PORTFOLIO OF ORIGINAL COMPOSITIONS
AND ANALYTICAL COMMENTARY

A thesis submitted to the University of Manchester for the degree of
Doctor of Philosophy
in the Faculty of Humanities

2014

Donal Sarsfield
School of Arts, Languages and Cultures
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Figures</td>
<td>5</td>
</tr>
<tr>
<td>Abstract</td>
<td>8</td>
</tr>
<tr>
<td>Declaration</td>
<td>9</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>10</td>
</tr>
<tr>
<td>Introduction</td>
<td>11</td>
</tr>
<tr>
<td>Chapter One: Recording Sound</td>
<td>13</td>
</tr>
<tr>
<td>Chapter Two: Transforming Sound</td>
<td>31</td>
</tr>
<tr>
<td>Chapter Three: Organising Sound</td>
<td>51</td>
</tr>
<tr>
<td>Conclusion</td>
<td>80</td>
</tr>
<tr>
<td>Bibliography</td>
<td>82</td>
</tr>
<tr>
<td>Selected Discography</td>
<td>86</td>
</tr>
<tr>
<td>Appendix A: Additional Works</td>
<td></td>
</tr>
<tr>
<td><em>Everybody Knows Everything</em></td>
<td>88</td>
</tr>
<tr>
<td>Appendix B: Performances of Works</td>
<td>92</td>
</tr>
<tr>
<td>Appendix C: Dynamic EQ Filtering</td>
<td>94</td>
</tr>
</tbody>
</table>
Portfolio of Works

6. The Doors Piece (2012 – 2013) 29:01

Appendix

Supplementary Materials

Audio CD 1

Audio CD 2
1. The Doors Piece (2012 – 2013) 29:01

Appendix CD and USB Flash Drive
1. – 14. Sound Examples No. 1 - 14
16. The Suitcases Piece (Gallivanting) (Prix Luigi Russolo edit) (2010 – 11) 9:40
18. The Snare Piece Click Track (2011 – 12) 11:12

Scores

The Snare Piece

Final Word Count: 15227

---

1 High-resolution soundfiles are included on the USB Flash Drive.
List of Figures

Fig 1.1 Use of ‘real landscapes’ in the portfolio

Fig 2.1 Drawing illustrating image of effect of footstep underneath floor

Fig 2.2 Vertical filtering band pass of piston soundfile

Fig 2.3 Vertical filtering ‘reject’ – environment acoustic of piston soundfile

Fig 2.4 Town hall door – with visually distinguishable squeaks

Fig 2.5 Non-time stretched ‘Beyer Doorbird’

Fig 2.6 Dynamically time stretched ‘Beyer Doorbird’

Fig 2.7 Drawing of radiating coin in pocket

Fig 2.8 The first 12 inharmonic partials of a snare drum stroke

Fig 2.9 Single snare drum resonance with resonant filtered 220 Hz and 1288 Hz

Fig 2.10 Sonogram of snare resonances in The Snare Piece (1:55 – 1:56)

Fig 3.1 Volans’ visual metaphor

Fig 3.2 Structure of The Snare Piece – organised sound and snare material

Fig 3.3 Key for material in the snare drum part of The Snare Piece in Fig 3.2

Fig 3.4 Waveform of the opening phrase of The Snare Piece – A Onset Gesture (hard attacks), B Continuation Gesture (softer attacks and resonances), C Decay Gesture (buzz roll, annotated reiterations), D Termination (reinforced snare attack and reverb)
Fig 3.5 Snare onset, rhythm 1

Fig 3.6 Snare onset, rhythm 2

Fig 3.7 Snare onset, rhythm 1+2 combined

Fig 3.8 Approximate pitch information for descending and ascending sine tone-like bass figure

Fig 3.9 Deconstructing composite – *The Doors Piece* (7:16 – 7:50)

Fig 3.10(a & b) Phrase lengths of *The Luc Ferrari Piece*

Fig 3.11 Use of text and voice in the portfolio

Fig 3.12 Waveform of vocalisation used in *The Doors Piece*

Fig 3.13 Approximate notation of vocalisation in Fig 3.12

Fig 3.14 Structure of *The Doors Piece*

Fig 3.15 Sonogram of ‘C Heavy Door 8’

Fig 3.16 Sonogram of ‘Liv Men Door 3’

Fig 3.17 Demonstration of additive rhythmic process

Fig 3.18 Annotated opening of *The Doors Piece* (0:00 – 0:15)

Fig 3.19 Periodicity of the opening phrases in *The Doors Piece*

Fig 3.20 Distribution of specific sounds in Part A of *The Doors Piece*

Fig 3.21 Annotated ‘Multicut’ composite
Fig A.1 Sonogram of raw snare attacks

Fig A.2 Chords derived from raw snare attacks

Fig A.3 Original melodic material

Fig A.4 Time stretched melodic material

Fig C.1 Dynamic EQ filtering used in *The Luc Ferrari Piece* 4:06

Fig C.2 Dynamic EQ filtering used in *The Luc Ferrari Piece* 4:07

Fig C.3 Dynamic EQ filtering used in *The Luc Ferrari Piece* 4:08

Fig C.4 Dynamic EQ filtering used in *The Luc Ferrari Piece* 4:09

Fig C.5 Dynamic EQ filtering used in *The Luc Ferrari Piece* 4:10
Abstract

This portfolio of original compositions investigates how a concentrated perspective on one particular sound source has the potential to develop a perceptual link between the listener, the work and the world in which we live. To this end a contradictory approach to organising sound is employed; sounds are chosen for their intrinsic properties but are never fully removed from their referential identity. This approach is framed within a broad awareness of cultural listening, which recognises the value of the sound sources in society, but within the confines of the work these sounds operate with neutral symbolic function in order to emphasise their morphological identity. The commentary discusses the main issues arising relating to the composition of the six works in the portfolio, namely the recording, transformation and organising of recorded sound.
Declaration

I hereby declare that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning;

Copyright Statement

i. The author of this thesis (including any appendices and/or schedules to this thesis) owns certain copyright or related rights in it (the “Copyright”) and s/he has given The University of Manchester certain rights to use such Copyright, including for administrative purposes.

ii. Copies of this thesis, either in full or in extracts and whether in hard or electronic copy, may be made only in accordance with the Copyright, Designs and Patents Act 1988 (as amended) and regulations issued under it or, where appropriate, in accordance with licensing agreements which the University has from time to time. This page must form part of any such copies made.

iii. The ownership of certain Copyright, patents, designs, trade marks and other intellectual property (the “Intellectual Property”) and any reproductions of copyright works in the thesis, for example graphs and tables (“Reproductions”), which may be described in this thesis, may not be owned by the author and may be owned by third parties. Such Intellectual Property and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property and/or Reproductions.

iv. Further information on the conditions under which disclosure, publication and commercialisation of this thesis, the Copyright and any Intellectual Property and/or Reproductions described in it may take place is available in the University IP Policy (see http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=487), in any relevant Thesis restriction declarations deposited in the University Library, The University Library’s regulations (see http://www.manchester.ac.uk/library/aboutus/regulations) and in The University’s policy on Presentation of Theses.
Acknowledgements

First and foremost I would like to thank the Elizabeth Maconchy composition fellowship (administered by the Irish Arts Council) which enabled me to undertake my research, my supervisor Professor David Berezan, for his support, and my colleagues in the NOVARS community.

I would also like to thank my partner in crime Peter Campbell, and friends Sam Salem, Irma Catalina Alvarez, Chris Swithinbank, Andrew Hamilton, and my family, especially my parents for their continued support for my creative endeavours.
Introduction

“I’m not trying to seduce anyone with my music, I’m trying to get people interested”\textsuperscript{2}.

This commentary is in three chapters with each devoted to an aspect of composition: recording, transforming and organising sound\textsuperscript{3}. The focus of each of the six pieces has been on one particular sound, or person, in an attempt to show why I found each of these subjects of interest in the first place.

My research investigates how a concentrated perspective on one particular sound source has the potential to develop a perceptual link between the listener, the work and the world in which we live. To this end an internal contradiction to organising sound underlies my artistic approach: I want the listener to recognise a sound source, so that they may pay attention to the particular intrinsic properties of that sound source in future. This approach is framed within a broad awareness of cultural listening\textsuperscript{4}, which recognises the value of the sound sources in society, but within the confines of the work these sounds operate with neutral symbolic function in order to emphasise their morphological identity.

My research was guided by the observation that a lot of electroacoustic music, though technically polished, was lacking something personal. By this I mean either a clearly autobiographical subject matter or something of the more stubbornly subtle, eccentric or esoteric side to life. This is the

\textsuperscript{2} Parmegiani, Bernard (2008), \textit{Conversations with Evelyne Gayou}, Booklet accompanying INA GRM box set.
\textsuperscript{3} Although a number of terms exist to describe the use of recorded sound in a composition (acousmatic, electroacoustic, computer music, soundtrack, tape composition) I prefer to use the term ‘organised sound’, coined by Varèse in the 1920s, as it is the least prescriptive categorisation of what I do.
\textsuperscript{4} For Chion, cultural listening “\textit{turns away} (...) (\textit{without ceasing to hear it}) \textit{from the sound event and the circumstances which it reveals about its source and uses it as a means to comprehend a message, a meaning, values}”. Chion, Michel (1983), \textit{Guide to Sound Objects}. Pierre Schaeffer and musical research, English translation by John Dack and Christine North, \texttt{http://www.ears.dmu.ac.uk/IMG/pdf/Chion-guide/GuideSectionI.pdf}, EARS site (ElectroAcoustic Research Site) (accessed 01/08/2013).
area I have set out to explore in my research; the subject of the personal through sound.

Chapter One discusses the issues of recording sound, recording techniques and how recording relates to the subject matter of a piece. The process of field recording is explained, alongside the technical challenges of sourcing material directly in its ‘natural’ environment, and the means by which the recording process can, in and of itself, alter the means by which an ‘everyday’ sound is expressed within the final composition. Questions relating to the inherent meaning/metaphorical use of sound are discussed and the place of ‘real landscapes’ within the portfolio is also explained as one means of developing an altered perception of the sonic material in use.

 Whilst it is important to my aims that my work is created with fundamentally recognizable source material, Chapter Two addresses my employment of transformations across the portfolio and their use in the creation of longer textures and sustained morphologies, acting as an environment contextualizing the main focus of the piece, and offering a broader palette from which to develop a deeper appreciation of the intrinsic properties of the material resulting from the recording process explained in Chapter One. The aesthetic questions arising from the use of transformations are also addressed.

 Finally, Chapter Three looks at issues relating to the organisation of sound on a small, medium and large scale by presenting three specific examples of composite soundfiles: a structural analysis of The Snare Piece and an analysis of the opening of The Doors Piece. Also addressed are issues relating to organising sound and instrument, the use of text as a structuring device to offer a ‘commentary’ within the pieces in some cases, and the methods of organising a multiplicity of perspectives into a concentrated account of one particular sound source/sound type.
Chapter One - Recording Sound

“Schaeffer considered that the most revolutionary element of concrete music had not been the discovery of new machines or sounds, but the discovery, by the ear, of new potentialities”

This chapter investigates the relationship between subject matter and sound recording and describes the development and refinement of the recording technique used throughout the portfolio. Since the vast majority of material originated as field recordings, and as I allowed the recording process to dictate some aspects of the compositional process, it is important to establish my approach to recording in an effort to illuminate how and why I recorded the sounds that I did.

The subject matter – why record this sound?

“The faculty of creating is never given to us all by itself. It always goes hand in hand with the gift of observation. And the true creator may be recognised by his ability always to find about him, in the commonest and humblest thing, items worthy of note”.

The subject/concept for a piece acts as the ‘key in the ignition’. It provides both constraint and focus to the act of recording. The choice of the subject for each piece was guided by listening: at a certain point I moved from hearing a sound to paying attention to its inherent properties. This way of listening demonstrates Schaeffer’s concept of ‘reduced listening’:

“Reduced listening is the listening attitude which consists in listening to the sound for its own sake, as a sound object, by removing its real or supposed source and the meaning it may convey... In reduced listening, our listening intention targets the event which the sound object is in itself (and not to which it refers) and the values which it carries in itself (and not the ones it suggests)”.

---

7 Be this to a recording, in concert, or in a service station on the M6.
8 The two exceptions to this approach are The Luc Ferrari Piece and Everybody Knows Everything (discussed in Appendix A).
9 Chion, Michel (1983), Guide to Sound Objects. Pierre Schaeffer and musical research, English translation by John Dack and Christine North,
The sound recorded, however, is not the thing itself: it becomes something else through the process of recording. What that something else is has been written about at great length over the past half century: objet sonore\textsuperscript{10}, mimesis\textsuperscript{11}, poietic or esthetic\textsuperscript{12}, landscape\textsuperscript{13}, source bonding\textsuperscript{14}. When I use the sound of a door in my piece I am not trying to represent or symbolise a real door: I am only interested, to paraphrase Stravinsky, in how a ‘sound expresses itself’\textsuperscript{15}.

I did not decide a priori that I would record a door, until I heard a door which sounded so good that my attention was unconsciously drawn to the inherent properties of that sound. A large number of doors were recorded for The Doors Piece but the reason for choosing the sounds I used in the piece normally depended on a range of criteria:

- the quality of the recording
- the morphology of the sound
- the potential of the sound to create and elaborate relationships\textsuperscript{16} with

\begin{itemize}
  \item \url{http://www.ears.dmu.ac.uk/IMG/pdf/Chion-guide/GuideSectionI.pdf}, EARS site (ElectroAcoustic Research Site) (accessed 01/08/2013).
  \item Stravinsky, Igor & Craft, Robert (1962), \textit{Expositions and Developments}, London: Faber & Faber, p. 101. Speaking in 1962 about his remark that ‘music is powerless to express anything at all’ Stravinsky aims to clarify his position stating, ‘I stand by the remark, incidentally, though today I would put it the other way around: music expresses itself’. For me how a sound expresses itself \textit{within the context of the piece} is of primary importance.
  \item The most common relationship between the sounds in each piece is that they are drawn from similar \textit{types} of sound sources, e.g. doors, footsteps, snares.
\end{itemize}
other sounds, and
• the fact that some doors sound better than others\textsuperscript{17}.

I was always interested in what a sound \textit{sounded} like, not what it meant, or could mean. I was not interested in exploring or exploiting the relationship between reality and abstraction, but rather in creating works which were, to quote the photographer, curator and critic John Szarkowski, “not factually impeccable but seamlessly persuasive”\textsuperscript{18}. To highlight the sonic properties of a sound, it must be treated differently than if it were to be used metaphorically. The sounds of doors do not, for example, ‘open’ or ‘close’ parts of \textit{The Doors Piece}. The pattern of door attacks which appear at the start of that piece are shaped into a rhythm which to my ear would not be out of place played on percussion\textsuperscript{19}.

