Analysis of *Crosstalk*, a work by Michael Vaughan

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This article presents a full analysis of *Crosstalk* – a piece for tape by Michael Vaughan (1989). The methodological approach employed here develops its concepts and techniques from those of Music Semiology and Spectromorphology. The former provides the concept and method of semiological neutral inference – as applied by Nattiez (1982, 1990). The latter – developed by Smalley (1986) – offers tools and a terminology for the characterisation of timbre and temporal functionality within the musical work.

1. INTRODUCTION

The following analysis employs a methodology aimed at deriving those aspects of structure and musical processes which are a result of timbral characteristics and interaction of the sonic material presented in a work, rather than of extra-musical elements such as anecdotal references, precompositional algorithmic constructs, etc. Obviously, depending on the nature of a work, extra-musical references may be necessary in order to have a complete analytical picture. However, a large number of tape pieces are almost exclusively articulated by means of what Emmerson (1986) calls 'abstract discourse', in which case the current methodology may hopefully provide a useful insight into structuring mechanisms. *Crosstalk* (Vaughan 1989) is a representative example of this category of works.

2. THEORETICAL BACKGROUND AND STRATEGY

While a detailed description of the analytical approach is discussed elsewhere (Fischman 1995), its basic premises will now be reviewed.

In the first place, analysis is carried out at the semiological neutral level, which is directly dependent on actual musical material and its physical articulation within the work. Within this dimension, a set of relationships may be grouped according to paradigmatic axes, defined by Nattiez (1982) as 'axes which group together identical or equivalent units from an *explicitly* stated point of view'.

The criteria applied in order to establish paradigms depends directly on the abstract characteristics of sound and of its articulation within the piece. These are well described by the theoretical model provided by spectromorphology (Smalley 1986), which includes a set of continua used as criteria for classification (pitch–effluvium, attack–effluvium and gesture–texture), an exhaustive set of basic morphological archetypes characterised by three temporal phases (onset, continuant and termination) and a strategy for the formation of structure by means of a bottom-up process. In the latter, spectral components are combined to form the basic meaningful units, which are then combined to produce sections at the next hierarchical level; the latter are combined to form the next level, and so on.

Theoretical principles are put to work by means of the following strategy:

(1) Determination of the basic meaningful sonic units and classification of these into families according to spectromorphological characteristics.
(2) Production of a graphic score.
(3) Segmentation of the piece according to hierarchical levels.
(4) Description of each level, pointing out relationships and identifying paradigms.
(5) Overall summary comprising the following:

- description of the main paradigms and listing of paradigmatic axes,
- summary of overall directional tendencies, and
- summary of overall spectromorphological tendencies.

3. SOUND FAMILY CLASSIFICATION

Figure 1 provides a full list of the classification into sound families, including the graphic symbols used in the score. These appear in their original form when there is a pure manifestation of the represented sound family. However, as the piece develops, there are several instances of hybrids consisting of a combination of families, which are a result of interactive processes. In such cases, a composite symbol consisting of a mixture of the pure manifestations is used.

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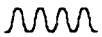
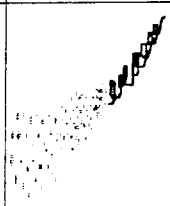
Sound family	Graphic symbol	Morphology	Pitch continuum	Attack continuum	Gesture-texture continuum	Brief description
A		closed attack-decay	noise	discrete	gesture	noise burst
B		attack impulses	node ↑ noise	discrete	gesture	more or less metallic blows
C		graduated continuant	noise	grain ↑ effluvium	texture	————
D		graduated continuant	inharmonic note ↑ node	grain ↑ effluvium	texture	gliding sound, inharmonic, sometimes begins with iteration which fuses into effluvium
E		attack-decay	harmonic note	effluvium	texture/ texture setting	continuous pitched drone, sometimes glissando
F		attack-decay	note proper	discrete	gesture/ gesture-framing	ostinato pitch belonging to a mode or scale

Figure 1. *Crosstalk* – sound families (Fischman 1995: 471).

4. GRAPHIC SCORE

This is provided in figures 2–8. In addition to events and timings in the piece, the score also contains the hierarchical subdivision into sections, starting at level 0 and building up to level 5, which contains the three major sections of the whole work. Arrows indicate directions in one or more spectromorphological dimension.

5. SECTION DESCRIPTION

The piece can be divided into three major sections: onset [5.1], continuation [5.2] and termination [5.3].

Level 5: Section [5.1] (O)[1] (0:00–1:42)

This section is the onset of the whole piece. It consists of two subsections: onset [4.1] and termination [4.2].

Level 4: Section [4.1] (O) (0:00–0:53)

Section [4.1] has an onset [3.1], a continuant [3.2] and a termination [3.3].

Level 3: Section [3.1] (O) (0:00–0:23)

Level 2: Section [2.1] (O) (0:00–0:08)

[0.1] (= [1.1]) is used to begin the whole piece. It consists of a strong gesture based on sound family B, followed by a sound with grain functioning as a centred/pivoted setting. The initial gesture does not have an immediate continuation at levels 0–2 but, as will be shown later, it functions within a paradigmatic axis at levels 3–5. It will henceforth be referred to as *cadential paradigm 1*.

[0.2] provides the next seminal gesture: counterpoint between bursts. Initial ascent, right–left. This is developed as [3.1] unfolds.

[0.3] is the reverse (also the inverse) of [0.2] both in pitch and in spatial location. Together, [0.2] and [0.3] set two basic trends which are reflected at other levels in the piece: ascent and descent. In this case, these are produced by contrasting two discrete sounds; however, as will be shown below, they will also be realised using continuous sounds which change pitch gradually. Furthermore, the relationship between the occurrence of these basic motion trends appears to be of structural importance throughout the piece and will be referred to as the *ascent–descent paradigm*.

Level 2: Section [2.2] (C) (0:08–0:16)

[2.2] is a developed inverse of [2.1] for the following reasons:

- The direction of [1.2] (ascent–descent) is reversed in [1.3] and [1.5] (descent–ascent).
- A continuant ([1.4]) is added which consists of the repetition of a variation of [0.4]; the latter is

[1]O: onset, C: continuant, T: termination.

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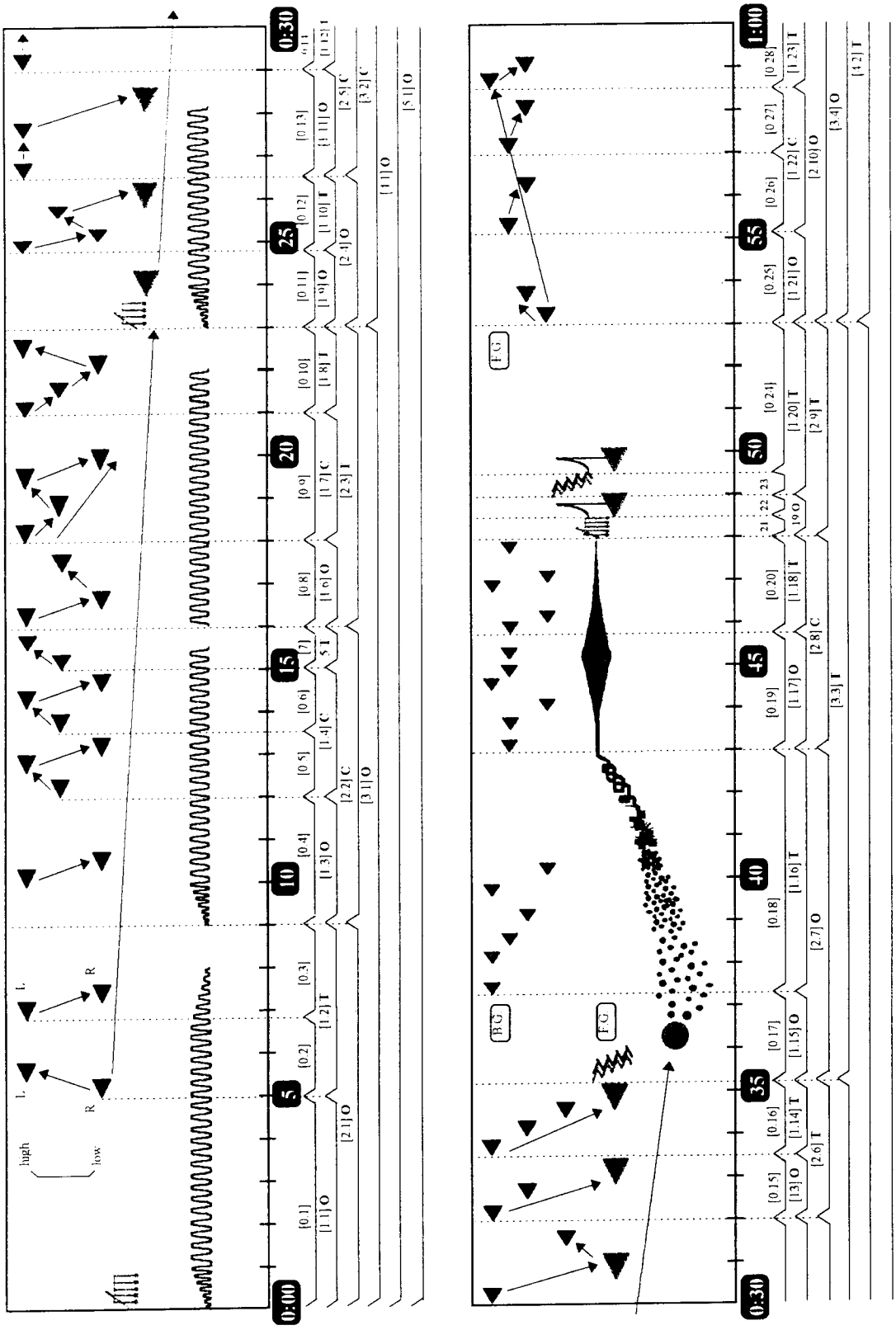


Figure 2. *Crosstalk* – graphic score (0:00–1:00) (Fischman 1995: 472)

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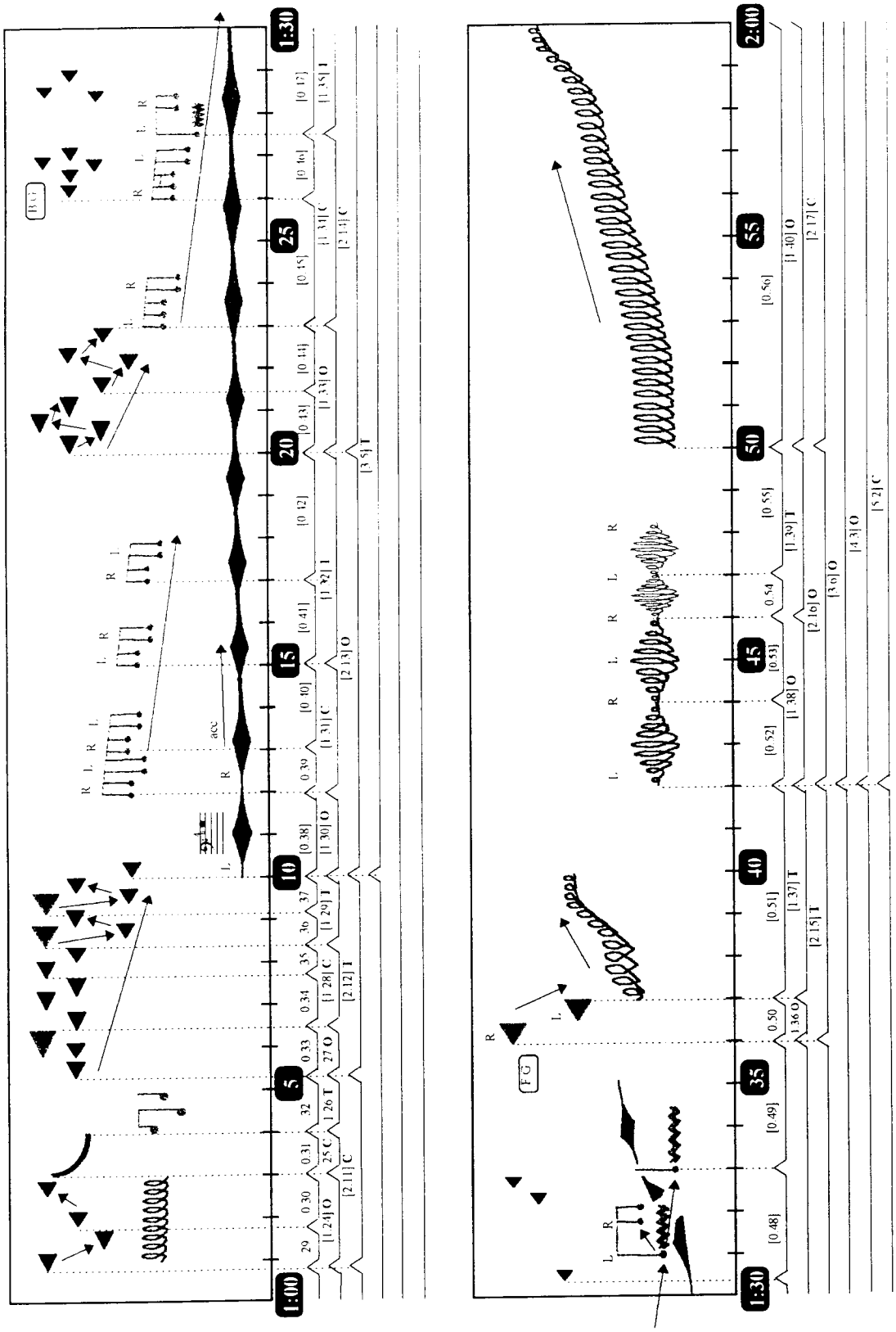


Figure 3. *Crosstalk* – graphic score (1:00 2:00).

