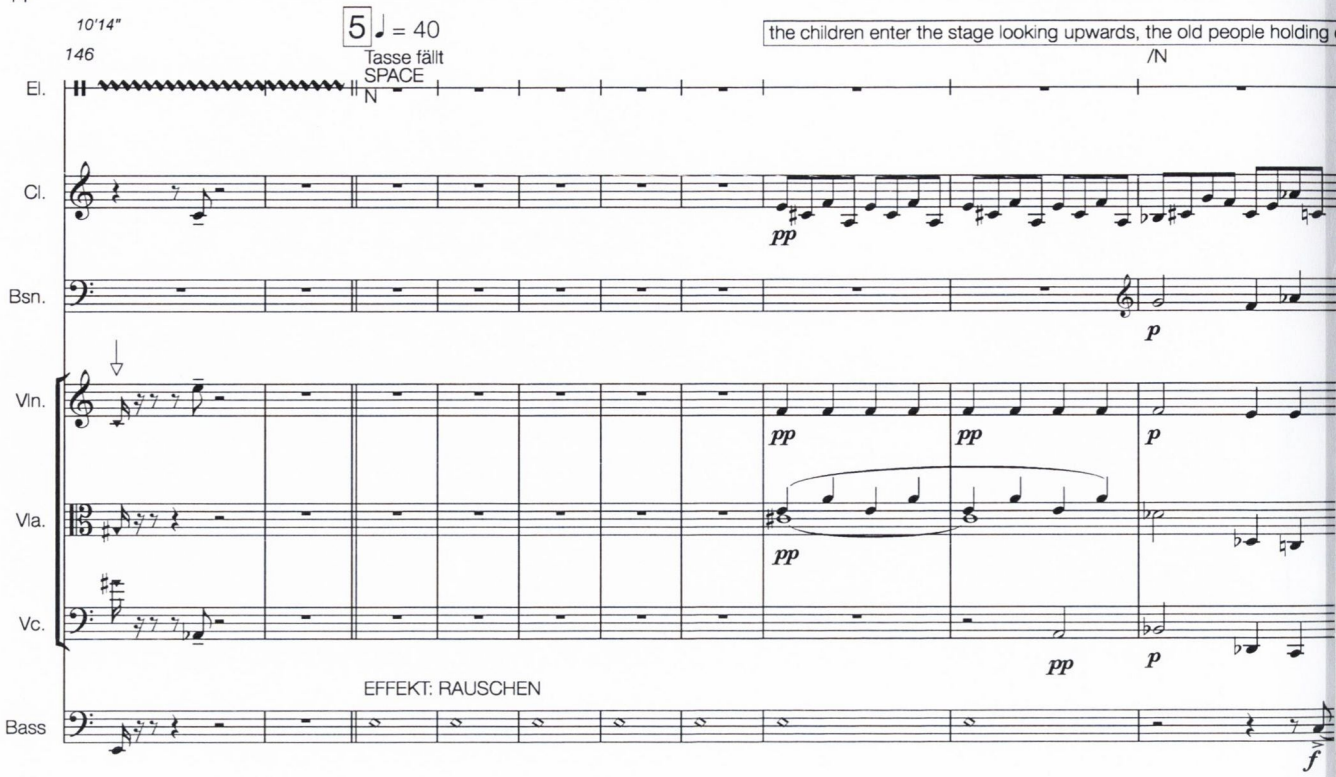

8'31"
113
(ENTER)
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

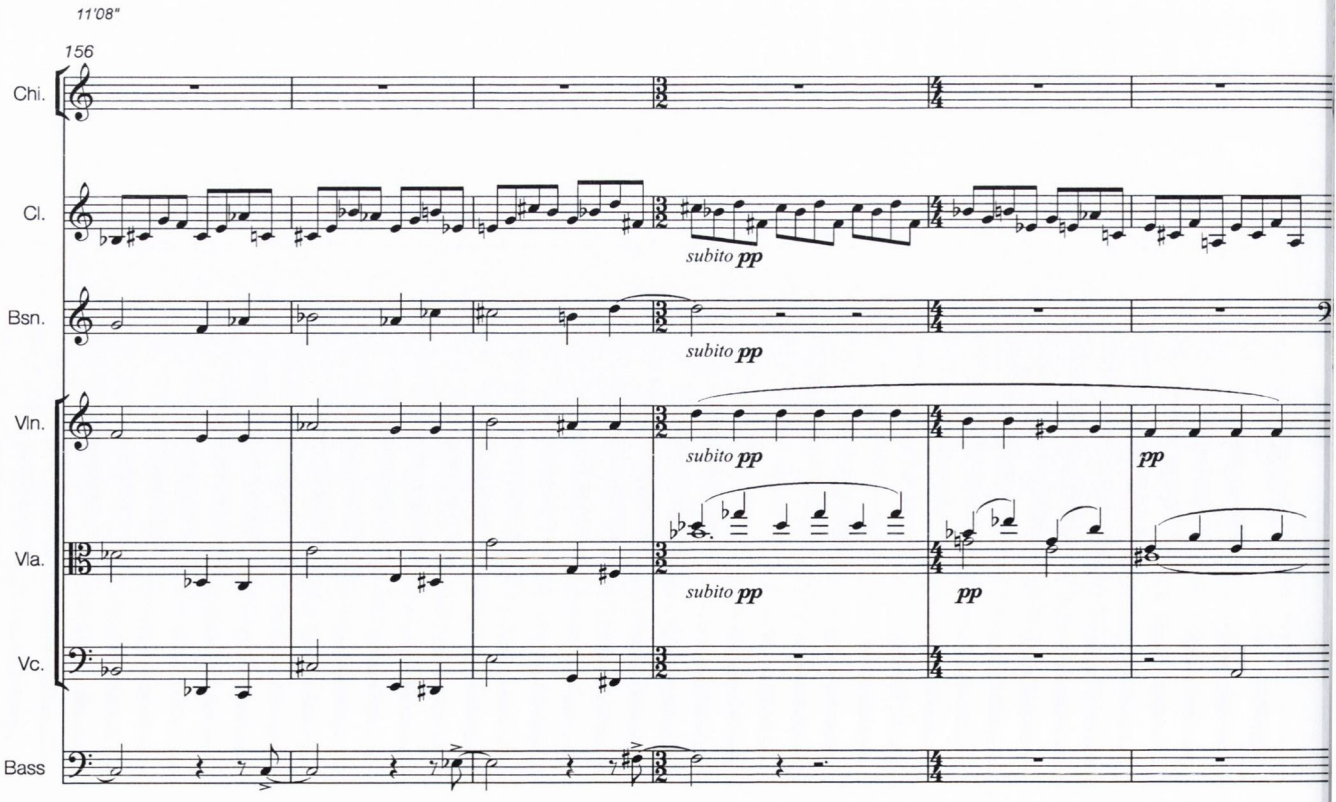

8'49"
119
SPACE
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

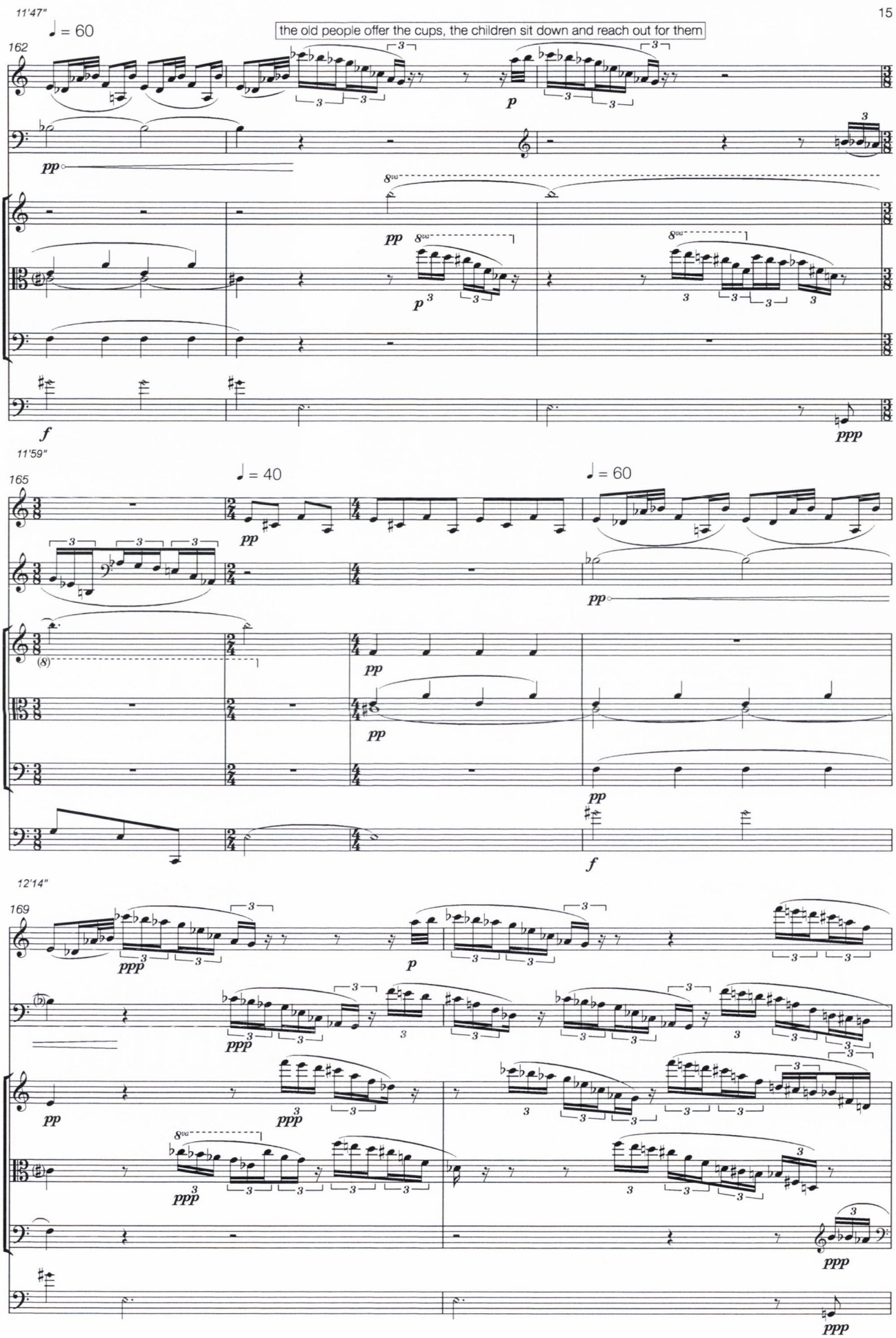

9'08"
126
H
(ENTER)
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

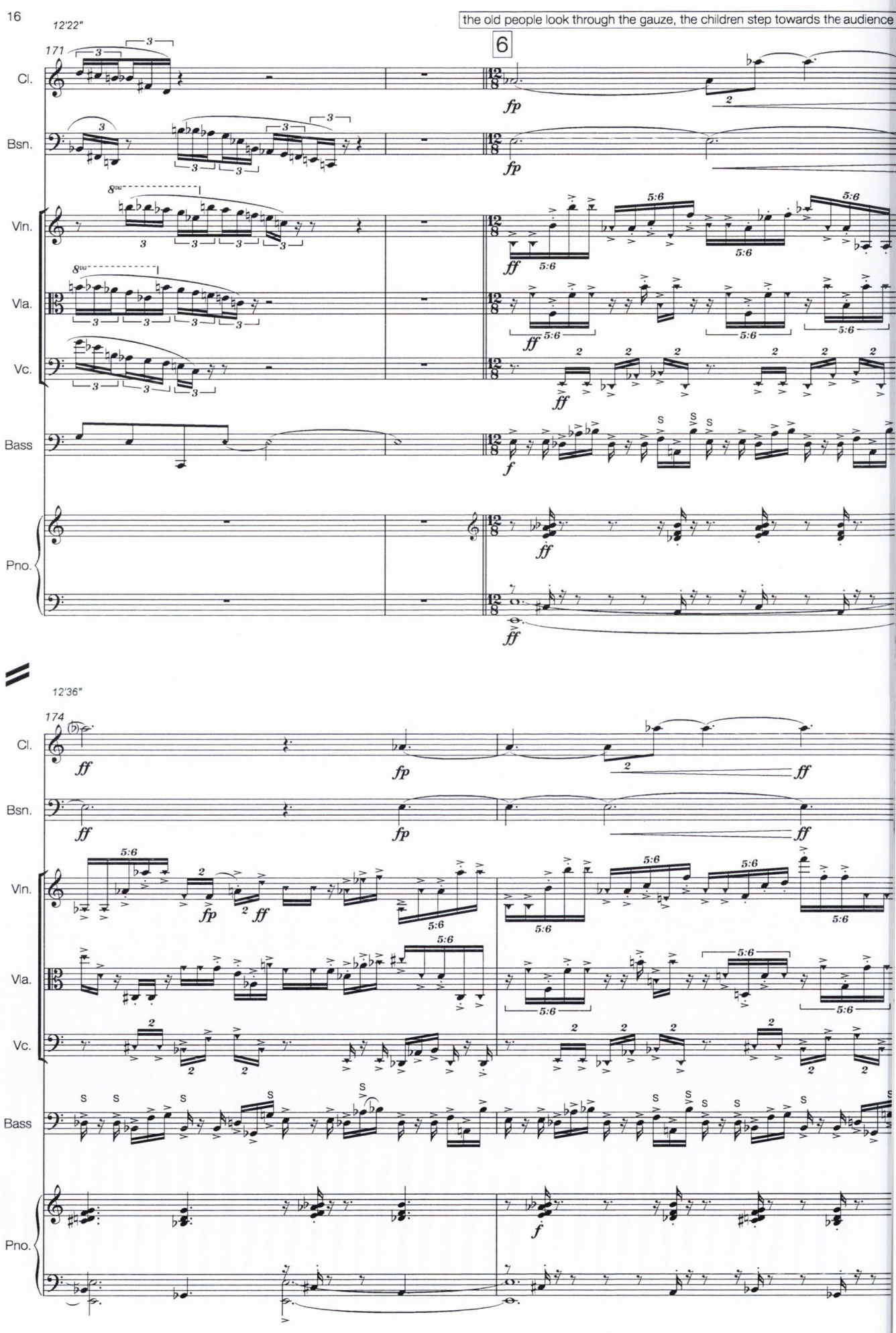

9'34"
133
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
8va

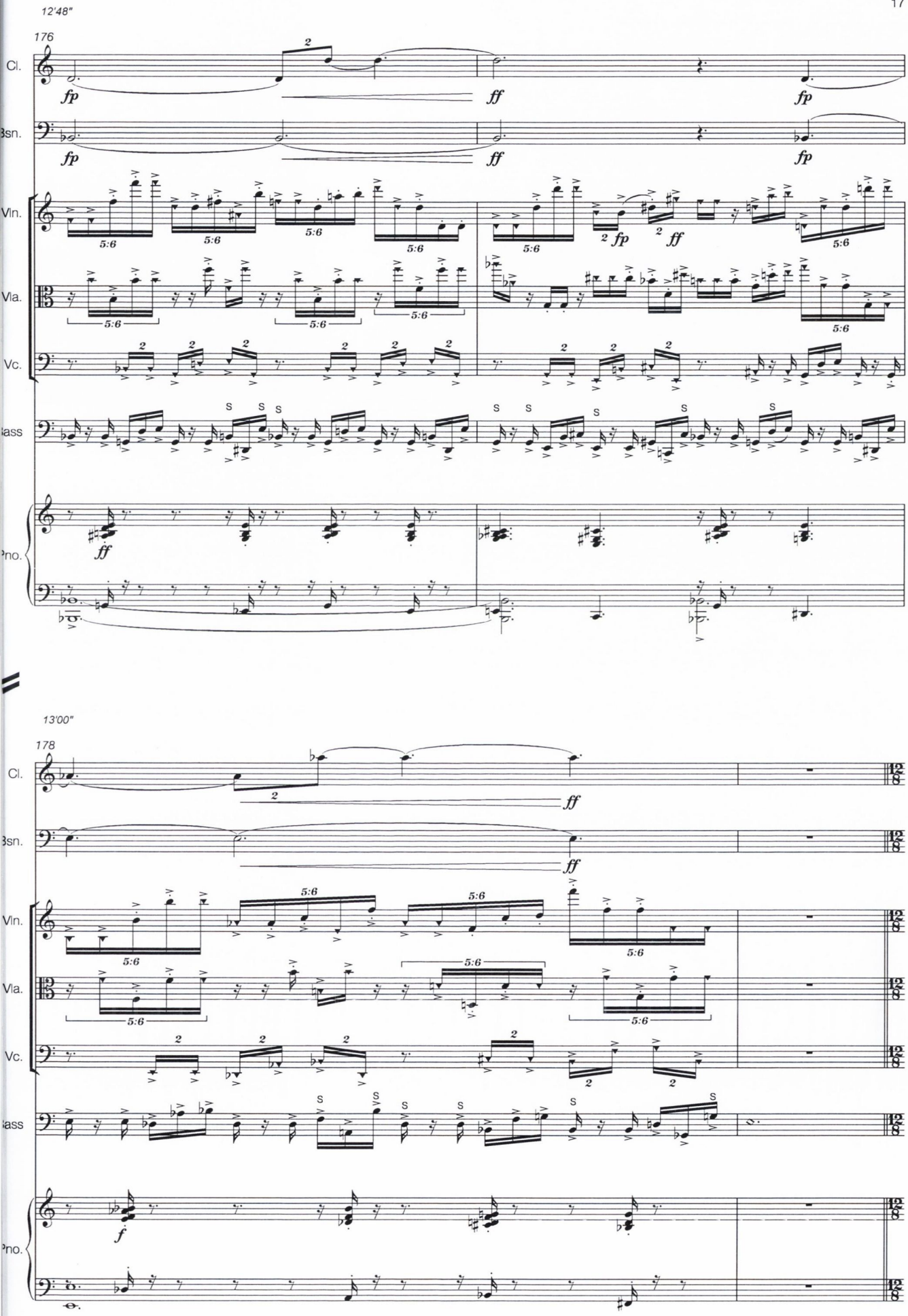

9'56"
140
Y
El.
Chi.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
8va

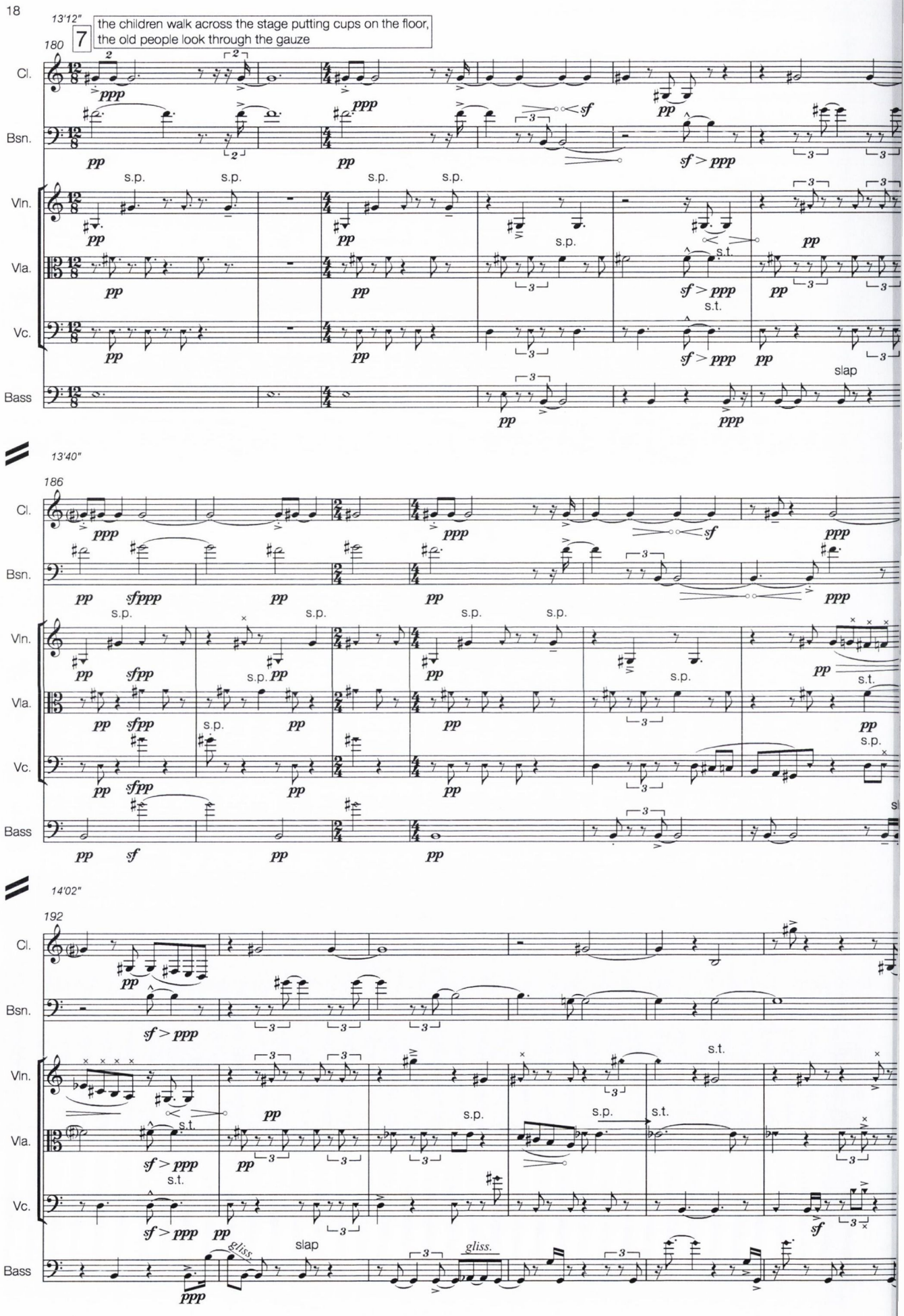

10'14"
146
5
♩ = 40
Tasse fällt
SPACE
N
the children enter the stage looking upwards, the old people holding
/N
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
p
EFFEKT: RAUSCHEN
f

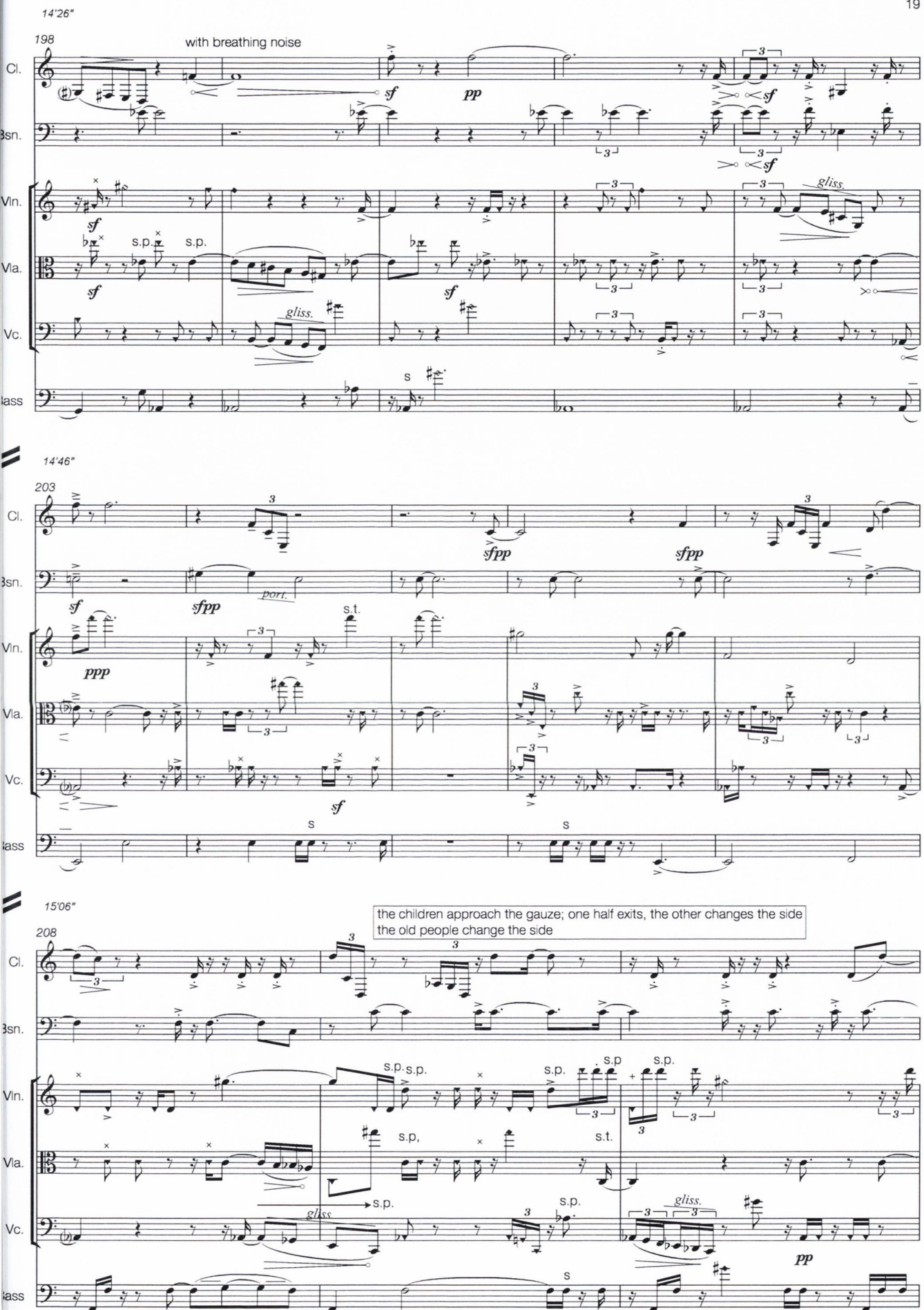

11'08"
156
Chi.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
subito pp
pp

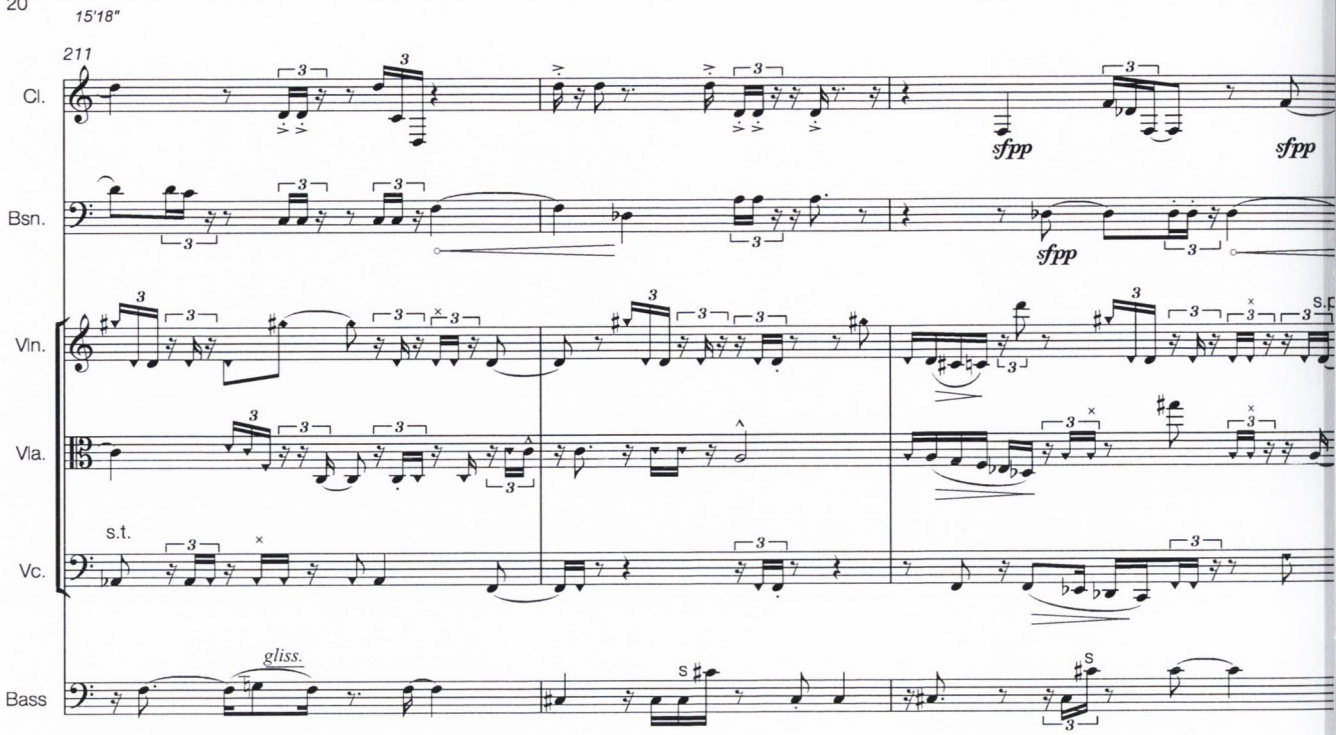

11'47"
♩ = 60
the old people offer the cups, the children sit down and reach out for them
162
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
11'59"
165
♩ = 40
♩ = 60
12'14"
169

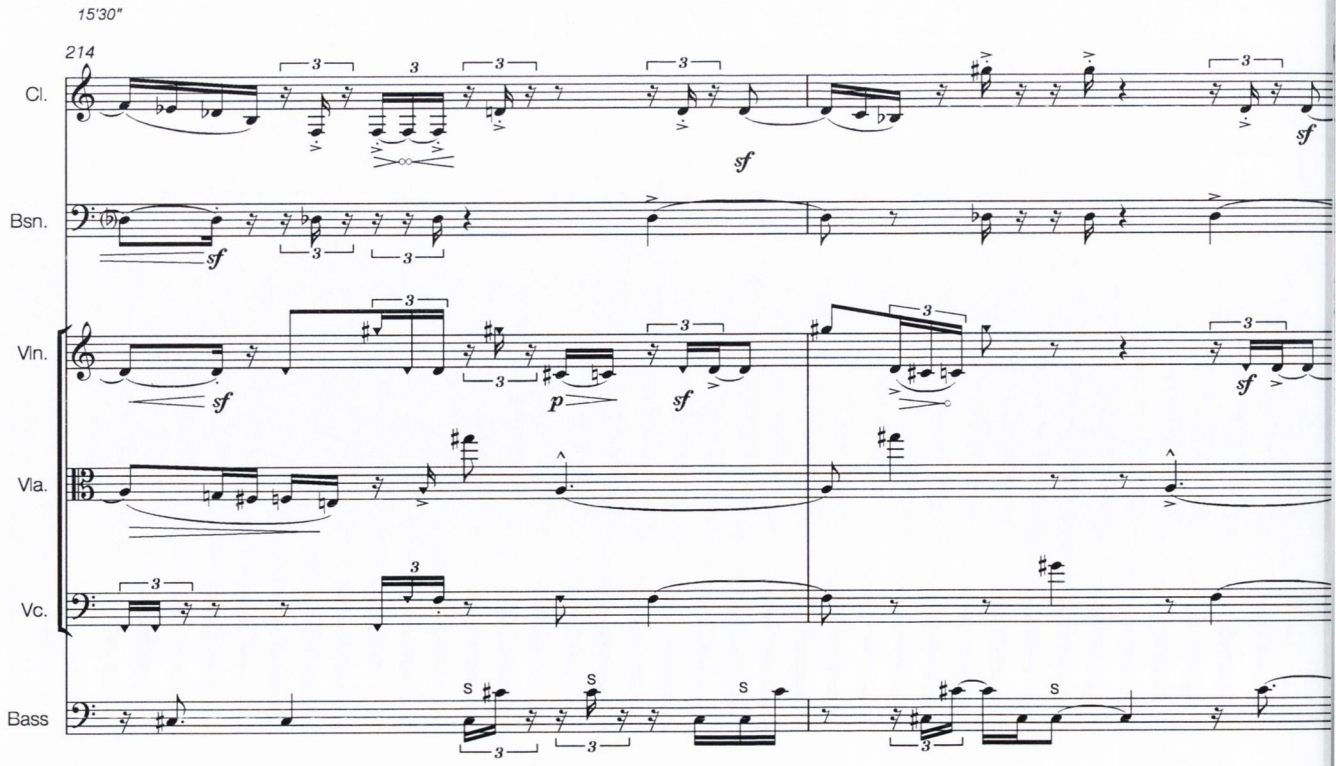

12'22"
the old people look through the gauze, the children step towards the audience
171
6
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
12'36"
174

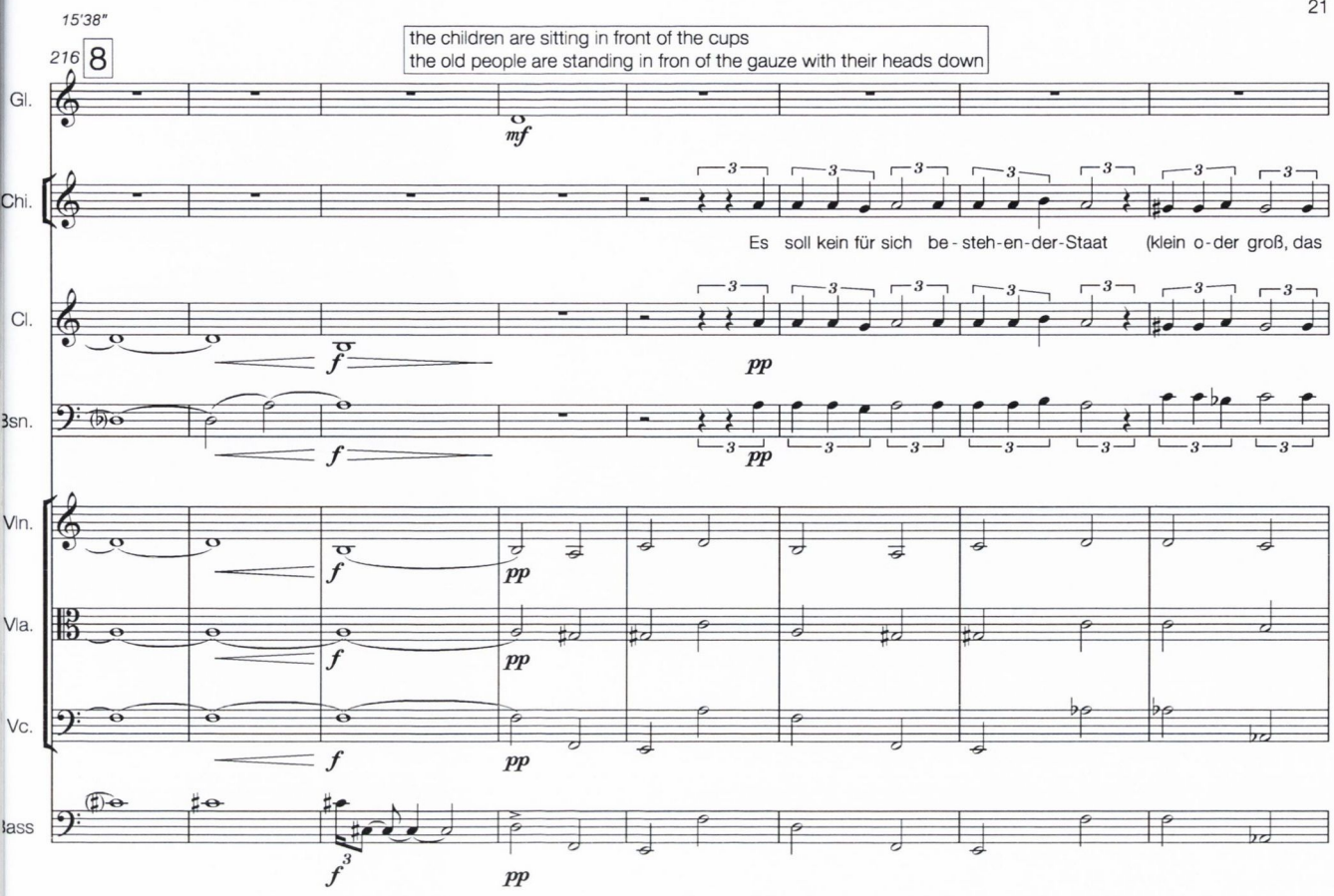

12'48"
176
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
fp
ff
5:6
2
S
13'00"
178
f

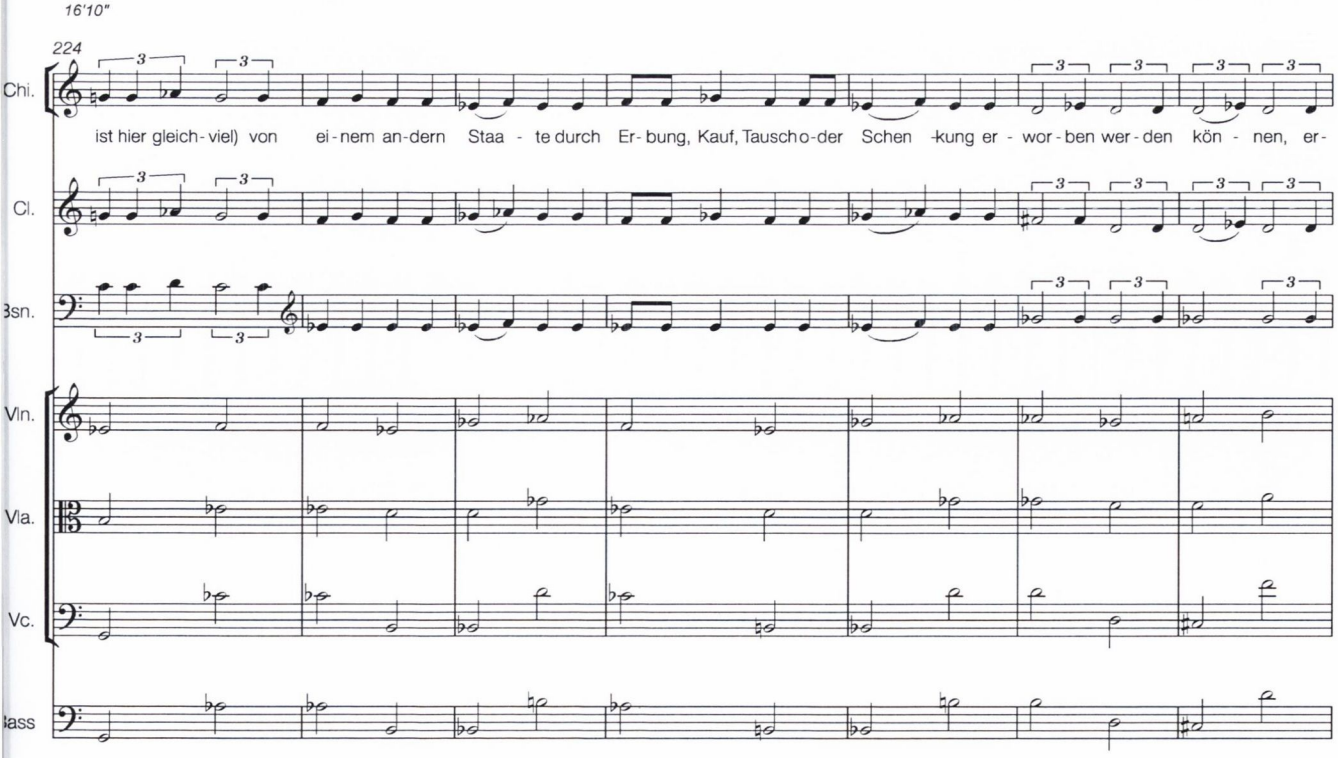

13'12"
7
the children walk across the stage putting cups on the floor,
the old people look through the gauze
180
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.p.
s.t.
slap
13'40"
186
14'02"
192
gliss.

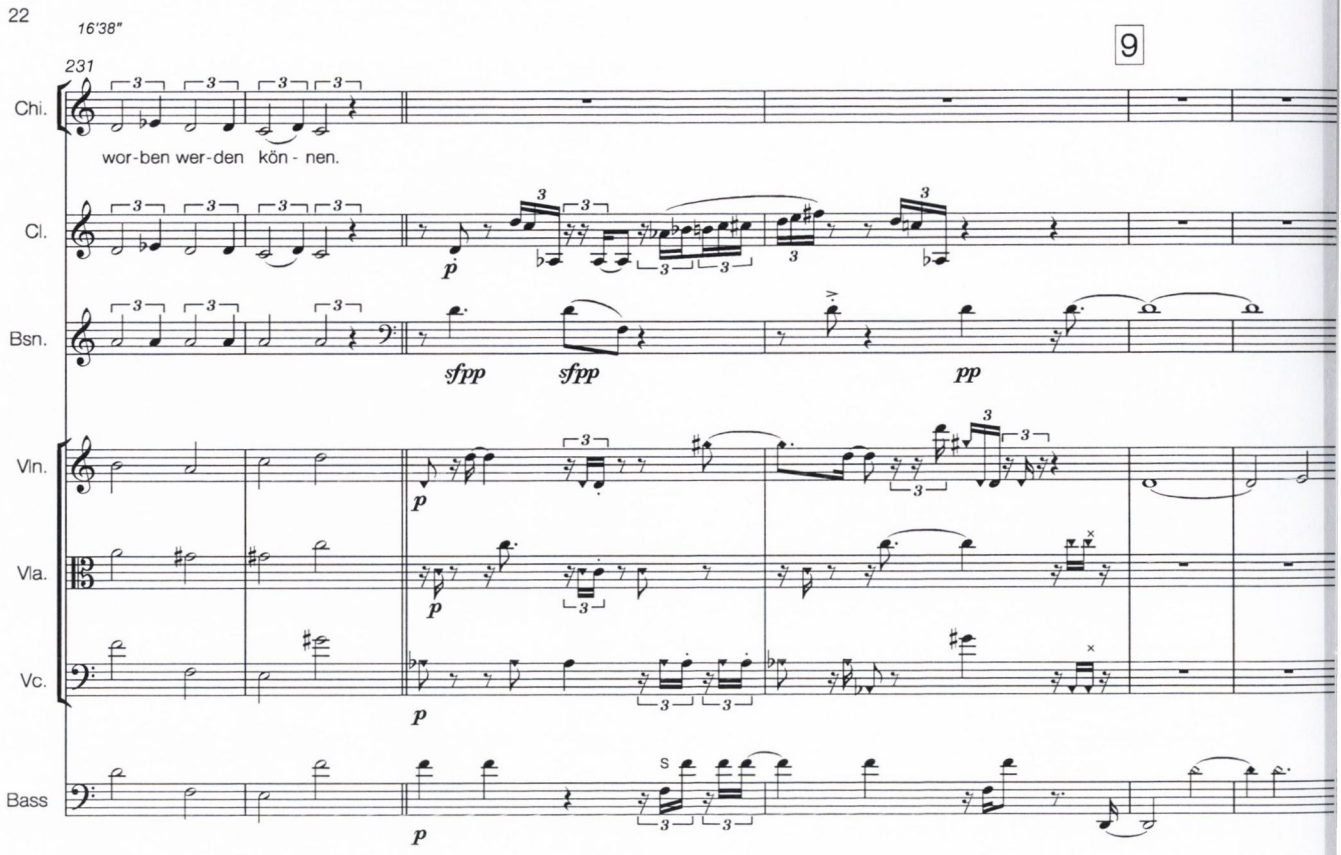

14'26"
198
with breathing noise
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
pp
sf
sf
s.p.
s.p.
sf
sf
gliss.
gliss.
s
14'46"
203
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
sfpp
sf
sfpp
port.
s.t.
ppp
sf
s
s
15'06"
208
the children approach the gauze; one half exits, the other changes the side
the old people change the side
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.p.
s.p.
s.p.
s.p
s.p.
s.p,
s.t.
s.p.
gliss.
s.p.
gliss.
pp
s

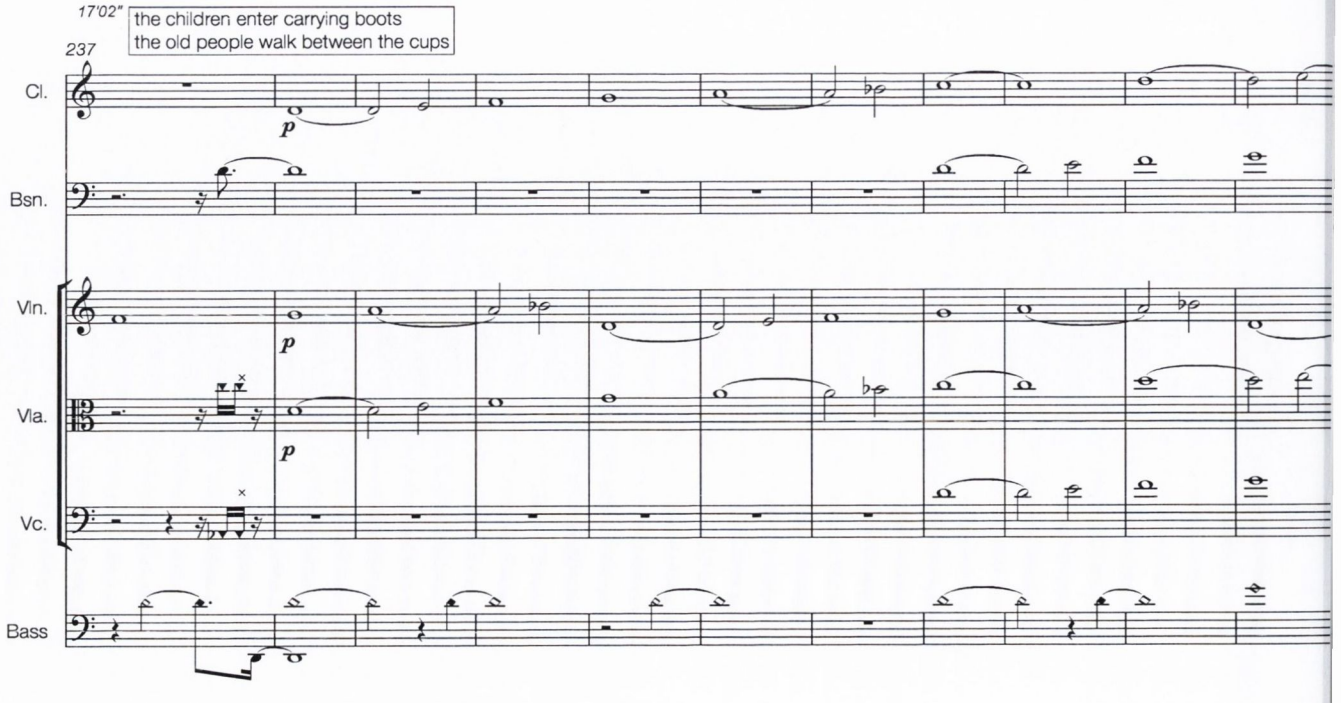

15'18"
211
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
sfpp
sfpp
s.t.
gliss.
S
S
S.D

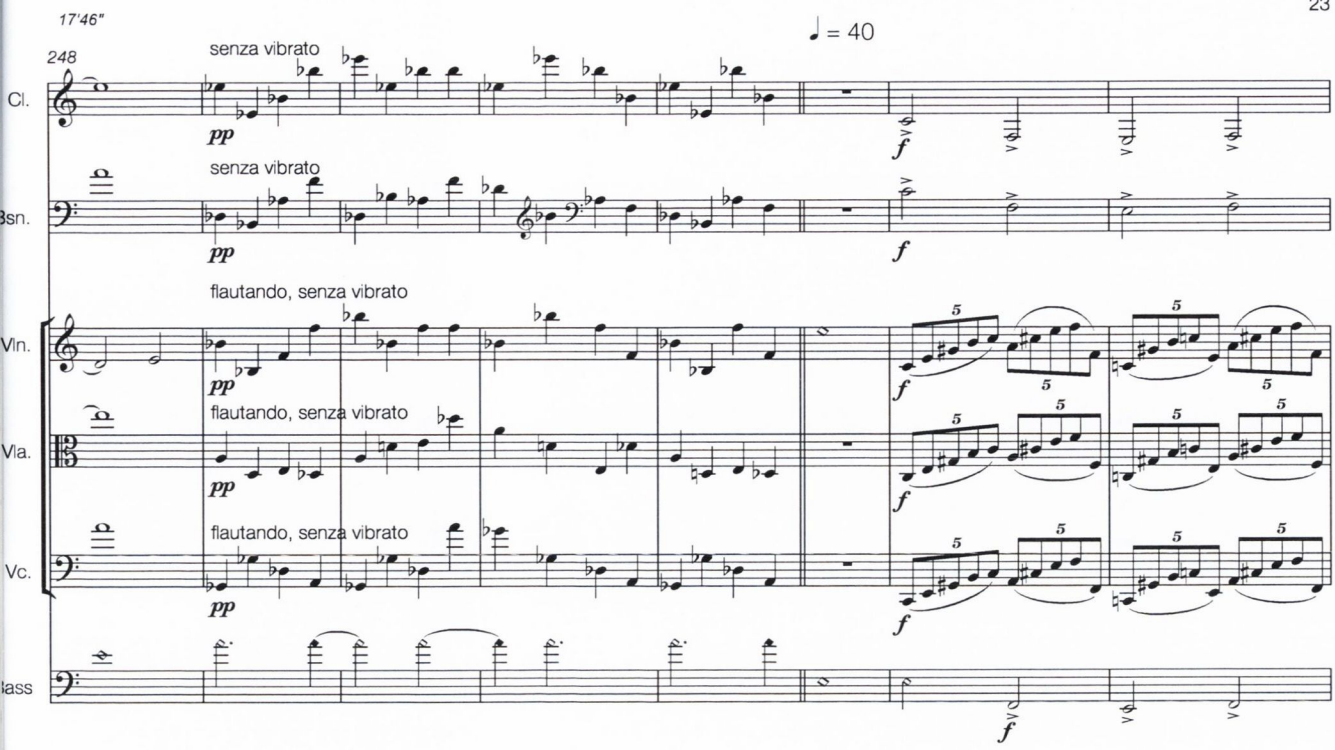

15'30"
214
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
sf
sf
sf
p
sf
sf
S
S
S
S

