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Structuring Processes in
Electroacoustic Composition

Volume II:
Figures

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Submission for Doctoral Degree

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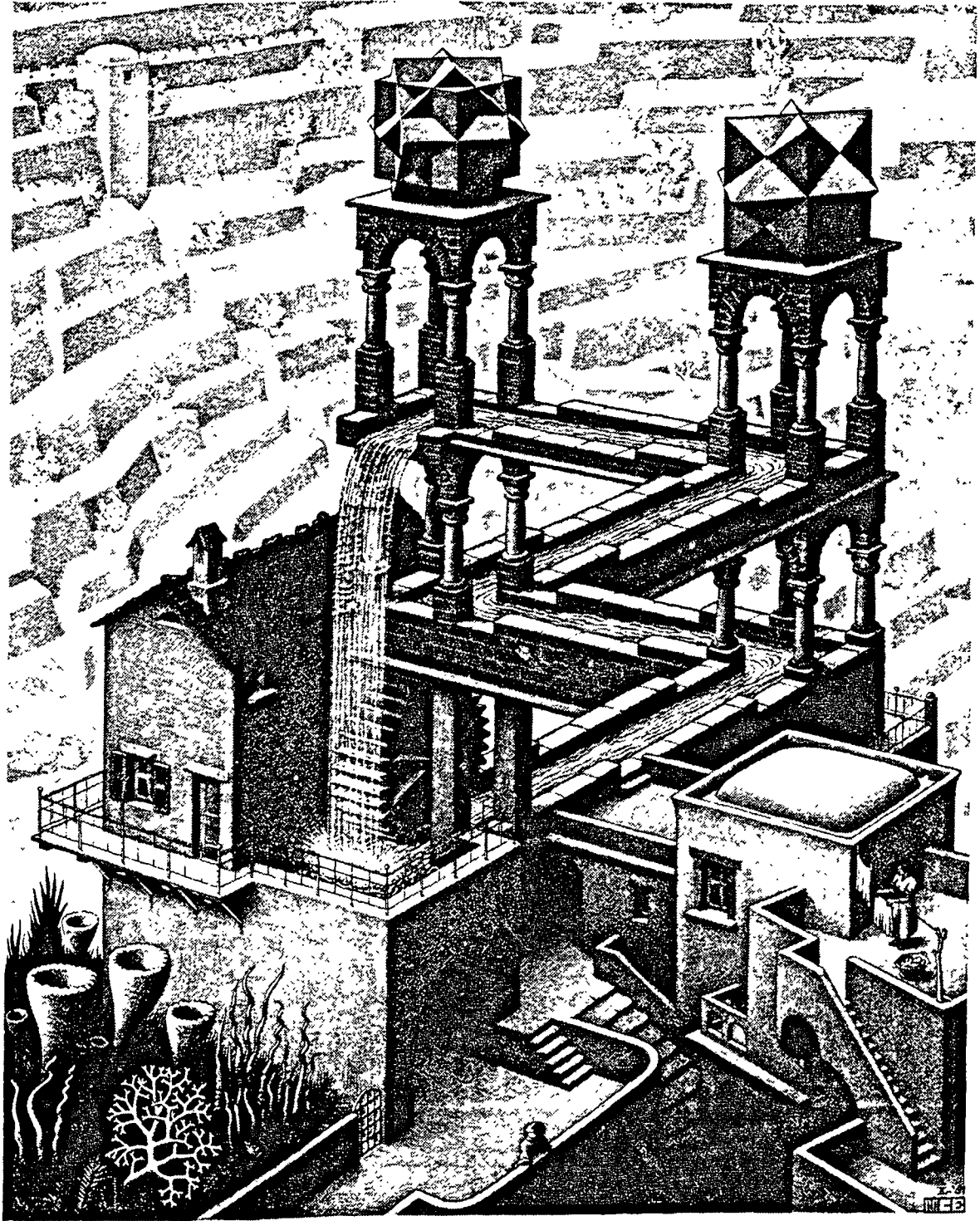


Figure 1.1 'Waterfall', (Lithograph 1961, Escher 1989: plate 76)
Example of a visual paradox.

