Middlesex University London

Middlesex University Research Repository:

an open access repository of
Middlesex University research

http://eprints.mdx.ac.uk

Mollison, Deborah, 2001.
Children's musical perception and creativity as a compositional model.
Available from Middlesex University's Research Repository.

Copyright:

Middlesex University Research Repository makes the University's research available electronically.

Copyright and moral rights to this thesis/research project are retained by the author and/or other copyright owners. The work is supplied on the understanding that any use for commercial gain is strictly forbidden. A copy may be downloaded for personal, non-commercial, research or study without prior permission and without charge. Any use of the thesis/research project for private study or research must be properly acknowledged with reference to the work's full bibliographic details.

This thesis/research project may not be reproduced in any format or medium, or extensive quotations taken from it, or its content changed in any way, without first obtaining permission in writing from the copyright holder(s).

If you believe that any material held in the repository infringes copyright law, please contact the Repository Team at Middlesex University via the following email address:
eprints@mdx.ac.uk

The item will be removed from the repository while any claim is being investigated.

"Children's Musical Perception and Creativity as a Compositional Model"

A thesis submitted to Middlesex University in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

DEBORAH MOLLISON

School of Art, Design and Performing Arts
Middlesex University

January 2001

THESIS CONTAINS CD/DVD

Acknowledgements

This thesis was completed under the supervision of Professor Michael Bridger, at Middlesex University. I would like to express my gratitude to him for his critical comments on earlier drafts.

My thanks are extended to Professor William Tiller, Stanford University and Professor Hannah Steinberg, Middlesex University, for their informal interviews.

Special recognition is also given to Connaught House School, London and head teachers Mrs Keane and subsequently Mrs J. Hampton whose encouragement and support enabled me to work with the children in a creative and original way. I wish to thank them both for allowing me to use the performances of the children's compositions that I taped during my time at the school, for this study.

Finally, I would acknowledge the efforts and work of John Coleman both colleague and friend, for his considerable help in the lay-out of this study.

DEBORAH MOLLISON

"Children's Musical Perception and Creativity as a Compositional Model"

A thesis submitted to Middlesex University in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Abstract

The intention of this study was to understand more fully the process of creating musical composition. As a means to do this I created a compositional model, "Maya's Words", a conscious experiment which utilised the techniques I discovered and codified from children's compositions. By utilising the model as a working tool and the information extracted from the children's works I was able to draw together my own theories and observations concerning the process of musical composition and how it works. Within the study I have also examined my own process of musical composition and drawn, in a limited way, upon my work on the methodology behind the compositional procedures of composer Elisabeth Lutyens.

The way in which the children used their own musical ideas in a flexible and original manner illustrated a mental state that seemed to be able to grasp thoughts from anywhere, without reference, for example, to tradition or style. This dexterity brought to my attention the notion that the children were using fragments of ideas / music / sound and integrating them into their own compositions.

In the compositional model for this study I chose to compose in a way that utilised information from this study in many manifestations but it also had to be an organic growth as a means to be real and for me to have a true input into it as a composer. It also had to incorporate many of the study elements into it otherwise it would not be a conscious experiment. The two forces here, for me have worked in tandem as the flexibility of approach used by the children has allowed me to work in a flexible way in this compositional model and yet the uncomplicated way in which the children evaluated their own progressions has had a profound influence on me too and provided me with a method of self-evaluation which does not create self-inflicted damage to my own feelings about my composition. I hope in the same way that this study will allow composers a freedom of perspective that will open for them a new understanding of musical composition.

Contents

Acknowledgements	i
Abstract	ii
Contents	iii
1 - Introduction	1
2 - Sequence of Learning	17
3 - Lines of Growth	24
4 - Circuit of Activity	30
5 - Framework	45
6 - Model	77
7 - Conclusion	95
8 - Further Ideas	100
9 - Appendices	112
10 - Bibliography	185

Chapter 1 - Introduction

Drawing from empirical and experiential information gained from my work with children aged 4 - 11 years the intention of this study was to understand more fully the process of creating musical composition. This intention was to be realised by the creation of a compositional model which would: act as a store house of components of musical language as defined by me given the findings of this study; give an illustration of theories that I expounded within the study; provide me with a work 'in progress' which for the latter duration of this study would do the aforementioned tasks whilst simultaneously acting as a sounding board for my own compositional work to expand. In addition the model would act as a resource for my thoughts to work through any other material or new ideas gleaned during the course of the study. The compositional model which I have entitled "Maya's Words" was a conscious experiment which utilises the techniques I discovered and codified from the children's compositions.

As a child I began composing music without any prior instruction in composition. I had been to a few piano lessons after which something within compelled me to compose and I have been composing ever since. My investigation within this study to understand more fully the process of composition was propelled by the fact that I have always had a burning interest in music and the formation of its elements. The undertaking of this study and in fact my compositional work with the children both occurred as unplanned events in my life. My work with the children began with a job opportunity (which is further explained in the outline of the structure this study is to take, which follows in due course) whilst my work in this study was initiated by with an unexpected prompt in my life which occurred years after my work with the children where I found myself wanting to understand what I was doing when I was composing. Given that I had been inspired by the children's work and that I felt I could relate to their processes as I too had composed as a child, I concluded that an examination of the children's compositional work would be a good place to start.

One of my first ideas was to try and understand what I call a 'line' of music and how this might manifest itself within the mind of a composer. This 'line' (for me) could be a tune, a sequence of events, a series of patterns, a collection of timbres, anything of a musical nature that continues. The shapes of musical phrases in music, often create lines or progressions and I thought I might find more information on how these were formed by looking at the work of the children.

From observing how children built and constructed composition I might be able to build my own structural template. I felt that this 'line' must be a mental line of progression; that is, a line of thought which translates itself into an audible line of music which can be heard. I wondered how it might grow.

I remembered that as a child I would sit and observe objects, drawing lines around them in my mind and attached to these lines were melodies in my head. Smooth melodies around smooth objects; spiky objects were difficult. Up and down was easy. My starting point for the study became the search for someone or something that resonated even if only in part to my thoughts concerning the 'line' of music. If I found such an authority I could utilise their work as a base for my thoughts to spring from. For me this came in the work "Structural Functions in Music" by Wallace Berry. To begin with the route of enquiry he maps out for musical investigations seemed to fit my path of potential development for this study, he states:-

> "a belief in the importance and necessity of logical analysis of the musical experience of the study of objective data derived in the analysis of structure and experience. That experience can be regarded as the sum of responses attributable to particular musical processes, the action-reaction complex set up whenever there is perception (and enhanced when there is cognition) of musical stimuli issuing in contexts in which syntactic relations are cultivated and controlled as the result of disciplined creative acts. I strongly affirm that belief in logical analysis, and in the necessity and worth of the pursuit of rational inquiry into the musical experience." [1]

My experience in my work with the children was that the children composed happily and in a focused manner with regard to their work and creative endeavours. A striking feature of the resulting compositions was that they were achieved from a source of growth that was not structured, or as part of a study, but which grew in a natural and unformulated way. This approach echoed the pathway of my own early compositional development.

Given the evolutionary growth of the language of composition for the children it became vital for me to use my instincts as a composer, in this study, to make my own decisions and theories as to the meaning of some of the advances I saw in their work over the years. Again there is support for me in this in Berry's writing:

[1] Berry - Structural Functions in Music, page 2

> "At the same time I see that mode of inquiry as one in which conjectural hypothesis and intuition (where intuition is the creative fusion of acquired knowledge and experience) are vital in triggering necessary questions and answers, and in suggesting interpretations which can be examined for plausibility and, at times, susceptibility to empirical verification." [2]

Berry often refers to the shaping of lines and the 'invisible line' and this for me became the clinching determination in my deciding to utilise as much of his theoretical grounding as possible as a base for this study, he states:-

> "Still it is a sound basic premise that the shaping of lines of element-change is an all but universal factor in musical function and expression; and certain elements are applicable across virtually all historical-stylistic boundaries, notably those of texture and rhythm." [3]

Whilst immersing myself in the world of Berry's analytical vocabulary I soon realised that, although his ideas and theories made much sense to me, I would have to make up my own theories and define my own thoughts concerning my study if it was to make a progression that I could call my own. Even so, the importance of texture and rhythm became weighted not only by Berry's focus on them in his writings but also for me in my work as, in progressing through the study, I found these areas to be of utmost significance. Significant not only in (my own) written composition, but also in the way in which I felt music might potentially form in our minds. These facets are illustrated in my model and further examination of them is seen throughout the study in a variety of forms.

My approach would differ from that of Berry's in that I considered the work of the children to be raw and unaffected by any preconditioned notions of the formation of music as opposed to looking, as Berry does, at accredited works composed by seasoned composers. In addition the model I have created is an organic testament for my ideas and a 'live' musical example of theory. Stravinsky stated in his series of lectures entitled 'Poetics of Music' :-

> "The study of the creative process is an extremely delicate one. In truth, it is impossible to observe the inner workings of this process from the outside. It is futile to try to follow its successive phases in someone else's work. It is likewise very difficult to observe one's self. Yet it is only by enlisting the aid of introspection that I may have any chance at all of guiding you in this essentially fluctuating matter." [4]

---

[2] Berry - Structural Functions in Music, page 2,
[3] Berry, ibid. page 12
[4] Stravinsky - Poetics of Music in the form of six lessons, page 50

I have possessed this book since my teenage years and have consistently found new inspirations from it; his writing seems so simple and yet it holds much depth for me as a composer. Prior to going forward with this study, I wanted to look at the work I had undertaken in my previous study for my Masters degree to see if any of my thoughts there could be developed. I had chosen to study the works of Elisabeth Lutyens; on my first meeting with her she recounted how she met Stravinsky and stories of him; I felt this was a good start. I remember it was after reading her book entitled "The Goldfish Bowl" that I was first drawn to look at her compositions. I had previously looked over the work of numerous composers of her era to see if I could find anything that I felt aligned to musically (I was at that time concerned about my own compositional language; where did it come from and how was it to develop?). When I found the score for her 5 Bagatelles for piano I felt empathetically aligned to the musical 'lines' and phrases in the compositions. I also thought that it was a relief that they were atonal compositions in that they made total sense in one way and yet did not provide the stereotypical harmonic information that would be expected of an English composer of her era. As someone with perfect pitch I found this extremely refreshing and a release from the constricting boundaries of expected cadential sequences.

In my study on Elisabeth Lutyens I was concerned only with her world of composition and how this came about. I looked at her background and how this may have affected her writing and came to the view that the influence of the work of her father, the architect Sir Edwin Lutyens, could be seen, not only in her compositions, but also in the way in which she wrote. In my interview with her she stated:

> "Every composer writes what he hears. I get my architecture and then the whole thing is built through...there are endless questions and then I hear, and then I write - I don't devise. I generally hear each note."[5]

Elisabeth spent much time as a child looking over the structural plans of her father's work and I believe that this made an imprint on her mind making the structural aspect of her composition an important but, albeit, natural part of her work. Could this have any correlation with my looking at the circumference of objects? In my study on her I traced a pathway of development and growth in her stylistic abilities; I looked at the functions of timbre in her writing through use of instrumentation and in her late work her use of more developed forms of rhythmic densities. The importance of timbre and rhythm was clearly identified.

[5] Price - The Perceptibility of the Compositional Procedures of Elisabeth Lutyens, page 158

Looking at my analysis chart of her works I can see that my devised system of musical analysis in this study has partially evolved from some of the discoveries that I uncovered through analysis of Lutyens' work. For example some of my analytical phrases and ideas such as:-

> "rhythmic densities dictate tonal centres," "semitonal shifting," "spasmodic surges," "fluctuates spasmodically according to text," "alternating time-signatures - constant shift of beat," "flow of harmony is natural outcome of motivic activity."[6]

These phrases represented for me the easiest way of describing in words what I heard and saw in her music. This is a technique I have sought to continue in this study with reference to my analysis of the children's compositions and in the construction of my musical components.

The progression that I had noted in Elisabeth Lutyens' works would give me an excellent framework of reference to continue with my own course of analysis in this study. I felt confident I could find a correlation between the (visual) impact of data on the mind of a composer by looking at the children's works and building upon my observations concerning Lutyens' work and my own compositional writing. More importantly I felt that the value of noting the progressions in her work were centred in the fact that her writing as a serial composer had been a natural and unformulated occurrence as she had pioneered its use in England. This in some way tied in with the unplanned and natural way in which the children (and myself) encountered musical composition which was for them a new language.

In continuation of my consideration of the musical 'line' and what this might mean, I thought a lot about how it may have manifested itself in my world. I remembered studying French at school. I could read it but found it hard to speak. I found it easy if I repeated something short, without thinking, by mimicking , if you will. I was trying to understand why I found long sentences so difficult when I realised that I had been attempting not only to duplicate the words the teacher had imparted, but also to remember the pitch of the words as she said it so that I could make it sound good. A string of notes in words, a line of music. I did not know then why French was a problem for me, but I know now as I decided to look into pitch and the voice and discovered the writings of Diana Deutsch. I found her work absorbing. Not only had she uncovered relationships between pitch perceptions of certain nations and the speaking voice of those countries, but she had also written at length about perfect pitch.

[6] Price - The Perceptibility of the Compositional Procedures of Elisabeth Lutyens, page 155.

My problems in French class were explained:-

> "Research into the way individuals hear particular sequences of tones reveals how the brain uses different cues to make sense of ambiguous sounds. Indeed, the latest studies suggest that perception of certain musical paradoxes is related to the processing of speech." [7]

How would this processing of speech affect my resulting theories concerning the works of the children and would my ideas would be biased to children living in England? I was relieved to reflect that the school in which my compositional work was produced was an International school with students from every corner of the globe in attendance.

Deutsch's work did lead me to investigate further the impact of voice and song upon the children and this too is represented within the study notwithstanding the fact that the model for the study entitled "Maya's Words" was inspired by the vocal intonations and emotions of the poet Maya Angelou reading her own work. The relationship between poetry and words again is an area that warrants investigation and which I have visited at various points within this study.

> "Linguistic analysts distinguish prosodic features of speech from syntactic; stress, pitch, volume, emphases, and any other features conveying emotional significance, as opposed to grammatical structure or literal meaning. There are many similarities between prosodic communication and music. Infants respond to the rhythm, pitch, intensity, and timbre of the mother's voice; all of which are part of music. " [8]

I began to question how language is acquired within our mind and if there was a correlation between the acquisition of language and the acquisition of music as a language. Again the work of Deutsch was an inspiration but her work came from a particular investigative stance e.g. testing pitch by playing musical phrases and / or notes in succession to students and then analysing this data. I would be trying to examine how music is formulated in our minds and how this may be charted. In trying to home in on information concerning language development I discovered a vast area of study and one where cognitive forces come into their own.

> "Just over three decades ago, the American linguist Noam Chomsky came up with an answer; the world's languages are all governed by the same universal grammar and each baby is born with a knowledge of that grammar.

[7] Deutsch - Paradoxes of Musical Pitch, Scientific American, August 1992 page 70
[8] Storr - Music and The Mind, page 9

> ...The idea rocked the then-dominant creed of behaviourism which said, in a nutshell, that animals must learn everything from scratch, but it raised as many questions as it answered. How did the universal grammar evolve? How is it encoded in genes and the neural structures of the brain? If language is rooted in biology, what is its relationship to mind and thought?" [9]

This statement "rocked me" and for this study I took a look at the history of cognitive development and decided how best it may apply to my own theories. To begin with I wanted to investigate the work of Steven Pinker, a cognitive psychologist and scientist, to find out how his investigations into language could relate to the development of musical language. Pinker states:-

> "The learning period synchronises the language ability of each child to that of everyone else around them." [10]

With this I began to ask how does the child learn and what steps are taken. How does acquisition of a language take place? I remembered my study of these issues when I undertook a year of teacher training and this gave me a good base from which to start.

Even so, from this point my study and investigations splinter out into a few differing regions. Interest in the neural structures of the brain led me in one direction whilst I still needed to find more information on cognitive psychology. In addition, the work of Susanne Langer has had a profound effect. All of these avenues aided my own development of a framework of how I believe compositional ideas could form in our mind.

By looking at Pinker's work I concluded that I may need a practical method by which to evaluate the children's compositional development over a predetermined selection of years of study:

> "In language diversity, you can also see how the mental machinery of language, the universal grammar, can be stretched and what its limits are." [11]

My initial instincts concerning my approach to the musical analysis of the children's works was at one point gearing itself toward making observations about what the works had in common, using traditional methods and to use this as a starting point. However the approach I chose was to begin by making a list of all of the eclectic approaches used by the children in their

[9] New Scientist - June 1994, page 28
[10] New Scientist - June 1994, page 30
[11] New Scientist - June 1994, page 31

compositions, I have called these musical techniques 'components' and use these components as a 'sonic trail' to chart the percentage of their application and then to utilise this information further from there. Sternberg's theory of components and metacomponents allowed me to use the idea of children processing information and evaluating for themselves what their next step might be as they are in progression. I liked the idea of breaking down the approaches into musical techniques, thus having these as components which could be used to evaluate actual progression. This was also a way around the critique of Sternberg's work by Colley and Beech where they state;

> "Another problem with Sternberg's model is that the metacomponents, although crucial to intelligence and intellectual development, defy precise operational definition (Carrol,1986), thus hindering their empirical utility." [12]

The study of cognitive information allowed me to combine an array of thought concerning cognitive progression in language for my own ends in terms of adapting the cognitive theory toward application in musicology i.e. toward my analysis of the children's work. The selection of authors I have drawn upon is expanded in Chapter 2 entitled "Sequence of Learning."
It was through utilisation of the cognitive outline provided by my "Sequence of Learning" that I created the means to devise what I have called the "Circuit of Activity." Through tracking the 'sonic trail' i.e. the percentage of use of the components / musical techniques used in the children's compositions, I was able to cross reference this material with observations and experiences gained from working with the children and create a pathway of musical progression which I then called the "Circuit of Activity." Using the results formed from recognising a "Circuit of Activity" I was then able to construct a "Framework" which I felt represented the way in which thoughts may gather and operate in our minds during musical composition. (See Chapter 5.) For the latter stages of this work the writings of Susanne Langer became invaluable, her description of cerebral processes made me question how music could activate our minds:-

> "Human emotion is phylogenetically a high development from simpler processes, and reason is another one; human mentality is an unsurveyable complex dynamism of their interactions with each other
> and with several further specialised forms of cerebral activity, implicating the whole organic substructure.." [13]

For me the word organic was key, organic growth of the mind and of language, given the circumstances and influences. The evaluation of such progression thus becomes a mode of operational definition.

---

[12] Colley and Beech - Acquisition and Performance of Cognitive Skills, page 38
[13] Susanne K. Langer - Mind:An Essay on Human Feeling, page 9

My model was an organic construction moulding its form from the findings of the study. My own compositional writing is fuelled by my emotions but, when I thought about my source(s) of stimulation for it, I unravelled a complex selection of starting points and thus this, in turn, indicated activity on many levels of thought and being. Langer specifies in detail routes of passage for thought and thought progression in her work and this became of interest as these issues are quoted and explored within my study.

By building up information from the analysis of the children's works and from my own work in the model "Maya's Words" I became able to visualise a structure in my own mind as to how I thought music could grow in our minds. This structure, which resembled a tree's branches without leaves, represented how I thought musical lines grew. As my research progressed I was able to build around this structure and form a "Framework" which I believe represented a construction outlining how composition gathers and forms in our minds. When I showed this to my tutors, both independently suggested that the 'tree' I had drawn did not have to go up in a vertical direction like a 'real tree' and it was this practical suggestion that helped me further along with constructing my "Framework." (I have a poor sense of direction and get lost frequently. Changing the direction of this 'tree' somehow released my thought and allowed me to think more clearly about the framework I was building. I am convinced that this too is related to how my own mind works in conjunction with visual stimuli.)

As I was constructing this "Framework", my compositional model "Maya's Words" became a critical piece of evidence for me as I was able then to cross-reference my thoughts about the "Framework' with details of construction from the model which represented to me a practical working model of information gathered. The model became like a piece of apparatus that I had to play with, it was visual and exterior to my inner thoughts and ultimately derived from the original source i.e. the children's compositions.

Two years into this study I began to collect material from scientific journals to ascertain if any scientific developments concerning scans of the brain could reveal any supportive information. I was shocked when I discovered pictures of an artist's renderings of brain stimulation on laboratory rats,[14] as these looked very much like the branches of the tree that I had previously sketched out. (These were illustrated going upwards like a tree!) I was encouraged to see that

[14] Life Magazine - July 1994, page 69

some of my projected ideas concerning my "Framework" of how music works within our minds had been related within other areas of research. (See Chapter 3, page 25.)

Whilst my study proposes a potential pathway in the mind along which composition might form and also attempts to identify an array of components which may be utilised as a musical language; it does not investigate the subconscious workings of the mind. I mention the importance of imagery in composition and there are adequate examples of compositions following pathways being given by a mental imagery in this study. I mention the 'data accessing bank' where I surmise memory may retrieve melody previously stored subconsciously and input it without knowing. However, I do not mention dreams or subconscious drifts of thought; these have not been addressed as I have little data here with the exception of my own compositions. Therefore in trying to find a source of composition, from a raw material, track down its journey, give empirical information and formulate these findings I have not addressed my investigation toward the conscious subconscious dimension. There may be superficial mention to these areas but if I were to begin such an investigation I would have to begin again with Pinker's projection of a gene that houses language, tie this in with information concerning laws of universality concerning musical frequencies and how these notions could possibly interact. For now though I would simply say: in my study I have attempted to attend to the processing and output of musical composition from our minds and use this information to create my own 'live' theoretical model which can then be used as a working example for other composers. How this progresses within the study is defined now more fully.

When I decided to undertake compositional projects with children aged 4 - 11 years, it was a conscious experiment not for the purpose of working toward a study (the notion of which arose some 5 years later) but because an opportunity allowed for me to devise a curriculum of musical study for the children I was to tutor. I decided upon composition because I was a composer and had found the experience of composing creatively exciting and rewarding.

I had not anticipated that the way in which children approached their work would be both enlightening and in some cases ingenious. It had not occurred to me that the methodology used by the children when undertaking a task would differ from my own. Once I noticed that the children were finding and creating their own unique pathways toward achieving musical goals I felt instinctively

that it was important to let them develop their own language of musical thought and sought to encourage this . I have used my observations and experiences with the children in this music-making process as the starting point of this study as opposed to investigating the history and tradition of musical composition:-

> "In the case of musical creation there are certain scaffolds, or frames, that are pre-defined by the structures of particular musical idioms... the structure can itself be created and shaped by the composer: the blueprint, or skeleton, is not preformed. One way of studying the nature of those blue-prints and the ways in which they are developed by composers, is to look at composer's sketches and manuscripts."[15]

It is the intention of this study to examine the sketches of compositional work created by children aged four to eleven years (which were recorded over a period of four years) as a means to learn more about musical composition and how it evolves. I found that I had to decide upon a place to start given the unformatted evolution of this study. In many cases children made noise, or sound, forming patterns and shape. I took these to be an external representation of how children's minds open up into the world of sound, music and composition. This then would be the starting point.
Schaeffer stated:-

> "Repeat a fragment of sound twice; it is no longer an event; it is music." [16]

It is my belief that sound repetitions and the accumulation of perceived cognitive and physical memories form the basic prerequisites for the "structuring" of any 'music'. [17] Therefore to begin with, this study investigates our perception(s) of music, sound. As sounds are 'logged' into our memories and perceptions so we are given tools from which to create the language of music. I define this process as that of language acquisition, musical composition developing as a unique language for each individual. As a means to exemplify this, information concerning cognitive psychology will be identified and used to support my own theories concerning the development of children's musical perception. Using cognitive psychology as a foundation for my own musical theories, I then extended the musical theories into their own world i.e. the world of composition and musical analysis. My intuitive notions and beliefs which

---

[15] Hargreaves - The Developmental Psychology of Music, page 151
[16] Schaeffer - A La Recherche d'une Musique Concrete (1952) page 21
[17] Collins Gem English Dictionary, page 348 " Music" definition of:"An art form using melodious and harmonious combination of notes; laws of this; composition is this art."

formulate my theories have, through the study and gathering of such aforementioned information, been substantiated as the study has progressed. For example; it was my belief following the work undertaken with the children, prior to the onset of the study, that the acquisition of musical language develops alongside that of spoken language; the journey of acquisition of sound beginning before we are born preceding the process of acculturation. Scientific data is given to elucidate the notion that the accumulation of our awareness of sound (i.e. even as frequency or waves) takes place as early as in the womb. It may be noted that tests by music psychologist Diana Deutsch reveal clear links between the development of our musical perceptions to that of our spoken language. [18]

The next step of this thesis was to investigate the effect that sounds and musical frequencies have as they are perceived by us in musical terms; that is how they are organised in recognisable combinations i.e what we call music. This will be achieved through analysis of works composed by children. Transition along the journey of acquisition of music as a language will be defined, as far as possible, in musical terms. It is my understanding , from working with and observing young children in creative compositional projects, that they quickly begin to acquire a language of music / sound that can be seen to develop into a more 'sophisticated' though personalised format. This gives the young child an established base of creative workings (in sound and music) from which to imbibe further sources of learning. The moulding of an independent creative cognitive musical path within the mind of the child will allow for a greater comprehension of music/sound and language.

Guidelines concerning the development of children's' musical abilities, taken from the work of contemporary music psychologists, will be addressed as a means to provide a varied foundation of opinion concerning specific musical elements, which will serve to lead into the subsequent sections of this study. The focus for my analysis will be guided by the following bias:-

> "Cognitive psychology thus comprises an account of processes in the brain in terms of a series of models (the hypothetical constructs) rather than in terms of physiology." [19]

By listening and analysing these compositions I believe we see a 'sonic trail' or a map, if you will, of the cognitive processes i.e. through the realisations of the

[18] Deutsch - Paradoxes Of Musical Pitch - The Scientific American, August 1992, page 70
[19] Shuter-Dyson & Gabriel - The Psychology of Musical Ability, page 238

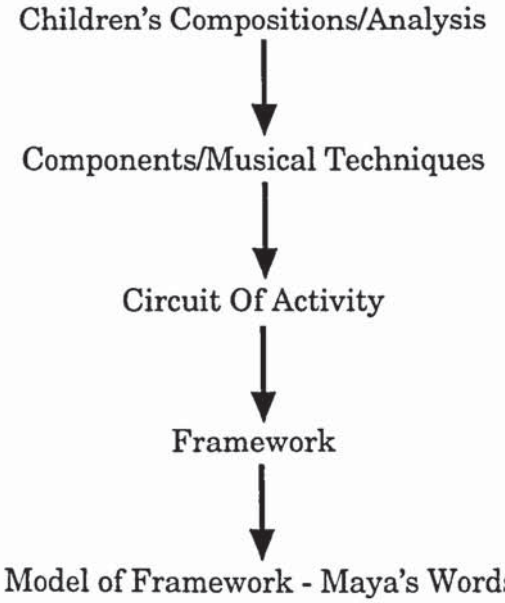
compositions. Certainly as the children listened to their own compositions and those of the other children I felt the children learned, through open discussions, to dissect components of sound / music and integrate any modifications they felt needed into their subsequent work.

> "Listening, though, represents only the final link in the chain of communication that is initiated by composition: composers can hope to connect with prospective audiences only if order is inferable from their music, implying that it should be organised with due respect to mental operation of the type mentioned by Meyer - Listening is necessarily analytical abstracting, classifying and organising musical stimuli into patterns, processes, and relationships." - from this it follows that at least some musical order (indeed, in my opinion, the better part of it) must be attributable to the sonic realisation of human cognitive processes." [20]

A cross-section of compositions was examined as a means to investigate how a 'blueprint' and 'skeleton' of the composer's idiom may become defined. Whilst analysing these works I consistently referred to my notes and memories concerning the sessions with the children and whilst not knowing the outcome of my formulations at the beginning of the study I did feel, if I began a composition of my own which would run as a parallel source of input, I might be able to place my findings from the study in it. The compositional model thus became a sounding board for my theories drawn from the techniques I discovered and codified from the children's compositions. Without the model the study would have formulated a different approach and not one that is a practical work in progress.

The following chart illustrates the outline of this study, those stages already mentioned and those that evolved after the analysis of the children's works:-

[20] Ockelford - A Theory Concerning the Cognition of Order in Music, page 7



Concept formation and perceptual analysis.
By researching certain aspects of cognitive psychology and adding this information to my memories of observing children as they composed I devised a diagram which in broad terms shows how I believe composition may become ignited in the brain. This "Sequence of Learning" represents the conception of musical thoughts and how they grow and extend.

Lines of growth - Growth of acts - Components / Musical Techniques.
As musical thoughts and acts grow and multiply they can eventually join together and form a line of musical thought. A growth line if you will. By additive patterning acts and thoughts grow. The particles of thought that form this line can be any musical facet. Therefore these need identification. For this purpose I have devised a vocabulary of musical terms formulated in part from the analysis of the children's compositions but also from the experience gained whilst working alongside the children through open discussion.

Circuit of Activity.

This derives from the view that compositional development travels to a certain point and then reaches a plateau. After this the journey may begin again and be either identical to the first or in an incremented form. I have called this the "Circuit of Activity". The journey of compositional processes can be seen in the analysis of the children's works and it was through examining this information that I constructed my theory about the "Circuit of Activity".

Framework.

Here I have devised a structure that illustrates the forces that I believe work together as we compose. Through analysis of the children's works and those of my own I have identified areas of our mind that clearly operate in conjunction with thoughts concerning musical composition, as well as identifying a breakdown of how musical forces may work alongside each other in the mind. Specific regions of thought and breakdown into musical fields are identified and reference made to how these came to be recognised in both the children's work and also in my own compositions.

Model.

"Maya's Words", a compositional model which defines in a practical manner the information drawn from my analysis of the children's compositions. Although the model in one way represents an example of procedure in that it was designed to be a conscious experiment, the irony was that the compositions of the children had a 'free-flow' feel wherein development became a natural progression and so this I have also striven to incorporate within this model with respect to my own writing. This duality of purpose concerning the model has added additional insight into the practical application of my theories within the study and in doing so I feel the model could thus be of benefit to the composer who reads the study and wishes to know how its notions can be implemented with reference to their own work. Composers both past and present have devised systems of broadening our understanding and perceptions of music and sound. Many of these methods have been adopted for the purpose of musical education and training

The study concludes and following this I expound findings from the world of science and investigative cognitive psychology where many of my theories gleaned through working with children are proving to become reality. I believe my work with the children provides a much needed examination of music acquisition from a source untainted by preconditioning of music tuition and one

that is both raw and natural. The children thus are creating their own language in music, if we define language as such:

"A system of sounds, symbols etc for communicating thought; specialized vocabulary used by a particular group, style of speech or expression." [21]

Attempts by composers in the 20th Century to escape from and evolve out of the influences of tonal music (i.e. what I refer to as the subliminal accumulation of perceived frequency patterning - see Chapter 8, page 107) in serial music and music concrete reflected composers need to be released from certain boundaries of understanding and conditioning. In allowing the young child to begin to develop their own sound/musical language prior to all work concerned with the tuition of music, we increase their potential to develop a more unconditioned route for creative composition and provide them with the faculty to comprehend music(s) of any style. By looking at the musical language, vocabulary, created by the children we are able to grasp an insight as to the fundamental aspects of formation and processing of musical composition.

"Music can best be understood as a system of relationships between tones, just as language is a system of relationships between words. There are many varieties of music, just as there are many languages..." [22]

I think that the relationship between the musical sounds or tones as organised by the children indicates that from an early age the children were able to communicate their thoughts through this medium and as such it became a language, part of the unique musical language called composition.

[21] Collins Gem - English Dictionary, page 300
[22] Storr. A - Music and The Mind, page 64

Chapter 2 - Sequence of Learning

In researching the area of cognitive psychology to define its relevance to this study, I located a route toward understanding more closely how I believe musical composition is initiated and progresses. I have called this route a "Sequence of Learning." The following chapter outlines how I came to define it as such.

Prior to the analysis of compositional work an explanatory guide drawing upon the arena of cognitive psychology is needed as I have chosen to relate my thoughts and observations concerning the acquisition of musical composition as a language partially via this medium. Cognitive psychology has been defined as:-

> "An approach to psychology that emphasises mental processes in perception, memory, language, problem solving, and other areas of behaviour." [1]

These mental processes, perception, memory, language, problem solving are aligned to those I feel I need to look at in this study as the musical analysis to be undertaken will focus upon the very beginnings of the formation of the language of musical composition. The mental processes concerning concept formation, perceptual decision making, growth of acts, use of memory, development of skills, are those which I have chosen to examine both in terms of the recent findings of cognitive psychologists and with reference to my own ideas concerning the acquisition of the language of musical composition. Wherever possible, findings of cognitive psychologists will be utilised that apply to the earliest age-sources as these relate more directly to the needs of this study. Through the course of this study I will draw my line of thought from perceptual decision making toward the growth of acts and this will be defined further at a later stage. In addition to the above definition I have incorporated the development of skills, again an area of behaviour that illustrates growth both on a physical and mental plane. In fact cognitive psychology was originally developed to enhance the understanding of the mind as follows:-

> "The interest in perceptual motor skills which arose in the 1950's and 1960's resulted from sponsorship by industrial and military sources interested in developing and improving weapon and radar systems which had been invented or improved during and after the Second World War. Essential to the design of these, was an understanding of the physical and mental

[1] Wade & Tarvis - Psychology, 3rd Edition, page 16

capacities of the individuals operating them and of the best way to train operators. Indeed, much of the contemporary literature on training is based firmly on research conducted at this time."[2]

Avenues of development in cognitive psychology have led to huge areas of research where attention has been directed towards, for example, the importance of imagination, intuition, emotion. This is ironic given the context of its original implementations (i.e. the observation of behavioural patterning for military use) but significant as it exemplifies the radical changes being made in this medium of research which is now looking forward to the future. Some of these changes have been noted as follows:-

"In closing, infants are much more than we thought.. Nineteenth century science was materialistic in viewing the baby as body, brain and reflex material. The 21st century view of babies will, I believe, focus on their sensations, emotions, sense of self, personality, communication ability, mind and consciousness." [3]

In concurrence, the educationalist Douglas Sloan states in "Imagination and Insight" (1982) that an epistemological orthodoxy has settled over the modern mind, and that this orthodoxy has :

"adopted a narrowly quantitative, materialistic and functionalist view of knowledge with such zeal that it tends to exclude feeling, imagination, the will and intuitive insight from the domain of rationality - or to accord them only the most limited importance and to deny any place for mind, meaning and persons constituent of reality." [4]

I believe that within the domain of music making and creating the level of technical (performance) achievement attained thereby by children has been, and still is, used as a guideline for educational progression without real consideration for the importance of conceptual thought. The reason for this may be because the processes within our minds have, until the advent of PET (Positron Emission Tomography) brain scans, remained hidden:-

"Why, then, have these intellectual skills received relatively little attention until the last decade? One reason for this may well be that much of their performance is invisible. ...The skilled pianist produces a prolonged sequence of hand, finger and foot movements which are clearly visible and are outside the expertise of most of the spectators, in addition to a highly complex pattern of sound." [5]

---

[2] Colley & Beech - Acquisition and Performance of Cognitive Skills, page 2
[3] Chamberlain - Babies Are Not What We Thought: Call for a New Paradigm, page 10
[4] Sloan - Imagination and Insight, preface, page 7
[5] Colley & Beech - ibid, page 2

The many layers constituting this "complex pattern of sound" are as intricate as the physical manoeuvres exhibited during performance. Both manifestations are controlled by a backdrop of mental processes. However, throughout history, the minds of composers have been considered as inexplicable and even mystical. The first step is to examine these mental processes in a progression and this is relevant to my ideas concerning the acquisition of music as a language.

Concept formation and Perceptual analysis.

Recent reviews of educational methods concerning children's responses and behavioural patterning show that studies in concept behaviour are suggesting that we have tended to confuse the infant's motor incompetence with conceptual incompetence. Piaget was particularly influenced in his theorising by the difficulties that children as old as a year have in finding a hidden object, especially when it is hidden in more than one location a number of times in succession. The phenomena he demonstrated have been replicated many times, but it now appears that much of the difficulty infants have in such situations is due not to a lack of understanding of object permanence but to other factors. It has been stated that:-

> "it seems safe to assume that they (babies) either are born with or acquire early in life the capacity to form concepts, rather than to assume that conceptual functioning can occur only as an outcome of a lengthy sensorimotor stage." [6]

In outlining how we could look at the perceptual actions of a child and describe these in terms of a conceptual format it has been suggested that:-

> "The simplest case of perceptual analysis occurs when two simultaneously presented objects are compared, or a single object is compared to an already established representation." [7]

If we:

> "assume that perceptual analysis can lead to concept formation, it is still necessary to formulate the vocabulary in which the resulting concepts are couched." [8]

Thus sounds/musical noises perceived or used in contrast formulate the basis of a vocabulary for the language of music composition.

---

[6] Mandler - A New Perspective on Cognitive Development in Infancy
American Scientist, May-June 1990, page 243

[7] Mandler - ibid. page 240

[8] Mandler - ibid, page 242

To "compose" has been defined as:-

> "..to form by putting two or more parts or things together, to place in order, to arrange artistically, to originate." [9]

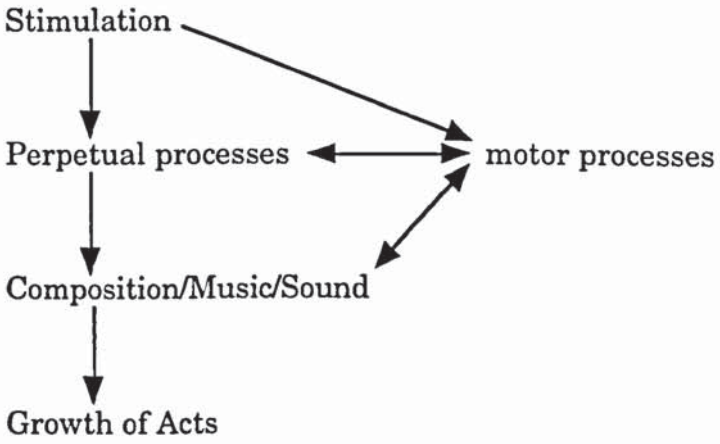
In observing the compositional activities in progress, of pupils at any stage, we must seek to see which ideas (harmonies/rhythms/timbres etc) are set in contrast. This represents the initial stage of the pathway wherein we develop the ability to create a compositional line of ideas. The act of deciding which sound/musical fragment should combine or follow is determined by the composer.

> "According to Sternberg, cognitive growth depends heavily upon the metacomponents. The metacomponents, capable of monitoring their own effectiveness, may learn from their failures and successes and may thus continually refine their own functioning." [10]

This sequence of learning is gained internally within the mind as a result of the act of setting about the task of in this case compositional activities. This view is shared with reference to the acquisition of language:-

> "Noam Chomsky(1957,1980)..argued that the brain must contain a language acquisition device, a "mental module" that is programmed to acquire language and the rules of grammar." [11]

My idea of how the aforementioned "sequence of learning" might begin is based upon that used by Colley and Beech.



We can see that the stimulation of the perceptual process ignites the act of thought and begins the sequence of creativity. This perceptual process can

[9] Collins Dictionary, 1985
[10] Colley and Beech - Acquisition and Performance of Cognitive Skills, page 37
[11] Wade and Tarvis - Psychology, 3rd Edition, page 472

be simple or complex and can include the incorporation of motor processes as a means to enhance itself. The end result can be exhibited as the use of motor process or employ solely perceptual processes, the difference being only if it is manifested by performance or maintained as an internal structure within the mind.

My next question would be, how do these thoughts grow? I lean toward the work of Langer, where she draws every action and thought back to a chemical reaction in the mind. It is as if an idea, or even two thoughts set in contrast that could create an idea, begin a chain reaction, like cells multiplying. The journey from here is dependent on other aspects of influence, which will be unravelled further in the study. To begin with if we consider every thought to be an 'act' as expressed as follows by Langer:-

> "..every act makes some impression on the system in which it occurs; that is to say, it sets the stage in some special way for subsequent events. As a rule it clears a path for its own passage, and thereby for that of any other act very much like itself. This path finding process is generally called "facilitation." Naturally enough, an act facilitated by a precursor is apt to run its course somewhat more rapidly than one that finds no obvious track to follow" [12]

We may apply this sequence and use the same analogy to the growth of thoughts expressed within the mind whilst in the act of creating musical composition. Each musical idea / fragment is linked to the next and also the ideas used within any subsequent composition. (This is regardless of whether creative ideas come when working within a group, or working alone.) A potential thought structure along which the creation of musical composition could travel, albeit on a mental plane, or even through physical means (through improvisation / trial and error.)

Langer continues:-

> "Despite the principles of homeostasis, which is apparent in the inhibition of enzyme syntheses by an accumulation of their own products, acts do grow. Acts grow in scope, in complexity, and in intensity, according to(1) their chances of implementation; (2) their organising propensities, which depend largely on the opportunities they create for sub acts to develop, and for lesser acts in progress to become entrained; and (3) the energy of their original motivation, which may be greatly enhanced by confluent impulses in the course of actualisation." [13]

[12] Langer - Mind: An Essay on Human Feeling, page 143
[13] Langer - ibid. page 154

Again, I would relate Langer's point number three to my thoughts from the introduction where I observed that through performance, listening and open discussion, the course of subsequent compositions may be adapted or altered. In addition, in rehearsing composition prior to performance, we see acts in the process of practice. The act of practice or practice of acts (be they thoughts or physical motions) may occur using either perceptual or motor format.

> "Practice produces both internal and external sensory consequences which are thought to be essential for learning to occur. It is for this reason that mental practice (MP), rehearsal of a skill in imagination rather than by overt physical activity, has intrigued training theorists, especially those interested in cognitive processes." [14]

What is described is that mental practice may occur as any skill is in process of acquisition. It is possible to extend and polish "mental rehearsals" within the mind into more formalised expressions, as would a pianist who imagined their performance in memory prior to a concert. The mental techniques used for this specific task initially differ from those needed, for example to create a compositional progression, in that on the one hand the music is there ready to memorise whilst in composition the music is created prior to memorising within the mind. Memory is a keen participant within the domain of musical composition and the many areas of potential application add toward the myriad of probable uses. If we consider the following types of memory:-

> "We really have at least five kinds of memory which seem, offhand, to be distinct and possibly of different derivation...(4)Inductive memory, the power of memorising generally regarded as somewhat special endowment, very unevenly distributed among people and apparently with little relation to general intelligence; it seems to be largely limited to words or tunes, and certainly to involve the peculiar mechanism whereby each new unit-word or tonal element - is like a step in a preformed progression, being induced by its predecessor in the framework of a phrase, statement or poem (which may have no real linguistic sense) or, in music a melody." [15]

In addition a composer may even draw upon memories of music heard (subconsciously) and incorporate workings of these into a composition as described:-

> " hypothesised feedback loops among performance, knowledge acquisition, and metacomponents provide additional information, further facilitating performance and intellectual growth." [16]

---

[14] Colley and Beech - Acquisition and Performance of Cognitive Skills, page 72
[15] Langer - Mind: An Essay On Human Feeling, page 290
[16] Colley and Beech - ibid, page 37

Where the incorporation of some such preformed idea is added to the original line of thought the two mental techniques work together. These memory skills may be seen to act as follows:-

> "At the beginning of the process, the child has two well-formed skills at a given level. The two skills function separately from each other until some object of event in the world induces the child to relate to the two skills. If at this point the child is capable of the next developmental level, he or she will unravel the relationship between the two skills, gradually inter -coordinating them. This unravelling will include a series of micro developmental steps involving the other transformations, and it will culminate in the inter coordination." [17]

This statement may also apply to a wide range of skills developed be they mental processes or motor skills.

> "Intellectual skills link perception and action and are concerned with translating perceptual input into a skilled response by using appropriate decisions." [18]

The process of decision making has a notable growth rate with reference to the generalised rate of acquisition. The decision making process which would begin from the earliest conceptual thought of a child is set into action. The process of acquiring the language of music composition begins slowly, however I have noted that the speed of acquisition after a certain point becomes fluid and seems to flow with ease. The decision making process also appears to follow this growth pattern. My findings here are consonant with the following remarks:-

> "A generalised theory of acquisition must take into account the way in which performance changes during acquisition. One important change is in terms of the apparent use of attentional resources. Early in acquisition, only a small amount of the available information can be attended to, while later on, the performer can accomplish the task easily and apparently has the capacity to spare." [19]

(Rates of growth may be related to the "Circuit of Activity," see Chapter 4, page 44)

[17] Colley and Beech - Acquisition and Performance of Cognitive Skills, page 41
[18] Colley and Beech - ibid, page 2
[19] Colley and Beech - ibid, page 5

Chapter 3 - Lines of Growth

By utilising information from the compositional works of the children and also ideas and approaches of thought from the children expounded from our many general discussion groups, I created a list of components, parts of a musical language, which may be seen as particles which I then use to analyse those same works. These particles create a sonic trail, a map of empirical data, forming evidence from which to project theories concerning the acquisition of musical composition. I have always felt that the journey to acquisition formed a pathway, or line, in our minds; in the previous chapter we have seen how a line of thought could grow and in this chapter we explore how to trace that line in musical terms. Along with my own theories I have found the work of musicologist Wallace Berry to be aligned to many of my theoretical projections and so for the purpose of my analysis of children's compositions I intend to draw partially upon the framework of analysis used by Wallace Berry in "Structural Functions in Music."

> "The study of particular syntactic techniques and procedures, however tentative its conclusion, can render the expressive communication of musical meaning less mysterious that it is often thought (and sometimes wistfully hoped) to be; indeed the belief that logical insights can be had into relations between structure and effect underlies all productive and aesthetic inquiry." [1]

In this statement Berry relates directly to the intention of the analytical approach to be undertaken in this study toward determining the origins of the acquisition of music as a language. For me the "expressive communication of music" would be the translation of sound into sonic patterns recognisable and organisable, not mysterious but something that can be logged in our minds and later developed and expressed as a language, i.e. musical composition. In addition, Berry describes the flow of musical structure and its functional and expressive consequences within an "intensity curve" which is "delineated by groupings and controlled by association of events underlying nearly all composed music." Thus Berry's "intensity curve" becomes for me an "invisible line," a line of music heard within the head of composers, conductors and musicians. Berry states:-

> "Musical structure may be said to be the punctuated shaping of time and 'space' into lines of growth, decline, and stasis hierarchically ordered." [2]

These "lines of growth" I would associate directly to my aforementioned

[1] Berry - Structural Functions In Music, page 2
[2] Berry - ibid. page 5

thoughts in Chapter 2 (page 21) regarding the "Sequence of Learning" during the acquisition of musical composition and perhaps there is also a direct correlation to my supposition that there is a template within the brain wherein such occurrences may take on a physical form:- (See Chapter 5 entitled "Framework.")

> "Within the human brain each neuron contains at one end threadlike appendages called axons, which send signals to other nearby neurons. At the other end of the neuron are similar threadlike appendages called dendrites, which receive messages from nearby cells. Axons and dendrites tend to shrink with age, but experiments with rats have shown that intellectual exertion can spur neurons to branch like roots of a growing tree creating networks of new connections." [3]

As a means of relating my musical findings in a coherent pathway to exhibit the process of acquisition, I intend to follow the outlines given in an American publication entitled "Psychology" which refer directly to the acquisition of language. This outline entitled"Acquiring Language" concludes with the following:-

> "At present, we can draw these conclusions about language development.(Rice,1989; Slobin,1985):
>
> 1. A child's very first sentences follow simple rules. These rules are specific to children's speech and show up in every language around the world. They are not necessarily the rules of the adult language.
>
> 2. A child's grammar becomes gradually more complex, as the child's thinking does; but as experiments on Piagetian principles have shown, children's thinking is often well ahead of their ability to express themselves.
>
> 3. A child's language is creative and original from the start. Language does not come merely from imitating adults or passively parroting adults' rules. In fact, if adults are too intrusive in their efforts to direct a child's use of language, they may impede rather than enhance the child's language skill." [4]

This may be applied in musical terms as follows:-

1. A child's first musical sounds are related to timbre, metre or repetition in its purest manifestation. Their use of these compositional/musical elements relates specifically to their personal experiences in sound. They do not necessarily use any rules (as we know them in musical terms); this applies both in terms of formation of the musical language and use of any instruments. (This

[3] Golden - Building A Better Brain, Life Magazine, page 67
[4] Wade and Tarvis - Psychology, page 474

will also depend upon the developed stage of motor skills.)

2. A child's musical language (i.e. elements of musical grammar, if you will) does become more complex, as the child's thinking does. I would state that the child's ability to think in the language of music is often well ahead of their ability to express themselves in language. (This does not necessarily depend on motor skills).

3. A child's language is creative and original from the start. Musical language does not come from merely imitating adults or passively parroting adults rules. In fact, if adults are too intrusive in their efforts to direct a child's use of musical language, they may impede rather than enhance the child's development.

As a means to examine the children's compositions in a way that is relevant to my intuitive notions and thoughts, I believe it is necessary to search for the progressions toward acquisition of music as a language. By comparing these progressions from year to year of study an outline of growth should emerge, that is a sonic trail or map.

As cited earlier, (Chapter 2, page 20) cognitive growth depends heavily on "metacomponents" and by looking at these metacomponents we can monitor their effectiveness. As part of this study I have devised a list of musical components which I hope will serve the same function as metacomponents and allow us to have greater insight into the growth of the acquisition of music as a language; thus the musical 'mental module' (Chapter 2, page 20) forms shape. The components herewith mentioned were devised not only given the need to find a more detailed route for the analysis of the children's compositions, but also in alignment to thoughts gained following preparations for Chapters 5 and 6 whereby looking at my own compositional language and, comparing certain facets with all else that I have studied, I have become more deeply involved in the pathway of describing the essence of what I feel a musical (meta) component might be.

In part, the unorthodox assembling of musical terms and words has also arisen given the unorthodox approach shown by the children in composition given their lack of knowledge concerning practising methods of composing, musicology or performance.

COMPONENT BREAK DOWN-DEFINITIONS

See spreadsheets in appendix to identify specific usage of any component, hereafter also referred to as musical technique.

1. Accompanying / percussion

Where percussion instruments act in a manner of accompaniment. Where percussion instruments act in a more independent way, this will not be logged as accompaniment.

2. Adjacent time frames / Alternate time frames

Moments where two or more realisations of time dimensionality are utilised within a composition either simultaneously or separately.

3. Atonal

Where the implication of sound is toward "atonal" i.e. non-tonal specific
Definition: "Atonal, not in any key, the synthesis of all keys rather than the absence of any."

4. Answering phrases / Direct conversation

Where directional activity is noted either in phrases that respond or answer a previous phrase or where the phrase directly converses with itself or another part.

5. Bitonal

Where the implication of sound is toward "bitonal" i.e. two key specific (Either in key application, interval use or sustained pedal use.)
Definition: "Bitonality, the use of two keys simultaneously;"

6. Blocks of joint thought

Where there are sectional changes to the structure of a composition where all parts change more or less simultaneously without specific direction leading from one part.

7. Combination of feels / Musical thoughts

Where two or more sections of composition utilise contrasting part activities.

8. Contrary motion / Criss - cross contrary motion

Any usage of contrary motion

9. Extension of phrases
Where syntax, be it melody, accompaniment, rhythm, is able to extend beyond any initial statement in a recognisable way.

10. Glisses
Any usage of glissando

11. Images as structures
Where a picture or image has been used to stimulate the formation of the composition both structurally and / or / as in process of formation.

12. Integration of known tunes
Where identifiable melodies or tunes are implanted within the composition

13. Intersecting notes
Where one specific note acts as a linking note of importance and intersects two musical actions.

14. Interspersed tune/suspended melody
Where a tune or melody have a recurring role within the composition but are suspended from statement by another part which gains importance.

15. Inversion
Where notes stated either from a melody or chords of the composition have been inverted in subsequent musical syntax.
Definition: Invert / Inversion, "turned upside down"

16. Melody repetition / with variation
Where melody, or fragment of melody has been restated, or restated with variation.

17. Octave awareness
Where the use of a note with an octave displacement from the core notes of the composition is used as a type of phrase punctuation, or to create a noticeable musical effect.

18. Ostinato
Definition: "Ostinato, a persistently repeated musical figure or rhythm."

19. Passing around / rhythms / textures
Where a musical idea, rhythmic, melodic, timbre and so forth, is passed from part to part within the musical composition.

20. Percussion conversation
Where percussion instruments (for this purpose any that are non-pitching) play a significant part within the identity of the compositions structure and are clearly seen not to be used "in accompaniment."

21. Rambling in a mental line
Where the direction of the part (be it rhythmic, melodic etc) is seen to meander as if in an improvisatory manner.

22. Random with measured
Occurring in either set-time frame or where adjacent time frames are seen, where there is clear use of rhythm or melody etc against which another element is utilised that does not have a set relation to these.

23. Reverse patterning
Where rhythms, melodies (or fragments of) are subsequently stated backwards.

24. Sequencing
Definition: "Sequence; (1) the repetition of a phrase at a higher or lower pitch than the original."

25. Triads
Definition: "Triad, a three note chord consisting of a particular note plus its third and fifth note above."

Chapter 4 - Circuit of Activity

A selection of fifty of the children's compositions was analysed for the purpose of this study. The children aged between 4 - 11 years worked in groups. Each of the components, that is musical techniques that I identified for the purpose of this analysis, was examined for application in every composition and the resulting information is listed in the appendix along with a more detailed explanation of the analysis. For the specific analysis of each composition I gave every piece the following classification.

Use of musical technique	**1**
Partial use of musical technique	**0.5**
No evidence of musical technique	**0**

Usage of each technique can be matched to specific compositions by referring to the numbered spreadsheets in the appendix . The original performance of each composition is also recorded on a CD which is enclosed. In addition I have notated a selection of scores in varied presentations and formats, these too are found in the appendix. In some cases the scores have detail of analysis written on them. (I refer more widely to those compositions where scores have been notated.)

Through the information provided by the spreadsheets I have created pie charts from which we can see visually the percentages and frequency of use of any musical techniques within each specific year and comparative years. Although this itself provides a specific type of empirical evidence concerning the progression of these musical techniques it does not tell us how these techniques worked. As a means to understand how these musical techniques were formulated I have attempted to cross-reference the information I have gathered from these analysis charts with an overview of information concerning the working practices of the children. To do this I have chosen the following headings to work with:

- **Group dynamic**
- **Motor Skills**
- **Performance**
- **Musical Awareness**

As with the analysis pie charts, these may be examined through comparison to evaluate development patterns and this perhaps will create enough material to

allow us to begin to construct a map of progression. I would like to propose at this stage that the analysis charts that register all of the information concerning usage of musical techniques already form a sonic pathway, as it were, of the density of techniques employed by the children within differing age bands. It is now the map of progression, which represents the way in which the journey of acquisition of music has occurred, which is of interest. As with the charts the following investigations are drawn from within the specified age bands of study.
We are able to oversee the journey of acquisition from examination of these age bands* and this information has led to my theory called the" Circuit of Activity".

(* In addition to the conclusions drawn from these children's works, it is also my contention that I have witnessed the same "Circuit of Activity" in the works of individual composition students that I have tutored over a number of years whose ages have ranged from 11 years to 30 years.)

- <u>Year 1 (age 4½- 6)</u>

I have no taped or other material collated from this year available to study, as previously mentioned I had not undertaken this work with a view that it could be used in any theoretical study. I have only memories which are not enough given the detailed information gleaned from the compositions of the children in other years. However some of my overwhelming memories are:-

As children of this age learn to clap their name in a rhythm, or clap to a piece of music, they often move their heads. It is as if they use their heads to help with co-ordination of the mind. Do we see here the separation of thought, the thoughts of the brain and our physical matter as the child's head etches out a clap that the brain has recognised. Sometimes it was as if the head was willing the hands to clap the appropriate sounds.

In addition, when listening to music at this age, the position of the child's head again becomes relevant. Heads would be turned to the side, or more directly toward the sound source as if trying to achieve a better understanding (perhaps through hearing more clearly) through the physical motion of the head. If a piece of listening was enjoyable, then the whole body may be used to testify, jumping or moving to show happiness.

Any singing would be non-key specific, boys especially slower than girls in attaining a sense of pitch and learning a tune. Over the year many would improve and in a group of children singing with a strong lead vocally or a lead melody played on a piano, a song could sound a lot like it was holding a good sense of pitch. Unaccompanied, the tuning of the children's singing could easily fall apart and illustrate no sense of pitch.

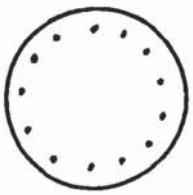
The fact that we now know that melody integrates both sides of the brain may help illustrate that girls have an aptitude at an earlier age to access these parts of the brain, which in turn may lead to more integration within social behaviour.

There would be very little group bonding and each individual acted more like an island. Exceptions would be made if special friendships were formed and in these instances the attachments would be almost zygotic in that all musical activities would involve one child copying the other's actions.

- <u>Year 2 (Age 6-7)</u>

Group dynamic

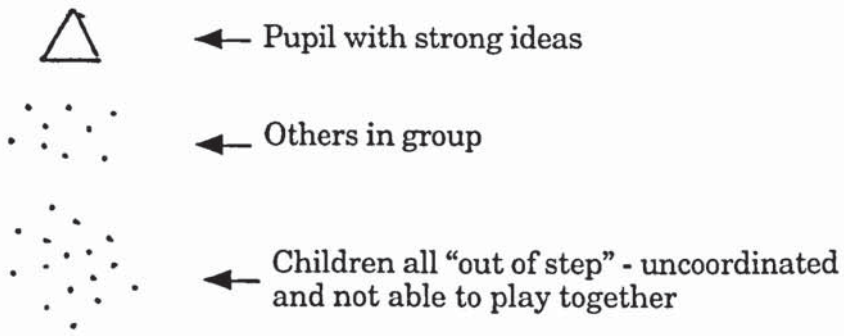
Scattered initially, some children walking off into spaces of their own and on the whole a lack of experience of participation in group activity was noted.



Children isolated, beginning to learn how to work in a group

Motor Skills

Co-ordination and playing together in a small group posed initial problems for Year 2; this was to be expected as motor skills are in the process of formulation. (See diagram below where a group of children, represented by dots, attempt to play together but are uncoordinated.) Children with strong ideas either dominated or played regardless of the others. (See diagram below where the large triangle represents a dominant child whilst the others in the group are shown by smaller dots.) In some cases if a child had strong musical ideas this took over and the child could not align these ideas with the physical requirement of playing. During the course of a year these problems would mostly always become resolved in some way. The child would learn to play alongside the other children, preferring this to being isolated by the rest of the group. The child would learn to adapt musical ideas into a practical manifestation on an instrument. The child would learn to cope with holding or playing an instrument and thus facilitate their musical ideas.



Performance

Mesmerisation in performance was common both with the young listener and the young performer. Sometimes a child would walk up to another whilst playing and touch the instrument as if oblivious of the occurrence and general activity, mesmerised by either the sound or the fact that another child was playing the instrument. In some cases it was almost as if the opening of the child's mind (brain) to the 'sounds' of music created a state of 'suspended animation' for the rest of the body. Everything became still and a hundred per cent of their focus would be on the musical sound. Often the child would stand still as if 'stunned.'

Musical Awareness

It was possible to watch and almost witness the initiation of a thought within specific children or within working groups. Children would pick up instruments,

try and work out how to play them, often they would ask if they were unsure, but they would also devise their own ways of holding and playing the instrument. Very frequently the emergence of a musical idea would occur shortly after the child felt comfortable holding an instrument. Occasionally a child would request to be told what to do, becoming very upset at having to create something without the guidance of a parent. Most frequently after a few weeks this anxiety passed and the child would feel confident to try and create. Once an idea was there it was just a question of how this idea was to be expressed in terms of coordination and performance. To begin with ideas were short, a note or two, a scratch on a wood-block, lifting a tambourine up and down. For the individual child, a few scratches or a tap would be their contribution to the group activity. This would then be integrated into a composition and used as part of it. (Refer to composition No 43 where two contrasting musical ideas alternate.) Over the course of a term ideas were extended and sustained over longer periods. This would mean that in some cases, children were now adding ideas together, for example, a tap and a scratch, and then offering this forward as their contribution to the composition. The composition would thus be extended along with the child's line of thought. The child's line of thought was making progress on an internal basis specific to the child's mind, but also on a larger scale, by working in a group and being able to be part of a composition where many thoughts are used. A "Circuit of Activity" was initiated within the mind and the format of that circuit was dual. The acquisition (albeit initiation) of compositional language was begun and with this the foundation for acquiring experience of how constructions (mind, group) are built. This foundation can later be used at any time in the future as reference for any / many other activities, as a template. (See Chapter 5, "Framework" where this template "A & B =" is identified further.)

The maximum time gestation for a composition formed by group work at this age was around 30 seconds after which it appeared the child(ren) could not sustain anything concrete. At this point the composition either fell apart or rushed to a bumpy end as there was no formulated or constructed way to end. (The task of learning how to end a composition came through a variety of methods: one child would order the others to stop, often by physically grabbing the instrument: two or more children would argue until a decision was made and an ending devised: a collective 'rush' or stop was decided upon.)

Towards the end of the year, the use of answering phrases (as direct musical conversation between player to player be it timbral, a melodic fragment, an action with an instrument creating a noise) seemed to be prevalent and this was mostly seen in use of percussion instruments. (Refer to composition No 45 where castanet and Indian bell engage in a musical conversation.)

An introduction of melodic interest was seen in the use of glissandos. At this age, a variety of tuned chime bars and some glockenspiels were available for use. The chime bars were very unpopular, children were limited by the fact that they believed they could only hit them one way in order to make a sound and quickly lost interest. In addition, to begin with, many children would not go to the glockenspiels as they often told me that they could not play it. "You have to learn it first" - this was a strong belief. This all would change later and using glissandi was a first step towards change for many children.

It became possible to introduce the notion of time by the use of imagery. I would suggest a train going on a journey, stopping either to let some passengers off or to refuel if it was an old steam train, and then either coming to the end of the journey or becoming a run-away train. (The purpose of this suggestion was to encourage the notion of time elapsing and closure of the composition as in nearly all instances the children at this age had no notion of drawing a composition to closure. Over time this skill was acquired. Time seemed to go into slow motion for the children. Not only did it seem as if the children had had no practice at being asked to create an idea but the notion of creating it, practising it, performing it, listening to it all was so new for them. As was the notion of time. It was interesting to see how over the year the notion of time became focused not only for the individual but for the group. In a few isolated examples the group / child would perform extended compositions taking much more time than normal at which point the other children would comment, "This is long". Was there a standard rate of growth of idea with standardised expectations? I am not sure as it was all so unstructured. On reflection I believe the group created its own set of evaluations as time progressed. (Please note pie chart on page 120 and the limited percentage of usage for adjacent time frame for this age. This reflects that a standardised notion of time had not been established in the child and therefore it was unusual for adjacent time frames to occur given this.)

In these early works I saw many early signs of growth. The beginning of a "Circuit of Activity" (the growth of ideas). For example, I saw how time in music began to find a meaning. Group decisions to 'stop' showed a way of

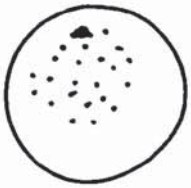
measuring times distance with imagery within the children's minds perhaps doing the same. Even before this, whilst observing 'time standing still' as the children decipher information, i.e. a 'sound', I felt that there must be a relationship between the use of "Adjacent time frames" (See Chapter 3, page 27) and learnt time. (Perhaps the locale in our minds that is visited in creation of "Adjacent time frames" is a processing centre that is available for processing and growth of ideas.)

The beginning of a line of thought was seen at this stage of composition, fragments of thoughts, linked together and sustained as far as possible. (Refer to Chapter 5, "Framework") *In students aged from 18 - 30 that I have tutored, the growth of a line in their compositions was seen to occur from fragments, but the rate of growth is much accelerated.*

<u>Year 3 (Age 7-8)</u>

Group dynamic

More focused on the task, eager and able to work together. One child would take charge, shown by the darkened triangle in the insert below. Improved ability to work together as a group is indicated by the circle around the dots.



Children able to work more closey as a group

Motor Skills

Co-ordination is much improved, the intervening summer always engendered much maturation. Many musical techniques started to develop and this may reflect in the development of certain motor skills, such as the ability to hold a percussion instrument and count beats at the same time. This relates directly to the fact that the employment of percussion instruments was seen more as an accompanying figure rather than as a way of conversing in a rhythmic dialogue.

Performance

An improved sense of surrounding and experience from previous years' activities was very telling, providing a good foundation for new growth.
In the event of a new child's participation aspects of behaviour from this child would be those of a beginner. The pattern of acquisition of composition when a beginner joins a group who have already had experience in composition is not unlike the normal pattern. In some cases integration is rapid and in others a little slower than expected depending on the individual child and the group dynamic.

Musical Awareness

Ideas were becoming extended. Small melodic fragments, sometimes played in inversion, would arise from what would seem to be a rambling line of musical notes. In some cases small sequences would occur. It was as if the children discovered as they practised; what they liked and fragments of this became more identifiable to themselves, others in the group and in performance, the listener. (See composition Number 38) I feel these fragments became identifiable to the children not only because the performance of these learnt musical bits was usually more steady but also because of what may be expected in terms of known musical language and somehow the child(ren) recognised this too. I surmise the children formulated this recognition through this rehearsal performing of their compositions, working the material until it sounded right to them and in association with information that they had picked up from listening to music, language, singing, other compositions from other children, anything and everything. (I remember one child relating a story about a parent playing the spoons at home, the child brought in spoons to play in class and before long everyone was imitating spoon playing.)

Use of bitonal / dissonant harmony, for example intervals such as major / minor seconds, occurred as a matter of contrast of notes rather than of structure of a harmony. I felt as if a harmonic language, as known and expected in western tradition of music, had not established itself for a couple of reasons:-
1) The children had restricted skills on the instruments.
2) The thought patterns of the children seemed to resonate around timbre. Sometimes this related to the fact that they could not hold the instrument correctly or did not know how to hold the instrument and then constructed their own methods of doing so which led to their own discoveries concerning sound and timbre. Sometimes even when the child knew how an instrument was held and played, they would create sounds and timbres using the instruments in creative

ways to suit their own intentions. Noticeably there was no use of triads at this level.

The use of random patterns of notes with measured patterns exhibited a stage of growth where the mind was attempting to play and coordinate the physical activity of playing whilst the mind was attempting to expand into differing realms of musical awareness. (See compositions number 38 and 40) Thus the "Circuit of Activity" expanded on many levels.

<u>Year 4 (age 8-9)</u>

Group dynamic

Personalities begin to develop within the groups and usually the pattern of hierarchy set earlier on in the term stayed through the term. The groups changed members regularly but in some instances key pupils seemed somehow to find themselves working a lot together and where this was the case the group dynamic reverted to a regular pattern. See diagram below where two children lead a number of others in a highly organised group.



Motor Skills

It is interesting to see the arising dominance of pupils who gain ability in motor skills or who have developed some confidence in their own thoughts and are prepared to be in charge of the group activity. This became even more interesting when the criteria for taking charge did not depend on the children's proven ability in playing a musical instrument. In some instances the pupils who had learnt some formal musical skills became isolated within the group as it not only restricted their musical language to those their technique allowed them to play, but also to that which they were taught sounded correct. In this year many diverse musical techniques were encountered and explored and a variety of ways which promoted in turn, more accelerated advancement of motor skills.



Pupils with no formal training in music become inventive and uncaring about the restraints of technique, although eager to learn new ones.



Skills learnt through formal music lessons sometimes created technical problems for the pupil, isolating them from the group.

Performance

Confident and carefree sometimes even 'serious'. The children seemed to enjoy the performances whether they had had formal musical training (i.e. were learning an instrument) or not. Sometimes pupils without formal training performed their ideas in a much more confident manner than those who had the physical techniques learnt through music lessons and this frequently surprised me. The psychological element of performance, even at this age was of vital importance.

Musical Awareness

The advance taken from Year 3 to Year 4 was remarkable. Year 4 pupils utilised nearly all of the component headings, 24 of 25 whilst 17 components were used in Year 3. Ideas occurred in a melting pot of uses and combinations of the musical techniques / components are evenly distributed. Progression was seen and now included musically are:- the use of triads, reverse patterning, passing around rhythms and textures, ostinato, octave awareness, integration of known tunes, combination of musical thoughts and feelings. The children discovered musical techniques, components and then we listened to their compositions after which we would have a group discussion about the processes involved. For example: the discovery of triads always seemed a landmark. If one group member or group figured it out within a week another had worked it out from listening to the other group or even / often asking them what they had done. As a policy, I always tutored musical aspects of their compositional growth after the event, so in the case of triads, as soon as the use became prevalent within a group(s) I would explain a little about its structure. I used the same method for description of all musical techniques and was astounded to see how much quicker the pace of learning became. (In my years of tutoring pianoforte, where explanations always were in anticipation or adjacent to the

occurring musical event, it became hard to judge if a pupil could take in the theoretical explanation, just because it was required, for example, to play 3 notes in a chord.) It was clear however from this practical method and working policy that the children really understood the concept of a triad and had more or less discovered its formation for themselves. This showed me an indication that constructs were forming within their minds on many levels, as to explain the intricacies of a triad and how it works within the syntax of harmony, to a beginner, is quite a task. Yet the resonance of a triad, as opposed to a minor second, and its root position, first inversion, second inversion proved to be a guiding factor in the child's ability to say "that works for me / us" or "this doesn't." The resonance of the sound activating a pattern within the mind, a structure that the child recognised in any key and could recreate given experience. Certainly for all of the musical techniques as listed as components the method of discovery came from one source, the children's work.

Year 5 (age 9-10)

Group dynamic

Members working together, who had done so for years, operated like a machine with well-oiled cogs. A lot of logical, technical ideas seemed to be brewing at this stage and the group embraced new ideas with enthusiasm.

Two groups



Motor Skills

A more settled group dynamic led to steady advancement in compositional terms and thus the process of thought patterning seemed to develop in a more balanced way. (See the following diagram which shows a larger group harmonious in every sense.) It seemed as if the "Circuit of Activity" was learnt and now it was simply becoming more sophisticated in its application.



Group harmonious
in every sense.

Performance

More skilled and poised with utmost control of proposed elements of the composition. Sometimes diagrams and charts were made as a means of ensuring the performances went ahead in a smooth manner.

Musical Awareness

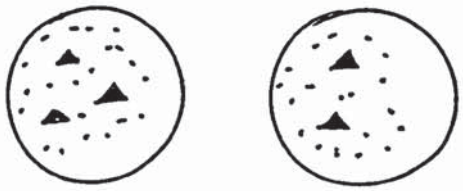
In year 5 we saw development of usage of certain musical techniques such as:- triads, ostinatos & octave awareness. The use of intersecting notes to link phrases and harmonies and the combination of thoughts and styles was far greater than in the previous year. The complexities of the language are evident within the compositions both aurally and on analysis.

<u>Year 6(age 10-11)</u>

Group dynamic

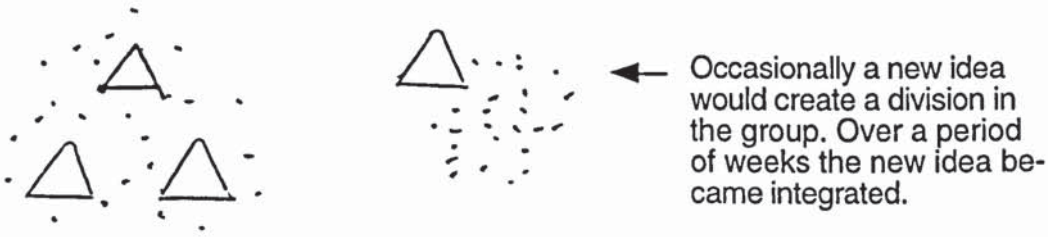
Excited and lively. New ideas were thrusting forward in any manifestation. Sometimes this would create a slightly volatile dynamic in the group as if not knowing the outcome of a huge experiment.

Two groups



Motor Skills

Intellectual advancement begun in Year 6 really allowed a new level of composition to emerge. In many ways the enthusiasm exhibited in groups who had been doing composition for sustained years and who by now could hear their own progress sparked a confidence of exploration, this encouraged the dexterous use of musical techniques which were dealt with in new approaches. Also the means, physically through performance, to realise these new ideas and notions were gained with effort which seemed spurred on by a sense of what could be achieved.



Performance

Controlled and poised, but with the potential for some emotional outbursts. Some pupils became tearful if they could not express their ideas physically through performance or via another player through the realisation of the composition. This could be the result of the added pressure of many of the academic tests that the pupils had in this year. The musical ideas seemed to be bountiful from almost all of the pupils. Composition may have provided an outlet for creative thought in this strict period of study however at some stage composers encounter more stressful moments in their lives and this may promote a new level of work, so I feel the observations here are still relevant.

Musical Awareness

In Year 6 we saw a big increase in the use of rambling along in a mental line with increase use of images and structures :- as if a whole new progression was going to start again in terms of organising the mind for further development; a new "Circuit of Activity" at a differing depth. Melody with repetition was still utilised, use of extended of phrases and intersecting notes is smaller, use of triads is comparable. There was much more use of sequencing in Year 6 whilst there was little use of bitonal harmony. Use of glissandi was increased, perhaps to be utilised in a new way and there was less use of ostinato and octave

awareness whilst greater use of passing around textures. All in all it always felt like a new level of awareness, certain aspects reminded me of the plateau reached between Years 2 and 3, which is why I felt here it was the beginning of a new "Circuit of Activity" and development.

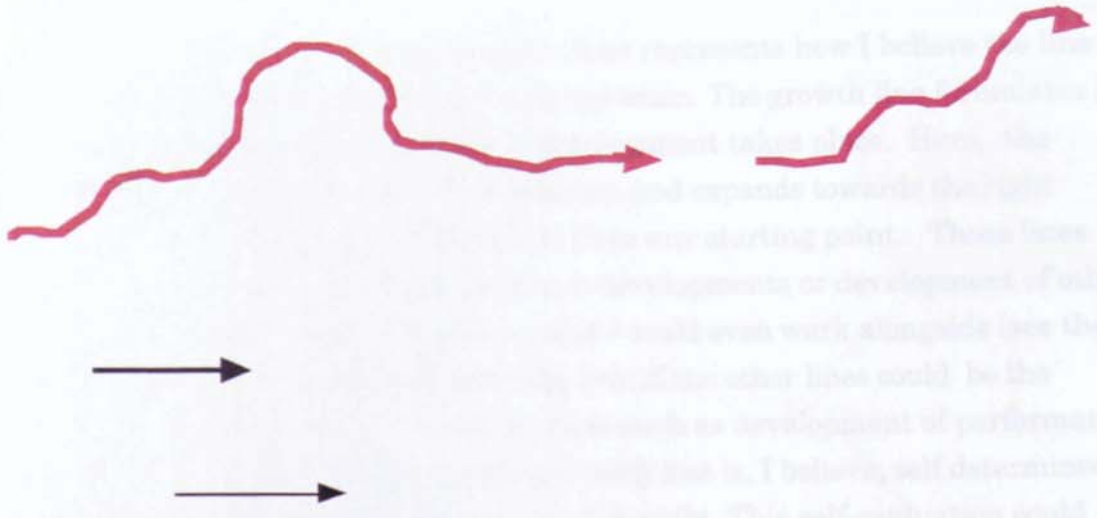
This pattern of extension of the "Circuit of Activity " by beginning a new one, duplicates the pattern with regard to finding that some composers retreat to the technique of drawing upon a "Safe Place" as a means to extend further and, when the extension has occurred, the "Safe Place" is there for reference and security for new ideas. (See Chapter 5, "Framework")

Summary

To summarise, the growth of musical progression in terms of utilisation of musical techniques and performance skills could clearly be seen, as could the extension of musical thought through the application of these techniques, thus the acquisition of music i.e. composition as a language evolved. I consider that the group dynamic did not hinder the advancement of the acquisition and in many ways helped the progression through the externalisation of the music through constant performance, whereby the composer(s) had resource to hear their pieces and thus had the opportunity to be more objective to their own feelings through this externalisation. Thus a "Circuit of Activity " (meaning development of thought and in alignment, physical abilities) is completed. By Year 6 we could trace a clear development of the "line" of the music within the working syntax of the group and, I believe, within the individual.

The diagram on the following page shows how ideas may come to a 'plateau' before new growth of ideas begins again:-

Circuit of Activity



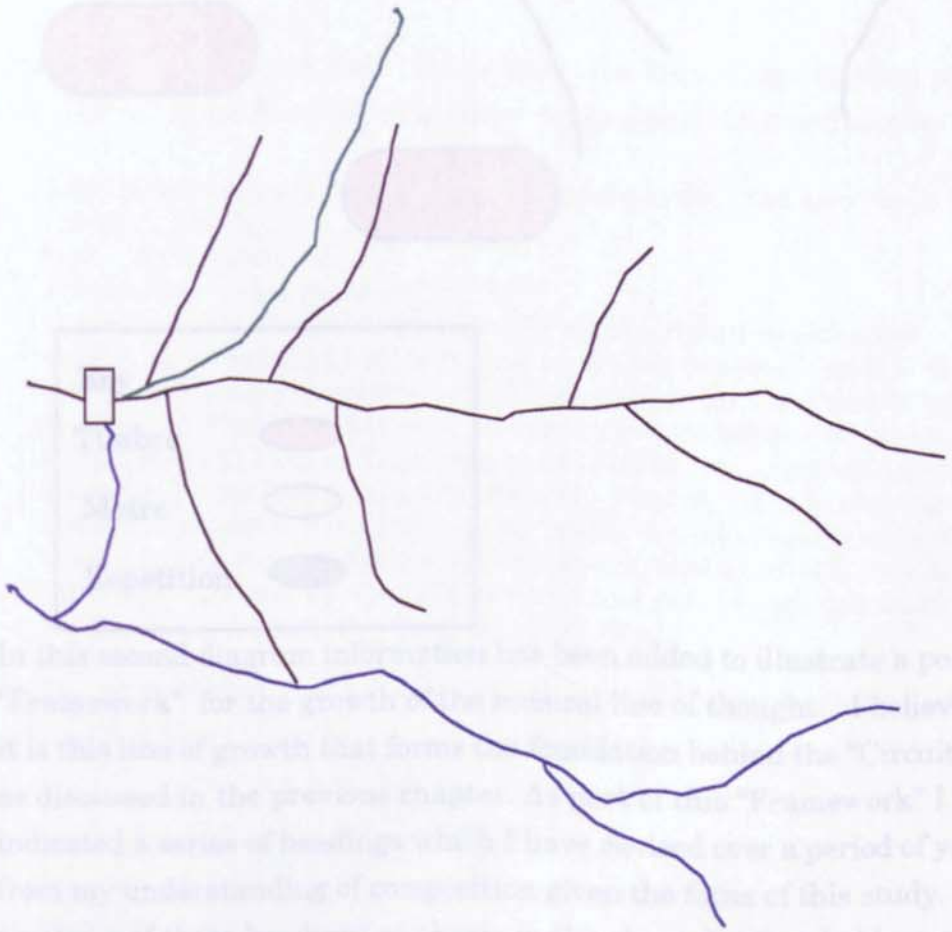
Circuit activation dependent on level of intensity

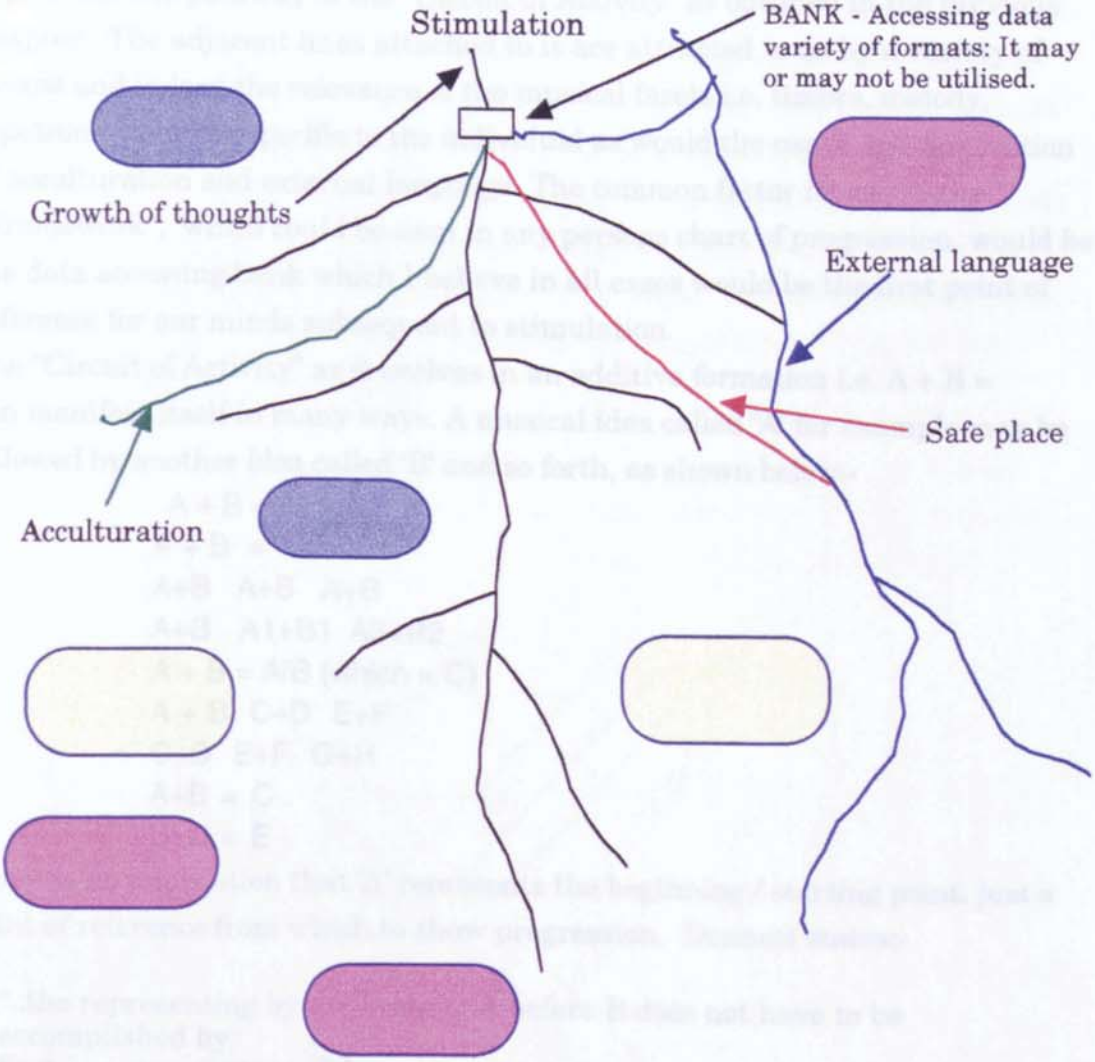
Many of the above findings would, I believe, apply to any group of pupils or students beginning a course of composition. The length of time needed to move forward from a starting point depends on the age and skills already acquired by the pupil or student. The journey, that is the acquisition of motor skills, musical skills, development of thought, musical techniques etc. as shown above is not unlike that taken by a composer working alone. This path of growth illustrates what I believe forms the basis for the development of a composer's unique style and moreover given continual practice the level of growth and assimilation should continue throughout the composer's life with expected plateaus from which the next step is only a matter of continuance.

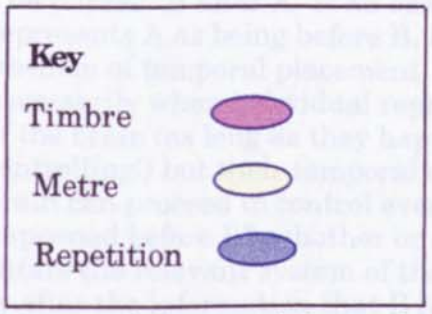
The progression of the line of music provides the key towards discovering how our minds operate as we compose music. In the following chapter this will be the starting point for investigation.

Chapter 5 - Framework

In musical terms, the following diagram best represents how I believe the line of compositional thought might develop in the brain. The growth line formulates in the brain and grows as compositional development takes place. Here, the growth line begins on the left of the diagram and expands towards the right however the growth line may formulate from any starting point. Those lines attached would show other compositional developments or development of other aspects of the minds function which might / could even work alongside (see the blue / lower horizontal line). In addition, any of the other lines could be the development of an external motor process such as development of performance skills . The pathway and development of each line is, I believe, self determined and self evaluated by the inner process of thought. This self-evaluation could occur as a natural ongoing process formed by practice, but affected by the psychological placement of the mind. (See reference to Langer, Chapter 2 page 21) This is then a pathway of acquisition: showing a growth line which represents the development of composition as it grows in our mind.







In this second diagram information has been added to illustrate a possible "Framework" for the growth of the musical line of thought. I believe that it is this line of growth that forms the foundation behind the "Circuit of Activity" as discussed in the previous chapter. As part of this "Framework" I have indicated a series of headings which I have devised over a period of years drawn from my understanding of composition given the focus of this study. (The positions of these headings as shown in the above diagram hold no specific purpose except to illustrate their presence)

I believe this growth line showing the acquisition of musical composition represents the pathway of the "Circuit of Activity" as outlined in the previous chapter. The adjacent lines attached to it are attracted to us by a variety of means and indeed the relevance of the musical facets i.e. timbre, melody, repetition would be specific to the individual as would the usage and application of acculturation and external language. The common factor for me in the "Framework", which could be seen in any persons chart of progression, would be the data accessing bank which I believe in all cases would be the first point of reference for our minds subsequent to stimulation.