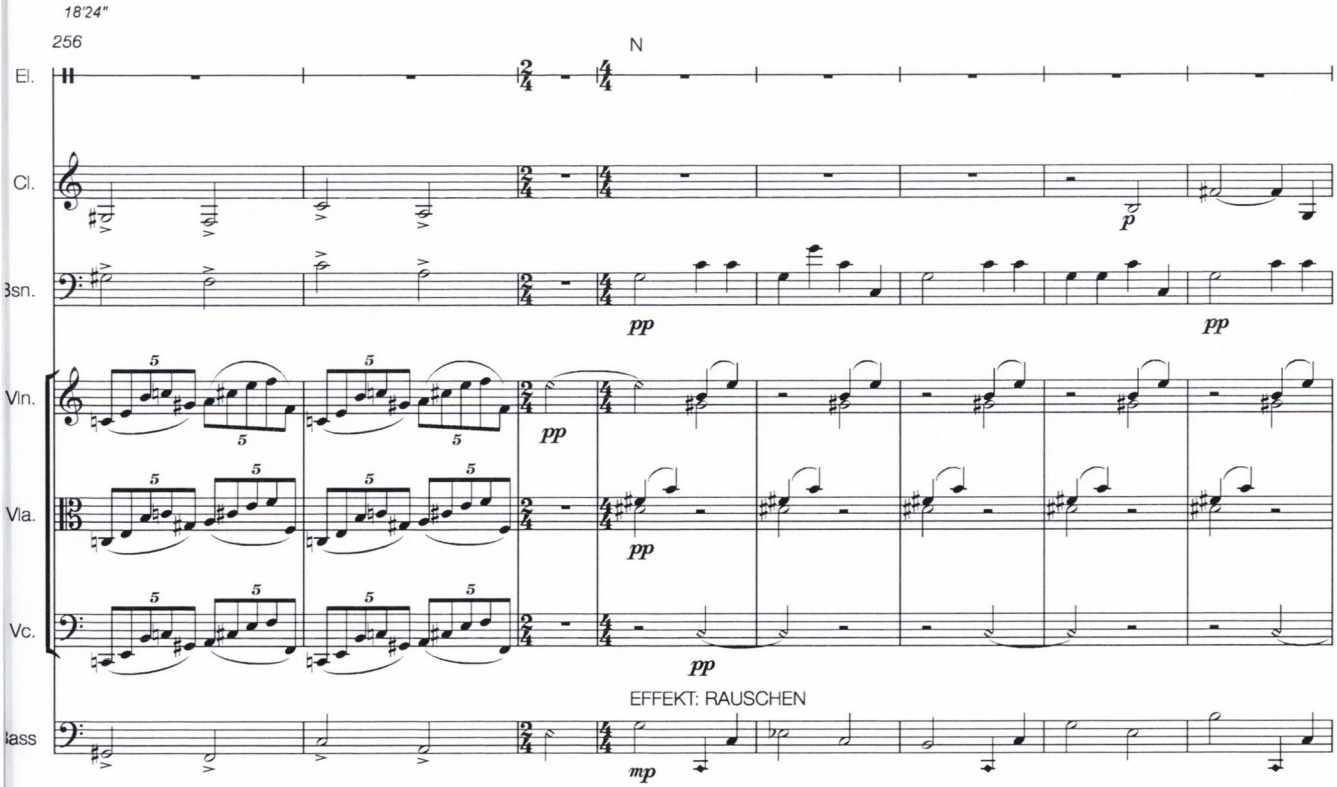

15'38"
216
8
the children are sitting in front of the cups
the old people are standing in fron of the gauze with their heads down
Gl.
Chi.
Es soll kein für sich be-steh-en-der-Staat (klein o-der groß, das
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

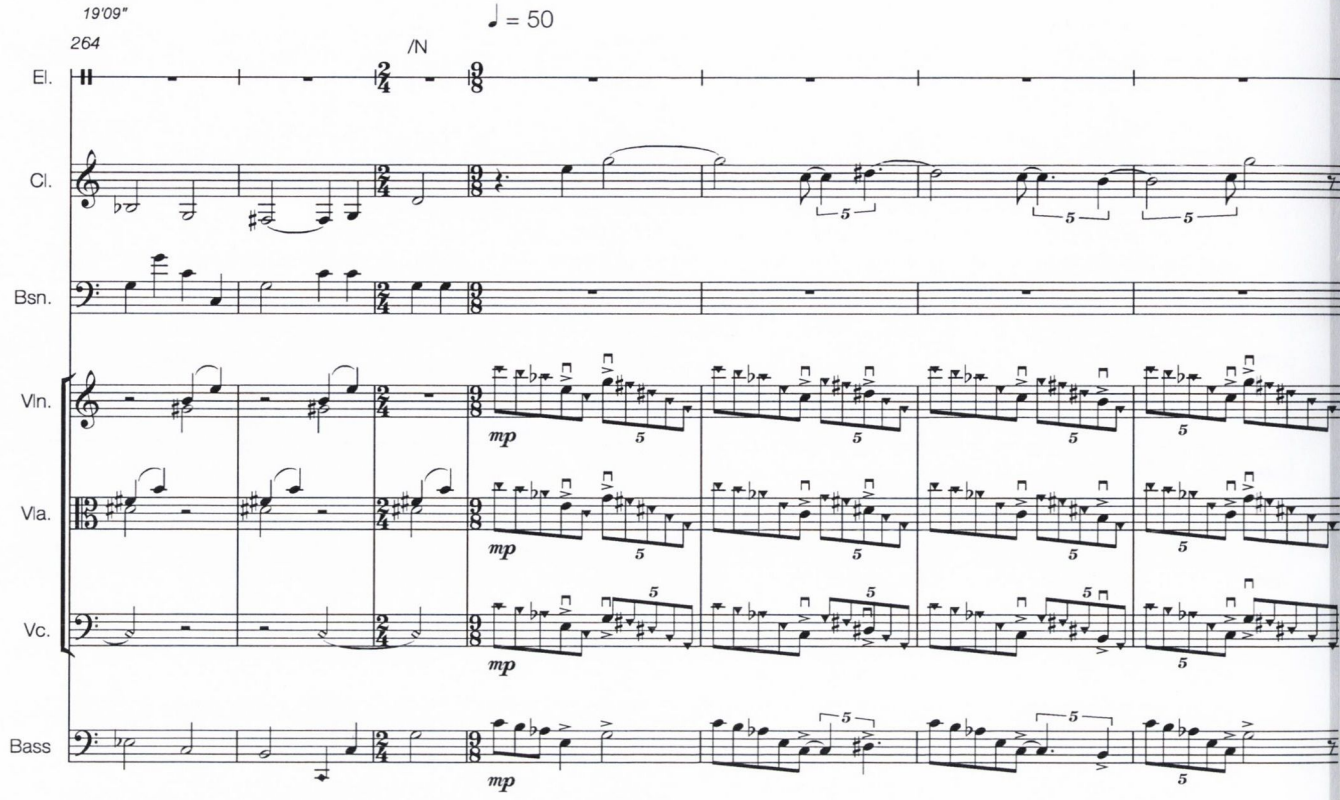

16'10"
224
Chi.
ist hier gleich-viel) von ei-nem an-dern Staa - te durch Er-bung, Kauf, Tausch o-der Schen -kung er - wor-ben wer-den kön - nen, er-
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

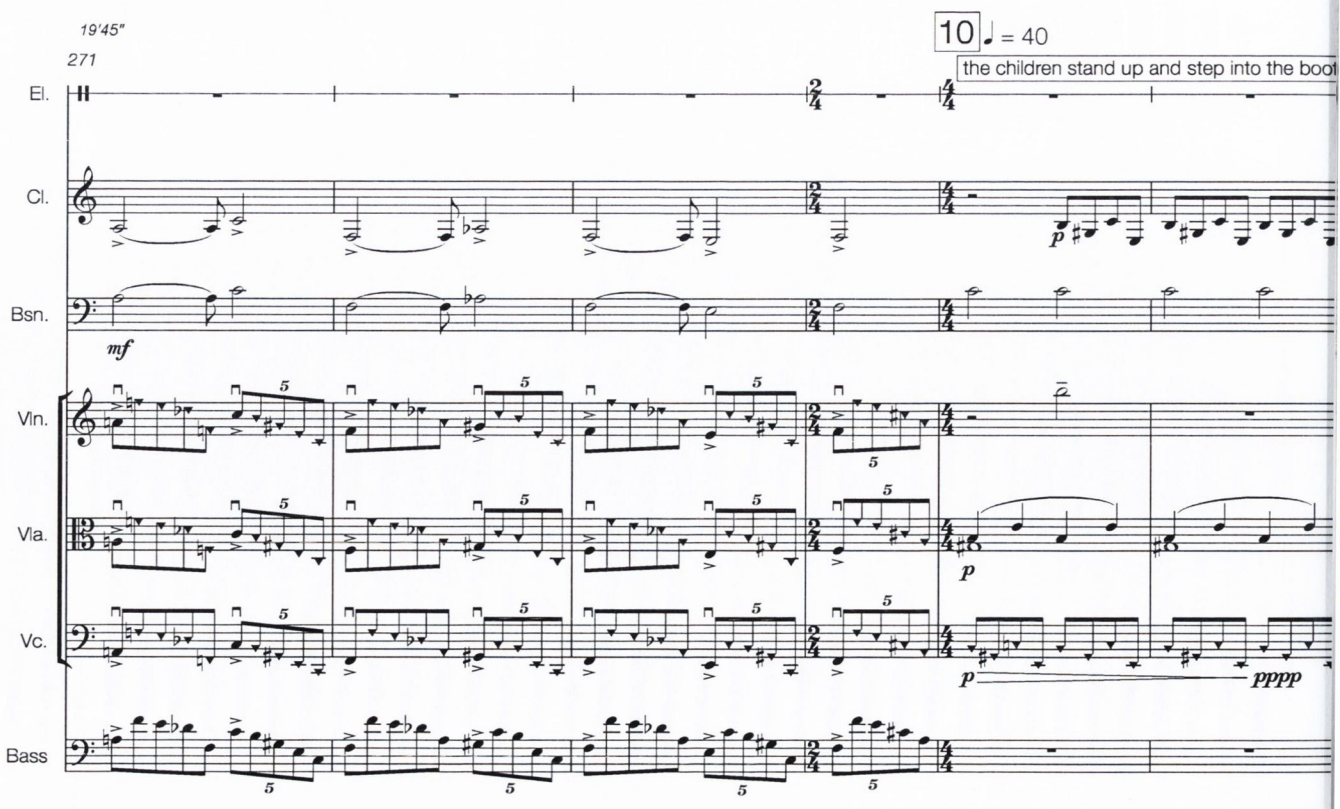

16'38"
231
9
Chi.
wor-ben wer-den kön - nen.
Cl.
Bsn.
sfpp
sfpp
pp
Vln.
Vla.
Vc.
Bass
p

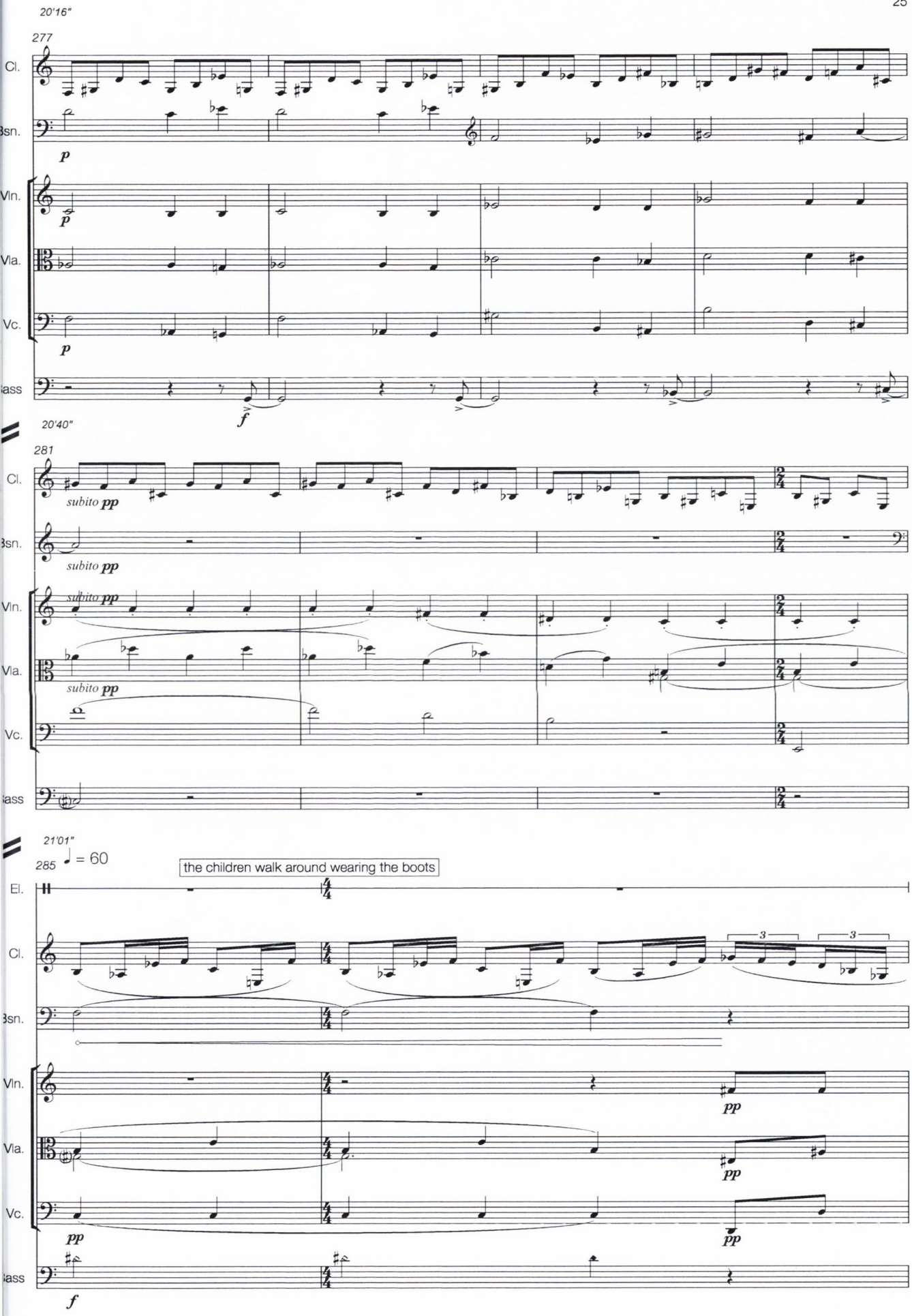

17'02"
the children enter carrying boots
the old people walk between the cups
237
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p

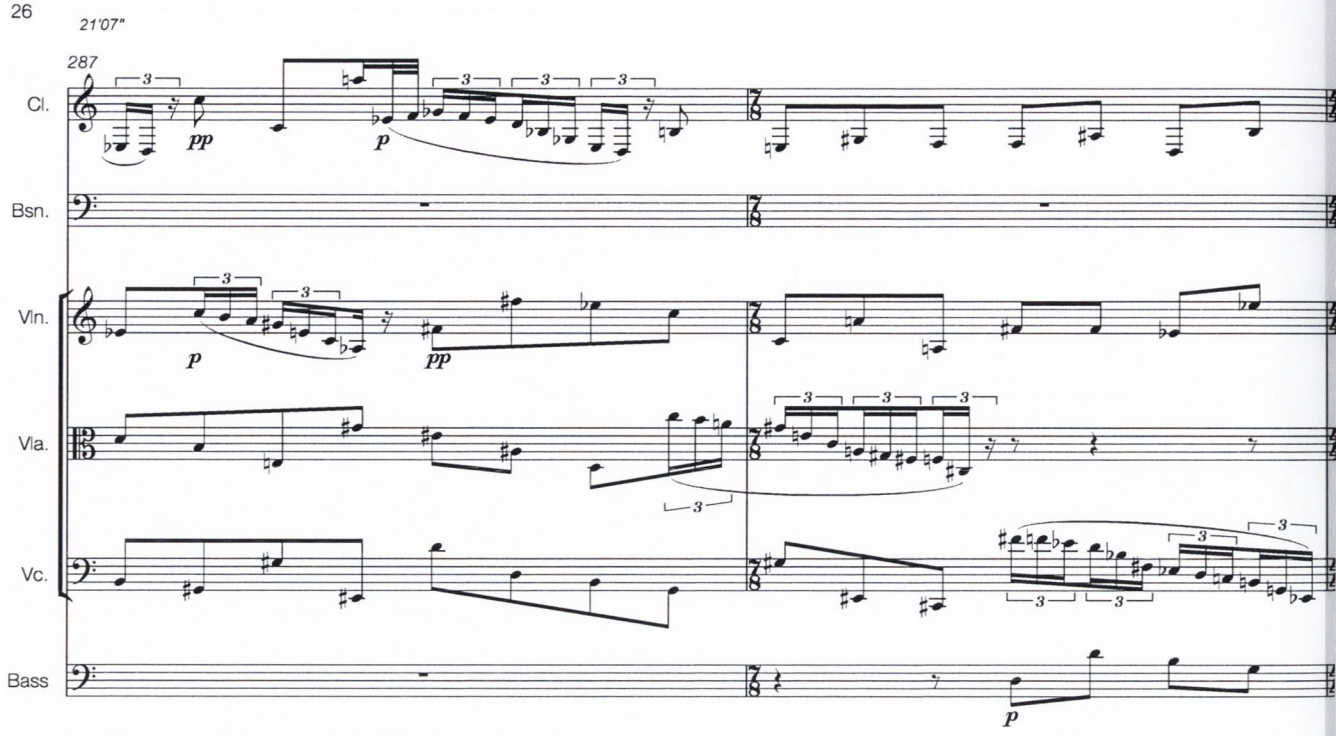

17'46"
248
♩ = 40
senza vibrato
Cl.
pp
f
senza vibrato
Bsn.
pp
f
flautando, senza vibrato
Vln.
pp
f
flautando, senza vibrato
Vla.
pp
f
flautando, senza vibrato
Vc.
pp
f
Bass
f

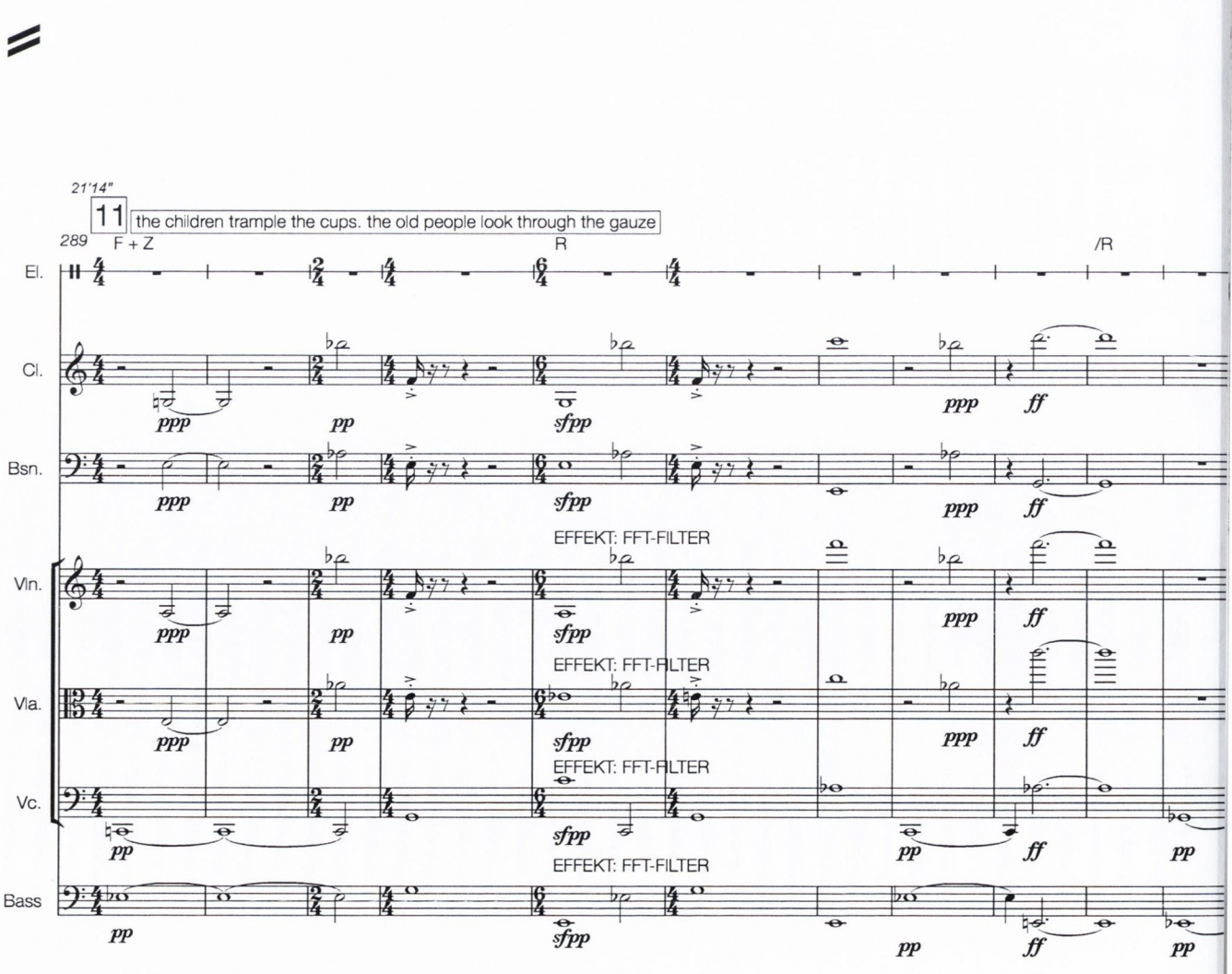

18'24"
256
N
El.
Cl.
p
Bsn.
pp
pp
Vln.
pp
Vla.
pp
Vc.
pp
EFFEKT: RAUSCHEN
Bass
mp

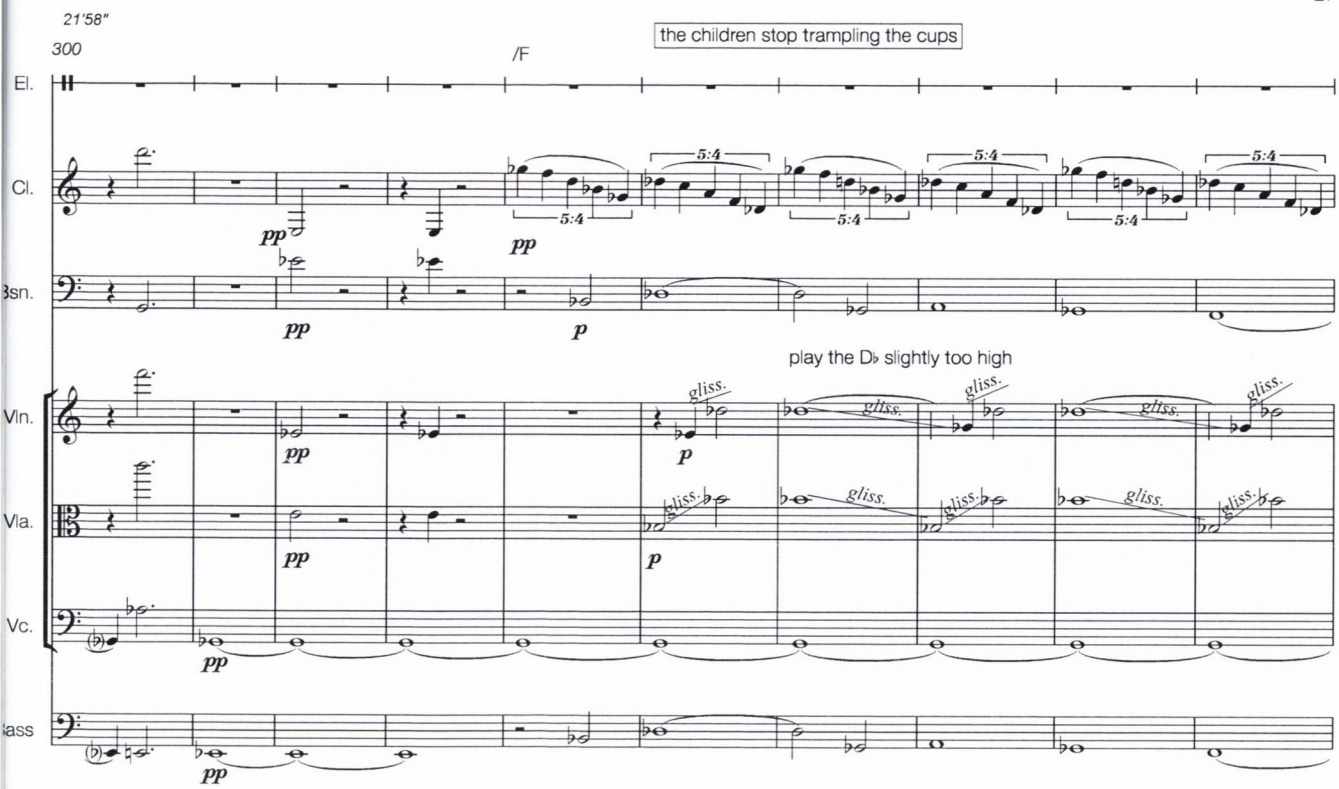

19'09"
264
/N
♩ = 50
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mp

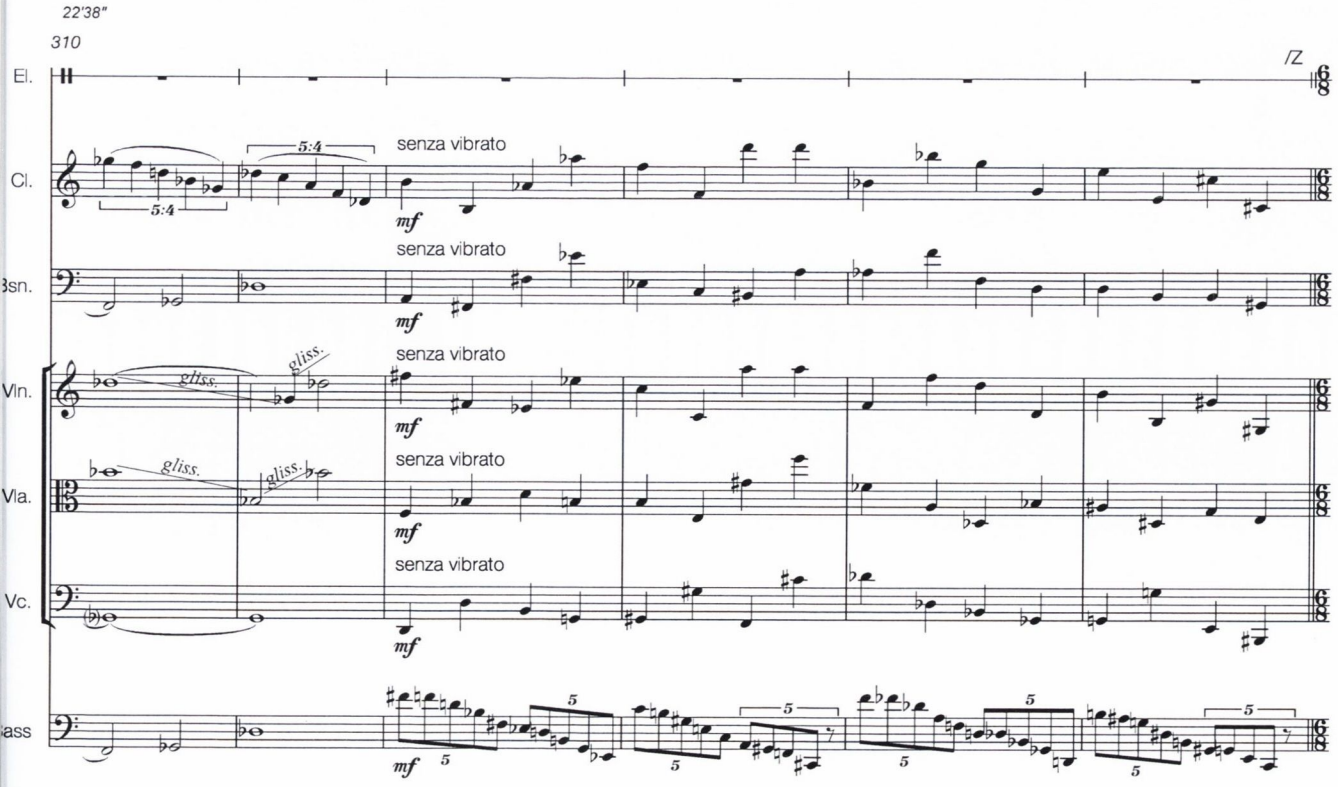

19'45"
271
10
♩ = 40
the children stand up and step into the boot
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mf
p
pppp

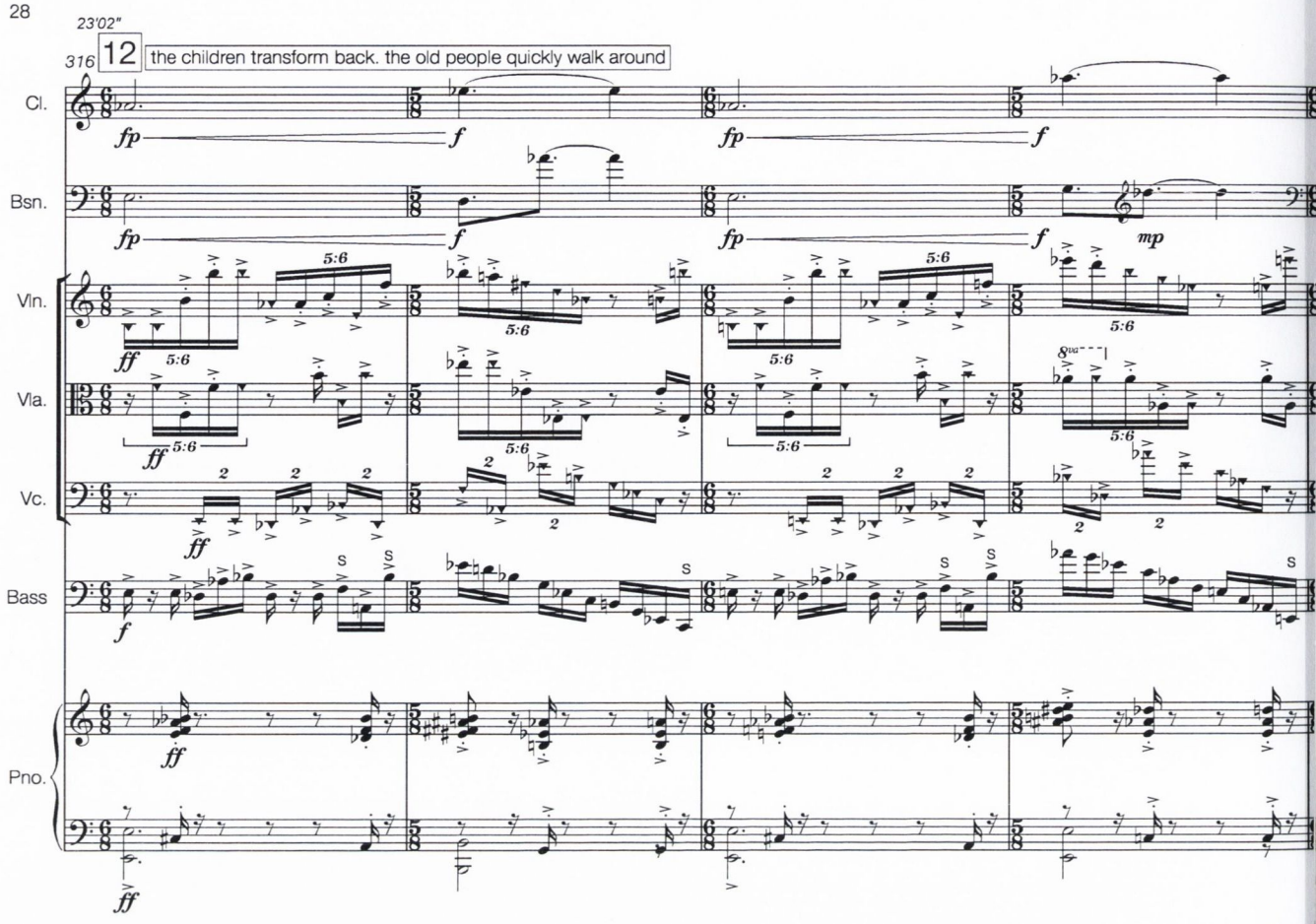

20'16"
277
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
f
20'40"
281
subito pp
21'01"
285
♩ = 60
the children walk around wearing the boots
El.
3
pp

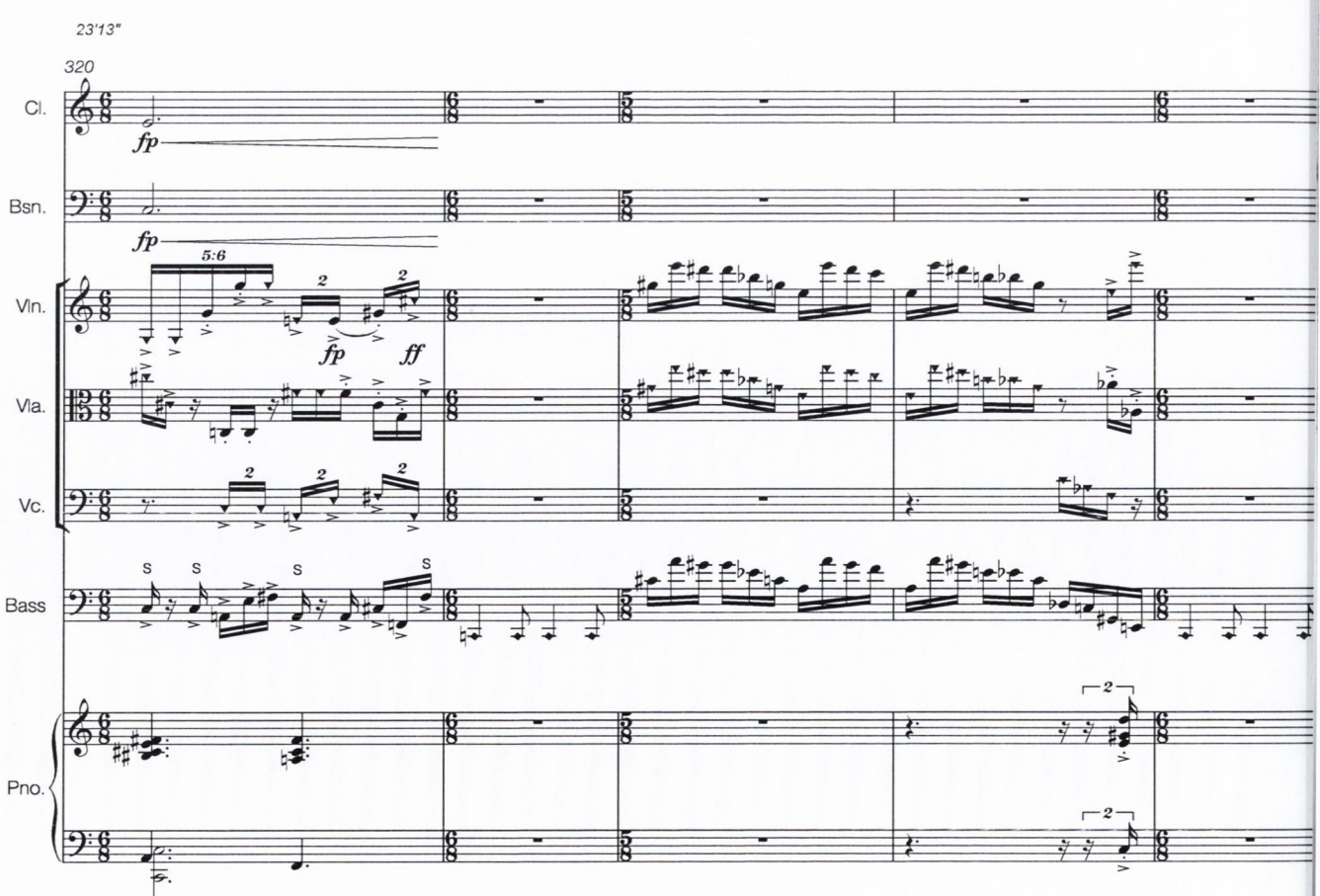

21'07"
287
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
p
3

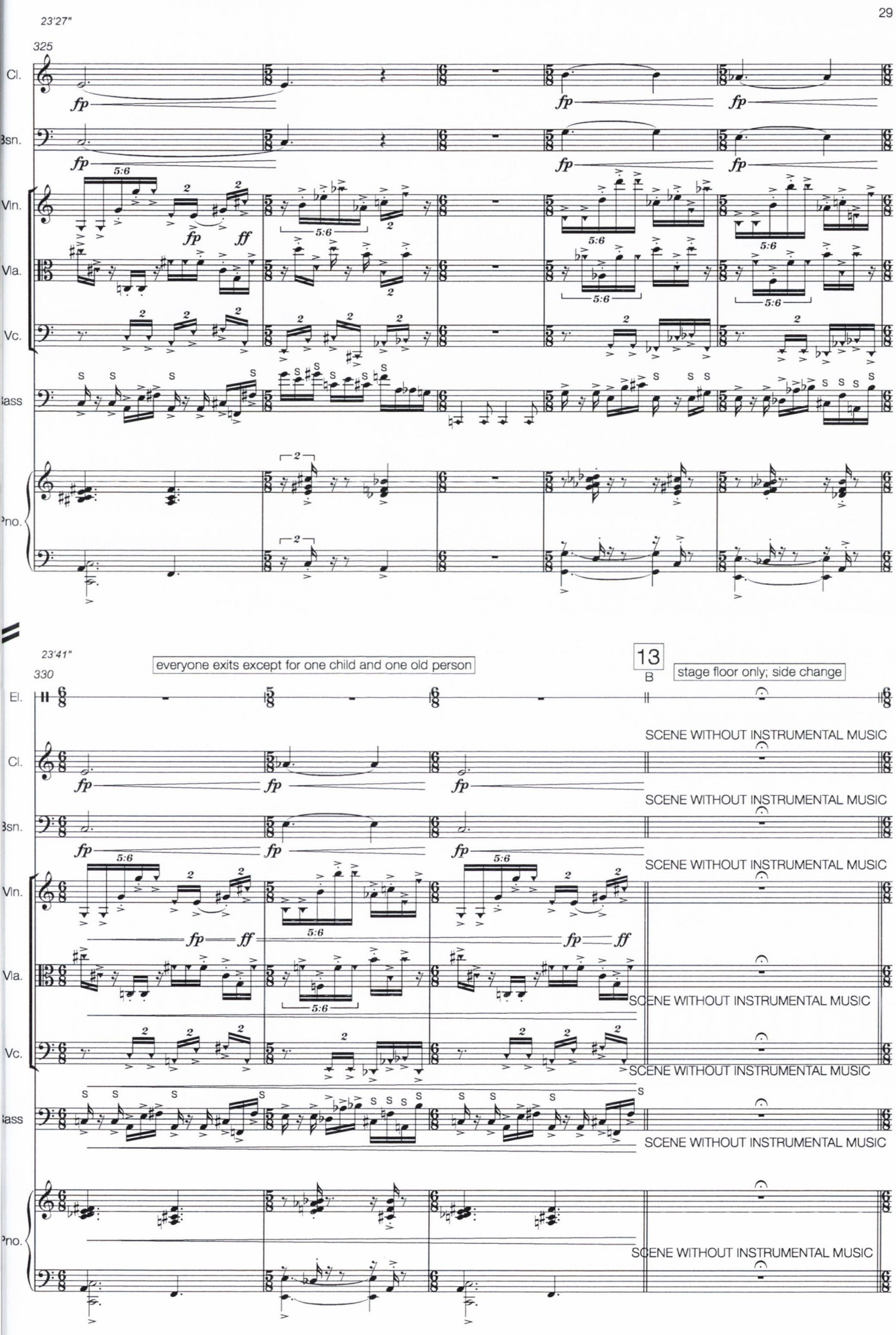

21'14"
11
the children trample the cups. the old people look through the gauze
289
F + Z
R
/R
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
EFFEKT: FFT-FILTER
ppp
pp
sfpp
ff

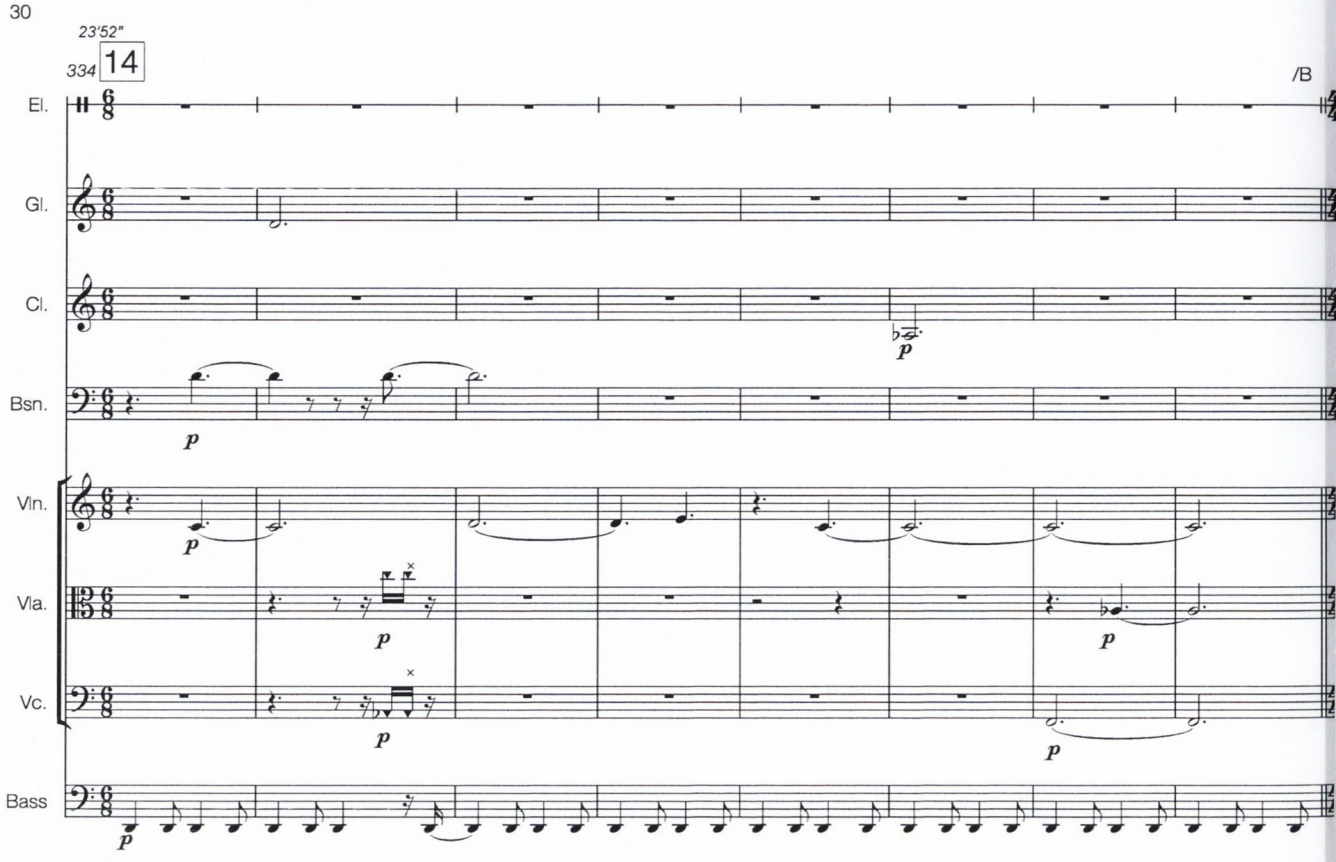

21'58"
300
/F
the children stop trampling the cups
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
play the D♭ slightly too high
pp
p
gliss.
5:4

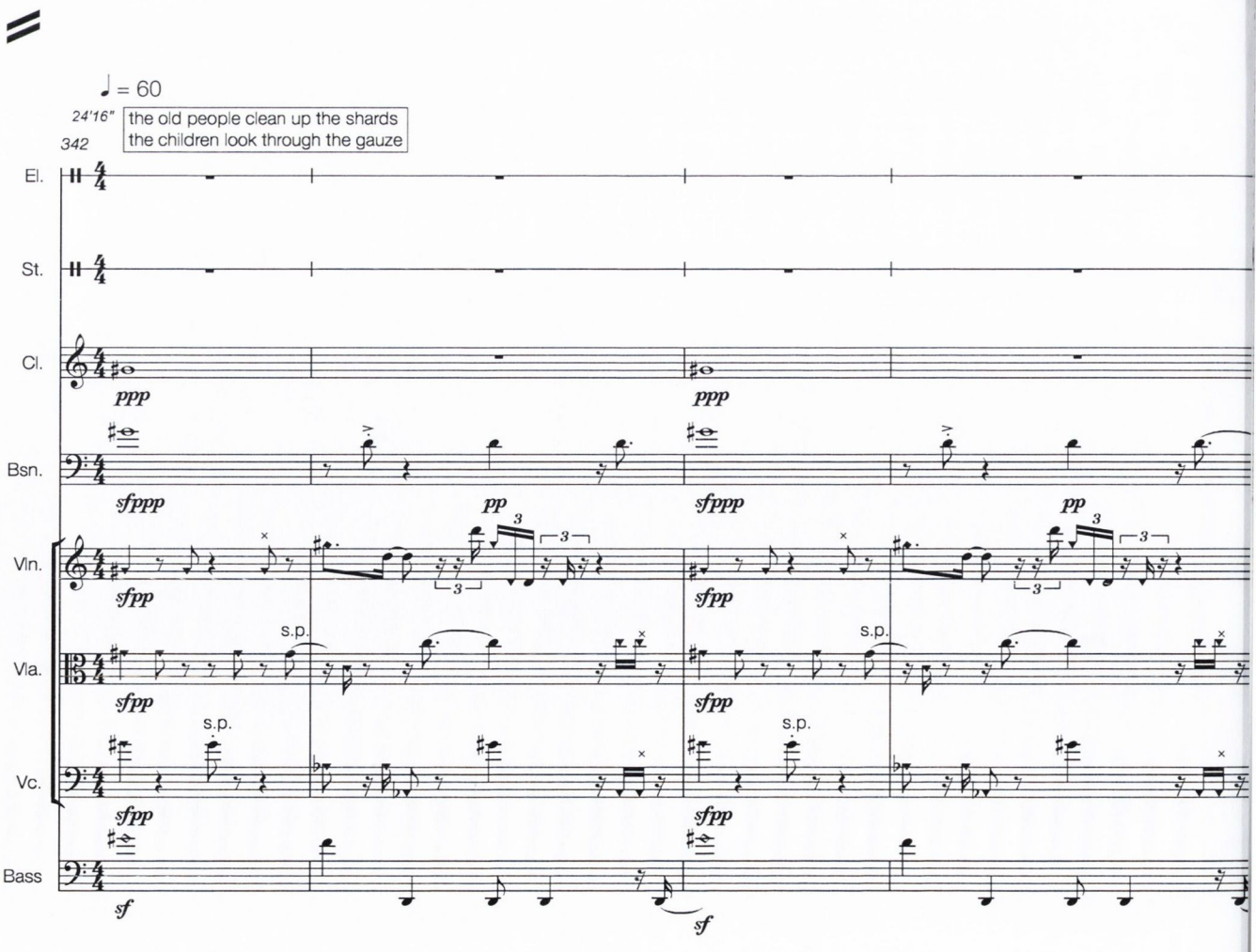

22'38"
310
/Z
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
senza vibrato
mf
gliss.
5:4
5

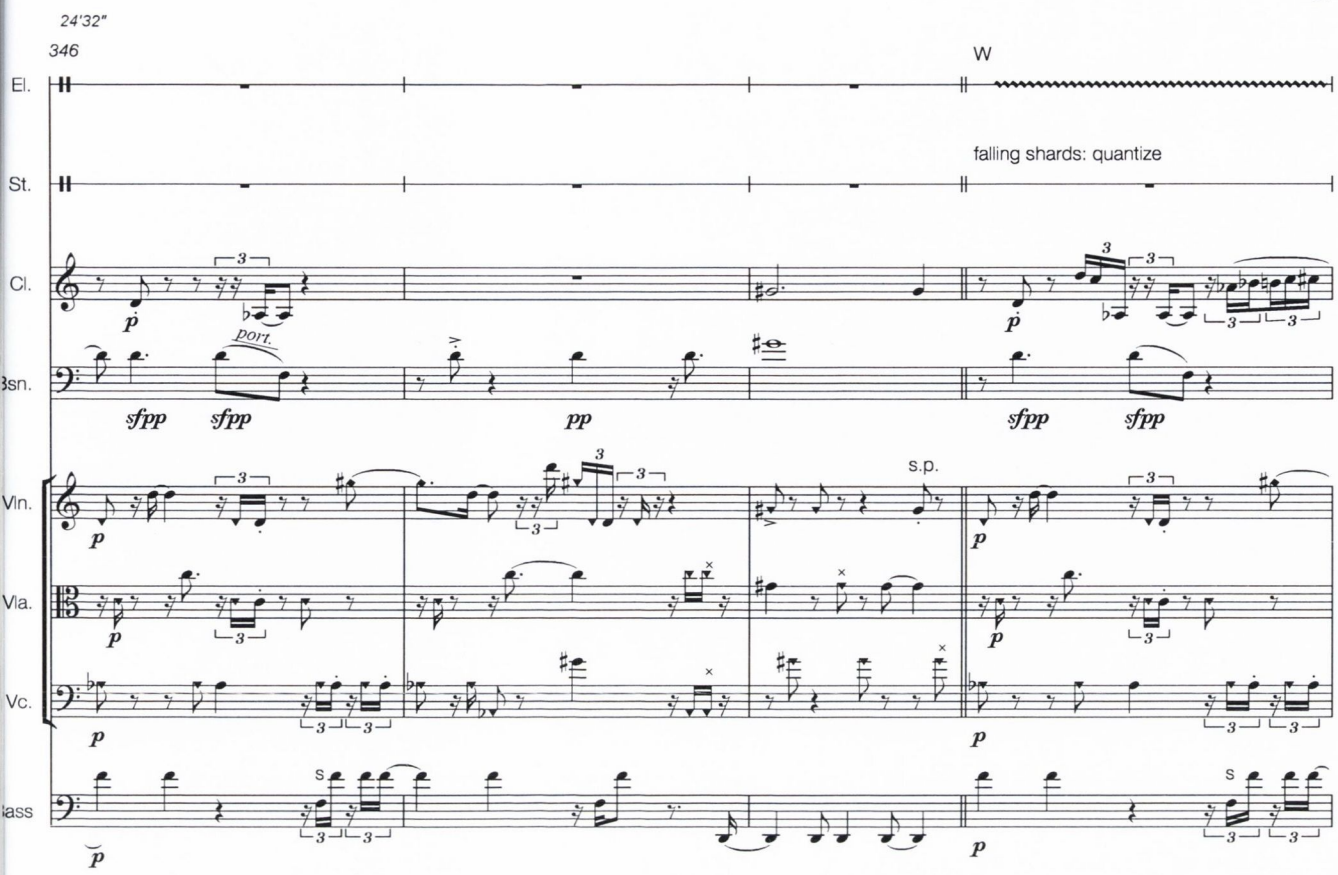

23'02"
316
12
the children transform back. the old people quickly walk around
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.