If we take the example of how a door sound is used in Harrison’s \textit{Unsound Objects}, Dhomont’s \textit{Novars}, and Wishart’s \textit{Red Bird}, we can examine how composers have used this particular sound type within the context of organised sound. Hirst has summarized that in \textit{Unsound Objects} Harrison uses the door sound “to initiate or terminate sections or processes”\textsuperscript{20}, whereas in \textit{Novars} the sound that sweeps across the stereo field in the opening section suggests it is derived/synthesised from a recording of a

\textsuperscript{17} Through the process of audition certain sounds stand out above others for the composer for reasons which are sometimes inexplicable.

\textsuperscript{18} Szarkowski, John (2002), \textit{William Eggleston’s Guide}, 2\textsuperscript{nd} Ed., New York: Museum of Modern Art, p. 7. My approach to recording sound was greatly influenced by reading Szarkowski’s writing on photography, not necessarily in \textit{what} I recorded, but \textit{how} I recorded.

\textsuperscript{19} Although this pattern of attacks never lose their ‘door’-ness, they are treated more as attacks. It is a balancing act between composing a phrase so that it is flexible, but not restricting the repetition so that the pattern becomes predictable. Once that happens the listener ‘switches off’ – and the pattern stops being listened to as a shifting pattern of door attacks and starts to be heard primarily as a repeating rhythmic object, in which the rhythmic properties of the phrase attract the listeners attention more than the morphological properties of the sounds themselves.

\textsuperscript{20} Hirst, David (2013), Connecting the Objects in Jonty Harrison’s \textit{Unsound Objects}, \url{http://www.orema.dmu.ac.uk/?q=content/connecting-objects-jonty-harrison%E2%80%99s-unsound-objects} (accessed 01/08/2013).
door sweep. Here (and in other works by Dhomont\textsuperscript{21}) the sound of a door functions on a number of levels, both symbolically and metaphorically.

In \textit{Red Bird}, Wishart uses a number of sound types, each of which “carries a symbolic weight established in the unfolding of the piece”\textsuperscript{22}. The construction of “complex nets of meaning and allusion”\textsuperscript{23} across the work are controlled by Wishart’s remarkable technique, in particular his handling of perceptual transformations\textsuperscript{24}. The door sounds used in \textit{Red Bird} support the dramatic scope of the piece, to explore and articulate the “opposition between open and closed conceptions of the world”\textsuperscript{25}.

In all three works perceptual correlations between sound types occur within the confines of the piece, but do not extend beyond it: listening to \textit{Red Bird} or \textit{Unsound Objects} does not sharpen awareness to the sounds of doors in daily life, in the way which I aim for in \textit{The Doors Piece}. My research proposes that a concentrated perspective on one particular sound source can develop a perceptual link between the listener, the work and the world in which we live. Across the portfolio a large percentage of the

\textsuperscript{21} For Dhomont the sound of a door is a potent symbol, it is not just the sound of a door. That all three works of his \textit{Cycle des profondeurs} feature the sounds of doors cannot be accidental. In \textit{Novars} Dhomont uses direct quotations from Schaeffer’s \textit{Etude aux objets} together with Machaut’s \textit{Messe de Nostre Dame} to draw a poetic and symbolic link between the arts nova of the 14\textsuperscript{th} century and the discovery of musique concrète. By referencing Henry’s infamous door Dhomont pays homage to the work of Pierre Henry and his role in Schaeffer’s journey. In \textit{Forêt Profonde}, the sound of a creaking door in the third movement, or rather the attempted unlocking of a latch, is suggestive of an opening up, or letting in of something that is locked away for good reason. The continued attempt to open the lock (contextualised by the sounds which surround the door opening – a quick intake of breath and the phrase ‘Tis nothing, love...Try to sleep’) connote that the sound of the door signifies an entrance of something that could raise concern.


\textsuperscript{24} These perceptual transformations can mediate between two distinct sounds thus the sound of a slamming book transforms into the sound of a door closing.

\textsuperscript{25} Wishart, Trevor (1996), \textit{On Sonic Art}, p. 168 (original emphasis).
soundfiles are untransformed to allow the potential for the listener to
discover a perceptual correlation of their own. I want the listener to
recognise the sounds, so that they may pay a little more attention to the
inherent sonic properties of that sound in future. Although this artistic
approach presents a contradictory point of view, it is driven by a desire to
create new contexts for clearly recognisable sounds. As Waters notes when
writing about the contemporary cultural context in acousmatic music, “it
is no longer innovation in material but the context in which that material
is used or experienced that determines what it might mean”\textsuperscript{26}.

Nevertheless, as Wishart states, “in putting together a sonic architecture
which uses sound-images as metaphors, we are faced with a dual
problem. We must use sound transformations and formal structures with
both sonic impact and metaphorical import”\textsuperscript{27}. It is not meaning, but a
clearly metaphorical handling of material that is avoided in the portfolio
where possible. In an effort to highlight the sonic properties of a sound,
the material is organised in such a way as to negate the metaphorical
import of the clearly referential sound sources.

That these sounds (clapping, footsteps, doors) are all pervasive but seldom
noticed is useful for my purpose: I simply want people to pay more
attention to sound. These works point to and are made with sounds that
appeared to the composer’s ear\textsuperscript{28}. This approach to using recognisable
subject matter within an artistic medium is similar to the use of letters and
numbers in the work of the American painter Jasper Johns:

“\textit{These were things people know, and did not know, in the sense}
that everyone had an everyday relationship to numbers and letters,
but never before had they seen them in the context of a painting. I

\textsuperscript{26} Waters, Simon (2000), Beyond the acousmatic: hybrid tendencies in
electroacoustic music, \textit{Music, electronic media, and culture / edited by Simon
Emmerson}, Aldershot: Ashgate, p. 70.
\textsuperscript{27} Wishart, Trevor (1996), p. 166.
\textsuperscript{28} Smalley (1997) warns against the dangers of the composer’s ear relying
upon the specialised listening mode of reduced listening, as it strips ‘extrinsic
threads’ from a sound, and can cause ‘perceptual distortions’ by shifting a
focus on background, rather than foreground components of sound.
However, perhaps the composer wants to distort perceptions?
wanted to make people see something new. I am interested in the idea of sight, in the use of the eye. I am interested in how we see and why we see the way we do.”

**Turning subject into sound**

Greenburg argues that, “once decided upon the subject in a way dictates a number of compositional decisions.” If the subject matter of each piece is identified in its title, then these sounds form the main, but not exclusive, focus of each piece. The idea of the subject dissolves in the process of composition when the actuality of working concretely with the sound takes over and the process of repeated listening induces a sort of prolonged contemplation of the potential of the sounds.

**The why of recording**

All recording captures sound, but the concerns of the composer can affect what the composer is looking for in a recording. The art of recording can be used both to discover material, and to capture particular sonic properties. Why a composer sets out to record can perhaps reveal which of these two poles the composer is closer to. If we compare Dhomont’s *Forêt Profonde* and Ferrari’s *Far West News* we can see how this why of recording affects the process of composition.

The subject matter for both pieces acts as a conceptual frame/focus for gathering materials: for Ferrari this was the American Far West, for

---

31 Since transformational processing can transform sound to almost any degree, I never restricted myself to only using the sounds derived from one source, or sound type. The goal is to consider a range of means by which the perception of a sound may be altered, or refreshed.
32 Stepping outside of the categories of ‘acousmatic melodrama’, ‘radiophonic’ or ‘anecdotal works’, the method of gathering materials for these pieces was the same: with a microphone and recorder. By which I mean these pieces were made in exactly the same way – what distinguishes them is the means of expression.
Dhomont, psychological exploration of the depths of fairy tales through the medium of acousmatic art$^{33}$.

“Acousmatic art is the art of mental representations triggered by sound”$^{34}$.

In order to create *Forêt Profonde* Dhomont judged carefully what he needed *before* he set out to record$^{35}$ (the Bettelheim, Shakespeare and fairy tale texts, Schumann’s *Kinderszenen*). All of the elements of the piece serve the role of subject matter; they serve Dhomont’s interest and effort to explore the potential of the acousmatic medium. Through the process of travelling around America and recording what he found, Ferrari knew that he would *find* the material of *Far West News* and listening back *after* would reveal material that he could use in the piece. This approach is more open to chance, and could be described as more Cageian than Schaefferian in spirit.

“The act of recording – that is, the way in which you capture a sound - was a creative gesture in and of itself”$^{36}$.

If we step back even further we can see a distinction emerging between studio based recordings$^{37}$, and field recordings: the full spectrum from complete control to total chaos. Since recording in ‘the field’ is unpredictable, it can be assumed that certain sounds were not necessarily considered for use in a composition until the composer heard them. Although recording in a studio still offers some potential for such accidents to arise, these discoveries will only occur with whatever sound sources the composer brings to the studio. This is not to say that Dhomont did not discover material by accident, or that Ferrari did not plan where he would

$^{33}$ And the capacity of acousmatic art to project images in the mind of the listener.
$^{34}$ Dhomont, Francis (1996), Is there a Quebec sound?, *Organised Sound*, 1, Cambridge: Cambridge University Press, pp. 24-25.
$^{35}$ Or use recordings of, as in the incorporation of Schumann’s *Kinderszenen*.
$^{37}$ Which is where most of the recordings for *Forêt Profonde* were recorded.
visit without some idea of the soundscape of that area but their attitude to recording demonstrates a fundamental difference of approach to the *why* of recording: *to discover, or, to capture sounds*.

For my own work I knew what type of sounds I wanted to record\(^38\) but I did not know exactly what they would sound like or indeed where I would find them, until I heard them myself. Where I found a good sounding door had as much to do with chance as it did to with careful consideration of where a good sounding door might be found\(^39\). As my research investigates the means by which ‘everyday’ sounds can be reconsidered anew, it was important that I *find* these sounds, as a listener might, rather than *construct* them.

The main exception to this approach was the gathering of materials for *The Luc Ferrari Piece*. In 2011 the *Association Presque Rien*\(^40\) offered fifty-one soundfiles from the archive of Luc Ferrari\(^41\) for use in the creation of new works. Whilst this may seem like a fundamentally different approach to creating a piece, I was presented with material which was controlled and limited by my own acts and choices, yet in other ways beyond my control. The tension between these two poles was again fundamental to the creation of the piece. In this instance knowing very little about the recordings helped to treat the material objectively, and not as meaning-carrying devices\(^42\).

---

\(^38\) Once decided upon the subject provides a focus on what to listen out for and what to record. While *searching* for a good sounding door I may have come across another sound that I found of interest.

\(^39\) For example in old buildings spread across a university campus.

\(^40\) “Presque Rien” Prize 2011, run by *Association Presque Rien*.

\(^41\) I have been drawn to the work of Luc Ferrari for a number of years, so the decision to make a piece with his soundfiles was based more on my appreciation of his work than the intrinsic properties of the soundfiles themselves.

\(^42\) Only rudimentary information was given, usually just the place and year of recording, e.g. 048, *Portrait-Spiel: Machine à sous Kunsthalle Baden Baden, Juin 1971*. 
The use of recorded sound for creative purposes

The technological ability to record sound (and, by implication, any sound) radically altered the relationship between both how we listen to sound and music, and what we listen to. The use of field recordings for primarily creative, rather than documentary or broadcast purposes dates back to the late 1940s and Pierre Schaeffer’s investigations at RTF (French National Radio). For the composers of the post war generation, this discovery was one strand in a complete reappraisal of the fabric of music. Due to the inexhaustible possibilities in the range of sounds that can be extracted from the surrounding environment, this process has continued ceaselessly to this day. Whilst this process of exploring sound remains, what has perhaps changed the most, however, is the technical means of capturing sound.

Recording equipment

As would be expected from the nature of my research interests, as outlined above, nearly all of the recordings in the portfolio were made ‘in the field’, recorded either on an Edirol R44 or Zoom H4 recorder, and, usually, with a pair of omnidirectional 4060 DPA microphones. These small microphones offer high quality recording relative to their size, can be placed almost anywhere (including positioned discretely on one’s person) and have long cables to facilitate flexible microphone placement. As Yewdall notes omnidirectional recording in the field can be both a blessing and a curse,

“The good thing about the omnidirectional microphone is that it has a relatively even pattern that picks up everything around it. The bad thing is that it has a relatively even pattern and that it picks up everything around it”.

---

43 Recording, transforming and organising sound connects such disparate composers as Matmos, Phill Niblock, Chris Watson, Hildegard Westerkamp, Gilles Gobeil, Michel van der Aa.
44 In most instances I recorded alone, and without headphone monitoring.
Field recording technique

By its very nature, field recording is not simply a matter of identifying and capturing sound, but rather a continual process of problem solving and testing oneself against the unknown. Despite these challenges, I favoured recording in the field as the sounds I wanted to record were mostly not transportable to a neutral acoustic environment but more importantly as noted recording in the studio greatly reduces the possibilities of unplanned discoveries. ‘In the field’ one has to respond quickly to the environment, to capture sound before a unique opportunity passes. By immersing myself in field recording, I gradually acquired a solid knowledge of what constitutes a good quality recording. Once I had mastered this process on a technical level I started to experiment with different recording techniques, which often produced interesting, and surprising results – the controlled unpredictability of field recording allowing the serendipitous to be captured, transformed and organised.

Unexpected alignments

The act of recording can often capture unexpected alignments or tangents between events which may go unnoticed at the point of recording. However, what can go unnoticed during recording can be brought into focus for the listener by the act of composition. When I was recording a creaking toilet door used in The Doors Piece (8:40 – 9:36) I felt that the tuning up of the ensemble further down the corridor was spoiling the recording. Upon listening back I found the relationship between the two sonic events created a dynamic interaction that was not present when the door was recorded alone. In that recording the discernable pitch (‘concert

---

46 In some instances I recorded sound sources in the studio as recording elsewhere would only have added unnecessary atmosphere to the recordings (e.g. the poetry reading of MacNeice and Auden, some single hand claps, and the ebow on the snare drum).
47 For example recording hand dryers in toilets combined a technical challenge with fleeting opportunity.
48 Perhaps the distinction between experiment and luck is best left undefined.
49 More than half of the recordings which feature in The Doors Piece are from toilet doors.
A’ at 440 Hz) in the background accentuates the harmonic profile of the
door. Indeed the creak becomes contextualized by the activity of the
ensemble: almost in tune with their pitch, but not quite.

For *The Footsteps Piece* (4:20 – 6:12) I recorded a number of footsteps in a
variety of places. On one occasion, in Venice, whilst recording my
footsteps, the bells of St. Mark’s started to ring. When listening back to this
recording the bells could be heard *in equilibrium* with my footsteps: I had
involuntarily responded to the rhythm of the bells with the speed of my
walk. Had I been much closer to the bells my footsteps would not have
been audible. In this instance the recording of the bells was used primarily
for their rhythm, not for any ecclesiastical or metaphorical purpose. As
with the previous example, the relationship between disparate elements
can be framed seamlessly within a sound recording.

