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Metaanthropos/Evolutio 2 for Chamber Orchestra and Electronics

by

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ABSTRACT

METAANTHROPOS/EVOLUTIO 2 is an interactive composition for the combined resources of a chamber ensemble (strings, woodwinds, brass and percussion), and a computer. The composer's intention was to create a work that integrates these two different worlds of sound. The computer plays triggered (preprocessed) soundfiles and provides real-time sound processing, including analysis, transformation, and spatialisation of the acoustic instrumental sounds.

The basic idea of the compositional technique in this piece was to construct an evolving sound, controlled according to different processes and criteria. This approach offers the possibility of building a musical gesture, not as a series of discrete notes, but as a continuum in which all the musical parameters are continuously modified.

The duration of the work is about seventeen minutes.

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I also want to thank my wife, Elena, for her continuous support and encouragement throughout the entire process of writing the piece, and finalization of the project.

At last but not the least, I would like to thank my parents for their unreserved support in pursuing my dreams.

Dedicated

to

my beloved wife Elena

and my dear parents Radmila and Sinisa

TABLE OF CONTENTS

Approval Page.....	ii
Abstract	iii
Acknowledgements	iv
Dedication	v
Table of Contents	vi
List of Examples and Figures	vii
METAANTHROPOS/EVOLUTION 2: AN ANALYSIS	1
Introduction	1
Semiology	3
Musical Materials	4
Structure and Form	8
Part I	9
Part II	18
Part III	39
Conclusion	41
METAANTHROPOS/EVOLUTION 2 FOR CHAMBER ORCHESTRA AND ELECTRONICS	42
Instrumentation	42
Duration	43
Notation and Note on Performance	44
Score	48
Bibliography.....	111
Appendix A: Overall Form	112
Appendix B: Graphical Presentation of the Becoming of the Song, the Principles of Elasticity and Harmonic Rhythm, and the Overall Growth of the Piece.....	113
Appendix C: <i>Max-MSP Patch</i> - an Interactive Real-time Graphic Programming Environment for Production and Modification of Digital Audio Signals	114
Appendix D: <i>Cecilia</i> – an Environment for Digital Signal Processing	116
Appendix E: CD-ROM	117

LIST OF EXAMPLES

Example	Page
1. Main gesture (M)	7
2. Macedonian folk song	7
3. Principle of elasticity 1 (a)	10
4. Principle of elasticity 2 (soundfile1)	11
5. Harmony: field of forces (1)	13
6. Filtering technique (1)	15
7. Rhythmic pattern (b).....	16
8. Harmony: field of forces (2)	17
9. Folk song (c1).....	19
10. Rhythmic pattern (d).....	20
11. Folk song (c2).....	20
12. Harmony: field of forces (3)	22
13. Monophonic – polyphony	23
14. Principle of elasticity 3 (e).....	25
15. Rhythmic pattern (f).....	26
16. Folk song (c5)	27
17. Folk song (c6)	28
18. Rhythmic pattern (g) and Monophonic-polyphony	29
19. Filtering technique (2)	31
20. Filtering technique (3)	33
21. Folk song (c10) and Complex texture	35
22. Harmony: field of forces (4).....	36
23. Folk song (c11).....	38
24. Main gesture (M1)	40

LIST OF FIGURES

Figure	Page
1. Elasticity	5
2. Position of the Orchestra on Stage	47

Introduction

The title of the work, METAANTHROPOS/EVOLUTION 2, is a concept synthesized from several elements: *meta* (Greek) – meaning “beside” or “beyond”, *Anthropos* (Greek) – meaning human in general, and *Evolutio* (Latin) – meaning “growth” or “development”, a process that leads to a higher stage of development. This is the second piece written under this concept.

For a long time the concept has been an essential element of my thought in general and a motivation for all my activities in the field of music and in society. My intention is to get deep into the states of human awareness, to explore the two integrally related aspects of human internal world – the affect and cognition and, using sound as a medium, to create an autonomous musical syntax and form.

I have realized through experience that we humans, quite often speak in favor of something, but we act against it and do the reverse. Jaques Lacan wrote “...The function of the language is not to communicate, but to give the subject a place from which he can speak...to express his desire...”¹ I add to this: “and to hide his desire behind the words”.

Music functions in another way. The ‘desire’ and the sound articulated into music are closely related since there are no words to mediate between them. The composer’s states of awareness are directly engraved into the sound as a medium, melting with it, shaping the physical existence of the sound into a live, articulated, and meaningful

¹ Jaques Lacan: *Seminar on ‘The Purloined Letter’*, Yale French Studies, 1976.

musical syntax and structure. In that direction METAANTHROPOS/ EVOLUTIO 2 is another journey.

The basic idea of the compositional technique in this piece was to construct an evolving sound, controlled according to different processes and criteria. This approach offers the possibility of building a musical gesture, not as a series of discrete notes, but as a continuum in which all the musical parameters are continuously modified. I analyzed different sounds originating both from traditional musical instruments and sound synthesis in the computer. These sounds were processed using various digital signal-processing programs (see Appendices C and D) that enabled me not only to modify already existing sounds, but also, by using different techniques of resynthesis, to create new ones as well. These new sounds are stored as soundfiles in the computer's memory. During the performance both the stored soundfiles and the instrumental sounds processed in real-time will be presented along with the acoustic sounds of the instruments.

In the composition, there is a high degree of cohesion between the acoustic sounds and both the sounds produced and the sounds transformed by computer in real-time. By translating the sonic shapes obtained through the various techniques of resynthesis into musical gestures and phrases, my intent was to develop a new approach to musical architecture. In concept, these transformations of sound take a musical idea that was born and used in the instrumental realm and extend it into the world of electronics. In this way, the coherence between the two worlds is reinforced and the impact of musical gestures is expanded.

Semiology

In this piece, I aimed to explore the possibility of the existence of a homology and form of inherent organization between the musically structured gestures and forms of various states of human awareness as elements of signification. I have been led by the idea that the sound structured as a musical gesture is capable of evoking, through mediated and symbolic fashion, the structures of the world and the states of being and human awareness which sustain them. The sound articulated as a gesture appeals to the logic of our mental processes. As Suzana Langer wrote: "...The inner life has formal properties similar to those of music – patterns of motion and rest, of tension and release... of sudden change..."². In a similar manner J. Shepherd and P. Wicke³ stated about music: "It is simply that 'its inherent characteristics', its use of iconic and non-denotative potentials of sounds, provides it with a special capacity to exercise power in a direct and concrete fashion. It can speak directly, concretely *and with precision* to the states of awareness which constitute our subjectivity, our very being".

Led by this idea, and using a homology (analogy in structure), I tried to 'translate' the emotional, affective, rational, and intuitive states and processes, through articulated sonic gestures as a mediator, into musical meanings.

The basic constituent units of the overall form are musical gestures and the relations between them. The structure of the piece lies not in the individual sounds occurring only diachronically, which refers only to the relations between two subsequent

² Suzana Langer: *Philosophy in a New Key* (Cambridge, 1942. Mass.: Harvard University Press)

³ J. Shepherd and P. Wicke: *Music and Cultural Theory* (Malden, 1997. Mass.: Blackwell Publishers Ltd.)
p - 213

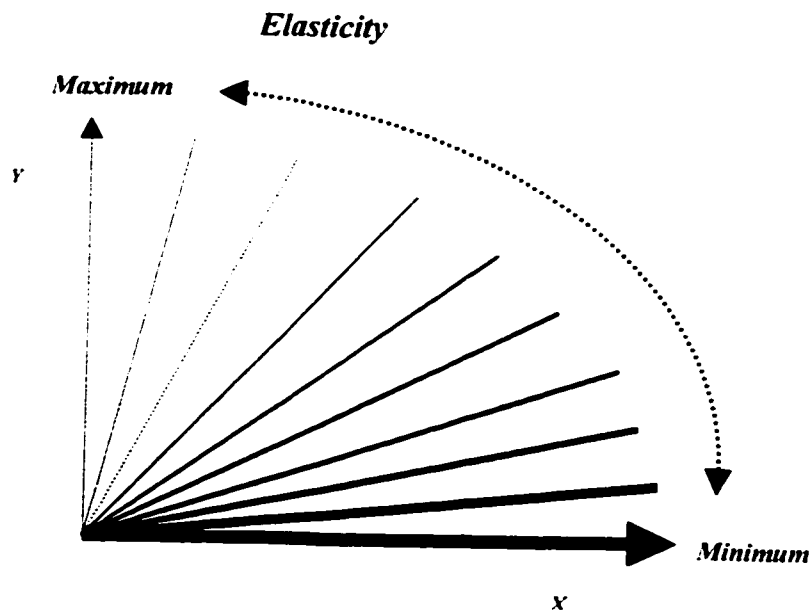
sounds, but in bundles of relations between all sounds that function both synchronically and diachronically. Firstly, on the morphological level, or micro plane, all the parameters of a sound (pitch, harmony-timbre, rhythm, meter, dynamic etc.) are integrated into a unique and complex musical gesture. Secondly, on the syntactical level or macro plane, the manner in which musical gestures relate to one another melodically, harmonically and rhythmically, evolves into the musical structure of the piece.

Musical Materials

In this composition I worked with three types of musical materials. The first embraces several musical materials under one principle, the principle of *elasticity*. They are designated with **M** - Main gesture (Example 1), **a** (Example 3), and **e** (Example 14). This principle commonly refers to objects, qualities and processes of the material world and is associated with the sciences, physics in particular. However, it can function as a temporal structure in music. In general, *elasticity* is a principle of impulsiveness upon which the material is capable of both returning to the initial state or form after transformation and of adopting to the change in a variety of circumstances, through many transitional and, sometimes for the listener, imperceptible stages.

Take a look, for example, at a simple x/y - graph (Figure 1), which scales the degree of *elasticity* and suppose that at one period of time, the melodic-rhythmic gesture either moves close to the y or x axis:

Figure 1



The vertical movement (y -axis) is analogous to our vertical movement on the Earth, where the gravitation force causes changes in our body, which resists the gravitation. The gravitation and the resistance of the body make an elastic gesture where each of the two forces tend to pull against each other. This situation is highly unpredictable, with impulsiveness, fast changes and instability. During the horizontal movement (x -axis) where the body is relatively under the permanent gravitation, changes occur in discrete steps and it is easier for one to perceive and describe the overall movement.

The second type is constituted of melodic-rhythmic materials derived from a Macedonian folk song (Example 2), and are designated with **c**. Throughout the piece, they are in process of delineation which I call *becoming of the song*, i.e., they evolve into a song in the second half of the piece.

The third type, a group of *rhythmic patterns*, is represented by **b** (Example 7), **d** (Example 10), **f** (Example 15), and **g** (Example 18) materials. They are either derived from the above-mentioned folk song or are completely autonomous subjects.

The overall form of this composition can be defined as interplay of all these elements and their complex relationships.

Structure and Form

For analytical purposes the piece can be divided into three parts, each of which can be further divided into sections: Part I (m.1-67) has four sections; Part II (m.68-302) has eleven sections, and Part III (m.303-end) has two sections. The sections are made up of three types of material: a) 'thematic' musical material such as: **a, b, c, d, e, f, and g**; b) transitional material that builds the bridges: **B, B1, B2, B3 and B4**; c) Main gesture - a figure represented by a harmonic *glissando*, designated with **M**. Please see Appendix A for an overview of the form.

The different types of music material and the relations between them will be analyzed with respect to:

- 1) the degree of *elasticity*, referring to the melodic-rhythmic aspect of a single line or harmony-timbre which is always in motion;
- 2) the process of *becoming the song*;
- 3) the harmonic rhythm, i.e., rate of change of harmony-timbre.

Part I

Part I of the piece begins with the material designated with **M** (see Example 1), a harmonic *glissando* gesture on 'C', played by the Horn. Its function is very similar to the function of the opening motive of the Beethoven's Symphony No.5 that H. Riemann called a *motto*. However, in this piece it introduces a type of gesture that will be a remarkable building unit throughout the piece, representing the principle of *elasticity*.

Section 1 of Part I (m.2-13) is built of musical material designated with **a** - a single chord with 'C' as a fundamental (Example 3). It is an extension of the initial harmonic *glissando* gesture (**M**). The harmonic partials are spread over all groups of instruments of the orchestra, and extended in time. The effect of such a gesture is an evolving spectrum and it is analogous with the principle of *elasticity*: the amplitude envelope begins from the fundamental, continues upwards to the highest region of the partials and then turns back to the initial position.