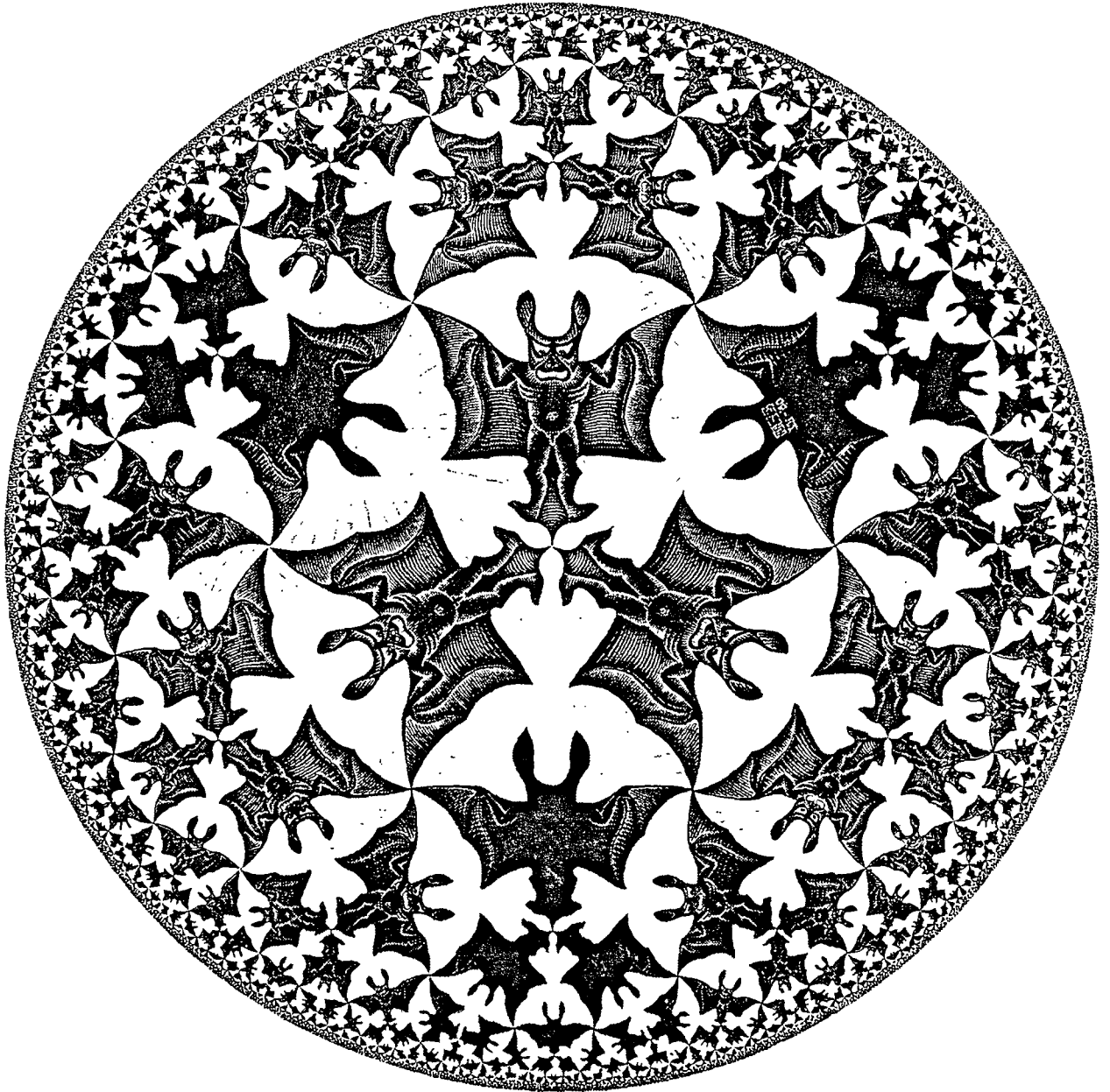


Figure 1.2 'Circle Limit IV', (woodcut print 1960, Escher 1989: plate 25).
Example of a periodic drawing.

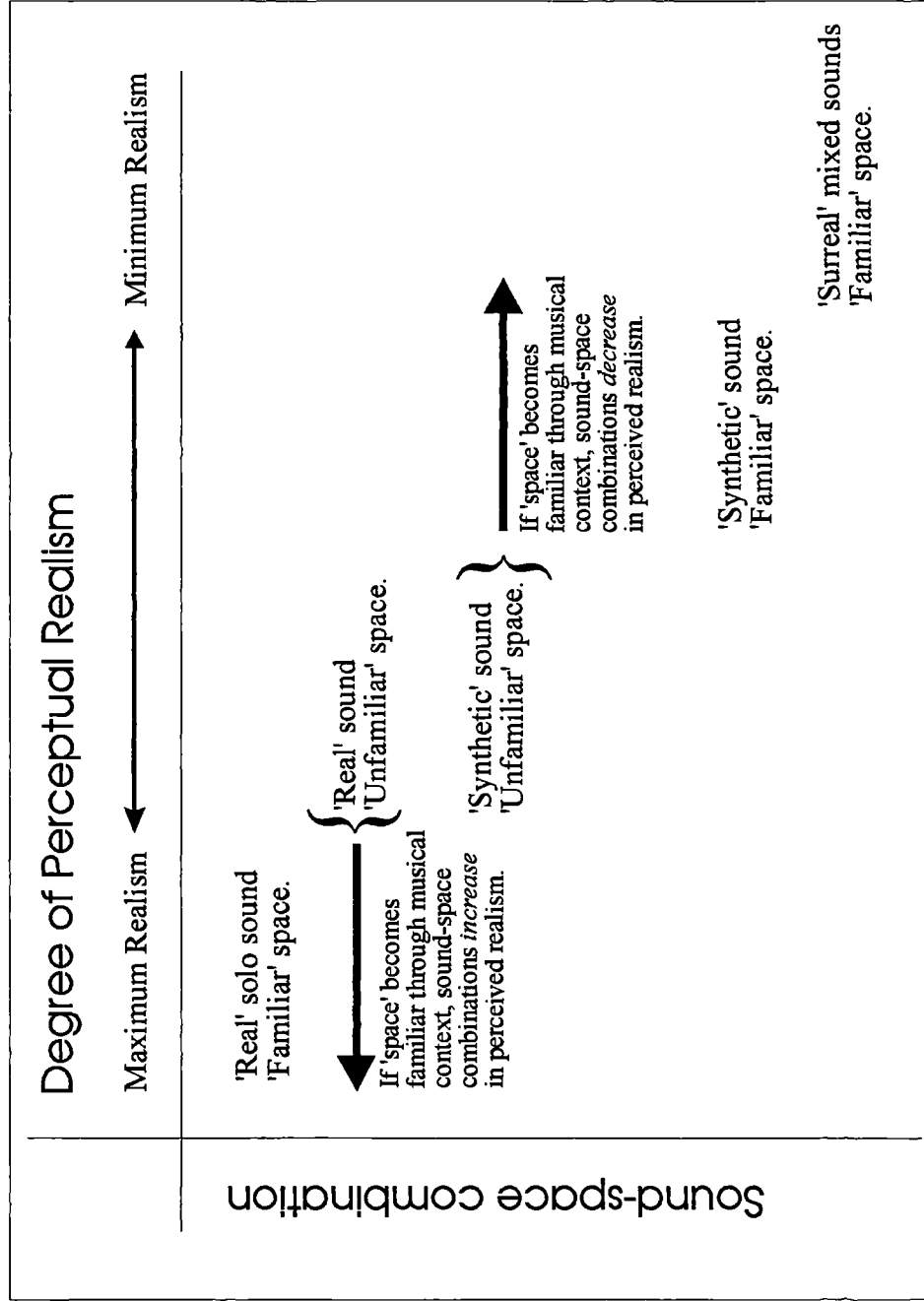



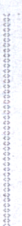




Figure 1.3. Relationships between sound and space in terms of perceptual realism.