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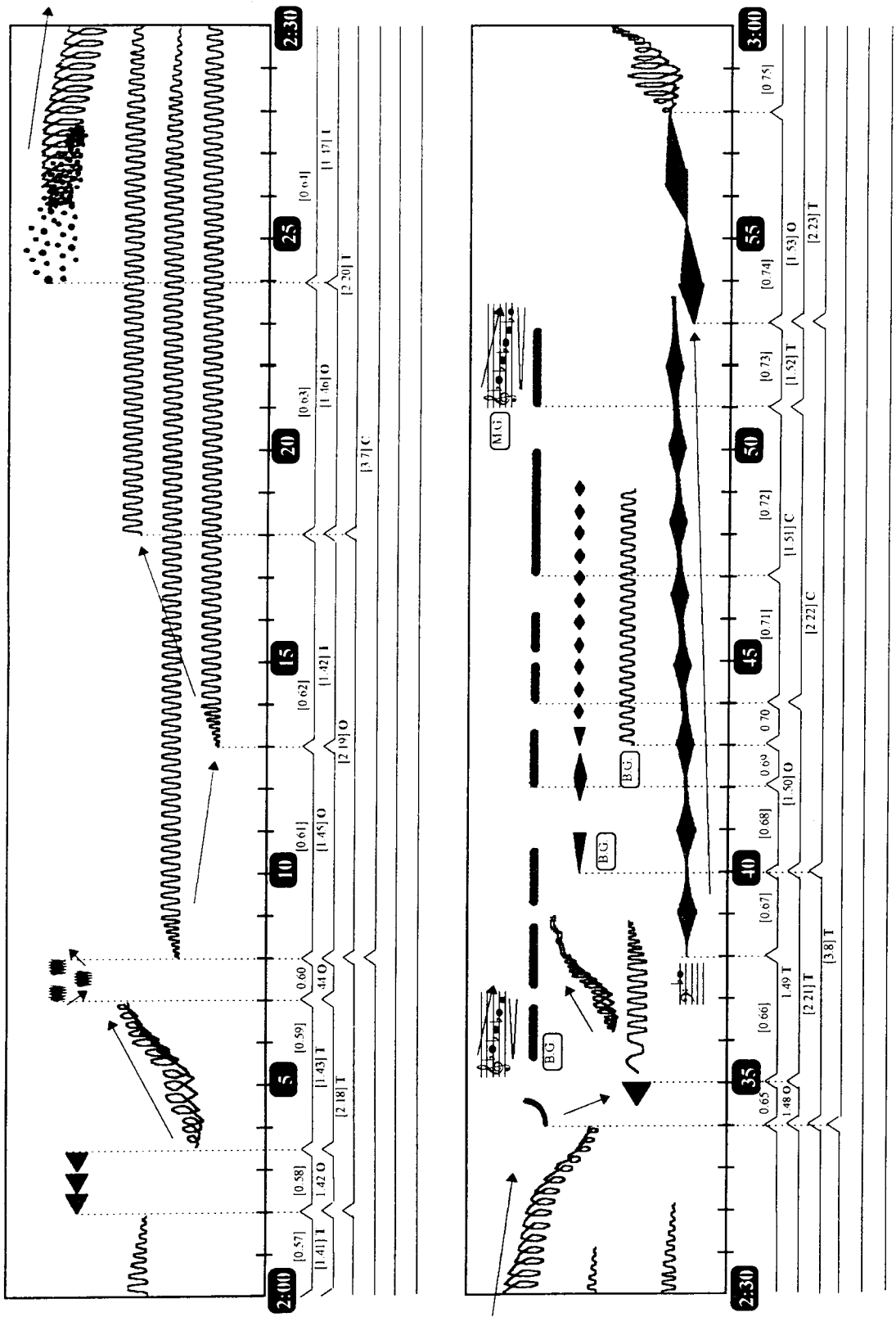


Figure 4. *Crosstalk* – graphic score (2:00–3:00).

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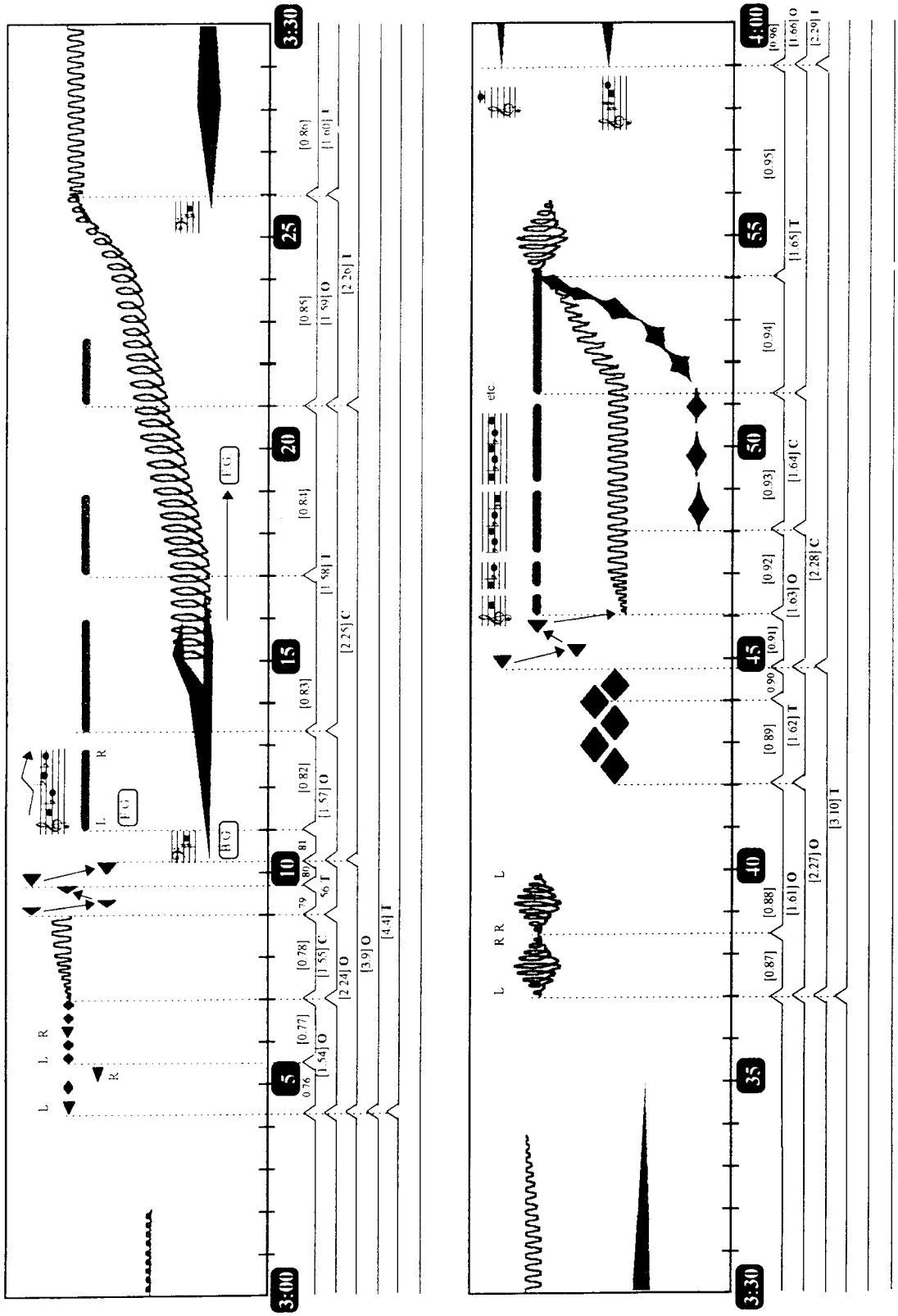


Figure 5. *Crosstalk* – graphic score (3:00–4:00).

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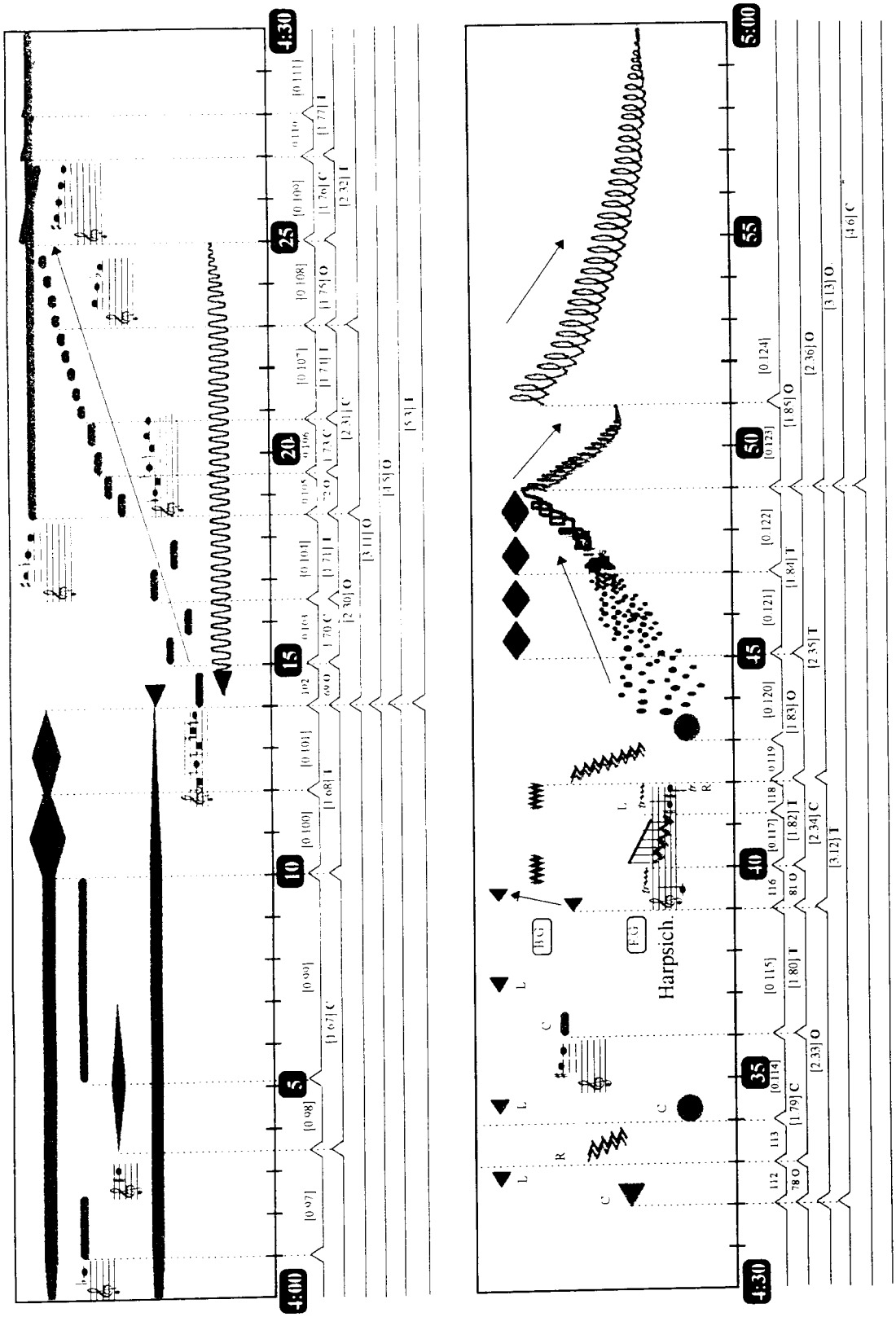


Figure 6. *Crosstalk* – graphic score (4:00–5:00).