Example 3

Principle of elasticity 1 (a)

The musical score for Example 3, titled "Principle of elasticity 1 (a)", is a multi-staff orchestral score. It features the following instruments and parts:

- Fl. (Flute):** The top staff, marked with a *mf* dynamic.
- Ob. (Oboe):** The second staff, marked with a *mf* dynamic.
- Cl. (Clarinet):** The third staff, marked with a *mf* dynamic.
- Bsn. (Bassoon):** The fourth staff, marked with a *mf* dynamic.
- Tr. (Trumpet):** The fifth staff, marked with a *mf* dynamic.
- Horn:** The sixth staff, marked with a *mf* dynamic.
- Tbn. (Trombone):** The seventh staff, marked with a *mf* dynamic.
- Perc.1 (Percussion 1):** The eighth staff, marked with a *mf* dynamic.
- Perc.2 (Percussion 2):** The ninth staff, marked with a *mf* dynamic.
- VI.1 (Violin 1):** The tenth staff, marked with a *mf* dynamic.
- VI.2 (Violin 2):** The eleventh staff, marked with a *mf* dynamic.
- Vla. (Viola):** The twelfth staff, marked with a *mf* dynamic.
- Vc. (Violoncello):** The thirteenth staff, marked with a *mf* dynamic.
- Db. (Double Bass):** The fourteenth staff, marked with a *mf* dynamic.

The score is written in a single system with a common time signature. It includes various musical notations such as notes, rests, slurs, and dynamic markings. The overall structure is a single melodic line for each instrument, with some instruments playing in unison or octaves.

In the second measure, this principle is supported by **soundfile1**, which extends the sound of the timpani and spreads it through the acoustic space (Example 4).

Example 4

Principle of elasticity 2 (soundfile1)

The musical score for Example 4 is arranged in eight staves. The top two staves are labeled 'Perc.1' and 'Perc.2'. The next four staves are labeled 'VI.1', 'VI.2', 'Vla.', and 'Vc.'. The bottom two staves are labeled 'Db.' and 'Elect.'. The score shows a complex rhythmic and melodic structure across these instruments.

In measure 9, **soundfile2** performs a similar action with the sound of the vibraphone. This is an important moment, where the extension of this sound forms a melodic cell that later will evolve into an articulated song (**c** – material).

A succession of chords with a strong harmonic relevance can be seen in Example 5. These are four harmonic points – chords in measures 2, 5, 14 and 15. The syntax of the

work, the way in which these harmonic points are connected, is based on the principle of *difference* of color, or more precisely, that of *harmonic* and *inharmonic partials*⁴. The first point (first colon in the example) is built of the harmonic partials on 'C'. The second has some inharmonic partials, while the third point (first measure of the third colon) is completely built of inharmonic partials on C that is raised a quarter tone. The spaces between them are considered to be a *field of forces*, filled with harmonies whose role is to provide a gradual increase of tension up to the fourth point (second measure of the third colon) that offers a partial relaxation. In fact, the chord's fundamental is 'C', and partials in the woodwinds and brass are identical with the ones of the first chord of this progression, but, the full relaxation is undermined by the inharmonic partials in the two violins and viola.

As a conclusion, it is necessary to say that, in addition to the use of *difference* between the harmonic and inharmonic partials as a reliable tool for connecting two succeeding sounds, intuition played an important role. Together they provide a potential for control of a number of degrees and transitional states between tension and relaxation.

⁴ *Harmonic* partial is in an integer multiple of the fundamental frequency; *inharmonic* partial is not in an integer ratio to the fundamental frequency.

Example 5

Harmony: field of forces (1)

(1) (2) (3) (4)

Fl. Ob. Cl. Bsn. Tr. Horn Tbn.

Perc. 1 Perc. 2

VI. 1 VI. 2 Vla. Vc. Db.

Section 2 (m.14-24), is built of a single chord (**a1**) which further expands in elastic gesture by using a *filtering technique*⁵ which reinforces and attenuates regions of the spectrum of the sound known as *formants*⁶ (Example 6).

⁵ In electroacoustics the term is used for boosting or attenuating selected regions of the frequency spectrum.

⁶ A *formant* is a peak of energy in a spectrum, which can include both harmonic and inharmonic partials as well as noise. Formant peaks are characteristic of the tones radiated by many musical instruments as well as of the vowels spoken by the human voice.

Example 6

Filtering technique (1)

The image displays a musical score for a symphony orchestra, titled "Example 6" and "Filtering technique (1)". The score is arranged in a standard orchestral format with the following instruments and parts from top to bottom:

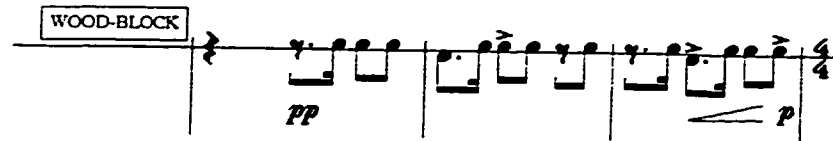
- Fl. (Flute)
- Ob. (Oboe)
- Cl. (Clarinet)
- Bsn. (Bassoon)
- Tr. (Trumpet)
- Horn
- Tbn. (Trombone)
- Perc. 1 (Percussion 1)
- Perc. 2 (Percussion 2)
- VI. 1 (Violin 1)
- VI. 2 (Violin 2)
- Vla. (Viola)
- Vc. (Violoncello)
- Db. (Double Bass)

The score consists of 14 staves, each with a clef and a key signature of one flat (B-flat). The music is written in a common time signature (C). The notation includes various rhythmic values, including eighth and sixteenth notes, as well as rests and dynamic markings. The overall structure is a single system of music, likely representing a specific technique or exercise for the instruments listed.

Section 3 (m.24-40) introduces the rhythmic pattern designated with **b** (Example 7).

Example 7

Rhythmic pattern (b)



It is a recurring rhythmic pattern which metaphorically, serves as a “vehicle” to the **a2** material (m.36-40), which presents the principle of *elasticity*. **Soundfile3** (m.24) follows the **soundfile2** after a short break, thus, continuing the melody (derived from the folk song, and designated with **c**) as a counterpoint to the rhythmic pattern in the percussion.

Section 4 (m.41-66) is based on the **c**-music material, which is now introduced in the orchestra. It is a material derived from the rhythmic aspect of the folk song (see Example 1). It is accompanied by **soundfile4** (m.40), which is anticipated by the gesture in the timpani in the m.39. It expands this gesture over the acoustic space, stretching the sound into a continuous mass, and finally transforming it into a broken-glass like sound and dispersing it in several directions (principle of *elasticity*). The harmonic rhythm is in ratio 1:1, i.e. it corresponds to the overall rhythm, or in other words, the changes of the color coincide rhythmically with the $7/8 = 3+2+2$ pattern (m.41-52).

From the m.46-58, other harmonic points build the harmonic progression: measures 46, 50 and 58 (Example 8).

Example 8

Harmony: field of forces (2)

Fl.
Ob.
Cl.
Bsn.
Tr.
Horn
Tbn.
Perc.1
Perc.2
VI.1
VI.2
Vla.
Vc.
Db.

The manner in which these harmonic points are connected is based on the principle of *difference* of color, harmonic and inharmonic partials, as I explained earlier in this analysis. The spaces between these points are filled with harmonies whose role is to provide a gradual increase of tension and drive the flow of the music into an uncertain and unknown direction up to the m.66 (principle of *elasticity*). At this point a triangle-sound is spread through the virtual space, in an articulated syntax that overlaps with the beginning of the next Section (**soundfile5**).

The Main gesture (**M**) harmonic *glissando*, marks the end of the Part I (m.67). The whole Part is reminiscent of the 'exposition' of the sonata form in the tonal music. However, in this case, it is not an exposition of the 'subjects' that contrast one to another and are expected to be developed, but it is an exposition of the main principle of *elasticity*, the materials derived from the folk song, and the rhythmic patterns.

Part II

Section 1 (m68-87) of Part II is constituted of two musical materials: **b1** and **c1**. The first is a reappearance of the previous rhythmic pattern (see Example 7) that drives the flow of the music. The latter (**c1**), which is melodic-rhythmic exposition of the material derived from the folk song, is brought in by the strings in m.75 (Example 9).

Folk song (c1)

The musical score consists of five staves. VI.1 and VI.2 have a melodic line with triplets and dynamics of *p*, *mp*, *p*, *mp*. VI.1 and VI.2 are marked *sul tasto*. Vla. has a sustained chord with dynamics of *pp* and *ppp*, marked *sul pont.* Vc. and Db. have a rhythmic pattern with triplets and dynamics of *p*, *mp*, *p*, marked *sul pont.*

From this point up to m.82, **b1** and **c1** materials are superimposed and each of them occurs in a different tempo (the **b1** rhythmic pattern played by wood-block has a quarter-note value of 60 M.M., the **c1** material played by the strings has a quarter-note value of 90 M.M.). At the same time, the gestures in the strings - *1/2 col legno jete* (m.70), including the **c1** material from the m.75, are transformed in real-time by the computer. It extends the gestures simulating a space, which is characterized by a high level of reverberation of the sound (marked as **real-time6** in the score). In m.77, **soundfile7** introduces a gesture as an extension of the sound of the woodwinds and

strings from the same measure. Thus, we have three superimposed simultaneous textures with three different speeds. This section is brought to the conclusion with an expansion and distortion of the pulsation from the oboe and the flute (m.83-86) by **soundfile8** (m.84).

The Section 2 (m.86-103) introduces another rhythmic pattern (d) played by the snare drum (Example 10).

Example 10

Rhythmic pattern (d)

The musical notation for Rhythmic pattern (d) is written on a single staff. It begins with a box labeled "SNARE DRUM" and "snare off". The notation consists of a series of eighth notes, with some groups of three notes beamed together and marked with a "3" below them. The piece starts with a *pp* dynamic, followed by a crescendo to *mp*, then a *p* dynamic, a crescendo to *mf*, and finally a *p* dynamic. The notation is divided into measures by vertical bar lines, with time signatures of 7/8 and 8/8 indicated.

Its pulsation is derived from the folk song (see Example 1) but this time the formula $7/8=3+2+2$ is reversed into $2+2+3$. This new "vehicle" accompanies the **c2**, a material which is derived from the folk song (trumpet - m.91). Thus, two different types of gestures are superimposed along the flow of the music (Example 11).

Example 11

Folk song (c2)

The musical notation for Folk song (c2) is written on a single staff. It begins with the label "Tr." and a *mf* dynamic. The notation consists of a series of eighth notes, with some notes beamed together. The piece starts with a *mf* dynamic, followed by a crescendo to *mf*, and finally a *mf* dynamic. The notation is divided into measures by vertical bar lines, with a time signature of 7/8 indicated.

At the same time, the pulsation in the extremely high register in the violins (m.91-95) is subjected to real-time transformation by computer (**real-time9**). The Section ends with a transformation, which involves the distortion and spatialisation of the gesture articulated with *pizzicato* in the strings (m.91), simulating a sound moving back and forth (**soundfile10**).

The Bridge - **B1** (m.104-112), is characterized by a dense texture and a strong *intensification of the present*, as Gerard Grisey⁷ describes similar situations, where ‘the listener is literally propelled toward the unknown’. The flow of the music is dispersed, firmness disappears, and different parts of the overall gesture take on their own direction (**soundfile11**). This is a part in which the principle of *elasticity* dominates, i.e., as it is shown in the Figure 1, the level of *elasticity* is close to the *y* - axis. The space between the two harmonic points, from m.106 to m.112 is bridged by an elastic gesture with a dense harmonic rhythm, based on inharmonic partials (Example 12).

⁷ Gerard Grisey: *TEMPUS EX MACHINA, réflexions sur le temps musical* , 1980 (unpublished)

Example 12

Harmony: field of forces (3)

The image displays a musical score for a section titled "Harmony: field of forces (3)". It is divided into two columns, with arrows indicating a transition from the left column to the right column. The instruments listed on the left are:

- Fl.
- Ob.
- Cl.
- Bsn.
- Tr.
- Horn
- Tbn.
- Perc. 1
- Perc. 2
- VI. 1
- VI. 2
- Vla.
- Vc.
- Db.

The score shows various musical notations, including notes, rests, and dynamic markings. The right column shows a simplified version of the same material, with many notes removed or replaced by rests, indicating a reduction in complexity or a change in the harmonic field.

Section 3 (m.112-129) is built of **c3**, **c4** and **e** music materials. The first two are new derivations of the folk song. This time, its single line is divided and played by the three brass instruments, which complementarily perform a unique line. This technique is often called *monophonic polyphony*⁸, where each pitch stated melodically is sustained as harmony following its attack. It is a gesture with a dual function – both melodic-rhythmic and harmonic (Example 13).

Example 13

Monophonic -polyphony

G

♩ 1110

Fl.

Ob.

Cl.

Bsn.

Tr.

Horn

Tbn.

⁸ This term is used for the above mentioned technique in Steven Stucky's book, *Lutoslawski and His Music*, (Cambridge, 1981. Cambridge University Press, p-125)

The melody is doubled in the vibraphone. This material is accompanied by four pulsations in the woodwinds, each of which has a different density, rhythm and tempo.