**Lightning doesn't strike twice**

Recording allows you to capture lightning. *The Snare Piece* acts as a frame
for the recording of a street performance of a Shakespeare soliloquy. The
various elements of this scene could have been conceived in the studio: a
young American reciting the soliloquy from Act V, Scene V of
Shakespeare’s *The Life and Death of Richard II*, a snare drum playing a
marching beat at fluctuating tempo, an audience clapping, some wind
noise, some closely recorded voices of people commenting upon the
performance. The snare drum could then have been panned, filtered and
dynamically adjusted to suggest it was approaching from the horizon
until it was passing in front of the microphone. That said, the effort and
time required to create such a peculiar scene would almost certainly
prohibit its creation in the studio. Being practiced in, and committed to,
field recording meant that I was prepared when lightning unexpectedly
struck in Stratford upon Avon on a Saturday morning, simply because I
was lucky to have a recorder with me. That scene presented itself whole
and I recognised that when I listened back to the recording: lightning
doesn’t strike twice. The ability to record sound ‘in the field’ allows for

---

50 I was about 750 metres away, as was the microphone.
unexpected rich sonic events, like the one above, to be captured and incorporated into larger sonic structures.

**Real Landscapes**

Sometimes what I recorded was so vivid (as in the last example) that to transform the recording would be to obscure the qualities that defined it. I would classify these detailed recordings as real landscapes, where a near perfect balance of elements is captured to create a coherent “aural image of real sounds in a real acoustic space”. Examples of these real landscapes feature throughout the portfolio (see Fig 1.1), and are usually embedded within a synthesised background texture, which helps to conceal the distinct acoustic properties of a soundfile, while also unifying the ‘surface’ of a piece. These real landscapes generally operate over a wider expanse of time than the rest of the material in the pieces and offer contrasting energy, behaviour or density of sonic information in relation to what proceeds or follows them; for example in *The Luc Ferrari Piece* the continual development and elaboration of short gestures in the first part (0:00 – 7:30) balances with the large single real landscape in the second part (7:31 – 12:03). Similar contrasting use of real landscapes occurs in *The Clapping Piece* (0:44 – 1:02) and *The Snare Piece* (3:28 – 4:10).

I would classify a real landscape as a recording that requires no further method to create a coherent sonic image (as relates to Volans’ concept of ‘material, method and image’ discussed at the start of Chapter Three). In each instance the sonic image is of ‘real’ sounds in a ‘real’ acoustic space. Barreiro defines the concept of a sonic image as:

> “mental representations motivated by sonic stimuli that reach the listener in an acousmatic listening situation and that can be

---

51 See Wishart (1996), for a further discussion relating to the theory of landscape in sonic art.
53 When they appear in a piece a real landscape is always the main focus of that section. Although all recordings have the potential to act as real landscapes what constitutes a specific recording as a real landscape depends on the context created within a piece.
determined by a focus on either the intrinsic or extrinsic aspects of sound – or even a combination of both.”54

<table>
<thead>
<tr>
<th>TITLE</th>
<th>TIMING</th>
<th>SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Clapping Piece</td>
<td>(0:44 – 1:02)</td>
<td>Sharp cut into soprano note, silence, crowd applause</td>
</tr>
<tr>
<td>The Suitcases Piece</td>
<td>(7:00 – 7:55 and 10:34 – 11:09)</td>
<td>Suitcase going over cobblestones and ramp / train announcement from perspective of suitcase wheels</td>
</tr>
<tr>
<td>The Footsteps Piece</td>
<td>(4:20 – 6:12)</td>
<td>Walking in Venice with bells</td>
</tr>
<tr>
<td>The Snare Piece</td>
<td>(3:28 – 4:10 and 9:20 – 10:20)</td>
<td>Shakespeare soliloquy and marching snare drum</td>
</tr>
<tr>
<td>The Luc Ferrari Piece</td>
<td>(8:15 – 12:03)</td>
<td>Real landscape with wind, cowbell, flute, dog</td>
</tr>
<tr>
<td>The Doors Piece</td>
<td>(8:40 – 9:32, 18:18 – 18:45 and 21:23 – 22:40)</td>
<td>Tuning up toilet door, runner in tunnel, opening of the train door with aeroplane passing overhead</td>
</tr>
</tbody>
</table>

Fig 1.1 Use of ‘real landscapes’ in the portfolio

While Truax notes that one of the primary intentions of the soundscape composer is to “enhance the listeners awareness of environmental sounds”55 I would not classify these real landscapes as soundscapes, as within the context of each piece they usually serve to change the rate of change (as exemplified in the use of the scene in *The Luc Ferrari Piece*).

Static microphone position

All sound recordings have the potential to be inscribed with a significant level of detail\textsuperscript{56}, but where the microphone is placed in relation to the sound can heighten particular qualities over others. When recording a moving sound source a static microphone placement offers a panoramic vantage point, which can help to create a sense of depth within the stereo field. Recordings using this type of microphone placement feature throughout the portfolio\textsuperscript{57}.

Moving microphone

A physically moving microphone, on the other hand, can create a sense of forward motion, quite literally, in the recording. The panoramic opening door\textsuperscript{58} sound in \textit{The Doors Piece} (3:47 – 3:51) was captured by placing one DPA microphone close to the hinge, while the other was placed at the door handle (see Fig 2.4 for the sonogram of the recording). The sound is immediately identifiable, but by placing the microphones in different locations the stereo image is split into an unusual spatial spread across the left and right channel. When played back the recording suggests that the width of the door is the same distance apart as that between the stereo loudspeakers projecting the sound.

Attitude to recordings – favouring the peculiar

The process of field recording allowed me to make use of recordings with distinctive or peculiar features such as a particularly wide stereo spread, or some unusual balance of elements. In \textit{The Suitcases Piece}\textsuperscript{59} (10:34 – 11:10),

\textsuperscript{56} For example spatial information, spectral occupancy, morphology, amplitude.
\textsuperscript{57} Particularly pertinent examples can be found in \textit{The Clapping Piece} (2:48 – 3:04), \textit{The Footsteps Piece} (8:43 – 9:00) and \textit{The Snare Piece} (9:20 – 10:10).
\textsuperscript{58} See Sound Example 1 on the Appendix CD, where the motion of the door and the creak of the hinge feature in separate channels. This unusual spatial spread is why I chose to use that particular recording of a door opening. All sound examples can be found on the Appendix CD/USB Drive.
\textsuperscript{59} See Sound Example 2.
for instance, the train announcement is heard from the perspective of the wheels of the suitcase travelling over a ribbed concrete ramp. Here, the microphones were hung from the top of the suitcase to get as close as possible to the sound of the wheels. When listening back\textsuperscript{60} I found the perspective of the recording appealing because the location of the microphone framed two clearly identifiable sources into a curious, unexpected whole. Although not all the speech is clearly audible, due to context (and automated speech inflection), the text is identifiable as a station announcement. What mattered was that the train announcement is heard from the perspective of the suitcase, and vice versa, capturing a natural perspective of foreground and background within the recording itself.

**Environment as filter**

All recordings capture the presence of a sound within a given space\textsuperscript{61}, and the physical properties of the environment can naturally filter or mask attributes of the sound. This was the case in the recordings of the suitcase\textsuperscript{62} made in the passageway beside NOVARS\textsuperscript{63} for *The Suitcases Piece* (1:22 – 1:34 and 1:39 – 1:50). In this instance, the slim passageway between the buildings reflected the sound of the wheels on cement, accenting the mid-range frequencies. Two large diaphragm condenser microphones were positioned at the end of the passageway to capture the approaching and receding of the suitcase as it passed from one distinct acoustic space into another. For *The Clapping Piece* most of the clapping was recorded in a

---

\textsuperscript{60} Many long recordings were made capturing the typical journey of a suitcase – controlling the setting and main sonic elements, but what occurred in the periphery (‘in the field’) was unknown – in this case, I was recording my suitcase on the travelators at Manchester Airport en route to the train station.

\textsuperscript{61} Thus impacting on the resonance or reverberation profile of the sound.

\textsuperscript{62} See Sound Example 3.

\textsuperscript{63} NOVARS Research Centre, The University of Manchester. The passageway is about 8 metres long, 1 metre wide and has high walls on either side which reflected the sound of the wheels as it passed through it. The passageway leads into a courtyard type square.
medium sized concert hall, which coloured all these recordings with a similar reverberant profile\textsuperscript{64}.

In a more controlled environment, there is the possibility of making multiple recordings of a sound source simultaneously. In the studio when recording the ebow\textsuperscript{65} on the snare guts I positioned two omnidirectional microphones inside the snare drum, as well as two large diaphragm condenser microphones a few inches outside the drum. Here the double stereo recording technique offered three closely related recordings of the same sound source: omnidirectional, large diaphragm condenser, or both combined.

\textbf{Recording distance / proximal information}

The issue of recording distance is often overlooked and although it is often hard to resist the temptation to place the microphone as close as possible to any sound source, especially when the opportunity allows, as my recording technique developed, I came to agree with Szarkowski that “closer is merely easier, not necessarily better”\textsuperscript{66}. The closer the microphone to the sound, the greater the level of detail; but this close microphone technique also “effectively excludes the acoustic environment”\textsuperscript{67}. If the composer requires a more accurate “disposition of a sound with a space”\textsuperscript{68} then more often than not a more distant microphone placement would be preferred.

To capture a detailed recording of the point of contact between a footstep and a wooden floor in \textit{The Footsteps Piece}\textsuperscript{69} (0:01 and 0:34 – 0:39) two omnidirectional microphones were placed almost at ground level, close to

\textsuperscript{64} Layering multiple recordings made in a single environment on top of each other very quickly highlights any distinctive room features (such as a high frequency buzz from the lighting).
\textsuperscript{65} A hand-held electronic bow for guitar.
\textsuperscript{67} Huber, David Miles, & Runstein, Robert E. (c1997), \textit{Modern Recording Techniques}, London: Focal Press, 5\textsuperscript{th} ed., p. 113.
\textsuperscript{68} Wishart, (1996), p. 146.
\textsuperscript{69} See Sound Example 4.
my feet. A close microphone position captures the point at which the heel, followed by the ball of the foot, made contact with the floor. The natural acoustic of, in this case, the large tiled room ‘coloured’ the recording but only enough to add some natural reverberation. A similar technique was used for The Suitcases Piece (1:17 – 1:18 and 3:42 – 3:44) where the microphones hung from the suitcase as it passed over a steel ridged raised ramp. A preference for close microphone technique can also be concerned with amplitude: the quieter the sound, the harder it is to record at any distance. In The Doors Piece (23:46 – 25:02) a close microphone technique enabled me to capture the movement of air being sucked underneath a door.

**Approach to using multiple recordings of a single sound source**

Using multiple recordings of a single sound source is consistently explored throughout the portfolio, and was guided by a desire to extract the wealth of detail available from a single sound source. Although I had recorded a number of multiple single source sound files before (hand claps, footsteps and snares) The Doors Piece was an attempt at using a succession of similar sound files individually to create something more concentrated and sustained on a larger scale.

When listening back to the same door I had recorded a number of times I discovered that each recording was slightly different, whether due to the force of the pulling motion/degree of tension in the spring, or the position of the microphone in relation to the sound source. I decided to work with these multiple recording of a single sound source in an effort to exploit a continuum of similarities and dissimilarities available from one sound source/typology. If we examine the three door attacks (19:10 – 19:15) although we can identify that they are very similar, the spatial position, decay profile, spectral density and reiterative response to the force of the main attack are all slightly different with each recording. Although the

---

70 See Sound Example 5.
71 See Sound Example 6.
72 In The Clapping Piece (0:17 – 0:44) the multiple recordings are quickly accumulated into layers, masking the distinctive qualities of each clap.
differences between these sounds could in theory have been achieved through the transformation of one door recording, the time taken to produce these results in the studio would have been prohibitive (if indeed I could have imagined what I was looking for). In this respect I feel that the use of multiple recordings of a single sound source can in itself act as a transformational agent if it allows the composer to create a series of closely related, but distinctive soundfiles. The use of multiple recordings demonstrates the range of possibilities that a single sound can provide, and thus provide the space to deepen the listener’s experience of that single sound type.

By the end of the portfolio most of the material was handled in an untransformed state, however the act of transforming a sound can greatly increase the options available to a composer when organising sounds on a global scale, and in seeking to open up the possibilities of my material, transformation also proved to have a vital part to play in the composition of these pieces.
Chapter Two – Transforming Sound

“The capacity for electroacoustic music to project and manipulate sonic images is now acknowledged as a cornerstone of the medium’s aesthetic potential.”

This chapter explores the role of transformation across the pieces, examining how my approach to transforming sound evolved over the course of the portfolio.

Why transform recorded sound?

As with the technology of recording, the tools to transform recorded sound have developed dramatically over the last fifty years. With the advent of digital signal processing the various transformational options available to the composer are almost unlimited. Some composers transform sounds to accentuate the properties of the original recording while others use transformations to create sounds not otherwise available.

As stated in Chapter One I tried to make pieces which are “not factually impeccable but seamlessly persuasive.” I thus transform sounds to both increase the sonic palette/spectrum available for use, and also to accentuate the properties of a certain sound. The purpose of each transformation is entirely based on the context of the piece, but all the transformations are extracted from sounds which I found of interest in their original state. When trying to craft an image I do not draw a distinction between transformed and untransformed sound. The act of transformation is not an end in itself, but rather lays the groundwork for the eventual organization. It is the place of a sound in an overall organizational framework that matters most (see Chapter Three).

Attitude to transformations

“If sound objects are used which do reveal their causal origins and are exploited by the composer for these qualities, they will have a

73 Young, John (2007), Reflections on sound image design in electroacoustic music, Organised Sound, 12 (1), pp. 25.
75 Meaning that I did not record a sound for its transformational potential.
“double meaning”. Their intrinsic sound characteristics will be apparent but so will their reference to a source. It is the composer who must decide whether to choose to abstract features and suppress reference or vice versa.\textsuperscript{76}

Sound transformation can be guided by a number of factors: aesthetic approach to sound, the amount of material available to a composer, a desire to create new sounds or develop a network of relationships between a sound and its transformation, or simply to keep the listener engaged. Westerkamp’s \textit{Kits Beach Soundwalk} is one of the clearest examples of a purposeful transformation: she exaggerates some aspects of the sound to entice the listener to continue to listen\textsuperscript{77}. Wishart’s \textit{Imago}, on the other hand, explores extensive transformations of a single sound source, the clink of two whiskey glasses, to explore the “surprising richness of possibilities”\textsuperscript{78} available from one sound source.