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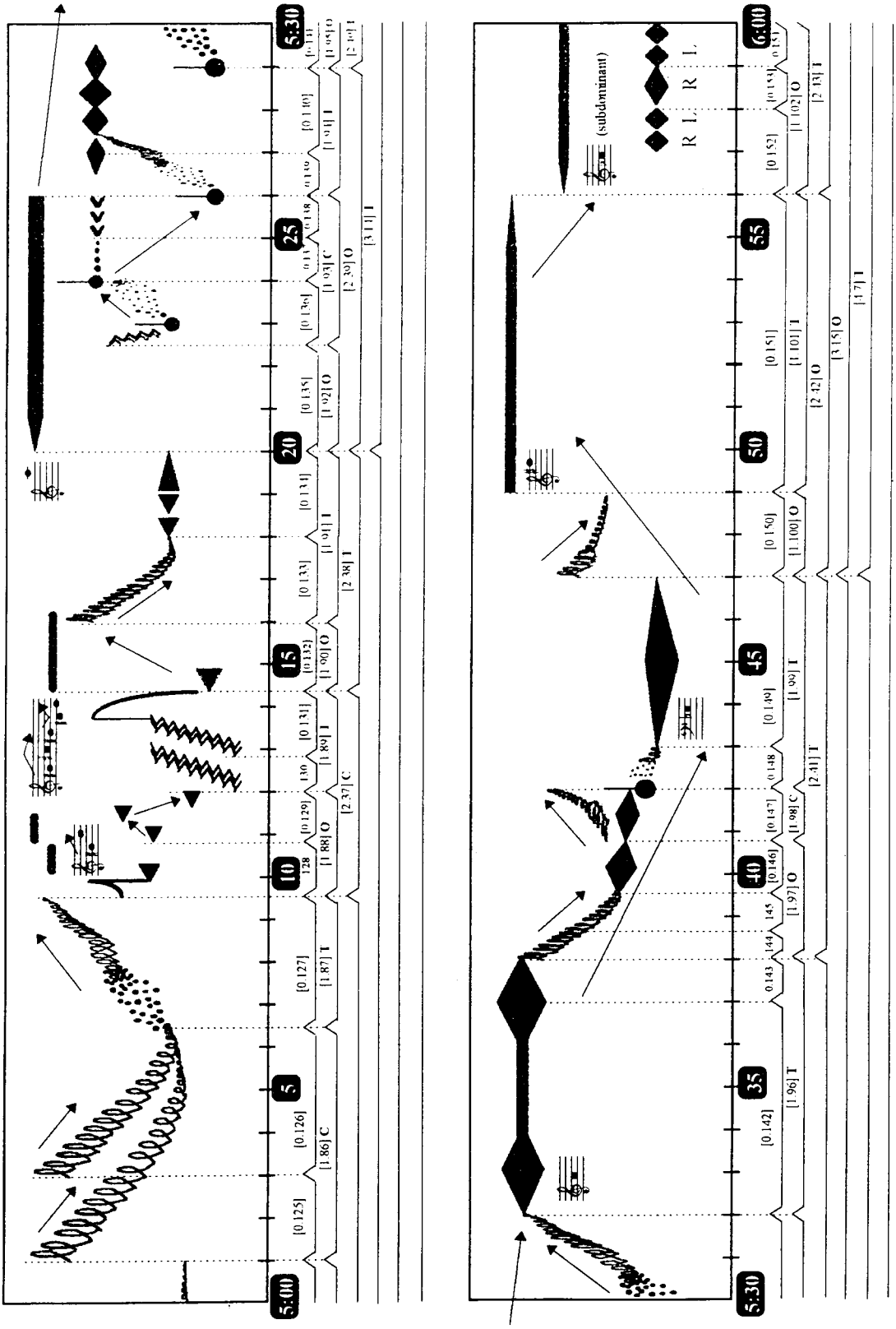


Figure 7. *Crosstalk* – graphic score (5:00–6:00).

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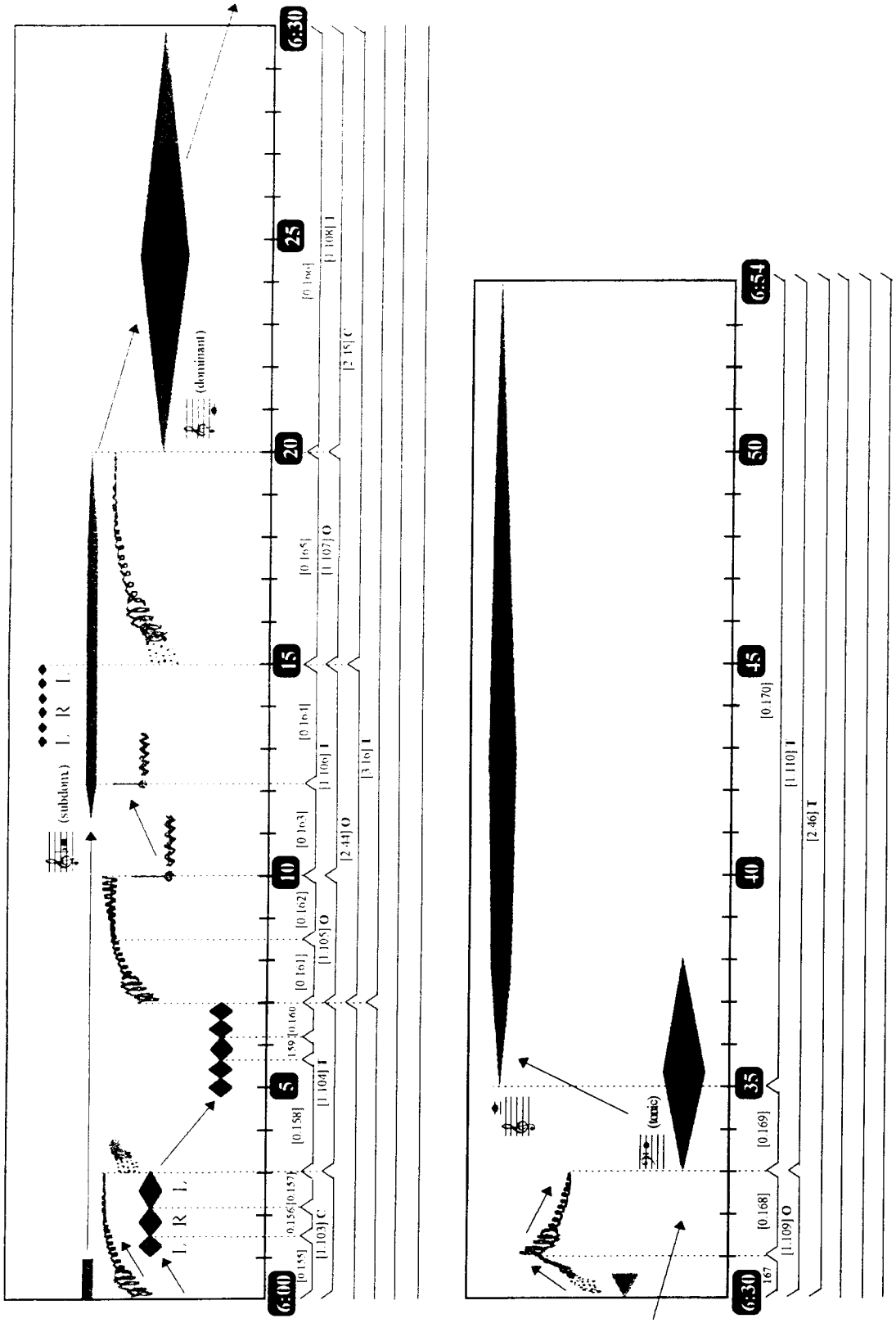
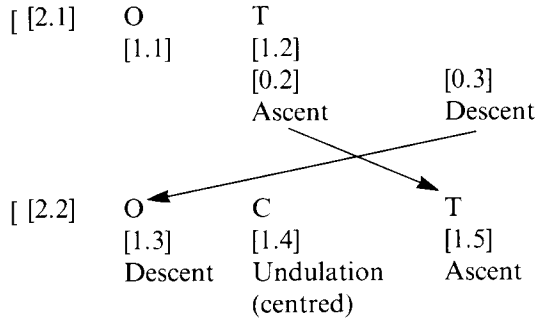


Figure 8. *Crosstalk* – graphic score (6:00–6:54).

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a repetition of [0.3]. In fact, this variation sets a particular tendency which, as will be shown below, constitutes a paradigmatic identity throughout the piece. It will therefore be called the *medium–high–low paradigm*.

This is illustrated below:



Finally, the first variation of [0.4] produces the sequence *medium–high–low* in [0.5]. It will be seen below that this constitutes a paradigm which is realised in different ways throughout the piece and will henceforth be called the *medium–high–low paradigm*.

Level 2: Section [2.3] (T) (0:16–0:23)

[2.3] is a variation by permutation of [2.2]. [0.8] reverses the direction of [0.5] and [0.9]–[0.10] permutate the ending as follows:

	Start	End
[0.8]	High frequency burst	Middle frequency burst
[0.9]	High frequency burst	Low frequency burst
[0.10]	High frequency burst	High frequency burst

If we take the endings of each of these we obtain the sequence *middle–low–high* which is the inverse of [0.5]. Therefore, [2.3] can be considered to be an expansion or development of the inverse of [0.5], which is a development of [0.4]. Also, [0.4] is an exact repetition of [0.3], the reverse (or inverse) of [0.2].

Summary of Section [3.1]

The structure and content of this section may be described as follows: the onset [2.1] consists of the section delineator [1.1] (*cadential paradigm 1*) and [1.2] (*ascent–descent paradigm*). The continuant [2.2] is a development of the inverse of [2.1] which, as a result, introduces the *medium–high–low paradigm*. The termination [2.3] is a variation by permutation of the inverse of [2.1].

Level 3: Section [3.2] (C) (0:23–0:35.3)

Level 2: Section [2.4] (O) (0:23–0:26.5)

[0.11] opens with a gesture similar to [0.1] (*cadential paradigm 1*). In a sense, it may be seen as the delayed continuation of [0.1] and also as an assertion of the possible use of this type of gesture as a paradigm which starts the level-3 sections. Also, a new sound of lower frequency appears; this can be considered to be a hybrid of families A and B. Therefore, it is possible to observe descent at level 3, when considering the expansion of register, since the lowest gestural sound available in section [3.2] is lower than that in section [3.1].

Finally, there is a functional and morphological parallel between [2.1] and [2.4]. Both function as openers to a level-3 section using *cadential paradigm 1*, followed by a presentation of gestures produced with sound family A which are developed in subsequent level-2 sections.

Level 2: Section [2.5] (C) (0:26.5–0:32)

This is a development of [1.10] resembling the development of [1.2] in [2.2]. This time, though, variation is generated by omission rather than by addition of sounds. Therefore, in view of the parallel between [2.1] and [2.4], there is also a functional and morphological parallel between [2.5] and [2.2]. Also note that [0.14] (= [1.12]) is a variation of [0.8] and, as such, a realisation of the *medium–high–low paradigm*.

Level 2: Section [2.6] (T) (0:32–0:35.3)

[2.6] is a variation of [2.5] by means of sound addition. Therefore, the relationship between [2.5] and [2.6] is similar to that between [2.2] and [2.3] and, as a result, there is a functional and morphological parallel between [2.6] and [2.3].

The general direction here is descent: both [1: 13] and [1:14] end in the newly introduced lowest sound.

Summary of Section [3.2]

There is a functional and morphological parallel between [3.1] and [3.2], as follows:

[3.1]	⇐⇔	[3.2]
[2.1]	⇐⇔	[2.4]
[2.2]	⇐⇔	[2.5]
[2.3]	⇐⇔	[2.6]

Therefore, [3.2] (*c.* 12.5 s) can be seen as a compressed repetition of [3.1] (*c.* 23 s).

There is a further element of symmetry: while [1.2] opens the gestural counterpoint based on sound family A, [1.14] closes it since, as will be seen in section [3.3], it is pushed to the background. Interestingly enough, the relation between [1.2] and [1.14] is isomorphic with that between [0.2] and [0.3], implementing the *ascent–descent paradigm*.

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Level 3: Section [3.3] (T) (0:35.3–0:53)

Level 2: Section [2.7] (O) (0:35.3–0:43)

[1.15] opens with a variation of the sound family B gesture in [1.1] and [1.9], confirming its paradigmatic cadential status. This gesture is now a hybrid of sound family B and a gestural version of sound family C. The B + C gesture is followed by a sound which can be related to a new hybrid of families A and B. This time though, its morphology is closer to that of sound family B. It also contains lower frequency components; therefore, the descent initially observed between the lowest gestural sound available in section [3.1] and that of section [3.2] can now be extended to section [3.3].

Finally, sound family D is introduced. It replaces sound family C, which does not appear as texture in section [3.3]. Sound family D also adopts some of the functionality of family A since it ascends in register. Furthermore, it takes over the foreground from this sound family.

Level 2: Section [2.8] (C) (0:43–0:48)

This constitutes a variation of [2.7] generated through the manipulation of sound family A, in a similar fashion to [2.2] and [2.5]. This time, however, sound family A is in the background.

Level 2: Section [2.9] (T) (0:48–0:53)

This section is the first concentrated summary within the piece. In spite of being so short (the actual sounds only last 2 seconds), it contains all the sound families used so far. It is interesting to notice that family D is converted into a short gestural glissando that serves as anacrusis to the cadential gesture. This is a process similar to that applied to sound family C in [1.15].

Summary of Section [3.3]

There is a morphological parallel between [3.3] and both [3.1] and [3.2]. They all start with a gesture based on sound family B, followed by variations on gestural material. However, in [3.3] there is an interchange of foreground–background relationships as well as modification of the syntagmatic realisation of each paradigm using different sound families: for example, the closing *cadential paradigm 1* is a mixture of sound families A to D (instead of only using B and C). Also, ascent is primarily realised using sound family D instead of sound family A.

Summary of Section [4.1]

The paradigm initiated in [1.1] (= [0.1]) has a cadential function beginning and ending sections from level 3 upwards. In this sense [1.1], [1.9] and [1.15] belong to the same paradigmatic axis, namely

[1.1] (= [0.1]) opens [3.1]
[1.9] (= [0.11]) opens [3.2]
[1.15] (= [0.17]) opens [3.3]

Comparing these gestures, it is possible to identify a new paradigmatic archetype: *strong short gesture–long continuant texture*. Its syntagmatic realisation is varied using different sound families:

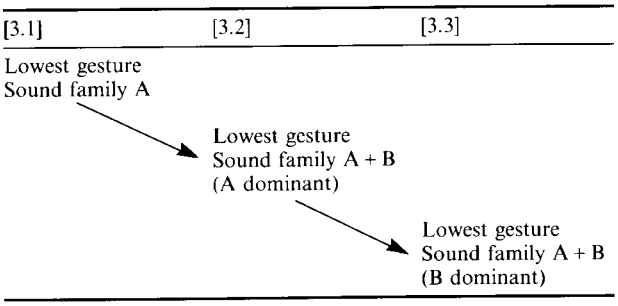
	Gesture	Texture
[3.1]	Sound family B	Sound family C
[3.2]	Sound families A, B	Sound family C
[3.3]	Sound families A, B, C	Sound family D
	Sound families A, B, C, D	Silence ([2.9])

It is also possible to observe that while gestures are dominant in sections [3.1] and [3.2], the situation is altered in [3.3]. There is an interchange between gesture-driven and texture-driven background and foreground according to the following progression:

	[3.1] ⟸⟹	[3.3]
Foreground	Gestural Sound families A, B Discrete	Textural Sound family D Effluvium
Background	Textural (Sound family C) Grain	Gestural (Sound family A) Discrete

This trend is interrupted in [2.9]. However, as was pointed out above, [2.9] has a cadential role.