The chord in the strings (m.112) is repeated, displaced, transposed and its color is transformed by **soundfile12**.

In m.118, the flow of the music is divided in two separate directions. The strings and woodwinds play the first one, where the initial four pitches from the violins, which are derived from the folk song, are progressively accelerated. The second gesture (in the brass section) is in continuous deceleration. At this point, one can experience the potential of *elasticity*, where two forces pull against each other.

Monophonic polyphony reappears in this Section (in brass, m.123-127), this time, accompanied by several different pulsations in the rest of the orchestra and by a distorted and displaced chord from m.123 played by the strings (**soundfile13**). Along with this, in m.123-125 the two different harmonies in the orchestra and the **soundfile13** collide. In the theory of tonal music (Janecek)⁹ it is known as *cumulus* and originally found in a few of Beethoven's piano sonatas.

The following musical material, designated with **e** (m.129-145), is characterized by a high degree of instability, continuous color change, and dense harmonic rhythm (principle of *elasticity*, Example 14).

⁹ Janecek, Karl. *Harmonie razborem*. Praha, 1963.(Statni hudebni vydavatelstvi).

Example 14

Principle of elasticity 3 (e)

The image displays a musical score for a symphony orchestra, titled "Example 14" and "Principle of elasticity 3 (e)". The score is arranged in a standard orchestral format with 15 staves. The instruments listed on the left are: Fl. (Flute), Ob. (Oboe), Cl. (Clarinet), Bsn. (Bassoon), Tr. (Trumpet), Horn, Tbn. (Trombone), Perc. (Percussion), VI.1 (Violin I), VI.2 (Violin II), Via. (Viola), Vc. (Violoncello), and Db. (Double Bass). The score features complex rhythmic patterns, including sixteenth and thirty-second notes, and is characterized by frequent slurs and dynamic markings such as *ff* (fortissimo) and *f* (forte). The percussion part includes a section labeled "STUPENDO". The notation is dense and detailed, typical of a full orchestral score.

The **c5**, material that is derived from the folk song, appears in m.147, and the clarinet and the three brass instruments play in a complementary fashion (Example 16).

Example 16

Folk song (c5)

Cl.

Bsn.

Tr.

Horn

Tbn.

pp *p* *pp*

mp > p *fff*

pp < p *fff*

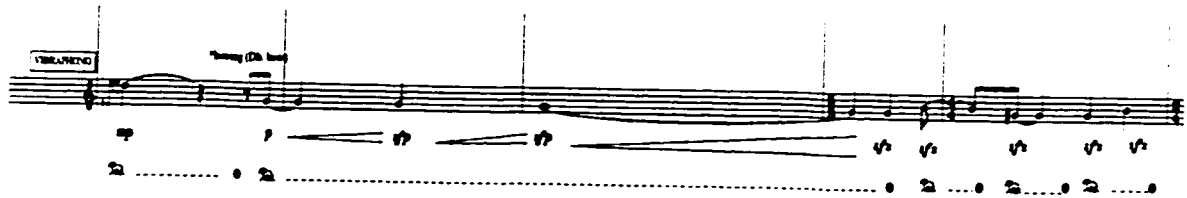
pp < p *fff*

con sordino

con sordino

con sordino

The **soundfile15** (m.144) performs a 'thickened' line as a counterpoint to **c5**, simulating a situation in which it could be perceived as being far away behind the orchestra on the stage. The **c6** material, which is derived from the folk song, as all **c** - material is, is presented in m.154, by the bowed vibraphone (Example 17).

Folk song (c6)

Between the m.151-153, for a short time, there is reminiscence of the principle of *elasticity* (a material), through the *filtering technique* (mentioned earlier) which reinforces and attenuates regions of the spectrum of the sound. It accompanies the c6 material.

The music flow evolves into Bridge **B2**, supported by the gesture of **soundfile16** in m.159. It begins with a gradual transformation of the miniature gesture played by the glockenspiel, whose strong metal-like sound continuously being transformed into a wood-like sound, thus anticipating the gesture of the temple-block in m.163.

In **B3** (m.161-164), a sudden burst of energy in m.163 (*elasticity*) disintegrates the flow of the music up to the m.165, where **soundfile17** plays a bell-like sound.

The Section 5 (m.168-191) brings in another musical material designated with **g** (Example 18).

Example 18

Rhythmic pattern (g) and Monophonic-polyphony

The musical score for Example 18 is arranged in a standard orchestral format. The instruments listed on the left are: Fl. (Flute), Ob. (Oboe), Cl. (Clarinet), Bsn. (Bassoon), Tr. (Trumpet), Horn, Tbn. (Trombone), Perc. 1 (Percussion 1), Perc. 2 (Percussion 2), Vl. 1 (Violin 1), Vl. 2 (Violin 2), Vla. (Viola), Vc. (Violoncello), and Db. (Double Bass). The score is divided into measures by vertical bar lines. A large bracket spans across the Flute, Oboe, Clarinet, Bassoon, and Trumpet parts, with the label *Monophonic-polyphony* written to its right. Another bracket spans across the Trombone and Percussion 1 parts, with the label *Rhythmic pattern* written below it. A third bracket spans across the Percussion 2, Violin 1, Violin 2, Viola, Violoncello, and Double Bass parts, with the label *Folk song* written below it. The notation includes various musical symbols such as notes, rests, and dynamic markings.

Its rhythmic character overtakes the overall flow of the music, serving as a “vehicle” to the upcoming **c7** material (derived from the folk song), played by double bass. It is coupled, first, with the trumpet in octave in m.170, and later with the trombone and the horn, presented in *monophonic-polyphony* (each pitch stated melodically is sustained as harmony following its attack).

From m.184-190 the gestures of the brass are distorted by computer in real-time (**realtime18**). This is followed by shifting the character of the gestures in the strings from the regular triple pulsation, into elastic, slowly evolving spectrum, enriched with trills.

The Bridge (**B4**) (m.192-199) is built of an unstable, ‘ever moving gesture’ that increases the degree of unpredictability and tension – manifesting the power of the principle of *elasticity*.

In Section 6 (m.200-216) the piece reaches the climax. This Section is based on the material of the folk song (**c8**), played by trumpet and the gesture from the beginning of the piece (**a**), with its strong elastic character (m.200). From m.200-216, the computer in real-time (**real-time19**) continuously ‘filters’ the spectrum of both the strings and woodwinds. Another element that turns the attention to the previous events is the rhythm, or more precisely, the pulse of the folk song $7/8=2+2+3$ (Timpani, m.202-205).

Section 7 (m.217-226) and No.8 (m.227-251) are constructed from **a3** and **c9** musical material respectively. The first (**a3**) uses the *filtering technique* that was introduced earlier (Example 19).

Filtering technique (2)

The musical score for Example 19, titled "Filtering technique (2)", is presented in a standard orchestral layout. It consists of the following parts and systems:

- Flute (Fl.):** The top system, featuring a melodic line with various articulations and dynamics.
- Oboe (Ob.):** The second system, mirroring the flute's melodic line.
- Clarinet (Cl.):** The third system, providing harmonic support with sustained notes and rhythmic patterns.
- Bassoon (Bsn.):** The fourth system, similar to the clarinet part.
- Trumpet (Tr.):** The fifth system, playing a rhythmic accompaniment.
- Horn (Horn):** The sixth system, also playing a rhythmic accompaniment.
- Trombone (Tbn.):** The seventh system, providing a low-frequency rhythmic accompaniment.
- Percussion 1 (Perc.1):** The eighth system, featuring a complex rhythmic pattern with a box labeled "GLATTENWEL".
- Percussion 2 (Perc.2):** The ninth system, featuring a complex rhythmic pattern with a box labeled "SCHNAPPEWEL".
- Violin 1 (VI.1):** The tenth system, playing a melodic line with various articulations.
- Violin 2 (VI.2):** The eleventh system, mirroring the Violin 1 part.
- Viola (Vla.):** The twelfth system, playing a melodic line with various articulations.
- Violoncello (Vc.):** The thirteenth system, playing a melodic line with various articulations.
- Double Bass (Db.):** The fourteenth system, playing a melodic line with various articulations.

This gesture is reinforced by real-time processing (**realtime20** in m.217), performing a continuous color-change (*flanging*¹⁰) and a *crescendo*. The **soundfile21** increases the density of both the harmony and texture (m.223-227).

Section 8, follows with a texture built of several multi-layered gestures that accompany the solo trumpet, playing material based on the folk song. These gestures are played first by the cello, double bass, trombone, bassoon; second, by flute, oboe and clarinet; third, by snare drum and the last, by the timpani (m.227-232). Later, in m.232-239, the gestures of the violins, viola, and woodwinds, get melted into a single gesture, characterized by a continuous *evolving spectrum* and *trills*. The third group of gestures that accompany the solo in trumpet begins in m.239. It consists of the gestures that reinforce certain regions of the spectrum (*formants*) which are progressively filtered in real-time by computer, simulating a spatial movement of the sound from the strings (**real-time22**). The section ends with the climax of the solo trumpet line, accompanied by a gesture that extends and develops the single hit of the glockenspiel in m.247 (**soundfile23**). This section is distinct from all the others by the dominance of the material derived from the folk song and the complexity, richness, tension, and force of the principle of *elasticity*.

After the short Bridge **B5** (m.252-256) Section 9 (m.257-264) brings in **a4** material with a gesture based on *filtering technique* (Example 20).

¹⁰ In electroacoustics, the term is used to designate a variable time delay effect: delay lines whose delay times vary as signals pass through them.

Example 20

Filtering technique (3)

Fl.

Ob.

Cl.

Bsn.

Tr.

Horn

Tbn.

Perc.1

Perc.2

VI.1

VI.2

Vla.

Vc.

Db.

From m.257, the density of the texture gradually increases and reaches a climax in m.264. Along with these gestures, in **soundfile24** the single hit of the cymbal in m.258 evolves into a melody, which is also derived from the folk song. The end of this Section overlaps with the beginning of the Section 10 (m.264-287). It is built of the **c10** material (derived from the folk song) played by trumpet and is accompanied by a complex pulsation in the woodwinds, horn, trombone, timpani, and snare-drum combined with a temple-block up to the m.276 (Example 21).

Example 21

Folk song (c10) and Complex texture

The musical score for Example 21 is a complex orchestral arrangement. It features nine staves, each representing a different instrument or percussion part. The instruments are: Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), Bassoon (Bsn.), Trumpet (Tr.), Horn, Trombone (Tbn.), Percussion 1 (Perc.1), and Percussion 2 (Perc.2). The score is written in a single system with a common time signature. The music is characterized by a dense, intricate texture, with many overlapping melodic lines and complex rhythmic patterns. The notation includes various musical symbols such as notes, rests, beams, and dynamic markings (e.g., *p*, *f*). The overall style is that of a modern or contemporary orchestral work, possibly influenced by folk music as indicated by the title.

From this point on, the gestures in the accompaniment gradually decelerate to the point where they are completely transformed into a static sound in m.284, while the solo line in the trumpet follows a similar path of deceleration to the stage where only a single gesture of minor third is being shared between the trumpet and the trombone (m.282-287). At m.281 the strings bring in a *pizzicato glissando* that ends as a static chord in the next measure (Example 22).

Example 22

Harmony: field of forces (4)

The musical score for Example 22 consists of five staves, labeled VI.1, VI.2, Vla., Vc., and Db. on the left. Each staff begins with a *pizz.* (pizzicato) instruction and a dynamic marking of *fff*. Above the first three staves, there are markings for *gliss.* (glissando) and *arco ord. non vib.* (arco ordinario non vibrato). The score shows a gradual deceleration of the accompaniment, with the *fff* dynamic changing to *pp* (pianissimo) by the end of the first measure. The final measure shows a static chord. The Db. staff has a *pp* dynamic marking at the end.

This harmonic progression from the initial chord down to the chord in the m.282 is similar to the relation **V - I** in the tonal system. However, this relationship does not have the same effect because the *field of forces* between the chords is rich with inharmonic partials, and masks the descent to the final chord. It is perceived as a unique gesture, representing the principle of *elasticity*. Another gesture, that from **soundfile25**, expands and disperses the initial chord of this gesture throughout the acoustic space (m.281-284). The last chord (m.282) in the strings is actually the same chord introduced in Section 1 of Part I, based on the harmonic partials on 'C'.

After the Bridge (**B5**) (m.288-294), which is based on gestures of *evolving spectrum (elasticity)*, and a melodic gesture that expands the vibraphone line (**soundfile26**, m.291-295), we are at the point where the last section (No.11) of Part II begins. This section is solely based on the material from the folk song (**c11**), which for the first time is represented by a gesture in the strings (Example 23).