Transforming sound can be as much about the transformational process as it is about the relationship between original and transformed sound. In \textit{The Clapping Piece} the transformations push the sound sources into unrecognizable morphologies, but those transformations are always related to the context of the hand clap. In general, then, the works in the portfolio do not explore perceptual connections between an original sound and its transformations\textsuperscript{79}, nor are there extended morphological transformations, or investigations to try and ‘get inside the sound’. The tendency of acousmatic pieces to try and ‘get inside the sound’ relates closely to the metaphor of microphone as microscope. I have attempted rather to investigate looking out from the sound and forming new

\begin{footnotes}
\footnotetext[77]{Lane, Cathy & Carlyle, Angus (2013), Conversation with Hildegard Westerkamp, \textit{In the field: the art of field recording}, Devon: Uniform books, p. 116.}
\footnotetext[78]{Wishart, Trevor (2012), \textit{Sound Composition}, York: Orpheus the Pantomime, p. 101.}
\footnotetext[79]{Although there are a few exceptions: the clearest example of a perceptual relationship between transformed and untransformed sound occurs during \textit{The Clapping Piece} (1:16 – 1:23) where the dynamically time stretched claps decelerate into ordinary clapping.}
\end{footnotes}
relationships by placing sounds in ‘new’ contexts. Sounds which are clearly identifiable are repeatedly reorganised and permuted within the foreground of a piece, while background textures and gestures provide a more controllable (and convincing) frame to bind the sounds together. Since a large portion of the material used in the portfolio are attack-based sounds (hand claps, footsteps, snare strokes, closing doors), the transformational processes were generally employed to create textures and longer sustained morphologies. Transformation creates a richer context – as Matisse says: “The object is not so interesting in and of itself. It is the environment that creates the object”.

In his article *Dancing in the Dark*, Volans proposes that there are no fixed laws of composition and that everything depends on context; he suggests that musical discussion (even of technique) needs to be conducted via imagery/metaphor. Volans makes the point that:

“technique is ‘the right method at the right time’ but what guides us in making the choice of appropriate method cannot be adequately explained except in terms of the resultant image... A discussion of technique is meaningless without a discussion of imagery”.

Sometimes an image to guide the transformational process suggested itself through repeated audition of a soundfile, which I would usually sketch roughly to use as a guide. These sketches came during the initial period of working with the soundfiles and helped move the idea from conception to

---

80 For example, the snare drum in the Shakespeare soliloquy, the poetry of MacNeice with the sound of suitcases, or the tuning of a door with the tuning of an ensemble.


83 Each night at the end of working in the studio I would turn off the lights and computer screens and listen to what I had composed that day in complete darkness. Listening this way facilitated an overview of where the piece was developing, but also, more importantly, it allowed me to listen to the sounds so that they might trigger shapes or images in my minds eye.
realisation, although the final result often evolved beyond the original concept. Below is one such example (see Fig 2.1).

![Image of effect of footstep underneath floor](image)

**Fig 2.1 Drawing illustrating image of effect of footstep underneath floor**

**Image, sonic image and sound**

For the opening of *The Footsteps Piece* I wanted to create a sense of hearing the footstep both from above and beneath the surface of the footfall\(^8^4\) to offer a fresh perspective on a familiar sound. To do this I tried to remove the ‘foot on floor’-ness from the sound, and to do that I cross filtered a series of footsteps with two small range frequency bands; one low, and one high\(^8^5\). Through this process of cross synthesis\(^8^6\) the footsteps lose their sonic fingerprint but keep the motion of one leg moving in front of the other\(^8^7\). The perceptual link to the footstep relating to this transformation is provided by the single footstep which opens this gesture\(^8^8\). This ability to manipulate the identity of a sound to highlight one aspect of its behaviour (in this case its motion) offers the potential to develop and exploit a variety of relationships between sounds.

Throughout the portfolio the basic tools of filtering, transposition and time stretching were the transformations which offered the most potential. Each of these is considered individually below.

---

\(^8^4\) I initially experimented with filtering various echoes and delays but the results were too obvious.

\(^8^5\) 230-340 Hz and 5040–5120 Hz.

\(^8^6\) Cross synthesis (and source filter synthesis) is when the parameters of one sound are mapped onto another sound.

\(^8^7\) Albeit at a slow pace.

\(^8^8\) A soft low comb filtered resonance which follows immediately after the footstep acts as a sort of sonic imprint, and has a *causal relationship* with the first footstep.
Filtering

Since all recordings made in the field contain some degree of noise, the majority were filtered for noise or removal of artefacts. The filtering process has a double benefit: the soundfiles are cleaner, and therefore more adaptable for transformation, and the process of filtering afforded me time to get to know the soundfiles better through repeated listening. For me the software programme Audiosculpt proved the most useful tool for filtering as the sonogram allows the composer to see bands or areas of noise, which in most cases can be distinguished visually and removed accordingly. Sometimes I used a multiband parametric compressor to aurally filter a sound (and in some cases I used both visual and aural filtering).

Aural filtering tended to be more explorative, trying out various plug-ins, looping small fragments, whereas with visual filtering I would usually be more aware of what the outcome would be (single and multiband filtering, removal of hum and hiss, extraction of specific frequencies, transposition or time stretching). These transformations could be classified as process focused transformations and source focused transformations. In both cases recognising what was useful was decided by audition. Since explorative transformations take greater time, when time was running short the number of explorative transformations decreased.

---

89 “A visual representation of the spectral contents of a sound, the distribution of the signal energy over frequency, and how this energy distribution evolves over time”. Audiosculpt 3.0 Manual, http://support.ircam.fr/docs/AudioSculpt/3.0/co/Sonogram%20Introduction.html (accessed 01/08/2013).

90 Wishart mentions the distinction between process focused transformations and source focused transformations and concludes that “transformations focused in the source, retain the same infinite potential that the infinity of natural sound sources offer us”. Wishart, Trevor (1994) Audible Design: a plain and easy introduction to practical sound composition, York: Orpheus the Pantomime, p. 24.

91 Although this was in tandem with a change in perspective towards transformations – see page 48.
Resonance filtering / multi-band filtering

Resonance filtering helps to unify the surface of a piece through the subtle cohesion of the parameter of pitch. This technique was primarily used throughout the portfolio on a small scale to ‘colour’ a soundfile. For each piece I created a number of resonance preset settings which could be applied to any sound. For example in The Luc Ferrari Piece resonance filtering appears on three different soundfiles (2:49 – 2:52, 4:06 – 4:10, 7:15 – 7:30), highlighting frequencies which take on a greater prominence later in the flute melody in the last third of the piece. Resonance filtering can also be applied to a soundfile repeated in close succession, to accentuate or ‘colour’ the natural spectrum of a sound. This was the case with the continuum of micro clicks in The Footsteps Piece (1:38 – 1:55) and the reiterative pulsed door morphology in The Doors Piece (4:50 – 5:19).

Vertical filtering

Vertical filtering enabled me to sharpen the onset and decay of a sound which proved valuable when overlapping layers of sounds which were recorded in different environments. The process of vertical filtering (see Fig 2.2) was applied to the piston soundfile in The Suitcases Piece (2:00 – 2:20) and was also used for the sequence of footsteps in The Footsteps Piece (0:34 – 0:39). This type of filtering worked best on attack-based sounds, which had clear onsets and terminations.

---

92 1044 Hz (C6) and 1269 Hz (D♯6 +33 cents) with fine Q with increasing gain. The Q of a filter is the “steepness with which a filter cuts out unwanted frequencies” (Wishart, (1994), p. 128).
93 1269 Hz (D♯6 +33 cents) with an expanding Q filter. See Appendix C for screenshots of the evolution of the parameters.
94 990 Hz (B5) moving to 860 Hz (A5 – 33 cents)
95 Vertical columns band passed in Audiosculpt.
96 See Sound Example 7.
97 See Sound Example 4.
For *The Doors Piece* the squeaks of unoiled doors were filtered, and labelled as ‘doorbirds’ because their register and inflection was reminiscent of birdsong. I extracted these sounds because I liked their morphology and melodic contours, and as these sounds were harmonically focused it was relatively straightforward to extract their partials through the process of visual filtering. This technique was also...
employed to filter the audience whistle in *The Clapping Piece* (2:57 – 3:07) and the howling wind recording in *The Doors Piece* (23:20 – 24:50). In all cases the filtering process removes the unnecessary spectral information from a soundfile, which helps keep the spectral space uncluttered when layering multiple soundfiles.

Fig 2.4 Town hall door – with visually distinguishable squeaks

**Transposition**

In an effort to refine the lower spectrum of the works some soundfiles were transposed downwards to boost the low frequency content. In most instances these transpositions were not time corrected, meaning that the soundfile increased in length proportional to the degree of transposition. In *The Clapping Piece* (1:03 – 1:30) single hand claps are transposed downwards to create a much larger booming sound. For *The Snare Piece* a recording of an ebow on the snare guts was transposed downwards\(^98\) (-1900 cents) which created a series of slower, richer low pulsations. This transposed ebow soundfile appears throughout *The Snare Piece*, although

\(^98\) Non-time corrected.
is particularly audible at 0:45 - 1:30. A different transposition (-1700 cents) is presented towards the end of the piece (10:25 – 10:50). The crackling distorted sound which features in The Luc Ferrari Piece (0:04 – 0:09) is a snare drum roll leading to single attack played back at the wrong sample rate

The use of single sine tones to strengthen the low register was consistently used throughout the portfolio for spectral reinforcement. In The Suitcases Piece (0:12) a short single low sine tone 35 Hz (C♯1) reinforces the spectral register of the opening gesture.

**Time stretching**

In The Suitcases Piece (3:42 – 3:46) a single recording of a suitcase travelling over a steel ridged raised ramp was time stretched slightly (by a factor of .95, .90, 1.05 etc.). These variations were overlapped and panned in different trajectories to create a dense gesture acting as a structural marker throughout the piece (5:01 – 5:05 and 10:28 – 10:30). Wishart talks about using this process of layering end-synchronised sounds with slightly different speeds to create an ‘accelerating echo’ effect, which leads to a rising-pitch portamento. When I employed this technique I found that the result was stiff and predictable, but through varying the alignment (and panning) of the end aligned sounds it created a more diffuse gesture.

**Dynamic transposition and time stretching**

“Time-varying process can [...] effect a radical transformation within a sound”

A number of soundfiles were either dynamically transposed, or dynamically time stretched to create a degree of internal flexibility in the

99 This was discovered through a glitch with the computer communicating with the MOTU audio interface.
sound. The shape of a rising dynamic transposition of a high frequency narrow sound appears across a number of works: *The Suitcases Piece* (9:06 – 9:11), *The Snare Piece* (10:40 – 10:48), and *The Luc Ferrari Piece* (12:22 – 12:30). These rising dynamic transpositions are always linked to a termination or dispersal of energy. These glissando-like transpositions also feature in the lower spectrum (as pure sine tones) and there are many examples throughout *The Luc Ferrari Piece*. Sometimes a dynamic transposition was found in the middle of the spectrum, as in *The Suitcases Piece* (14:00 – 14:20), similar in effect to inner voice movement in a chorale, when the middle voice moves but the outer voices are stationary.

At one point in *The Doors Piece* (5:45 – 5:50) I wanted to use a doorbird soundfile which was longer than any of my original doorbird soundfiles. Rather than repeat the soundfile I dynamically time stretched it to accentuate the morphology of the original sound (see Fig. 2.5 and 2.6).

---

102 From D2–E2, D2–G2, D2–A2.
Since the doorbird soundfiles were in some way bird-like, morphological accentuation was possible only to a limited extent (in this instance dynamic time stretching up to a factor of 2.5). Beyond that, morphological similarity to the image of bird song was lost.

In *The Suitcases Piece* (4:44 – 4:58) the low reiterative pulsing hum is dynamically time stretched. Here the dynamic transformation acts as a dissipation of energy to the opening part of the piece.
Dynamic Filtering

Through the extraction or masking of frequencies from the spectrum, the dynamic filtering\textsuperscript{103} of a transformation (usually parametric dynamic compression) can suggest a greater distancing of material or another means of offering a change in aural perspective. Such transformation occurs in *The Clapping Piece* (1:52 – 1:59), *The Footsteps Piece* (7:18 - 7:30), and *The Luc Ferrari Piece* (4:15 – 4:34).

Splicing

Thinly sliced grains of sound (0.04 – 0.06 seconds long) were extracted from soundfiles, repeated, and shaped into a continuum\textsuperscript{104}. This looping of micro samples first appeared in *The Footsteps Piece*. For this piece I was trying to highlight the sound of coins rattling in a pocket (as in Fig 2.7 below). The drawing visualises the imagined acoustic signal transmitted from the impact of the coins against the thigh as the leg moves. Sometimes these repeated clicks were resonant filtered, or annotated with a dynamic parametric filter.

\[ \text{Fig 2.7 – Drawing of radiating coin in pocket} \]

“As Curtis Roads describes it, a click is too short to hold on to as a pitch. A single, lonely click has nothing going on for it as a rhythm, either. And a

\textsuperscript{103} Automation of a transformation enables the composer to vary parameters dynamically over time.

\textsuperscript{104} For *The Footsteps Piece* the click was extracted from a recording of coins rattling in a pocket whereas for *The Luc Ferrari Piece* these clicks were sonic flaws (clicks and pops) in Ferrari’s original soundfiles.
click is over before there’s time for listening to pick up much useable information on timbre”\textsuperscript{105}.

This technique of repeating small grains was developed to a greater extent in \textit{The Luc Ferrari Piece}. Sometimes small clicks with no perceivable pitch information are repeated (0:14), while at other times clicks are extracted from sounds with a perceivable harmonic profile (0:35 – 0:36)\textsuperscript{106}. In the latter case these pitched grains are scattered throughout the opening section, and subtly introduce specific frequencies into the harmonic landscape of the piece, which contextualize the harmonic properties to the sounds immediately preceding or following the click (as in the car horn/dog bark/click at 2:22). As one third of the piece contains clear melodic material in the key of G, the choice of the harmonic clicks (pitched at C5 and D5) and bass sine-tones in the same key (D2 – G2) aims to provide clear diatonic relationship to the tonal centre of G, in an effort to unify the harmonic cohesion of disparate materials.

\textbf{Use of reverb}

Reverb is carefully applied to certain sounds for a number of effects though in most cases reverb is used to create a believable acoustic space\textsuperscript{107}, which is extremely useful when layering soundfiles which have been recorded in a number of different environments. The most common use of a touch of reverb is to reinforce the end of a gesture or phrase as in \textit{The Snare Piece} (0:17 and 7:27), \textit{The Footsteps Piece} (1:28 – 1:31) and \textit{The Luc Ferrari Piece} (0:02 – 0:04). Sometimes the use of reverb helps facilitate the transition from one sound to another, by masking the end point of a soundfile, as in \textit{The Suitcases Piece} (1:18 – 1:20). While in the same piece (2:11 – 2:19) a much greater degree of reverb is applied to the piston

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{105} Norman, Katharine (2004), \textit{Sounding Art: Eight literary excursions through electronic music}, Aldershot: Ashgate, p. 18.
  \item \textsuperscript{106} Extracted from the flute melody which appears in the final third of the piece.
  \item \textsuperscript{107} The tendency in acousmatic work to apply a blanket of reverb across all of a piece can create a safe, but uniform space. The work of Gilles Gobeil, in particular ‘\textit{Ombres, espaces, silences...}’ is a particularly good example of considered controlled use of reverb across the surface of an entire piece.
\end{itemize}
\end{footnotesize}
sound, dramatically changing the reflections of the sound, suggesting a shift in perspective.