The lowest sound used in the gestural counterpoint follows a pattern of descent:



Therefore, it is possible to conclude that, in spite of the ascending directional tendency of [3.3], the dominant direction in [4.1] is descent.

Level 4: Section [4.2] (T) (0:53–1:42)

This section only has two level-3 component subsections: an onset [3.4] and a termination [3.5].

Level 3: Section [3.4] (O) (0:53–1:10)

Level 2: Section [2.10] (O) (0:53–1:00.8)

The general motion of [2.10] is ascent: [0.25] (= [1.21]) and [0.26] implement the *ascent–descent paradigm* in a compressed pitch register. [0.27] and [0.28],

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compressed again, are both instances of descent. At first sight, this seems to break the realisation of *ascent–descent*; however, if one accepts that the general tendency of the beginning noise burst from [0.25] to [0.28] is ascent, then it is possible to see the repetition of descent in [0.28] as complementing the overall ascent tendency throughout [2.10].

[2.10] may also be considered a compressed inverse version of [4.1] as follows: firstly, it compresses the pitch register of [4.1], since the register of [2.10] fits into the register of the gestures of [3.1] (which is then expanded downwards in [3.2] and [3.3]). It is inverse because of the direction of expansion [2.10] towards higher pitch, as opposed to the direction of descent in [4.1]. Secondly, its shorter duration obviously compresses [4.1] in the time domain.

For similar reasons, [2.10] may be seen as a compressed version of [3.10].

Level 2: Section [2.11] (C) (1:00.8–1:05.5)

The relationship between [0.29] and [0.30] is descent–ascent, which is the reverse (or inverse) of the *ascent–descent paradigm*.

[0.32] is a slowed and simplified version of *cadential paradigm 1* ([0.1], [0.11], [2.9]). It is also a different syntagmatic realisation of the *medium–high–low paradigm* initially realised with sound family A in [0.5], [0.6], [0.8] and [0.14].

The relationship between [2.10] and [2.11] can be viewed against the *ascent–descent paradigm* if one compares the pitch directions of their respective beginnings:

[0.25] is the reverse (or inverse) of [0.29]
[0.26] is the reverse (or inverse) of [0.30]

The morphology of [2.11] and the sound families used in it make it a compressed version of [3.3]. At the same time and for the same reasons, it could be considered to behave as an expanded reversed version of [1.19].

Finally, the introduction of a more distinct version of sound family B is a step closer to the revelation of the main source of the sounds, the harpsichord (see [4.5], particularly [2.34], below).

Level 2: Section [2.12] (T) (1:05.5–1:10)

The sound initially related to a hybrid of families A and B in [0.11] appears again in [0.33]; however, this time it seems to be at a higher pitch than the gestures based exclusively on sound family A.

[0.36] is another realisation of the *medium–high–low paradigm*, with the A + B hybrid as its highest pitch (compare with [0.14], where this hybrid has the lowest pitch).The same comment applies to [0.37].

The general direction of section [2.12] is descent by means of permutations and variations of sound family A and its derivatives (A + B). In this sense, a parallel can be established with [3.2] and even with [4.1]. Also, together with [2.10] it implements another instance of the *ascent–descent paradigm*.

Summary of Section [3.4]

As discussed above, there is a general tendency to compression. In fact, [3.4] could be seen as a compressed version of [4.1] for the following reasons:

- [2.10] is compressed with respect to [3.1]. Its directional tendency is ascent; the reverse of [3.1],
- [2.11] is a compressed version of [3.3], and
- [2.12] is a compressed version of [3.2].

Although [2.12] has the same directional tendency as [3.2] (descent), the sound characterised as sound family A + B occupies the top register (rather than the bottom, in the case of [3.2]).

The *ascent–descent paradigm* is realised in [3.4] as a whole as a result of the directional tendencies of its onset [2.10] (ascent) and its termination [2.12] (descent). This is a direct development of the material of the pair [0.2]–[0.3].

Level 3: Section [3.5] (T) (1:10–1:42)

Level 2: Section [2.13] (O) (1:10–1:20)

Sound family E appears for the first time in [0.38]. An immediate relationship seems to be established with sound family A since the former seems to come out of the last burst of the latter and also because of the right–left spatial interplay between each articulation of sound family E (similar to that of sound family A in the beginning of the piece). This is more noticeable when the pitch drone accelerates.

A similar spatial relationship may be established between sound family A and the descending sounds of family B.

[1.32] is an augmented extended version of [1.31].

Level 2: Section [2.14] (C) (1:20–1:36)

This is an extended development of [2.13] since [1.33] develops [1.30] (sound family E) and [1.34] and [1.35] are variations of [1.31] and [1.32]. [2.14] also reintroduces sound family A.

Finally, sound families B and D seem to merge in some sort of wide vibrato or even a trill-like gesture ([0.47] and [0.49]), which is again closer towards the revelation of the main source, especially the harpsichord trills (see [4.5], particularly [2.34], below).

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Level 2: Section [2.15] (T) (1:36–1:42)

[2.15] represents a cadential point. In fact, not only does it end [3.5] but so do the level-4 and level-5 sections [4.2] and [5.1]. Furthermore, it may be argued that [2.15] is a realisation of the reverse (or inverse) of the *ascent–descent paradigm*: in the first place, descending [0.50] (= [1.36]) has an obvious similarity with [0.3]. In the second place, [0.51] (= [1.37]) consists of an ascending gesture based on sound family D. This anticipates the use of the latter in order to articulate ascent and descent and to demarcate sections in [5.2].

Summary of Section [3.5]

This section introduces a new sound family (E). This appears initially as a rooted setting which 'takes off'. In fact, the existence of this sound may justify the grouping of other sounds in section [3.5].

It could be argued that the general direction of [3.5] is descent, realised by means of sound family B gestures. However, this is overcome by the ascending drone belonging to sound family E which becomes the dominant sound in this section. Therefore, the tendency of [3.5] will be considered to be ascent.

Summary of Section [4.2]

This section introduces sound family E at level 4, which emphasises the tendency of ascent in [3.5]. In contrast to [4.1], descending tendencies are not as strong in [4.2]; therefore, [4.1] and [4.2] could be grouped according to their directional tendencies as follows:

Descent	Ascent
[4.2]	[4.1]

This is the inverse (or reverse) of the *ascent–descent paradigm*.

Although [4.2] is only divided into two level-3 sections, a parallel can be established with [4.1]. Firstly, the material in [3.4] combines and compresses that of [3.1] and [3.2]. Secondly, [3.5] has a morphology which is similar to that of [3.3] due to the long, continuous, ascending family E sound (akin to the family D sound in [3.3]).

[3.1] + [3.2] [3.3]

[3.4] [3.5]

Summary of Section [5.1]

Cadential paradigm 1 which acted as a level-3 separator, can now be extended to level 4 in various ways:

Possibility 1

Section	Opening	Closure
[4.1]	[1.1]	[2.9] = [1.19] + [1.20] (same morphology as [1.1])
[4.2]	[1.1] morphology	[2.15] = [1.36] + [1.37]

Possibility 2

Section	Opening	Closure
[4.1]	[1.1]	[1.19]
[4.2]	[1.20]	[2.15]

In this case, [2.9] would not contain [1.19] and would rather be the onset of [3.4] and [4.2].

Possibility 3

Section	Opening	Closure
[4.1]	[1.1]	[0.20] (uses sound family D)
[4.2]	[2.9]	[2.15]

Here, [2.9] would contain both [1.19] and [1.20] and be the onset of [3.4] and [4.2].

Possibility 1 was chosen here because of the way [2.9] appears to work within the context of the piece since:

- There is no pause between [2.8] and [2.9], whereas there is a 3-second gap between [2.9] and [2.10] which seems to reinforce the separation between larger sections ([4.1] and [4.2]).
- The ending of [2.8] is rather open, seeming to demand a resolution.
- The existence of an implicit but unarticulated morphology similar to that of [1.1] which opens [4.2] (short gesture – long continuant texture) could be justified by the fact that, if it actually appeared in the piece, it would become an immediate redundant repetition of [2.9].

As a consequence, there seems to be a shift in the function of *cadential paradigm 1* from [4.1] to [4.2]. In [4.1] it is primarily used to open sections, whereas in [4.2] it is primarily used to close them.

Finally, [0.51] (= [1.37]) introduces a new termination element which consists of the use of sound family D. It will be shown below that the latter characterises terminations in [5.2], as opposed to those in section [5.1]. In other words, cadential paradigm 1 evolves from the type of sounds used in [0.1] (mainly the percussive families A and B) towards long graduated terminations of family D, which will be identified as *cadential paradigm 2*.

Level 5: Section [5.2] (C) (1:42–4:14)

This section acts as the continuant of the piece. It consists of two subsections: onset [4.3] and termination [4.4].

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The decision on setting a level-5 delimination at this point can be justified for the following reasons:

- the cadential function of [2.15], which is followed by a long silence and a change towards the use of new sonic material, and
- the paradigmatic similarity between [1.38]–[1.39] and [0.2]–[0.3] (see [2.16] below).

Level 4: Section [4.3] (O) (1:42–3:04.3)

This section has an onset [3.6], a continuant [3.7] and a termination [3.8].

Level 3: Section [3.6] (O) (1:42–2:08)

Level 2: Section [2.16] (O) (1:42–1:50)

[1.38]–[1.39] articulate the *ascent–descent paradigm* using sound family D. However, the directional tendency in the pitch domain of [0.2]–[0.3] is lost. Nevertheless, spatial articulation and gestural content can still be related to the original paradigm. Because of this and also because of being the opening level-2 section of [5.2], [2.16] could be considered akin to [2.1], albeit lacking the cadential articulation provided by the opening [1.1]. This is similar to the opening of [4.2] above (see possibility 1 in section [5.1] summary). As stated above, a possible reason for keeping [1.1] implicit may be due to the fact that [2.15] already provides the downbeat; an additional downbeat in [2.16] may then be redundant.

Finally, since [2.15] is considered to be a realisation of the *ascent–descent paradigm* which undergoes a process of syntagmatic transformation from using sound families A and B to the use of sound family D, [2.16] could be seen as the completion of this process towards the exclusive use of sound family D – a dominant type in [5.2].

Level 2: Section [2.17] (C) (1:50–2:02)

This section can be seen as a development of [1.37] by means of temporal dilation in [1.40] and the addition of a little coda in [1.41].

Level 2: Section [2.18] (T) (2:02–2:08)

This may be seen as a development of [2.15], this time by variation and permutation, as follows:

[2.18]	⇐⇔	[2.15]
[1.42]	⇐⇔	[1.36]
[1.43]	⇐⇔	[1.37]
[1.44]	⇐⇔	[1.36]

Also, [1.42] may be seen as a realisation of the *ascent–descent paradigm* with a pitchless A + D hybrid, where the middle sound is used as a pivot, being the end of descent and the beginning of ascent.

Section [2.18] may also act as a compressed synthesis of the sequence [2.16]–[2.17]. In this sense, [1.44] provides a 'justification' for the introduction of sound family C in [1.41] – the so-called coda of [2.17] – by using a merger of this sound family and sound family D to rearticulate the inverted *ascent–descent paradigm* developed in [2.16]. In this case, as in [1.42], the middle sound is used as a pivot, being the end of descent and the beginning of ascent.

Summary of Section [3.6]

In view of the comments above, [3.6] can be seen as a development of [2.15] and its expansion from level 2 to level 3 as follows:

[2: 16] develops [1.36]
[2:17] develops [1.37]
[2.18] develops [1.36] and [1.37] and synthesises [2.16] and [2.17].

The techniques used in this development are similar to those used in [3.1] to develop [1.2], and in [3.2] to develop [2.4].

The overall directional tendency of [3.6] can be seen as ascent, which functions as a variation of [3.5] realised using sound family D instead of sound family E.

Level 3: Section [3.7] (C) (2:08–2:34)

Level 2: Section [2.19] (O) (2:08–2:18)

This section realises the descent tendency originally stated in [0.3] with the following changes:

- Temporal dilation. This is achieved by using sound family C in its original form.
- Pitch compression. Instead of descent from high to low, this is descent from middle to low, which can only be confirmed *a fortiori* after observation of [2.21]. In fact, [2.19]–[2.21] conforms to a rather expanded variation of the *medium–high–low paradigm* in [0.8].

Level 2: Section [2.20] (T) (2:18–2:34)

This section completes the variation of the inverted *medium–high–low paradigm* which began in [2.19].

Sound family D reappears in [1.47]; this time, though, the sound descends, giving [3.7] an overall directional tendency of descent in contrast to [3.6].