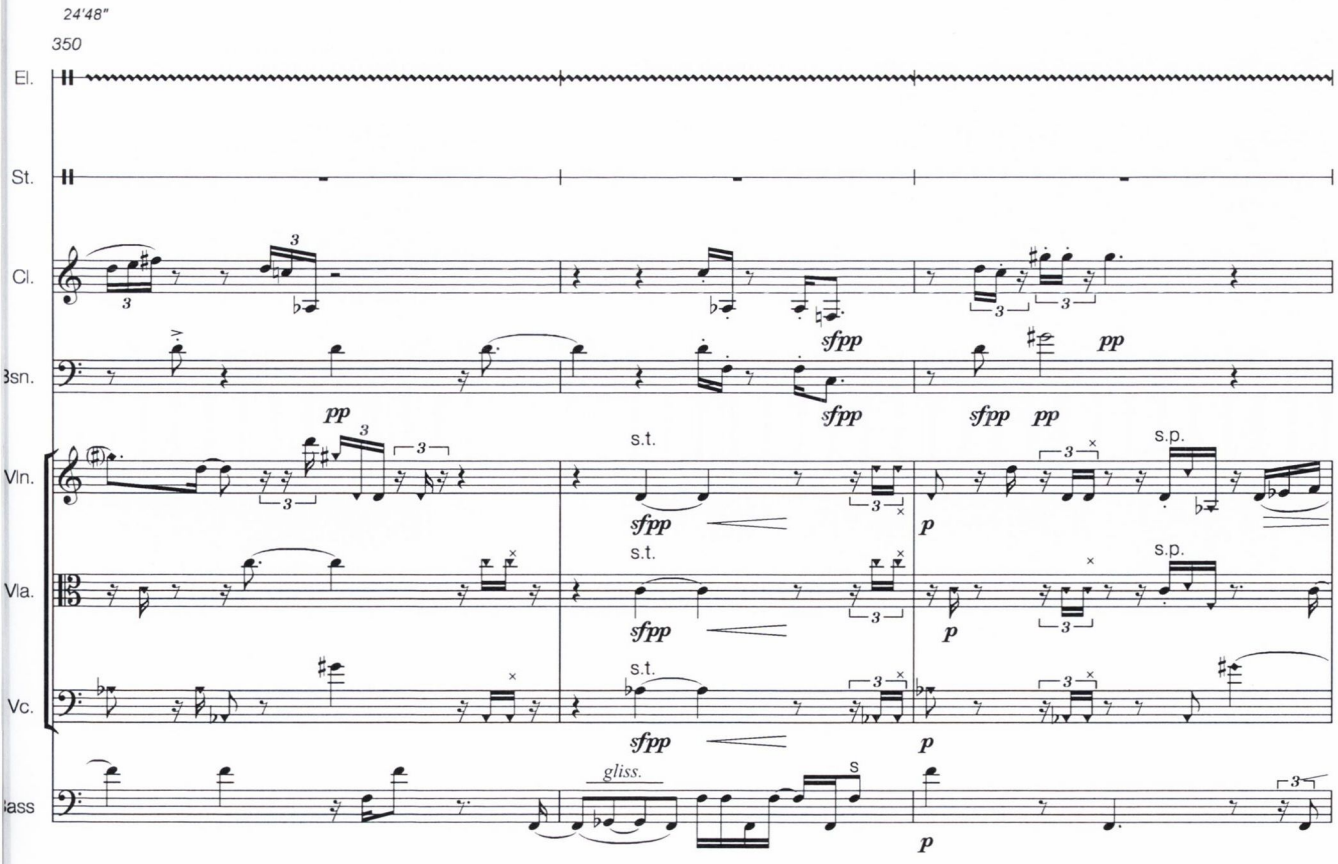

23'13"
320
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.

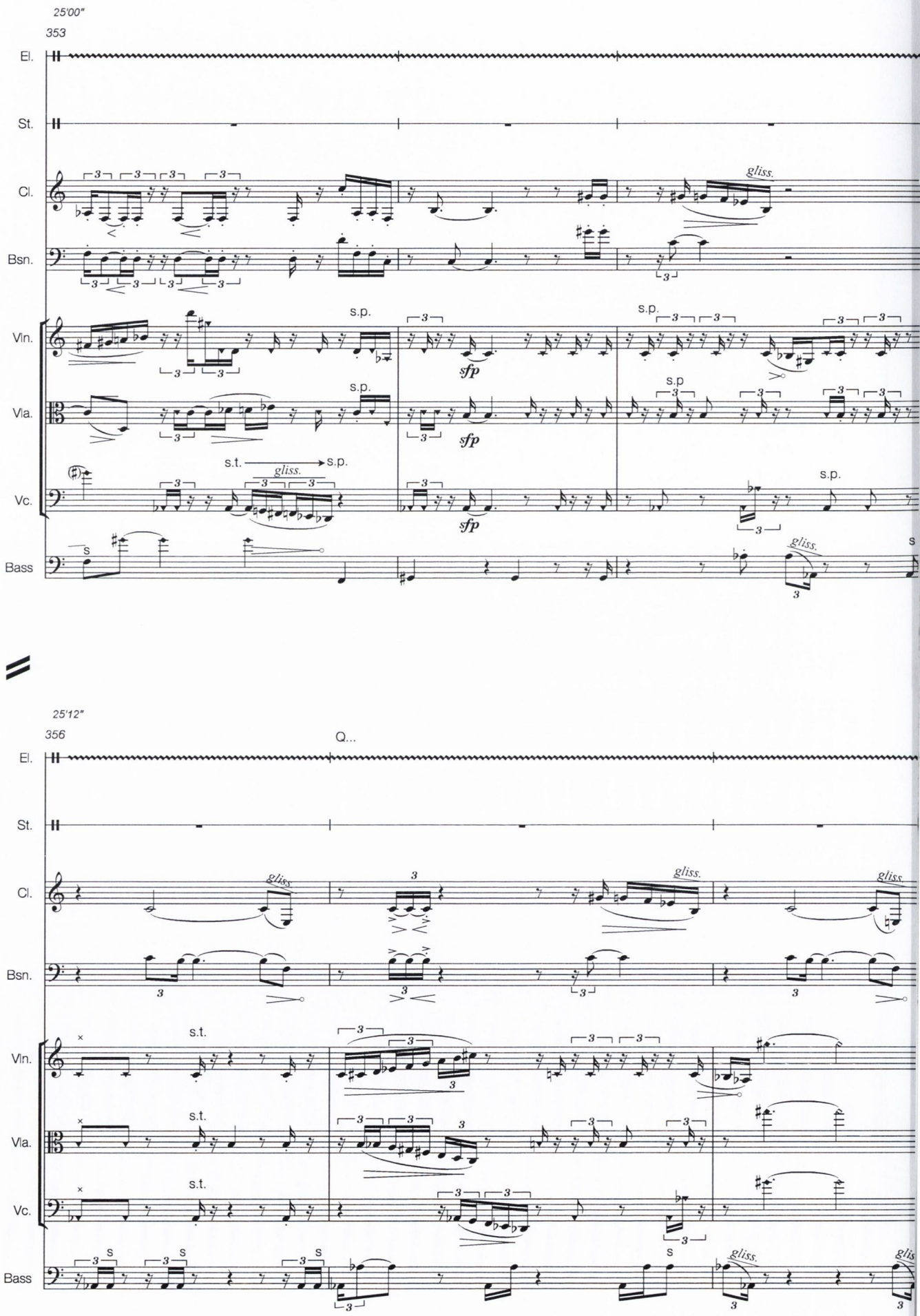

23'27"
325
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
23'41"
330
everyone exits except for one child and one old person
13
B
stage floor only; side change
El.
SCENE WITHOUT INSTRUMENTAL MUSIC

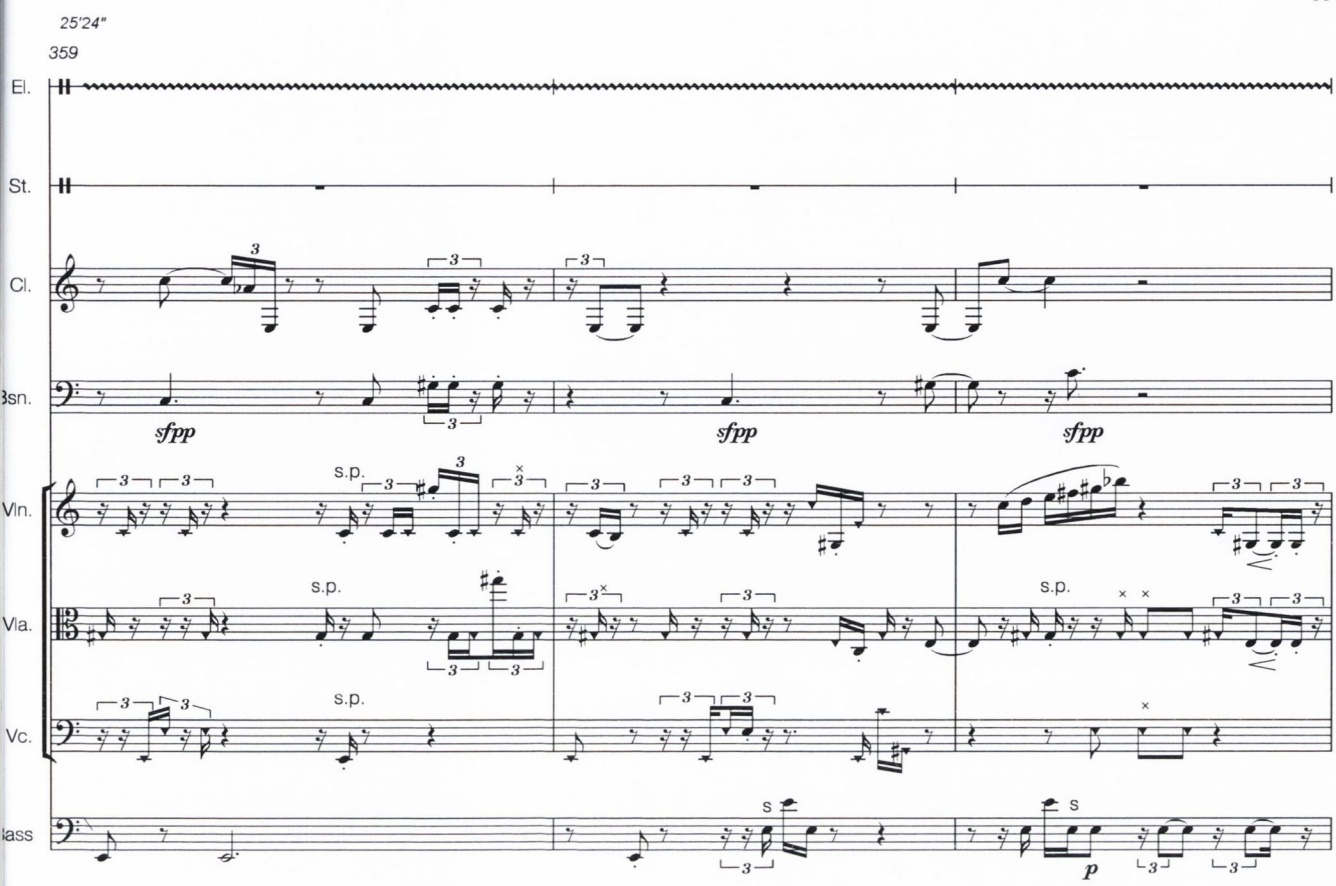

23'52"
334
14
/B
El.
Gl.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p

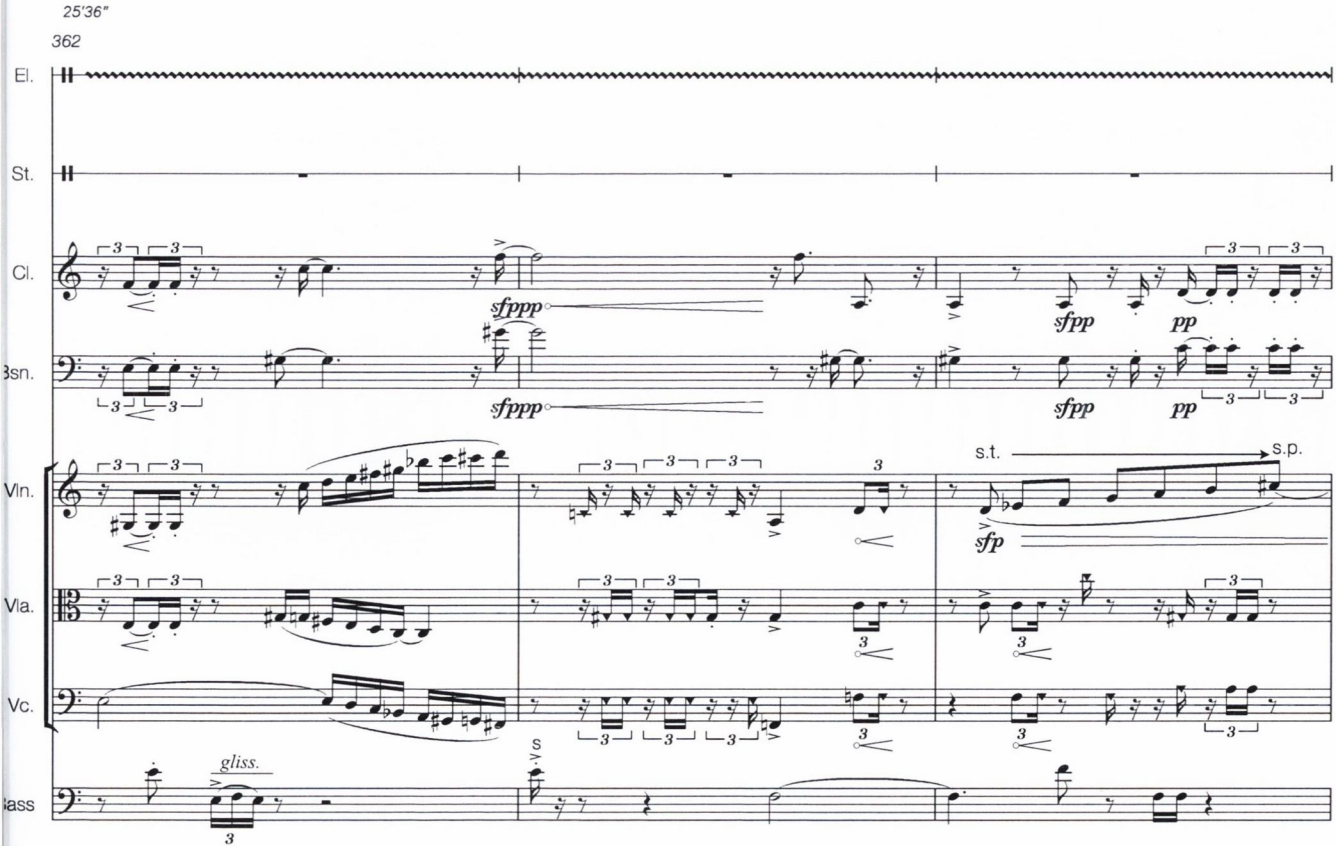

♩ = 60
24'16"
342
the old people clean up the shards
the children look through the gauze
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp
sfppp
pp
sfpp
s.p.
sf

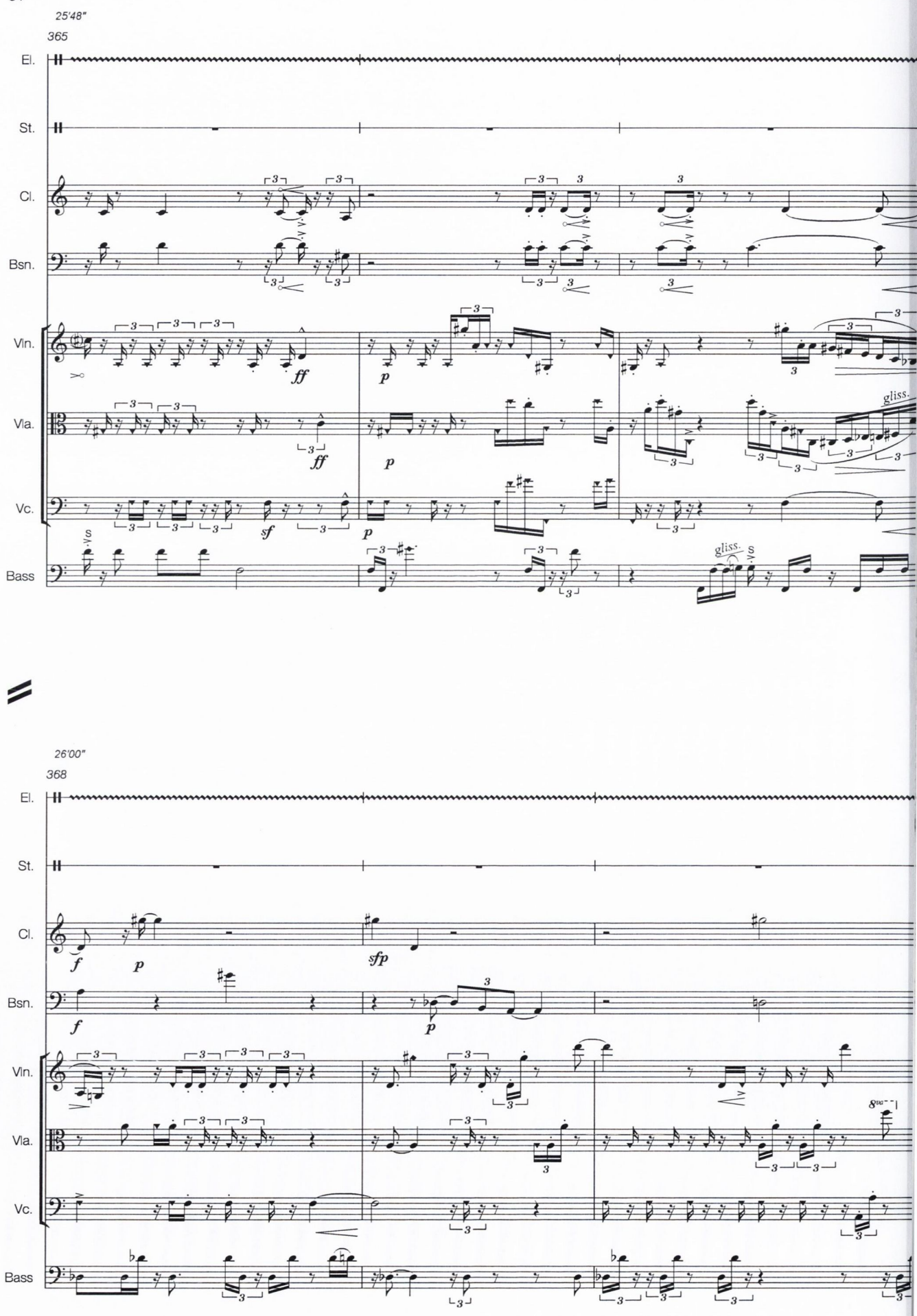

24'32"
346
W
El.
St.
falling shards: quantize
Cl.
Bsn.
port.
Vln.
Vla.
Vc.
Bass
s.p.

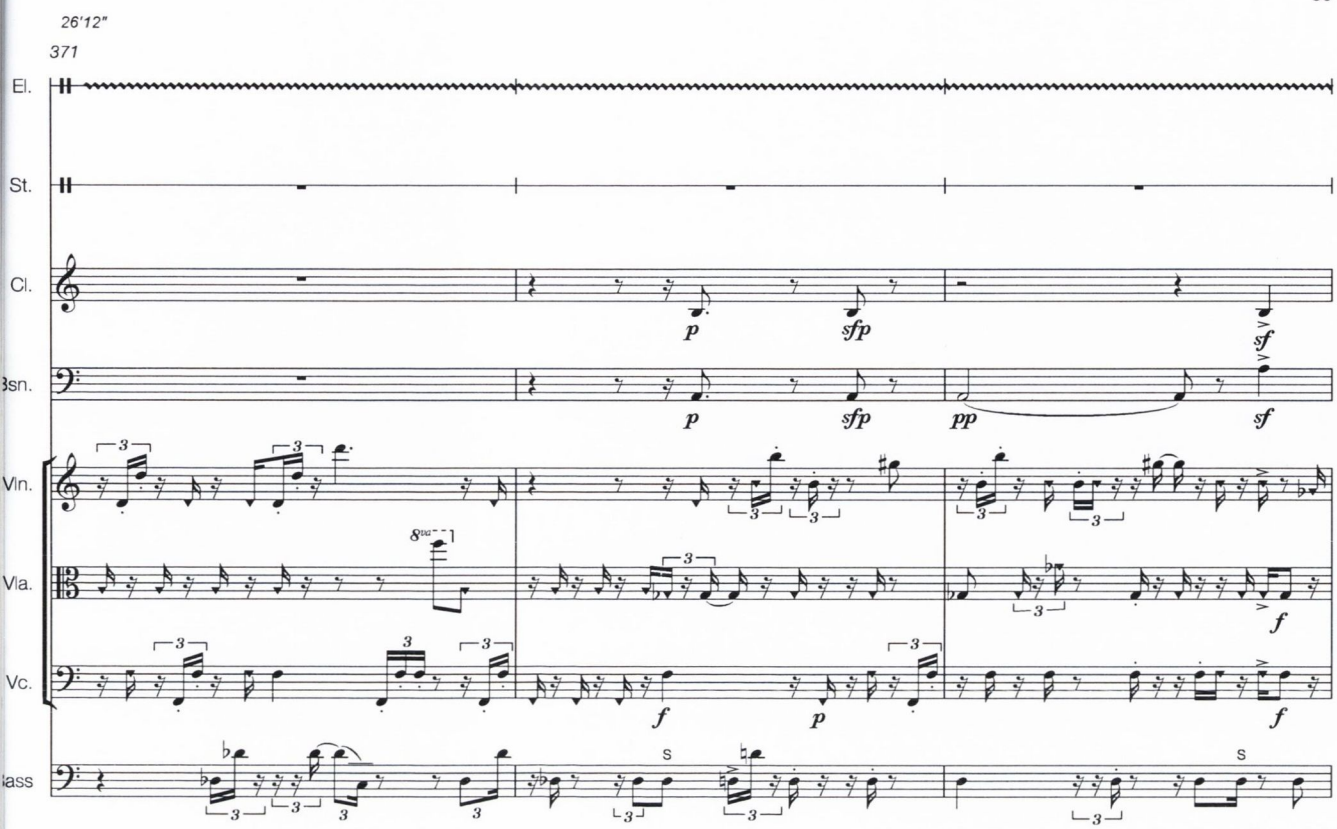

24'48"
350
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.t.
s.p.
gliss.

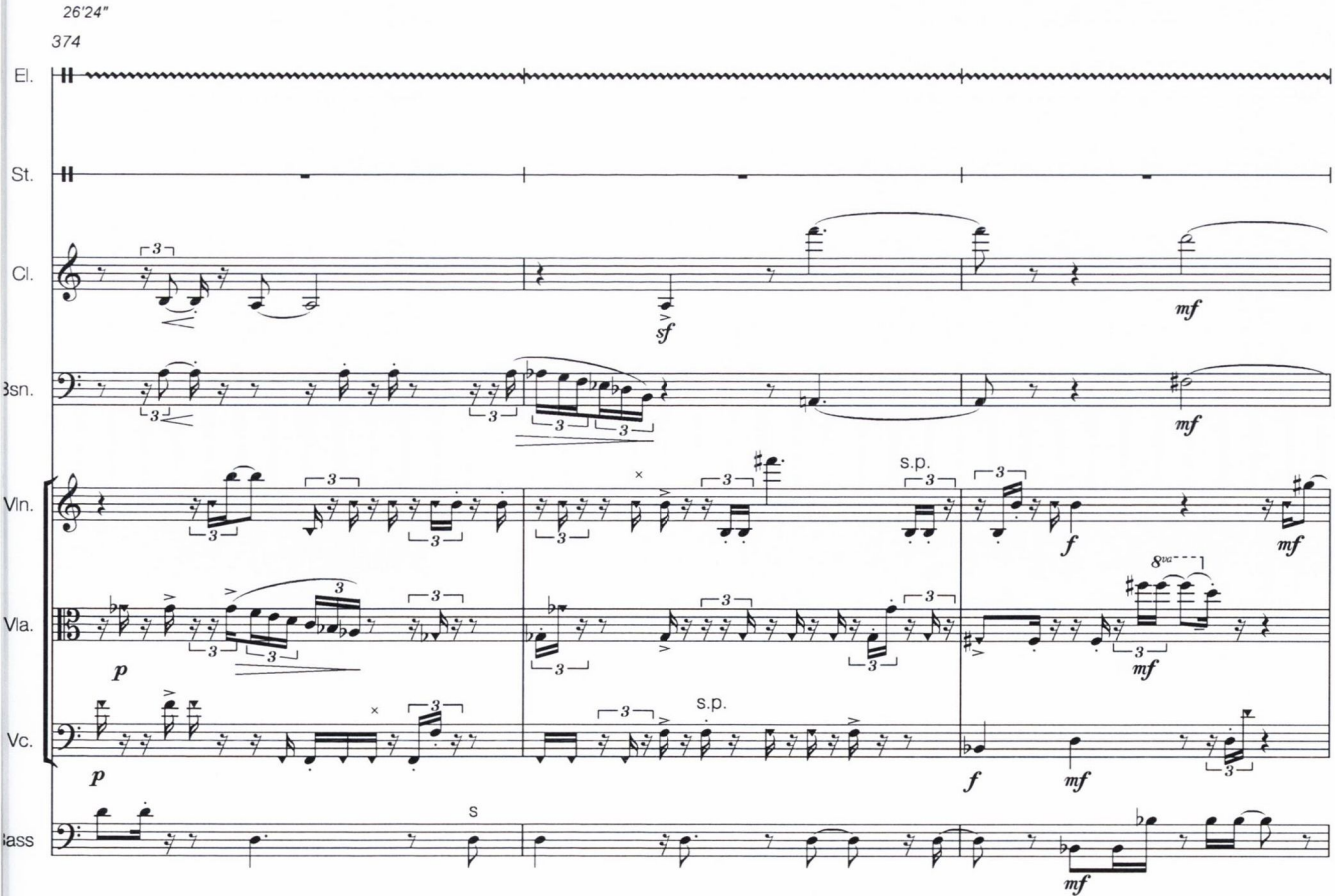

25'00"
353
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.
s.p.
sfp
s.t.
s.p.
s
25'12"
356
Q...
s.t.

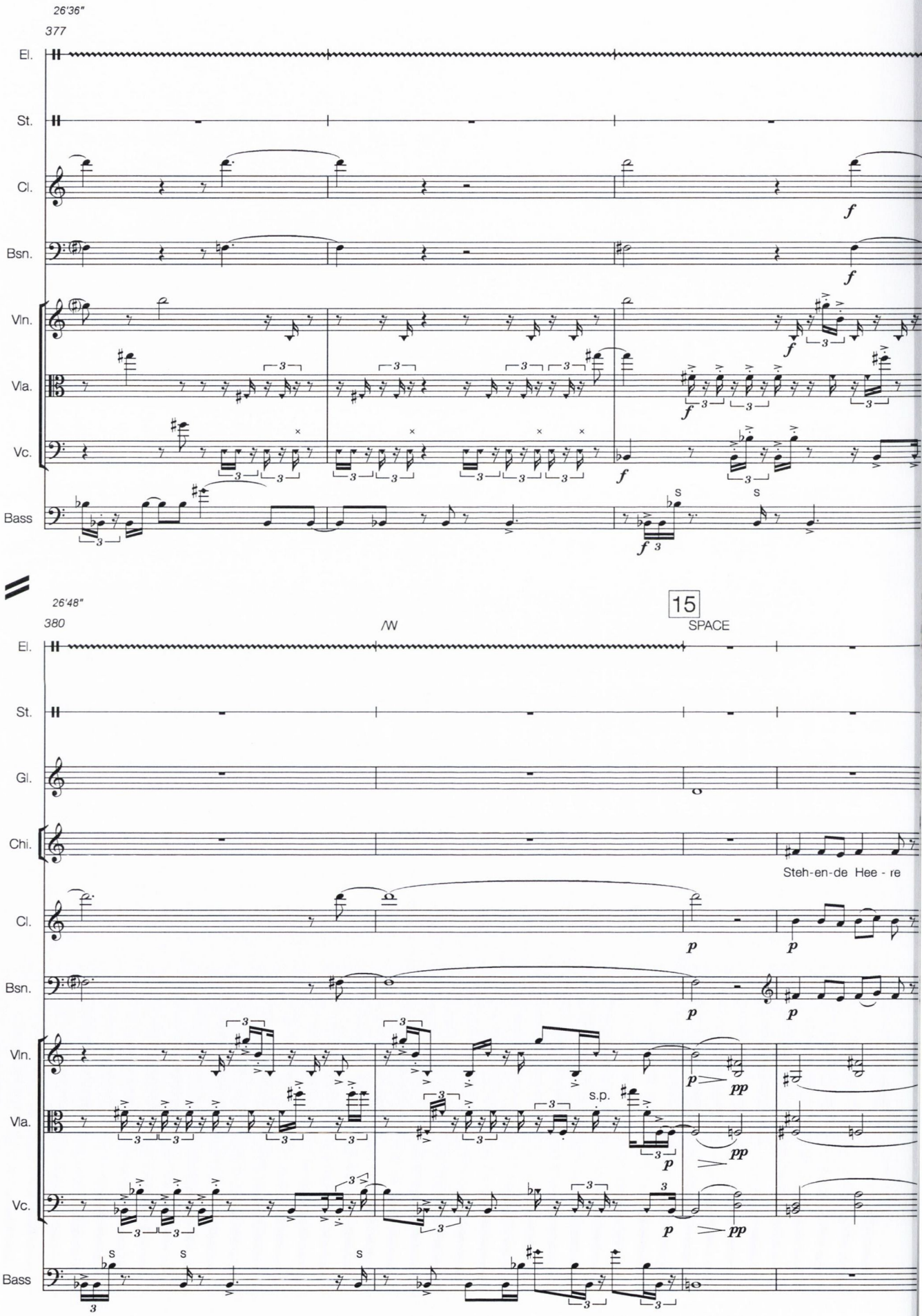

25'24"
359
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
sfpp
sfpp
s.p.
s.p.
s.p.
s
s
p

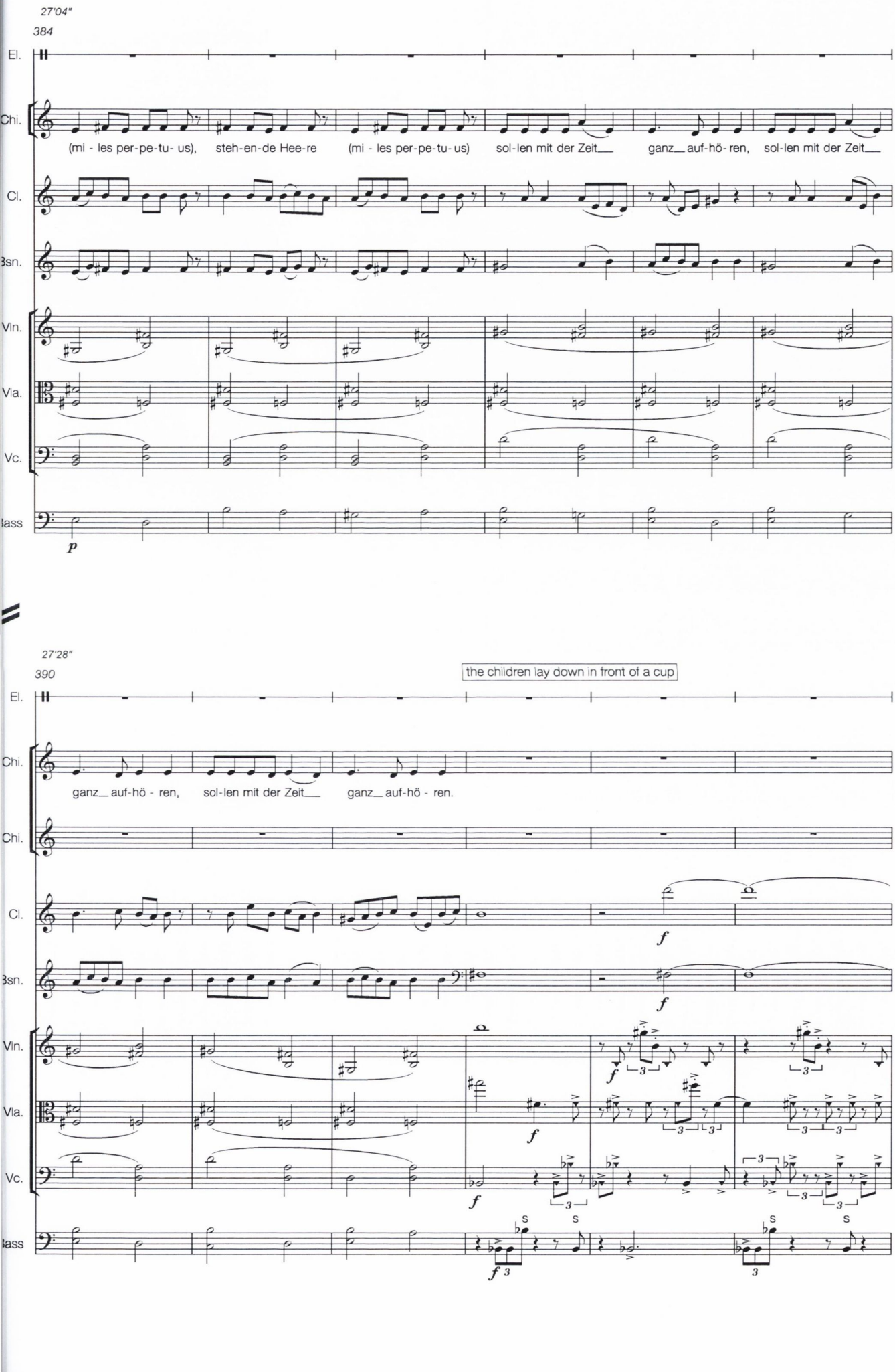

25'36"
362
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfppp
sfppp
sfpp
sfpp
pp
pp
s.t.
s.p.
sfp
gliss.
s

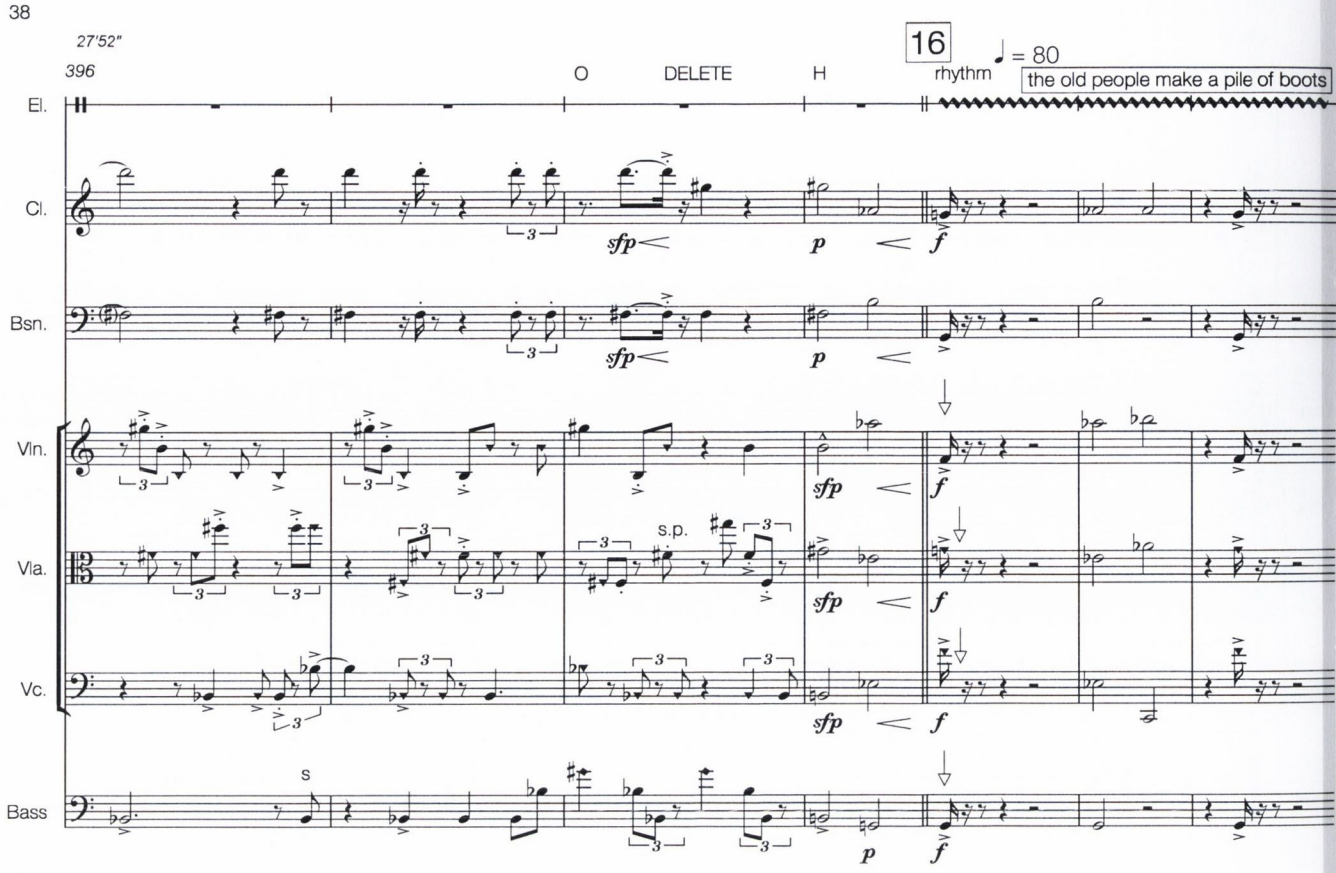

25'48"
365
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ff
p
sf
gliss.
26'00"
368
sfp
8va

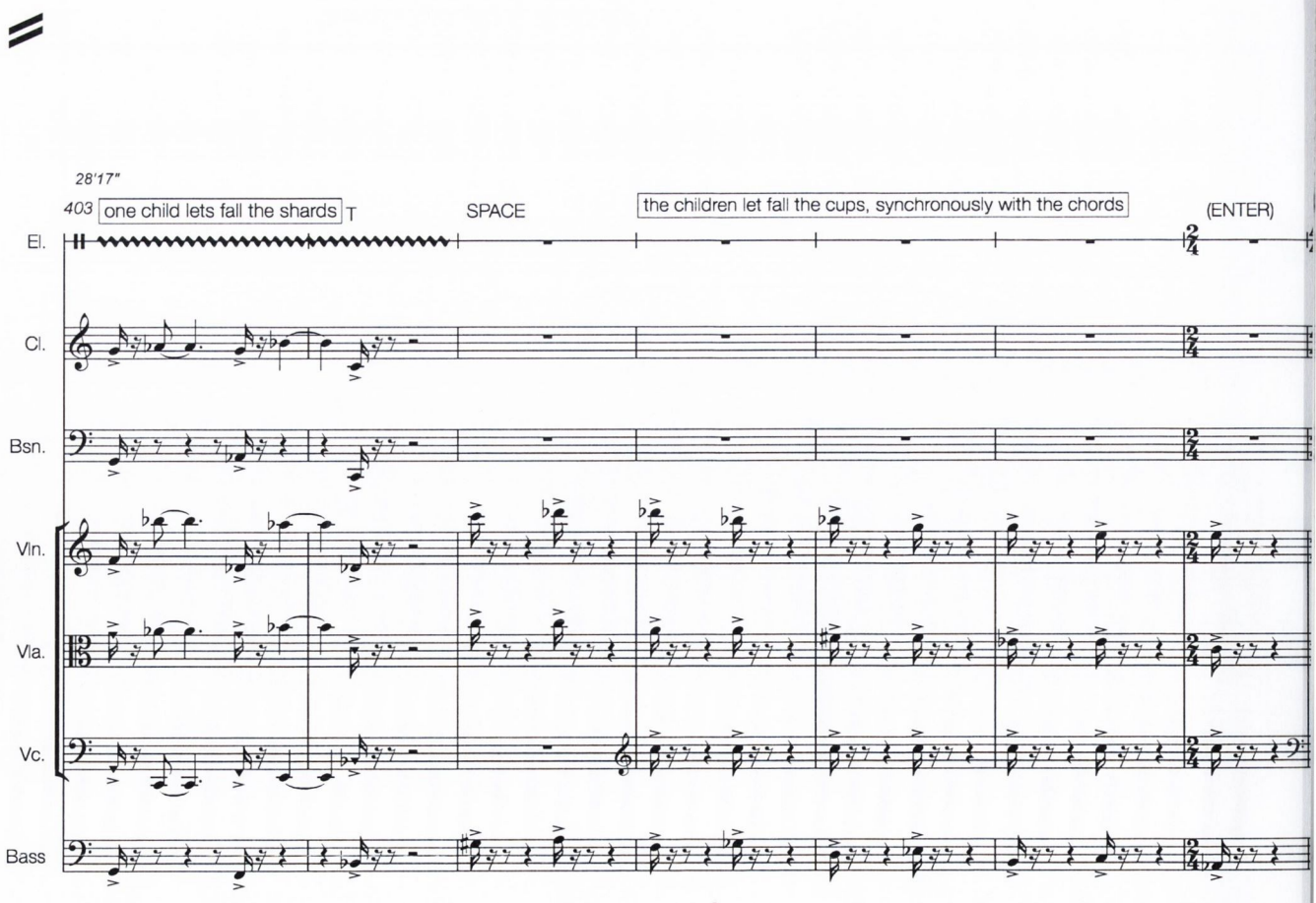

26'12"
371
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
sfp
sf
pp
f
mf
8va
3
s

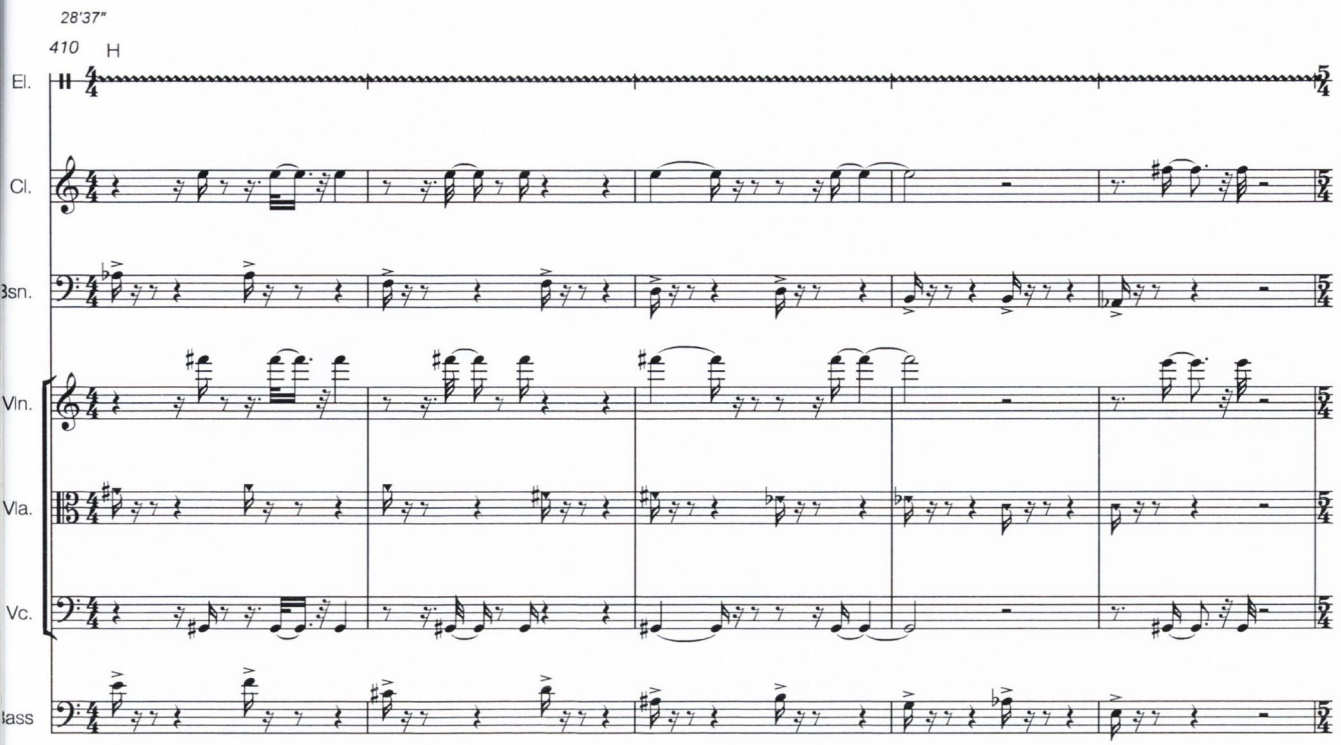

26'24"
374
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
sf
f
mf
s.p.
8va
3
s

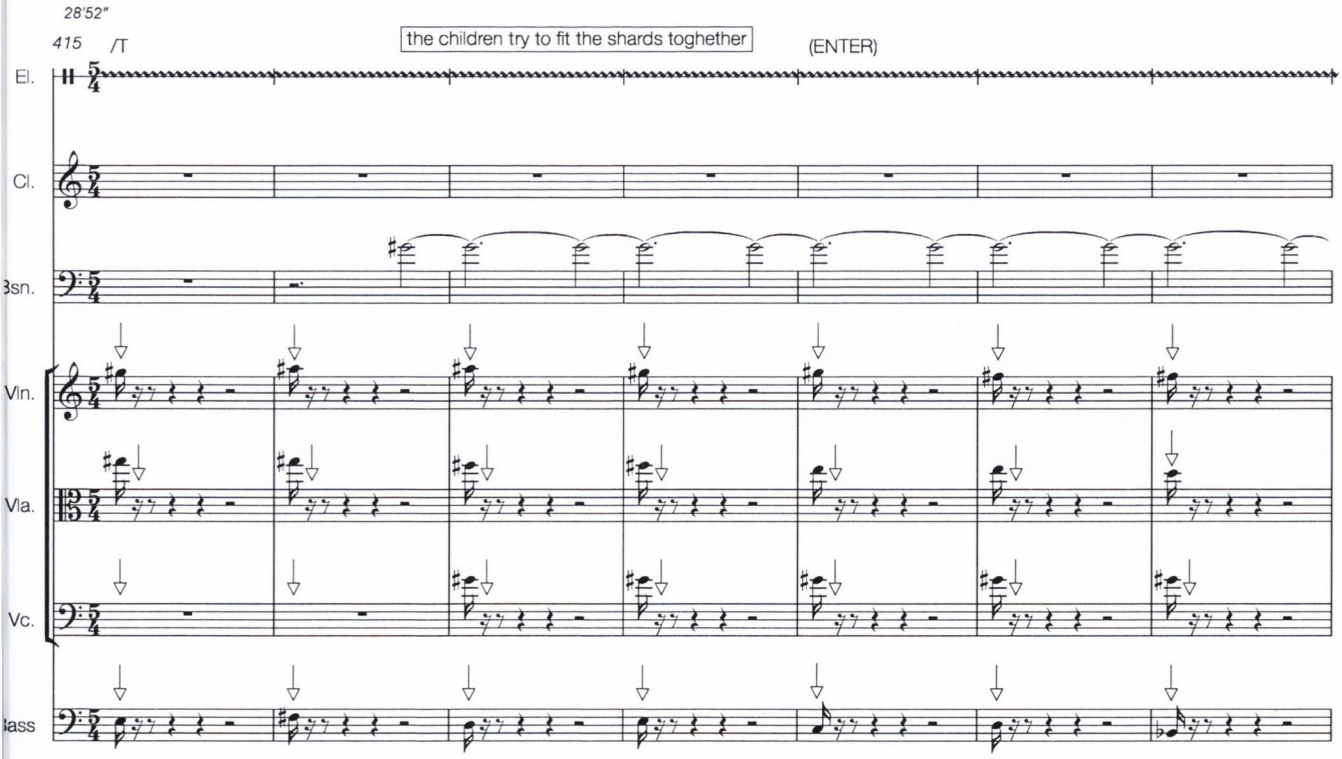

26'36"
377
El.
St.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f
26'48"
380
/W
15
SPACE
Gl.
Chi.
Steh-en-de Hee - re
p
pp
s.p.
s