**Re-working of soundfiles throughout the portfolio**

Finding good material is difficult: when found I want to get the most out of it, meaning that a number of soundfiles are re-worked across the portfolio. Usually this re-working was governed by exploiting the potential of a sound as my technique developed. The difference between the shaping of the reiterative low pulsing in *The Suitcases Piece* (4:44 – 4:56) and the opening gesture of *The Snare Piece* (0:07 – 0:18) demonstrates an increased refinement in handling of materials. The recordings of an ebow on the snare guts proved so useful that these recordings feature across the final three pieces. In *The Snare Piece* (0:48 – 1:23) these sounds were transposed downwards to provide low harmonic pulsations, whereas in *The Luc Ferrari Piece* (11:37 – 11:45) the pulsing occurs at the original pitch and provides mid range spectral/harmonic support. In *The Doors Piece* (0:05 – 0:09) a static section of the ebow recording was used as harmonic texture in the background, while later (22:34 – 23:34) the pulsing (transposed down 600 cents) acts as a transitional texture from one environment to another.

The piston soundfile is another example of a sound that is reworked across pieces. In *The Suitcases Piece* (1:55 – 2:20) this sound acts as a reiterative foreground energetic motion, whereas in *The Footsteps Piece* (8:49 – 9:20) the sound is used as a rhythmic pulse that rises in and out of the background texture. For *The Luc Ferrari Piece* (0:02) one single piston strike is extracted, with reverb applied, and is used as part of a composite image.

**Extraction of harmonic information from soundfiles**

One advantage of transformational processing is that it can remove the

---

108 See Sound Example 8.
109 See Sound Example 9.
direct identity of the sound’s origin, but keep some aspects of the intrinsic property of the sound/recording (as in the motion of the cross synthesised footstep discussed earlier). Most of the layered ‘harmonic’ content of the pieces comes from the process of extracting partial information from a soundfile which is then resynthesized. Using Audiosculpt it is possible to find the fundamental frequency of any sound and in turn track the harmonic or inharmonic partials through partial tracking analysis. The information from this analysis can then be synthesized to create a new sound. A similar process is chord sequence analysis, where “the average value of partials is yielded via two different methods, in order to produce a sequence of stable components.” This analysis produces a series of related frequencies, which provide raw harmonic material which can then be further transformed and annotated. This process produced some interesting synthesized soundfiles that have a rich, static harmonic profile, and which were useful in the creation of background textures. This type of material features in background textures of The Suitcases Piece (3:15 – 3:42 and 8:24 – 8:44), The Footsteps Piece (0:59 – 1:28) and The Luc Ferrari Piece (8:25 – 9:58).

One interesting by-product of filtering is that the removal of certain unwanted sounds, the hum from an air conditioner, say, can provide a series of frequency bands which can be exploited further. This was the case in extracting the sound of a pervasive waterwheel from recordings made in the Powerhall of the Manchester Museum for Science and

110 “Partial tracking analysis allows you to detect and visualize the partials a sound”, http://support.ircam.fr/docs/AudioSculpt/3.0/co/Partial%20Tracking%20Analysis.html (accessed 01/08/2013).
111 This process of using technology to analyse the constitution and behaviour of a sound is most associated with the French Spectral composers, most notably Gérard Grisey and Tristan Murial. The parameters of partial tracking analysis also allow for various responses through choosing harmonic or inharmonic partial analysis, maximum number of partials selected, and amplitude threshold.
112 http://support.ircam.fr/docs/AudioSculpt/3.0/co/Chord%20Sequence%20Analysis.html (accessed 01/08/2013).
113 Which in turn can be layered quite easily on top of one another.
Industry. The frequency bands from the waterwheel provided the basis for a lot of the harmonic information of *The Footsteps Piece*. The process from original recording, through a series of transformations, to final soundfile is a good example of process-focused transformation:\textsuperscript{114}

1. Original recording
2. Extraction of noise bands
3. Resynthesis from partials
4. Various transpositions – both non-time corrected and time corrected
5. Apple ‘Aud Distortion’ Plug-in
6. Waves ‘Doubler’ Plug-in
7. Reversal of soundfile
8. Automated volume curving (within the Pro Tools Session)

**Harmonic snare resonance**

Sometimes transformations were driven by a concept that I wanted to investigate. For *The Snare Piece* the purpose of the harmonic snare resonance transformations was to try and highlight the harmonic properties of a single attack from an inharmonic percussion instrument. Wishart defines inharmonic sounds whose “spectra may be bell-like or drum-like (being focused in some sense but lacking definite pitch)”\textsuperscript{115}. To highlight the resonance of the snare attack I first needed to remove the initial attack. Analysing the fundamental frequency of this soundfile I then applied inharmonic partial tracking analysis (see Fig 2.8) to find the first twelve inharmonic partials of the single snare stroke. Following that I compiled a succession of five resonances which I doubled with a chorus plug-in and following this I time stretched this soundfile by a factor of .35 (to remove the audible identity of the snare drum stroke).


The fundamental frequency for this particular snare stroke is focused around B2. By applying resonance filtering to certain partials I can highlight 220 Hz and 1288 Hz (as seen in Fig 2.9), which in relation to the fundamental frequency (B2) suggest an octave displaced 7th harmonic and an approximation of the 10th harmonic.

This sequence of four harmonic snare resonances (Fig 2.10) features
throughout the first ‘Snare Carnival’ section of *The Snare Piece* (1:55 – 3:15). The pattern of accented partials are clearly visible, as are the five distinct repetitions.

In *The Snare Piece* these sequences of accented resonances feature in the Snare Carnival sections (1:54 - 3:20 and 7:35 - 9:05), while a continuous chain of unaccented resonances feature in the final quarter (9:40 – 10:11 and 10:23 – 10:58) of the piece. These repeated harmonic resonances create a static harmonic field, helping to create a harmonic unity to the work. Although these transformations are far removed from the original, they retain the original harmonic fingerprint of the single snare stoke. That this sonic information is extracted from a single snare drum stroke is not made explicit in the piece, nor would I consider it important for the listener.

**Aesthetic questions arising from transformations**

About halfway through my research I reassessed my approach to transformations. If I heard a sound and found it of interest in and of it

116 Through a perceptual correlation between the unprocessed and transformed sound.
itself, I no longer saw the necessity to process the sound through extensive transformation. The clearest example of this refinement in approach is the use of the Parisian hand dryer, which features twice in the portfolio - once as part of a wider gesture in The Suitcases Piece (1:25 – 1:27) and again at the start of Everybody Knows Everything\textsuperscript{117} (0:01 – 0:13). In The Suitcases Piece the descending morphology of the sound of the hand dryer reinforces the contour of the sound of the suitcase as it approaches the microphone. The recording of the suitcase is shaped by two distinctive features (the transition between two distinct spaces, and the motion of the suitcase towards and away from the microphone) which creates quite a peculiar, curved spectral profile\textsuperscript{118}. In the gesture the suitcase sound is the main focus and the hand dryer acts more as supporting background texture\textsuperscript{119}.

At the start of Everybody Knows Everything the same sound is presented on its own, prefacing the piece. Here the context creates a clear ambiguity. On the one hand the audience is looking at a piano quartet waiting to perform, and on the other hand we hear the sound of a hand dryer projected through loudspeakers. What is the sound doing here? Although only presented once, this sound balances with the chord at the end, both in duration (approximately thirteen seconds) and in quantity (both sounds appear only once in the piece). In both instances the sound is employed for its morphological qualities, but in Everybody Knows Everything the identity of the sound competes with a comprehension of the morphology. This area of clear ambiguity created by the use of identifiable sound had an impact on my relationship to handling materials, specifically in the reduction of transformative processing in the final two works of the portfolio.

\textsuperscript{117} See Appendix A.
\textsuperscript{118} See Sound Example 2.
\textsuperscript{119} Although the suitcase sound is inharmonic, the suggested harmonic contour of the pitch raises as the suitcase moves away from the microphone into the alleyway, causing a sort of reverse Doppler effect. The audible presence of the hand dryer sound in the gesture is somewhat limited - see Sound Example 11 for a comparison of the gesture with, and without, the sound.
Having explored the range of transformational processes employed in the portfolio, I shall now demonstrate the techniques used to organise these sounds.
Chapter Three - Organising Sound

“Grateful as we must be for the new medium, we should not expect miracles from machines. The machine can give out only what we put into it. The musical principles remain the same whether a composer writes for orchestra or tape. Rhythm and form are still his most important problems and the two elements in music most generally misunderstood.”

In this chapter I will demonstrate how I organised sounds on a small, medium and large scale by presenting three examples of ‘composite soundfiles’, a structural analysis of The Snare Piece, and an analysis of the first part of The Doors Piece.

Material, method, image

In his article Dancing in the Dark, Kevin Volans talks about the relationship between materials, method and image: “craftsmanship involves a knowledge of a body of precise skills which enable one to make the same thing over and over again. Hence, in an important sense, composition has nothing to do with craft directly and everything to do with transcending it.” He illustrates his discussion with a visual metaphor (see Fig 3.1).

![Fig 3.1 Volans’ visual metaphor](image)

In this illustration, material is represented via a set of triangles of diminishing size. The method involves tilting the triangles one inside the other, eventually subsuming the original material into something different, and new - “a clearly defined image”, which only emerges “if we

---

120 Varèse, Edgar & Wen-chung, Chou (1966), Rhythm, Form and Content, Perspectives of New Music, Vol. 5, No. 1, p. 15.
choose methods and materials well”\textsuperscript{122}. In the final arrangement the triangles are still recognisable, but the image that we see is something above and beyond the constituent parts.

**Composite gestures**

A composite gesture is a combination of sounds which cohere in the way Volans demonstrates into a single, new image\textsuperscript{123}. The accumulation of recordings can be vertical or horizontal. Vertical accumulation is the technique of layering sounds on top of one another simultaneously to form discrete objects or gestures (as in *The Snare Piece* opening gesture discussed below), whereas horizontal accumulation is the layering of non dynamic sounds\textsuperscript{124}, usually employed to create background textures (as in *The Suitcases Piece* 8:20 – 8:39 or *The Snare Piece* 3:30 – 4:25). At its simplest, this process of combining sounds is at the core of composition, and of my practice, but as Volans notes, the method of combination must be chosen well, i.e. there is no ‘one-size-fits-all’ solution - the criteria which impact on which sounds work well together is different for each piece. Explanations of how this decision making process was carried out in the case of particular pieces is given below.

**Solo percussion mixed pieces**

Although there are a number of successful solo percussion mixed pieces\textsuperscript{125} the snare drum has rarely been presented as the main focus in a ‘mixed’ work\textsuperscript{126}. The intention with *The Snare Piece* was not to create a ‘hyper

\textsuperscript{122} Ibid.

\textsuperscript{123} The use of the term image here has a dual meaning; both the sonic image (as defined by Barreiro in Chapter Two) i.e. the mental representations and shapes imagined when listening to the sound, and also Volans’ metaphorical image – how material, when organised successfully, has the potential to become more than a sum of the parts.

\textsuperscript{124} Sounds with a limited amplitude profile, and usually a homogenous texture.


\textsuperscript{126} There are some exceptions, notably, Lippe’s *Music for Snare drum and Computer* (2007).
instrument\textsuperscript{127}, but to present the snare drum in a different (if wholly self made) context\textsuperscript{128}.

**Structure of The Snare Piece**

![Figure 3.2: Structure of The Snare Piece – organised sound and snare material](image)

**Figure 3.2** Key for material in the snare drum part of The Snare Piece in Fig 3.2

![Buzz Roll](image)

![9/30 Crochet Phasing](image)

![Rod on Stick pattern](image)

The overall structure is divided into six sections (shown by the red

\textsuperscript{127} Where the electronic sounds are derived from the live processing of the instrumental part through MAX/MSP which can lead to the interest being in the process of how something is sounded, rather than what it sounds like.

\textsuperscript{128} Incorporating recordings of snare drums into the organized sound part, and having a ‘live’ snare drum is akin to seeing a portrait and the sitter simultaneously.
brackets in Fig 3.2), which subdivide into smaller phrases, and the general shape of *The Snare Piece* is palindromic. This structure is most clearly articulated through the symmetrical distribution of material for the snare drum, the balance of section lengths in the organised sound and the single central appearance of the buzz roll section (see Fig 3.2).

The snare drum material makes use of five types of material (see Figs 3.2 and 3.3) which helps to clearly delineate the identity of the material. Sometimes the snare drum material is repeated or elaborated (as in the semiquaver triplets at \( \frac{\text{♩}}{\text{♩}} = 74 \) at rehearsal letters B-C and O-P), modified (see the ‘sticking pattern’ from bars 114 - 125 and 183 – 189), or reversed and compressed (compare bars 127 – 133 and 176 – 180).

Having presented an overview of the piece I shall now focus on the opening gesture of *The Snare Piece* to demonstrate Volans’ principle outlined above.

*The Snare Piece* opening phrase: onset, continuation, decay, termination (0:00 – 0:20)

The opening phrase of *The Snare Piece* was constructed by combining a series of sounds, many of which are recordings of a snare drum (buzz rolls, clear single attacks, combination of brush and stick patterns on the snare rim, and guts stroked). This opening phrase consists of three successive gestures, each with different perspectives and distinctive characteristics, forming a morphological evolution from onset (attacks), continuation (resonance to buzz roll) to termination (attack).

---

\[129\] In the organised sound part it is not the actual material which is retrograded but rather the length of sections (compare 0:00 – 1:50 with 9:05 – 10:58). For the Snare Carnival sections the material is primarily the same. \[130\] See Sound Example 12, which presents the various sonic components of the phrase individually, then collectively.
A: Onset Gesture (0:00 – 0:03)

At the core of the opening onset gesture four individual snare attacks\(^{131}\) are arranged into a rhythmic motif at the tempo of \(\texttt{♩} = 90\)^{132}.

This rhythm acts as an audible grid around which the other sounds of the onset gesture are structured\(^{133}\).

---

\(^{131}\) The first snare attack is the attack from which all the ‘snare harmonic resonance’ material was extracted (as discussed in Chapter Two).

\(^{132}\) The choice of tempo is significant as the Snare Carnival sections, which appear later in the piece are at \(\texttt{♩} = 90\).

\(^{133}\) Although the snare drum is an inharmonic percussion instrument the four individual snare attacks suggest different partials, ‘highlighting’ around the pitches D\#5 - B4 - F\#4 - B4, which suggest a melodic contour of the third, tonic, dominant and tonic.
Added to this rhythm is a composite of snare attacks with their resonances shortened, arranged as in Fig 3.6.