Summary of Section [3.7]

[3.7] can be seen as an inverted, dilated version of the *medium–high–low paradigm*. It is also interesting to

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note that this is the first time sound family C is used in its original form in order to articulate a paradigmatic axis.

The appearance of sound family D gives this section a descending directional tendency.

Level 3: Section [3.8] (T) (2:34–3:04.3)

Level 2: Section [2.21] (O) (2:34–2:40)

[1.48] is a variation of *cadential paradigm 1* (initially stated in [1.1] and realised in [1.9] and [1.15]). The function of the hybrid A + B in [1.1] is now performed by a combination of sound families A, D and E, somewhat reminiscent of [2.9]; sound family B is notoriously absent. The function of this realisation is similar to that of previous appearances of the paradigm, namely, as an opener of level 3 sections. Finally, the appearance of an ascending version of sound family D in [1.49] completes a realisation of a reversed *ascent–descent paradigm* and establishes a strong similarity with [2.15]. Therefore, [2.21] is a development of [2.15].

Sound family F appears (in the background) for the first time in the piece.

Sound family E appears at slightly higher pitch than that of [2.13].

Level 2: Section [2.22] (C) (2:40–2:53)

The most salient feature of this section is the ascending version of sound family E, which establishes a parallel with [3.5]. At level 2, a parallel may now be established between [2.21]–[2.22] and [2.13]–[2.14]. This motion occurs against a background including sound families A, C and F. The latter leaps to middle ground towards the end of the section. Sound family B is still absent.

Level 2: Section [2.23] (T) (2:53–3:04.3)

This can be seen as a simplification of [3.3] in which the counterpoint of sound family A and the cadential ending [2.9] are omitted. Families D and E merge into one sound while ascending in the pitch domain.

An additional parallel may be established between this section and [2.15]. Both occur after a long ascent based on sound family E. Both end with an ascending version of sound family D. They differ in the sounds which precede the latter: in [1.36] it is an A + B hybrid; in [1.53] a different type of gesture is composed of sound families A, E and D. This is the same type of substitution described in [2.21] when referring to [2.15]. Again, sound family B is excluded.

Summary of Section [3.8]

The cadential paradigm stated in the beginning of the piece is revived here after not being used since the end of [5.1]. This enhances the first appearance of sound family F. The latter appears initially in the background ([0.66]) and moves to the middle-ground ([0.73]).

The appearance of the low drone (sound family E) which slowly ascends ending in/converting into sound family D shows [3.8] a morphological similarity with [3.5]. This may suggest that the function fulfilled by sound family B in [3.5] is now realised using sound family F; however, while the former repeats groups of two attacks at the same 'pitch' (internal tendency) but descends in general (external tendency), the latter descends from attack to attack (internal tendency) but repeats this pattern as an ostinato, staying at the same pitch level (external tendency). Furthermore, the background based on sound family A used in the continuant [2.22] (and to a certain extent, the use of sound family C) may be related to the use of this sound family in the foreground of [2.14] (continuant of [3.5]). Furthermore, as mentioned above, there is a functional and morphological parallel between [3.8] and [3.5]. Functionally, both are used as terminations at level 4. Morphologically, the parallel may be summarised as follows:

[3.8]	⇐⇔ [3.5]
Subsections:	
[2.21] [2.22] [2.23]	⇐⇔ [2.13] and [2.15] ⇐⇔ [2.14] ⇐⇔ [2.15]
Sound family E	Sound family E
Ascending drone	Ascending drone
Sound family B	Sound family F
Internal tendency: static External tendency: descent Dominance: foreground	Internal tendency: descent External tendency: static Dominance: background→middle-ground
Sound family A	Sound families A + C
Dominance: FG	Dominance: BG

Summary of Section [4.3]

In [4.3], sound family D serves as a level-3 realisation of the *ascent–descent paradigm*:

[3.6]	–	[3.7]
Ascent		Descent

Thus, the pair [3.6]–[3.7] could also be related to [3.1]–[3.2] which are themselves a development of the pair [0.2]–[0.3], particularly in their directional tendencies (ascent–descent). Furthermore, a parallel between [3.5] and [3.8] was established above. Therefore, the diagram presented in the section [4.2]

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summary above can be extended as follows:

Ascent				Descent	Ascent
[3.1][2]				[3.2]	[3.3]
[2.10]	⇐	[3.4]	⇒	[2.12]	[3.5]
[3.6]				[3.7]	[3.8]

Finally, although [3.7] descends, the directional tendency of [4.3] is rather that of ascent because of the strong tendencies of [3.6] and [3.8].

Level 4: Section [4.4] (T) (3:04.3–4:14)

This section has an onset [3.9] and a termination [3.10]. It is characterised by the arrival of family F to the foreground in [0.82].

Level 3: Section [3.9] (O) (3:04.3–3:37)

Level 2: Section [2.24] (O) (3:04.3–3:10.2)

This acts as a summary and reminder which uses the material presented in the beginning of the piece (sound families A and C). In this sense it is a compressed version of [3.1] and [3.2].

[0.79] is also isomorphic with [0.8] and, as a result, with all the previous manifestations of the *medium–high–low paradigm*, namely [0.5], [0.6], [0.14], [0.32], [0.38] and [3.7].

[0.80] is identical with the first part of [0.3].

The transition from sound family A (discrete) to sound family C (granular) in [0.77]–[0.78] may point to a spectromorphological relationship between these. For example, sound family C could be conceived as originating from the compression of iterations of sound family A.

Level 2: Section [2.25] (C) (3:10.2–3:21)

Sound family F appears in the foreground for the first time. Also, the merger of sound families D and E presented in [2.23] is temporally dilated, extending towards a continuation in [2.26] (see below) instead of fading out ([2.23]).

Level 2: Section [2.26] (T) (3:21–3:37)

The merger of sound families D and E initiated in [2.25] is extended to include sound family C. The low drone appearing in [1.60] suggest an incomplete realisation of the *ascent–descent paradigm* (only [0.3]) using two different sound families (C and E). This is reinforced by the original restatement of [0.3] in [0.80].

[2]It is fair to say that [3.1] is not wholly ascending. However, the initial ascent statement [0.2] is dominant because it is a germinal gesture which initiates an important paradigm (even [0.3] derives from it) and it is also the real propellant of discourse in this section and throughout the piece.

Summary of Section [3.9]

The merger of sound families D and E initiated in [3.8] ([2.23]) is now extended to sound family C ([2.25]–[2.26]) in another realisation of the ascent paradigm – this time, ascent is continuous (as opposed to discrete in [0.2]). Furthermore, the group [2.25]–[2.26] forms an *ascent–descent* relationship; however, it is interesting to notice that this is a hybrid of a continuous directional tendency (continuous ascent in [2.25]) with a discrete one (discrete descent in [2.26]). Therefore, [3.9] brings together the transformational mergers between sound families established separately in [1.44] (sound family D + C, see [2.18] above) and [2.23] (sound family D + E).

A far-fetched possibility – which is, nevertheless, worth considering – is that [3.9] is a remote development of [1.19] and [1.20], and therefore a realisation of the *cadential paradigm 1* at level 3. An isomorphic parallel can be established as follows:

[1.19]		[1.20]		[3.9]	
[0.21]	(S.F. B)	[0.23]	(S.F. B + C)	[2.24]	(S.F. A and C, A predominant)
[0.22]	(S.F. D) (S.F. A + B)	[0.24]	(S.F. D) (S.F. A + B)	[2.25] [2.26]	(S.F. D + E + C) (S.F. E)

Isomorphism may also be established between [3.9] and [2.18] and, at the same time, betwen [3.9] and [3.6] (which, incidentally, contains [2.18] as its termination). This duality is consistent with the consideration of [2.18] as a summary of [2.16] and [2.17], which are, respectively, the onset and continuant of [3.6]. The isomorphic parallel can be listed as follows:

	[3.9]	[3.6]	[2.18]
O	[2.24] (A + C, A dominant)	[2.16] (D)	[1.42] (A + D)
C	[2.25] (D + E, F in foreground)	[2.17] (D)	[1.43] (D + C)
T	[2.26] (E, texture)	[2.18] (C + D, gesture)	[1.44] (C + D, gesture)

Level 3: Section [3.10] (T) (3:37–4:14)

Level 2: Section [2.27] (O) (3:37–3:44.8)

A direct parallel can be established between [2.27] and [2.16] which leads back to the [0.2]–[0.3] paradigm (see [2.16]), as follows:

- both [1.61] and [1.38] use sound family D, and
- the duration of [1.61] is in between the duration of [1.38] and that of [1.39] ($T_{[1.38]} > T_{[1.61]} > T_{[1.39]}$).

On the other hand, [1.62] uses a combination of sound families A and E, which is a new syntagmatic manifestation of the paradigm.

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Level 2: Section [2.28] (C) (3:44.8–3:59)

This is a level-2 compressed version of [3.8] (which was shown to be related to [3.5]). Note the following parallels between these sections:

[3.8]			[2.28]	
O	[2.21]		[1.63]	
	O	[1.48]	O	[0.91]
	T	[1.49]	T	[0.92]
C	[2.22]		[1.64]	
T	[2.23]		[1.65]	

[0.91] is isomorphic with [0.79] and, as a result of the parallels established above, with those sections which implement the *medium–high–low paradigm*. But, at the same time, it leads towards the appearance of sound family C in [0.92] and could therefore be seen as a realisation of *cadential paradigm 1* ([1.1]), where sound family B is replaced by sound family A.

Sound families C, D and E merge in [1.65]. This is aided by the use of reverberation.

Level 2: Section [2.29] (T) (3:59–4:14)

This section acts as a summary of [5.2]. In this sense it fulfils a role similar to that of [2.15]. Interestingly enough, it is constructed exclusively with the two new features introduced in [5.2], namely, sound family F and the use of fade out to end sections (see summary of [5.2] below). However, this time, the fading out sound does not ascend or descend but rather stays at the same pitch. In fact, as will be seen later, this, in combination with the use of sound family E, is the cadential trait of [5.3]. Therefore, [2.30] anticipates the cadential characteristic of the next level-5 section, in the same way as [2.15] anticipated that of [5.2]. Also, [1.68] completes the realisation of the *ascent–descent paradigm* initiated in [1.61], the beginning of [3.10]. Both [1.61] and [1.68] conserve only some of the gestural and spatial context of [0.2]–[0.3], but do not materialise the ascent and descent directional tendencies in the pitch domain. This could be seen as compression of the pitch register. It is interesting to notice that this delayed realisation of the paradigm starts with sound family D ([1.61]) and ends with sound family E ([1.68]), anticipating again the transfer of cadential role from the former to the latter in [5.3].

Finally, [2.30] may also be seen as a compressed version of [3.7]. However, while the latter mainly uses sound families C and D, [2.30] uses families E and F.

Summary of Section [3.10]

Because of the isomorphic parallels between [2.27]–[2.28]–[2.29] and [3.6]–[3.7]–[3.8], [3.10] may be considered a compressed level-3 version of [4.3]. Furthermore, due to its temporal position at the end of [5.2], [3.10] assumes the role of summary of the material of this section, which was initially introduced in [3.6].

Summary of Section [4.4]

A parallel between [3.9] and [3.6] was established above. In addition, [3.10] was considered to be a summary of [4.3]. Therefore, [4.4] develops [3.9] and, at the same time, summarises [4.3]. Its main directional tendency is ascent.

Summary of Section [5.2]

The two most prominent features of [5.2] are:

- The introduction of sound family F, which, as explained below, also changes the emphasis in dimension, regarding directional tendencies at level 5, from pitch (in the broadest sense of 'sound height') to foreground–background.
- The use of a different paradigm to demarcate sections.

Introduction of sound family F

This happens gradually, appearing initially in the background ([0.66]) then as middle-ground ([0.73]) and finally in the foreground ([0.82]). Therefore, since sound family F becomes a dominant force, a directional tendency from background to foreground – which could perhaps be related to the directional tendency in pitch in [5.1] (see section [4.1] summary) – may be established in [5.2] as follows:

	Dimension	Direction	Sound families
[5.1]	Pitch	Descent	A, A + B
[5.2]	Background/ foreground	Background→ foreground	F

This means that the focus of the dominant directional tendency at level 5 is shifted from the pitch continuum in [5.1] to the background–foreground axis in [5.2].

Section demarcation

A major difference between sections [5.1] and [5.2] can be established when one looks at the demarcation of level-3 and level-4 sections. In section [5.1], the so-called *cadential paradigm 1* is used in order to differentiate sections – either at the beginning, using the end of the previous section as anacrusis (e.g. [0.10] and [0.11] between level-3 sections [3.1] and [3.2]), or at the end of a section (e.g. [2.9] at the end of both [3.3] and [4.1]). On the other hand, in section [5.2], endings are determined by fade out of continuous ascent or continuous descent – henceforth defined as

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cadential paradigm 2 – which act as closure with no anacrusis towards the following section (e.g. [2.23], [2.26]). At the same time, the sound families predominant in terminations also change from A and B in [5.1] to D, C and E. The following table summarises the differences:

	Termination paradigm	Predominant sound families
[5.1]	Anacrusis–down beat	A, B
[5.2]	Fade out of continuous ascent or descent	C, D, E

Cadential paradigm 1 is devoid of prominence. Except for hints in [1.48] and [0.91] it disappears completely. On the other hand, the cadential fade out of section [5.2] uses different sound families as this section evolves. This changes from a predominant use of D and C to the use of sound family E (and to a certain extent, F), as follows:

[4.1]			[4.2]	
[3.6] D	[3.7] D + C	[3.8] D + E	[3.9] C + D + E	[3.10] E + F

Other features

An attribute worth considering is the relationship between the directional tendencies of [4.3] and [4.4]. Both are rather of ascent. At first, this may seem to upset the *ascent–descent* paradigm relation established between [4.1] and [4.2]. However, this is compensated by the fact that there is a strong tendency towards descent in [5.3], as will be explained below (see the summary of [5.3]).