Colour Codes

Rocks } Ice }	
Breath synth.	
Busker	
Synthetic	
Dustcart crash and hooter } Wood } Crunch }	
Water	

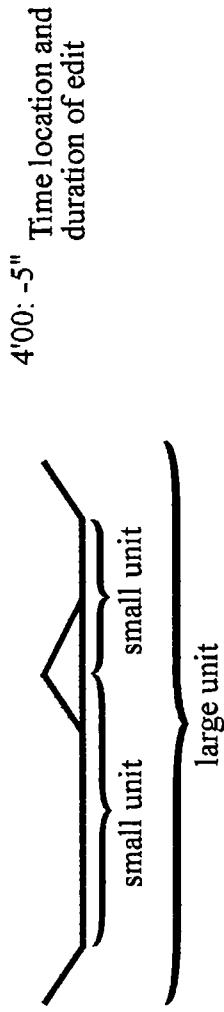
Broken lines indicate source sound transformed into pitch material, i.e. semi-synthetic.

Text codes

Dog snuffle	snuffle
Door creaks	creaks
Footsteps	footsteps
Speech	text
Aural focus	position of sound in listener's aural focus

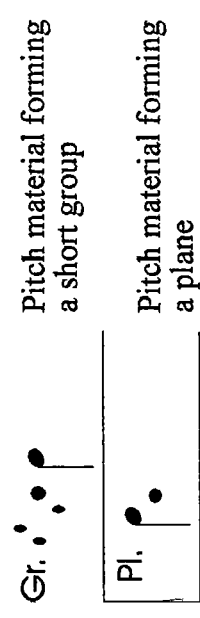
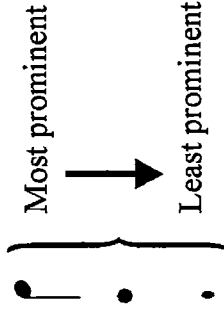
Macro-time unit demarcations

Material edited in the September 1996 remix



Pitch notation

Identified pitch in order of prominence



--- Cross section reference between materials

'Earth Haze' analysis KEY

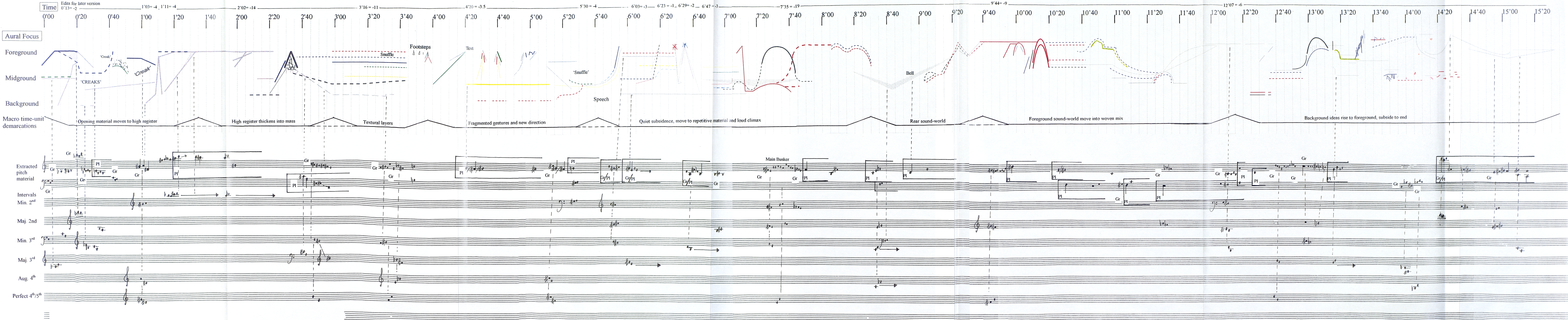


Figure 1.4 'Earth Haze' Analysis - Levels of Aural Focus and Related Pitch Extraction.