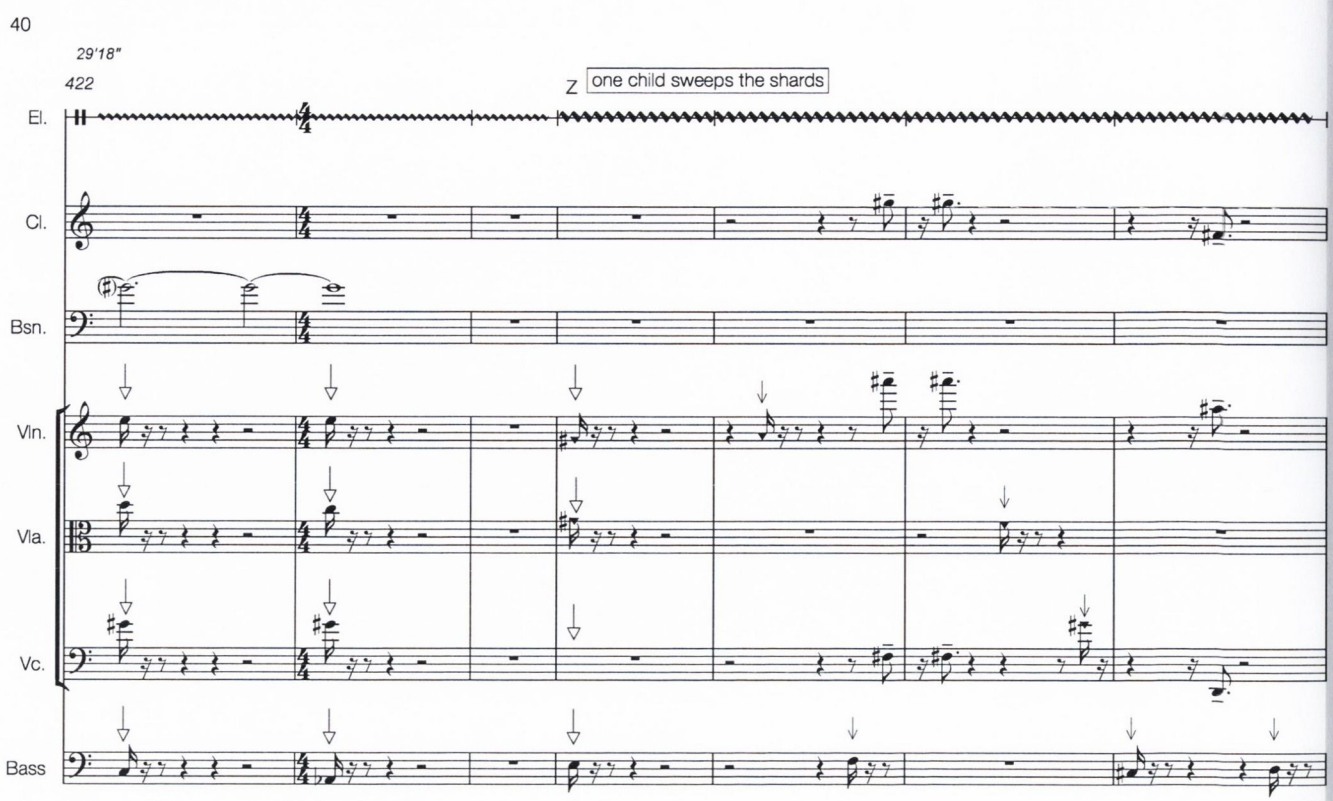

27'04"
384
El.
Chi.
(mi - les per-pe-tu- us), steh-en-de Hee-re (mi - les per-pe-tu- us) sol-len mit der Zeit ganz auf-hö- ren, sol-len mit der Zeit
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
27'28"
390
the children lay down in front of a cup
El.
Chi.
ganz auf-hö - ren, sol-len mit der Zeit ganz auf-hö - ren.
Chi.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f
S
3

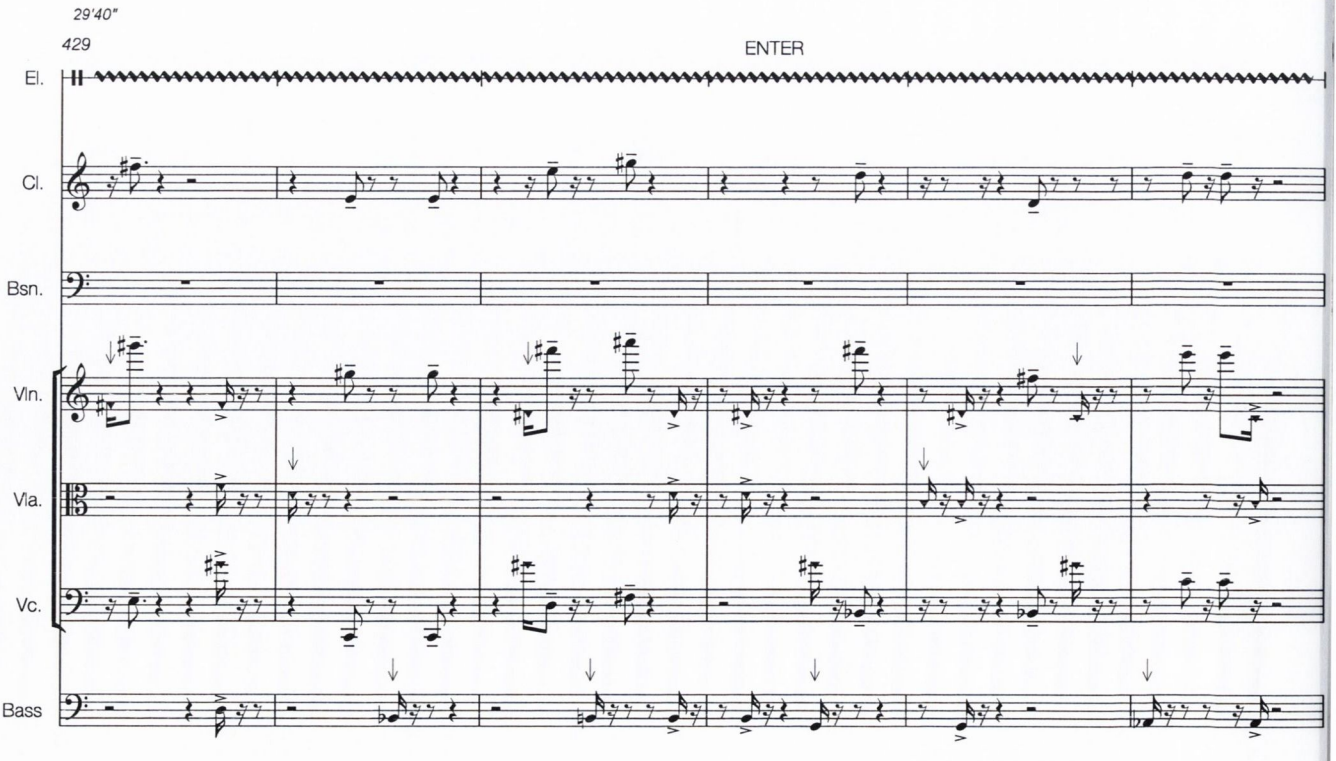

27'52"
396
O
DELETE
H
16
rhythm
♩ = 80
the old people make a pile of boots
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfp
p
f
s.p.
s

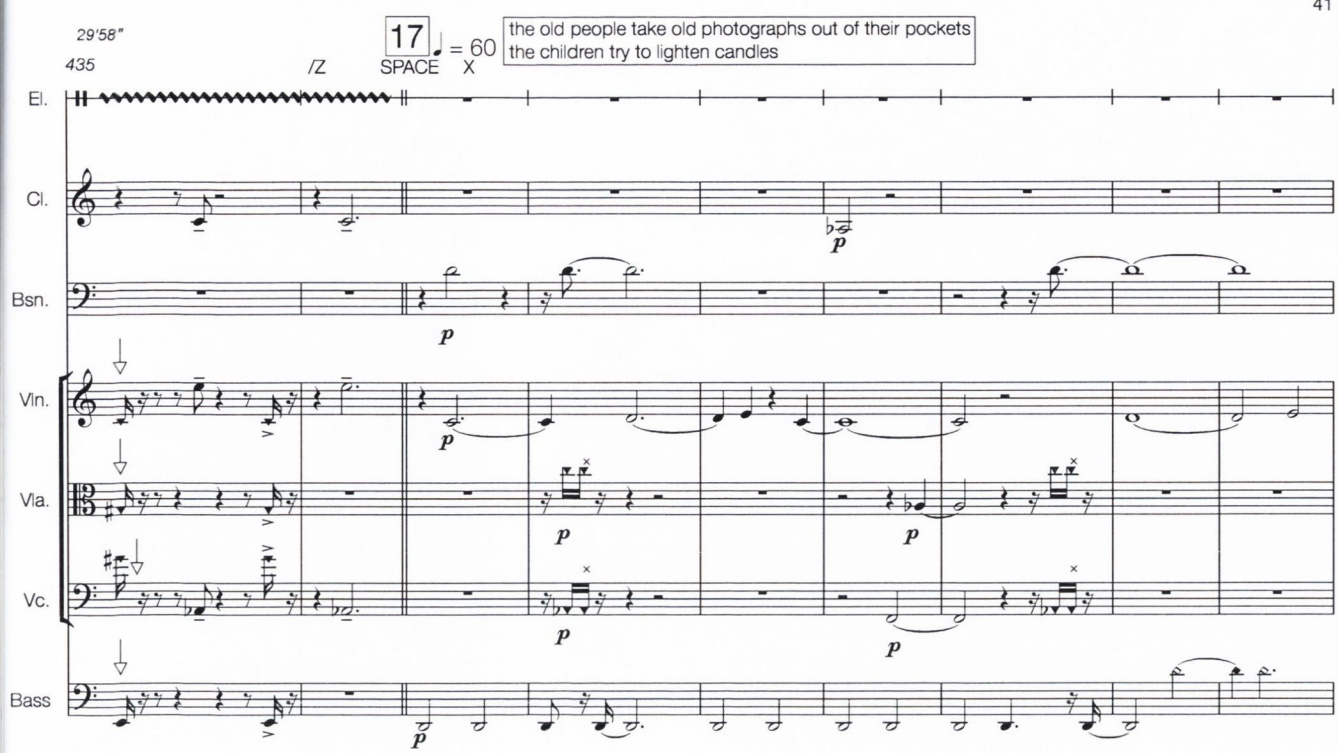

28'17"
403
one child lets fall the shards
T
SPACE
the children let fall the cups, synchronously with the chords
(ENTER)
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

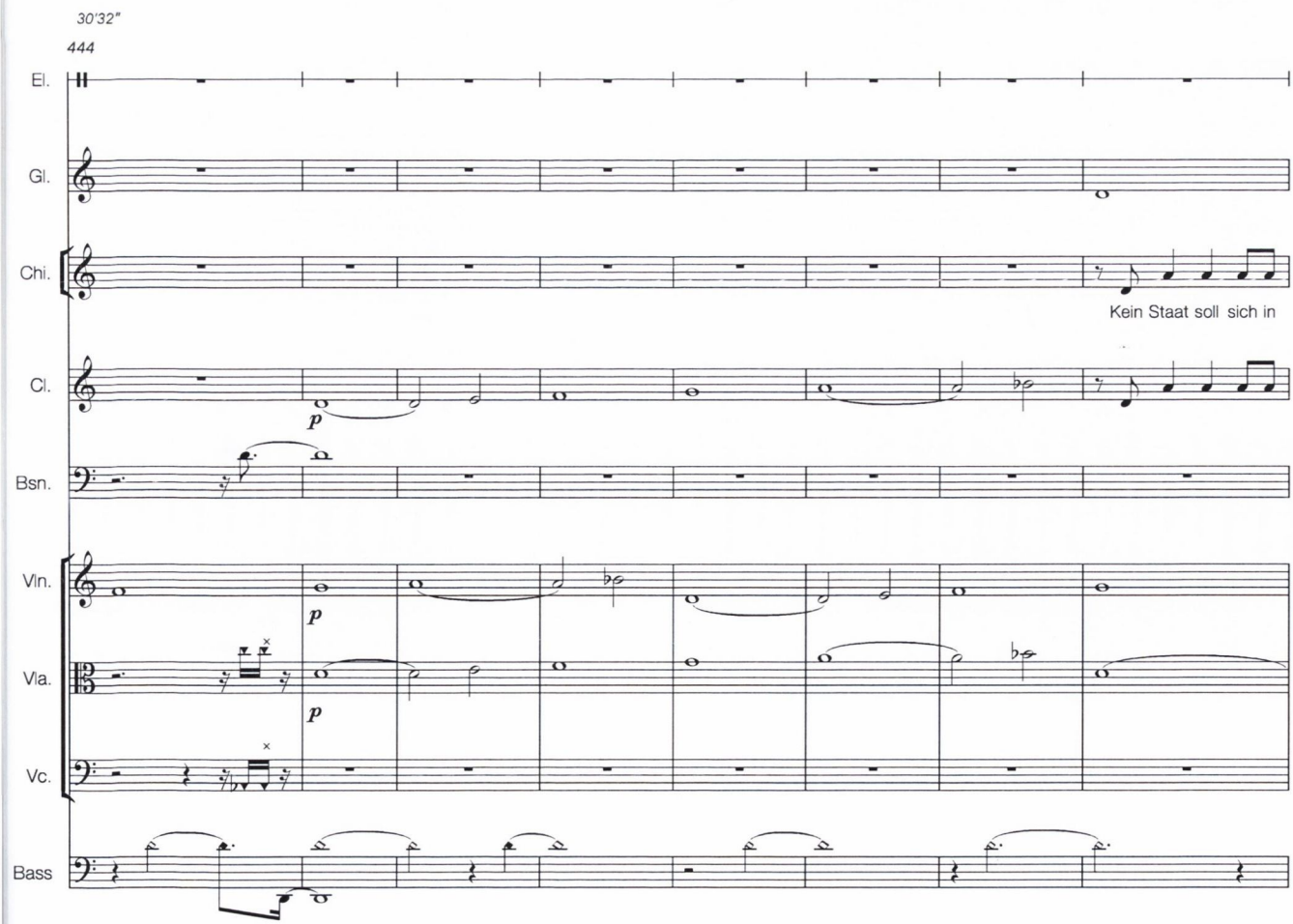

28'37"
410
H
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

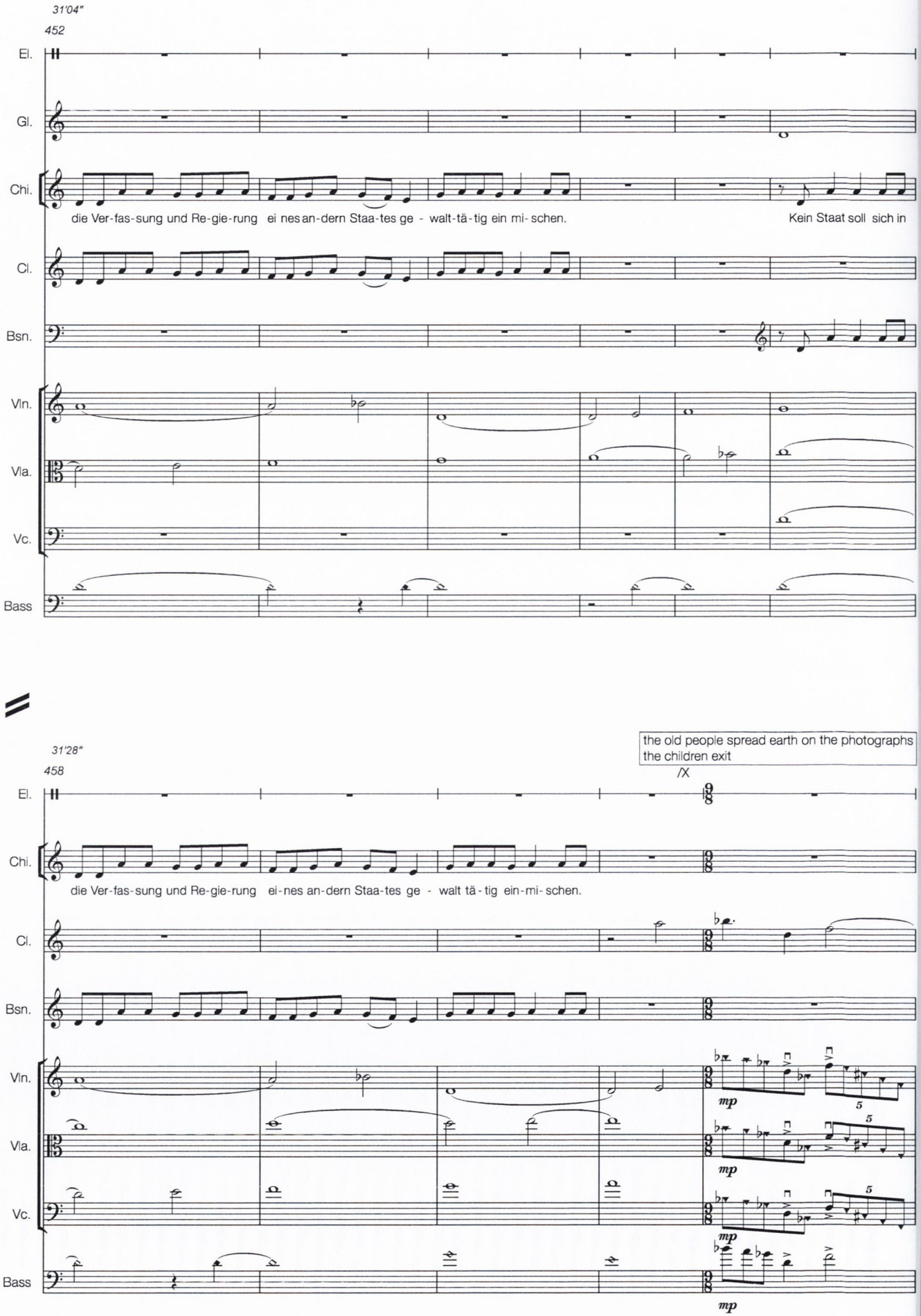

28'52"
415
/T
the children try to fit the shards toghether
(ENTER)
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

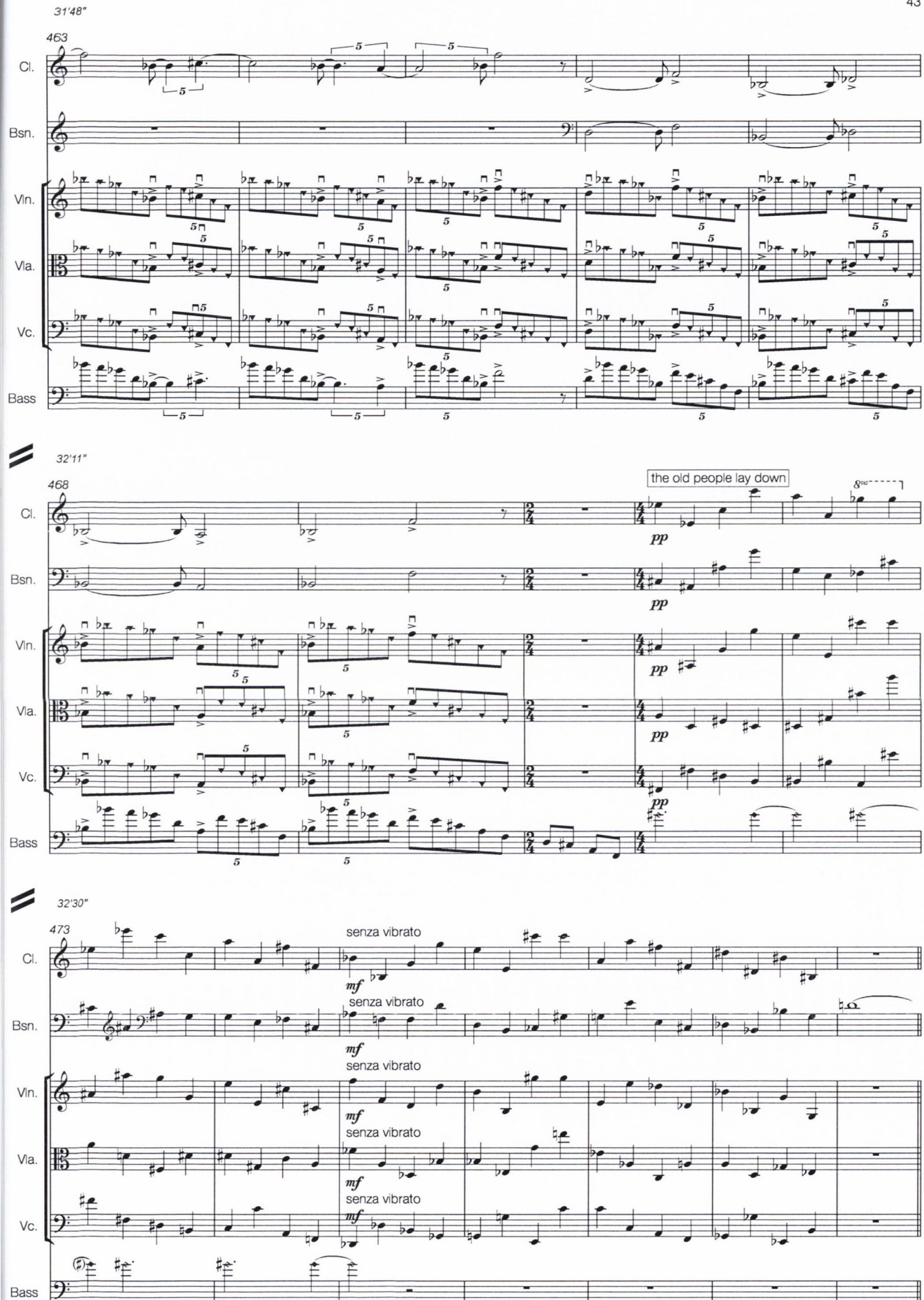

29'18"
422
Z
one child sweeps the shards
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

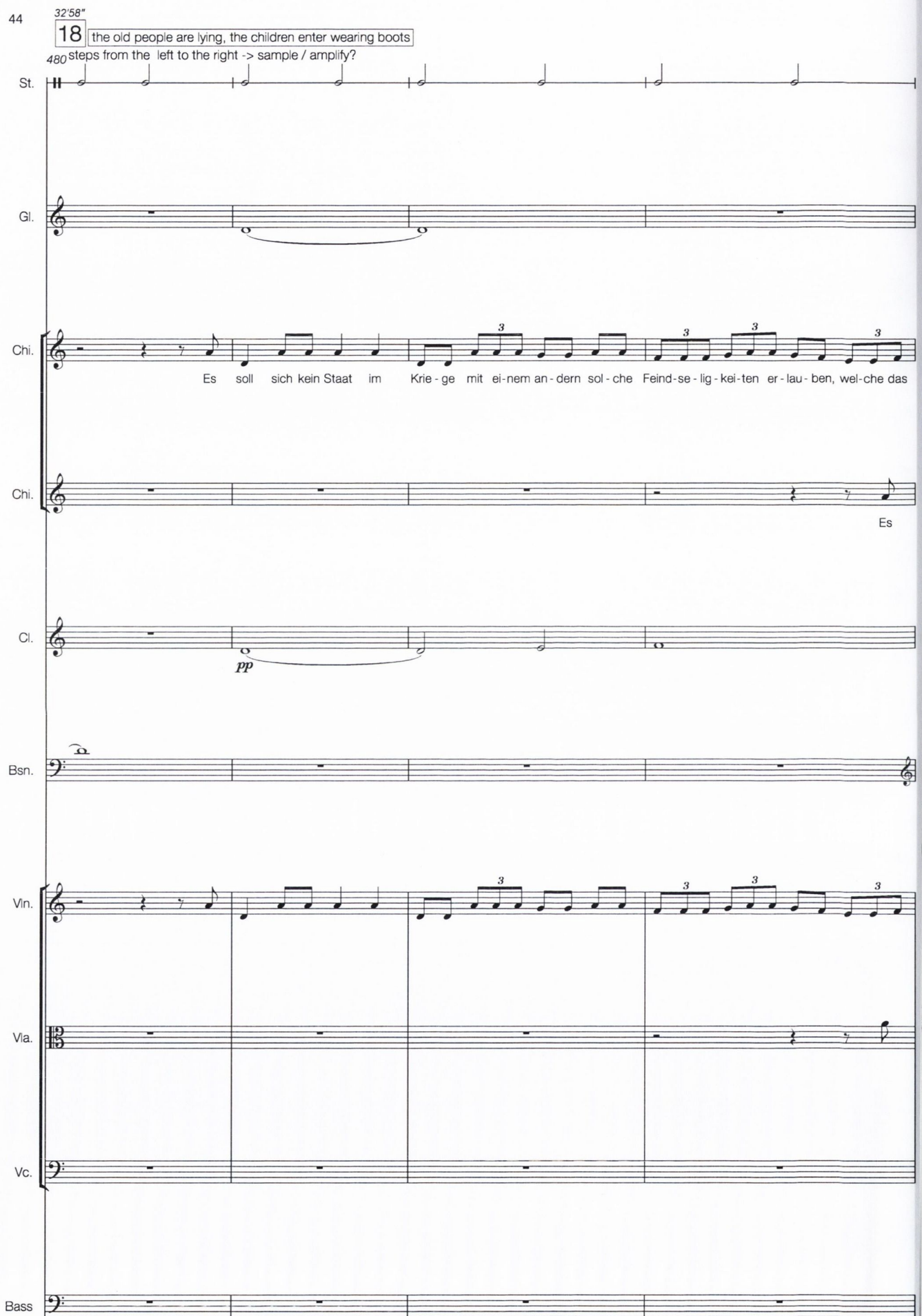

29'40"
429
ENTER
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

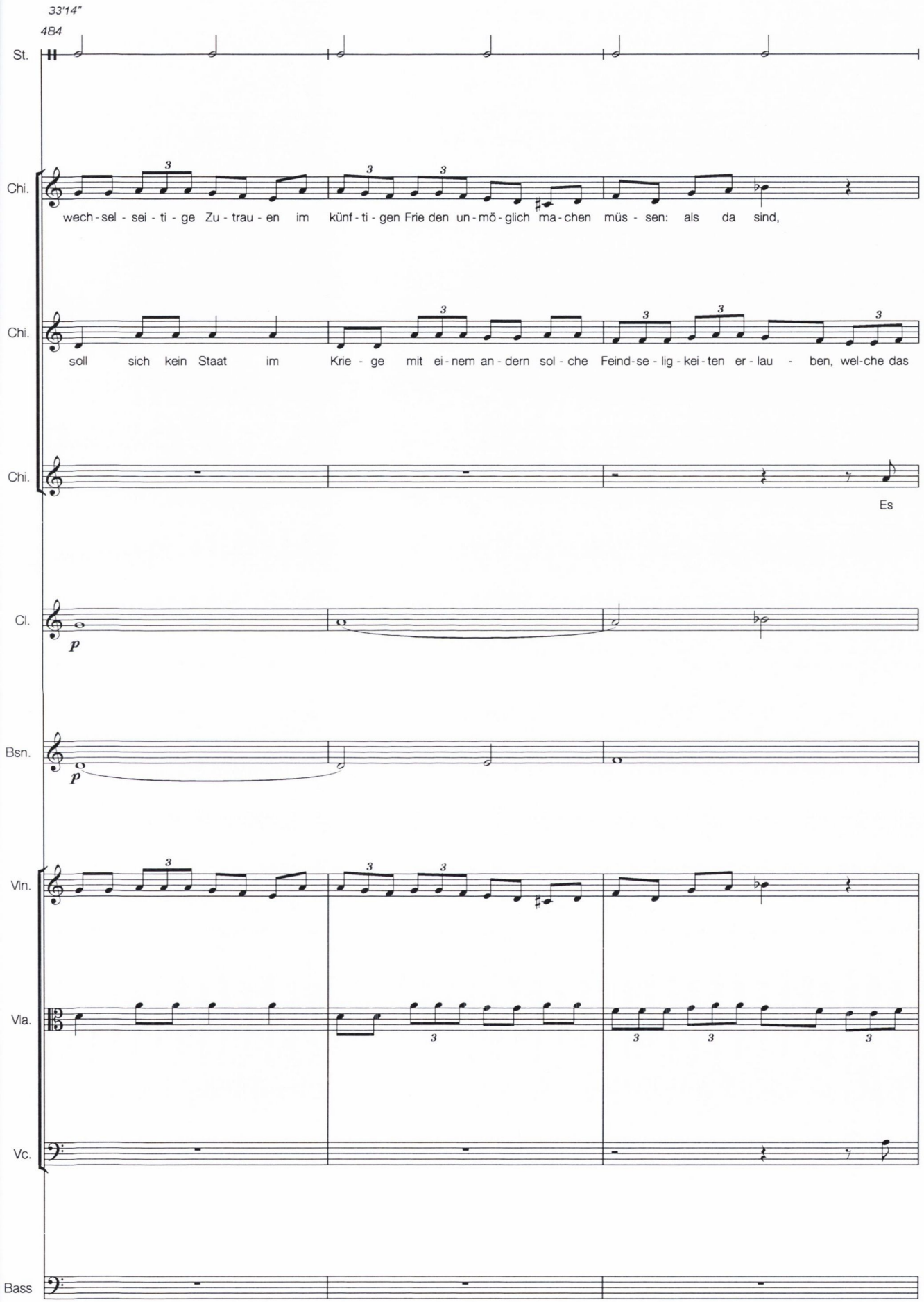

29'58"
435
/Z
17
SPACE
♩ = 60
X
the old people take old photographs out of their pockets
the children try to lighten candles
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p

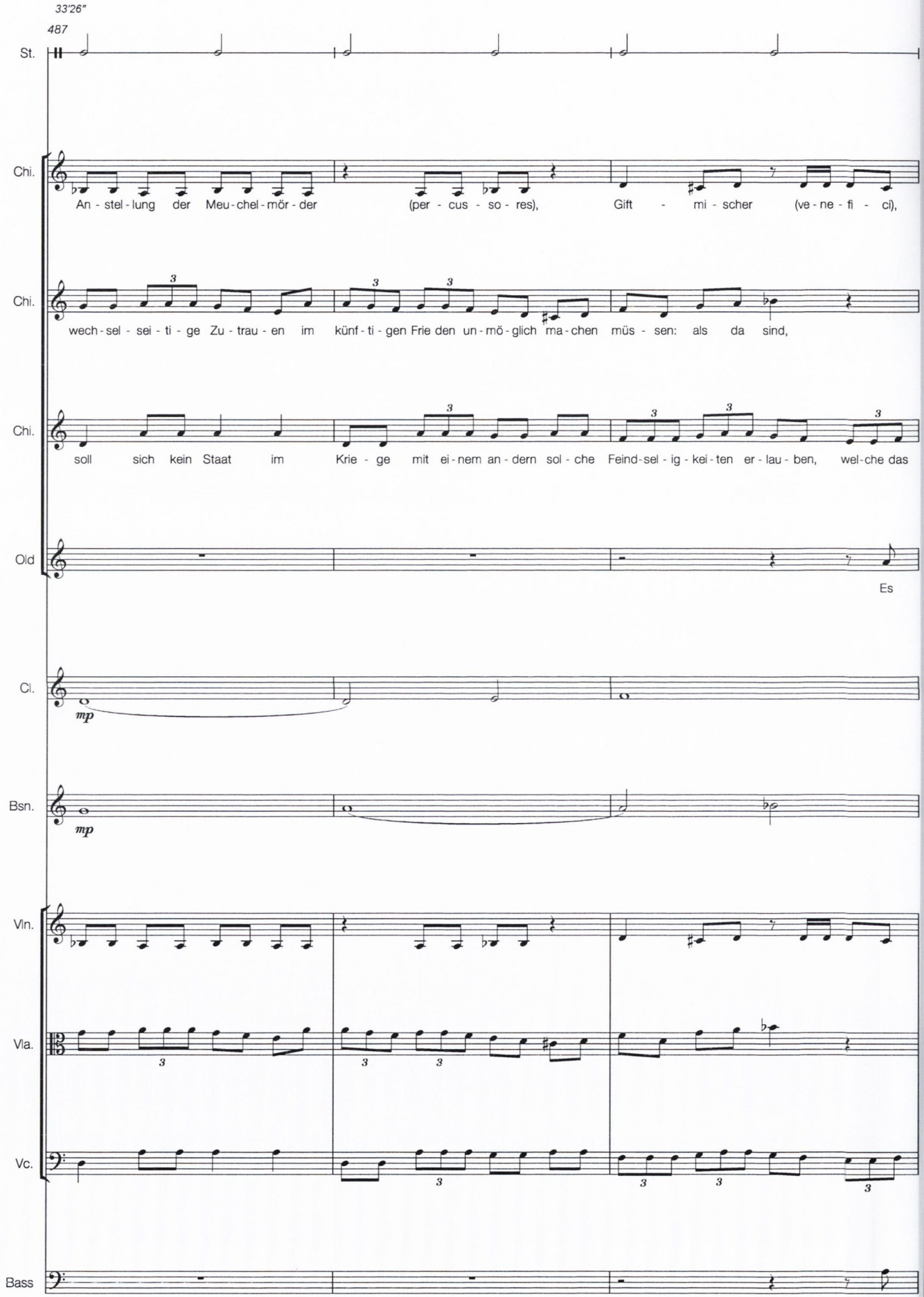

30'32"
444
El.
Gl.
Chi.
Kein Staat soll sich in
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p

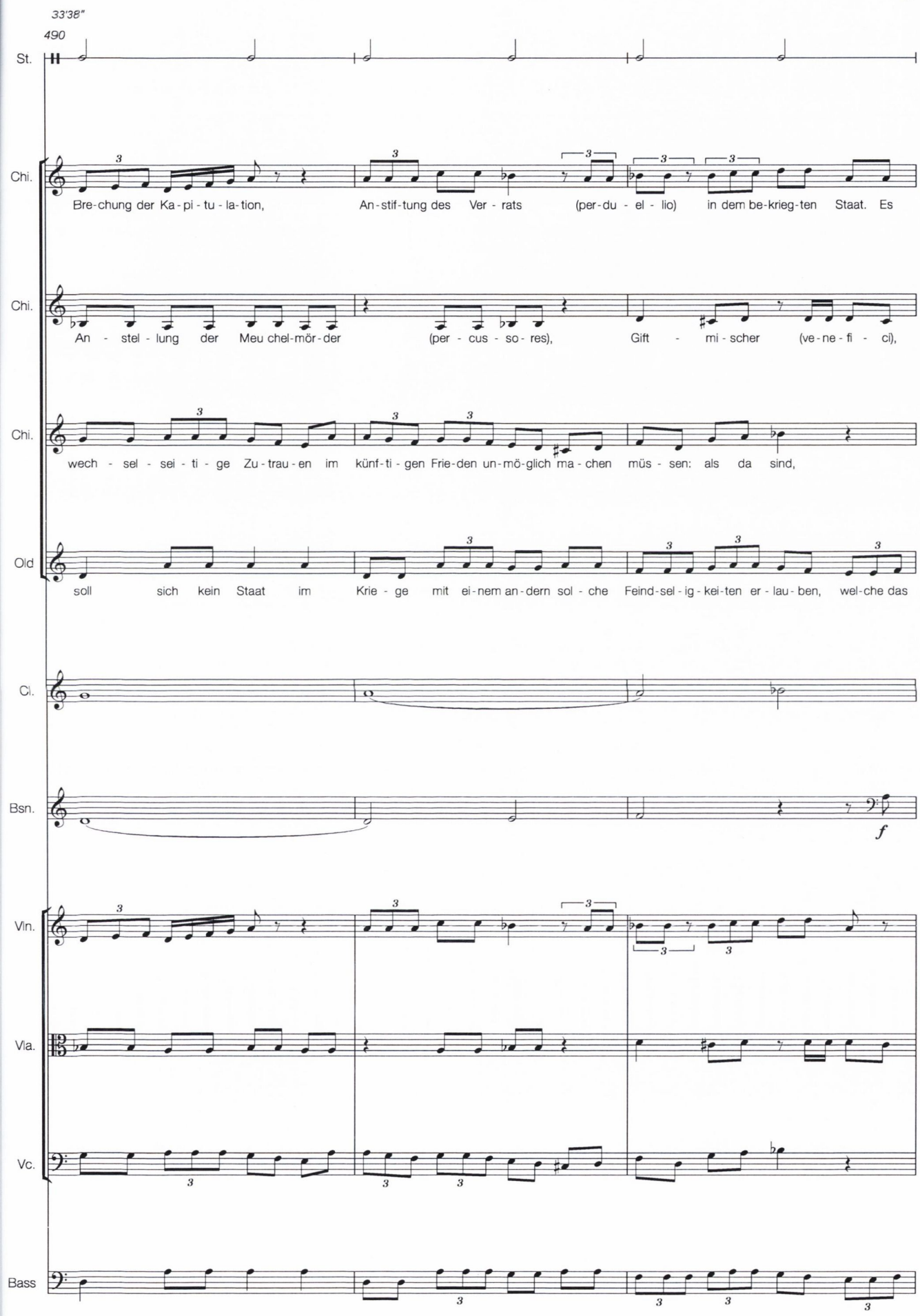

31'04"
452
El.
Gl.
Chi.
die Ver-fas-sung und Re-gie-rung ei nes an-dern Staa-tes ge - walt-tä-tig ein mi-schen.
Kein Staat soll sich in
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
31'28"
458
the old people spread earth on the photographs
the children exit
/X
El.
Chi.
die Ver-fas-sung und Re-gie-rung ei-nes an-dern Staa-tes ge - walt tä-tig ein-mi-schen.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mp
5

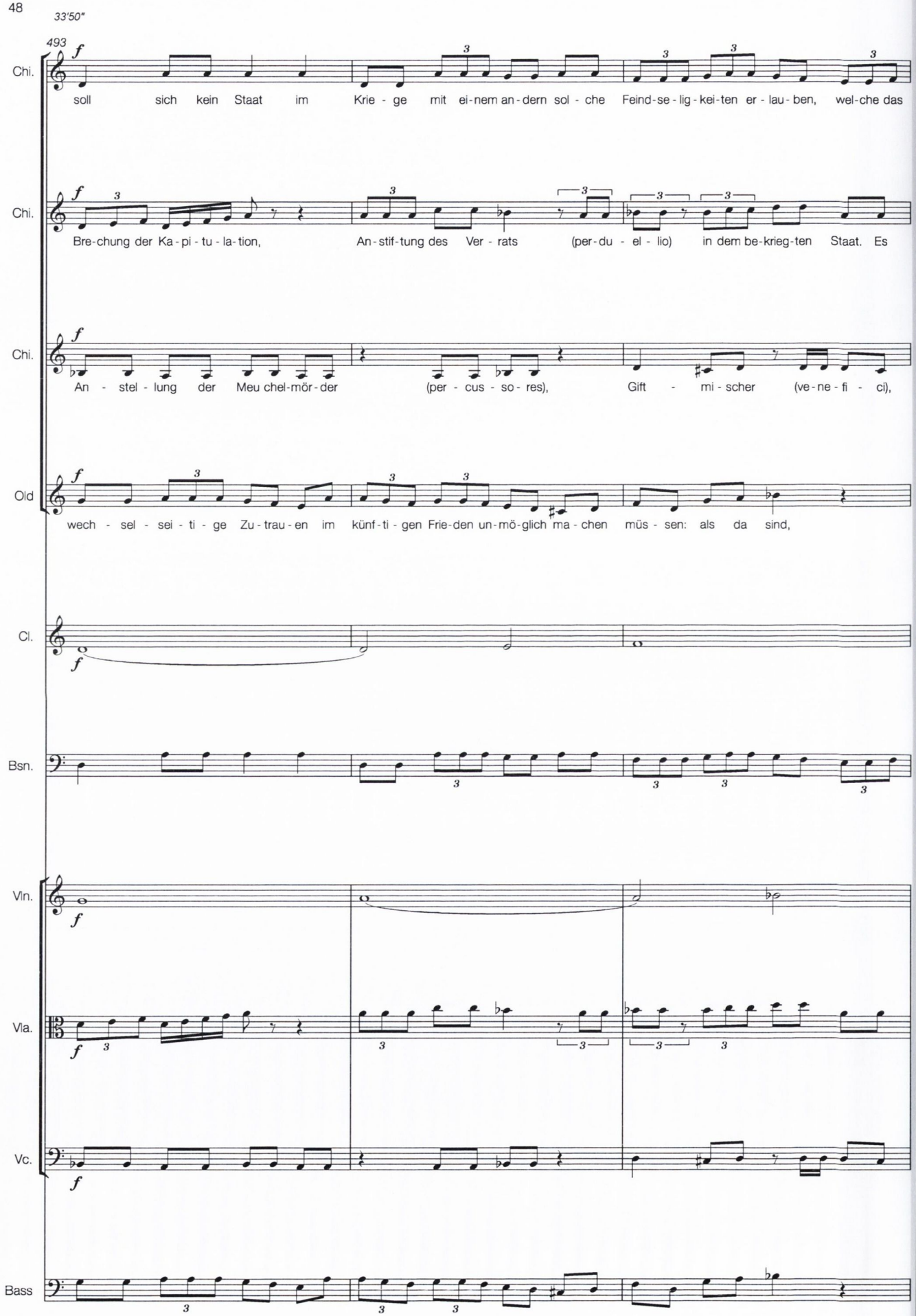

31'48"
463
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
32'11"
468
the old people lay down
pp
32'30"
473
senza vibrato
mf

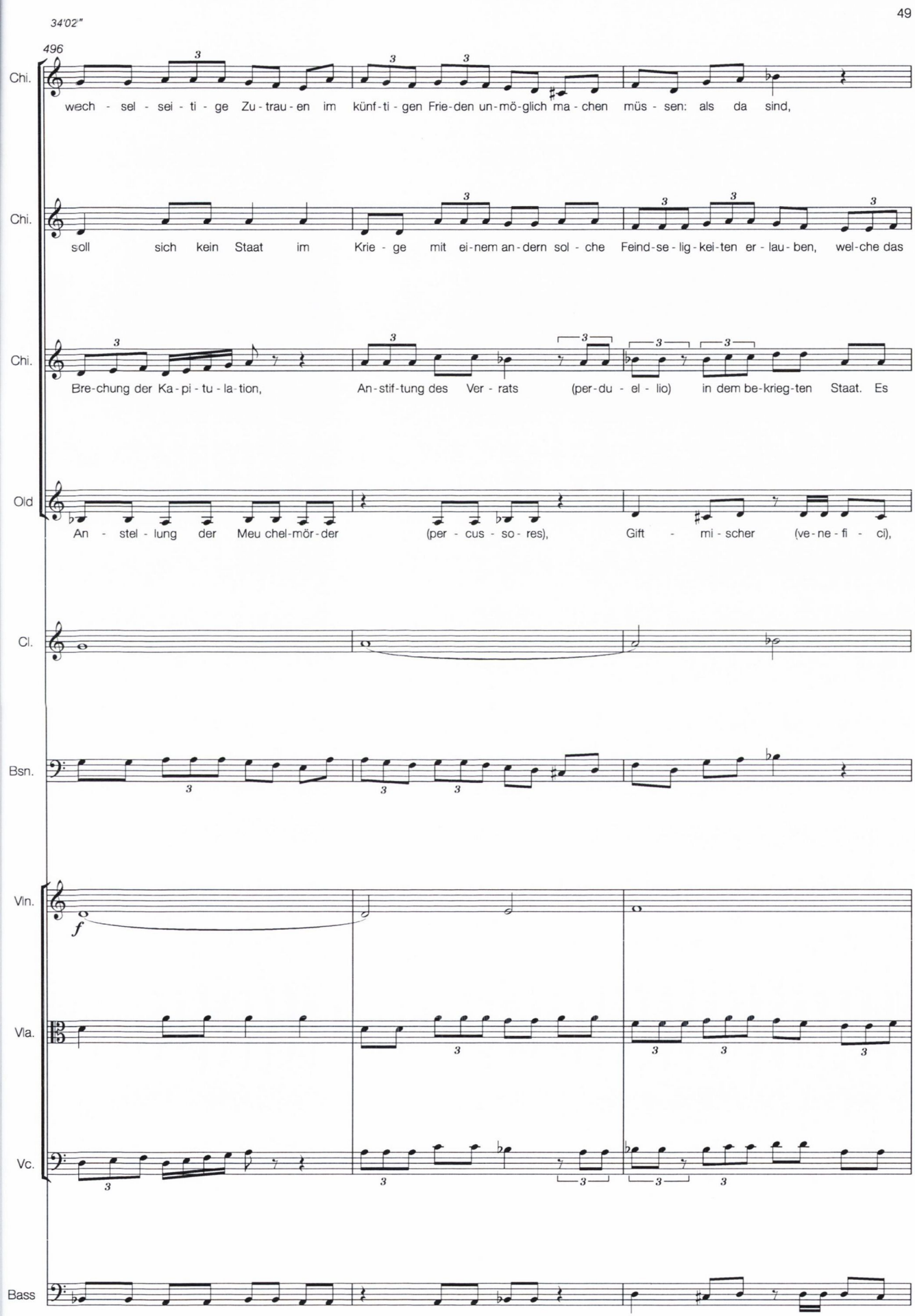

32'58"
18
the old people are lying, the children enter wearing boots
480 steps from the left to the right -> sample / amplify?
St.
Gl.
Chi.
Es soll sich kein Staat im Krie - ge mit ei - nem an - dern sol - che Feind - se - lig - kei - ten er - lau - ben, wel - che das
Chi.
Es
Cl.
pp
Bsn.
Vln.
Vla.
Vc.
Bass

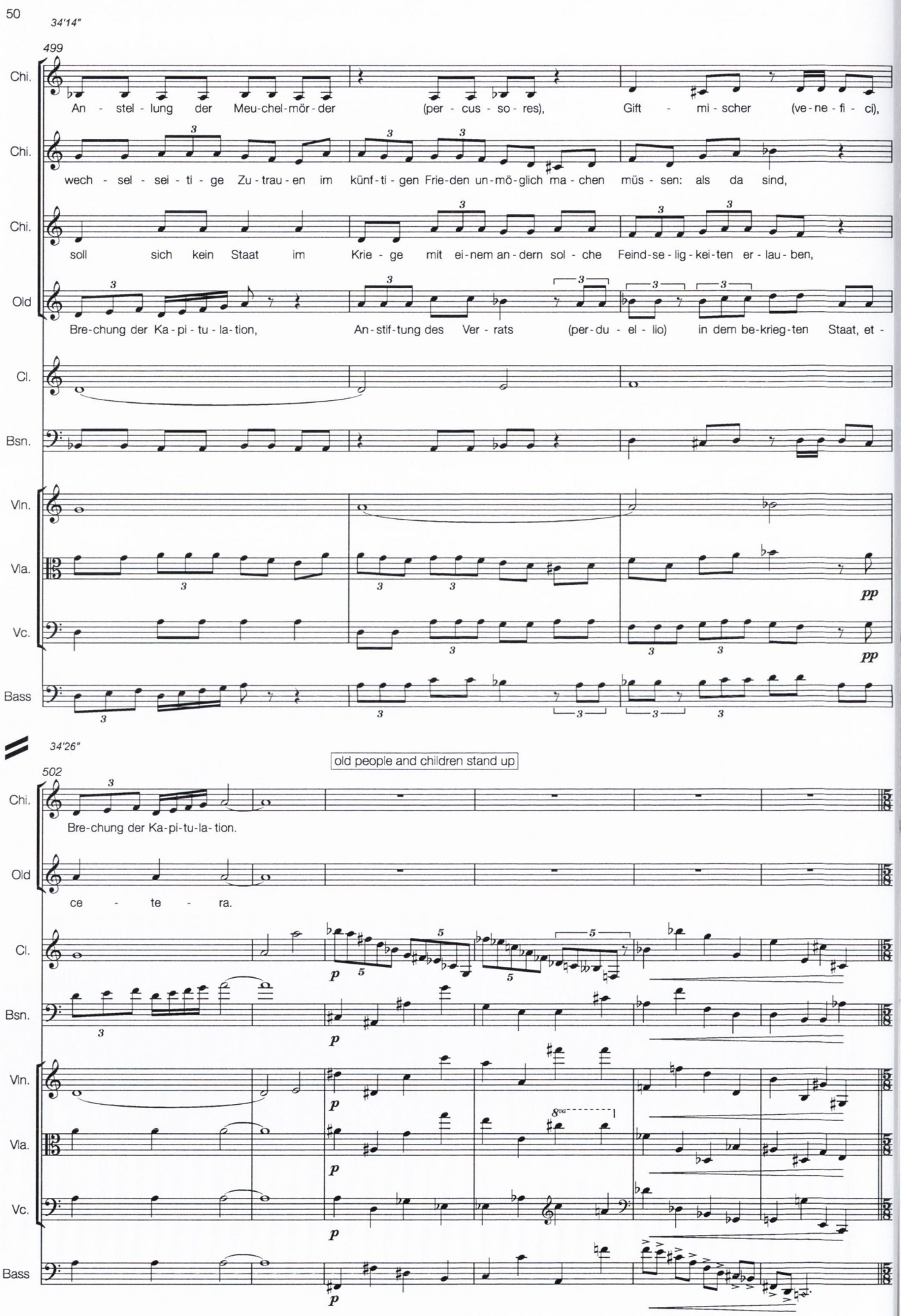

33'14"
484
St.
Chi.
wech - sel - sei - ti - ge Zu - trau - en im künf - ti - gen Frie den un - mö - glich ma - chen müs - sen: als da sind,
Chi.
soll sich kein Staat im Krie - ge mit ei - nem an - dern sol - che Feind - se - lig - kei - ten er - lau - ben, wel - che das
Chi.
Es
Cl.
p
Bsn.
p
Vln.
Vla.
Vc.
Bass

