Music, Sound, Space and Time:

A practice-based spectromorphological and space-form investigation in composition and performance

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Abstract

This commentary is a record of my research into the spatial characteristics in my composition and its relationship with the concepts of spectromorphology and space-form as proposed by Denis Smalley. My research is also informed by the ideas of oneiric phenomenological experience of place (the home) in Gaston Bachelard's *The Poetics of Space* and the way Brandon Labelle extends those ideas in parts of *Acoustic Territories: Sound Culture and Everyday Life*.

I contextualise my research with reference to composers who use space as a primary concept in their work. Phil Niblock, Steve Roden, Theodoris Lotis and John Luther Adams have all informed my work with their differing expositions of spatial detail.

My works manipulate sound to create spaces in compositions that reference ideas of human experience by Bachelard and Labelle using the tool-kit that Smalley provides.

In my original contribution to knowledge I identify Smalley's concept of transcontextuality in its ambiguous and acousmatic setting (to create imagined extrinsic connections in the listener) as a conceptual bridge between spectromorphology and the *poetic image* that is the genesis of oneiric reverie in *The Poetics of Space* and extended into the realm of acoustic territory by Brandon Labelle. I also use Smalley's concept of behavioural spaces and extend this to include transcontextual behaviour of oneiric reverie in a domestic setting that references my own research pieces.

In summary I revisit my research questions in light of the pieces I have researched and reflect on how they have been engaged with. I also survey the research pieces and draw out examples of where oneiric experiences are invited and possible in the music. I draw conclusions that the oneiric transcontextual possibilities are linked directly to spatial properties in composition and define some basic parameters where the research shows they can exist.

Introduction

Music and sound[1] and how they interact within the parameters of space and time are under constant negotiation. Influences from technology, art, politics, philosophy and other unpredictable sources of influence constantly mediate the use of sound and the creation of music that will represent a wide spectrum of listening experiences depending on the composer's concerns. It is in this context of change and development that I comment on my practice and its more immediate relationship to the concepts of spectromorphology, space-form, phenomenology, transcontextuality, imagination and reverie.[2]

The research pieces that constitute my practice provide the development of ideas based on two key writings from Denis Smalley[3] that introduce the concepts of spectromorphology and space-form, and the relationship between these and the further concepts researched through the compositions. The ideas of transmission[4], imagination and reverie[5], and the phenomenological approach to researching these concepts through compositional decision making provides a methodology that expands and contextualises the toolset Smalley proposes. The idea of space(s) and what that can mean is central to my practice and this commentary annotates the way that space-form is re-figured within the research-based outcomes in the compositions.

Musique Concrète, computer music and the studio as a composer's tool synthesized with post structural and phenomenological concerns in avant garde practice all contribute to new possibilities with sound. This new aural territory had little resemblance to previous practice and most established theoretical methodology, music theory and notation that represented a "lattice" based organization of tones[6] (the tonality of traditional western art music). This new practice required its own toolset of theory, concepts and methodology and this need has been

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[1] Sound as the possible material of music but as yet unorganised and unused as music by the listener.
[2] Denis Smalley, 'Spectromorphology: Explaining Sound-Shapes', *Organised Sound*, 2.2 (1997), 107–26 <https://doi.org/10.1017/S1355771897009059>.
[3] Smalley, 'Spectromorphology: Explaining Sound-Shapes'; Denis Smalley, 'Space-Form and the Acousmatic Image', *Organised Sound*, 12.1 (2007), 35–58 <https://doi.org/10.1017/S1355771807001665>.
[4] Brandon LaBelle, *Acoustic Territories : Sound Culture and Everyday Life* (New York: Continuum, 2010). 212. *"The development of electronic transmission, and related infrastructures of towers and networks, uncovers a culture or aerial imagination. The suggestive beaming of signals enacted by antenna creates a medial space, nurturing ideas of freedom and communications, power and magic"*
[5] Gaston Bachelard and M Jolas, *The poetics of space*, Beacon paperbacks (Boston: [Boston, 1976).
[6] Trevor Wishart and Simon Emmerson, *On Sonic Art*, Contemporary Music Studies, New and rev. ed. (New York: Routledge, 1996). 23

met with writing that redefined the musical landscape. Pierre Schaeffer, Michel Chion, Barry Truax, Trevor Wishart and Denis Smalley amongst many others have all contributed to an understanding of music that centres on sound objects, morphology and spatial properties. This strand of writing has its provenance in Musique Concrète which Pierre Schaeffer captures in *Traité des objets musicaux* (1966).[7] Whilst different sections of the wider post war experimental music have their own practices, there is significant crossover. Pieces such as Mortuous Plango[8] which invoke a very specific music concrète atmosphere use techniques from computer music to programme the sounds that we are invited to listen to[9]. The acousmatic nature of the music based on the morphologies and spatial properties of the bell overtones and boy's voice are manipulated using computer programs and this sometimes hidden synthesis of computer technology and music defines my practice and electroacoustic music more widely.

My Methodology

My compositional practice has two main processes which are important and relational. Firstly, I establish my research goals that the piece is concerned with investigating. This strand is always present in compositional decision making and operates at the highest level. The more organic decisions described below are checked against it.

The second strand is the material itself. Once I have chosen the basic sound objects to be used in a work, I will often just spend time experimenting with them – manipulating them through processing to increase variety, timbral choices and different lengths of material. I tend to background the first process in this 'play' though it is always there. I have no real expectations of this process accept that it will generate possible new material for the composition. I will end up with the original material and the new material I have created through this process of discovery/play and I will then turn to more conscious decisions of composition, arrangement and mixing.

This phase involves the relationship between very intuitive building decisions of smaller structures from the sound material and the referencing of this ongoing process against the

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[7] Pierre Schaeffer, *Traité des objets musicaux : essai interdisciplines*, Pierres vives (Paris: Éditions du Seuil, 1966).
[8] Jonathan Harvey, 'Mortuos Plango, Vivos Voco' (Faber Music, 1980) <https://www.fabermusic.com/repertoire/mortuos-plango-vivos-voco-1154>.
[9] Jonathan Harvey, 'Cut and Splice 2005' <https://www.bbc.co.uk/radio3/cutandsplice/mortuos.shtml> [accessed 10 December 2019].

research goals. The process of intuition is very important in this phase and my experience is that I can build many small to medium scale sound structures which are layered in rich spectromorphologies by joining material based on their innate qualities that I perceive. I consider this phase to be an extension of the play involved in creating sound material by processing. These processes can be clearly heard throughout *Tibetan Bells* and *Seven*.

As structures get larger and more complex, I can reach a point where I engage with the research goals actively. I am at a point where the composition has something to say about these goals. They have always been there so in a sense they always inform but at this phase they can inform higher level decisions in structure, be reformed themselves due to the compositional process or set aside as the composition has developed in a significantly different direction.

Research Questions

1. How will my practice use the language of perception/reception to inform compositions within and across the boundaries of the electroacoustic genre, as suggested in the concepts of spectromorphology and space-form by Denis Smalley (1997, 2007)?

2. What methodology can be created using Smalley's writing as a starting point that contributes to an inner or personal soundscape being made explicit? What perceivable characteristics will conform and add to the spectromorphological theory?

3. Can spectromorphology provide a coherent conceptual space for tonal music to be included in my contemporary electroacoustic practice, or is the inclusion of tonal music a regressive gesture (and does it sound so) in my practice?

4. Can live composition/performance and listener participation/composing/collaboration in live realizations of new music be spectromorphologically narrated?

5. How will the attendant psychological concerns of Smalley's (and others) writing be used in my methodology?

Theory

Smalley

Denis Smalley's writing acknowledges and borrows from Pierre Schaeffer's work and seeks to provide a toolset for analysis in what might be apprehended when listening to electroacoustic compositions. *Space-form and the acousmatic image* (2007) builds on the Space and Spatial morphology section of his *Spectromorphology: Explaining soundshapes* article in Organised Sound (1997). Spectromorphology is a term that covers the morphologies over time that sound often exhibits in electroacoustic or acousmatic music[10]. It deals extensively with *gesture, texture, trajectories, root, canopy* and the introduction and dispersal of aural energies in works. Whilst Smalley offers spectromorphology as an analytical toolset in listening to music, he acknowledges that it can be used as a compositional tool too (with the proviso that it won't make you a better composer[11]).

The key premise of space-form is that listening to electroacoustic work primarily in the spatial domain rather than a time-based domain is of intrinsic value and rewards the listener with a different understanding of the composition than a purely temporal listening experience.[12]

Denis Smalley begins his *Space-form and the acousmatic image* article by recounting the personal experience of listening to a soundscape at a quayside home on the Orbieu river in Southern France and he starts to build his concepts from his description of this experience.[13] The experience becomes a central 'picture' for the concepts Smalley introduces in the article and I found it worth analysing as it offers itself to be part of a methodology of composition in what it offers and also in what is omitted.

Smalley starts by describing the landscape he is experiencing – setting the scene. He gives his own location and makes a point of stating that he moves his head to enter the soundscape:

> *"I lean on the windowsill and put my head outside to let my ears enter the outdoors space."[14]*

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[10] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 107 Section 2: Definitions and Contexts
[11] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 107
[12] Smalley, 'Space-Form and the Acousmatic Image'. 54 *" … space should now move to centre stage to become the focal point of analysis of, or commentary on, acousmatic music."*
[13] Smalley, 'Space-Form and the Acousmatic Image'. 35
[14] Smalley, 'Space-Form and the Acousmatic Image'. 36

He gives the time of this listening experience (dusk) and states that the conditions are "*acousmatic*"; general features of the physical landscape can be perceived but sources for the sounds cannot. The soundscape consists of the river, animal noise from frogs, cicadas and swifts, human agency from the sound of cars. From this sparse and natural soundscape Smalley begins to offer concepts tied to location, behaviour and layers. The river sound is "*backgrounded*" by Smalley as he wants to focus on the other elements. "*Zoned*", "*signalled*" and "*behavioural*" spaces are introduced to describe the frog/cicada/swift behaviour. "*Proximate*", "*personal*", "*perspectival*" and "*distal*" spaces are invoked by cicada/swift activity. Human agency in the form of cars act as instigators of "*vectoral*" space and "*vectoral wipe*" (where a movement of an object shrouds the background sound it moves across).[15]

The description of Orbieu is more complex than the key terms Smalley introduces above might suggest. His description includes many spectromorphological attributes and behavioural features that foster spatial-agency groupings such as "zoned spaces" [16]However, the Orbieu experience does act to introduce the first layer of space-form terminology and is referred back to throughout the article.

As an exemplar of space-form (the listening of electroacoustic music with space as the aesthetic) the Orbieu experience has some advantages and disadvantages. The relative tranquillity of the experience allows Smalley to focus in and analyse specific sources with relative ease, even if the analysis pinpoints to zones. The sense of location within space is never in doubt and movement within the space, even layered movement with vectoral wipes, is precisely offered. Smalley essentially offers a listening experience with which he can state:

> "*By now the perspectival and spectral space of this soundscape had, to my mind, become as satisfying and fully formed as it could be, and I could arrive at an holistic view*"[17]

The Orbieu experience benefits from being sparse in terms of sound sources and predictable sound movements. Birds fly and cars move, cicadas chirrup and frogs croak. Everything is in its natural state. There is much that is not present and this contributes to a largely Cartesian experience of subject and object. The scene is also significant in lack of utterance. My

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[15] Smalley, 'Space-Form and the Acousmatic Image'. 37
[16] Smalley, 'Space-Form and the Acousmatic Image'. 36
[17] Smalley, 'Space-Form and the Acousmatic Image'. 37

practice has been equally informed by ideas expressed about human agency and human sensibility and work by Brandon Labelle and Gaston Bachelard are significant influences in my methodology.

Brandon Labelle

In his chapter Sidewalk in Acoustic Territories[18] Brandon Labelle maps out the political, social, architectural and personal properties of being in this space. The sonic properties of the sidewalk are highlighted as they signify the processes of the properties above. The soundscape Labelle describes here differs fundamentally from the Orbieu soundscape:

> *"We enter an acoustic space in continual evolution with so many perspectives. Construction noise in the distance, laughter passing here and there, the skirting and skidding of shoes on the pavement, bicycles shooting past to circulate a wind of energy by the ear, all bumping and whirling in a flood of warmth and monotony."[19]*

Labelle's description suggests participatory involvement in a way that the Orbieu environment does not. It is difficult to foresee a "*holistic view*" becoming apparent of the sidewalk in the same way Smalley states was possible with Orbieu.[20] This sense of required participation to experience the soundscape – a phenomenological approach to the sounds, is significant to my practice in its suggestion of immediacy and impermanence, human experience, and of space being determined by our apprehension of it.

Immediacy and impermanence are themes in Labelle's description of Sidewalk but also implicit in his chapter on Sky[21] that describes a space that is unseen and tangential to our sensory reception.[22]

Bachelard

Capturing listening experience and the spaces that they occur in is a central concern in my practice. Gaston Bachelard's *The Poetics of Space* is an influence on my practice and

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[18] LaBelle. 85 Sidewalk: Steps, gait, and rhythmic journey-forms
[19] LaBelle. 94
[20] LaBelle. 88. *"The sidewalk is a threshold between an interior and an exterior, between different sets of rhythms that come to orchestrate the dynamic passing of exchange each individual body instigates and remains susceptible to."*
[21] LaBelle. 201. Sky: Radio, Spatial Urbanism, and Cultures of Transmission.
[22] Smalley deals with mechanical/radio/tv sound in the term mediatic space (Smalley, 39) but Labelle extends the terrain significantly in his section Sky.

methodology in this aspect as he views ideas about the domestic space of home and spaces within it from a phenomenological perspective that extends human experience to include reverie, dream, childhood and poetic imagination.[23] Bachelard's concepts of the spaces he writes about are conceptually different to the way that Spectromorphology and space-form are articulated and they have provided a space to research dimensions of intimacy and inner-space in my practice and the methodology that underpins it.[24]

Bachelard's introduction to *The Poetics of Space* is an essay on the 'poetic image', a point of creative apprehension that has influenced the methodology of my practice and is cited by Denis Smalley and Brandon Labelle. Bachelard describes a move away from an 'objective' view of the philosophy of poetry towards a phenomenological approach. He asserts that a defining feature of the poetic image is its lack of causality:

> *"The poetic image is not subject to an inner thrust. It is not an echo of the past. On the contrary: through the brilliance of an image, the distant past resounds with echoes, and it is hard to know at what depth these echoes will reverberate and die away. Because of its novelty and its action, the poetic image has an entity and a dynamism of its own; it is referable to a direct ontology."*[25]

It is in the nature of the poetic image to be something other than just another conscious process[26] and Bachelard spends some time talking about a phenomenology of the 'soul'.[27] Once he has established the location for receiving and apprehending the poetic image Bachelard expands on the sense of 'reverberation' that allows poetic images to affect us and others.

The poetic image also resonates. Resonance and reverberation are different; resonance is the effect of the image on our life as it intersects with the wider world.[28] Reverberations are more profound and localized in our phenomenological experience; they *"bring about change of being"*.[29]

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[23] Bachelard and Jolas.
[24] I make a connection between Smalley's idea of a transcontextuality fostered by imagination and Bachelard's oneiric experience of the house.
[25] Bachelard and Jolas. xvi
[26] Bachelard and Jolas. xxi *"Forces are manifested in poems that do not pass through the circuits of knowledge"*
[27] Bachelard and Jolas. xx
[28] Bachelard and Jolas. xxii
[29] Bachelard and Jolas. xxii

My research portfolio

My practice researches spectromorphology and space-form compositionally through the prism of oneiric and wider human apprehension as discussed by Gaston Bachelard and Brandon Labelle. Discovering intersects where phenomenological listening and spectromorphological and space-form composition meet in my practice is a major research outcome.

My portfolio of research works comprises of the following 5 pieces. Earlier working, where noted to highlight earlier realisations of ideas discussed are included in the portfolio as described in Appendix 1.

Tibetan Bells (2011)

This work uses a set of Tibetan bells as the only sound source to create a piece that explicitly explores a spectromorphological soundscape of the underground[30][31] using the toolset that Smalley introduces in *Spectromorphology: explaining sound-shapes*.[32]

Seven (2012)

Seven researches the process of internal or inner soundscape by manipulating a synthesis of utterance and piano with the aim of establishing a *transcontextual* listening experience of the material to enter the world of reverie that Bachelard refers to in *The Poetics of Space*. The exploration of inner space is a research interest and Bachelard's quotation of Rilke in chapter 2 is something this piece seeks to actualise within its own terms[33].

Home (2016-18)

Home researches a contemporary domestic idea of home in a spectromorphological and space-form context. The piece researches domestic activity and the space that is home and

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[30] LaBelle. 1. Underground: Busking, Acousmatics, and the Echo.
[31] Bachelard and Jolas. 18. Bachelards description of cellar provides some compositional commentary and inspiration too.
[32] Smalley, 'Spectromorphology: Explaining Sound-Shapes'.
[33] Bachelard and Jolas. 70. The private world Rilke describes in his childhood duties of dusting and polishing are analogous to oneiric listening that I intend to support in composition in *Seven*. This is discussed in the commentary chapter for the piece.

what home might mean in terms of boundaries. Sonic material is used to suggest spaces that are a mixture of geographical and behavioural through human agency.

Solea (2019)

Solea researches the use of spectromorphological concepts in a tonal instrumental setting that directly reflects my third research question. The piece is contextualised partially by work from Phill Niblock (Hurdy Gurdy[34]), but also the exposition of space in the work of John Luther Adams, particularly *The light that fills the world*[35], with the necessary acknowledgement in the differing scales of instrumentation and process.

Four Radios (2019)

Four Radios researches spaces generated by *mediatic* material that is processed by a Purr Data patch to explore potential spectromorphologies created by real time performance of the patch. Sounds are processed and manipulated by an intuitive reading of live radio signal using the performers knowledge of the patch's processing potential and a real-time analysis of the incoming signal to research Smalley's toolset.

Composers

There are many contemporary composers that work with these themes and my work is contextualized by their practice. Theodore Lotis, Steve Roden, John Luther Adams and Phill Niblock work with spatial concepts and explore limits of perception in their composition. Manuella Blackburn has used spectromorphology and space form to create a composers tool box which she has used in her own electroacoustic composition[36].

Steve Roden

There are two distinct aspects to Steve Roden's work that interest me conceptually; his creation of "possible landscapes" using studio techniques to amplify quiet or casually

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[34] Phill Niblock, 'Hurdy Gurdy' (Touch (UK)) <https://doi.org/TO:49>.
[35] John Luther Adams, 'The Light That Fills the World' (Coldblue, 1999) <https://doi.org/CB0010>.
[36] Manuella Blackburn, 'The Visual Sound-Shapes of Spectromorphology: An Illustrative Guide to Composition', *Organised Sound*, 16.1 (2011), 5–13 <https://doi.org/10.1017/S1355771810000385>.

inaccessible sounds, and his aesthetic stance of "lower case" an approach that emphasizes close listening and the surfacing of the quiet or overlooked.[37]

Roden's work uses these concepts to create pieces that are primarily spatially aware; *A Quiet Flexible Background For a Harmonious Life*[38] evokes a space more than temporal movement from the beginning with a 'pad' sound that subjectively suggest human agency through machinery (Something Smalley conceptualizes as mechanised space in space-form[39]). This figuring of a space is enhanced by the subjective qualities of the other main sound at the beginning of the piece – a sound that has qualities of tremolo and swept frequency filtering but evokes a behavioural space[40] that could be the croaking of frogs – suggesting a night-time setting. A cicada type sound that emerges intermittently further into the piece helps the illusion of a nocturnal soundscape.

Roden is unhurried in his deployment of sounds and uses layers to introduce new avenues of listening. *Eight breaths of different length*[41] establishes 3 main sounds of the duration of the piece and with subtle mixing and the addition of two background sources, creates a piece that avoids static repetition by the way the layers remain distinct for so long and then blend in the final third.

Theodoros Lotis

Theodoros Lotis[42] was a student of Denis Smalley and has created many works that explore spectromorphology and space-form as well as authoring several papers that explore aspects of Smalley's research. Lotis uses layers of sound that are clearly apprehendable to create a depth of field in listening that exemplifies a space-form approach to composition. *Instant of a Crystal Glass*[43] and *Le Grain d'Annette*[44] convey a sense of space that develops with the introduction and diffusion of layers that are born of source material and the studio. My

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[37] Steve Roden, 'Steve Roden' <http://www.inbetweennoise.com/bio/> [accessed 10 December 2019]. *"In the sound works, singular source materials such as objects, architectural spaces, and field recordings, are abstracted through humble electronic processes to create new audio spaces, or possible landscapes. The sound works present themselves with an aesthetic Roden has described as lower case – sound concerned with subtlety and the quiet activity of listening."* From biography
[38] Steve Roden, 'Schindler House' (new plastic music, 2002).
[39] Smalley, 'Space-Form and the Acousmatic Image'. 39
[40] Smalley, 'Space-Form and the Acousmatic Image'. 36
[41] Steve Roden, 'Three Roots Carved To Look Like Stones' (Sonoris, 2003) <www.sonoris.org>.
[42] Theodoros Lotis, 'Theodoros Lotis' <https://www.theodoroslotis.com/> [accessed 10 December 2019].
[43] 'Lustro 01' (CMMAS, 2011).
[44] Theodoros Lotis, 'Theodoros Lotis - Listening' <https://www.theodoroslotis.com/music> [accessed 10 December 2019].

research pieces use layers to create morphing space that references Lotis' practice in his composition.

Phill Niblock

Phil Niblock's work is centred on the creation of longer pieces utilising drones, normally from musical instrument sources. Individual pieces such as *Harm*[45] and longer album works like *Touch Five*[46] create their own internalised worlds of soundscape using granular synthesis techniques of differing lengths, and pitch shifting. The layers that are so distinct in Thoedoros Lotis' work are typically blended in Niblock's work allowing spaces to evolve over longer periods of time. My research piece Seven references this technique to create a transcontextual soundscape.

John Luther Adams

John Luther Adams uses orchestra and tonal composition to convey space and the techniques he uses in composition reference electroacoustic and spectromorphological/space-form concepts in a way that allows for connections to be made. Simple repetition, tone clusters, drones, diffusion, layering of timbres and pitches and development over appreciable time allow for a spectromorphological analysis of his work - something anticipated and allowed for in Smalley (1997). [47]Works such as *Clouds of Forgetting, Clouds of Unknowing*[48], *Become Ocean*[49] and *The light that fills The World*[50] create complex soundscapes that inform my approaches in particular to my third research question.

This commentary

The following chapters are a commentary on my research based around the pieces I submit for my portfolio. They include references to supporting material collated in the appendices and Appendix 1 explains where material can be found in the portfolio.

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[45] Phill Niblock, 'Touch Three' (Touch, 2006) <https://doi.org/TO:69>.
[46] Phill Niblock, 'Touch Five' (Touch, 2013) <https://doi.org/TO:91>.
[47] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109. Smalley makes the point that contemporary instrumental composition can be analysed spectromorphologically.
[48] John Luther Adams, 'Clouds of Forgetting, Clouds of Unknowing' (New World Records, 1995) <https://doi.org/80500>.
[49] John Luther Adams, 'Become Ocean' (Cantaloupe Music, 2014) <https://doi.org/CA21101>.
[50] Adams, 'The Light That Fills the World'.

Tibetan Bells

One of my main research threads is the relationship of *spectromorphology* and *space-form* with the model of *acoustic territory* that Brandon Labelle offers. My research supports a compositional methodology that uses spectromorphology, acousmatic transcontextual development and environmental development alongside an understanding of the self as an aural, creative, phenomenological and imagining assemblage. These processes and attributes are capable of projecting limitless possibilities to compose or create through listening full virtual soundscapes of rich diversity; soundscapes that support thought-scapes or oneiric-scapes.

Tibetan Bells is an arrangement of audio that uses processing on a single sound source of a set of Tibetan bells (see figure below). Most of the processing mimics tape based compositional techniques (slowing and speeding up of material, cutting and reversing sections) and this reflected one of my main compositional questions; what kind of spectromorphologies were available from this single source and how would a spectromorphological composition take place as a result of the sounds discovered by audio processing. The order of decision making in the compositional build (the decisions I made about structural layering of the piece), and that relationship with the creation and arrangement of smaller pieces of sound processing, is one of the central areas of research into how spectromorphological composing emerges from this work.