The "Circuit of Activity" as it evolves in an additive formation i.e. A + B = can manifest itself in many ways. A musical idea called 'A' for example may be followed by another idea called 'B' and so forth, as shown below:-

A + B = A1 + B1
A + B = C
A+B A+B A+B
A+B A1+B1 A2+B2
A + B = A/B (which = C)
A + B C+D E+F
C+D E+F G+H
A+B = C
C+D = E

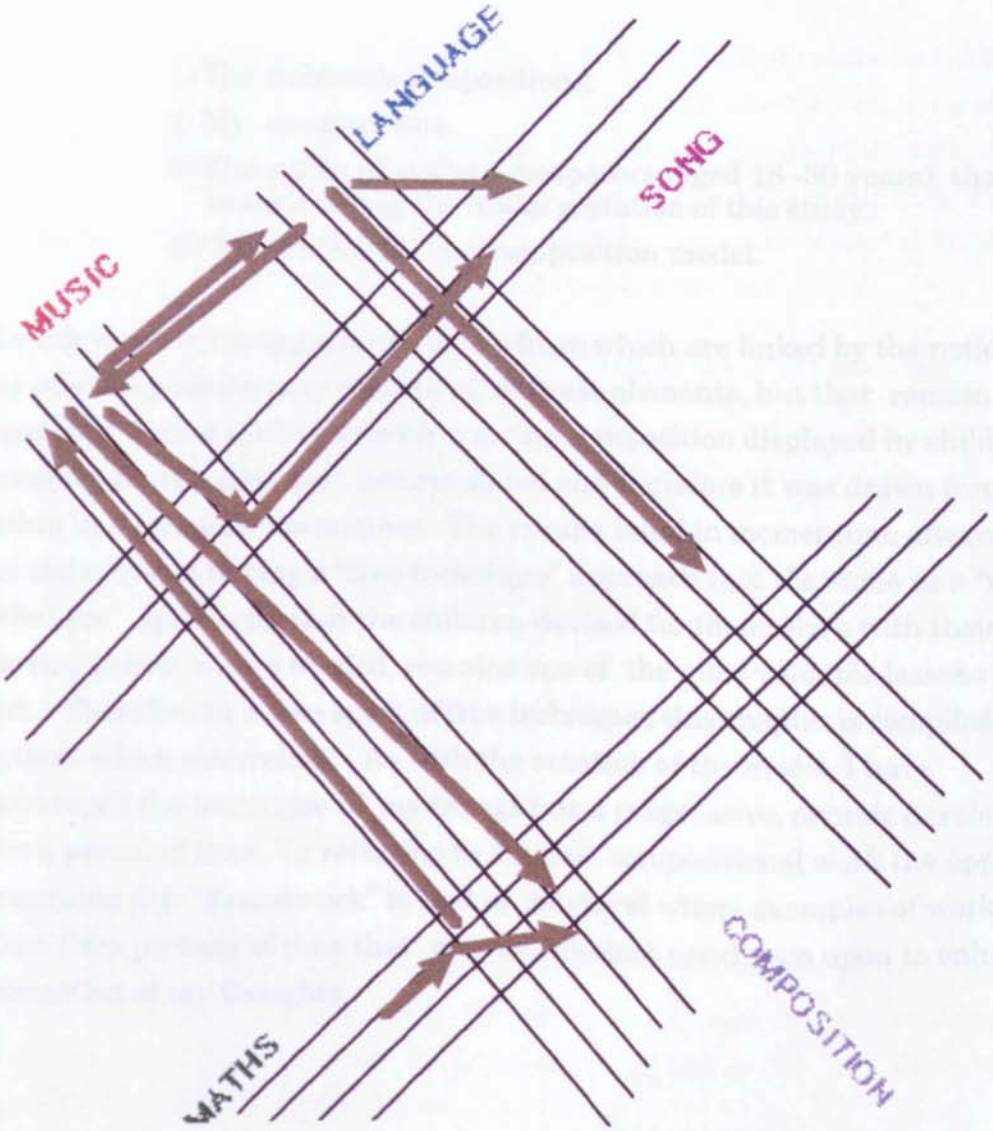
There is no implication that 'A' represents the beginning / starting point, just a point of reference from which to show progression. Dennett states:-

> "..the representing by the brain of A before B does not have to be accomplished by:
> first: a representing of A.
> followed by: a representing of B.
> The phrase "B after A" is an example of a (spoken) vehicle that represents A as being before B, and the brain can avail itself of the same freedom of temporal placement. What matters for the brain is not necessarily when individual representing events happen in various parts of the brain (as long as they happen in time to control the things that need controlling!) but their temporal content. That is, what matters is that the brain can proceed to control events "under the assumption that A happened before B" whether or not the information that A has happened enters the relevant system of the brain and gets recognized as such before or after the information that B has happened." [1]

It may even be that the development of "A" or "B" may be mapped down to neuronal activity.[2]

[1] Dennett - Consciousness Explained, page 149
[2] Hameroff - Consciousness Connects Our Brains to the Fundamental Level

In addition, I imagine that it would also be possible for several 'circuits' to run simultaneously and for the line of acquisition to have a series of adjacent lines with similar offshoots running alongside it. I would even suggest that whilst working on a musical idea, in a composition, one of these other parallel circuits could be stimulated into greater growth if the data accessing "Bank" found common ground from which to process. A grid of interaction forms and process of activation is specific to data reference. Perhaps these routes of operation could even signify neural interactions and pathways. The "Framework" could act as a grid - like structure that interlocks with many other regions of the brain, as suggested in the following:-



By examining the areas identified within the "Framework" which are listed as a series of headings, I hope to trace how this musical 'line' grew in the model "Maya's Words", my earlier compositional work and thus, with the evidence of the codified data taken from the children's compositions, to expound the notion that although rates of development concerning the acquisition of music as a language may vary, the route by which it progresses is very much comparable.

The spontaneity and confidence achieved by children in their musical compositions given no particular or any particular starting point has led me to a freedom of thought. This has enabled me to consider many differing aspects of how I think a framework might be formed and what constituent parts it could contain, without any preconceived notions of hierarchical structure. These parts are shown as headings; Safe Place, Growth Line, Bank, Acculturation, Repetition, External Language, Tone Colour, Metre and Musical Sketches. Each heading may reference:

1) The children's compositions;
2) My compositions.
3) The works of student composers (aged 18 -30 years) that I tutored during the initial gestation of this study.
4) "Maya's Words" my composition model.

The relevance of having a series of headings which are linked by the notion that any one composition may contain all of these elements, but that remain separated, is that the formula for creating composition displayed by children remained for the most part unformulated and therefore it was drawn from within in a spontaneous manner. The results build in momentum, always, but the technique of having a "free technique" approach (not the same as a "no technique" approach) that the children devised for themselves with their own starting points, where needed, remains one of the most valuable lessons for my part. Therefore in a true spirit of free technique, this chapter is compiled in sections which interrelate. As with the creation of the model, I have encouraged the technique of my thought as a progressive, organic development over a period of time. In referring to my past compositional work the approach concerning this "Framework" is that of retrieval where examples of works taken from pockets of time that may be relevant are drawn upon to enhance illustration of my thoughts.

The headings in the frameworks are defined as thus:-

Safe Place

We recreate what we know and use this as a starting point for creativity. This provides a foundation for growth without the complex anxiety of having to create a new idea and it gives us a stable beginning for development of thought. It could be that we recall a memory, or a process (musical) that has worked for us in the past; it could be anything that we know well.

Growth Line

The creation of the progression and development of ideas growing into a line of thought. As this develops we look at what attracts itself to grow alongside the line, what this in turn attracts to it and how this may or may not relate to the original line.

Bank

We access data: data may be stored in a variety of formats and also accessed in a variety of manifestations. Data we know and have experienced, data that is new and we seek to experience by utilisation through composition, data that is stored, even buried and used when / if it is needed again. Drawing from the Bank does not provide the same psychological security 'net' that is seen with ideas drawn from the "Safe Place". . Paul Robertson states:-

> "A significant discovery is that one small area of the brain seemingly contains a total recall of music heard between the ages of eight and eleven. For example, one patient with a lesion in this area constantly suffered unwelcome replays of the brass band music of his youth. ...It is interesting in the light of this knowledge that so many composers have commented that their mature styles have been based on their earliest musical experiences. Is it possible that the storehouse of such musical memories (that we all have) is accessed more readily by the composers?" [3]

Acculturation

How social conditioning has an effect upon thought.

Repetition

Of notes, melodic lines, rhythms, techniques, theories, notes, timbre, silence etc

External Language

This would be the effect that language and speech has on our thinking patterns not only in terms of rhythm, shape and sound but also in terms of contour. Language forms lines of shape be they spoken, visual or felt and these may reflect and work into our thoughts.

(See reference to work of Diana Deustch in Chapter 1, page 12)

[3] Robertson - The Great Divide, page 2.

Tone Colour / Timbre

Here we theoretically discern how sound and music may be experienced in:- timbral colours, orchestrations, our emotions.

Metre

The context for analysis of metre is approached in this study in several forms: a) impulse; b) a rhythm that drives through a composition from beginning to end; c) a motivically created figure that has a series of intensities which dictate metre.

Musical Sketches

Musical sketches may show external indications of the mind's working and be a guide to techniques employed within the structure of the composition.

SAFE PLACE
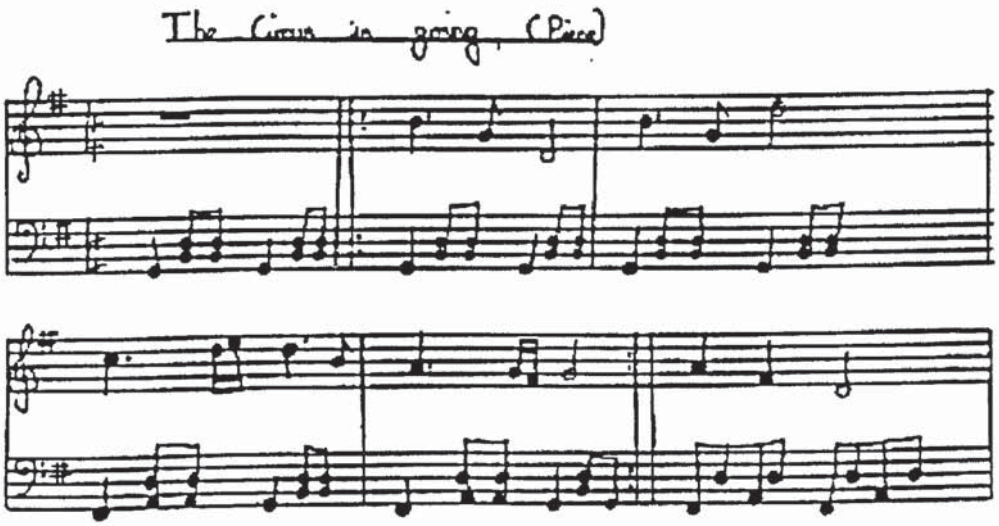
Children's Compositions:

Beginning a composition from a "Safe Place" often presented itself as the starting point for compositional activity. Young pupils used in some part something of what they were comfortable doing as a springboard to (other) musical occurrences or as techniques. In many instances where a subsequent composition of an exploratory manner had not worked to the approval of the pupil, the next composition often reverted back to a technique that had worked in a previous composition and thus progression ensued on this basis. For example, melodies sung from early childhood were integrated into compositions. Often these melodies were starting points i.e. "Safe Places" for the children to begin their work. And in these cases it was the memories / feelings associated with the melodies that promoted thoughts, rather than the need to learn to reproduce the melody on an instrument. Most of the children simply sang the songs whilst composing new material. Some children would relate stories of their mothers brushing their hair, or fathers giving them a present, it seemed that the security of the memory acted as a springboard for the composition as well as a safe place to begin.

"Most high achievers are well integrated with the 'inner child' and many of these people keep tangible transitional objects around them as a source of instant recall for nourishing and challenging memories." [4]

My Compositions:

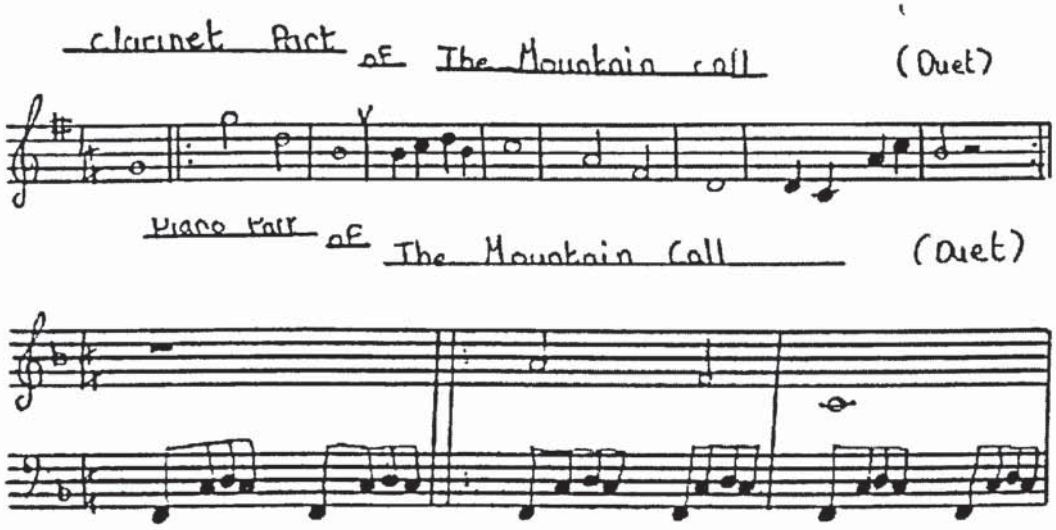
As I reflect on my own work I can see how I chose to compose from a 'Safe Place' as shown in the following examples:- My first composition (aged 7) was written for piano and I was able to play it; I felt comfortable with the piano. The following piano composition "The Circus is Going" was one of my earliest:-



I remember shortly thereafter wanting to compose a piece for voices and lots of instruments but constantly getting upset because I was not able to lay it out in my scrap book (the place where I stuck my compositions.) I remember buying a new scrap book in the hope that this might suggest more room to put whatever was needed, but to no avail. It was summer holidays and there was no-one to show me how to lay my ideas out.

[4] Zdenek - The Right Brain Experience, Chapter: Re-calling Childhood Memories.

I can remember hearing lots of small melodies coming from all over my mind and felt confused as to how they could be put onto paper. I had attempted to stretch out to new sounds and instruments, but then reverted to writing some more piano pieces. When school began again, I heard the clarinet and then composed for clarinet and piano.



In these instances the decision as to which instrument to compose for was taken from a place of knowing. Only when I was sure of the sound and the potential of the instrument was I able to write for it. I gained confidence to write through listening to the instrument. As aural experience grew I became able to understand the sounds in my head. For me, finding out about an instrument became a "Safe Place" to begin composition from.

Taking this further, in my horn concerto entitled "Global Nation", I found that a musical process which began in my violin concerto "Ocean Witness", became much more dense. (Process described in ensuing section, page 56) In this instance the use of a process felt safe to me and one that I could expand upon in a subsequent composition.

Maya's Words:

In the model " Maya's Words" we saw that the formation of the harmony had developed. This development is not unrelated to the aforementioned horn concerto which was written and completed whilst I composed "Maya's Words." The acquisition through experience in the horn concerto of a heightened accumulation of tonal clusters had incremented in use especially in the recapitulation of the model. I drew upon harmony as tonal and atonal centres of importance, either for the process of facilitating expansion or for the purpose of continuance from a place of musical security and this process is, for me, a "Safe Place".

What is clear towards the latter portion of "Maya's Words" is that the combination of the 1) linear tonality and 2) the merging clouds of tonalities had become so dense as to make usage inseparable; in the latter part of the piece both push towards the end in a thick dense mass which may represent a starting point for a next composition having taken perhaps two concertos to work towards this point. (i.e. two techniques utilising a "Safe Place" as a starting point.) I believe these harmonic structures in the model had expanded and, through a 'temporal field' attracting experience to itself, continued to expand. (See diagram of "Framework": Chapter 5, page 46)

This harmonic expansion would not have occurred so freely if it were not for the examination of the children's works and the techniques utilised for the creation of this model.

Growth Line

Children's Compositions:

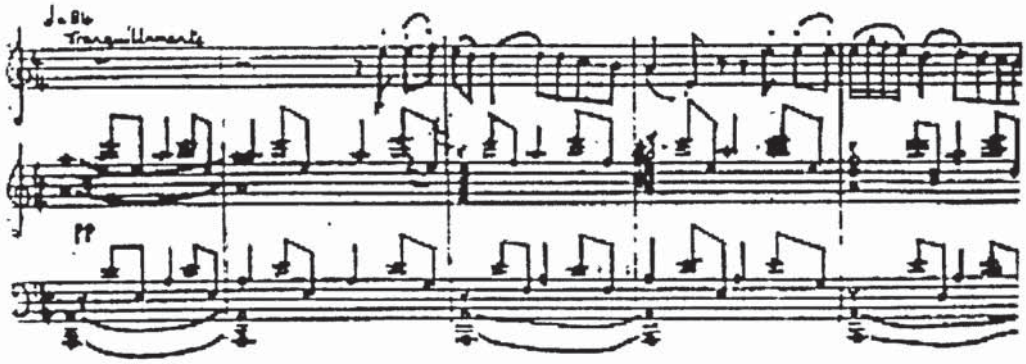
Development of a "Growth Line" was seen to arise from a substantial period of compositional activity and was noticeably evident in Year 6 compositions. (See page 42) As previously mentioned I believe the 'line' to be applicable to most musical events that follow on in a path to form a progression. (See "Lines of Growth" Chapter 3)

My Compositions:

In my own compositional work as a child I developed my own sense of line in my writing and I realise this by looking at it now; by reflecting and using information from the data acquired from the children's works I can see how this "Growth Line" may have grown. When I was thirteen, I remember composing a piece for violin and piano entitled "Crepuscule" which was performed three years later in a concert in Lyons on a music course that I attended. At the
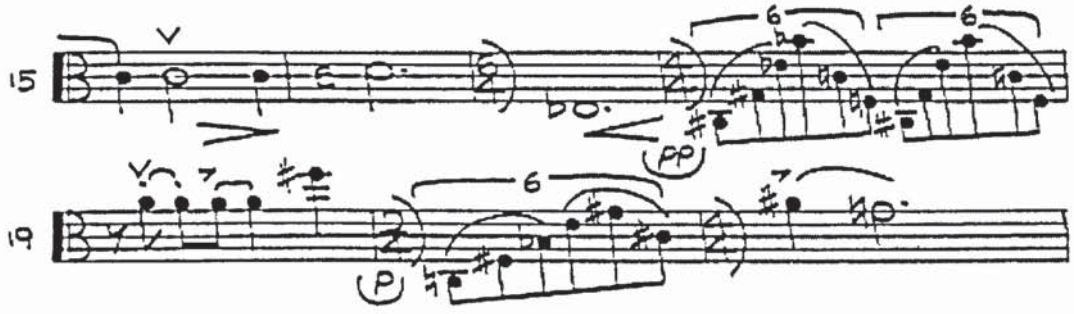
performance I thought how the atmosphere created in performance evoked the feelings I had felt when writing the piece.

Crépuscule

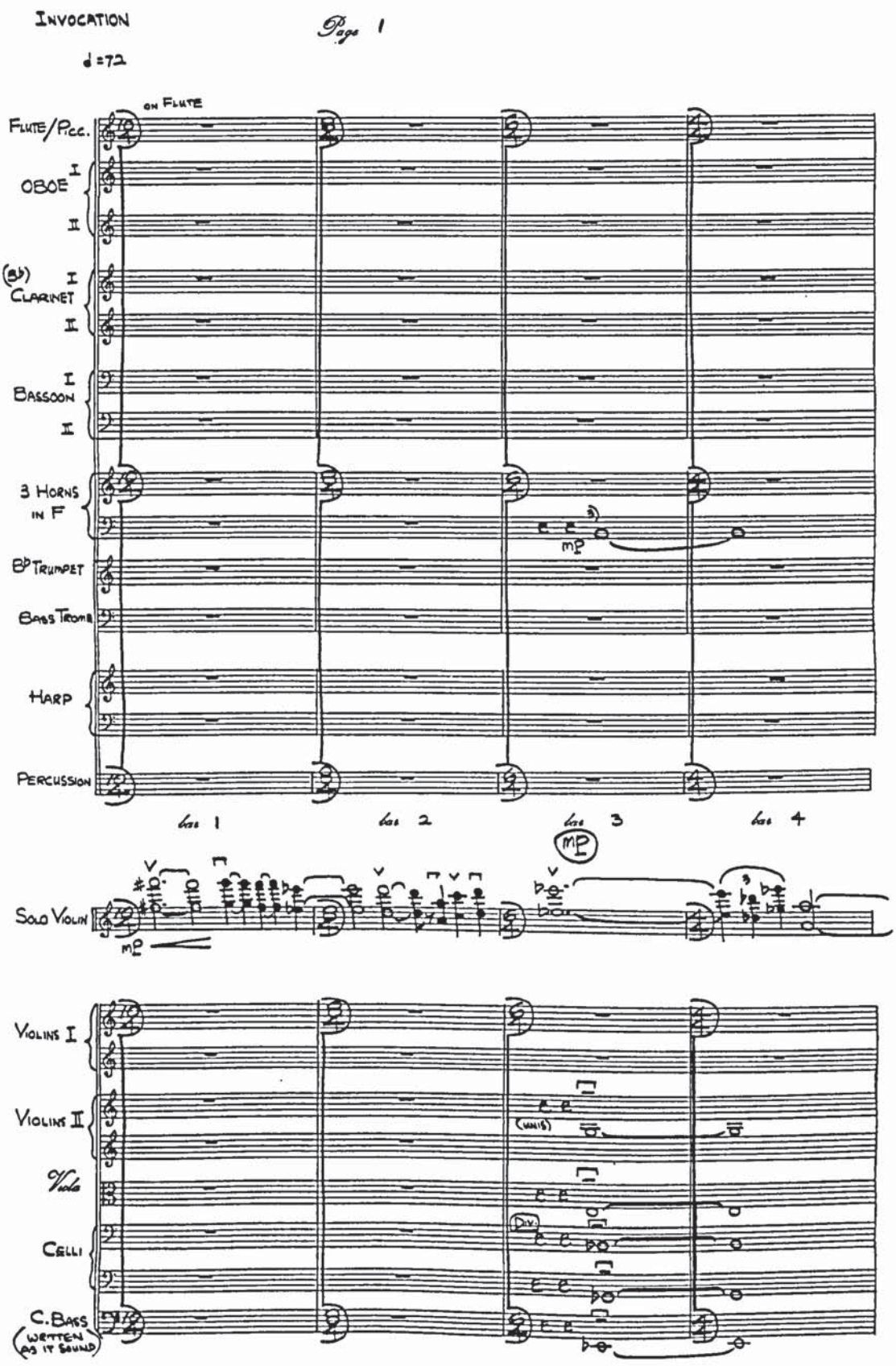


Listening to the violin line was like dragging a marker through my mind indicating the very passage of my emotions as the composition was several years old when I heard this first performance. I now know that what I felt could have been the realisation through performance of my passage of musical thoughts at that time, the line of thought, a "Growth Line".

I also remember feeling very similar emotions whilst listening to a performance of "Three Wishes" a composition written almost a decade later for solo viola. There was a performance at the ISCM in London that I remember clearly. Again I felt as if a marker was travelling through my emotions this time dragging with it something much more substantial, more heavy, an image that comes to my mind is "heavy luggage." This composition most definitely had associated with it " emotional baggage" and hearing it externalized instantly reminded my memory of why I wrote the piece. The'"Growth Line" of this composition could be considered multiple personality. The shape is set by the solo viola line, but fragmented harmonies and rhythms indicate different simultaneously running conversations or musical moments, as shown in the following excerpt form "Three Wishes". Here bars 18 and 20 are similar in feel and refer to each other whilst bars 19 and 21, different to bars 18 and 20, relate to each other.



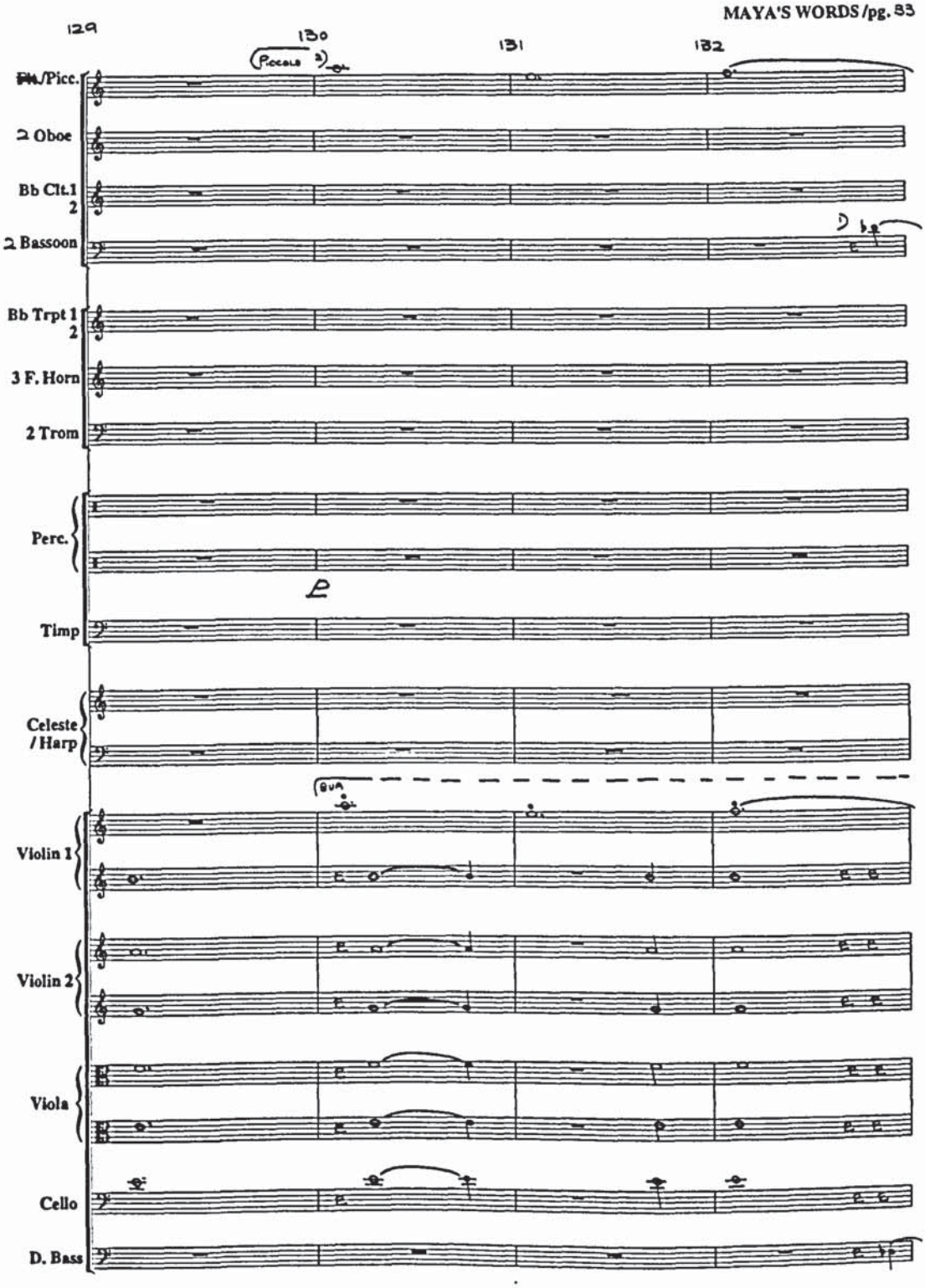
This, I now see, exhibits a musical progression that has developed throughout my compositional work, but in differing manifestations. For example in the first movement of "Ocean Witness" a thin violin melody opens the concerto and within minutes there are dense clouds of a tonality which seem to merge with the melody and dissipate again. (See example on the following page.) Sometimes, these clouds are atonal are then replaced by tonal clouds which have timbral experimentation within. So here there are two series of formations of attraction, one atonal, one timbral. It is the "Growth Line" that leads the way on the solo violin, added to this are suggestions of harmonic intention for the movement; in this way I use the same method as shown previously in the example of the viola line of "Three Wishes."

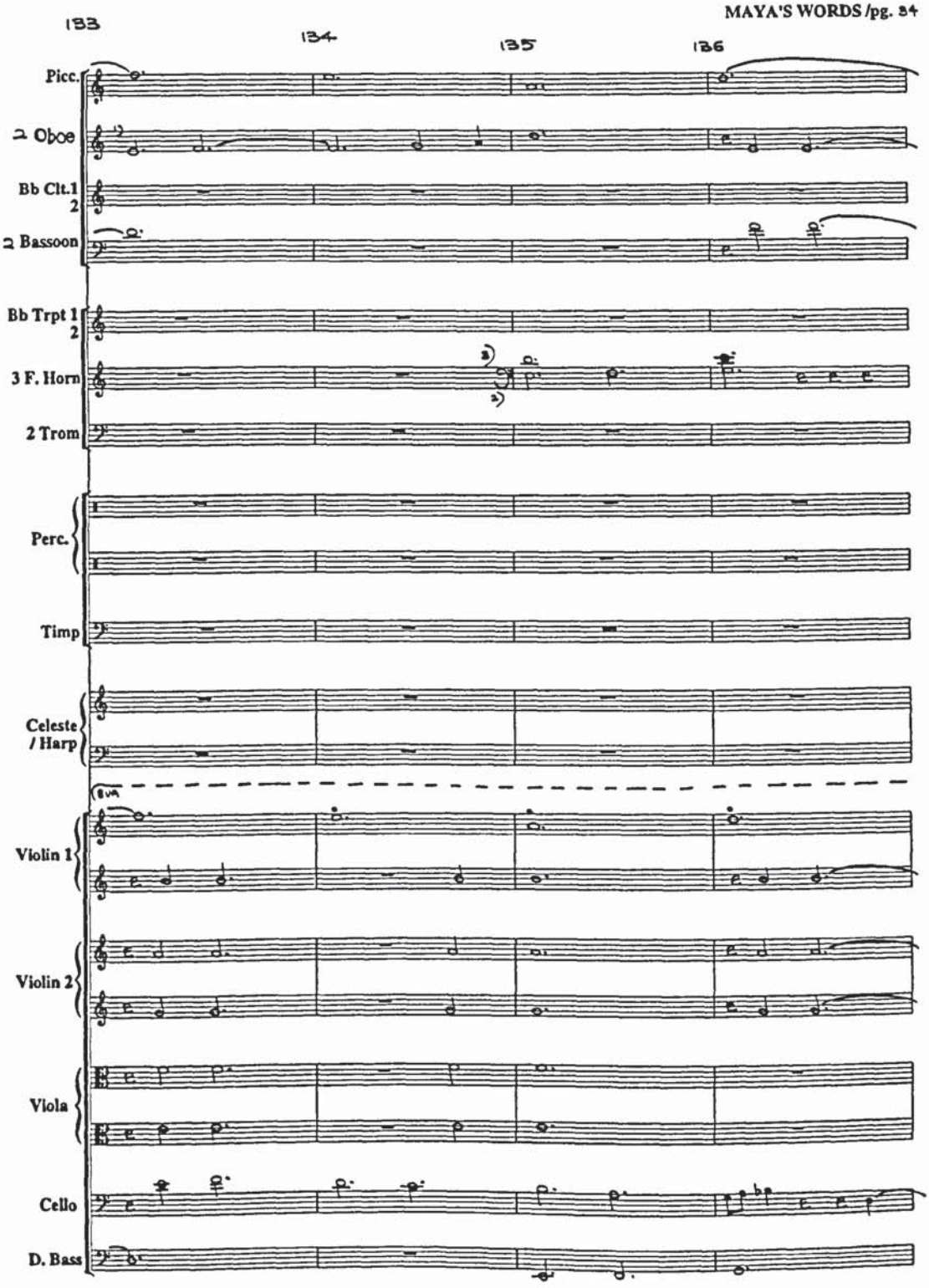

INVOCATION
Page 1
♩=72
on Flute
Flute/Picc.
Oboe I
II
(B♭) Clarinet I
II
Bassoon I
II
3 Horns in F
B♭ Trumpet
Bass Trom.
Harp
Percussion
bar 1
bar 2
bar 3
bar 4
mp
Solo Violin
mp
Violins I
Violins II
(unis)
Viola
Div.
Celli
C. Bass
(written as it sound)

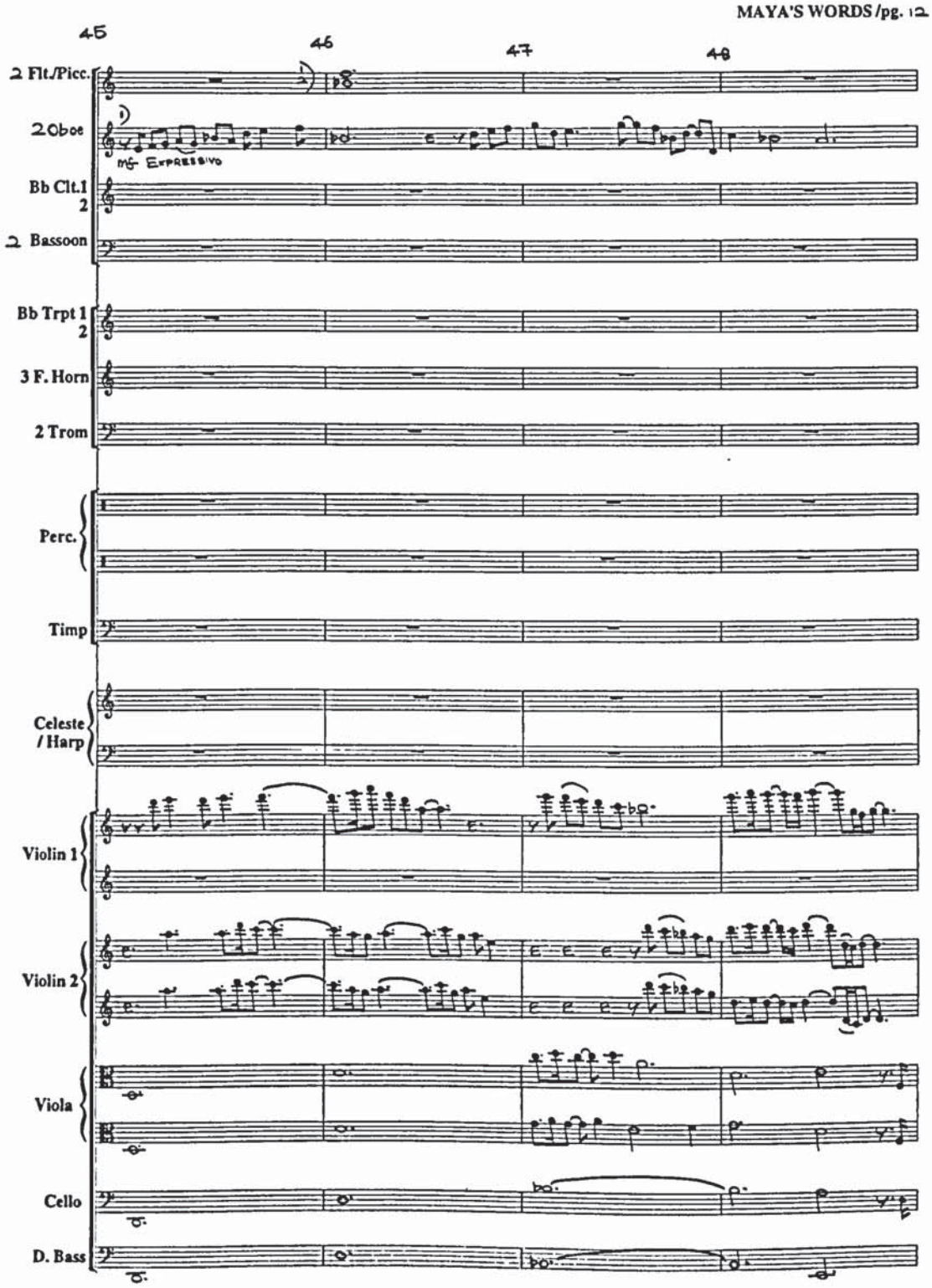
Maya's Words:

In "Maya's Words" there is a "Growth Line" of harmony which works its way through the composition and attracted to this, like metal chippings that stick to a magnet, are clouds of atonal clusters which already seem to know the place that they are going to go to and even the place within the structure as a whole that they are going to designate themselves. (See score on next two pages, bars 130-136) This was a not a technique I consciously worked out even though I was conscious of utilising a freer approach to my composition which in turn might have facilitated a broader growth line than before, as I felt more confident. Here the model illustrates part of the "Framework" (see diagram at the beginning of this chapter) where we see that ideas can attach themselves to the "Growth Line." This linear harmony travels along melodic lines; more often than not a melodic line implicates the harmony, but then another melodic line will come in, implying another harmony. (See bars 45 and 46 on page 64) It is as if the process has multiplied, this can happen again and again perhaps even simultaneously. (Refer to Grid at the beginning of this chapter, page 48) Sometimes there are five of six lines and to each of these various harmonic implications are attached. Not all are realized in the orchestration of the composition i.e. some still are in my mind and present themselves as abstract forms sounding in my mind when I look through the score. This process is also particularly evident in the last movement of "Global Nation", but on a more unified form where one melodic line would start and come to almost a dead end and, at that dead end, another line of thought would pick it up and carry on like tributaries coming to the mouth of a river. Many lines would come into the one, or the opposite, one line would branch into many.

In "Maya's Words" we see a thickening of this process, we see different lines happening at different places within the work, but there is a continuity to the process and the formation is structural. Here we have an example of the 'multi-faceted' expansion of the "Growth Line". Again, in noting that the children had a free approach to their compositions I was able to integrate in my work many lines of musical thought and not necessarily worry about the implication of doing so. It felt good and I did it. In addition, I felt whilst doing so, a very direct influence from the work of composer Charles Ives. In his work the attraction of musical densities and timbres altogether in large wafts of sound merging from one segment to another, in the middle of which many intricate melodic lines simultaneously weave, suggested to my mind a liberation and freedom that no other music seemed to.


129
130
131
132
Fl./Picc.
Piccolo
2 Oboe
Bb Clt. 1
2
2 Bassoon
Bb Trpt 1
2
3 F. Horn
2 Trom
Perc.
P
Timp
Celeste
/ Harp
8va
Violin 1
Violin 2
Viola
Cello
D. Bass


133
134
135
136
Picc.
2 Oboe
Bb Clt.1
2
2 Bassoon
Bb Trpt 1
2
3 F. Horn
2 Trom
Perc.
Timp
Celeste
/ Harp
8va
Violin 1
Violin 2
Viola
Cello
D. Bass


45
46
47
48
2 Flt./Picc.
2 Oboe
mf Expressivo
Bb Clt.1
2
2 Bassoon
Bb Trpt 1
2
3 F. Horn
2 Trom
Perc.
Timp
Celeste
/ Harp
Violin 1
Violin 2
Viola
Cello
D. Bass

BANK

Children's Compositions:

Pupils were seen to draw upon their experience, whether it be to create a composition on the theme of "Close Encounters" (see composition number 22), or it be to use discussion or a story that had been told in class as an immediate reference. On the whole I noticed that even when the latter was the case, the pupil invariably compared the discussion or story to something directly in their experiences (i.e. via a memory or memory of a physical experience) and used this as a source for creative thought. Perhaps in the children's compositions, where use of adjacent time frames is evident, it could represent the external result of differing stimuli of our data bank coming to the fore without any real context with the exception of running adjacent to the next / following musical idea. An external manifestation of the act of learning how to place experiential data in a context.

My Compositions:

I believe that my emotions are the vehicle I use (it is not necessarily the same with every composer) to access the place where experience and influences are held. I imagine that this place is a portion of the brain which acts and reacts to all sorts of other stimuli in my brain, information held there has a gestation time but in some way I draw upon it in every new composition. Perhaps as I access through my emotions this process activates it .

> "Through my work with Dr Peter Fenwick, consultant neuropsychiatrist to Maudsley and Bethlem Hospital, London, we concluded that the relative dominance of a hemisphere could indicate how the musical styles of certain composers develop. We realised that mainly intuitive composers, writing essentially emotional music, would use the rhythmic and concordant language of the right hemisphere, where meaning, emotions and rhythm are experienced. Those whose work was predominantly intellectual and logical would draw on the dissonant, arythmic world of the left." [5]

We activate layers of data where we have combined experience of everything in life and even, if you so believe, pre-birth experience. Therefore elements of memory could work alongside present reactions and decision-makings. It is as if various aspects of thought act simultaneously in this bank in order to make the right choice for the next part or portion of the composition. For example, as part of the process of composition for me melody is broken

[5] Robertson - The Great Divide, page 1

down from fragments of linearity to fragments of tiny motives which undergo a myriad of usages; they invert, repeat etc; this process is for me, subliminal. I know this takes place when I hear (in my mind) these small musical fragments, but do not stop to analyse them because the physical act of writing it down, (for me,) is too quick. When finishing a composition it is possible to find these references of: inversions, themes that were extended or contained diminution etc., but this is a process that happens through experience. In the model we see the use of techniques and data that have been learnt from the examination of the children's work. In employing these techniques in the model and in conjunction with the method of implementation we see that I have stored much of this material in my own data bank and have drawn upon it in the model. Musical evidence of what I consider to be a "Bank" a place where we access data.

Maya's Words:
In the model I have not consciously drawn upon my data' Bank' although in retrospect it could have been fun to integrate a known theme or even a theme from another of my own compositions into the model. I sense now that my conditioning and belief that I should never have any material in my own composition but my own has provided perhaps a restriction to the model. However I do acknowledge the influence of the works of Charles Ives (see page 61) and in addition I have drawn upon certain Russian Influences in my use of scalic passages and orchestrations. (See Chapter 6, page 87.)

ACCULTURATION

Children's Compositions:
At any age, elements of (family) life and / or experiences play a large part in the working mind of a composer. Songs sung by family (at home) would be affectionately introduced into class. Working at composition in group work would reveal behavioural practice that was obviously modelled on those used at home. One prevalent example was that boys from cultures where women are not considered to be primarily in charge, would find it difficult to have a girl lead the group. In some instances the parents of such pupils found this hard to deal with and aired their concern. Another interesting observation was that quite commonly pupils who were not know as the 'high-flyers' of their class (in academic terms) often began to draw confidence from achieving in composition. The option of having their own idea presented and used for evaluation was one that usually gathered much momentum. In some cases the academic work started to improve for these pupils.

In most cases the assimilation of the language of musical composition became the driving force behind all group work and development of this language became an extremely strong dynamic. In time groups bonded despite any divides created by background and / or working practices at home.

My Compositions:

The structures and lines of melodies that I composed from the age of thirteen to the age of eighteen remained for me, in my life, a constant force. Neither of my parents were musicians and I enjoyed the act of composing alone. At the age of eighteen when 'student' training began (representing for me a transition from the Junior Academy to the Senior Royal Academy of Music) a newly awakened portion of my mind began to question every element of my composition. It was the logical part. I questioned everything; notes, melodies, everything had to exist for a reason and there also had to be a reason for composing a piece; it was not good enough just to write. I remember being influenced by my peers who always seemed to have reasons for composing and many seemed to struggle over every minuscule part of their work. I felt that it could not be correct to be prolific and that I should have more discernment in my work. Over the three years of my studies, the internal battles between the intellectual requirements of my mind demanding reasons for musical ideas and justifications for themes and melodies, led me to stop composing and to think about what I was doing. The music I was composing at this time seemed to go only so far and then stop. It was like a huge "blank " as if some element of my mind had been deactivated and that there was no way to think past the gap. This was a familiar occurrence towards the latter part of my years of study at the Royal Academy. I prohibited myself from using my childhood technique of imagining my composition being performed on stage and then the continuance would be heard in my mind and then I would then write it down. Even so, despite these internal struggles in my composing I felt compelled to continue.

Some time later I stumbled upon the autobiography of Elisabeth Lutyens in the ISCM library and decided that I would like to know more about the life and work of this composer; this I subsequently undertook as part of a Master's degree. I found that the structure of her writing although based on a twelve note pattern was written by her in an unplanned and natural process. Please refer to my Master's study entitled "The Perceptibility of the Compositional Procedures of Elisabeth Lutyens".[6]

[6] Price - The Perceptibility of the Compositional Procedures of Elisabeth Lutyens

Lutyens imbibed structural elements i.e. mathematical data from the studies of architectural works which she looked at with her father when she was a child, and was able to resource this part of her brain into her compositional writings. Accessing them through an 'every day' way she stated:- "Dogs bark, composers compose".

Studying the form and content of the works of this composer somehow helped my mind past a certain point in my own writing so that without realising it, the analysis and inspection of all the works during the time I spent on my M.Phil. were helping my own mind to bridge a gap that was self-created.

In many ways the language of Lutyens is very different from my own, but it was that invaluable experience of delving into her musical language which expanded my own perceptions of what musical language is. Despite the conflict that life placed upon Lutyens, her conviction that she had to compose gave me a great confidence, and I now know that such confidence is vital for any composer.

Maya's Words:
In every way my approach to this model does not represent my normal route. I have chosen in the model to abandon all inner logical criticism and listen solely to my emotional intuitions. If I felt a passage was not correct I would rewrite it because of how I felt and not because I felt it may not be right given the meaning of 'right' provided me by years of academic training in composition. I have always used my emotions as I compose but never in such a direct way. As mentioned, the children seemed to write as they saw fit; if this was based on emotion, intellect, external influences etc. I cannot say specifically, however as an observer they certainly had an inner system which gave demarcation points of approval and disapproval. In my model I attempt to emulate this approach by doing, what for me, is the most natural thing, which is composing through my emotions. I feel now as if this approach has provided me with a more certain compositional route for progression.

I have acknowledged and accepted that I am using the formal structure of a classical Sonata Form movement as a means to be able to discern clearly the components I have utilised within the model. I first composed a Sonata form movement at the age of thirteen and feel that the construction of this form is so ingrained within my formal process as not to inhibit my evaluations of the use of

components within the study as outlined in Chapter 3. I do not believe I could evaluate, in a true sense, the impact of my academic training in composition on the model without a structure provided as a guide by which to do so.

REPETITION

Children's Compositions:

Use of repetition can be seen in varying formats within the children's compositions, in early years through percussive repetition and accompaniment and later on through sequences and imitation. Within our "Bank" we house thematic data for each composition and use of direct motivic repetition for a new composition may be sourced from material stored in this bank. Initially repetitive ideas may be as simple as clapping a rhythmic pattern that was heard and repeating it over.

My Compositions:

When composing again, after a gap of a few years in my early twenties, my first set of compositions came out as serial pieces without any preplanning. It was as if my mind was 'emptying a language' and at the time I believed this had occurred as a result of my years of studying the scores of Elisabeth Lutyens. This serial information became stored in my mind, in a certain place as an amplification of my own 'Bank ' where information had placed itself for reference purposes. I found myself repeating patterns of composition I had never written, just studied . As part of my process of 'emptying my mind' I composed several compositions which I threw away immediately after scoring as I recognised they were not "me". Eventually I began to compose again feeling more like my old self. Ideas were timid but fluid and my 'growth line' returned, as if I was starting all over again "from scratch" but not in reality from scratch because there was a certain knowing and confidence. I now believe that this was me beginning a new "Circuit of Activity" following a gap in my work.

One of the first pieces that I wrote at this time was a viola piece entitled "Three Wishes. (See reference to this composition on page 56). This is a composition for a solo instrument and although the melodic line divides into two and three parts as it dialogues in a musical sense it is almost as if there should be two or three players. There is a lot of experimentation with timbre: the tune might be sustained in a certain place and then do a flurry into atonality and then return to tonality. On a very simplistic level the structures found here in this composition are in themselves templates indicating structures of form that find

themselves repeating in a variety of manifestations and on a much larger scale orchestrally in my violin concerto "Ocean Witness."
Following this viola composition, there were a series of short pieces for solo instruments. In these, the process of delving into my own "Bank" and retrieving certain information was occurring. In addition different stylistic influences were also manifesting in my work eg. in my "Three Studies" for French horn I began experimenting with different inflections of jazz and soul music - but musically always grounding my work in the piece to a place where I felt it was me. It was in these horn compositions that we see another type of repetition. The use of the technique of drawing upon the "Bank". The repetition here is the return to and fro to the "Bank" to draw out information(s) that may be stored within . This is a technique I utilise in my film scoring. Of course this type of repetition may also be used for any of the other musical techniques listed or discussed such as use of "Growth Line". I see that the use of repetition has the potential to be as multi-faceted as the "Growth Line" in its use. These examples suggest to me that possibly any or all musical techniques have potential for multi-faceted applications and growth.

Maya's Words:
By using the formal structure of a classical Sonata Form movement and its anticipated formal pattern we see that repetition within the fabric of the model in this sense, is not unusual for example, the first subject is repeated as expected in the recapitulation. What is of note is the components used for repetition: such as the repetition of adjacent time-frames or repetition of harmonic growth lines.

EXTERNAL LANGUAGE

Children's Compositions:
Children loved working with the words from songs or poems. It was easy to activate enthusiasm for composition by using imagery from stories or poetry and it seemed to ignite the thought process. (see chart in Chapter 2 page 20 entitled "Sequence of Learning") From here the step toward creativity and composing seemed shorter, an introduction into patterns of thought had taken place and thoughts could ensue. I have met several screenplay writers who use music to write scripts to; music becomes for them, the introductory element to thought allowing a creative flow to follow. In accessing our thought patterning through adjacent means, we, as writers, are not presented with a blank page from which to start. This blank page could represent a (dormant) mind which simply needs a small amount of stimulation from which to start. As a composer

works, visual images, emotion, all play a part and can help give ignition to thought. This should not imply that there are not occasions where music presents itself as thought in a pure form as it often does.

My Compositions:

The influence of poetry has been strong on my melodic and motivic writing because of my love of: sentences ,words and forms of poetry throughout my teenage years. For me when reading poetry, it is as if the lines of words in the poem suggested melodies to my mind, unheard melodies and unnotated; a structural imprint was made somewhere in my mind.

(The lack of pitch or notes is fairly important for someone with perfect pitch . It signifies a release from the normal, where every sound or group of sounds represent identified pitches.)

The notion of where a line of thought or even a line of a shape is going has always been of great interest to me as mentioned in the beginning of this study. (See Chapter 1, page 2) For me therefore, an imprint, a history of thoughts about music and lines has been in my mind since childhood. From this I understand now that when I read a poem I am affected by :-

- *The contour of the words visually*
- *The sound of the words aurally*
- *The meaning of the words emotionally*
- *The sense of the words logically*
- *The look of the words on the page*

All of these facets stimulate my creativity like a blueprint of depth; this translates into my mind and from there music can often be stimulated.

Maya's Words:

I was drawn to the writing of Maya Angelou by hearing her read her own poetry on television. The intonation of her voice was deep and matched the depth of meaning of her language. The contour of her voice whilst reading I found most absorbing as it travelled up and down in pitch with the meaning, her meaning, of the text. The resonance of the sound of her voice was something that stayed with me in my thoughts for some time. Her reading and poetry inspired my tone poem, the model for this study.

TONE COLOUR / TIMBRE

Children's Compositions:

In early years, sound / timbre plays an important part for many young pupils and provides a route toward discovery. (See Chapter 4, page 34)
Also of interest was the effect sound / timbre had upon the temporal field of the children through vibration. Children would lean over keenly to hear delicate sounds and children would put hands over their ears if a cymbal was being 'sliced ' saying that it made their skins 'creep'. Japanese scientists have undertaken tests with children placing electrodes on their skin and measuring the skin's density following the impact of sound in their work entitled:-
"Temporal variation of electrodermal activity during auditory stimulation"
(Shibagaki,Masamitsu & Yamanaka, Tadashige (1991).
(The relationship of sound / music to the temporal field is discussed in this study on pages 54 and 47.)

Perhaps the physical imprint made on our bodies by sound produces a neural translation in our brains which works alongside our aural perception. Young children often strike instruments hard to make the loudest sound possible; sometimes they hold the instrument so delicately that it looks as though it is going to drop. Could these actions suggest the child is learning to decipher the impact of sound via this suggested neural translation.

My Compositions:

Prior to this study "tone colour " / " timbre" never held for me a heightened external significance until I began my work with the children. I saw that in discovery of sound, timbre and tone colour became foremost in what the children might be choosing as an instrument to compose upon. I suddenly realised that the utilisation of timbre and tone colour was part of my process, I just had not noticed it until now. By stepping back and seeing its importance in creativity through watching children utilise timbre I appreciate its importance within many aspects of my own composition. In an early manifestation of choice concerning timbre, I can remember a violin composition where the use of harmonics was of importance to the title which was called "twilight " but I hated the English word as it did not sound like the music and so I searched for the French word which was "Crepuscule". (See page 55) The sound of the line of the French word better suited the composition. In retrospect I can see how timbre has evolved in my writing. It is ' meshed' into the fabric of "Crepuscule" and pervades all of my work in differing ways. I am pleased through this study to become further acquainted with its value.

Maya's Words:

I determined to utilise timbre in my model " Maya's Words" and found 'use of timbre' (if you will) placed itself within the technique that I had previously been using as a method to develop my writing as a "Growth Line". This I was able to understand from what I had learnt through analysis of the children's work.

In "Maya's Words," clouds of timbral effects (in orchestrational terms) are there, stated. These 'clouds' of timbral language move along with other facets e.g. "Growth Line", and work integrally with the composition. This process I have used in my violin and horn concertos, but here it is used in a new way as part of the structure of the whole composition much in the same way as melody and harmony work for me in earlier compositions. It seems natural to determine to use a component of composition just because you like it, just like the children would play an instrument in a certain way, just because they liked it. Given previous thoughts concerning the logical questioning of why I would employ certain techniques in my student compositions, I can see that this could seem a departure from the logical to the fanciful. And yet the children had taught me that in many ways our minds do a lot of work for us and in deciding that you 'like' something you have committed a portion of your thinking about it already and so you may as well proceed and go with it. You may not like it when finished and then you have learnt through your own experience.

METRE
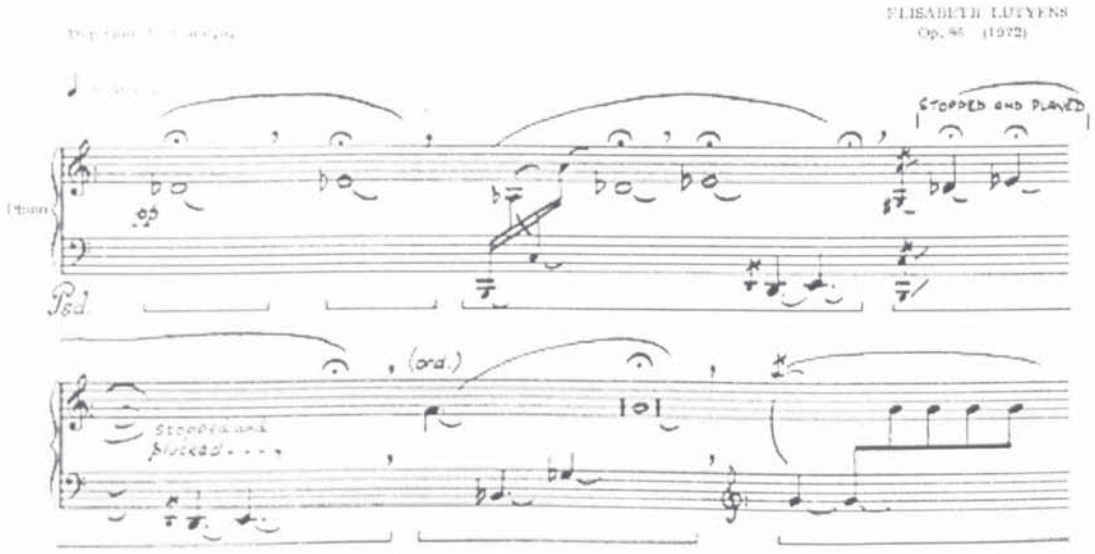
Children's Compositions:

By looking at the children's work I think it is clear that the use of metre is very dependent on the pupil. Until this study, it was not always clear to me why some pupils would have a fanatical sense of pulse and metre whilst others would be very laid back and I could not correlate this to my own work. As shown, the growth of the language of composition can be seen to be unique in its formation. I would argue that the well tried notion of a driving rhythm working its way toward a peak is not the only way in which metre is exhibited in the children's work. Centres of rhythmic densities; adjacent time frames where metre runs at parallel pace are all evident . (See composition number 45.) Given the analysis for the children's works I have formulated that the context of understanding and my analysis of metre within this study exists in several forms: A) a pulse or B) a rhythm that drives through a piece from beginning to end or C) a motivically created figure that has a series of intensities which create metre.

My Compositions:

In my earlier compositions, especially in the years of study when my intellect was questioning my reason for composing, I had felt that my use of metre was too gentle and I was happy in my writing just to drift along using a melody to lead the way. (I can clearly remember thinking to myself in the canteen of the Royal Academy, at the age of eighteen:- " how would / could I progress with this composition if I did not lead with a melody or melodic fragment?") I think the reason for this was because this was the way that my own 'Bank' of thoughts was developing. I believe composers will develop their own "Frameworks" for growth and this may not always initiate around metre. For me melodic, tonal and timbral specifics have developed throughout my compositions in ways that have dictated an intensity or a non-intensity of motivic interest. I noticed in my study of Lutyens' works that in some compositions, for example in her piano composition entitled "Plenum", there are intensities of motivic interest which create rhythmic ebb and flow.

PLENUM



Maya's Words:

In " Maya's Words" I have experimented with metre in a way that I have not done so before in that I have consciously utilised the technique of "Adjacent time frames" with reference to my use of rhythm. I understood from the children's work how to integrate it into my own work (see Chapter 6, page 82) and therefore the process of integration into "Maya's Words" was more natural than expected.

SKETCHES

(See page 11 paragraph two)

Children's Compositions: Sketches and Graphic scores

If you ask a group of children to produce their own sketches or graphic scores following an explanation of what a graphic score is, requesting that they make up their own without following a structure or blueprint, you may notice that each pupil approaches it in an individual way whether they have composed a composition already and are making it as a chart to the music they have composed, or making it as a guide to compose and then to perform to. Some pupils begin with the circumference of such a sketch and work inwards. Some start with the most precise detail so it is not obvious as to what they are constructing until they make a certain amount of progress and others may draw more recognisable shapes before deciding upon the circumference outline or any specific details. By looking at the way the pupils work we can see a blueprint for the individual way in which the inner minds may be approaching any one task.

My Compositions:

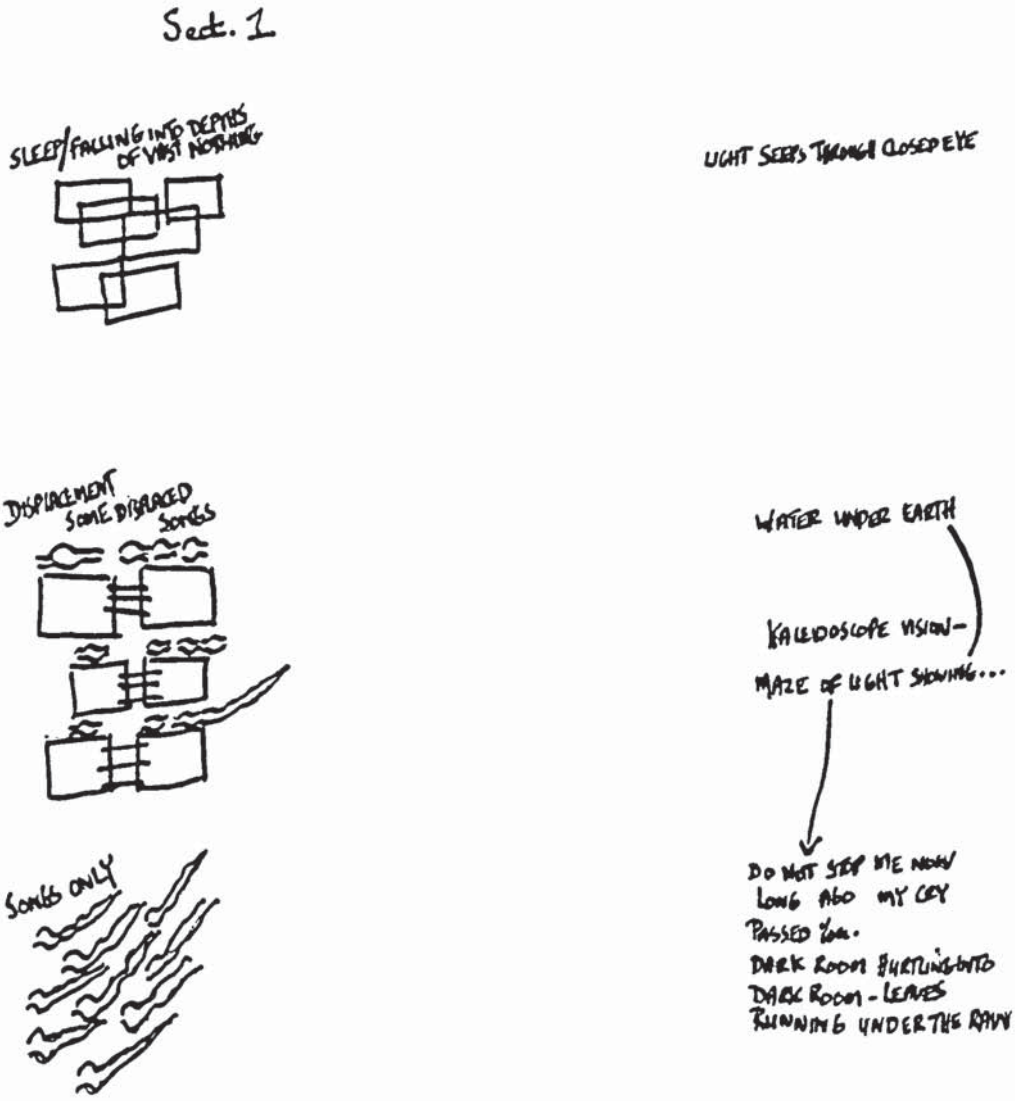
As a child I remember writing very big notes (i.e. quarter inch sized crotchets) and for years every sketch and manuscript was big and also beautifully written. I somehow felt that the presentation of the score gave me security. This pattern changed over the years of my composition until at the moment its barely legible and scrawled. I know that for me this represents a sense of progression in how secure I feel about my writing. This certainly does not apply to everybody, but I believe there are patterns of behaviour shown in composers' sketches that: act as a litmus test to the composers psychological feelings about their work; illustrate the stage at which their work is. That is, sketches can indicate order of procedures within the mind of the composer. By knowing the work and sketches of a composer at any one stage plateaus of development or progression can be monitored. (See "Circuit of Activity', Chapter 4) In my own composition I think my sketches may mean the following:-

"3 Wishes" (1981)

This was sketched very fluidly but quite neatly, in long growth lines. The music was emotionally driven.

"Ocean Witness" (1993)

The music filled my mind in blocks of sound that over a period of time became more detailed and distinct in instrumentation. The sketches would begin as small fragments outlining a block, that I would find myself filling in idiosyncratically. Sometimes music I felt belonged to the end of the composition came before music that belonged in the middle section. I sensed where they belonged although I was partially aided by a sketch that I had made of some of my ideas in graphic form, see sketch:-
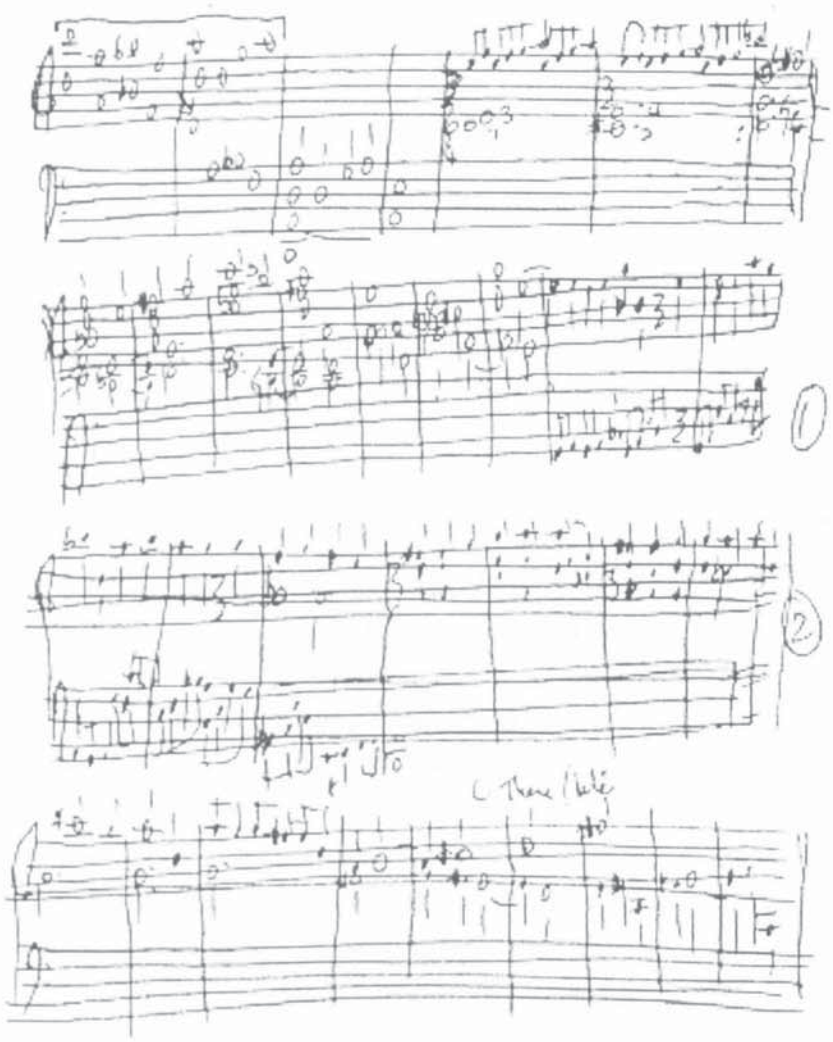


"Global Nation" (1996)

This followed the same procedure as Ocean Witness but with many more linear simultaneous fragments of melody presenting themselves from the outset.

"Mayas Words" (1995 -1998)

In the formation of this model I used a very liberal approach to my sketching of ideas in that I used a variety of methods and even completed the composition in a way that I have never done before.

Following initial thematic ideas which I sketched on pieces of paper whilst waiting for a business meeting,see sketch below:-



The music for "Maya's Words" sometimes came into my mind in aggressive blocks that were almost completely orchestrated. One particular section (marked fortissimo!) woke me from my sleep, pounding in my mind. I was able to orchestrate this outburst immediately. The piece was composed over

several years and often took hold of my mind, sometimes the smallest detail would play itself to me in my mind like an acrobat, jumping up and down, reverse etc. until I would decide where I felt it belonged. I would later write it down. When nearly complete I had the piece copied up, leaving huge gaps where the score was unfinished. This was a new technique that I have never used before, however I was inspired by the approach of the children's work to compose in a more spontaneous manner. I waited until I felt my mind could do it and then set about finishing the composition. I found I was able to get an overview from somehow not being drawn into my own scoring i.e. by recognising my writing, and could sense exactly how to finish it. This procedure gave a greater objectivity and I felt this was an important part of the finalisation of the work as it was written over several years.

STUDENT COMPOSERS:

Through my work tutoring composition students aged 18 - 30 years of age, I have noted that not all composers are able to find inspiration or entry point into a composition in the same way. I may achieve this entry through my emotions or through stimulation such as language, but other composers access it in different ways. By looking at sketches I was able to identify these routes more easily.

S1. (Male) Accessed composition through pure improvisation. This student would bring in his sketches on tape, having improvised a potential new section of the composition. We would discuss the ideas, placement of ideas within the whole and he would go away and work toward the progression of the composition in a way he felt to be appropriate. Intrinsic elements grew to be structured over the years and formal structures grew in addition. As with my own work, minimal planning was undertaken from the outset but his style grew and this expressed itself in a route known to that composer. The way he accessed his own resources, i.e. found inspiration / accessed his data bank of compositional resource, was through improvisation.

S2. (Male) Finding it difficult to compose and access any inspirational source or "bank" of information, he composed by using a structural framework of chord patterns. He would write these out on manuscript in blocks and the block of chord patterns stopped exactly when he ran out of ideas. He had taught himself to compose this way, but this route also seemed to be prohibiting any progress and he admitted that he found the system restricting and had been finding difficulty in composing. His knowledge of chords was restricted to those he could play well.

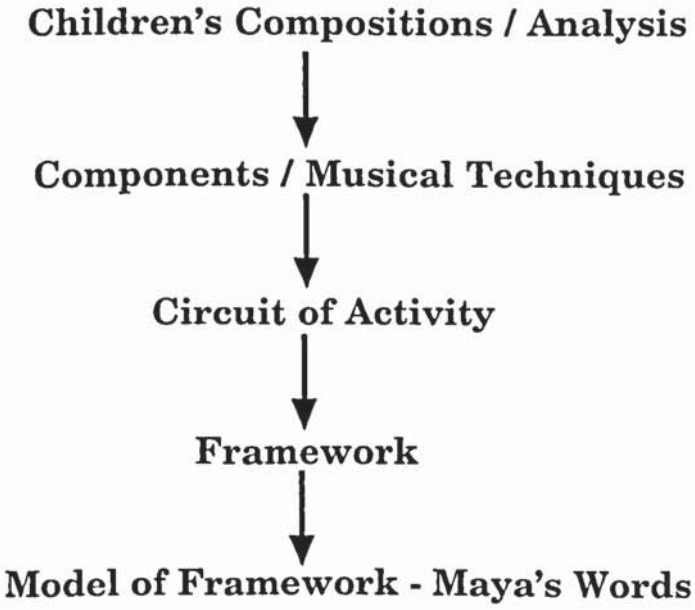
We then tried an experiment: I asked him to compose using one melody line: firstly suggested as a means to promote potential access to further musical thoughts but also as a means to free up his physical restrictions. I had surmised that he would be able to play different melodies, using one hand only (on the keyboard) and as he had already begun composing using this instrument as an instant sounding board for his work this seemed a good way to extend his inner lines of thought. His melodic sketches became more extended than those using chords alone and he was then able to use this method to extend his thought when composing. (Rhythmic exercises would have been another possible avenue to try). The experiment was successful and he subsequently became prolific.

S3 (Female) This student seemed to access musical thought through emotions. The writing of this particular student seemed to be forming itself in a very similar route to that of my own work. Her sketches resembled my own (her writing was fairly neat and organized) and it was inspiring observing her progress in work. I felt my own pathway secure and grounded seeing that it was seemingly one of many 'normal' routes of growth.

S4 (Male) This student used much logic and thought as a sort of skeleton framework from which to draw upon his own musicality and as he extended his compositions, both the intellectual framework from which he used to access any musical composition expanded along with his compositions; both were simultaneously expanding. His sketches usually took shape in a series of number charts that accompanied the first jots of notes on manuscript paper. For him, after the initial sketches, a full scale number diagram was made from which the whole composition followed very swiftly as it usually represented in very direct form, the organisational pattern of the numbers. A final year composition included a piece where the words of a famous author were repeated, dissected and organised into a formal structure alongside which mathematical patterns were translated into music. The sketches for this composition came in the form of a drawing which illustrated the formal shape of the composition. The interplay between mathematics and language in this work and the mind were seen in the sketches in representational form. The sketches represented the external structures of what was forming in the composer's mind and the interplay between maths and language was formidable. This non-emotional approach differs from the use of maths and music in Elisabeth Lutyens' work where utilisation of numerical patterning was wholly intuitive.

Chapter 6 - Model

The following diagram indicates a placement of findings in this study, these findings formed from the codified information of the children's works. By implementing these findings as a working model we see that the composition is a model of the elements sited in the "Framework" given in Chapter 5 .
The act of composition and specifically the process involved in forming the model for this study has led me to realise that psychological inhibiters from within the composers' mind (this in addition to elements of the framework) are also in realisation during the process of a composition. In the appendix I have included a working plan which evolved as a means to deal with some of the psychological issues that may be raised whilst in midst of a composition.



Model - "Maya's Words"
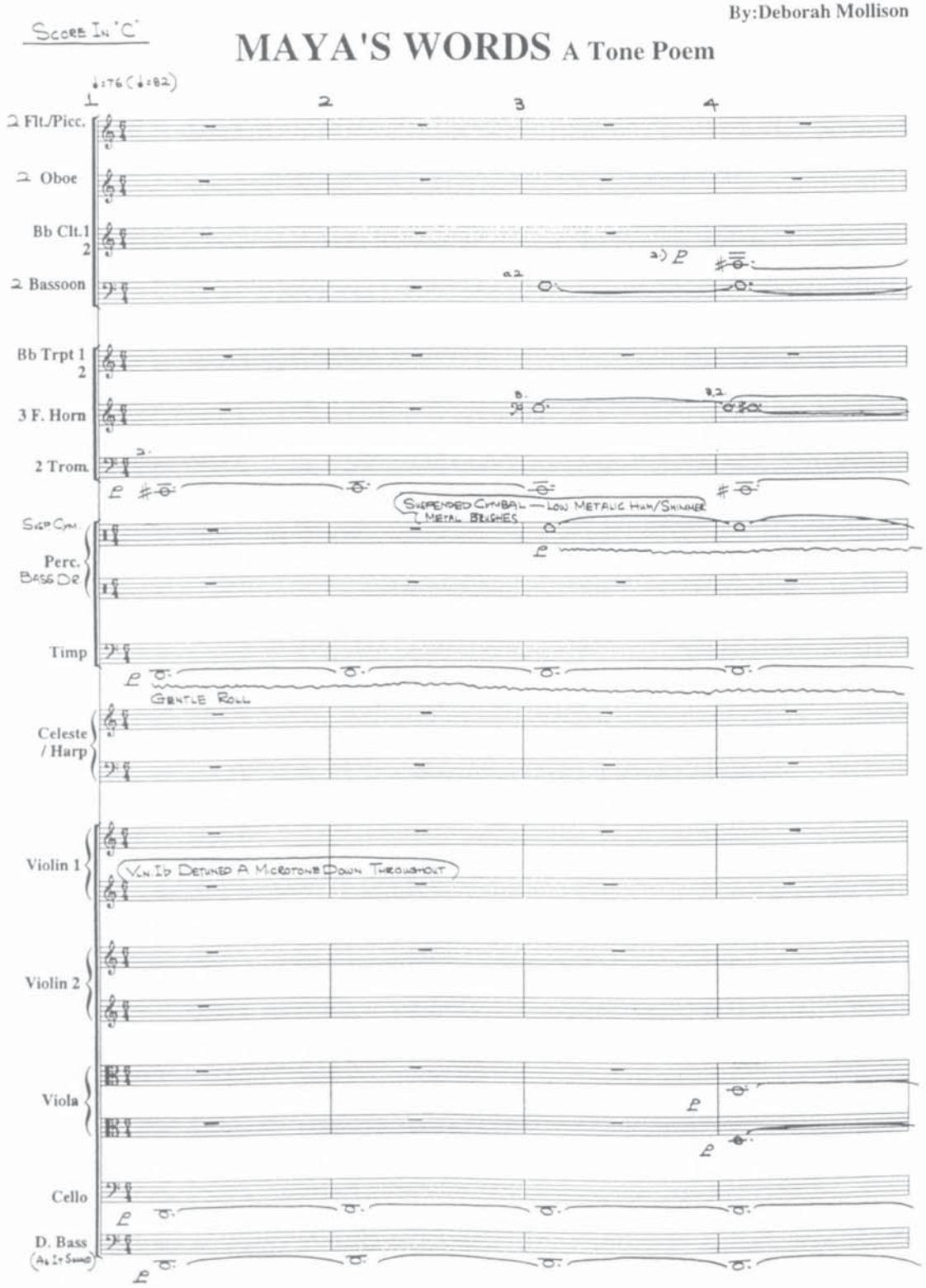
The form of the model is that of a tone-poem which is in an extended Sonata Form. I have admired "The Wanderer" fantasy for pianoforte by Schubert for a long time and have wanted to make a tone-poem that was as extended as this fantasy, but for orchestra. The Schubert composition has a feeling of 'coming home' thematically at expected structural points and this I wanted to include within the tone-poem. (I do feel that the use of key-structure within the model represents the influence of my liking for the enharmonic key changes found in Schubert's work and this shows that I have somehow accessed my own data "Bank".)

At the beginning of this study I was unaware of the outcome of the findings and I felt a structure of some sort would provide a steady base for comparison both in terms of noting new uses of the structure but also in terms of being able to pinpoint new techniques that may be operational. For me, the use of a classical Sonata Form movement was a process I found almost automatic and I felt this was good as I would not have to worry about the structure I was creating but simply turn all attention toward implementing a method of composition using the codified information gleaned from the children's works. The use of this structure which relates to musical tradition in terms of its formal shape, is to be considered as that of a skeleton on which the new materials encoded from the children's composition grew. Children, even at the earliest age, still utilise tools within their experience and in doing this I emulate this pattern of growth and development. It follows, therefore, that the analysis of the model follows the shape of the Sonata Form after which I look at what aspects of the model are evident and how they are working within this structure.

Introduction of "Maya's Words"

The tone poem begins with a sustained semitonal interval on which a layer of sustained sound grows. The purpose of the opening dissonance is to make the listener aware that subtle sound dissonances are to be integrated into the work at a later stage. After the second statement of the sustained cluster a surge of thematic descending material is stated leading to a chord which reverses the order of the semitonal statement. That is notes c# played by the bass trombone whilst the timpani trills d, and the celli and double basses play a low d. See bars 1 - 4 on the following page:-

"Maya's Words", bars 1 - 4



Relationship to study:

The notion of two things contrasting is of interest not only because I have referred to it as the beginning point of perceptual understanding in this study (see Chapter 2, page 19) but because it seems a natural place to begin. I use a minor second to show two notes together in contrast with each other. Here I have utilised contrast in an intervallic sense. In addition, I have added textural contrast as sustained smooth lines of thought seen in the opening theme contrast with the swiftly following emotional outburst seen at bar 13.
With these two sets of contrasts we can also note the contrast of controlled in juxtaposition to uncontrolled and the dissonant alongside the non-dissonant..

> "Neurologically, the two main factors that stimulate arousal are novelty and repetition. Repetition tends to diminish emotional response so that even a slight novelty immediately produces a marked heightening of arousal....this interplay between novelty and altered repetition is the major means of achieving limbic (i.e. in brain) arousal . It is also an apt image to describe fundamental musical strategies." [1]

Because of the influence of the children's work I have found that the use of timbre is one that now invades my consciousness. My starting point; use of this minor second, low in register where our hearing is less precise, the beating of the tuned notes because of the pitch, in a wider field of circumference and using a timpani trill so I blur the definition of sound.
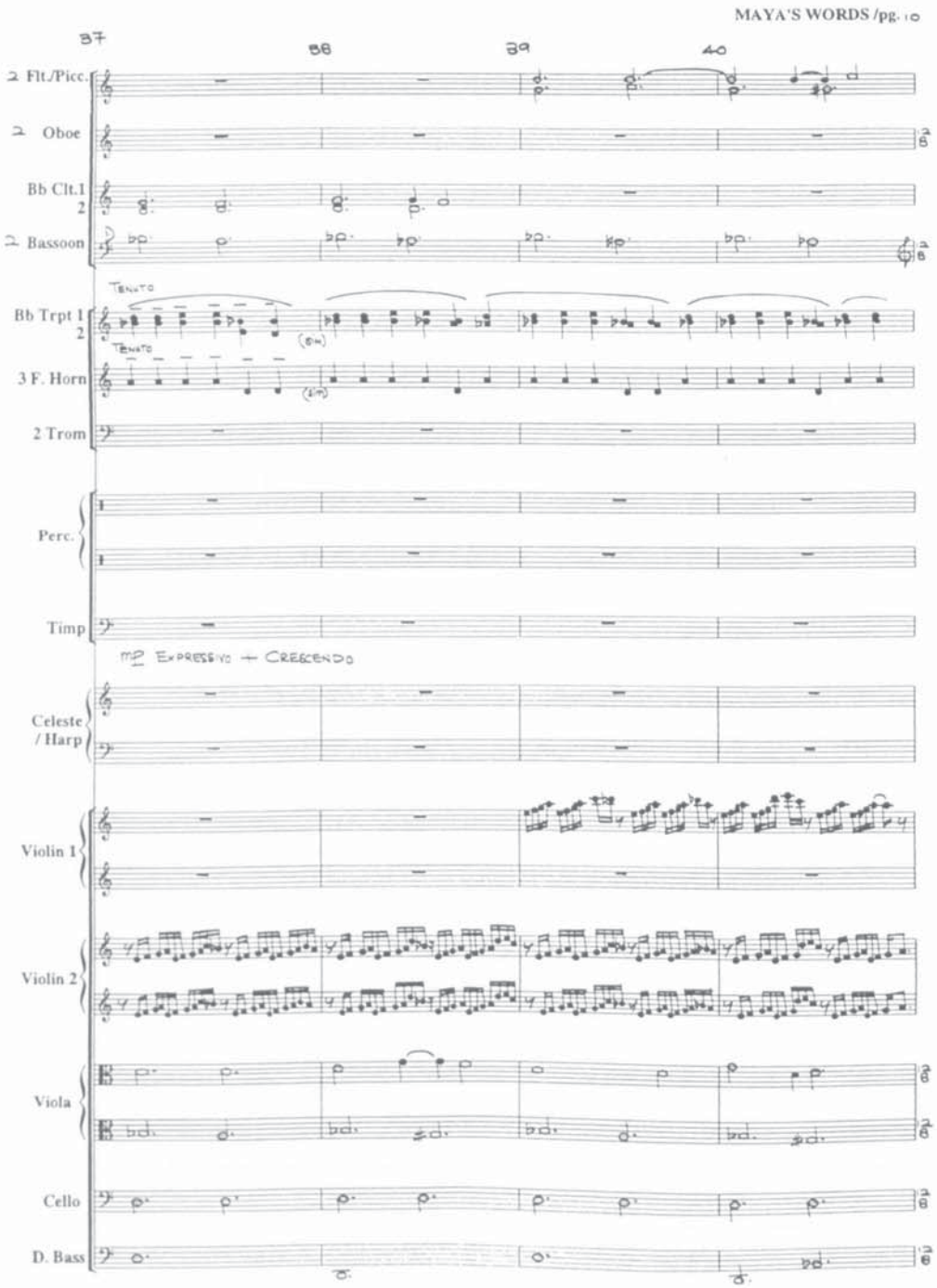
> "Trills are clear - cut and distinct if not too rapid, but become confused if the rapidity is too great; the admissible rapidity being greater in the treble than in the bass;" [2]

My intention here is to use wider bandwidths of sound, hence my use of the first violins partially detuned for the entry of the first subject. I have noticed that in the children's works the blurring of the bandwidths of sound, caused by whatever reasons (e.g. use of instruments not in tune, use of instruments in non-specific way) does not inhibit the overall structure and flow of a composition and is in many cases an integral part of it. If we look at children's composition number 43, composed by Year 2 pupils, we can see that: two contrasting ideas are stated as a combination sound (on bells and wood block) and then castanets are set in conversation throughout the duration of the composition. The composition also begins with a glissando figure on the bells and wood block which together create an interesting timbral effect.

[1] Robertson - The Great Divide, page 1
[2] Woods - The Physics of Music, page 87

First Subject.

The floating, veiled theme of the first subject (in bar 21) haunted me for months until I wrote it down. It was always my intention to use the detuned note as in my compositions I am keen to exploit dissonance in a natural and expanding growth. This notion of natural expansion I attribute directly to observing the natural integration of elements into a composition by children. At bar 37 a restless bridge section ensues. (See below bars 37-39)



The music here questioning and answering itself as if it is some part of my mind referring to itself. (See reference to Lutyens Chapter 1 page 4) This is a technique that I have used for years and that the children could be seen to use frequently in their compositions. In the cello and bass at bar 41 I use a different time frame. The use of alternate time frames is something that has evolved naturally in my work following the children's example. When I had heard use of such techniques in avant-garde compositions at music college I had always wondered in what particular mental placement would a composer have to be to 'feel' this technique and to use it not in a designed way, but in a way that felt natural. Because of my observations in the children's compositions I had noted that it is just a process that eventually merges into the fabric of the composition. By realising this it seemed that it would not be so hard to achieve if developed over a period of time relevant to the individual. I use this technique rhythmically, whilst harmonically I am united and as one all the way through the passage.

Relating to study.

For me the use of the detuned violin represents a broadened bandwidth of perceptual thought which has grown in my work alongside this study over a period of time. Perhaps the 'place' in my mind, as it were, has expanded to make this a natural and everyday feeling and this has occurred through practice thus it relates through my belief that ideas can grow.

The contrast of the first subject and the bridge is a microcosm of the introduction (again a natural expansion of thought) where use of contrast of ideas is again seen (the first subject is sustained and the bridge more questioning.) The initiation of using adjacent time frames was a natural process and it is interesting that for me as it happens only from a rhythmic perspective and not a harmonic one.

It was not until my analysis of the children's works that I understood the meaning or relevance of adjacent time frames even though I had encountered some similar procedures in the late piano works of Elisabeth Lutyens, for example, Plenum. (See example Chapter 5, page 71) In children's composition number 4, the drum exhibits a different time frame to other instruments in the composition. At this age it is doubtless if it could be a problem with the pupil's motor-coordination (knowing the pupil I can say it was not) but certainly an adjacent mind set could be felt against the running of the composition as a

whole. It seemed a natural event (and not an uncommon one) in the children's works and for me now too. (See Chapter 5, page 72)

Finally, the Bb used in the opening and in the first subject is a core note and one which inspires my emotion for this composition. I have identified in the works of Lutyens and in the children's compositions where these core notes take effect. (See "The Perceptibility of the Compositional Procedures of Elisabeth Lutyens", page 152, where Lutyens puts circles around certain notes in her sketches which show that they are of importance. [3]) As I was embarking upon the model I felt the pull of this Bb harmonically and immediately decided to utilise it. Fortunately this worked as a natural progression for me and did not feel formulated in any way. (However even if formulated it would have suited the purpose of this model.)