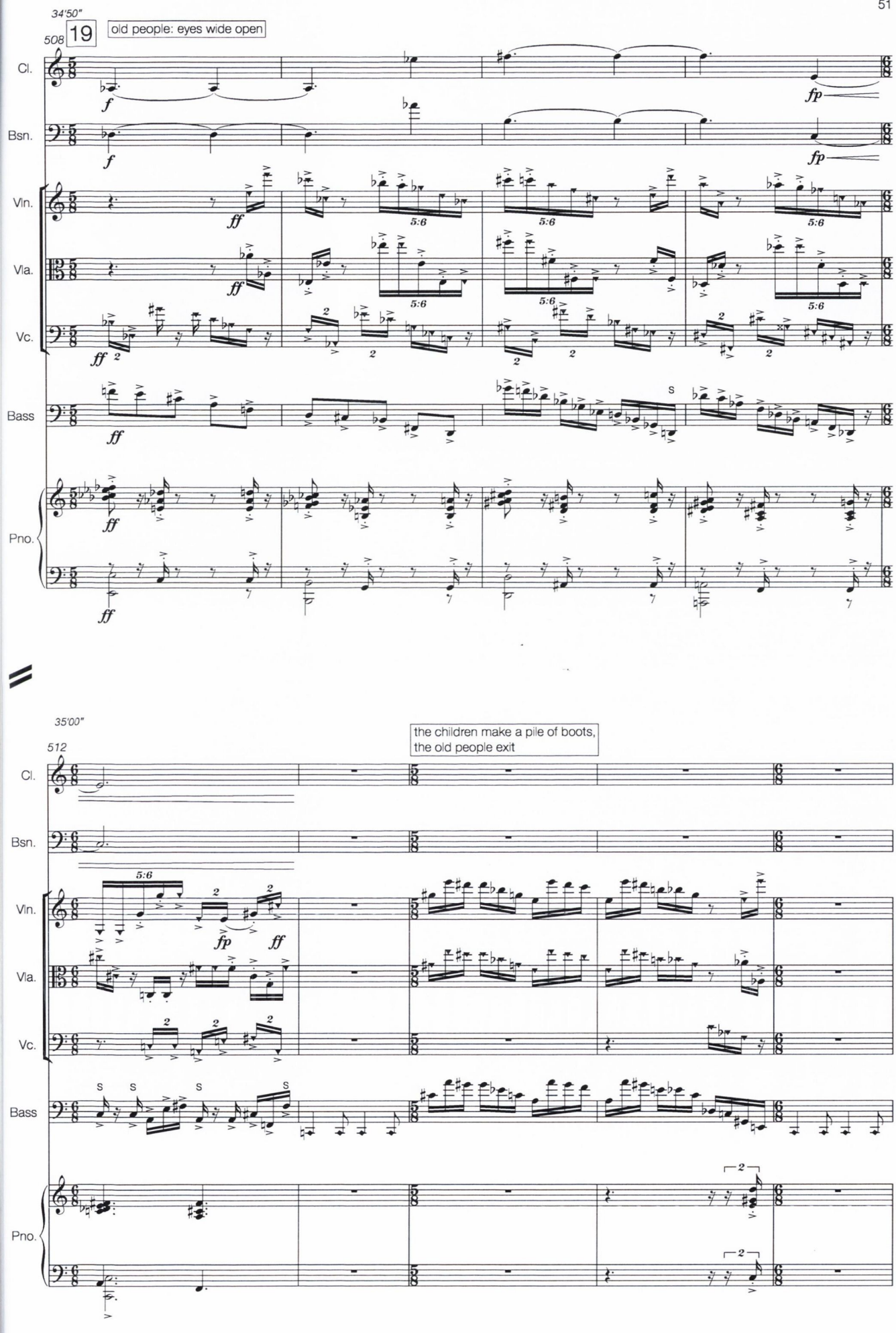

33'26"
487
St.
Chi.
An - stel - lung der Meu - chel - mör - der (per - cus - so - res), Gift - mi - scher (ve - ne - fi - ci),
Chi.
wech - sel - sei - ti - ge Zu - trau - en im künf - ti - gen Frie den un - mö - glich ma - chen müs - sen: als da sind,
Chi.
soll sich kein Staat im Krie - ge mit ei - nem an - dern sol - che Feind - sel - ig - kei - ten er - lau - ben, wel - che das
Old
Es
Cl.
mp
Bsn.
mp
Vln.
Vla.
Vc.
Bass

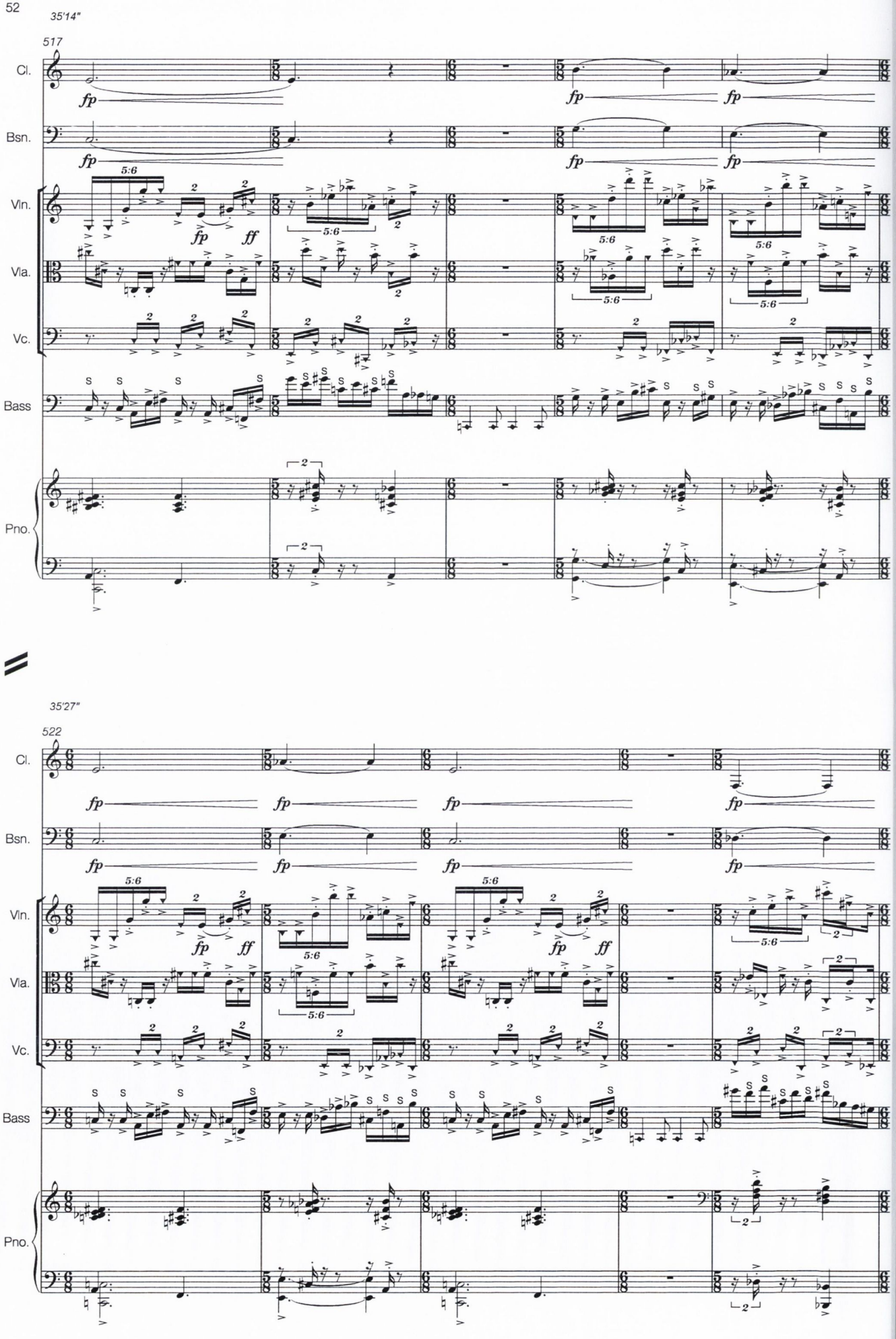

33'38"
490
St.
Chi.
Bre-chung der Ka-pi-tu-la-tion, An-stif-tung des Ver-rats (per-du-el-lio) in dem be-krieg-ten Staat. Es
Chi.
An-stel-lung der Meu chel-mör-der (per-cus-so-res), Gift-mi-scher (ve-ne-fi-ci),
Chi.
wech-sel-sei-ti-ge Zu-trau-en im künf-ti-gen Frie-den un-mö-glich ma-chen müs-sen: als da sind,
Old
soll sich kein Staat im Krie-ge mit ei-nem an-dern sol-che Feind-sel-ig-kei-ten er-lau-ben, wel-che das
Cl.
Bsn.
f
Vln.
Vla.
Vc.
Bass

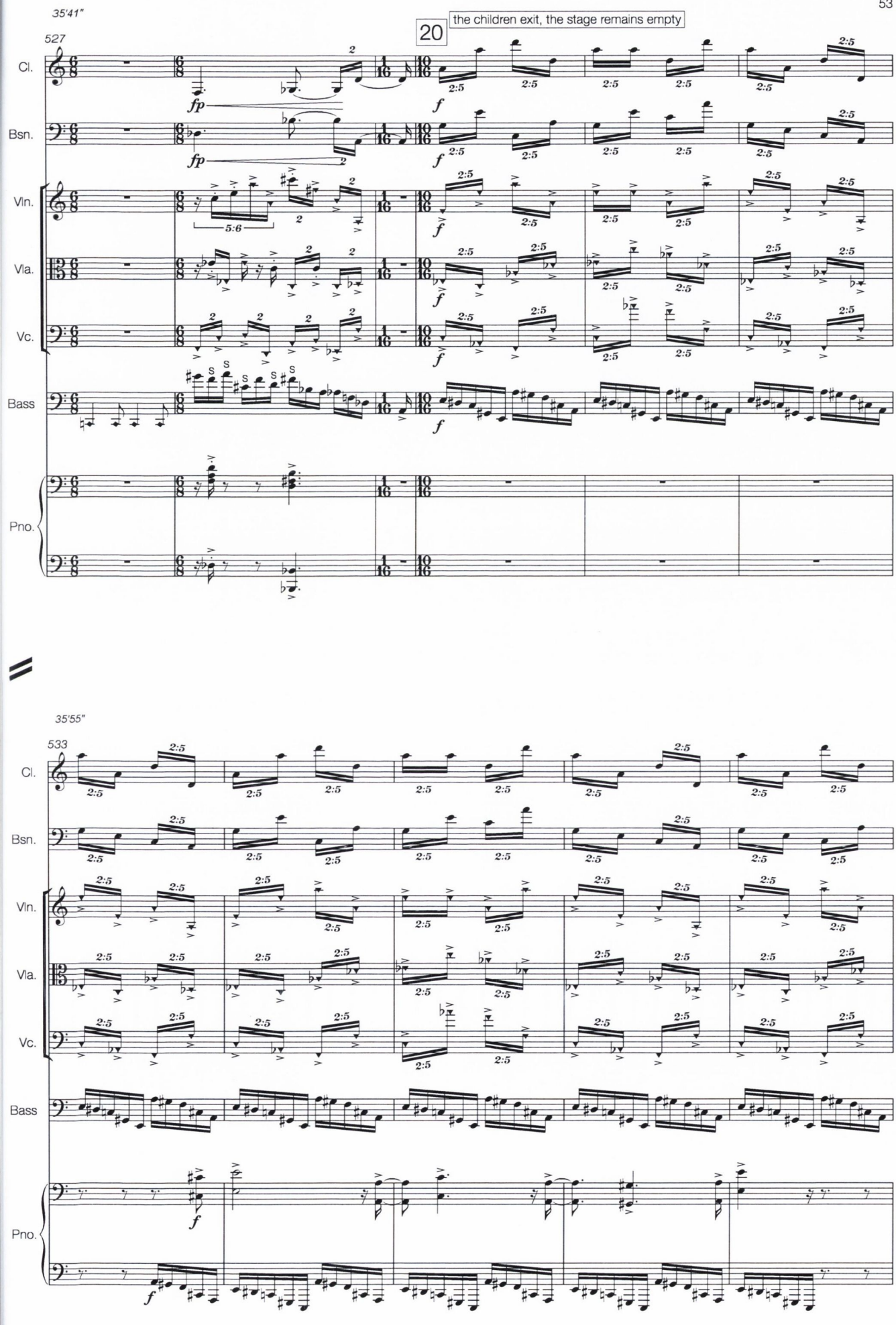

33'50"
493
Chi.
soll sich kein Staat im Krie - ge mit ei-nem an-dern sol - che Feind-se-lig-kei-ten er - lau-ben, wel-che das
Chi.
Bre-chung der Ka-pi-tu-la-tion, An-stif-tung des Ver - rats (per-du - el - lio) in dem be-krieg-ten Staat. Es
Chi.
An - stel - lung der Meu chel-mör-der (per - cus - so - res), Gift - mi - scher (ve-ne - fi - ci),
Old
wech - sel - sei - ti - ge Zu-trau-en im künf-ti-gen Frie-den un-mö-glich ma-chen müs - sen: als da sind,
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

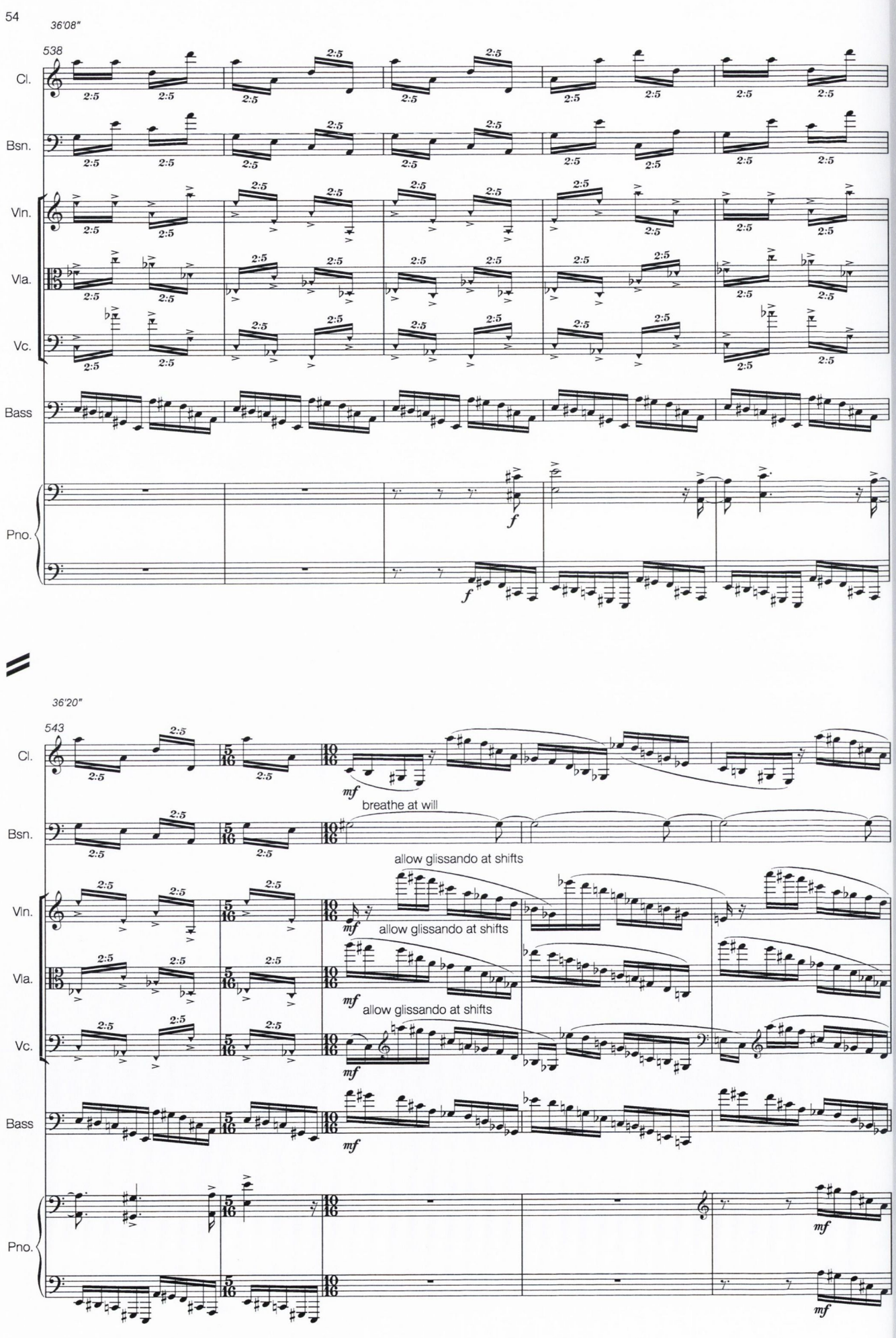

34'02"
496
Chi.
wech - sel - sei - ti - ge Zu - trau - en im künf - ti - gen Frie - den un - mö - glich ma - chen müs - sen: als da sind,
Chi.
soll sich kein Staat im Krie - ge mit ei - nem an - dern sol - che Feind - se - lig - kei - ten er - lau - ben, wel - che das
Chi.
Bre - chung der Ka - pi - tu - la - tion, An - stif - tung des Ver - rats (per - du - el - lio) in dem be - krieg - ten Staat. Es
Old
An - stel - lung der Meu chel - mör - der (per - cus - so - res), Gift - mi - scher (ve - ne - fi - ci),
Cl.
Bsn.
Vln.
f
Vla.
Vc.
Bass

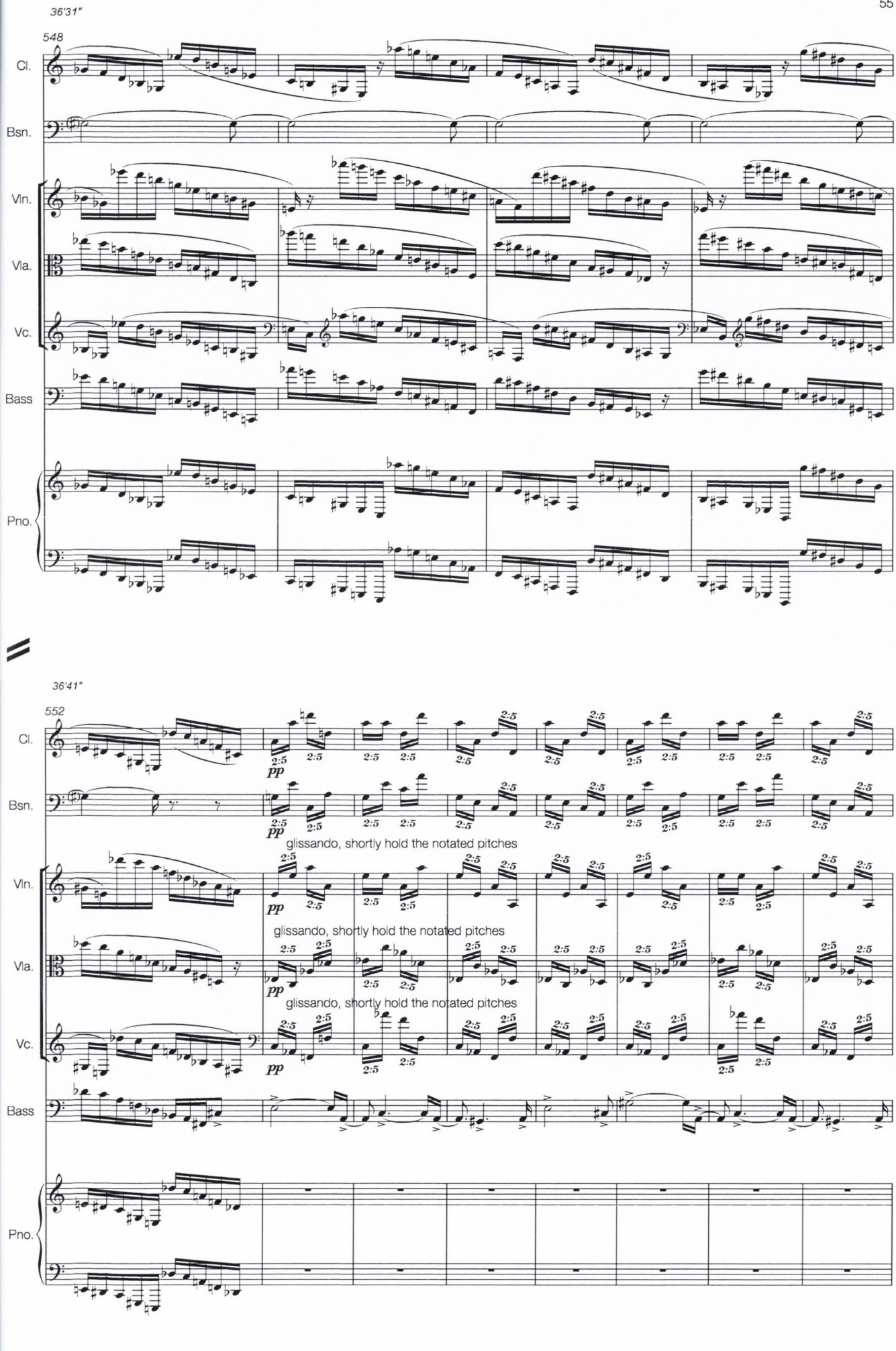

34'14"
499
Chi.
An - stel - lung der Meu-chel-mör-der (per - cus - so - res), Gift - mi - scher (ve-ne - fi - ci),
Chi.
wech - sel - sei - ti - ge Zu - trau - en im künf-ti - gen Frie-den un-mö-glich ma - chen müs - sen: als da sind,
Chi.
soll sich kein Staat im Krie - ge mit ei-nem an-dern sol - che Feind-se - lig - kei-ten er - lau - ben,
Old
Bre-chung der Ka - pi - tu - la-tion, An-stif-tung des Ver - rats (per-du - el - lio) in dem be-krieg-ten Staat, et -
Cl.
Bsn.
Vln.
Vla.
pp
Vc.
pp
Bass
34'26"
old people and children stand up
502
Chi.
Bre-chung der Ka-pi-tu-la-tion.
Old
ce - te - ra.
Cl.
p
Bsn.
p
Vln.
p
Vla.
8va
p
Vc.
p
Bass
p

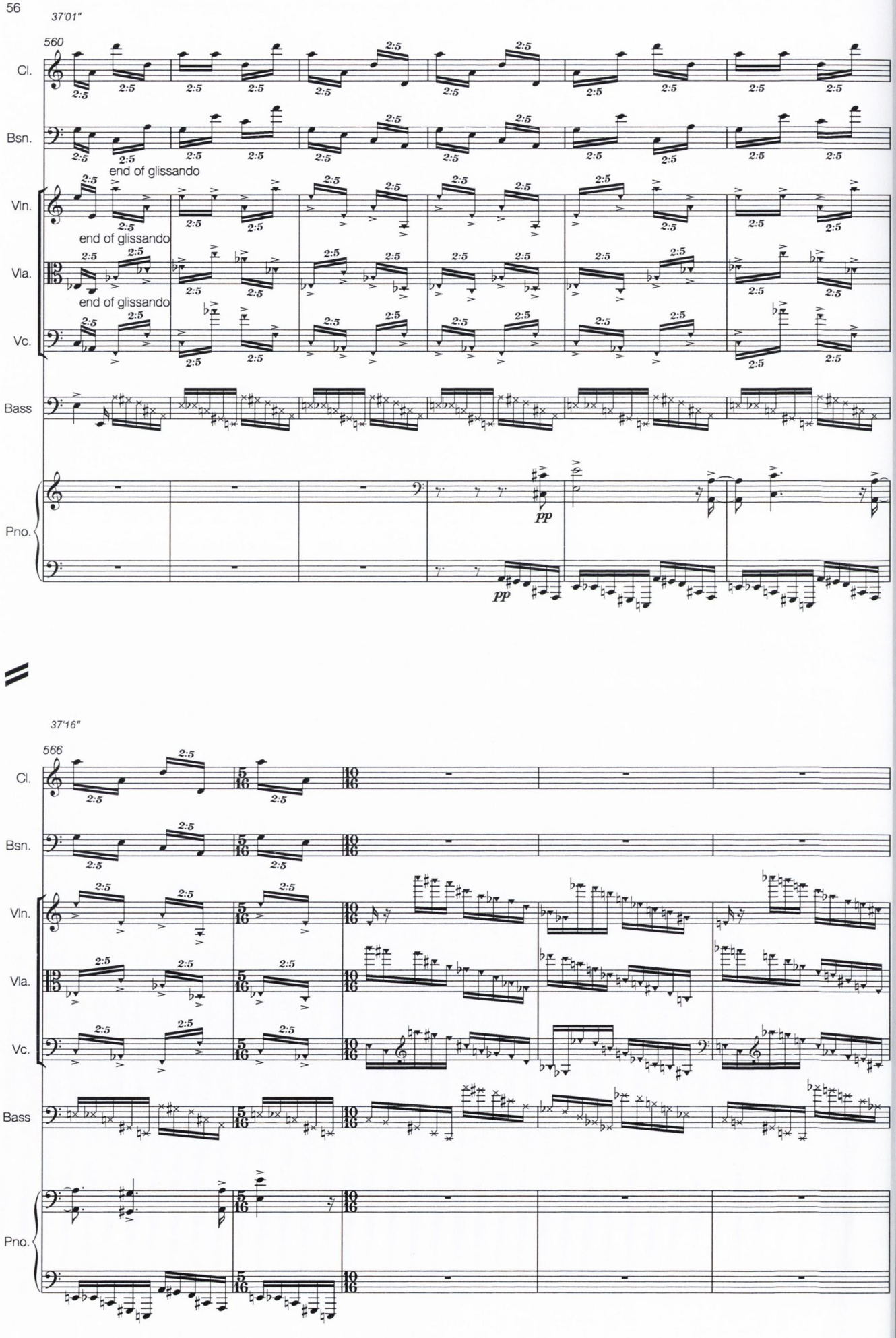

34'50"
508
19
old people: eyes wide open
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
35'00"
512
the children make a pile of boots,
the old people exit

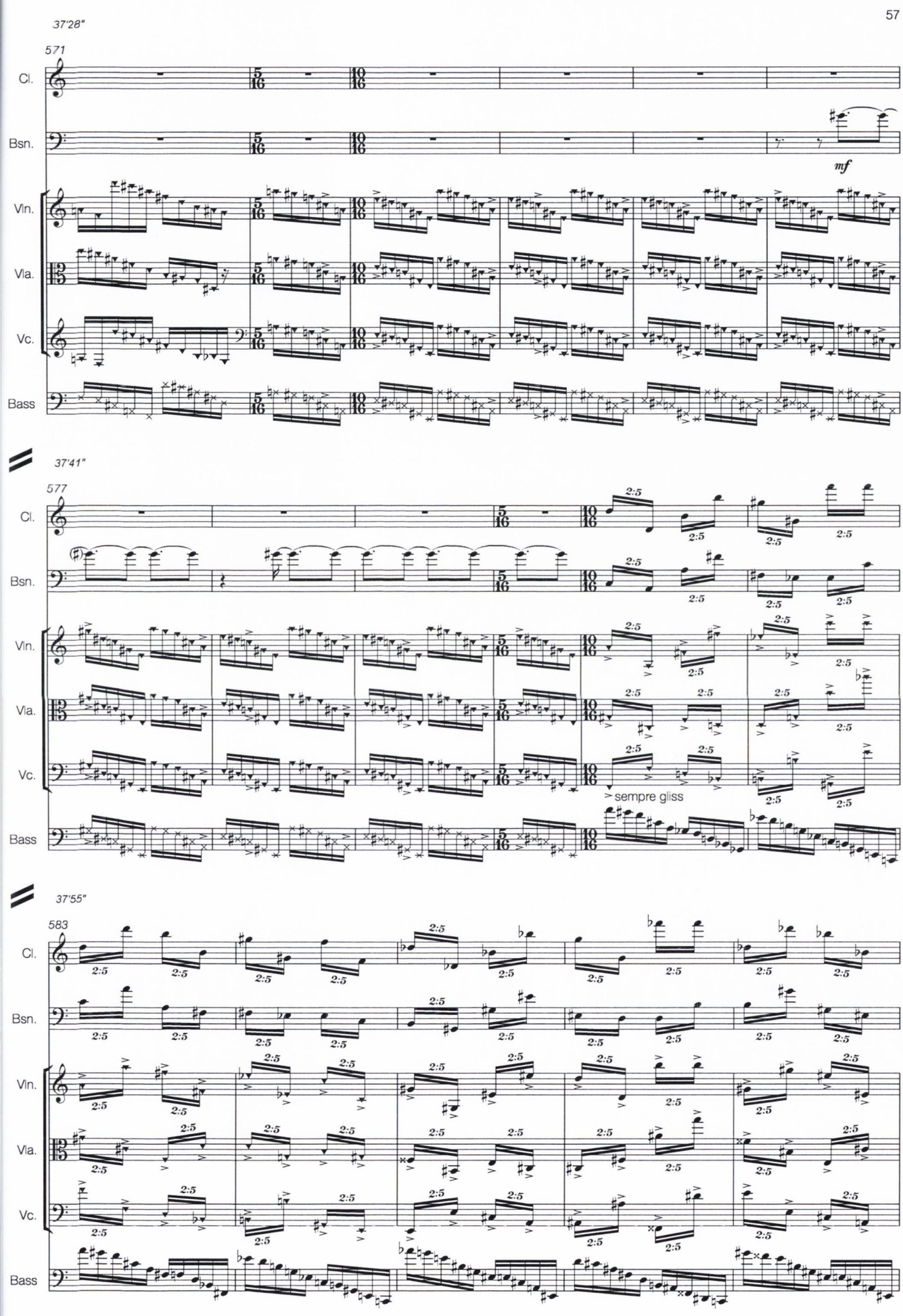

35'14"
517
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
fp
ff
5:6
35'27"
522

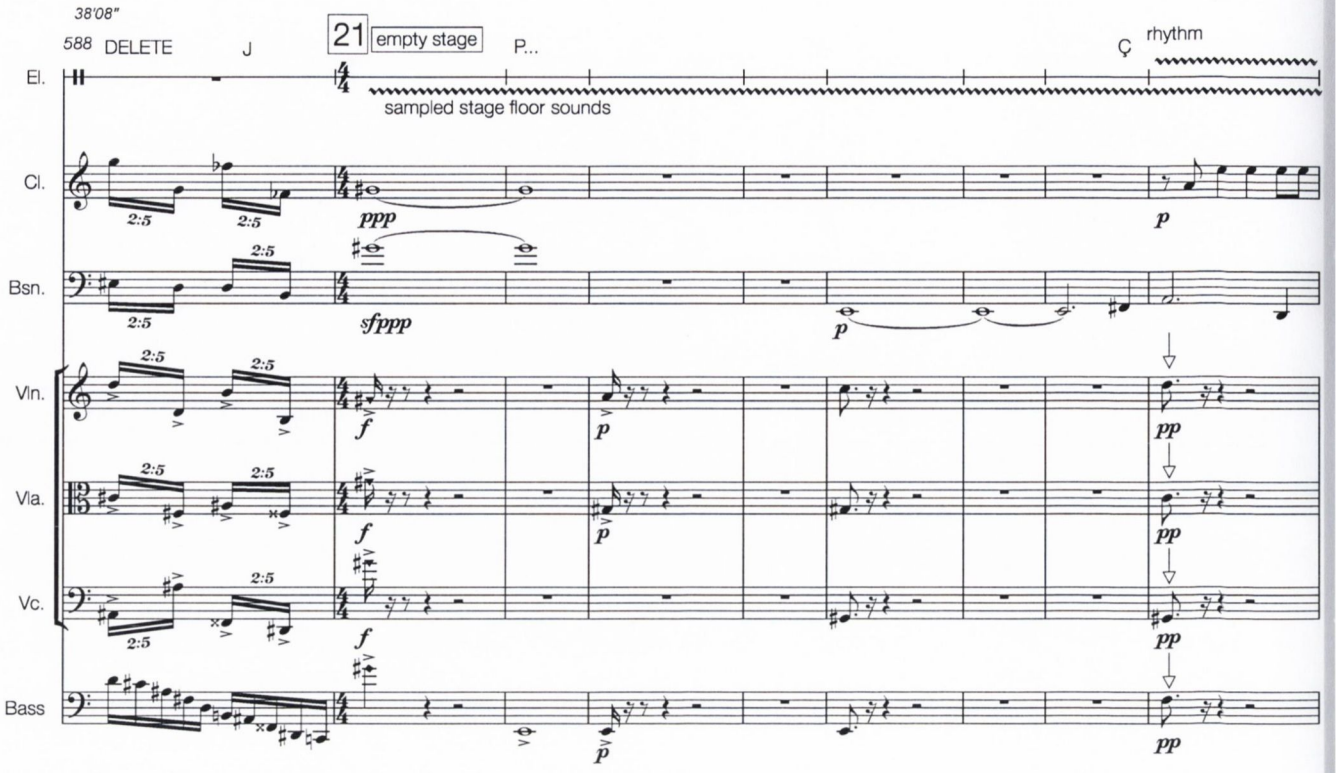

35'41"
527
20
the children exit, the stage remains empty
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
35'55"
533

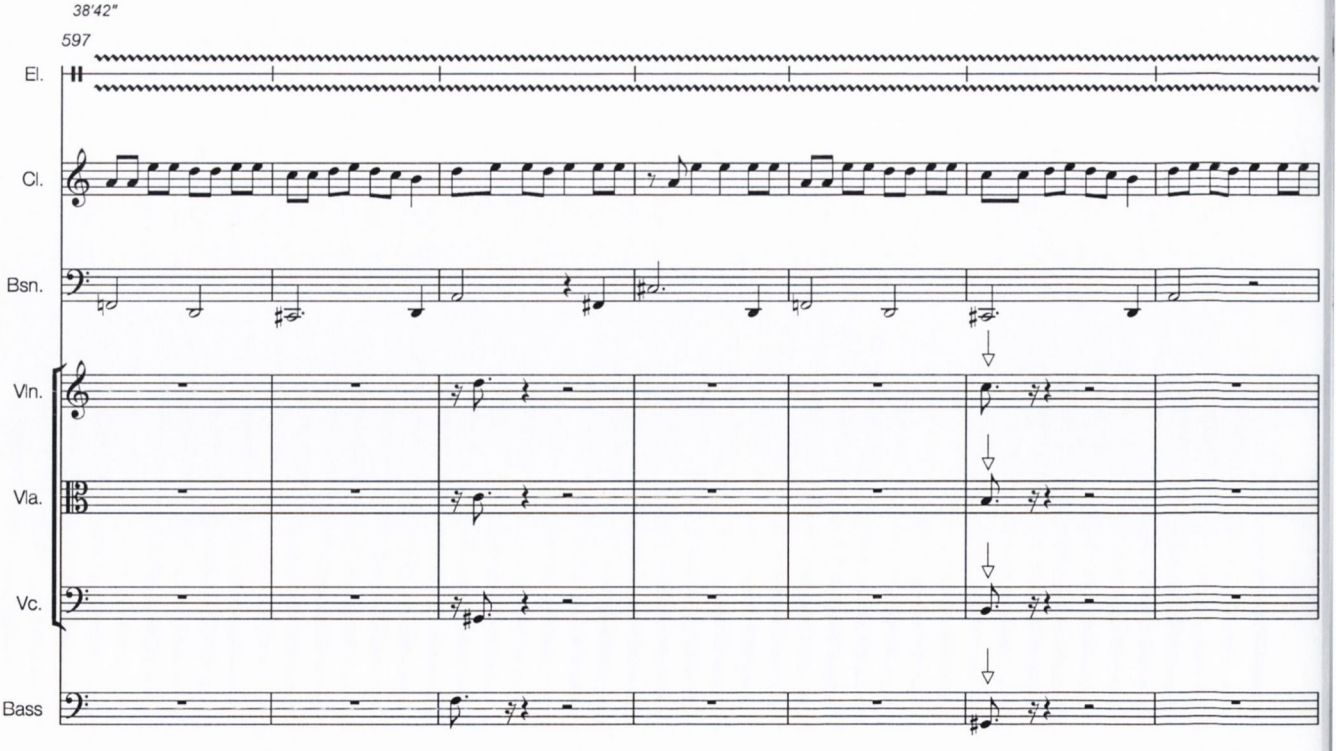

36'08"
538
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
2:5
f
36'20"
543
mf
breathe at will
allow glissando at shifts
allow glissando at shifts
allow glissando at shifts
mf

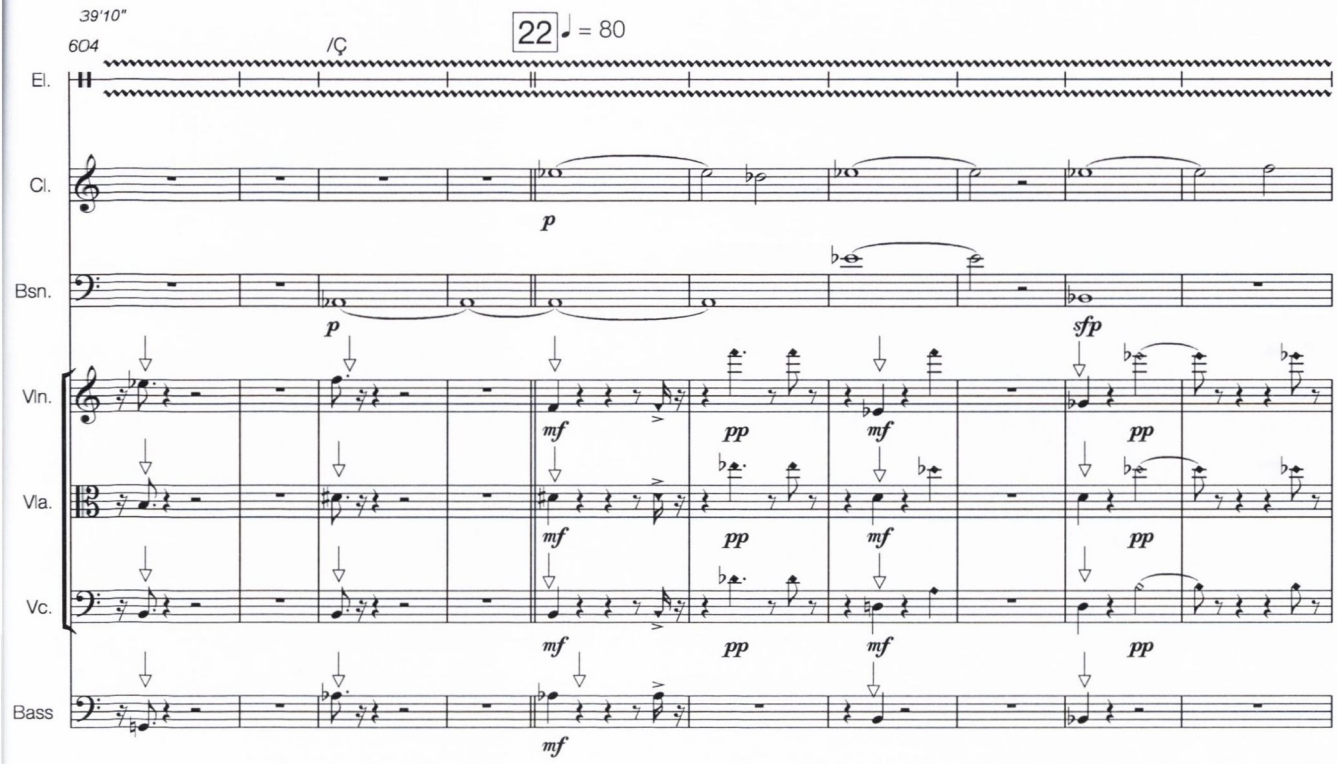

36'31"
548
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
36'41"
552
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
pp
2:5
glissando, shortly hold the notated pitches
glissando, shortly hold the notated pitches
glissando, shortly hold the notated pitches

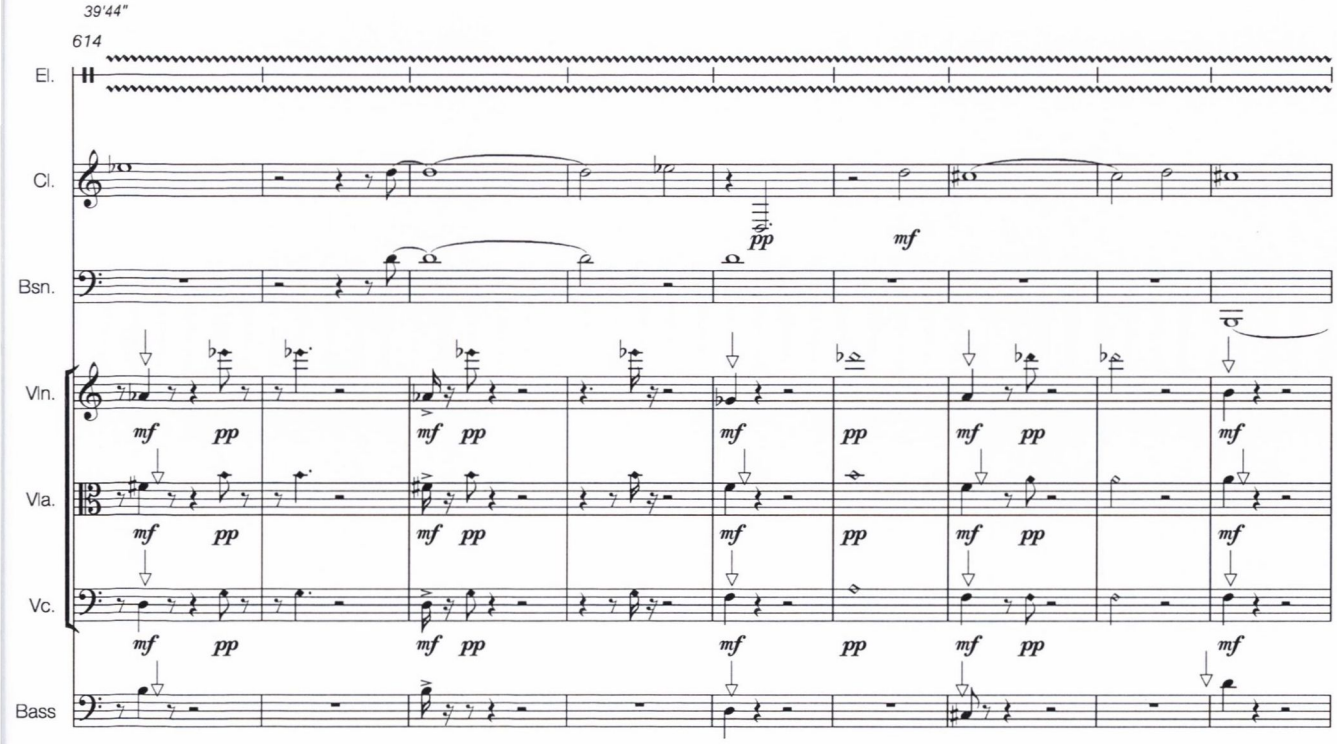

37'01"
560
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
end of glissando
end of glissando
end of glissando
2:5
pp
pp
37'16"
566
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
Pno.
2:5
5/16
10/16

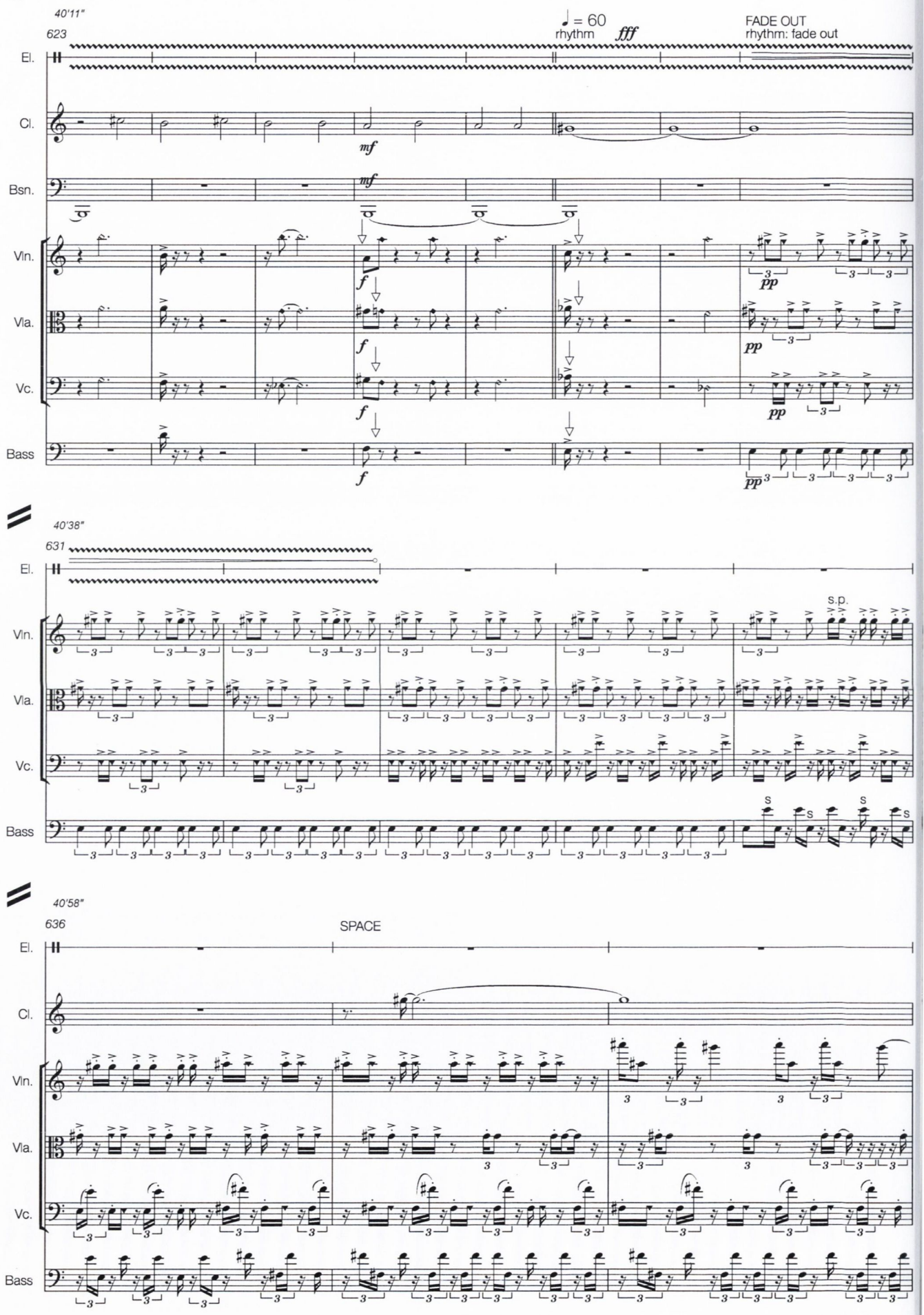

37'28"
571
Cl.
Bsn.
mf
Vln.
Vla.
Vc.
Bass
37'41"
577
2:5
> sempre gliss
37'55"
583

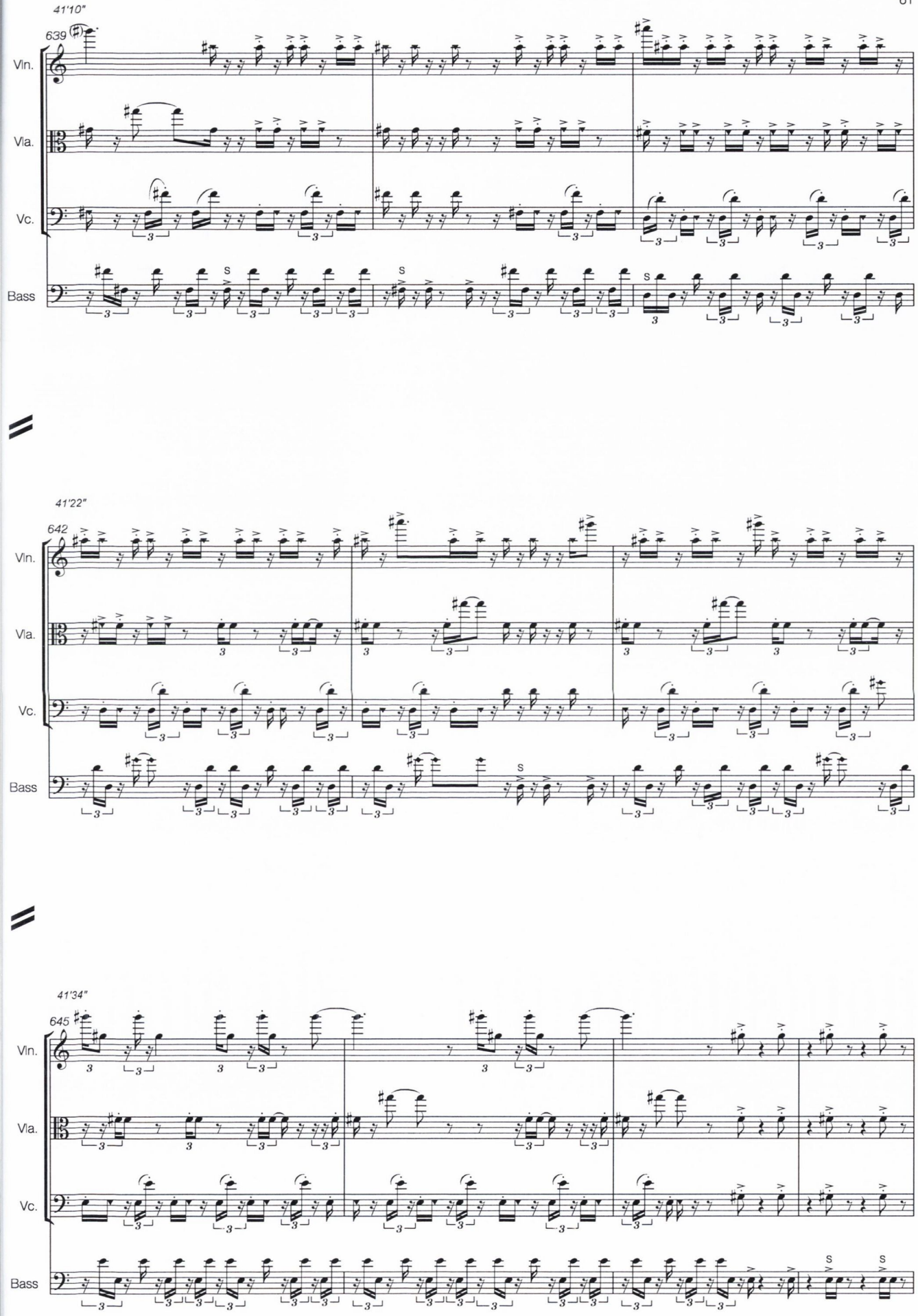

38'08"
588 DELETE
J
21 empty stage
P...
Ç rhythm
El.
sampled stage floor sounds
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp
sfppp
f
p
pp
2:5