![Fig 3.6 Snare onset, rhythm 2](image)

This second group of snare attacks are quieter than the four main attacks. These two rhythms are superimposed to create a composite rhythm.134

![Fig 3.7 Snare onset, rhythm 1+2 combined](image)

A harmonically rich sawtooth filtered sound, panning right to left, is added to the composite snare attacks immediately after the first beat. This sound has been resonance filtered to create a discernible harmonic identity: a D major 6 chord, accenting the pitches of D, F#, A, B. A low frequency sine tone-like bass figure is then positioned between the second and third beats of the grid.

![Fig 3.8 Approximate pitch information for descending and ascending sine tone-like bass figure](image)

The descending and ascending morphology of this sound is answered/balanced by the soft onset reiterative maraca like shaker sound,

---

134 The first attack of rhythm 2 acts as a sort of an appoggiatura to the first attack of rhythm 1.
positioned between the third and fourth beat\textsuperscript{135}.

Also added between the third and the fourth beats is a low sine tone frequency 82 Hz (E2) which enriches the harmonic function of the D major 6 chord (i.e. ninth in the bass). The fourth and final beat of the rhythmic grid is a snare attack reinforced by two seconds of artificial reverb, suggestive of a change in space or greater distance from the previous attacks. After this fourth beat the pure sine tone 82 Hz is combined with another sine tone, 78 Hz (D♯2), which causes an oscillation between the two\textsuperscript{136}. Similar to the behaviour of the filtered sawtooth sound, this sine tone oscillation behaves like a prolonged resonance of the snare attack.

**B: Continuation Gesture (0:03 – 0:07)**

This gesture acts as a transition from the opening onset gesture, which was primarily attack-based, to the decaying gesture, which is a sustained continuum of snare buzz rolls. It contrasts with the opening onset gesture in terms of amplitude, typology and perspective. This gesture is the quietest section of the entire phrase due to the softer snare attacks produced by striking the stick on the rim in combination with a wire brush on skin and these softer attacks are intertwined with a series of repeated short harmonic snare resonances\textsuperscript{137} with different partials highlighted. This sequence of repeating resonances is panned in the pattern of RLRRLRLRLL\textsuperscript{138}.

The metric grid of the onset gesture has evolved into a less clearly defined metre, although when the repeated harmonic resonances enter (0:04) their duration (0.33 seconds) forms a regular pulse at \( \dot{J} = 180 \). These repeating harmonic resonances are continued through to the termination of the phrase which not only help to bind these two gestures together through the

\textsuperscript{135} Each reiterative soft onset sound is 0.08 seconds long and is panned LLRRLLRR, as in the ‘mamadada’ snare drum rudiment.

\textsuperscript{136} From The Footsteps Piece onwards I developed a preference for oscillating low frequency sine tones. An analogy I would offer is a very clean bass vibrato.

\textsuperscript{137} As described in Chapter Two.

\textsuperscript{138} Paradiddle snare drum rudiment.
parameter of metre and harmony, but also help the transition from the second to the third gesture by the sustained presence of one typology. At the end of the transition gesture a single snare harmonic resonance is reversed and joined to its non-reversed resonance, which has a tail of four repeated soft onset attacks, each at $J = 180$. This transition closes with the presentation of a further new sound, the stroking of the snare guts with the tips of the fingers.

**C: Decay (0:07 – 0:18) and D: Termination of gesture (0:18 – 0:20)**

The decaying gesture focuses on the clear morphology of a repeated snare buzz roll$^{139}$. Added to these buzz rolls are the dynamically resonance filtered micro coin clicks (which featured in *The Footsteps Piece* 1:38 - 1:57), a low fast reiterative soft edged pulsation$^{140}$ and a pitched harmonic feedback tone$^{141}$ focused around 2349 Hz (D7). This decaying gesture presents the clearest cohesion between the constituent soundfiles in this opening phrase since they are all either morphologically stable, repetitive, or non-changing. Coming after the continuous evolution of the onset and its continuation, this morphological stasis helps focus the static energy of the phrase towards its conclusion. The termination of the phrase is a single snare attack with artificial reverb applied, reinforced with another soft onset snare attack$^{142}$ and a tapping of the snare guts with the hand.

Although the opening phrase is a concentrated presentation of a large amount of material, it presents the essential information which will be explored throughout the piece, be it morphological, harmonic, rhythmic, or gestural. Due to the concentration of material, the phrase is followed by ten seconds of silence$^{143}$ before the entry of the snare drum.

Similar composite gestures appear throughout the portfolio. The opening phrase of *The Clapping Piece* (0:00 – 0:13) is constructed in a similar fashion to the opening phrase of *The Snare Piece* in the alignment of sounds

---

$^{139}$ These repeating buzz rolls are shaped by a crescendo diminuendo pattern.

$^{140}$ Taken from the hum of a train engine in a stationary position.

$^{141}$ Produced from placing an ebow on the snare guts.

$^{142}$ Produced with a soft header beater on the snare with the guts off.

$^{143}$ This is the longest duration of silence in any piece in the portfolio.
derived from multiple perspectives of one sound source\textsuperscript{144}. For \textit{The Luc Ferrari Piece} a single composite gesture (0:00 – 0:09) evolves throughout the first half of the piece, while other times these composite gestures are a passing alignment of materials, as in \textit{The Suitcases Piece} (2:37 – 2:41) or \textit{The Footsteps Piece} (2:02 – 2:08). For \textit{The Doors Piece} (7:16 – 7:50) I reverse this process, \textit{audibly} deconstructing a composite gesture, stripping the various elements away until a single sound object is left (see Fig 3.9).

\hspace{1cm}

\textbf{Fig 3.9 Deconstructing composite – \textit{The Doors Piece} (7:16 – 7:50)}

Having focused on the composition of the first phrase of \textit{The Snare Piece}, below I turn to the process of combining instrument with organised sound.

\section*{Organising sound and instrument}

The majority of the organised sound was composed first which meant that the snare drum part was crafted within a restricted frame. This restriction in turn suggested snare drum material which would work with/against the organised sound. For example the Snare Carnival section (1:50 – 3:20)

\textsuperscript{144} Single handclaps recorded in a studio, single handclaps recorded in a medium sized concert hall, and applause from a large concert hall.
is a repeating loop\textsuperscript{145} of elements presented in the opening of the piece (0:00 – 0:07), but aligned in a different combination. Given the spectral density of the Snare Carnival section\textsuperscript{146} (1:50 – 3:20 and 7:35 – 9:05) the snare part was composed primarily for its audibility; it had to be clear to stand against the looping pattern of this section. The clearest pattern I could think of was a simple repeating crotchet pulse. I experimented with various tempi (fast to slow) before deciding upon $\text{♩} = 90$. While experimenting with the tempo of the crotchet pulse I overlaid a midi realisation of $\text{♩} = 90$ with another midi realisation of $\text{♩} = 91$ which produced an audible phasing process\textsuperscript{147}. The organised sound part consists of five interdependent layers of material\textsuperscript{148}, which when combined with the phasing snare drum creates six layers of sound occurring simultaneously. This process was chosen as it produced an interesting interplay between the snare part and the organised sound\textsuperscript{149}. The advantage of using the phasing process was that the process produced the snare drum material automatically for the two Snare Carnival sections\textsuperscript{150}, resulting in three minutes of material. The other advantage of the phasing is that it offered a much larger cycle of periodicity\textsuperscript{151}, helping to unify the

\begin{itemize}
  \item \textsuperscript{145} The loop (1.9 seconds long) is repeated in a series of phrases, usually of 4, 8 or 12 repetitions with regular interruptions.
  \item \textsuperscript{146} The Snare Piece marks a noted increase in the use of small scale repetition in my work, specifically the Snare Carnival section. This loop of material was discovered during the compositional process (and features in the organised sound at 0:57 – 0:58).
  \item \textsuperscript{147} This process is most associated with Steve Reich and his series of early phase shifting works, Piano Phase, Violin Phase etc. This is the first time I have used a phasing process in my work.
  \item \textsuperscript{148} A hard-edged attack sound which moves right to left across the stereo field, rising and falling low sine tone-like morphology, snare rims and wire brush pattern, reiterative maraca like shakers and harmonic snare resonances.
  \item \textsuperscript{149} Due to the complexity of playing 91 crotchets in the space of 90, a click track was employed to secure synchronisation between the performer and the organised sound. For me the click track is a means to an end: it facilitates synchronisation in the most efficient way.
  \item \textsuperscript{150} In the first appearance the basic phasing pattern is ornamented and lasts for one and a half cycles. In the second Snare Carnival section after the phasing pattern has completed a single cycle the phase morphs from 91:90 into 91:60.
  \item \textsuperscript{151} To complete one cycle of 91:90 in the tempo of $\text{♩} = 90$ takes 60 seconds.
\end{itemize}
large number of small blocks of repeating material. To quote Varèse, this is an example of “simultaneous interplay of unrelated elements”.¹⁵²

**Fusion and contrast between organised sound and snare drum**

To aid the correlation between the snare drum and the organised sound a large number of snare drum recordings¹⁵³ are incorporated in the organised sound. Writing about fusion and contrast in mixed electroacoustic music Menezes notes that “it will be more plausible to work, on support media, with sounds originating from the proper instruments used in the composition rather than with disparate sounds coming from other sources, without any related origin to the physical materiality of the employed acoustic instrument”.¹⁵⁴ Menezes proposes that if the source sounds for the creation of the fixed media environment have the same spectral, timbral and behavioural properties as the

¹⁵² Varèse, Edgar & Wen-chung, Chou (1966), Rhythm, Form and Content, Perspectives of New Music, Vol.5, No. 1, p. 15. Varèse states that in his own works “rhythm derives from the simultaneous interplay of unrelated elements that intervene at calculated, but not regular time lapses” (emphasis mine).

¹⁵³ Various recordings of snare drums form the majority of material used in the organised sound. Other materials (such as the transformations discussed in Chapter Two) were incorporated for the sake of sonic interest. What guided my compositional decisions was ultimately how it sounded, not how it was made. To take the example of the Snare Carnival section it was made by layering various materials which I had considered may be of use in the compositional process. Although the sounds in themselves are unrelated, when layered on top of one another they become more than a sum of their parts. This method of construction is a means to an end: there is no intrinsic correlation between the technique of layering sounds and what the result sounds like. To contrast if we take Lippe’s *Music for Snare Drum and Computer* how it sounds and how it is made are directly linked (if we consider that the piece is made anew in every performance). Here the electronic part tracks parameters of the snare drum performance and “uses the information to continually influence and manipulate the computer sound output by directly affecting the digital synthesis and compositional algorithms in real-time” (Lippe, 2007). In Lippe there is a direct correlation between the parameters that are monitored (frequency domain, filtering, delay, spatialisation), the resulting sound, and what we hear: how it sounds is intrinsically connected to its method of construction.

instrument, then creating a fusion between the two elements will be a preferred starting point. In The Snare Piece the organised sound and the snare drum part move from relative independence towards synthesis and back again. Similar materials are presented in both, most notably the repeating 11 beat panning filtered snare figure (3:22 – 4:24) in the organised sound, which is then ‘answered’ with a repeating 12 beat pattern in the snare drum part (bars 114 – 125). Both figures are in the tempo of $\dot{=}$ 158 and share the same dynamic profile (rising and falling). After the appearance of the marching snare drum in the organised sound (9:20 – 10:20) which fluctuates between $\dot{=} = 70 – 74$, the snare drum material from Rehearsal letters B-C is recapitulated (at its original tempo of $\dot{=} = 74$) which suggests that the organised sound and the snare drum have fused metrically.

‘Similarity is hidden’

During the composition of The Luc Ferrari Piece I came across a quote from Stravinsky that had a profound impact on my approach to handling different types of material in relation to one another:

“Variety is valid only as a means of attaining similarity. Contrast is everywhere. One has only to take note of it. Similarity is hidden; it must be sought out, and is found only after the most exhaustive efforts”.

This seeking out of similarity helps to define the relation of the parameters of one sound with another, which facilitates the ability to transition between materials fluidly. This cycling through of material was first consciously explored in the first part of The Luc Ferrari Piece (0:00 – 7:30) where unapplied repetition (to borrow Luc Ferrari’s phrase) keeps the rate of change high (see Fig 3.10 for a graph representing phrase lengths

\[\text{For example the Snare Carnival Section } \rightarrow \text{ waves of dissolving buzz roll section } \rightarrow \text{ 2}\text{nd Snare Carnival Section.}\]

\[\text{Stravinsky, Igor (1947), p. 34.}\]

used in *The Luc Ferrari Piece*). Sometimes the similarity can be found in the parameter of pitch\textsuperscript{158}, pulse\textsuperscript{159}, texture\textsuperscript{160} or morphology\textsuperscript{161}.

Fig 3.10a, Phrase lengths of *The Luc Ferrari Piece* (0:00 – 1:05)

Fig 3.10b Phrase lengths of *The Luc Ferrari Piece* (light blue represents the use of the ‘landscape’ scene)

Similar soundfiles can also be used to layer on top of one another to create a sense of depth. For *The Snare Piece* the waves of the dissolving buzz roll section (5:37 – 6:37) consist of an accumulation of multiples types of similar sounds (in this instance mostly repeated buzz rolls). This technique is also a guiding principle in the developmental energy of *The Clapping Piece* (0:17 – 0:44) and *The Suitcases Piece* (2:50 – 3:09).

\textsuperscript{158} *The Doors Piece* (4:08 – 4:17) where the doorbird shares the same pitch (G) as the opening of the *Music for George* fragment.

\textsuperscript{159} In the same example the pulsing engine sound shares almost the same tempo as the *Music for George* fragment (♩ = 184 / 192).

\textsuperscript{160} *The Luc Ferrari Piece* (5:57 – 6:03).

\textsuperscript{161} *The Doors Piece* (1:39) features the sound of a door attack followed by the sound of a snare drum attack; (21:30 – 25:02) the falling contour of the passing aeroplane balances with the rising and falling contour of the recording of the howling wind.
A number of harmonically static continuums feature throughout The Doors Piece. Although they are recorded from different sources\textsuperscript{162} when considered typologically these sounds can be considered similar, and their use within the piece acts as a cohesive agent\textsuperscript{163}.

**Text as structuring device**

In The Snare Piece the primary consideration for using the Shakespeare soliloquy is the alignment of the Shakespeare with the presence of the marching snare drum in the recording (as discussed in Chapter One). The soliloquy appears twice during the piece, in both cases immediately after the Snare Carnival sections. The first appearance of the soliloquy\textsuperscript{164} introduces the male voice into the landscape of the piece while the second appearance resolves/justifies the inclusion of the text within the context of the piece. When the opening gesture does recapitulate (9:05 – 9:22) it is augmented by the re-entry of the voice. The main scene is placed towards the final quarter of the piece as the revelation of the marching snare drum forms the climax of the piece. Small excerpts of the marching drum rhythm (usually one bar) are positioned in the organised sound at various points throughout the piece\textsuperscript{165}.