Finally, section [5.2] can be seen as a development of [5.1] by variation along paradigmatic axes. For example, the *ascent–descent* initially articulated by sound family A in [0.2]–[0.3] is realised as follows:

Section	Sound family + comments
[0.2]–[0.3]	A
[1.2]–[1.14]	A in ascent ([1.2]) – A + B in descent [1.14]
[2.10]–[0.28]	A
[2.10]–[2.12] ([3.4])	A + B
[0.29]–[0.30]	A
[1.35]–[1.106]	B + D (B predominant). Inverse
[1.36]–[1.37] ([2.15])	A + B in descent – D in ascent. Inverse
[1.38]–[1.39]	D. Pitch compression
[1.42]	A + D. Pivot middle sound
[1.44]	C + D. Pivot middle sound
[1.40]–[1.47] ([3.7])	C
[1.48]–[1.49] ([2.21])	A + D + E in descent– D in ascent. Inverse
[1.61]–[1.68]	D in [1.61]. E in [1.68]. Pitch compression
[1.62]	C + A. Extended

The *medium–high–low paradigm* is implemented by correlating dilation in the time domain with height in pitch and expanded to include family C.

Section	Sound family + comments
[0.5]	A
[0.6]	A
[0.8]	A. Reverse + inverse
[0.14]	A. Reverse + inverse
[0.32]	B. Reverse + inverse
[0.36]	A + B. Reverse + inverse
[0.37]	A + B. Reverse + inverse
[0.43]	A. Extended variation
[0.44]	A. Extended variation
[3.7]	C. Inverse
[0.79]	A. Reverse + inverse

Level 5: Section [5.3] (T) (4:14–6:54)

This is the termination of the piece. It is the only section with three level-4 subsections: [4.5], [4.6] and [4.7]. This, as will be seen below, may be due to the function of [4.5], which acts as a condensed summary before the piece is brought to a close by [4.6] and [4.7], the latter assuming a function similar to that of a traditional coda.

Level 4: Section [4.5] (O) (4:14–4:49)

This section has an onset [3.11] and a termination [3.12].

Level 3: Section [3.11] (C/T) (4:14–4:32)

Level 2: Section [2.30] (O) (4:14–4:18.5)

[1.69] is a time-compressed version of [0.4] with the addition of sound family F. This creates an immediate parallel with the beginning of the piece.

An ascending tendency is established using sound family F notes which diverge from a graduated continuant based on sound family C. As a result, the latter acts as a rooted setting.

Level 2: Section [2.31] (C) (4:18.5–4:23)

An additional version of sound family F creates a canopied setting which acts as a boundary to the ascending sounds.

Level 2: Section [2.32] (T) (4:23–4:32)

The ascending sounds merge with the canopied setting.

Summary of [3.11]

A parallel can be established between [3.11] and [3.5]. In the first place, the function performed by sound

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family B in [3.5] is now taken by sound family F, which reverses the direction to ascent:

[3.5]		[3.11]
Sound family B (descent)	⇔	Sound family F (ascent)
Sound family E (ascent)	⇔	Sound family C (static)

Therefore, a change in direction is established between [3.5] and [3.11] which reminisces the *ascent–descent paradigm*.

Level 3: Section [3.12] (T) (4:32–4:49)

Level 2: Section [2.33] (O) (4:32–4:39)

[0.112]–[0.113] is another realisation of the *ascent–descent paradigm*. Also, [1.79] is almost identical to [0.17], except for the absence of sound family D, implementing *cadential paradigm 1* after its long disappearance in [5.2].

Level 2: Section [2.34] (C) (4:39–4:43)

This section assumes great importance since it contains the only recognisable sound in the piece: the harpsichord. It then becomes apparent that the latter is the main source of sound material and that [2.34] provides just a brief glimpse at this source.

It is possible to identify isomorphism between the trill in [1.81] and sound families B and D (e.g. [0.47], [0.48] and [0.49]) and also with the morphology of sound family C. Similarly, [0.117] establishes isomorphism between sound family B (e.g. as used in [0.1] and [0.39]), and families C and D.

The inclusion of [0.2] in [1.81] reinforces the assumption that [4.5] is a condensed summary.

Level 2: Section [2.35] (T) (4:43–4:49)

This section is isomorphic with [2.7]. The main difference lies in the gestures which in [2.7] are based on sound family A and occupy the background. This is replaced in [2.35] by a simplified rhythmic version consisting of a hybrid of sound families A and D which is closer to the foreground. Furthermore, [1.83] is a full implementation of *cadential paradigm 1* ([1.15]).

Summary of Section [3.12]

[3.12] contains nearly all the sound families and their characteristic use in the piece, except for sound family E. In addition there is a unique glimpse at the harpsichord in [2.34]. Therefore, this is the most intense concentration of material in the piece and, to a certain extent, is almost a compressed version of the whole.

The absence of sound family E is compensated later in section [5.3] by the cadential role it assumes and by the fact that it is used to end the piece.

Summary of Section [4.5]

Nearly all the material of the piece is condensed in section [4.5] except for sound family E. This is also the only level-4 section which contains the 'harpsichord revelation'. It is therefore logical to conclude that [4.5] serves as a summary for the whole of the piece. Furthermore, it could be argued that it assumes a role akin to that of a traditional recapitulation.

Level 4: Section [4.6] (C) [4:49–5:47)

This section has an onset [3.13] and a termination [3.14].

Level 3: Section [3.13] (O) (4:49–5:20)

Level 2: Section [2.36] (O) (4:49–5:09.5)

[0.123] can be traced back to *cadential paradigm 1* ([0.1]) by virtue of its temporal nature, consisting of a short gestural onset, followed by a long continuant. The following parallel may be established:

	Short gestural onset	+	Continuant
[0.1]	Sound family B (iterative)		Sound family C (granular)
[0.123]	Sound families B + D (granular)		Sound family D (near effluvium)

The hybrid composed of sound families B and D which dissolves into a pure family D continuant is characteristic of section [5.3] and, as a result, alludes to *cadential paradigm 1*.

The overall tendency in [1.85] is that of temporal dilation: [0.124] stretches [0.123] in time. This tendency is counteracted by [1.86], whereby the D + B complex which begins in [0.126] is a compressed version of that in [0.125]. Here, it is possible to attempt a correlation between time and pitch domain, establishing an equivalence between high vs low (or, if desired, low vs high) and long vs short. In this case, dilation and contraction in the time domain may be equivalent to ascent (descent) and descent (ascent) in pitch. Consequently, the pair [1.85]–[1.86] may be viewed as a realisation of the *ascent–descent paradigm* (or of its inverse). [1.87] ascends, and therefore, together with [1.86], realises the *ascent–descent paradigm* in the pitch domain. Also, except for the absence of an initial attack, [1.87] is isomorphic with [2.35] and, as a consequence, with [2.7].

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It is now possible to establish an analogy between the directional tendencies of material in [2.36] and the use of sound family A in the *ascent–descent paradigm*, since there is a descent–ascent relationship between [1.85] and [1.86] on the one hand and [1.87] on the other (reverse or inverse of [0.2]–[0.3]):

Descent		Ascent
[1.85], [1.86]	⇔	[1.87]

On the other hand, this is also the overall directional tendency of [2.2]:

	Descent		Ascent
[2.2]	[1.3]	[1.4]	[1.5]
[2.36]	[1.85]	[1.86]	[1.87]

It will be shown below that the reversal of direction in [1.87] has significance concerning structure at level 5 (see summary of [5.3]).

Level 2: Section [2.37] (C) (5:09.5–5:14.3)

A new manifestation of the *ascent–descent paradigm* occurs here. For the first time it is realised using notes:[3] sound family F ascends a tritone from about G♯ to D ([1.88]) (descent is delayed until the onset of [2.38]). There is also a direct reference to *cadential paradigm 1*: [0.128] and [0.131] are directly related to [0.22] and [0.24].

Finally, the *medium–high–low paradigm* is reminisced in [0.129]. Therefore, [0.129] is isomorphic with [0.5] – which is itself related to [0.8]. Thus, the axis initiated by [0.5] can be extended as follows:

Section	Sound family + comments
[0.5]	A
[0.6]	A
[0.8]	A. Reverse + inverse
[0.14]	A. Reverse + inverse
[0.32]	B. Reverse + inverse
[0.36]	A + B. Reverse + inverse
[0.37]	A + B. Reverse + inverse
[0.43]	A. Extended variation
[0.44]	A. Extended variation
[3.7]	C. Inverse
[0.79]	A. Reverse + inverse
[0.129]	A

It is possible to observe that [0.129] closes a cycle of transformations of this paradigm, bringing it back to its original sound family and directional tendency (medium–high–low).

Level 2: Section [2.38] (T) (5:14.3–5:20)

The note realisation of the *ascent–descent paradigm* initiated in [2.37] ([1.88]) is completed in [1.90], descending from about the same pitch used to start [1.88] (roughly G♯) towards D♯ to fill an octave interval. Within this descent, there are further internal realisations of ascent–descent pairs as follows:

Ascent		Descent		
G♯	→	A♯	→	G♯
(large) Descent		Ascent		
(G♯)	→	D♯	→	E

The pair [1.90]–[1.91] may also be treated as an elaborate manifestation of the *ascent–descent paradigm* using four different sound families: a hybrid A + B ascends to F. This is followed by descent of a B + D hybrid.

Summary of Section [3.13]

This section consist of a series of references to the main paradigmatic axes in the piece. Some of these use syntagmatic realisations already employed in previous sections, while others provide new ways of implementing the paradigms. The referential processes may act as summary, although to a lesser degree of concentration than in [4.5] (particularly [3.12]). This idea is reinforced by a mixture of *cadential paradigms 1* and *2* (used in [5.1] and [5.2]) and the general set of flashbacks to previous material. The closure of the paradigmatic axis cycle initiated by [0.5] in [0.129] is of particular interest.

The directional tendencies at level 2 may be determined by those of the prominent lower-level sections and summarised as follows:

[2.36]	[2.37]	[2.38]
Mostly descent	Ascent	Descent
[1.85]	[1.88] (sound family F)	[1.90] (sound family F)
[1.86]		[0.133] (D + B hybrid)

Level 3: Section [3.14] (T) (5:20–5:47)

Level 2: Section [2.39] (O) (5:20–5:29)

This is a development of the *medium–high–low paradigm* (initially [0.5], rearticulated in [0.129]). Here, its realisation consists of a mixture of sound families; however, a discrete sound composed of a combination of sound families B, D and E – appearing midway through [0.136] and at the beginning of [0.137] and [0.139] – serves as the main pivot (see arrows in the score).

Level 2: Section [2.40] (C) (5:29–5:32)

A version of continuous ascent using sound family D, which begins in [2.39], establishes a sequence in

[3] The term *note* is used here according to the terminology of spectromorphology, which refers to a sound with definite pitch.

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[0.136], [0.139] and [0.141]. Each appearance lasts longer. This seems to corroborate the idea developed in the commentary of section [2.36] which equates ascent in the pitch domain with time dilation. This sequence is significant from another point of view: the last appearance of sound family D (which is similar to the first appearance in [2.7]) leads to sound family E. The latter, which appears initially as a gesture, settles into a pitched drone which is finished by another gesture. Remembering that sound family D was used to realise *cadential paradigm 2* – the main termination in section [5.2] – the change to sound family E also signifies a change to a new cadential paradigm. In fact, as the piece progresses towards its conclusion, the use of sound family E drones as cadential material takes over (see section [5.3] summary). This type of ending will henceforth be called *cadential paradigm 3*.

Finally, the interaction between sound family E gestures at the beginning and end of [1.96] can be traced back to the bursts which originated the *ascent–descent paradigm* in [0.2]–[0.3]. In [1.96], though, pitch is compressed until it is flat. Although there is no real ascent or descent in the pitch domain, the gestures in [1.96] may be tacitly implied as a result of the similar gestural relationships to those in [0.2] and [0.3].

Level 2: Section [2.41] (T) (5:32–5:47)

[1.97] and [1.98] (sound families B + D) can be considered new instances of the reverse (or inverse) of the *ascent–descent paradigm*. The use of sound family A bursts in [0.146]–[0.147] (which are almost at the same 'pitch') reinforces the assumption regarding compression of the *ascent–descent paradigm* in the pitch domain (see commentary of [2.40]) and, as a result, completes the realisation of this paradigm initiated in [1.96].

The descending cadential material in [0.148] consisting of sound family D + B is transformed into sound family E in [0.149], enforcing the transition from *cadential paradigm 2* to *cadential paradigm 3*, particularly in view of the fact that [0.149] is not only used to conclude level 1 and 2 sections but also brings [3.14] and [4.6] to an end.

Summary of Section [3.14]

While the series of references to the main paradigmatic axes in the piece continues, it is more sparse given the increasing use of sound family E as cadential material. Therefore, the main feature of this section is the transition from *cadential paradigm 2* to *cadential paradigm 3*. Also, as the latter becomes established, this prominent function of sound family E compensates for its absence throughout section [4.5]. It is also worth noticing that there is a correlation between *ascent–descent* and *cadential paradigms*: The D + B hybrids which transform into sound family E drones do so as a result of ascent ([2.40]) and then descent ([2.41]), conforming to the [0.2]–[0.3] paradigm.