Figure 1: The bells used in the piece Tibetan Bells

Smalley argues in 'Spectromorphology: Explaining Sound-Shapes' that certain types of music are more suited to spectromorphological analysis than others. Spectral qualities, motions and fluctuations, ambiguous sound sources are cited as some of the qualities (as

opposed to notes, rhythm and instruments/known sounds) that are suited to the spectromorphological concepts.[51] Music that is acousmatic; where *"the sources and causes of the sounds are invisible … when the listener cannot connect the sounds heard with the observed physical activity which supposedly produces them."*[52] is where the focus of spectromorphology lies. This acousmatic music can be instrumental and Smalley cites the work of Grissey, Xenakis and Dillon amongst others to make this point.[53]

When a wide range of instruments are used Smalley likens a spectromorphological approach to *"the orchestra is 're-synthesised' into a kind of spectromorphological hyper-instrument"* where sound and texture take precedence over notes and instrument separation.[54]

The methodology deployed in the creation of Tibetan Bells is well suited to researching these concepts as it is wholly acousmatic and its layered sounds are primarily concerned with the morphologies of textures and motions created by slowing down and speeding up the source instrument. The composition starts with the recording of the bells in my home studio. The bells were vibrated using 5 interactions; single hits, repetitive hits, scrapes, strikes and rubs.

I chose to work with these bells because their natural sonic quality suggested I would be able to reveal a rich timbral spectromorphology in the processing stage of research. The bells have a very short onset which features the 'click' of their impact. The release/sustain and decay of the bells is a smooth continuant of harmonics that lasts 8 seconds if struck with moderate impact. The inherent spectromorphology of the natural sound includes a high frequency 'openness' that I intuitively wanted to research a process of spatial composition.

The piece researches the interior spectromorphologies of the bells and the consequent soundscape. The primary methodology is a slowing of the recorded sound and then manipulation of the resultant sound using digital processing. The textures that emerge are given trajectory by the emergence of higher frequencies (e.g. 32 secs and 3.13 mins) and the propulsive quality of the clicks and thuds that start at 37 secs. I layered tracks to create a soundscape that ultimately suggest submergence and weight. Processing the sounds in this way removes any clear bell like resemblance to the sounds and creates an acousmatic

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[51] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109
[52] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109
[53] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109 Smalley includes these composers where their work is *"concerned with spectral and textural complexity"*.
[54] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109

environment[55] where *reduced listening* can occur[56]. These terms from Pierre Schaeffer's *Traite des objets musicaux: essai interdisciplines*[57] are included in Michel Chion's *Guide* and used and commented on by Denis Smalley. The links between Smalley's concepts within spectromorphology and Scaheffer's work as collected in *Traite des objets musicaux* are explicit and Smalley's work is in part an exposition and then development of Schaeffer's work.

Smalley is concerned that reduced listening can lead to "*perceptual distortions*" and an overcompensation towards "*background*" and "*intrinsic*" material[58]. But reduced listening is clearly essential in the acousmatic soundscape in the way it centres on sound objects and allows the listener and composer to prioritise what is being heard in a phenomenological way that temporarily removes associations and meanings that the sounds might convey[59]. Chion also argues through quotation that reduced listening is connected to an "*ordinary listening*" which takes into account "*What is going on?*" and "*What does it mean?*"[60]

The other processing concerns manipulations that speed up the bell sound and clusters them to create layers that cohere into a soundscape that occupies space in the soundscape that is subjectively above the established textures. These sounds are augmented by some untreated bell single hits that are heard in the second half of the piece. This secondary soundscape is introduced 2 minutes into the piece and the following spectrogram shows this clearly as well as the bass centred activity of the textures and then the sparser higher frequency activity of the secondary soundscape cluster as it develops through the remainder of the piece.

I undertook the following signal processing with Tibetan Bells:

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[55] Michel Chion, *Guide Des Objets Sonores: Pierre Schaeffer et La Recherche Musicale*, ed. by Christine North John Dack, BUCHET/CHASTEL (Paris: INSTITUT NATIONAL DE LA COMMUNICATION AUDIOVISUELLE, 1983). 11

[56] Michel Chion. 30 *"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. More precisely, it reverses the twofold curiosity about causes and meaning (which treats sound as an intermediary allowing us to pursue other objects) and turns it back on to the sound itself. 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)."*

[57] Schaeffer.

[58] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 111 Smalley is concerned that reduced listening leads to two problems; the removal of extrinsic threads by sonic interest in details of the sound; and focussing on background micro-detail at the expense of foreground material. I understand the first problem as a composer's dilemma, but it is one that assumes a concreteness to extrinsic meaning where I would argue for transcontextual ones in my own work.

[59] Michel Chion.

[60] Michel Chion. 31

- The bells were recorded into an Akai DPS 24ml II on individual tracks. They were struck using different techniques as described above.

- Some of the tracks were exported to Audacity to be slowed using a time stretch function set to its maximum duration.

- All sounds are eventually imported into Logic. Tracks are arranged and some muted and hidden.

- Logic plugins Space Designer, Delay Designer, Tape delay and compression were applied to some tracks (this can be seen on a track basis in the Tibetan Bells Logic project as linked in Appendix 1).

- Mix automation is applied to the tracks that sound. Pan, volume and some FX tails are automated.

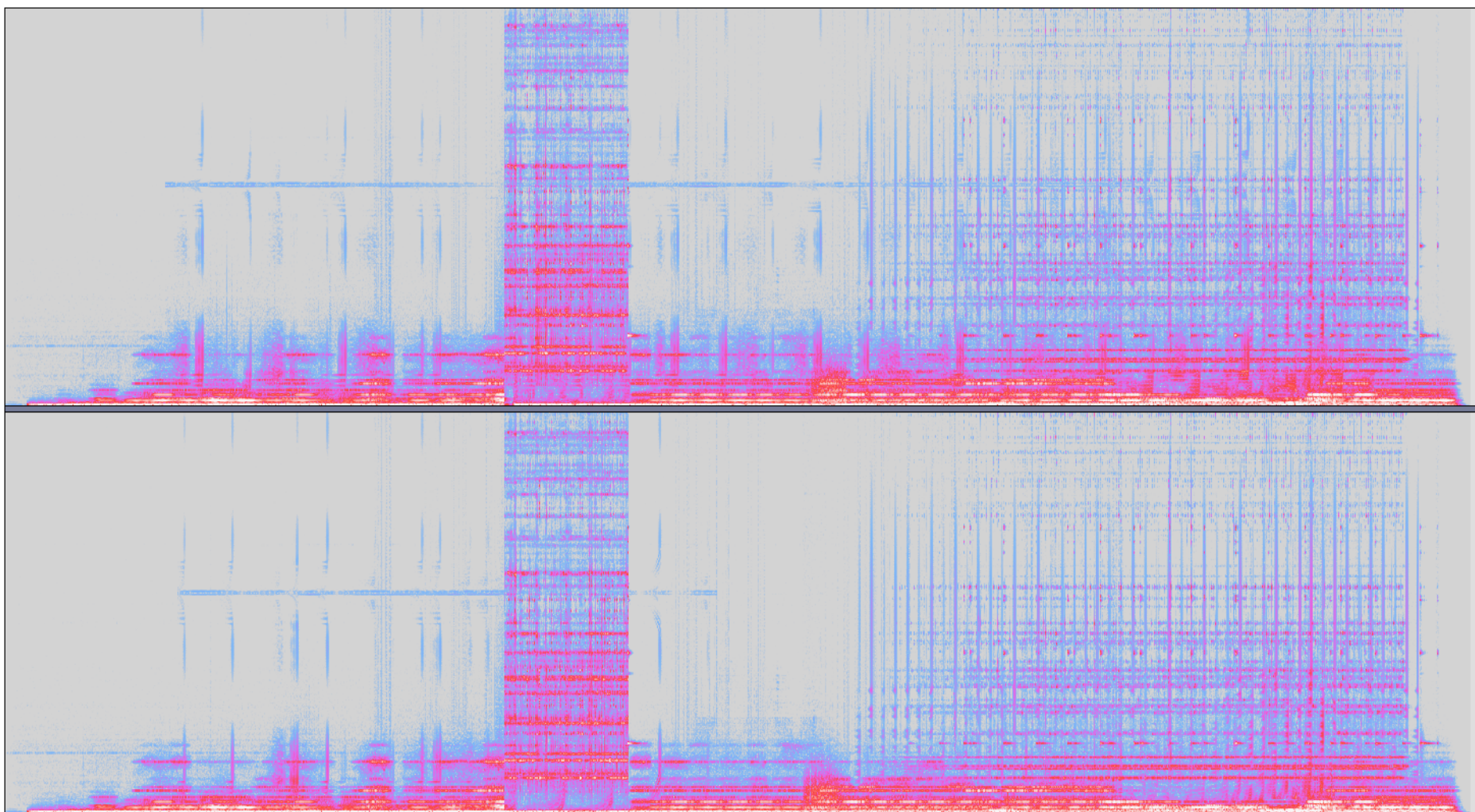- The project is bounced to stereo.

Figure 2: The spectrogram of Tibetan Bells as generated by Audacity showing a frequency range of 0 - 20kH on the x axis

My process of slowing the bells reveals a rich spectromorphology and I chose to start with a slowly emerging drone that is in the bass register of the piece. The drone resonates and partials come to the foreground establishing a presence that evolves in spectral content as well as in motion with undulations, clicks, and pulses that keep the sound from being static throughout the piece.

Denis Smalley is concerned with what these sounds represent in a musical experience and his concepts of *intrinsic* and *extrinsic*, and *gestural surrogacy* are relevant to this point about sounds[61]. In *Space-form and the acousmatic image*[62] he starts to describe an environment he is listening to Orbieu in southern France as a model to open out his concepts into a space orientated view. The Orbieu space is real and the listening is an apprehension of sounds that have not been manipulated.[63]

Tibetan Bells is a collage of manipulated sounds (interspersed with the untreated sound of the bell midway through the piece) so it is a different experience. There are similarities (The introductory drone in *Tibetan Bells* has a similar function in the sense of *root* and *canopy* as the river which Smalley "*backgrounds*"[64]) but because the sounds in *Tibetan Bells* are low, reverberant and difficult to clearly source-bond, the soundscape created is of the underground and meaning attached to the sounds enters the concepts of acoustic territory that Brandon LaBelle offers in *Acoustic Territories: Sound Culture and Everyday Life*.[65]

Labelle uses part of the introduction to consider the perspective of "*the self*" and contrasts self "*in hearing rather than sight*" quoting from Steven Connor's *The Modern Auditory I*:

> "*The self defined in terms of hearing rather than sight is a self image not as a point, but as a membrane; not as a picture, but as a channel through which voices, noises and musics travel.*"[66]

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[61] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110, 112 In his description of intrinsic and extrinsic features centred on cultural dentification Smalley allows for transcontextuality that allows for "*imaginary and imagined extrinsic connections.*" My practice researches this as a prime creator of space in my work. Gestural surrogacy, the assumption of a cause of sound by the listener is closely tied to this transcontextuality in aiding imagination and later oneiric focus in my practice.
[62] Smalley, 'Space-Form and the Acousmatic Image'.
[63] Smalley, 'Space-Form and the Acousmatic Image'.37-8 "*Possibly the most important strategy in arriving at an holistic view of the space-form of this experience is that I disregard temporal evolution: I can collapse the whole experience into a present moment, and that is largely how it rests in my memory.*"
[64] Smalley, 'Space-Form and the Acousmatic Image'. 36
[65] LaBelle.
[66] Roy Porter, *Rewriting the Self [Electronic Resource] : Histories from the Renaissance to the Present*, Ebook Central (London: Routledge, 1997). 211

How we understand the concept of self will inevitably figure the description of what we hear and then what we apprehend. A language around self that moves away from a binary and ocular fixation with self, and what self perceives, offers significant advantages in the kinds of relationships that can be thought of when we consider sounds and musics that are space-centric.

In composition, this is helped by the practice of reduced listening as it aids the selection of sound objects that are acousmatic in nature. Beyond this is a sense of practice that requires a description of collages of sounds as they are arranged together. The composition of *Tibetan Bells* relies on a single source and my signal processing is greatly aided by the practice of reduced listening. I want to show the 'content' of the bells by 'laying out' their spectromorphologies using time stretching as the most revealing function to do so. As I arrange *Tibetan Bells* sounds are chosen to be joined very intuitively along the principle of matching them as sound objects aurally for continuation (so they work as extensions of each over and cohere into new layered objects). They cease to function as single objects even if they can still be perceived individually. As they function collectively there is room beyond a spectromorphological analysis that deals with the potential 'acoustic territory' they create and Tibetan Bells begins to establish the territory of the underground within the first minute.

LaBelle describes the underground as:

> "… a reverberant space; cavernous and dim, it echoes with sounds and voices to unfold in uncertain yet urgent messages."[67]

As *Tibetan Bells* progresses, the introductory drone is first augmented (at 22 secs) by 4 partials sounding out to widen the frequency spectrum of the drone (close to the pitches G, B, D♯, C♯).

The drone is augmented by 3 sounds (at 32, 37 and 42 secs) that layer a shorter reverberant and deep strike and then a continuous pulse that extends through most of the piece. The drone has 'remote surrogacy' in Smalley's concepts of gesture and surrogates and the strike and pulse have 'third-order surrogacy' as a machine agency is likely to be inferred by the sounds.[68] The drone functions both as a *root* and a *canopy* (one that is broken frequently by

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[67] LaBelle. 4
[68] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 112 Surrogacy is Smalley's terminology for the listeners need to attach a cause to a sound they hear. Remote and third order surrogacy are at the edge of known

interventions from other sounds)[69] and has attributes of *texture motion* that follow the path of streaming/continuous/sustained/periodic in the figure below.[70]

This figure has been removed from this version of the thesis due to copyright restrictions.

Figure 3: The texture motion model that Smalley proposes in Spectromorphology: explaining sound-shapes

Using the drone to open the piece is a conscious compositional choice that has clear spectromorphological attributes that enable my intent to create a general environment of 'underground' that can then explore the sonic and psychological signifiers of that location. These two aspects of compositional choice are not necessarily separate, and Smalley writes of a:

> " ... *transcontextuality throughout electroacoustic music ... encourages imaginative and imagined extrinsic connections because of the variety and ambiguity of its materials, because of the reliance on the motion of colourful spectral energies, its emphasis on the acousmatic, and not least through its exploration of spatial perspective.*"[71]

Smalley argues extrinsic features are culturally embedded and often traditionally rely on clear identification with the sound sources. This Electroacoustic version is relational but different, especially in the role that ambiguity and reduced listening play in fostering a sense of space; the opposite of traditional extrinsic construct.[72]

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perceptual cause. Third order deals with sounds where the listener will be unsure of the "nature or cause" of the sound whereas remote surrogacy is a state where nothing but 'vestiges' of meaning are comprehensible. Using these sounds in my practice is one of the ways I create the transcontextual extrinsic connections I am concerned with in my research questions.

[69] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 121
[70] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 118
[71] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[72] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110

Tibetan Bells uses *texture* and *gesture motions* within different layers to give a balance of *internal activity* and *motion*. The drone is arguably both textural with strong spectromorphological identity, and gestural with its pulse.[73]

Many of the layers in *Tibetan Bells* sound for a significant duration (having used time stretch to slow the original recordings I intuitively used complete or long sections of the resultant audio because I felt my research questions were finding answers in the detail of these extended sounds) and have motion and growth processes which tend towards the Bi/Multidirectional part of Smalley's model of *Motion and growth processes* (see below). "*Agglomortation*" and "*dissipation*", "*divergence*" and "*convergence*", "*exogeny*" and "*endogeny*" are used in the piece[74]. Exogeny is intended in the high-pitched bell clusters (1.59 mins – 2.29 mins) into the piece which serves to fracture the existing soundscape completely. I Use 4 layered tracks of bell hits, rubs and scrapes which are sped up to create a sound that is antithetical to the existing sounds in both perception and the processing used to make it. Where the material up to this point is blended and open to exploration through time stretching, the sped-up bells are functioning as a rupture and have an intended gestural alarm surrogacy. They also occupy a different sonic space in their presence and frequency (Logic's track eq shows significant peaks at 2 and 5 KHz with additional activity at 20KHz which must contribute to its more immediate place in the soundscape).

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Figure 4: Smalley's model for motion and growth processes in Spectromorphology: explaining sound-shapes

The transcontextuality (see above) that deals with spectromorphologies and extrinisic attributes is in the concept of motion-rootedness in *Tibetan Bells*. Motion-rootedness refers to sounds "*rooted to a solid plane*" and Smalley also uses the term '*earthbound*' in motion

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[73] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 114
[74] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 116

rootedness[75]. In my compositional choices, I would also suggest gravity and weight as useful attributes within the spectromorphology of motion and specifically motion rootedness.

When Brandon LaBelle talks of the underground he is talking about a space of ideas rather than a specific location. He fills this idea with attributes ot the physical, sensory and psychological; a place where sound can " ... *echo, expand, and disorientate ...*" and an environment of "*energy distribution, data networking, ... a humming, vibrating strata*".[76]

The underground is also a place of "*creaks and murmurs, a slow shifting of acoustical particles that hover on the threshold of perception, and which carry the possibility of threat, danger, and inversion ...*"[77]

Compositionally, spectromorphology provides the toolset that explains and provides acousmatic transcontextual composition in Tibetan Bells. Motions, growth, structures, textures, behaviours, density – all spectromorphological concepts are used to work with sympathetic sound sources derived from the bell that allow an environment to be created by "*imaginative and imagined extrinsic connections ...*"[78]

Spectromorphological composition also aids the acousmatic "*contouring of perceptual experience*", a reference LaBelle makes to Michel Chion's theory of how aural perception can direct visual apprehension. Listening, "*the ear isolates a detail of its auditory field and follows this point or line in time*"[79] Labelle also argues that a property of sound is movement:

> "*it brings the original source from there to here.*"[80]

The way spectromorphological concepts expand on the idea of 'bringing' in a rich variety of ways provides their ability to support transcontextual composition in the imagined and acousmatic environments of sound object composition that mirrors traditional transcontextual listening. An aural contouring of imagined perceptual space is enabled.

Decisions I have made in making then arranging the sounds have been largely intuitive in the moment of doing. I listen to the sound objects and am concerned with joining them as sympathetic objects that go on to create a larger more complex object that retains a cohesive

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[75] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 117
[76] LaBelle. 5
[77] LaBelle. 5
[78] Smalley, 'Spectromorphology: Explaining Sound-Shapes'.110
[79] Michel Chion, Claudia Gorbman, and Walter Murch, *Audio-Vision : Sound on Screen*, Second (New York: Columbia University Press, 2019). 11
[80] LaBelle. 6

sonority. My own musical and cultural inclinations would strongly favour this approach but in the case of *Tibetan Bells*, I always felt I was listening to material that inherently 'needed' this approach and once I was convinced that the sounds were well served by this attitude the composition and arrangement of them became intuitive and possibly reflexive.

Tibetan Bells develops to offer layers of sound that provide material for the listener to decode through projection and imagination. The layers use reduced listening in the compositional activity of sound selection and arrangement but then work to acknowledge Smalley's concerns in his discussion of "The composer's ear"[81] by using the layers to create the *ruptures, progression* and *animation* that in their presence and ambiguity feed the listeners apprehension.[82]

Tibetan Bells has two other sonic layers; an explosion of bells that sound at 2 mins (and ends with an untreated sounding of the bells) and then a canopy of bell hits that develops from 3 mins 38 secs.

The bells that dominate at 2 minutes are the most *foregrounded* sound in the piece and are clearly *exogenic* in their motion. They serve as the biggest rupture to the soundscape and in the way that they are simply present at one point and then cease to be at 2 mins 29 secs they act as a deliberate *textural* challenge to the environment. Their clear bell like properties are a sound that doesn't 'belong' to the underground so they demand a listening re-adjustment that includes their sonic signifying. The continuity of the hammering repetitions underneath provides motion rootedness in the existing soundscape so the sense of rupture is not complete. The slight crescendo in *spectral density* before their arrival projects imminence and momentum into the bell texture that allows for its presence. The untreated bell sound at the end of the texture is clearly *source-bonded* to its instrument and also its function of a marking of time and a bringing to an end and offering a beginning simultaneously.

The bell sounds that appear at 3mins 38 secs are different in their role and offer a motion that is best matched by *float* in Smalley's *Seven characteristic motions* (see figure below)[83]

[81] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 111
[82] LaBelle. 6
[83] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 117

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Figure 5: Smalley's 7 characteristic motions from Spectromorphology: explaining sound-shapes

The long fade-in and use of a long reverb establish the bells as a canopy and the soundscape that has been underground apart from the bells at 2 mins gains more spectral height and this combined with the lightness of the sounds creates possible spaces akin to caverns where the vertical limits are important (but not foregrounded) through their newness in both their sounding and the changed space they allow for.

Compositionally the bells at 2 mins act as destination, a point where a rupture creates a temporary period of *stasis* through new texture. As the piece develops from this point the introduction of the bells as a new *canopy* signifies new acoustic territory to be apprehended. With the continual development of more motion-rooted spectra punctuated with ambiguous percussive hits and pulses, Tibetan Bells provides a spectromorphology that invites continual creative reinterpretation within a gesture-surrogacy largely centred in Smalley's definition of remote surrogacy and acousmatic transcontextual projection.[84]

My methodology of using spectromorphological concepts to create and arrange layers of sound from a single source worked to produce a second methodological concern that uses gesture surrogacy and transcontextual extrinsic threads to create virtual spaces, providing opportunity for the listener to engage in phenomenological listening. Where the sounds are ambiguous, and meaning is created in imaginative modes, the concept of the *poetic image* in *The Poetics of Space*[85] becomes relevant as a cause of apprehension and composition. Tibetan Bells explores the spectromorphological possibilities of composing using a single source and in doing so offers answers to some of my research questions (see Conclusion).

My practice in Tibetan Bells was to use the spectromorphological descriptors of sounds, behaviours and functions to begin to make way for spatial composition with strong acousmatic transcontextual concerns. Knowing that the ambiguity of sounds allows for the

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[84] Smalley, 'Spectromorphology: Explaining Sound-Shapes'.110, 112
[85] Bachelard and Jolas.

imagining of meaning to be projected by the listener in a fluid, phenomenological process that is subject to re-evaluation, invited a composition that is centred on environments and spaces that foster this process. In *third order* and *remote surrogacy* of gesture[86] (where Tibetan Bells lies), these projections are coming from the listener and their sense of self, so the creation of *inner soundscape* is a probable outcome, especially where the composer has been able to present a specific acoustic territory to explore.

Transcontextual extrinsic values are associated with culture in less acousmatic music[87]. In the acousmatic they are more the product of imagination and an interpretation/projection relationship based on rich spectromorphologies[88]. Questions arise about the 'self' in terms of the listener and theories about creative apprehension, especially those about space, can come into play. Smalley opens the door at two distinct levels of analysis and apprehension. The first is concerned with sound-shapes, motions, textures, functions etc and the second uses these concepts to discuss spaces, meaning and a synthesis of composition and apprehension that is provide by the acousmatic nature of the work. Gaston Bachelard's *The Poetics of Space* explores some of this projection in a phenomenological analysis that offers a model of poetic image to shed light on how composition and composition via listening might occur[89]. Writings on Deleuze[90] [91]and Deleuze and Gauttari[92] on music also comment on this process, especially in the way they discuss the phenomenology of the moment. *Tibetan Bells* realises this process within a very particular sound-world of the bells. The next chapter uses human voice and tonal music as some of its varied sources to explore this methodology further.