Boulez asks when using text, “is the explicit meaning of any text obscured or heightened by the music designed to correspond with it?”\textsuperscript{166} The meaning of any text is affected by the context in which it is presented. The first time we hear the voice (“music, do I hear?”) the words are heard in relation to the sounds presented up to that point, and in effect seem to comment upon these sounds. The character of the voice is tentative, and

\begin{itemize}
  \item \textsuperscript{162} An ebow on a snare gut recorded with a close microphone technique, an orchestra tuning up or a hoover recorded at some distance in Antwerp Central Train station.
  \item \textsuperscript{163} By helping to create a typological counterbalance with the attacks (horizon and vertical).
  \item \textsuperscript{164} A skeleton of the soliloquy is presented in the piece, extracting two groups of lines relating specifically to sound and music.
  \item \textsuperscript{165} At 1:38, 2:47, 4:42 and 7:17.
\end{itemize}
somewhat jovial. With the second entry of the voice ("This music mads me, let it sound no more") the delivery of the text is heightened, although the relationship between text and the corresponding sound behaves in a similar manner. In this instance the meaning of the words (and the delivery of the text) seems to comment specifically not just on the repetition of materials, but upon the short scale looping\textsuperscript{167} of the end of the second Snare Carnival section (8:54 – 9:04). Furthermore this text is followed by applause from a street parade (and even the composer talking to his friend\textsuperscript{168}). These sounds contextualize the performance of the Shakespeare and act as another layer, almost like a commentary on the commentary, (it is a performance within a performance). Music about music, or rather sound about sound.

This aspect of self-commentary runs throughout the portfolio.\textit{The Clapping Piece} comments upon itself, through the use of the actual non-manipulated/transformed recorded applause (0:50 – 1:00), applause for applause so to speak, and through the prominence of the two voices: the first "Oh my" (2:07) and the second voice at the end questioning/warning the audience with the phrase "some of you are conditioned to clap". This self-commentary is reflected/projected towards an audience, bound by tradition (if not convention) to move their two hands together in a motion universally recognised as "approbation loudly expressed"\textsuperscript{169}. Although the composer will always desire a 'live' performance of their work I feel that\textit{The Clapping Piece} rewards projection within the social context of a concert environment, unconsciously peppered as it is, with the ritual of applause\textsuperscript{170}.

In general it is the voice that carries this aspect of self-commentary throughout the works (see Fig 3.11), either through the explicit meaning of

\textsuperscript{167} The length of the loop shrinks from 1.9 seconds to 0.8 seconds.
\textsuperscript{168} The audible presence of the composer is something that could have been removed with filtering, but I no longer saw the necessity to hide the presence of the author.
\textsuperscript{169} Oxford English Dictionary definition
\textsuperscript{170} It is in the concert hall that we hear the most acoustically rich applause, different from say the sound of applause from an audience on television, or at a football match.
the text, as in the use of the Shakespeare\textsuperscript{171} in The Snare Piece, or in the
delivery of the text, as in the deeply ironic, “\textit{wow, I’m going to keep it for my,}
the rest of my life; it’s beautiful” in The Suitcases Piece (3:10 – 3:15). In this
piece the poetic texts relate to the theme of friendship, while the anecdotal
texts refer to travel, and for me the two themes are interconnected.
Throughout the piece these texts interject between the sonic landscapes,
acting less as structural points than as signposts on a journey.

<table>
<thead>
<tr>
<th>TITLE</th>
<th>TIMING</th>
<th>DETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Clapping Piece</td>
<td>(2:07)</td>
<td>“Oh my”</td>
</tr>
<tr>
<td></td>
<td>(3:13)</td>
<td>“Some of you are conditioned to clap”</td>
</tr>
<tr>
<td>The Suitcases Piece</td>
<td>(3:12 – 3:16)</td>
<td>“Wow, I’m going to..”</td>
</tr>
<tr>
<td></td>
<td>Throughout</td>
<td>W.H Auden “For Friends Only”, Louis MacNeice “Coda”</td>
</tr>
<tr>
<td></td>
<td>(3:13)</td>
<td>Airport and train announcement</td>
</tr>
<tr>
<td>The Footsteps Piece</td>
<td>(10:20 – 10:30)</td>
<td>“You always need the tail”</td>
</tr>
<tr>
<td>The Snare Piece</td>
<td>(3:28 – 4:10 and</td>
<td>Shakespeare The Life and Death of Richard II, Act V, Scene V</td>
</tr>
<tr>
<td></td>
<td>9:20 – 10:20)</td>
<td></td>
</tr>
<tr>
<td>The Luc Ferrari Piece</td>
<td>Throughout</td>
<td>Priest in church</td>
</tr>
<tr>
<td>The Doors Piece</td>
<td>Throughout</td>
<td>Rising vocal inflection, reiterative attacks.</td>
</tr>
</tbody>
</table>

\textit{Fig 3.11 Use of text and voice in the portfolio}

The use of voice marks a human presence across all the works. As
Norman notes, “in a landscape based on environmental sound a human

\textsuperscript{171} It should, however, be noted that the choice of the text is also dictated as
much by the quality of the sound recording as it is by narrative concerns. The
parts of the Shakespeare recording which I did use had to be framed by other
sounds to mask the less than pristine quality of the original recording.
presence is something to identify with”\textsuperscript{172}. The inclusion of the voice in each of the pieces was not a conscious decision, but a natural outcome of trying to explore the subject of the personal through sound.

Writing in relation to vococentrism in film, Chion notes, “There are voices, and then everything else. In other words, in every audio mix, the presence of a human voice instantly sets up a hierarchy of perception”\textsuperscript{173}. In \textit{The Doors Piece} the vocal interjection acts as a structural marker throughout the work. The complete vocal soundfile is a five second clip (see Fig 3.12), with a hard onset attack, followed by two statements of a rising glissando and descending articulated reiterations (see notated example in Fig 3.13). In this instance the intonation and precise articulation of the vocalisation is more important than the meaning of the utterances. As the narrative or symbolic content of the utterances is slight (baa, dee, dom, yom) I can handle the sounds more as pure musical material, rather than carriers of meaning.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Fig3.12.png}
\caption{Waveform of vocalisation, used in \textit{The Doors Piece}}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Fig3.13.png}
\caption{Approximate notation of vocalisation in Fig 3.12}
\end{figure}

\textsuperscript{172} Norman, Katharine (2004), p. 97.
As the largest piece in the portfolio I shall now turn to the construction of The Doors Piece.

The Doors Piece

The Doors Piece is in eight parts (see Fig 3.14, where the black lines denote the division of parts), each of which offers a distinctive character or perspective on recordings of door sounds. Part A is primarily permutations of attacks interspersed with the introduction of other contrasting material. It is in four sections\(^{174}\) (see Fig 3.14, where the red lines denote the division of sections), which break down further into a series of phrases. Part B is a transitional scene: a deconstructing sound composite, which leads to a scene of the tuning door and a pulsing stasis. Part C is an exploration of a series of short repeating pulsed/hatched patterns\(^{175}\). Part D focuses on the morphology of howling wind, which evolves to focus on ‘doorbirds’ and non attack-based door based sounds (swooshes). Part E is framed by a reinvigoration of permutated attacks, interrupted by two scenes: a jogger running in a tunnel and a decrescendo and crescendo of sparse single door attacks. Part F is a succession of two distinct (but similar) morphologies: a passing aeroplane and overlapping howling wind. Part G is the culmination of a series of permutations of attacks\(^{176}\) while the Part H acts as a musical postlude where the ‘Multicut’ composite aligns with the Music for George\(^{177}\) fragment.

\(^{174}\) The four sections are from 0:00 – 1:50, 1:50 – 4:50, 4:50 – 6:30, 6:30 – 7:15.

\(^{175}\) Entitled the ‘Cézanne’ section because it was inspired by the painter’s technique of hatching small patches of shades of similar colours in close proximity to each other.

\(^{176}\) Entitled the ‘Frantic’ section.

\(^{177}\) Music for George is a short piece of music I wrote for piccolo, banjo, bass clarinet and cello.
Sometimes door sounds frame an event or scene, and are barely registered (akin to spotting something out of the corner of your eye)\(^{178}\), while other times the closing of multiple door sounds are compiled into dense patterns. Although there are a large number of door attacks used throughout the piece the two main types of attacks used are various ‘C Heavy door’ and ‘Liv(erpool) Men door’ soundfiles.

The ‘C Heavy’ doors were a pair of doors situated at the top of a stone stairwell, recorded with two omnidirectional microphones positioned on their handles. The close proximity of the microphones to the sound source, coupled with the reverberation location (with decay times of between two to four seconds) made these recordings appealing because of their clarity of detail and sense of depth. Added to this was the fact that the doors closed in succession, meaning that I could vary the time between attacks depending on how far back I pulled each door from the stationary position\(^{179}\).

---

\(^{178}\) This happens twice: the first time with the runner in the tunnel (18:10 – 18:49) and the second time at the opening of the train door at the start of sixth section (21:20).

\(^{179}\) For the most part this natural decay time suggested the space between attacks.
Fig 3.15 Sonogram of ‘C Heavy Door 8’, used throughout The Doors Piece

The ‘Liv Men’ toilet doors were recorded in a ground floor corridor with two omnidirectional microphones about two feet away. There is about half a second of natural reverberation and most of these attacks have slight reiterations (presumably the spring recoiling immediately after closing). These attacks sound much nearer, have a single attack with a more diffuse onset, and betray little information about their surroundings.

Fig 3.16 Sonogram of ‘Liv Men Door 3’
In terms of organisation, I found that these two typologies worked well together because their inherent sonic qualities complement each other. The Liv Men Doors have a quieter amplitude, a more diffused onset, are single attacks and are more localized within the stereo field\textsuperscript{180}. The C Heavy Doors have a greater sense of panorama,\textsuperscript{181} a softer focus but a more precise onset, and a distinct sense of motion in the stereo field (due to the positioning of the microphones).

In general attacks are grouped together in one of two ways: either as crushed attacks (0:06), like an appoggiatura, or at a discrete distance where each attack sounds in succession (e.g. 1:32 – 1:33). This minimum distance between attacks in succession is approximately 0.08 seconds (any closer and the onsets of each attack would start to overlap one another and muddy the detail). The distance between the two attacks of the C Heavy Doors was exploited as a rhythmic device: other attacks (usually Liv Men Doors) are positioned before, in between, or after the double attack of the C Heavy soundfiles to extend the basic unit in both directions\textsuperscript{182}. For example there are .18 seconds between the two attacks in C Heavy Door 8 soundfile, but there are .25 seconds between the two attacks in the C Heavy Door 7 soundfile. If I positioned a Liv Men Door attack .25 seconds before C Heavy 7 soundfile then I formed a sequence of three attacks in a regular tempo ($\downarrow = 240$ – See Fig 3.17).

\textsuperscript{180} See the passage of Liv Men doors solo (19:08 – 19:40) for a demonstration of their positioning in the stereo field.

\textsuperscript{181} Through a combination of the clarity of recording and the natural reverberation of the recording location.

Exploiting this additive and subtractive relationship helps to continually redefine the sequences of patterns and it is this technique that dominates in the primarily attack based sections of this piece. One of the primary challenges in composing with such a large number of short attack-based sounds was how to sustain interest over an extended period of time. In *The Doors Piece* repetition is used to explore the differences between similar sounding objects. Writing about the objective reality of repeating a sound object Schaeffer notes that, “the ear becomes increasingly alert, the more often one listens to the same object”. For example when presented with individual attacks in rapid succession which reappear in different permutations we start to listen past the attack, and focus on other properties of the sound beyond its natural typology (for example a sound’s harmonicity, spectral density, amplitude, position in the stereo

---


184 It is interesting to note that the primary typology used in Henry (1968) is that of the creak, i.e. the morphology, rather than the attack of a closing door.

field). As Chion notes in his discussion of Schaeffer’s ‘The Acousmatic Revelation’,

“By repeated listening to the same recorded sound fragment, the emphasis is placed on variations of listening. These variations do not arise from a ‘blurring’ of perception, but from “specific moments of illumination, directions which are always precise and always reveal a new aspect of the object, towards which our attention is deliberately or unconsciously drawn”186

For the first five works of the portfolio I built the piece up from left to right, composing in the direction of the flow of material. For The Doors Piece I wanted to explore another structural process and to this end I instead worked on a series of discrete parts, which I then organised in sequence towards the end of the compositional process. In an attempt to articulate a single structure for the work, the same attack-based sections are elaborated across the whole piece. As the activity in these sections increases they are positioned side by side with other sections which have little or no activity. This juxtaposition helps to maximise contrast and provide a series of different perspectives on the materials (as noted in the transition from Parts E – F – G).

Having looked at the large scale structure I will now focus on how the opening phrase is constructed, and examine the evolution of the four sections of Part A.

Part A of The Doors Piece

Much like the opening of The Snare Piece (and The Luc Ferrari Piece) a lot of material is presented in the first gesture of The Doors Piece which is then unpacked, developed or elaborated throughout the piece. The opening

---

fifteen seconds of *The Doors Piece* contains eight different materials\(^{187}\) (see Fig 3.18).

![Fig 3.18 Annotated opening of The Doors Piece, (0:00 – 0:15)](image)

1. Swoosh
2. Rising end weighted portamento vocal inflection
3. ‘C Heavy Door’ attacks (as described above)
4. Pulsing continuum (pitched around B3 quarter sharp)
5. ‘Liv Men’ door attacks (as described above)
6. Doorbird (short melodic contour – in this instance focused around the pitches G7 and F7)
7. Wind howling (manipulated)
8. Hard reiterative morphology (Knock Airport)

The opening phrase, which is approximately fifteen seconds long, is divided in two halves, with an upbeat to start. The beginning of the phrase

\(^{187}\) These sounds could be categorised as texture, vocal interjection, attack, continuum, melodic contour and reiterative morphology.
is indicated by the doubled C Heavy door, which acts as a downbeat throughout the section. This phrase shifts slightly as it repeats either through the subtle use of panning, small adjustments back or forth of the component sound files, or the gradual contraction and expansion of the phrase length itself (see Fig 3.19). This opening section of *The Doors Piece* demonstrates a more considered control of the periodicity of phrase length in comparison with the block repetition of the Snare Carnival sections of *The Snare Piece*, or the ‘unapplied repetition’ of *The Luc Ferrari Piece*. New sounds are incorporated into the phrase after one minute, some of which are alternative\(^{188}\) sounds to what we have already heard (1:21) while others are new types of attacks (1:27) or new sound types, e.g. short reiterative shakers (1:28). In the last twelve seconds of this section more new material is presented than has been introduced within the previous ninety seconds. The phrase culminates in the introduction of the snare drum (1:39)\(^{189}\) and the heavier mechanically operated door (1:40).

![Periodicity of the opening phrase in The Doors Piece](image)

\(^{188}\) That is, the same sound source but a different recording.