A general descent tendency can be observed in the pitch of sound family E, from [2.38] (high A) to [2.41] (low E), namely, from a canopied to a rooted setting. A parallel development in this group of sounds consists of the progressive tendency to 'swell', becoming slightly more gestural in [1.99].

Summary of Section [4.6]

This section still contains a large amount of material which can be considered as a summary of the piece. However, the appearance of the latter is sparse in comparison to [4.5] and occurs rather as a set of flashbacks interspersed between the stronger cadential presence of family D(+B) and, progressively, sound family E drones.

The general directional tendency of [4.6] is descent, slightly offset by the ascent in [2.37], but turning more resolute in [3.14], especially when one concentrates on the progression of sound family E drones.

Level 4: Section [4.7] (T) (5:47–6:54)

This section has an onset [3.15] and a termination [3.16].

Level 3: Section [3.15] (O) (5:47–6:07)

Level 2: Section [2.42] (O) (5:47–5:56)

In [1.101], sound family E ascends for the last time in order to initiate the final pitch descent tendency, which carries on until the end of the piece. This last upward leap can be seen to conform to the first part of the *ascent–descent paradigm*. In other words, there is an isomorphic relationship between [2.42] and [0.2]. Ascent in sound family E is counteracted by descent of a D + B hybrid in [1.100].

Level 2: Section [2.43] (T) (5:56–6:07)

The most important feature of this section is the last manifestation of the *medium–high–low paradigm*, which is realised with three groups containing a hybrid of sound families D and A (sound family D is shaped by the morphology of sound family A). In fact, each of these groups also realises the [0.2]–[0.3] paradigm, which, in spite of being 'flattened' in the pitch continuum (this has already been observed in section [2.40] with sound family E), still articulates the spatial right–left alternation characteristic of

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[0.2]–[0.3] and the way in which this is subsequently developed into variations (e.g. [0.4], [0.5], [0.6], etc.). Therefore, this is an instance of a paradigm (*ascent–descent*) occurring within another paradigm (*medium–high–low*):

Medium–high–low paradigm			
[0.5]	[2.43] [1.102] (medium)	[1.103] (high)	[1.104] (low)
Ascent–descent paradigm			
[0.2]–[0.3]	[0.152]–[0.154]	[0.155]–[0.157]	[0.158]–[0.160]

It is worth noticing that, when compared to [0.2]–[0.3], [1.102] and [1.104] have 'redundant' gestures in [0.153] and [0.159] (a total of five gestures instead of four). This is balanced by [0.103], which is actually missing a gesture.

Finally, the descent of the D + B hybrid in [2.42] ([1.100]) is complemented by ascent of the same type in [1.103] to realise another instance of the reverse (or inverse) of the *ascent–descent paradigm*.

Summary of Section [3.15]

The use of sound family E in order to generate a descending tendency which originated in [3.14] is continued in [3.15]. It is also interesting to note that the duration of each of sound family E individual drones becomes longer in comparison to [3.14] (see summary of [5.3] below).

Level 3: Section [3.16] (T) (6:07–6:54)

Level 2: Section [2.44] (O) (6:07–6:15)

The sounds at the beginning of [0.163] and [0.164] (sound family B + D, B prominent) are directly related to the main sounds of [0.48] and [0.49]. With the advantage of hindsight acquired after the appearance of the harpsichord source in [2.35], these can be related to a harpsichord trill. Furthermore, [0.163]–[0.164] also form an ascent pair similar to [0.2]. It would be logical to expect some descent compensating this in a fashion similar to the appearance of [0.3]. This can be found precisely in [1.35] ([0.47] to [0.49]) which, together with [1.106] ([0.163]–[0.164]), forms a reverse (inverse) manifestation of the *ascent–descent paradigm*.

The sound family A gestures in [0.164] appear to form a [0.2]–[0.3] pair but for the fact that there are three pairs instead of two or four. Therefore, either a pair is missing (if one expects two appearances of the [0.2]–[0.3] paradigm) or there is an extra pair (if one expects only one appearance of the [0.2]–[0.3] paradigm). However, this lack or surplus can be seen as providing an immediate balance to the unresolved pair [0.163]–[0.164]. We can therefore see a realisation of the ascent–descent paradigm involving [0.163]–[0.164] at two different levels: the first one ([1.35]–[1.106]) is based on spectromorphological affinity (i.e. the same sound family) in spite of temporal separation. The second one is based on temporal proximity. This is shown in the following table:

Ascent		Descent		Link	
Section	Sound family	Section	Sound family	Spectromorph. affinity	Temporal proximity
[0.2]	A	[0.3]	A	YES	YES
[1.106]	B + D	[1.35]	B + D	YES	NO
[1.106]	B + D	[0.164]	A	NO	YES
[0.164]	A	[0.164]	A	YES	YES

The descent directional tendency using sound family E which originated in [2.43] is continued in [1.106] by 'picking up' the same pitch (A) as in [2.44].

Level 2: Section [2.45] (C) (6:15–6:30)

This is a simplified version of [2.44]. Several sounds which appear in [2.44] are omitted, namely, the B + C hybrid related to harpsichord trills in [1.106], sound family C in [0.162] and sound family A in [0.164]. On the other hand, this is compensated by the fact that [0.165] – which corresponds to sound family B + D in [0.162] – is longer (in spite of its general tendency to become shorter, as explained in the summary of [5.3]). This may also be related to the temporal manifestation of the *medium–high–low paradigm* (see summary of [3.16] below). But the most important feature is that sound family E ([0.166]) becomes prominent to a degree previously unmatched in the piece. It is presented alone, undisturbed by other sounds (compare with [2.43] and [2.44]) reaching a relatively louder level (compare with [2.42]) and its longest duration so far (*c.* 10 s). In addition to the enforcement of *cadential paradigm 3*, the prominence of sound family E may also be related to a different structural function: as will be seen below, it fulfils a harmonic role similar to that of a dominant.

Level 2: Section [2.46] (T) (6:30–6:54)

An important feature of [2.46] is the fact that it is composed solely of cadential material: [0.167] contains material that can be related to *cadential paradigm 1* (characteristic of [5.1]). [0.168] contains *cadential paradigm 2* material (characteristic of section [5.2]) and [0.107] contains the conclusion of the whole piece embodied in an instance of *cadential paradigm 3* which uses sound family E and is characteristic of section [5.3].

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[0.167] and [0.168] form a realisation of *ascent–descent* which involves an A + B hybrid and an instance of sound family C in ascent, and a D + B hybrid in descent.

Summary of Section [3.16]

This section becomes less of a summary transforming gradually into a cadence, reinforcing the process by which the function of level-3 and level-4 sections in [5.3] shifts from recapitulation to conclusion.

The pitch relationships in this section suggest a harmonic function which could be consistent with tonal harmony. In this sense, there is a drop of a fifth from the drone in [1.108] (C) to that in [1.110] (F). Following this logic, the drone in [1.106] (A) acquires a subdominant function. It is therefore possible to attribute a cadential role to [3.16]. However, there is still an unexplained issue concerning the appearance of the last drone (high C) in [1.110] which may, at first sight, blur the idea of a cadence based on pitch. However, there are two possible ways of looking at its function: in the first place it may be seen as a reinforcement of the harmonic series based on F. In the second place, it may be the completion of a last realisation of the most persistent paradigmatic axis in the piece, namely reverse (or inverse) of the *ascent–descent paradigm*, as follows:

Descent	Ascent
[2.44]–[2.45] A♭→C	[0.169]–[0.170] F→C

Apart from the last drone, descent using sound family E can be seen as a continuation of [3.15] rather than a new instance of a descent pattern. This is backed up by the fact that the first appearance of sound family E in [3.16] is at the same pitch (~A) as its appearance in [3.15].

Another interesting feature of [3.16] can be observed by focusing on the morphology of each of its individual level-2 sections: [2.44] and [2.45] can be divided into an ascent ([1.105] and [1.107]) and constant pitch ([1.106] and [1.108]). [2.46] contains ascent ([0.167]), descent ([0.168]) and ascent ([1.110]) within constant pitch ([0.169] and [0.170]). From the point of view of content, these sections contain the three types of cadences used in the piece: [0.167] ([2.47]) is, to a certain extent, reminiscent of *cadential paradigm 1*, [1.105], [1.107] and [0.168] are vestiges of *cadential paradigm 2*, and the appearance of family E drones in [2.44], [1.108] and [2.46] serve as the final cadential element of the whole piece.

There are two important features in the time domain. Firstly, there is a further slowing down of the pace by virtue of the lengthening in duration of each new appearance of sound family E (see [5.3] below). Secondly, there is a new pitch–time paradigmatic correlation, similar to that discussed in the commentary to section [2.36]. This time, the *medium–high–low paradigm* undergoes a temporal realisation using a B + D hybrid: the duration of this hybrid in [0.161] (*c*. 1.5 s, medium) is shorter than its duration in [0.165] (*c*. 5 s, high) but longer than that of [0.167] (*c*. 1 s, low).

Summary of Section [4.7]

The harmonic relationships found in [3.16] may be extended to [4.7] by the projection of the A drone in [3.15] to that in [3.16]. Therefore, [4.7] may acquire a function similar to that of a traditional coda. Together with the function of [4.5] as a concentrated recapitulation, this may help explain the fact that [5.3] is the only section with three level-4 subsections.

Since it has been established that the descent initiated in [3.15] is continued in [3.16], it is now possible to 'telescope' further the projection of the ascent–descent paradigm ([0.2]–[0.3]) onto structural level 4, as follows:

Sound family	Structural level				
	0	1	2	3	4
Ascent D + B (D dominant)	[0.2]	→	[2.42]		
Descent E	[0.3]	→	→	→	[4.7]

Summary of Section [5.3]

This section begins in a hectic and condensed manner with the summary/recapitulation of [4.5], and gradually slows down in [4.6] and [4.7], becoming less dense until the only sounds left are family E drones. Further evidence of slowing pace can be found in the gradual lengthening of the duration of consecutive appearances of sound family E:

Section			Approximate duration (s)
[4.6]	[3.14]	[2.39]	6
		[2.40] ([1.96])	6
		[2.41] ([1.99])	4
[4.7]	[3.15]	[2.42] ([1.101])	7
		[2.43]	5
	[3.16]	[2.44]–[2.45]	9
		[2.45] ([1.108])	10
		[2.46] ([0.169]–[0.170])	5
		([0.170])	19

This sound family assumes an important role, bringing the piece to an end throughout the realisation of *cadential paradigm 3*, consisting mainly of long pitched drones. This type of termination was anticipated towards the end of [5.2] ([2.29]), in a manner similar to the anticipation of *cadential paradigm 2* in [5.1] ([1.37]). As a result, [5.3] gradually becomes less

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of a summary, transforming into a conclusion. This can be clearly observed at level 4:

Section	Function	Direction
[4.5]	Concentrated summary – source revelation	Ascent
[4.6]	Dispersed summary – strong cadential presence	Descent
[4.7]	Almost exclusively cadential	Descent

From here, a realisation at level 5 of the *ascent–descent* paradigm could be inferred:

Ascent	Descent
[4.5]	[4.6] + [4.7]

However, the above segmentation initially does not appear to be fully satisfactory since [4.5] is short in comparison to [4.7] and [4.8]. Why, then, use two sections to balance a short one, which, in addition has a relatively weak directional tendency?

A possible answer can be found in the fact that [4.5] is so highly concentrated in material and includes exclusively the harpsichord source. In additon, this makes it stand apart from the rest of the piece. Therefore, with [4.5] out of the way, the actual ascent–descent relationship must be sought in [5.2], and it is precisely the 'anomaly' encountered above in [5.2] – consisting of two consecutive ascending level-4 sections (see summary of [5.2]) – which is balanced by the two consecutive descending sections in [5.3]. Therefore we have:

Ascent	Descent
[4.3]	[4.6]
[4.4]	[4.7]

As pointed out above, [4.7] can be seen as a coda which is necessary in order to give the right balance and to emphasise the conclusion of the piece. Also, it was shown above that cadential material akin to the initial gesture of the piece (*cadential paradigm 1*) returns as prominent material in [5.3], after almost disappearing in [5.2]. Furthermore, not only does it return in its original form (e.g. [1.79]), but it also finds a synthesis with *cadential paradigm 2* in the D + B hybrid characteristic of [5.3] (e.g. [0.123]). Finally, this specific material becomes shortened as [4.6] and [4.7] progress, gradually giving way to sound family E, which constitutes the main element of descent in these two sections. In [1.87] (termination of [2.36]), this material changes direction to ascent, which characterises its appearance throughout the following sections. Thus, as it becomes shorter and less significant, so does the tendency to ascend. This is consistent with the conclusion that [4.6] and [4.7] have a directional tendency of descent. Therefore, the following transformations – concerning the pair [4.6]–[4.7] – can be established:

Cadential material:	sound family D + B	→	sound family E
Directional tendency:	ascent	→	descent

It was stated above (summary of [3.14]) that the D + B hybrid seems to dissolve into sound family E drones. Therefore, we have a transformation of sound family D + B into sound family E ([2.40] and [1.99]), which reinforces the transformation of cadential material and is the reverse of the process taking place in [3.5] (transition from the ascending sound family E drone beginning at [1.30] to sound family D cadential gesture in [1.37], which is interrupted in [1.36]), as well as [3.8] ([2.23]), [3.9] ([2.25]) and [3.10] ([1.65]).