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[86] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 112
[87] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[88] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[89] Bachelard and Jolas. xxiv
[90] Ian Buchanan and Marcel Swiboda, *Deleuze and Music* (Edinburgh: Edinburgh University Press, 2004).
[91] *Sounding the Virtual: Gilles Deleuze and the Theory and Philosophy of Music*, ed. by Brian Hulse and Nick Nesbitt (Burlington, 2010) <www.ashgate.com>.
[92] Gilles Deleuze, Félix Guattari, and Brian Massumi, *A thousand plateaus : capitalism and schizophrenia*, Continuum impacts (London: Continuum, 2004).

Seven

Seven is a tape piece that uses multiple sources including human utterance to create a soundscape that explores aspects of inner and personal soundscape, phenomenological attributes of spectromorphology and the writing of Gaston Bachelard in *The Poetics of Space*.[93]

Although the piece is presented as a whole, there are three distinct sections or phases that happen; the introductory phase of the boy and introductory electronics, a phase that has a processed piano providing context to the boy and electronics (from 6 mins 36 secs), and a final phase of increased electronic context for the boy with a final coda of all the sounds (from 19 mins 48 secs).

The piece uses the boy's voice to ask questions about *reverie* and dreaming that invite the listener to look back into personal soundscapes they might create from the material presented. Seven relies on the acousmatic transcontextual connection between the intrinsic and extrinsic to work in a phenomenological rather than cultural way[94] and the use of a child's voice – a whispering voice - is an intimate transport to that soundscape.[95]

Bachelard begins *The Poetics of Space* with a philosophical introduction that lays out the phenomenological principals that underpin the rest of his enquiry.[96] He proposes that the *poetic image* is a point of birth of which there is no causality that a psychological or psychoanalytical analysis can satisfactorily explain: "*The poet speaks on the threshold of being.*"[97]. The *poetic image* is a creative act born of imagination and it is *novel* and *dynamic*.[98]

Whilst Bachelard primarily focuses on the written output of a poetic image he cites the works of painters (Charles Lapicque and Georges Rouault)[99] and makes the point that " *… as soon*

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[93] Bachelard and Jolas.
[94] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[95] Edward T Hall, *The Hidden Dimension : Man's Use of Space in Public and Private* (London: Bodley Head, 1969). 116
[96] Bachelard and Jolas. xv - xxxix
[97] Bachelard and Jolas. xvi
[98] Bachelard and Jolas. xvi
[99] Bachelard and Jolas. xx, xxii

as an art has become autonomous, it makes a fresh start."[100]; suggesting that the *poetic image*, as an act of imagination is a phenomenological event in all creativity including music.

There are two attributes that Bachelard raises concerning the poetic image; that it does reveal the past and that it is an image that can be comprehended and experienced by others.[101]

Bachelard says of the past;

> *"... through the brilliance of an image, the distant past resounds with echoes, and it is hard to know at what depth these echoes will reverberate and die away."[102]*

The *sonority* of an image is due to the *reverberations* it creates for the composer or listener either in the act of creation or listening – which becomes an act of creation in itself. In music, the sounds are as the written word to the poetic image and their *resonance* opens up personal and inner soundscape to the listener.[103]

This resonance is centred on the listener;

> *"The poet does not confer the past of his image upon me, and yet his image immediately takes root in me. The communicability of an unusual image is a fact of great ontological significance."[104]*

It is an inherent quality of the poetic image to be communicated to others.

Bachelard is an influential writer for spectromorphology. Smalley cites him in his bibliographies for both *Spectromorphology: explaining sound-shapes*[105] and *Space-form and the acousmatic image*[106] as does Brandon LaBelle in *Acoustic Territories: sound culture and everyday life*[107]. His phenomenological and ontological approach to the poetic image shares common ground with Gilles Deleuze's concept of *the actual* as discussed by Christopher Hasty in *Sounding the virtual: Gilles Deleuze and the theory and philosophy of music*.[108]

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[100] Bachelard and Jolas. xxii
[101] Bachelard and Jolas. xvi - xvii
[102] Bachelard and Jolas. xvi
[103] Bachelard and Jolas. xvi Bachelard speaks of resonance and sonority.
[104] Bachelard and Jolas. xvii
[105] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 125
[106] Smalley, 'Space-Form and the Acousmatic Image'. 56
[107] LaBelle. 259

[108] Hulse and Nesbitt. 8 "the actual is the site of concretion. it is not subordinate to or dependent upon a prior "hyper-actual." notions of dependence, sub/super-ordination and hierarchization do not pertain to an emergence

Seven opens with a recording of a seven-year-old boy asked to talk about toys and then anything which occurs to him during the recording. The recording is cut and manipulated to create a balance between clearly comprehendible sections and sections that cause displacement using processing from the GRM toolset (see Appendix 2 for a track level diary of the processing on the boys voice). This first phase lasts approx. 6 mins 38 secs but can be further divided into sections that introduce layers of meaning by either disruption, new sound or echo.

The first sub-section starts with the boy whispering "the moon's all white" and ends at the point where a new disruptive sound introduces the next section at 1 min. This establishes the space of the boys voice and also introduces processing using GRM Tools that disrupt the flow of the spoken word to compose a fractured or distorted recording that is not clearly comprehensible.

The space of the boy's voice is *intimate* space and this is promoted by the choice of using whispering for the voice. *Intimate* space is very closely related to *gestural* space for Smalley in *Space form and the acousmatic image*. Gestural space is part of *enacted space* and *utterance space* is a subset of this Smalley's comments on *performed space* (a specific of enacted space) can relate to utterance.[109] Smalley derives his writing on enacted space from the idea of Proxemics as introduced by Edward T. Hall in *The Hidden Dimension*. Hall places whispering in a *far-phased intimate distance* (6 – 18 inches) and quoting the linguist Martin Joos, says:

> "*An intimate utterance pointedly avoids giving the addressee information from outside the speaker's skin. The point … is simply to remind (hardly inform') the addressee of some feeling … inside the speaker's skin.*"[110]

Seven makes use of what Smalley calls *microphone space* to achieve the establishing intimate space of which it starts[111]. This use of microphone space is aid to acousmatic composition:

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of the virtual into the actual and vice versa. the actual is a creature of innumerable difference (potentiality, virtuality) and is creative of new difference or a new virtual. "

[109] Smalley, 'Space-Form and the Acousmatic Image'. 41
[110] Hall. 118
[111] Smalley, 'Space-Form and the Acousmatic Image'. 43

"The acousmatic composer takes advantage of this special kind of intimate performed space when creating sound sources in front of a microphone."[112]

At 0.22 mins the boys voice begins to be disrupted by processing and becomes more difficult to listen to for semantic meaning. Compositionally there is an intention explore the voice as a sound object and create tension between that aim and still being able to decode the meaning of the spoken words at times. There is a specific disruption at 0.28 mins with the word "guns" being introduced at a louder volume. Because it derives from its own audio clip it has its own space and this dominates briefly. The word "guns" is repeated at 0.38 mins with a similar use of a separate audio clip to provide disruption. At 0.45 mins there is processing to the voice that takes on characteristics of radio interference. Compositionally, this is a point where questions about the space being offered to the listener are changing. The intention to augment the intimate opening space with disruptions to facilitate transcontextual acousmatic opportunities for the listener begin.

These disruptions continue to develop and become less voice like as the GRM tools processing allows manipulations that defy source bonding with utterance. This can be clearly heard at 1.02 mins, 1.09 – 12 mins, 1.21 mins, 1.29-32 mins, 1.35 mins, 1.40 – 2.03 mins which prefaces a period of silence (2.03 mins) and then clear spoken word (2.06 – 2.22 mins). These periods of change are layered with processing artefacts and choices that are more subdued; slight ring modulation as an artefact (1.27 mins and 1.39 mins) and changes to the voice-space that shift perception of what space is being encountered. There is a sustained period of processing (1.44 mins – 2.03 mins) which changes the sound source from voice and manipulated voice to abstract sound and this provides a significant rupture to the soundscape of voice and manipulations which are still clearly utterance. This is followed by a period of silence (2.03 mins – 2.06 mins) after which the voice returns and is intelligible for the period 2.06 mins – 2.23 mins. The piece develops from 2.24 mins to 3.34 mins with the voice identifiable as utterance but processed, interspersed with processing that creates abstract disruptions (2.36 mins, 2.42 mins, 3.16 mins), periods of silence (notably 2.29 mins, 2.38 mins, 2.44 mins, 2.55 mins) and ends with an echo process that shifts the space from utterance/intimate to a cavernous space that is an invitation for the listener to create

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[112] Smalley, 'Space-Form and the Acousmatic Image'. 43

transcontextual meaning based on the tension between utterance, intimate space and intelligibility, and disruption, abstract sound and spatial motion.

There is a compositional design in Seven that promotes transcontextual projection in the listener that centres on childhood and personal inner-space through the mechanism of reverie and day-dreaming. This design choice is based on Bachelard's philosophy of the home and its role as the intimate *"cradle"* of day-dream, reverie, something more than memory[113]. I have used the philosophy to compose using intimate space because I see a strong connection between the philosophy in *The Poetics of Space* and the idea that acousmatic music, and its ability to create shifting spatial territories, create transcontextual conditions for the imagination to play. In a soundscape that uses intimate space and utterance, Bachelards philosophy of the way we inhabit space and the resonances we experience, provide phenomenological possibilities that can be used to compose.

> *"Therefore, the places in which we have experienced daydreaming reconstitute themselves in a new daydream, and it is because our memories of former dwelling-places are relived as daydreams that these dwelling-places of the past remain in us for all time"[114]*

This phenomenology of the inhabited space in the soundscape of Seven provides the primary context in the domain of transcontextual imagination. Bachelard intimates how transcontextuality is possible and enabled between poet and reader (and composer and listener) when he comments:

> *"All I ought to say about my childhood home is barely enough to place me, myself, in an oneiric situation, to set me on the threshold of a day-dream in which I shall find repose in the past. Then I may hope that my page will possess a sonority that will ring true – a voice so remote within me, that it will be the voice we all hear when we listen as far back as memory reaches, on the very limits of memory, beyond memory perhaps, in the field of the immemorial."[115]*

Compositionally, the voice of the boy is designed to act as 'a voice so remote' to the listener. The disruptions, silences and changes in space through processing are designed to stop this

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[113] Bachelard and Jolas. 7 "And always in our daydreams, the house is a large cradle." And 8, "Our daydreams carry us back to it. And the poet well knows that the house holds childhood motionless "in it's arms""
[114] Bachelard and Jolas. 6
[115] Bachelard and Jolas. 13

voice being processed at a purely conscious level and instead offer the possibility of *oneiric* listening[116] which is then augmented by new layers – electronic sound and tonal music.

At 3.26 mins, directly after the cavernous shift in designed space, the boys voice says " … cars, playmobiles, army stuff, Power Rangers, guns …". At this point a layer of electronic sound is introduced to the piece (track Isaac24).

This layer is a result of processing the boys voice using the evolution plugin from GRM Tools and manipulating the cross-hair control in the interface in real time (see Appendix 2, Track 24). Evolution is a granular synthesis tool and real time manipulation helps create an output that sounds electronic rather than utterance and also has a semi-tonal consonance that changes in the period 3.34 mins – 6.38 mins. The notes (and octave) I detect are D6 (3.38 mins) Ds6 (3.55 mins) D6 (4.07 mins) C6 (4.19 mins) D6 (4.23 mins) A6 (4.38 mins) G7 (4.40 mins) G8 (5.05 mins) D8 (5.11 mins) G8 (5.17 mins) Cs8 (5.22 mins) E8 (5.27 mins) D8 (5.28 mins) C8 (5.38 mins) E8 (5.46 mins) C8 (5.50 mins) E8 (6.02 mins) C8 (6.05 mins) F8 (6.15 mins) E8 (6.20 mins) C8 (6.22 mins) E8 (6.27 mins) C8/F8 (6.30 mins) C8/E8 (6.37 mins). The C8/F8 and C8/E8 sound as intervals although there is intervallic overlap at other points.

These last intervals provide tonal resolution in the key of C and along with the quietening of the boy's voice and the end to the disruptions that begins to occur at 5.42 mins, form a clear space which invite *oneiric* listening. The layer (in these tones) lacks motion and the relatively high frequency of the pitches give a *hovering* effect to it's *canopy* function which I would add to Smalley's five characteristic paths in his figure 9 (external space) or figure 2 (seven characteristic motions).[117] The *canopy* effect supports a sense of *arena space* that is "bounded" and "enclosed"[118]. The transcontextual concerns of *Seven* make Smalley's quote of Lefebvre relevant:

> " … *neither a mere "frame', after the fashion of a frame of a painting, nor a form or container of a virtually neutral kind, designed simply to receive whatever is poured into it. Space is a social morphology: it is to lived experience what form itself is to the living organism, and just as intimately bound up with function and structure.*"

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[116] Bachelard uses the terms reverie, day-dream, dream and oneiric as interchangeable terms. Giving a metaphor for oneiric he says "To inhabit oneirically the house we were born in means more than to inhabit in memory; it means living in this house that is gone, the way we used to dream in it." (Bachelard and Jolas. 16)

[117] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 123

[118] Smalley, 'Space-Form and the Acousmatic Image'. 42

Space and the sound-objects that define those spaces; that act as canopies, roots and hover to indicate edges of space, are clearly not be seen as neutral but as part of what is happening or can be perceived in those spaces. In *transcontextual* pieces like *Seven*, the sounds that might function as boundaries or more often as the edges of perceivable space (there is a 'beyond') are part of what is transcontextual. To paraphrase Lefebvre they are the edge of the see-able painting rather than the frame.

There is a second element to the processing that the evolution plugin performs to the boy's voice. There are two periods of lower register noise that act as their own layer (4.31 mins to 5.02 mins and 5.48 mins to 5.58 mins). They are designed to signify another larger and distant space. There are similarities to the sense of underground that formed a key compositional process in *Tibetan Bells* but in the context of *Seven* they also point to the *remote voice* that Bachelard argues is the conduit of the poetic image[119] and, in the language of Smalley, the support for transcontextual exchange between composing and listening[120]. The sounds have pulse and beatings as textural features and occupy *third-order surrogacy[121]* with human agency inferred by their machine-like qualities. Their distance offers a freedom to move from the intimate space of the boys voice and move into reverie.

This possibility for reverie is also supported by a change to the processing of the boy's voice which is saying small variations of 'sonic screwdriver' and is being manipulated to the point where the sound of recognisable voice has to compete with processing that generates abstract sound in a period that builds through 5.30 mins -to 6.00 mins. At this point there is no spoken word for 8 seconds and then the boys voice comes back saying 'Its curly – curly wurly …' and is clearly intelligible. The contrast with the heavily processed voice leading to this point is to offer arrival at a new space; intimate in characteristic but also *elsewhere* from the early establishing intimacy of the voice at the beginning of the piece. This is a reinforcement of the new layers and their function of leading listening into possibilities of day-dream and reverie. At this point, at 6.38 mins, a layer of processed piano is faded into the composition. Between 6.38 mins and 10.46 mins there is one other layer that is intermittently heard (from 7.15 mins, 8.33 mins, 9.27mins, 10.12 ,ins, 10.32 mins); A GRM Tools (Pitch Accumulator) processing

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[119] Bachelard and Jolas. 13
[120] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[121] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 112

of the boy's voice that creates *texture-motions* of *remote surrogacy*[122] (see Appendix 2, Tracks Isaac16 and Isaac28).

The piano notes are from music I composed on guitar and transposed to piano (see below) to increase timbral content. The notes were recorded on a Yamaha grand-piano at Oxford Brookes University. The Evolution plugin from GRM Tools uses granular synthesis algorithms to blend individual notes into a new instrument which, along with the existing Evolution processing of the boys voice and the Pitch Accumulator processing, creates a tonal and motional 'spectromorphological hyper-instrument' that Smalley considers relevant when discussing orchestral music and it's suitability for spectromorphological analysis.[123]

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[122] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 112
[123] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 109

Figure 6: The original piano composition that I extemporised from in the Brookes recording session

This processed piano has no onset sounds and the granular synthesis makes tone changes happen slowly in transition and occurrence leading to a textural layer that supports and adds significant timbral and spatial information. The space evoked is large and structural. It functions as a fulfilment of the early indications of a larger soundscape as prefigured at 3.26 mins. It is the most open expression of the soundscape in *Seven* to this point. When Smalley discusses *gesture-surrogacy* he offers instrumental and synthesised instrumental music as second order surrogacy which asserts a clear relationship between sound and human gesture[124]. The granular synthesis applied to the piano in this layer of *Seven* removes the striking gesture from the listener and its role as *canopy* in an *arena space* makes a second

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[124] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 111

order surrogacy harder to establish. Tonal layers in composition can function at any surrogacy level if prime gestural material is removed. In music which has a *transcontextual* concern like Seven, the ambiguity of processed tonal layers has an important function in supporting a space which contains the intimacy of spoken work but offers an abstract context to it that enables reverie in the listener. The piano layer and the track Isaac24 are co-dependent and both (in different ways) significantly removed from their original source so that their *gesture-surrogacy* is remote.

The other layer in this section (between 6.38 mins and 10.40 mins) is made up of two tracks, Isaac16 and Isaac28. The pitch Accumulator GRM Tools is used to process the original audio to the point where it is unrecognisable and performs *texture-motion* functions[125]. The tracks are intermittent and serve to articulate the space created with the piano and Isaac24. Their motions are *vectoral wipes* in the terminology Smalley uses in the Orbieu soundscape[126], and in doing so they articulate space in the soundscape with their trajectories. This acousmatic, ambiguous soundscape is contrasted with the boy's voice that in this section (6.38 mins - 10.42 mins) has less processing and is clearly intelligible throughout.

A different layer of processed piano can be clearly heard from 10.45 mins and introduces a morph into a new section that lasts through to 19.49 mins. This layer is made up of two piano tracks, Brookes Original 1 and Brookes Original 2 and they are both processed with GRM Tools Shuffle as well as Logic's EQ and Space Designer tools. Whilst the sound is processed, it is clearly a piano and therefore sits as a *second-order surrogacy* in terms of *source bonding* but is occupancy and articulation of *arena space* and the *hyper instrument* quality of the processing are more relevant in *Seven*.[127]

The other layers are the piano processed by GRM tools Evolution which is now back-grounded and works with Isaac20 to articulate the size of the soundscape. Isaac20 is a track that has been processed to produce abstract *remote surrogacy* sound. The tracks Isaac16 and Isaac28 continue to play intermittently and the motion-textures are a key sound-source in

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[125] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 117
[126] Smalley, 'Space-Form and the Acousmatic Image'. 37
[127] Source-bonding and surrogacy, and performance space are discussed by Smalley as separate ideas in separate papers (Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 1997, Smalley, 'Space-Form and the Acousmatic Image'. 2007) but in compositions that are concerned with acousmatic material and the production of spaces, their analysis will both be present but one may be more relevant at a given time.

providing spatial context in the way their trajectories reveal the extent of the space (7.38 mins, 8.35 mins, 9.30 mins, 10.14 mins, 10.34 mins).

The boy's voice can be heard through to 13.35 mins but is quieter in the mix and the sense of intimate space is reduced although there is no processing on his voice. A new layer is introduced at 13.35 mins by sampling short excerpts of voice and repeating them, processing through GRM Tools Contrast (See Appendix 2, Isaac15). This layer creates a new space that has intimacy through utterance and a breathing effect that the repetitions and processing create. It is not the same space as the boy's voice up to this point but subverts that space in the function of providing a bridge between utterance and the many abstract voice sounds. The rhythm separates this layer from other utterance based abstract sounds and the crescendo ending at 15.09 minutes questions the difference in perception between the intimate voice space and the wider soundscape it exists within.

The section (10.45 mins to 19.49 mins) is compositionally carried with the relationship of the new piano layer and the soundscape created by tracks of voice processing that produce abstract sound (Isaac04, Isaac20, Isaac40, Isaac45 and the TransientRemoval1 track of piano that started at 6.38 mins). The piano uses pitch centre changes (11.18), melody (17.59 mins onwards), crescendo (16.04 mins onwards, 16.35 mins onwards, 19.22 mins onwards), harmonic resolution (15.17 mins - 15.25 mins), repetition (11.20 mins – 12.30 mins) and silences (15.30 mins – 15.43 mins, 17.20 mins – 17.30 mins) in its relationship with the wider soundscape to create movement, stasis, tensions and resolutions that punctuate and are punctuated by other motion tracks (Isaac15, Isaac16, Isaac28, Isaac04, Isaac40).

The processing sets the piano in an enormous space by the use of reverb (see figure 6 below) and the GRM Tools Shuffle effect blurs the attack of piano notes (without removing them) with its mixture of panning and delays. The compositional effect is to give the piano a space of middle-distance in the soundscape, never intimate because of the reverberant processing but familiar in contrast to abstract sound with its tonality. The melody that sounds from 17.59 is specifically designed to be *oneiric* in its high pitch and simple major scale phrases, and to support listening opportunities that are personal and are transcontextual in the way Smalley suggests is attainable in acousmatic music and Bachelard describes in the way that the poetic image can be shared. This section of the piece also concerns the research question as to whether tonal music can conceptually be coherent in a spectromorphological setting in my practice. The design of the sound so that it functions spatially in the composition and the lack

of dominance in the *note* suggests that it is possible to integrate tonality with spectromorphological analysis and electro acoustic composition.

Figure 7: The Logic Space Designer plugin setting for Brookes Original 1 and Brookes Original 2 tracks in Seven Logic project

With the absence or reduction of the intimacy in the boy's voice-space, the soundscape is able to be listened to as the primary experience. The shorter *texture-motions* that articulate this space are now foregrounded and act as mapping to the environment in a manner reminiscent of the swifts and the cars in the Orbieu soundscape[128]. The GRM Tool Pitch Accumulator processing gives a result that has a likeness to filtered white noise moving in arcs across the stereo image as the tool is controlled by the X/Y interface. The sound has a metallic high frequency edge at times and also a lower register rumble and these element interplay as the control is manipulated to provide timbral change that accentuates movement (particularly at 10.35 mins, 11.33 mins, 12.01 mins, 12.45 mins, 12.55 mins, 13.27 mins, 14.27 mins, 15.36 mins, 16.10 mins 16.58 – 17.28 mins). Isaac04 sounds from 16.12 mins to 17.23 mins and has been processed be GRM Tools Evolution and Space Designer to create a reverberant layer of breath. The source is clearly human but the processing gives it a distant space and its lack of intimacy, and its function as soundscape, make it an unsettling sound

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[128] Smalley, 'Space-Form and the Acousmatic Image'. 37

source. It can be heard in the composition at 16.32 – 16.50 mins and occupies time between two piano motifs that change the compositional mood towards tension.

The wider section (10.42 mins to 19.49 mins) ends with a piano crescendo that starts at 19.21 mins and concludes a smaller section of Seven which only contains the piano layer until just before the crescendo, at 19.16 mins where Isaac45 begins to sound a layer of electronic bell like sounds (processed by GRM Tools Reson – see Appendix 2 Track 45). This section starts at 17.59 mins with a piano melody discussed above as *oneiric* and provides a passage (17.59 – 19.15 mins) that is tonal and ends with IV – I resolution in traditional musical terms (19.00 mins to 19.15). The crescendo breaks this resolution and in its abrupt ending provides entry into a new space that starts the final section (19.49 mins – 26.43 mins [end]).

The section starts with the layer of bell sounds based on Isaac45 sounding alone for 19 seconds (19.49 mins – 20.08 mins). The space this creates is on a smaller scale than the preceding soundscape. There are two sublayers to this sound – a lower sounding register that provides the *floor*[129] of the space and a higher register that acts as *canopy-spots* in the sense that each short sounding indicates the size of the space.

This layer is joined by two voices in their own reverberant setting; "So what's it like being Seven – weird" is repeated and reveals a bigger space with processing that also suggests the underground (20.07 mins – 20.35 mins). The processing also creates a higher Theremin sounding layer that comes to the foreground at 20.43mins to 20.56 that is in the same space. This space is ruptured by GRM Tools Pitch Accumulator processing on the boy's voice from 21.21 mins to 21.46 mins that is designed to contrast with the intimate space the boy's voice establishes throughout the piece.