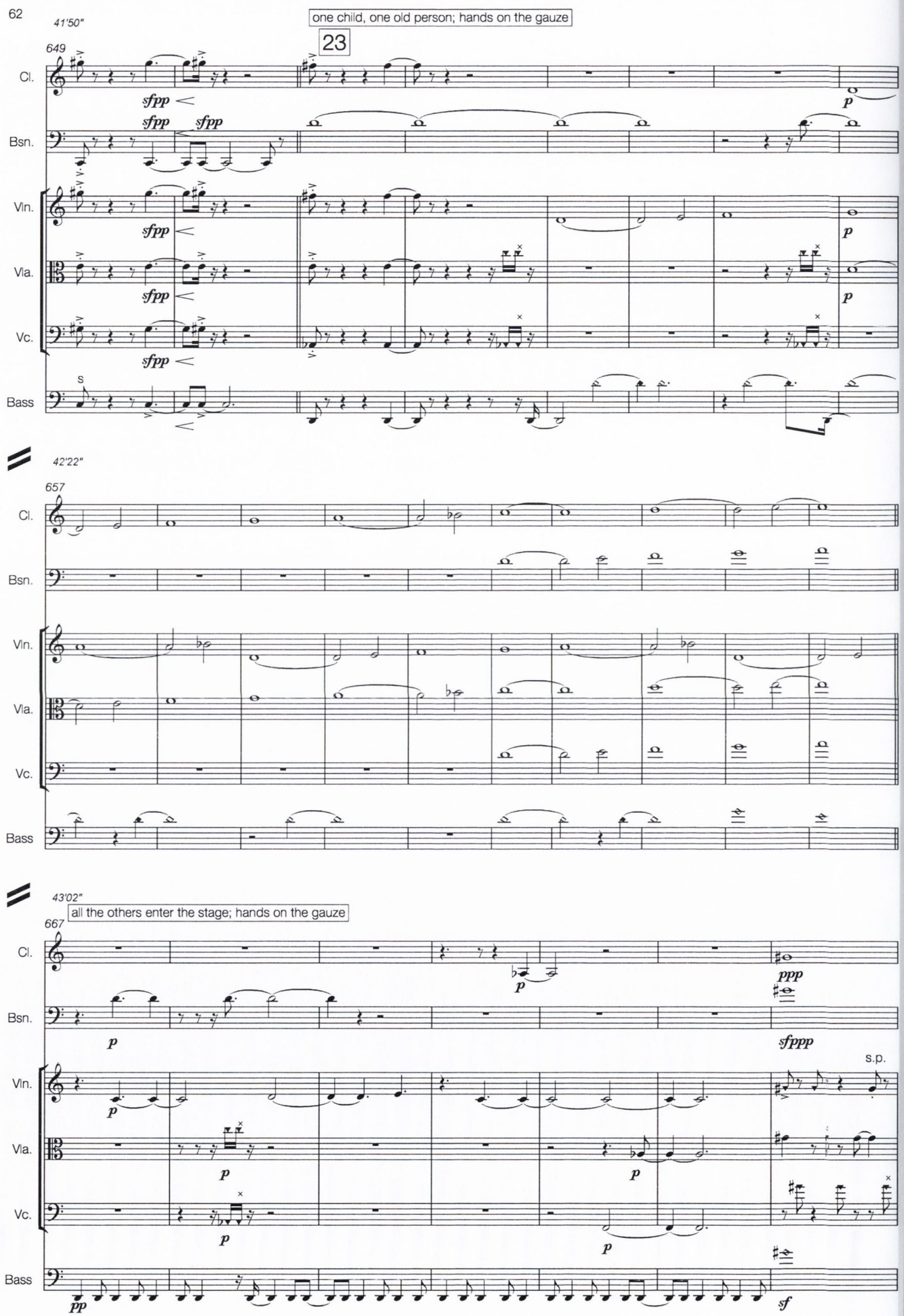

38'42"
597
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

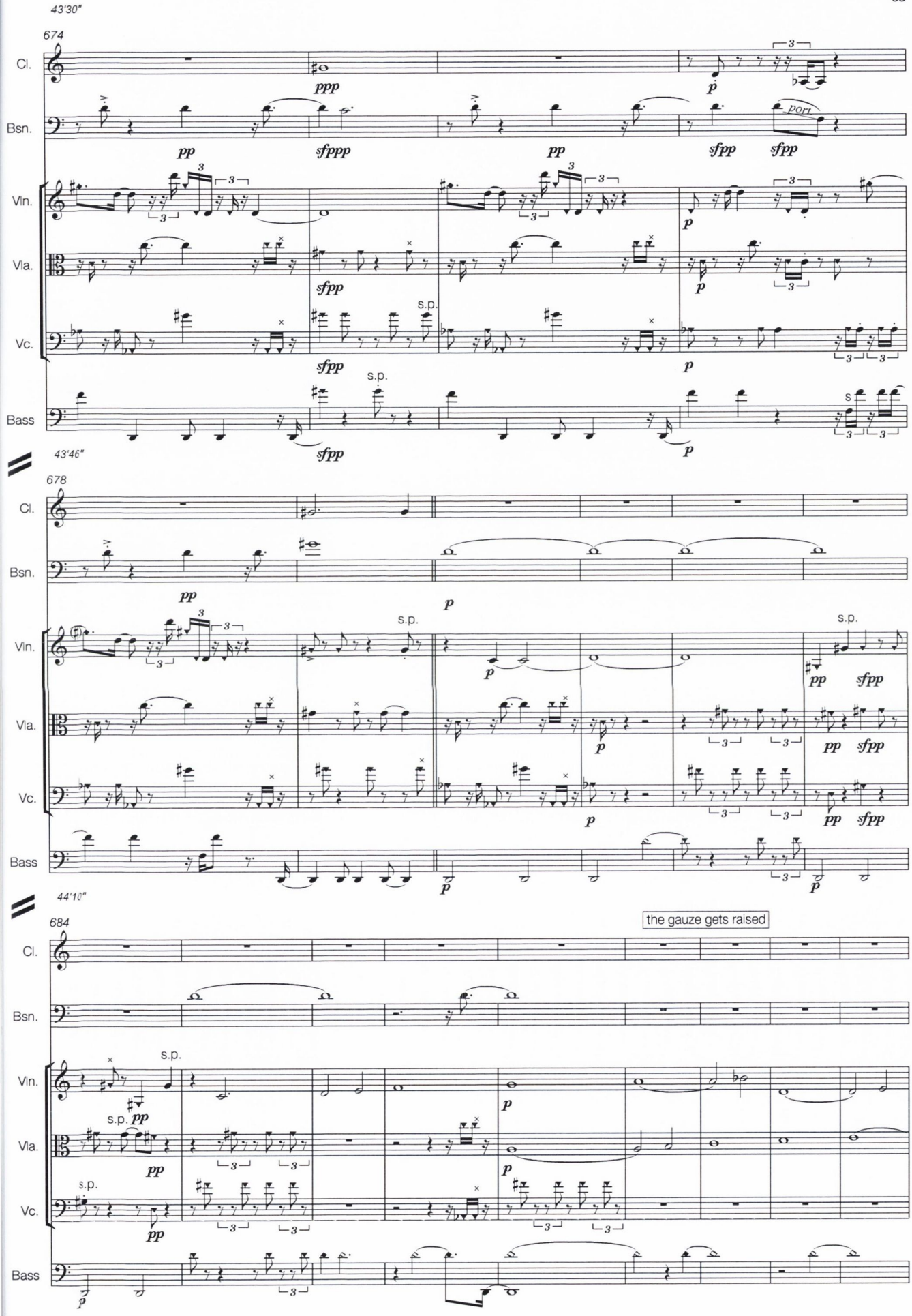

39'10"
604
/Ç
22
♩ = 80
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
sfp
mf
pp

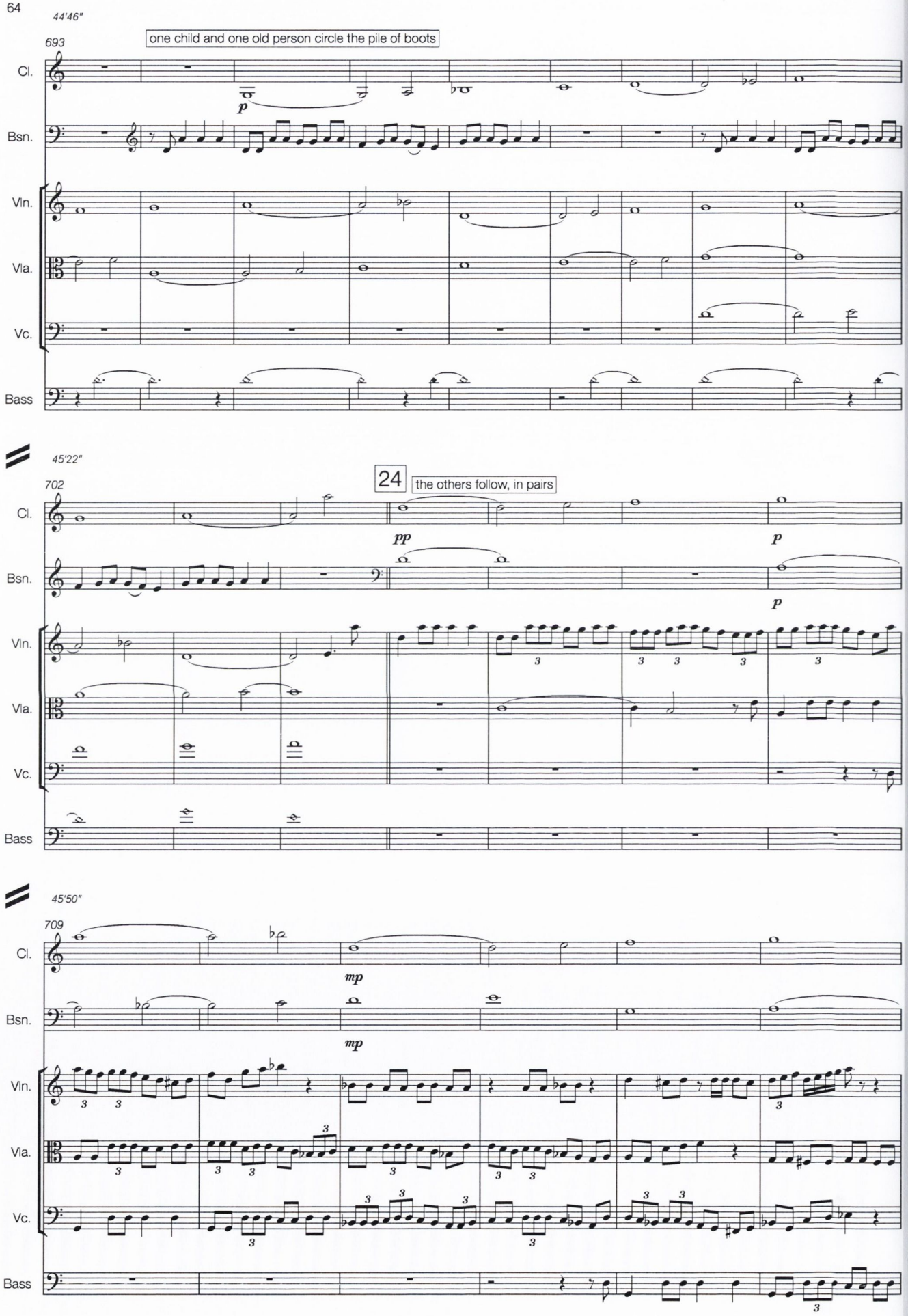

39'44"
614
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
mf

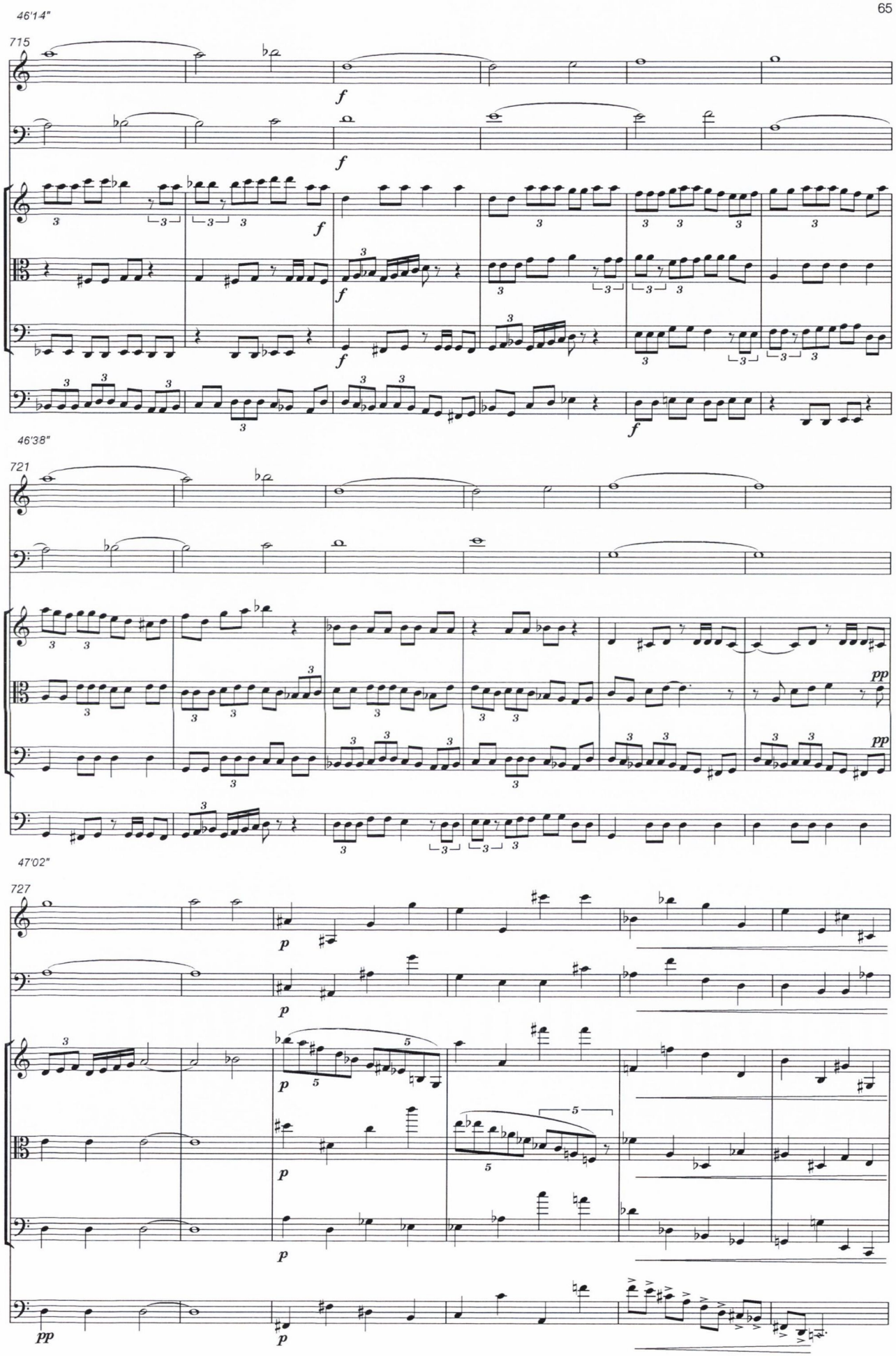

40'11"
623
♩ = 60
rhythm
fff
FADE OUT
rhythm: fade out
El.
Cl.
mf
Bsn.
mf
Vln.
Vla.
Vc.
Bass
f
pp
40'38"
631
s.p.
s
40'58"
636
SPACE

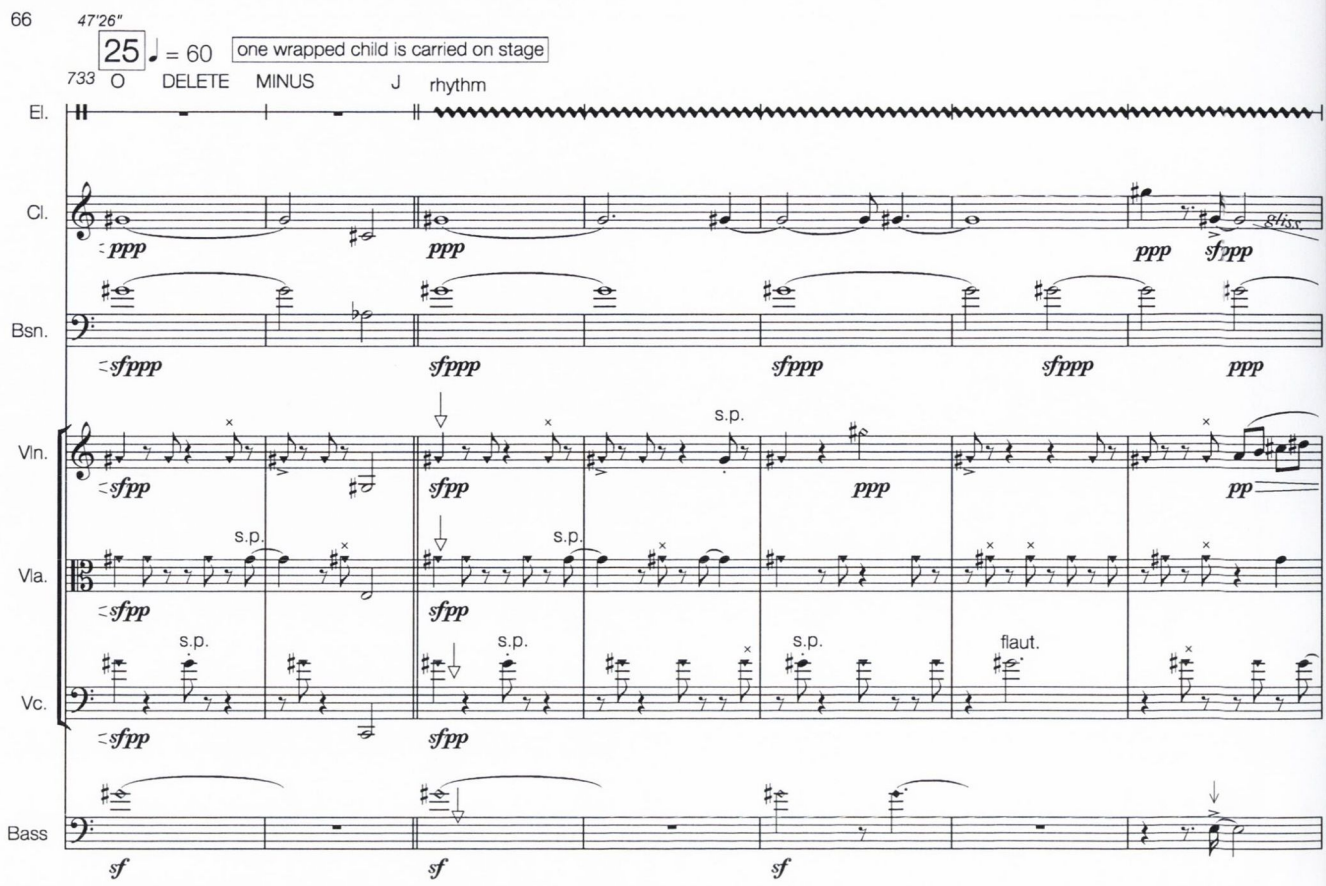

41'10"
639
Vln.
Vla.
Vc.
Bass
41'22"
642
Vln.
Vla.
Vc.
Bass
41'34"
645
Vln.
Vla.
Vc.
Bass

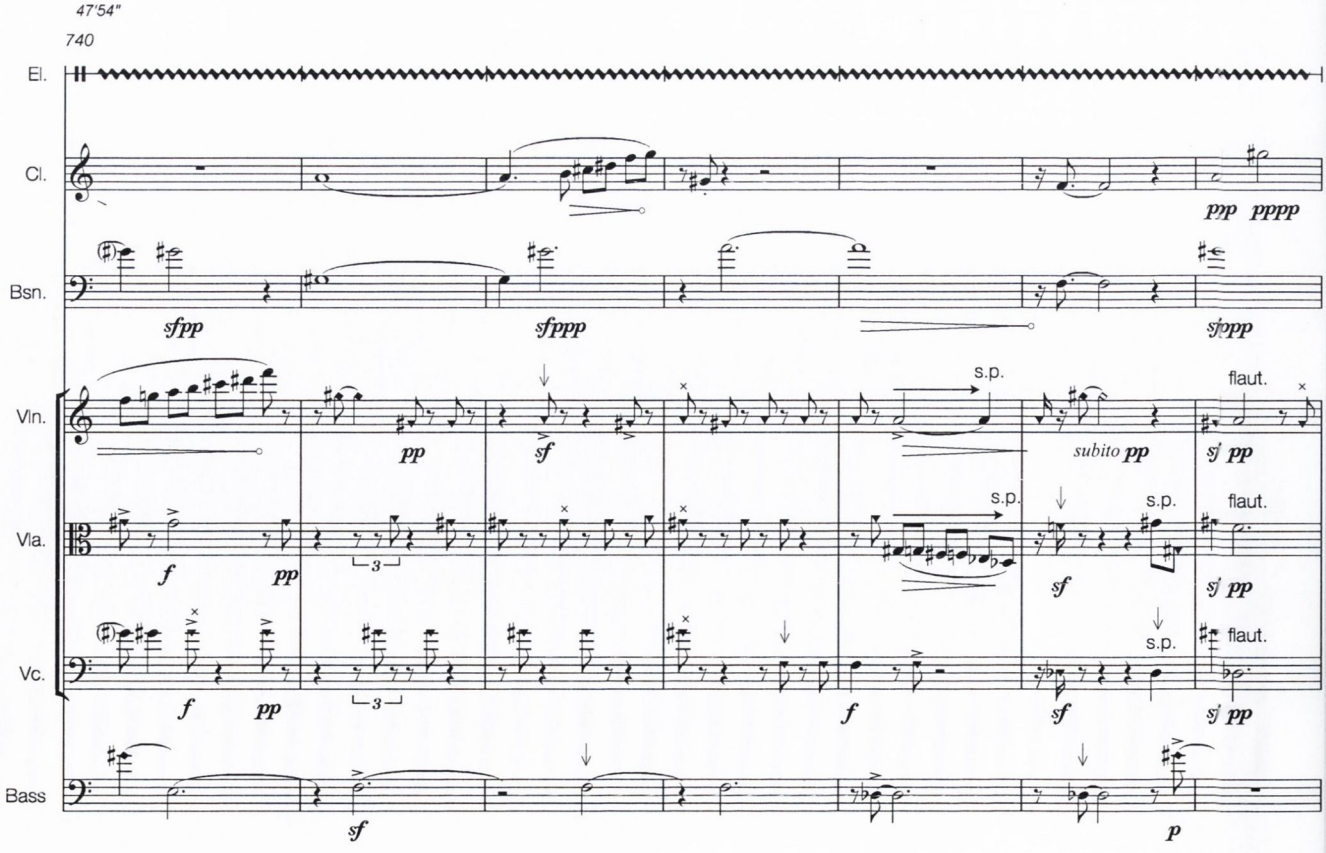

41'50"
649
one child, one old person; hands on the gauze
23
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
p
42'22"
657
43'02"
667
all the others enter the stage; hands on the gauze
ppp
sfppp
s.p.
pp
sf

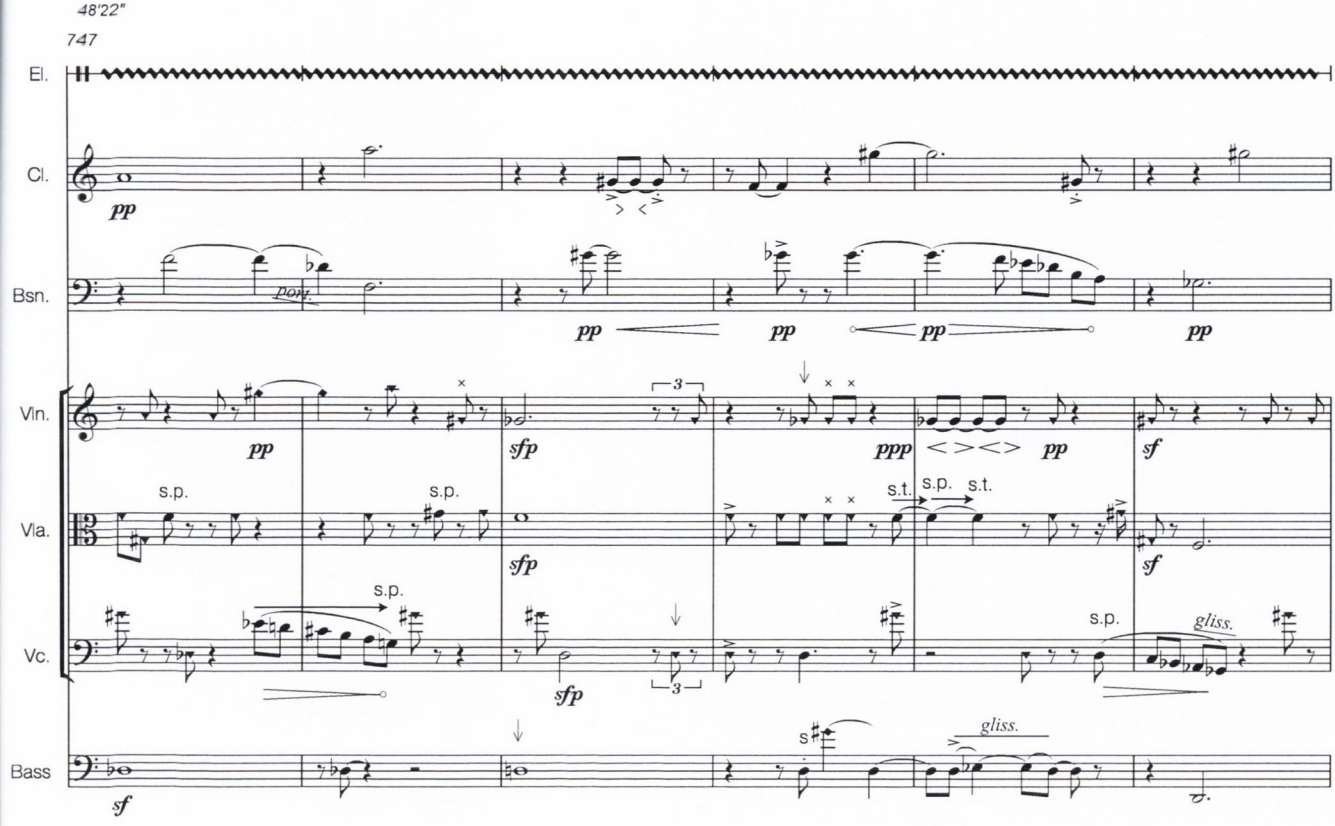

43'30"
674
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp
pp
sfppp
sfpp
p
port
s.p.
43'46"
678
44'10"
684
the gauze gets raised

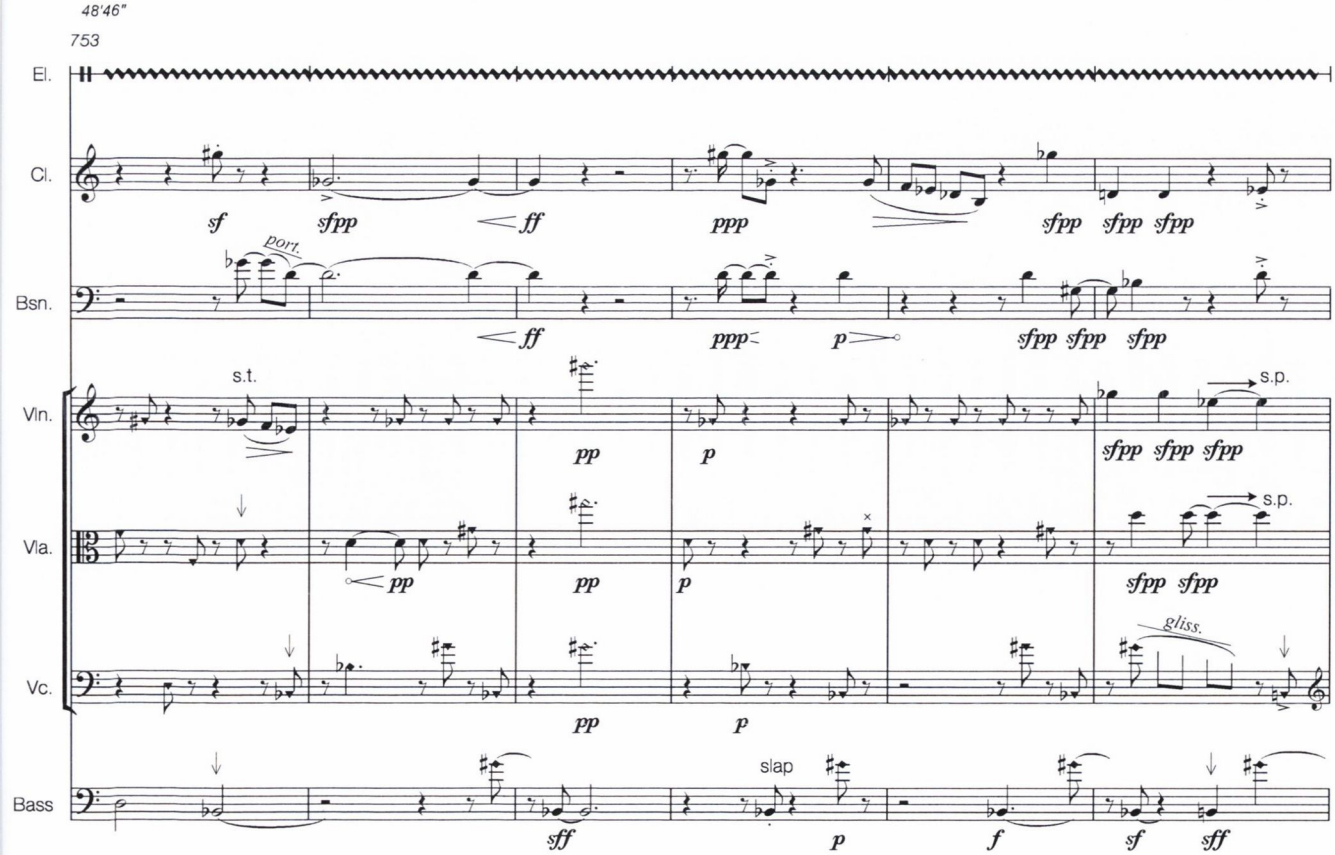

44'46"
693
one child and one old person circle the pile of boots
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
45'22"
702
24
the others follow, in pairs
pp
p
45'50"
709
mp

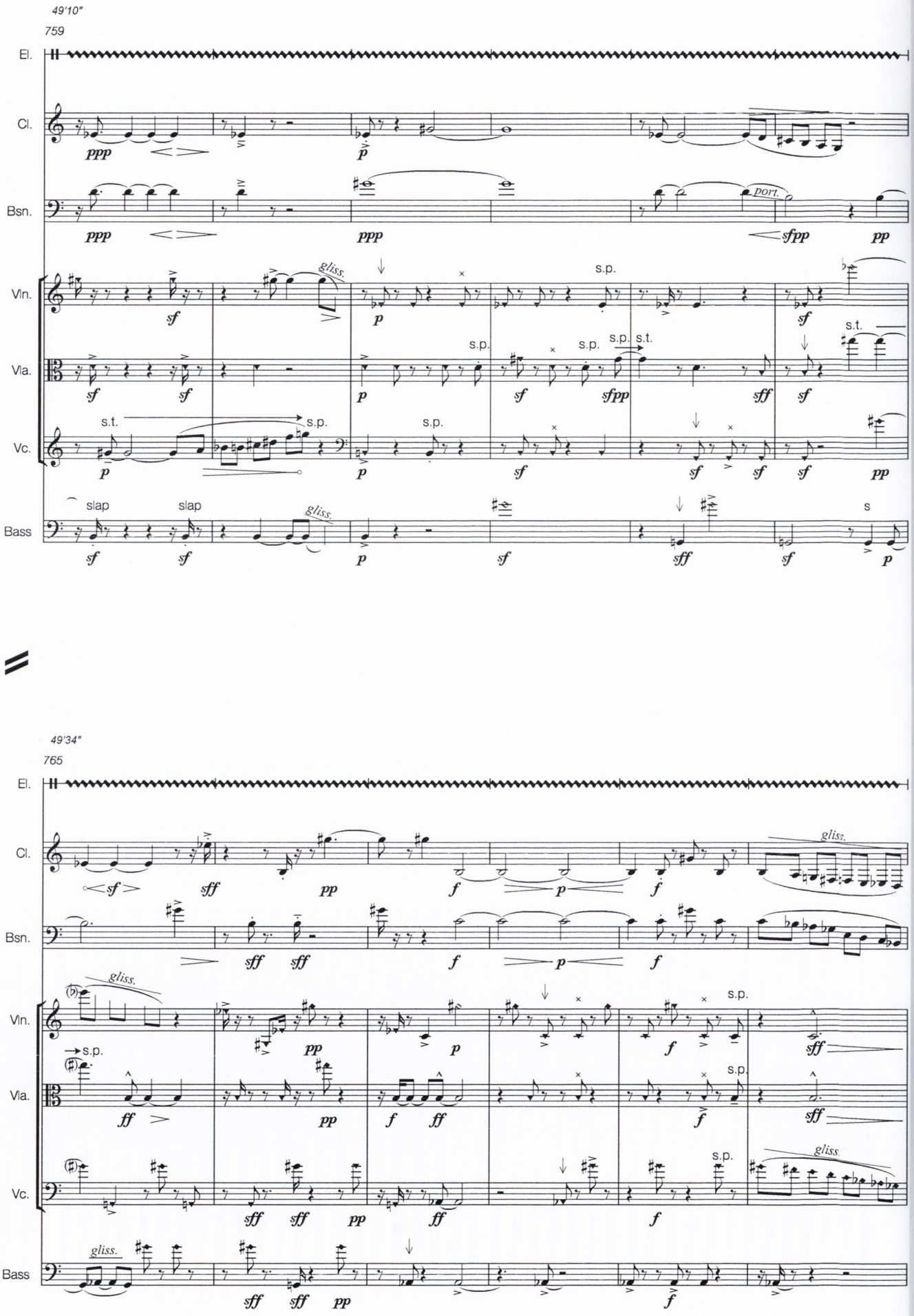

46'14"
715
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f
46'38"
721
pp
47'02"
727
p
pp


47'26"
25 ♩ = 60
one wrapped child is carried on stage
733
O DELETE MINUS J rhythm
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp
sfppp
sfpp
sf
s.p.
flaut.
gliss.


47'54"
740
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
sf
f
p
sfpp
sfppp
s.p.
flaut.
subito pp
3


48'22"
747
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
port.
sfp
ppp
sf
s.p.
s.t.
gliss.
3


48'46"
753
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
sfpp
ff
ppp
p
port.
s.t.
s.p.
gliss.
slap
sff
f


49'10"
759
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
ppp
p
port.
sfpp
pp
gliss.
s.p.
s.t.
sf
sfpp
sff
slap
s
49'34"
765
ff
f
→s.p.

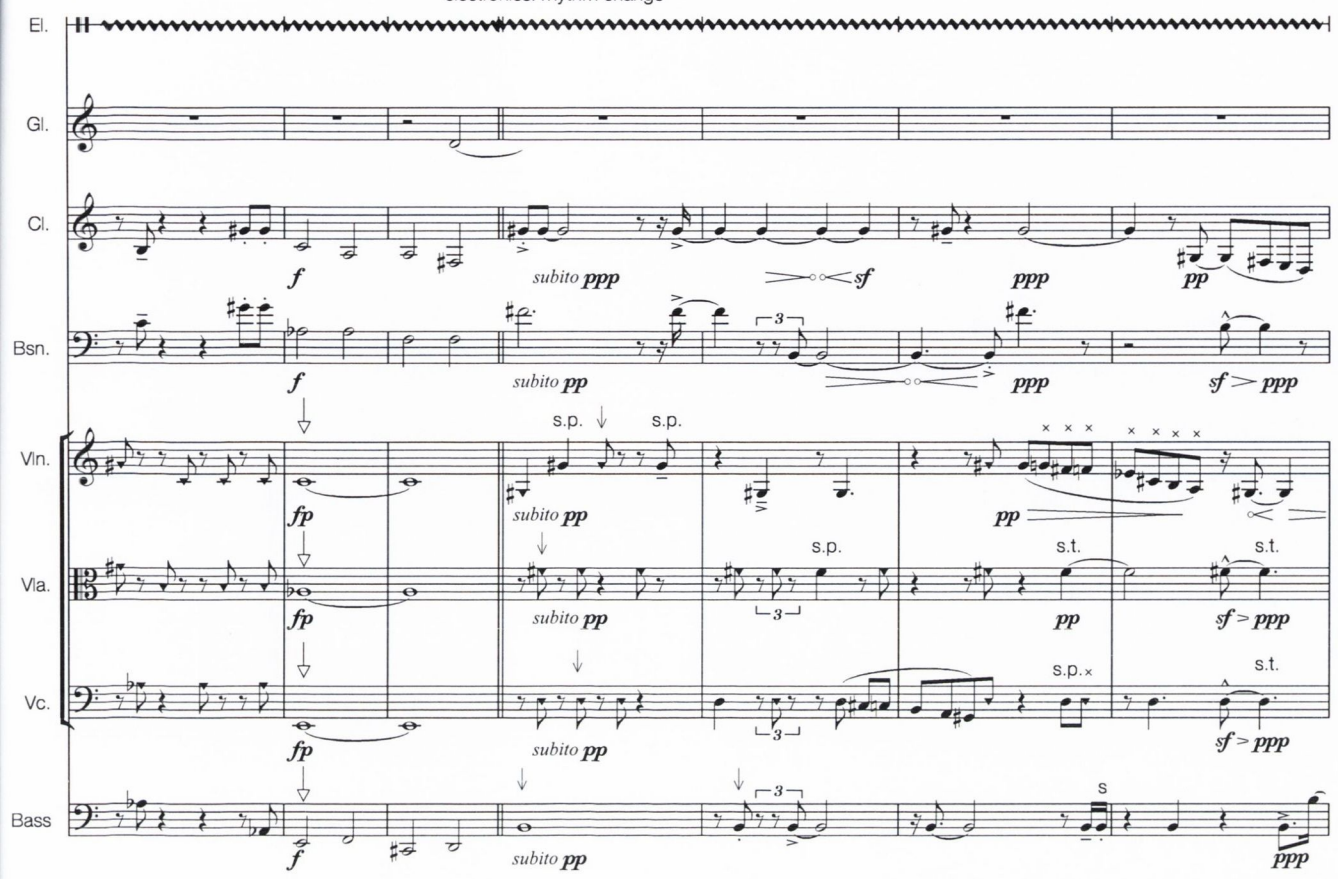
26

49'58"

771

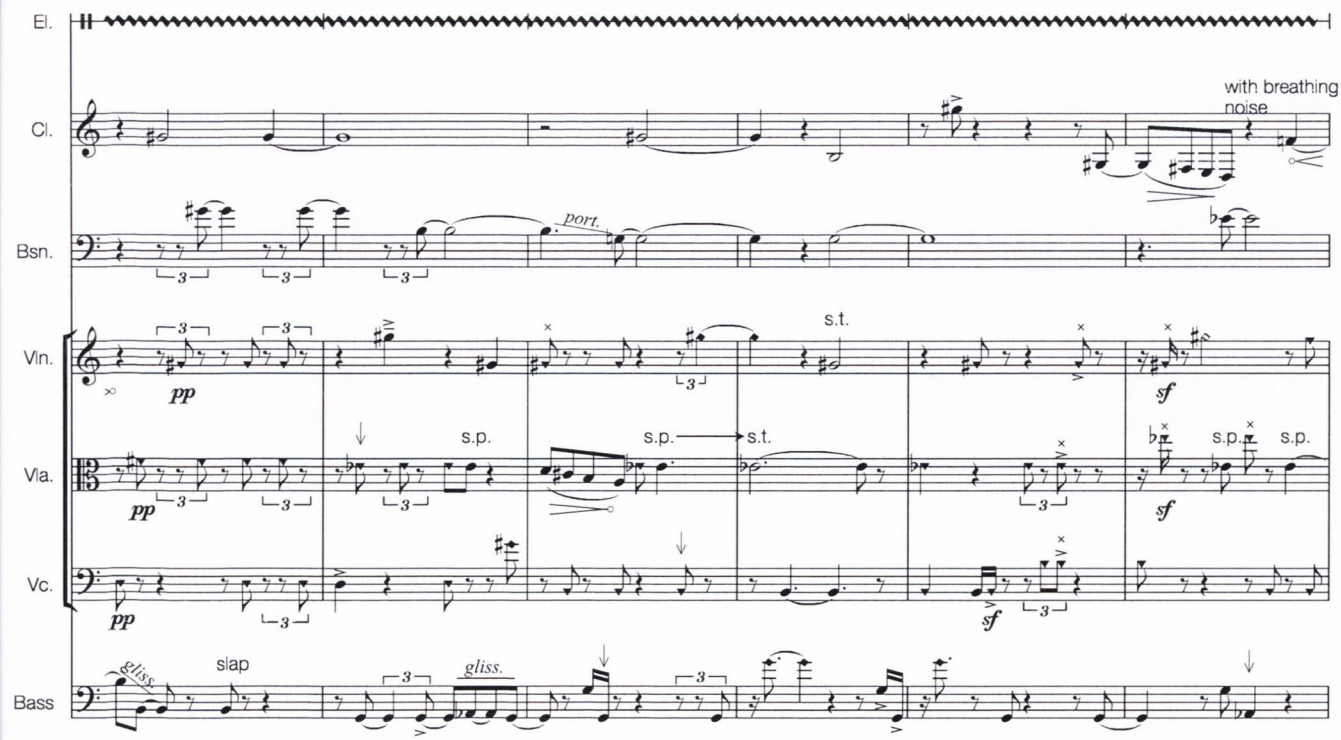
K the old people pick up slips of paper

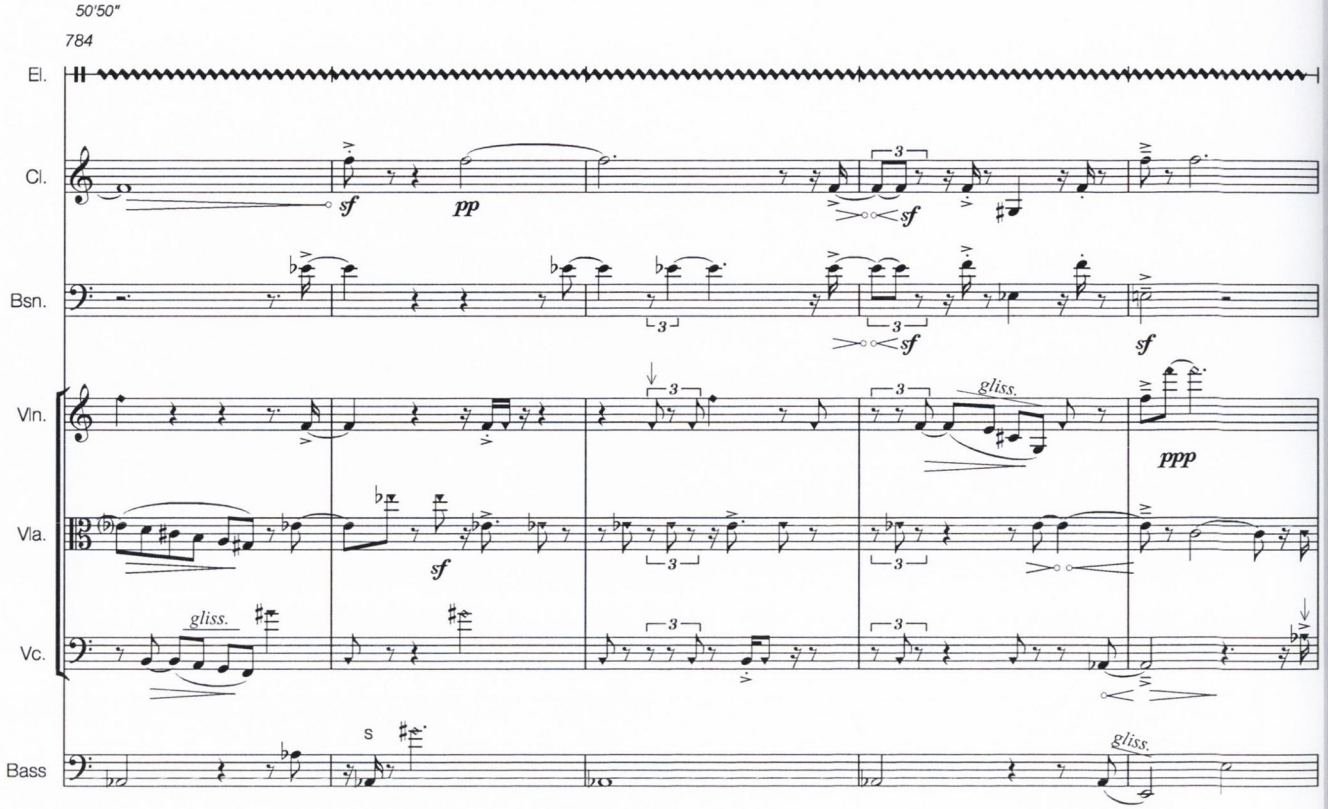
electronics: rhythm change

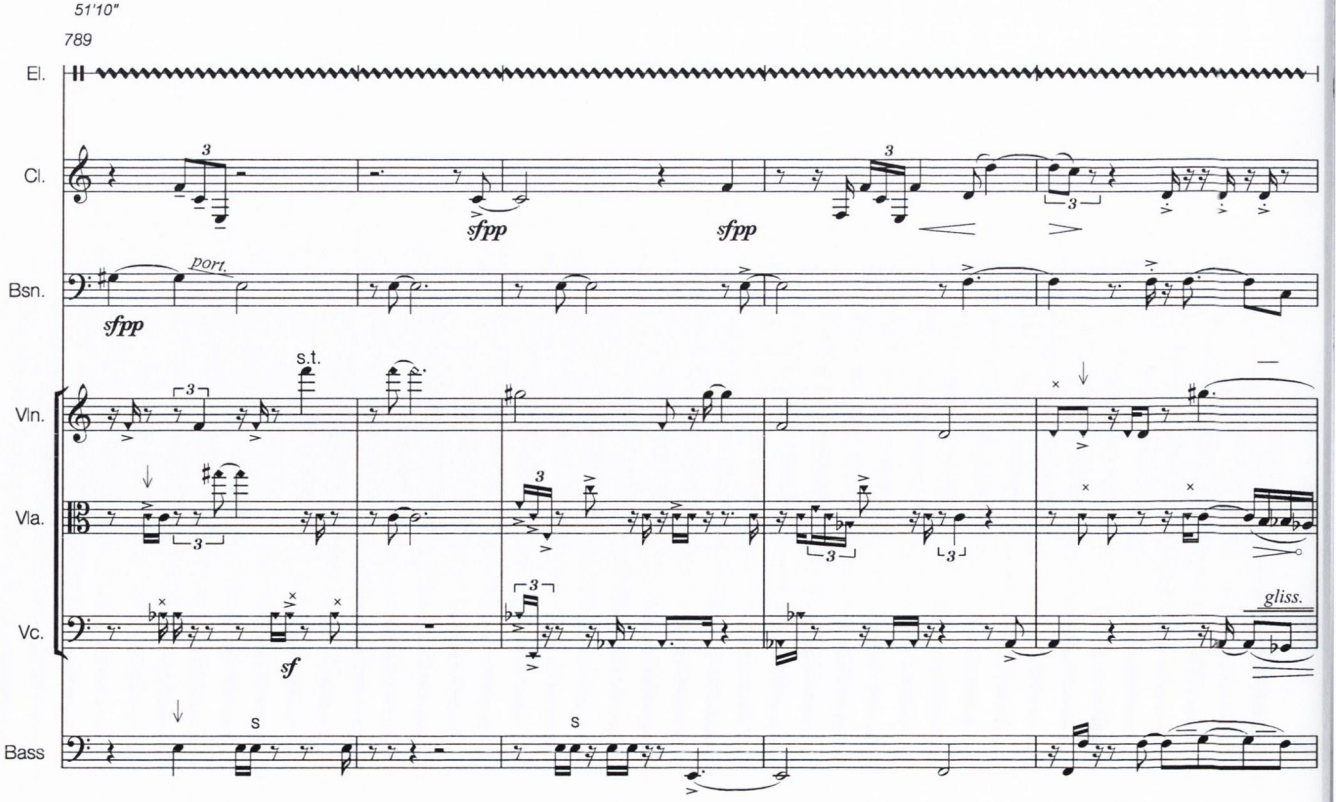


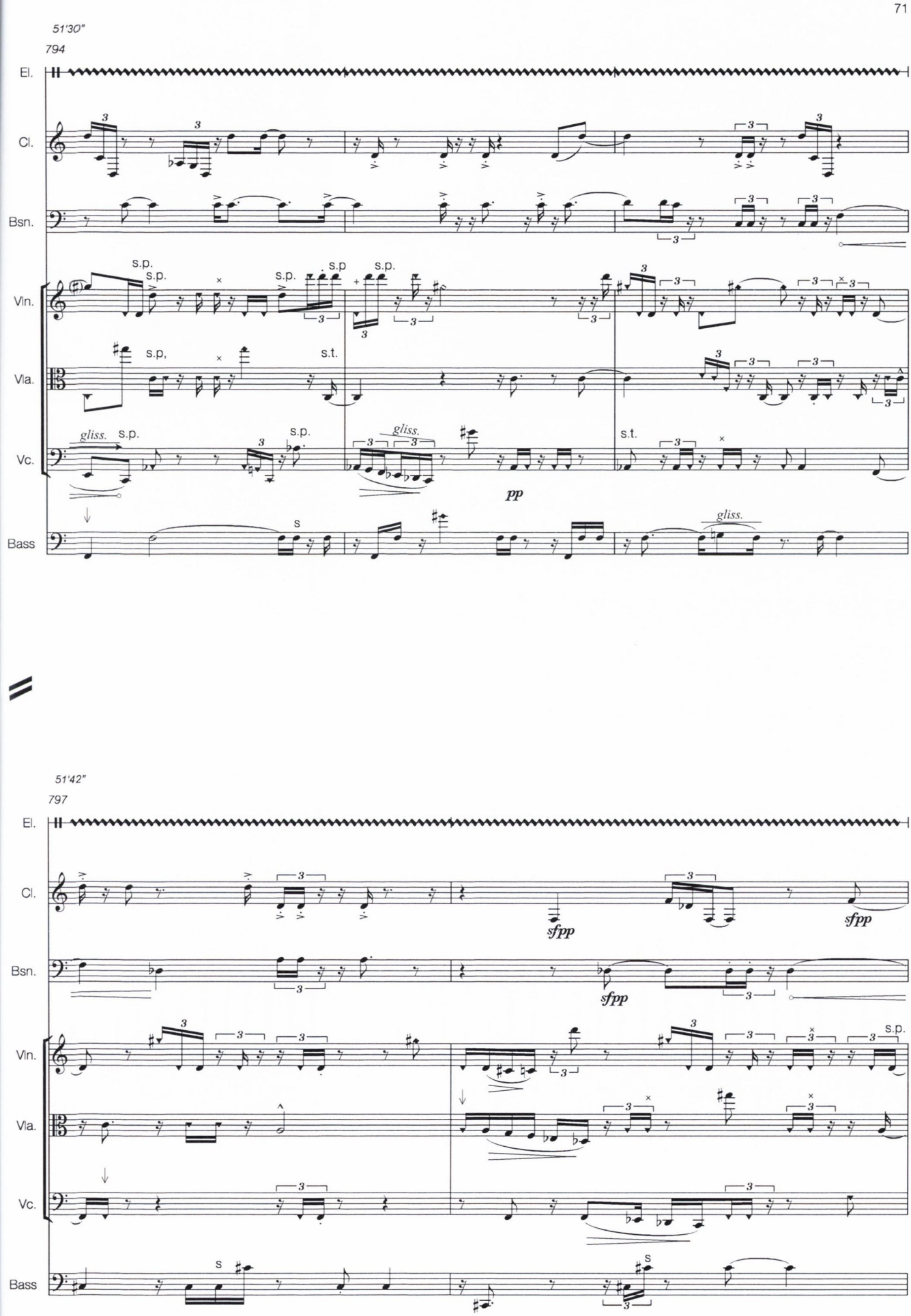
50'26"