Second subject.
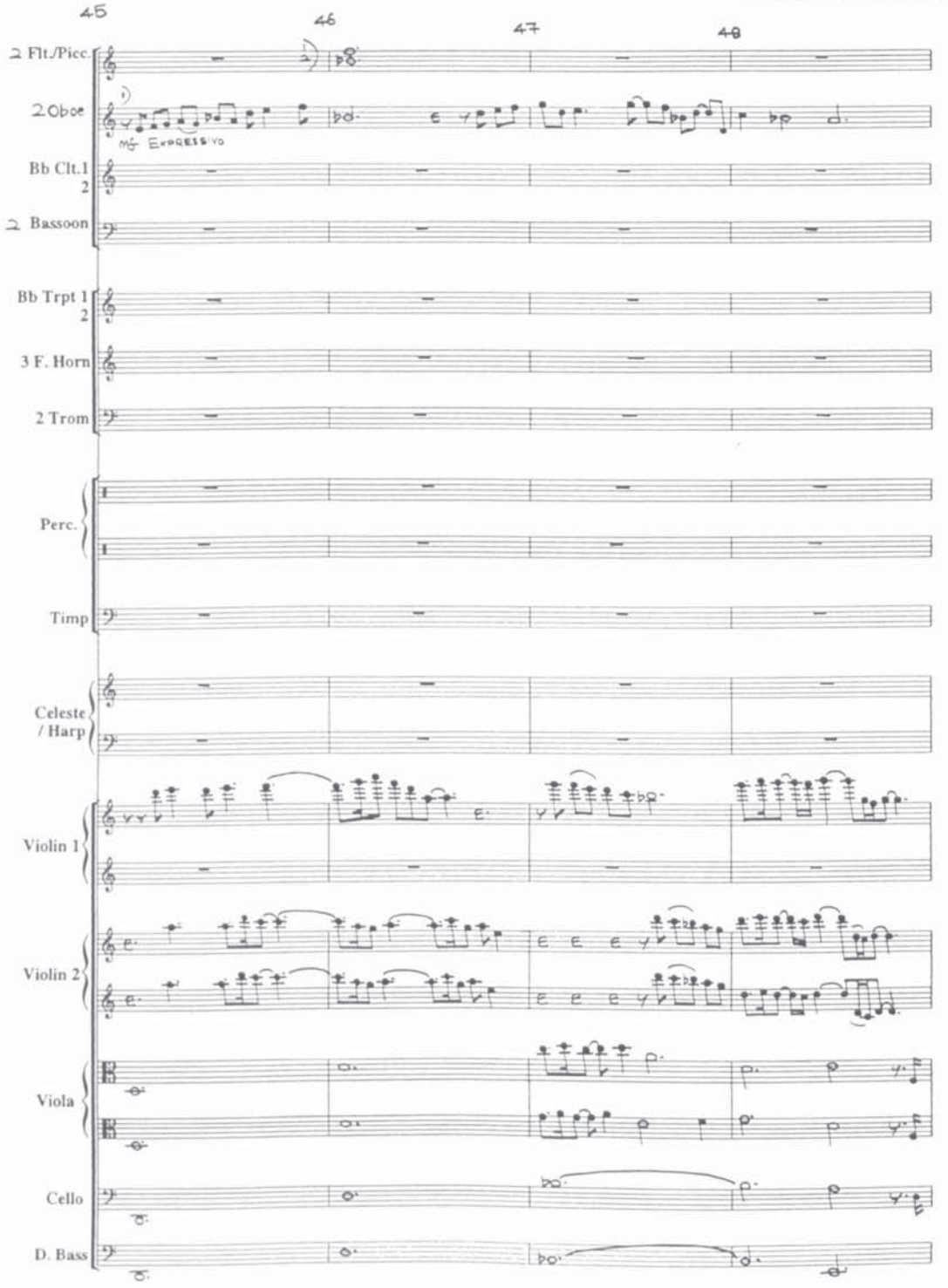
The questioning nature of the bridge is by way of introducing a more grounded questioning phrase posed by the oboe in the second subject; which is duly taken up by the strings.

The lower strings at bar 45 almost have the guise of the opening theme but quickly dispel into a more interactive harmonic play. Violins dilate into linear thematic fragmentation some of which (violin 2 bar 48) shows traces of the adjacent time frames from the previous sections. As the strings take up the theme all sections disperse into their own lines and with brief implications of modulatory material (which are relevant - the use of the key of F minor in violin 1 in bar 55 and Bb minor in the oboe is of import later) we are then brought back to D minor at bar 58 to a few bars that would ideally end the section but here we are launched into a huge chasm of emotional material which could be described as the "b" section for the second subject.
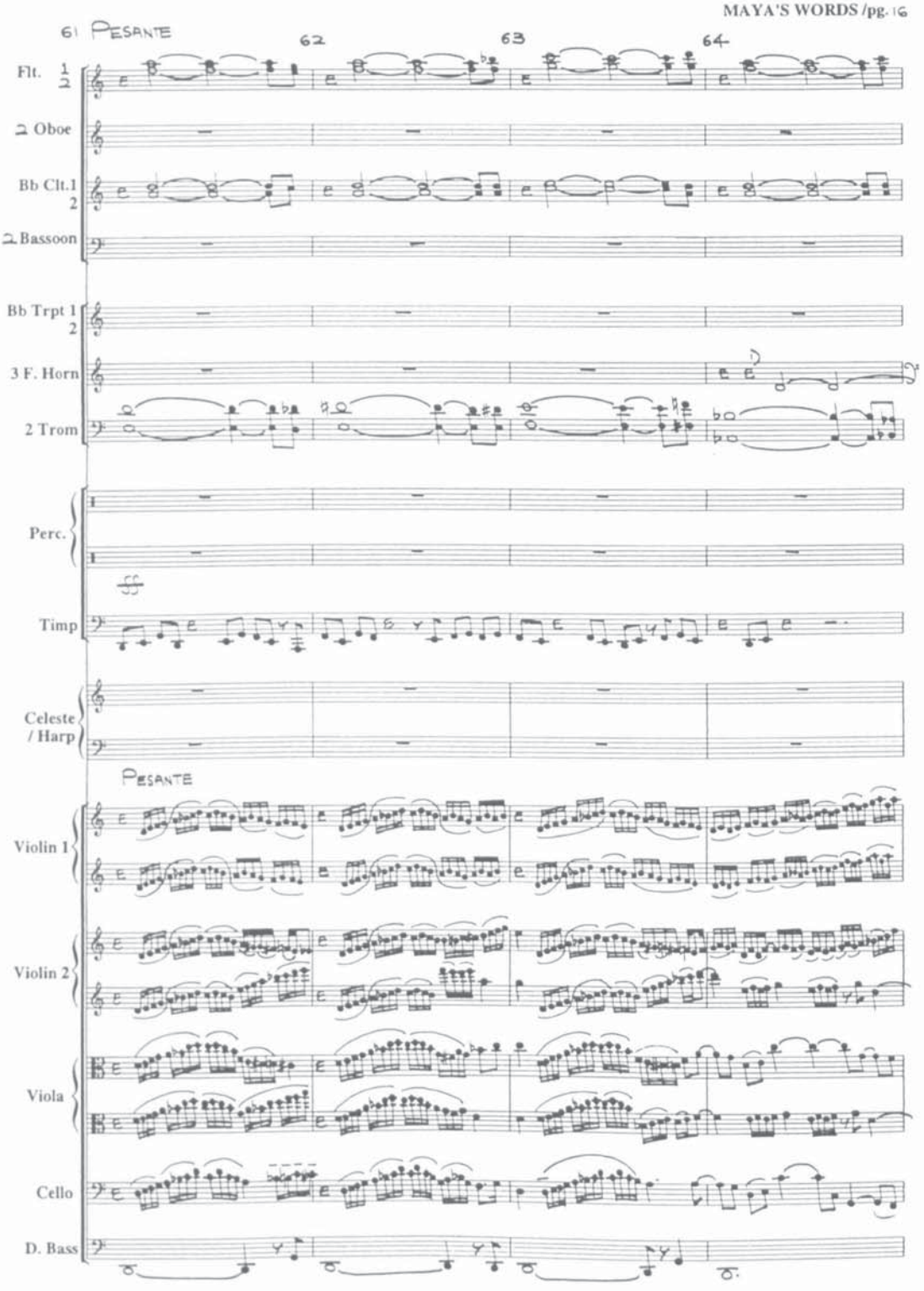
On the following page we see bars 45 - 48, the beginning of the second subject. And on the page after bars 61 - 64 where the 'b' section begins.

[3] Price - The Perceptibility of the Compositional Procedures of Elisabeth Lutyens

"Maya's Words", bars 45 - 48



"Maya's Words", bars 61 - 64



Second subject "b" section

As if the bondage of scales, harmony and tonality are inescapable the repeated semiquaver passages flail against the theme in the woodwinds. The scalic passages fragment but are then restated by the woodwinds. The emotional tide is high; at bar 65 the basses and celli have a reference to the main theme. At bar 75 we see adjacent harmonic usage with an attempt to integrate an adjacent time frame in the strings and an attempt to break free of the forces of harmony in the woodwinds, all comes to fruition at bar 77 where a climax peaks and from here all thought breaks down into a change of mood at bar 84.

Related to study:

The use of scalic passages is seen in children's compositions where there is a level of (motor) competence and in music the use of such passages is a normal practice. The order of one note following another in step, seems logical and both practical. The children recognised scalic patterns as they played as something normal, of order. We sometimes integrate what we know just because we know it or recognise it. Where children discovered triads for themselves, a knowing was felt amongst all of the children and then others copied or asked directly how this sound was achieved. The formation of a triad struck a memory in the children and they recognised it. (See Chapter 4, page 39)

The duality of use of scalic passages at this point in "Maya's Words" indicates a desire to try and escape from the scales and implying harmonies but in concurrence an espousal of harmony and celebration of language is also felt. The use of semiquavers for me houses both these emotional sets. These woodwind passages (bar 61) show contrast. What is of interest for the study is that one idea contains two contrasting emotional strands for the composer and can thus be used as a vehicle to show this. Almost like a word that means two things. Music can so easily imply one sentiment, emotion or thought to the listener albeit that the listener takes their own starting point of perception and uses this as a structure to understand. But how often is music saying many things in one line, one progression. It was clear from observation of the children when composing that, as a tutor, one did not always know what music meant for the child and so every session concluded with the children talking through the meaning of their work from which a greater understanding was gained.

These scalic passages in the model also have a Russian flavour and it is intriguing that in other compositions I have subsequently noticed that this nuance has occurred. When thinking about my study I relate this specifically to accessing my own data "Bank". Many of the first orchestral pieces that my parents took me to were by Russian composers and I loved the orchestrations of Tchaikovsky and Rachmaninov for some years as a child. Please note the children's composition entitled "Close Encounters" (composition number 22) where a child used the musical theme taken from the movie as part of the composition.

Codetta

In Db major the codetta forms a logical and considered end to the exposition- the detuned violin yearns for a more in depth answer to whatever issues were raised in the exposition. (This codetta leads directly into the development section at bar 90) The C# from the opening bars of the piece are now seen as Db. There is a serene feel about this small section as if calm before the storm. It is interesting that all elements are aligned and together with the exception of one solo line. Example of beginning of the Codetta found on next page, 88.

Relation to study.
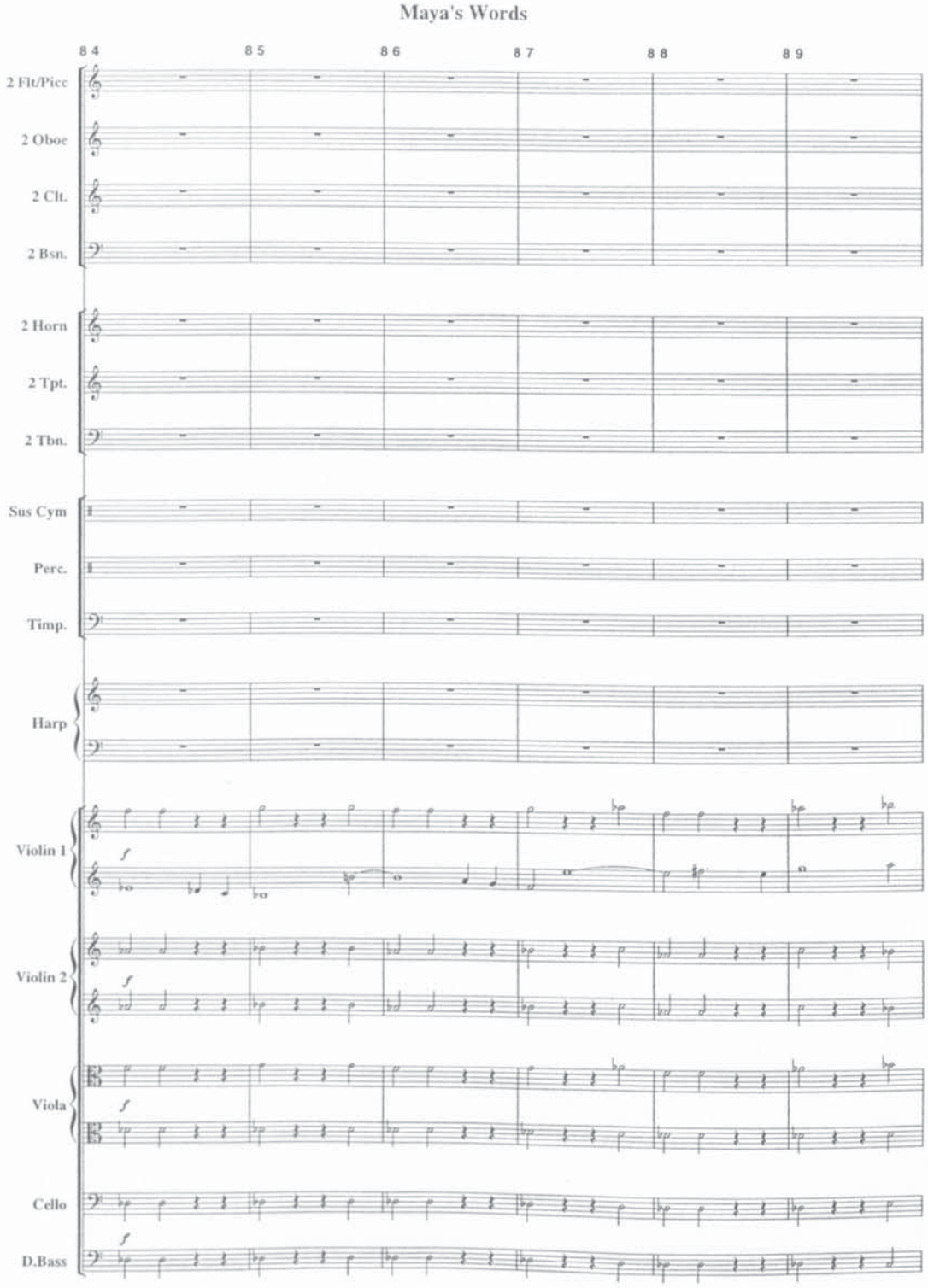
This codetta is almost akin to a 'safe place' - one where I feel settled and at ease and from where I sense ideas are about to grow. Also the repetition of the two beat crotchet rests in this section are as important as the notes; the repetition of silence here is felt almost like a heartbeat.

> " Logan argued that if the sound of the heartbeat is imprinted on the fetus, the fetus will pay special attention to it, in a way that i t would not to words or music." [4]
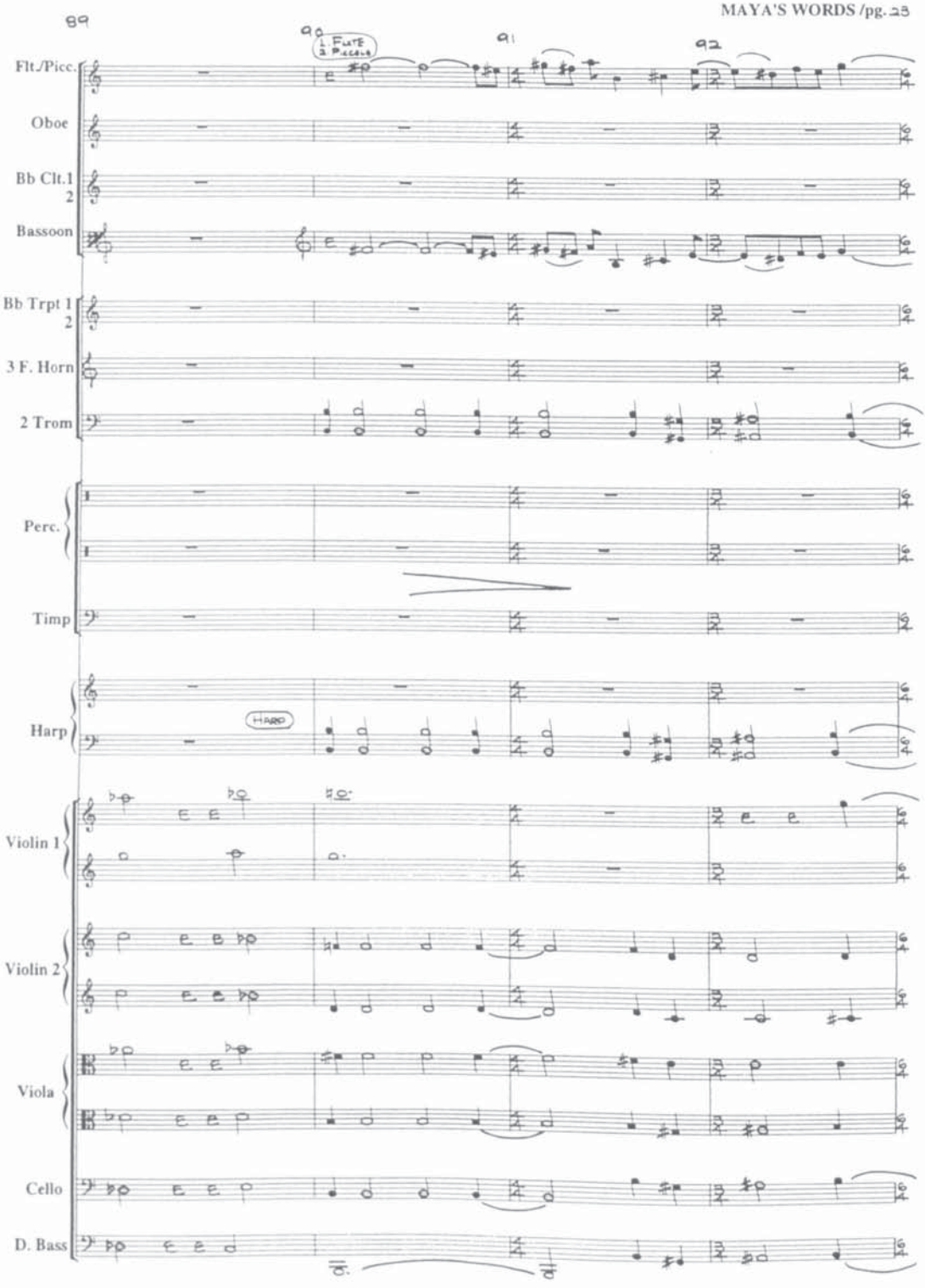
The singularity of the solo line has a linear shape and mental feel that escapes the regularity of the surrounding chords and this too I feel represents a mental thought that is wishing to lead forward. In children's composition number 31, we have a clear solo line that leads forward as if searching. It is almost an audible representation of the visual diagram (see Chapter 5, page 45) where we see musical pathways, neurons, at work in our minds. In this composition a simple, uncomplicated beginning leads to a gentle rambling of thought. It has a freedom of form.

[4] Chambers - Brave New Babies-learning before birth

Codetta begins at bar 84



Development beginning at bar 90.



Development
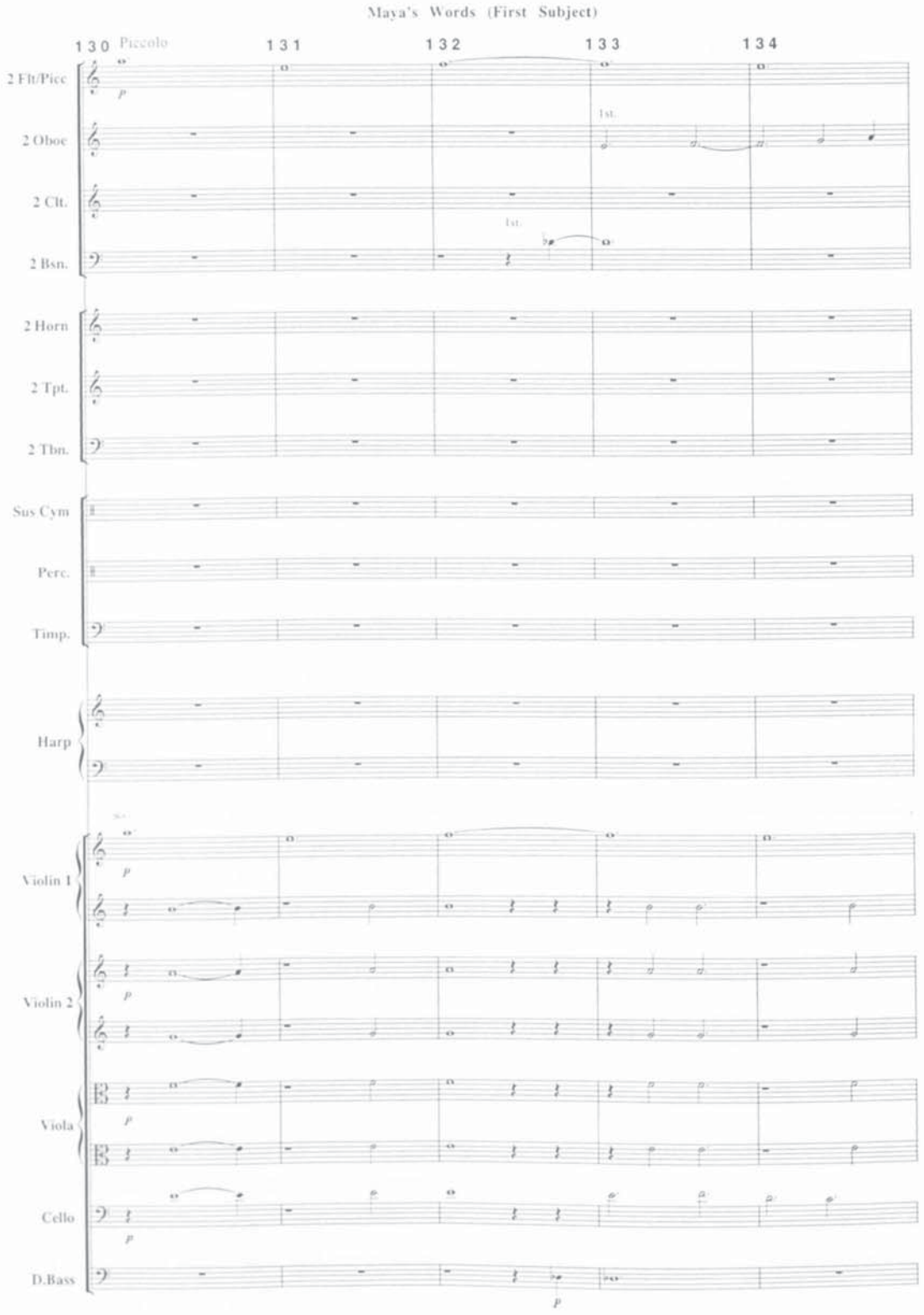
Beginning in B minor, significant as this is a semitone away from Bb. At bar 97 the theme now beginning on b (not F# as in bar 90) is restated with a more restless quaver figure accompanying in the strings. The use of the diminished 5th is as a dissonant interval provoking unease. The string accompaniment becomes even more agitated at bar 108 after the second statement of this theme is complete. Again this theme is heard at bar 113 this time in the strings in a more assertive guise and it is extended until, at bar 121, we hear an answering phrase that attempts to resolve the agitation but leads instead to a numb passage at bar 128.

In bar 130, the first subject is stated in a state of stasis (see reference to the children's work in Chapter 4 page 33.) accompanied by subdued clusters. (See example on following page of bars 130-134) At bar 138 a lonely mention of the development theme on the trumpet leads the music into a an extended section where fragments of the development theme are used against a more conciliatory harmonic accompaniment.

In bar 154 a new theme is heard on the woodwind in the key of Db major. Whilst new, it is an amalgam of other parts of the composition and it is accompanied by melodic fragments in the strings that disenfranchise themselves from its value.

All drifts into nothing until at bar 165 we have a triplet figure in the strings, then it is the woodwind that offer a positive direction, accompanied by a more striving theme in the viola and celli. This figure is then restated at bar 175 and before we are aware of the transition we hear the first subject at bar 179 in the strings. (Ascending in the double bass and inverted in the upper strings.) Like a dream within a dream (Shakespeare's "A Midsummer Night's Dream" comes to mind) the triplet figure melts into the recapitulation.

Bars 130-134: First subject in 'suspended animation'



Relating to study.

My line of thought, the "Growth Line", clearly developed as the model progressed. Fragments of the main theme are utilised in various means and the first subject returns to relay some meaning into the arena of composition. However it is not unlike a maze, which I believe represents my mind in a working progression. (See children's composition number 31) It is not so complex as to be unrecognisable to the analytical mind and I hope for the listener it will hold the emotional integrity to capture their emotions in a way that music should. It is the progression of my thought and I was happy to see it recreate itself in such a way as to illustrate the working progress of the model.

Again the Russian influence is felt with the theme at bar 154 and this directly relates to what I have referred to a drawing upon my data "Bank" as a means for progression. I am not convinced that this Russian influence would prevail in a shorter more concise composition and I feel that the expanded nature of "Maya's Words" has led me to draw upon reserves of emotion hidden, if you like even within the realms of what psychologists may call the "inner child" as a means to expand my conscious musical thought.

One of my 'safest' "Safe Places" is with the orchestra. I first heard the orchestra in my head as a child and began to write for it. For me now it is a position of security to compose for orchestra and thematically, rhythmically and in every other way the challenge of composition exists for me but not with the notion of having to find skills to orchestrate.

I have to acknowledge that the heaving emotionality that I felt reading the poetry of Maya Angelou has played a part in the swings of emotion felt in the development section of the model. The effect of language has provoked my own emotions to a heightened level. Thus I see the impact of 'external language' which activates emotion into activity and subsequently into inspiration and musical composition.

Recapitulation Bar 179

This begins in Db major and is stated on upper first violins together (i.e. the tuned first violins now play with the detuned first violins.) This is significant as the opening of the piece in D minor challenges the band width of the tonality of D and here we are in Db extending the same notion.

Relating to study.

I choose to have a recapitulation to this poem that is extended and developed in some way. I directly relate this to accessing my data "Bank' and was thinking specifically of one year where I studied the extended recapitulations of Haydn's Symphonies.

I have no instincts that lead me to complete the analysis of the composition past this point. I know some composers never analyse their work for whatever reasons and I feel that the premise for my analysis has been adequately covered to this point. I am not keen to know the precise mathematical procedures by which I have composed and completed the rest of my composition. I never plan the formal structure prior to the composition although the notion of Sonata Form and symphonic form was in my mind whilst writing in a subliminal way. (Call this acculturation if you will.) There are appropriate accuracies of structure gleaning through to the end and the composition seems to have upheld the relevant formal context.

The Model: "Maya's Words"

Working on "Maya's Words" as a model for this study has proven to be an illuminating and rewarding experience. I now feel I understand why I compose in the way that I do and also feel more confident in the continual journey ahead. It is paradoxical that for me, knowledge about my process has given me greater confidence as when young children compose they have very little of what we might consider to be 'knowledge' in the musicological sense, and yet (on the whole) they seem to make progress in a most confident way once past initial stages. In practise, I hope composers may utilise any aspect of the study and apply it to their own understanding of composition. As illustrated, the model holds within it information gathered in my study. It contains many of the components mentioned in Chapter 3 which I use as musical tools. It represents my own personal "Circuit of Activity" (Chapter 4) in a broad sense and probably many circuits of activity if looking at multi-faceted usage of areas identified within the "Framework" in Chapter 5.

As an unexpected consequence of working on my model, "Maya's Words", in conjunction to my study, I found that the working objective and overview of the study has given me an insight into my own psychological patterns in relation to the working on and completion of a composition. As previously mentioned, I was inspired by composer Elisabeth Lutyens' determination as a composer. The resolution that I made within myself years ago to compose because that is what I do, has been strengthened by techniques that I have learnt in my study not only from the musically applicable material but from my own observation about

the relationship of composition to my psychological being.

In the appendix of this study I have included some ideas concerning psychological matters that have arisen for me during the course of this study where I aim to identify some of the psychological factors I have encountered whilst working on "Maya's Words". This"Working Plan" may help the composer in the continuance of development of their own "Circuit of Activity."

Chapter 7 - Conclusion

The intention of this study was to understand more fully the process of creating musical composition. As a means to do this I created a compositional model, "Maya's Words", a conscious experiment which utilised the techniques I discovered and codified from the children's compositions. By utilising the model as a working tool and the information extracted from the children's works I was able to draw together my own theories and observations concerning the process of musical composition and how it works.

The 'line' of music that I wanted to investigate and had heard in my head as a child whilst looking at objects now represents to me one of many potential lines of occurrence that happen as we compose. If we look at the "Framework" in Chapter 5 we can see how these could begin to occur. These lines may be constructed of melodic, textural, timbral components, any progression that leads from one to another could constitute as a line of thought. They may be heard in our minds perhaps to be notated or exhibited through musical performance. They most probably never exist in isolation and where there is one clear line 'heard', such as a melody, there will be others activated in differing parts of our brains some of which may never be physically heard. I refer here to the fact that during the process of constructing the model, "Maya's Words", music often appeared in my mind as if from nowhere, some of which I knew I would never be able to write down, in musical terms, as it was not something I could write, it would always remain in my mind. In these places within the piece I felt that I would be listening on one level but filling in missing pieces, emotions, call it what you will, as the composition progressed, on another. Whether this is the same for the listener who is not the composer I cannot say.

As I decided upon my methodology concerning the cognitive approach I was to take in this study which is entitled "Sequence of Learning", I felt confident from the outset that the observational data I remembered from working with the children had guided me into appropriate decisions in this area. I believed the children created their own language and that this developed over a period of time. I believed that the children were able to evaluate their work and thus were able to make progress, citing some sort of internal judition with regard to their work.

I felt that composition would enable the children to understand the language of music more fully on a wider stylistic basis. All of these projections are clarified in the analysis of the children's works seen in Chapter 4. Adapting the meta-component theory (see Chapter 2, page 20) and applying this to musical analysis of the children's works helped provide the basic elements needed to analyse their music and codify data from it.

The breakdown of musical techniques into 25 components has for me provided a method: whereby a composer or tutor can identify a musical technique, original or customised, and describe it without necessarily needing to relate it to any pre-existing theoretical notions of music already acquired. The technique can be verbally identified and catalogued and thus exists as a tool.

The way in which the children used these components in a flexible and original manner illustrated a mental state that seemed to be able to grasp ideas from anywhere, without reference, for example, to tradition or style. This dexterity brought to my attention the notion that the children were using fragments of ideas / music / sound and integrating them into their own compositions. This observation in turn led to my decision to breakdown musical techniques into components.

> "...different sensory modalities may be 'stored' in the brain in different ways. Experimental evidence is in keeping with this supposition; thus, people's ability to remember visual material is not affected by the intrusion of irrelevant auditory items, whereas there is interference from irrelevant visual stimuli. However, it has also been found that, in some circumstances, information received through one sensory modality is stored in another. Thus, words, even when presented visually, tend to be processed as if they had been heard. Also, it is clear that, from quite an early age, children are able to transfer from one sensory modality to another".[1]

When composing the model" Maya's Words" I felt a freedom in my approach to my own compositional writing that I had not felt prior to this study. That freedom was created by the knowledge that the children composed as they felt and made progression. In the past I have composed and have been often unable to proceed freely feeling weighted down by self-criticism and doubt. As I compose now I evaluate my work and delete sections that I am not happy with because I am not satisfied and not because I feel they might not fit a required standard. This may be a psychological hurdle for me alone (I very much doubt it) but nevertheless it was one where I can pinpoint that the tools I learnt to use to deal with it came from the children's methodology. If I broke this down

[1] Rutter and Rutter - Developing Minds, page 198

into a musical form I could say that as I dissected the children's compositions into components realising whilst watching and listening to the children compose and later, whilst analysing their work, that order and motive are over-ridden by intention. The approach and use of anything that felt good to the individual became an important factor and then this in turn has led me to incorporate any elements I fancied into my model in a fashion illustrated to me by the children. I can confirm that I mentally dissected some of my known musical techniques into component elements and then just sensed where to put them, however and wherever I liked.

I find myself thinking of Legoland. I have watched children play with these pieces and construct beings and units that they play with for hours. I have also watched children construct cars, helicopters and trucks with these pieces because children have seen these things. I have observed adults showing children how to put these pieces together and then seen children mimicking these constructions. If anything, my list of musical components, I think, breaks musical composition down into smaller fragments which have the ability to work in any way. This mental flexibility I do not believe had ever occurred to me with reference to my own approach to musical composition, at least not in an overt, external way, perhaps only in subliminal passage as music works out a path for itself in our mind.

In the compositional model for this study I chose to compose in a way that utilised information from this study in many manifestations but it also had to be an organic growth as a means to be real and for me to have a true input into it as a composer. It also had to incorporate many of the study elements into it otherwise it would not be a conscious experiment. The two forces here, for me, have worked in tandem as the flexibility of approach used by the children has allowed me to work in a flexible way in this compositional model and yet the uncomplicated way in which the children evaluated their own progressions has rubbed off on me too and allowed me to do this without damage to my own feelings about my composition. In this model I feel as if I was allowed to play.

Using data codified by the use of components I have created a method which I have called "sonic pathway", whereby observational and / or creative data concerning children composing may be catalogued.

This method of cataloguing data may be used as a technique for musical analysis. The application and percentage of use of specific sound / musical components illustrates the patterns of use and thus gives a map of usage. This map may then be used in conjunction with other data as a means to compile a broader understanding. In many ways this sonic pathway analysis can be done without the facility of hearing a live performance. It can precede conventional musical analysis and be used as a tool, as I have done within this study, to enhance the more conventional approach of analysing compositional work giving firm, specific data to draw upon at any moment It was by using the information gathered by this method that I was able to construct another theory concerning the stages of acquisition of musical composition as a language. This I have called a "Circuit of Activity."

A "Circuit of Activity" is a route whereby our minds take journeys in musical composition and create pathways for themselves. These pathways form patterns. These patterns show where development of thought and in alignment certain physical abilities (related to musical performance) have completed a cycle of growth. A "Circuit of Activity"' is a chart that tracks this level of progression. (See Chapter 4, page 44) In this instance I apply this term only to musical composition. It was not possible for me to evaluate my own level of progression whilst composing my model as I had not yet discovered a method to do so. Had I done so, it could have proved frustrating to know that I was most probably in the middle of a "Circuit of Activity" that was self-created by an academic study. This "Circuit of Activity" could be a useful tool in measuring compositional growth. For me, finding this technique has explained why at some stages my compositional output seems to work in certain ways and now I am able to recognise if I am in midst of a cycle of development or if I am nearing the end of a plateau. It is like taking a basal temperature chart for a menstrual cycle and knowing where you are at any given time of the month. Whilst the temperatures themselves are not conclusive one by one, the amalgen of temperatures over the month gives a picture of how the body is working given the expected norm.

Construction of the "Framework" (see Chapter 5, page 46) began prior to the aforementioned codified procedures. From the start of this study I had a sense that I wanted to construct a blue-print , a model. The form referred to on page 46 is a visual representation but "Maya's Words" is the musical model that houses mostly all of what is illustrated on that page.

It did feel strange composing whilst recognising aspects of what was being produced as part of a component, or part of something that probably related to some other technical detail. As I discovered findings within the children's works I would be enthusiastic to find out more and then the transition to incorporate this into my own composition seemed natural. I refer to specific illustrations within the analysis of "Maya's Words" (see Chapter 6) but what I do not refer to is the strange feeling promoted by seeing the visual representation of the framework. As mentioned above where I felt that not all of my ideas were written in "Maya's Words" and that some are still within my mind and play out each time I look over the score, so it is with this model. The external representation of so much of the construction of the model somehow displaces my mind to another capacity when I look over it much in the same way that changing the direction of the tree (see chapter 1, page 9) did. I do believe that not every "Framework" will look the same as this one and that "Frameworks" may change and grow given the flow and changes of "Circuits of Activity." Any model once finished is old and whilst the structure and format of my "Framework" holds the key to how I believe composition can operate in our minds, I also think the construction of the "Framework" will differ from individual to individual. My model, being constructed from the codified information taken from the children's compositions is still, when one considers it, although hybrid, part of me. I am using the tools and illustrating methods rather like a patient who has had knee surgery. (*"The new part works, look how I am using it".)* This said however the intricate aspects of my model such as: "Safe Place": "Growth Line": "Bank": "Acculturation": "Repetition": "External Language": "Tone Colour": "Timbre": "Metre": "Sketches": (See Chapter 5) are I believe equivalent to, using the same analogy, the muscles around the knee, those which hold it together and so these intricate aspects are I believe are universal and applicable to any other individual as they compose. Again the "Framework" could be used as a tool to analyse compositional development.

My search to understand more fully the process of composition has reached the end of its own "Circuit of Activity. " As a composer I feel I have gained a deeper understanding about the process of composition and having the practical means to expand this by means of a model has transported my comprehension beyond that of theory.

Chapter 8 - Further Ideas

Whilst peripheral to the body of the study, I hope that this comparative overview may inspire further ideas. As a means of drawing some further reaching conclusions from the study as a whole, I would like to refer to information that is now being discovered within the world of scientific data. In comparing this information with my own deductions gleaned through the creation of my model certain information may support theories drawn in the study. I hope too that further refinement of what I consider to be different aspects of my analysis of the music referred to within this study will enable scientific researchers to be even more specific in their subsequent research in relation to music and the brain.

> "In a series of new studies made public on Sunday, researchers found that the brain: Responds directly to harmony. Using a medical PET scanner to monitor changes in neural activity, neuroscientists at McGill discovered that different parts of the brain involved in emotion are activated depending on whether the music is pleasant or dissonant Everyone knows music can produce powerful emotional effects. This suggests different emotions are represented in different parts of the brain.".[1]

I would here infer that the work undertaken with children aged 4 - 11 years may illustrate the development of what I believe could be neural pathways of the brain. The stages of growth could only be drawn by me from musical terms. As shown, the importance of experimenting with timbre was vital . This indicated that the children were activating differing portions of their brain, as some of the work with timbre could easily (and was) referred to as discordant. (In several instances teachers entered the room and asked why there was so much discordant sound (i.e. noise) and I explained that it was a creative process and in fact musical composition). This also suggests too that there is every potential for our minds to encompass what is termed as dissonant music, given a less conditioned and tonally based instructions as presently given at an early age. (See chapter 1 page 12) Perhaps through exploration of 'sound' (see definition of music / sound in Chapter 2) axons of the brain begin activation. Accessing these axons in such a way we may allow music to stimulate different parts of the brain and the growth of these sites may be enhanced by the growth of musical thought. The complexity of this thought, in compositional terms, being expounded within this study (see Chapter 5 entitled "Framework"). With regard to how this happens, one explanation could be that our emotions are affecting us.

[1] Hotz. - Study suggests music may someday help repair brain, L.A. Times, November 9th 1998, page A21.

"The brain seems to be a sponge for music and, like a sponge in water, is changed by it. The brain's left and right hemispheres are connected by a big trunk line called the corpus callosum. When they compared the corpus callosum in 30 nonmusicians with the corpus callosum in 30 professional string and piano players, researchers led by Dr Gottfried Schlaug of Beth Israel Deaconess Medical Centre in Boston found striking differences. The front part of this thick cable of neurons is larger in musicians, especially if they began their training before the age of 7. The front of the corpus callosum connects the two sides of the prefrontal cortex, the site of planning and foresight. It also connects the two sides of the premotor cortex where actions are mapped out before they're executed. "These connections are critical for coordinating fast, bi-manual movements" such as those a pianist's hands execute in an allegro movement, says Schlaug. The neural highway connecting the right and left brain may explain something else, too. The right brain is linked to emotion, the left to cognition. The greatest musicians, of course, are not only masters of technique but also adept at fusing their playing with emotion. Perhaps this is why." [2]

Within this study, I have related that some composers draw upon their emotions as a means to activate stimulation for composition. In addition, I have mentioned the profound effect sound (in any manifestation) may have on children. (See pages 31, 33 & 69) However, I have not investigated the emotive, ongoing part that could be played by our emotions, whilst composing, as a 'live' progression. For example: I play a few chords on the piano; they ignite my emotions into action (including for example, "Bank" ignition). Certain emotions activate my brain and it becomes an ongoing stream / flow of thoughts I begin to improvise; perhaps this will continue until it is broken.

This space, be it in improvisation or just thought suspended in emotion, is reminiscent of the example given early in the study of a child whose thoughts and actions look as if they are in suspended animation (see Chapter 4 page 33). However in the case of improvisation I think the suspended state has thought progressions within it: and therefore it is more a suspended "feel" or emotional state. I have not specifically dealt with emotion and its affects on musical composition but I believe it is a process that could possibly formulate itself within its own "Circuit of Activity"

[2] Begley - Music On The Mind, Newsweek, July 24th 2000, pages 51 & 52.

In my "Framework" I have drawn upon the areas of timbre, rhythm, melody as these for me; are the core musical elements, comprising of many components, from which children draw from as they compose (in addition to other non-musical influences.) I would suggest harmony follows. Studies also reveal that:-

> "We find that harmony, melody and rhythm had distinct patterns of brain activity. They involved both the right and left sides of the brain,...melody affects both sides of the brain equally. Harmony and rhythm seem to activate the left side of the brain more strongly than the right side." [3]

For me the relevance of harmony would be only as indication that a level of understanding of a harmonic language was there and possibly this portion of the brain may indicate a part where comprehension or development has taken place. It would be of interest to note not only in small children, if these same centres are activated, or not, with reference to harmony and in addition in which parts of the brain would experimentation with timbre show up. (Perhaps this could even relate in some way to language comprehension.)

I have wondered if melody may be instantly more recognisable given our patterns of acculturation, and thus affect both sides of the brain because of this. Memory or our data "Bank" could be referenced during recognition of melody. I wonder if what I call the "Growth Line" of thought, be it melodic (or rhythmic, say for example, as in Ravel's Bolero) may also cause affect to both sides of our brain within the growth patterns of compositional development especially given its importance for the growth of ideas and thus "Circuits of Activity."

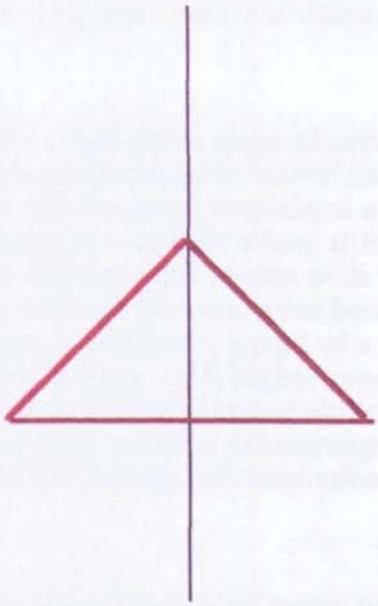
Another relevant matter would be as follows: - does a melody register in both sides of the brain equally because the brain has the ability instantly to translate the sound it hears into the mathematical division of the frequency of that note, or accumulation of notes and thus this registers on the right hand side of the brain as a matter of number patterns.

[3] Hotz. - Study suggests music may someday help repair brain, L.A. Times, November 9th 1998, page A21.

Left Side
Logical response to frequencies

Right Side
Emotional response to notes

melody



A mathematical division of shapes can be shown on a squid scan:-

> "When the NYU scientists aimed a SQUID (Superconducting quantum interference device) at a brain listening to various notes, they found an eerie reflection of the black and white keys on a piano. ...the brain hears loud sounds in a totally different place from quieter sounds, but also ....the areas that hear tones are laid out like a keyboard. "The distance between brain areas that hear low C and middle C is the same as the distance between areas that hear middle C and high C-just like on a piano." [4]

[4] Begley,Wright,Church & Hager - Mapping The Brain, page 42, Newsweek April 20th 1992.

Perhaps the line of our thoughts, given our appreciation of the music, can follow the same pathway or flow as indicated by densities and directions of the notes or their frequencies, orchestrations, timbres, rhythms etc.

I consider that the acculturation of the language of music as a child must surely enhance the working process of the brain and that the expansion of thought created by music, the growth of acts, the line of music and the mathematical implications given by the frequency ratios of notes, intervals and musical juxtapositions;

> "There is good evidence .. that while musical perception is chiefly a right hemisphere function in predominantly 'naive' listeners, it becomes a left hemisphere function in professional musicians and "expert' listeners (who grasp it's grammar and rules, and for whom it has become an intricate formal structure.). ...A similar shift occurs with those who become mathematical or arithmetical 'experts,' who become able to see mathematical concepts, or numbers, a part of a vast, well-organized intellectual universe or scheme. ..All higher reaches of scientific or artistic intelligence, as well as banal game-playing skills, require representational systems that are functionally similar to language and develop like it; all of them seem to move into becoming left hemisphere skills." [5]

It must be noted that our 'appreciation' of music may be defined by a variety of factors one of not insignificant importance is our ability to hear. Please note:

> "It is interesting to consider the facts of musical perception alongside of the known structure of the ear, and see how far it is possible to construct a theory which will explain the facts in terms of the structure. A most attractive theory is that which seems to have been first suggested by Cotugno (1736-1822) and later by Charles Bell (1744-1842) . It was developed in great detail by Helmholtz, and is know as the resonance theory. On this theory the fibres of the basilar membrane which are transverse and in tension act like resonators fairly heavily damped. The important facts to be explained are:
> 1) the ear responds to pure tones over a range of frequency of ten or eleven octaves:
> 2) pitch discrimination is acute over the middle of the range of audibility, but becomes less acute for notes of high pitch and much less acute for notes of low pitch:
> 3) when two notes of nearly equal frequency are sounded simultaneously, we hear beats, but only when the musical interval between the two tones is not too large:.....

[5] Sacks - Seeing Voices, pages 105 & 106.

5) two or more notes sounded simultaneously can be separately perceived, as can the constituent partial tones of a musical note..." [6]

However given that the SQUID scan exhibits shapes that illustrate mathematical divisions and also that:-

"Any two sources of musical tone differing in frequency by a few c.p.s. give rise to a combined sound which to the ear and brain is recognised as a single tone of frequency midway between the two, pulsating in amplitude at a rate which turns out to be the difference of the frequencies of the two tones" [7]

Perhaps the registration of sound on the brain and our perception(s) of it makes an imprint, given the circumstances provided, this then translates into neural information.

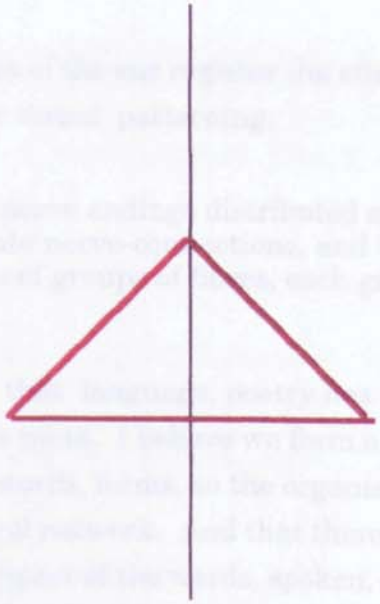
There is then, already a potential route created by melody(s) that travels in our minds, in a pathway. These imprints on our neural pathways create in part, the "Banks", "Safe Places", "Growth Lines" that we further activate in the formation of acquisition of (compositional/musical) language.

I am interested in the ability of the mind to make its own neural imprints and specifically the relationship between neural imprinting and formation of composition: (see Chapter 5, pages 47 & 48) for example (as stated in Chapter 1, page 4) I suggested that the large amount of time that Elisabeth Lutyens spent with her father, looking through his architectural plans, models and drawings may have activated a part of her mind that allowed her to access the ability to compose serial music, as a matter of course.

[6] Woods - The Physics of Music, page 87.
[7] Taylor - The Physics of Musical Sounds, chapter 8, page 115.

Left Side
Realisation into musical notes

Right Side
Visual neural imprints of diagrams



growth line - growth of compositional ideas

Gordon Shaw, professor of physics at the University of California Irvine has been working with teachers and parents, tutoring children aged three and four; he states:-

"We have shown that in some way training them in music at three or four is improving the way in which their brains recognised patterns in space and

time....We believe there is a common neural language that comes from some underlying structure in our brains. It is not only seeing patterns but sequences of patterns." [8]

Are neural imprints from visual stimuli somehow translated into differing parts of our minds for use, as in this case, i.e.musical composition. Just as the mathematical information concerning the frequencies of musical notes have potential to translate into our minds as a matter of course and register in an appropriate part of the brain.

Perhaps as the inner fibres of the ear register the stimuli of sound patterning, so the optical nerves register visual patterning.

" The various sensitive nerve endings distributed along the basilar membrane have separate nerve-connections, and therefore if a series of notes stimulate a series of groups of fibres, each group can produce its own mental effect..." [9]

There is also a possibility that language, poetry has a profound effect upon the inspiration of a composer's mind. I believe we form a visual stimuli based on the patterning of the written words, forms, so the organisational patterning of the words imprint on our neural network. And that there is a relationship between this and the (emotional) impact of the words, spoken, read, or heard in the mind. In some instances composers' music has shown more logical than emotional manifestations of the influence of words and language on their work, for example Schoenberg:

"Words(left hemisphere) even motivated many of his earlier works.....This obsessive exploration of the relationship between words and music .led to his sprech-stimme (speech song, as found in Pierrot Lunaire.)....His pioneering of the style of music known as serialism is largely arhythmic and dissonant. (left) ...Why then did he feel compelled to develop this dissonant style, which is so difficult for most of us to grasp?" [10]

For me, the visual look of the arrangement of the words, alongside the meaning which seems to render its own placement within my emotions, creates a reaction which stirs my inspiration via my emotions to compose. (See Chapter 5, page 68)

[8] Norton - Early Music Lessons Boost Brain Power, The Sunday Times Oct. 12th 1997
[9] Woods - The Physics of Music, page 88
[10] Robertson - The Great Divide, page 1.

One day it may be possible to trace these pathways more accurately, even using some cognitive studies, such as this, specifically geared toward musical information, as a map.

One thing is for sure, composition I believe may be accessed, at any age, by any available portion of the brain that can respond, hence my diagram (See Chapter 5, page 45) illustrating potential areas where and by which it could initiate and expand into.

> "Even allowing for cultural differences in musical tastes, the researchers found evidence of music's remarkable power to affect neural activity no matter where they looked in the brain, from primitive regions found in all animals to more recently evolved regions thought to be distinctively human." [11]

The article continues, stating that the brain:-

> "Interprets written musical notes and scores in an area on the brain's right side. That region corresponds to an area on the opposite side of the brain know to handle written words and letters. So, in studying the brains of expert musicians, researchers uncovered an anatomical link between music and language." [12]

From my studies or and work with children, not experts, I would suggest the same.

> "...We are guessing (the area) is involved in the visual processing of the score itself,..On the left, the same area is involved in reading." [13]

It has been shown that the brain:-

> "Grows in response to musical training the way a muscle responds to exercise." [14]

As suggested what I would refer to as a musical "lines of thought" grow with use, the rate of growth perhaps being dependent on a variety of factors such as starting point, age, etc. The article goes on to indicate:-

> "The area of the brain called the cerebellum, which contains about 70% of the brains neurons, was 5% larger in expert male musicians. Researchers, however, found no such size increase in the brains of female musicians, but said they may not have studied enough women to be certain".[15]

---

[11] Hotz. - Study suggests music may someday help repair brain, L.A.Times, page A21
[12] Hotz - ibid, page A21
[13] Hotz - ibid, page A21
[14] Hotz - ibid, page A21
[15] Hotz - ibid, page A21

Without specific focus on a gender comparison I can make no real conclusions through empirical study here, except through my years of work and observation with young children, where I have found the following: To begin with, girls seemed less able to be assertive than boys in creating composition, but given a period of concentrated study over several years, there was an amazing shift in their facility to create with confidence and in many cases where no peer pressure seemed in operation, the girls became very confident and, especially in groups of girls, many times out performed the boys in their compositional work.

Perhaps research in general now could draw upon the works of male and female composers and not musicians, as it is only in composition that we see the raw materials of the brain in operation. (i.e. not a brain in a process of realisation or simulation albeit performance.)

In considering all of the aforementioned material within this chapter thus far, I am led to wonder what implications may be gleaned in terms of the use of music on a much larger scale. If we can pinpoint the activity of the brain through the working patterns seen in composition, could this lead to even more findings in terms of medical and educational research? For example:-

> "Dr Ohno transcribed a Chopin piece into a chemical notation, sections of the resulting formula were the DNA of a human cancer gene." [16]

For me now there are even more unanswered questions; the more I look into musical composition and its formation, the more possibilities seem to be apparent. The key to drawing upon this study I feel will be to look at those areas which relate specifically to the reader and exploring these further. There are, I think, many such areas that could be open to further study and development:-

1. The study of the mind of adult composers as a means to gain further insight into the operations of the brain, the potential of musical composition to expand the workings of the brain and to use these findings to find out ways to develop these workings through a system of means to be discovered, some of which are expounded within this study.
It may be noted that :-

> "Robert C. Morrison of East Carolina University in North Carolina has developed computer programs that will translate patterns of numerical data into musical tones. He points out that the ear is a much more sensitive

[16] Dossey - The Body Of Music, from Healing Break-Throughs, page 141.

instrument than the eye for recognising patterns. Thus through the medium of music a person could distinguish recurrent themes in chemical analyses, economic indicators, and other patterns of data too complex to allow ready analysis either visually or mathematically. In quality control systems, an investigator could listen for disharmonies in the music instead of looking for mathematical irregularities." [17]

If the route by which the frequencies of music register in the brain was mapped, specifically then this could help solving tasks similar to those related above.

2. To use my musical findings, model and data to facilitate and aid the growth of new compositional thought not only in terms of adding great understanding to what might be considered the workings of composition but also to aid composers in working mode as a means to explore areas that they may not have already considered.

3. The implication of the working of this study, as a process of development was one that transpired through the course of the study. Not only is the composition "Maya's Words" a model for examination, being the work that was inspired from the initiation of this study, but now in fact the format of this study and each specific chapter within itself I believe are almost like a blueprint for the way in which the interconnecting sections of the brain works. In the same way that I feel that musical composition, the process of, sketching etc. represents stages of the growth i.e. the "Circuits of Activity", so I believe this study does in connection to my own work and development.

The effect of acculturation, experience, objects, reality upon our thinking is vital and I believe shapes our every day lives. The interplay of music to our lives ever more important. Intriguing studies are taking place in areas such as :-

- Human fetal heart rate changes and movement in response to sound and vibration [18]
- Biosonic Repatterning [19]

I would like to pursue the possibility that the electromagnetic wave forms of thought connect matter in a much more inter-connected way than we know. At the outset of this study I had embarked upon this thought as a starting point (See my interview with Professor William Tiller in the appendix) and found no way to proceed at that time as my ideas seemed to be without substance,

[17] Dossey - The Body Of Music, from Healing Breakthroughs, page 145.
[18] Grimwade, Walker, Bartlett, Gordon and Wood - Human fetal heart rate change and movement in response to sound and vibration, pages 86-91.
[19] Beaulieu - Biosonic Repatterning

having no scientific data to back them up. Thus the focus for my study took a more defined route along a purely musical pathway. At the end of my study I find I am also at a new beginning. It feels the same as the example I gave in Chapter 5 (pages 52 & 53) when I was trying, at the age of seven, to compose for voices and orchestra and I did not know how to write it down on manuscript. I feel this study has led me to a renewed starting point and this could now lead into investigations concerning, what would have been called the "telepathic" transmission of thoughts. Farfetched perhaps, but the power of the mind to communicate in unspoken ways is being investigated and through music a way may be found to understand this further.

> "Using the aptly named "thought translation device," patients amplify and dampen their brain waves in a way that allows them to select letters on a video screen and spell out messages. "For the first time" we have shown that it is possible to communicate with nothing but one's own brain" (and to be fair a pile of electronics) and to escape, at least verbally, the locked-in state."[20]

[20] Begley - ibid, page 64.

Appendices

Appendix A (page 113)

- Explanation of the method used for analysis of children's compositions:
  Abbreviations that are used in the spreadsheet break-downs are defined.

Appendix B (page 115)

- Summative spreadsheet information - 50 compositions

Appendix C (page 119)

- Summative pie charts of spreadsheet information - 50 compositions

Appendix D (page 125)

- Summative spreadsheet information - 5 compositions

Appendix E (page 129)

- Summative pie charts - 5 compositions

Appendix F (page 133)

- Children's compositions: Selected, varied graphic Scores

Appendix G (page 168)

- List of Children who's work features over the course of a few years

Appendix H (page 169)

- Informal interview with Professor William Tiller,Stanford University, California

Appendix I (page 176)

- Informal interview with Professor Hannah Steinberg, Middlesex University,
  London

Appendix J (page 178)

- Working Plan: Psychological concerns raised during the course of the study defined in brief are then structured into a positive structure to encourage growth in compositional activity.

Appendix K (page 183)

- List of Children's compositions as seen on CD 1

Appendix L (page 184)

- Information as seen on CD 2

Full Score - "Maya's Words" submitted with Thesis

Audio - Two CD's submitted with Thesis

- CD with children"s compositions: 1 - 50
- CD of "Ocean Witness" A Violin Concerto by Deborah Mollison.

Appendix A

The list of abbreviations of the components (musical techniques) formerly mentioned at the end of the chapter 3, have been devised as a means to aid display ease for the lay-out of the spreadsheet which acts as a summative chart for these facets in terms of analysis.

Following these abbreviations, a summary of the spreadsheet information for consideration. In the formation of this information I utilised all available children's compositions regardless of number available in any one year of study. It may be noted that in Years 4 and 5 more compositions were available for analysis than in Years 6, 2 and 3. As the formation for the intention of this study evolved many years after this work was undertaken and by chance the tapes of these recordings were kept by the school concerned, I felt it important for the analysis to utilise all of the available material for this portion of the study. (i.e. 50 compositions) For the purpose of clinical referencing I took 5 specimen compositions from each age band and produced pie charts for these. It was interesting to note that there were only a few minor changes shown in these charts in comparison to the charts drawn form all of the available compositions. From the pie charts visual comparison can be drawn which exemplifies the contrast between usage of the components in differing study years.

A selection of the children's compositions sketched in a variety of approaches are then shown with comments relating to the works,as significance dictated. I felt it important to vary the type of analysis for these pieces so that I may be able to view them from an external viewpoint without being drawn into any set patterns via the analysis which may indirectly dictate any patterns to the progressions of thought as I noticed them.

An explanation to the way in which the spreadsheets were formed and how this linked to my thoughts concerning the compositional aspects of this section of the study can be found at the beginning of Chapter 4.

<u>Ages of children in class years:</u>

Year 1 - aged (4+) 5-6
Year 2 - aged 6-7
Year 3 - aged 7-8
Year 4 -aged 8-9
Year 5 -aged 9-10
Year 6 - aged 10-11

COMPONENT ABBREVIATION CHART

Accompanying/percussion	A/P
Adjacent time frames/alternate time frames	Aj/TF/ATF
Atonal	ATONAL
Answering phrases/direct conversation	AP/DC
Bitonal	BITONAL
Blocks of joint thought	BJT
Combination of feels/musical thoughts	CF/MT
Contrary motion/criss-cross contrary motion	CM/CCM
Extension of phrases	EP
Glisses	GLS
Images as structures	IS
Integration of known tunes	IKT
Intersecting notes	IN
Interspersed tune/suspended melody	IT/SM
Inversion	INV
Melody repetition/with variation	MR/V
Octave awareness	OA
Ostinato	OST
Passing around/rhythms/textures	PA/RT
Percussion conversation	PC
Rambling in a mental line	RML
Random with measured	RM
Reverse patterning	RP
Sequencing	SEQ
Triads	TRIADS

Appendix B

Spreadsheets for Years 2 - 6.

Breakdown of Component Usage for 50 Compositions.

*** (Please note that Years 2 - 6 may also be referred to as Forms 2 - 6)**

Breakdown of Component usage for 50 Compositions. Years 2 - 6

1/50		A/P	AJ/TF/ATF	ATONAL	AP/DC	BITONAL	BJT	CF/MT
1	form 6	1	0	0	0	0	0	0
2	form 6	0	0	0	0	0	0	0
3	form 6	1	1	0.5	0	0	1	0.5
4	form 6	1	1	0	1	0	0.5	0
5	form 6	0	0	0	0.5	0	0	0
6	form 6	0	0	0	1	0	0	0.5
7	form 6	1	0	0	1	0	0	0
TOTALS	**form 6**	**4**	**2**	**0.5**	**3.5**	**0**	**1.5**	**1**
8	form 5	0	0	0	1	0	1	1
9	form 5	1	0	0	1	0	1	1
10	form 5	1	1	0.5	1	0	0	1
11	form 5	0	0	0	1	0	1	1
25	form 5	1	1	0	0	0	0	0
26	form 5	1	0	0	0	0	0	0
27	form 5	0.5	0	0	0	0	0	0
28	form 5	0	0	0	0.5	0	0	0
29	form 5	0	0	0	0	0	0	0
30	form 5	0	0	0	0.5	0	0	0
31	form 5	0	0	0	1	0	0	0
32	form 5	0	0	0	0.5	0	0	0
33	form 5	1	0	1	1	1	0	1
34	form 5	0	0	0	0.5	0	0	0
50	form 5	1	0	0	1	0	1	1
TOTALS	**form 5**	**6.5**	**2**	**1.5**	**9**	**1**	**4**	**6**
12	form 4	1	1	0	0.5	0	0	0.5
13	form 4	1	0	0	0.5	0	0	0
14	form 4	0	0	1	1	0.5	1	0
15	form 4	0	0	0.5	1	1	0	0
16	form 4	1	1	0	1	0	0.5	0
17	form 4	1	0.5	0	0.5	0	0.5	0
18	form 4	0	0.5	1	0	0	1	0
19	form 4	0	0	1	0	0	0.5	0
20	form 4	1	0	0	1	0	0	0
21	form 4	0	0	0	1	0	0	0
22	form 4	0	0	0	1	0	0	0
23	form 4	0	0	0	1	0	0	0
24	form 4	0	0	0	1	0	0	0
35	form 4	1	0	0	1	0	0	0.5
36	form 4	1	0	0	1	0	0	0
37	form 4	1	0	0	1	0	0	0
TOTALS	**form 4**	**8**	**3**	**3.5**	**12.5**	**1.5**	**3.5**	**1**
38	form 3	1	0	0	0.5	0	0	0
39	form 3	1	0	0	1	0	0	0
40	form 3	1	0	0	0.5	0	0	0
41	form 3	1	0.5	0	0	0.5	0	0.5
42	form 3	1	0	0	0	0.5	0	0
TOTALS	**form 3**	**5**	**0.5**	**0**	**2**	**1**	**0**	**0.5**
43	form 2	0	0	0	1	0	0	0
44	form 2	0	0	0	1	0	0	0
45	form 2	0	0	0	1	0	0	0
46	form 2	0	0.5	0	0.5	0	0	0
47	form 2	0	0	0	0	0	0	0
48	form 2	0	0	0	0	0	0	0
49	form 2	0	0	0	0.5	0	0	0
TOTALS	**form 2**	**0**	**0.5**	**0**	**4**	**0**	**0**	**0**

Breakdown of Component usage for 50 Compositions. Years 2 - 6

1/50		CM/CCM	EP	GLS	IS	IKT	IN	IT/SM	INV	MR/V
1	form 6	0	0	0	1	0	0	0	0	1
2	form 6	0	0	1	1	0	0	0	0	0
3	form 6	0	0	1	1	0	0	1	0	0
4	form 6	0	0	1	0	0	0	0	1	1
5	form 6	0	1	0	1	0	0	0.5	1	0.5
6	form 6	0	0	1	1	0	1	0	0	1
7	form 6	0	0	1	1	0	0	0.5	0.5	0.5
TOTALS	**form 6**	**0**	**1**	**5**	**6**	**0**	**1**	**2**	**2.5**	**4**
8	form 5	0	1	0	0	0	0	0	1	1
9	form 5	1	1	1	1	0	1	0	1	1
10	form 5	1	0.5	1	1	0	0	0.5	0	0.5
11	form 5	1	1	1	0	0	0	0	1	1
25	form 5	0	0	0	1	0	0	1	0	0.5
26	form 5	0	0	0	1	0	0	0	0	0
27	form 5	0	0	0	0	0	0	0	0	0
28	form 5	0	0	0	1	0	1	0	0	0
29	form 5	0	0	0	1	0	1	0	1	1
30	form 5	0	0	0	1	0	1	0	1	1
31	form 5	0	1	0	1	0	1	0	1	1
32	form 5	1	0	0	0.5	0	0	0	0	0.5
33	form 5	0	0	0	0	0	0	0.5	0	1
34	form 5	0	0	0	1	0	0	0	0.5	1
50	form 5	0.5	1	0	0	0	1	1	1	1
TOTALS	**form 5**	**4.5**	**5.5**	**3**	**9.5**	**0**	**6**	**3**	**7.5**	**10.5**
12	form 4	0	1	1	1	0	0	0	0	1
13	form 4	0	0	0	1	0	0	0	0.5	0
14	form 4	0	0	1	1	0	0	0	0	0
15	form 4	0	0.5	0	1	0	0	1	0	1
16	form 4	0	1	1	1	0	0	0	1	1
17	form 4	0	1	0	1	0	0	0	0	1
18	form 4	0.5	1	1	1	0	0	0	0	0
19	form 4	0	1	1	1	0	0	0.5	0	0
20	form 4	1	0	1	1	0	0	0	1	1
21	form 4	1	1	0	0	0	0	0	1	1
22	form 4	0	0.5	0	0	1	0	0	0	1
23	form 4	0	1	0	0	0	0	0	0	1
24	form 4	0	0.5	0	0	0	0	0	0.5	1
35	form 4	1	1	1	1	0	0	1	1	0.5
36	form 4	0	0	0	0	0	0	1	0	1
37	form 4	1	0	0	0	0	0	1	0.5	0.5
TOTALS	**form 4**	**4.5**	**9.5**	**7**	**10**	**1**	**0**	**4.5**	**5.5**	**11**
38	form 3	1	1	0	0	0	1	1	0	1
39	form 3	0	0	0	0	0	1	1	0	0
40	form 3	0	1	0	1	0	0.5	1	0	0.5
41	form 3	0.5	0	1	1	0	0	0	0.5	0.5
42	form 3	0	0	1	1	0	0	0.5	0	1
TOTALS	**form 3**	**1.5**	**2**	**2**	**3**	**0**	**2.5**	**3.5**	**0.5**	**3**
43	form 2	0	0	1	1	0	0	0	0	0
44	form 2	0	0	1	1	0	0	0	0	0
45	form 2	0	0	1	1	0	0	0	0	0
46	form 2	0	0	0	1	0	0	0	0	0
47	form 2	0	0	1	1	0	0	0	0	0
48	form 2	0	0	0	1	0	0	0	0	0
49	form 2	0	0	0	1	0	0	0	0	0
TOTALS	**form 2**	**0**	**0**	**4**	**7**	**0**	**0**	**0**	**0**	**0**

Breakdown of Component usage for 50 Compositions. Years 2 - 6

1/50		OA	OST	PA/RT	PC	RML	RM	RP	SEQ	TRIADS
1	form 6	0	0	1	1	1	0	0	1	1
2	form 6	0	0	1	0	1	0	0	1	0
3	form 6	0	0	1	1	1	1	0	0	0
4	form 6	1	1	1	0	1	0	0	1	1
5	form 6	0	0	0	0	1	1	1	0	0
6	form 6	1	0	1	0	0	0	0	1	1
7	form 6	0	0	1	0.5	0	0	0	0	1
TOTALS	**form 6**	**2**	**1**	**6**	**2.5**	**5**	**2**	**1**	**4**	**4**
8	form 5	0	0	1	1	0	0	0	1	1
9	form 5	1	0	1	0	0	0	1	0	1
10	form 5	0	0.5	0.5	1	0.5	1	1	0	0
11	form 5	0	0	0.5	1	0	0	1	1	1
25	form 5	0	1	0	0	0	1	0	1	0.5
26	form 5	0	1	0	0	0	0	0	0	0
27	form 5	0	1	1	0	0	0	0	0	0
28	form 5	0	1	0	1	0	0	0	0	0
29	form 5	0	0.5	0	0	0	0	0	0	0.5
30	form 5	1	0	0	0	0	0	0	0	1
31	form 5	0	0	0	0	1	1	0	0	0
32	form 5	0	1	1	0.5	0	0	0	0.5	1
33	form 5	1	0	0.5	0	0.5	0.5	0	0	1
34	form 5	1	0.5	0.5	0	0	0	0	0	0
50	form 5	1	1	1	0	0.5	1	1	1	0
TOTALS	**form 5**	**5**	**7.5**	**7**	**4.5**	**2.5**	**4.5**	**4**	**4.5**	**7**
12	form 4	0	0	0	1	1	1	0	1	0
13	form 4	1	0.5	0	1	0	1	0	0	0
14	form 4	0	0.5	0	1	0	0.5	0	0	0
15	form 4	1	0	0	0	1	0	0	1	0
16	form 4	0	1	0	0	1	1	1	1	0
17	form 4	0	0	0	1	0	0	0	1	0.5
18	form 4	0	0	0	0	0.5	1	0	0	0
19	form 4	0	0	0	0	0	0	0	0	0
20	form 4	0	0.5	1	0	0	0	1	1	0
21	form 4	0	0	1	0	0	0	0	0	0
22	form 4	0	0	1	0	1	0	0	0	0
23	form 4	0	0	1	0	1	0	0	1	0
24	form 4	0	0	1	0	1	0	1	0	0
35	form 4	0.5	0.5	1	0.5	0.5	1	0	1	0
36	form 4	0.5	0	0.5	0	0	0	0	0	0.5
37	form 4	0.5	1	0.5	1	0.5	1	1	0	0
TOTALS	**form 4**	**3.5**	**4**	**7**	**5.5**	**7.5**	**6.5**	**4**	**7**	**1**
38	form 3	0	0	0	0	0	0	0	0	0
39	form 3	0	0	0	1	0.5	0.5	0	0	0
40	form 3	0	0	0	0	1	1	0	1	0
41	form 3	0	0	0	0.5	0.5	1	0	0	0
42	form 3	0	0	0	0.5	0.5	1	0	0	0
TOTALS	**form 3**	**0**	**0**	**0**	**2**	**2.5**	**3.5**	**0**	**1**	**0**
43	form 2	0	0	0	1	0	0	0	0	0
44	form 2	0	0	0	1	0	0	0	0	0
45	form 2	0	0	0	1	0	0	0	0	0
46	form 2	0	0	0	1	0	0	0	0	0
47	form 2	0	0	0	1	0	0	0	0	0
48	form 2	0	0	0	1	0	0	0	0	0
49	form 2	0	0	0	1	0	0	0	0	0
	form 2	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**

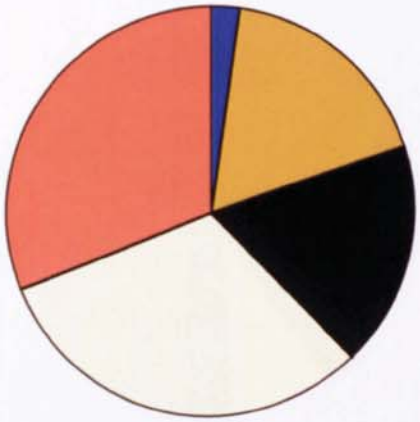
Appendix C

Summative Pie Charts

of Spreadsheet Information - 50 Compositions

- **Charts for years 2 - 6 taken directly from spreadsheet information as shown in Appendix B.**

*** (Please note that Years 2 - 6 may also be referred to as Forms 2 - 6)**



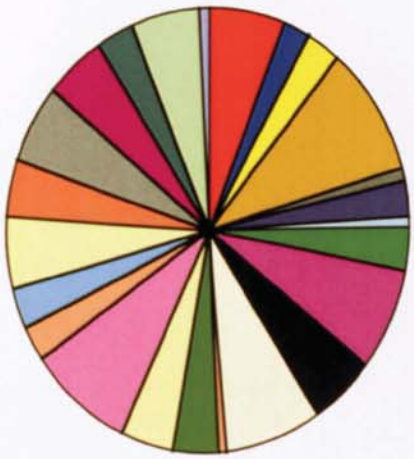
year 2

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



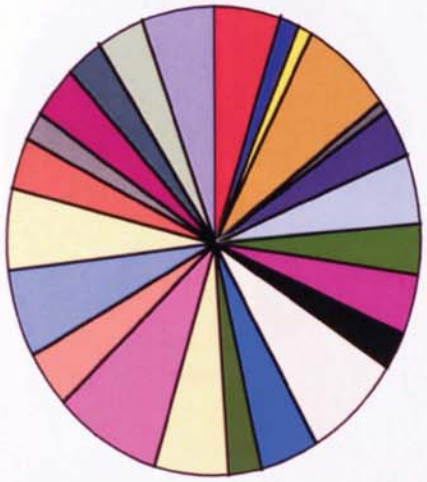
year 3

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



year 4

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



year 5

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



year 6

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads

Appendix D

Spreadsheets for Years 2 - 6.

Breakdown of Component Usage for 5 Compositions.

* (Please note that Years 2 - 6 may also be referred to as Forms 2 - 6)

Breakdown of Component usage for 5 Compositions, years 2 - 6

1/50		A/P	AJ/TF/ATF	ATONAL	AP/DC	BITONAL	BJT	CF/MT
1	form 6	1	0	0	0	0	0	0
2	form 6	0	0	0	0	0	0	0
3	form 6	1	1	0.5	0	0	1	0.5
4	form 6	1	1	0	1	0	0.5	0
5	form 6	0	0	0	0.5	0	0	0
TOTALS	**form 6**	**3**	**2**	**0.5**	**1.5**	**0**	**1.5**	**0.5**
8	form 5	0	0	0	1	0	1	1
9	form 5	1	0	0	1	0	1	1
10	form 5	1	1	0.5	1	0	0	1
11	form 5	0	0	0	1	0	1	1
25	form 5	1	1	0	0	0	0	0
TOTALS	**form 5**	**3**	**2**	**0.5**	**4**	**0**	**3**	**4**
12	form 4	1	1	0	0.5	0	0	0.5
13	form 4	1	0	0	0.5	0	0	0
14	form 4	0	0	1	1	0.5	1	0
15	form 4	0	0	0.5	1	1	0	0
16	form 4	1	1	0	1	0	0.5	0
TOTALS	**form 4**	**3**	**2**	**1.5**	**4**	**1.5**	**1.5**	**0.5**
38	form 3	1	0	0	0.5	0	0	0
39	form 3	1	0	0	1	0	0	0
40	form 3	1	0	0	0.5	0	0	0
41	form 3	1	0.5	0	0	0.5	0	0.5
42	form 3	1	0	0	0	0.5	0	0
TOTALS	**form 3**	**5**	**0.5**	**0**	**2**	**1**	**0**	**0.5**
43	form 2	0	0	0	1	0	0	0
44	form 2	0	0	0	1	0	0	0
45	form 2	0	0	0	1	0	0	0
46	form 2	0	0.5	0	0.5	0	0	0
47	form 2	0	0	0	0	0	0	0
TOTALS	**form 2**	**0**	**0.5**	**0**	**3.5**	**0**	**0**	**0**

Breakdown of Component usage for 5 Compositions, years 2 - 6

1/50		CM/CCM	EP	GLS	IS	IKT	IN	IT/SM	INV	MR/V
1	form 6	0	0	0	1	0	0	0	0	1
2	form 6	0	0	1	1	0	0	0	0	0
3	form 6	0	0	1	1	0	0	1	0	0
4	form 6	0	0	1	0	0	0	0	1	1
5	form 6	0	1	0	1	0	0	0.5	1	0.5
TOTALS	**form 6**	**0**	**1**	**3**	**4**	**0**	**0**	**1.5**	**2**	**2.5**
8	form 5	0	1	0	0	0	0	0	1	1
9	form 5	1	1	1	1	0	1	0	1	1
10	form 5	1	0.5	1	1	0	0	0.5	0	0.5
11	form 5	1	1	1	0	0	0	0	1	1
25	form 5	0	0	0	1	0	0	1	0	0.5
TOTALS	**form 5**	**3**	**3.5**	**3**	**3**	**0**	**1**	**1.5**	**3**	**4**
12	form 4	0	1	1	1	0	0	0	0	1
13	form 4	0	0	0	1	0	0	0	0.5	0
14	form 4	0	0	1	1	0	0	0	0	0
15	form 4	0	0.5	0	1	0	0	1	0	1
16	form 4	0	1	1	1	0	0	0	1	1
TOTALS	**form 4**	**0**	**2.5**	**3**	**5**	**0**	**0**	**1**	**1.5**	**3**
38	form 3	1	1	0	0	0	1	1	0	1
39	form 3	0	0	0	0	0	1	1	0	0
40	form 3	0	1	0	1	0	0.5	1	0	0.5
41	form 3	0.5	0	1	1	0	0	0	0.5	0.5
42	form 3	0	0	1	1	0	0	0.5	0	1
TOTALS	**form 3**	**1.5**	**2**	**2**	**3**	**0**	**2.5**	**3.5**	**0.5**	**3**
43	form 2	0	0	1	1	0	0	0	0	0
44	form 2	0	0	1	1	0	0	0	0	0
45	form 2	0	0	1	1	0	0	0	0	0
46	form 2	0	0	0	1	0	0	0	0	0
47	form 2	0	0	1	1	0	0	0	0	0
TOTALS	**form 2**	**0**	**0**	**4**	**5**	**0**	**0**	**0**	**0**	**0**

Breakdown of Component usage for 5 Compositions, years 2 - 6

1/50		OA	OST	PA/RT	PC	RML	RM	RP	SEQ	TRIADS
1	form 6	0	0	1	1	1	0	0	1	1
2	form 6	0	0	1	0	1	0	0	1	0
3	form 6	0	0	1	1	1	1	0	0	0
4	form 6	1	1	1	0	1	0	0	1	1
5	form 6	0	0	0	0	1	1	1	0	0
TOTALS	**form 6**	**1**	**1**	**4**	**2**	**5**	**2**	**1**	**3**	**2**
8	form 5	0	0	1	1	0	0	0	1	1
9	form 5	1	0	1	0	0	0	1	0	1
10	form 5	0	0.5	0.5	1	0.5	1	1	0	0
11	form 5	0	0	0.5	1	0	0	1	1	1
25	form 5	0	1	0	0	0	1	0	1	0.5
TOTALS	**form 5**	**1**	**1.5**	**3**	**3**	**0.5**	**2**	**3**	**3**	**3.5**
12	form 4	0	0	0	1	1	1	0	1	0
13	form 4	1	0.5	0	1	0	1	0	0	0
14	form 4	0	0.5	0	1	0	0.5	0	0	0
15	form 4	1	0	0	0	1	0	0	1	0
16	form 4	0	1	0	0	1	1	1	1	0
TOTALS	**form 4**	**2**	**2**	**0**	**3**	**3**	**3.5**	**1**	**3**	**0**
38	form 3	0	0	0	0	0	0	0	0	0
39	form 3	0	0	0	1	0.5	0.5	0	0	0
40	form 3	0	0	0	0	1	1	0	1	0
41	form 3	0	0	0	0.5	0.5	1	0	0	0
42	form 3	0	0	0	0.5	0.5	1	0	0	0
TOTALS	**form 3**	**0**	**0**	**0**	**2**	**2.5**	**3.5**	**0**	**1**	**0**
43	form 2	0	0	0	1	0	0	0	0	0
44	form 2	0	0	0	1	0	0	0	0	0
45	form 2	0	0	0	1	0	0	0	0	0
46	form 2	0	0	0	1	0	0	0	0	0
47	form 2	0	0	0	1	0	0	0	0	0
TOTALS	**form 2**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**

Appendix E

Summative Pie Charts

of Spreadsheet Information - 5 Compositions

- **Charts for Years 4-6 taken from a random sample of 5 compositions per year taken from the spreadsheet information previously illustrated.**
- **Years 2 and 3 for this 5 composition sample were identical to the pie charts shown in the 50 composition analysis.**



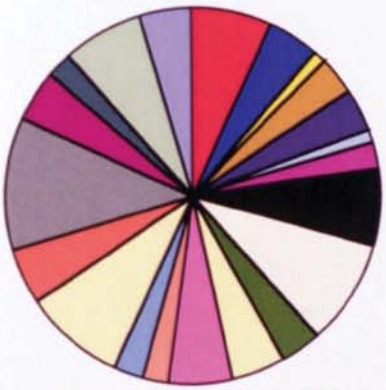
5 compositions:Year 4

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



5 Compositions:Year 5

- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads



5 Compositions: Year 6

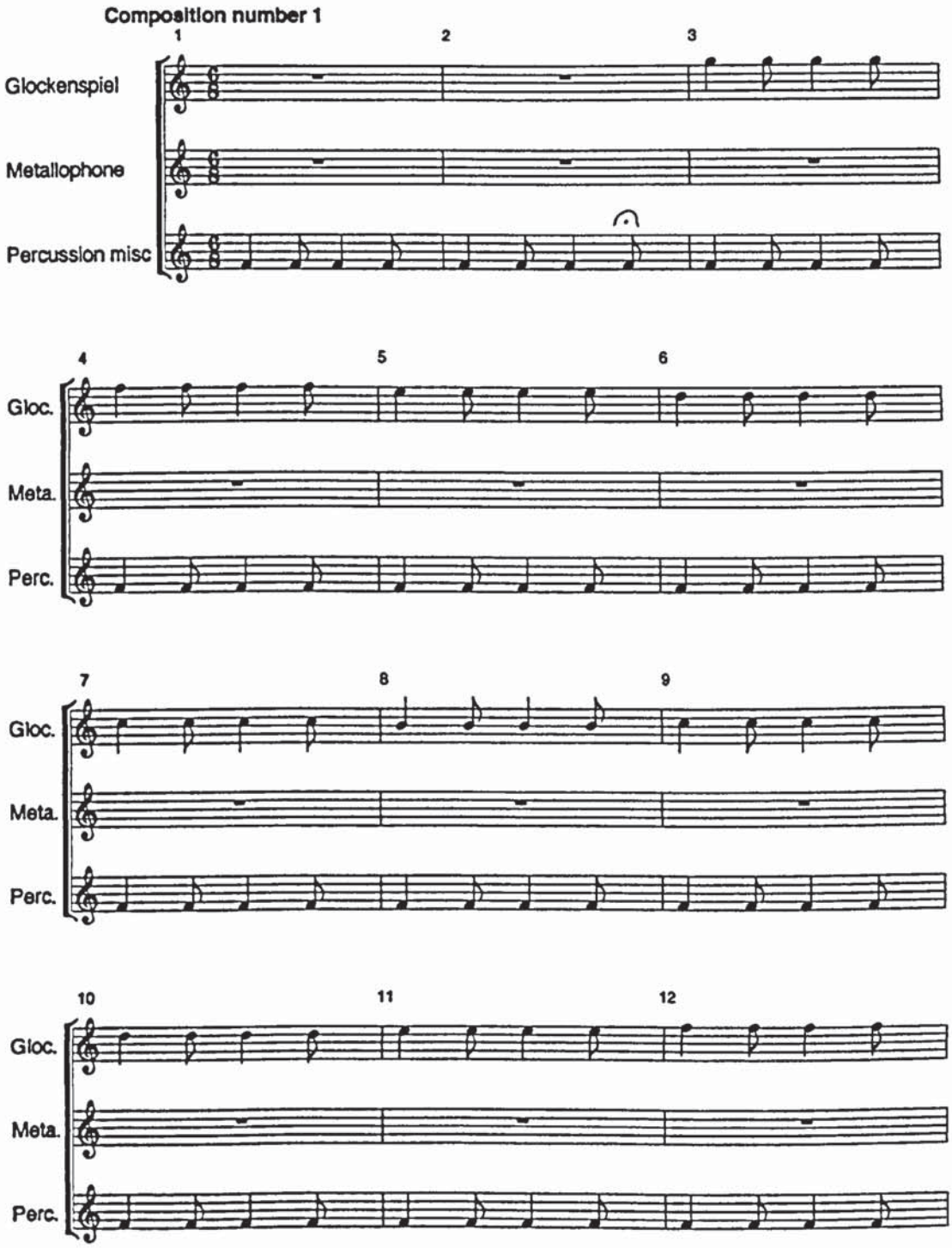
- accompanying/percussion
- adjacent time frames/alternate time frames
- atonal
- answering phrases/direct conversation
- bitonal
- blocks of joint thought
- combination of feels/musical thoughts
- contrary motion/criss/cross contrary motion
- extension of phrases
- glisses
- images as structures
- integration of known tunes
- intersecting notes
- interspersed tune/suspended melody
- inversion
- melody repetition/with variation
- octave awareness
- ostinato
- passing around/rhythms/textures
- percussion conversation
- rambling in a mental line
- random with measured
- reverse patterning
- sequencing
- triads

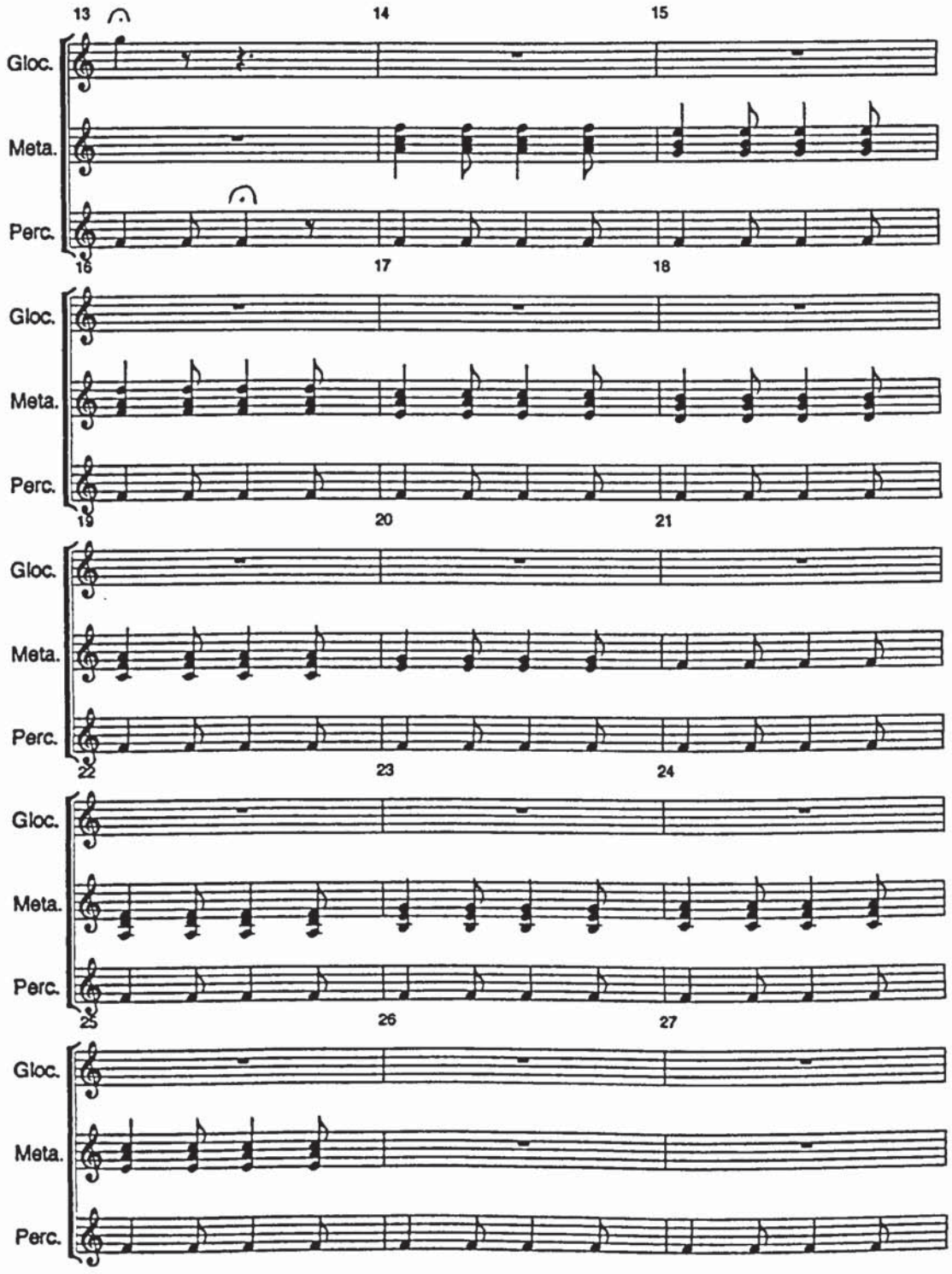
Appendix F

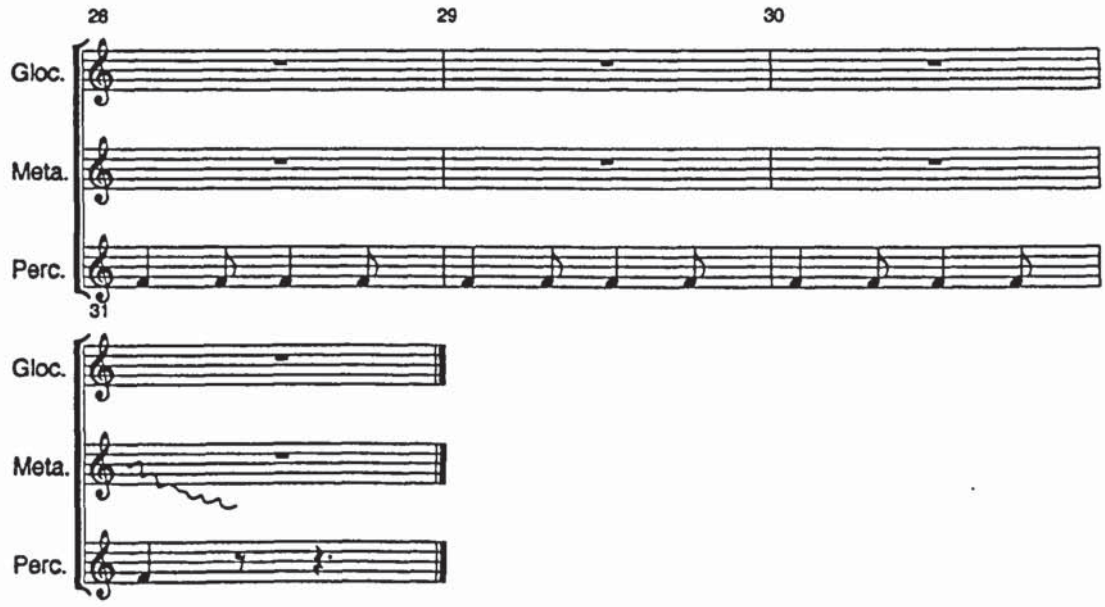
Children's Compositions
Selected Varied Graphic Scores

List of children's compositions to follow in score representation.