This enclosed underground space has the attributes of the cellar in Bachelard's *The Poetics of Space*. It is:

> " *… first and foremost the dark entity of the house, the one that partakes of subterranean forces. When we dream there, we are in harmony with the irrationality of the depths.* "[130]

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[129] Similar to root in Smalley's Occupancy of spectral space (Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 121)
[130] Bachelard and Jolas. 18

If we are transported to *"when we listen as far back as memory reaches, on the very limits of memory, beyond memory perhaps, in the field of the immemorial."*[131] then it will be possible and perhaps inevitable that some of this poetic reach will be disturbing – of the cellar.

At 21.51 the boys voice repeats the word "winter" with a filter fade that last until 22.25. It is interrupted by a lighter rupture of voice processing at 22.12 that is to the foreground and intimate in its lack of spatial depth. A new space begins at 22.27 mins that is based on Isaac27 (see Appendix 2 Track 27) and uses GRM Tools Bandpass to manipulate the voice. This is layered with Pitch Accumulator processing that disrupts and ends the space at 23.02 – 23.13 mins. This space is not tied to the cellar as metaphor and does not carry the fear associated with those images. It is designed to ask questions of where or how an ending to processes such as daydreaming, reverie might occur. The following silence of 5 seconds at 23.13 offers another way of reaching an end to these possibilities.

The boy's voice creates an intimate space at 23.19 with unprocessed sampling of a laugh and the word "grandad" (see Appendix 2 track 26). It is joined by a reverberant treatment of the voice at 23.36 mins and bells sounds at 23.49. The processing of Track 26 removes semantic meaning from the boy's voice but occasional words appear. A rupture sound at 24.18 creates a wider soundscape temporarily but the mixture of the processed boys voice and bells continue to 24.55 at which point the bells sound on their own to 25.10 mins.

An abstracted electronic sound precedes a coda of the GRM Tools Evolution processed piano that brings the piece to its end at 26.43 mins with rupture sounds creating various articulations of the soundscape at 25.43 mins, 25.49 mins, 26.06 mins and 26.23 mins. There is an absence of the boy's voice in any intelligible way and the soundscape is an abandoned stage for the departed intimacy. Tonal elements provide familiarity but the spectromorphology of the soundscape is composed to be more critical to the listening experience.

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[131] Bachelard and Jolas. 13

Home

Home is a collage composition (made of clearly defined tracks that combine without losing identity) that researches the meaning of home for me at a period between 2014 and 2015. I have subsequently moved houses, so this is no longer an environment I live in. The piece researches a handful of sounds from the house I occupied – and some from outside. They are:

- Cooking dinner

- Eating dinner with my children

- The dawn chorus recorded from my bedroom

- A recording of a folk song's guitar that I was playing during that time

- A recording of the philosopher Gaston Bachelard from a YouTube video (now removed and hosted by ina.fr)[132]

My research concerns the way these (mostly manipulated) sounds create distinct spaces that correlate with Smalley's ideas in *Space-form and the acousmatic image*, and also ideas of boundaries of the concept of home. Bachelard mainly offers a 'centralised' idea of house (the home of oneiric reverie and centre of poetic image)[133] and *Home* questions this in its choices of sound and intention of including the village of the house I lived in as part of the concept of home.

Bachelard in his second chapter, *house and universe*, gives two contrasting images of homes and their surroundings, firstly one where the house is relational but opposite to its winter environments. As the conditions outside become worse, the home gains in comfort and warmth:

> " *The house clung close to me, like a she-wolf, and at times, I could smell her odor penetrating maternally to my very heart. That night she really was my mother.*"

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[132] 'Portrait d'un Philosophe', p. 1 <https://www.ina.fr/video/CAF89004641/portrait-d-un-philosophe-video.html> [accessed 21 August 2019].
[133] Bachelard and Jolas. "A house is imagined as a concentrated being. It appeals to our consciousness of centrality."

And:

> *"Isn't it true that a pleasant house makes winter more poetic, and doesn't winter add to the poetry of a house?"[134]*

Later Bachelard discusses a more diffuse view of home, one where the walls are longer fixed. Quoting the poet Georges Spyridaki he offers a home that embraces its environment:

> *"My house ... is diaphanous, but it is not of glass. It is more of the nature of vapor. Its walls contract and expand as I desire. At times, I draw them close about me like protective armor . . . But at others, I let the walls of my house blossom out in their own space, which is infinitely extensible."[135]*

This *poetic image* of a breathing, expansive house is how I saw the home that is the subject of this research piece. Bachelard often restates that the oneiric house is not the geometry of its materials but the experience of living within the space, and remembering that living once the time of being there has passed.[136] Remembering not only the activities that took place in the house but the day-dreams and thoughts that occurred in attendance to these activities. He quotes Rilke speaking of polishing furniture as a child to draw out synthesis between daydream and activity:

> *" ...our little piano fell under my jurisdiction as duster. It was, in fact, one of the few objects that lent itself willingly to this operation and gave no sign of boredom. On the contrary, under my zealous dustcloth, it suddenly started to purr mechanically . . . and its fine, deep black surface became more and more beautiful. When you've been through this there is little you don't know!"[137]*

This deeply internalised world is an aspect of home that I wanted to capture in my choices in *Home*. The use of recordings from dinner and the preceding cooking are designed to enable this.

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[134] Bachelard and Jolas. 45, 38. Bachelard is quoting firstly Henri Bosco's *Malicroix*, and then Baudelaire.
[135] Bachelard and Jolas. 51
[136] Bachelard and Jolas. 59 Speaks of the reality of the house and what that reality provokes: "So this is why when often as you came home to it, down the road in a mist of rain, it seemed as if the house was founded on the most fragile web of breath and you had blown it. Then you thought it might not exist at all as built by carpenter's hands, nor had ever; and that it was only an idea of breath breathed out by you who, with that same breath that had blown it, could blow it all away."
[137] Bachelard and Jolas. 70

Home starts with the sound of a dawn chorus that I recorded from my bedroom window in late spring (using a Roland R26). The house I lived in at this time had no curtains in my bedroom and the window was left open from spring as the room would heat up quickly with sunrise. The dawn chorus would start sometime after 4 am and would always wake me up. I had no trouble falling back asleep so left this set of events to happen each day as I prioritised the fresh air and the dense and subjectively beautiful birdsong over being disturbed. The R 26 is a high-quality hand-held recorder and I recorded one morning to a 24 bit 44.1Kh file, but this recording inevitably misses some of the immersive spatial presence and depth of the chorus. Smalley writes of perspectival space when describing his Orbieu listening experience in *Space-form and the acousmatic image* to describe the wholistic space from the *perspective* of the listener, [138] and this represents the experience of the dawn chorus with exception of the known closed space of the bedroom which the chorus sound moves through continuously.

In the Orbieu soundscape, Smalley ascribes ecological space characteristics to the swifts he describes with *signalling* and *behavioural* space designations.[139] These designations are an acknowledgement that the sounds of living animals carry extra or different significance to the sound of physical phenomena such as wind blowing through trees or the sound of running water. Later, Smalley in talking about his own composition *Empty Vessels* ascribes *elevated space* as a quality of birdsong due to *source-bonding*.[140] The experience of *Home* is that *elevated space* would be relative to perspectival space though – if the listening position is also high up then the elevation effect will be affected and reduced.

Starting the piece with sound that fills *perspectival space* and also acts as *canopy* (*perspectival space* is more useful here as it contains the idea of depth and panorama that *canopy* doesn't in the same way) is a strong statement about where the boundaries are in the home I am choosing to describe. The other sounds in the piece are based on activity and living in the home but I wanted to establish the house as concept that transends the physicality of the material construction.

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[138] Smalley, 'Space-Form and the Acousmatic Image'. 36, 48. Smalley describes perspectival space as " … the flux in relations among three views – *prospective space, panoramic space and circumspace*." Prospective space is very similar to perspectival space and seems to be different due to a perceived intent of the listener to scan, quantify and measure what is perceived.

[139] Smalley, 'Space-Form and the Acousmatic Image'. 36

[140] Smalley, 'Space-Form and the Acousmatic Image'. 49

Smalley starts Space-form and the acousmatic image with a personal description of space is a southern French village – Orbieu[141]. My own Orbieu experience was to regularly walk in the village that this house exists in. The village has no through-road and thus virtually no sense of being a transport conduit. This allowed me to build a mental soundscape that had no propulsive direction or flow. The roads, especially outside of the commuter arrival and departure times, were quiet and encouraged a relaxed pace of walking. There are many footpaths and fields within the village that contribute to a sense of experiencing sound in locations that evolved in their aural content.

One of my main experiences was that to turn into the village from outside was to enter a separate world which came to constitute an idea of the front and back door to home being at the edges of the village roads; the front door being the road I would turn into after a day at work, and the back door being the path I took out of the village to walk towards the nearest market town (often to take my children to school) (see figure below). These would be the outer layers of home, where the first sense of protection, of being in *"the cradle"*[142] would occur and the feeling of exterior life was left behind.
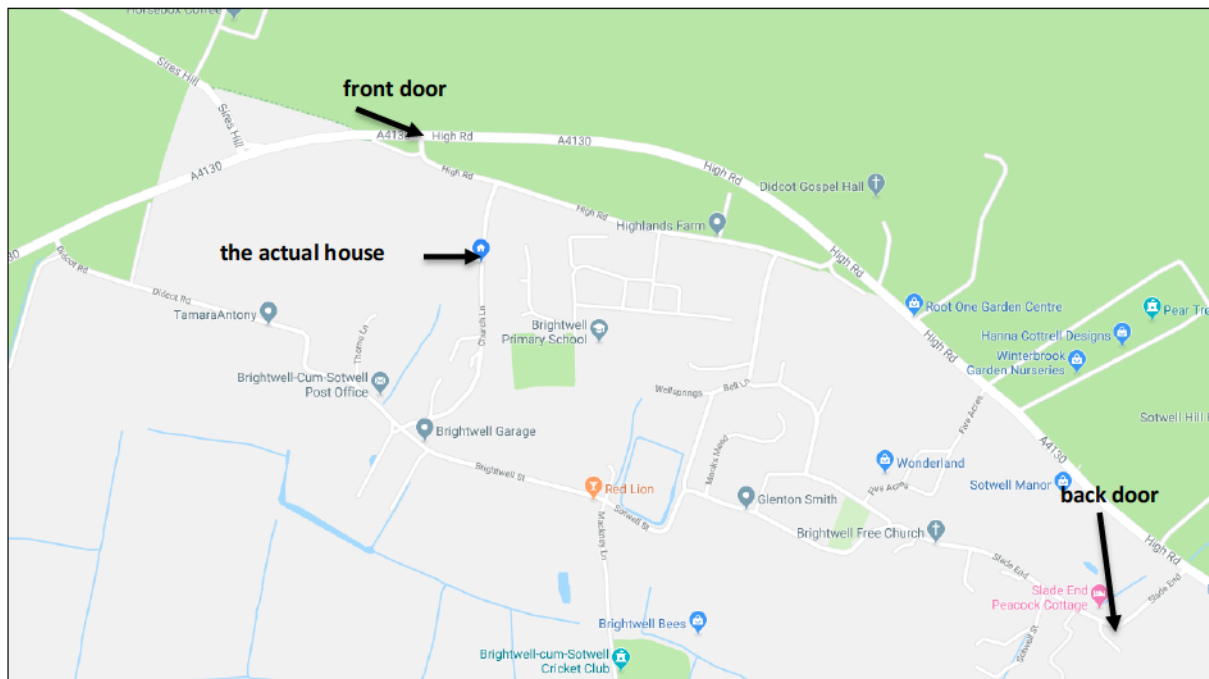
Figure 8: A Google map screen capture of the village where the house recorded in Home exists; Brightwell cum Sotwell.

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[141] Smalley, 'Space-Form and the Acousmatic Image'. 35
[142] Bachelard and Jolas. 7, 52. *"And always in our daydreams, the house is a large cradle."* And 52 gives a context of an open idea of house: *"The literary houses described by Georges Spyridaki and Rene Cazelles are immense dwellings the walls of which are on vacation. There are moments when it is a salutary thing to go and live in them, as a treatment for claustrophobia."*

There were other sound sources captured in the village that were not included in the piece. I recorded aural trails through the village but ended up with material dominated by breath and footfall which was against the sense of being and experiencing in a specific location that I wanted to reveal. The dawn chorus remains the only 'outside' source in the piece and my intention of showing the home as a place beyond its own walls is helped by the depth of this recording. The crows clearly heard (for example 2.24 mins) are a source from several hundreds of yards from the bedroom.

Capturing sounds in the house centred around three activities which happened consistently on a daily basis; cooking, eating dinner with my children, and playing guitar. The recording of Gaston Bachelard is abstract in comparison but tangential to the questions I was concerned with in *Home*. Whilst each track in *Home* is processed (apart from the dawn chorus which is simply muted at points), I didn't want to engage in a level of processing that I had invested in with Seven. My intention was to take on some of the ideas expressed by Luc Ferrari in *Almost nothing with Luc Ferrari*; especially ideas surrounding *narration* and *anecdote* and the idea of *unfinished* that permeates his account of *Presque Rien* (the concept);

> *"Presque Rien avec filles no longer follows the idea of a unity of time or space, instead forming a sort of poetic tale in which the characters ae played by sounds and the story is ultimately left unfinished, it is never told but rather unfolds to the senses like a landscape."[143]*

Ferrari describes the difference between anecdotal and narrative in relation to story:

> *"Narration is somewhat broader than anecdote. The anecdotal which appeared in Heterozygote (1963), is more akin to flashes; it doesn't necessarily tell a story. It is a poem in sound. Narration, on the other hand, really tells a story."[144]*

My understanding here of what Ferrari means by story is not to be strongly associated with literary ideas, with ideas of beginnings middles and endings etc. My understanding is that he means a sufficient passage of something is captured to give a genuine window into that something, at whatever level is offered or is comprehended. It is less ephemeral than anecdote, less the *poetic image* but more the reverie that the *poetic image* inspires.

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[143] Jacqueline Caux, *Almost Nothing with Luc Ferrari* (Errant Bodies Press). 155
[144] Caux. 149

In describing the Piece *Presque Rien no. 2 Ainsi Continue La Nuit Dans Ma Tête Multiple* Ferrari says:

> " ... *the night takes the "hunter" by surprise and seeps into his head. It then turns into a twofold description: the interior landscape modifies the night outside and, by compromising it, adds its own reality to it.*"[145]

These ideas of narration in the sense of experience and of a knowing internalisation provided me with a methodology for *Home* that allowed my decisions to focus on Bachelardian ideas[146] (both externally on what is home and internally and intimately on what *happens* there) that could be offered as a *hyper-documentary*; accessible in their sonic signature so as to be recognisable but processed so as to be supportive of a listener's internal soundscape.

The recording of the dinner is processed by GRM Tools Shuffling[147] and I use this process to mask the conversation captured but to maintain and enhance the presence of a domestic dinner in the piece. The Shuffling process also has an outcome that gives a hard texture-sound to the handling and use of cutlery and plates which gives a specific *hyper-real*[148] (since it is processed) sonic location when it can be heard that counteracts the more oneiric soundscapes that are present (e.g. 7.53 mins, 9.17 mins, 11.27 mins, 16.30 mins). The voices come through the process as fragments; broken then joined as fast moving sequences (see 16.17 mins onwards for example). What is being said can sometimes be heard but in too small sections to give meaning to the whole dinner but the tone and emotional content of the voices is maintained. I chose the track as the main domestic sound in Home as the evening meal was the one time of day when conversation between the three inhabitants would take place. Human agency in the house is central to questions that the composition deals with:

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[145] Caux. 155
[146] Bachelard and Jolas.
[147] 'The GRM Tools of Pack Complete I' <https://inagrm.com/en/store/product/11/complete-i> [accessed 8 September 2019]. "The processing proposed here is based on a traditional practice of musique concrète, which consisted of cutting up fragments of magnetic tape and sticking them back together in a different order, so as to introduce local disruptions into the signal, while preserving its global continuity.
Shuffling randomly samples fragments of variable dimensions in the last three seconds of the sound processed. It is possible to modulate the density of restitution of the fragments and their pitch. Depending on the size and density chosen, Shuffling enables a wide range of sound transformations: from the most conventional (chorus, flanger, harmonizer) to the most unexpected."

[148] I use the term hyper-real to describe sound that is clearly recognisable in its source but also has processing which is equally clearly heard that adds a further layer of meaning or quality to the sound – sometimes making the sound an architype or oneiric by the processing's quality of removing the sound from its 'real' setting. So hyper-real sounds are sounds that have been removed from their natural setting either subtly or more measurably but are still totally comprehensible as themselves.

- How will the attendant psychological concerns of Smalley's (and others) writing be used in my methodology?
- What methodology can be created using Smalley's writing as a starting point that contributes to an inner or personal soundscape being made explicit? What perceivable characteristics will conform and add to the spectromorphological theory?

In choosing to capture spaces around the idea of home, I am focussing on central oneiric ideas in *The Poetics of Space* and the human dimension that this means.

In his Orbieu soundscape, Smalley talks about *signalling* and *behavioural* spaces when describing some of the animal sounds. In his notes (2) he says:

> *"Slabbekoorn, in Marler and Slaberkoorn (2004) discuss birds' space; this idea is applicable to other living beings, and can be applied to textures in acousmatic music, where sources are not 'living' or identifiable."[149]*

The dinner track is certainly behavioural and signalling in its human agency and also has similarities to the *ensemble* space Smalley mentions in his hierarchy of *performance* space.[150] I would define *domestic* and *intimate-group social* as terms for the dinner track. *Domestic* deals with the activity, eating using house tools (cutlery, plates), and *intimate-group social* signifies group participation with members that are clearly well known to each other, and a setting where relaxed social interaction is occurring.[151]

In talking about behaviour and signalling, and then performance in regard to space, Smalley acknowledges and provides for living and human agency in these constructions. In my work with this track and the cooking track, I propose to extend this idea and to construct more terms to provide descriptors for the human activities in home settings that I have used. As architypes of human behaviour they may be used as extensions of Space-form and spectromorphology in analysis of other suitable material (sounds of human agency or sound that is *source-bonded* as such).

The cooking tracks are split into 2 regions (starting at 2.46 mins and 12.10 mins). The first is unprocessed apart from a tape delay applied to the sound of placing cutlery at the end of the

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[149] Smalley, 'Space-Form and the Acousmatic Image'. 36
[150] Smalley, 'Space-Form and the Acousmatic Image'. 42
[151] Hall. 121 Hall speaks of social space but not of specific contents that might occur in this space which can only exist with human behaviours as the measurement.

region (at 3.36 mins) which signifies a starting point for the main sound collage that forms the piece. I set this first region here to prelude the human agency that follows and to act as a contrast to the preceding birdsong (with space connotations of 'outside' and 'everywhere') and the processed guitar which has lost all human agency as a result of the processing and acts as one of the tracks which I worked to be non-relational to the home in a spatial way (the other track being the Bachelard track). The definite space of the cooking track centres the piece in the kitchen for the first time.

The second region of the cooking track uses processing from Logic's ChromaVerb plugin to change its space from *domestic* to *oneiric-domestic*. I chose the *Unstable Space, Airy* setting (see below) because the reverb doesn't sound enclosed in another space and as a consequence is open enough for me to use to explore the relationship of *hyper-real* sounds and *transcontextual-extrinsic* meaning. The processing invites the listener to use the familiarity of the sounds to remember and day-dream their own domestic experience.

Figure 9: The ChromaVerb setting used on the 2nd region of the cooking track in Home

The Bachelard track is taken from a video I found on YouTube of an interview of Gaston Bachelard that has since been removed and is now hosted on the *Institut national de l'audiovisuel* website[152]. I chose to include the audio from this video because of the quality of Bachelards voice and at a more theoretical level, as an acknowledgement of the importance of his writing in my research pieces, especially *Seven* and *Home*. This particular track started

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[152] 'Portrait d'un Philosophe'.

as its own Logic project (included in Appendix 1 - Bachelard.logicx). and I made decisions about the processing that were sonic representations of his writing; a concentration of the inhabited space, of oneiric reflection, of poetic image and a pathway to occupying the daydreams of childhood as hosted in the homes they took place in. As can be seen in the Bachelard.Logicx, tracks 33 – 88 contain the audio from the video cut and spread across these tracks to enable different processing. I chose to disassociate the spoken word from any fixed or identifiably natural acoustic space. I wanted the voice to speak from another plane of phenomenological experience; an abstract that relates to *Home* but is not of it. The *hyper-real* voice processing is designed to give listeners a pathway to their own experience and I view it as a *transcontextual* extension of the *perspectival* soundscape in an *oneiric-prospective* combination that expends the *canopy* function of the birdsong beyond its natural setting. The Bachelard track is closely related to the birdsong and works in tandem (but they are not synthesised) to create blurred edges of perception.

Each track from 33 through to 88 has been processed with a different patch form the Space Designer reverb plugin that is based on changing 'drone tone' impulse responses. These patches provide dense and harmonious reverberations that blend together cohesively and colour the voice in a large space that develops with each patch change but maintains spatial continuity.

Tracks 2 to 15 contain audio taken from these processed tracks and applies tape delays (from Logic Tape Delay plugin) and some GRM Tool Doppler processing to reveal sonic qualities within the spoken word. This is mixed back into the whole file to further remove the finished track from a natural space. As a finished track, the Bachelard track is definitely a specific space within the piece. The tonal reverberations offer an *arena space* that takes the voice into a *performance space* rather than a space of human utterance and as such it is *oneiric.*[153]

The remaining track I chose to put in *Home* is a processed capture of acoustic guitar music I was playing consistently throughout that year and as such it represents significant home activity, though the processing masks this in *Home*. The guitar was recorded on an Akai DPS24 mkII and I rerecorded this track into Logic using the scrub wheel of the Akai to reverse play the audio at the slowest speed possible. Slowing down the audio also alters its pitch and the new recording takes on a *texture-motion* (turbulent, continuous, granular,

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[153] Smalley, 'Space-Form and the Acousmatic Image'. 41, 42

accelerating- decelerating-flux[154]) that is subjectively cavernous, explosive and sometimes machine like (from 2.40 mins onwards). Occasionally I can still detect a musical instrument basis to the sound but I would *source-bond* it to a piano rather than acoustic guitar. I chose a reverb from the logic plugin Space Designer to add to the track to accentuate the larger space it now provides (see below).
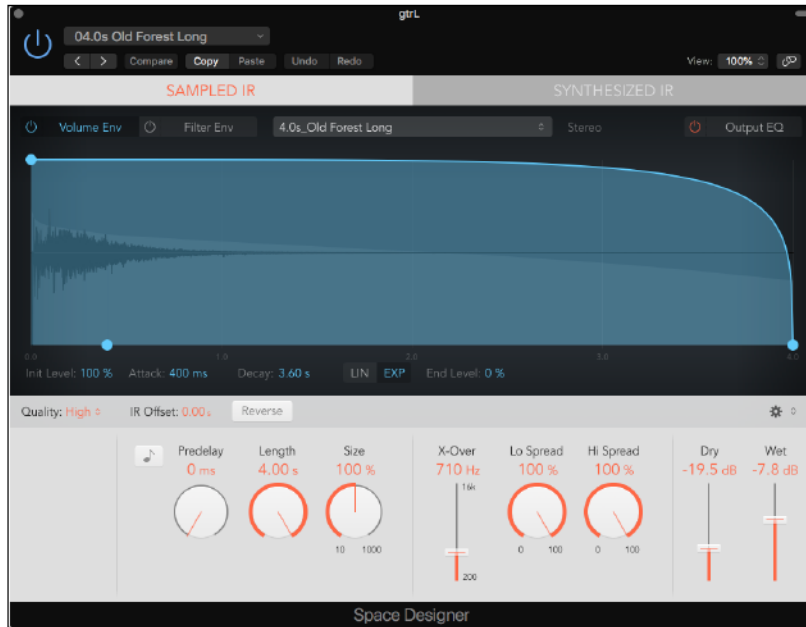

Figure 10: The Reverb setting for the stereo guitar tracks in Home

The sound is the most abstract expression in Home and has some emotive qualities of the cellar and the underground as expressed by Bachelard and Labelle, I chose to keep it in the piece as a sonic representation of the ideas around winter that Bachelard begins to discuss in his chapter *house and universe*, where he places the house in environment[155]. Winter is used to denote an undesirable *outside* that the house offers sanctuary from. The processed guitar in its *third order* or *remote surrogacy* has an aural remoteness to the domestic sounds that I used to give this dimension.