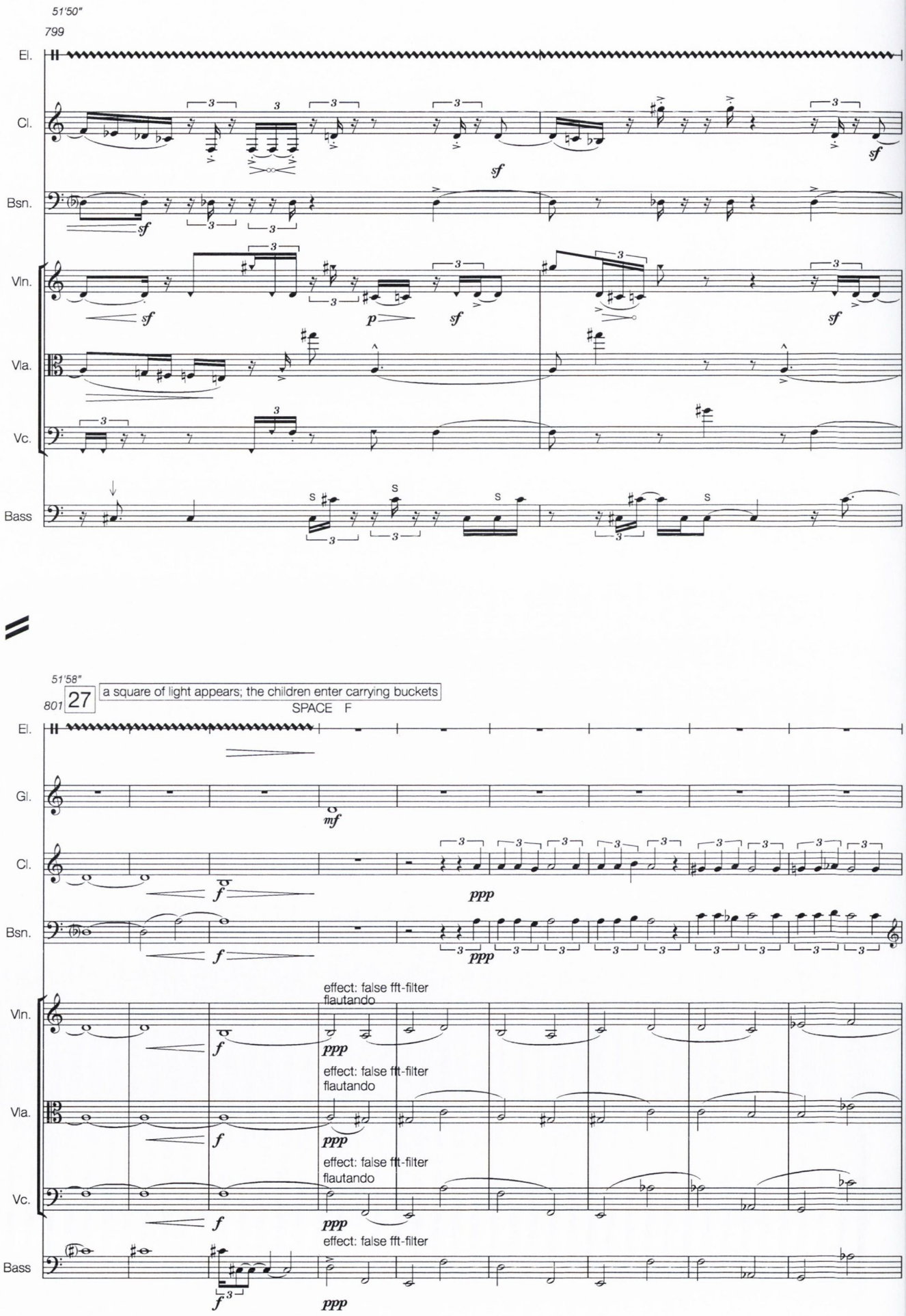
778

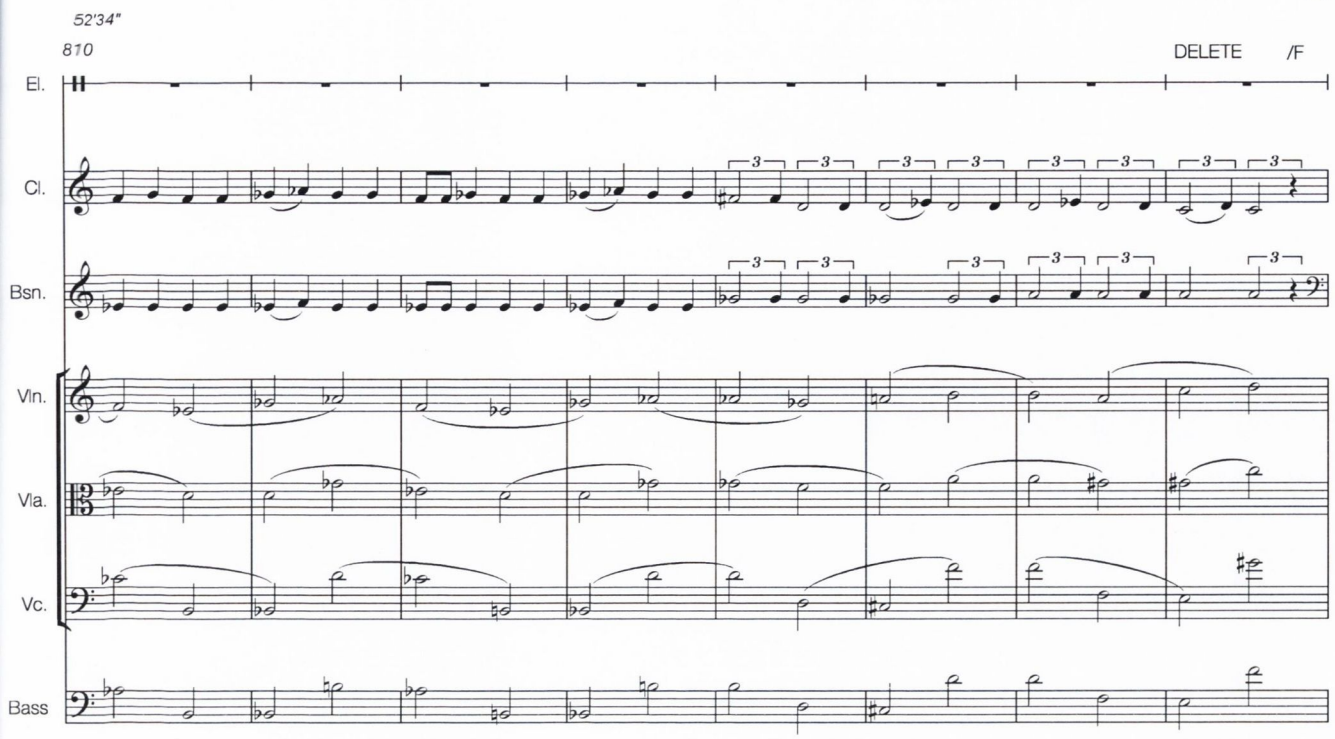


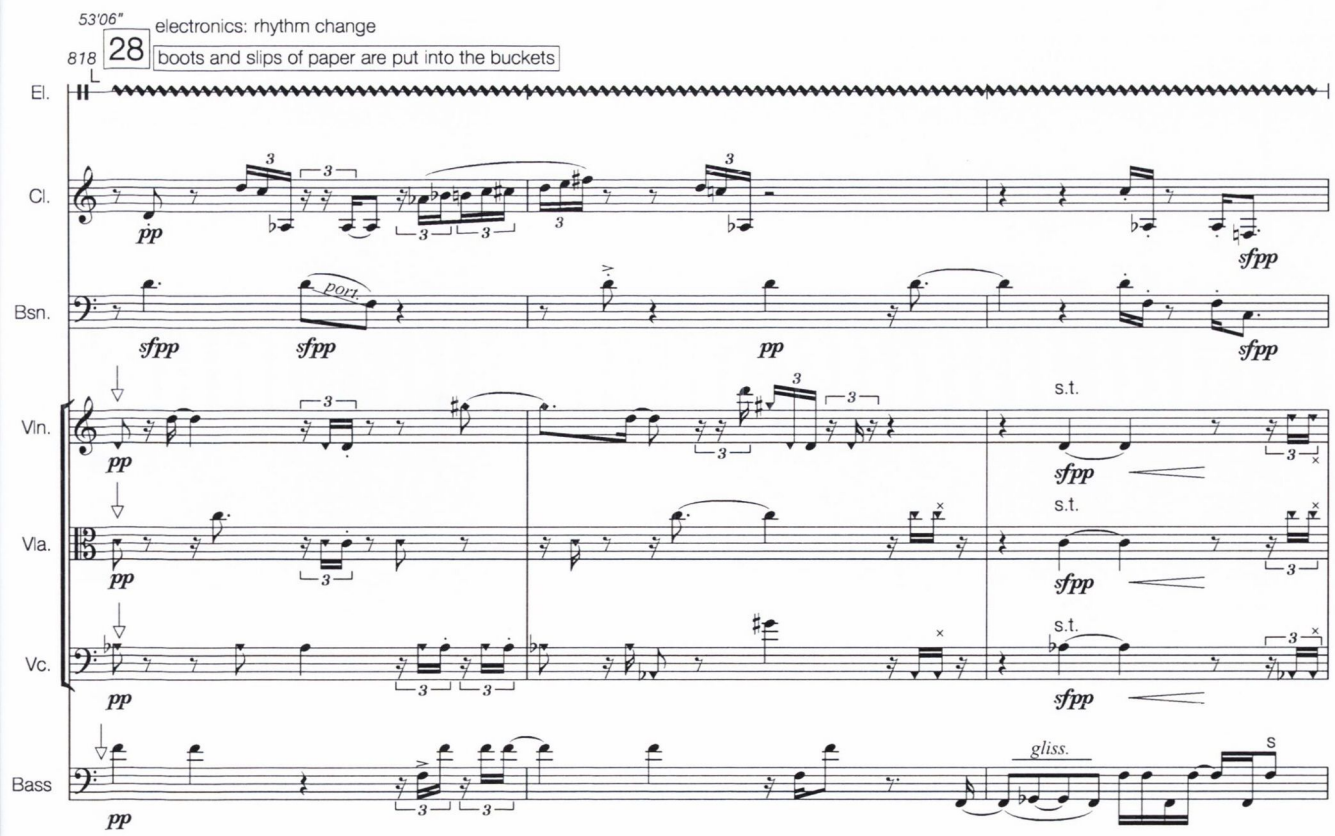

50'50"
784
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
pp
sf
sf
sf
gliss.
ppp
gliss.
s
gliss.

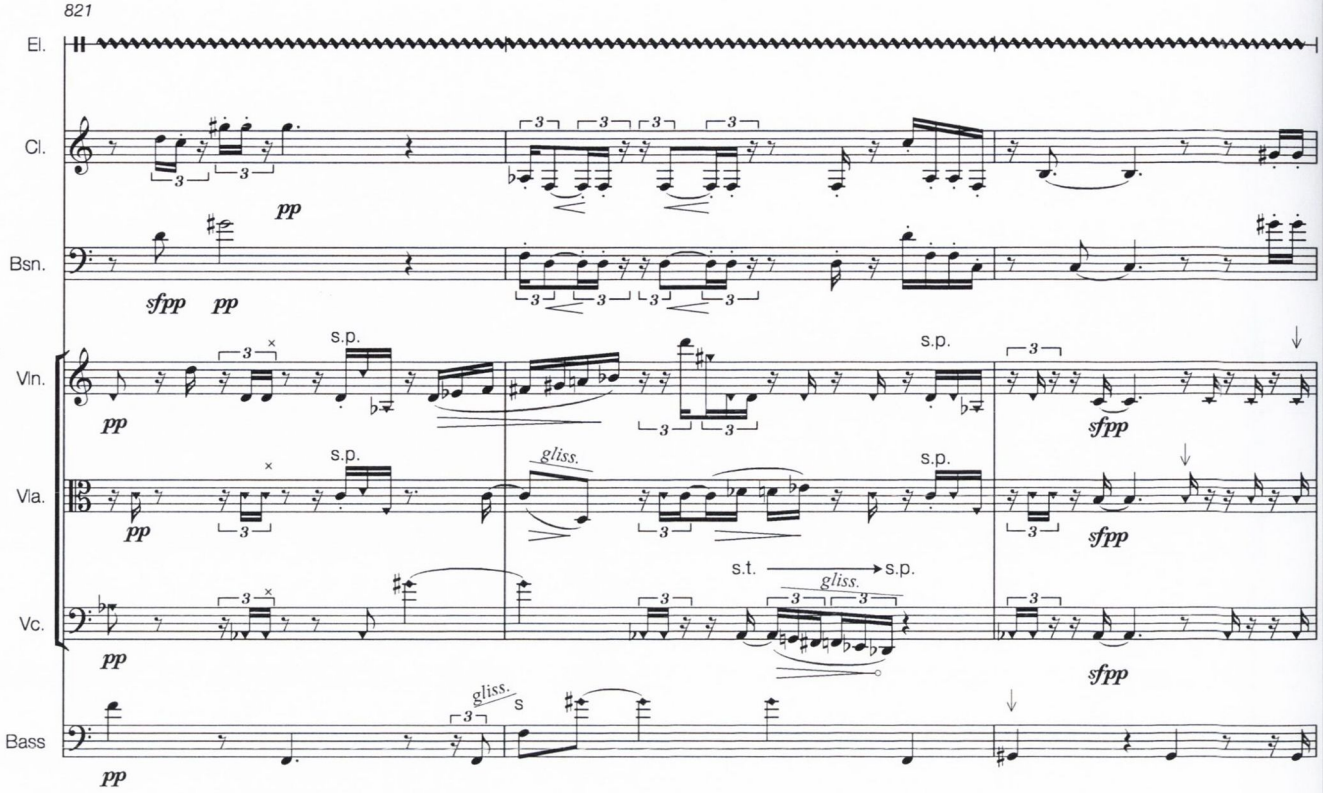

51'10"
789
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
sfpp
port.
sfpp
s.t.
sf
gliss.
s
s

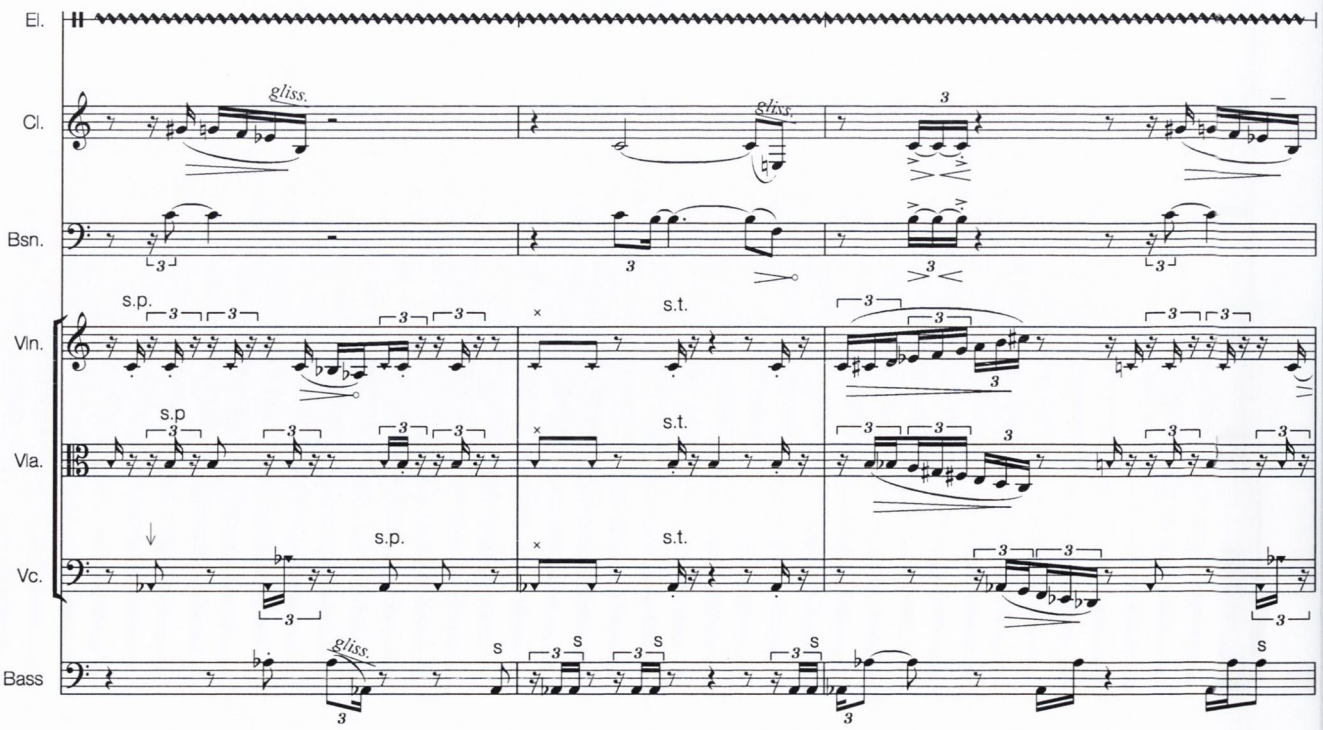

51'30"
794
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.p.
s.t.
gliss.
pp
51'42"
797
sfpp

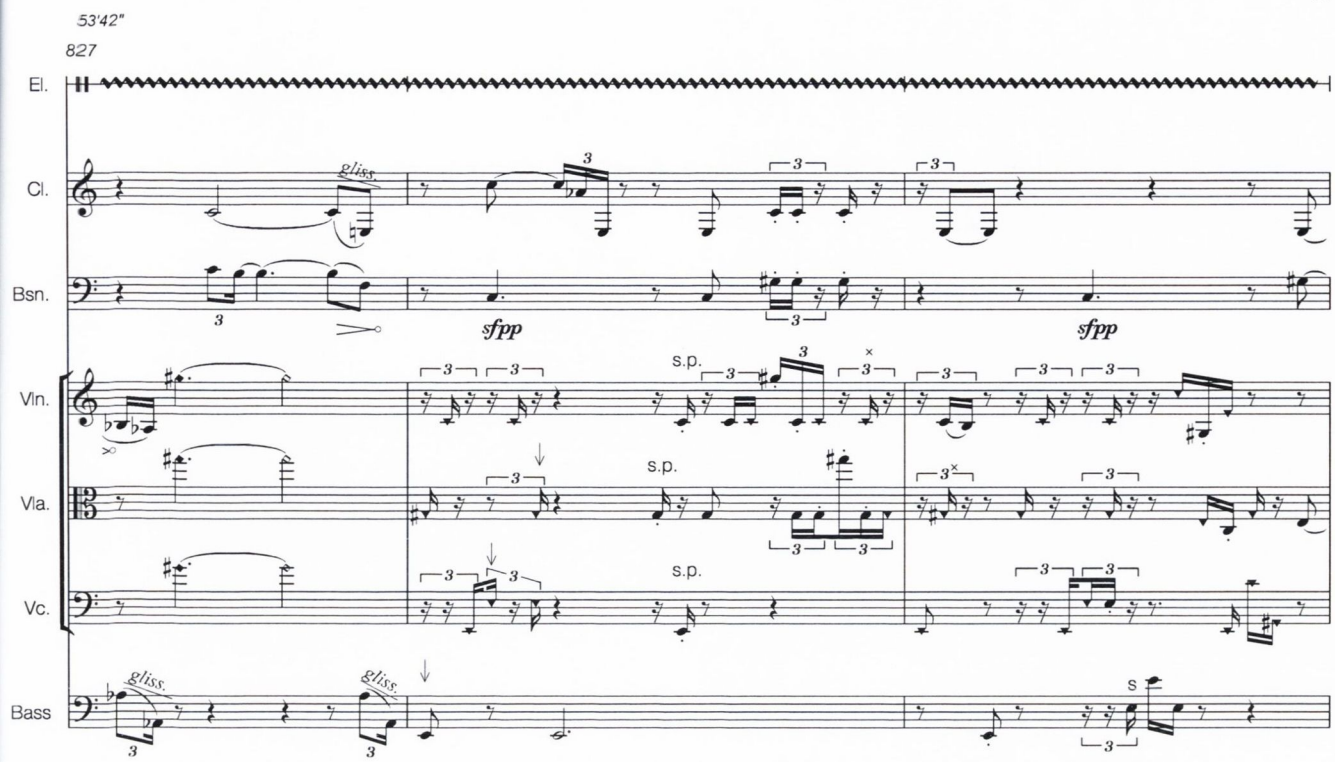

51'50"
799
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
p
S
51'58"
801
27
a square of light appears; the children enter carrying buckets
SPACE F
Gl.
mf
f
ppp
effect: false fft-filter
flautando

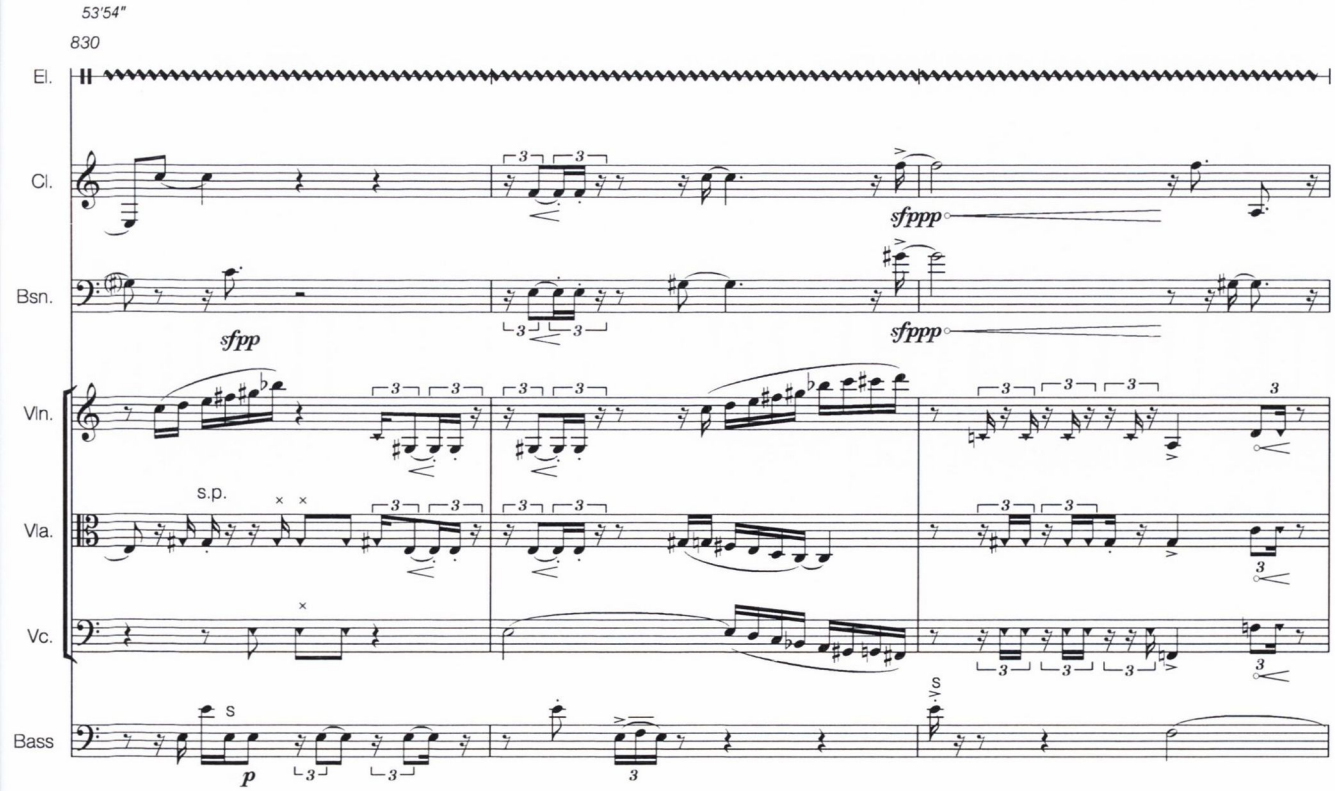

52'34"
810
DELETE /F
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

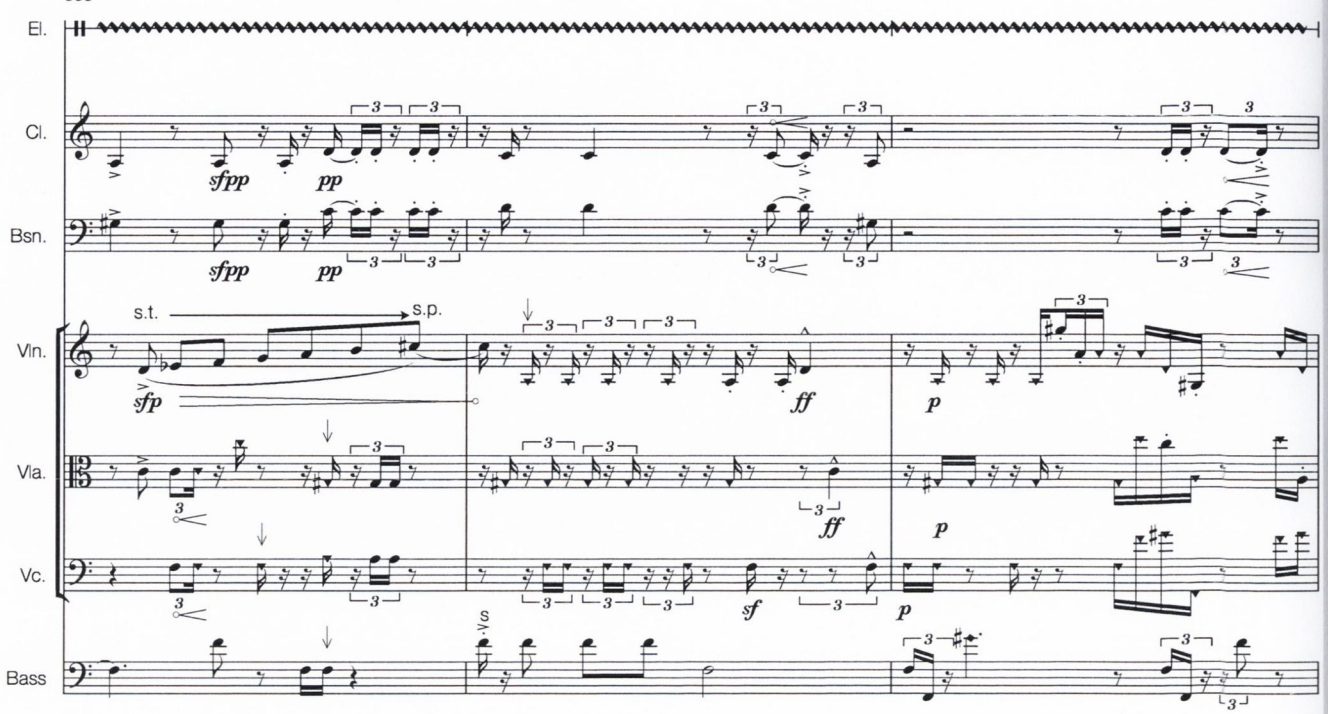

53'06"
electronics: rhythm change
818
28
boots and slips of paper are put into the buckets
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
sfpp
port.
s.t.
gliss.

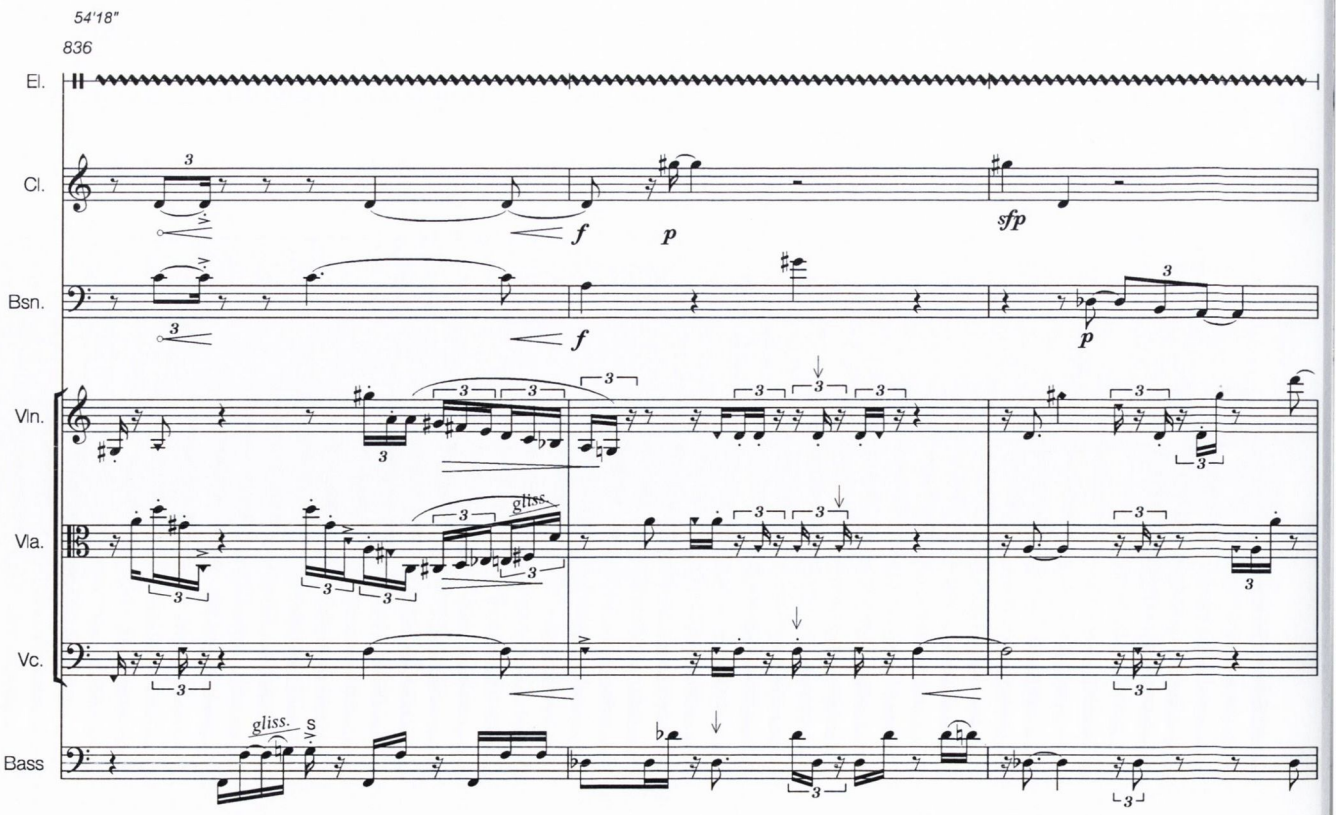

53'18"
821
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
pp
sfpp
s.p.
gliss.
s.t.
s

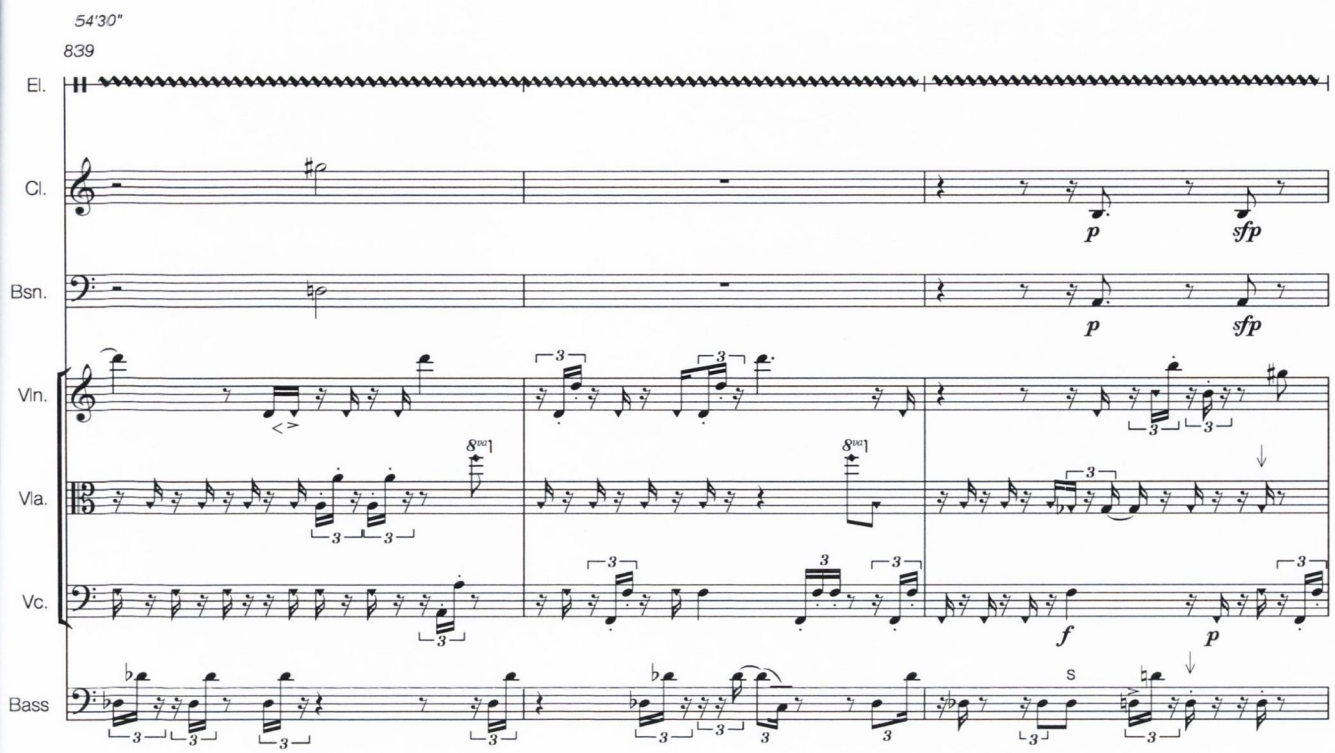

53'30"
824
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.
s.p
s.t.
s

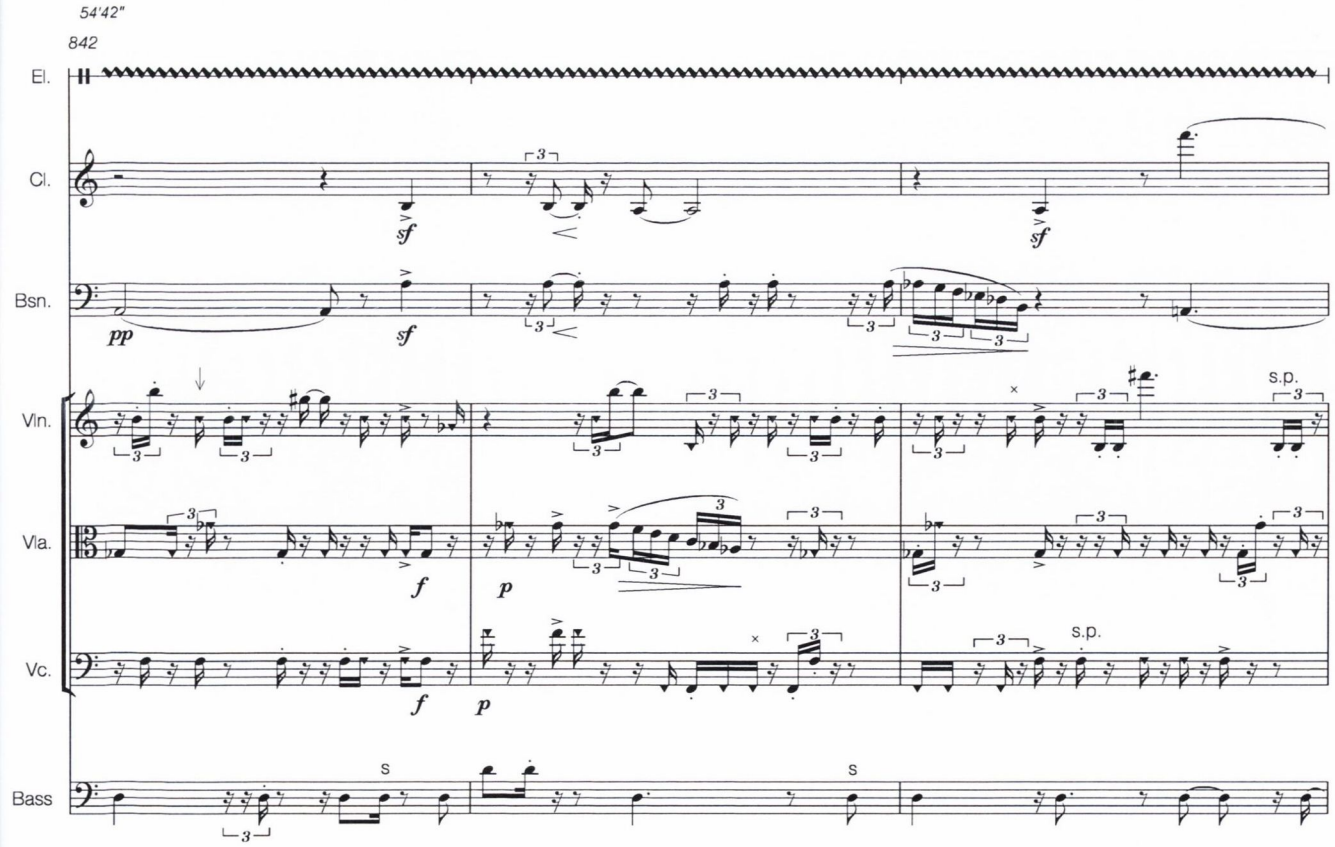

53'42"
827
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.
sfpp
s.p.
S

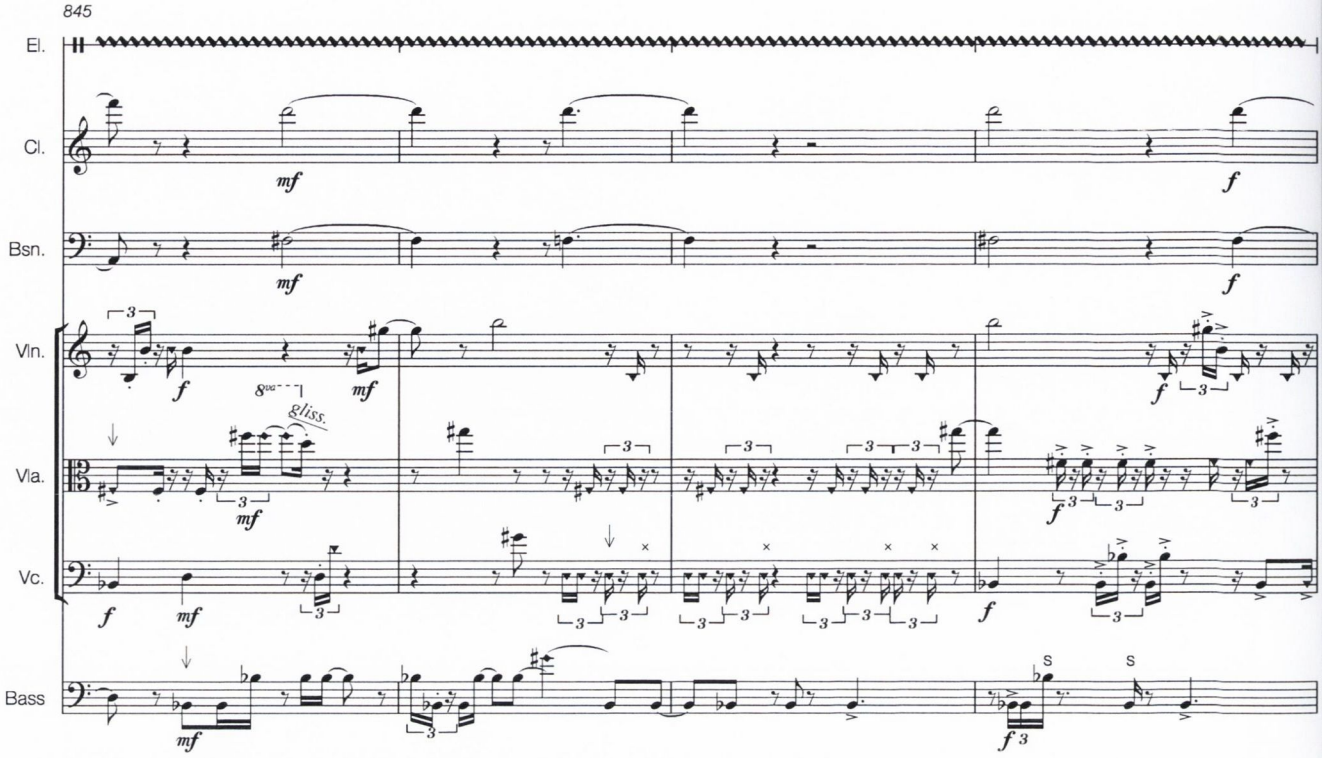

53'54"
830
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
sfppp
s.p.
S
p

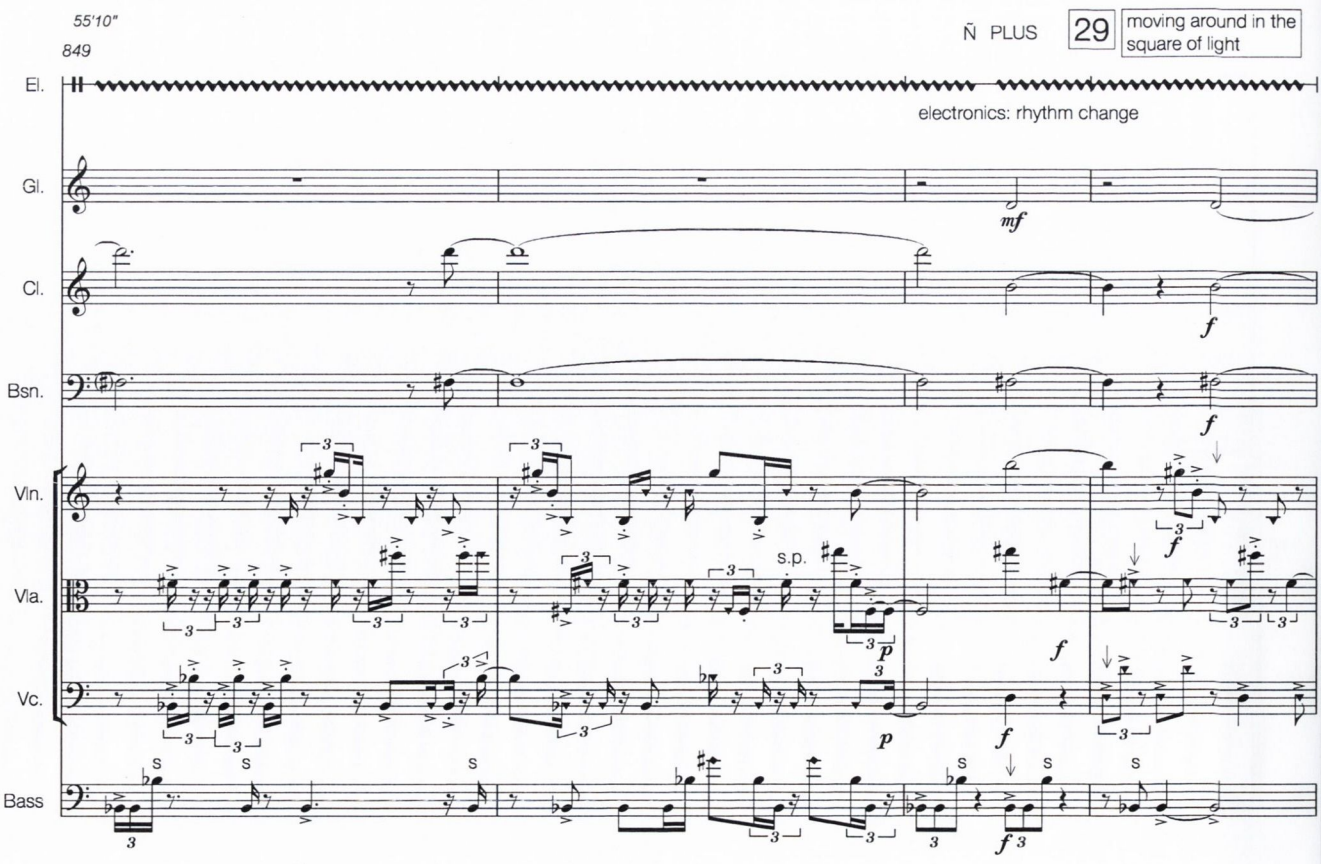

54'06"
833
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
pp
s.t.
s.p.
sfp
ff
p
sf


54'18"
836
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f
p
sfp
gliss.


54'30"
839
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
sfp
f
S


54'42"
842
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sf
pp
f
p
S.p.
S


54'54"
845
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
gliss.


55'10"
849
Ñ PLUS
29
moving around in the square of light
electronics: rhythm change
El.
Gl.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
s.p.

55'26"

853

ENTER

El.

Gl.

Cl.

Bsn.

Vln.

Vla.

Vc.

Bass

55'46"

858

MINUS

El.

Gl.

Cl.