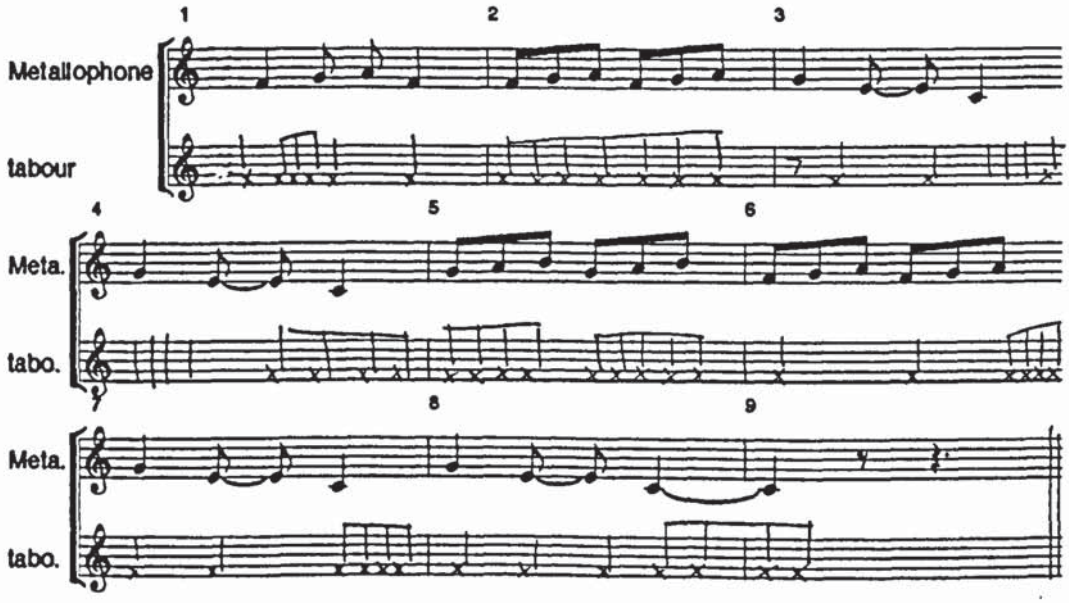
1	
2	
3	
4	Troupers
5	
6	Waltz
7	Church Bells
8	The Place of Doom
9	Confusion
10	
11	
12	
13	
14	
15	Space
16	Cheetah
17	Ballerina
18	Tiger
19	Whirlpool
20	The Olympic Dive
21	
22	Close Encounters
23	
24	
25	Raindrops
26	
27	
28	
29	Funfair
30	Dream
31	Funfair
43	
45	
46	
47	
48	
49	
50	


Composition number 1
1
2
3
Glockenspiel
Metallophone
Percussion misc
4
5
6
Gloc.
Meta.
Perc.
7
8
9
Gloc.
Meta.
Perc.
10
11
12
Gloc.
Meta.
Perc.
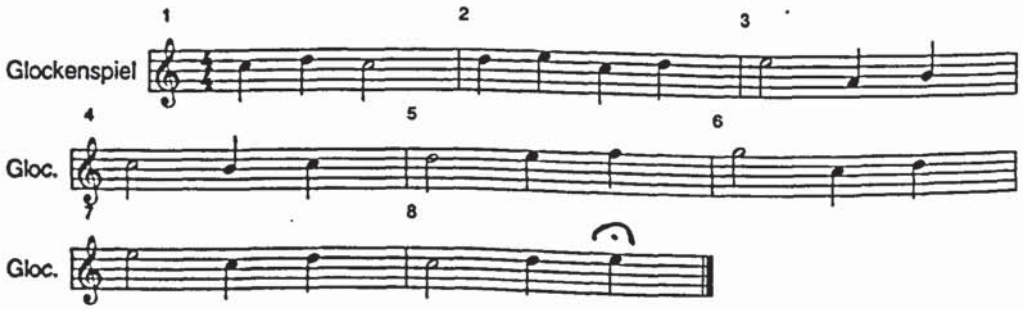

13
14
15
Gloc.
Meta.
Perc.
16
17
18
Gloc.
Meta.
Perc.
19
20
21
Gloc.
Meta.
Perc.
22
23
24
Gloc.
Meta.
Perc.
25
26
27
Gloc.
Meta.
Perc.
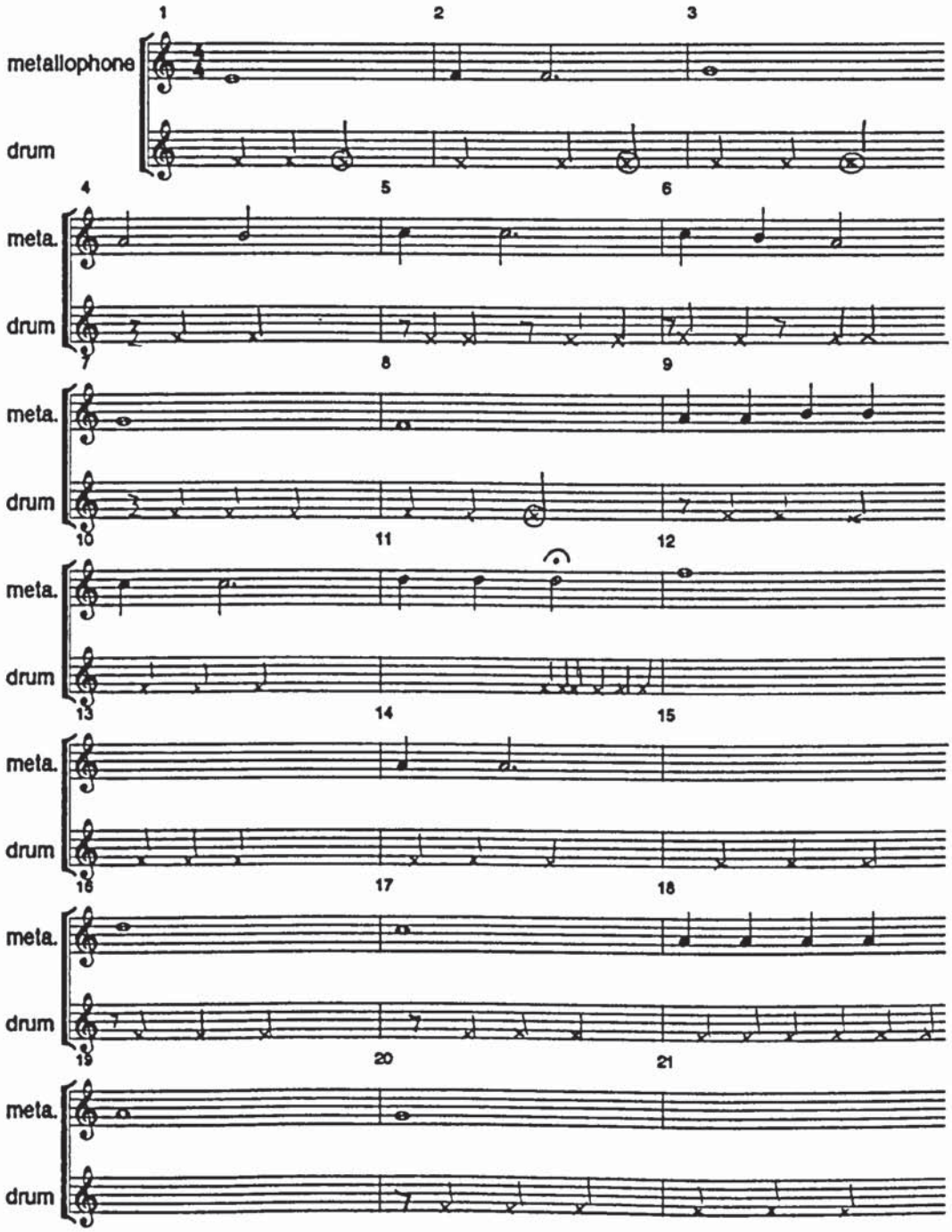


Composition number 2

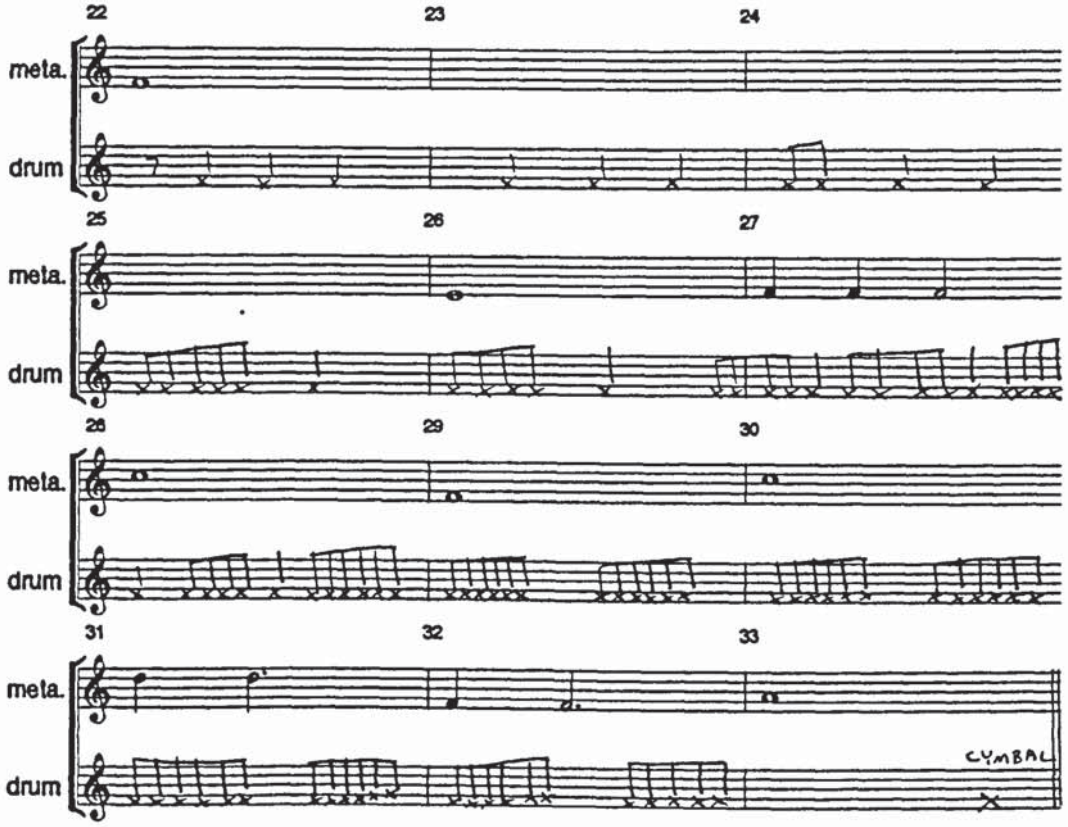


Composition number 3
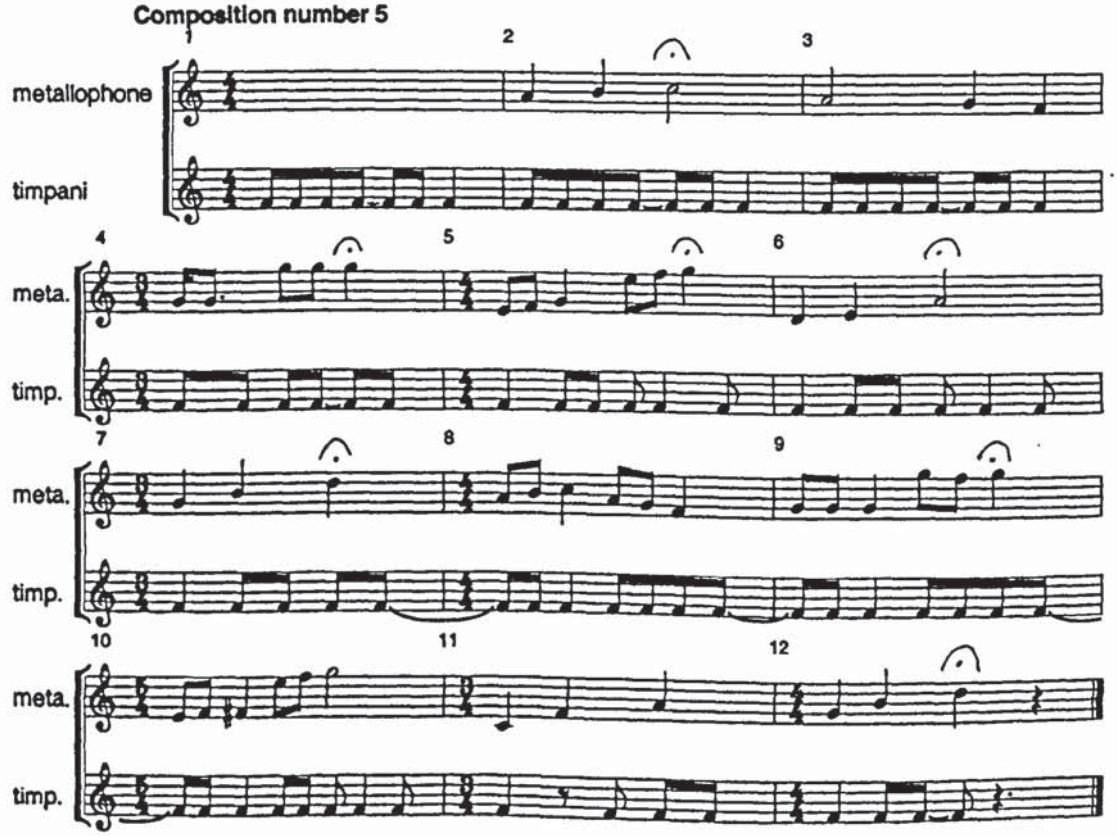


Composition number 4



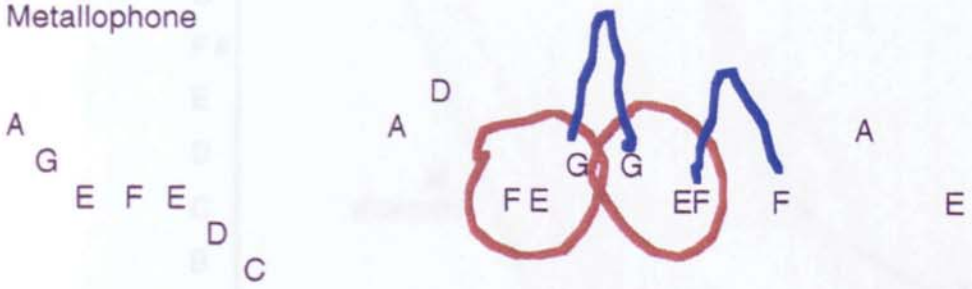


Composition number 5



Composition number 6

Waltz
Metallophone



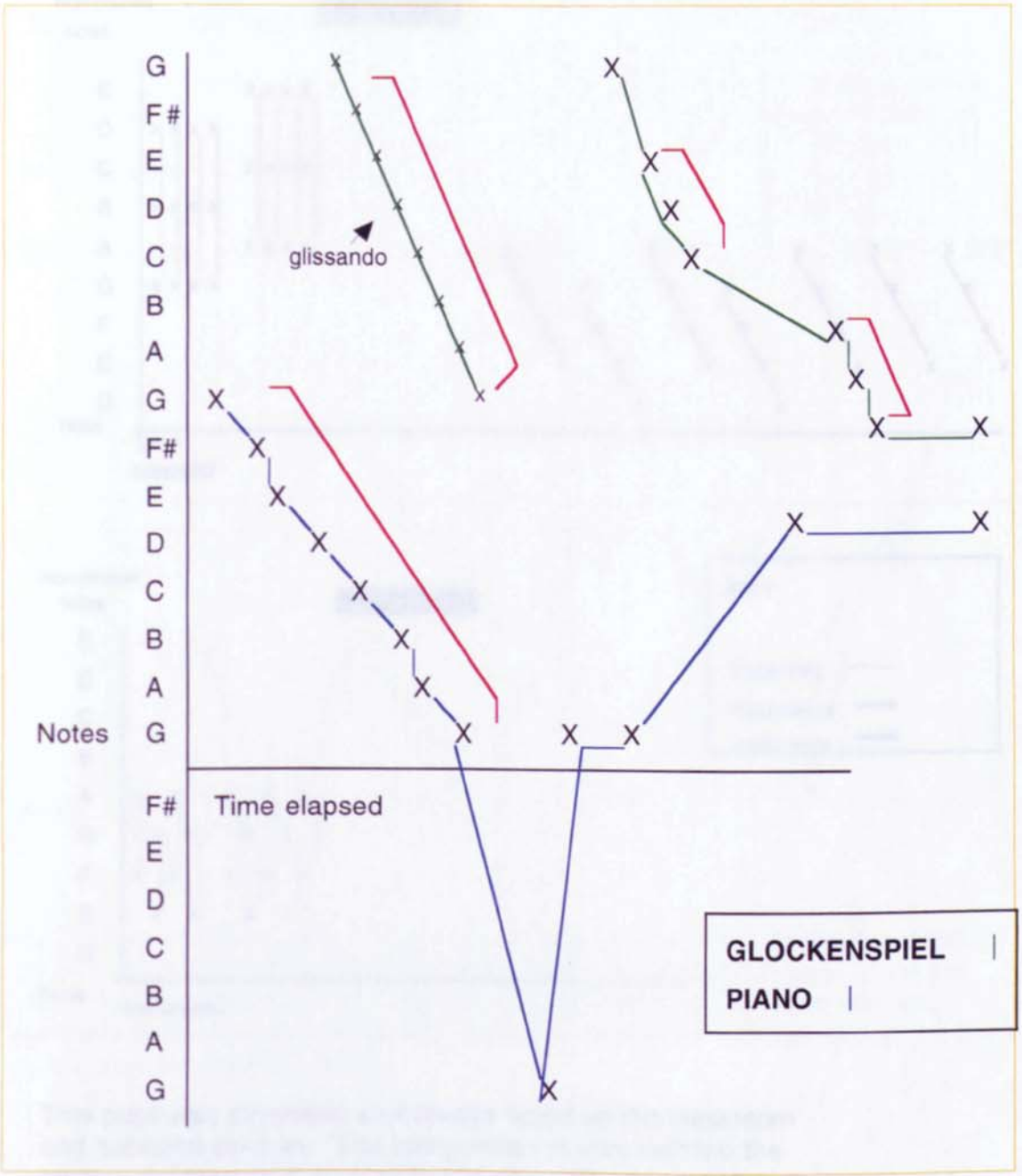
reverse patterning

intersecting notes

(NB Musical notes are shown here in letters.)

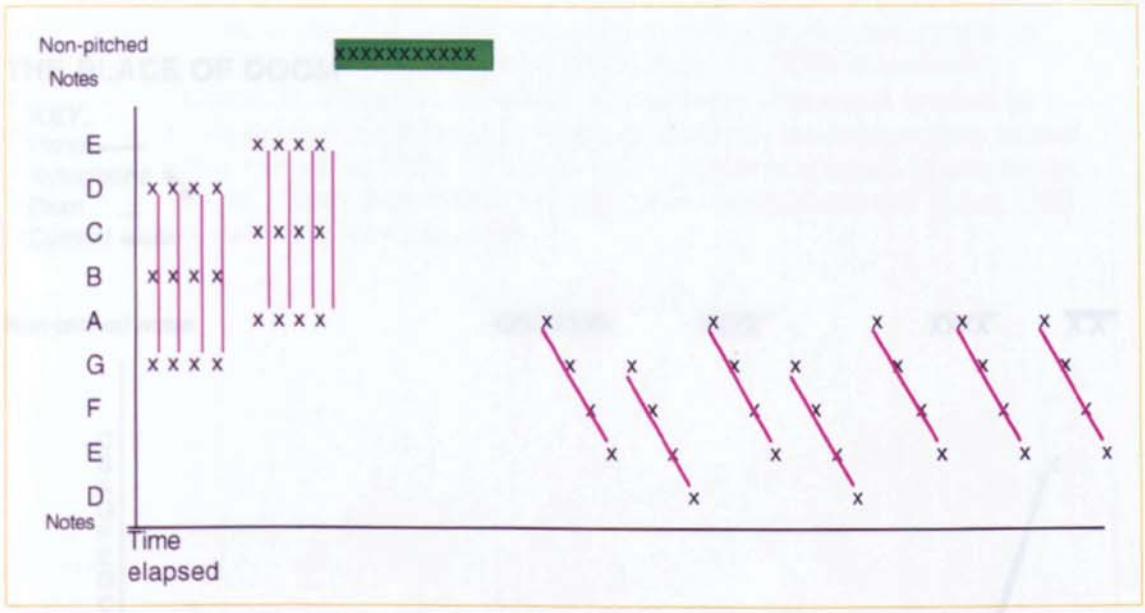
Composition number 7

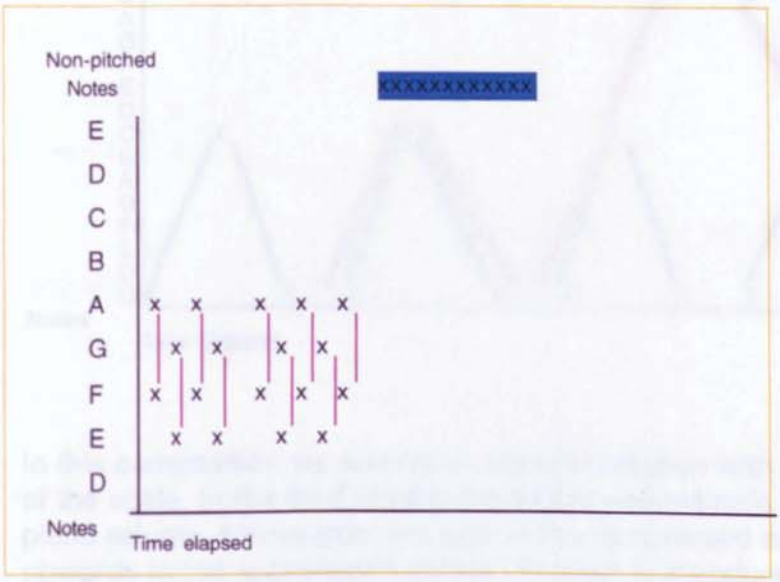
CHURCH BELLS



Pupil 'a' (piano) took a year to relax into composition, following very formal music lessons, at first he complained that he could not do it, but then he really enjoyed it. Pupil "b" worked a lot on his own, using sequences on the drums and later the guitar. The glock part initially follows the piano line, note the imitation shown, we see in the glock two small sequences where the 3 note line imitates itself. Pupil 'a' was seen to experiment a lot with octaves [i.e the displacement of] and scale passages.

Composition number 8



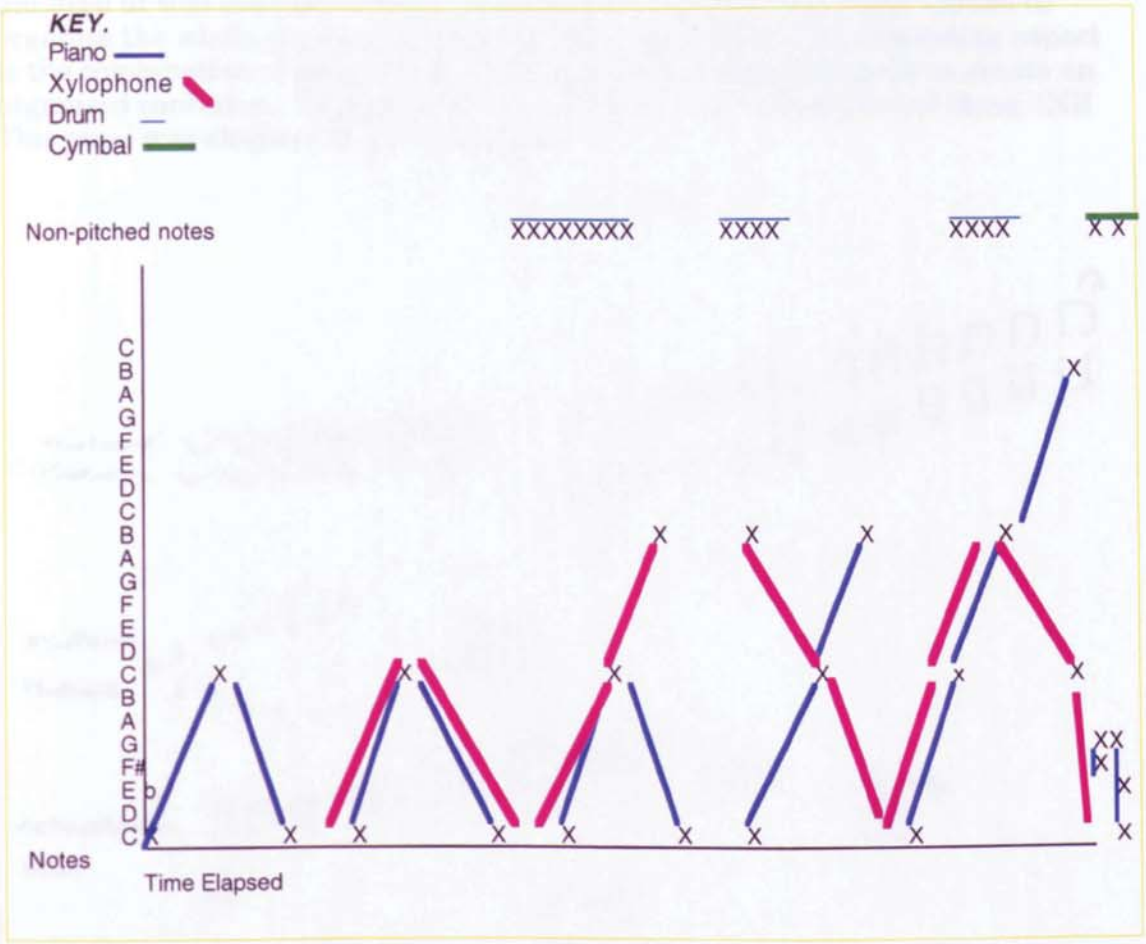




This pupil was organised and always tidied up the classroom and collected pens etc. This composition is very metrical the section divides are: 4/4/11/2/2/3/4/4/1/12 We see use of sequences in answering phrases and contrast provided by differing timbres i.e. sleigh bells and drum.

Composition number 9

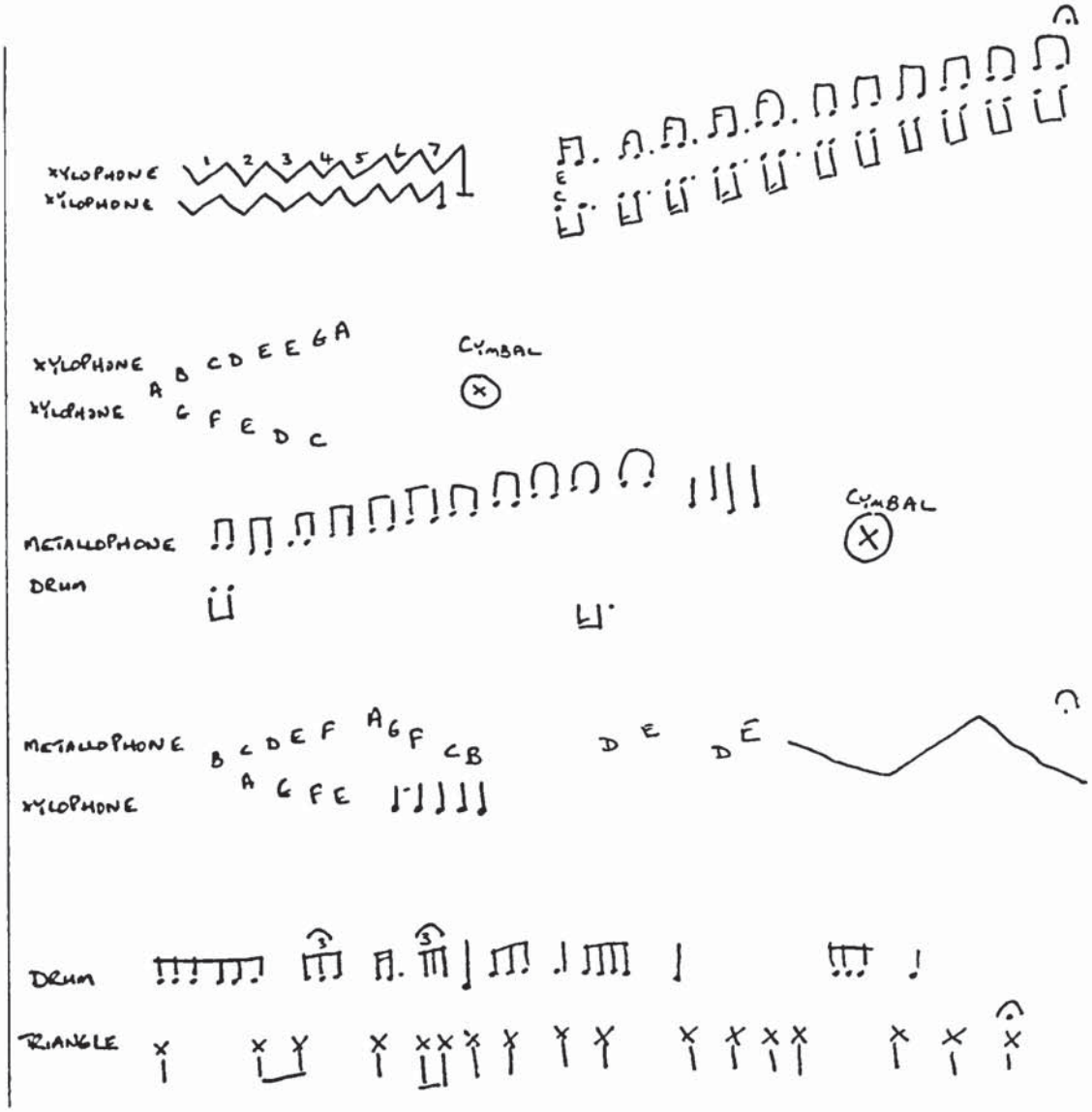
THE PLACE OF DOOM



In this composition we see much experimentation with octaves and the direction of the scale. In the third phrase the xylophone extends up the scale whilst the piano returns downwards and part of this is reversed as the piano extends upwards in the subsequent phrase. A crash is introduced on the cymbal for the last bar which depicts the title.

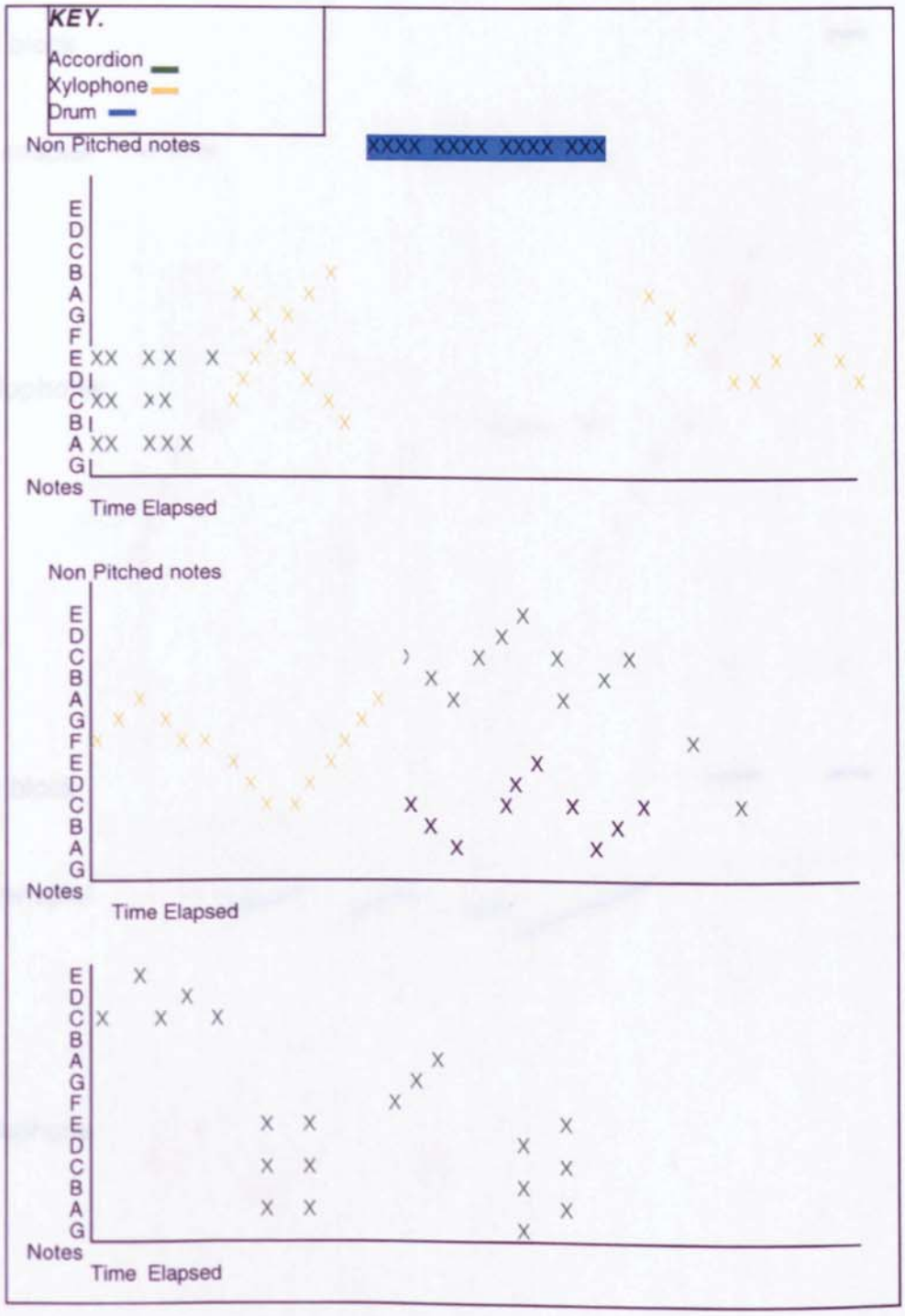
Composition number 10

This pupil preferred to compose alone and spent much time thinking prior to action. If this pupil worked within a group the others would be constantly annoyed at this time for thought especially as moreover this pupil tended to organise the whole groups' activities. In this composition the interesting aspect is the combination of feels and the differing uses of time and space to create an organised confusion. This piece shows a progressive combination of ideas. (NB This pupil was eloquent in two languages.)



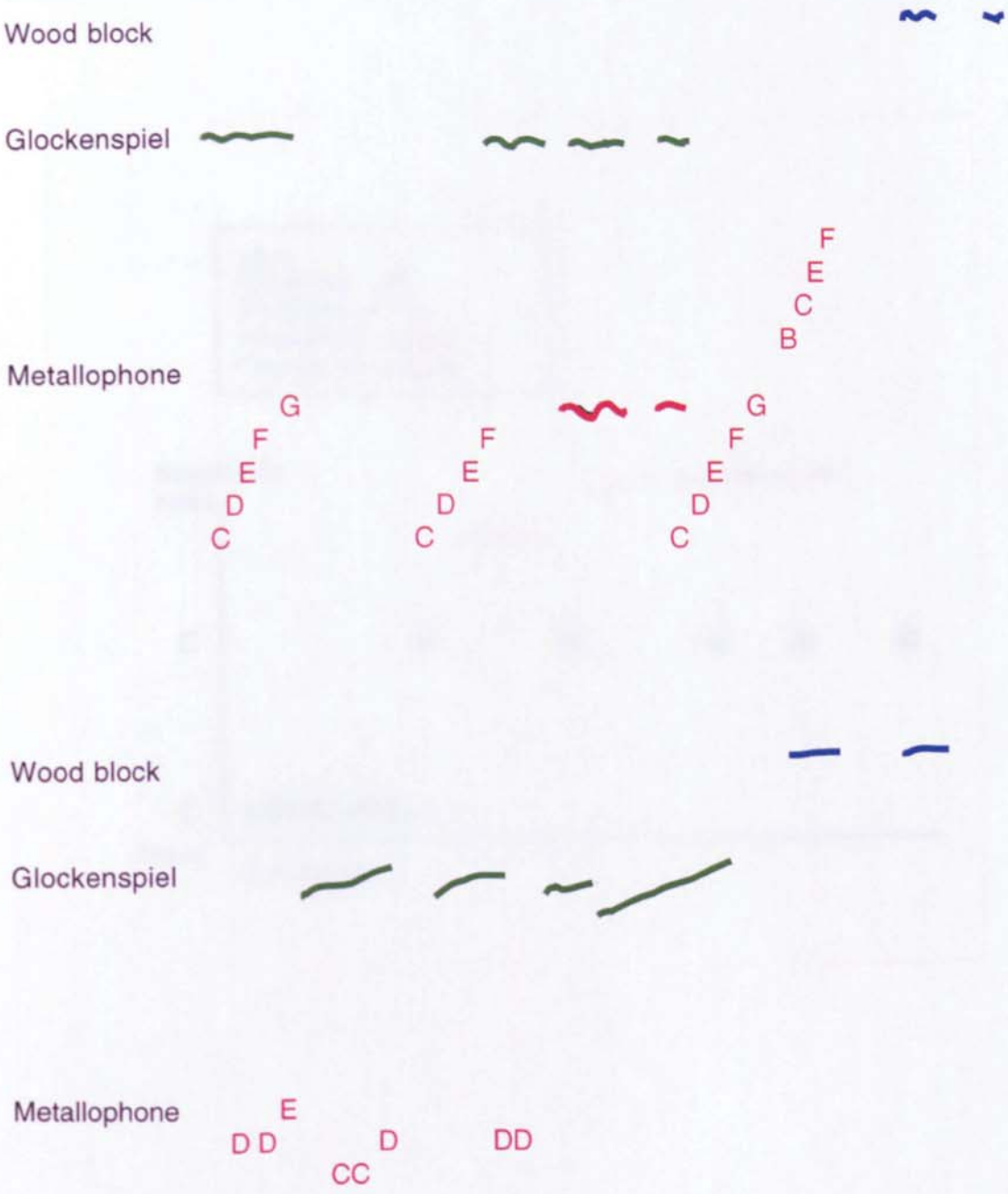
Composition number 11

Following a triadic introduction a pattern of notes in a scale forms a crisscross contrary motion and this is followed by a phrase of rhythmic dialogue. Finally a melody emerges. The concluding triads are taken from the introduction. We see here a combination of different musical thoughts blended together and which flow into a melody.



Composition number 12

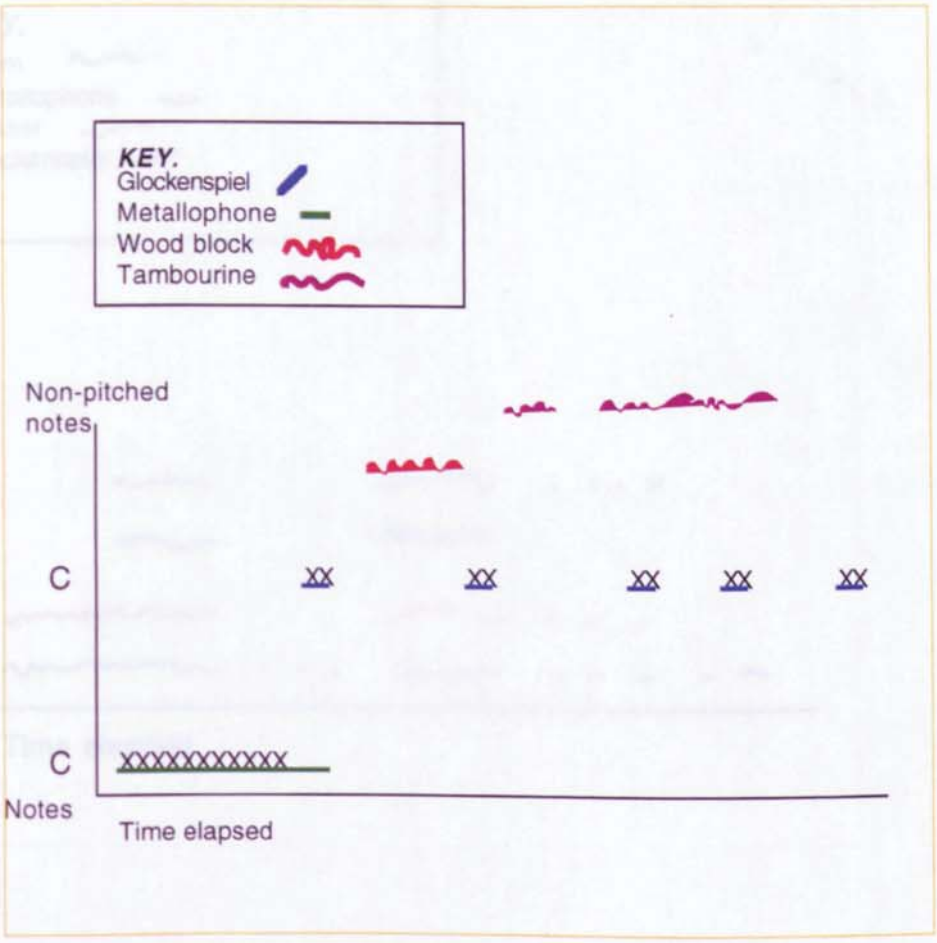
Train



Completion of a musical section is shown by the wood block. The metallophone line extends in its first phrase and retracts, using imitation in its second phrase.

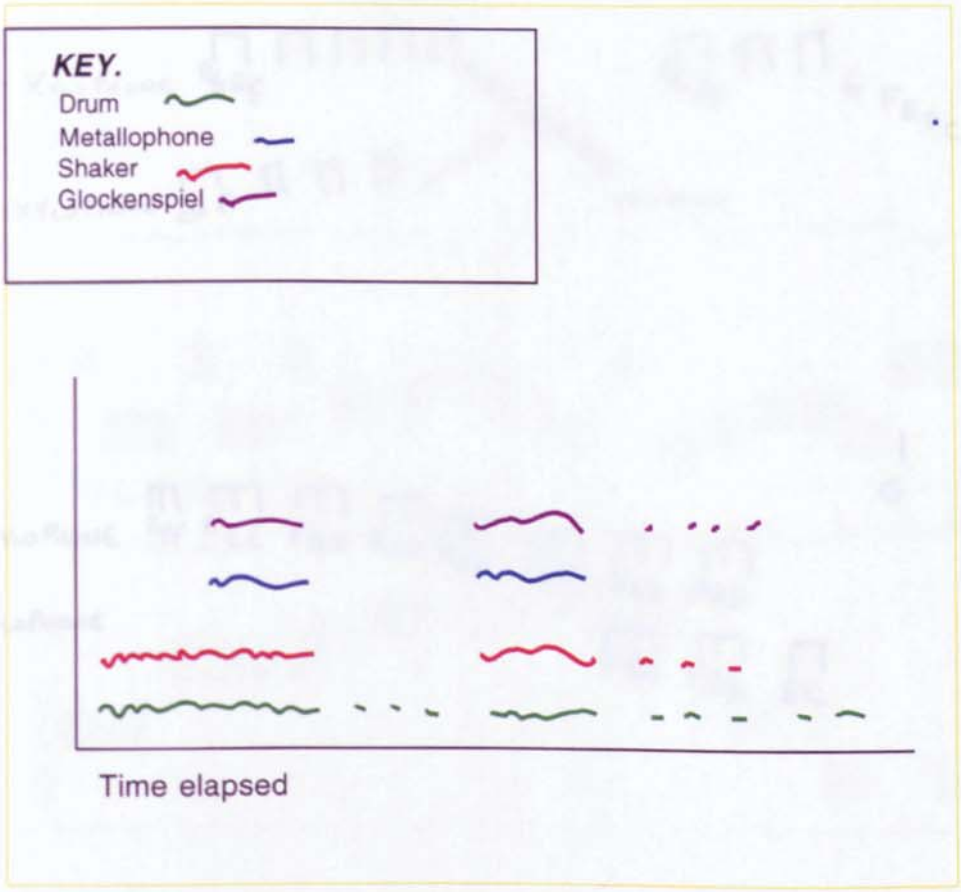
Composition number 13

The visual stimulation for this composition was that of a train and train's whistle. I imagine the opening metallophone figure to represent the train before the whistle blows.

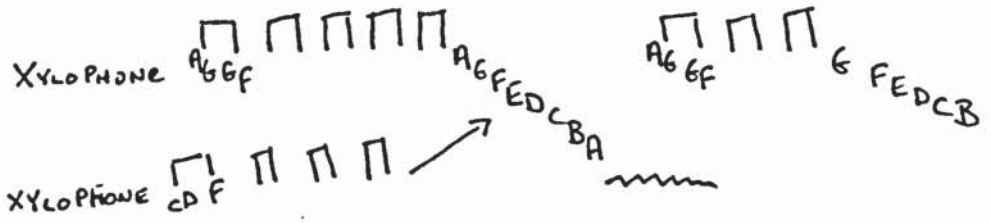


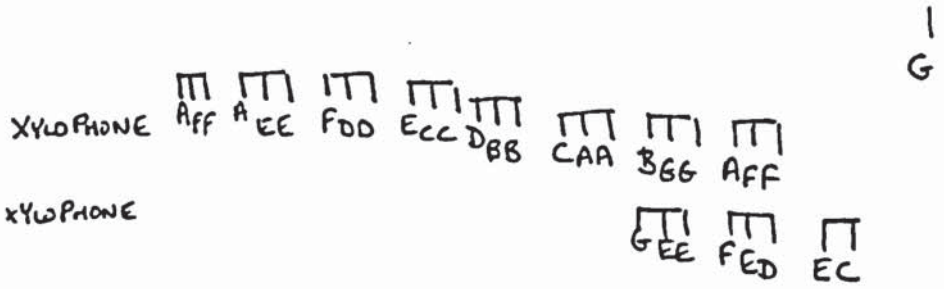
Composition number 14

The premise behind this composition is an imaginary image of a train that slows up and restarts. In contrast to the Year 2 compositions here we see the pupils have the ability to control their performance and thus shape and structure the composition in addition.



Composition number 15

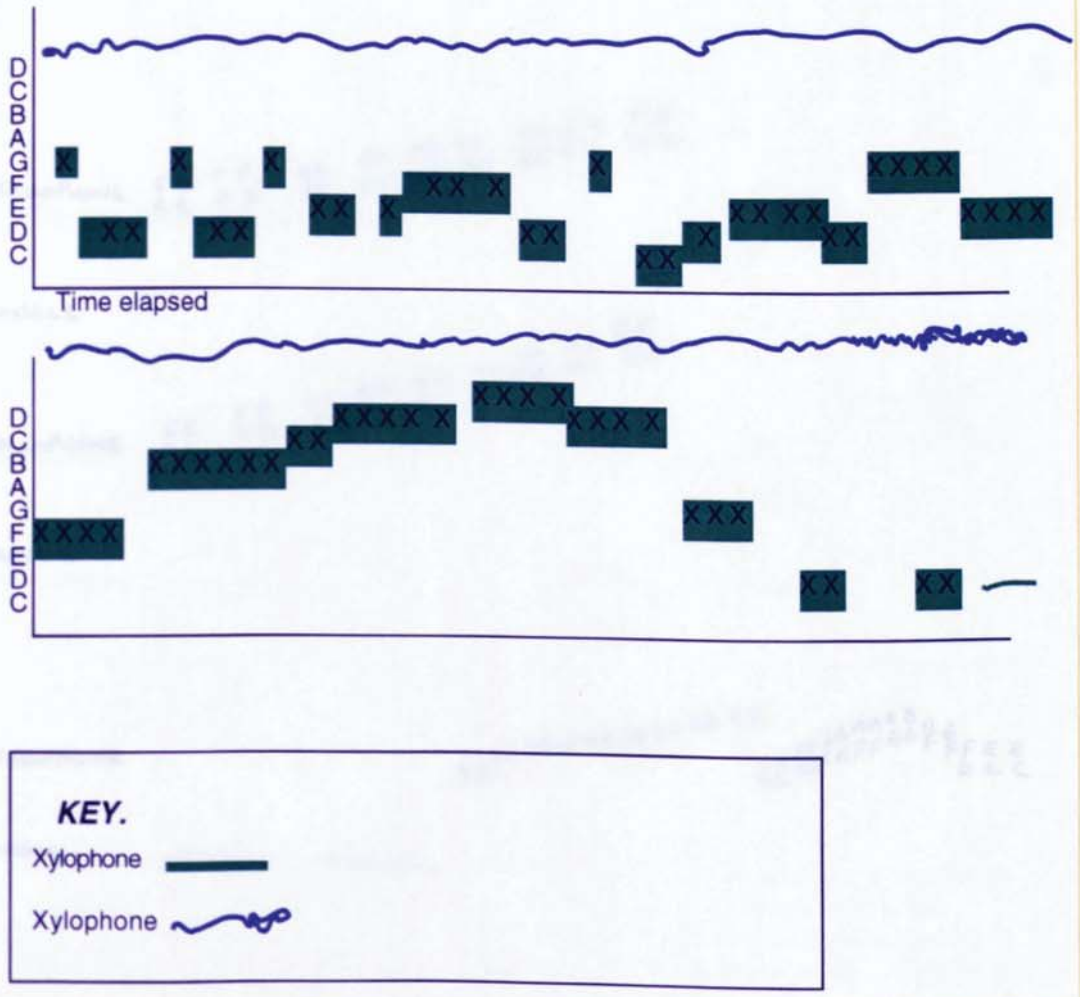




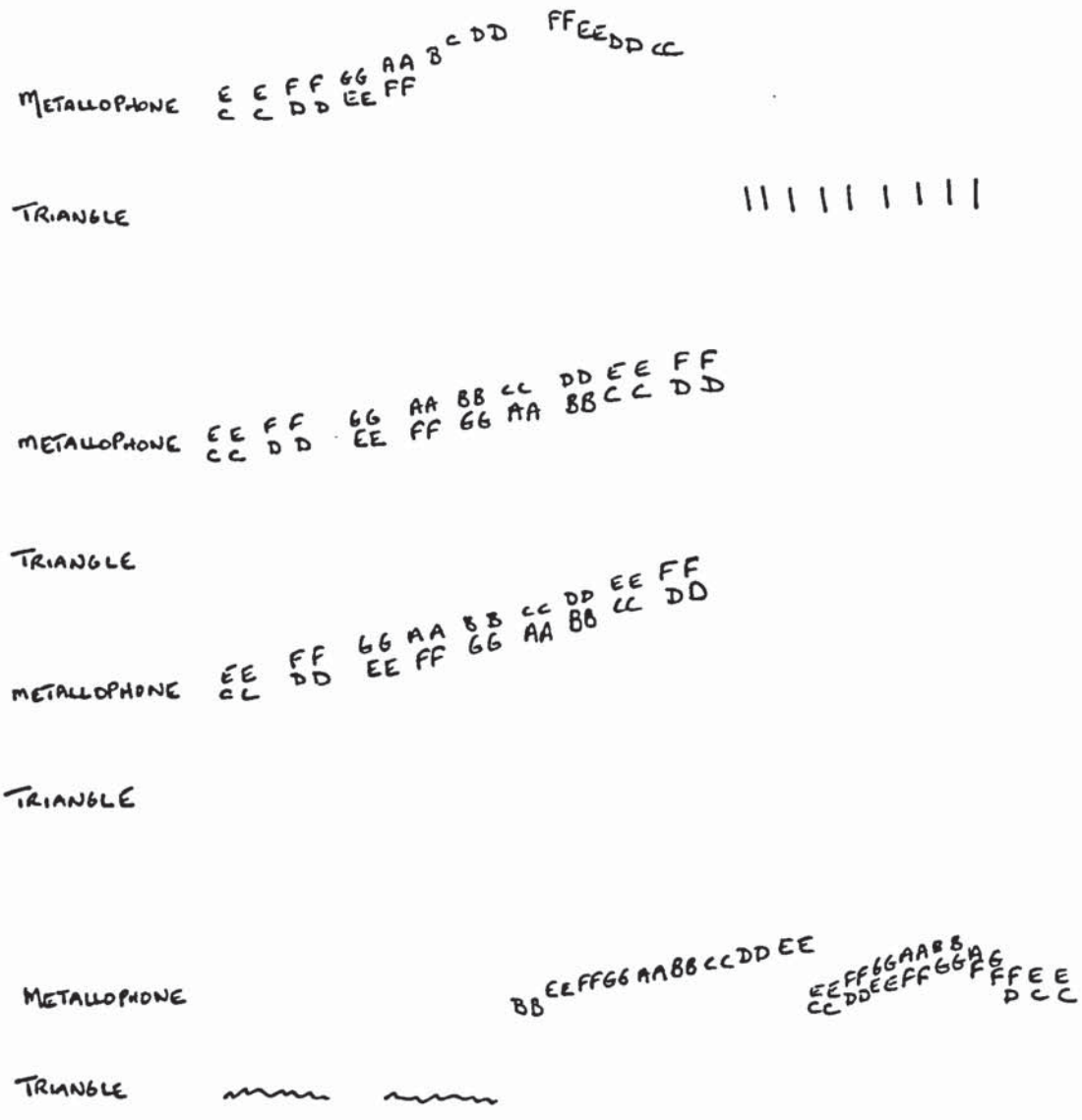
Composition number 16

A repeated slurry of glissando secures the boundaries (formally) for the musical ' line' underneath which seems to question and answer itself. This is extended into 4 note repetitions which, at the end, revert back to the 2 note "id's" if you will. The other xylophone then has a go and accelerates to the end. (This acceleration to end is also seen in Year 2 compositions as a means to try and finish a composition.)

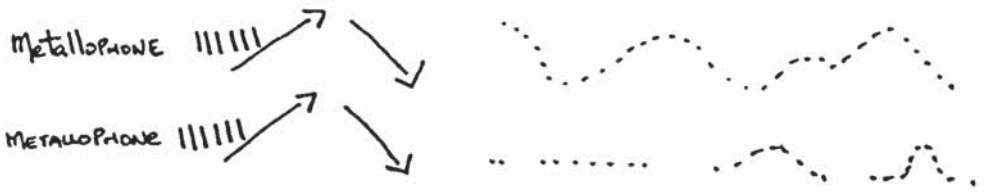
Cheetah



Composition number 17



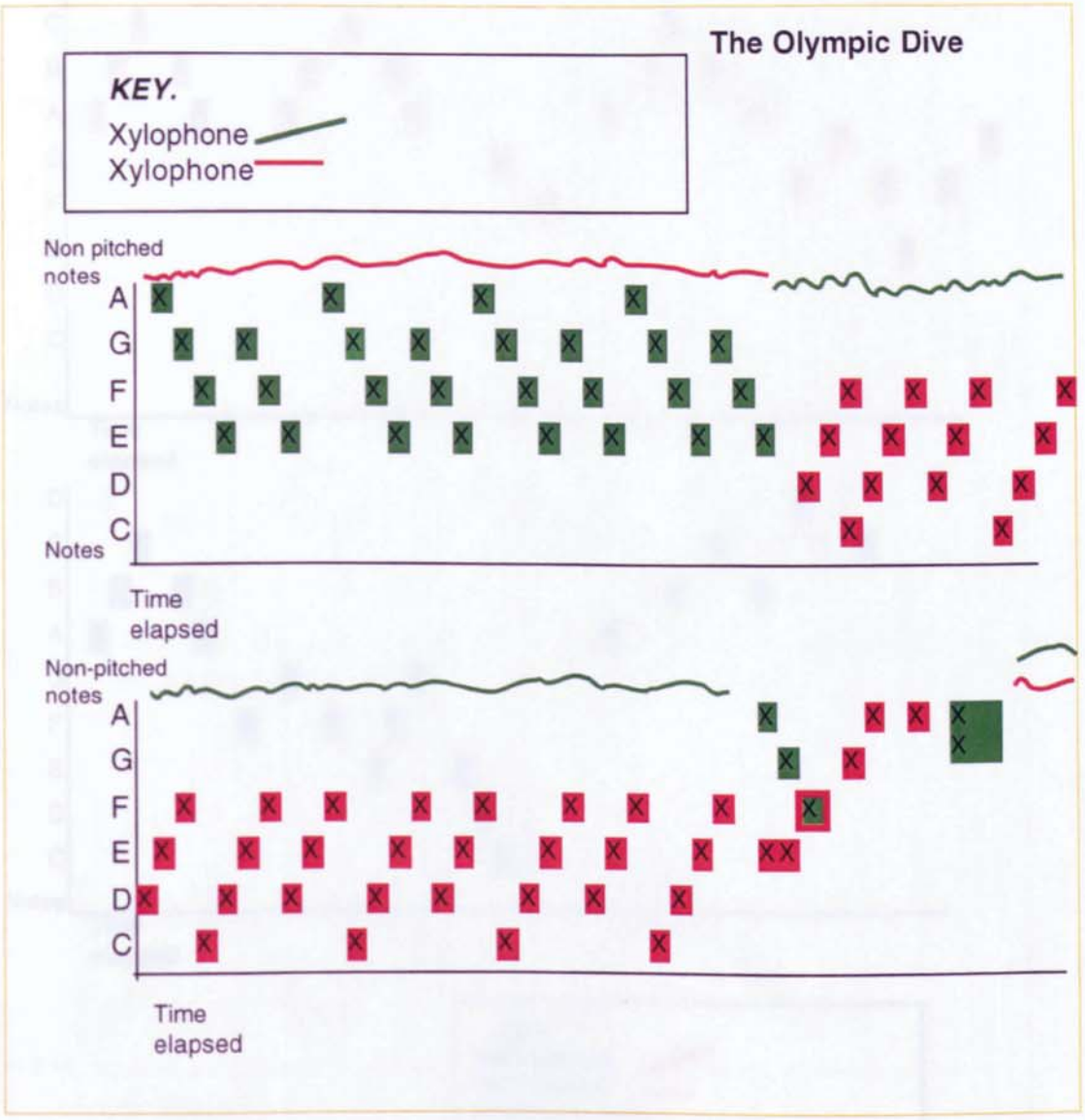
Composition number 18



Composition number 19

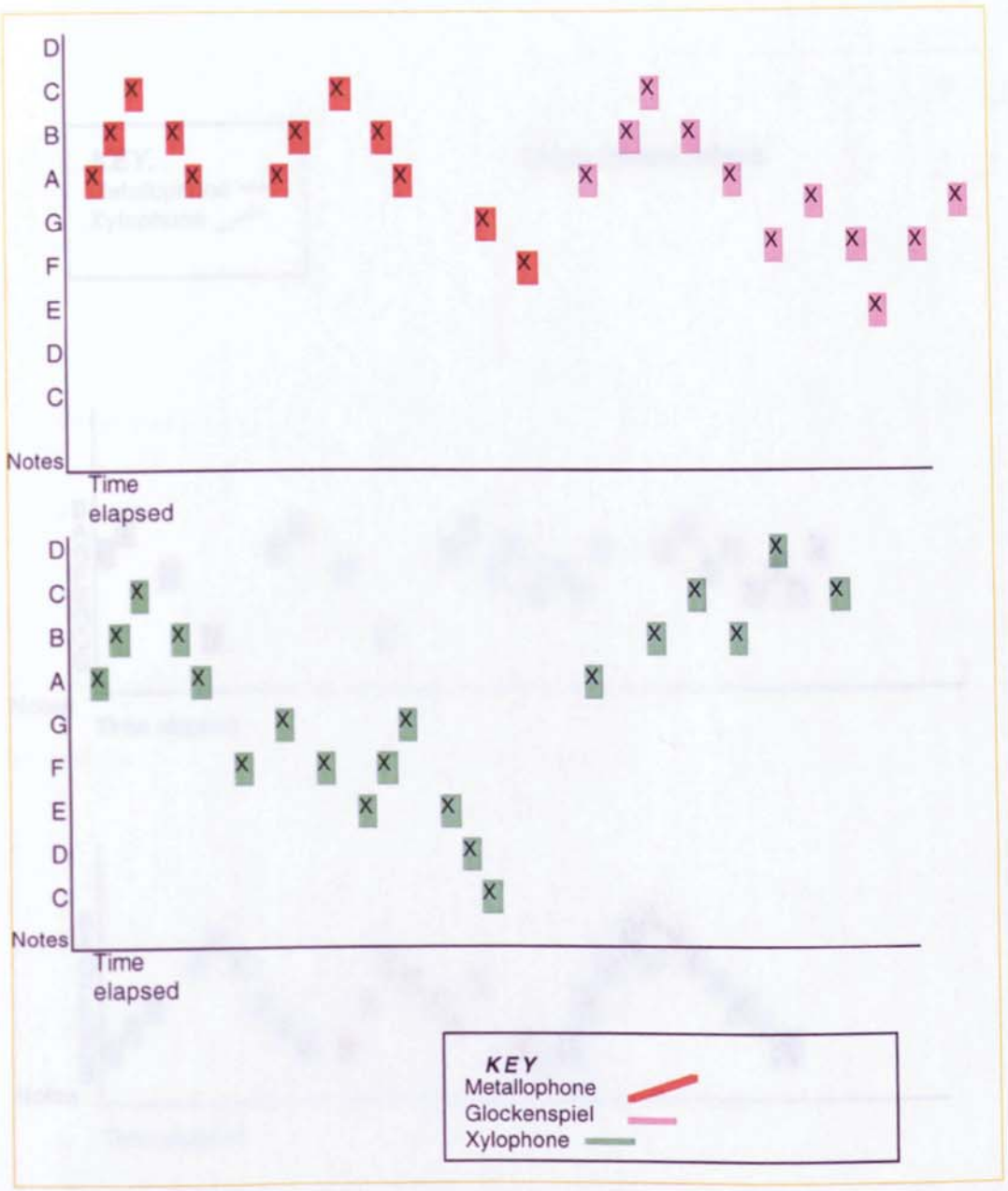


Composition number 20



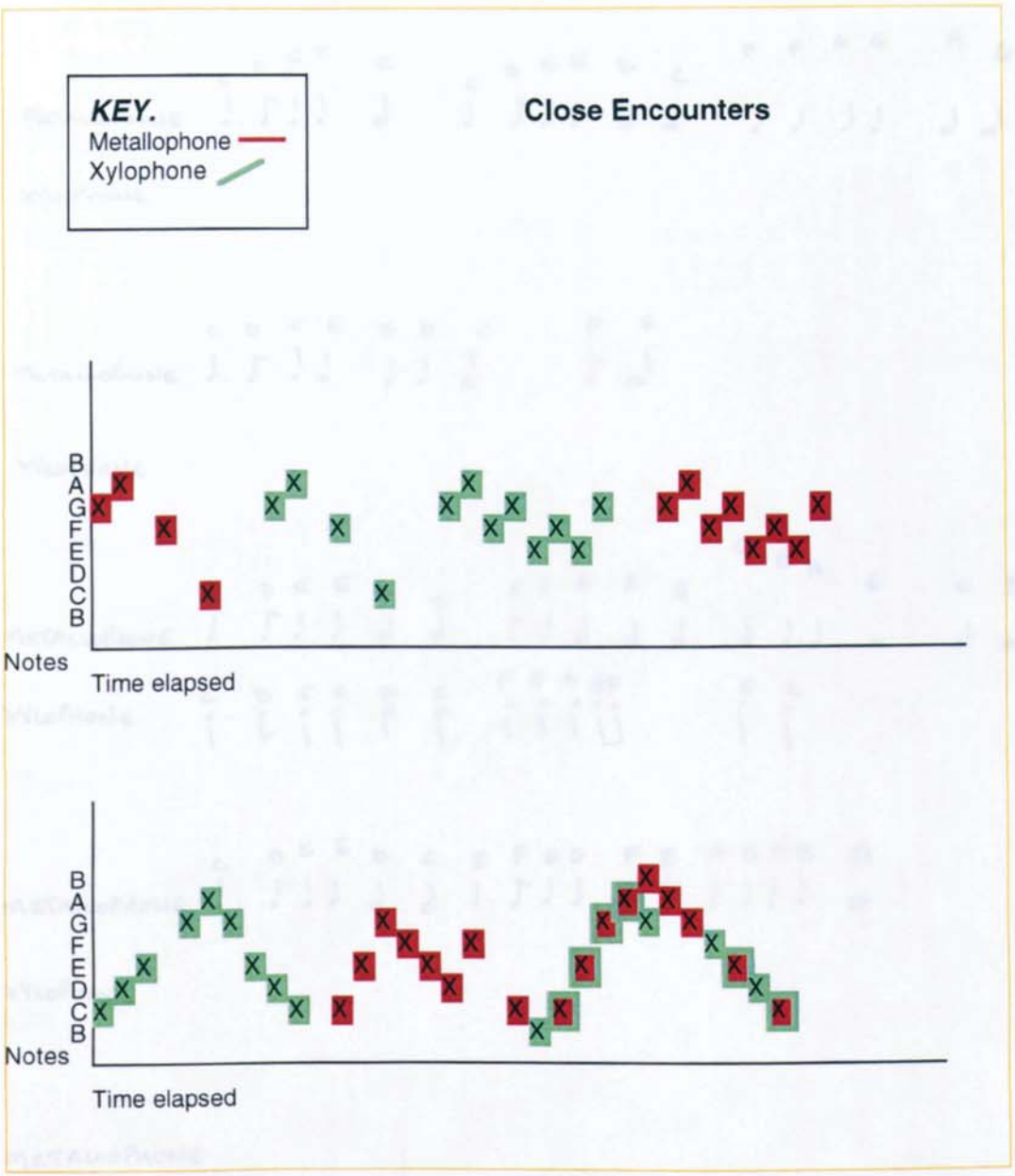
An exchange of musical line is seen in the opening phrases between Xylophone 1(red) and Xylophone 2 (green) a repeating musical phrase which ends in reverse patterning. The glissando figure also swaps over. For the latter portion of the composition both lines draw inwards in direction of a conclusion. In this composition we see two lines of thought drawn into one for the end. Each individual line working toward the focus of direction.

Composition number 21



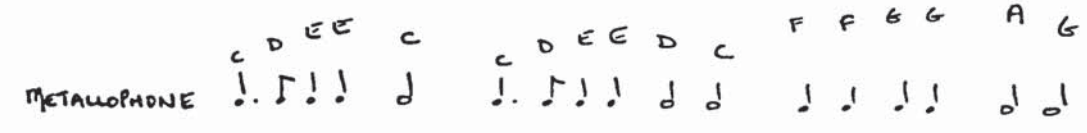
Theme, melody, stated and extended. The xylophone adds a new ending.

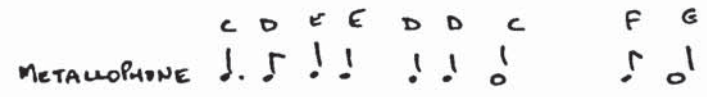
Composition number 22



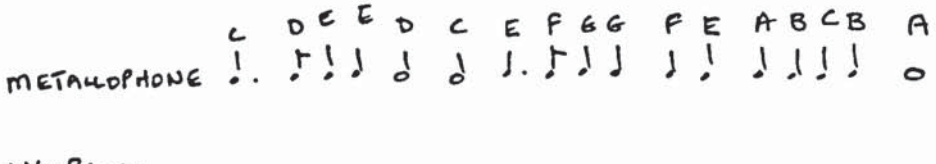
The theme here is taken from the film Close Encounters - this composition was an own choice subject.The theme is stated and then restated in differing ways, with both instruments concluding together. A fluid line of musical dialogue takes place and the melody of the film is thus extended in the pupil's minds. The musical fragment taken from the film is thus retained in the memory held there and used when needed (i.e. now) for the extension of thought. The theme may be amongst many in the "bank" of thought and themes from the mind of the pupil.

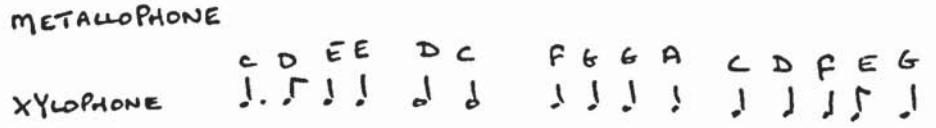
Composition number 23





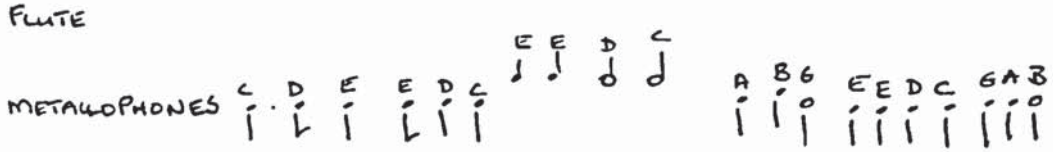


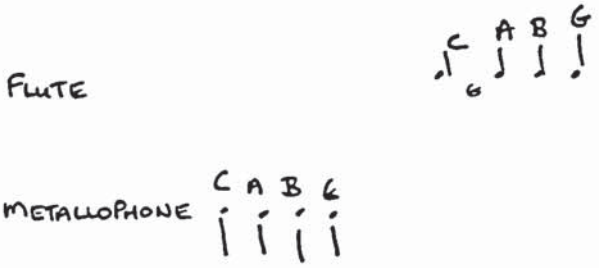




Composition number 24





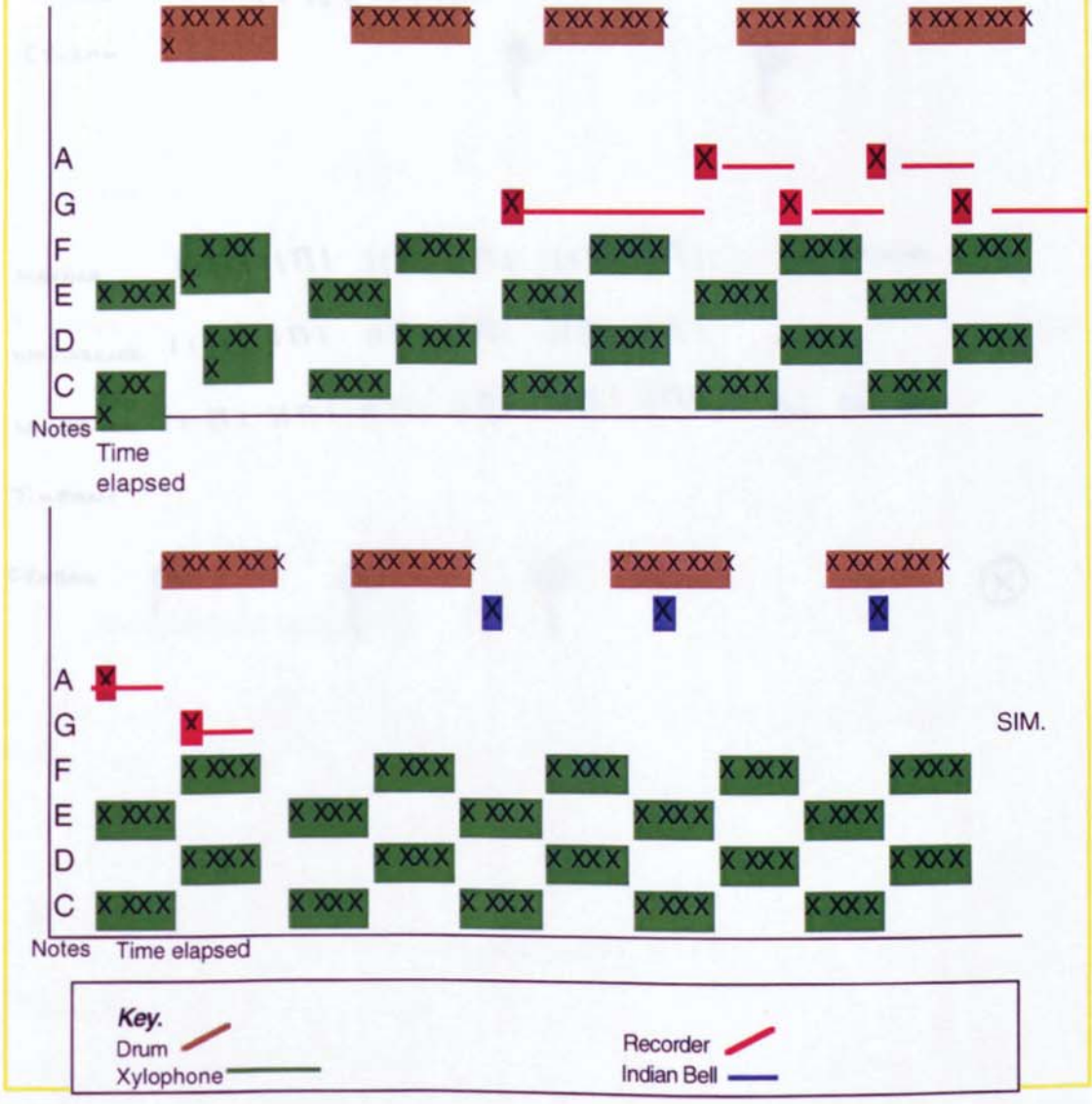


157

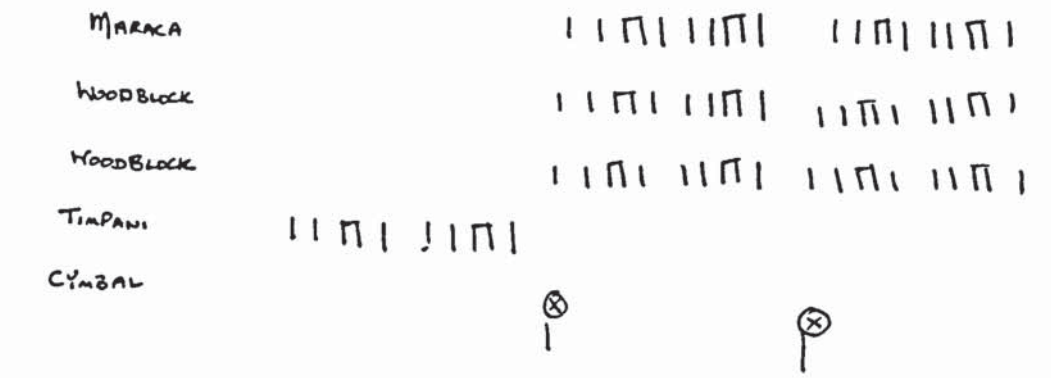
Composition number 25

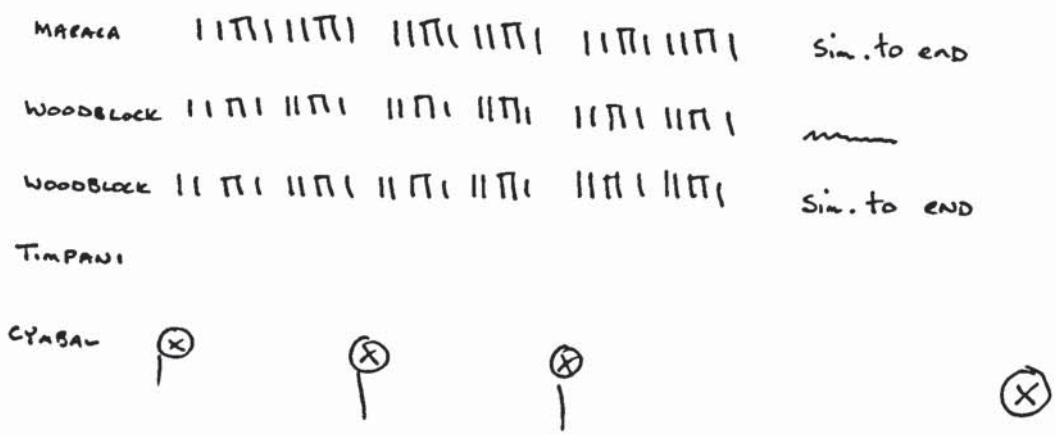
In three sections this composition uses differing timbres in each section. The middle section has a suspended melody played on the recorder against chords. The drummer was a pupil who was unable to keep any sense of "timing" in his playing and the other pupils did not enjoy including him in their group. He would also often get lost and go off in a tangent.

Raindrops

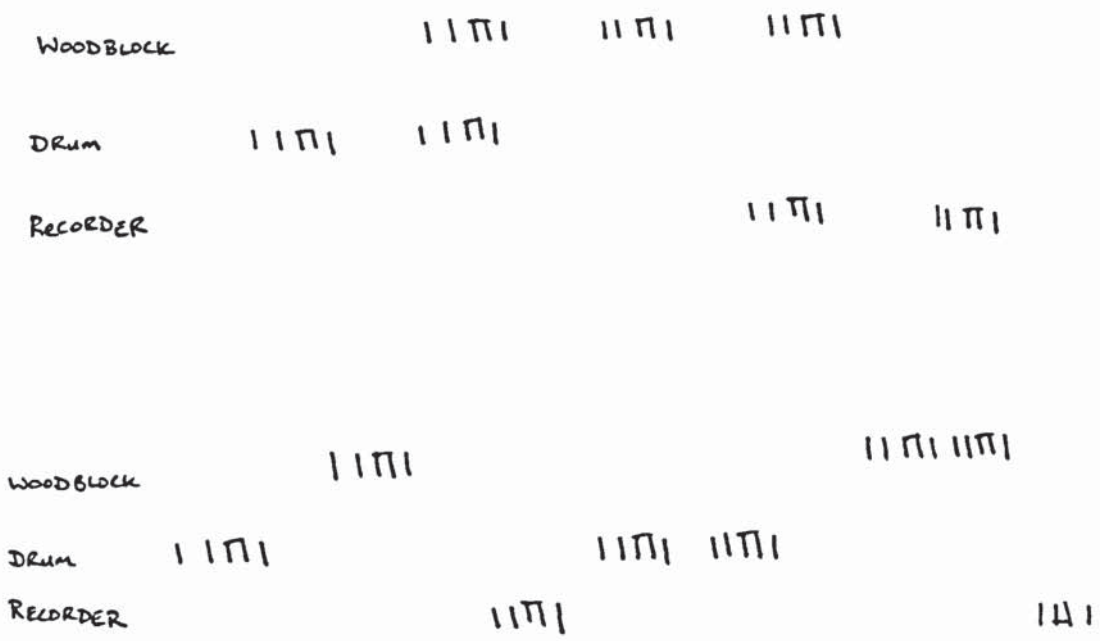


Composition number 26

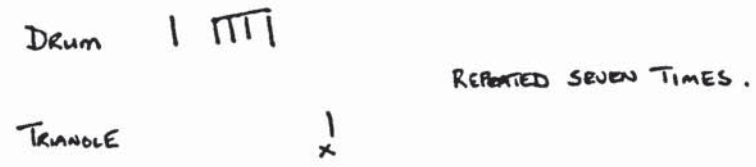




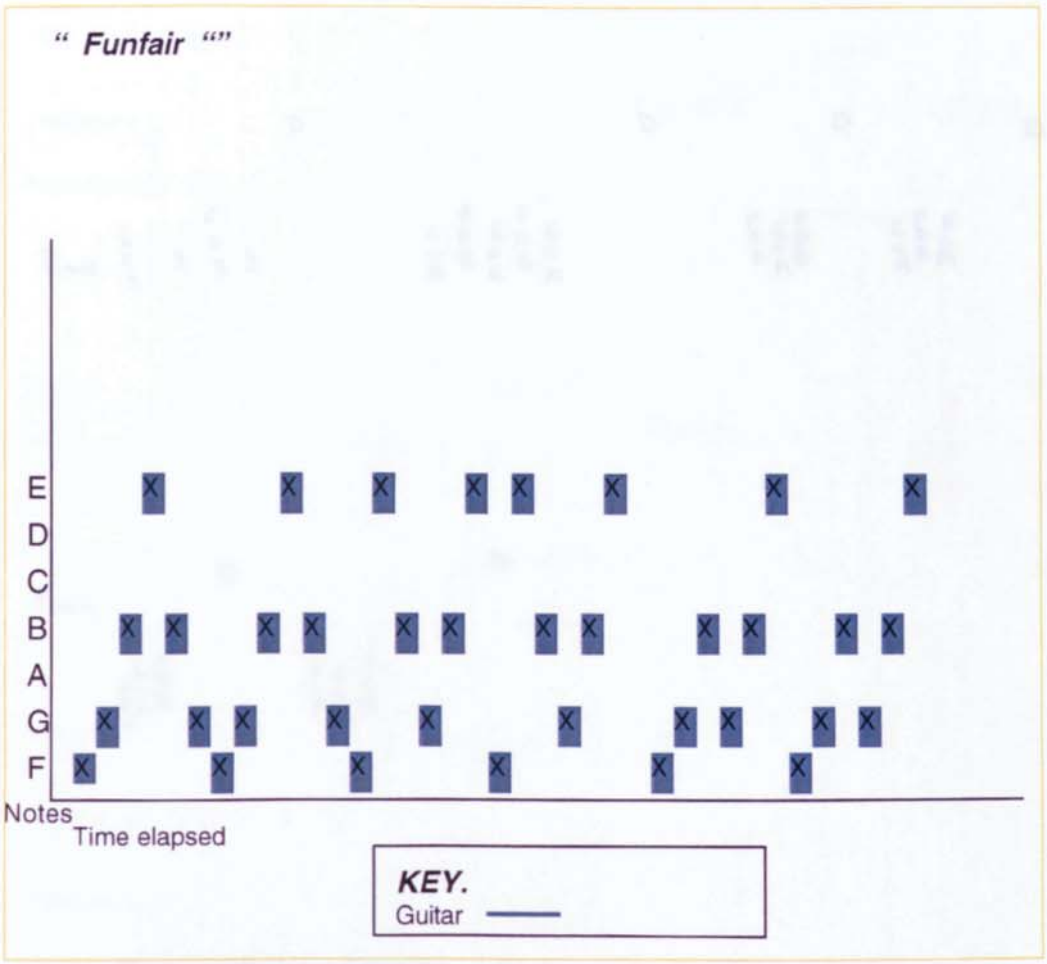
Composition number 27



Composition number 28

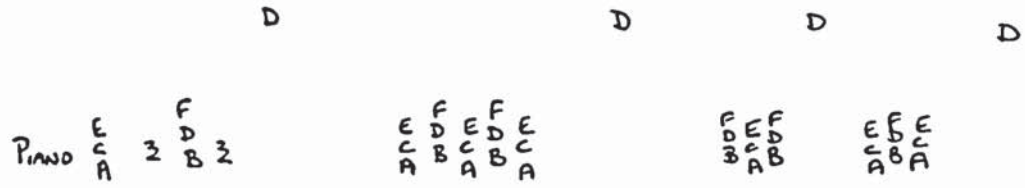


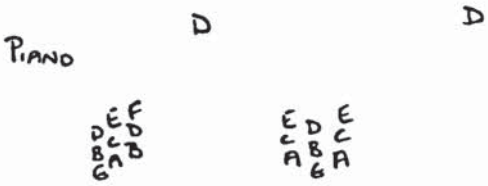
Composition number 29



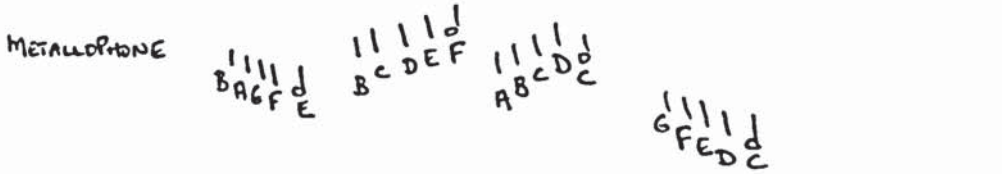
A melodic line that begins simply and then rambles as if trying to assemble itself into a form.