Finally, the piece ends with a strongly conclusive quasi-tonal cadence. In addition, as shown in the above commentary on [2.46], the last episode ([1.110]) completes an inverted manifestation of the ascent–descent paradigm which, for the first time is a complete realisation using sound family E (as opposed to the flattened preview in [1.68], the end of [5.2]).

6. OVERALL SUMMARY

6.1. Main paradigms

Ascent–descent

This forms the main paradigmatic axis of the piece. It is stated immediately in the beginning ([0.2]–[0.3]) and implemented and developed at all levels, from simple gestures to the general directional tendencies of level 5. It may be realised using discrete bursts, continuous sounds, or a combination of these. Furthermore, as seen above, some of its realisations cut through divisions between levels and sound families.

Initially, ascent and descent are expressed mainly in the pitch domain, with the morphology of sound family A and spatial differentiation (especially left–right alternation) as additional aspects of their realisation. However, as the piece progresses, different aspects become dominant. In extreme cases, pitch differences may become flattened until there is no direction in the pitch domain; nevertheless, the paradigm still retains its character because of spatial differentiation and/or imposition of a morphology similar to that of sound family A onto other families. The pair [1.38]–[1.39] is an example of this type of transformation. As a matter of fact, there is an explicit tendency of the piece towards progressive 'flattening' of ascent–descent in favour of pitch uniformity as well as expansion in the pitch–effluvium continuum to

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encompass most of the range between note and noise. For example, compare the following:

	Pitch variation	Pitch–effluvium	Sound family
[0.2]–[0.3]	Ascent–descent	Noise	A
[1.96]	No pitch variation	Pitch proper	E

Pitch compression is counteracted by widening of the register of sound family E as it becomes more prominent in the piece until the final manifestation of the reverse *ascent–descent* movement in [3.16].

It is now possible to list the complete *ascent–descent* paradigmatic axis:

Section	Sound family + comments
[0.2]–[0.3]	A
[1.2]–[1.14]	A in ascent ([1.2]) – A + B in descent [1.14]
[2.10]–[0.28]	A
[2.10]–[2.12] ([3.4])	A + B
[0.29]–[0.30]	A
[1.35]–[1.106]	B + D (B predominant). Inverse
[1.36]–[1.37] ([2.15])	A + B in descent – D in ascent. Inverse
[1.38]–[1.39]	D. Pitch compression
[1.42]	A + D. Pivot middle sound
[1.44]	C + D. Pivot middle sound
[1.40]–[1.47] ([3.7])	C
[1.48]–[1.49] ([2.21])	A + D + E in descent – D in ascent. Inverse
[1.61]–[1.68]	D in [1.61]. E in [1.68]. Pitch compression
[1.62]	C + A. Extended
[1.85]–[1.86]	D + B dilation – contraction in the time domain
[1.86]–[1.87]	D + B in descent – D in ascent. Inverse
[1.88]–[1.90]	F. Notes: G♯ to high D, G♯ to low D♯
[1.90]	F. Internal note movement
[1.90]–[1.91]	A + B ascends to F – B + D hybrid in descent
[1.95]–[2.41]	D + A + B + E (D and E predominant)
[1.96]–[0.146]/[0.147]	E in [1.96] – A in [0.146]/[0.147]. Pitch compression
[1.97]–[1.98]	D + B (D predominant)
[1.100]–[1.103]	D + B (D predominant)
[0.152]–([0.153])–[0.154]	D + A (redundant gesture)
[0.155]–[0.156]	D + A (missing gesture)
[0.158]–([0.159])–[0.160]	D + A (redundant gesture)
[1.106]–[0.164]	B + D (B predominant), [1.106]–A, [0.164]. Temporal proximity
[0.164]	A. Last four bursts
[2.44]/[2.45]–[2.46]	E. Descent from A♭ to C. Ascent from F to C. Inverse

Medium–high–low

This is first realised in [0.5] and transformed by means of reversion, inversion and permutation throughout the piece. The axis corresponding to the main manifestations of this paradigm follows below:

Section	Sound family + comments
[0.5]	A
[0.6]	A
[0.8]	A. Reverse + inverse
[0.14]	A. Reverse + inverse
[0.32]	B. Reverse + inverse
[0.36]	A + B. Reverse + inverse
[0.37]	A + B. Reverse + inverse
[0.43]	A. Extended variation
[0.44]	A. Extended variation
[3.7]	C. Inverse
[0.79]	A. Reverse + inverse
[0.129]	A
[2.43]	D + A
[3.16] ([0.161], [0.165], [0.167])	D + B dilation–contraction in the time domain

Cadential paradigms

There are certain formulae used in order to separate larger sections (level 3 onwards) throughout the piece. The so-called *cadential paradigms* fall within three categories which give each of the level-5 sections a distinct character.

Cadential paradigm 1

This is initially articulated in [1.1] and has the following morphology:

Short gestural onset + long continuant

The onset can consist of an upbeat or an upbeat and a downbeat. Sometimes, the continuant is omitted or shortened (this is usually compensated by the use of an upbeat). The onset predominantly uses sound families A and B although, sometimes, a short derivative of sound family D is used. The continuant is initially realised using sound family C and gradually replaced by sound family D as [5.1] progresses.

Cadential paradigm 2

This consists of fade out of continuous-ascent (e.g. [2.15] and [2.26]) or fade out of continuous-descent (e.g. [2.20]) which act as closure with no anacrusis before the following section. Sound families D, C and E are predominant in this type of termination.

Cadential paradigm 3

This consists of a long faded pitched sound from family E. As the piece develops, a process of transformation from *cadential paradigm 1* to *cadential paradigm 2* followed by transformation to *cadential paradigm 3*

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is realised according to the following table:

Section		Main cadential paradigm
[5.1]	[4.1]	1
	[4.2]	1 → ends in 2
[5.2]	[4.3]	2
	[4.4]	2 → ends in 3
[5.3]	[4.5]	1, 2, 3 (3 uses sound family F instead of E)
	[4.6]	3
	[4.7]	3

It is interesting to note that this classification reinforces the function of [4.5] as a condensed summary of the piece.

6.2. Directional tendencies

Level 3

It is now possible to complete the diagram describing the tendencies and setting level-3 sections within paradigmatic axes (see summary of [4.3]).

Ascent		Descent		Ascent
[3.1][4]		[3.2]		[3.3]
[2.10]	[3.4]⇒	[2.12]		[3.5]
[3.6]		[3.7]		[3.8]
[3.9]		[2.29]	[3.10]⇒	[2.28][5] (permutation)
[3.11]		[2.33] + [2.34]	[3.12]⇒	[2.35]
[3.13] (Inversion)[6]		[2.40]	[3.14]⇒	[2.41]
[3.15]				[3.16] (Inversion + variation by omission)[7]

Level 4

According to the level-4 directional tendencies discussed in various places above, we can list the following paradigmatic axes:

Ascent	Descent	Ascent
[4.2]	[4.1] (inverse or reverse of [0.2]–[0.3])	[4.5][8]
[4.3]	[4.6]	
[4.4]	[4.7]	

Level 5

It is now possible to determine a predominant directional tendency in each of the level-5 sections. The word 'predominant' is significant here, since there is an obvious diversity of internal directions within the sections. However, some of these tendencies have a stronger presence than others; therefore, the nature of each section is ultimately determined by the prominent tendencies.

While there is no real problem identifying the main characteristics of [5.2] and [5.3], [5.1] is not as conclusive, requiring some additional discussion. It is possible to argue that the main directional tendency of [5.1] is descent on the following grounds:

As discussed above, [4.1] has a strong tendency towards descent.

Although [4.2] has been identified mostly as ascending, this ascent is always counteracted by some (less emphatic) descent: [2.10] is counteracted by [2.12] and the sound family E ascent in [3.5] is counteracted by simultaneous descent of sound family B descent as well as sound family A descent in [1.33]. As a result we obtain:

Descent	Ascent	Descent
[5.1]	[5.2]	[5.3]

We can now establish isomorphism between the paradigmatic axes of levels 3, 4 and 5 by comparing the diagrams for each level with the following observations:

- The directions at level 5 are reversed (inverted). Nevertheless there is a strong correspondence between axes.
- While there is correspondence between the directions of level-4 and level-3 axes, the chronological positioning and correspondence along level 4 is rather irregular (for example, [4.2] appears before [4.1], [4.3] is paired with [4.6], etc.).

6.3. Overall spectromorphological tendencies

The following is a description of the evolution of the piece within the various spectromorphological dimensions.

Pitch continuum

There is a tendency from noise, as exemplified by the use of sound family A in the beginning of the piece, towards pitch (effluvium), as exemplified by the use of sound family E at the end, realising the last cadential paradigm and also taking over from A in the realisation of *ascent–descent*.

Attack continuum

The example above also illustrates an evolution from discrete towards effluvium. This is the reverse of progression in the pitch continuum.

[4] It is fair to say that [3.1] is not wholly ascending; however, the initial ascent statement [0.2] is dominant because it is a germinal gesture which initiates an important paradigm (even [0.3] derives from it). It is also the real propeller of discourse developed in this section and, in general, throughout the piece.

[5] [2.28] has an ascending tendency. Although [2.29] is rather neutral (neither ascending nor descending) it still presents contrast to [3.9] and [2.28]. Therefore, this is a variation withing the paradigmatic axis.

[6] The directions of [3.13], [2.40] and [2.41] are respectively descent, ascent and descent; therefore this is a case of inversion of direction.

[7] Given the assumption that [4.7] acts as a coda, it is acceptable to expect this irregularity.

[8] As stated above (summary of section [5.3]), because of its highly concentrated and particular content and its character of summary/recapitulation, [4.5] can be set aside as an unpaired section.

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Gesture–texture continuum

As a consequence of progression in the attack continuum, texture takes over from gesture as the piece evolves.

Spatial articulation

There is a tendency from strong external movement and localisation (e.g. left–right) towards weak internal movement and less-defined localisation. This is partly a consequence of the shift from gesture to texture.

The following table contains a comparison between the directions of movement in the different dimensions:

	Discrete			Effluvium
Pitch	←	←	←	←
Attack Gesture–texture	→	→	→	→
Space				

It is therefore possible to conclude that the movement from the discrete to the effluvium in pitch is balanced by movement in the opposite direction in other dimensions which, as observed above, are closely related.

7. CONCLUSION

Crosstalk is a piece in which discourse is developed by establishing relationships based on the timbral properties of its sonic material. The basic types of movement and energetic profiles of the latter are also reflected in the way structure is articulated, determining sections and their subdivisions. As a result, the elucidation of structure and discourse must go hand in hand with the understanding of the way in which these are abstracted from the materials as well as with the establishment of correspondence between microstructure and macrostructure. At the same time, the unique identity of a work is determined by the common features preserved while it proceeds in time. In this sense, it is strongly dependent on self-referential processes which may be explained within the concept of paradigmatic axes; namely, links between an internal set of archetypes determined by the interaction of material.

It is hoped that the analysis presented in this article is successful in deducing possible mechanisms which explain abstraction, correspondence and identity, shedding light on the particular dimensions of timbre in which these are realised. It should be clear by now that structuring processes in *Crosstalk* are articulated in various of these dimensions, such as the pitch–effluvium continuum, attack–effluvium continuum, physical space, time, etc. Furthermore, the interaction of dimensions has also been examined: for instance, ascent and descent in the pitch–effluvium may be correlated with dilation and compression in time.

It has also been shown that electroacoustic processes are not exclusive of techniques used in vocal/instrumental music. This was encountered in the discussion of tonal relationships towards the end of the piece, when a parallel emerged between the pitch of various drones and tonal harmonic functions (subdominant, dominant, tonic). Perhaps we may learn from this that it is possible to see the axes within which instrumental/vocal processes are carried out as particular dimensions of a universal set consisting of an encompassing conception of *timbre*, as discussed by Smalley (1994).

Finally, a particular methodology appropriate to abstract discourse has been put to work and thoroughly tested. Hopefully, it has proved useful; obviously, it is not exhaustive. While it is not intended to be a universal tool – which can be applied indiscriminately to any work – it is hoped that it can offer a reasonably rigorous approach which may deal effectively with the materials, discourse and syntax of tape music. However, it is important to remember that the content of a particular analysis is ultimately determined by the observations of the analyst. It is (s)he who has to discover functions, relationships and paradigms which, in our pluralistic times, may vary dramatically from work to work.

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https://doi.org/10.1017/S1355771898009078 Published online by Cambridge University Press

Fig. 1. *Crosstalk* – sound families (Fischman 1995: 471).

Figure 2. *Crosstalk* – graphic score (0:00–1:00) (Fischman 1995: 472)

Figure 3. *Crosstalk* – graphic score (1:00–2:00).

Figure 4. *Crosstalk* – graphic score (2:00–3:00).

Figure 5. *Crosstalk* – graphic score (3:00–4:00).

Figure 6. *Crosstalk* – graphic score (4:00–5:00).

Figure 7. *Crosstalk* – graphic score (5:00–6:00).

Figure 8. *Crosstalk* – graphic score (6:00–6:54).

6pt

⇒ ⇒ ⇒ ⇒ ⇒ ⇒

⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒

8pt

⇒ ⇒ ⇒ ⇒ ⇒ ⇒

⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒

9pt

⇒ ⇒ ⇒ ⇒ ⇒ ⇒

⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒

10pt

⇒ ⇒ ⇒ ⇒ ⇒ ⇒

⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒ ⇒

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