Folk song (c11)

It is accompanied by woodwinds and brass using the technique of *monophonic-polyphony* (m.295-299). The Section ends with a complete falling apart of the materials, supported by the descending gesture of **soundfile27**, down to a single pitch (C#) in the low register (m.300-302).

Section 1 of the Part III (m.303-327) is constructed of **b2** and **c12** musical materials, which were already exploited in the piece. The *rhythmic pattern (b2)*, after a longer period of time, brings the principle of *elasticity* to a low degree. Along with its driving function, the material derived from the folk song (**c12**) is being dispersed through the instruments of the orchestra: horn and trombone (m.305-310); oboe and flute (m.309-310); clarinet and flute (m.312-322); horn (m.311-312) and the clarinet (m.319-322). It is accompanied by the strings, which are filtered in real-time (**real-time28**).

Section 2 (m.327-343), the last section of the piece, begins with the superimposed *rhythmic patterns b3* and **f1**, accompanied by an extremely slow-moving gesture in the woodwinds and strings. They serve as a “vehicle” for **c13** (played by horn) - the last appearance of the material derived from the folk song (m.338-343). At m. 328, **soundfile29** enters with a chord on ‘C’, the chord changes its color, and **soundfile29** ends with a chord on ‘C#’ with some of its inharmonic partials. The last gesture, harmonic *glissando* over the harmonic partials on ‘C#’ in the horn (**M1** material), marks the end of the piece, confirms the dominance of the principle of *elasticity* and circumscribes the overall form (Example 24).

Main gesture (M1)

The image displays a musical score for a section titled "Main gesture (M1)". The score is arranged in a vertical column of staves, each labeled with an instrument or section. From top to bottom, the staves are: Fl. (Flute), Ob. (Oboe), Cl. (Clarinet), Bsn. (Bassoon), Tr. (Trumpet), Horn (French Horn), Tbn. (Tuba), Perc.1 (Percussion 1), Perc.2 (Percussion 2), VI.1 (Violin 1), VI.2 (Violin 2), Vla. (Viola), Vc. (Violoncello), Db. (Double Bass), and Elect. (Electric). The notation includes various musical symbols such as notes, rests, and dynamic markings. A prominent feature is a long, sustained chord that spans across all instruments, with a crescendo hairpin indicating it grows in volume over time. The score is presented in a clean, black-and-white format.

The last chord is extended throughout the acoustic space (**soundfile30**) and left to disappear.

Conclusion

The basic idea of the compositional technique in this piece – to construct an evolving sound – applies to both the musical gesture on micro plane, in which all the musical parameters are continuously modified and articulated into a unique musical gesture, and to the overall form on macro plane. The envelopes in **Appendix B** follow the development and changes of several basic parameters throughout the piece on macro plane, in order to provide a picture for the importance of each of these parameters individually as well as their cross-relationships. Following the envelopes of all these parameters, one can see the importance of the material derived from the folk song and its succession through the process of *becoming the song*.

Regarding the principle of *elasticity*, it is evident that the peaks and the valleys of this envelope coincide with those of the envelope of the harmonic rhythm. That means that the principle of *elasticity* is in direct proportion with the dense harmonic rhythm, i.e., with the gestures that are shaped on the basis of more frequent changes of harmony-timbre. In analogy, the overall growth of the piece is in direct proportion with both the dense harmonic rhythm and the principle of *elasticity*.

The idea of ‘evolving’ sound symbolizes the concept *evolutio* from the title of this work. Using sound as a medium, my intent was to explore the states of our awareness, to reinforce our thinking in general that would eventually lead to a different, hopefully better structured society, i.e. to *Meta Anthropos*.

METAANTHROPOS/EVOLUTIO 2
FOR CHAMBER ORCHESTRA AND ELECTRONICS

Instrumentation

Flute in C

Oboe

Clarinet in Bb

Bassoon

Trumpet in Bb (with harmon mute)

Horn in F

Trombone (tenor-bass) with harmon mute

Percussion (2 players):

4 Timpani

3 Gongs (three different pitches)

Guiro

Whip

2 Bongos

Temple-Block (five different pitches)

Wood-Block (two different pitches)

Snare-Drum

Suspended Cymbal

Vibraphone (with variable motor)

Xylophone

Glockenspiel

Triangle

2 Violins

1 Viola

1 Cello

1 Doublebass (with fifth string tuned to C)

Electronics:

4 stereo microphones	(Mic.1, Mic.2, Mic.3, and Mic.4)
Computer	(Apple Macintosh G3 or any other type capable of supporting Max-MSP - an interactive real-time graphic programming environment)
1 footpedal	(MIDI – sustain pedal, control No. 64)
1 MIDI interface	
Digital reverb processor	(set to 1.5 sec. reverberation time)
Audio mixer	(sixteen-channel)
Stereo pair speakers	
1 technician	a person sitting at the mixer, who will be responsible for: <ul style="list-style-type: none"> - activating and deactivating the microphones - controlling the work of the computer during the performance if necessary - controlling the balance between the sound of the orchestra, the sound coming out of the microphones and processed in real-time by the computer, and the sound of the pre-processed soundfiles stored into the computer's hard-drive.

This score is notated in C

The glockenspiel sounds an octave higher than written.

The double-bass (normal notes and harmonics) sound an octave lower than written.

Duration: 17 minutes

Notation and Note on Performance

General



one quarter-tone higher



three quarters higher



one quarter-tone lower



Three-quarters lower

'Grace' notes are always before the beat



trills (with the note which is a half step above)

Woodwind and Brass

fltz.

Flutter-tongue



breath only (without mouthpiece)

Brass

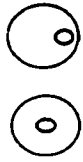
con sordino

harmon mutes (Trumpet and Trombone)

o.....+

open-to-close; this applies to hand stopping (Horn)

Percussion



play on the edge; play in the center of the Snare Drum

Strings



'Bartok' pizzicato



very high, indefinite pitch

ord. ----- sul pont.

ordinary, gradually changing to sul pont. and reverse

sul pont. ----- ord.

vib. ----- vib. molto

gradually increasing the degree of vibrato (both speed and width)

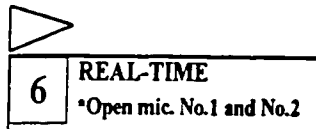
1/2 col legno

turn bow so that string is set in motion partly by hairs, partly by wood of bow

Electronics



The conductor presses on the footpedal triggering the pre-processed soundfiles, stored into memory of the computer



The conductor presses on the footpedal triggering the *sub-patches*.

The technician activates the microphones at the places marked with REAL-TIME symbols

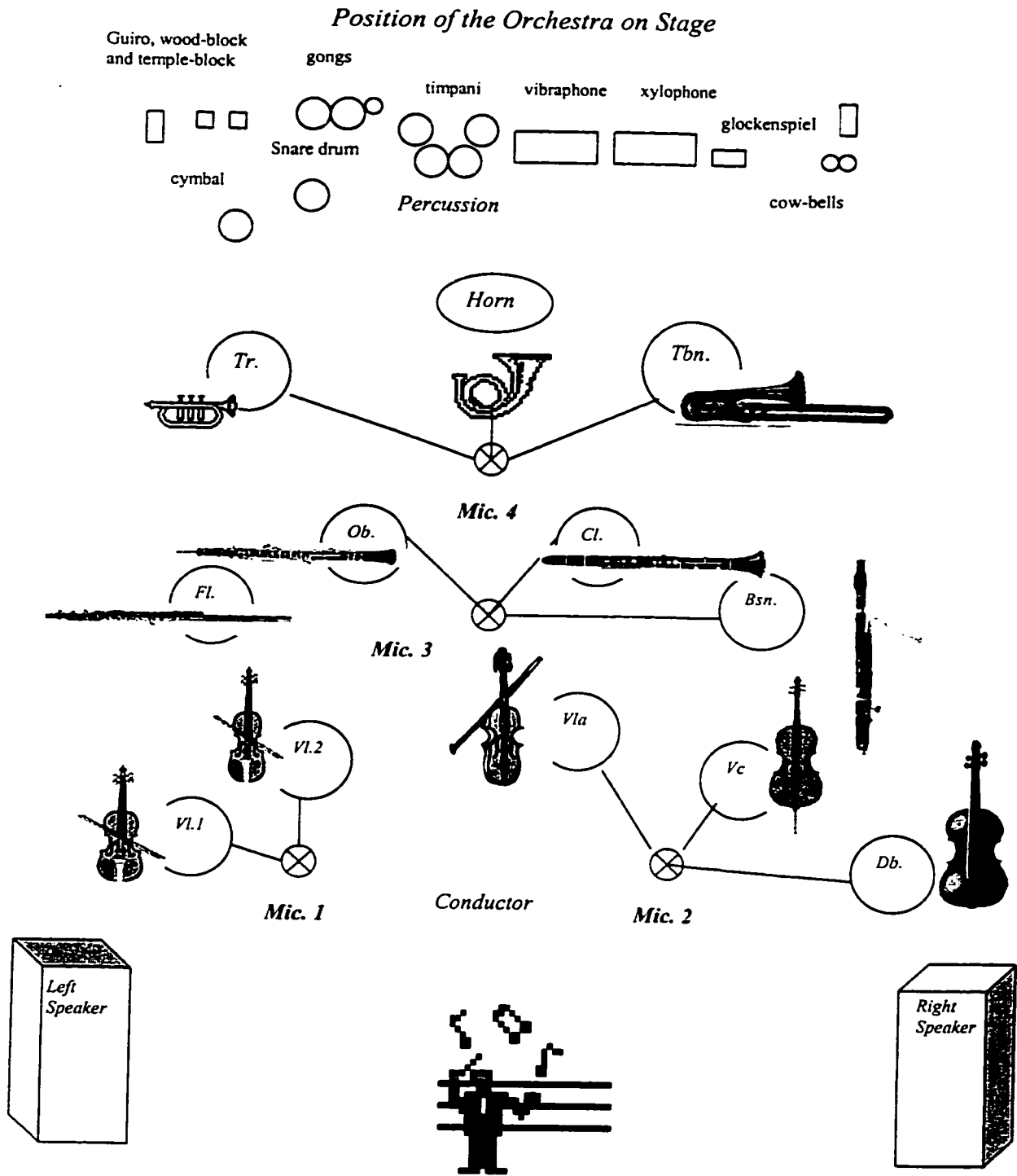
Certain points of the score are marked with these symbols - **soundfile1**, **soundfile2**, **real-time6** etc., which are *sub-patches* embedded into *Max-MSP Patch*¹¹ (see Appendix C), and are triggered by the conductor's footpedal (MIDI sustain pedal). Each of them will either initiate a playback of a soundfile or will initiate the transformation of the signal coming from the microphones. There are thirty *sub-patches*, twenty-three of which are programmed to playback the twenty-three soundfiles stored into the computer's memory, and seven *sub-patches* are pre-programmed for real-time processing. The conductor depresses the footpedal at places marked with the symbols, sending a "message" to the *Patch*. When the *Patch* receives the "message", it sends a cue to the corresponding *sub-patch*, which performs the action it was programmed for. Each pressing on the footpedal triggers the following *sub-patch*.

Position of the Orchestra on Stage

The microphones are placed in front of the orchestral groups: *Mic.1* in front of the violins; *Mic.2* in front of the viola, cello and double-bass; *Mic. 3* in front of the brass (trumpet, horn and trombone); *Mic. 4* in front of the woodwinds (flute, oboe, clarinet, and bassoon). The signals from the microphones are processed by computer in real-time and re-routed to the audio mixer. Some reverb (1.5 sec.) is added to these signals. The output of the pre-processed soundfiles, stored on the computer's hard-drive, is also routed to the audio mixer, but without additional reverb. The sound of these two signals from different origin, balanced with the acoustic sound of the orchestra, is sent to the speakers (see Figure 2).

¹¹ *Max-MSP* is an interactive real-time object-oriented graphic programming environment for the production and modification of digital audio signals.

Figure 2



7
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10

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22
23

18
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21
22
23

This musical score is arranged in systems. The first system includes four staves for woodwinds (flute, oboe, clarinet, bassoon) and four staves for strings (violin I, violin II, viola, cello). The second system includes two staves for woodwinds (trumpet, trombone) and two staves for strings (bassoon, double bass). The third system includes two staves for woodwinds (flute, oboe) and two staves for strings (violin I, violin II). The fourth system includes two staves for woodwinds (clarinet, bassoon) and two staves for strings (viola, cello). The fifth system includes two staves for woodwinds (trumpet, trombone) and two staves for strings (bassoon, double bass). The sixth system includes two staves for woodwinds (flute, oboe) and two staves for strings (violin I, violin II). The seventh system includes two staves for woodwinds (clarinet, bassoon) and two staves for strings (viola, cello). The eighth system includes two staves for woodwinds (trumpet, trombone) and two staves for strings (bassoon, double bass). The score is marked with various dynamics such as *pp*, *f*, *mf*, and *ff*, and includes performance instructions like *accor.* and *trumpet*. A rehearsal mark '3' is present at the beginning of the first system.