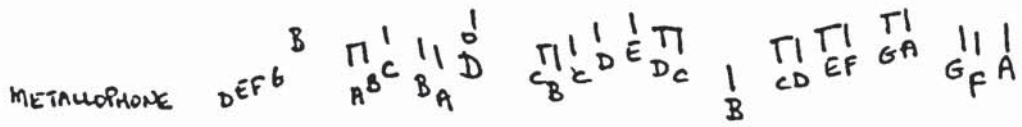
Composition number 30



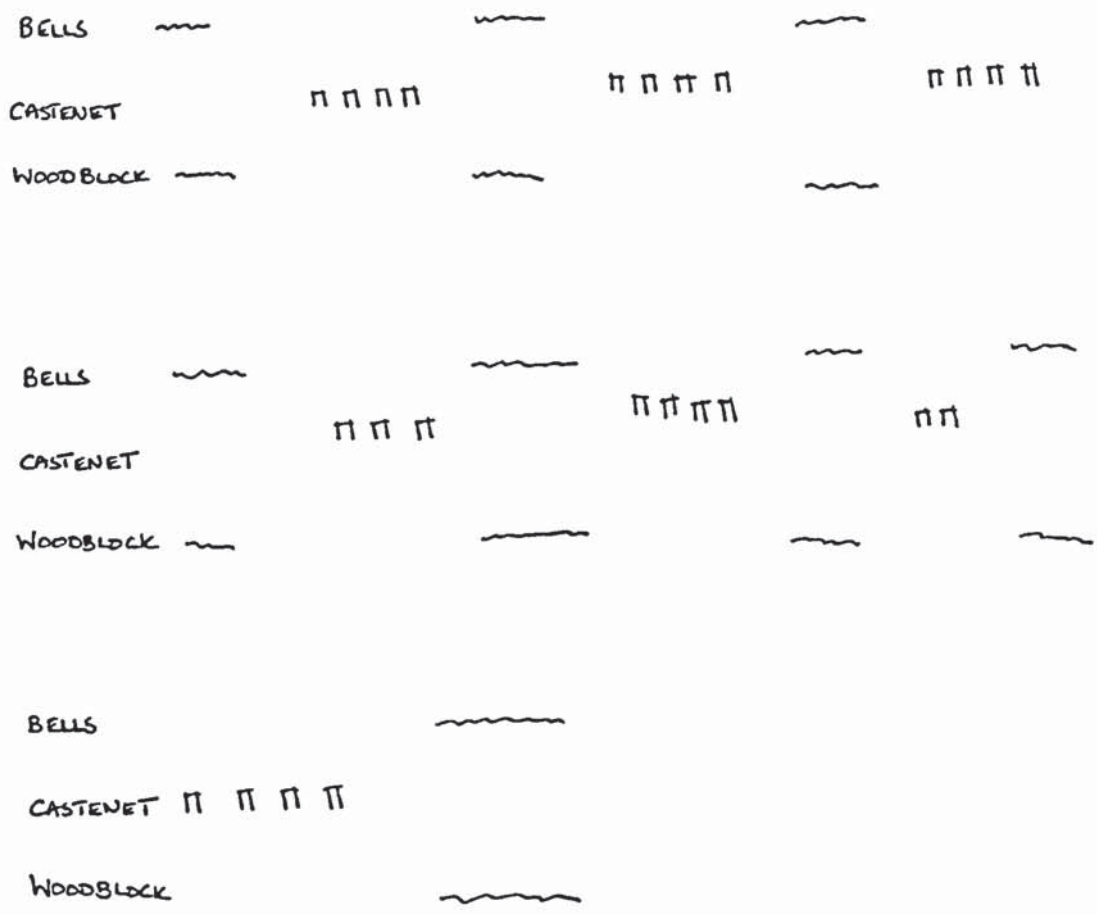


Composition number 31

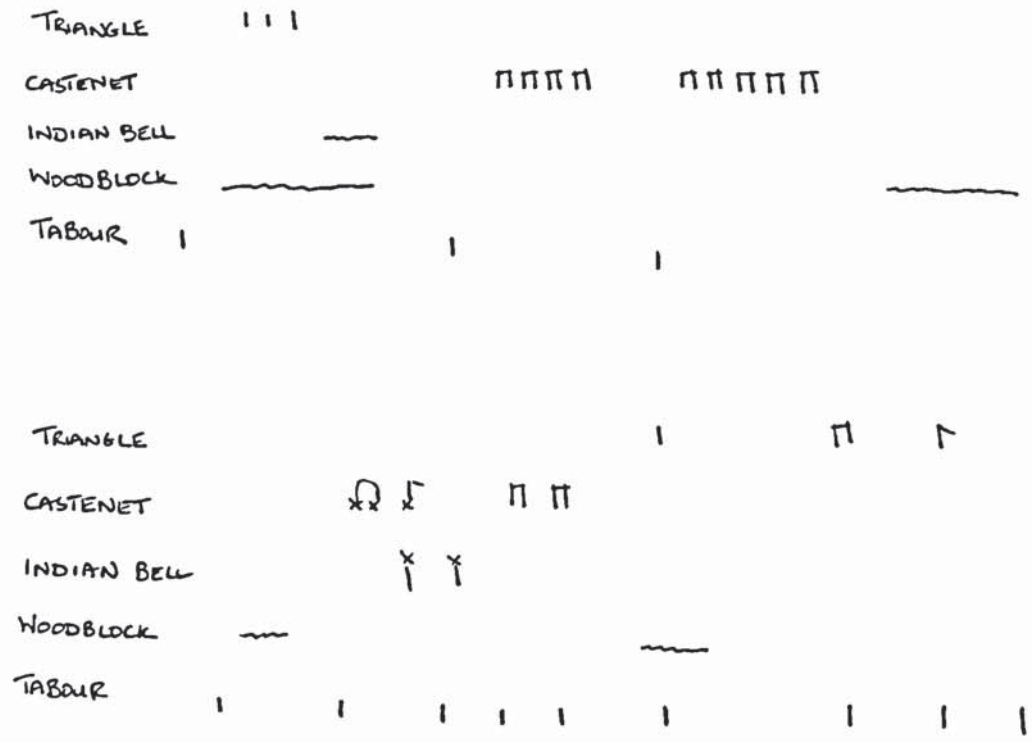




Composition number 43



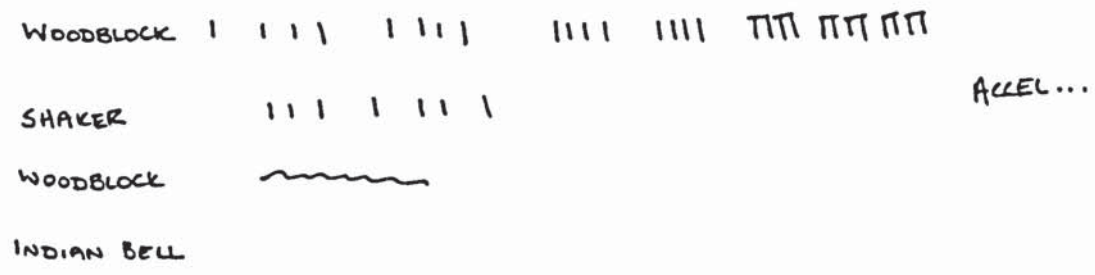
Composition number 45



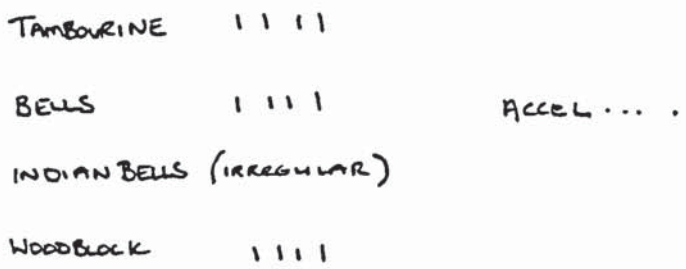
Composition number 46



Composition number 47



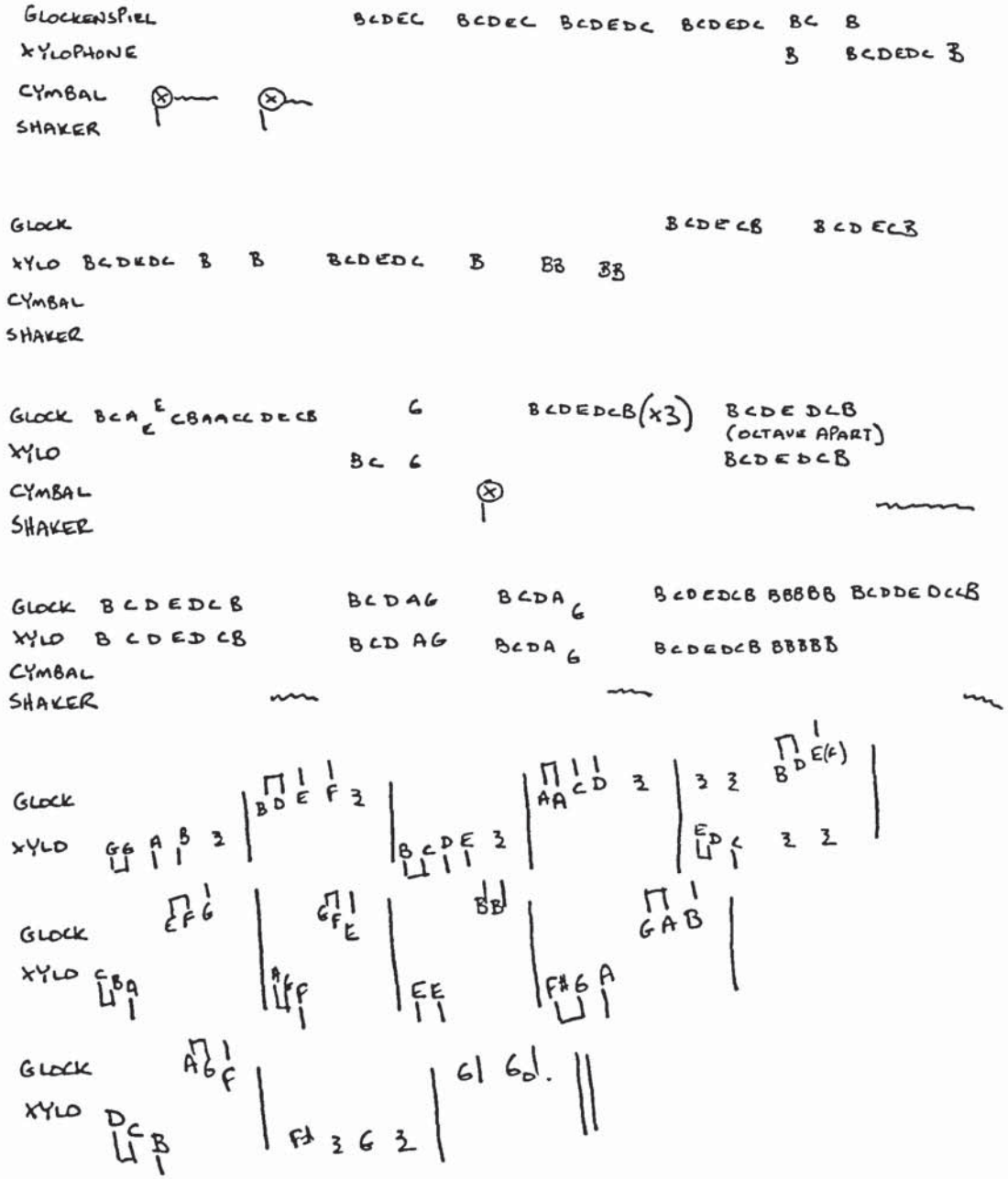
Composition number 48



Composition number 49



Composition number 50



Appendix G

Pupils who are seen in more than one year

	Year 2	Year 3	Year 4	Year 5	Year 6
Pupil "J "					
Composition No:		39		8, 26, 33, 39	2
Pupil " G "					
Composition No:			35	25, 29. 31	4
Pupil " W "					
Composition No:			37	9, 25, 34	
Pupil " D "					
Composition No:			37	10, 25, 30	4
Pupil " M "					
Composition No:		38		27, 32	5
Pupil " O "					
Composition No:		38		28, 29	7
Pupil " JG "					
Composition No:	45		22		

Appendix H

Deborah Mollison: an informal interview with Professor William Tiller: Emeritus Professor, School of Engineering, Stanford University. September 6th 1993

DM:
you state:- "the many energy frequencies move in geometrical patterns." - could you expand on this statement.

WT:
Now this first one, "many frequencies move in geometrical patterns," many frequencies again its the business of the Fourier superposition, so any pattern is a super-position of waves with those appropriate frequencies and appropriate amplitudes to build that pattern, so in the physical level, or the etheric level of the astral level or the mental level or the spiritual level, its there, that's what I mean. When we way "move" in geometrical patterns, the moving would be that we are including time in them so its four-dimensional it's like as I said (this thing i.e.Fourier) - so its the same thing.

DM:
Hans Jenny's' experiments show that "Sound frequencies have the propensity to call into arrangement random, suspended particles." In other words, sound is an instrument through which temporal frequency patterns can become formal, spatial and geometric patterns. Do you agree with this?

WT:
O.K., this is like the Cladni vibrational things, in that particular case; everything, everything has natural vibrational resonances, so as I said here is this shape, it has a sum of waves would define that shape. If I tapped it, (with something) then if I could look closely enough I would see the wave interference then, giving rise to standing wave patterns just as on a pond or on a membrane that's tied in circularly or tied square or tied triangular - those are boundary conditions that cause wave reflection and the wave reflection produces interference patterns which are troughs and peaks - and those patterns are the Cladni figures.

DM:
Would you consider it possible that frequencies of sound form such a geometrical pattern when analysed within the structures of a piece of music?

WT:
The meaning of the correlation isn't known yet. From the other things, the Fourier superposition, one would think that there's another variation not just frequency but also amplitude, which comes in. If its just frequencies, then it says the amplitudes are constant, for some reason, there's probably something to be learned as to why its something of the other. As well there is something to be learned in terms of the deeper meaning, if indeed the Fourier superposition approach is meaningful with music as well. I won't be surprised if it comes out to be meaningful, but its important to think about why it is meaningful. What is the expression, what is the deeper expression? I don't know what that is yet because I haven't thought about it.

DM:
Do you believe that sound frequencies creating the above-mentioned geometric patterns are registered internally i.e. body/brain, as we hear them?

WT:
Sound of course is terribly important to the body, and the body is a remarkable transducer of one form of waves into another form of waves. In particular the body has a) the membranes have a good deal of piezo electric material which converts electric signals into sound signals and vice-versa. Let me give you and example: If I have an electromagnetic wave of 10 megahertz (10 million hertz) signal coming into the body, you think, it turns out its wave length is about twice the size of our body, so it shouldn't couple very well with the body; however as it starts to stimulate certain membrane (aspects of the membrane) in particular the helical chains, this piezo electric effect causes the generation of a sound wave which then starts moving, and the sound wave for that 10 megahertz if the dimension is the cell, then the sound wave would go across the cell and will come back again at the same time that the trough has come of that electromagnetic wave and its because the sound velocity of the body is about one, on millionth of the electromagnetic wave velocity, so that although the resonant wave length is like twice the body size directly, its the size of the cell when it converts to sound. So it can stimulate the cell, and if you shift the frequencies it can stimulate an organ etc. So you can see outside stimuli coming in and then there's inside stimuli going out. Now lets go the other way, or from

the aspect of the cell itself, its moving, all its mechanical vibrations, the heat motions and everything else, there is a resonance at that frequency which travel through the body and through the piezo electric coupling, there's also a wave (electromagnetic wave omission) and organ, like the heart, the heart pumps and beats, it has resonances you can pick up electrically, and the resonances (which you pick up electrically) are really the sound resonances: its like the heart, think of the heart like a sphere, a sphere has many modes of vibration, it has one which goes like this, it has one in which this part goes up and that part goes down (so its a dipole) it has one which you have three waves around it, it has one with four waves around it, and one with five waves around it etc. If you take the electric signal from the heart and you go through a Fourier transform (which is just this kind of stuff) and display that on a computer, and people who can control their heart really get into their heart, what you see is a series of, like, pure notes at these different frequencies. So the body has all this cross talk of sound and such but it also has direct electric signals, that is even the atom. As an electron moves around the core either jumping to a higher energy state or down again, it omits an electromagnetic wave in the ultra-violet. If you combine atoms into a molecule, as they go through their energy states they're omitting in the red and infrared and so on. As you go to larger and larger structures you find that because of the movement of the body there's direct electromagnetic energy omission and so the frequency goes down and down. So the body is just pumping out these radiations both directly, electromagnetically and indirectly from the sound, and the body is pumping out sound also. (If we had sensitive enough things we would hear it!) So it turns our the body is like an antenna, and in antenna theory there are two parts:- there's the mathematically real part which is the wave that propagates and there is something called the mathematically imaginary part which is a standing wave-field very close to antenna, that's the aura. So there's a physical electromagnetic aura and from every one of these subtle levels the same process goes on. So all of that information is there, its in the body, its coming out of the body. If we had the tools we could read it, you could see.

DM:

In tests concerning the manipulation of visual mental images in children and adults it was found that the task demands had a greater effect on children than adults. Do you feel that children may be more receptive to frequencies and sound frequencies. If so, why? and do you have specific ages demonstrating this belief in transition.

WT:

O.K. my experience with children is defined in my work with Jim Carlton. Now what we found in that study of children was that children could see patterns in the air space, the air space between electric field plates, or magnetic field plates, most adults could not; and once the children had trained with these things, they could see them around children's bodies. Every child we tried could see them, with a little bit of instruction from the other children as to what it was and we worked with children from the order of 4 to 16. Once they reached puberty, most of them loose it because their parents say to put away childish things, or they are doing the wrong 'stitch' with respect to puberty etc. So for whatever reason it falls off. But not for everyone, we still have a 16 year old and he was the best. Now the thing that was clear in this for our studies, there was something objective and something subjective about it. That is on any one day we could change the voltage from zero to sixteen thousand volts, you'd reach a voltage where a child would see the pattern and would draw the pattern. Go up another voltage and they'd draw another pattern and so on. Another child on the same day would not draw the same pattern of the same voltage. The same child on another day would not draw the same pattern for the same voltage. But any time during any day, morning, noon or night, the child would draw the same pattern, that particular child. If we change the frequency of light shining down into this air gap, there was a set of frequencies where the child would see the pattern at a particular (without changing the) voltage and another set where they wouldn't and another set where they would, etc. So again something objective but again not correlated with all the children. We also found that the more creative were the children in normal play then the more patterns did they see between zero and fifteen thousand volts. So I came to the conclusions of the following: and the older I've become the more I feel that this is the way we perceive most things. That is, that there is something out there and our sensory system attends to it but what we accept as reality is a convolution of what is out there and our mind set. They're never unmixed, they're always combined. So that different people looking at the same thing would say I see something different or I hear something different of I perceive something different, because there is always that convolution with respect to what's already in the mind set. And young children of course don't have a lot of that and they are very open and so they can see more, I think. So I think all of those things enter that question. Let me tell you about an experiment which we haven't written up but and maybe I never will but it is related to seeing these things. It was the effect of pressure. We built a glass envelope kind of thing, a globe, and we put a gas in it and we had it within the field plates so the children were seeing the patterns in this gas and we could change the pressure in the gas. Well they found that the things were mobile that is, the pattern, and they

could move them around and they could change them and they would just play with them. Interesting stuff.

DM:

You state:- "Man has not yet become basically creative. His movement into creative fields is close at hand." Could you elaborate upon this statement.

WT:

Well I think creativity, children have more of it because they are more in touch with their core self and that's where the creativity is. Its really being in touch with the Universe. All the information is available there in the Universe, all the knowledge is available, its just at question of learning to tap it. Which is very different from our present education system. So the point is that most people are not yet basically creative because they haven't got through the (garbage that) the belief system you see that's the convolution. You can't perceive something out there without the convolution of what it is your belief system is intimately tied with, how creative you can be. And if you don't believe you can do it you certainly cannot. And so its getting past that and getting in touch with yourself and just having a sense of being in the Universe, because if you develop a sense of being then you're in touch and you're in tune with what is and your intuition starts to work. Now the more you evolve the more your intuition gets better and better and through lifetimes (and its a muscle building process essentially.) And so when I say that movement in creative fields are close at hand its because the Universe of course, is changing remarkably and the game is going to be very different a decade from now, I suspect. The walls between domains is thinning and there are going to be a lot of surprises for a lot of people.

DM:

In a recent article, Dr Paul Robertson states that certain composers were 'left-brain' composers, whilst others were called 'right-brain' composers. Do you think that this sort of analogy would fit within your frequency model of the human subtle body? and how?

WT:

Well left-brain composers are more linear thinkers its the more logical side, whereas the right brain is the non-linear and more creative side. In my modelling of these two domains the direct space and inverse space (negative space-time) that would be much more the right brain kind of thing (in negative space time) I don't connect it necessarily with the right brain per se, I haven't gone that far, maybe it will be , I don't know and I think that the composers I

really like compose with their heart. The brain is a wonderful machine but best used at the dictates of the heart. I mean the problems of humanity have been when its been the other way around.

DM:
Do you think that the rise of industrialisation and technology has had anything to do with the musical preoccupation of composers to create from an intellectual platform from the beginning of this century? Does this musical observation hold any relationship to your theories of mass frequencies?

WT:
I guess my view on this kind of thing is that quite some time ago we had a mysticism and science inter meshed and the last couple of hundred years has rooted them out and tried to submerge mysticism as a pathway to knowledge. And that was a useful thing in a sense that they could then focus on the science aspect which leads to industry and technology, the science aspect then focused on the simplest piece of the Universe and it taught us how to do science in the simple way. And so now that we know how to do it, we can go back and do the more complicated and can in fact incorporate mysticism into science without getting bent out of joint. But the coming periods are where science will look at these things more deeply , will realise that there are other pathways to knowledge and that new technology can be used to undo some of the problems of the old and there will be a heart technology, but inter-active initially with devices that are like training wheels ultimately we don't need them but most of us don't know how to do things with our own bodies unassisted, so there will be all those changes. I suspect then that the composers, its natural that they would create in that modality. I mean that's what people appreciated, but it isn't intellectual, that was the common Gestalt in the air-waves that people were picking up and so they would get it unconsciously and they would naturally deal with that. And so its been an exploration into that vector, if you like, of knowledge space, but its a huge knowledge space but there will be other vectors, and other musics and other kinds of dance and other kinds of technology as people respond to the inner note and just express it in their own way.

DM:
Where within the six-dimensional space lattice would you consider the process of composition to emerge from? (Within the mental realms of the brain, a combination of different realms?)

WT:

Again we come to mental realms, mental realms aren't just in the brain, mental realms in the heart work fine. Mental realms in any of the chakras. So think of it this way. From the sixth space lattice through the subsequent lattices the chakras, the energy centres they are the tuning devices and things cascade, its just like a transformer, which just transforms current voltage, these are just like transducers which transduce into another energy forms and such and also downshifted in terms of magnitude interacts with different bodies that we have, but it all starts I think within this simulator, it starts with our intention its a device for our growth and experience and our intention is to work with the device. Whatever our intention is, it feeds back to us the consequence of the intention. And that's how we learn. So the point is that the mental realms are not necessarily head realms of brain realms. Its better to think in terms of mental realms to any one of the seven major chakras endocrine systems.

DM:
How does the following statement relate to our acculturation or music/frequencies?
"There is a concept of time which has been referred to as the 'eternal now' (or spacious present) whereby past, present and future may exist simultaneously but in different vibrational time frames. It is possible that by shifting the frequency focus of one's consciousness one may be able to tune into specific time frames outside the present."

WT:
I would agree with that. I don't know how to do all that yet, but I'm working on it. If you just think in terms of this multi-dimensional coordinate. All of us and all of our Universe, and so the now is a place on that co-ordinate and the future is a place ahead and the pat is a place behind and the track sort of moves. That's one way of doing it. The other is of course that, since as we move on its still there and its still there then we can shift one to the other.

Appendix I

Deborah Mollison: an informal interview with Professor Hannah Steinberg, Professor of Psychology at Middlesex University.

DM:
In psychological terms what landmarks should I look for, for the acquisition of? Are there any standard facets?

HS:
The first one, are there any standard facets? Well I think what one might look for is sort of stages, isn't it, and the name that comes to mind is Piaget but I don't think he worked with music as far as I know he worked with reasoning and perception and so on, and at present as far as I'm aware the idea of stages is actually being criticised and felt that its not a very helpful thing to do and felt that its better to follow progress rather than look for discrete stages.
(I mention in Shutter Dyson & Gardner had been criticising Piaget mostly for that - yes I am sure they would but I think in Phd one shows awareness of influential theories even if they are now no longer regarded as very valid.)

DM:
Is there any new, current thinking related to my study that you are aware of, for example in a recent television documentary on monkeys we saw of their ability to learn language and acculturation was mentioned.

HS:
I'm not good on television so I can't help you with that but I do know things like the New Scientist progress but I think if you're interested in animals there's a big literature on things like for example, bird song, and how they learn it when they are small and that might be relevant. (Apparently most of the young learn by imitation but if you isolate them I think they also sing but not as similar to as mothers song, something like that. Look at ethology books for example, Lorenz.)

DM:
How is visualisation regarded in psychology?

HS:
Its regarded well, it's fashionable and it's used in all sorts of places included sports and games, you get a kind of practise in sport, competitive sports are taught to visualise winning. Maybe it stimulates imagination, certainly if you're trying to do something and rehearse something in the absence of actually being able to do it, practise which takes the form of visualisation can be very helpful. A visualisation to me is that you actually visualise, image something, and you can do it with kind of aesthetic imagery, movement in the muscles, so you could image playing the recorder by feeling it without doing it.

DM:
Do you think things have become more complex in our understanding of things?

HS:
In the brain one knows of more substances that carry messages and such, previously one knew of fewer and so inevitably because all of these substances have some sort of function, sometimes it's not known what the function is, but they do eventually, they do influence other goings on, because brain substances don't work in isolation.

DM:
What helpful ways could you think of that might help me with the analysis of musical extracts on my tape.

HS:
Largely has to be justified subjectively, you have to decide what's important, and then see then whether you can do it, I am sure other people have done some of this but I shouldn't think there's a standard way. I think quantum analysis is very fashionable at the moment, people have realised that there is a great richness of material, other than numerical information but it means having a look at books and papers on qualitative analysis. How far its been applied to music I really can't tell you.

Appendix J

Working Plan

In association with the working analysis in conjunction with the rest of the study I felt it could be appropriate to provide an active sounding board to more thought about the working mind of a composer and the composer's relationship to not only musical concerns of form and content, but also to use these findings to form a generalised summation of how to continue not if you (as a composer) are suffering from mental block, fear of failure, fear of continuance. As a beginner to know how to proceed following an initial effort is vital. I have therefore devised a working plan that may be used as a guide for the working composer. This plan aims to identify some of the psychological factors I have encountered whilst creating the model "Maya's Words" and thus help the composer in the continuance of development of their own work and if you so will, their own "Circuit of Activity."

1. Trust your intuitive thought patterns.

When an idea comes into your mind let it run. Work it through as far as you can go with it before standing back to reflect.

Remember, if it is an idea you think may be from an already existing composition, that you may be tapping into your data" bank" of experience and drawing upon this, do not immediately throw out the idea. Work with it and use it as a means to extend your own thought. If it is a carbon copy of another idea you may wish to edit it and by doing this you may feel more happy to continue. Only if you are sure that you can recreate a new idea within the same 'feel' that you had would I suggest that you throw out the offending idea. This occurrence, in my experience, is infrequent, but there is no need to act rashly and feel inadequate because of it. As mentioned it is simply that your mind is drawing information from your data "bank" of material.

Use the same feeling (or even technique) that inspired you to compose the first idea to let you follow through on continuing the composition. Imagine a glass that has emptied of water and then imagine that its simply full again whilst feeling that feel or recreating the starting point you had had in the beginning when you started the

composition. Empty the glass in your mind as you continue to write. Sometimes the glass will feel small and then sometimes huge. Allow yourself to open up to letting in your thoughts. In this way you encourage your growth line of thought to flow and thus over time development of this line will ensue. If you have used a musical technique rather than a feeling, begin with the same technique again and see if you can take it into a new or further direction. Do not be hard on yourself if you think it is too repetitive or that it is not working into the right sort of material instantly, these things come with time and practice.

Remember an idea for a technique may be initiated by something triggered from your experience and acculturation and this is a natural, not contrived, point of initiation.
You may use a starting point that you always use and this will not always be so. But in doing this you may be drawing from your 'safe place' and using it as a springboard. Again this is a natural progression and if you work it through it will lead you to use other facets of your work as 'safe places' and thus the utilisation of the technique expands.

Expect to be inspired by words, shapes of words, shape. Sound or word in written form has a shape or line which our mind imbibes. Take any fragment from anything and you will know when it registers with you, and use this as a point of expansion. Experiment with this if you will.

2. Work through any anxieties i.e. anger,depression, etc. without punishing yourself mentally.

It becomes a matter of habit saying to yourself "Its not good enough." This has an impact on your mind and increasingly makes making it 'good enough' a challenge, sometimes insurmountable. Instead practice not doing this and simply have in your mind the thought that if you sense that you can rework a passage, phrase, instrumentation, whatever, to bring you closer to where you think you feel you need to go, then do this, otherwise leave it.

In time the growth of material will lead you toward development. It is important to try and sense where you feel you are not creating the exact feel you need and by doing this hone into a technique that will allow you to, if you will, improve - my word would be develop. practising any technique will lead to overall growth and provide you a sound base for your composition in the long term. Try and make this a positive growth pattern.

Anxieties are real and you need to see if the anxiety you feel is one you feel about your compositional technique or an anxiety that you have as a result of some external influence or worry. If you need to put anxiety into your composition that is another matter and yet you still need to know the source of the anxiety. If you do isolate the source of the anxiety as being from your insecurities about your musicality and abilities then practice a positive approach as mentioned above. If your anxiety is from an external source you need to recognise this instantly and if you cannot 'free' yourself from this feeling whilst writing, then perhaps you need to take a small break and think through the cause of your anxiety, clear your concerns before continuing. Often external anxieties cause the composer to have a blockage in their work and then the anxiety is compounded by the fact that the composer believes that he or she is 'no good'. Finally, if you need to have the anxiety (or any other such emotion) in the composition, then work it as suggested in the section "Trust your intuitive thought patterns."

3. Do not compare your work to others.

Compare yourself to yourself, not to others. By all means appreciate and love or hate the work of other composers, but whilst writing, as a means to allow your mind to flow in a free and uncluttered way, I would suggest that you do not continually listen and compare what you are writing to other composers. It is very easy to be drawn into a number of pitfalls if you do, such as:

- I'll never be that good.
- Listen to that orchestration, thematic development, nuance of timbre etc I have to try that
- (S)He was only 15 when he wrote that - I best give up.
- (S)He can do it, I can do it.

Perhaps in between compositions make up for all of your lost listening time if you so like.

4. Make a positive plan of procedure for yourself.

Plan out a working schedule that fits in with your habitual behaviour. Try and make it a natural inclusion but also regular. Make a guide timetable of when you would like to have achieved what by, and use this as a starting point. You may have to adapt certain facets of both your timetable and your day to day activities but at least having a plan of both allows you to sense a progression.

This is important as you will have a sense of achievement at having kept to a plan, even if not much has been written. I remember beginning a composition and having such a schedule worked out and then spending the first ten days sitting at the kitchen table, lying on the kitchen table, sitting on the kitchen floor, walking around the garden, doing no writing before my first idea popped in. Remember a schedule may allow you the valuable time you need to get in tune with yourself and so this too is good, to work into a practice, and also into a schedule. I do believe that this mental practice of aligning yourself to a disciplined time schedule is one that also grows and develops. I believe that from small schedules with a regular working practice it is possible to develop a working technique - just in the same way that I believe in the growth of thoughts and ideas.

5. Take time with solitude to work in.

It is important, however you have structured your timetable, to make your writing place a place of solitude and quiet. External influences all play a part and the most effective way to allow your mind to begin to operate is from a place of quiet. By this I do not mean psychologically 'quiet' or mentally 'quiet' - just work in a quiet place. It can be anywhere, if you are really in the thick of your writing and ideas are pushing forward like a dam that's bursting, then quiet is not important, a place to write in such circumstances can be anywhere where you have the tools to do so. For me paper and pen, for others computer. But, if you are beginning a project or not in full flow with ideas, then silence is helpful. Again you may have to practice working in a quiet space as you may not be used to it. It can be hard to begin with. Have short breaks to begin with if it becomes a difficulty. Work with the inner thought of your mind and know that you are creating space for your musical ideas to be heard in your mind.

6. Sketch in whatever way works most effectively for each project.

It does not matter how you get it down, just get it down. Some composers do mathematical grids, some do charts, drawings, some use manuscript others computers. Develop the working practice that suits your mood and temperament best. Sometimes it is healthy to want to try and use a different method of sketching out your musical ideas than the one you have used for some time. This can be like changing embouchure on a wind or brass instrument. I would suggest you only do this when you feel absolutely secure in doing so. If you

have developed a technique of compositional writing where from the outset you have initiated a variable assortment of ways of logging down your composition - fine, but most composers align to a method and stick to it as a means to allow development to grow in a 'measurable(?)' way. It is important, I feel, not to hop from one form of sketching to another as a means of exhibiting that you are composing, as this in the long term would have the possibility of slowing up your overall development, even so if you did have a condensed working schedule and used multi techniques you would still develop.

Appendix K

List of Children's Compositions on CD

1	
2	
3	
4	Troupers
5	
6	Waltz
7	Church Bells
8	The Place of Doom
9	Confusion
10	
11	
12	
13	
14	
15	Space
16	Cheetah
17	Ballerina
18	Tiger
19	Whirlpool
20	The Olympic Dive
21	
22	Close Encounters
23	
24	
25	Raindrops
26	
27	
28	
29	Funfair
30	Dream
31	Funfair
32	The Jungle
33	
34	'Train' *Improvisation*
35	
36.	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	

Appendix L

OCEAN WITNESS

A Violin concerto by Deborah Mollison

"Ocean Witness" was inspired by the poetry of Frances Horovitz and by concern about the plight of whales and dolphins.

i. Invocation

The refraction of the water and internal movement within - our depth of being.

ii. Death Dance

Whaling ship tracks whale to slaughter. Cadenza represents struggle for life.

iii. Elegy

For the greed of man .

iv. To Life

Celebration of energy, dolphins swimming just under the surface,life's force.

- **(Recording not for duplication)**

Bibliography

Ayer, A.J.
The Central Question of Philosophy.
Pelican: published by Penguin 1976: reprinted 1977 & 1978

Bazelon, I.
Knowing the Score
Published, Van Nostrand Reinfold Co. Ltd in 1975 New York, U.S.A.

Beaulieu, PhD John
Biosonic Repatterning
An Energy Approach to Music and Sound in The Healing Arts
Wellness Management, USA 90403

Begley, Sharon
Thinking will make it so: With 'cortical control'
brain waves can move matter."
Newsweek, April 5th 1999

Begley,S. / Wright, Lynda. / Church, Vernon. / Hager, Mary.
Mapping the Brain
Newsweek April 20 1992

Berry, Wallace
Structural Functions in Music
Dover Publications Inc., New York 1987 ISBN 0--486-25384-8

Blanck, Peter David
Interpersonal Expectations Theory, Research and Applications.
Edited Blanck, published by Cambridge University Press 1993
New York ISBN 0-521-41783-x

Boden, Margaret
The Creative mind
Published by Abacus books 1992 Gt.Britain ISBN 0-349-10469-7

Bronowski, J.
The Origins of Knowledge and Imagination.
Published by New Haven & London Yale University Press in 1978

Campbell, Don.
Music Physician for Times to Come
Published by Quest Books,1991, Wheaton, Il, USA
ISBN 0 8356 0668 6

Cavallero, C. / Foulkes, D.
Dreaming as Cognition
Published by Harvester Wheatsheaf, U.K. 1993
ISBN 0 13 302159 9

Chamberlain, David B. PhD
"Babies are not what we thought: call for a new paradigm"
Prepared for the World Congress of Prenatal & Perinatal Psychology & Medicine May 15,1992, Cracow,Poland.

Chambers, Dan
Brave New Babies-learning before birth?
Published by Channel 4 Television 1994 ISBN 1 851 441131

Choate, R.A. / Rossi , Nick
Music of Our Time An anthology of works of selected contemporary composers of the 20th Century.
Published by Cresendo, 1969 in Boston Mass.

Colley, A.M. and Beech, J.R.
Acquisition and Performance of Cognitive Skills
Published by John Wiley & Sons Ltd 1989

Collins Gem English Dictionary
Published London and Glasgow, reprinted 1985 ISBN 0 00 4583264

Cone, E.T.
The Problems of Modern Music
Published by Norton & Co., New York, U.S.A.,1960)

Dennett, Daniel C.
Consciousness Explained
Published by Penguin Books 1993,London ISBN 0-14-012867-0

Deutsch, Diana
The Psychology of Music
Published by Academic Press 1982. New York: London.

Deutsch, Diana
Paradoxes of Musical Pitch
Scientific American, August 1992.

Dossey, Dr Larry
The Body of Music from "Healing Break -Throughs"
© 1991 - Published 1993 in Great Britain by Judy Piatkus Pub Ltd., 5 Windmill Street, London W1P 1HF

Drever, J.
A Dictionary of Psychology.
Penguin Reference Book, pub by Penguin Aylesbury, Bucks 1952

Elliot, Charles
Locating the Energy for Change: An Introduction to Appreciative Inquiry
Published by the International Institute for Sustainable Development 1999. ISBN 1 895536-15-4

Forte, Allen
The Structures of Atonal Music.
Published by New Haven & London Yale University Press. 1977

George, Graham
Tonality and Musical Structure
Published by Faber, London 1970

Gerber, Richard
Vibrational Medicine
Published by Bear & Company, Santa Fe, New Mexico 1988
ISBN 0 939680 46 7

Golden, Daniel
Building a Better Brain
Life Magazine (724444) /USA/ July 1994

Goldman, Jonathan
Healing Sounds: The Power of Harmonics
Published in Great Britain in 1992 by Element Books Ltd
ISBN 1 85230 314 X

Griffiths. P.
Modern Music,The Avant Garde since 1945
Published by Dent, 1981

Grimwade,Walker,Bartlett,Gordon and Wood.
Human fetal heart rate change and movement in response to sound and vibration.
American Journal of Obstetrics and Gynaecology (1971)

Hargreaves, David J.
The Developmental Psychology of Music
Cambridge University Press. London 1986 ISBN 0 521 30665

Hameroff , Stuart
Consciousness Connects Our Brains to the Fundamental Level

Hotz, Robert Lee
Study suggests music may someday help repair brain
Los Angeles Times, Monday, November 9th, 1998

Huntley, J.
British Film Music
Published by Skelton Robinson in London, 1947

Jarman, J.D.
Problems of Perceptibility Affecting Formal Design in Nontonal Music
Ph.D. Durham University (England) 1968-9)

Jung, C.G.
Synchronicity: An Acausal Connecting Principle
Translation by R.F.C.Hull
Bollingen Foundation/Princeton University Press,N.J. USA. 1973
ISBN 0 691 01794 8

Lang, P. H. / Broder, N.
Contemporary Music in Europe
Published by Dent, London 1966

Langer, Susanne K.
Mind: An Essay on Human Feeling
Abridged Edition, 1988 The John Hopkins University Press
Baltimore, Maryland 21211. ISBN 0-8018-3705-7

Lawlor, Robert
Sacred Geometry
Published in USA by Thames and Hudson 1982
Library of Congress Catalogue Card Number 88 51328

Layton, R. / Searle, H.
Twentieth Century Composers:
Britain,Scandinavia and the Netherlands.
Published by Weidenfeld & Nicolson in Great Britain, 1972

Lewis, H.D.
Contemporary British Philosophy 4th Series
Published by George Allen and Unwin Ltd., In London 1956

Lutyens, E.
A Goldfish Bowl
Published by Cassell, London 1972

Machlis, J.
Introduction to Contemporary Music 2nd Edition
Published by Dent, London May 1980

Mandler, Jean M.
A New Perspective on Cognitive Development in Infancy
American Scientist May-June 1990

Manwell, R. / Huntley, J.
The Technique of Film Music
Published by Focal Press, 1957

McClellan, Randall
The Healing Forces of Music
Published in Great Britain by Element Books Ltd
ISBN 1 85230 255 0

A New Dictionary Of Music.
Published by Penguin Books, Great Britain

Norton, C.
Early music lessons boost brain power
The Sunday Times, October 12th 1997 UK

Ockelford, George A.
A Theory Concerning the Cognition of Order in Music
PhD. University of London 1984 - 1992

The Oxford Concise Dictionary.
Oxford University Press 1982 ISBN 019 861132-3

Perle, G.
Serial Composition and Atonality 2nd Edition
Published by Faber in London, 1968

Price, Deborah H.B.
The Perceptibility of the Compositional Procedures of Elisabeth Lutyens" A thesis submitted for the degree of Master of Philosophy, Department of Music. Lancaster University, England. September 1984

Raynor, H.
Music in England
Published by Hale, London 1980

Read, G.
Contemporary instrumental Techniques
Published by Collier MacMillan, London 1976

Reti, R.
Tonality, Atonality, Pantonality
Published by Barrie & Rockliff, London 1958

Riley, J.H.
The Piano as a Medium for Musical Invention in the Years Since 1945
Thesis: M.A.Bangor,W 1966

Robertson, Paul
The Great Divide, taken from 'The Mind of Music"
part of the Medici string quartet series for Classic fm 1994

Rognoni, L.
The Second Vienna School, Expression and Dodecaphony.
Translated from the Italian by Robert W. Mann. Distributed by Calder & Royars, 1977 (Published by J. Calder, London 1977)

Rutter, Michael and Marjorie
Developing Minds
Published by Penguin Books 1993, London ISBN 0-14-012569-8

Rufer, J.
Composition with Twelve notes
(Related only to on another / Translated by Humphrey Searle.
Published by Rockcliffe, London , 1954

Ryle, G.
Dilemas
Tanner Lectures 1953
Published by Cambridge University Press, 1954

Sacks, Oliver.
Seeing Voices
Picador, published by Pan Books in the UK, 1990
ISBN 0 330 317 44X

Samson, Jim
Music in Transition
A study of tonal expression and atonality 1900-1920
Published by Dent, London 1977

Sear,W.
Electronic Music
A guide to electronic music and synthsizers
Published by London Omnibus Press, 1977

Searle, H.
Twentieth Century Counterpoint. A guide for students
Published by William Norgae, London 1954

Shibagaki, Masamitsu & Yamanaka, Tadashige
(1991). "Attention of preschool children: **Temporal variation of electrodermal activity during auditory stimulation**. Perceptual and Motor Skills, 72,1115-124. Child Development Abstracts & Bibliography Volume 66 November 1 1992

Shuter-Dyson and Clive Gabriel
The Psychology of Musical Ability
Published by Methuen N.Y. 1968 ISBN 0416 71300-9

Sloan, Douglas
Imagination and Insight
The emancipation of thought in the modern world
Greenwood press. 1982

Smith-Brindle, R.
Serial Composition
Oxford University Press, London 1966

Storr, A
Music and The Mind
Published by Harper Collins, Great Britain, 1992
ISBN 0 00 686 1865

Stravinsky, Igor
Poetics of Music
Translated by A. Knodel & I Dahl
Published by Vintage books in the form of six lessons, New York, 1947

Szonyi, Erzebet
Kodaly's Principles in Practice
Corvina. 1990 ISBN 963 13 2994 1

Taylor, C.A.
The Physics of Musical Sounds
Published by the English Universities Press Ltd 1965

Tiller, William A.
What Are Subtle Energies?
Journal of Scientific Exploration, Vol 7, No 3, pp293-304,1993

Wade, Carole and Tarvis, Carol
Psychology 3rd Edition
Harper Collins, New York 1993 ISBN 0-06-500217-2

Warnock, G. J.
The Philosophy of Perception (Oxford readings in Philosophy.)
Published by Oxford university Press, 1967

Whittall, Arnold
Music Since the First World War
Published by J.M.Dent & Sons, 1977 ISBN 0460 042 556

Woods, Alexander
The Physics Of Music
Chapman and Hall London 1975 ISBN 0 470 959789 HB

Yates, P.
Twentieth Century Music
First Published by Allen & Unwin, London 1968

Zenatti, A.
Monographies Francaises De Psychologie No 17
La Development Genetique De La Perception Musicale.
Centre national De La Recherche Scientifique Paris 1966

Zdenek, Marlilee
The Right Brain Experience
Chapter "Re-calling Childhood Memories"

MAYA'S WORDS

A Tone Poem

Composed by

DEBORAH MOLLISON © 1998

Concert Score in C

Instrumentation

Flute

Flute/Piccolo

2 Oboes

2 Clarinets in Bb

2 Bassoons

3 Horns in F

2 Trumpets in Bb

1 Tenor Trombone

1 Bass Trombone

2 Timpani

1 Percussion
Suspended Cymbal & Bass Drum

Celeste

Harp

Violins Ia

Violins 1b
Detuned a microtone down throughout
(Microtone = Quartertone)

Violins 2

Viole

Celli
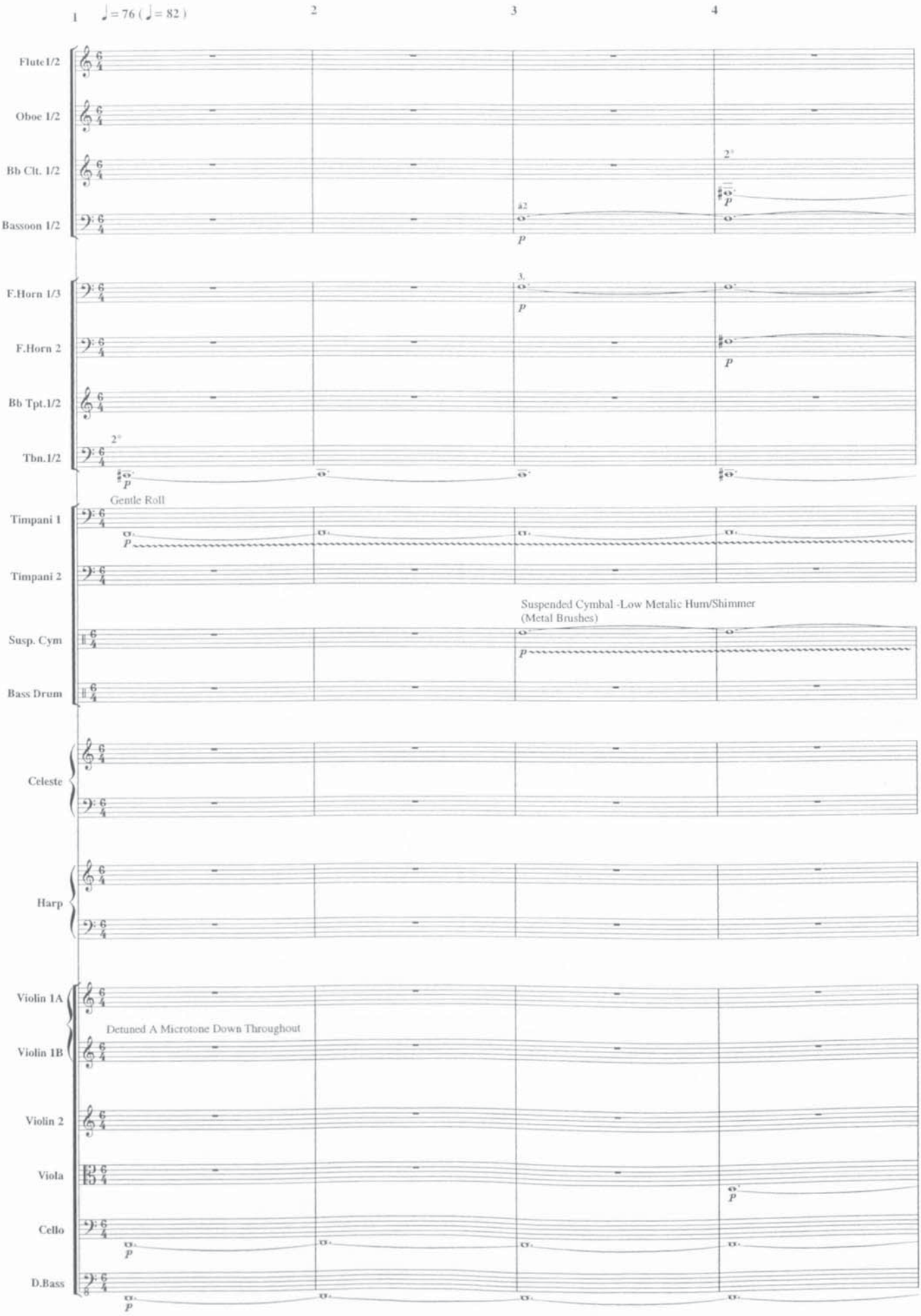
Double Basses
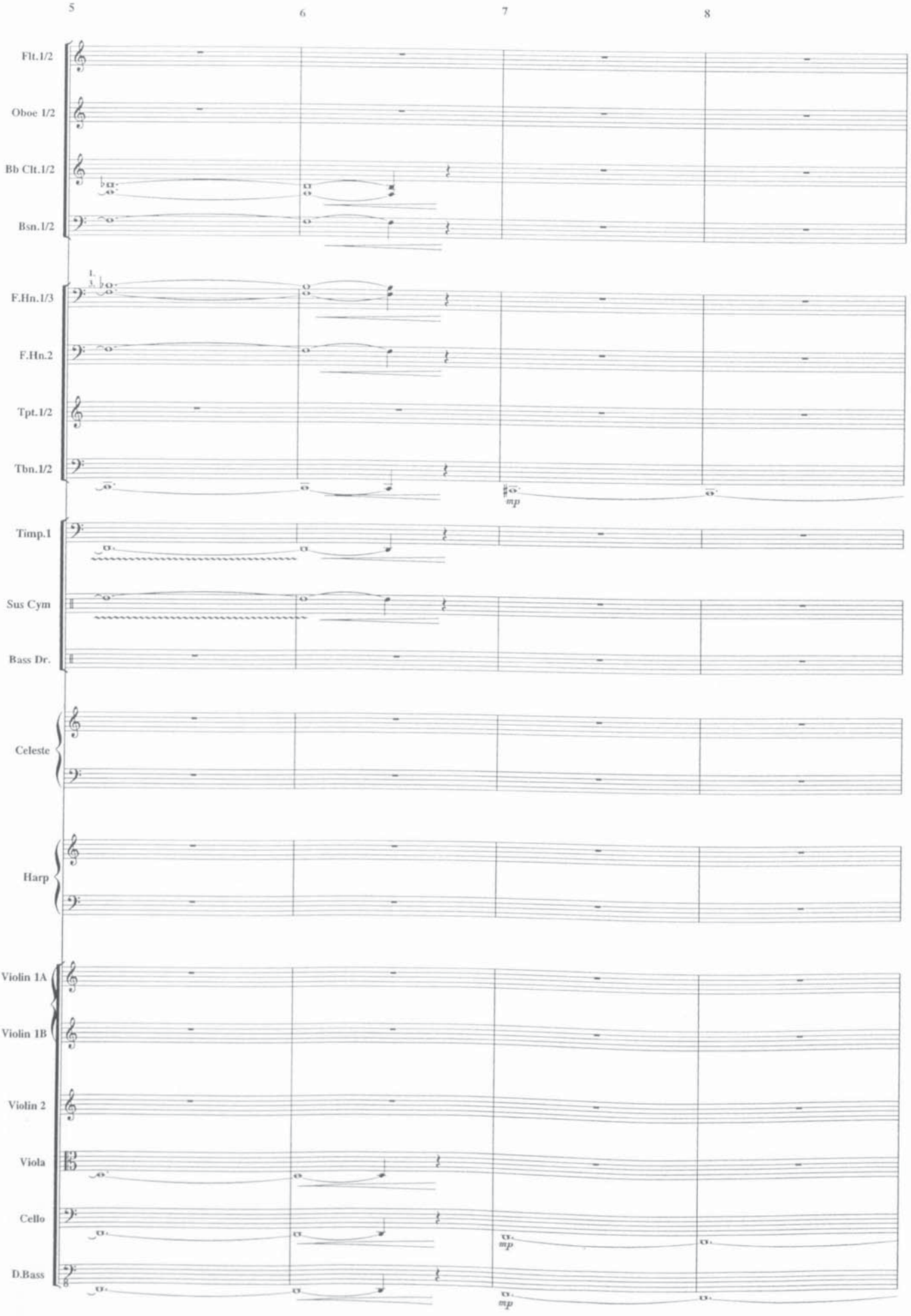
Score preparation - Fiesta Mei Ling +44 (0)20 8205 6734

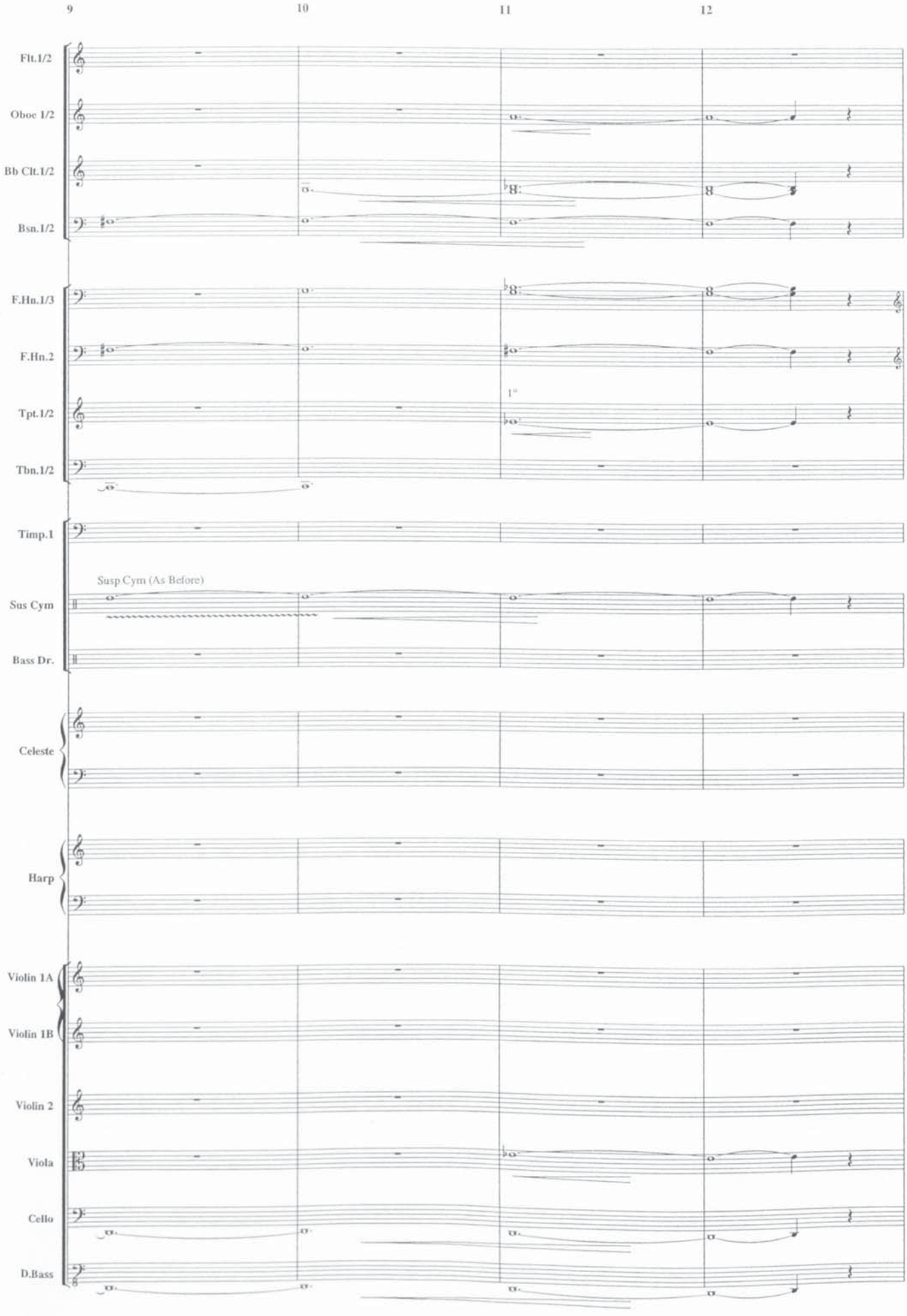
Concert Score
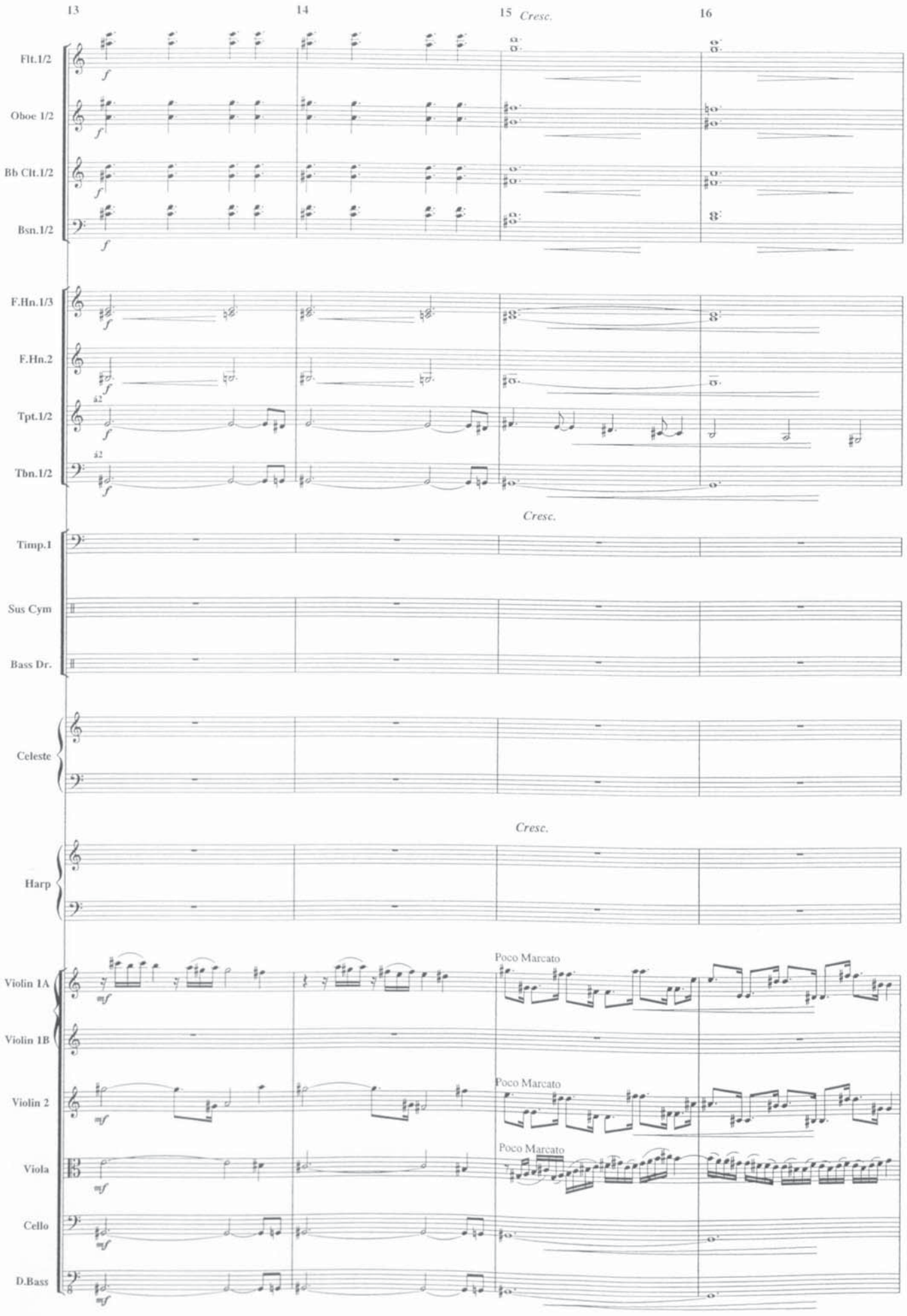
MAYA'S WORDS A Tone Poem
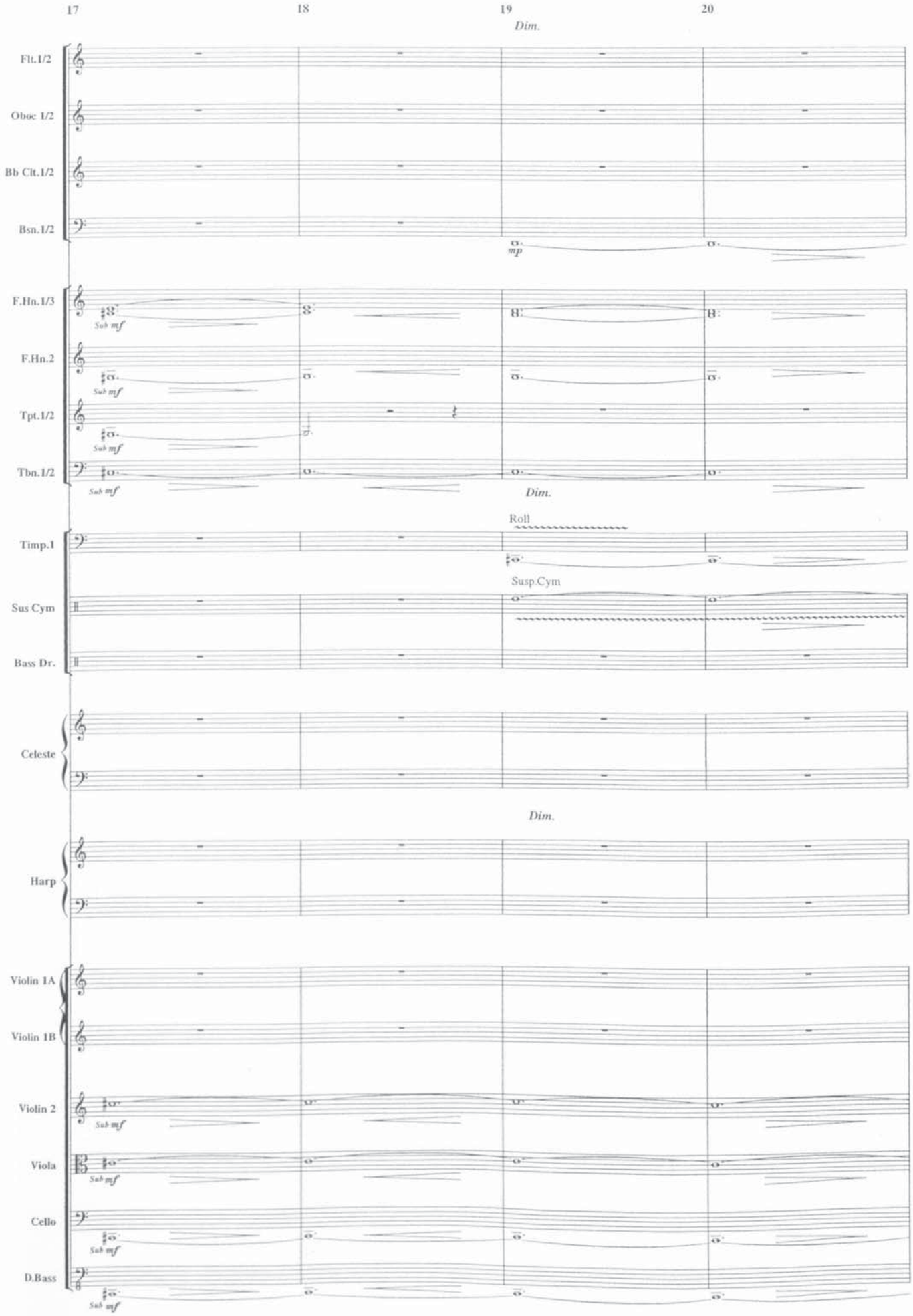
By: Deborah Mollison
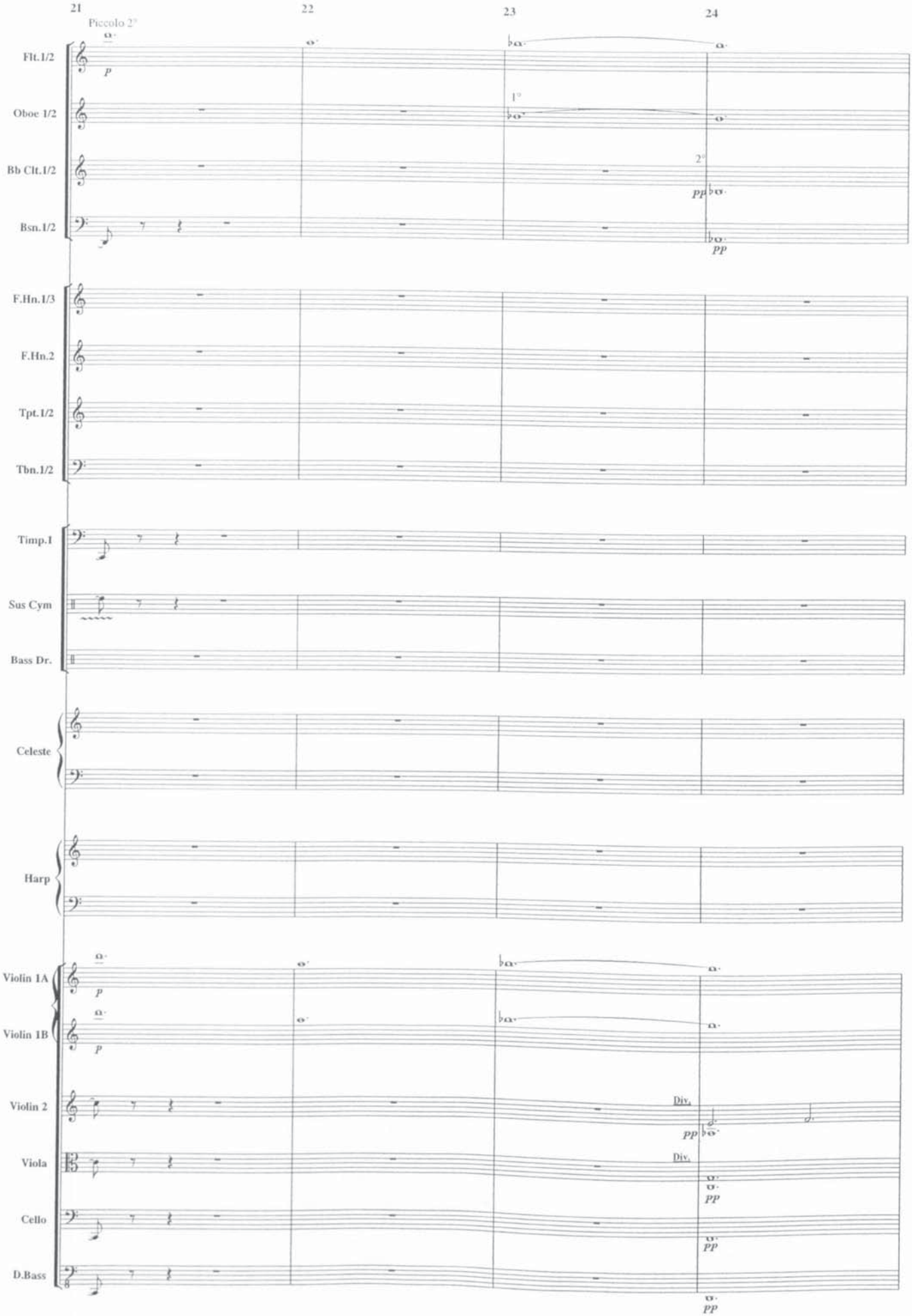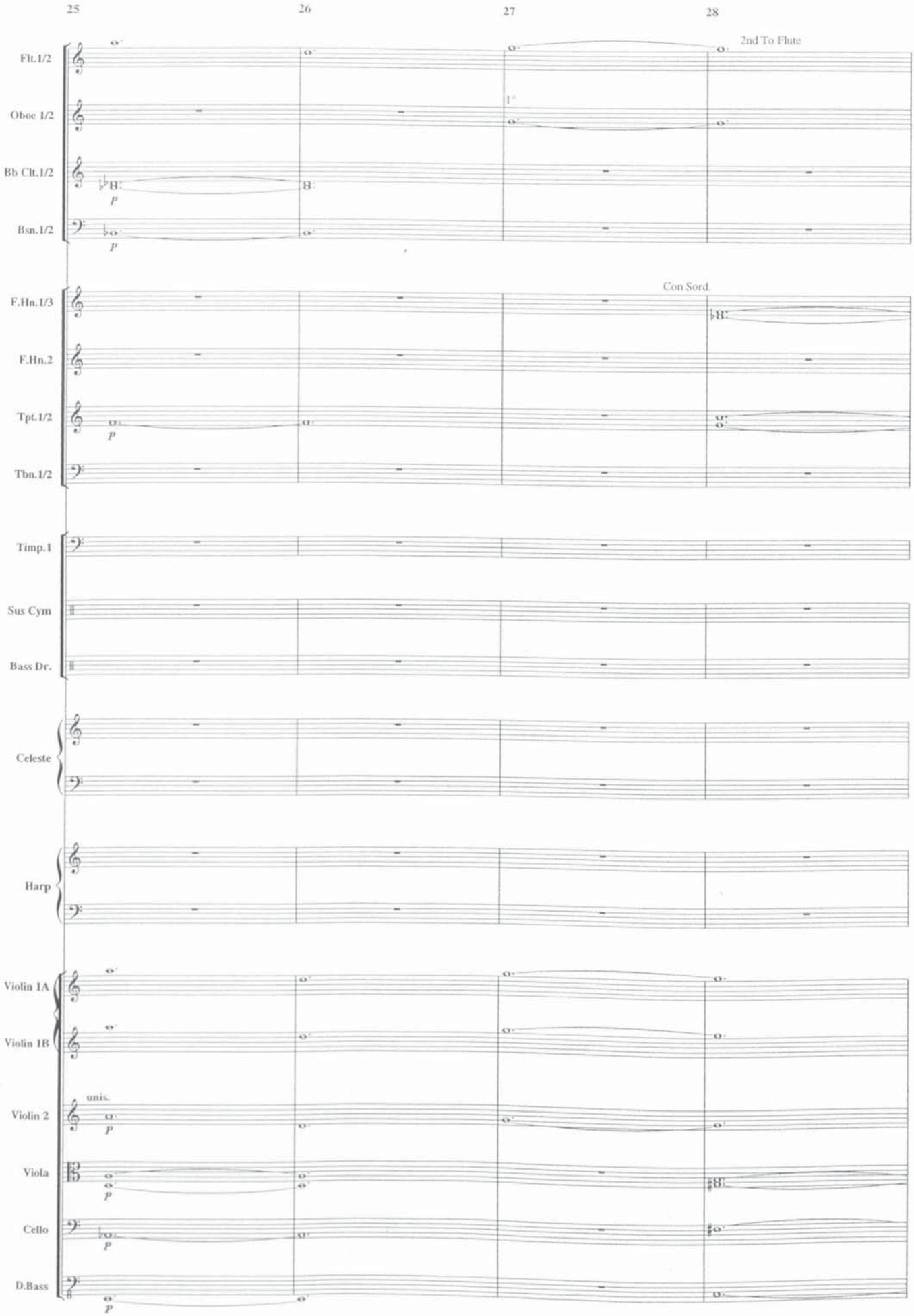



5
6
7
8
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
mp
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
mp
D.Bass
mp
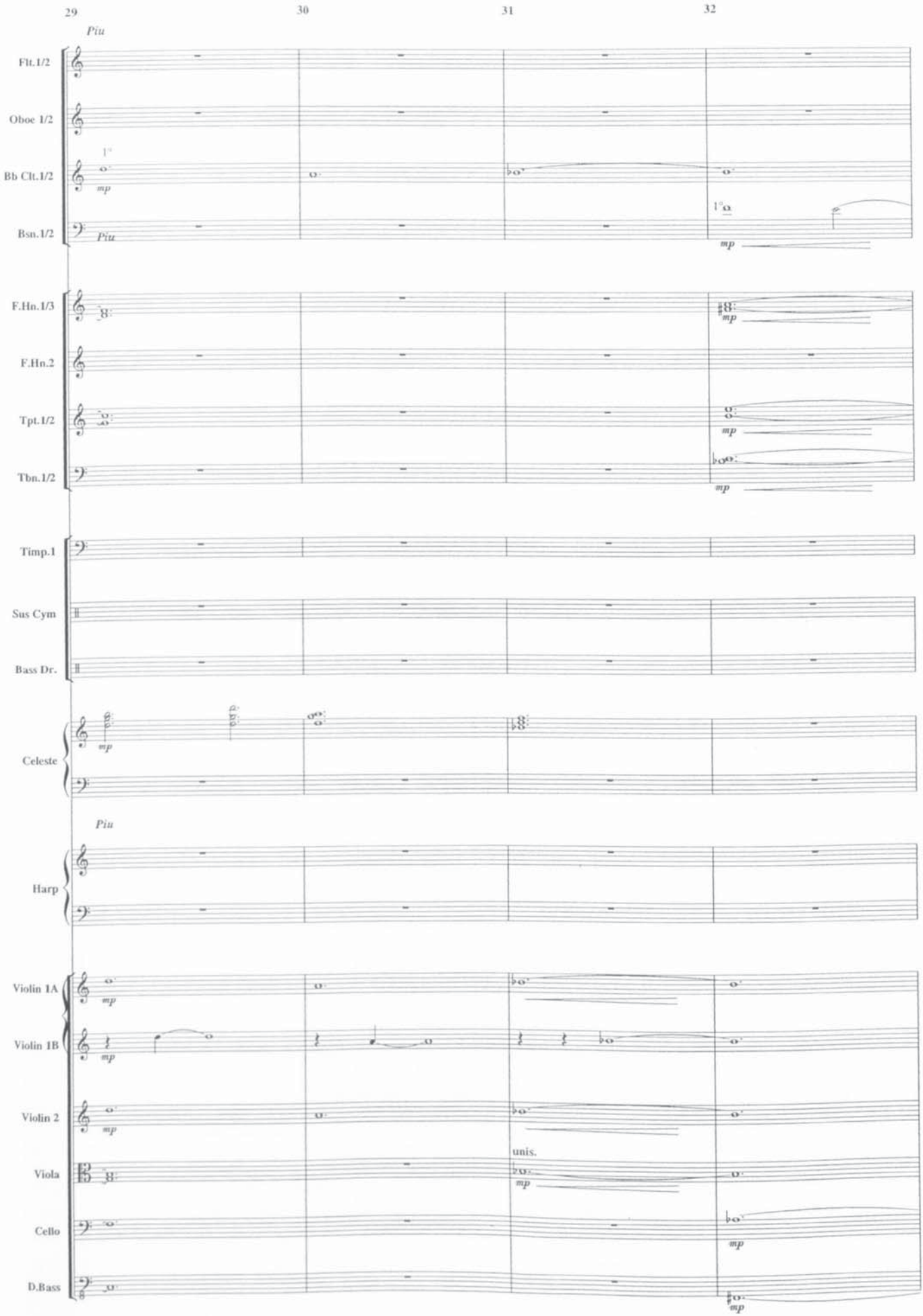

9
10
11
12
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
1°
Tbn.1/2
Timp.1
Susp Cym (As Before)
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
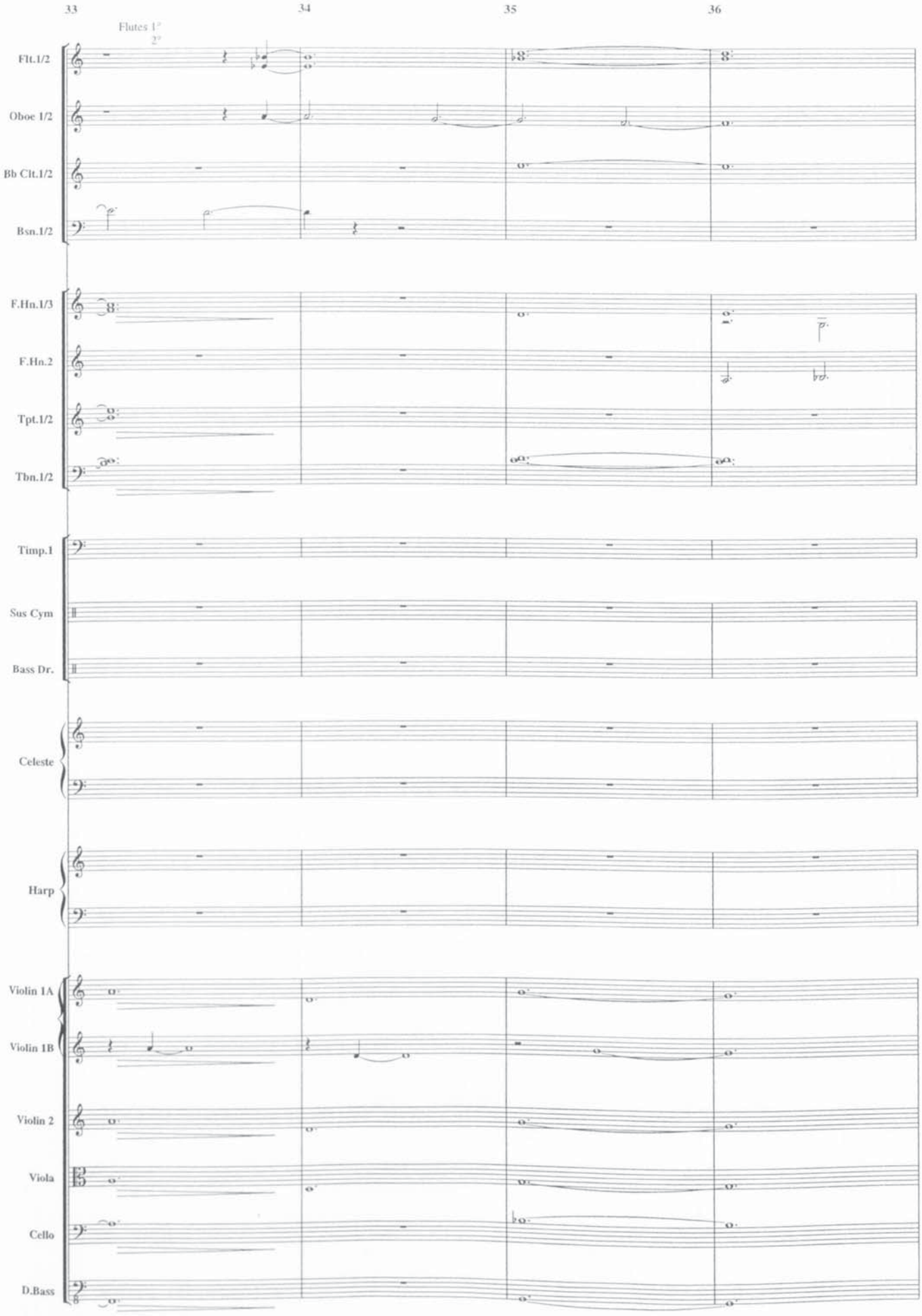

13
14
15 Cresc.
16
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Cresc.
Timp.I
Sus Cym
Bass Dr.
Celeste
Cresc.
Harp
Poco Marcato
Violin 1A
Violin 1B
Violin 2
Poco Marcato
Viola
Poco Marcato
Cello
D.Bass
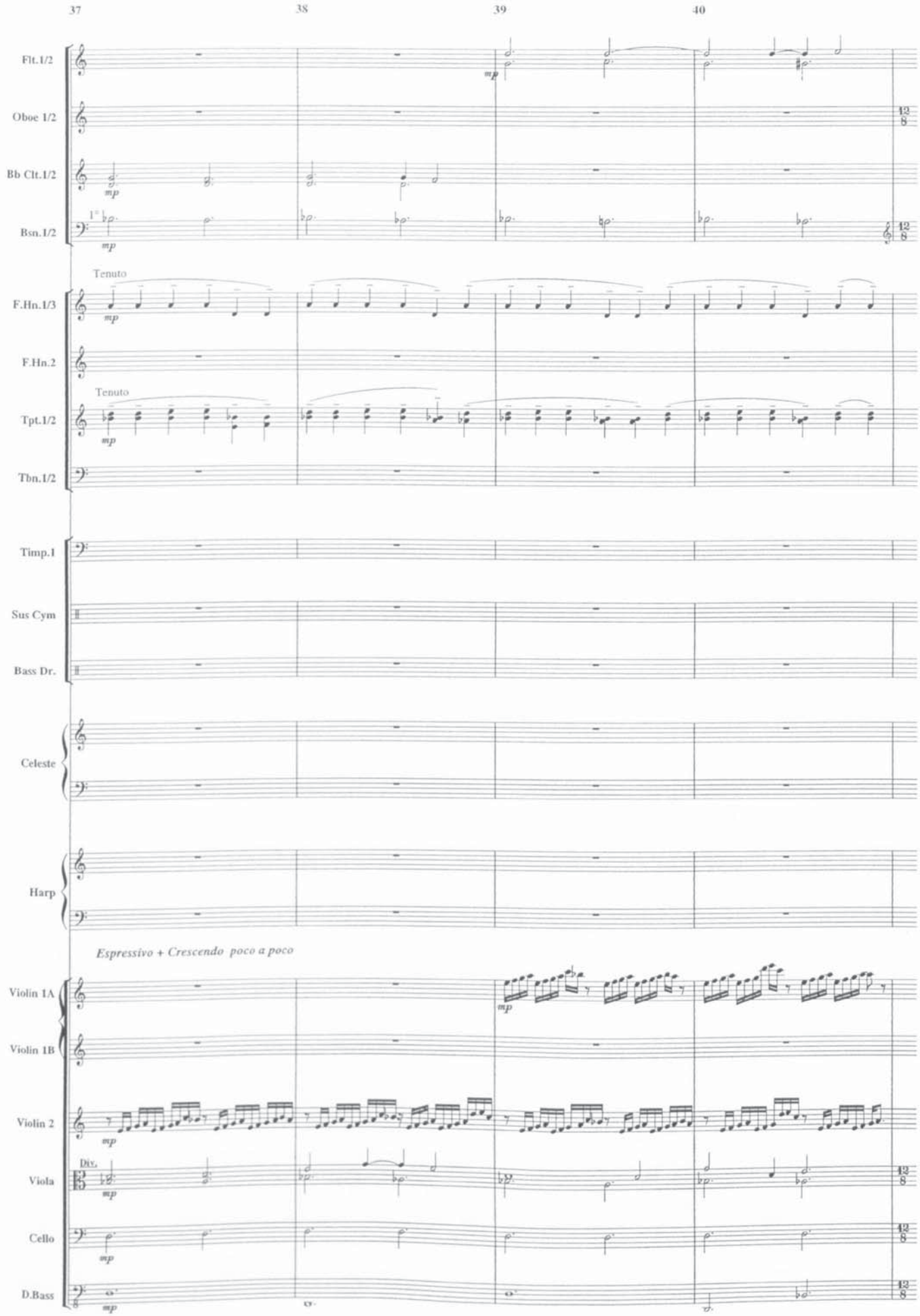

17
18
19
20
Dim.
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
mp
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Sub mf
Dim.
Roll
Timp.1
Susp.Cym
Sus Cym
Bass Dr.
Celeste
Dim.
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
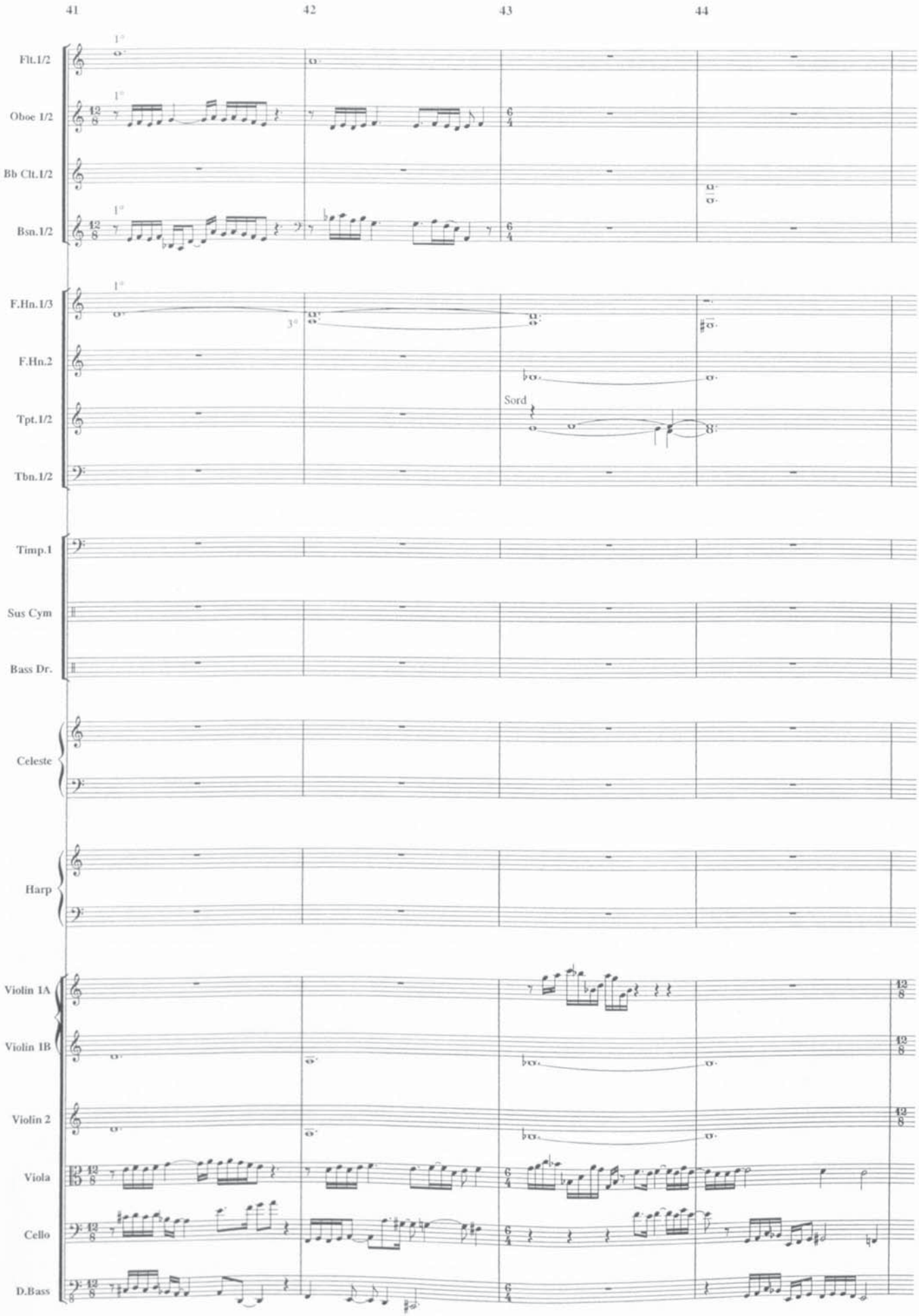

21
22
23
24
Piccolo 2°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.I
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
1°
2°
Div.
Div.
P
PP