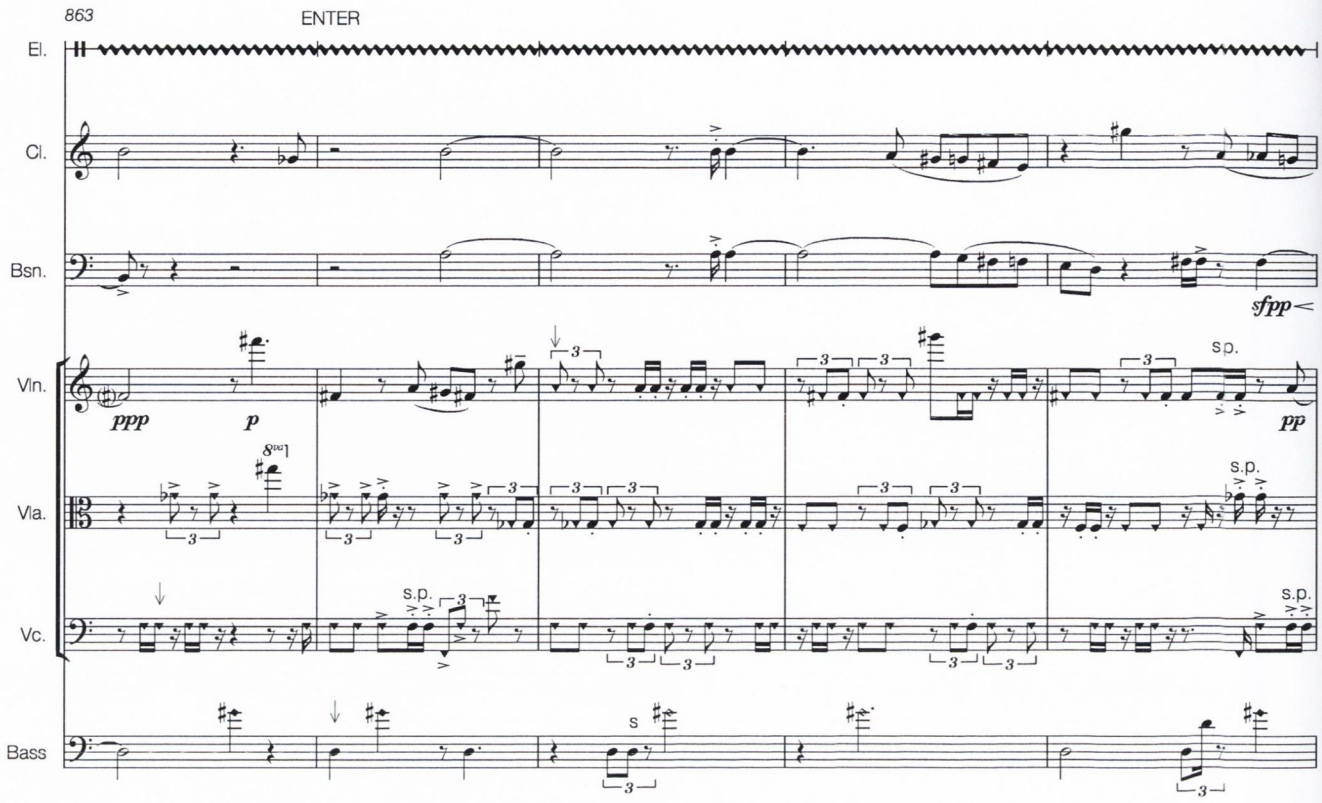
Bsn.

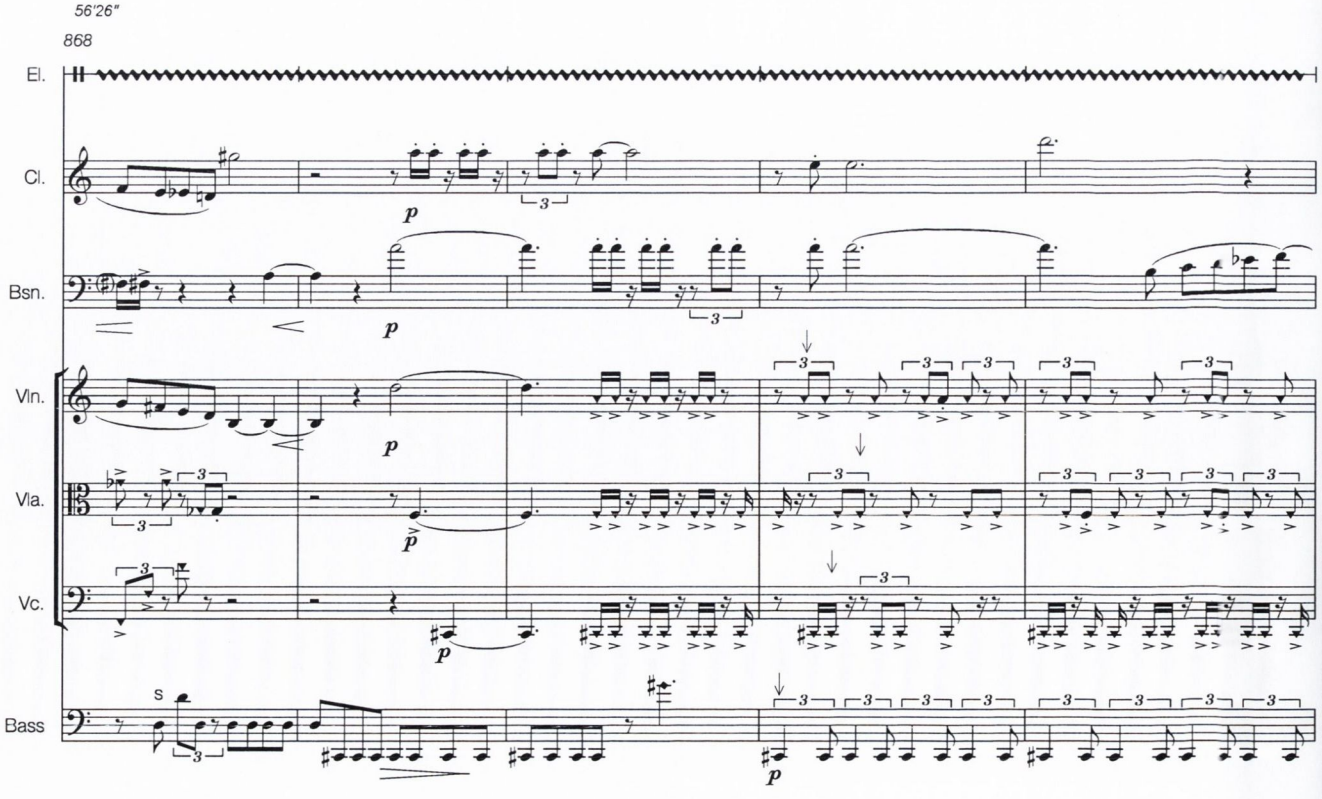
Vln.

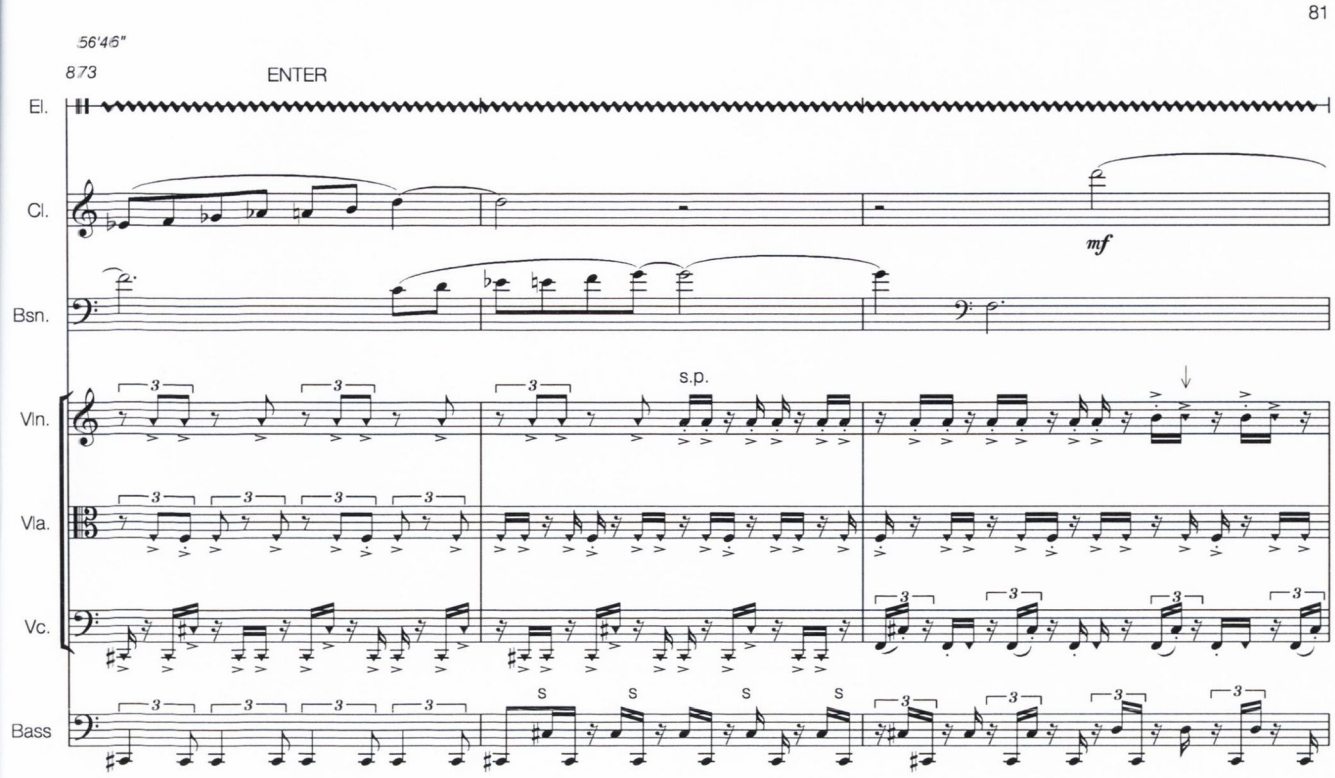
Vla.

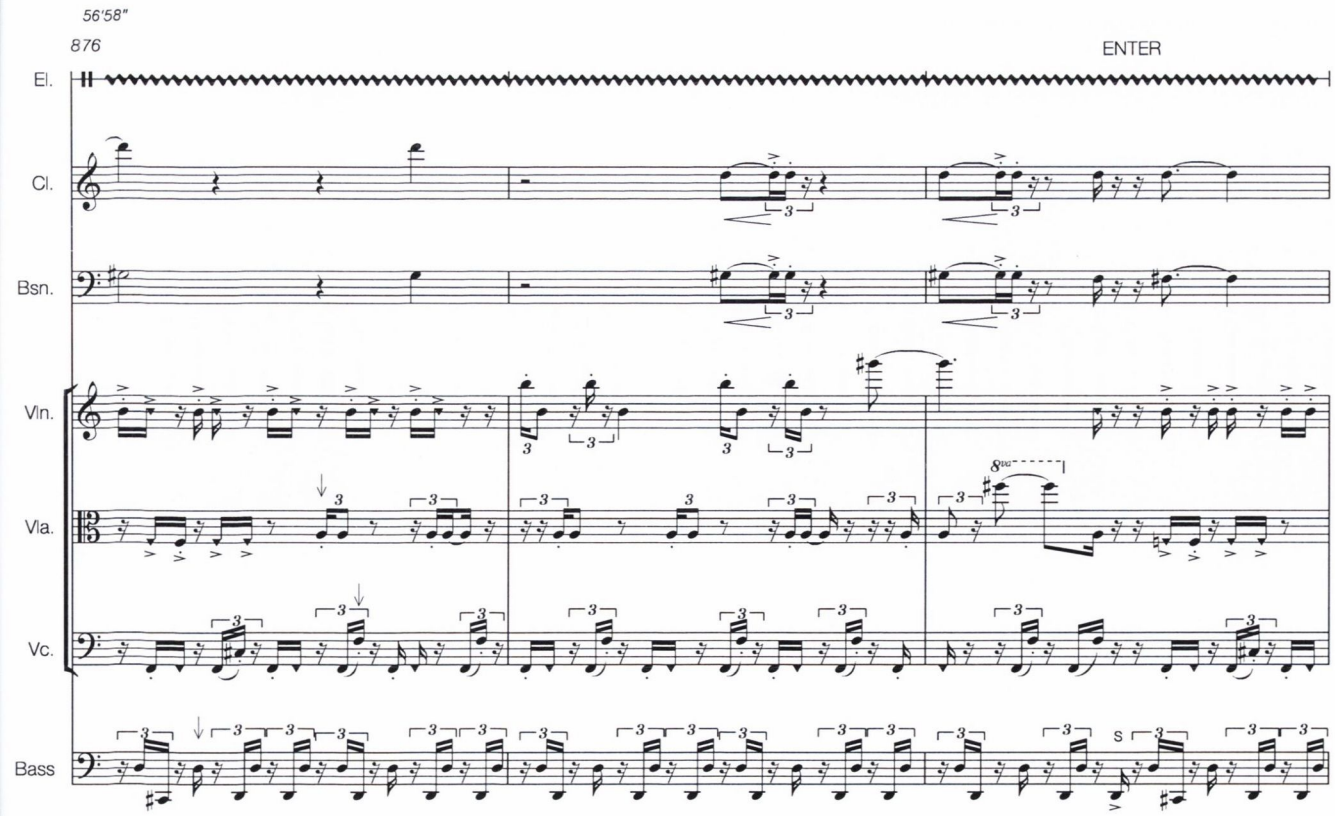
Vc.

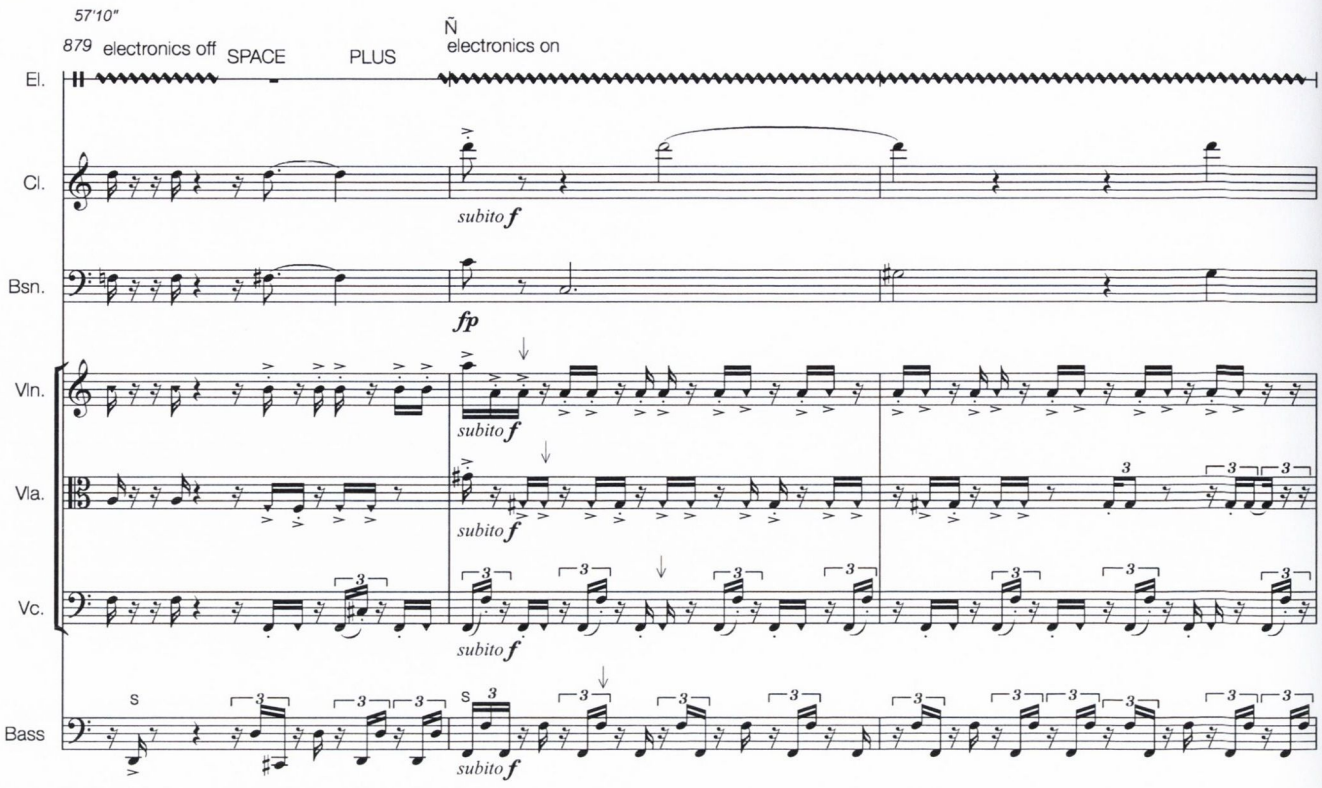
Bass

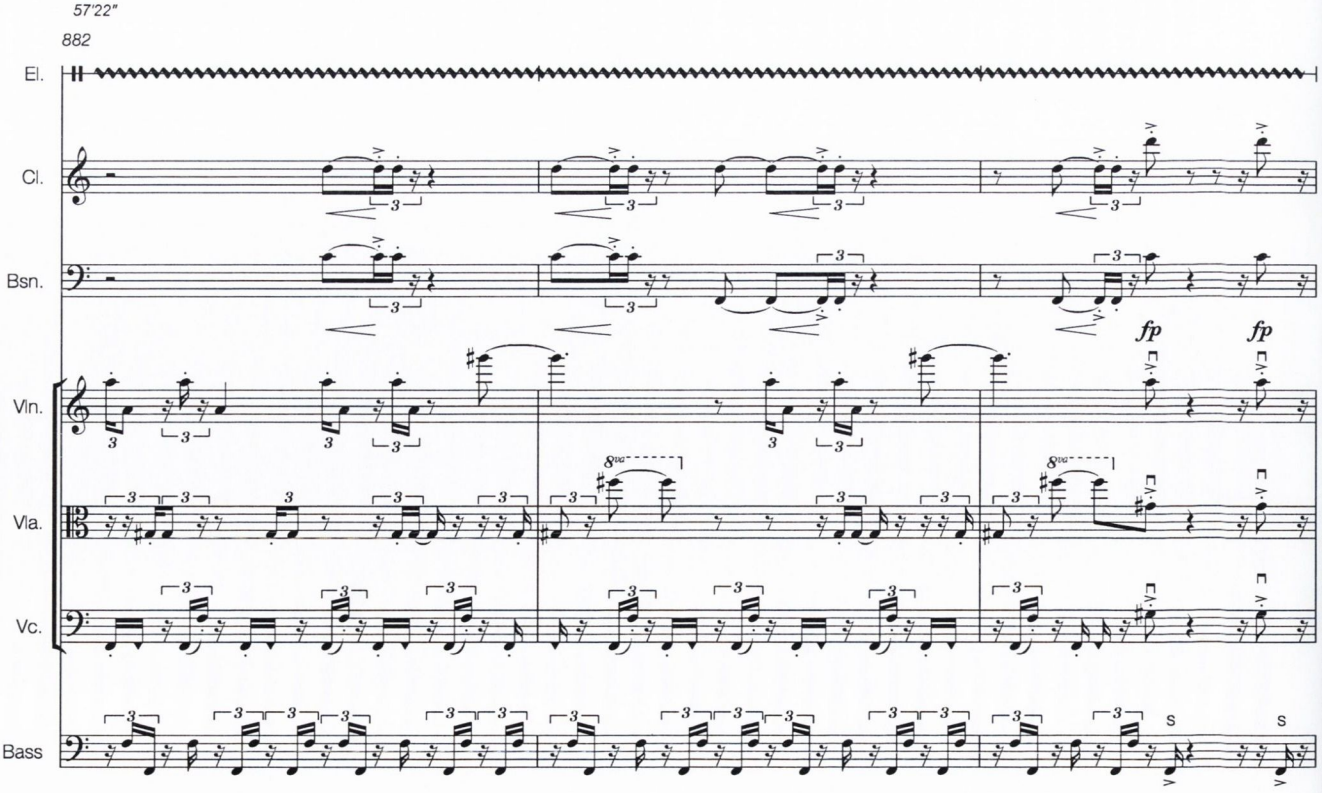

56'06"
863
ENTER
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
sfpp
ppp
p
pp
s.p.
s

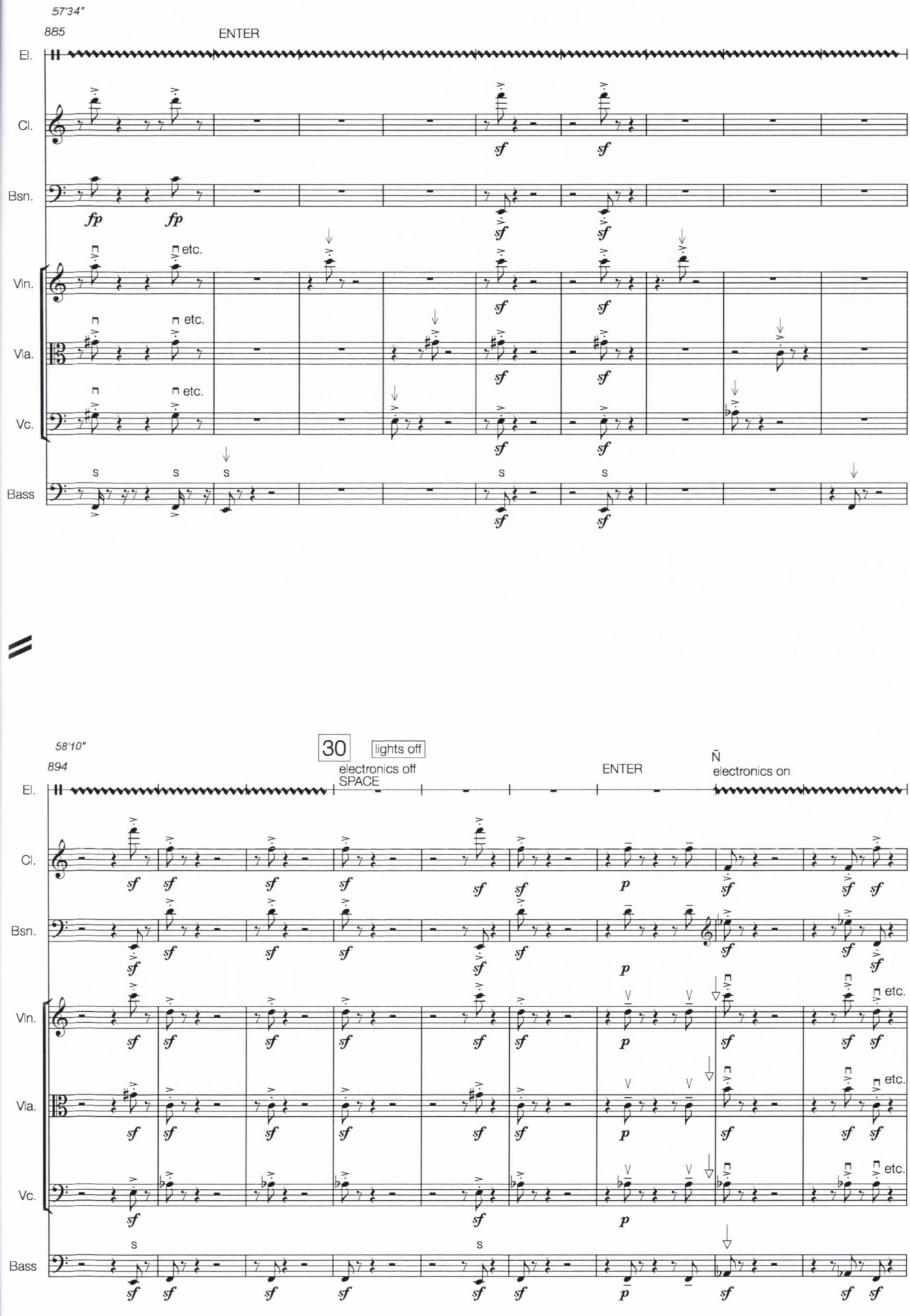

56'26"
868
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
p
s

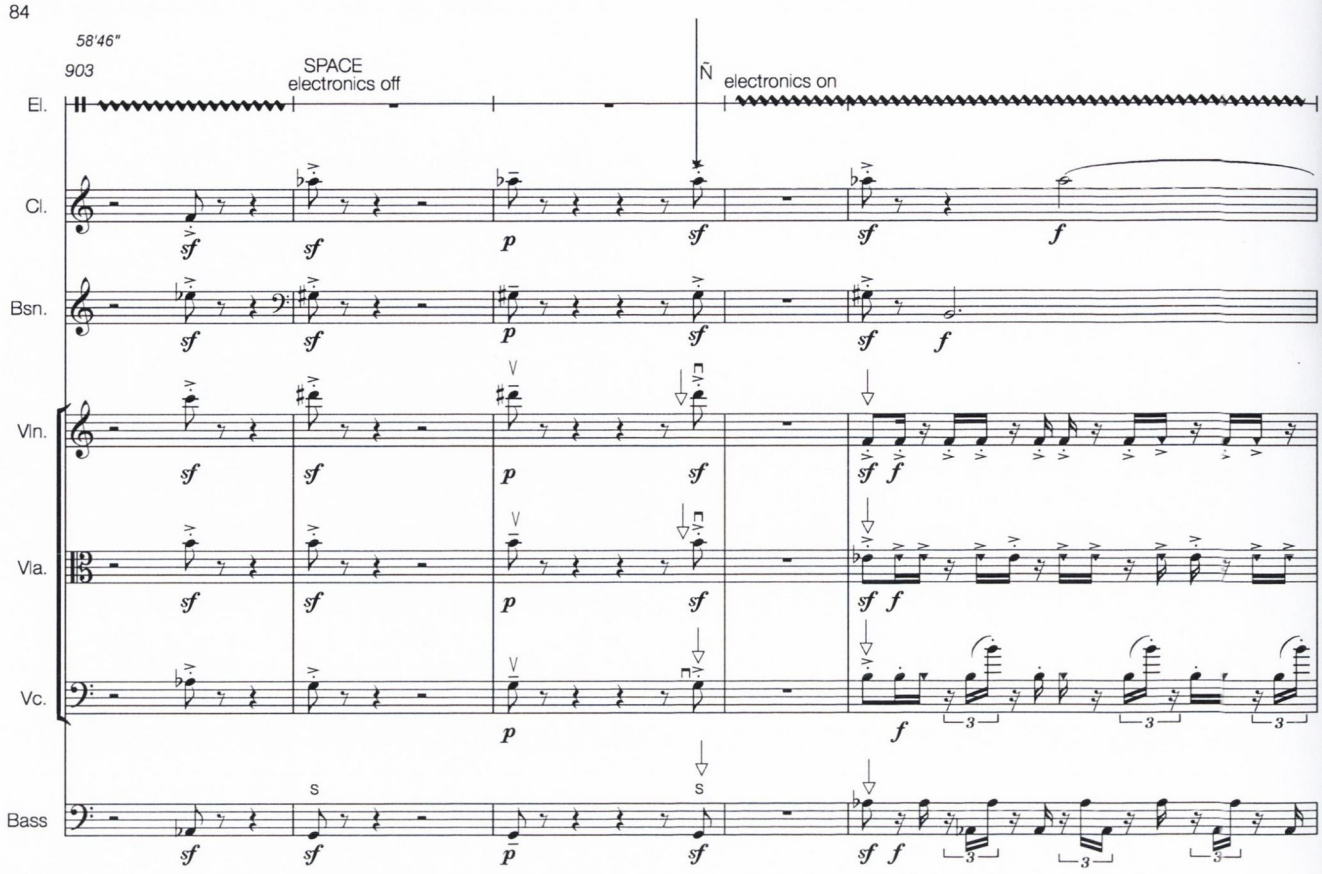

56'46"
873
ENTER
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mf
s.p.
S

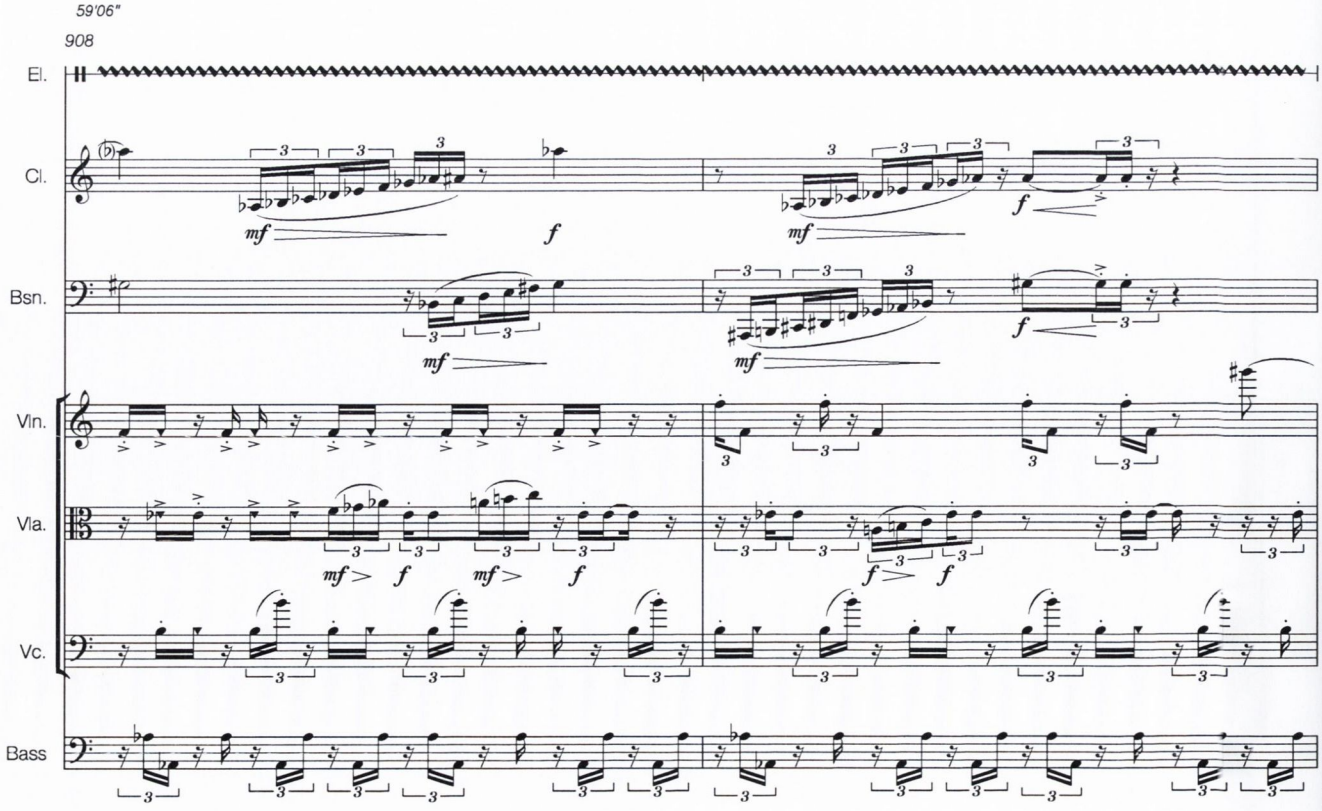

56'58"
876
ENTER
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
8va
S

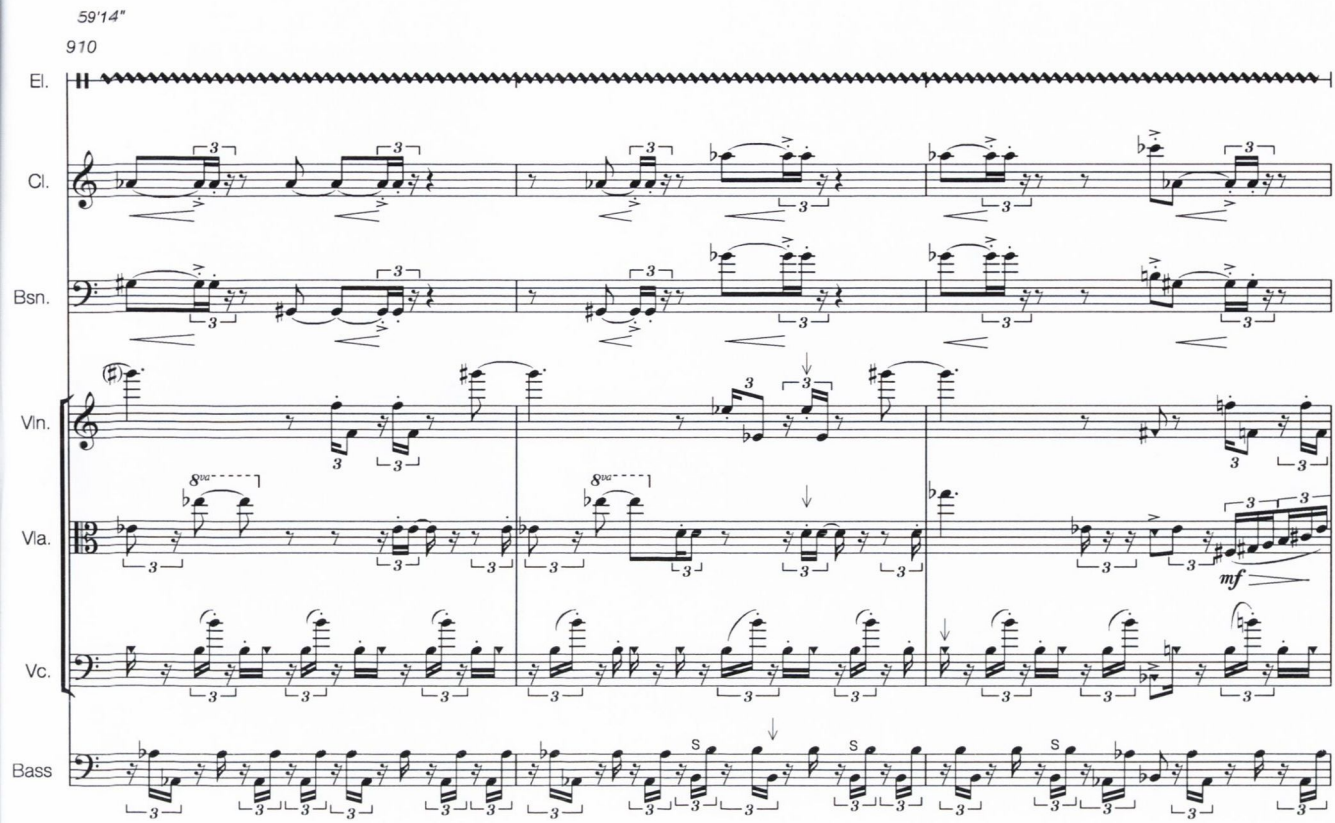

57'10"
879
electronics off
SPACE
PLUS
Ñ
electronics on
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
subito f
fp
s

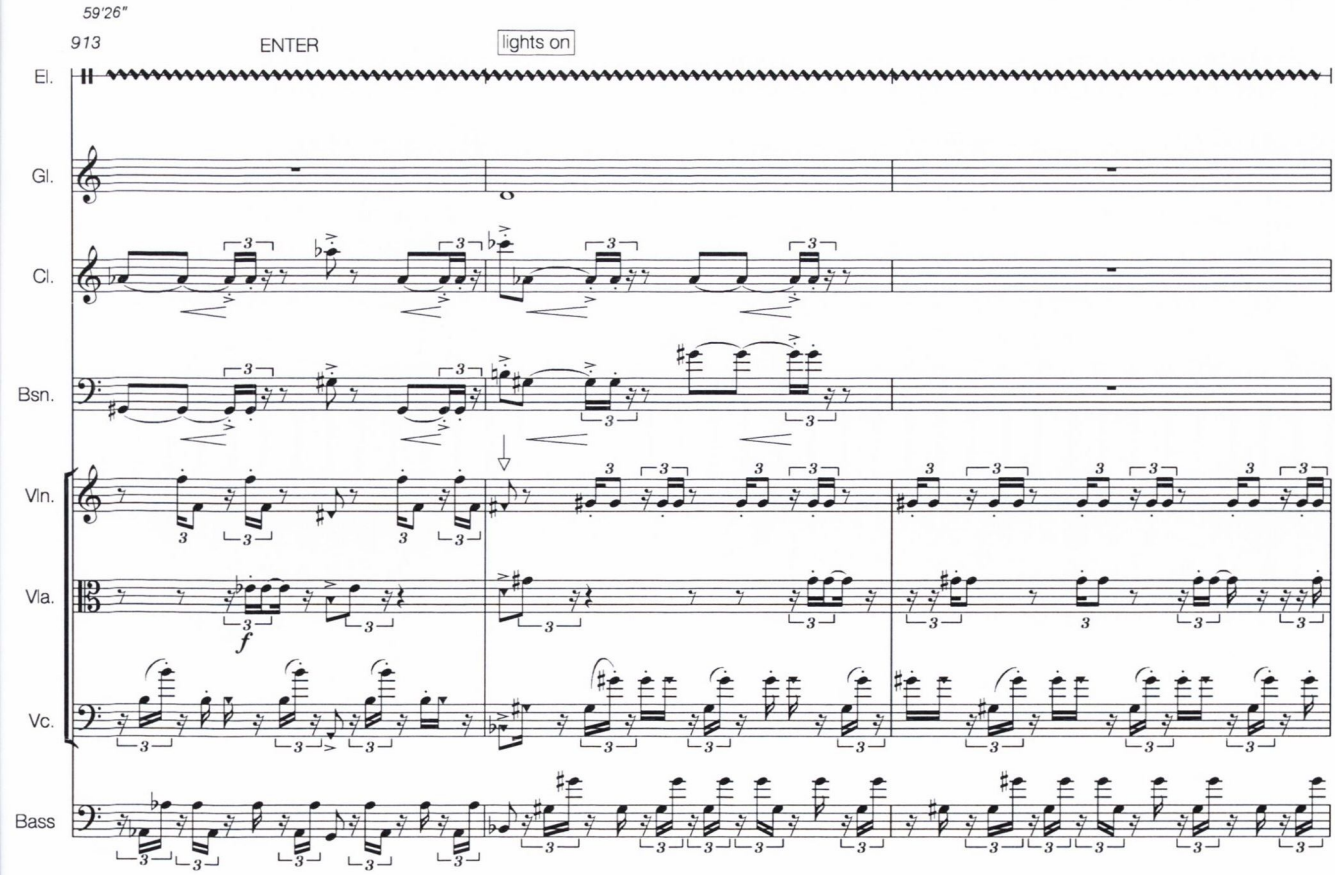

57'22"
882
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
fp
8va
s

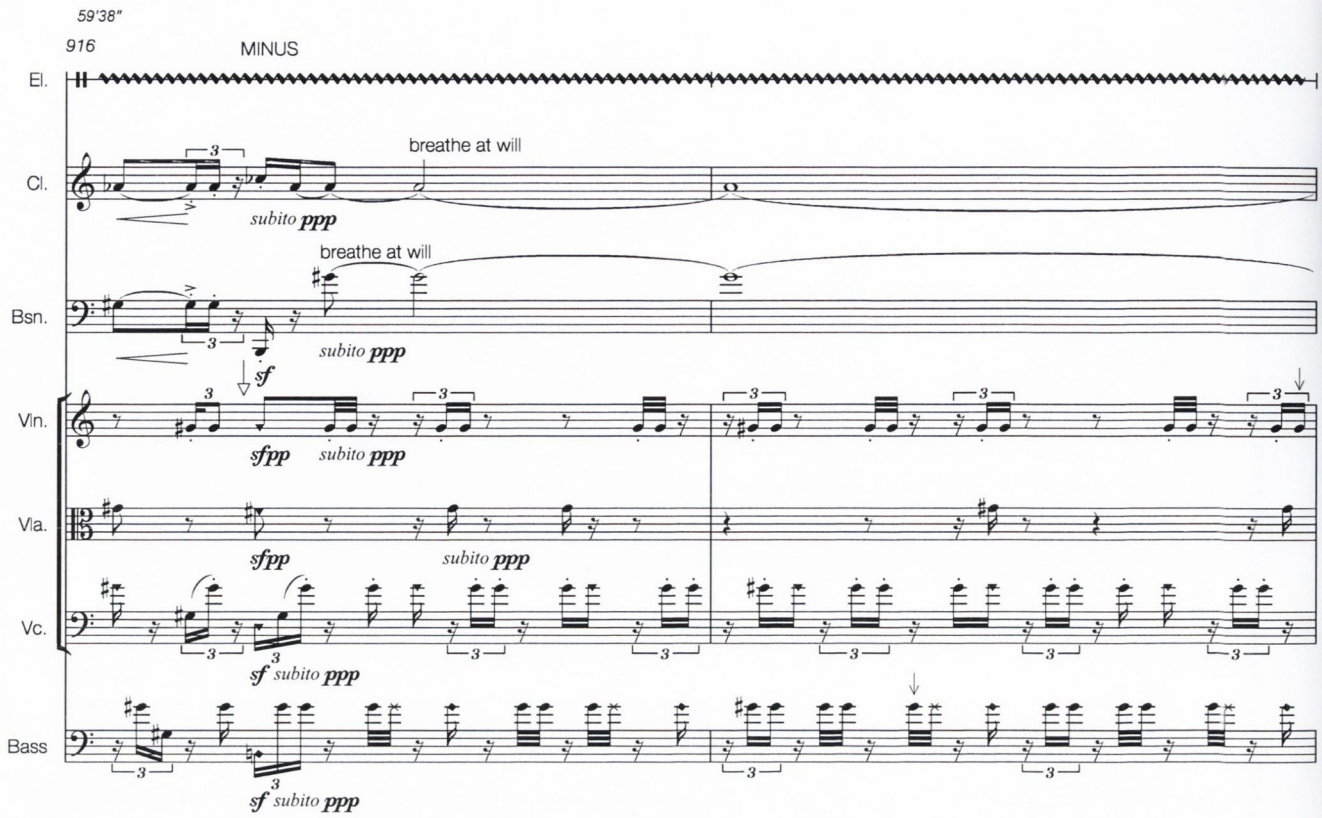

57'34"
885
ENTER
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
fp
sf
etc.
s
58'10"
894
30
lights off
electronics off
SPACE
ENTER
Ñ
electronics on
p

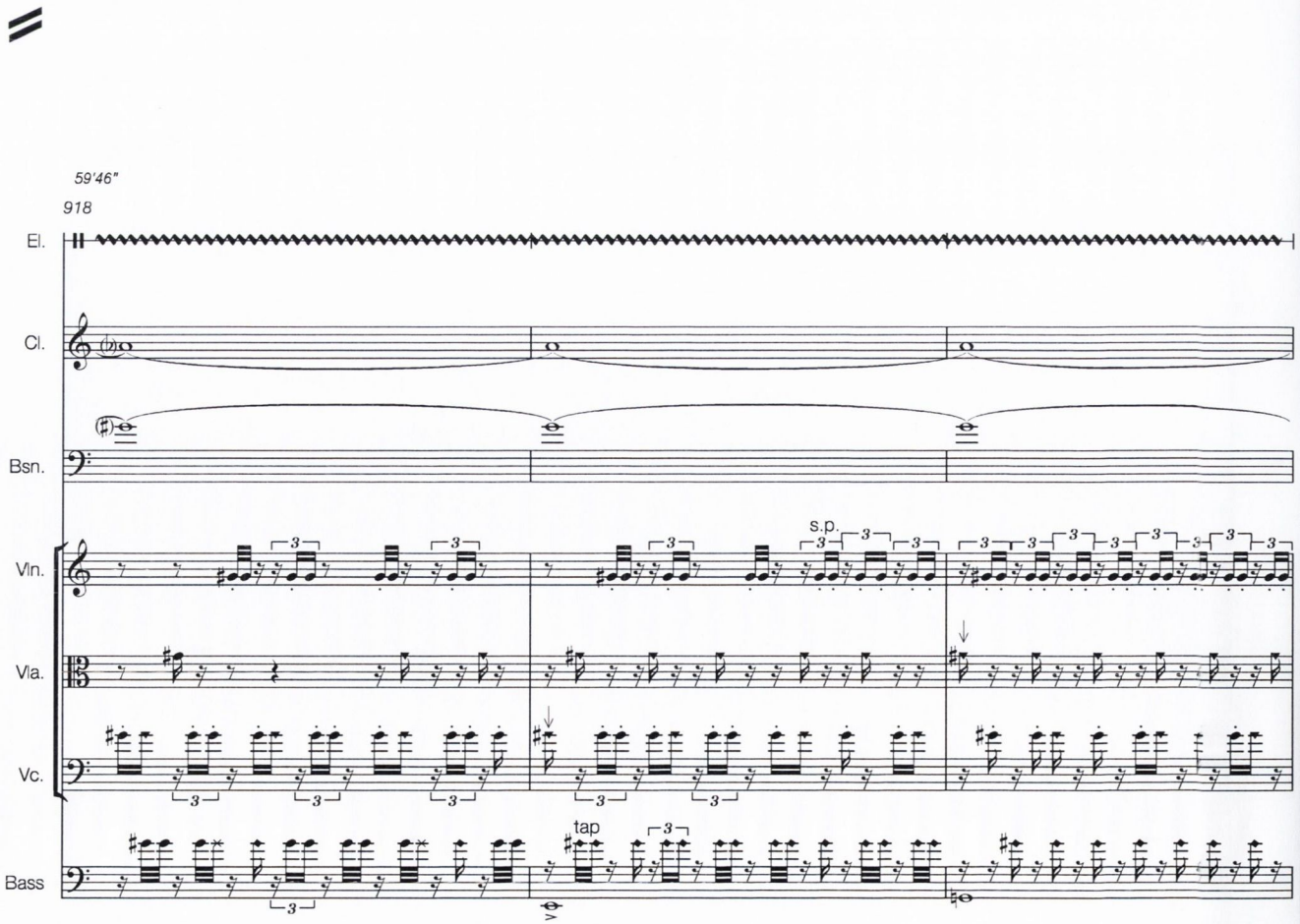

58'46"
903
SPACE
electronics off
N
electronics on
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass

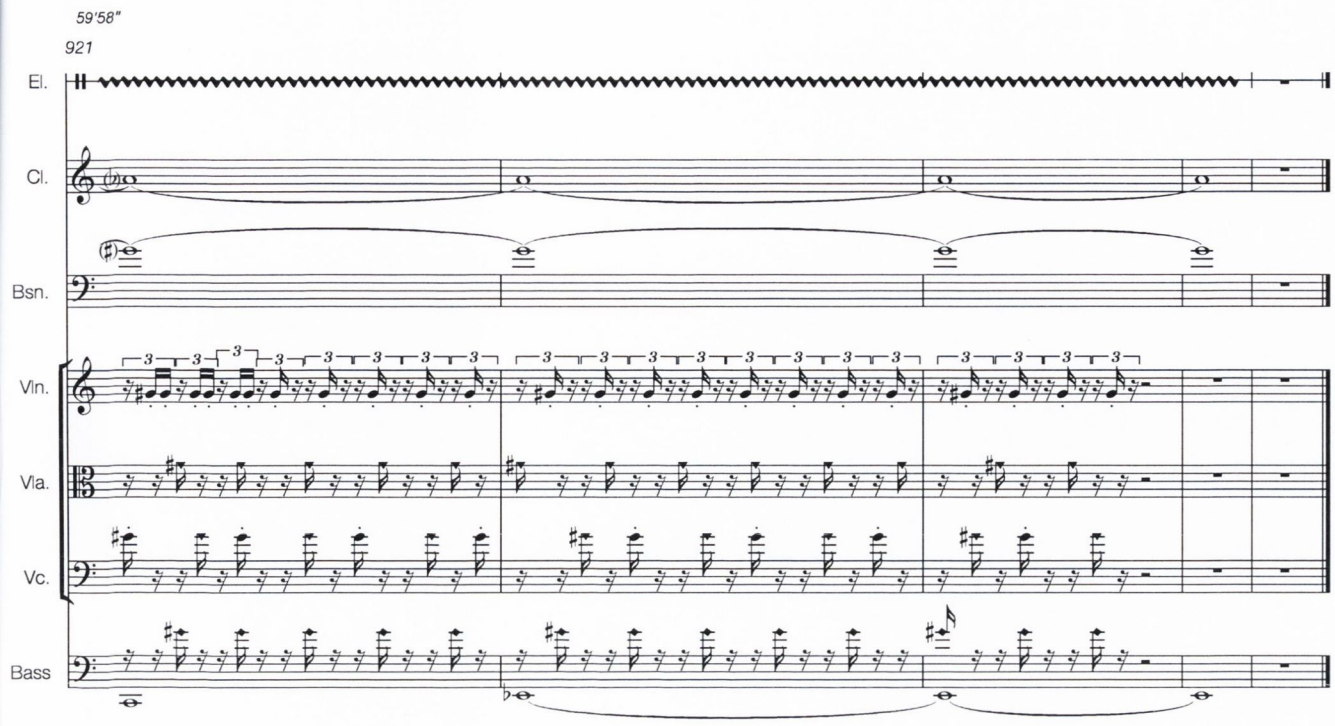

59'06"
908
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass


59'14"
910
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
mf


59'26"
913
ENTER
lights on
El.
Gl.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass
f


59'38"
916
MINUS
El.
Cl.
breathe at will
subito ppp
Bsn.
breathe at will
subito ppp
sf
Vln.
sfpp
subito ppp
Vla.
sfpp
subito ppp
Vc.
sf subito ppp
Bass
sf subito ppp


59'46"
918
El.
Cl.
Bsn.
Vln.
s.p.
Vla.
Vc.
Bass
tap


59'58"
921
El.
Cl.
Bsn.
Vln.
Vla.
Vc.
Bass