Fast 15 sec.

This page of a musical score contains measures 11 through 15. It features a variety of instruments including Violins I and II, Violas, Cellos, Double Basses, Flutes, Clarinets, Bassoons, and Percussion. The notation includes dynamic markings such as *ppp*, *pp*, *mf*, *f*, *mp*, and *pp*, along with hairpins for crescendos and decrescendos. The woodwind parts (Flute, Clarinet, Bassoon) have some sections obscured by black redaction boxes. The Percussion parts (Perc. 1 and Perc. 2) also show some redacted notation. The string parts are fully notated with various articulations and dynamics. The score concludes with a 'Finis' marking at the bottom left.

This page of musical score, numbered 53, contains the following sections and markings:

- Violins I (V1):** Features dynamic markings *p*, *pp*, *f*, and *mf*. Includes performance instructions: "SOUND EFFECTS" and "WOOD EFFECTS".
- Violins II (V2):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Violas (V3):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Violas (V4):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Celli (C):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Bassoons (B):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Double Basses (DB):** Features dynamic markings *p*, *pp*, *f*, and *mf*.
- Woodwinds:** Includes staves for Flute 1 (Fl. 1), Flute 2 (Fl. 2), and Clarinet 1 (Cl. 1), with dynamic markings *p*, *pp*, *f*, and *mf*.
- Other:** A circled "C" is present at the top right of the page.

②

Violin I
Violin II
Cello/Double Bass

Violin I
Violin II
Cello/Double Bass

Part 1

Part 2

Violin I
Violin II
Cello/Double Bass

①

1
2
3
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11

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13
14
15
16

17
18

This page of musical score contains the following sections:

- Violins I (Vn. I):** Four staves with complex rhythmic patterns, including sixteenth and thirty-second notes. Dynamics range from *f* to *ff*.
- Violins II (Vn. II):** Four staves with similar rhythmic patterns to the first violins. Dynamics range from *f* to *ff*.
- Violas (Vla.):** Four staves with a more melodic line, often featuring slurs and accents. Dynamics range from *f* to *ff*.
- Violas (Vla. 2):** Two staves with a melodic line, including a section marked "Cresc." (Crescendo).
- Celli (Vcl.):** Four staves with a melodic line, often featuring slurs and accents. Dynamics range from *f* to *ff*.
- Bassi (Vcl. II):** Four staves with a melodic line, often featuring slurs and accents. Dynamics range from *f* to *ff*.
- Woodwinds:** A section at the bottom of the page, including staves for Flute (Fl.), Clarinet (Cl.), Bassoon (Fag.), and Saxophone (Sax.), with various articulation marks.

The score includes a variety of dynamic markings such as *f*, *ff*, *mf*, *pp*, and *sfz*, as well as articulation marks like accents, slurs, and hairpins. A vertical dashed line indicates a section change or rehearsal mark.

This page of a musical score contains ten systems of staves. The first system (measures 1-4) features four staves (1-4) with dense rhythmic patterns, marked *pp* and *sfz*. The second system (measures 5-8) features four staves (5-8) with melodic lines, marked *pp*, *ppp*, *f*, and *sfz*. The third system (measures 9-10) consists of two empty staves (9-10). The fourth system (measures 11-14) features four staves (11-14) with melodic lines, marked *mf*, *pp*, *ppp*, *f*, and *sfz*. The fifth system (measures 15-18) consists of two empty staves (15-18). The sixth system (measures 19-22) features four staves (19-22) with melodic lines, marked *mf*, *pp*, *ppp*, *f*, and *sfz*. The seventh system (measures 23-26) consists of two empty staves (23-26). The eighth system (measures 27-30) features four staves (27-30) with melodic lines, marked *mf*, *pp*, *ppp*, *f*, and *sfz*. The ninth system (measures 31-34) consists of two empty staves (31-34). The tenth system (measures 35-38) features four staves (35-38) with melodic lines, marked *mf*, *pp*, *ppp*, *f*, and *sfz*. The page concludes with a double bar line and a blank staff.

Violin I

Violin II

Percussion 1

Percussion 2

Violins III & IV

Musical score for strings and woodwinds. The score includes parts for Flute 1, Flute 2, Violin 1, Violin 2, Viola, and Cello/Double Bass. The score is divided into measures by vertical bar lines. Dynamic markings such as *p*, *mf*, *f*, and *pp* are used throughout. Performance instructions include "Behind the bridge" and "REAL-TIME".

Flute 1
 Behind the bridge
 1-2 and higher parts
 REAL-TIME
 *Oppos. str. Viol. 1 and Viol. 2 30 sec.

Violin I

Violin II

Viola

Cello

Double Bass

Conductor's part

Violin I and Violin II parts, measures 1-4. Dynamics range from *p* to *fff*.

Viola and Violoncello parts, measures 1-4. Dynamics range from *pp* to *mp*.

Percussion 1 and Percussion 2 parts, measures 1-4. Includes dynamic markings *mf* and *f*.

Woodwind parts (Flute, Oboe, Bassoon, Clarinet), measures 1-4. Includes dynamic markings *mf* and *f*.

④ key pattern

Violins I: *f* *p* *mp* *mp*

Violins II: *f* *p*

Violas: *f* *p*

Cellos/DB: *f* *f*

trumpet solo

Trumpets: *p* *f* *sf* *pp* *mp* *mp* *mp* *mp*

Percussion: *mf* *mp* *f* *pp* *ppp* *pp* *mp* *f* *mp* *mp* *mf*

trumpet

Trumpets: *p* *mp* *pp* *f* *pp < mp > pp* *mp < pp > mp* *p* *< pp > mp* *p*

viola

Violas: *mp* *f* *mf <* *mf <* *mf <*

12 and lighter perc

12 and lighter perc: *mp* *sf* *mf* *mf* *mf* *mf*

Musical score for strings I, II, and Cello/Double Bass. The strings I and II parts are in treble clef, and the Cello/Double Bass part is in bass clef. Dynamics include *mp*, *mf*, *f*, and *sfz*. There are various articulations and slurs throughout the passage.

Musical score for strings I, II, and Cello/Double Bass. The strings I and II parts are in treble clef, and the Cello/Double Bass part is in bass clef. Dynamics include *mf*, *f*, and *p*. There are various articulations and slurs throughout the passage.

Musical score for Percussion 1. The part is written on a single staff with a treble clef. It features a complex rhythmic pattern with various dynamics including *mf*, *f*, and *sfz*.

Musical score for Percussion 2. The part is written on a single staff with a treble clef. It features a complex rhythmic pattern with various dynamics including *mf*, *f*, and *sfz*.

Musical score for Violins I and II, Viola, Cello, and Double Bass. The Violins I and II parts are in treble clef, the Viola part is in alto clef, and the Cello/Double Bass part is in bass clef. Dynamics include *mf*, *f*, and *sfz*. There are various articulations and slurs throughout the passage.

This page of a musical score, numbered 67, contains the following parts:

- Vocal Parts:** Soprano (S), Alto (A), Tenor (T), and Bass (B). The vocal lines feature lyrics in Italian, including "E se tu lo senti", "E se tu lo senti", "E se tu lo senti", and "E se tu lo senti".
- Woodwinds:** Flute (Fl), Oboe (Ob), Clarinet (Cl), Bassoon (Bs), and Contrabassoon (Cb). The woodwinds play melodic and harmonic lines with various articulations.
- Percussion:** Perc 1 and Perc 2. Perc 1 has a section marked "Tutti".
- Strings:** Violin I (V1), Violin II (V2), Viola (Va), Violoncello (Vc), and Double Bass (Cb). The string section provides a rich harmonic and rhythmic foundation.

The score is written in a standard musical notation with various dynamics (p, mf, f, sf) and articulation marks (accents, slurs, staccato) throughout. The vocal parts are written in a grand staff with lyrics underneath. The instrumental parts are written in their respective staves, with woodwinds and strings often playing in unison or in close harmony.

This musical score is arranged in systems. The first system contains four staves for strings (Violin I, Violin II, Viola, and Cello/Double Bass). The second system contains three staves for strings (Violin I, Violin II, and Cello/Double Bass). The third system is for Percussion 1, with a snare drum part. The fourth system is for Percussion 2, with a cymbal part. The fifth system contains five staves for strings (Violin I, Violin II, Viola, Cello, and Double Bass). The score includes various musical notations such as dynamics (f, mf, mp, p), hairpins, and articulation marks.

Musical score for a symphony, featuring multiple staves for woodwinds, strings, and percussion. The score includes dynamic markings such as *mf*, *f*, and *ff*, and a tempo marking *Allegro*. The notation includes various musical symbols like notes, rests, and slurs.

Flute 1 (Fl. 1): *mf* *f* *ff*

Flute 2 (Fl. 2): *mf* *f* *ff*

Oboe (Ob.): *mf* *f* *ff*

Bassoon (Fg.): *mf* *f* *ff*

Clarinet in B-flat (Cl. Bb.): *mf* *f* *ff*

Clarinet in A (Cl. A): *mf* *f* *ff*

Piccolo (Pic.): *f* *ff*

Violin I (Vl. I): *f* *ff*

Violin II (Vl. II): *f* *ff*

Viola (Vla.): *f* *ff*

Cello (Vcl.): *f* *ff*

Double Bass (Cb.): *f* *ff*

Percussion (Perc.):

The score is divided into measures by vertical bar lines. A double bar line with repeat dots is used to indicate the end of a section. The tempo marking *Allegro* is placed above the first staff.

This page of a musical score contains the following staves and parts:

- Violins I (Vn I):** Four staves with dynamic markings *mf* and *f*.
- Violins II (Vn II):** Four staves with dynamic markings *mf* and *f*.
- Violas (Vla):** Four staves with dynamic markings *mf* and *f*.
- Cellos (Vcl):** Four staves with dynamic markings *mf* and *f*.
- Double Basses (Vclb):** Four staves with dynamic markings *mf* and *f*.
- Flutes (Fl):** Two staves with dynamic markings *f* and *mf*.
- Clarinets (Cl):** Two staves with dynamic markings *f* and *mf*.
- Bassoons (Fg):** Two staves with dynamic markings *f* and *mf*.
- Trumpets (Trp):** Two staves with dynamic markings *f* and *mf*.
- Trombones (Trbn):** Two staves with dynamic markings *f* and *mf*.
- Conductor (Cond):** A single staff at the bottom of the page.

The score includes various musical notations such as slurs, accents, and dynamic markings (*mf*, *f*) throughout the measures.

This page of musical score, numbered 71, contains the following staves and parts:

- Violins I (V1):** Features a melodic line with frequent slurs and dynamic markings of *f* and *mf*.
- Violins II (V2):** Mirrors the Violins I part with similar phrasing and dynamics.
- Violas (V3):** Provides harmonic support with a steady melodic line.
- Violas (V4):** Similar to the previous Viola part, contributing to the texture.
- Celli (V5):** Plays a more rhythmic and harmonic role, often with sustained notes.
- Double Basses (V6):** Provides the bass foundation for the string section.
- Woodwinds:** Includes parts for Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), Bassoon (Bs.), and Saxophone (Sax.), each with distinct melodic and rhythmic contributions.
- Brass:** Features parts for Trumpets (Trp.), Trombones (Tbn.), and Tuba (Tuba), providing power and harmonic reinforcement.
- Drum:** A single staff at the bottom of the page, currently empty.

The score is characterized by complex phrasing, frequent slurs, and dynamic markings such as *f* (forte) and *mf* (mezzo-forte). The notation includes various note values, rests, and articulation marks.

This page of musical score contains the following sections:

- Woodwinds (Flutes 1 & 2, Oboes 1 & 2, Clarinets 1 & 2, Bassoons):** Staves 1 through 7, featuring complex melodic lines with many slurs and dynamic markings.
- Brass (Trumpets 1 & 2, Trombones 1, 2, 3, 4):** Staves 8 through 12, with parts for Tromba 1 and Tromba 2. The parts are more rhythmic and often play sustained notes or short phrases.
- Strings (Violins 1 & 2, Violas, Cellos, Double Basses):** Staves 13 through 17, providing harmonic support with various rhythmic patterns and dynamics.
- Conductor's Part:** A large staff at the bottom of the page, labeled "COND. PART" and "18 ME.", which contains cues and dynamic markings for the conductor.