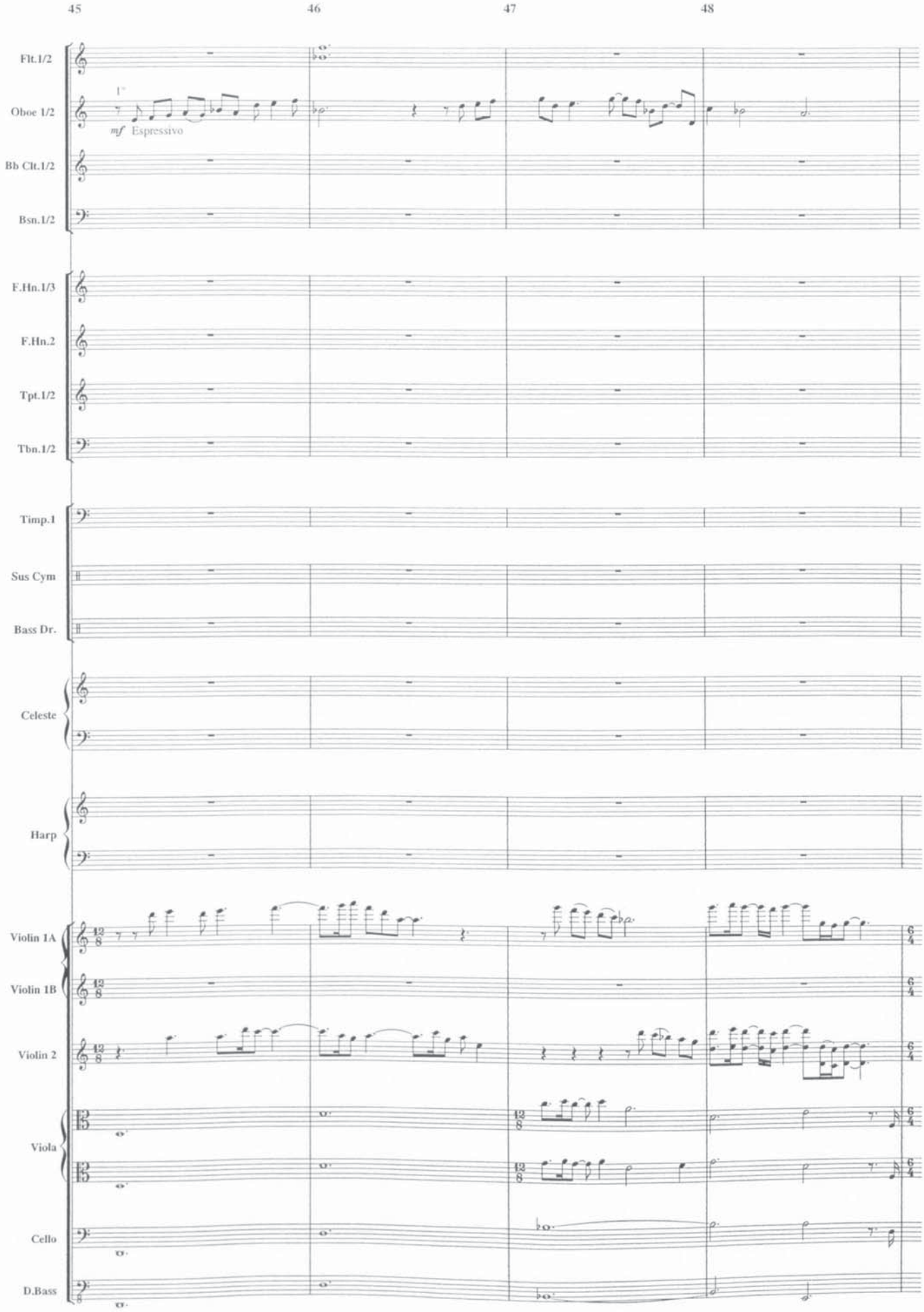

25
26
27
28
2nd To Flute
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
Con Sord.
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
unis.
Violin 2
Viola
Cello
D.Bass
P
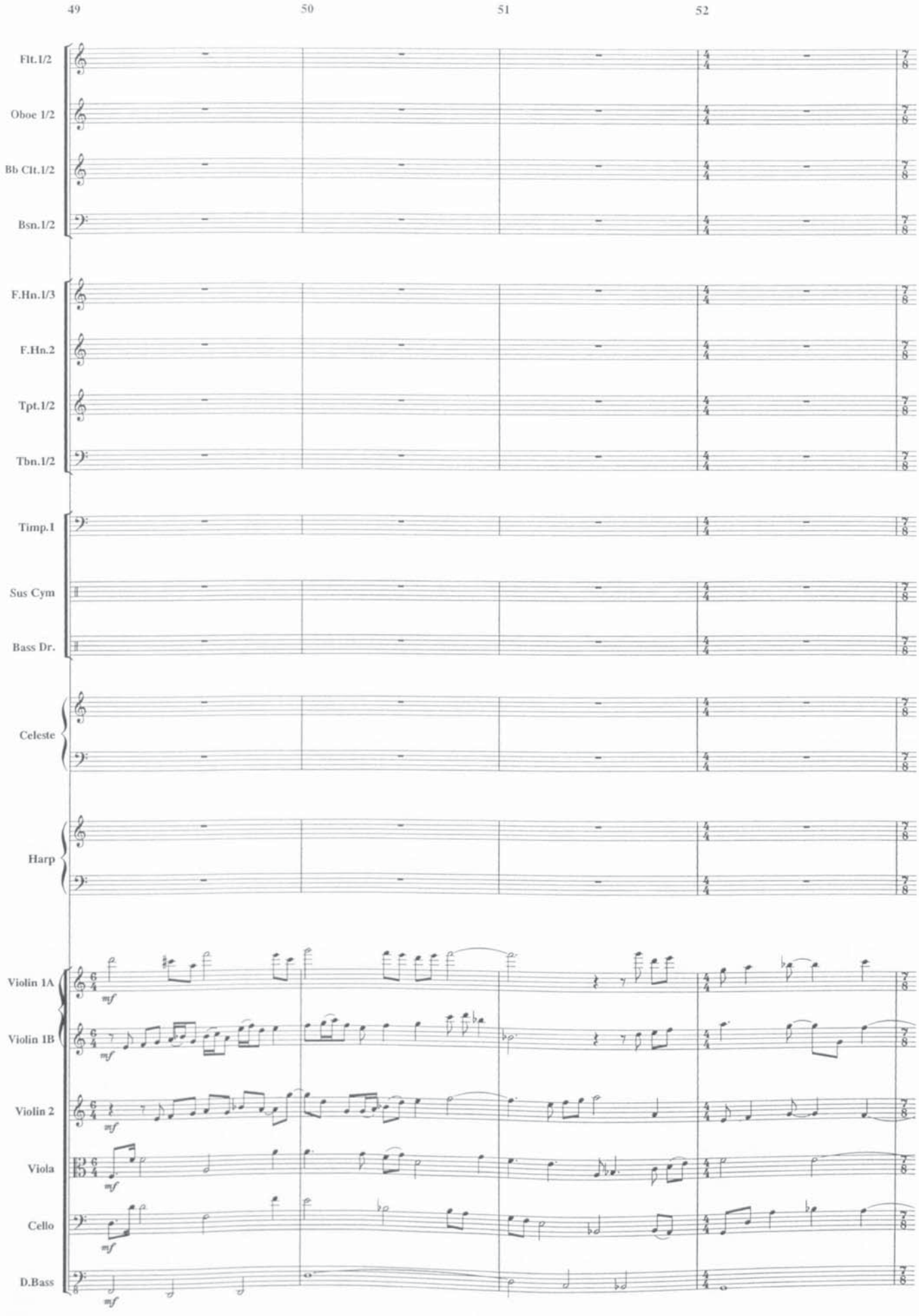

29
30
31
32
Piu
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
mp
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
unis.
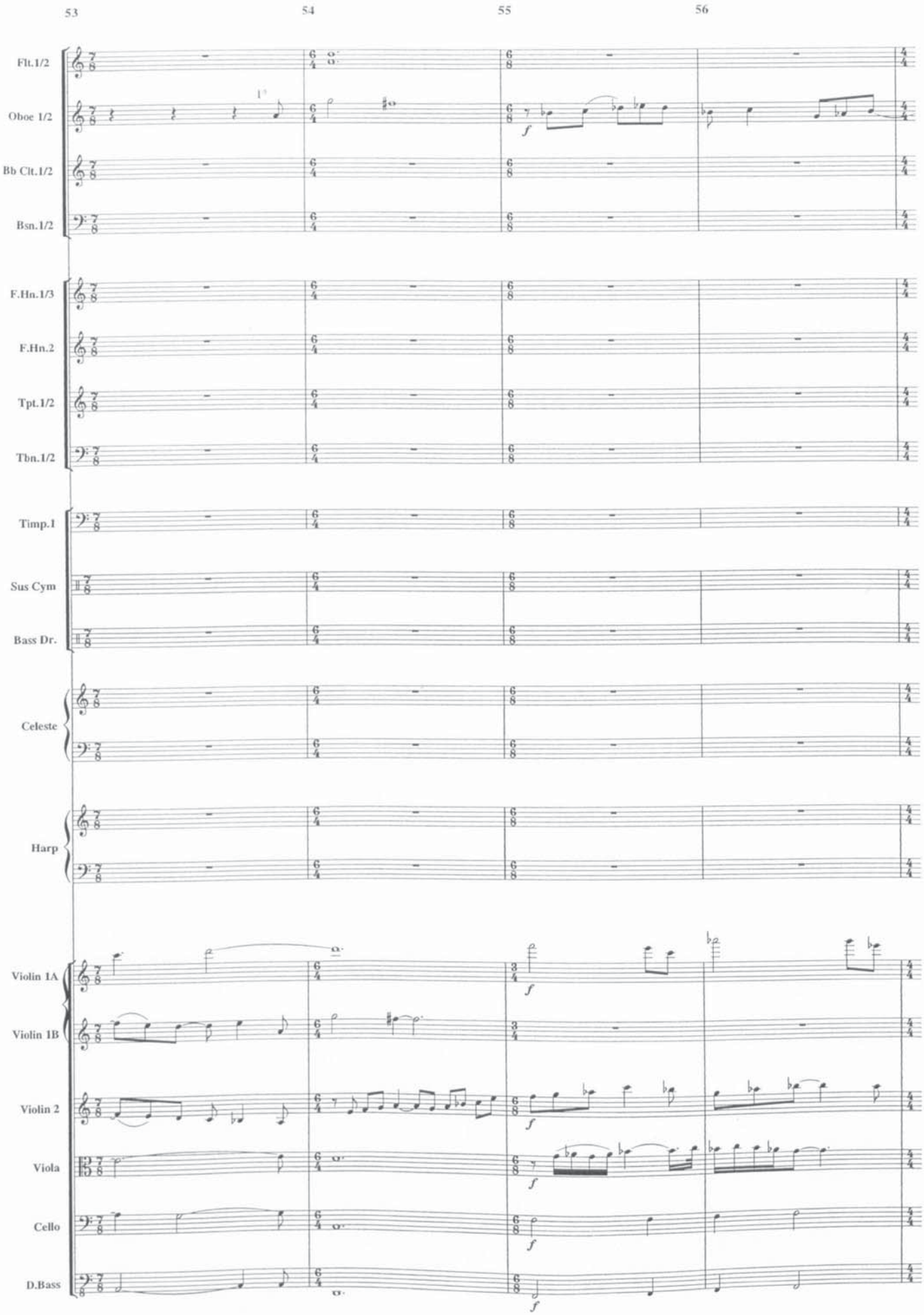

33
34
35
36
Flutes 1°
2°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
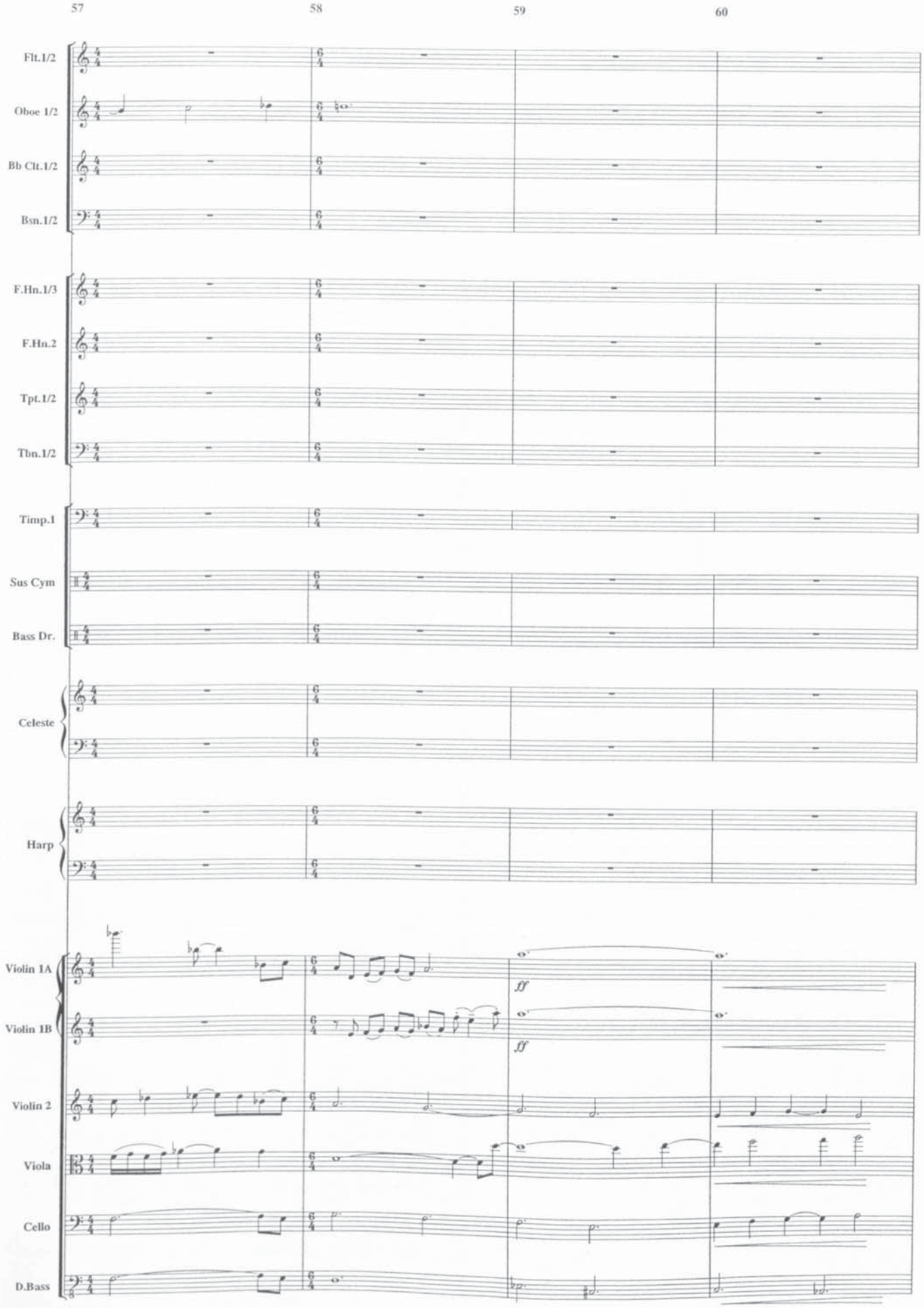

37
38
39
40
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
mp
1° b
Tenuto
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Espressivo + Crescendo poco a poco
Violin 1A
Violin 1B
Violin 2
Viola
Div.
Cello
D.Bass
12/8
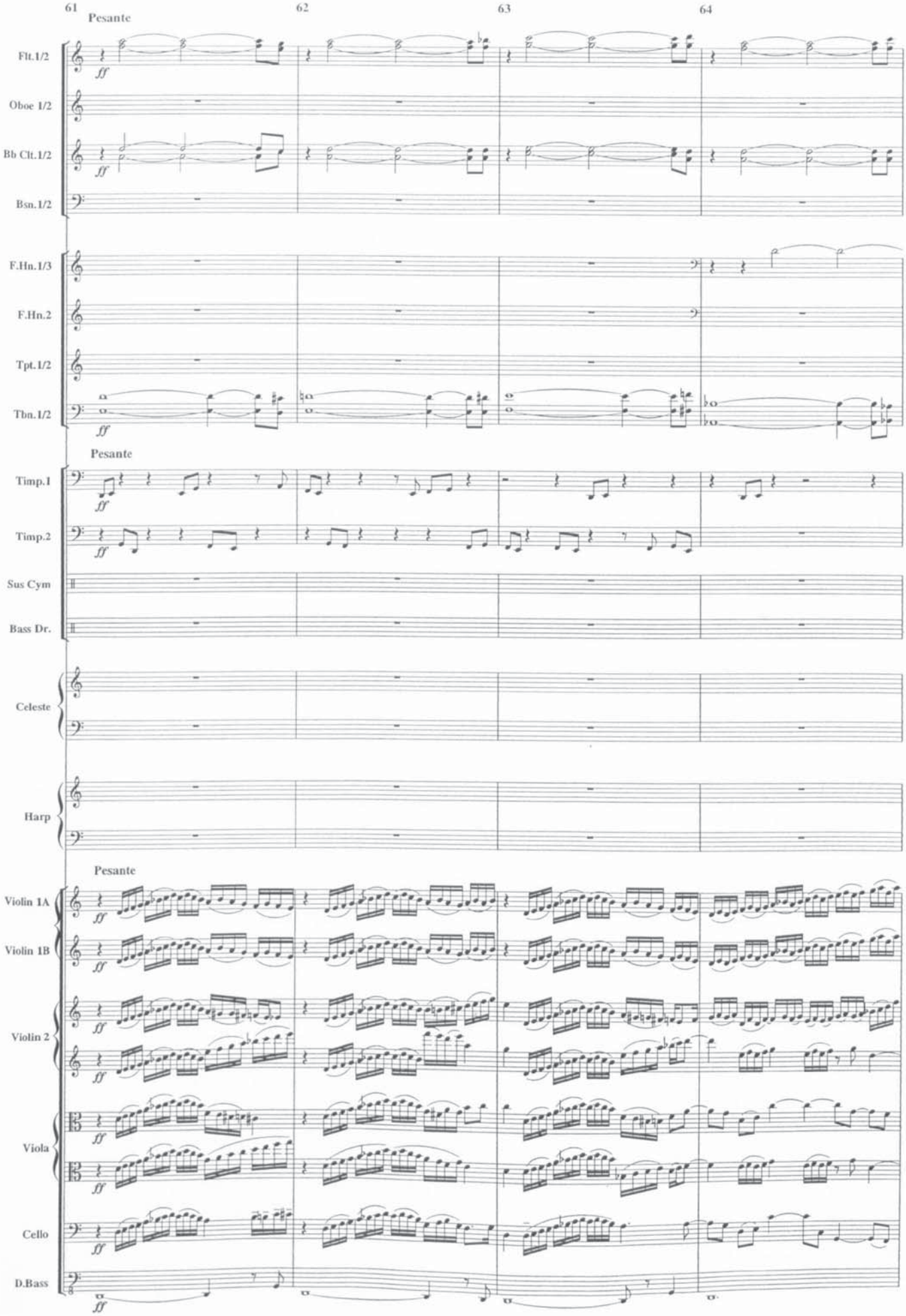

41
42
43
44
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Sord
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

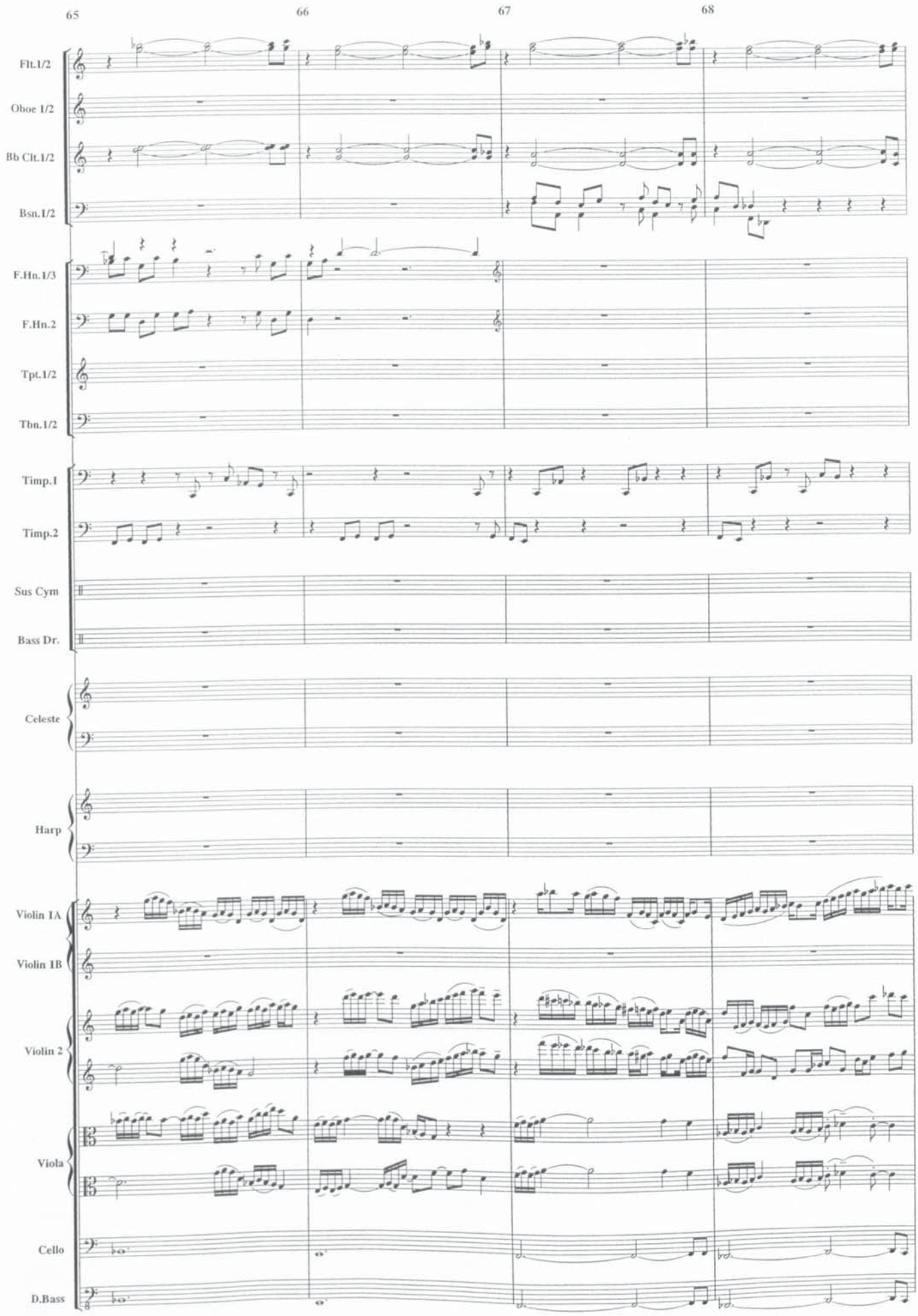

45
46
47
48
Flt.1/2
Oboe 1/2
1"
mf Espressivo
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
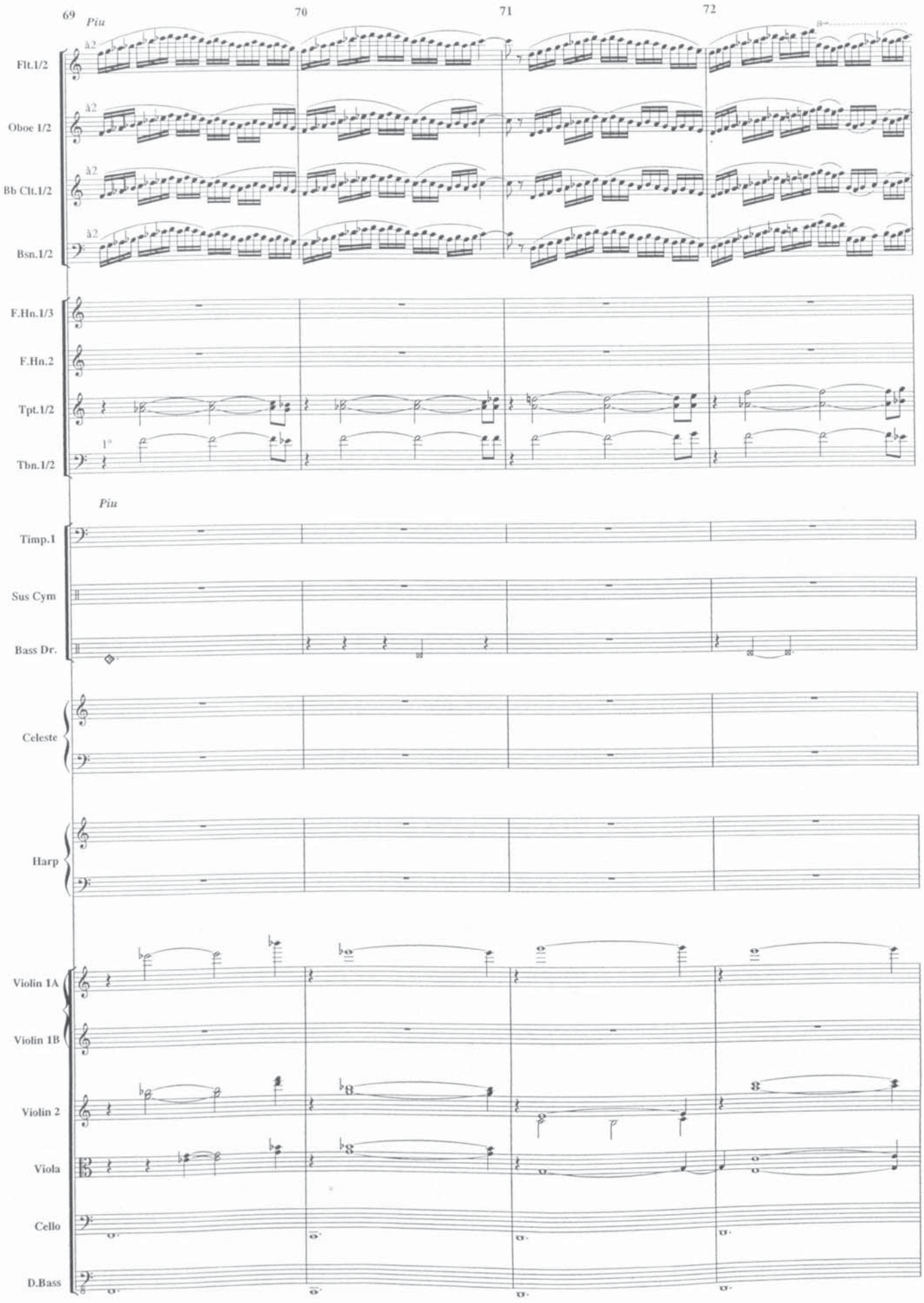

49
50
51
52
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
mf
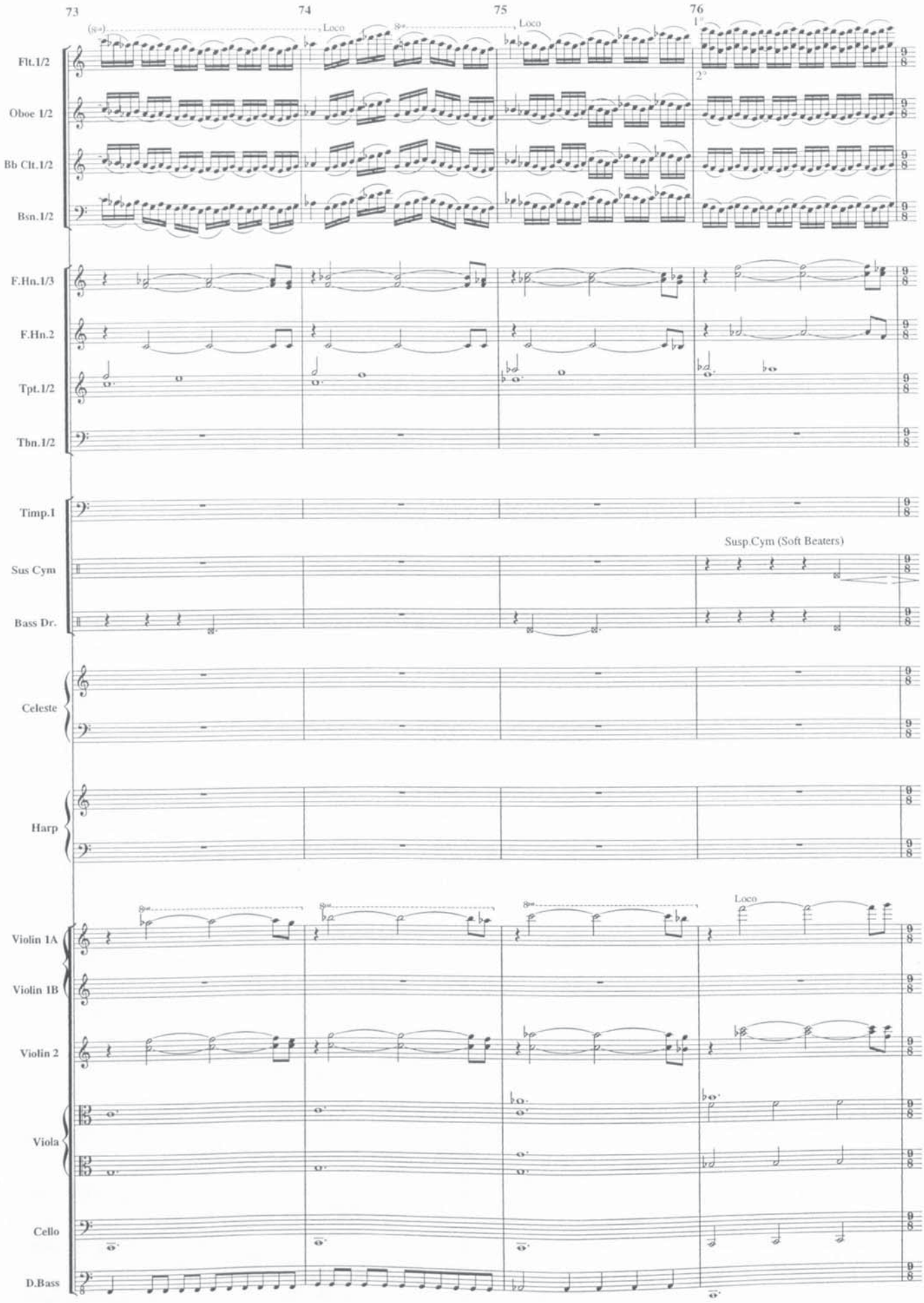

53
54
55
56
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
f
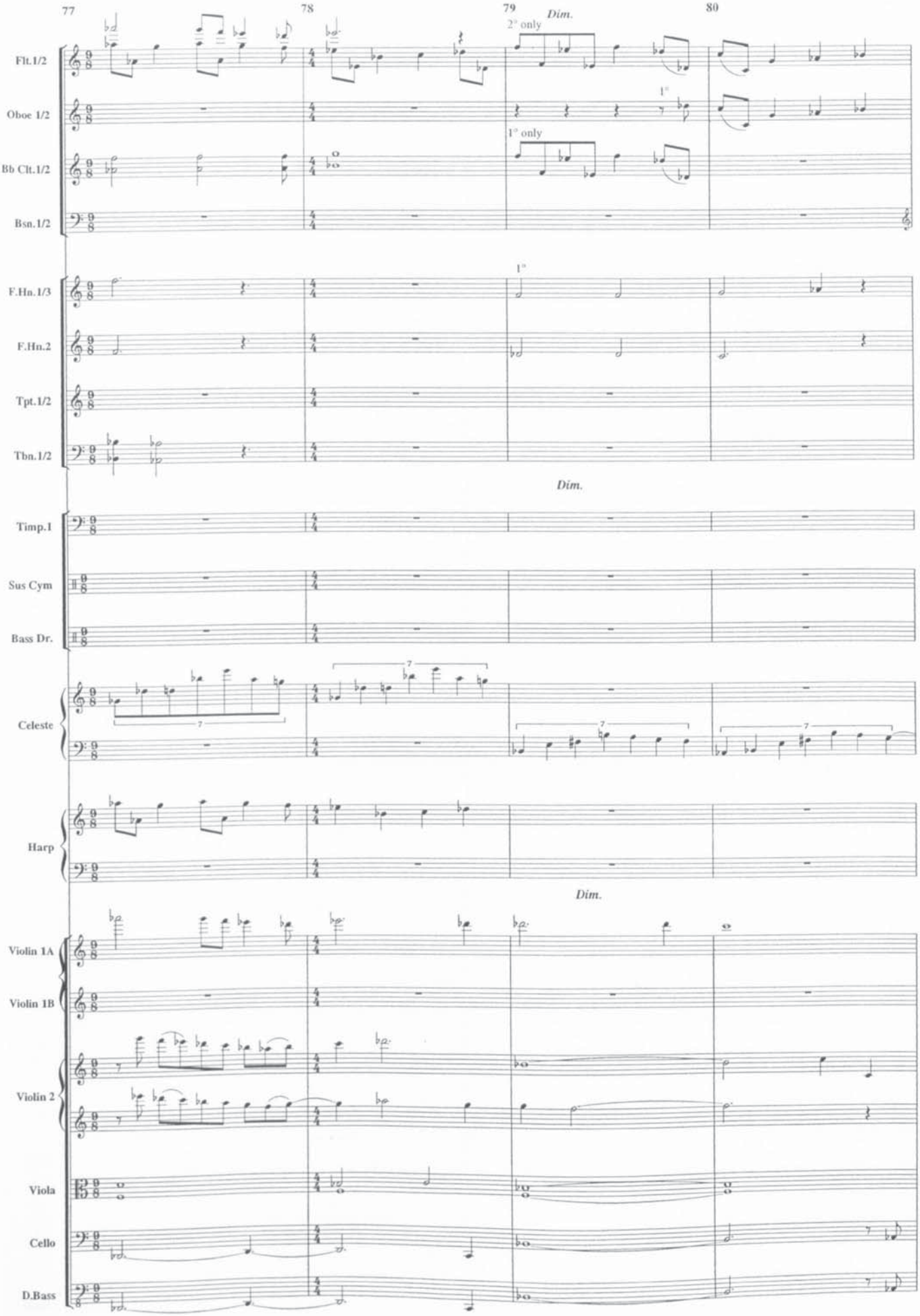

57
58
59
60
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
ff
ff
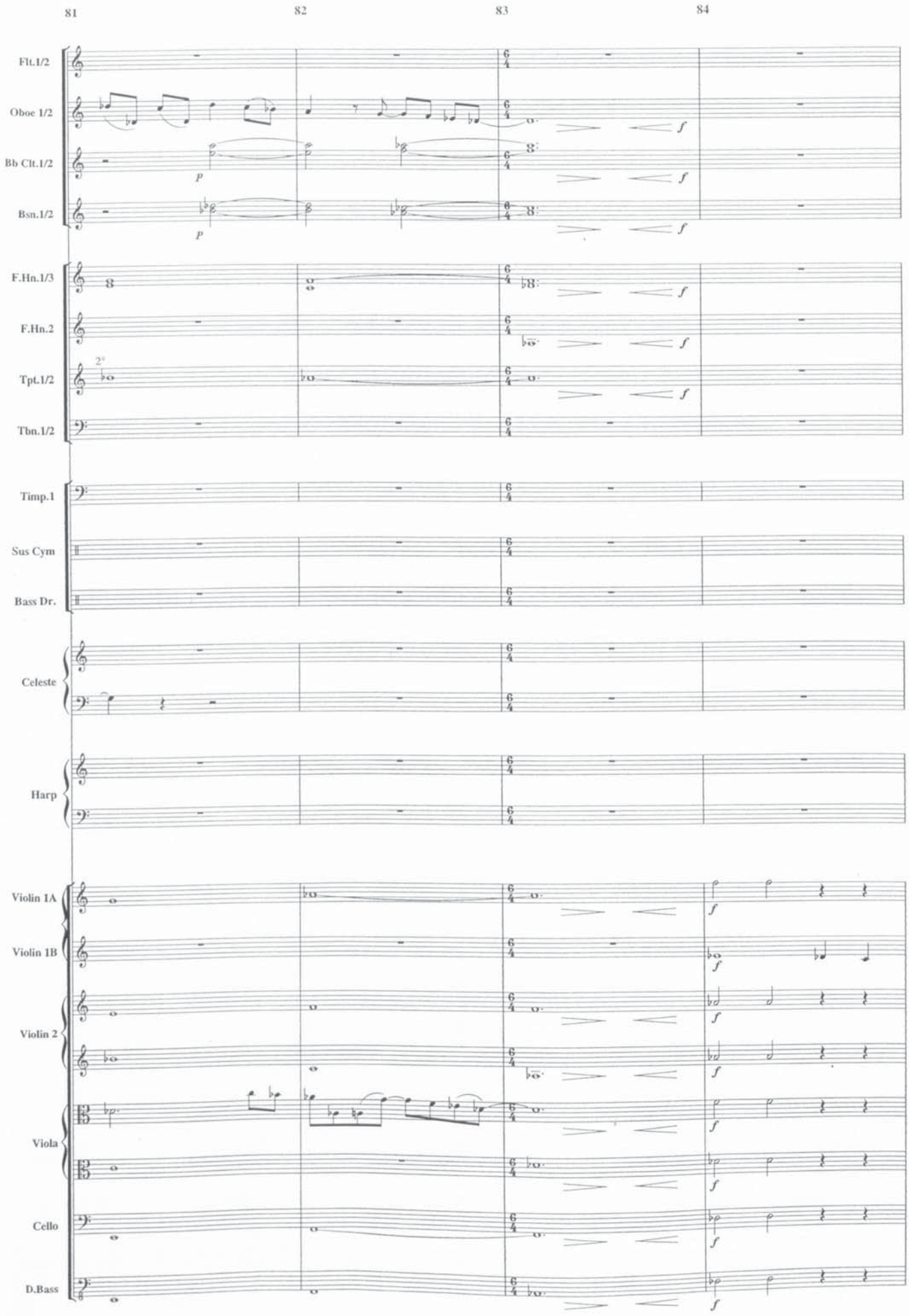

61
62
63
64
Pesante
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Pesante
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Pesante
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
ff

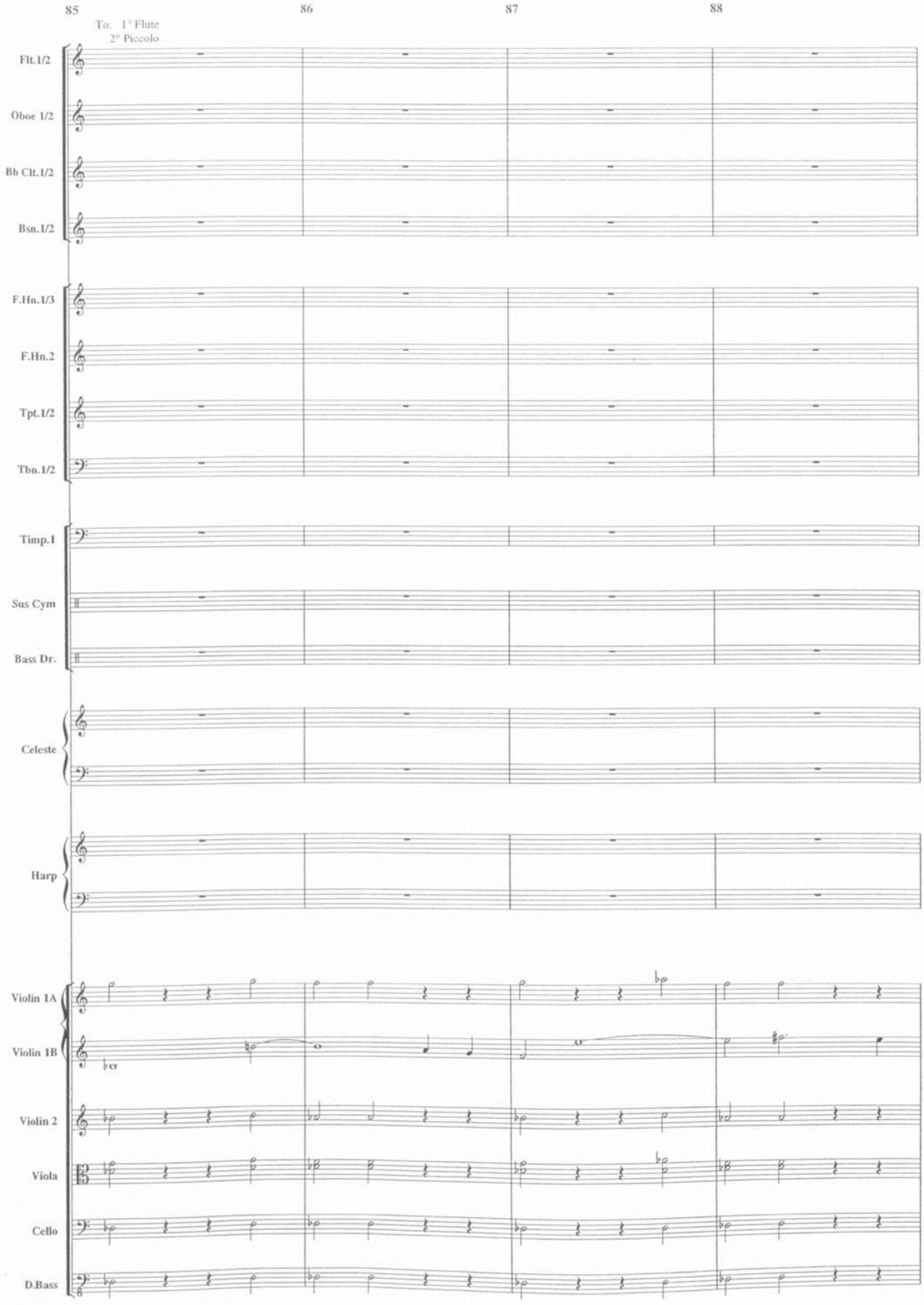

65
66
67
68
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
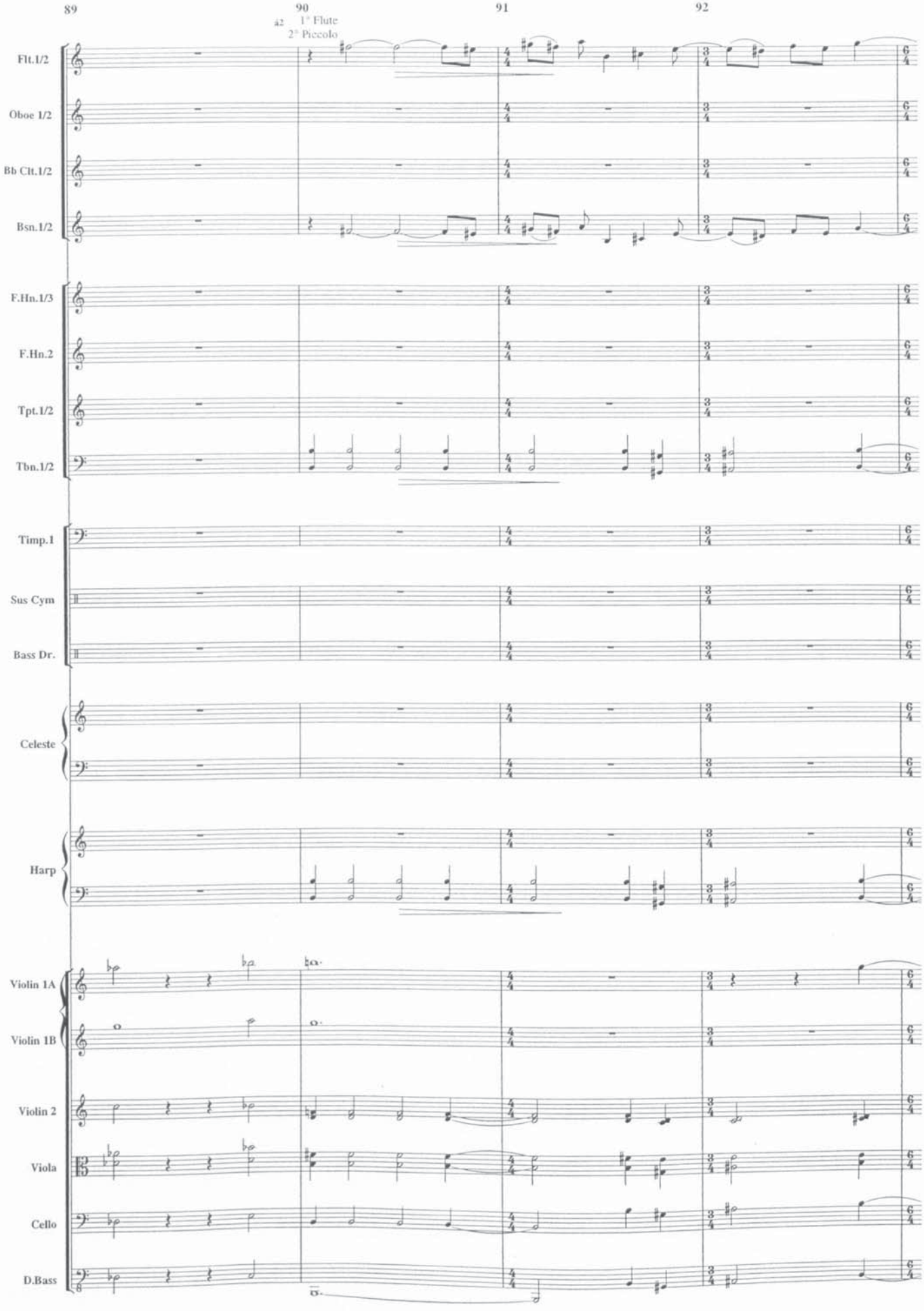

69
70
71
72
Piu
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Piu
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
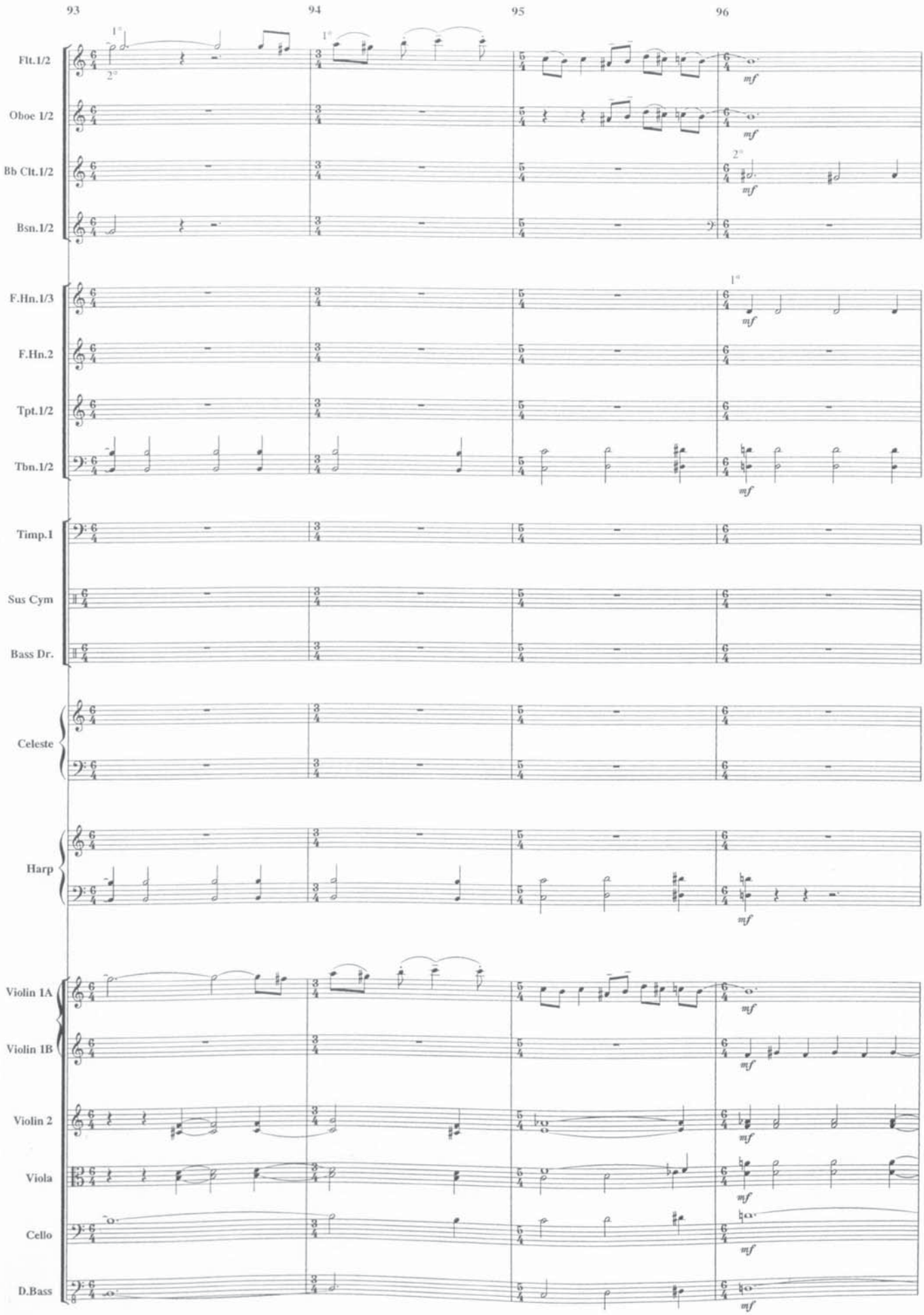

73
74
75
76
Loco
Loco
1.
2.
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Susp.Cym (Soft Beaters)
Sus Cym
Bass Dr.
Celeste
Harp
Loco
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

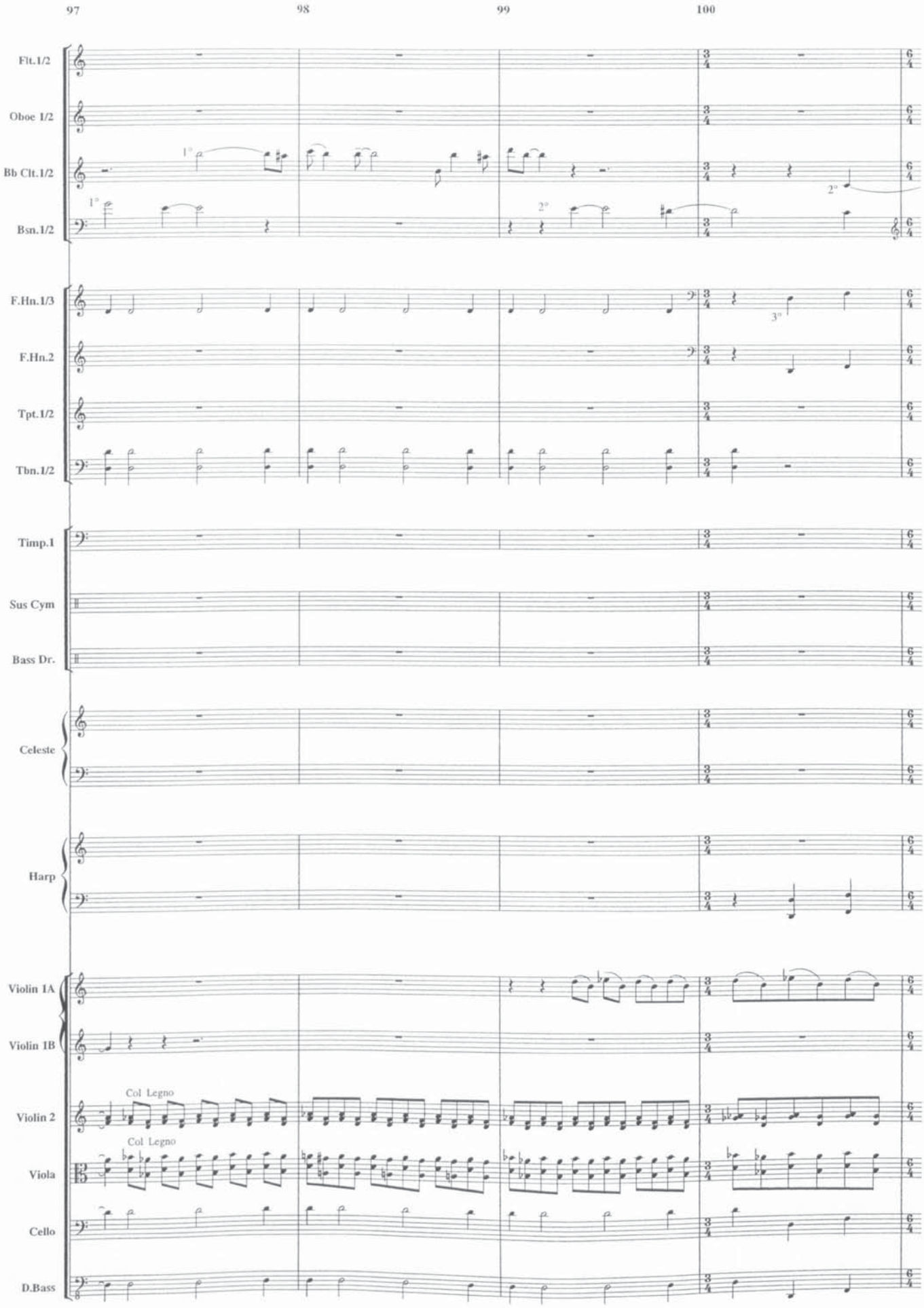

77
78
79
80
Dim.
2° only
1°
1° only
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Dim.
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Dim.
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
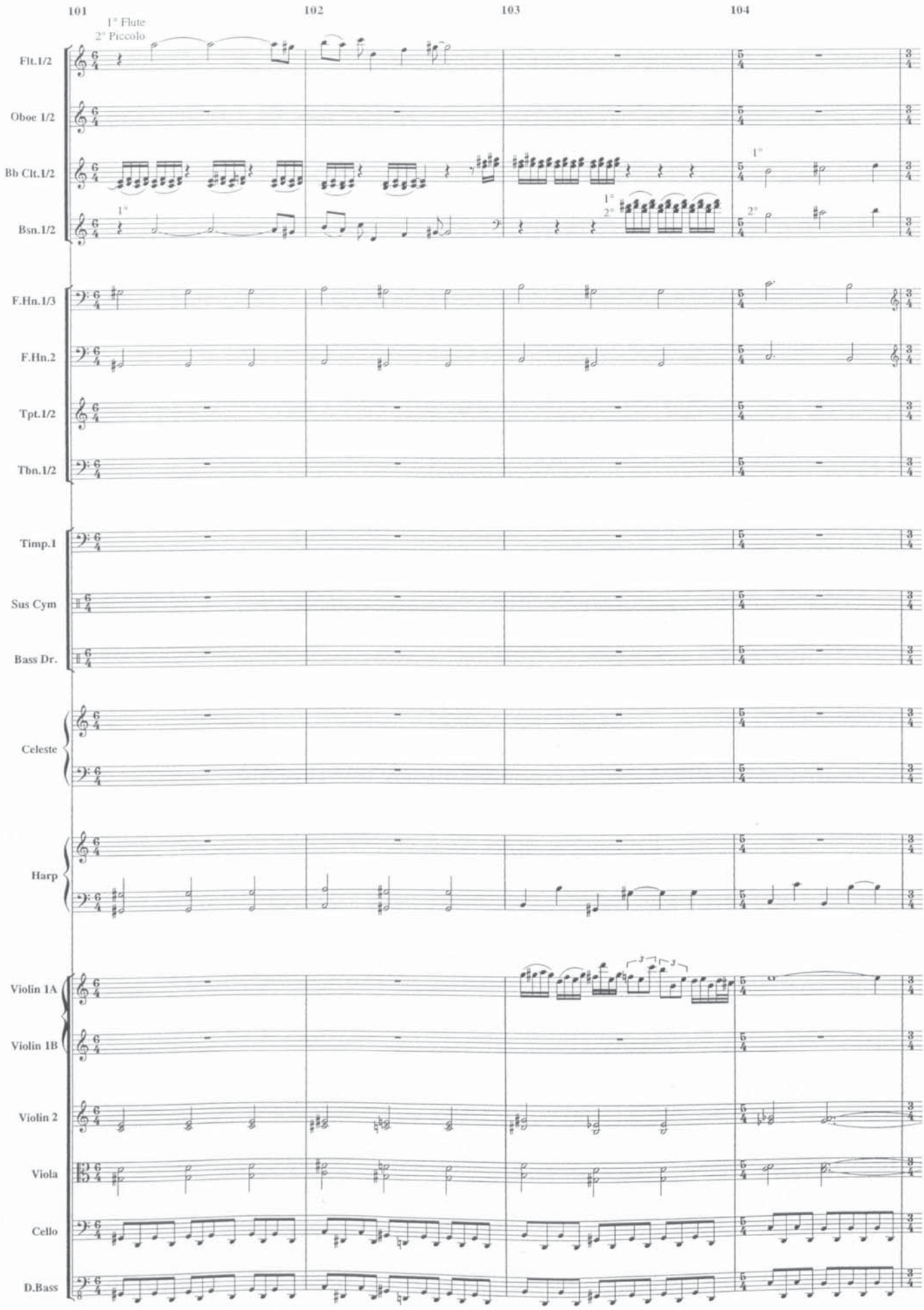

81
82
83
84
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
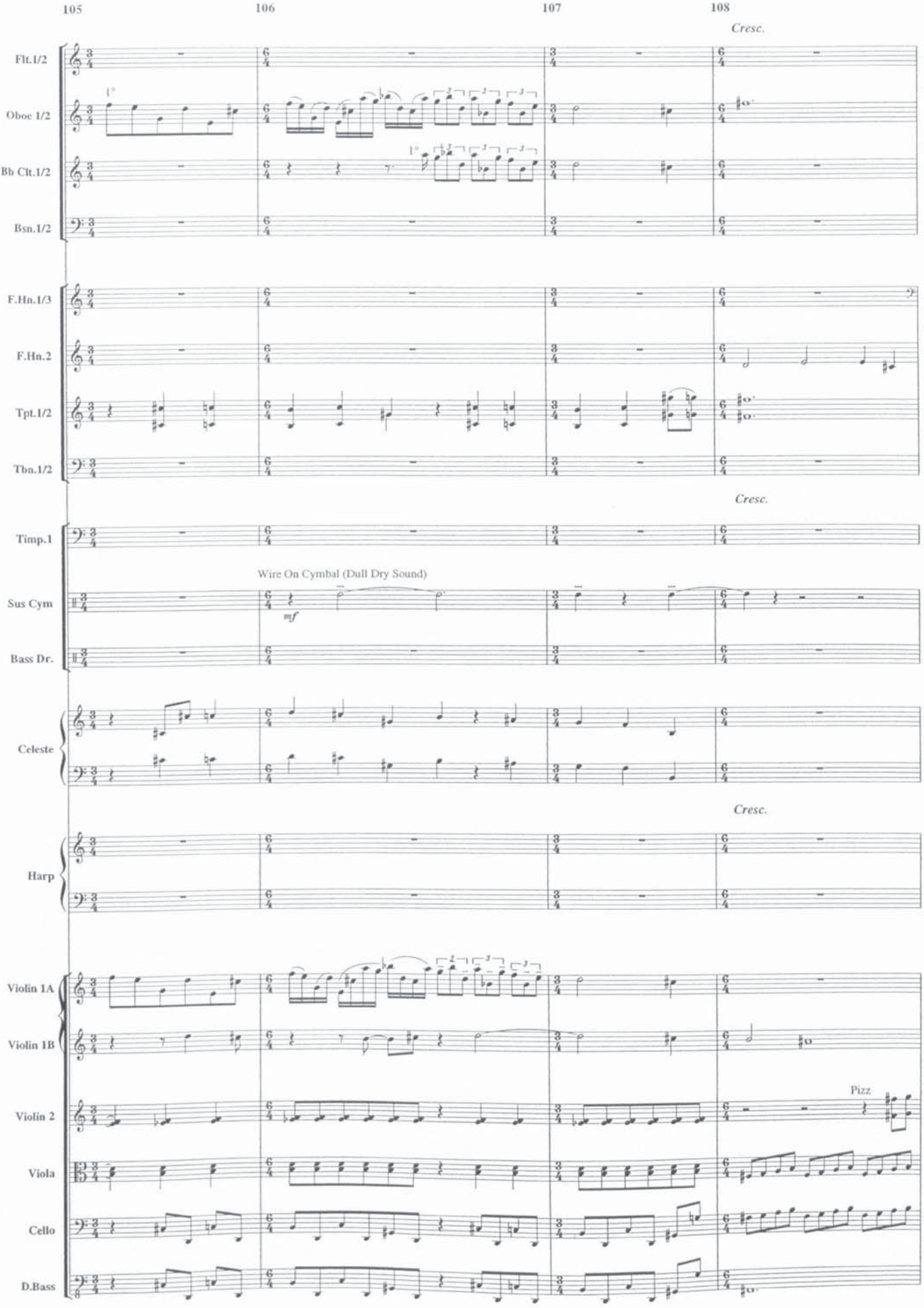

85
86
87
88
To: 1° Flute
2° Piccolo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
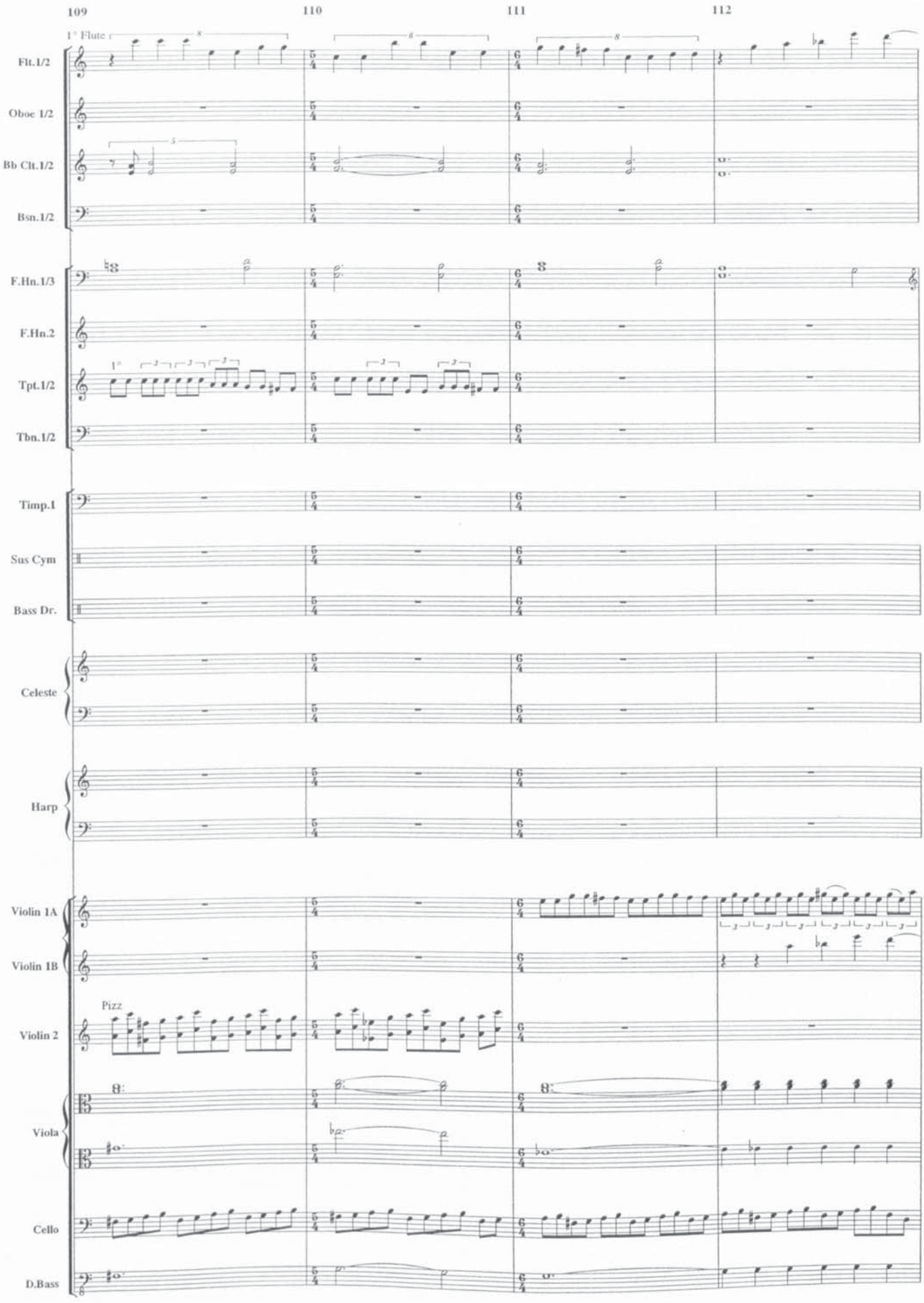

89
90
91
92
a2 1° Flute
2° Piccolo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
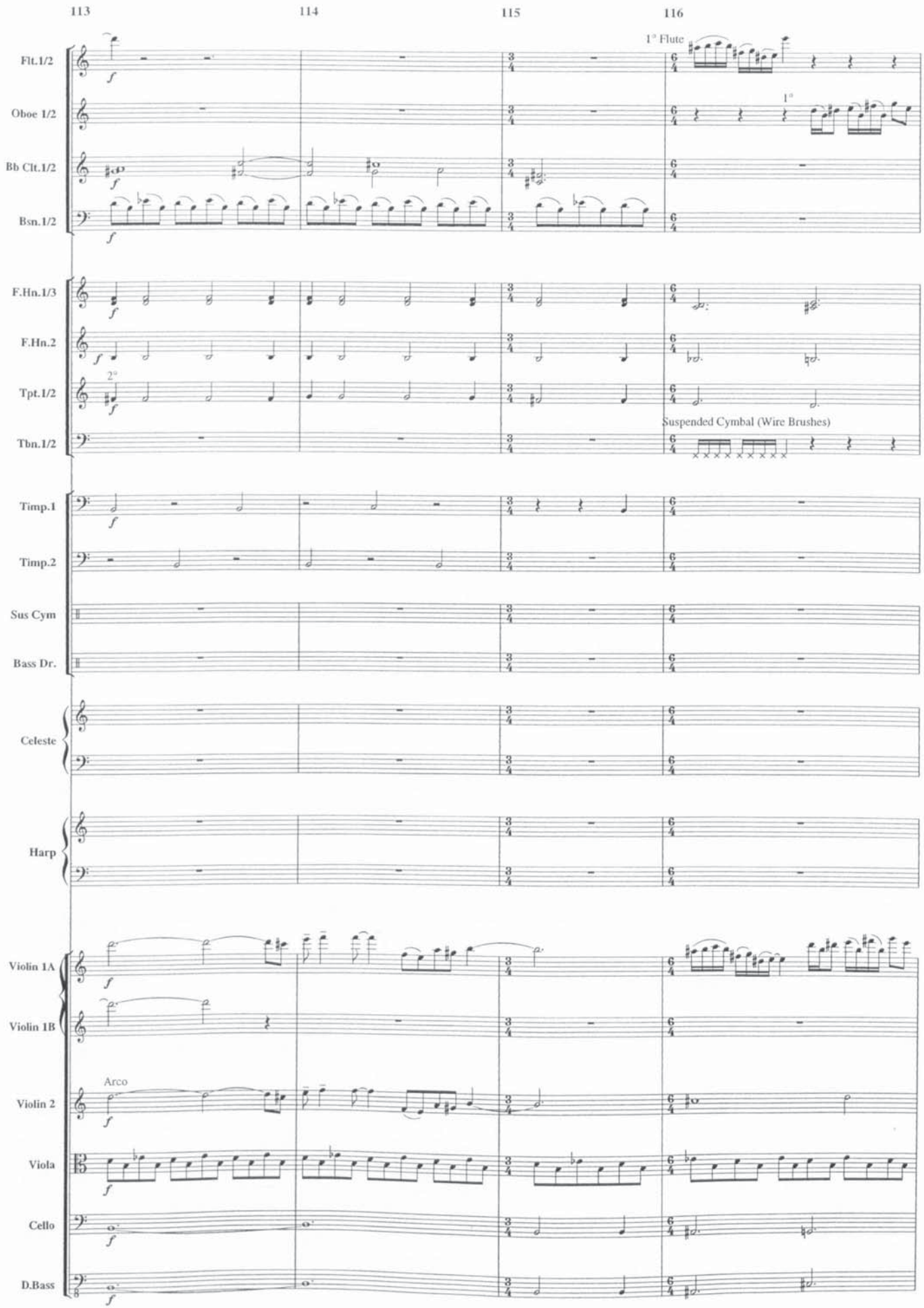

93
94
95
96
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
mf
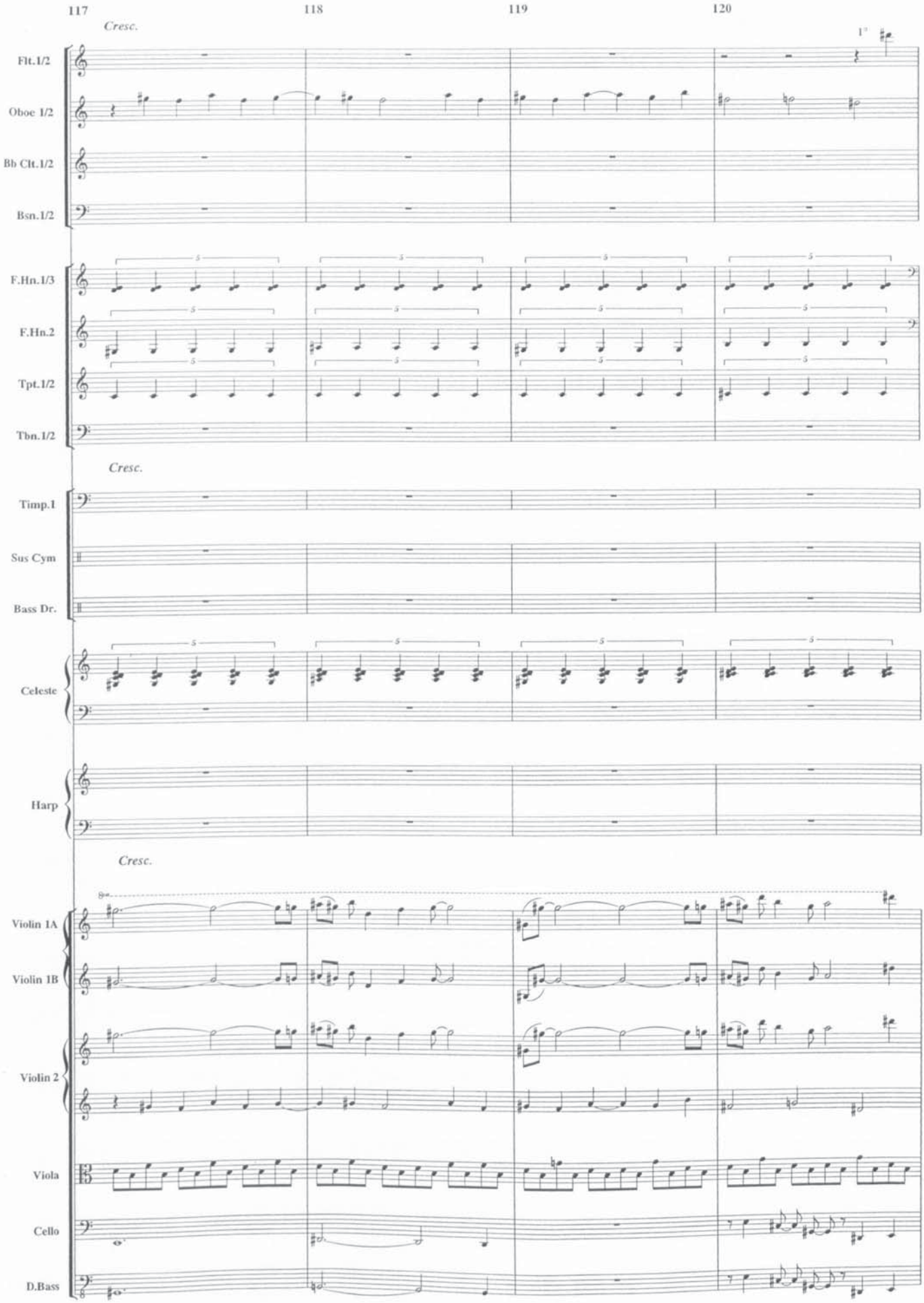

97
98
99
100
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Col Legno
Col Legno
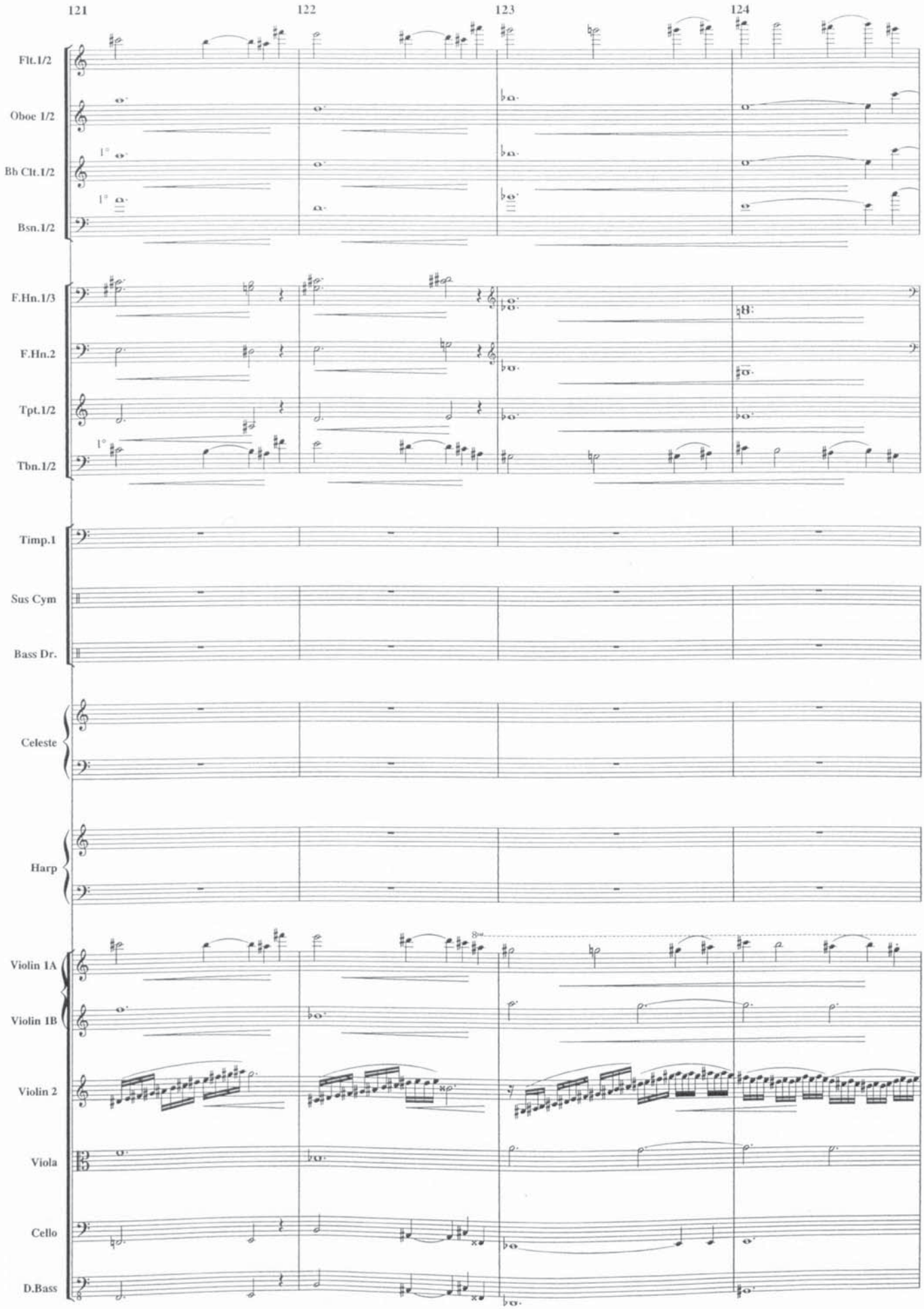

101
102
103
104
1° Flute
2° Piccolo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
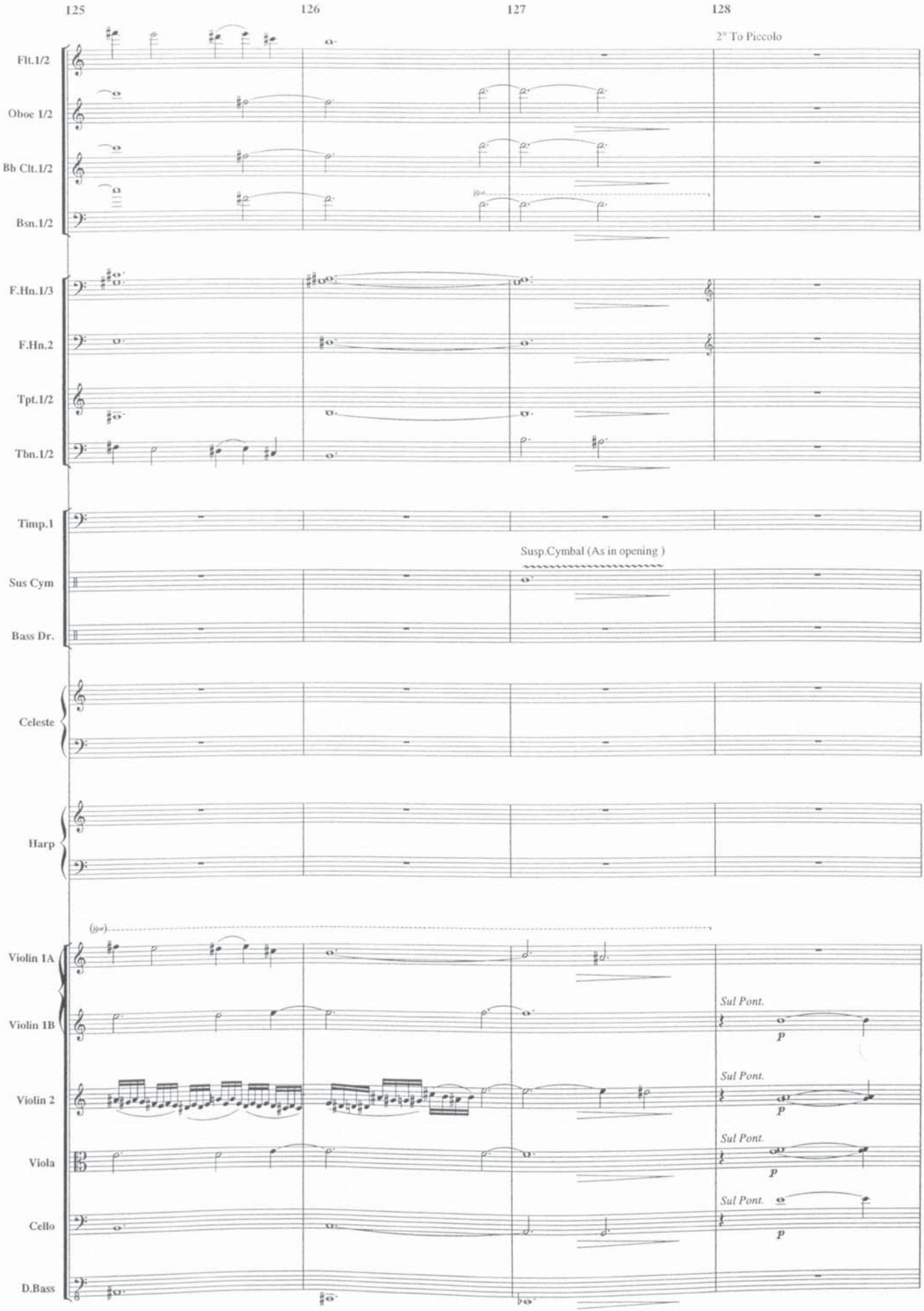

105
106
107
108
Cresc.
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Cresc.
Timp.1
Wire On Cymbal (Dull Dry Sound)
Sus Cym
mf
Bass Dr.
Celeste
Cresc.
Harp
Violin 1A
Violin 1B
Violin 2
Pizz
Viola
Cello
D.Bass
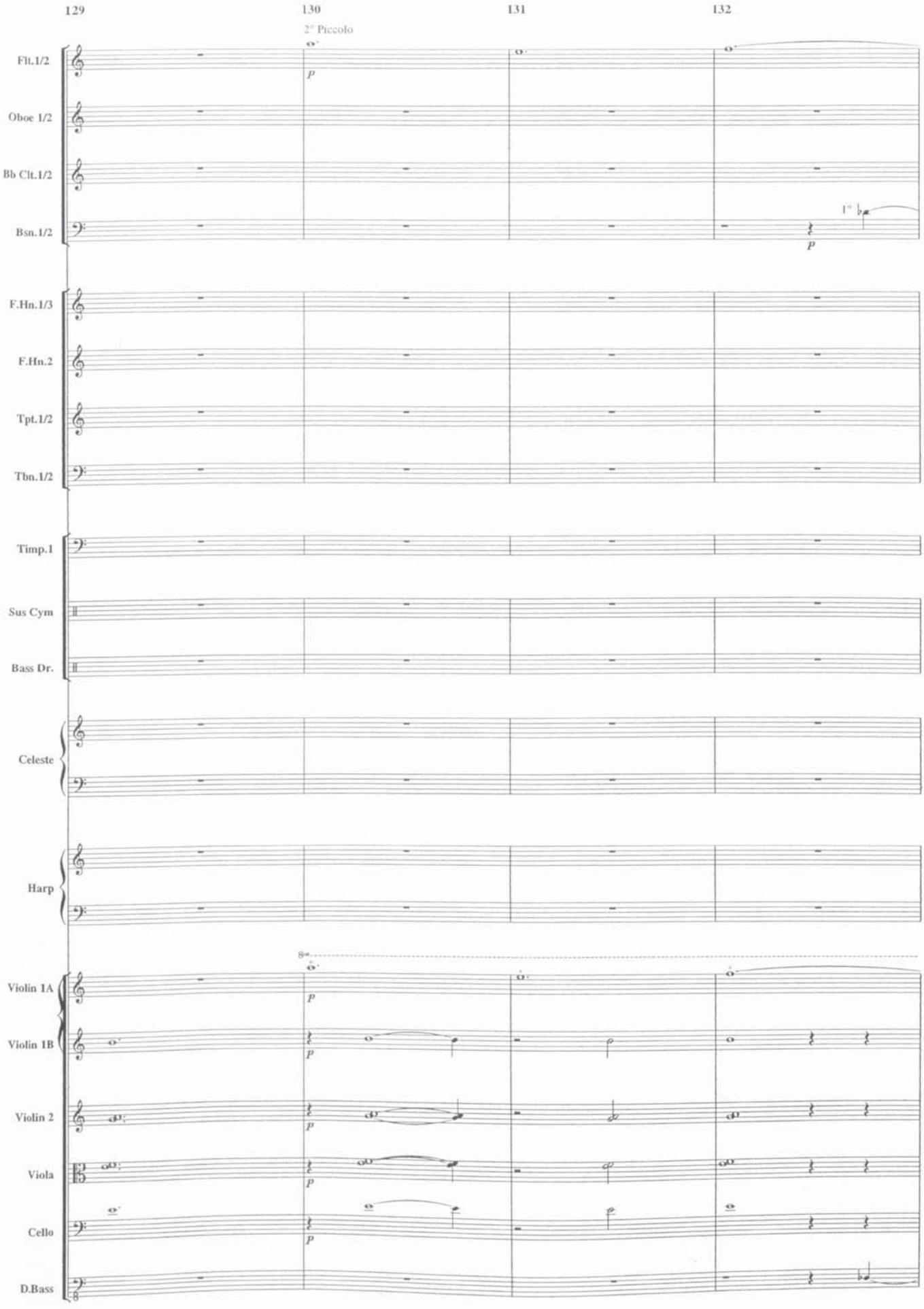

109
110
111
112
1° Flute
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Pizz