1	2	3	4	5	6	7	KEY
Motion of pitch group and plane.	Location of dense interval groups	Grouping based on micro-scale structures in pitch and tessitura.	Sound grouping based on micro-details without considering pitch.	Grouping based on macro-scale structures in pitch and tessitura.	Sound grouping based on macro-details without considering pitch.	Macro-scale time demarcations.	
Gr. Gr.Gr. Gr.Gr. Gr.Gr. Pl.	Dense	0'00 Assortment of maj and min 3rds, min 2nds, aug and perfect 4ths; group narrow into a high plane of min 2nd intervals.	0'00 'Rocks' transform into 'synthetic' material, with 'synth breath'. Implication of a large space. 'Door creaks' distanced by reverb.	0'00 High and low pitch layers..	0'00 'Rock' and dense 'synthetic' gestural material.	0'00	KEY Gr. - Pitch group. Gr. - Pitch group forming plane Pl. - Pitch plane. } - Grouping of similar material.
↓				1'00 Midrange gesture and ascent to high register plane.	1'38 'Synthetic' material rise to high register plane.	1'38	
Gr. Gr.	Dense	2'20 - 3'40 'Buck' noise-pitch contour, prominent maj / min 3rds groups and planes; sustained plane on A ₄ , ending at 3'20 with contour on maj/min 3rds, perfect/aug 4ths.	2'10 'Busk' material emerges to form a noise surge, which subsides into an active, iterative texture, culminating at 3'50 in 'footsteps'.	2'30 Plane broken by noise material; descent through midrange pitch progression; cadential-type culmination at 3'00.	2'30 Noisy 'busk' material emerges and then falls to a textural plane, ending in silence.	2'55	
↓	Dense			3'00 Midrange tessitura	3'55 Sparse gestures injecting into a static plane. Resonant 'water' sound and implication of distant sound-world.	3'55	
Pl. ↓				4'00 Midrange resonant 'footsteps' followed by midrange plane at 4'20.	5'20 Thin material	5'40	
Gr. Pl. ↓		4'20 Static plane on G/F ₄ with C ₄ modulation. Pitch group interruption at 5'00; resume G plane.	3'55 Implication of a large space. Resonant 'water' with 'rock' gesture injections. 'Crash' and 'synth breath' material die into a quiet 'synthetic' plane.	5'10 Quiet midrange pitch gesture; pitch plane modulation.	5'48 Large 'rock' attack followed by rhythmic loops, and a fast disintegration into a mixture of material, then accumulating at 7'11	5'48	
Gr. Pl. ↓	Dense	5'48 Interruption by noise gesture followed by repeating maj / min 2nd/3rd groups which form linear planes, interrupted at 6'30 and modulation to B.	5'40 Very quiet speech.	5'48 Oscillating linear plane broken by noise-gestures; move to low-mid plane at 6'40.	7'11 'Crunch' and 'busk' noise gestures fall into 'wood' and 'rock' repetitive texture. Fast fade towards 8'30.	7'11	
Gr. Pl. ↓				7'24 Dense noise-pitch contour; fall to quiet low-mid plane.	8'30 Slow moving synthetic material.	8'30	
Gr. Pl. ↓	Dense	7'20 'Busk' pitch contour in E minor, rests on F plane.	7'11 Loud 'crash' and 'busk' material fragment into iterative texture and sweeping gestures, which fade to reveal material at 8'30	Continuous descent of layered planes towards a 'passive' low register plane at 8'30.	9'35 'Crash' loud source.	9'35	
Pl. Pl. Pl. ↓	Dense	8'30 Mid-bass layered planes aug / perfect 4ths, min 3rds, maj 2nds	8'30 Short overlap of 'synthetic' material and previous texture. Implications of large space. Vague 'rain' and 'bell' sounds accumulate into 9'40	9'35 Interruption by noise sounds. High-mid plane move to low register at 10'40.	10'14 Surface rhythmic features fall away to end, losing spatial implications.	10'14	
Gr. Pl. ↓				9'50 Increased plane layering results in rich pitch implications; long duration of major / minor mode modulations in low-mid pitch ranges.	12'20 Spectrally thin material accumulates towards 13'00.	12'20	
Pl. Pl. ↓				10'14 Loud 'crash' and 'rock' injections transform into repeating gestures with rhythmic coincidence.	13'00 Dense layers of 'busk' and 'synthetic' material. Relaxation into gentle material.	13'00	
Gr. Pl. ↓		9'40 - 12'15 Sparse assortment of single note pitch planes, broken by noise. Increase in strength and density to rest at 11'30 on E plane.	10'19 Subside into ambiguous spatial implications, iteration and sudden cut.	12'20 Spectrally thin pitch implications sustained from previous section.	14'28 Quiet accumulation of synthetic gestures, subside to end.	14'28	
Gr. Pl. ↓				13'00 Sudden rise into noise material with pitch descent; oscillating, sustained planes, broken with injections. Woven pitch planes and pitch groups.	15'30	15'30	
Gr. Pl. ↓	Dense	12'20 Tiny pitch groups broken by fast rise into busk contour in F minor. Rests on an oscillating plane of maj 3rds.	12'20 Sparse material with rear 'crash', 'busk', 'rock' and 'synth' sounds accumulate into loud 'busk' material.	14'28 Quiet, linear plane weave in high-mid planes. Culminates on end perfect cadence.			
Gr. Pl. ↓				13'12 Rhythmic accumulation and 'rock' gesture injections.			
Gr. Pl. ↓				14'00 Decreasing 'rock' and 'crash' material. Implications of an increasing space with mainly synthetic material, descending to close.			
Gr. Pl. ↓				15'30			
Gr. Pl. ↓							
Gr. Pl. ↓							
Gr.		13'55 Maj 6th and maj 3rd groups articulated in plane					
Gr.		14'28 High plane of maj 2nds descend into a weave of different pitch planes, cadencing onto A/F, with A minor implications.					

Figure 1.5 Alternative Listening Strategies in the Perception of Form Including Pitch Consideration.

Sound grouping based on micro-details without considering pitch.	Sound grouping based on macro-details without considering pitch.	Macro-scale time demarcations.
0'00 'Rocks' transform into 'synthetic' material, with 'synth breath'. Implication of a large space. 'Door creaks' distanced by reverb.	0'00 'Rock' and dense 'synthetic' gestural material.	0'00
'Synthetic' character maintained along high register plane.	1'38 'Synthetic' material rise to high register plane.	1'38
2'10 'Busk' material emerges to form a noise surge, which subsides into an active, iterative texture, culminating at 3'50 in 'footsteps'.	2'30 Noisy 'busk' material emerges and then falls to a textural plane, ending in silence.	2'55
3'55 Implication of a large space. Resonant 'water' with 'rock' gesture injections. 'Crash' and 'synth breath' material die into a quiet 'synthetic' plane.	3'55 Sparse gestures injecting into a static plane. Resonant 'water' sound and implication of distant sound-world.	3'55
5'40 Very quiet speech	5'20 Thin material	5'40
5'48 Rhythmic interaction of 'rock', 'crash' and 'synth.'. Accumulates into a large attack material which subsides.	5'48 Large 'rock' attack followed by rhythmic loops, and a fast disintegration into a mixture of material, then accumulating at 7'11	
7'11 Loud 'crash' and 'busk' material fragment into iterative texture and sweeping gestures, which fade to reveal material at 8'30	7'11 'Crunch' and 'busk' noise gestures fall into 'wood' and 'rock' repetitive texture. Fast fade towards 8'30.	
8'30 Short overlap of 'synthetic' material and previous texture. Implications of large space. Vague 'rain' and 'bell' sounds accumulate into 9'40	8'30 Slow moving synthetic material.	8'30
9'35 Enclosed space with 'crunch' sounds.	9'35 'Crash' loud source.	9'35
10'14 Loud 'crash' and 'rock' injections transform into repeating gestures with rhythmic coincidence.	10'14 Surface rhythmic features fall away to end, losing spatial implications.	
11'19 Subside into ambiguous spatial implications, iteration and sudden cut.		
12'20 Sparse material with rear 'crash', 'busk', 'rock' and 'synth' sounds accumulate into loud 'busk' material.	12'20 Spectrally thin material accumulates towards 13'00.	12'20
13'12 Rhythmic accumulation and 'rock' gesture injections.	13'00 Dense layers of 'busk' and 'synthetic' material. Relaxation into gentle material.	
14'00 Decreasing 'rock' and 'crash' material. Implications of an increasing space with mainly synthetic material, descending to close.	14'28 Quiet accumulation of synthetic gestures, subside to end.	
15'30	15'30	15'30