1

This page of a musical score contains the following sections:

- Woodwinds (Flutes 1 & 2, Oboes 1 & 2, Clarinets 1 & 2, Bassoons 1 & 2):** Staves 2 through 7. These parts feature complex rhythmic patterns with many sixteenth and thirty-second notes, often with slurs and accents. Dynamic markings include *f* and *mf*.
- Violins:** Staves 8 and 9. The Violin I part (8) has a melodic line with slurs and accents, while the Violin II part (9) provides harmonic support.
- Violas:** Staff 10. Similar to the Violin II part, it provides harmonic support with a melodic contour.
- Celli and Double Basses:** Staves 11 and 12. The Cello part (11) and Double Bass part (12) play a rhythmic, pulsating accompaniment.
- Trumpets and Trombones:** Staves 13 through 16. These parts are primarily harmonic, with some melodic fragments. The Trumpet parts (13, 14) and Trombone parts (15, 16) are clearly marked.
- Drums:** Staff 17. This staff is mostly empty, indicating that the drum part is not written on this page.

This page of a musical score contains measures 16 and 17. It features multiple staves for various instruments, including strings (Violins I, Violins II, Violas, Cellos, Double Basses) and woodwinds (Flutes, Clarinets, Bassoons). The notation includes complex rhythmic patterns, dynamic markings such as *pp*, *mp*, *f*, and *fff*, and articulation marks like accents and slurs. A circled '2' is present above the first staff in measure 16. The bottom of the page includes a rehearsal mark for measure 16 and the text '17 sec.'.

Musical score system 1, measures 1-2. Includes staves for Flute (F), Oboe (O), Clarinet (C), and Bassoon (B). Dynamics include *mp*, *f*, and *sf*.

Musical score system 2, measures 3-4. Includes staves for Trumpet (T), Trombone (TR), and Tuba (TU). Dynamics include *pp*, *f*, and *ff*.

Musical score system 3, measures 5-6. Includes staves for Percussion 1 (Perc 1) and Snare Drum (SD). Dynamics include *mp*, *sf*, and *f*.

Musical score system 4, measures 7-8. Includes staves for Percussion 2 (Perc 2) and Triangle (TR). Dynamics include *mp*, *f*, and *fff*.

Musical score system 5, measures 9-12. Includes staves for Violin 1 (V1), Violin 2 (V2), Viola (VA), Violoncello (VC), and Double Bass (DB). Dynamics include *mp*, *f*, *ff*, and *sf*.

Musical score for a symphony, consisting of multiple systems of staves. The score includes:

- Violins I (VI I):** The top staff of the first system, featuring melodic lines with dynamic markings such as *pp*, *f*, and *ff*.
- Violins II (VI II):** The second staff of the first system, mirroring the Violins I with similar melodic and dynamic patterns.
- Violas (VI):** The third staff of the first system, providing harmonic support and counter-melodies.
- Celli (VI):** The fourth staff of the first system, often playing a more rhythmic or harmonic role.
- Double Basses (VI):** The fifth staff of the first system, providing the lowest bass line.
- Woodwinds:** Multiple systems of staves (Flutes, Oboes, Clarinets, Bassoons) are present, each with its own part.
- Brass:** Staves for Trumpets and Trombones, providing harmonic reinforcement and melodic motifs.
- Percussion:** Staves for various percussion instruments, including timpani and snare drum.
- Conductor's Part (Cond.):** Located at the bottom of the page, showing the overall structure and dynamics of the piece.

The score is written in a standard musical notation style, including clefs, time signatures, and various musical symbols such as beams, slurs, and dynamic markings.

③

Violin I
Violin II
Cello/Double Bass

This system contains three staves. The Violin I and Violin II staves are mostly empty, with only a few notes at the beginning. The Cello/Double Bass staff contains a melodic line with dynamic markings such as *f*, *sf*, *mf*, and *fz*.

Violin I
Violin II

This system contains two staves. Both Violin I and Violin II staves feature complex melodic lines with many slurs and dynamic markings including *f*, *sf*, *mf*, *fz*, and *sfz*.

Violin I
Violin II

This system continues the melodic development for Violin I and Violin II, with dense notation and various dynamic markings like *f*, *sf*, *mf*, and *fz*.

Violin I
Violin II

This system shows further melodic progression for the violins, with dynamic markings such as *f*, *sf*, *mf*, and *fz*.

Violin I
Violin II
Viola
Cello/Double Bass

This system contains four staves. Violin I and Violin II have dense melodic lines. The Viola staff has a more rhythmic accompaniment. The Cello/Double Bass staff has a melodic line with dynamic markings like *f*, *sf*, *mf*, and *fz*.

DAI

An empty musical staff with a single line and a clef, located at the bottom of the page.

①

Violin I
Violin II
Viola
Cello/Double Bass

Flute 1
Flute 2
Clarinet

Piccolo

Perc. 2

Violin I
Violin II
Viola
Cello/Double Bass

②

This musical score page contains the following staves and parts:

- Violins I (V1):** Features a melodic line with accents and dynamic markings of *f* and *sf*.
- Violins II (V2):** Features a melodic line with accents and dynamic markings of *f* and *sf*.
- Violas (Va):** Features a melodic line with accents and dynamic markings of *f* and *sf*.
- Violoncello (Vc):** Features a melodic line with accents and dynamic markings of *f* and *sf*.
- Double Bass (Cb):** Features a rhythmic accompaniment with dynamic markings of *f* and *sf*.
- Flute 1 (Flk. 1):** Features a melodic line with dynamic markings of *f* and *sf*.
- Flute 2 (Flk. 2):** Features a melodic line with dynamic markings of *f* and *sf*.
- Clarinet (Cl):** Features a melodic line with dynamic markings of *f* and *sf*.
- Trumpet (T):** Features a melodic line with dynamic markings of *f* and *sf*.
- Horn (Horn):** Features a melodic line with dynamic markings of *f* and *sf*.
- Tuba (Tu):** Features a melodic line with dynamic markings of *f* and *sf*.
- Drum (Drum):** An empty staff at the bottom of the page.

The score includes various musical notations such as accents (>), dynamic markings (*f*, *sf*), and slurs. The notation is arranged in a standard orchestral layout with strings at the bottom and woodwinds above.

Violin I, Violin II, Viola, and Cello parts. Each instrument has two staves. The music features long, flowing melodic lines with dynamic markings such as *mf*, *mp*, and *ff*. A circled number '2' is visible above the first violin staff.

Piano part consisting of three staves (treble, middle, and bass clefs). The piano part is highly rhythmic and technical, with many sixteenth and thirty-second notes. Dynamic markings include *fp*, *f*, and *ff*.

Two percussion parts, Perc. 1 and Perc. 2. Perc. 1 has a single staff with a complex rhythmic pattern. Perc. 2 has a single staff with a simpler rhythmic pattern. Both parts include dynamic markings like *f* and *ff*.

String quartet parts: Violin I, Violin II, Viola, and Cello. Each instrument has two staves. The music is characterized by sustained, long notes with dynamic markings of *ff* and *fff*. There are some performance instructions in small text, such as "to high as possible" and "not jump".

This musical score page contains the following parts:

- Violin I (V1):** Features a melodic line with dynamic markings *mf*, *f*, *sfz*, and *ff*. It includes a first ending marked (1).
- Violin II (V2):** Mirrors the Violin I part with similar dynamics and phrasing.
- Viola (V3):** Provides harmonic support with dynamics *mf*, *f*, and *ff*.
- Violoncello (V4) and Double Bass (V5):** Play a rhythmic accompaniment with dynamics *mf*, *f*, and *ff*.
- Flute (Fl):** Features a melodic line with dynamics *sfz*, *f*, and *ff*.
- Clarinet (Cl):** Features a melodic line with dynamics *sfz*, *f*, and *ff*.
- Bassoon (Bs):** Features a melodic line with dynamics *sfz*, *f*, and *ff*.
- Woodwind Ensemble (Perc. 1, Perc. 2):** Includes parts for Percussion 1 and Percussion 2, with dynamics *mf* and *ff*.
- Violins (V1, V2):** Includes parts for Violin I and Violin II, with dynamics *mf*, *f*, and *ff*.
- Viola (V3):** Includes a part for Viola with dynamics *mf* and *ff*.
- Violoncello (V4) and Double Bass (V5):** Includes parts for Violoncello and Double Bass with dynamics *mf*, *f*, and *ff*.

The score is written in a common time signature and includes various musical notations such as slurs, accents, and dynamic markings. At the bottom of the page, there is a section labeled "Dati" with a line for "8 sec."

This page contains musical notation for measures 11 through 14. The score is organized into systems for different instrument groups:

- System 1 (Measures 11-14):** Includes staves for Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), Bassoon (Fg.), Trumpet (Tr.), Trombone (Tbn.), and Tuba/Euphonium (Tuba/Euph.).
- System 2 (Measures 11-14):** Includes staves for Percussion 1 (Perc. 1) and Percussion 2 (Perc. 2).
- System 3 (Measures 11-14):** Includes staves for Violin 1 (V1), Violin 2 (V2), Viola (Vla.), and Cello/Double Bass (Cello/Bass).
- System 4 (Measure 14):** Includes a staff for the Double Bass (Bass).

The notation features various musical symbols such as dynamics (e.g., *mf*, *mp*, *f*, *ff*, *pp*, *sfz*), articulation marks (accents, slurs), and performance instructions. A vertical dashed line is present between measures 11 and 12.

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1

[N] 2.100 200

Part 1
 Part 2

no pizz.
 no marc.

22 REAL TIME
 20 pages inc. No. 1 and No. 2 21 sec.

①

String I, II, and Cello/Double Bass staves. The score features dynamic markings such as *f*, *mf*, *ff*, *sfz*, and *sfz > mf*. The notation includes slurs, accents, and hairpins.

Violin I and II staves. The score includes dynamic markings like *f*, *mf*, and *ff*, along with slurs and accents.

VIOLA I

VIOLA I staff. The score includes dynamic markings like *f* and *ff*, and a box labeled "GLACIANTOPIE".

VIOLA II

VIOLA II staff. The score includes dynamic markings like *f* and *ff*, and a box labeled "VIRAPLINE".

Violin III, Violin IV, and Double Bass staves. The score includes dynamic markings like *f*, *mf*, *ff*, and *sfz*, along with slurs, accents, and hairpins.

23 SOUNDFILE 18 sec.

Soundfile track with a duration of 18 seconds.

Perc 1

Perc 2

mf

mf

Violin 1

Violin 2

Viola

Cello

mp

f

sf

This page of a musical score contains the following parts:

- Violin I (Vn I):** Four staves with dynamic markings *ppp*, *fp*, *mf*, and *pp*.
- Violin II (Vn II):** Four staves with dynamic markings *fp*, *ppp*, *fp*, *mf*, and *pp*.
- Viola (Vla):** Four staves with dynamic markings *fp*, *ppp*, *fp*, *mf*, and *pp*.
- Violoncello (Vcl):** Four staves with dynamic markings *ppp*, *fp*, *fp*, *mf*, and *pp*.
- Contrabasso (Cb):** Four staves with dynamic markings *pp*, *fp*, *fp*, *f*, and *f*.
- Part 1 (Part. 1):** Two empty staves.
- Part 2 (Part. 2):** Two empty staves.
- Violin III (Vn III):** Four staves with dynamic markings *f*, *fp*, and *f*.
- Violin IV (Vn IV):** Four staves with dynamic markings *f*, *fp*, and *f*.
- Viola (Vla):** Four staves with dynamic markings *f*, *fp*, and *f*.
- Violoncello (Vcl):** Four staves with dynamic markings *f*, *fp*, and *f*.
- Contrabasso (Cb):** Four staves with dynamic markings *f*, *fp*, and *f*.
- Flute (Flaut):** Two empty staves.

Violin I (V.I.)

Violin II (V.II)

Viola (V.III)

Cello (V.IV)

Bass (V.V)

Violin I (V.I)

Violin II (V.II)

Bass (V.V)

Perc. 1

TRAPDRUM

Perc. 2

right edge

left edge

TRAPDRUM

Violin I (V.I)

Violin II (V.II)

Viola (V.III)

Cello (V.IV)

Bass (V.V)

Flute 1

(3)

This page of a musical score contains measures 70 through 79. It features several staves for string instruments and woodwinds. The string section includes Violin I (VI 1), Violin II (VI 2), Viola (VI 3), Violoncello (VI 4), and Double Bass (VI 5). The woodwind section includes Flute (Flaut.). The score is written in a standard musical notation with various dynamics such as *f*, *mf*, *pp*, and *ppp*, and includes phrasing slurs and accents. The woodwind parts for Flute 1 and Flute 2 show melodic lines with some rests. The string parts provide a harmonic and rhythmic foundation. The page number '95' is located in the top right corner, and the measure number '(3)' is positioned above the first staff.

First system of musical notation, featuring four staves. The top staff is marked with a forte *f* dynamic. The second and third staves are marked with piano *p* dynamics. The bottom staff is marked with a forte *f* dynamic. The notation includes various rhythmic patterns and melodic lines.