I arranged the sounds that make up *Home* intuitively and I based decisions on the sonic blending of texture motions that allowed a sense of flow at a higher structural level but still reveal multiple layers of spectromorphologies at a more detailed *reduced listening* level[156].

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[154] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 118
[155] Bachelard and Jolas. 41 Bachelard says Winter is "by far the oldest of seasons" and this "confers age upon our memories" He extends the winter environment in its ability to foster oneiric thoughts.
[156] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 111 In the Section 2.8 Smalley discuss the pros and cons of reduced listening which he denotes as a Schaefferian concept; it is "an investigative process whereby detailed spectromorphological attributes and relationships are uncovered."

The piece is spatially *domestic-oneiric-narrative*; a combination of ideas from Bachelard and Ferrari that I combine to propose the structure's content/intent. The intent is to move into the oneiric from the domestic narrative and its *hyper-setting* provide by the guitar and Bachelard spoken word tracks, and to some extent, the birdsong.

I am aware that my choice not to include the village trails I recorded has left me with choices when approaching these questions in future. A more complete composition would be realised with the village captured through more than the birdsong. Spatial capture of areas of the village that were significant to me in the idea of home would be a priority in future. Sounds from the house; electricity, pipe noises, creaks and wind are also subjects that I would address in future work in this compositional interest. As it is, *Home* narrates questions about domestic inhabiting of a house and that house's boundaries, both real and oneiric.

Solea

Introduction

Solea is a Live-performance piece and I have included a recorded version of a performance in the portfolio (QuadraphonicSoleaOutput.logicx) as detailed in Appendix 1. The live performance allows for variation; the effects chain and Purr Data (the latest extended version of Pure Data) processing is able to produce different results in each performance and the decisions I make in manipulating the effects or triggering sub-patches in the programming are able to be varied each performance.

I place *Solea* in the wider practice of artists including Phill Niblock's work in drawing out timbral and spectral detail from overtones in the performance instrument (*Feedcorn Ear*[157], *Hurdy Hurry*[158]); the compositional layering (using orchestra and computer processing respectively) that John Luther Adams (*Become Ocean*[159], *The light that fills the World*[160]) and Theodoros Lotis (*Arioso Dolente/Beethoven op.110*[161]) employ in their works; and the spatial concerns within works such as *Piano Nets* by Denis Smalley[162].

The programming and additional sounds are designed to figure a soundscape rather than to be apprehended in a linear manner. The spaces they suggest are designed to be *oneiric* and available for the listener to personalise with their own concerns. To enable this, I made choices surrounding the performance:

- The use of baritone guitar gives a lower register to the origin sounds that promotes a foundational quality to the texture-motions that are created.
- The underlying chords are chosen to be ambiguous in tonal centre (the first chord has a flat7th as the lowest note) but to harmonically cohere and support slow development.

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[157] Niblock, 'Touch Five'.
[158] Niblock, 'Hurdy Gurdy'.
[159] Adams, 'Become Ocean'.
[160] Adams, 'The Light That Fills the World'.
[161] Theodoros Lotis, 'Époque de l'eau' (electrocd, 2003) <https://electrocd.com/en/album/2357/Theodore_Lotis/Époque_de_1_eau>.
[162] Denis Smalley, 'Valley Flow; Piano Nets; Wind Chimes; Clarinet Threads; Darkness After Time's Colours.' (Montreal: Empreintes Digitales, 1982) <www.metamkine.com>.

- The first quality of the guitar effects chain is granular synthesis which provides the texture-motions and has a function of smoothing and extending the chords for long periods. A compressor and EQ pedal are also used to support this function.
- Each chord still has a defined beginning and end and this supports a higher structural layer of continuity as each new chord is heard but has significant tonal and timbral continuation from the preceding chord.
- The secondary function of the guitar effects chain is to draw out timbral and spectral detail with the use of the filters on the H.O.G. pedal. The result is a spectromorphology that evolves slowly as I control the H.O.G. with slow movements.
- The Purr Data processing analyses the guitar effects chain and provides further partials that are then arranged to provide a larger soundscape that is figured by the movement of these new sounds.

Figure 11: The original chords for Solea. These can be heard in the Logic file Original Solea in the Solea folder in the portfolio.

The guitar effects chain and processing

The composition has two areas of production: The guitar playing and processing, and the subsequent processing through Purr Data.

The effects chain for the guitar is:

Electro-Harmonix SuperEgo

Electro-Harmonix H.O.G. (harmonic octave generator)

Electro-Harmonix Canyon

Behringer EQ pedal

Mooer Big Yellow compressor pedal

Korg Kaoss Kp3+

The compressor pedal and an eq pedal are inserted into the effects chain to reduce spikes in volume changes or in particular frequency ranges that the creative processing might generate.

The guitar chords being manipulated are available as described in Appendix 1

The guitar signal enters the SuperEgo which uses granular synthesis to produce a drone. The drone lasts for as long as the performer chooses and is switched on and off by the pedal which is set to its latch mode.

This drone is always affected by the Canyon which has a setting called shimmer (that models 4 other Electro-Harmonix pedals - two Memory Man delay-modulators, a POG2 pitch shifter and a Soul Preacher compressor). This is a specialised reverb effect that generates upper partials to create a subjectively rich wash of sound that extends the source timbral content as well as adding spatial depth.

The HOG pedal is switched in and out of the chain when the performer chooses to do so. The controls of the HOG used in this composition comprise of:

Dry output

-2 octaves

-1Octaves

Original

+5th

+1 octave

+ 1octave and 5th

+2 octaves

+ 2 octaves and a 3rd

+3 octaves

+4 octaves

Spectral gate button

Envelope controls

Resonant filter

These controls are manipulated in real time by the performer to change the timbral quality of the guitar post granular synthesis. The octave (and octave plus interval) sliders boost those specific frequencies. If the original slider (see below for control layout) is set to zero then the spectral content of the drone is controlled by my choices in positioning the other sliders. The tonal sweeps and changes to the drone can be heard throughout the guitar recording of *Solea* (listen to SoleaGuitar.wav in the Solea folder as described in Appendix 1) but specifically at 1.28 mins to 1.46mins and 10.14 mins to 10.18 mins.

Figure 12: The Electro-Harmonix H.O.G. pedal. The settings shown are the default starting point for manipulation in the composition. Everything is set to zero and the original signal is playing through the pedal at a level that doesn't introduce distortion.

The envelope sliders to the right of the octave sliders control the attack speed of the upper and lower frequencies of the signal and the filter section adds a resonant sweep function to the signal path. Both of these are manipulated in the performance. I use the envelope sliders to control high frequency harshness as the H.O.G. pedal is unable to produce high fidelity synthesis. I use the resonant filter to introduce swells to the tonal changes I introduce with the octave sliders. This can be heard throughout but specifically at 10.31 mins to 10.33 mins.

The result of this signal processing is fed to the Korg Kaoss KP3+ and I use this device as a phrase (re)sampler and processor. The KP3+ has 4 (re)sample playback tracks which can

contain up to 12 seconds of audio in each sample. In my performance I use the Kaoss pad to create sample tracks that I can use to play along with the live signal. I re-introduce samples that capture audio before the H.O.G. sliders are engaged. This option allows me to return to a 'base' sound when I have experimented with the sliders (11.29 mins onwards).
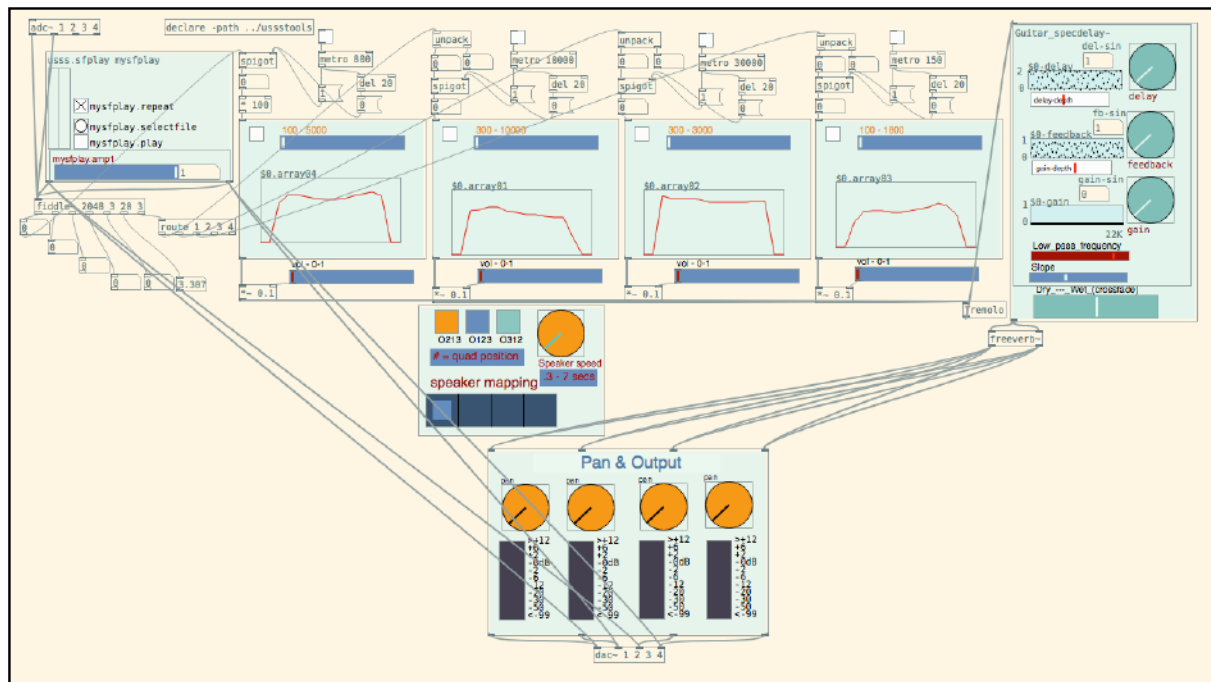
The Purr Data program

Figure 13: Solea04.pd - the main patch and human interface for manipulating the guitar signal and its sinusoids.

The programming is where questions of space and spatial movement are researched. The environment programmed is responding to the ideas of space that Smalley talks of - especially the dynamic living aspect that he quotes from Lefebvre[163]. I am concerned with spatial dynamics and motions that support the listeners own sense of decoding and use in personal soundscapes.

The Program has four main functions:

- To compute partials based on an analysis of the guitar signal it receives.
- To produce sound based on these partials using synthesis I program.

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[163] Smalley, 'Space-Form and the Acousmatic Image'. 38. "neither a mere 'frame', after the fashion of the frame of a painting, nor a form or a container of a virtually neutral kind, designed simply to receive whatever is poured into it. Space is a social morphology; it is to lived experience what form itself is to the living organism, and just as intimately bound up with function and structure." (Lefebvre 1991: 93

- To process the original signal and the synthesised partials using sequences based on the solea rhythm of flamenco music and delays and reverbs to create spatial depth.
- To distribute these sounds across a quadraphonic array of speakers dynamically to create the soundscape.
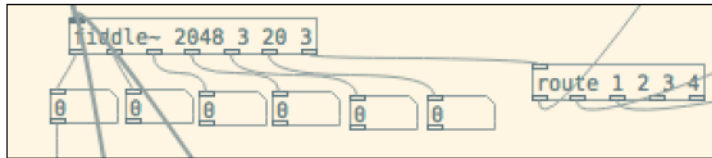

Figure 14: The Fiddle object reading data from a test recording of Solea

The guitar performance

The guitar performance is converted to digital by the adc~ object in a live setting where it can then be processed by programming before being converted back to analogue by a dac~ object. Alternately it can be recorded and played back into the program using the sfplay object provided as part of the USSS toolkit:[164]
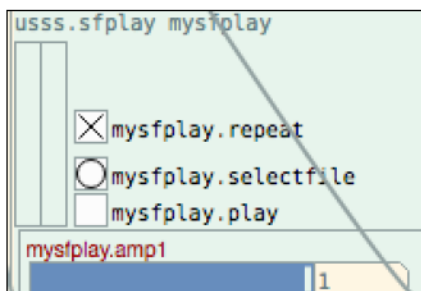
Figure 15: The sound file players that the usss toolkit provides. I changed its graphical appearance to match a design used throughout Solea and 4 Radios

The fiddle object

The fiddle object:

> "... estimates the pitch and amplitude of an incoming sound, both continuously and as a stream of discrete "note" events. Fiddle optionally outputs a list of detected sinusoidal peaks used to make the pitch determination."[165]

With the arguments I select in the numbers to the right in the fiddle object, the output will be 3 sinusoidals as frequencies being refreshed every 23 milliseconds. My instinct is that the

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[164] Adrian Moore, *Sonic Art*, Sonic Art, 2016 <https://doi.org/10.4324/9781315684024>. Chapter 2 (38 – 92) describes the content of the toolkit.
[165] From the Fiddle~-help.pd file that is part of the Pd-l2ork.app distribution.

speed of these frequency change outputs is unstable in its intended function to feed a synthesizer that will play the frequencies at a much slower rate. I used a spigot function controlled by a metro object to control the frequency output and chose an arbitrary 600 milliseconds as the default output:
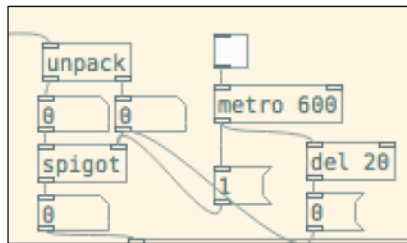
Figure 16: The programming of the spigot object using metro and del objects to control the speed of output of the data being read.

The synthesizer

My main concern with the design choices in the synthesizer is to add to the live performance sound in a sonic extension of the processed guitar, and not to create a discrete entity that is in contrast to the guitar. The synth abstraction is shown on the following page:
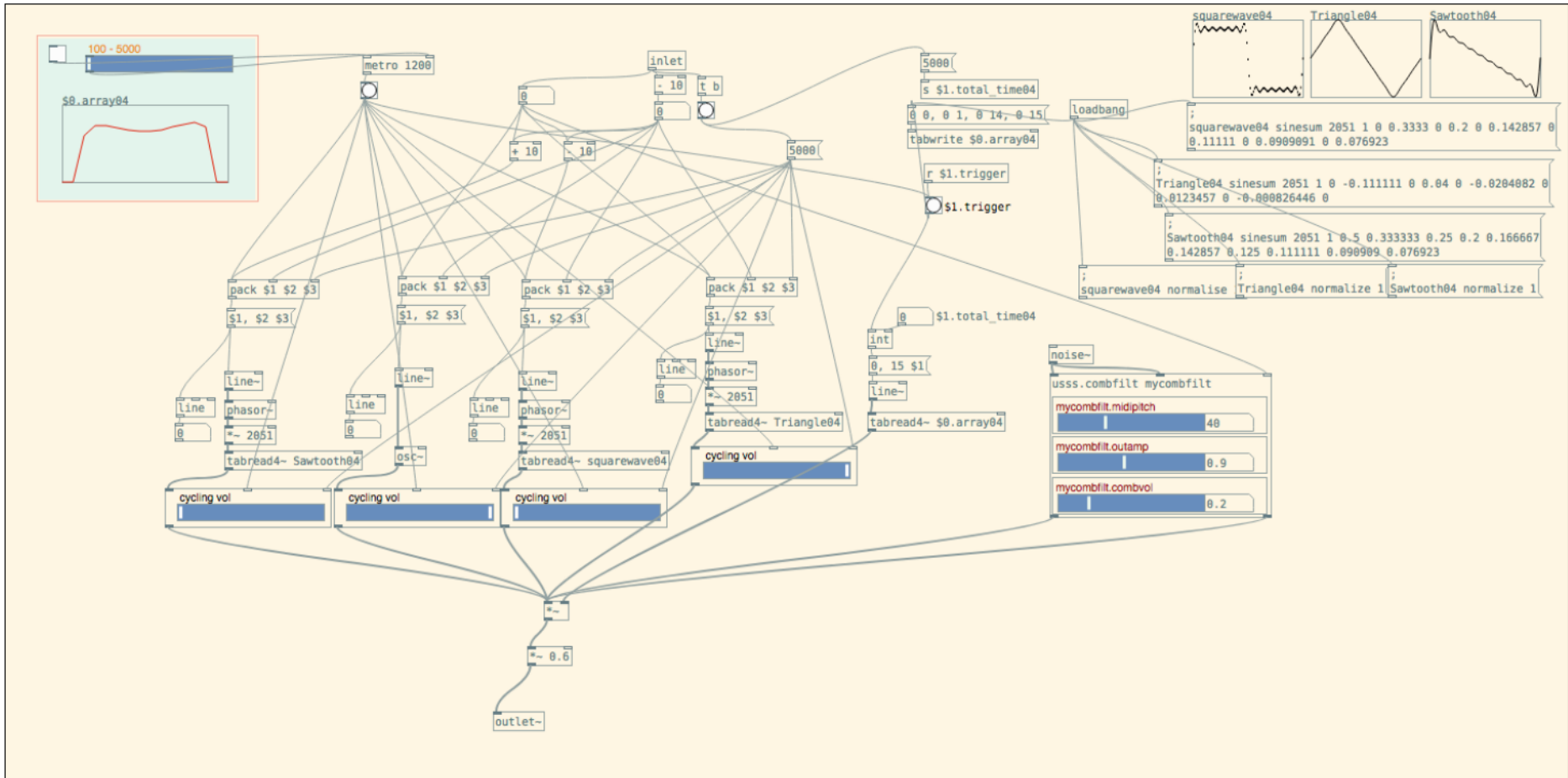
Figure 17: fiddleSynth04.pd: all the synths sounding the sinusoidals have a identical construction, but values generating the sound engine are different.

The synthesiser combines 5 sound-sources; a sawtooth wave, a sine wave, a square wave, a triangle wave and a comb-filter taken from the USSS toolkit. The waves are written into message boxes as table data and plotted in arrays shown to check that the data is correct for the wave form. The waves are then normalised as part of the gain-stage structure. The data is commonly available to build waves and I chose the data in The Pure Data Floss manual available online[166].
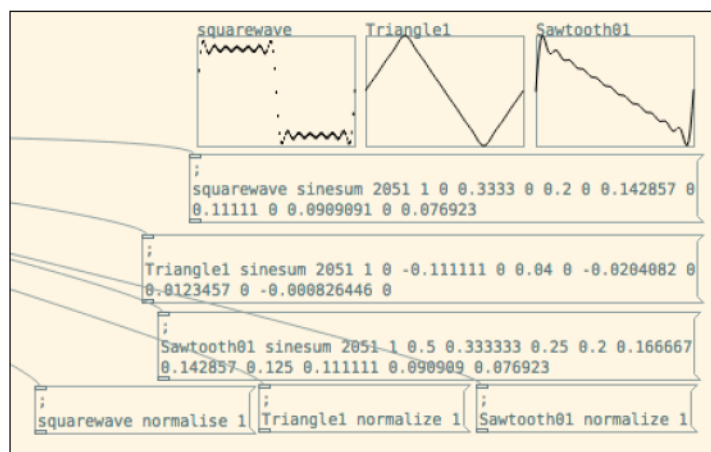
Figure 18: The wave data and arrays in fiddleSynth02.pd

The waves are read by code that is identical for the three table based wave shapes:
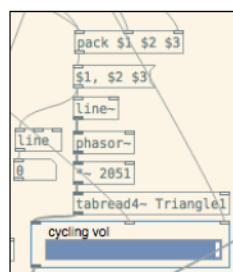
Figure 19: The code to feed note data to the wave shapes in fiddleSynth02.pd

The pack object accepting 3 variables allows the line~ object to send a portamento between two frequencies over a set time. Underneath the tabread4~ object is an abstraction that varies the volume of play for the particular wave shape from near-zero to near-one (maximum volume) over the duration on the note. Each wave-shape has this and they are set in opposite directions; the saw-tooth and sine-wave travel from near-zero to near-maximum, the square-wave and triangle-wave travel from near-maximum to near-zero. The frequencies being fed

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[166] 'Pure Data Floss Manual' <http://write.flossmanuals.net/pure-data/introduction2/> [accessed 15 December 2019].

to the line~ object (through the $1, $2, $3 variables) are the frequency being sent by the fiddle object, and two small offsets that I chose to create a tone which can be altered in its perceived 'thickness' dependent on the offset values. This allows me to change how much the sound will distinctly 'cut through' the composition's mix of tones and give me choices about whether I select the sound to define the soundscape's geometry. By setting it as a *foreground* sound, I can use volume, filtering, reverb and panning in the mixing section to reveal the soundscape *canopy* or boundary (should it have one) or I can use it to add to timbral detail that adds texture detail and motions to the soundscape. In the main submission piece, QuadraphonicSoleaOutput.logicx examples of foreground sounds figuring the soundscape can be heard throughout but specifically at 8.06 mins.

The volume envelope for each synth in Solea is drawn in an array that is accessible from the main patch. This gives maximum flexibility in the composition to change sound envelopes during a performance or allow others to do so in collaboration.
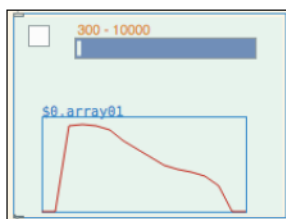
Figure 20: The volume envelope for fiddleSynth01.pd with an example diminuendo drawn into the array

The controls that can be set for each fiddleSynth abstraction are:

- Whether it sounds or not
- The speed of change of the frequency being given by the fiddle~ object (metro and spigot code in Figure 13)
- Changes to the offset frequency values coded
- Changes to the portamento range coded using dollar-sign variables
- The length of note sounded
- The volume envelope
- Amplitude attenuation as an end process

All of these parameters can be changed in a live setting at the discretion of the performer(s) or listeners if desired.

The effects

I designed the effects section after the synthesiser to add texture-motion to the synthesized notes and to give some initial spatial information with reverb and delays, tremolos and paning.

Tremolo

I coded this patch to introduce a solea rhythm back into the piece because I wanted to reference the heritage of the original performance (OriginalSolea.logicx in the portfolio in the Solea folder as and research similarities between *aural surrogacy* (Smalley) and *extrinsic-surrogacy* provoked by the point made in *Flamenco* by Clause Schreiner:

> *"Flamenco as the art of cantaores, bailaores and tacaores, performed for a close circle of spectators in an intimate and integrated atmosphere, becomes questionable if, thanks to the availability of video and cassette recordings, it can be repeated at any time – and indeed anywhere and before any kind of audience."*[167]

Is Smalley's concept of the culturally driven extrinsic link[168] open to a similar model of orders of surrogacy in the light of the point made by Schreiner. If cultural assimilation is probably not authentic (in the way suggested above), what is the activity we engage with in making extrinsic connections to audio? Is it possible to suggest that cultural extrinsic connections might be at different levels of surrogacy analogous to source-bonding and as such are related to oneiric qualities? These questions might be better represented in the original piece of music that *Solea* is an expression of (in the portfolio, in the Solea folder as OriginalSolea.Logicx). The solea effect in the submission piece might be too subtle to pursue this.