Fig. 1.51 Alternative Listening Strategies in the Perception of Form

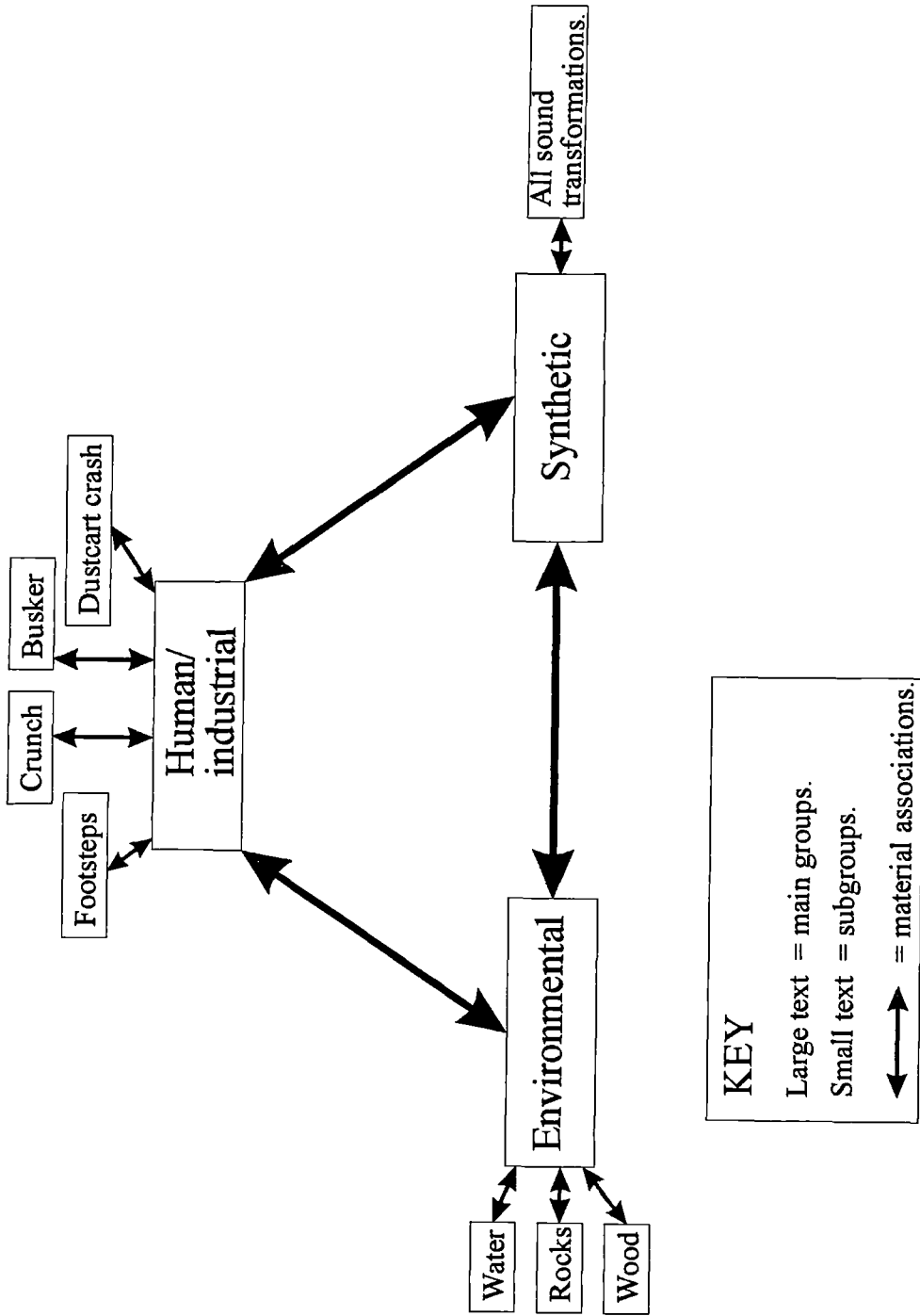


Figure 1.6 Possible Material relationships in 'Earth Haze'