Second system of musical notation, featuring three staves. The top staff is marked with piano *p* dynamics. The middle staff is marked with piano *p* dynamics. The bottom staff is marked with piano *p* dynamics. The notation includes various rhythmic patterns and melodic lines.

Third system of musical notation, featuring two staves. The top staff is marked with piano *p* dynamics. The bottom staff is marked with piano *p* dynamics. The notation includes various rhythmic patterns and melodic lines.

Fourth system of musical notation, featuring two staves. The top staff is marked with piano *p* dynamics. The bottom staff is marked with piano *p* dynamics. The notation includes various rhythmic patterns and melodic lines.

Fifth system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

Sixth system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

Seventh system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

Eighth system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

Ninth system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

Tenth system of musical notation, featuring one staff. The notation includes various rhythmic patterns and melodic lines.

③

Violin I
Violin II
Cello/Double Bass

Violoncello
Double Bass

Part 1

Part 2

VI I
VI II
VA
VB
VC

Dir.

This musical score page contains the following parts and markings:

- Violins I (V1):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Violins II (V2):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Violas (V3):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Violas II (V4):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Violoncellos (V5):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Double Basses (V6):** Features dynamic markings of *pp*, *ppp*, and *mf*.
- Flutes (Fl):** Features dynamic markings of *f*, *mf*, *f*, *pp*, *f*, and *pp*.
- Clarinet (Cl):** Features dynamic markings of *f*, *mf*, *f*, *pp*, *f*, and *pp*.
- Trumpets (Tr):** Features dynamic markings of *f*, *mf*, *f*, *pp*, *f*, and *pp*.
- Drum 1 (Dr1):** A blank staff.
- Drum 2 (Dr2):** A blank staff.
- Woodwinds (W):** Features dynamic markings of *f*, *mf*, *f*, *pp*, *f*, and *pp*.
- Other:** Includes a *ppp* marking in the upper strings and various performance instructions like *rit.* and *rit. poco.*

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Violin I
Violin II
Viola
Cello/Double Bass

Flute 1
Flute 2

Perc. 1

Perc. 2

Violin 1

Violin 2

Viola

Violoncello

Double Bass

This page of musical score contains the following staves and markings:

- Staves 1-4:** Violins I, Violins II, Violas, and Cellos/Double Basses. Dynamic markings include pp , $pp >$, and $pp >$.
- Staves 5-7:** Flutes, Oboes, and Clarinets. Dynamic markings include $pp >$.
- Staff 8:** Bassoon. Dynamic markings include f , mf , and pp .
- Staff 9:** Horns. Dynamic markings include f , mf , and pp .
- Staves 10-12:** Trumpets I, Trumpets II, and Trombones. Dynamic markings include f , mf , and pp .
- Staff 13:** Percussion. Dynamic markings include f , pp , and mf .
- Staff 14:** Timpani. Dynamic markings include f , pp , and mf .
- Staff 15:** Cymbals. Dynamic markings include f , pp , and mf .
- Staff 16:** Triangle. Dynamic markings include f , pp , and mf .
- Staff 17:** Snare Drum. Dynamic markings include f , pp , and mf .
- Staff 18:** Bass Drum. Dynamic markings include f , pp , and mf .

Musical score for strings and woodwinds, measures 27-32. The score includes parts for Violin I (V1), Violin II (V2), Viola (V3), Violoncello (V4), Double Bass (V5), Flute (Fl.), Clarinet (Cl.), Bassoon (Bs.), and Contrabassoon (Cb.). The music features complex rhythmic patterns, including sixteenth and thirty-second notes, and dynamic markings such as *mf*, *f*, *pp*, and *sfz*. A section of the score is marked with a triangle and the number 27, indicating a specific measure.

Det: 27 SOUNDFILE 16 sec.

This page of musical score contains the following sections:

- Violins I (V1) and Violins II (V2):** The top two staves, featuring complex rhythmic patterns and dynamic markings such as *pp*, *p*, *f*, and *fff*.
- Viola (VA) and Cello (VC):** The next two staves, with similar rhythmic and dynamic notation.
- Double Bass (VB):** The fifth staff, providing a bass line with dynamic markings.
- Woodwinds:** A section of staves (partially obscured) containing woodwind parts with dynamic markings.
- Brass:** A section of staves (partially obscured) containing brass parts with dynamic markings.
- Percussion:** The bottom staff, labeled "Perc.", with a section titled "REAL TIME" and a note "30 sec.".

The score is marked with various dynamics including *pp* (pianissimo), *p* (piano), *f* (forte), and *fff* (fortissimo). It also includes performance instructions such as "TEMPO MOLTO" and "soft strings".

③

This musical score page contains measures 1 through 12. It features a full orchestral arrangement with the following parts: Flute 1 (Fl. 1), Flute 2 (Fl. 2), Oboe (Ob.), Bassoon (Fg.), Clarinet in B-flat (Cl. Bb.), Clarinet in A (Cl. A), Bassoon II (Fg. II), Violin I (VI. I), Violin II (VI. II), Viola (VI. A), Violoncello (VI. C), Double Bass (VI. B), and Cymbal (Cym.). The score includes various musical notations such as dynamics (p, mf, f, pp, fpp), articulation (accents, slurs), and performance instructions like 'rit.' and 'rit. poco'. The woodwind parts (Flutes, Oboe, Bassoon, Clarinets) have melodic lines with slurs and accents. The string parts (Violins, Viola, Cello, Bass) provide harmonic support with sustained notes and rhythmic patterns. The Cymbal part is mostly silent, with a few notes indicated.

This musical score page contains the following parts and markings:

- Flute (Fl):** Part 1 and Part 2. Part 1 includes a section marked "1. Flute".
- Clarinet (Cl):** Part 1 and Part 2. Part 1 includes a section marked "1. Clarinet".
- Violin (Vl):** Violin I and Violin II. Both parts include the instruction "1.2. Violin".
- Viola (Va):** Part with instruction "1.2. Viola".
- Violoncello (Vc):** Part with instruction "1.2. Cello".
- Double Bass (Cb):** Part with instruction "1.2. Bass".
- Woodwinds:** Flute, Clarinet, and Bassoon parts with various dynamics like *pp*, *f*, and *ppp*.
- Brass:** Trumpet and Trombone parts with dynamics like *f*, *pp*, and *ppp*.
- Strings:** Violin, Viola, Violoncello, and Double Bass parts with dynamics like *pp*, *f*, and *ppp*.
- Articulation:** Numerous slurs, accents, and dynamic hairpins throughout the score.
- Other:** Percussion parts (Perc. 1 and Perc. 2) and a section labeled "Flaut." at the bottom.

This musical score page contains several systems of staves. The first system includes staves for Violin I, Violin II, Viola, and Cello/Double Bass, with dynamic markings such as *ppp*, *p*, *mf*, and *f*. The second system features a Flute staff and a Clarinet staff. The third system consists of two staves, likely for Oboe and Bassoon. The fourth system contains two staves, possibly for Horns. The fifth system includes staves for Violin I, Violin II, Viola, and Cello/Double Bass, with dynamic markings like *sp* and *sfz*. The sixth system also includes staves for Violin I, Violin II, Viola, and Cello/Double Bass, with dynamic markings like *sp* and *sfz*. The seventh system contains staves for Violin I, Violin II, Viola, and Cello/Double Bass, with dynamic markings like *sp* and *sfz*. The eighth system includes staves for Violin I, Violin II, Viola, and Cello/Double Bass, with dynamic markings like *sp* and *sfz*. The ninth system consists of two empty staves.

③

Violin I
Violin II
Cello/Double Bass

Trombone I
Trombone II
Trombone III

Part 1

CYLINDERS

Part 2

TEMPLE BLOCKS

Violin I
Violin II
Viola
Cello
Double Bass

Drum

1. 2. 3. 4.

5. 6. 7.

Perc 1

Perc 2

V1

1/2 and higher part

V2

1/2 and higher part

V3

1/2 and higher part

V4

1/2 and higher part

Dist

This musical score page contains the following parts and markings:

- Flute (Fl.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Clarinet (Cl.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Bassoon (Fg.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Oboe (Ob.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Violin I (Vl. I)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Violin II (Vl. II)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Viola (Vla.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Violoncello (Vcl.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Double Bass (Cb.)**: Measures 1-16, dynamic markings *pp*, *f*, *pp*.
- Chorus (Chor.)**: Empty staff at the bottom of the page.

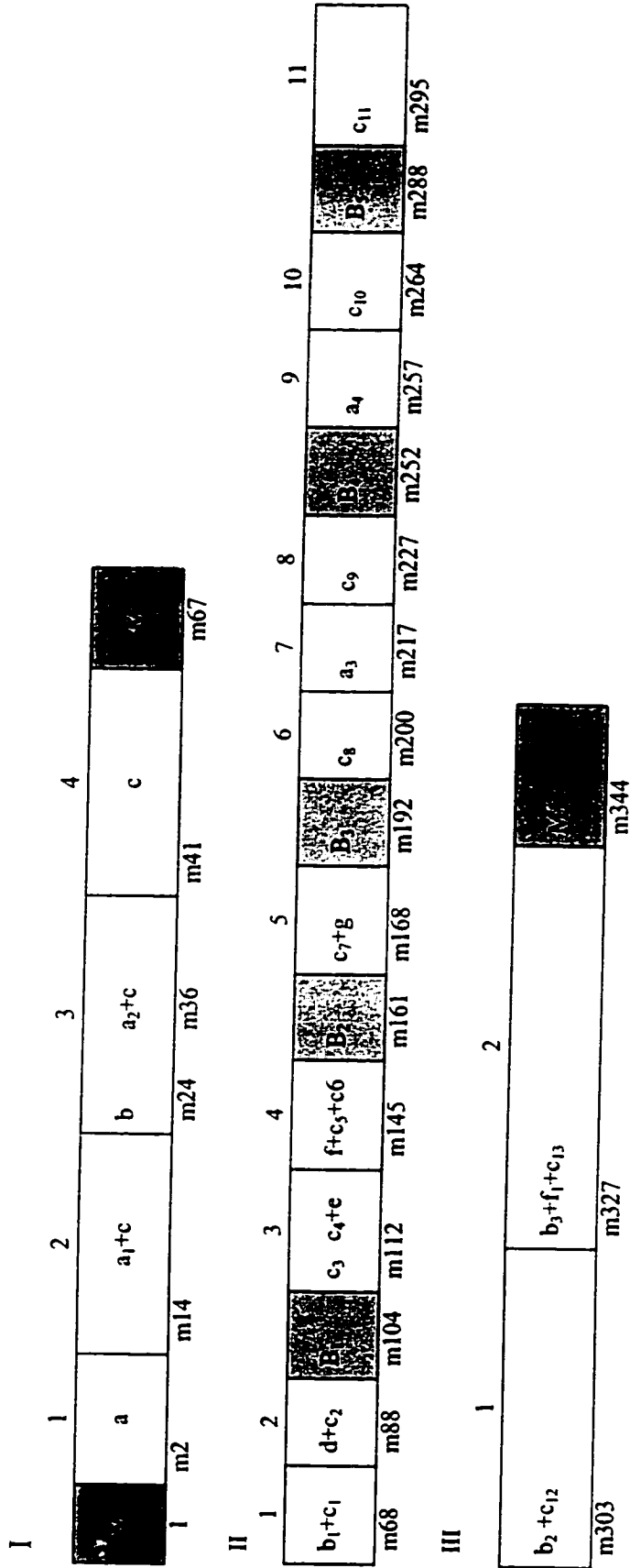
Additional markings include *pp* (pianissimo), *f* (forte), and *pp* (pianissimo) throughout the score, along with various musical notations such as slurs, accents, and dynamic hairpins.

Musical score for Percussion and Strings, measures 30-35. The score is divided into two systems. The first system includes Percussion 1 (Perc. 1) and Percussion 2 (Perc. 2). Perc. 1 includes Glockenspiel, Triangle, and Tom-tom. Perc. 2 includes Vibraphone. The second system includes Violins I (VI I), Violins II (VI II), Viola (VA), Cello (VC), and Double Bass (DB). The score features various dynamics such as *pp*, *ppp*, *f*, and *mf*, along with articulation marks like accents and slurs. A rehearsal mark is present at the beginning of measure 30.