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[167] *Flamenco*, ed. by Claus Schreiner (Amadeus Press, 1990). 31
[168] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
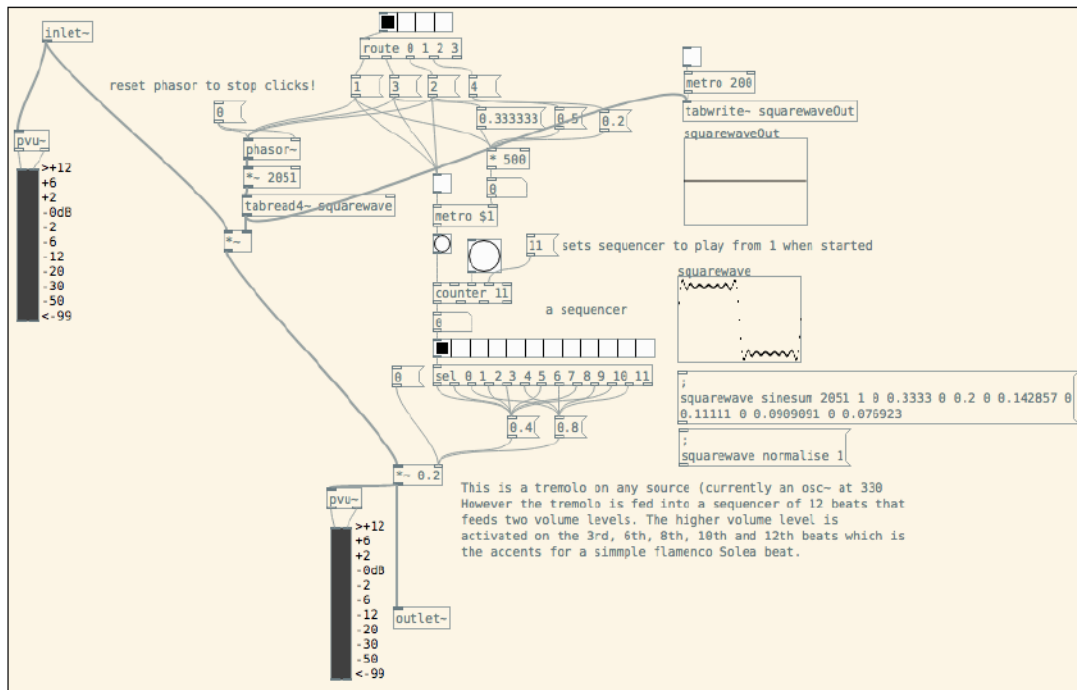
Figure 21: The coding for a tremolo effect based on the solea rhythm. The code allows for different speeds and is generated by reading a square wave which gives a more defined tremolo effect.

The code modulates the signal with a square wave visible on the right side of Figure 21. A square wave gives a clearly defined modulation in comparison to a simple sine wave. The top of the figure shows some code to allow the modulation speed to change by user choice with a horizontal radio button feeding a route object. In the centre of the patch a toggle feeds a metro object that drives a 12 indices counter. The counter feeds a select object that changes the volume on indices 3, 6, 8, 10, 12. This give a 12 beat cycle with accents on the beats that are correct for a solea rhythm. There are reset functions for the phasor that drives the modulation (the phasor object reads the square wave) and the counter so it can be restarted without clicks. I use this code on slower synth tones from the fiddle object – fiddleSynth02.pd generates tones that are 30 seconds in length so it is an ideal signal to process with this tremolo as the effect will be heard more clearly. You can hear the tremolo at 3.05 mins in QuadraphonicSoleaOutput.logicx.

Guitar_specdelay~

I discovered this patch on the Guitar extended website[169] which has several tutorials and examples of signal processing aimed at guitar players. I changed the input method of the

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[169] 'Guitar Extended Spectral Delay' <https://guitarextended.wordpress.com/2012/02/07/spectral-delay-effect-for-guitar-with-pure-data/> [accessed 18 November 2019].

program to reflect the needs of my own signal-chain in *Solea* and created a new, smaller graphical interface for the patch:
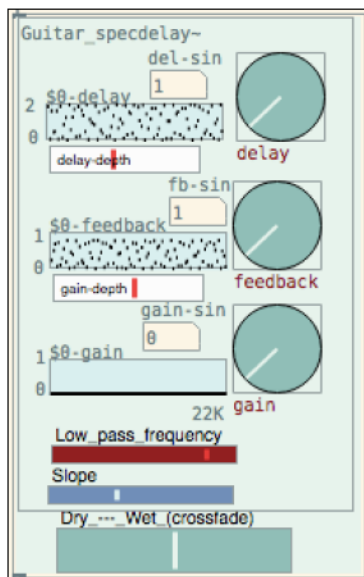
Figure 22: My version of the spectral delay patch available from the GuitarExtended website and based on an original patch by johannes Kreidler

Spectral delay separates the result of FFT signal analysis into 'bins' that can be re-synthesised with different delay times creating an evolving effect across the spectral frequency of the analysed signal. The processing adds spatial spread and depth to the signal and allows me to design the output towards suggesting spaces in the soundscape with this sound (see from 14.04 mins for example).

Freeverb~

Freeverb is an object supplied by the Purr Data distribution and is based on the Scroeder-Moorer algorithm. There are 8 parameters that can be automated shown below in figure 18:

Figure 23: The reverb parameters available for automation or value specifying in composition

Mixing the output

The signal chain ends with each signal being mixed to a quadraphonic speaker array using automated panning.

Panning

I wrote code to automate panning in a quadraphonic speaker array over a time frame ranging from 0.3 seconds to 7 seconds. I chose these parameters intuitively and after testing a small speaker system in my own studio.
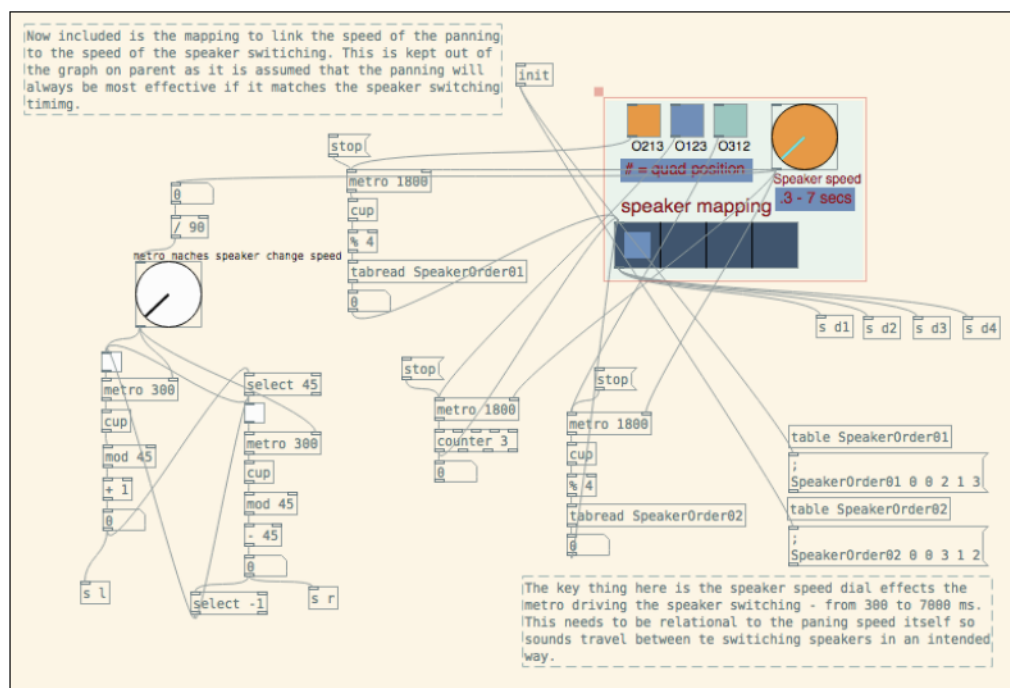
Figure 24: The code for the quadraphonic panning showing the speed function and the tables for the speaker order.

The patch distributes 3 speaker mappings to a pan function. The speaker mappings are available to choose from the graphical interface and the non-sequential mappings are generated by tables. The speed of switch from speaker to speaker is generated by a user-controlled knob with values ranging from 300 to 7000 ms. This data is sent to code that divides this time by the 90 indices required to generate a full stereo pan from. -45 to 45 as values sent to the pan object in the final output module. The select objects form a loop as each pan reaches its end point. The speaker mapping and pan values use send and receive objects to communicate their data.

Output

This data is processed by the final output stage which feeds a quadraphonic speaker array.
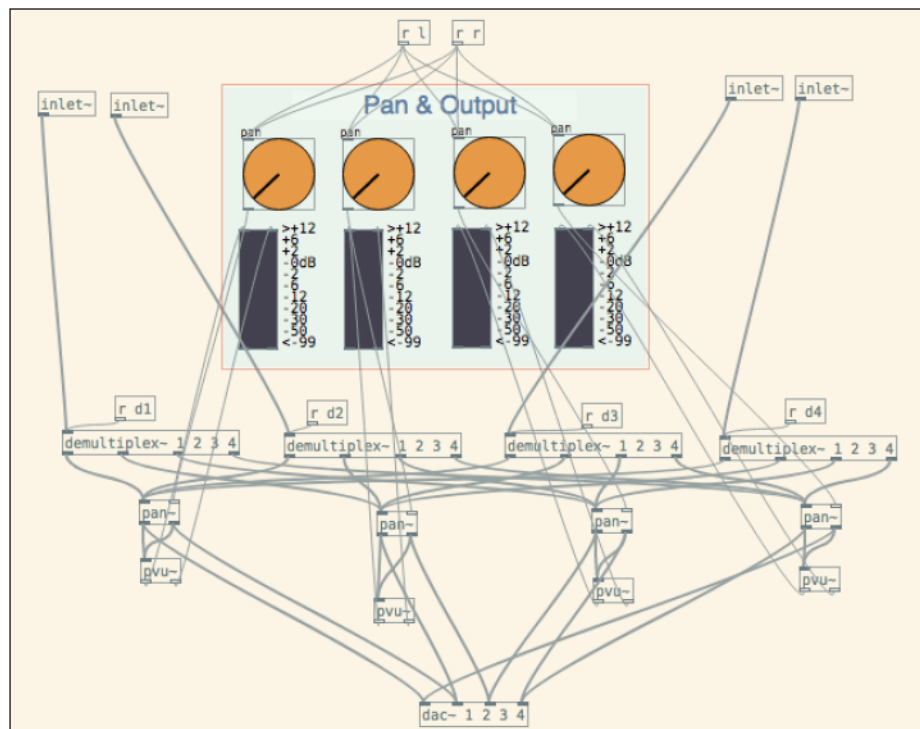
Figure 25: The output section showing the current pan and signal strength for each speaker.

The demultiplex~ object sends the signal it receives to one speaker at a time dependent on the speaker mapping it receives. Metering in the graphical interface allows the mapping to be visualised in terms of signal strength and the pan knobs show the current pan value. I coded this mix output to help realise *texture-motion*.

Conclusion

With *Solea*, I have researched the use of tonal material and its relationship with spectromorphological concepts as tools of composition rather than analysis. I have done this in the specific environment of the Purr Data environment. In using musical material that had significant rhythmic relationship to the flamenco form of solea I also research perception in the limits of extrinsic cultural limits and their relationship to gesture surrogacy. There are also questions relating to this cultural vestige of solea rhythm to the transcontextual possibilities of the piece. *Solea* is tonal but the choices of processing I have made with the guitar pedals and the coding allow it to share a spectromorphological analysis with

acousmatic material which leaves the potential for listener based *transcontextual-extrinsic* experience. Questions about a potential relationship between the solea vestiges and transcontextual experience are relevant and perhaps more so to listeners who recognise the heritage of solea form. Nonetheless the two different concerns are obviously present in the methodology of composition and exist as possibilities of experience.

Four Radios

Introduction

Four Radios uses the tuned signal from 4 radios to provide input into a Purr Data program that samples, processes and mixes the audio to create a soundscape. It was initially designed to be an installation but in its current iteration it is prone to static results and it is better suited to live performance where real-time changes to the programming parameters provide more choice in creating spectromorphologies from the radio signal. The recorded example (available as QuadraphonicFourRadiosOutput.logicx in the portfolio) uses audio from Radio 1, 2, 3 and 4. This gives a source audio that is nationally[170] available on most radio devices and includes the 3 most popular radio stations nationally and gives a wide range of material. Spoken word, current popular music, music from the last 70 years or so and classical and world music over centuries can be mixed together from these stations. I chose these stations for their familiarity in England to provide focus on the subsequent compositional choices in the recorded performance. Notwithstanding the variables of what (radio station) scheduled programming is captured, choosing other stations, international ones for example, might produce different *extrinsic* relationships in their apprehendable cultural signatures.

Smalley talks about sound that comes into a real space from radios, tv's, phones as *mediatic space*[171] (a subset of *enacted space* [generated by human agency] and more generally, *behavioural space*):

> " ... *suggests, and transmits to us, spaces from beyond our immediate enacted space ...Mediatic space creates not so much a direct spatial form, but an image of spaces and places, events, distances, which impinge on, and form part of the spaces within which we act.*"

Beyond this description, Smalley doesn't discuss the type of spaces possible from accessing radio (or the other mediatic space providers). My research in this piece includes questioning

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[170] 'Radio Stations Ranked by Weekly Reach in the United Kingdom (UK) as of 3rd Quarter 2019 (in 1,000 Listeners)' <https://www.statista.com/statistics/286892/uk-radio-stations-ranked-by-listeners-reached/> [accessed 7 November 2019].
[171] Smalley, 'Space-Form and the Acousmatic Image'. 39.

the relationship of a spectromorphological/space form analysis of the mediatic space of Four Radios with an enquiry into what else is available to the listener.

When Gaston Bachelard writes about the oneiric house in *Poetics of Space* he makes two statements that relate to the questions in *Four Radios*. Firstly, he says:

> *"For our house is our corner of the world. As has often been said, it is our first universe."*[172]

And later, in talking about different oneiric types of houses he quotes Georges Spyridaki as he describes a home that spatially morphs:

> *"Sometimes the house grows and spreads so that, in order to live in it, greater elasticity of daydreaming, a daydream that is less clearly outlines, are needed. "My house" writes Georges Spyridaki "is diaphanous, but it is not of glass. It is more of the nature of vapor. Its walls contract and expand as I desire. At times, I draw them close about me like protective armor ... But at others, I let the walls of my house blossom out in their own space, which is infinitely extensible. Spyridaki's house breathes."*[173]

The receiving and decoding of radio waves is one way the house expands and contracts and provides universality.[174] Brandon Labelle is very aware of Bachelard's philosophy in his section on sky in Acoustic Territories:

> *" ... but I do know the immensity of the sky gave me a sense of the poetics of all that matter above my head ... it brings me to what Bachelard understands as "childhood", which is not only a distant time in one's life, but importantly, the drive of the imagination itself."*[175]

Labelle quotes Joe Milutis who poetically sees the ether as *"an electronic rain that is continuously decoded and received in common or poetic ways."*[176]. These words remind me of my own experience as a child; of moving between a state of listening which decoded the actuality of the broadcast and backgrounding it as material that might provoke, shape or

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[172] Bachelard and Jolas. 4
[173] Bachelard and Jolas. 51
[174] The contemporary iteration of this technology is the mobile phone – a phenomenon that didn't exist for Gaston Bachelard or my own childhood. The questions this device provokes about *home* and *first universes* in the way Bachelard writes are numerous and very relevant to spatial considerations of our inner soundscapes. But the device wasn't present in my own oneiric home and the radio was. A radio in the kitchen when I was a child was the intervention of the universe into the home, albeit a scheduled and culturally British universe.
[175] LaBelle. 204
[176] LaBelle. 205

direct daydreaming or imaginative play. When Labelle sees the sky as a place of *"resonances to locate a poetics, the point of departure not only for imagining but for sound as well"*[177] I identify my primary research question in Four Radios: Can the decoded radio waves provide material for a spectromorphologically narrated Purr Data exploration of that balance of poetic and common? Labelle talks of radio being about *"manifestations of terrestrial projections … aerial figures like thunderers … Radio hovers between fantasies of transmission, of sonic emanation, of airy imagination …"*[178] – a world where the specific broadcast is not the only experience available.

The Purr Data program
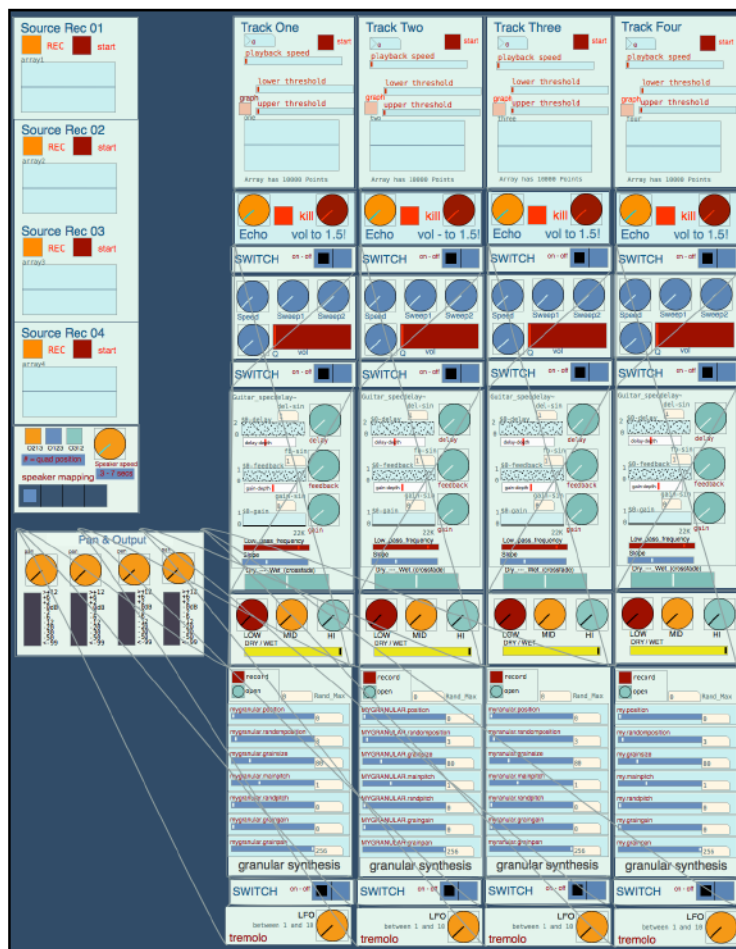
Figure 26: The main patch for Four Radios: SpectromorphologyMachine02.pd showing the interface with all of the real time controls available.

[177] LaBelle. 204
[178] LaBelle. 207

I started writing the Purr Data patch by deciding that the piece would be quadraphonic and moving a sound in a specific speaker location and then to be able to move it from speaker to speaker in a quadraphonic array would be my first task. I created SpeakerMapping.pd and Output01.pd to do this. These abstractions are used in *Solea* too but they were created for Four Radios initially. They are described in the previous chapter.

Figure 27: SpeakerMapping.pd which sets the speed and speaker order for the pan

Figure 28:Output01.pd which receives the panning information and feeds it to a 4 channel dac~ object using the demiltiplex object.

The next phase of experimentation in the pure data involved recording a voice and then manipulating it. I started with a patch called VoiceToSoundWave01.pd and this was based on some looping patches that are detailed in the *Loadbang* by Johannes Kreidler[179].

Figure 29: VoiceToSoundWave.pd

I mixed Kreidler's looping patches with some of my own patch programming to create a patch that added an ADSR envelope to the recorded voice.

I then started working with a series of patches called HumanLooper.pd - HumanLooper04.pd, and then subsequently RadioLooper01.pd – RadioLooper04.pd. I was experimenting using two patches by Kreider: a sampling patch and a loop patch. The synthesis of these two patches creates a process that captures the human voice (or any other signal) and then plays it back at variable speeds and backwards. My research was in manipulating captured audio in spectromorphological ways and as these patches grew that research began to include the abstractions I used or wrote in the final patch – SpectromorphologyMachine02.pd. All the research code prior to this is in the electronic resources portfolio as described in Appendix 1. One of my main technological outcomes in my methodology was to understand the importance in setting the right parameter limits for processing. I found that much of the processing code I adopted or wrote was only effective in my compositional needs in a particular range of its scope. Finding this scope took on an importance I had not appreciated at the beginning of this research.

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[179] Johannes Kreidler, *Loadbang: Programming Electronic Music in Pure Data*, 1sr edn (Wolke Verlag, 2009). 130. Kreidler's chapters on Sampling (112 - 145) and Wave Shaping (146 - 162) provided examples of code that shaped the initial development of my coding in SpectromorphologyMachine02.pd.

Audio Capture

SpectromorphologyMachine02.pd starts with the capture of 4 audio signals – in this case 4 radio stations.

Figure 30: source01.pd audio is captured in 9 second cycles and written to n array

I created an abstraction, source01.pd, to manage the 4 channels of audio being received by the adc~ object. The programming is the same for all of them. A user can press the start toggle for each individually and this sends a 1 to the select~ object that allows the incoming audio to be recorded to an array. The start button also sets a delayed message by 9 seconds to be sent back to the start toggle to turn it off which sends a 0 back to the select object to finish the array. Another 100-millisecond delay is also triggered at this point which feeds back to the start toggle to turn it once again to restart the process in a loop. Up to 4 channels of audio are written into 9 second arrays in this way and can then be read by the rest of the patch. I chose to loop the audio because it is my understanding that there is a finite amount of time

that can be written to an array (90 seconds[180]) and I decided intuitively that 9 seconds was more than long enough to create spectromorphologies with further processing.

The track abstractions

The 4 arrays that are captured by source01.pd are read by 4 track abstractions that have the same object layout but different automation.
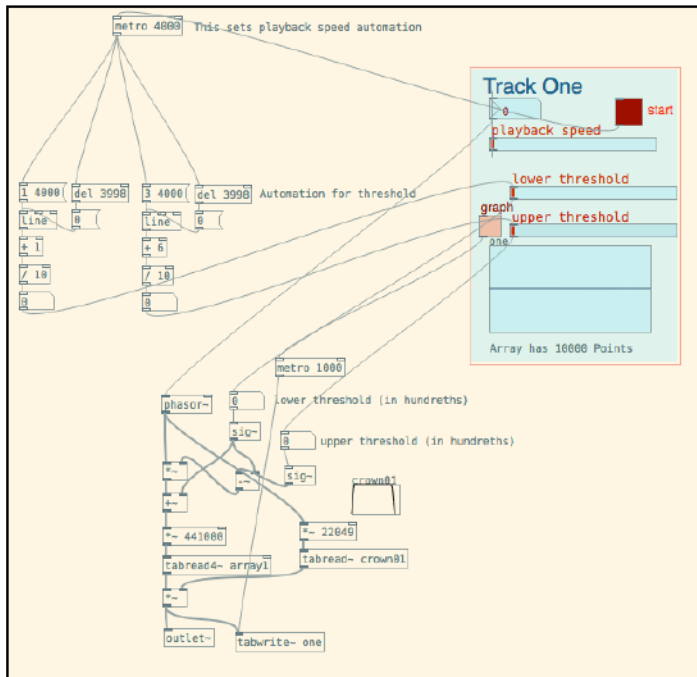
Figure 31: The captured audio is read into an array with optional automated threshold adjustments and controls for playback speed

A phasor~ object reads the incoming array of audio at a speed set by a slider called playback speed with parameters set from 0 to 1.5. Playback at the original speed occurs approximately at a setting of 0.11 so there is a wide scope for playing back at a variety of speeds. This is clearly heard throughout the example recording but especially at 9.32 mins. The track abstractions capture audio in 4 second segments so audio is repeated twice if the track is heard. This gives the performer a brief chance to anticipate audio and make decisions accordingly.

[180] Kreidler. 118

Echo/volume signal processing

The signal from the track abstractions is fed to an abstraction EchoAndVolOne.pd (there are 4 of these with the relevant number as the end of the abstraction name).
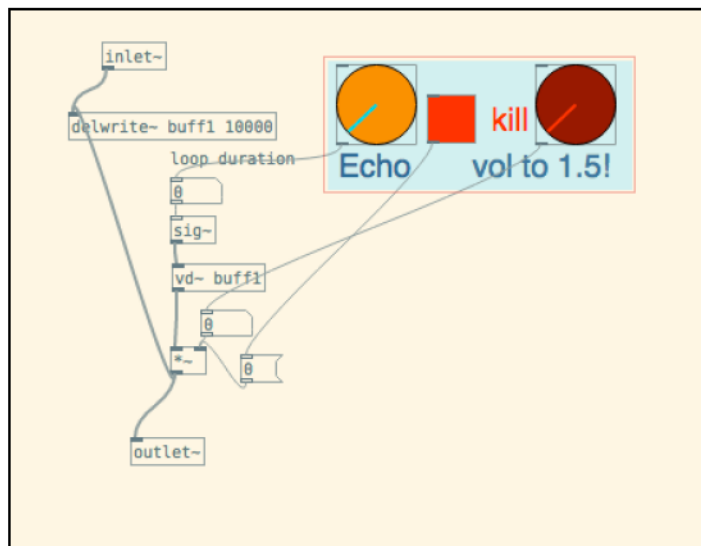
Figure 32: EchoAndVolOne.pd with a simple delwrite echo, immediate volume termination and a volume attenuator

This abstraction attenuates the volume from 0 to 1.5 (to cope with weak signal) and has a simple echo that reads from a 10 second buffer using the delwrite~ and vd~ objects. There is also a 'kill' switch which functions as a safety stop to the track's signal if needed. As the main patch grew in complexity I realised that managing the gain structure is important to the outcomes, and being able to stop signal is desirable in a live performance setting where feedback or other uncontrollable surges of audio could become a danger.