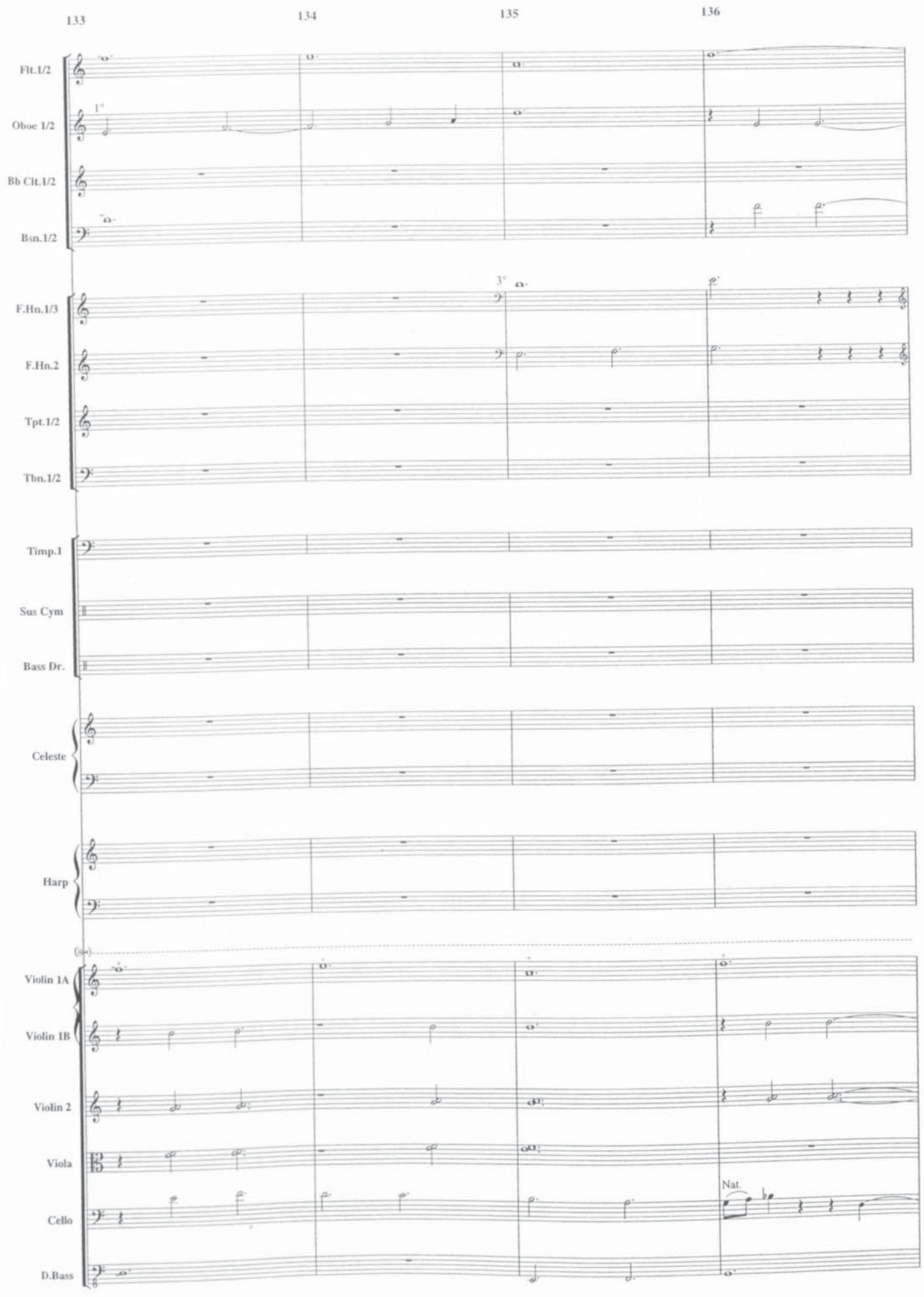

113
114
115
116
1° Flute
Flt.1/2
Oboe 1/2
1°
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
2°
Tpt.1/2
Suspended Cymbal (Wire Brushes)
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Arco
Violin 2
Viola
Cello
D.Bass
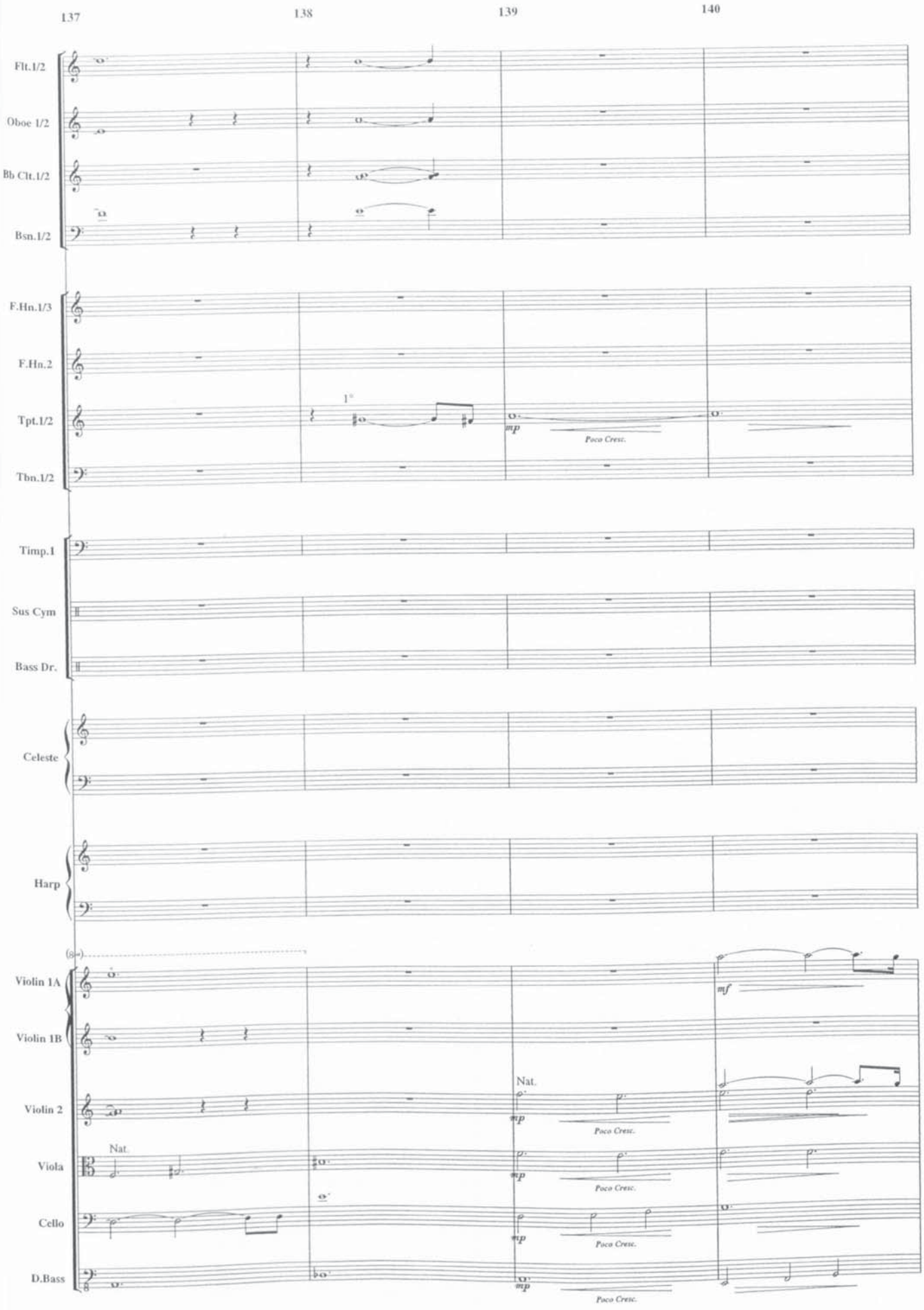

117
118
119
120
Cresc.
1°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Cresc.
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Cresc.
8va
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
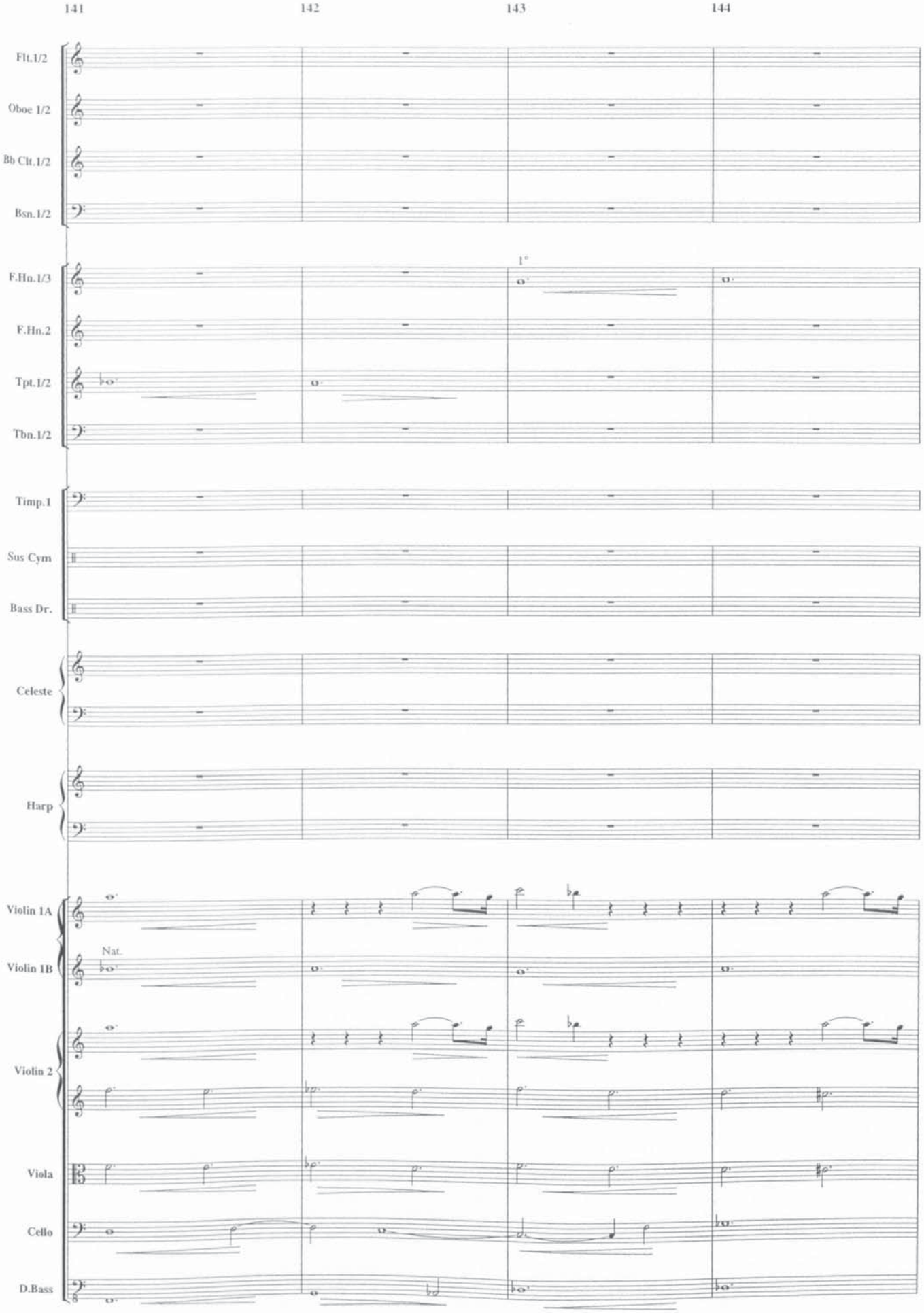

121
122
123
124
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
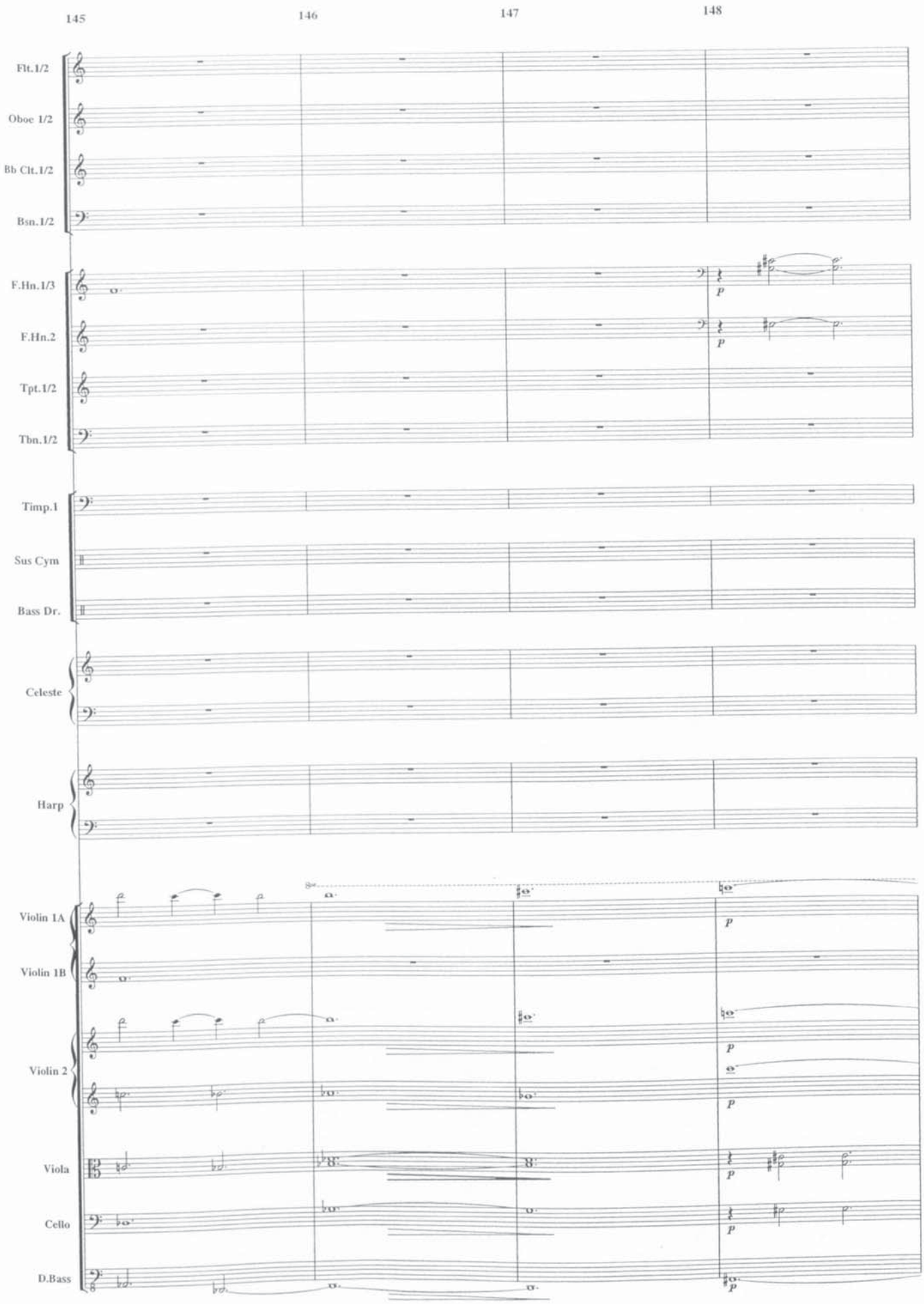

125
126
127
128
2° To Piccolo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Susp.Cymbal (As in opening)
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Sul Pont.
p
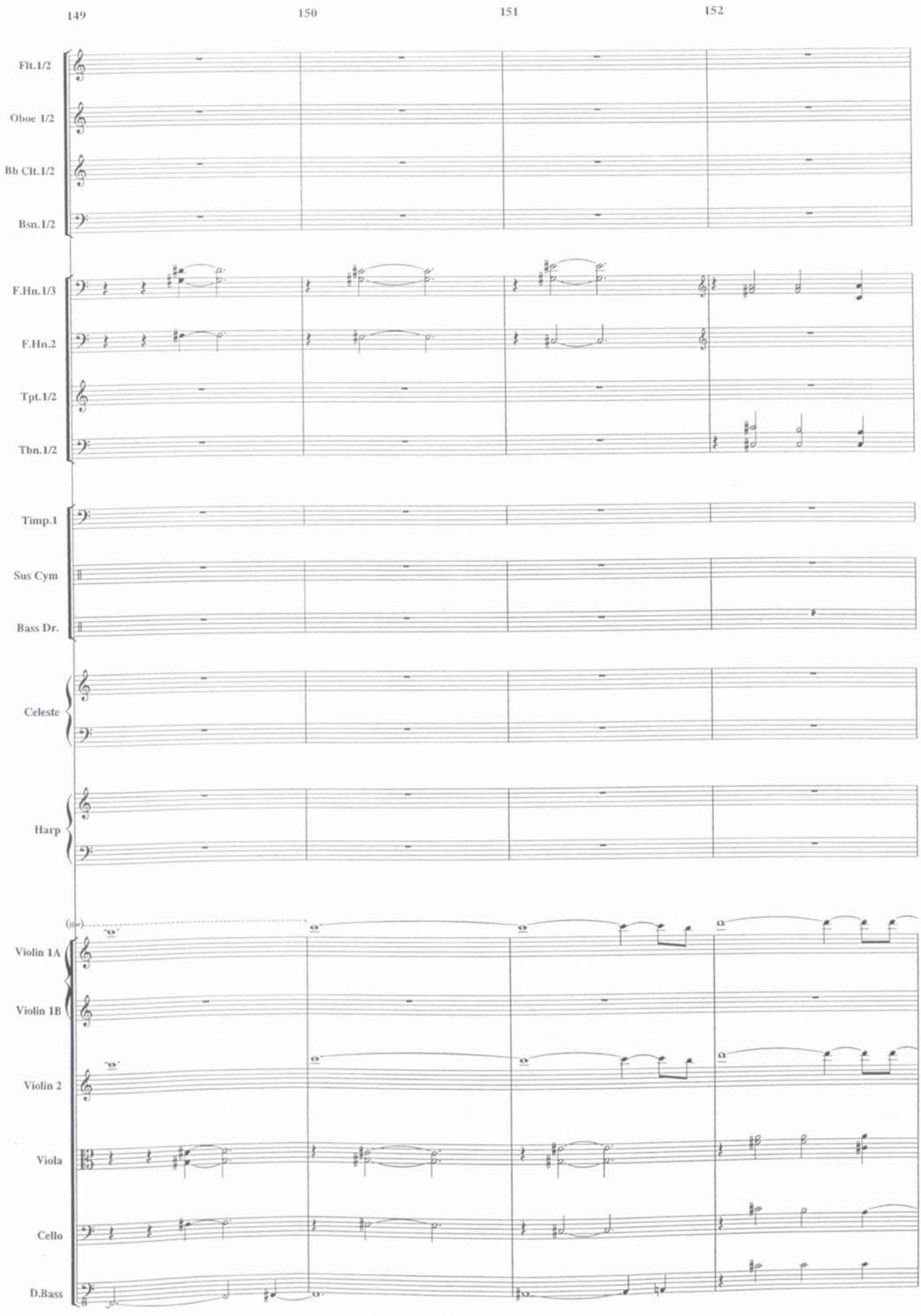

129
130
131
132
2° Piccolo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
8va
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
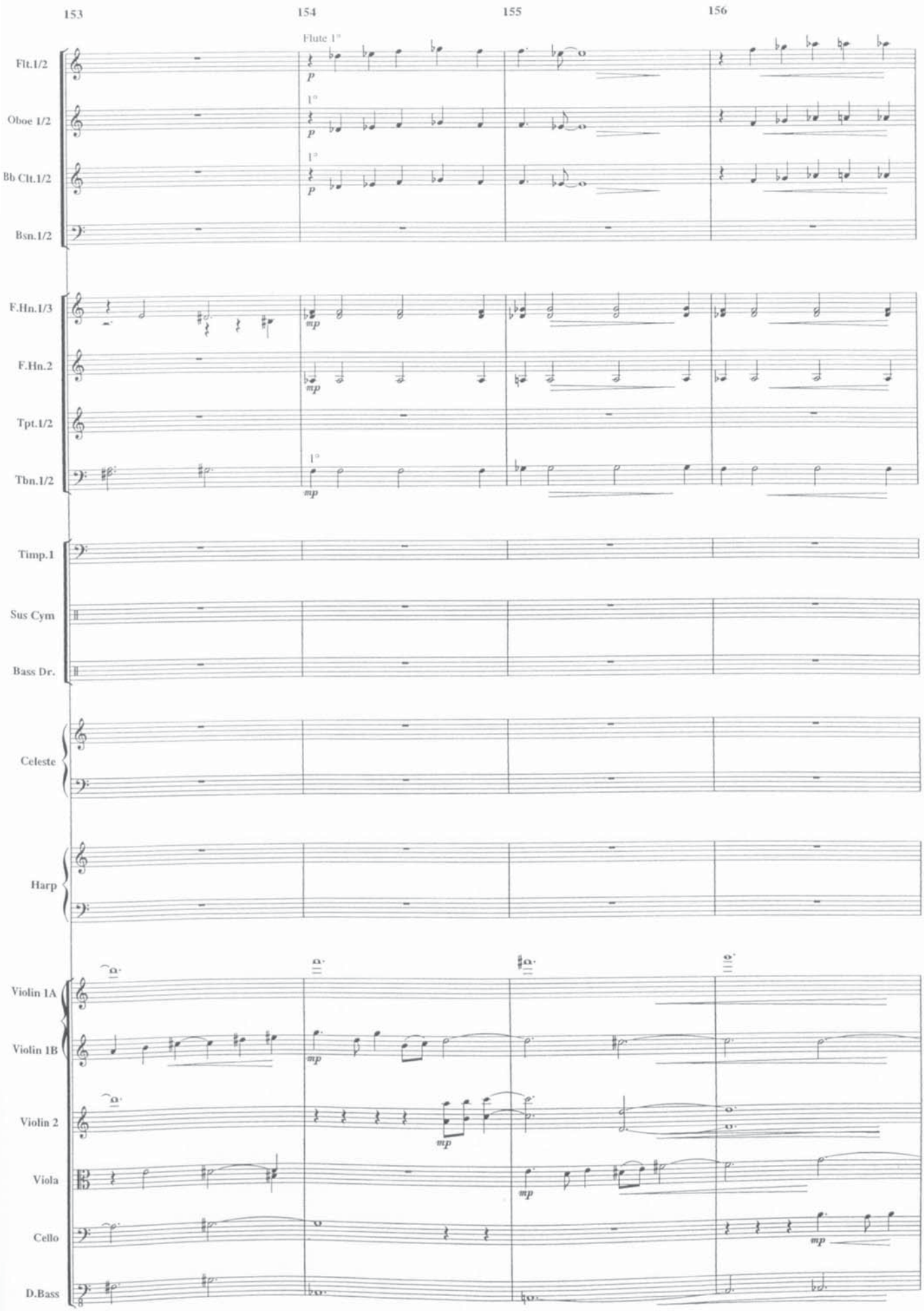

133
134
135
136
Flt.1/2
Oboe 1/2
1°
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
3°
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
(8va)
Violin 1A
Violin 1B
Violin 2
Viola
Nat.
Cello
D.Bass
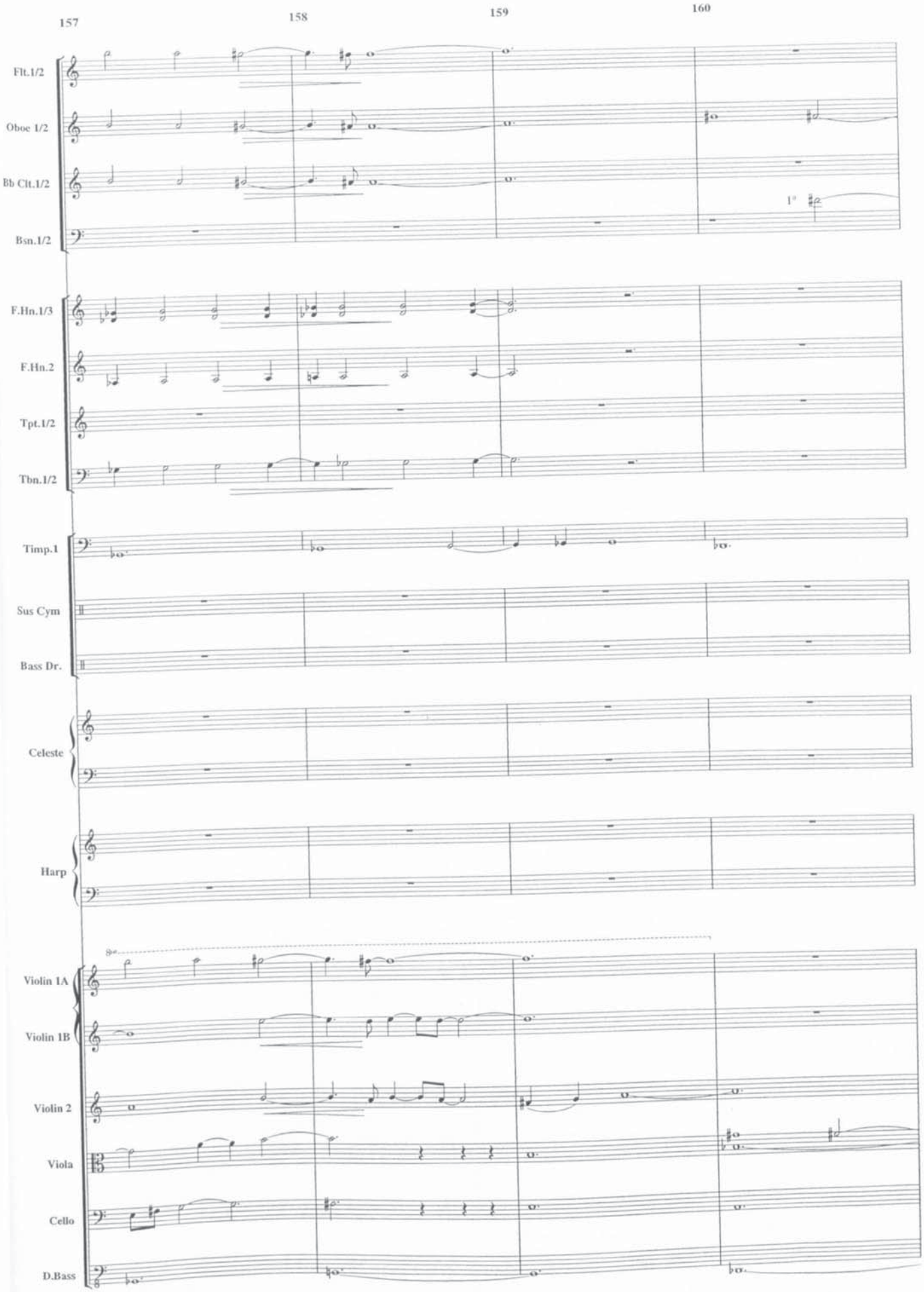

137
138
139
140
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
1°
mp
Poco Cresc.
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Nat.
mf
mp
Poco Cresc.
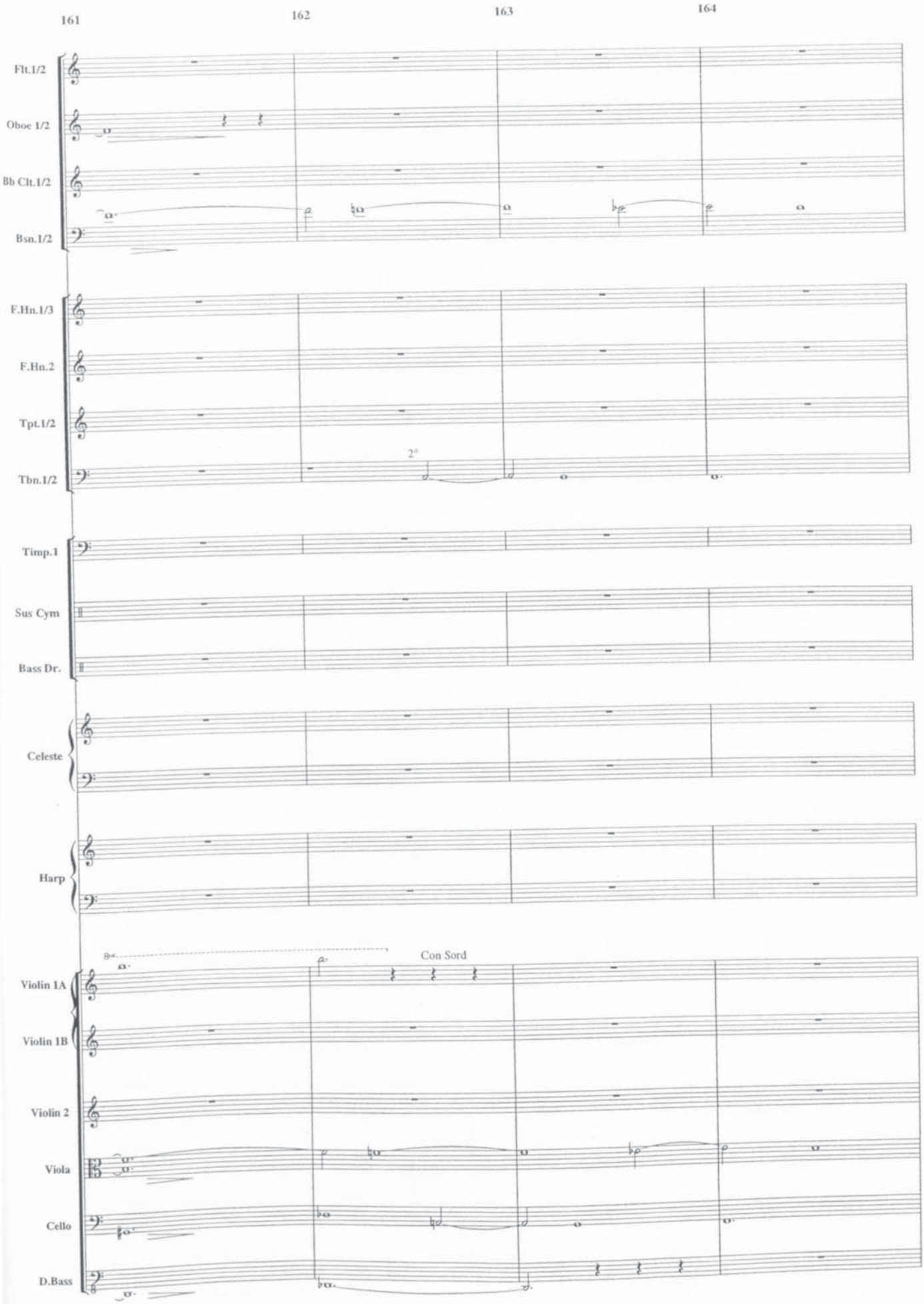

141
142
143
144
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
1°
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Nat.
Violin 2
Viola
Cello
D.Bass
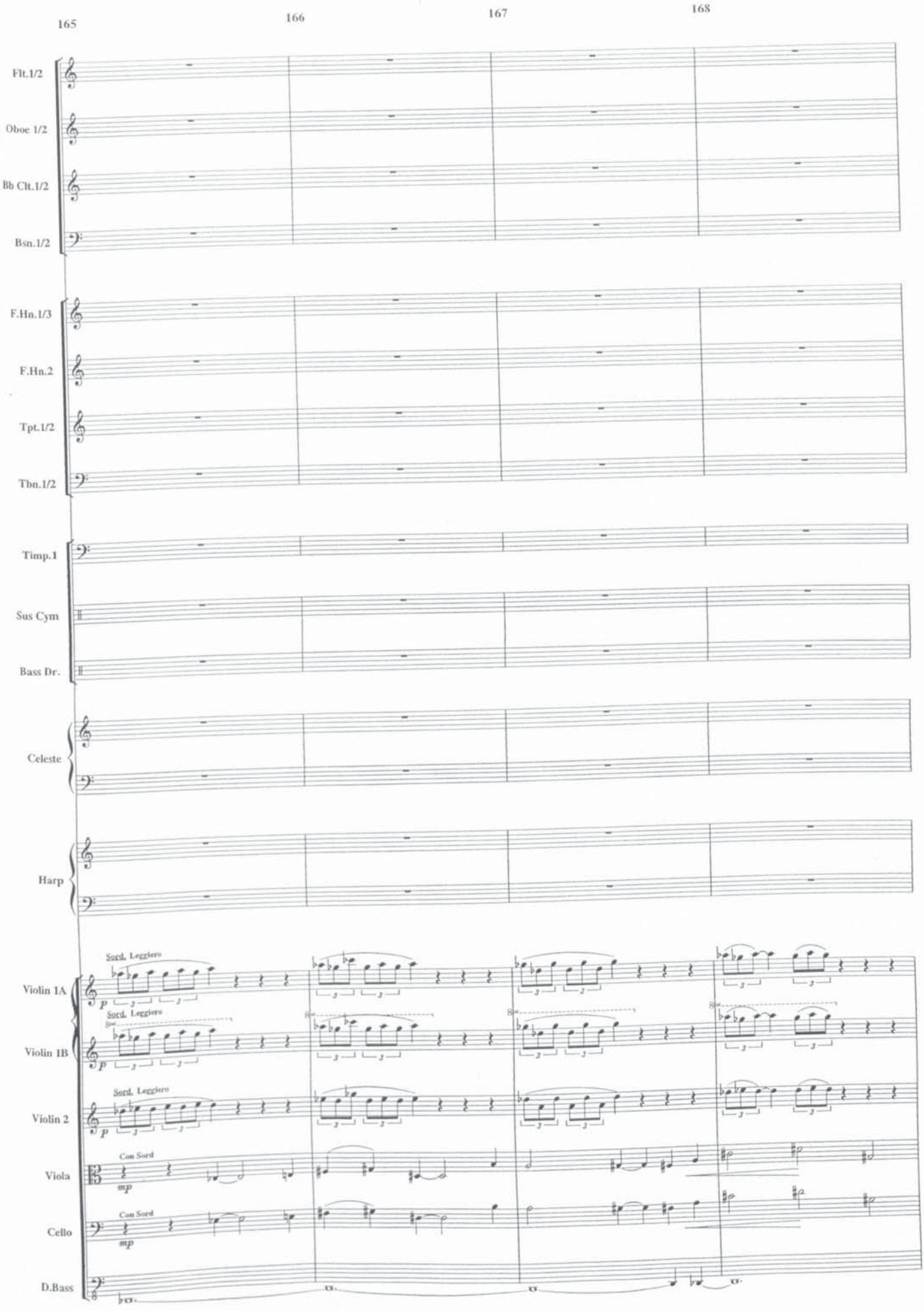

145
146
147
148
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
P
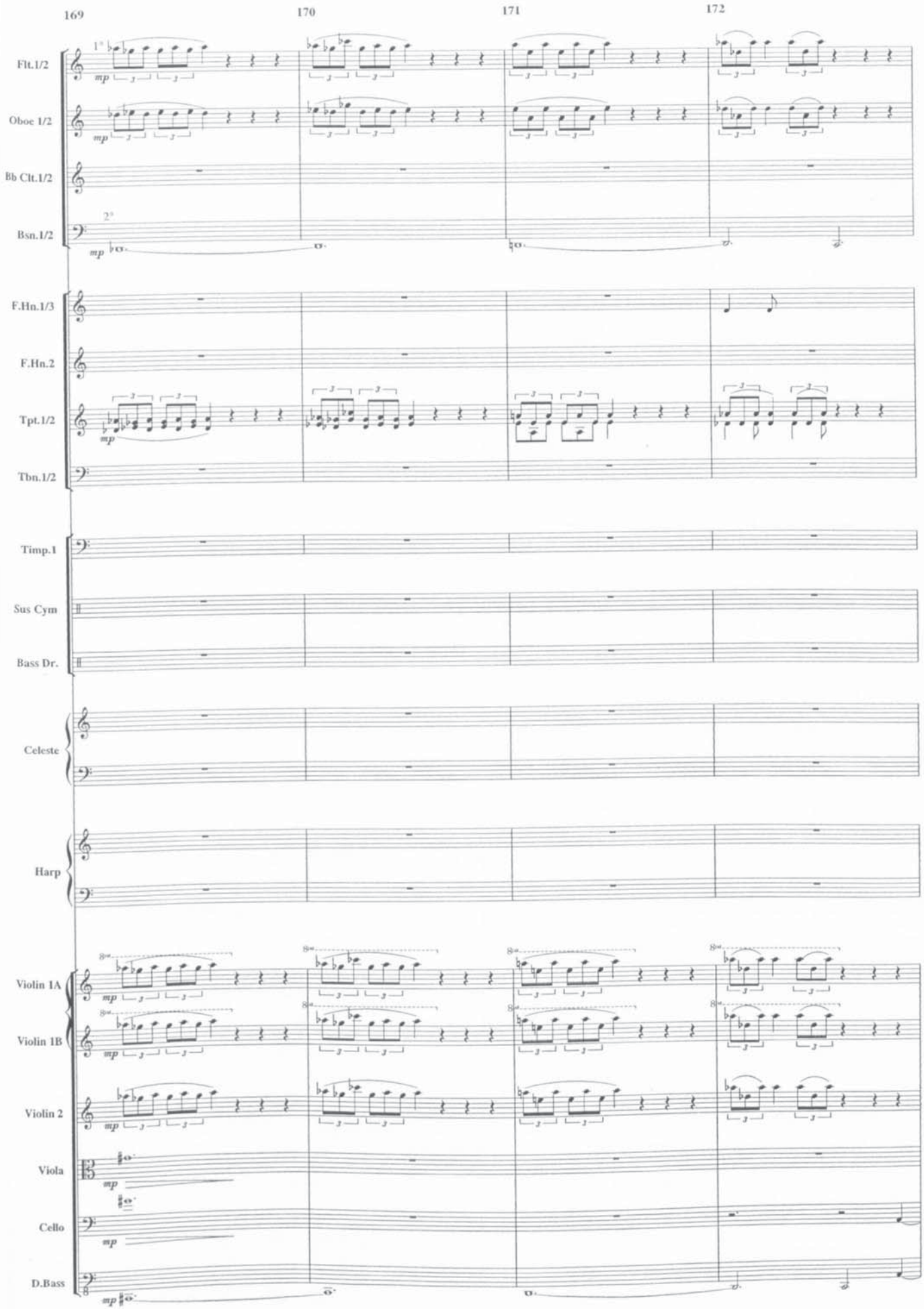

149
150
151
152
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
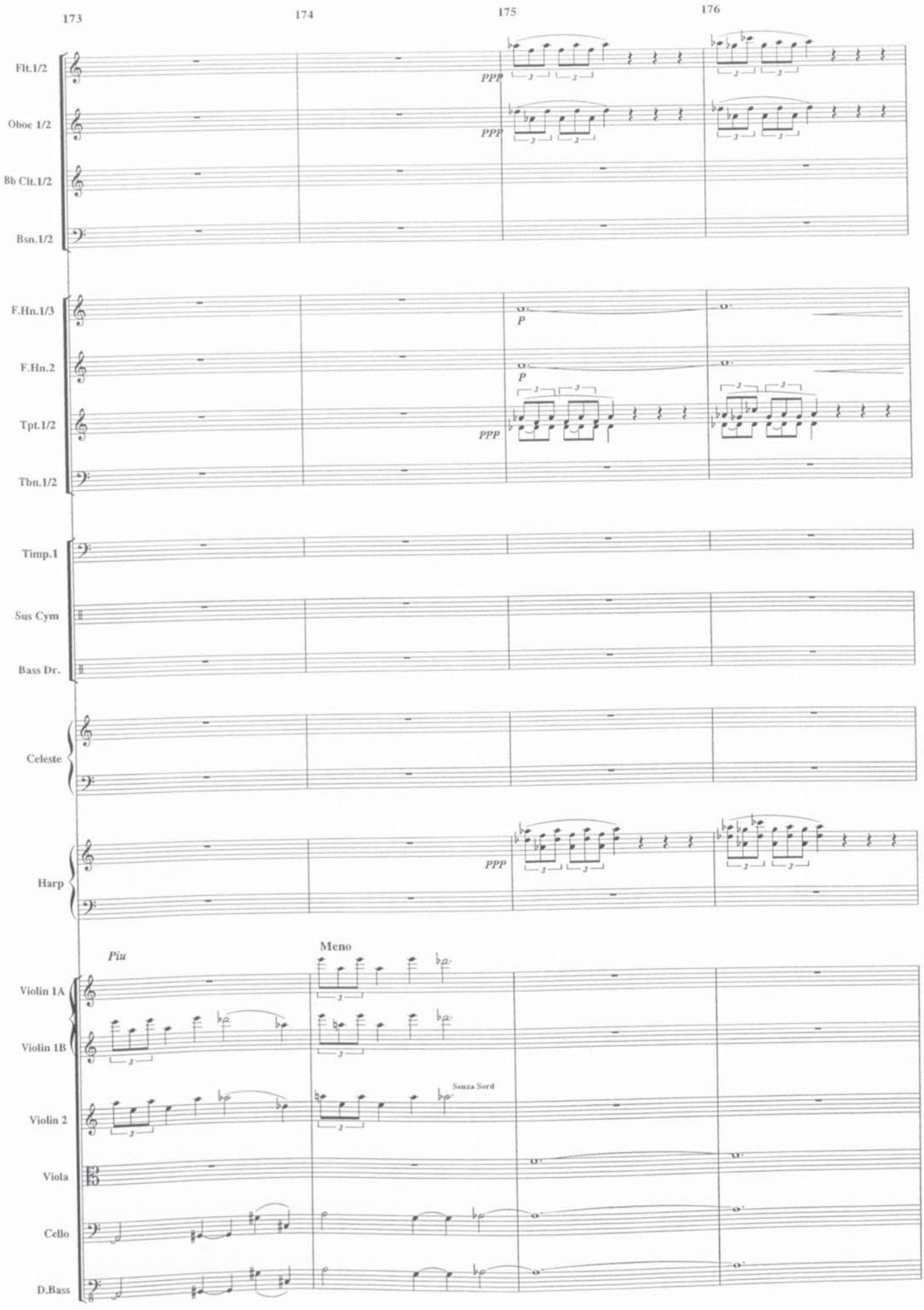

153
154
155
156
Flute 1°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
P
mp
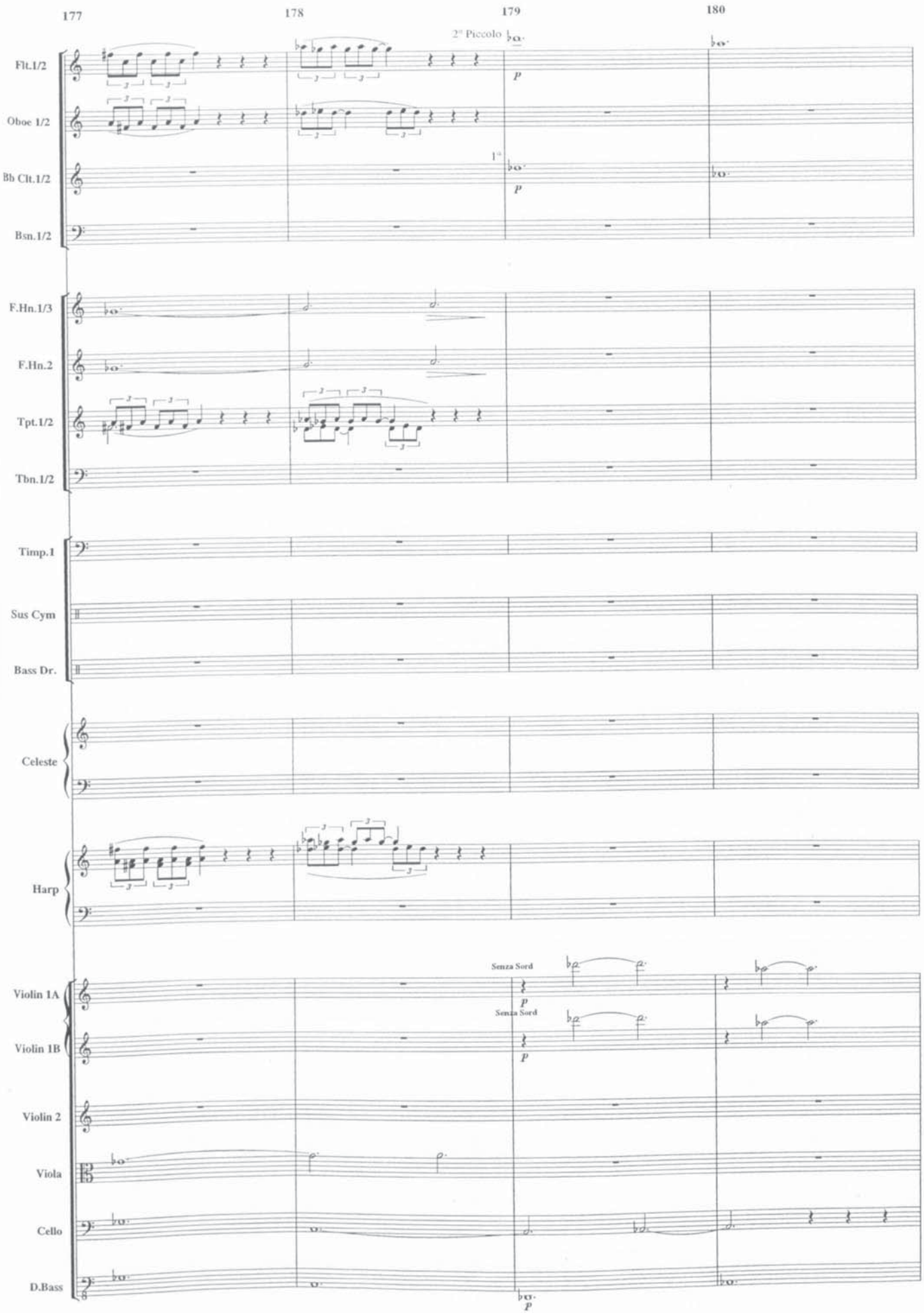

157
158
159
160
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
8va
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

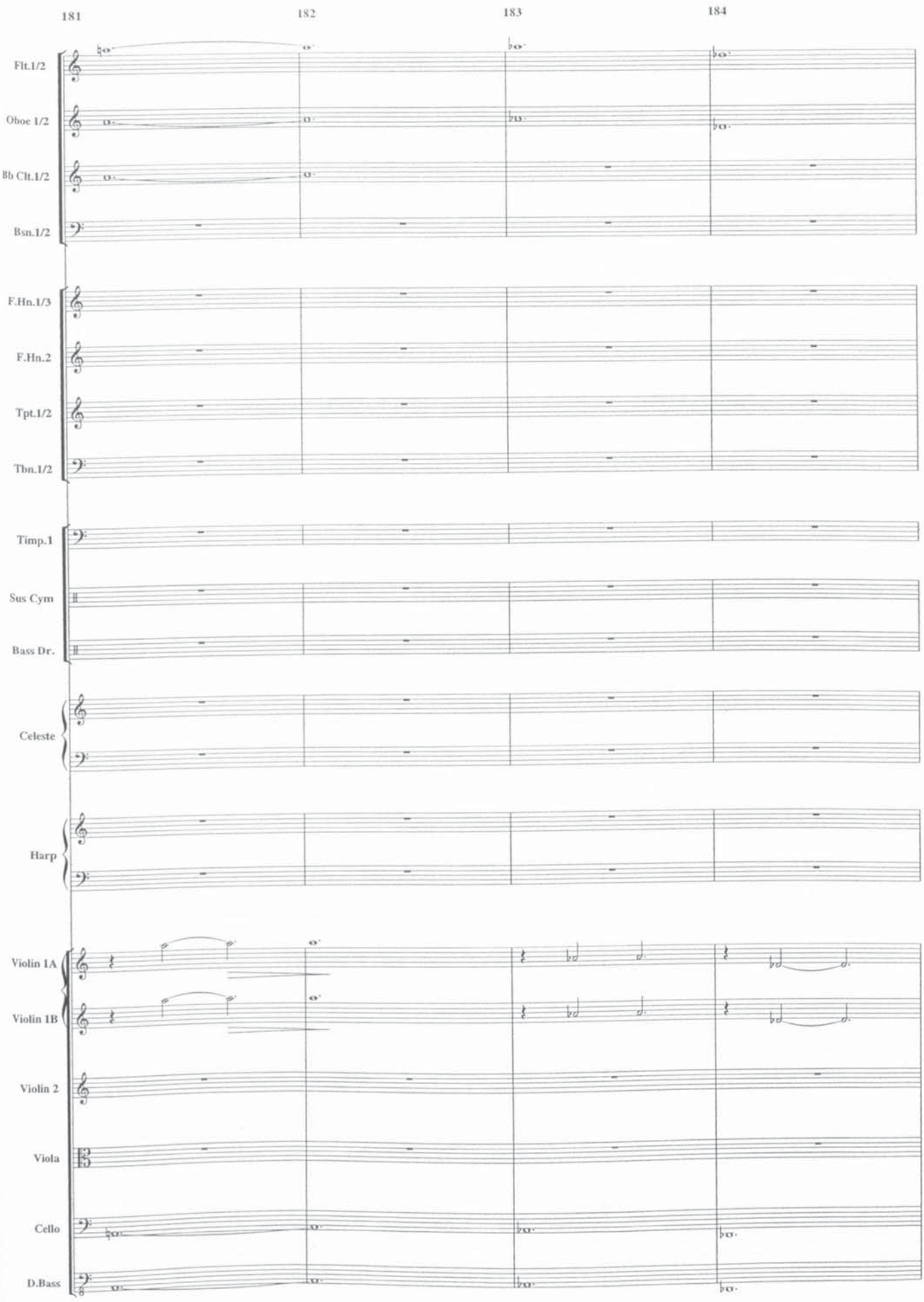

161
162
163
164
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
2°
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Con Sord
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
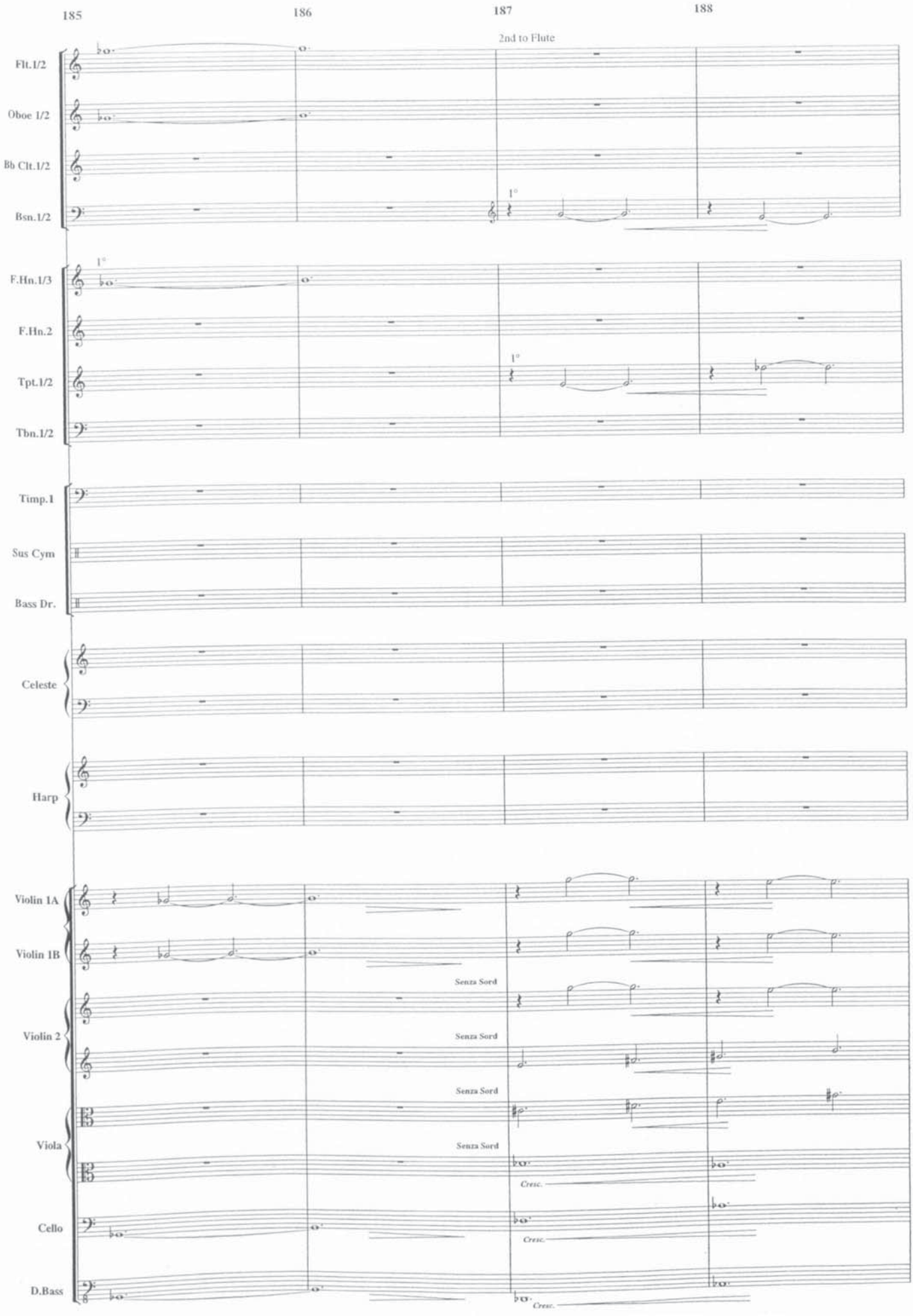

165
166
167
168
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Sord. Leggiero
Con Sord
p
mp
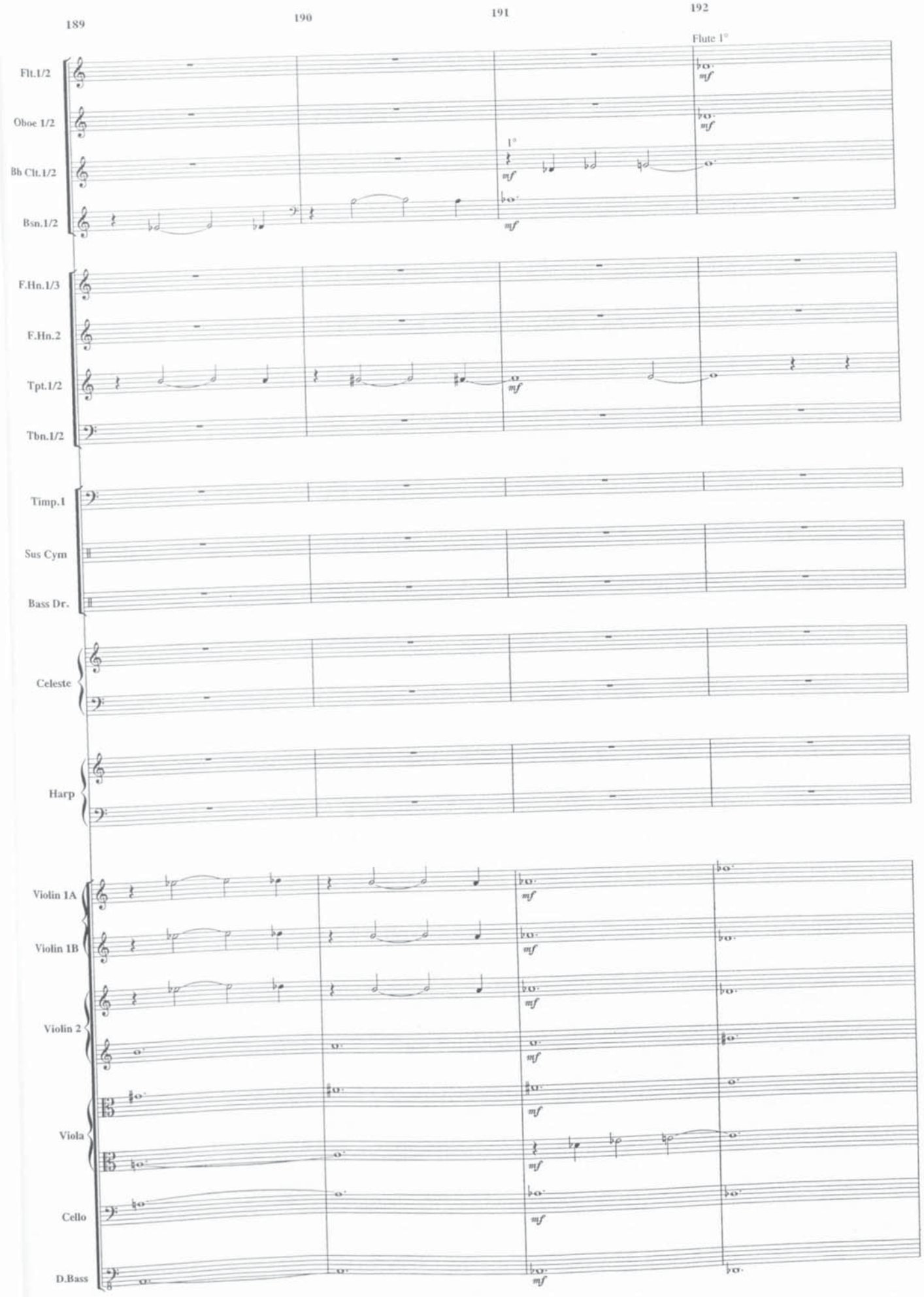

169
170
171
172
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
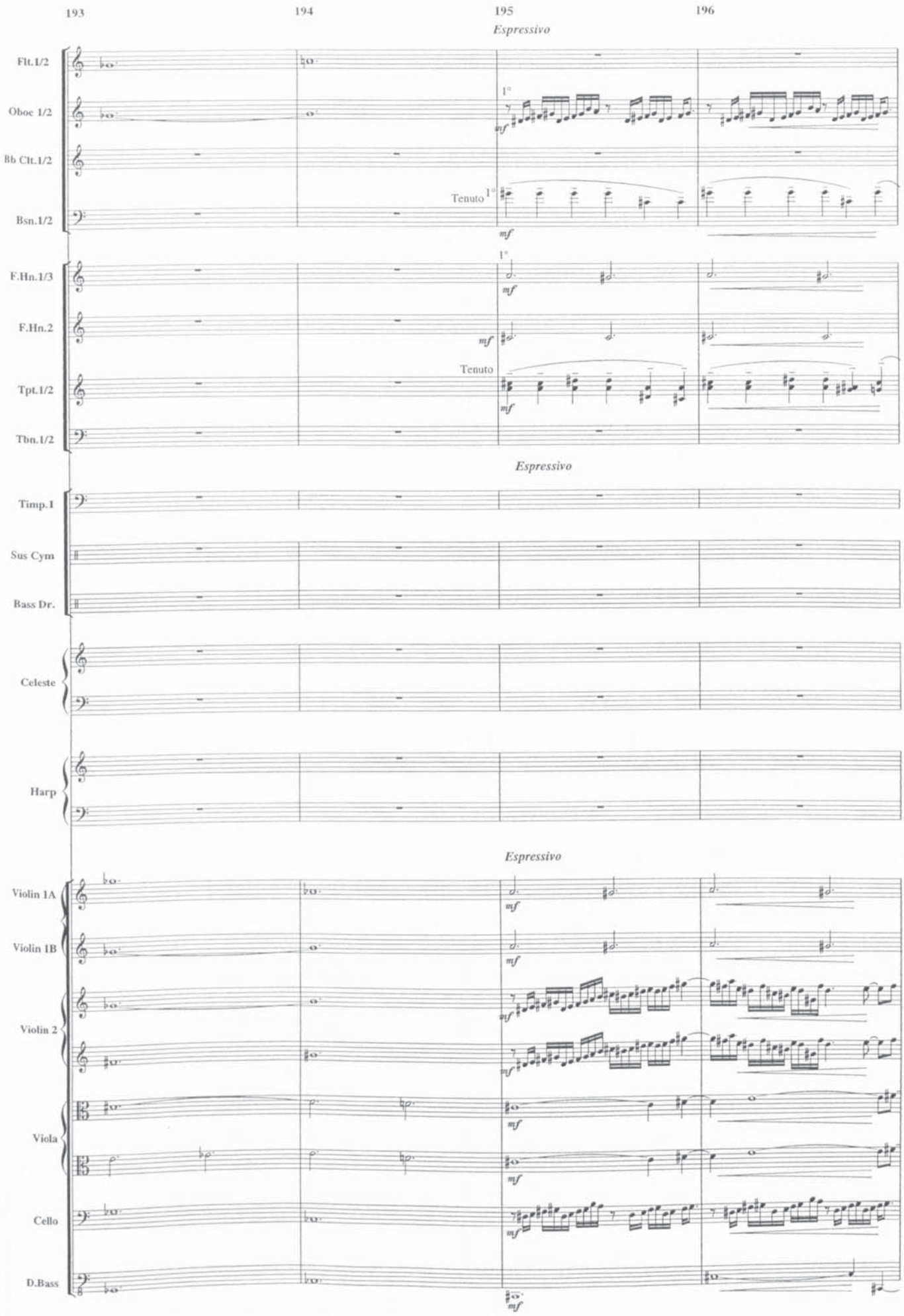

173
174
175
176
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
PPP
P
Piu
Meno
Senza Sord
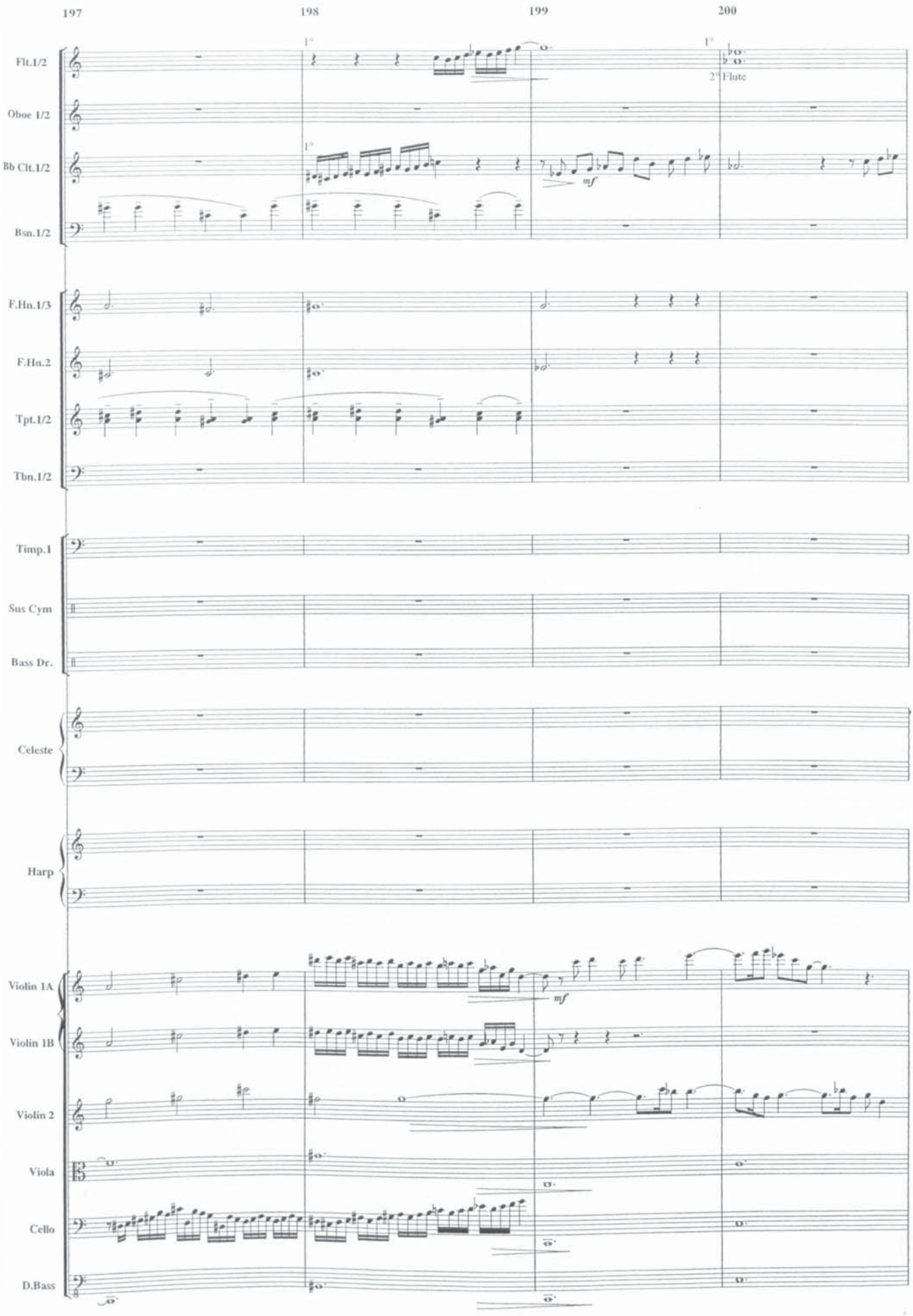

177
178
179
180
2° Piccolo
Flt.1/2
Oboe 1/2
1°
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Senza Sord
Senza Sord
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
P

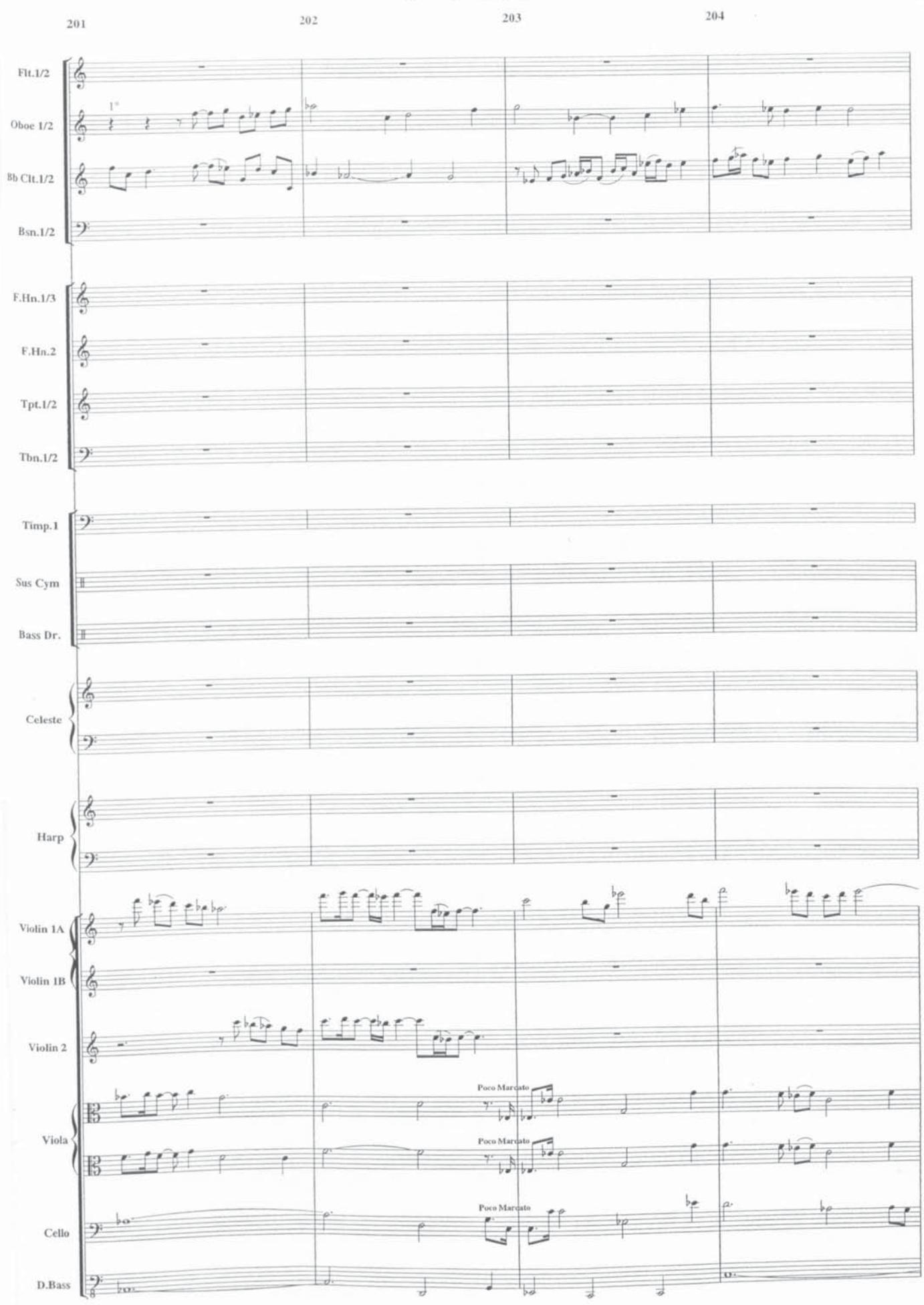

181
182
183
184
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
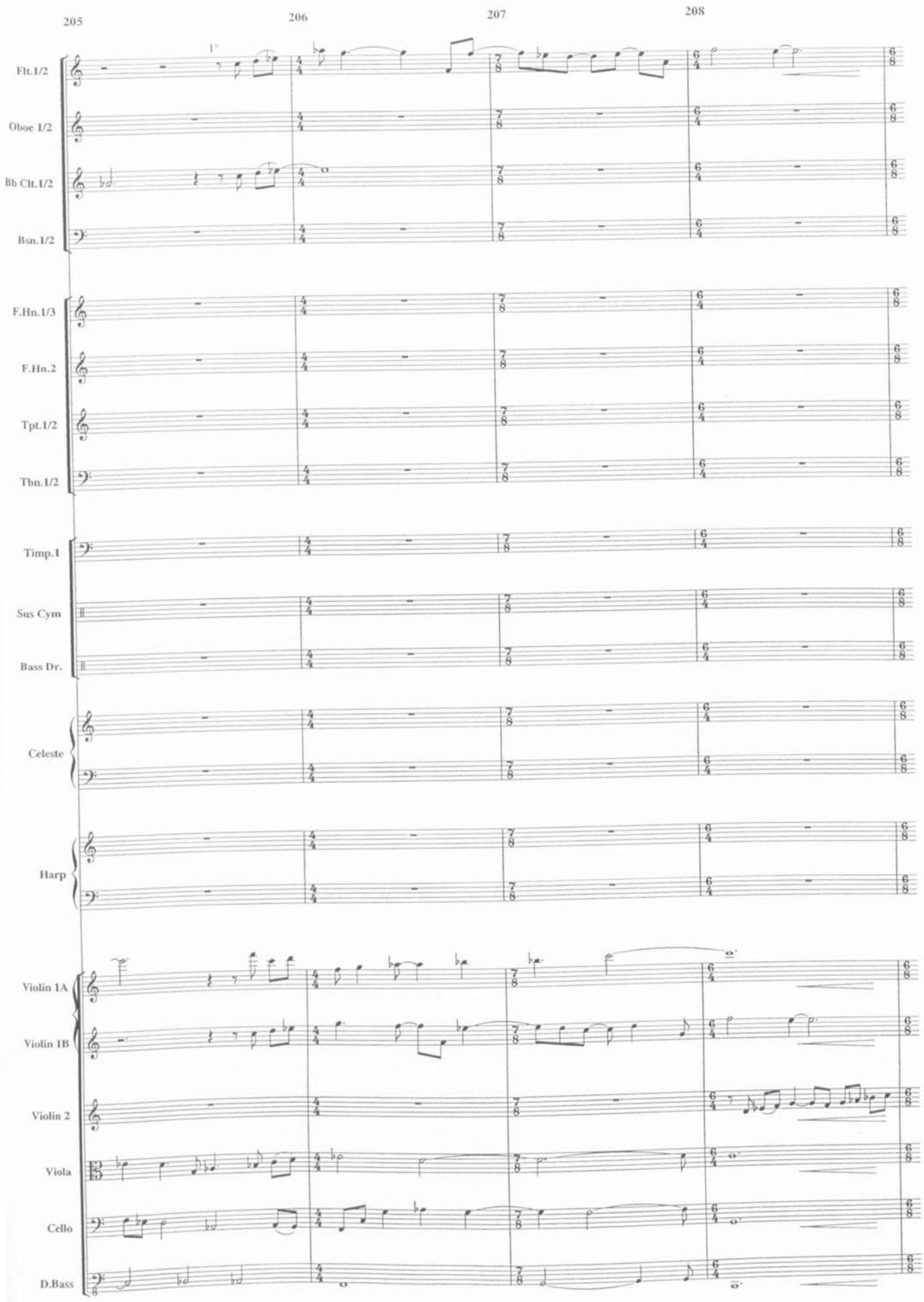

185
186
187
188
2nd to Flute
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Senza Sord
Cresc.
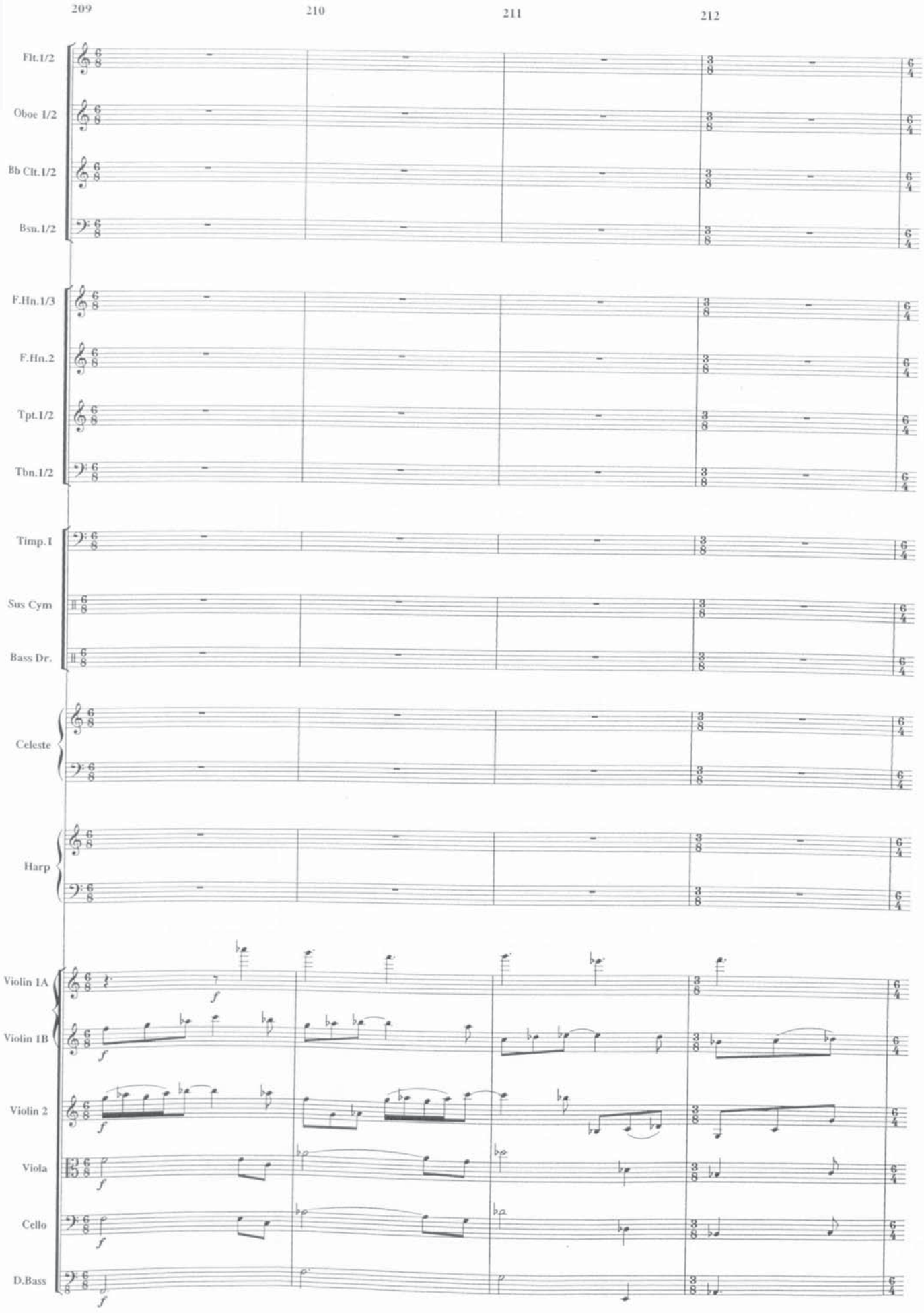

189
190
191
192
Flute 1°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
mf
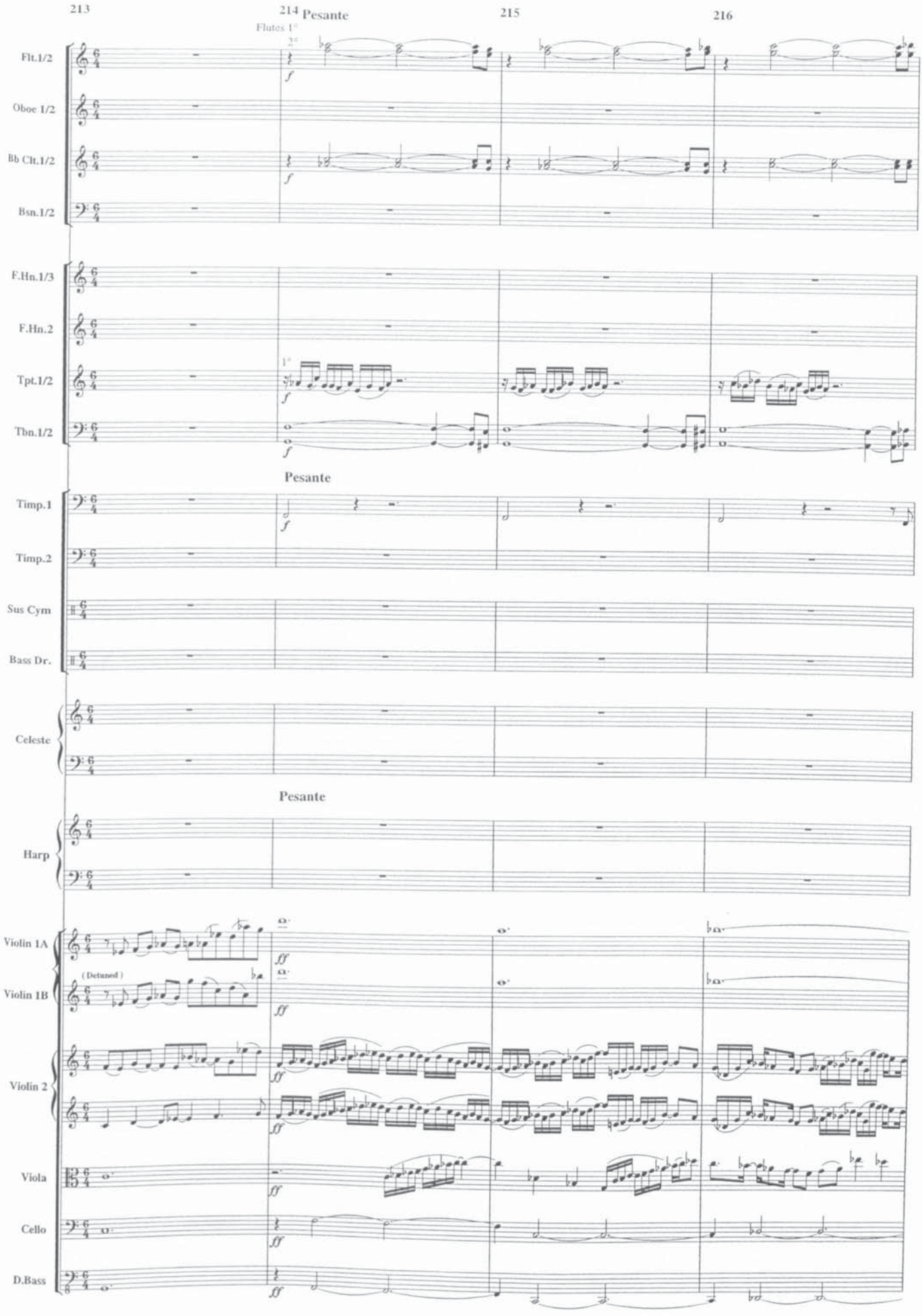

193
194
195
196
Espressivo
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
Tenuto
mf
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Espressivo
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Espressivo
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

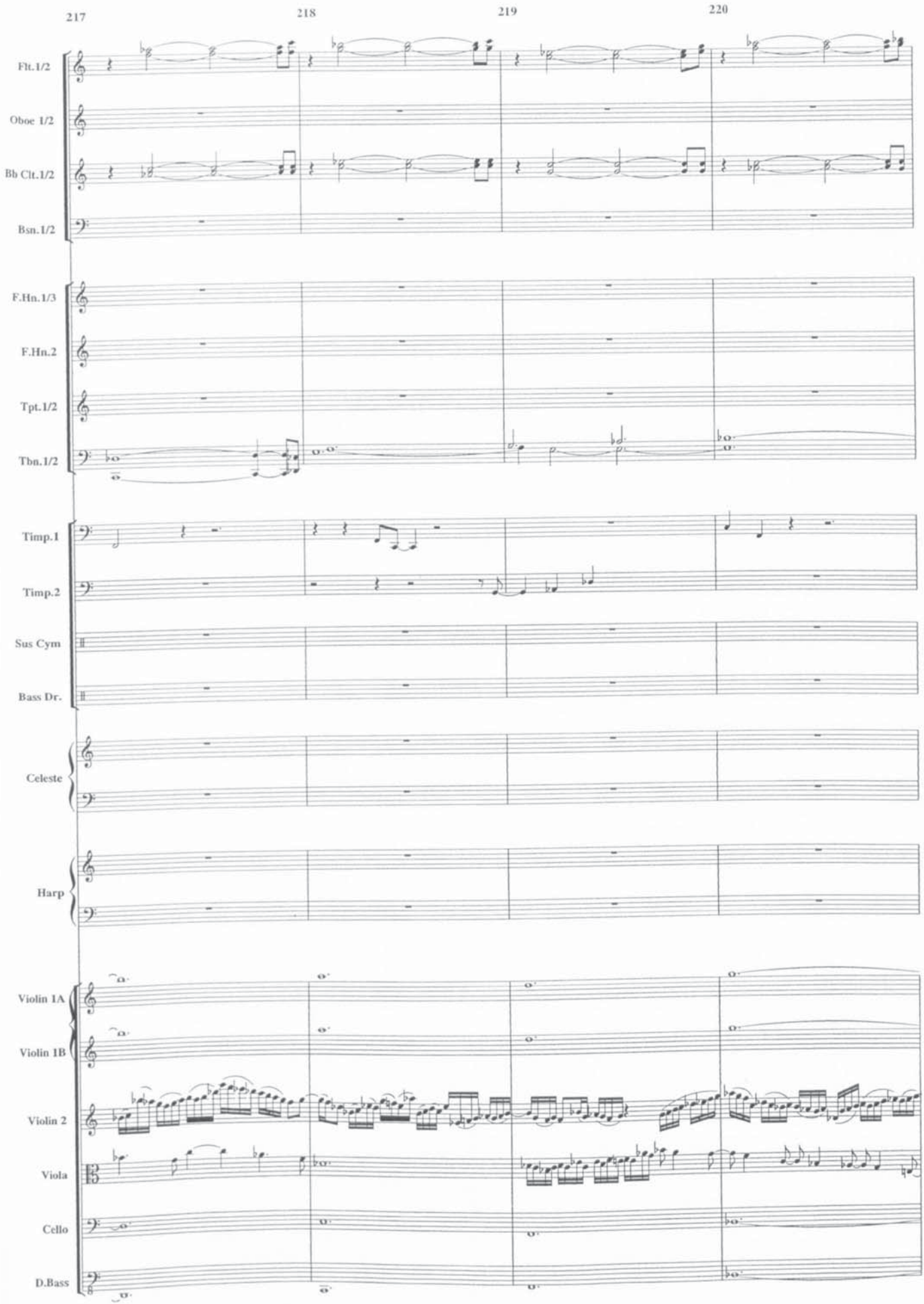

197
198
199
200
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
1°
2° Flute
mf
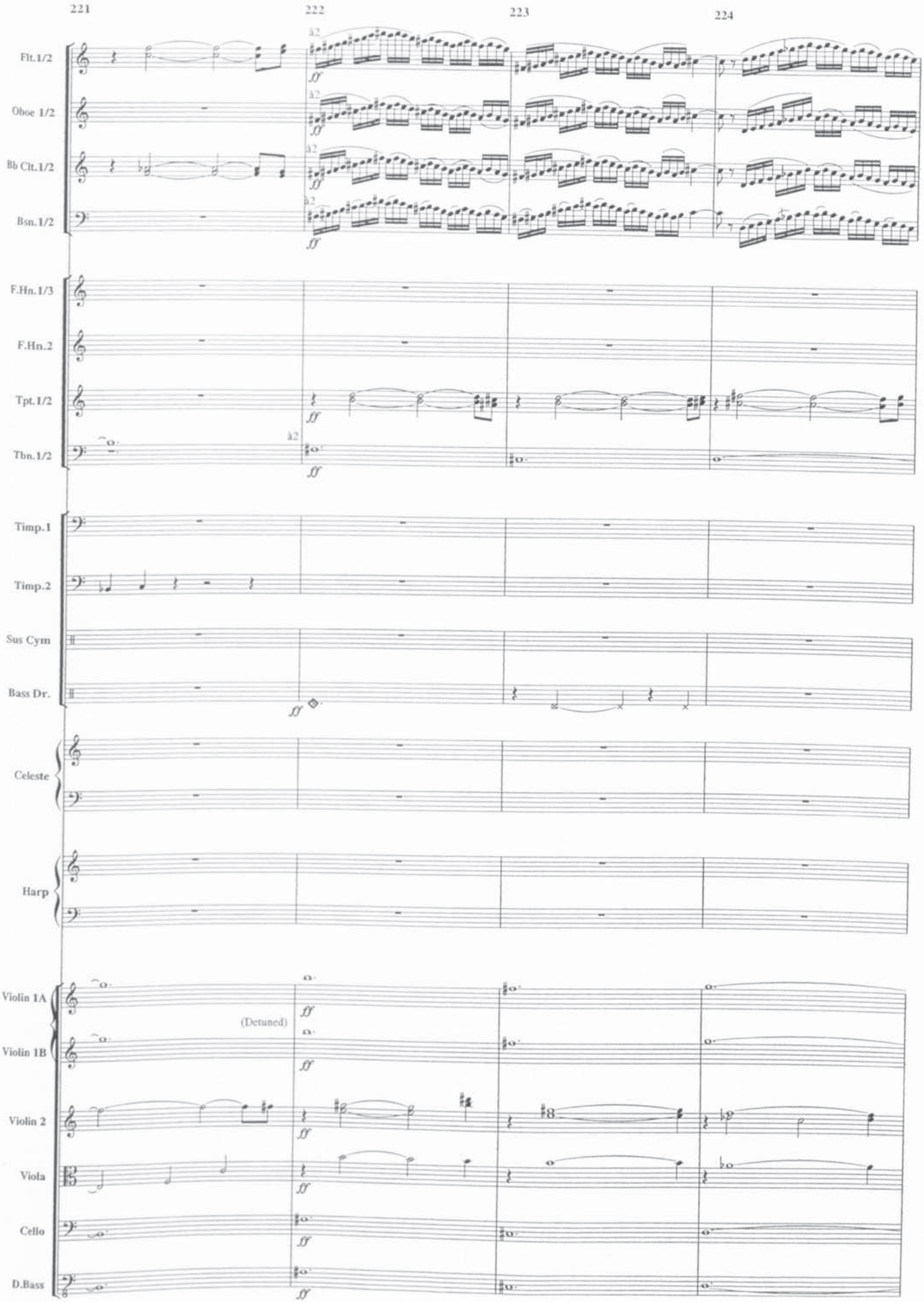

201
202
203
204
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
Poco Marcato
Poco Marcato
Poco Marcato
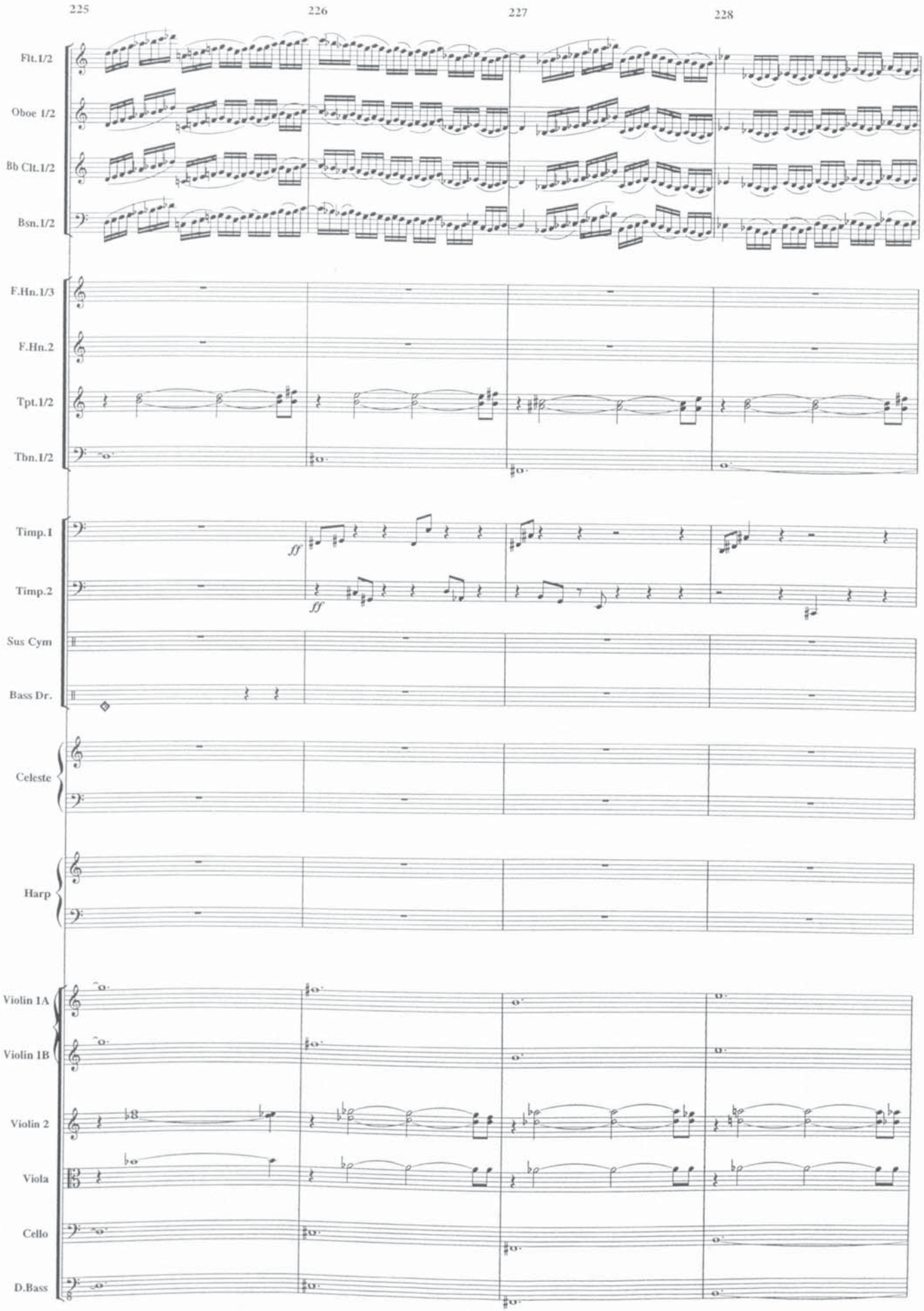