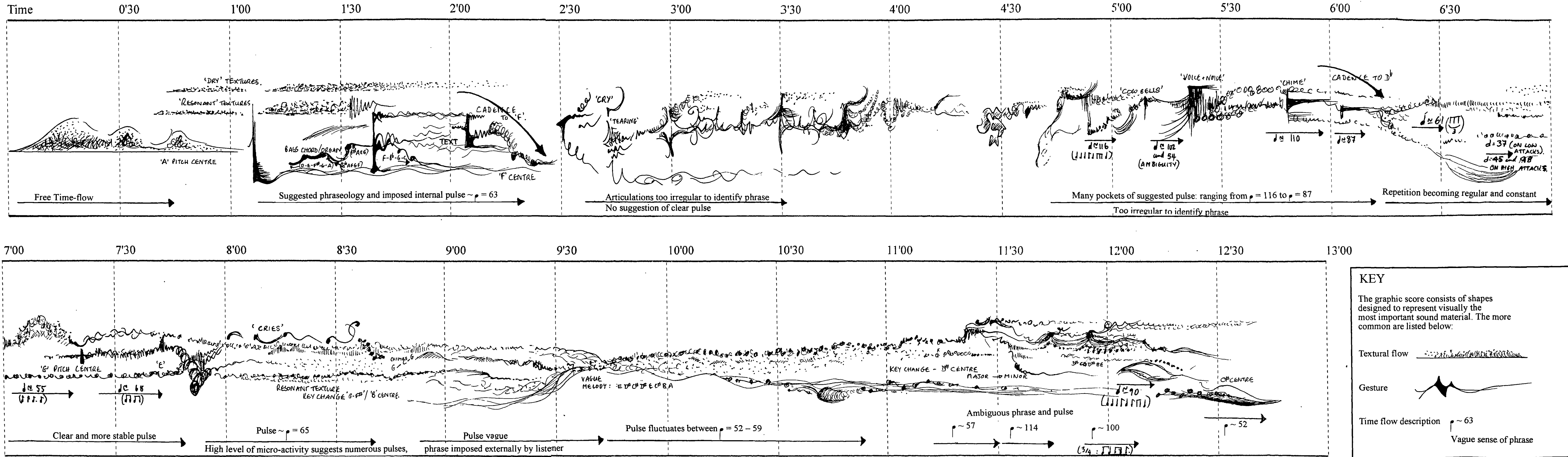


Figure 3.1 'Little Animals' graphic score

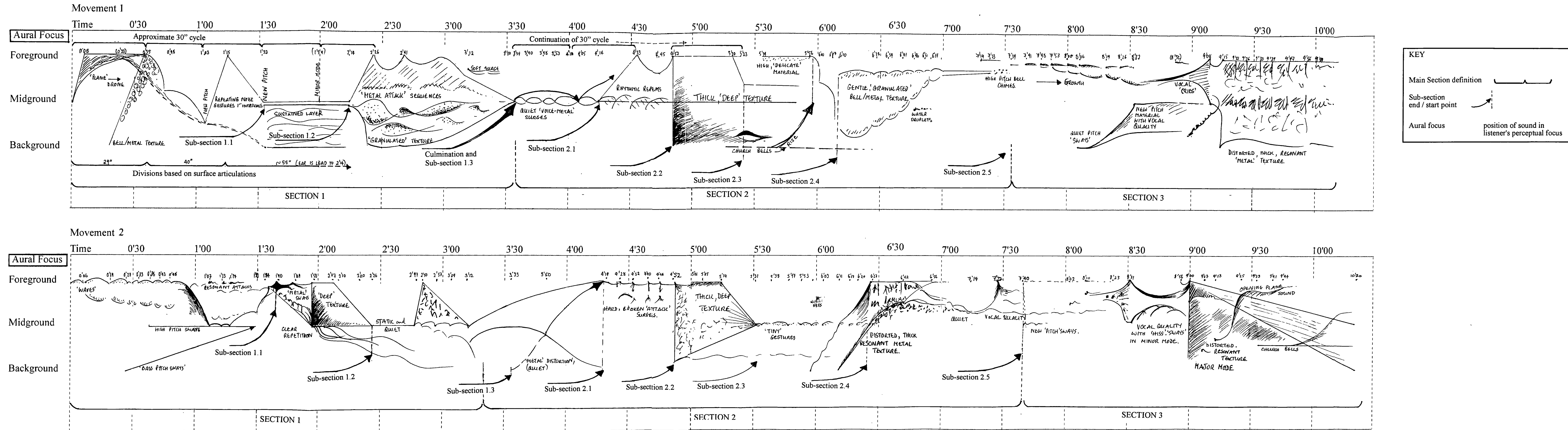


Figure 3.2 Analysis of perceptual focus and time relationships in 'Racing Unseen'.