The switch

Switches are used throughout the main patch to turn modules on or off.
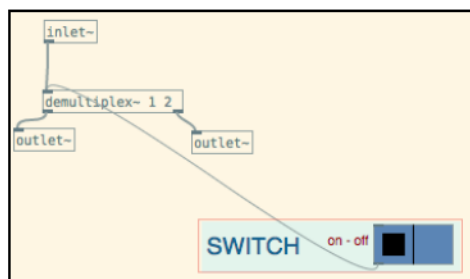
Figure 33: A simple graphical switch that uses the demultiplex~ object to feed different sections of the subsequent signal chain

The switch enables me to bypass the next module wherever it is placed. In the current design I have enabled the frequency filter, spectral delay and tremolo modules to be bypassed. I

knew from the earliest experiments that having all the modules on at all times would not help an exploration of layered spatial audio so the switch becomes a fundamental design attribute to SpectromorphologyMachine02.pd.

The frequency filter

The frequency filter is based on a 'Moog style' low pass resonance filter available as part of the libraries for Purr Data.
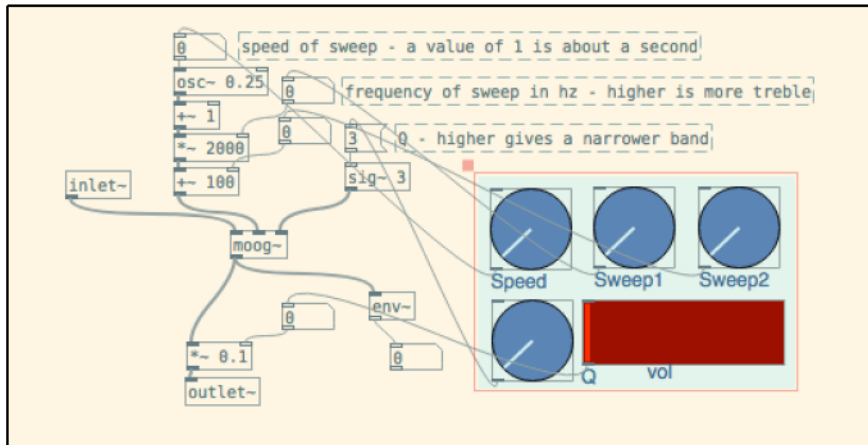
Figure 34: A moog style low pass resonant filter with graphical interface

I added a graphical interface to control the parameters of the filter, volume attenuation and the speed of the filter sweep. I changed the input from a phasor object to the signal of the track. I found that the filter is capable of processing higher frequency signals in textural spectromorphologies which helped me create spatial constructs when the signal processing allowed that to happen. The effect can be heard at 0.49 mins.

Spectral delay

The spectral delay abstraction is the same module as used in *Solea* and I adapted the version of this coding found at the Guitar Extended website.[181]

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[181] 'Guitar Extended Spectral Delay'.
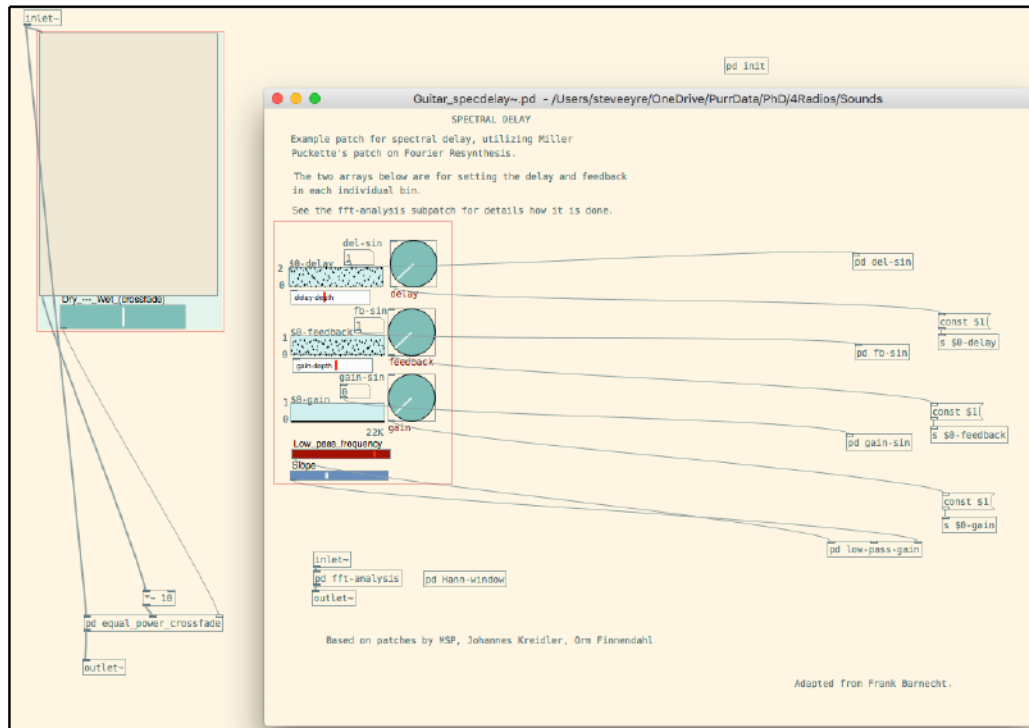
Figure 35: The spectral delay abstraction with its own sub patch with the controls

This is a complex patch based on a tutorial patch by Johannes Kreidler that explains the process as:

> *"You can also play back certain bins with different amounts of delay to achieve what's called a "spectral delay". The FFT analysis is written to two different buffers. Using an array, you can determine the delay for each bin."[182]*

I changed the input for the Guitar Extended patch to a track signal for my purposes and re-designed the graphical interface to suit Spectromorphology Machine02.pd. I used this module to add spatial information to already rich textures and an example of this is at 10.45 mins. It has a different and more subtle effect on the signal that the echo earlier in the signal-chain but I used both simultaneously at times during the performance of the example piece.

Equalisation

I found a simple EQ tool on the Pure Data forums and configured it's graphical interface to fit SpectromorphologyMachine02.pd.

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[182] Kreidler. 187
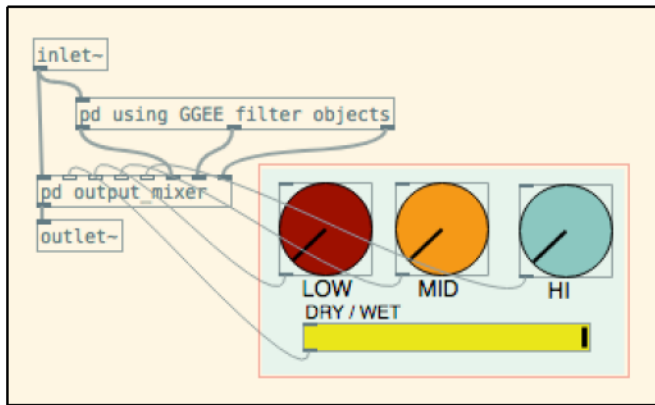
Figure 36: The graphical interface for the eq abstraction. A dry wet mix is added to the Low, Mid and Hi controls

I created a graphical interface to feed the mixer subpatch parameters that are also fed by the actual filtering of the equalisation:
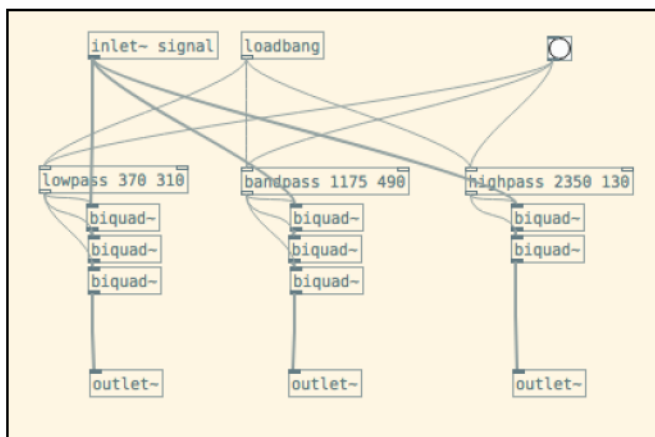
Figure 37: Signal is sent to stacked biquad~ objects which are shaped by a lowpass, bandpass and highpass filter

The mix of filtered signal with dry signal, and the relative strength of each band is dealt with in a mix subpatch:
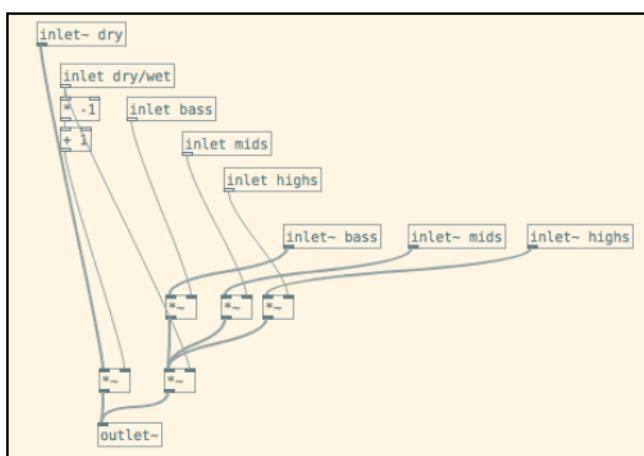
Figure 38: The mix subpatch showing how the filtered sound attenuates the dry signal

Having a basic equaliser as a tool was useful in shaping the performance at several points in the example and I used it to change the sense space at 11.39 – 11.46 mins as well as to filter out material at the end of the performance to accent hi frequency *canopy* detail at 14.28 mins.

Granular synthesis

This patch is taken from the USSS Tooolkit and the only changes I made were to its colour scheme.
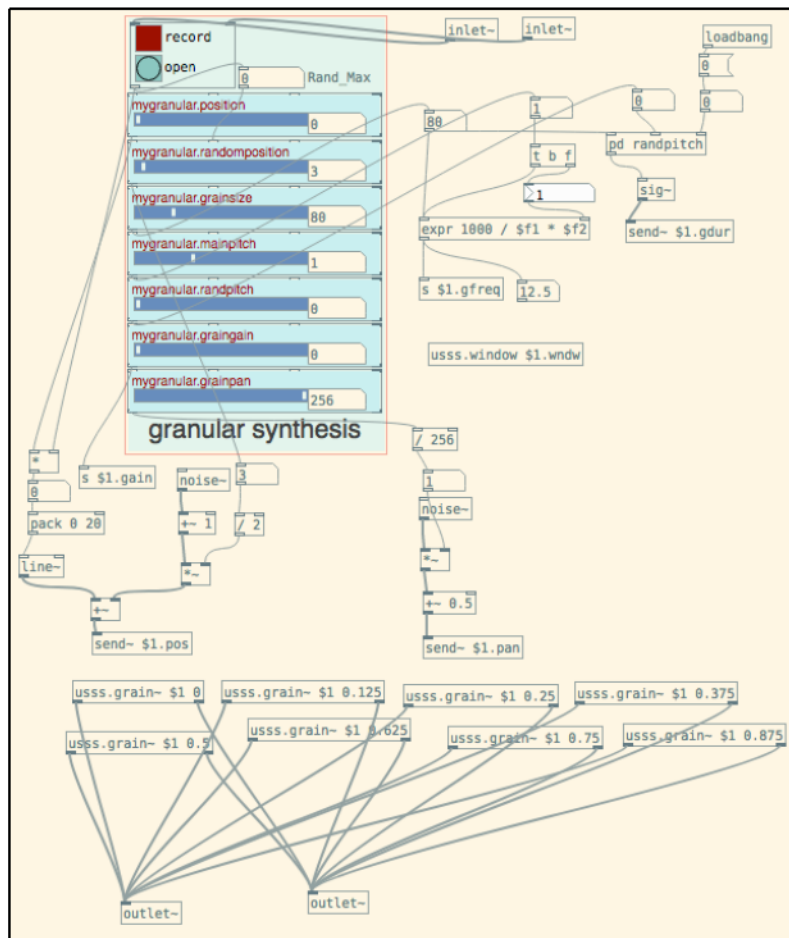
Figure 39: The granular synth abstraction courtesy of USSS Toolkit

I use the module in *Four Radios* to create mid-ground textures from the track signal. I connected the module directly to the EchoAndVolOne.pd module so the effect is receiving either dry or echo only signal. I am manipulating all of the sliders and managing the overall strength of the effect by the graingain slider. The effect can be clearly heard at 5.39 mins.

Tremolo

The signal chain is finally processed by a simple tremolo patch I wrote to be able to rupture the continuous flow of the granular synthesis in the manner of a 'slicer' effect. I designed its use with the intention of creating motions in conjunction with the panning.
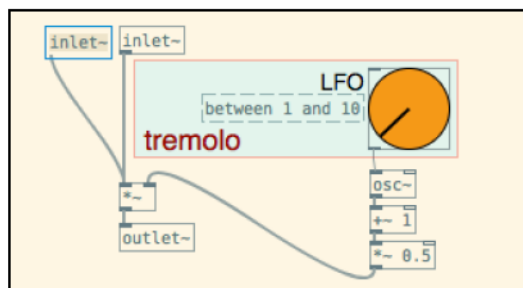
Figure 40: A simple osc~ driven tremolo I wrote to offer motion to longer textures

The tremolo is limited by a knob to 10Hz which I designed as the upper limit of speed I needed to effect continuous material. This is arbitrary and can be easily changed. The tremolo can be heard at 8.43 mins in the composition where it partners the automated panning to create motion in the longer texture.

Performing the example

Performing with SpectromorphologyMachine02.pd required some initial setting up that I detail below. My experience was that this quickly grew to be second nature but was essential to a 'good take'.

Setting up

These are the pre-performance steps I take before starting a performance with this patch:

- Check radio tuning. Make sure that the radio station chosen is being received clearly – unless this is not your intention.
- Check Sound card metering. I found radio 4 was Particularly quiet and Radio 1 and 2 were the loudest. Setting the input trim on the soundcard (Behringer U-Phoria UMC 404 HD) so that signal was not distorting but being received was important.
- Set switches to off. All filtering, delay and tremolo were switched out of the signal chain to start with. Granular synthesis was disengaged and echo and volume were set to zero.
- Set low threshold to minimum, high threshold to maximum.

- Setup frequency filter and spectral delay with varied settings (knowing they were switched out). I Enabled these modules to effect the signal as soon as they were switched in to stop unnecessary setting up during the performance.

- Setting the equalisation knobs to non-zero values to avoid audio glitches. The equalisation module had an occasional fault that manifested if parameter knobs were left at zero. Setting these to a value has in my current experience overcomes the fault. The fault results in a very loud signal (not related to the performance) being processed through the dac~ object. This fault is not part of the research and could potentially be painful to listeners.

- Selecting a speaker mapping and speed. The speaker mapping module needs to be engaged by choosing one of the mappings and then setting the speed of speaker movement – which can be checked by watching the resultant knob movement in the output module.

- Pressing start for each channel of Source Rec. Start allows the 1st audio arrays to be written to over 9 seconds. These can then be read at speed set by the performer and the volume bought up to start the audio performance.

Performance

My process in the example piece starts with selecting the radio 4 channel and setting the playback speed to 0.1 or 0.2. Bringing up the volume and adding the smallest amount of echo I can choose with the mouse. In my testing this has reliably brought interesting spectromorphologies into the performance. I allow this to develop for as long as it remains texturally interesting and to get an early sense of the space afforded by the quadraphonic auto mapping of the pan and speaker direction.

The rest of the performance is intuitive, using my knowledge of the modules and how they shape sound with the changing signal coming in. I know which channel has which radio station playing but I cannot audition them in this current iteration of *Four Radios*. The audio repeats in the track abstraction so there is a small amount of time to anticipate what might help develop the composition. Of course when songs are being played, I have more time to develop processing to work with signal that I can have expectations of.

Whilst the changes to the parameters of effects, switching them on and off and processing the original source are intuitive, I do have research questions and methodology to guide me. The Introduction to this chapter collects some ideas from Smalley, Bachelard and Labelle that

focus on the relationship between more concrete aspects of mediatic space to use Smalley's phrase, and the more oneiric, poetic and sonic. When Labelle sees the sky as a place of *"resonances to locate a poetics, the point of departure not only for imagining but for sound as well"*[183] he gives a methodology to guide the intuitive manipulating of the tool I have made and curated, and a way to explore the source audio I chose:

- Starting slowly (literally by slowing audio down) and establishing some of the spatial detail with the speaker mapping as a first priority.
- Looking for small scale structures/sound objects within the audio and using the modules to add to their sonic significance.
- Look for sympathetic layering from different tracks; experimenting to build structures from two or more tracks playing together.
- Once a performance has become established over some time, experimenting with ruptures to the existing structures with more extreme use of the tool's parameters – wider sweeps of echo, speed changes, volume cut-offs, equalisation changes, switching modules in and out of the signal chain.
- Seeking a wide variety of textures that the tool can produce. Different levels of grain and hardness, vectoral wipes, semi opaque layers with softer characteristics, high and low frequency textures that can act as root and canopy functions to the soundscape.
- Looking for ways to expand and collapse spatial constructs within the performance to keep interest in the idea of soundscape as well as temporal developments.
- Working with the sonic intersect of voice to texture. Bluring spoken word and surfacing transitions to texture that simple processes like speed changes can give.

When I perform with the patch and the radios, I want to provide sonic space to listeners where the domestic normality of the device is contrasted with its ability to import a universe and provoke a universe of the poetic. Bachelard doesn't necessarily consider such devices when he talks of *"our first universe"* but that language is appropriate to the device's ability to open up an otherwise inaccessible world, a world where the poetic image will be present too.

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[183] LaBelle. 204

Technical and performance issues experienced

In my testing of the patch and source audio three issues became apparent. Firstly, the equalisation patch provokes an occasional fault if any of the knobs are left set to zero (including the dry/wet slider). The resultant audio fault was loud and would be unpleasant to experience over a loudspeaker system. I do not currently know why the fault is present, but caution is needed with this patch and testing the output at low levels is necessary to avoid the fault at full volume before a performance.

The second issue is acknowledging that the interface is difficult to manage in some transitions within a performance. Programming a reset mechanism (possibly using init in a message box) would be one partial solution to this but some hardware controls would help in the faster manipulation of parameters too.

Finally, when I recorded my test performances to select an example for my portfolio, the captured tracks of audio were marked with pops and clicks. This marked the recordings from the beginning and gave a less than optimal record of the performance. My experimentations with noise removal software were successful in reducing this problem but future performance capture process should focus on reducing this problem. I suspect the 4 channel streaming between the audio interface and a digital recorder I used is the issue but until a can compare with another system I cannot confirm.

These issues are useful to acknowledge and future iterations of SpectromorphologyMachine and the audio capture of performance will concentrate on removing the problem with the equalisation, adding midi control functionality to the patch and finding a glitch free solution the capture of the performance.

Output

The Example performance presented in the logic file QuadraphonicFourRadiosOutput.logicx is the result of the following output process:

- The 4 dac~ object channels were fed to a Behringer u-phoria UMC 404HD soundcard.
- 4 Channels of audio were streamed from the Behringer via audio cable to a Zoom R16 16 track digital hard disk recorder and written to its SD card. No processing was used in the Zoom.
- The 4 audio files written were transferred via usb to my mac book air and then imported into a logic project.

- The pops and clicks were treated with an instance of Sonnox Declicker (trial copy) on each track. Once this had proved to be a successful treatment each track was bounced in place with the declicker processing written into the new file.

- Track 3 and 4's output was changed to outputs 3 and 4 to return the project to a quadraphonic output. The project was saved.

All of the Purr Data code and example sound files are available in the Four Radios folder as described in Appendix 1.

Conclusion

Denis Smalley's theories of spectromorphology and space-form have provided the structure to my research through my compositional output. They provide a clear toolset for acousmatic analysis and are evidently suited to compositional planning at most structural levels.[184][185][186] My output has used his spatial ideas and descriptions of texture and motion in each piece submitted. I have found with my portfolio that I agree with his conclusion in *Investigating space-form* that prioritising a spatial view comes before attending to *"a taxonomy of spectromorphologies"[187]*. His comments about 3 different space forms; *"journey" ("narrative"), "changing views of the same space"* and *"multiple"* spaces are concepts I have used within my portfolio.[188] Smalley is describing an analysis role to space-form here but my research shows that these are valid compositional goals too. My experience shows there is an extremely close relationship between spectromorphology and space-form. In my experience it is the rich and varied toolset of spectromorphological concepts with their emphasis on layers, opacity, surface, canopy and motion that are the tools to build the space-form. Both are present in my design as composition takes place and their roles intertwine; the spectromorphological authors space-form but then space-form guides spectromorphological decisions.

What spaces are and what they might bring with them is a central question in my portfolio. There is a particularly important passage in *Spectromorphology: explaining soundshapes* that represents a fusion in my composition between Smalley's toolsets and ideas about the home, the poetic and daydreaming introduced by Gaston Bachelard and discussed further (and widened in his concept of acoustic territory) by Brandon LaBelle. In Section 2.6 Intrinsic-extrinsic threads Smalley speaks of a unique *transcontextuality* that acousmatic music

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[184] The following citations (191 and 192) refer to articles by Manuella Blackburn and Theodoros Lotis, 2 contemporary composers heavily influenced by Denis Smalley and spectromorphology and space-form as **compositional** devices.

[185] Blackburn.

[186] THEODOROS LOTIS, 'The Creation and Projection of Ambiophonic and Geometrical Sonic Spaces with Reference to Denis Smalleys Base Metals', *Organised Sound*, 8.3 (2003), 257–67 <https://doi.org/10.1017/S1355771803000232>.

[187] Smalley, 'Space-Form and the Acousmatic Image'. 54

[188] Smalley, 'Space-Form and the Acousmatic Image'. 55 "I recognise three main space-form processes, which can be intermingled. The first is the 'journey'., a more traditional 'narrative' approach where one is aware of passing between spaces. A second process adopts changing views of the same space; on balance the listener takes a holistic view. A third process is occupied with multiple spaces, mixed materials possibly intercuttings, dislocations, and impressions of simultaneous spaces, although the final view could well be a holistic one."

possesses due to *"variety and ambiguity of its materials"* and *"not least through its exploration of spatial perspective"*.[189] The intrinsic is centred on the spectromorphological nature of the sound being heard (Smalley uses an example of textures of falling stones) but the unique transcontextuality is a type of extrinsic connection:

> *"The wide-open sonic world of electroacoustic music encourages imaginative and imagined extrinsic connections ..."*[190]

This is the conceptual location where the acousmatic invites listeners into Bachelard's reverie and spaces can contain the fantastical or the dreaded; "thunderers"[191] figure the skies and "buried madness" and walled in tragedy" of a cellar[192]. Smalley writes about *transmodal perception* in Space-form and the acousmatic image and connects the term to Chion's "trans-sensorial" concept of sound. Transmodal perception refers to the fact that our knowledge of sonic attributes such as texture have in part to do with sight and touch as well as aural perception. In the world of acousmatic listening this transmodality leaves space for the imagined:

> *"I am led spontaneously to contemplate the, possibly unique or unfamiliar, virtual transmodal richness afforded by the aesthetic configurations of the music."*[193]

This *"virtual transmodal richness"* is relational to another concept Smalley talks about in the acousmatic – *source-bonding*. Source bonding is the listeners activity of ascribing a cause to a sound. This can be real or imaginary and *"bonding play"* in the acousmatic would be common.[194] What bonding the listener engages with is open and possibly (probably) un-envisaged by the composer.