205
206
207
208
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
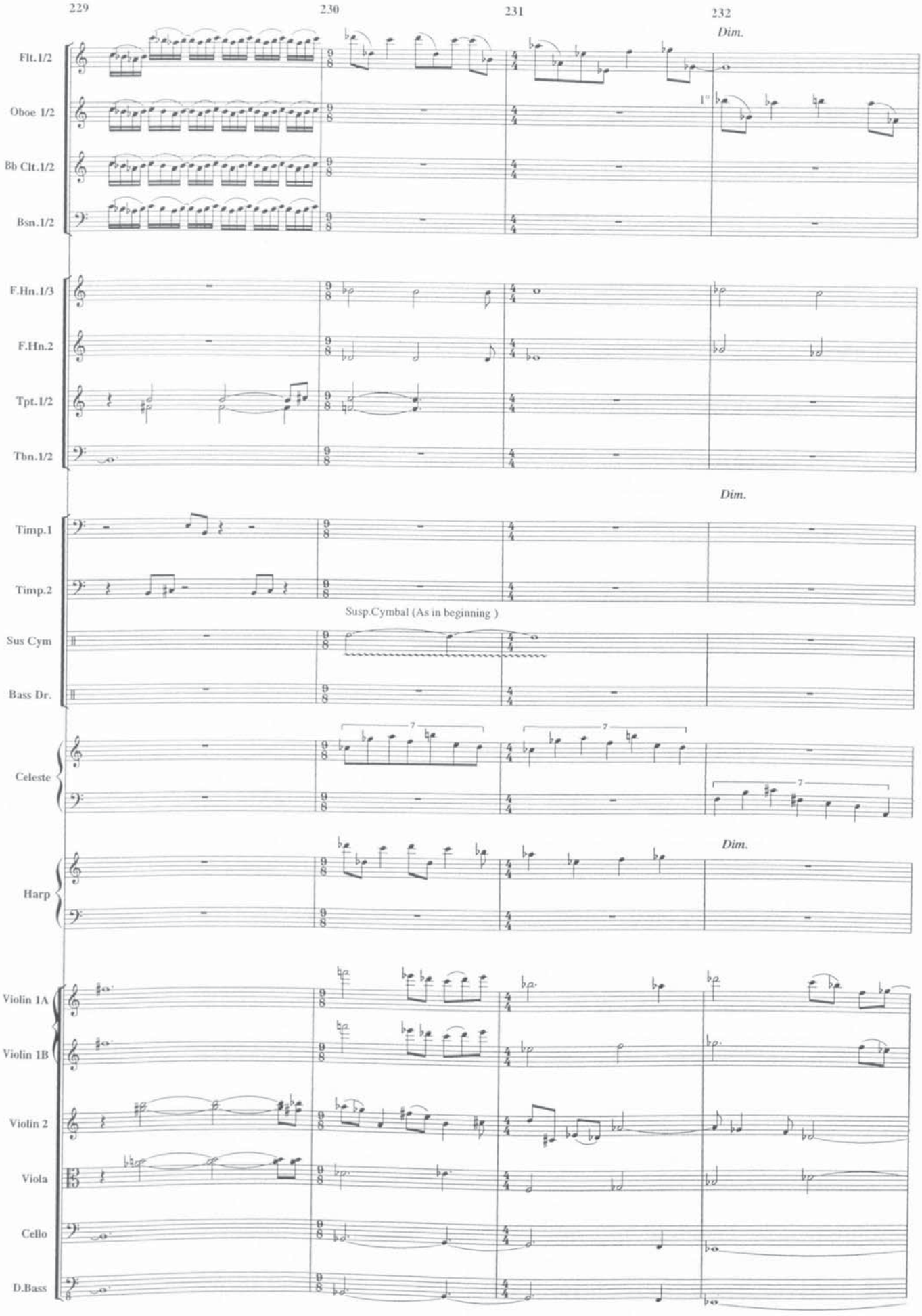

209
210
211
212
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.I
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
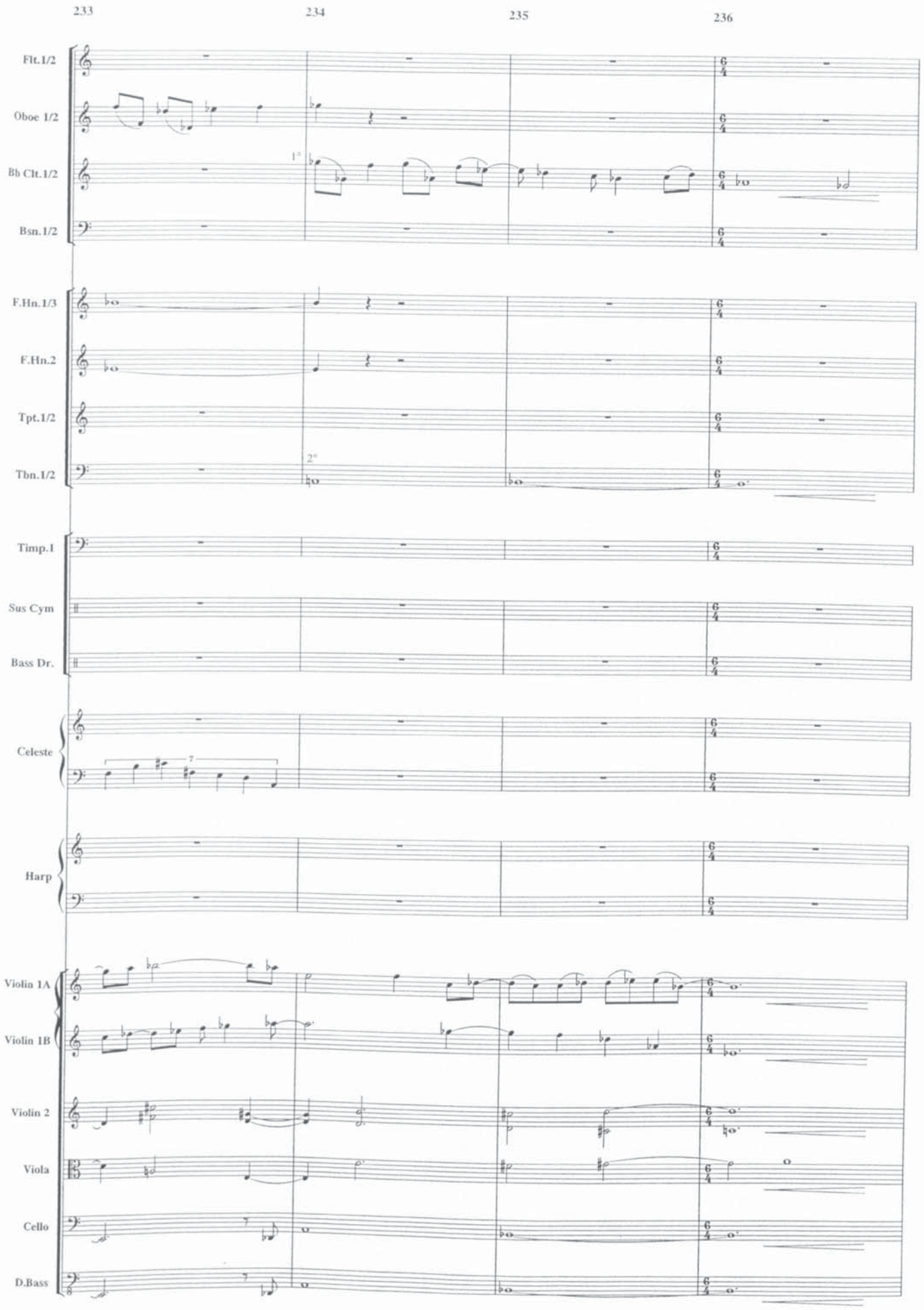

213
214
Pesante
215
216
Flutes 1°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Pesante
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Pesante
Harp
Violin 1A
Violin 1B
(Detuned)
Violin 2
Viola
Cello
D.Bass
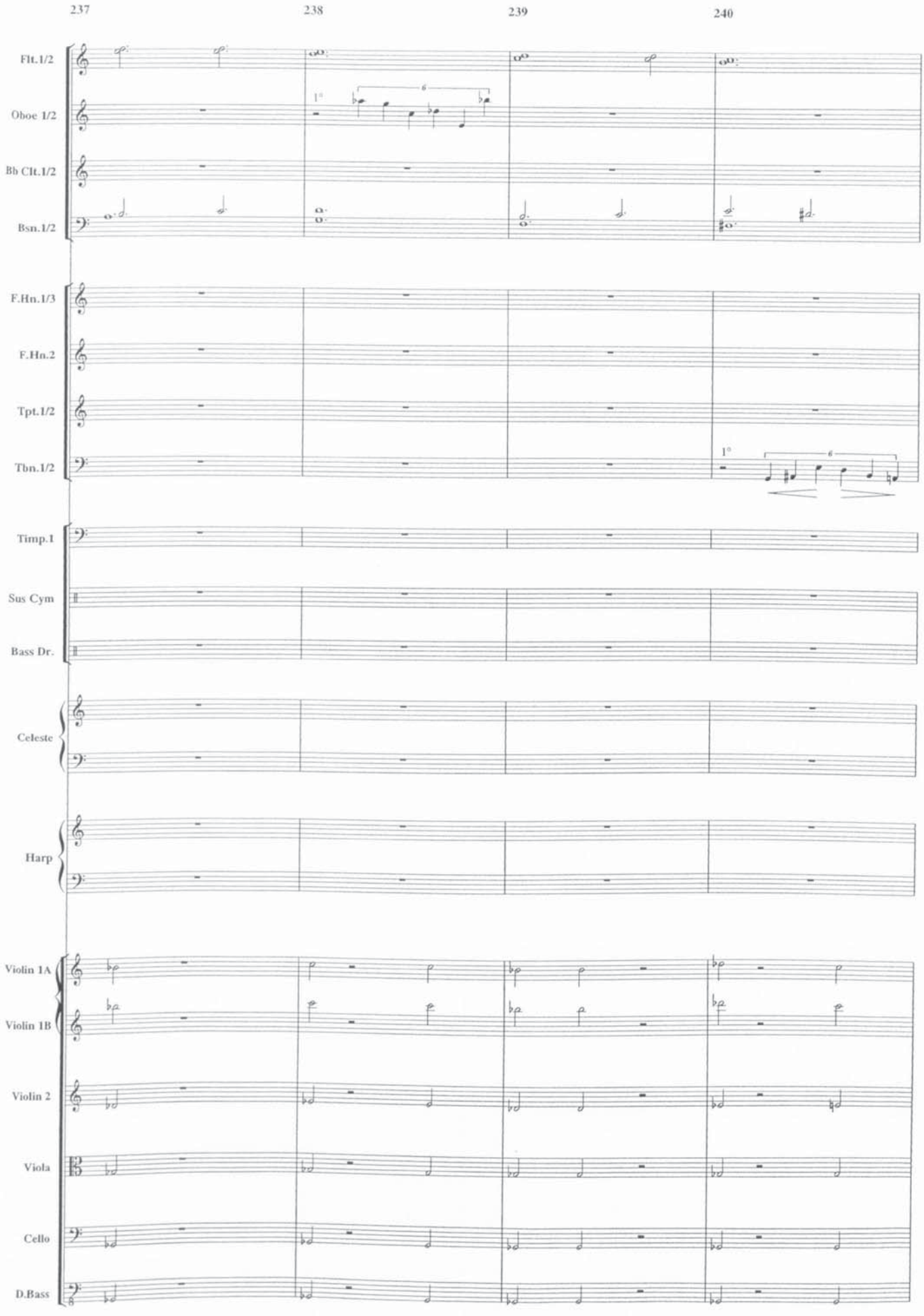

217
218
219
220
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
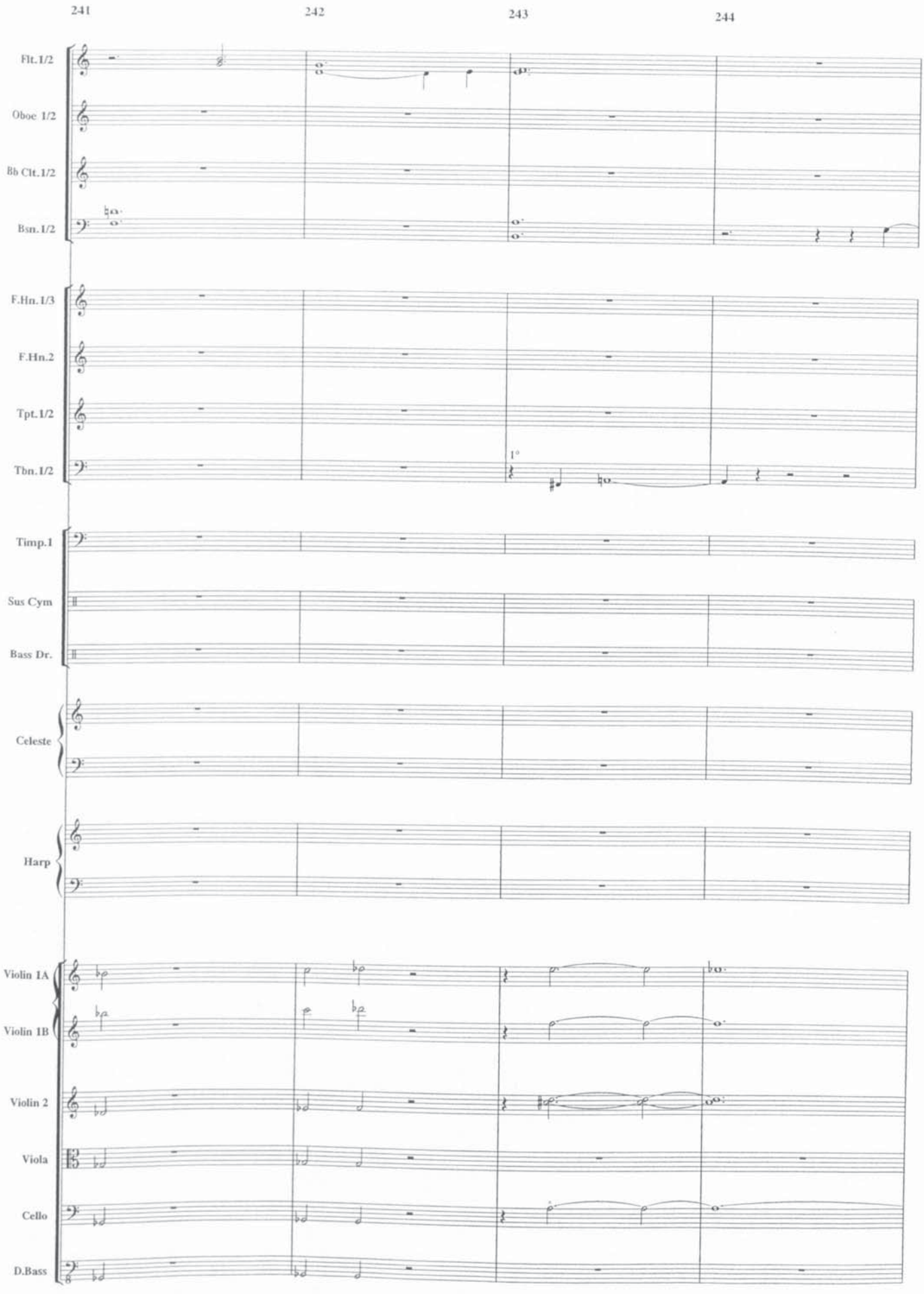

221
222
223
224
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
(Detuned)
ff
à2
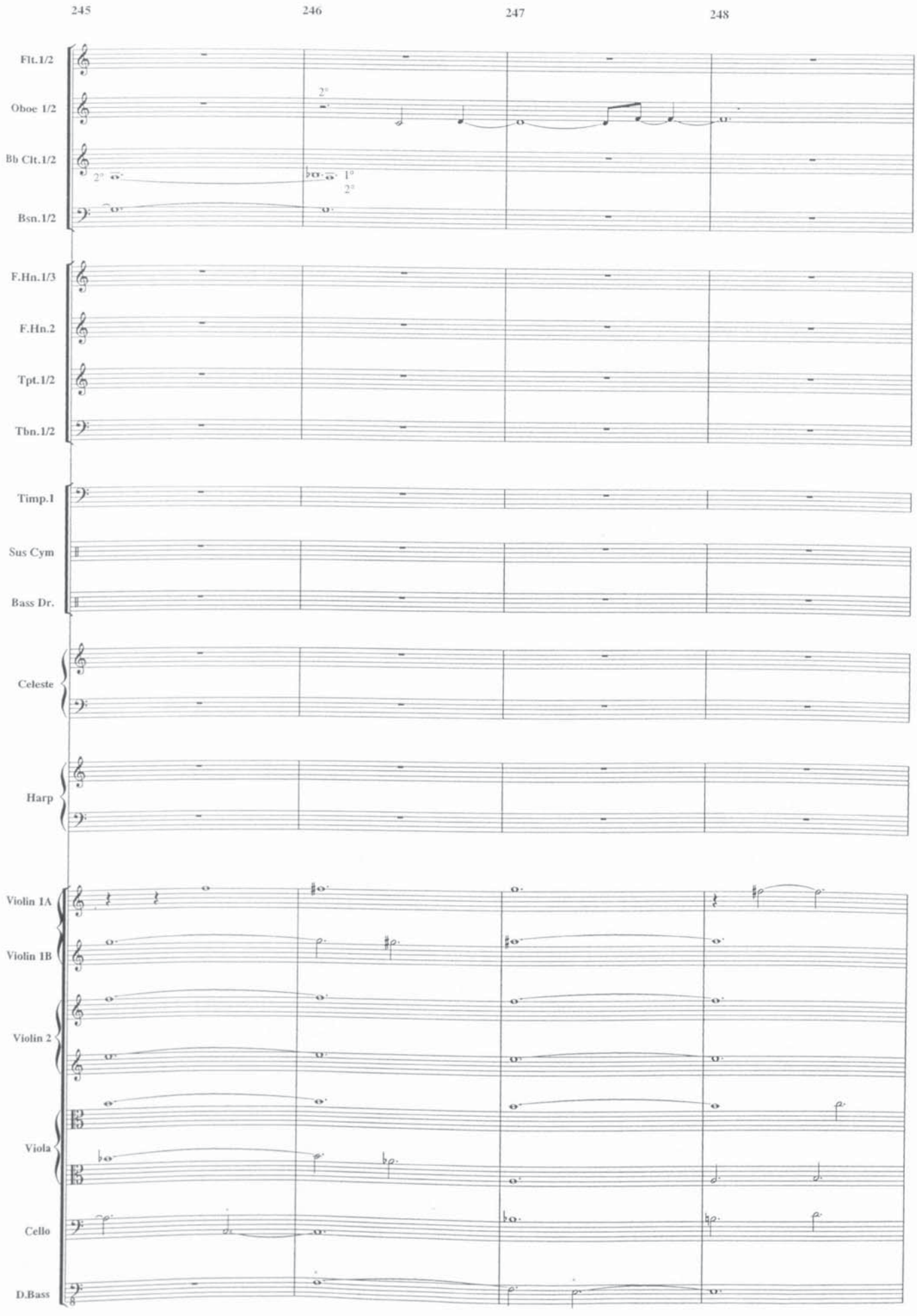

225
226
227
228
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
ff
ff
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
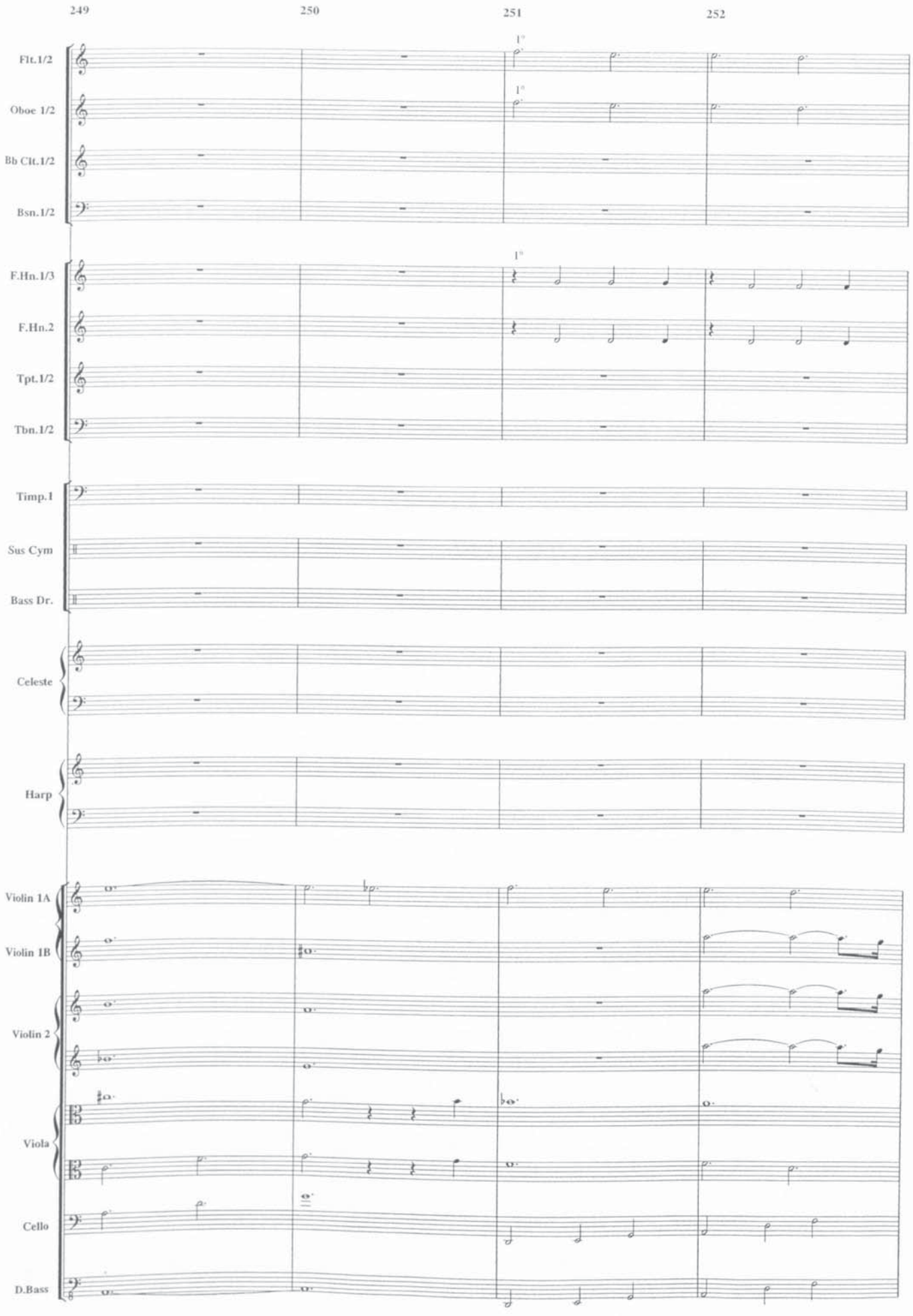

229
230
231
232
Dim.
Flt.1/2
Oboe 1/2
1°
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Dim.
Timp.1
Timp.2
Susp.Cymbal (As in beginning)
Sus Cym
Bass Dr.
Celeste
Dim.
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
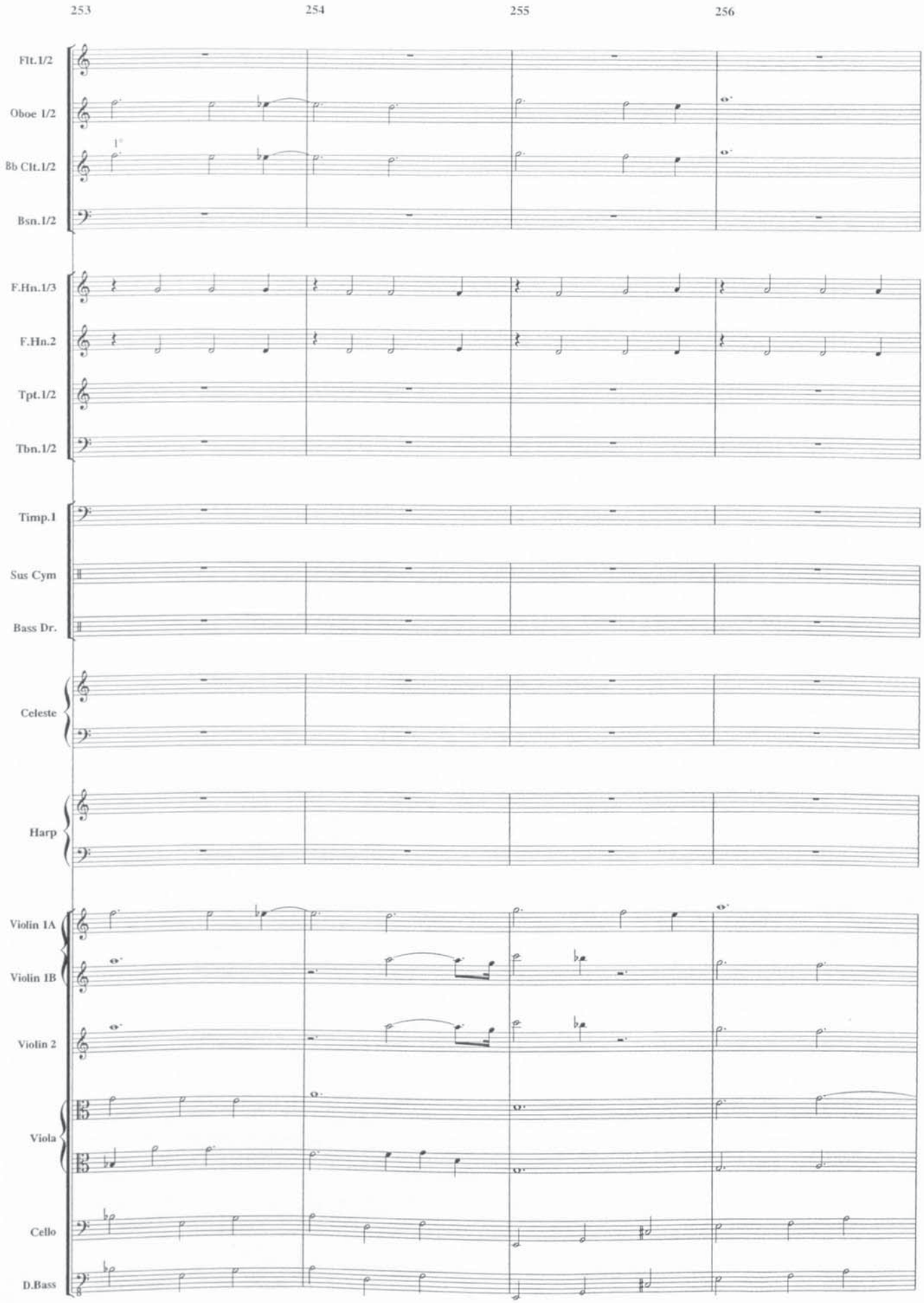

233
234
235
236
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
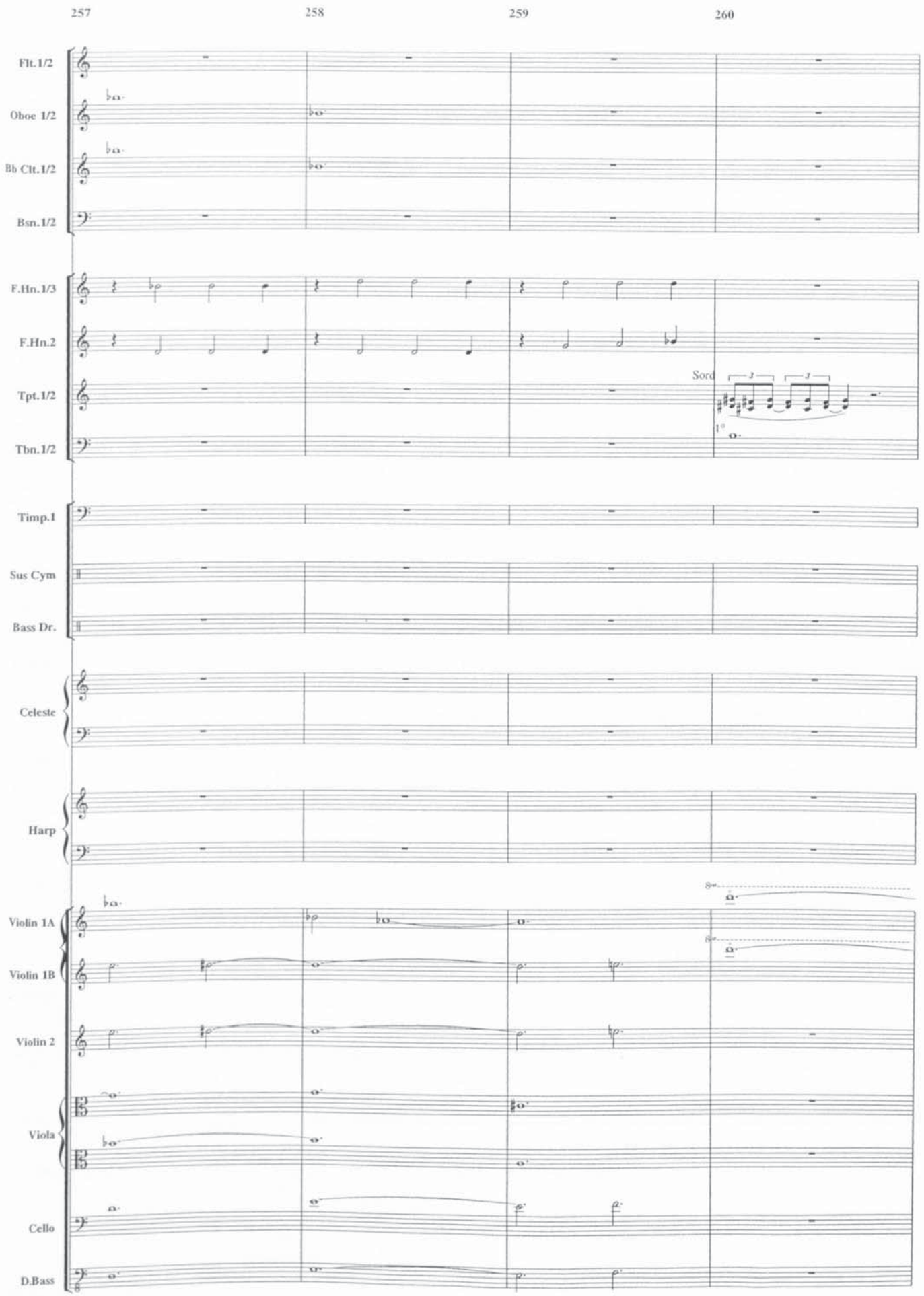

237
238
239
240
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
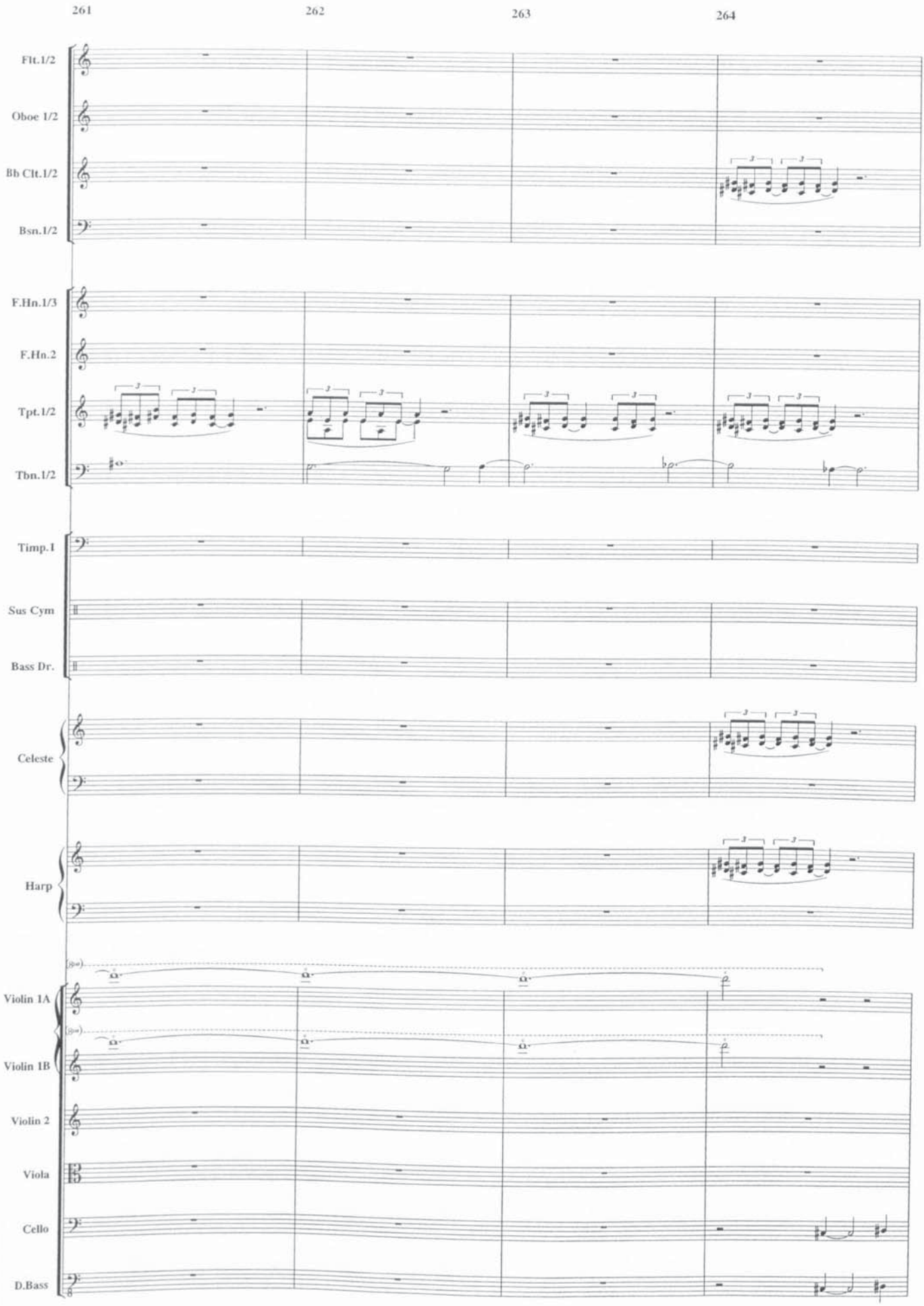

241
242
243
244
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
1°
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

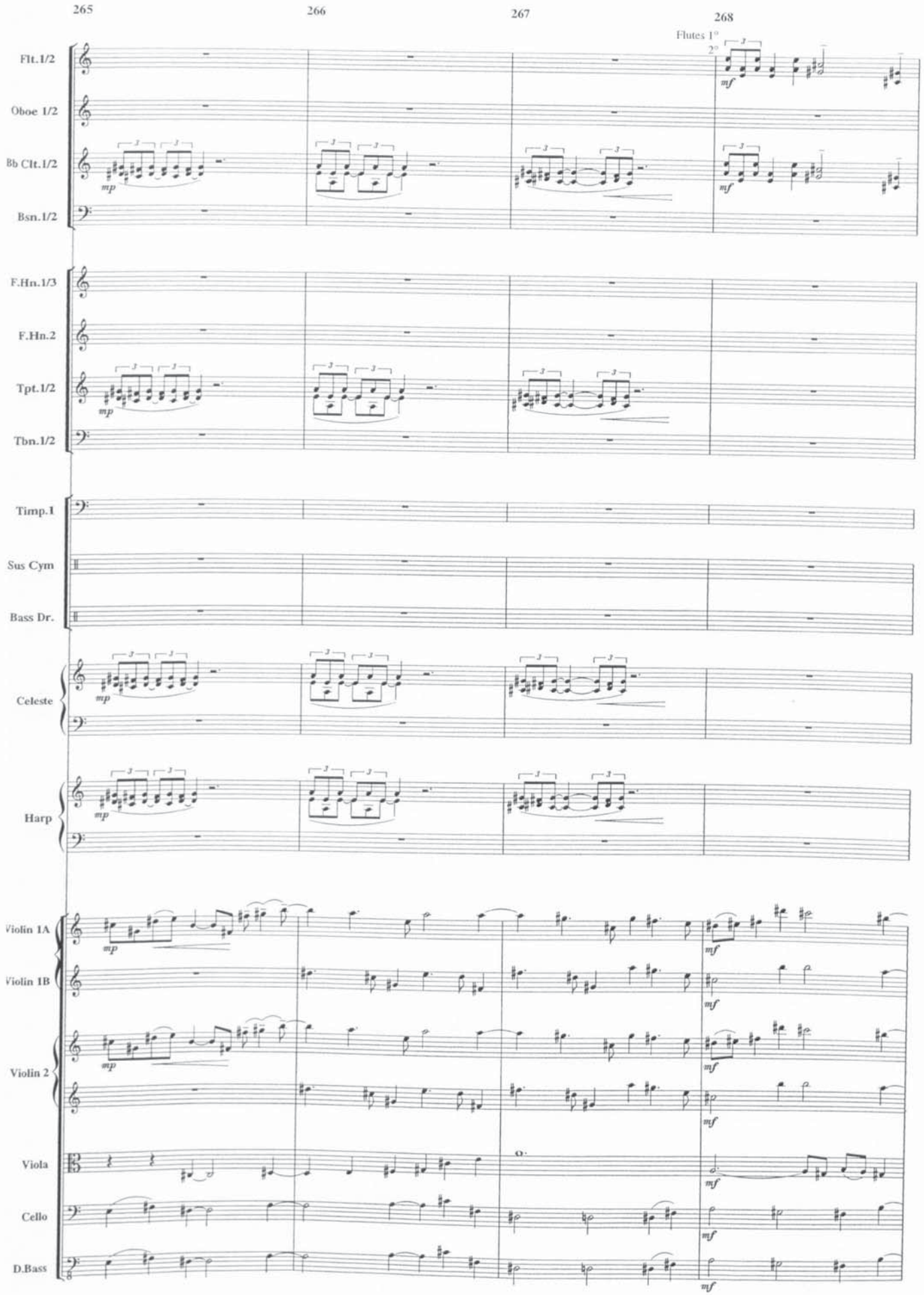

245
246
247
248
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
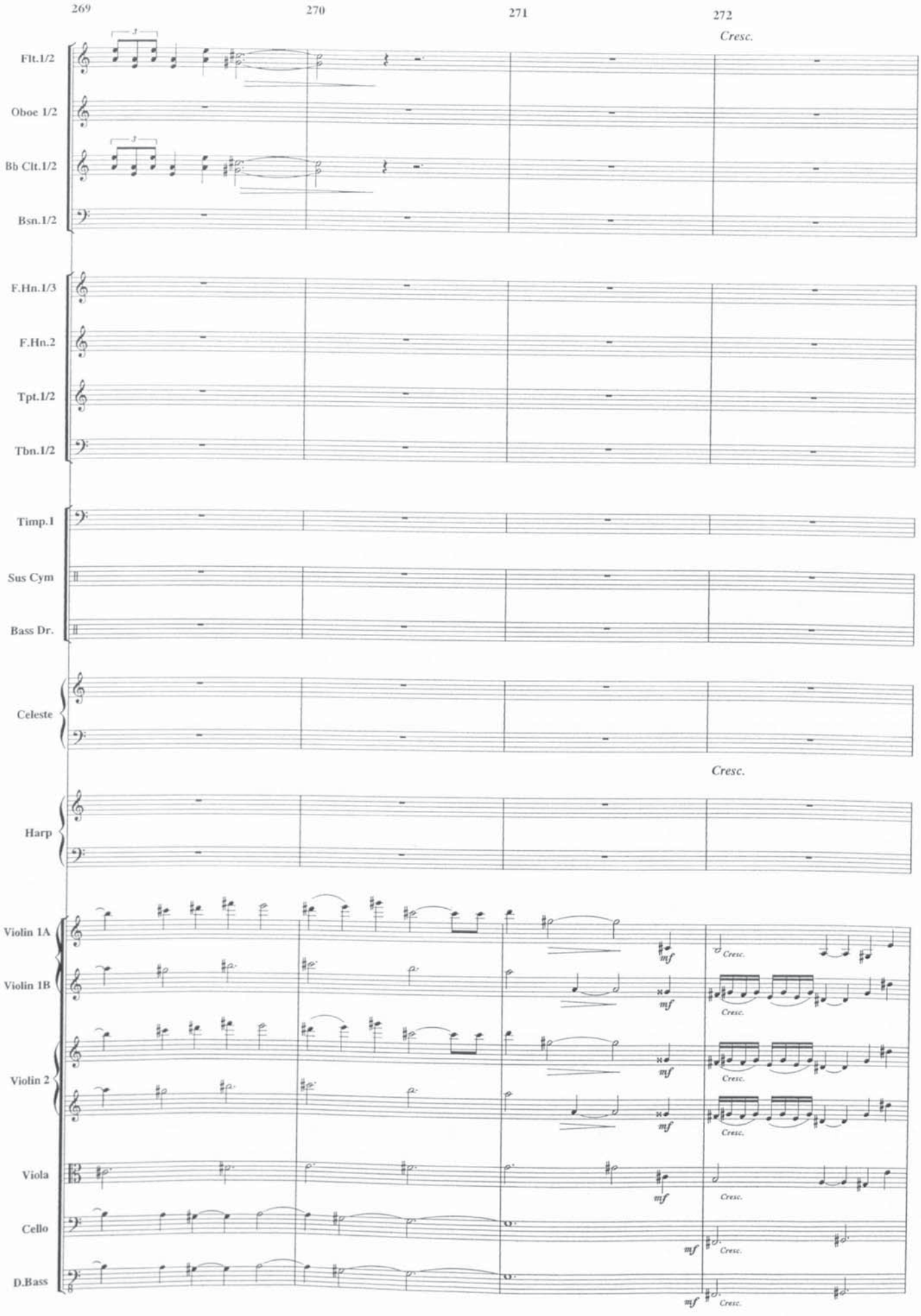

249
250
251
252
1°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

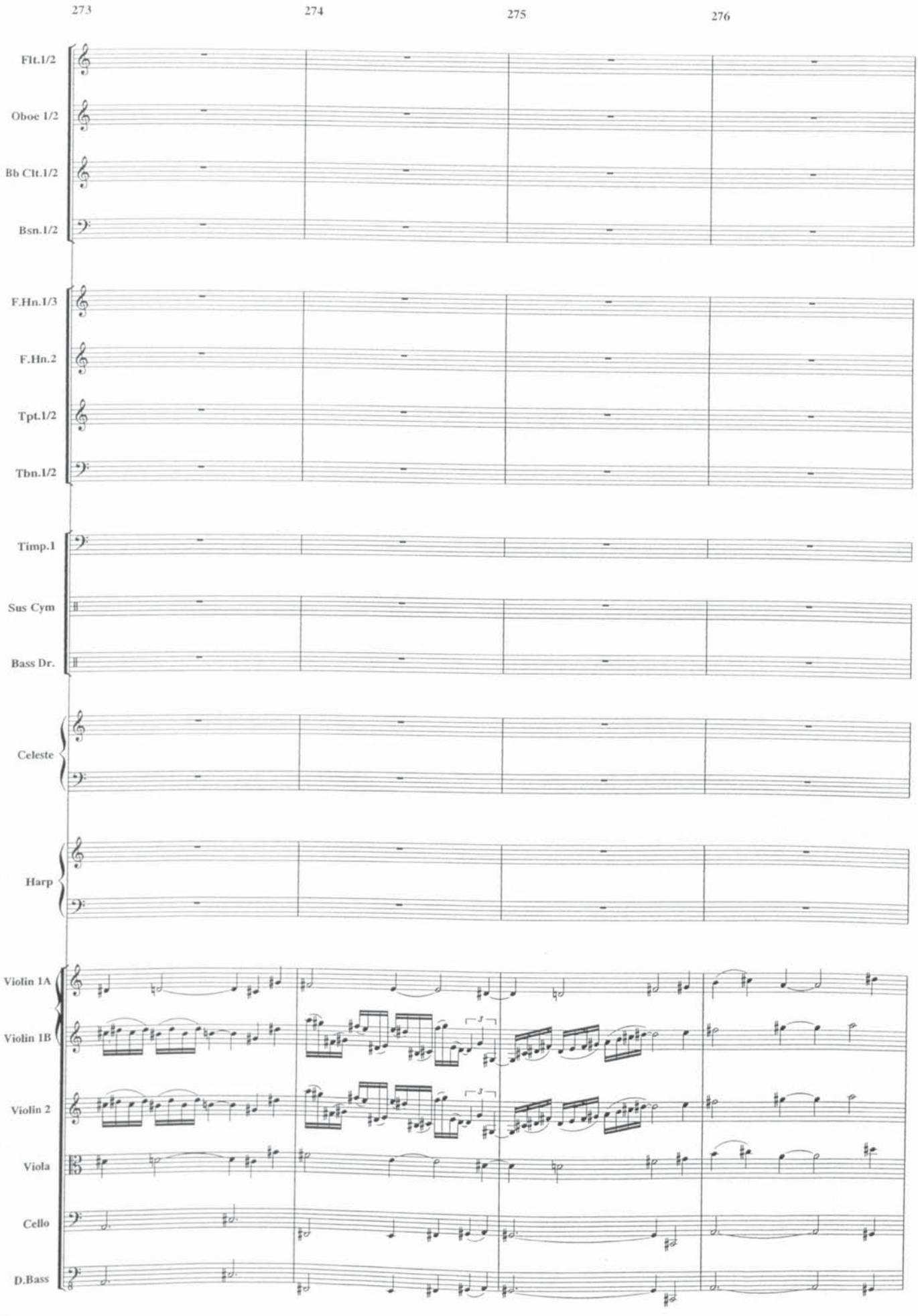

253
254
255
256
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
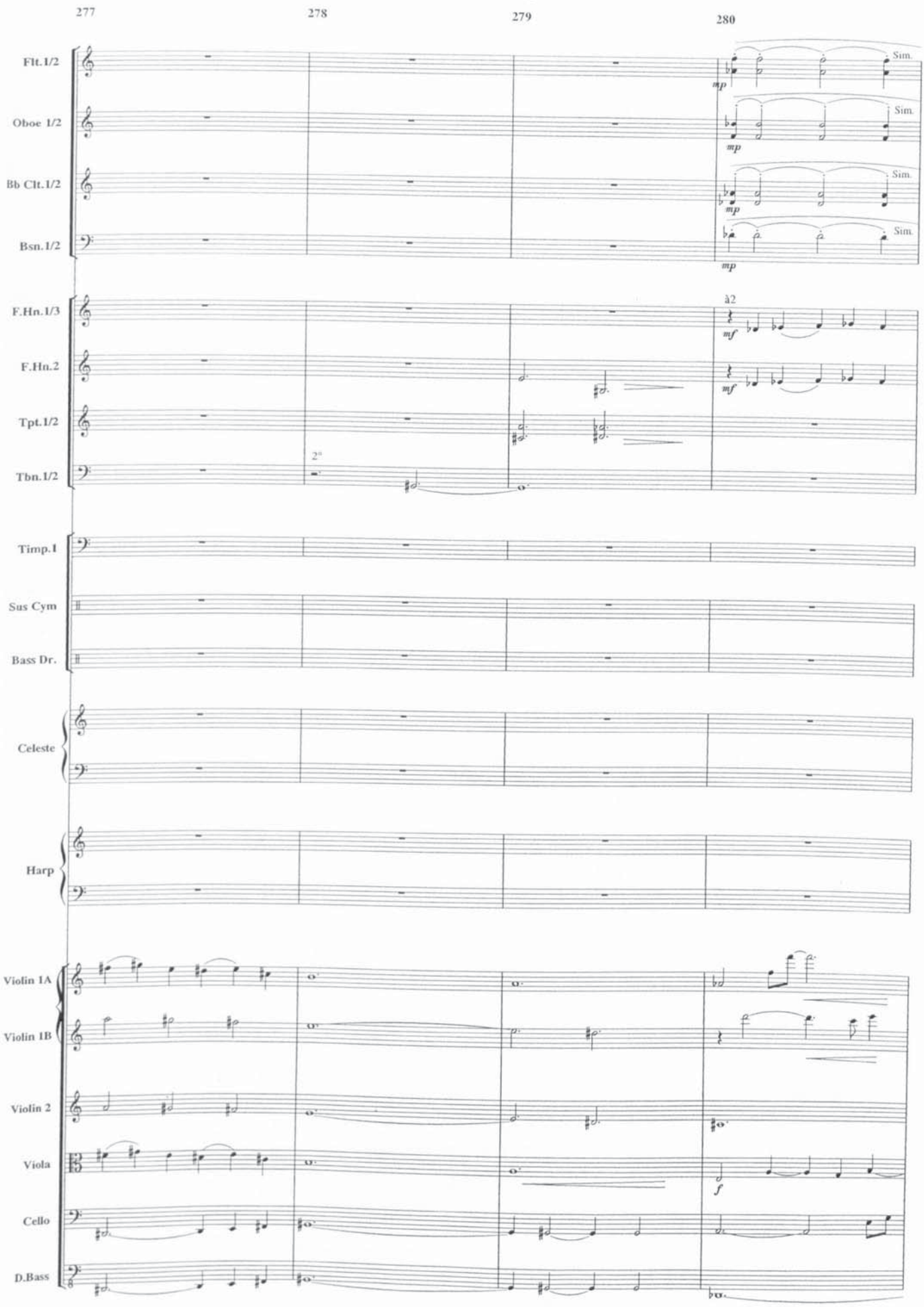

257
258
259
260
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Sord
1°
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
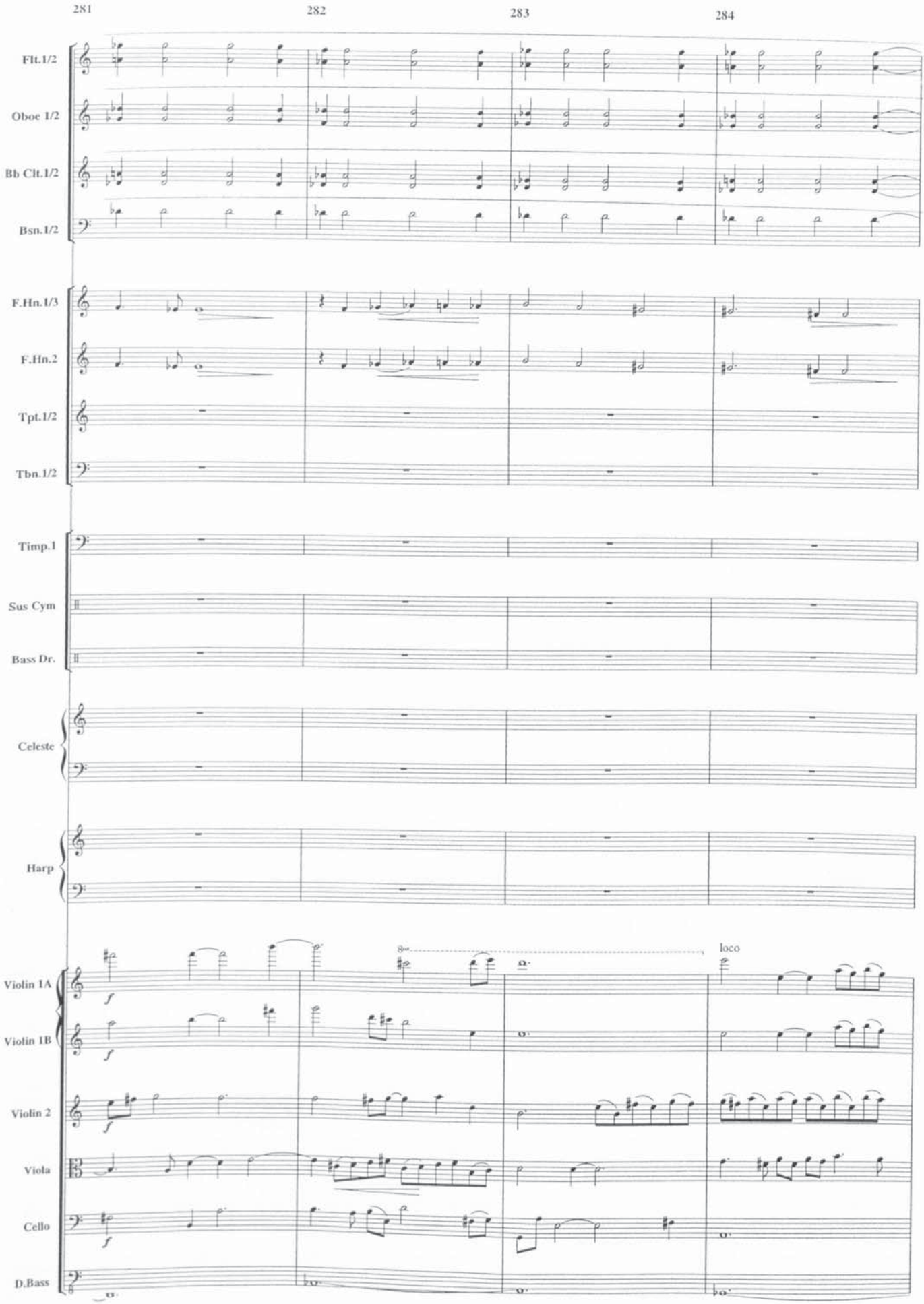

261
262
263
264
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.I
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
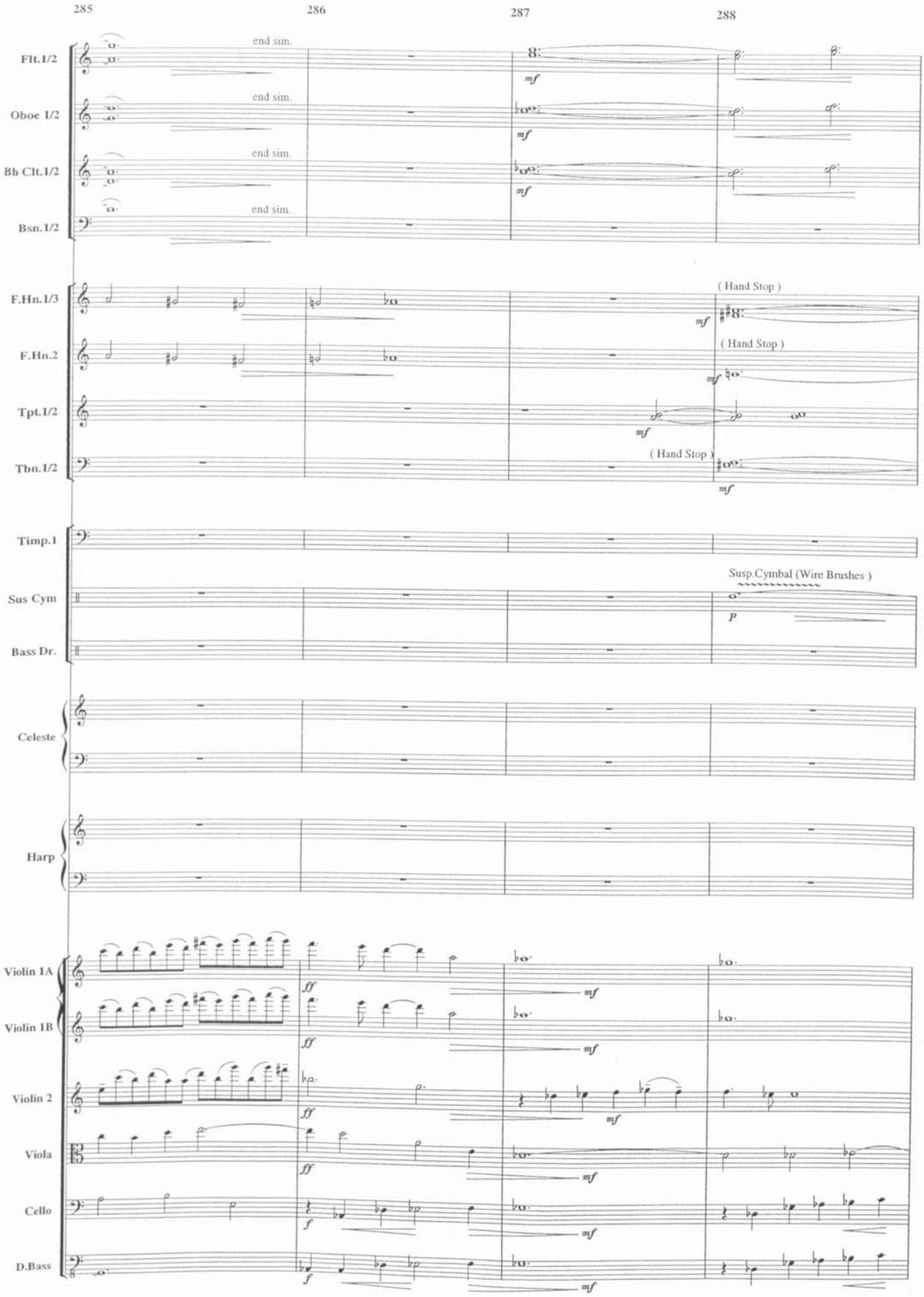

265
266
267
268
Flutes 1°
2°
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.I
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
mp
mf
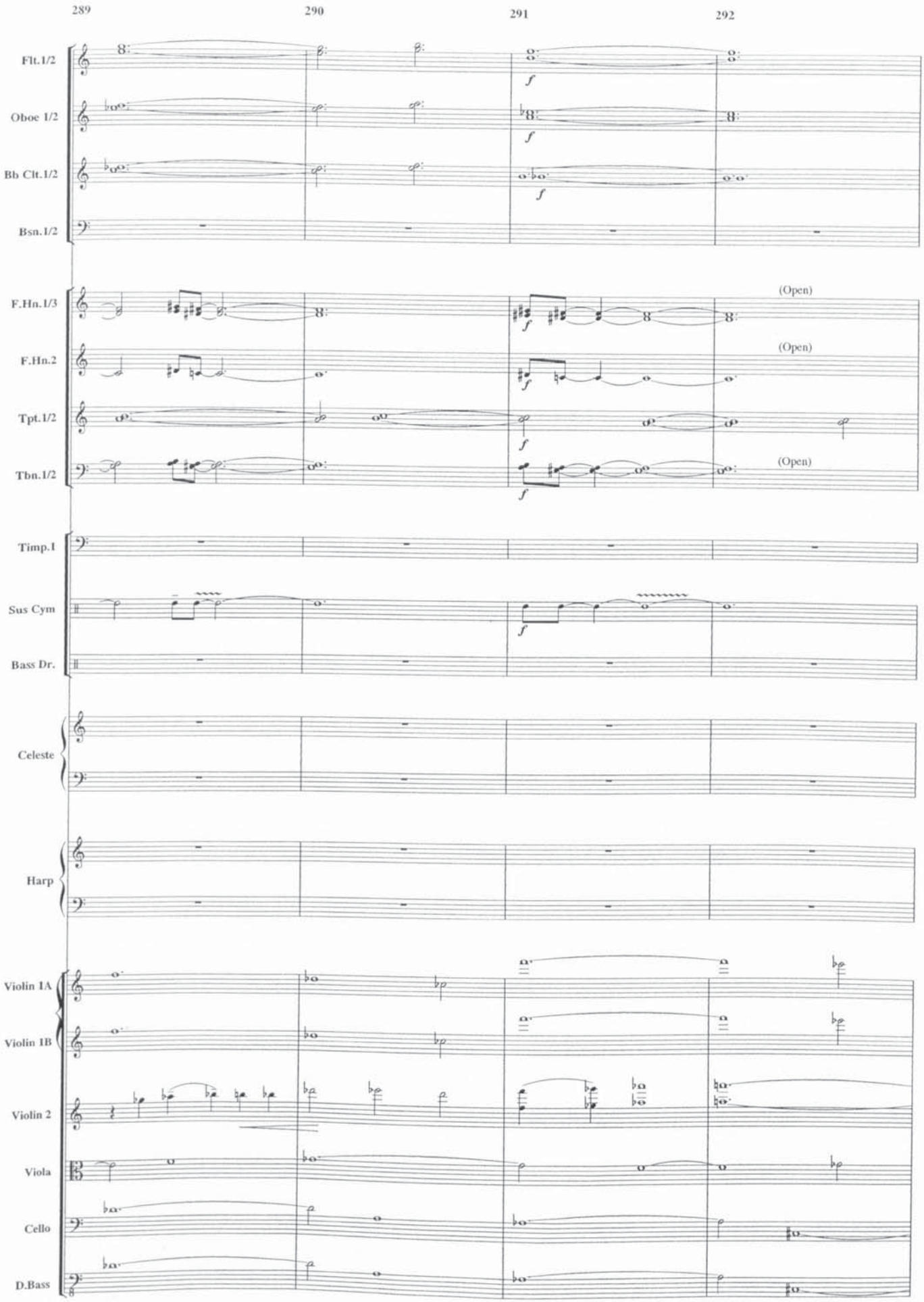

269
270
271
272
Cresc.
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Cresc.
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
mf
Cresc.
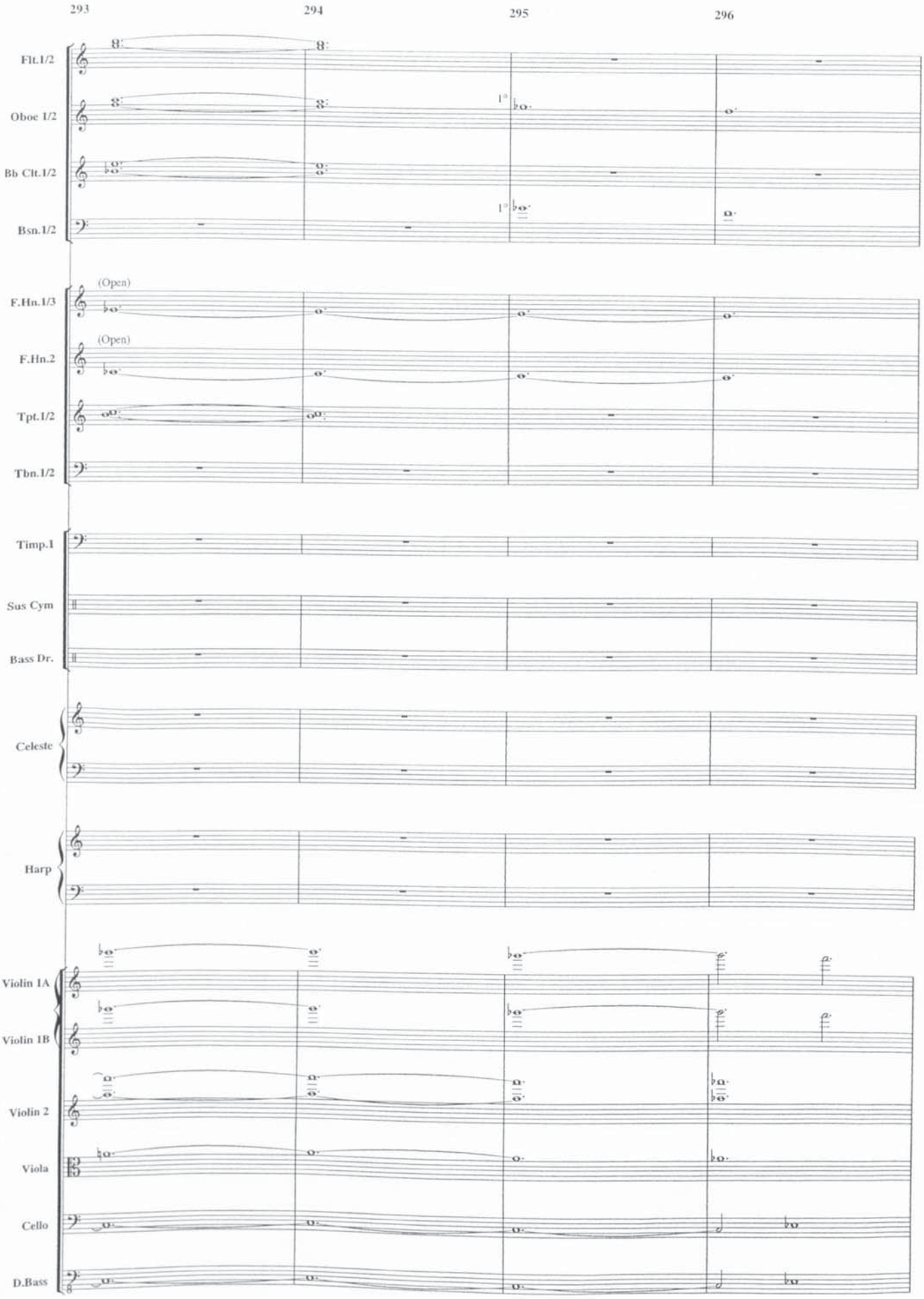

273
274
275
276
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
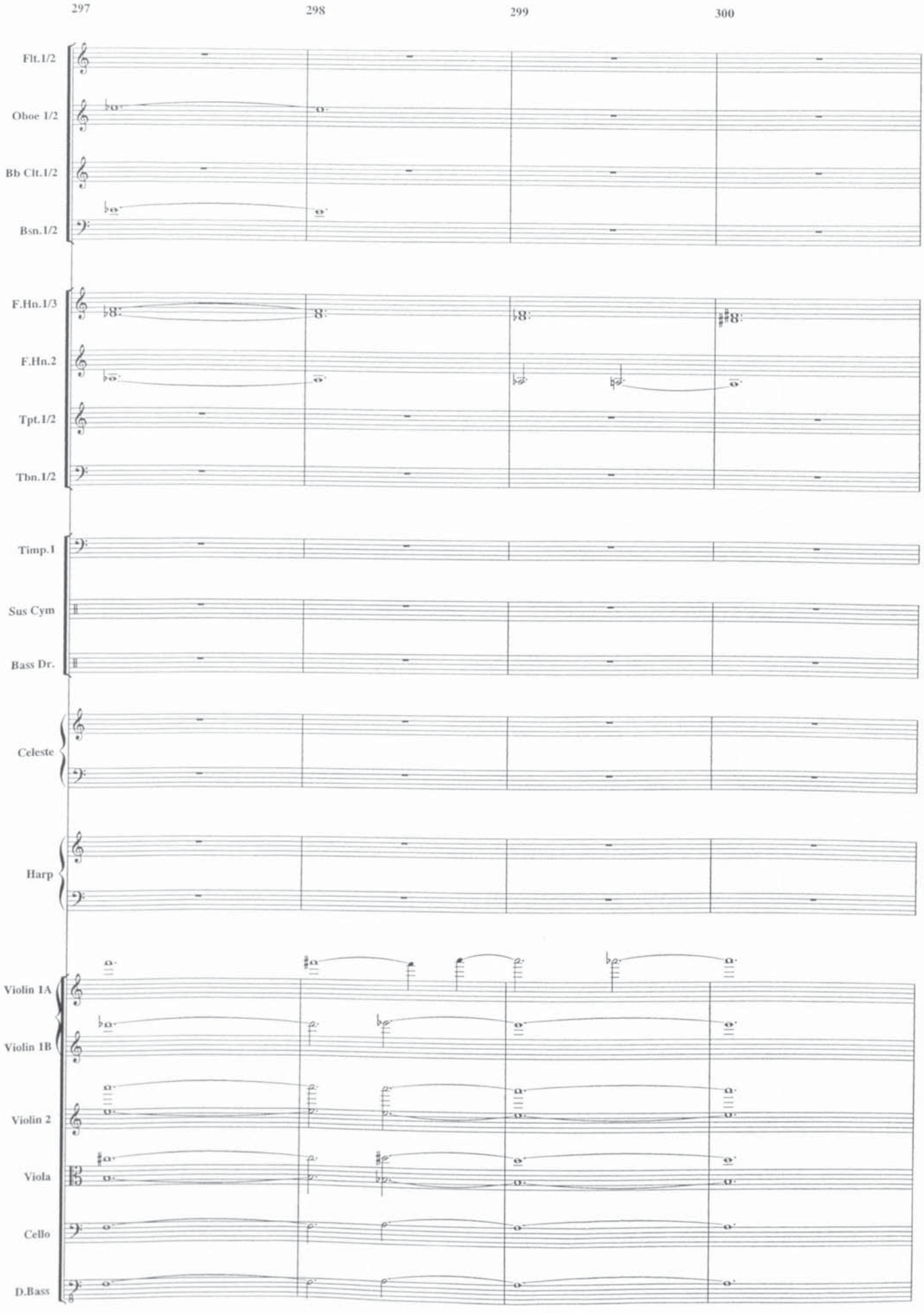

277
278
279
280
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
Sim.
mp
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
à2
mf
2°
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
f
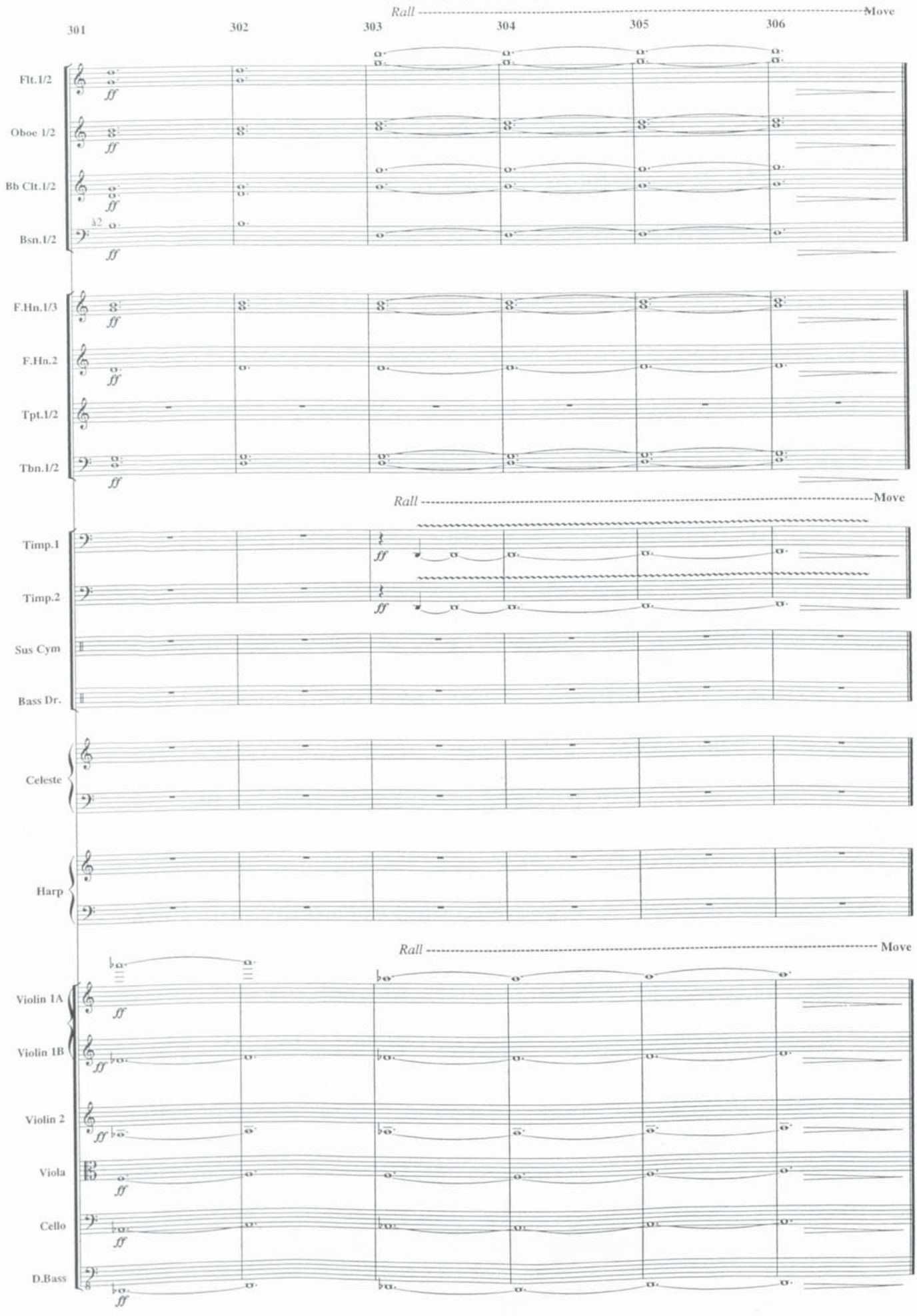

281
282
283
284
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
f
8va
loco


285
286
287
288
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
end sim.
mf
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
(Hand Stop)
Timp.1
Sus Cym
Bass Dr.
Susp.Cymbal (Wire Brushes)
p
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
ff
f


289
290
291
292
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
(Open)
(Open)
(Open)
Timp.I
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass


293
294
295
296
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
1°
F.Hn.1/3
(Open)
F.Hn.2
(Open)
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass


297
298
299
300
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass


Rall
Move
301
302
303
304
305
306
Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
à2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass
ff

PhD: Deborah Mollison: Middlesex University
Children's Musical Perception and Creativity as a Compositional Model

OCEAN WITNESS

A Violin concerto by Deborah Mollison

"Ocean Witness" was inspired by the poetry of Frances Horovitz
and by concern about the plight of whales and dolphins.

i.Invocation
the refraction of the water and internal movement within - our depth of being.

ii. Death Dance
Whaling ship tracks whale to slaughter. Cadenza represents struggle for life.

iii.Elegy
For the greed of man .

iv To Life
Celebration of energy, dolphins swimming just under the surface,lifes force.

(Recording not for duplication)

PhD: Deborah Mollison: Middlesex University
Children's Musical Perception and Creativity as a Compositional Model
List of Children's Compositions on CD

1	**26**
2	**27**
3	**28**
4 "Troupers"	**29 "Funfair"**
5	**30 "Dream"**
6 "Waltz"	**31 "Funfair"**
7 "Church Bells"	**32 "The Jungle"**
8 "The Place of Doom"	**33**
9 "Confusion"	**34 "Train"*Improvisation***
10	**35**
11	**36.**
12	**37**
13	**38**
14	**39**
15 "Space"	**40**
16 "Cheetah"	**41**
17 "Ballerina"	**42**
18 "Tiger"	**43**
19 "Whirlpool"	**44**
20 "The Olympic Dive"	**45**
21	**46**
22 "Close Encounters"	**47**
23	**48**
24	**49**
25 "Raindrops"	**50**

MAYA'S WORDS

A Tone Poem

Composed by

DEBORAH MOLLISON © 1998

Concert Score in C

Instrumentation

Flute

Flute/Piccolo

2 Oboes

2 Clarinets in Bb

2 Bassoons

3 Horns in F

2 Trumpets in Bb

1 Tenor Trombone

1 Bass Trombone

2 Timpani

1 Percussion

Suspended Cymbal & Bass Drum

Celeste

Harp

Violins Ia

Violins 1b

Detuned a microtone down throughout

(Microtone = Quartertone)

Violins 2

Viole

Celli

Double Basses

Score preparation - Fiesta Mei Ling +44 (0)20 8205 6734

Concert Score

MAYA'S WORDS A Tone Poem

By: Deborah Mollison

1 ♩= 76 (♩= 82) 2 3 4

Flute1/2

Oboe 1/2

Bb Clt. 1/2

Bassoon 1/2

2°

&2

p

p

3.

F.Horn 1/3

F.Horn 2

Bb Tpt.1/2

Tbn.1/2

p

p

p

2°

p

Gentle Roll

Timpani 1

Timpani 2

p

Suspended Cymbal -Low Metalic Hum/Shimmer
(Metal Brushes)

Susp. Cym

Bass Drum

p

Celeste

Harp

Violin 1A

Detuned A Microtone Down Throughout

Violin 1B

Violin 2

Viola

Cello

D.Bass

p

p

p

5 6 7 8

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

1.
3.

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

mp

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

mp

D.Bass

mp

9 10 11 12

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

1°

Tbn.1/2

Timp.1

Susp.Cym (As Before)

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

13 14 15 *Cresc.* 16

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Cresc.

Timp.1

Sus Cym

Bass Dr.

Celeste

Cresc.

Harp

Poco Marcato

Violin 1A

Violin 1B

Violin 2

Poco Marcato

Viola

Poco Marcato

Cello

D.Bass

17 18 19 20

Dim.

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2 *mp*

F.Hn.1/3 *Sub mf*

F.Hn.2 *Sub mf*

Tpt.1/2 *Sub mf*

Tbn.1/2 *Sub mf*

Dim.

Roll

Timp.1

Susp.Cym

Sus Cym

Bass Dr.

Celeste

Dim.

Harp

Violin 1A

Violin 1B

Violin 2 *Sub mf*

Viola *Sub mf*

Cello *Sub mf*

D.Bass *Sub mf*

21 22 23 24

Piccolo 2°

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

P

1°

2°

pp

PP

Div.

25 26 27 28

2nd To Flute

Flt.1/2

Oboe 1/2

1°

b Clt.1/2

p

Bsn.1/2

p

Con Sord.

F.Hn.1/3

F.Hn.2

Tpt.1/2

p

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

unis.

Violin 2

p

Viola

p

Cello

p

D.Bass

p

29 30 31 32

Piu

Flt.1/2

Oboe 1/2

1°

Bb Clt.1/2

mp

1°Ω

Bsn.1/2

Piu

mp

F.Hn.1/3

mp

F.Hn.2

Tpt.1/2

mp

Tbn.1/2

mp

Timp.1

Sus Cym

Bass Dr.

Celeste

mp

Piu

Harp

Violin 1A

mp

Violin 1B

mp

Violin 2

mp

unis.

Viola

mp

Cello

mp

D.Bass

mp

33 34 35 36

Flutes 1°
2°

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

37 38 39 40

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

mp

Tenuto

Espressivo + Crescendo poco a poco

Div.

41 42 43 44

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1° 3° Sord

45 46 47 48

Flt.1/2

Oboe 1/2

1°

mf Espressivo

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

49 50 51 52

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

mf

53 54 55 56

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1°

f

57 58 59 60

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

ff
ff

61 62 63 64

Pesante

Flt.1/2 *ff*

Oboe 1/2

Bb Clt.1/2 *ff*

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2 *ff*

Pesante

Timp.1 *ff*

Timp.2 *ff*

Sus Cym

Bass Dr.

Celeste

Harp

Pesante

Violin 1A *ff*

Violin 1B *ff*

Violin 2 *ff*

Viola *ff*

Cello *ff*

D.Bass *ff*

65 66 67 68

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

69 70 71 72

Piu

Flt.1/2 — à2

Oboe 1/2 — à2

Bb Clt.1/2 — à2

Bsn.1/2 — à2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2 — 1°

Piu

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

73 74 75 76

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

(8va) Loco 8va Loco 1° 2°

Susp.Cym (Soft Beaters)

8va 8va 8va Loco

77 78 79 80

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

Dim.
2° only
1°
1° only
Dim.
Dim.

81 82 83 84

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

85 86 87 88

To: 1° Flute
2° Piccolo

Flt.1/2

Oboe 1/2

♭b Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

89 90 91 92

42 1° Flute
2° Piccolo

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

93 94 95 96

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

97 98 99 100

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

Col Legno

Col Legno

101 102 103 104

1° Flute
2° Piccolo

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

105 106 107 108

Cresc.

Flt.1/2

Oboe 1/2

1°

Bb Clt.1/2

1°

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Cresc.

Timp.1

Wire On Cymbal (Dull Dry Sound)

Sus Cym

mf

Bass Dr.

Celeste

Cresc.

Harp

Violin 1A

Violin 1B

Violin 2

Pizz

Viola

Cello

D.Bass

109 110 111 112

1° Flute

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Pizz

Violin 2

Viola

Cello

D.Bass

113 114 115 116

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1° Flute
1°
2°
Suspended Cymbal (Wire Brushes)
Arco

117 118 119 120

Cresc.

1°

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2

Cresc.

Timp.1
Sus Cym
Bass Dr.
Celeste
Harp

Cresc.

8va

Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

121 122 123 124

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

125 126 127 128

Flt.1/2

2° To Piccolo

Oboe 1/2

Bb Clt.1/2

8va

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Susp.Cymbal (As in opening)

Sus Cym

Bass Dr.

Celeste

Harp

(8va)

Violin 1A

Violin 1B

Sul Pont.

p

Violin 2

Sul Pont.

p

Viola

Sul Pont.

p

Cello

Sul Pont.

p

D.Bass

129 130 131 132

2° Piccolo

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

p

1°

133 134 135 136

Flt.1/2

Oboe 1/2

1°

Bb Clt.1/2

Bsn.1/2

3°

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

(8)

Violin 1A

Violin 1B

Violin 2

Viola

Cello

Nat.

D.Bass

137 138 139 140

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

1°

mp

Poco Cresc.

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

mf

Violin 2

Nat.

mp

Poco Cresc.

Viola

Nat.

mp

Poco Cresc.

Cello

mp

Poco Cresc.

D.Bass

mp

Poco Cresc.

141 142 143 144

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

1°

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Nat.

Violin 1B

Violin 2

Viola

Cello

D.Bass

145 146 147 148

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

149 150 151 152

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

(8va)

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

153 154 155 156

Flute 1°

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

157 158 159 160

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
1°
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

161 162 163 164

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

2°

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Con Sord

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

165 166 167 168

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Sord. Leggiero

Violin 1A

Sord. Leggiero

Violin 1B

Sord. Leggiero

Violin 2

Con Sord

Viola

Con Sord

Cello

D.Bass

169 170 171 172

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

173 174 175 176

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

PPP *P* *ppp*

Piu

Meno

Senza Sord

177 178 179 180

2° Piccolo

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1°

p

Senza Sord

p

181 182 183 184

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

185 186 187 188

2nd to Flute

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1°

Senza Sord

Cresc.

189 190 191 192

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

Flute 1°
1°
mf

193 194 195 196

Espressivo

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1° *mf* Tenuto *Espressivo*

197 198 199 200

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

1° 1° 2° Flute 1° mf mf

201 202 203 204

Flt.1/2

Oboe 1/2

1°

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Poco Marcato

Poco Marcato

Cello

Poco Marcato

D.Bass

205 206 207 208

1°

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

209 210 211 212

Flt.1/2
Oboe 1/2
♭b Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

213 214 Pesante 215 216

Flutes 1°
2°

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

f
1°
Pesante
(Detuned)
ff

217 218 219 220

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

221 222 223 224

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

à2 ff (Detuned)

225 226 227 228

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Timp.2
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

ff
ff

229 230 231 232

Dim.

Flt.1/2

Oboe 1/2

1°

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Dim.

Timp.1

Timp.2

Susp.Cymbal (As in beginning)

Sus Cym

Bass Dr.

Celeste

7 7 7

Dim.

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

233 234 235 236

Flt.1/2
Oboe 1/2
Bb Clt.1/2
1°
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
2°
Timp.1
Sus Cym
Bass Dr.
Celeste
7
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

237 238 239 240

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

241 242 243 244

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
1°
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

245 246 247 248

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

249 250 251 252

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

253 254 255 256

Flt.1/2
Oboe 1/2
Bb Clt.1/2
1°
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

257 258 259 260

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

Sord
1°
8va
8va

261 262 263 264

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

265 266 267 268

Flutes 1°
2°

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

mp *mf*

269 270 271 272

Cresc.

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

F.Hn.1/3

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Cresc.

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

mf *Cresc.*

273 274 275 276

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

277 278 279 280

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

Sim.
mp
à2
mf
2°
f

281 282 283 284

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

loco

285 286 287 288

Flt.1/2 — end sim. — mf
Oboe 1/2 — end sim. — mf
Bb Clt.1/2 — end sim. — mf
Bsn.1/2 — end sim.

F.Hn.1/3 — (Hand Stop) — mf
F.Hn.2 — (Hand Stop) — mf
Tpt.1/2 — mf
Tbn.1/2 — (Hand Stop) — mf

Timp.1
Sus Cym — Susp.Cymbal (Wire Brushes) — p
Bass Dr.

Celeste

Harp

Violin 1A — ff — mf
Violin 1B — ff — mf
Violin 2 — ff — mf
Viola — ff — mf
Cello — f — mf
D.Bass — f — mf

289 290 291 292

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

f

(Open)

293 294 295 296

Flt.1/2

Oboe 1/2

Bb Clt.1/2

Bsn.1/2

(Open)

F.Hn.1/3

(Open)

F.Hn.2

Tpt.1/2

Tbn.1/2

Timp.1

Sus Cym

Bass Dr.

Celeste

Harp

Violin 1A

Violin 1B

Violin 2

Viola

Cello

D.Bass

297 298 299 300

Flt.1/2
Oboe 1/2
Bb Clt.1/2
Bsn.1/2
F.Hn.1/3
F.Hn.2
Tpt.1/2
Tbn.1/2
Timp.1
Sus Cym
Bass Dr.
Celeste
Harp
Violin 1A
Violin 1B
Violin 2
Viola
Cello
D.Bass

301 302 303 304 305 306

Rall ---------- Move

Flt.1/2 — ff

Oboe 1/2 — ff

Bb Clt.1/2 — ff

Bsn.1/2 — à2 — ff

F.Hn.1/3 — ff

F.Hn.2 — ff

Tpt.1/2

Tbn.1/2 — ff

Rall ---------- Move

Timp.1 — ff

Timp.2 — ff

Sus Cym

Bass Dr.

Celeste

Harp

Rall ---------- Move

Violin 1A — ff

Violin 1B — ff

Violin 2 — ff

Viola — ff

Cello — ff

D.Bass — ff