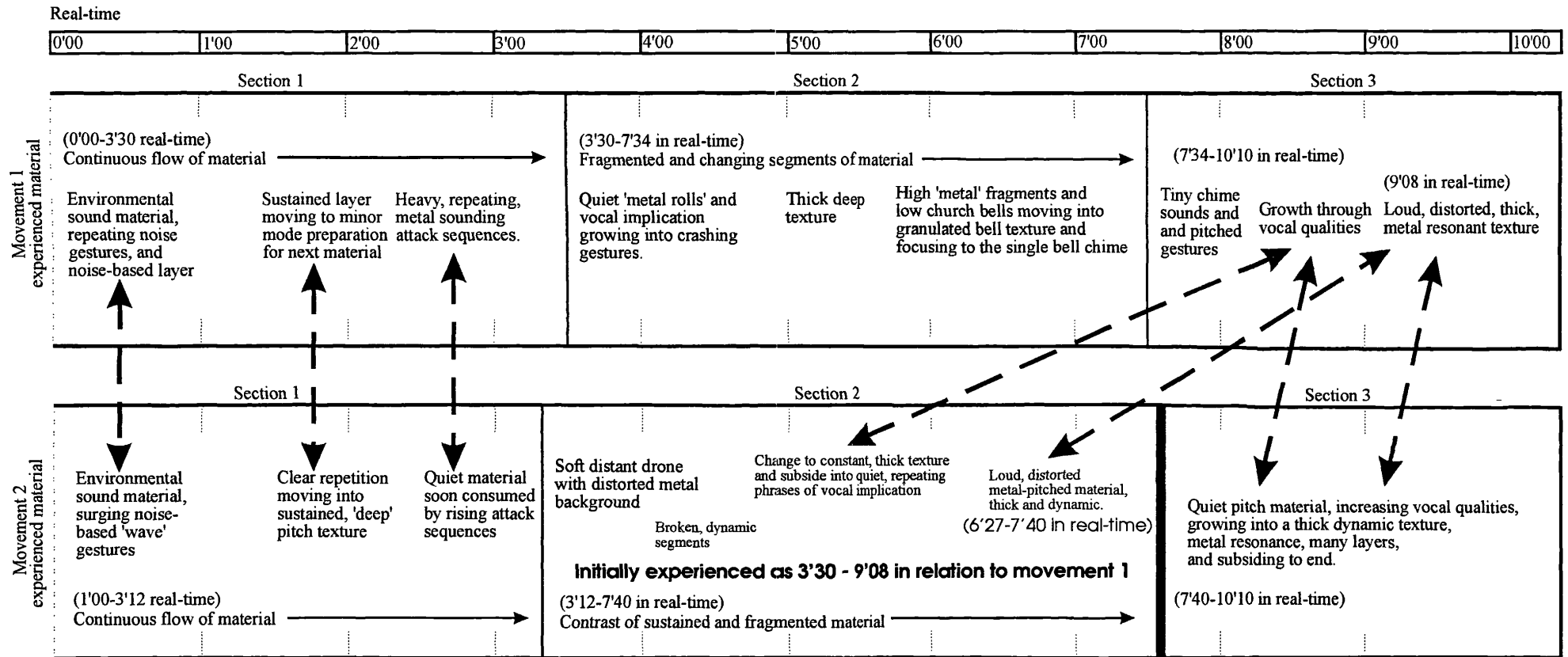
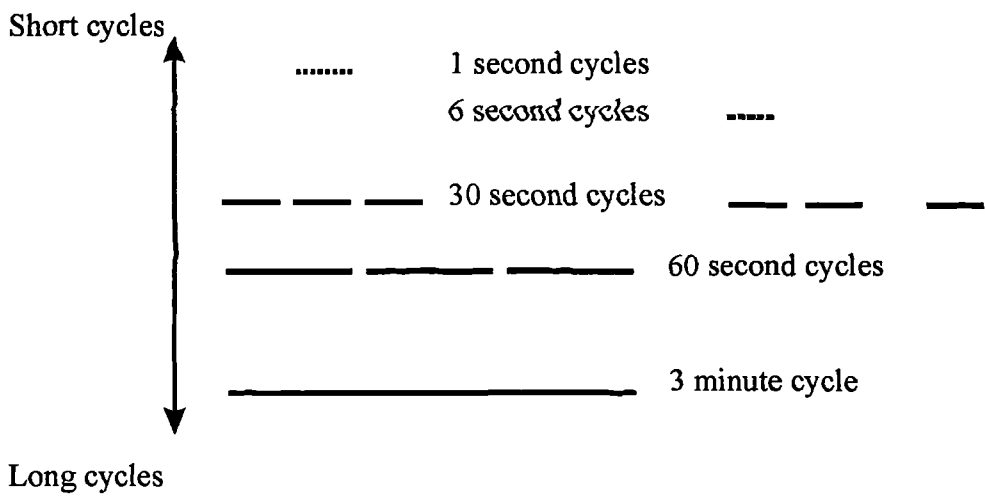


Figure 3.3 The association of materials between the two movements in 'Racing Unseen'.

After 1 minute



After 4 minutes



After 10 minutes

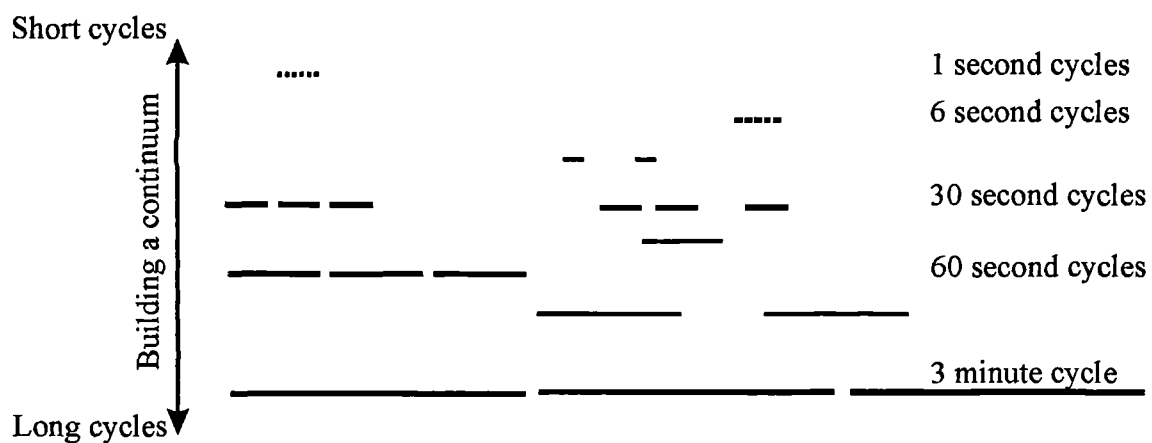


Figure 3.4 Establishing a hierarchy of repetitive cycles: a hypothetical example based on an approximation of material in 'Racing Unseen'