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Appendix A
Overall Form

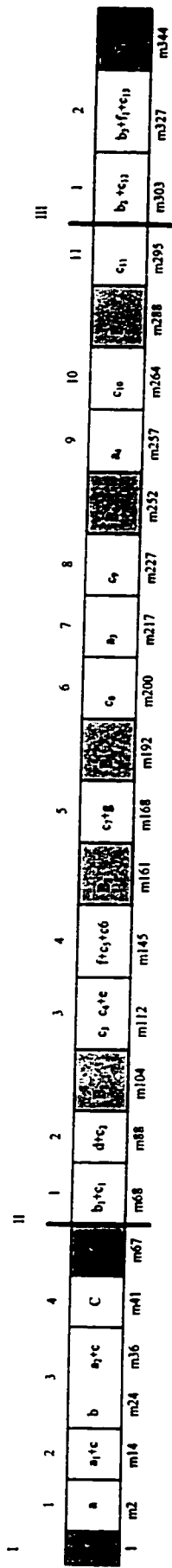


Legend:

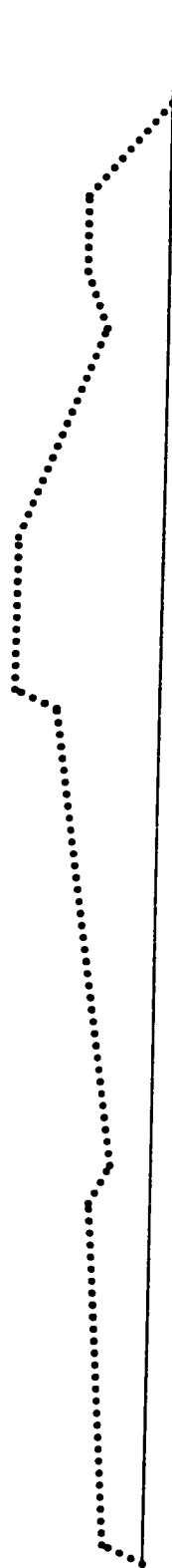
- I, II, III = Parts
- 1,2,3,... = Sections
- M, M1 = Main gesture
- a,b,c,d,e,f,g = Musical materials
- B1,B2,B3,B4,B5 = Bridges

Appendix B

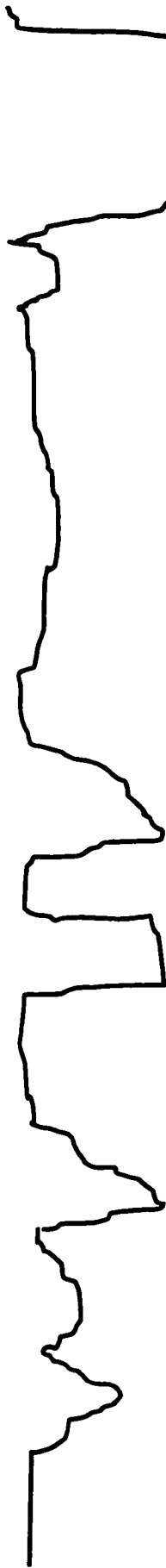
Graphical Presentation of the Becoming the Song,
the Principle of Elasticity and Harmonic Rhythm,
and the Overall Growth of the Piece



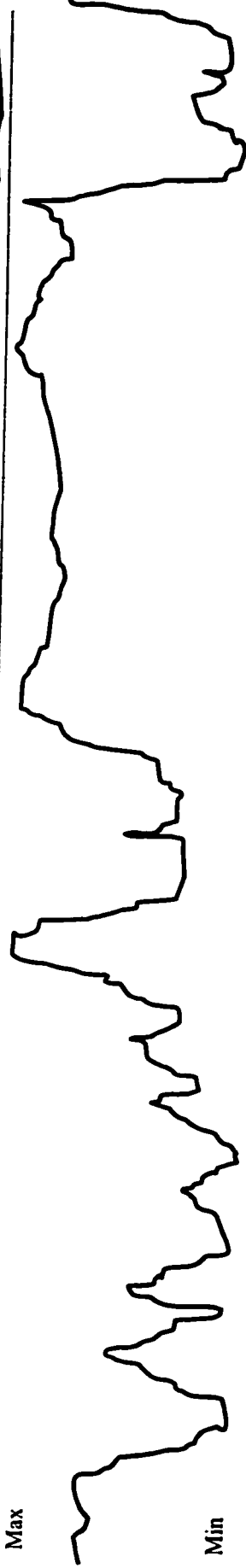
Becoming the Song



Elasticity

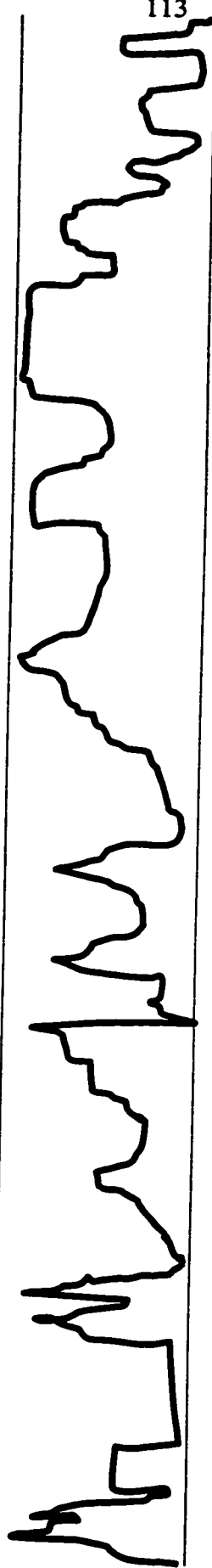


Harmonic Rhythm



Min

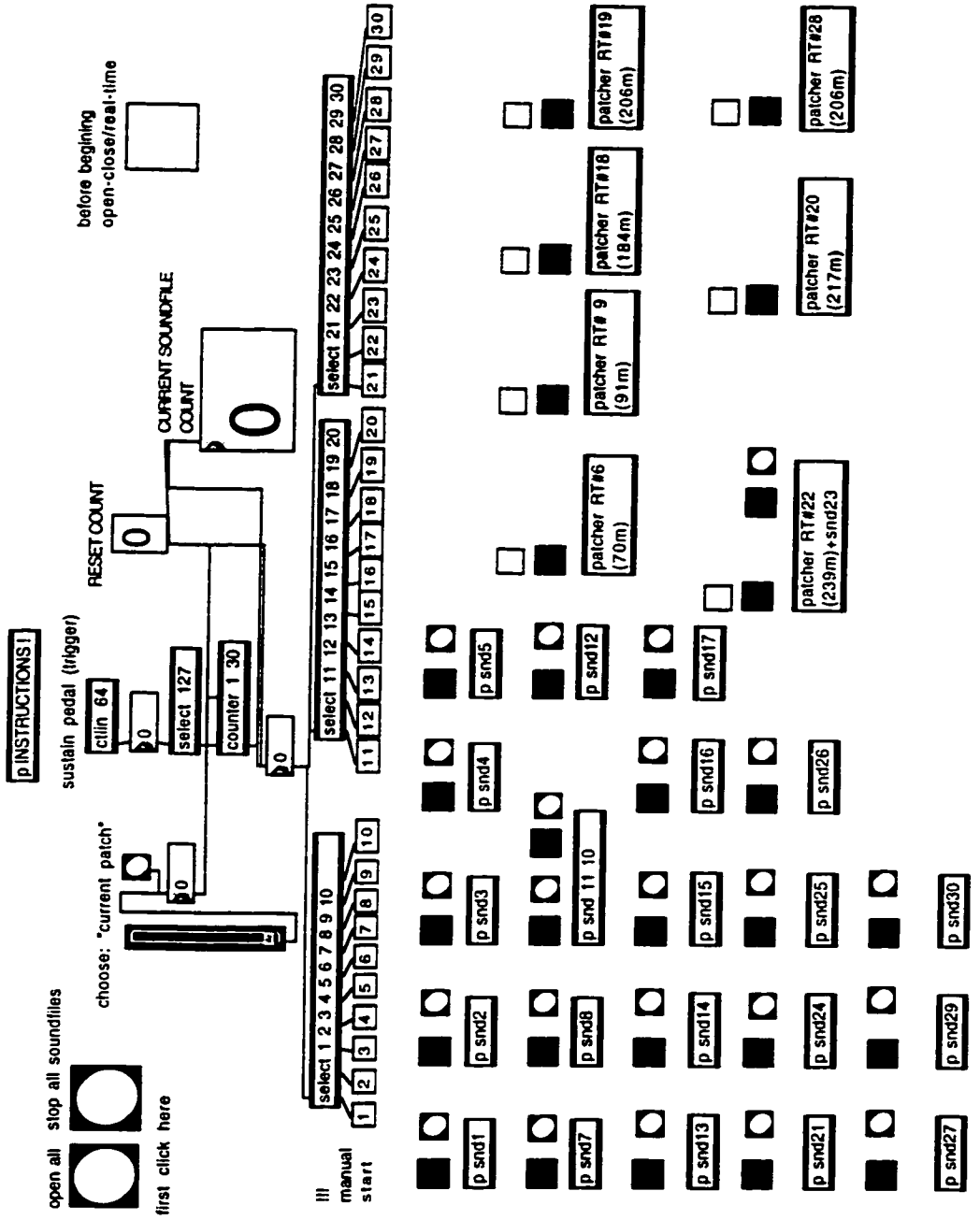
Overall Growth



Appendix C

Max-MSP Patch - an Interactive Real-time Graphic Programming Environment for Production and Modification of Digital Audio Signals

Miroslav Spasov: METAANTHROPOS/EVOLUTION 2 for Chamber Orchestra and Electronics
MSP-MAX Patch - an Interactive Real-time Graphic Programming Environment
for Production and Modification of Digital Audio Signals



The *patch* is a fundamental concept of *Max/MSP*. It comprises a graphical configuration of *objects* (boxes) connected by *patch cords*. When objects receive a signal through their *inlet*, they can execute the function they are assigned for, and send the result through their *outlet* to another *object*, *patch*, or digital-to-analog converter. Using the object called *patcher*, the program provides a mechanism for nested patches (*sub-patches*). That means that an entire *patch* can be relocated to a *patcher* object, which simplifies a patch's appearance, and provides an opportunity for creating a single multi-functional *patch*, like the one created for this piece (see the previous page). The *objects* on the left (*sub-patches*: **p snd1**, **p snd2**, etc.) are programmed to playback the pre-processed soundfiles; the *sub-patches* on the right (**patcher RT#6**, **patcher RT#9**, etc.), are programmed to modify the incoming signal in real-time. The web of *objects*, located in the upper part, control the process of interaction between the live performance and the entire complex of functions of the *patch*. The conductor presses on the footpedal at places marked with the symbols - **soundfile1**, **soundfile2**, **real-time6** etc., sending a "message" to the *Patch*. When the *Patch* receives the "message", it sends a cue to the corresponding *sub-patch*, which performs the action it was programmed for. Each pressing on the footpedal triggers the following *sub-patch*.

Appendix D

Cecilia - an Environment for Digital Signal Processing

*Cecilia*¹¹ was the most used software for sound transformation in this piece. It is a graphical environment for music and signal processing that uses *Csound*¹² as its underlying audio processing engine. As a completely programmable tool with real-time interactive processing of soundfiles or live input, it relies on a set of time-based and frequency-based audio-processing techniques, such as: *direct synthesis*, which generates waveforms by sampling a stored function representing a single cycle; *subtractive synthesis*, that begins with a complex sound and applies filtering to it; *frequency and amplitude modulation*, where the *modulator* signal transforms the *carrier signal*; *spatialization*, where the signal is spread throughout a virtual space (left and right speaker), etc..

The manner, in which the twenty-three soundfiles of this piece were composed, originates from *sound-object* oriented composition, from the 1950s in Paris, called *musique concrete*. The sounds were obtained from previous recordings (of the instruments from the orchestra, playing certain short phrases from the score), then submitted to complex chains of transformations, and finally reorganized into soundfiles using *ProTools*¹³, a graphical multitrack audio mixing environment.

¹¹ *Cecilia* was developed by J. Piche and A. Burton at the Faculte de musique de l'Universite de Montreal. It is freely available by FTP from <ftp://ftp.musique.umontreal.ca/pub/>

¹² *Csound* was created by Barry Vercoe in 1986. For additional information see: Vercoe, Barry. *Csound: A Manual for the audio Processing Systems and Supporting Programs*. Cambridge, 1986. (Mass: MIT Media Lab.)

¹³ *ProTools* is product of *Digidesign*; for more information visit its website: www.digidesign.com

Appendix E

CD-ROM: METAANTHROPOS/EVOLUTIO 2 for Chamber Orchestra and Electronics

CD-ROM entitled *METAANTHROPOS/EVOLUTIO 2 for Chamber Orchestra and Electronics*, is an integral part of this Thesis. It contains the *Max-MSP Patch* and all the pre-processed soundfiles. They are saved as standard stereo *AIFF* (Apple Interchange File Format).

For performance, a computer with a fast processor and large *RAM* (Random Access Memory) is needed, as well as *Max-MSP* - an interactive real-time object-oriented graphic-programming environment for the production and modification of digital audio signals.

The biggest part of the *Max-MSP Patch* (*sub-patches* for real-time processing and resynthesis) was produced in the Electroacoustic Music Studio in the Department of Music. The project was completed in the Integrated Arts Media Lab in the Faculty of Fine Arts.