\(^{189}\) The presence of the sound of the snare drum roll at the end in this passage (1:39) could be attributed to three factors: The phrasing of the passage was percussive in the *behaviour* of the sounds, and the inclusion of the snare drum was in keeping with the behaviour of the material. The single snare stroke is a clear attack, and has a similar morphological profile to the attack of a closing door. I often re-worked sounds from previous pieces and a few soundfiles are always carried over from piece to piece.
Although compact, the upbeat presents two sounds which feature throughout the piece: the swoosh, which features on its own and also as part of the ‘Multicut’\(^{190}\) composite (see below), and the rising vocal inflection. As the only voice used in the piece, the rising vocal inflection stands out amongst all the sounds used. It is used sparingly throughout and it is always supported/heard in relation to a composite attack gesture. This vocalisation acts as conductor of sorts to the door attacks: the voice tries to cajole the other sounds to follow his lead but he fails to do so. Only once does the ‘conductor’ directly influence the consequent alignment of sounds (26:50 – 27:00) when the metric information from the descending articulated reiterations is used as the parameter to align the door attacks (i.e. semiquavers at \(\text{J} = 120\)).

The primary developmental energy of the first two sections of Part A is the typology of the attack. In the second section (1:50 – 4:50) the phrase becomes embedded\(^{191}\) into an expanding succession of attacks\(^{192}\) (built around the unit of the C Heavy soundfiles) while further elements are introduced (see Fig 3.20 for the distribution of these sounds throughout Part A). These elements can be classified as:

- Attacks: more door attacks (2:01), the introduction of Wood Pecker door sound (2:42) – magpie-like bird call

\(^{190}\) So called because it is a series of multiple cuts from the morphologies of various door creaks.

\(^{191}\) Although some sense of the downbeat is distinct it is still audible at 2:02, 2:22, 2:39 etc.

\(^{192}\) The principle of developing variation allows me to create a series of connected but non-identical patterns. The concept of developing variation was coined by Schoenberg, specifically in relation to the compositional technique of Brahms. Schoenberg defines developing variation as changes “which proceed more or less directly toward the goal of allowing new ideas to arise” (Schoenberg, 2006:247), while Frisch (1982) clarifies Schoenberg’s definition as “the construction of a theme by the continuous modification of one or more features (intervals, rhythms) of a basic idea, according to certain recognised procedures, such as inversion, fragmentation, extension, and displacement” (Frisch, 1982: 220). In The Doors Piece the basic unit/material presented at the start of the piece are extended, fragmented and augmented in the attack based sections of the work, which account for one third of the work (see Fig 3.14).
• Morphologies: continuous creaking/drilling sound (1:58), rising and falling contour of howling wind (2:05), panoramic door opening (2:21), foregrounded abrasive creak with musicians tuning up to A in the background (2:29)

• Melodic contours/musical material: short doorbirds (3:52), Music for George material (4:10), extended doorbirds (5:43)

Fig 3.20 Distribution of specific sounds in Part A of The Doors Piece

This cycling through of sounds with a similar typology coupled with brief introductions of new materials (and morphologies) creates both a sense of familiarity and disorientation. The transition to the third section (4:50) is indicated by the change from an elaboration of attacks to the introduction of a continuous/evolving morphology. This reiterative soundfile is the longest continuous sound presented so far in the piece. Discrete fragments are extracted from this soundfile to create much shorter reiterative impulses and these shorter components, which are connected at disjunctive angles, feature in the ‘Multicut’ composite (5:38 – 5:50).

The principle of construction of the ‘Multicut’\(^{193}\) composite is similar to the construction of the opening composite of The Snare Piece. It is 3.9 seconds long and features a series of short reiterative impulses, a single resonance

---

\(^{193}\) See Sound Example 13, which presents the various sonic components of the Multicut individually, then collectively.
filtered soft onset attack, a swooshing motion, two doorbirds, and the abrasive Aperghis door\textsuperscript{194}, which together form three interconnected layers of sound: reiterative, texture and melodic (see Fig 3.21). What makes this composite more versatile (as opposed to the opening composite of \textit{The Snare Piece}) is not necessarily the resultant image, but the increased flexibility of getting from one image/composite to another, made possible by using short reiterative impulse-based sounds positioned at the start and the end of the composite which are extendable in either direction\textsuperscript{195}. This \textquote{Multicut} composite is first incorporated into the sonic texture with three variations (5:38 – 5:51), then later used to transition out of the Cézanne patterning section\textsuperscript{196} (13:09), and appears again in a slightly reduced manner in the musical postlude (27:46 – 28:16) aligning metrically with the pulse of the \textit{Music for George} fragment.

\textsuperscript{194} So called because the composer George Aperghis recommended this particular door to me at the Darmstadt Summer Courses for New Music 2012.

\textsuperscript{195} These reiterative impulses act like small hooks that can grab on to, or stretch out towards, other sounds. These sounds are all extracted from a larger soundfile.

\textsuperscript{196} As both the Cézanne pattern and the \textquote{Multicut} composite use the same reiterative impulses, it is possible to transition from one to the other with a minimum of effort.
The third section incorporates more extended morphologies and doorbird material and acts as a transition from primarily attack based sounds of the first two sections. This section reaches a conclusion with an expansion of spectral and pitched space and a temporary cessation of the lower register (5:55). A short transition passage reignites the energy (primarily swooshes, doorbirds and the abrasive Aperghis doors) before the reappearance of the voice, this time with the phrase extended to include the reiterative descending “dadadadada”. The final transition into the last section (6:25) is a succession of two separate sounds with opposite amplitude and complementary panning profiles. This section brings the listener into a different acoustic environment, and offers a release after the concise energy of the opening three sections. The final gesture of the rotating door (7:03) leads from one acoustic environment to another (countryside to cityscape). After this point the rate of change decreases, and nearly all of the following sections develop, evolve, permutate or reconfigure the various materials which have been presented in Part A of the piece.

197 The sound of a plastic door seal against linoleum, and the sound of marshes in the wind.
Conclusion

“One of my complaints about the younger generation is that for me at least sound was the hero, and it still is. I feel that I’m subservient. I feel that I listen to my sounds, and I do what they tell me, not what I tell them. Because I owe my life to these sounds, right?”

For the past four years my compositional research has focused on recording, transforming and organising sound. My approach to organising sound evolves out of acousmatic tradition but pursues a more oblique perspective on the use and contextualisation of identifiable sound sources to present a more persuasive argument for the listener to (re)consider the morphology of the sound source. At the root at this contradictory approach is a desire to stimulate a perceptual link between the listener, the work and the world in which we live.

These research aims were addressed by creating a series of pieces which focus on a particular sound source, instrument or person and which employs these subjects as a focus to the recording activity and the gathering of materials. Various transformational processing was employed to extend the range of sound sources available, while the tools of filtering, transposition and time stretching offered the greatest potential to create a cohesive environment for the focal sounds of each piece. The use of these environments can create a more persuasive impression when attempting to create a concentrated account of one particular sound source/sound type.

As the discussion of the structure of The Snare Piece and The Doors Piece demonstrated, referential sound can be organised on small, medium and large scale, and the symbolic function of the sound can be negated to create a more morphological argument within a piece. The use of texts can also play a role as a re-contextualising element for the original sound material.

---

The works thus provide the space for the listener to discover a perceptual correlation on their own, which is why a large percentage of the soundfiles are untransformed: I want people to recognise the sounds, but to be given a new perspective on these sounds, as achieved by the means discussed, and so hopefully pay a little more attention to the inherent sonic character of that sound in future, outside the confines of the concert hall experience\textsuperscript{199}.

\textsuperscript{199} The exception being The Clapping Piece, where the concert hall is the natural environment for clapping.
Bibliography


Hirst, David (2013), Connecting the Objects in Jonty Harrison’s *Unsound Objects* [http://www.orema.dmu.ac.uk/?q=content/connecting-objects-jonty-harrison%E2%80%99s-unsound-objects](http://www.orema.dmu.ac.uk/?q=content/connecting-objects-jonty-harrison%E2%80%99s-unsound-objects) (accessed 01/08/2013).


Varèse, Edgar & Wen-chung, Chou (1966), Rhythm, Form and Content, Perspectives of New Music, Vol. 5, No. 1, pp. 11-19.


Wishart, Trevor (2012), Sound Composition, York: Orpheus the Pantomime.


Selected Discography

Dhomont, Francis (1989), Novars, on *Cycle du son*, empreintes DIGITALes, IMED 0158.


Gobeil, Gilles (2005), ‘Ombres, espaces, silences…’, on *Trois songes*, empreintes DIGITALes, IMED 0892.

Harrison, Jonty (1995), Unsound Objects, on *Articles Indéfinis*, empreintes DIGITALes, IMED 9627.

Henry, Pierre (1968), *Variations pour une porte et un soupir*, Philips, Cat# 836 898 DSY.


Scores

Appendix A – *Everybody Knows Everything*\(^\text{200}\)

During the process of creating materials for *The Snare Piece* I compiled a succession of snare attacks with their resonances removed. This soundfile\(^\text{201}\) was too obvious to be used in the piece in its raw state, but through repeated audition of the succession of short attacks I started to appreciate the harmonic pattern created by the successive individual attacks. Having selected a short sample of attacks, a spectral analysis of the sample allowed me to see which partials were accented naturally in the spectrum. I ‘translated’ this partial information into a set of pitches, which were aligned to create a series of chords\(^\text{202}\), (see Fig A.1 and A.2 for sonogram analysis of the raw snare attacks and resultant pitches). This use of technology to analyse sound could be described as employing a spectral approach to orchestration, “orchestration being the area in which the composer exercises subjective choice in manipulating raw sonogram material”\(^\text{203}\). These pitches were then mapped across the instrumentation of a piano quartet\(^\text{204}\), and formed one distinct set of material used in *Everybody Knows Everything*.

\(^{200}\) The Max/MSP Patch for the piece is included on the USB Flash Drive.
\(^{201}\) See Sound Example 14.
\(^{202}\) The rhythm was dictated by the original sequence of the composite of short attacks.
\(^{204}\) I was attending a composer course where all the participants had to compose a short piece for piano quartet.
The other material used for the piece was a melody I had composed for an early version of The Suitcases Piece. This melody was time stretched by a factor of .10, which kept the contour of the line, but radically changed its character (See Fig A.3 and Fig A.4).
Although I had to create material in an extremely short time there was something revelatory about applying the processes and techniques which I would normally reserve for my studio work (spectral analysis and extreme time stretching) to generate notes on the page. This avenue is one which I aim to explore further in my future work.
Donal Sarsfield  (2011/12)

Everybody Knows Everything

For Piano Quartet and Fixed Media

Score
**Everybody Knows Everything (2011/12)**

For Piano Quartet and Fixed Media

Violin
Viola
Cello
Piano

Throughout the piece seven soundfiles are triggered by a MAX patch.

**Notation:**

![Press spacebar to trigger soundfile in MAX Patch.](image)

**Dynamics**

Dynamics are to be extreme throughout, especially in the piano part. When chords in quick succession are marked ff/f – p, the chords should be voiced with an irrational jaunty strong/soft touch.

**Text**

“I ask myself more and more why everybody knows so much about art”.

“Everybody knows everything”.

“What was great about the fifties was that for one brief moment – maybe, say, six weeks - nobody understood art”.

Taken from Morton Feldman, Give my regards to Eighth Street, published in *Give My Regards to Eighth Street, Collected Writings of Morton Feldman*, ed. B. H. Friedman, Exact Change: Cambridge USA, 2000.
Stage Layout

Equipment:

Laptop, Mixer.

System Requirements: Mac OSX 10.5 or later, MaxMSP Version 5 or later.

A person is required to trigger the soundfiles for the Max Patch which are indicated in the score.
EVERYBODY KNOWS EVERYTHING
For piano quartet and fixed media

A Upbeat and percussive
\( \frac{\text{A}}{4} \) = 138

Violin

Viola

Cello

Piano

Fixed Media

Trigger Soundfile 1

A Upbeat and percussive
\( \frac{\text{A}}{4} \) = 138 marcato - jaunty

Copyright © D Sarsfield
Soundfile 2: He says, "I ask myself more and more, why everybody knows so much about art"
Soundfile 3: “Everybody knows everything”
B Crazed belly dance

Vln.

Vla.

Vc.

Pno.

F. M.

B Crazed belly dance

Vln.

Vla.

Vc.

Pno.

F. M.
Soundfile 4: "I ask myself more and more why everybody knows so much about art".
Vln.  Vla.  Vc.  Pno.  F. M.

\[ \text{Yo-yoing, lighter} \]

\[ \text{Yo-yoing, lighter} \]

\[ \text{Yo-yoing, lighter} \]

Soundfile 5: “Everybody knows everything”.

\[ \text{Yo-yoing, lighter} \]
Soundfile 6: “What was great about the 50's, was that for one brief moment, say six weeks, nobody understood art”.

Vln.
Vla.
Vc.
Pno.
F. M.
Soundfile 7: "Everybody"

\textbf{Hushed}  
\textit{con sord}

\textbf{Hushed}  
\textit{con sord}

knows everything".
Appendix B – Performances of Works

The Clapping Piece (2010)

Week of Speakers, Huddersfield (May 2010)
Cuenca, Spain (Sept 2010)
MANTIS, Manchester (Oct 2010)
San Francisco Tape Music Festival (Jan 2011)
EIMAS Brazil (Sept 2011)
Darmstadt Summer Course for New Music (July 2012)

The Suitcases Piece (2010 -11)

Cuenca, Spain (Sept 2010)
ISCM World Music Days, Brussels (Oct 2012)

The Footsteps Piece (2011)

MANTIS, Manchester (Mar 2011)

The Snare Piece (2011 – 12)

iFIMPac, Leeds (Damien Harron) (Dec 2012)
Harmonic Series, Southbank, (Sam Wilson) (Feb 2013)
New York NYCEMF (Levy Lorenzo) (April 2013)

The Luc Ferrari Piece (2012)

MANTIS, Manchester (Mar 2012)
EMUFEST, Italy (Oct 2012)
Distractfold Ensemble, Manchester (Dec 2012)
Sonorities, Belfast (Apr 2013)
The Doors Piece (2013)

MANTIS, Manchester (Mar 2013)

Everybody Knows Everything

Dartington International Summer School (Aug 2011)
Free State, Crash Ensemble, Dublin (Apr 2012)

Prizes / Awards

Joint First prize for The Suitcases Piece at the Concourse International de Musique Bruitiste Luigi Russolo 2011.

Amendments

Some changes were made to The Snare Piece after the first performance, and there are some discrepancies between the score and the recording submitted, most notably the inclusion of the ride cymbal at Rehearsal Letter Q.
Appendix C – Dynamic EQ Filtering - The Luc Ferrari Piece (4:06 – 4:10)

Fig C.1 Dynamic EQ filtering used in The Luc Ferrari Piece 4:06

Fig C.2 Dynamic EQ filtering used in The Luc Ferrari Piece 4:07
Fig C.3 Dynamic EQ filtering used in The Luc Ferrari Piece 4:08

Fig C.4 Dynamic EQ filtering used in The Luc Ferrari Piece 4:09
Fig C.5 Dynamic EQ filtering used in The Luc Ferrari Piece 4:10