0'00 - 0'10
Bars 1-3

0'12 - 0'21
Bars 4 - 7

0'22 - 0'35
Bars 7 - 13

0'44 - 1'01
Bars 14 - 23

1'30 - 1'52
Bars 28 - 36

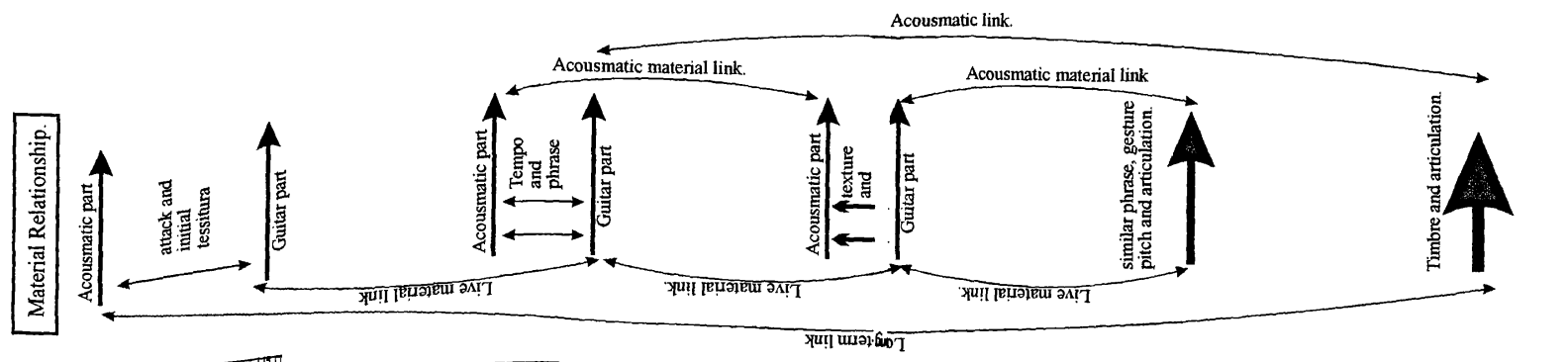
1'56 - 2'06
Bars 36 - 45

2'14 - 2'39
Bars 46 - 54

KEY
Each phrase consists of:

- ▭ Sustained material increasing in intensity.
- A detailed live instrumental texture mixed with smooth acousmatic material.
- ⋯ An attack articulation serving to terminate the previous material.

Figure 4.1 Early stages of gesture and phrase expansion in 'Imago'



Score Extract.

0 - 0'06
Bars 1-4
Violent
mf
mf
mf
mf
mf
mf

2'52 - 3'00
Bars 85 - 92
Andante
mf

3'12 - 3'23
Bars 98 - 102
Andante
mf

3'38 - 3'44
Bars 108 - 110
Co-ordination through articulation, phrase and gesture.

4'27 - 4'31
Bars 129 - 131
Repeating texture
mf
mf

Fusion through timbre and articulation.

Material Relationship.

Acoustic part
attack and initial tessitura
Guitar part

Acoustic part
Tempo and phrase
Guitar part

Acoustic part
texture and
Guitar part

Acoustic part
similar phrase, gesture pitch and articulation.
Guitar part

Timbre and articulation.

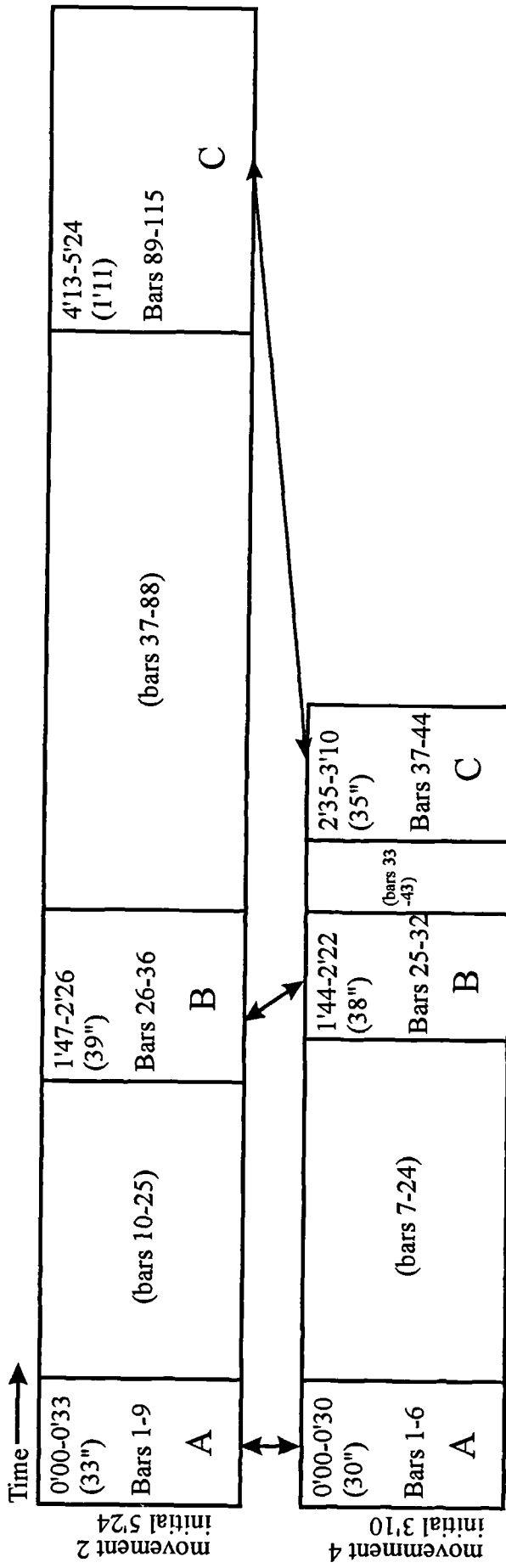
KEY

Weak relationship between parts

Strong relationship between parts.

Chronological links.

Figure 4.2 Association of materials in 'Surf'.



- A = common instrumental material
acousmatic and live material in movement two reflected in live material in movement four
- B = common instrumental material
acousmatic and live combined articulations in movement two reflected in live material in movement four
- C = movement two pitch, gesture and timbral density reflected in movement four
considerable reduction in length
- ↔ linkage between the two movements

Figure 4.3 Buoyant Charm material association between movements two and four