Original contribution to knowledge

My research pieces show that the concepts of transcontextual extrinsicity, transmodal perception and source bonding can become, in the ambiguity of the acousmatic, a virtual,

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[189] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[190] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110
[191] LaBelle. 207
[192] Bachelard and Jolas. 20 "Whereas in the cellar, even for a more courageous man than the one Jung mentions, "rationalisation" is less rapid and less clear; also it is never *definitive*. In the attic, the day's experiences can always efface the fears of night. In the cellar, darkness prevails both day and night, and even when we are carrying a lighted candle, we see shadows dancing on the dark walls."
[193] Smalley, 'Space-Form and the Acousmatic Image'. 39
[194] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110

imagined and creative phase of entry into the oneiric, the first universe of the childhood home, and the internal thought-scape of more universal human intuitions. My research suggests that this is an attribute of listening experience that can be actively supported by compositional choices in sounds and the building of spatial structure in arrangement/layering of material.

Bachelard locates the entry into oneiric activity with the 'poetic' image, a split moment of something irreducible:

> *"For nothing prepares a poetic image, especially not culture, in the literary sense, and especially not perception, in the psychological sense."*[195]

Bachelard also contends that the image is entirely communicable between originator and audience:

> *"The poet does not confer the past of his image upon me, and yet his image immediately takes root in me. The communicability of an unusual image is of great ontological significance."*[196]

Bachelard does not use explicit examples of music in his writing about the poetic image but does include the works of artists such as Georges Rouault and Charles Lapicque as examples. My portfolio researches the idea that the poetic image is equally found in music and sonic arts including the acousmatic. Bachelard's inclusion in the bibliographies of Denis Smalley and Brandon Labelle suggest that this idea is not widely contentious.

The way Bachelard describes the poetic image and what is essential about it; *"the poet does not confer the past …"* and *" … is just barely enough to place me, myself, in an oneiric situation …"*[197] has a resonance to me with Smalley's idea of *transcontextuality*. Both are talking of brief, irreducible moments of origin where the poetic leads to the oneiric. This moment is open to all who experience the poetic image and my research suggests this includes all who listen to such moments in spectromorphologically and space-form authored music. The strength of the image is in its *"communicability"* and invitation for the listener to apprehend it in their own *universe*[198]. An analysis of this music should then include

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[195] Bachelard and Jolas. xviv
[196] Bachelard and Jolas. xvii
[197] Bachelard and Jolas. 13
[198] Bachelard and Jolas. 4. Bachelard uses universe to describe the knowable, liveable experience of living and as such it is always from the perspective of the listener in my use.

descriptive terminology to acknowledge this and indicate its occurrence. In reference to my own research I would suggest an oneiric analysis is viable in the following:

Tibetan Bells

Reading from the Logic project Tibetan Bells Study:

- The starting of the 'taps' at 38 seconds provides a significant spatial layer change starting a *journey* architype according to Smalley's model. The sound introduces a significant transcontextual change to the soundscape that invites oneiric participation from listeners.
- There is a higher frequency rising canopy texture-motion in the distance at 3.47 that elevates the soundscape horizon and offers a new distant space that is transcontextual.

Many of the other sounds are foreground sounds and in Tibetan Bells, I don't intend for them to have transcontextual meaning; they are there spectromorphologically in the way Smalley describes *intrinsic* threads.

Seven

Reading from the Logic project Seven:

- The soundscape opens significantly at 3.20 mins with a reverberant echo that is transcontextual. This is followed by the introduction of transcontextual tones at 3.35 mins which provide a space for the boy's voice that is not the same as the opening sections. Removing some of the *intimate space* attribute of the voice opens oneiric possibilities for the listener.
- Textures are removed from the soundscape at 6.02 mins which leaves the boy's voice more exposed and contrasts this intimacy with a sparse canopy that is transcontextual in nature, partially due to the tonal elements of the longer tones.
- The emergence of the piano at 6.38 reveals new layers of the soundscape and is both essentially spatial in nature and transcontextual in providing new points of reference to be oneirically processed. The composition follows Smalley's architype of *"changing views"* of the same space (the space centred on the boy).
- Texture- motions at 7.35 to 8.07 mins provides movement within the soundscape which is essentially transcontextual.
- The emptying of the soundscape at 8.50 mins is transcontextual/oneiric.

- The change from tonal material to texture at 10.38 is transcontextual in its spatial morphing.
- The piano notes at 12.34 mins in conjunction with textural emptiness provides oneiric space.
- The reverberant textural whispering at 16.37 mins is transcontextual-oneiric.
- The piano melody at 17.58 is extrinsic (culturally towards childhood in its simplicity and high register) and transcontextual-oneiric as the echoing places the sound high and distant in the soundscape.
- The bell like tones at 19.49 mins create a new soundscape after the piano crescendo that establishes new oneiric possibilities.
- The space develops in 20.08 mins with the introduction on voice and abstract sounds that enhance transcontextual imagination.
- The reverb at 23.34 changes the voice space from intimate to textural and is transcontextual.
- The soundscape is reduced to bells at 24.57 mins and the joined by 'electronic' tones before the arrival of the piano again at 25.30 mins. This slow moving, background textural material supports oneiric projection.
- The tonal coherence from 26.00 mins that supports texture-motions and vectoral wipes is oneiric in its *root-canopy* support.

Home

Reading from the Logic project Home:

- The processed guitar, when the birdsong finishes at 2.44 mins creates a new space which can be transcontextual and even more so when the kitchen sounds, especially the frying, emerge sufficiently at 3.22 mins.
- Cutlery echoes on the table, birdsong cuts in and out and a new space is opened with the recording of Gaston Bachelard's voice, treated with reverbs, starting at 3.37 mins.
- The complex and changing reverb settings on Gaston Bachelard provide a consistent but evolving oneiric space that is interspersed with a dinner conversation and birdsong. Each track shifts between foreground and background but the reverb effect on the Bachelard track is always a transcontextual canopy that provides oneiric space.
- The dinner conversation after the end of the Bachelard track at 12.44 mins is transcontextual in it's quiet apprehendable domesticity.

- There is another period of domesticity at 21.22 mins which starts with the sound of a pepper mill and has a mixture of radio and children's voices with cooking sounds that collectively becomes extrinsic and transcontextual. The sounds are collectively able to be culturally apprehended by many British people and in their normality there is potential for oneiric transcontextual activity.

- The words "Imo, dinner" which can be heard in their own reverberant space are transcontextual in the pocket of space they provide in contrast to the material both sides of them.

Solea

Reading from the Logic project QuadraphonicSoleaOutput:

- The tone G4 emerges in the composition at 3.15 mins (it is present before but this is where I apprehend it as a significant part of the soundscape) and continues to be present until 4.20 mins providing a consistent plane that has root like properties[199]. Its consistency is transcontextual and provides an oneiric device for the listener.

- A pad sound emerges at 6.44 mins until 7.50 mins that has evolving inner motion and combines well with another texture at 7.22 mins to create opening in the upper-mid register of the soundscape to create transcontextual possibilities.

- A repeating texture emerges at 10.20 mins that is in the mid ground of the soundscape. It lasts until 12.22 mins and evolves over time creating a lulling rhythm which is transcontextual.

- There is a significant textural change to a tone cluster at 15.03 mins that is transcontextual.

- A pad sound centred on middle C emerges at 13.40 mins and is filtered revealing higher frequencies until it dissolves into very high frequency spectromorphologies still centred around the tone C. This is transcontextual-oneiric.

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[199] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 116-117. Smalley calls this motion-rootedness and discusses the attachment to a plane of "a solid bass anchor". I use the term plane since the tone G4 is the "solid bass anchor".

- The soundscape settles into a tonal centre of B major from 18.15 mins to 22.04 mins which evolves but stays centred. This continuous plane of reference can provide transcontextual possibilities as well as cultural-extrinsic[200].

Four Radios

- From 4.59 mins there is clear background music and a voice over that is subject to volume, reverb and speed changes which enable transcontextual apprehension but the period is short.

- From 6.07 mins a processed voice sample emerges that has a tape loop quality (a mixture of speed change and short repeats) to 8.37 mins. The sample repeats with subtle shifts in rhythm but is always recognisable. It is positioned in the near background. There are many examples of foreground sounds in this time period that invite closer listening. As such it becomes transcontextual over time.

- From 14.42 mins there is a high register noise-based tone that lasts until the end of the piece. It is joined briefly by music that interjects at 14.56 mins and has some additional low register hum at 15.36 mins onwards. The sound fluctuates but is present throughout until it fades at the. End of the piece. It is transcontextual in its movement and presence for over a minute. Its abstract *remote-surrogacy* nature contrasts with the majority of other sounds in the piece.

Conclusions

Surveying my own research output, I believe there is a place within spectromorphological and space-form analysis for oneiric analysis using transcontextuality as a concept tool. My research shows that the places this occurs tend to be:

- canopy, root, background or mid background.
- Sounds that reveal change in spatial apprehension in their morphology. Just one example would be a filter sweep that revealed high register detail to a spatial setting over a period of time. Another would be an introduction of a new sound morphing from existing spectra to reveal new spatial detail.

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[200] Smalley, 'Spectromorphology: Explaining Sound-Shapes'. 110. *"Music is a cultural construct, and an* **extrinsic** *foundation in culture is necessary so that the intrinsic can have meaning. The intrinsic and extrinsic are interactive"*

- Sounds that lie behind foreground material as layers but are always motional and texturally morphing. Static sounds don't appear to work transcontextually.
- Sounds that do not have an obvious source-bond. Remote order surrogacy works well for transcontextual purposes.

I conclude that transcontextual experience is a feature of a spatial appreciation of a soundscape.

Denis Smalley offers spectromorphology as a toolset for analysis of what can be heard within acousmatic music for listeners who are aware of the concepts. On this basis an analysis of the transcontextual possibilities of a piece is possible, as I have done above with my own research output. Transcontextuality is analogous to a doorway within the music, a place where the listener might enter their own inner experiences facilitated by the *"wide open sonic world of electroacoustic music"*. Bachelard's *Poetics of space* gives a strong oneiric reading of the home and I believe his reading of domestic home spaces is analogous to music's ability to foster oneiric inner space. Both Labelle And Smalley cite Bachelard and Labelle engages directly with the poetic and oneiric in his chapter on Sky.

Not all inner space has to be oneiric. It is not possible to know the thoughts of the listener by any method of analysis discussed here. Bachelard argues that oneiric experience is universal in humans; it is how we genuinely and properly encounter domestic spaces such as home. This activity; on the edge of memory and more that memory, an imaginative experience called reverie by Bachelard, and supported in *Poetics of Space* by analysts such as Jung, is intrinsic to human behaviour. I propose an analysis of transcontextual moments – places where the music deliberately (and sometimes accidently) invites imaginative play, and therefore, a significant possibility of oneiric experience.

My research also suggests that there is a place for a further extension of behaviours attached to space. Smalley allows for signalling and behavioural space in his analysis of Orbieu but doesn't discuss spatial considerations when the acousmatic source contains or is utterance. My research shows that the voice is a significant and even prime agent in signalling types of space. In Seven, I use the voice of a seven-year-old boy to convey intimacy and oneiric possibility. The whispering is a sign of intimate space according to Hall[201], and for any listener over that age is a clear invitation towards their own childhood. I class this space as

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[201] Hall. 118.

intimate-oneiric and set that as an archetype of spectromorphological space-form analysis. In Home I class the mixture of the dinner conversation and *mediatic* radio space as *domestic-oneiric* and the recording of Bachelard as *mediatic-oneiric*. The reverb treatments of his voice are oneiric and the processing of his speech changes perception from source bonded to close or 2nd order surrogacy which offers potential for transcontextual experience, especially in the wider mix of materials. The use of utterance in composition can be extremely varied. I experienced comic reactions to some of the voice manipulations in *Four Radios* and this is not supportive of transcontextual experience. What I propose is a taxonomy of behavioural aspects of utterance in acousmatic music that include transcontextual experience such as the oneiric. When I assess the acoustic territory of my research, I propose that utterance is a key spatial definer in *Seven* and *Home* and is important in *Four Radios*. Utterance will always be behavioural as a signature of human agency and a taxonomy of concepts to explore that behaviour adds depth to space-form analysis. An awareness of transcontextual concepts helps to define possibilities for this taxonomy.

My research has led me to understand how helpful spectromorphology and space-form are in the process of analysing and composing music with an acousmatic aesthetic. I have experienced a synthesis between the two that allows for complexity in textures and layers and spatial constructs that are co-dependent and came into existence simultaneously. I have come to see Brandon Labelle's descriptor of *acoustic territories* as an accurate and useful term for the completed research outputs I have engaged with. Implicit in the word territory is a possibility to explore and this is a key compositional feature for my research. Within exploration is the possibility of transcontextual experience leading to oneiric behaviour. Including this phenomenon in analysis as part of the wider spectromorphological and space-form tool set is a critical outcome for my research. So much of musical experience is naturally private in the minds of listeners who can be very different as humans but accepting that there are places which are transcontextual and using a consistent methodology for noting them is possible in some acousmatic music. My research has involved acousmatic and electroacoustic composition, but I do not believe that these forms are the only home for this analysis.

My research also points to a space for a behavioural analysis of utterance in composition. Utterance can be a defining spatial author in composition so a taxonomy for its behaviour in composition is important. I have suggested the terms *intimate-oneiric*, *domestic-oneiric* and

mediatic-oneiric for the utterance in my research pieces. I would expect many others to emerge from different sources and architypes to become established with a greater survey.

Revisiting my research questions

My research questions and my responses are as follows:

1. How will my practice use the language of perception/reception to inform compositions within and across the boundaries of the electroacoustic genre, as suggested in the concepts of spectromorphology and space-form by Denis Smalley (1997, 2007)?

I have used spectromorphology and space-form extensively to construct my research pieces. Using spectromorphological concepts helps in the development of finding sonic material, arranging it into small combinations and layers, and sequencing these into larger forms that have intrinsic spectromorphological interest. Space-form happens simultaneously as the spectromorphological construct suggests spatial detail that can then guide further work. In light of my research this question could be rephrased:

- How do the analytical concepts in spectromorphology and space-form inform my compositional methodology and what is their relationship at the different points of composition?

2. What methodology can be created using Smalley's writing as a starting point that contributes to an inner or personal soundscape being made explicit? What perceivable characteristics will conform and add to the spectromorphological theory?

I have worked with a methodology that uses Bachelard's work on an oneiric appreciation of home and poetic image to use a methodology based on ideas of transcontextual possibility with Smalley's concepts. I have used ideas from Brandon Labelle's *Acoustic Territories* to widen my spatial research into areas he writes about as underground and sky as well as Bachelard's home.

My research suggests that this question should start from a point of reference in Bachelard's idea of oneiric. Terms such as transmodal, transcontextual, source bonding, surrogacy would be extension models of the oneiric nature of being and listening. Questions about the way that this natural behaviour is engaged in since the time of Bachelard's writing would also be germane. I would rephrase the question:

- What methodologies of composition emerge from an understanding of oneiric experience as described by Gaston Bachelard in *The Poetics of Space* and where are the analytical points of synthesis in Smalley's concepts of spectromorphology and space-form? How do they help in describing a practice? What extensions to the idea of domestic oneiric experience are available since Bachelard's writing?

3. Can spectromorphology provide a coherent conceptual space for tonal music to be included in my contemporary electroacoustic practice, or is the inclusion of tonal music a regressive gesture (and does it sound so) in my practice?

I have used tonal material in my research pieces and experienced this as a non-critical decision in relation to spectromorphological analysis. Tonal material can be spectromorphologically analysed and constructed. Working with timbre and motion have been important to me with tonal material in giving it coherence in electroacoustic practice.

I would rephrase this question:

- What compositional methodology and process allows for tonal music/material to be used in electroacoustic music without it superimposing its extrinsic cultural references over the electroacoustic aesthetic? Does Spectromorphology provide tools for this practice?

My methodology involved processes of granular synthesis and choice about the pace of tonal material that highlighted timbre as a central concern. Spectromorphological concepts of texture, flow and motion were used in *Seven* and *Solea*.

4. Can live composition/performance and listener participation/composing/collaboration in live realizations of new music be spectromorphologically narrated?

My experience of live performance recordings of *Solea* and *Four Radios* indicates that decisions can be based on a spectromorphological analysis of what is heard in real time, and when material develops without intervention, spatial considerations can be brought into decisions too. My research suggests that oneiric experience is associated within spatial considerations so oneiric possibilities are real within those decisions too. I would rephrase this:

- Are the conceptual ideas of imagination, play and oneiric experience within spectromorphology/space form and *The Poetics of Space* a significant agent in live composition and performance? Are collaborations in composition and wider

participatory events where audience decision making facilitated able to be narrated by these concerns?

5. How will the attendant psychological concerns of Smalley's (and others) writing be used in my methodology?

The main concept I researched within spectromorphology and space-form is transcontextual experience. This is a type of imagination-based extrinsic process that allows for listener participation in inner soundscape activity. The use of utterance as significant material in my research piece has also allowed space to explore psychological concerns through human agency. I use the term psychological here to describe how a listener feels and responds to acousmatic music narrated by spectromorphology and space-form. The concept of transcontextual sounds opens possibilities to discuss the listening experience in a psychological way. Bachelard warns against trying to explain the poetic image in contemporary (to him) psychological terms. An idea of mind without soul is unhelpful to Bachelard. In light of my research a more specific way to ask this is:

- Where are the key bridges in imaginative and oneiric experience in Smalley's and Bachelard's (and others) writing and do they provide a layer in spectromorphology/space-form that can be used in compositional methodology?

In the BBC4 broadcast, *Blue Note Records: Beyond the notes*[202] Herbie Hancock says:

"What's contained on the record is incomplete because it doesn't include the process of the person listening to it and how it effects them."

My research provides a methodology for composing and analysing music with acousmatic qualities that builds on existing ideas within spectromorphology and space-form to provide connections into the inner world of listening. Bachelard offers one experience of the poetic in oneiric activity and this has informed my view and practice in using spectromorphology and space-form in this research. Brandon Labelle's Acoustic Territories provided a way for me to view an acousmatic piece during and after its composition. He imbues each territory with human perspective and extends Bachelard's oneiric model to include dystopian human occupation of territory too. I end this research (at this point) and commentary with a methodology that extends spectromorphology and space-form analysis with concepts of

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[202] Sophie (dir) Huber, 'Blue Note Records: Beyond the Notes' (BBC4, 2019) <https://www.bbc.co.uk/programmes/m000b8pd#credits>. At 29 mins

transcontextuality and behavioural space. This allows for new analytical and compositional bridges between works and listening experience in a way that focus' on the connection Herbie Hancock makes.

Glossary

Acoustic territory

I use Labelle's term to mean a total experience of a soundscape that uses Smalley's idea of space-form but includes oneiric soundscape and a need to inhabit the soundscape phenomenologically to realise its full potential.

Behavioural space

An aural space in a work or a period of listening that is centrally defined by animal activity or human agency.

Hyper-documentary

Luc Ferrari's marriage of what is actually perceivable in sound and the listener's internalisation of those sounds to produce a soundscape that is more than a simple aural survey of a period of time.

Hyper-real

A sound is recorded and its source can be clearly heard but through processing the sound is aurally excited becomes larger and more significant than the source. The sound can act beyond its natural realm of being apprehended and so becomes a hyper version of itself with added implications as a listening experience.

Hyper-setting

A soundscape that mixes natural and identifiable sound with oneiric sound that functions to enhance and offer transcontextual interpretation in the setting.

Intimate-group-social

A small scale gathering with defined expectations – family or close friends in an established behavioural arena such as eating together.

Intimate-oneiric

Sounds that have the qualities of intimacy that Hall's proxemics describes but also function spatially and have processing or mixing that allows for oneiric possibilities. See Conclusion for a description of these spatial qualities.

Inner/personal soundscape

The world a listener creates in relation to the music heard through transcontextuality and possibly aided by the process of reverie. If the listener is affected by poetic images in the music, then reverie is likely to occur.

Mediatic-oneiric

Mediatic is a term from Smalley that defines the heard sound as coming from media – the radio, TV or the internet etc.. When this source is 'backgrounded' by the listener, either in listening to composed material or listening in normal activity, it can take on oneiric possibilities in associations with other listening times and spaces in the listener's experience. It joins these multiple experiences and encourages reverie.

Oneiric-domestic/Domestic oneiric

Sounds that are clearly perceived as domestic in setting, behavioural as human agency is recognised but also processed or mixed to signal oneiric possibility. I associate oneiric qualities with spatial functions in sounds so oneiric-domestic sounds will be spatial in nature and be able to be described in spectromorphological and space-form language.

Oneiric listening

Is the result of reverie. A quality in the soundscape allows the listener to move away from a conscious listening experience and to inhabit a private soundscape reflecting aspects of childhood experience that surface because the heard soundscape has offered a poetic image to the listener.

Oneiric-prospective

I take Smalley's idea of prospective – of surveying the soundscape from a "*vantage point*" through to the perceived canopy and define this for an oneiric reading of this soundscape where appropriate.

Poetic Image

I use Bachelard's term in the way I understand he uses it. A short irreducible, a priori event that provokes a reverie into the past. Bachelard cites examples in poetry and art and I propose music as a source of poetic image too.

Reverie

Reverie (or daydreaming) is the listener's processes of thought that is looking into the past and re-inhabiting the places of childhood daydreams. Bachelard centres this around the home but I use this to include any significant childhood place and also for similar processes that revisit other areas of the listener's past that possibly constitute steppingstones to a childhood return.

Transcontextuality

The connections a listener makes in response to ambiguous acousmatic material that rely on imagination and the possibilities of reverie as well as the perceived extrinsic quality of a sound.

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Appendix 1: Location of Files

All the files referred to in this commentary including the finished pieces are located at:

The included USB stick

https://1drv.ms/u/s!Agtl3tKlYSeCmBZtlVKPLxh7HkSN?e=yi7yer

Each Composition has its own folder and there is a text document WhereToFindThings.docx that will point to all resources for the portfolio. It will clearly state which are the submission files and what are supporting files.

Appendix 2

Seven: Production notes

Track 1

Isaac: 'The moon is all white'

Having already cut Isaac's speech into regions I am now recording them into the Akai DPS24mkII to add further real time processing. I started by recording twelve passes of the first region – 'The moon is all white' without any processes. I then engaged the PitchAccum tool from Ircam and used the real-time control ball (with a touchpad as physical controller)

This tool used as a real time sound manipulator is capable of transforming original sound completely and providing motional sounds that can vary in texture but have a fundamentally spatial role. The map boundaries in their movement and suggest frequency boundaries with their changing content – from solely high pitched sound to a low frequency weighting that dominates. The dramatic nature of these sounds with amplitude swells and frequency changes allows them to fill the role of sound have mass that Smalley includes as concept in *Spectromorphology: Explaining sound shapes*.

Track 2

Isaac: 'Hundreds of hundreds of hundreds of years ago'

Using Fusion with 1 reader line. I set the reader line to read the entire frequency spectrum of the voice and to start perfectly vertical so the reading was read simultaneously across all pitches. I then introduced a 1 degree shift on the reader so that it started reading higher frequencies faster than lower ones – each pass of the speech I added a further degree of separation so the effect was that of clear speech becoming increasing blurred as the higher frequencies were separated by longer time spans from the lower frequencies. The final 9 degree setting resulted in a sound that followed some of the original contours of the material but was no longer recognizable

as speech. The final processing was to shorten the line of the reader so it accessed progressively less of the frequency range giving a subjective result of turning the broadly human frequency range into one that sounded like birds.

Track 3

Isaac: 'Little bits of grey silver'

Using the Freeze tool I allowed the original file to play through a few times before engaging the tool. The Freeze tool allows you to select any amount of the region and loop it as many times as you want to produce changeable loops of your own making. I used the tool in real time recording to the Akai so I could change the length and duration of the loop on the fly. I could also change where the loop started from so I selected different areas of the speech in a continuous movement using the mouse. I then began to use the controls for pitch to change the materials playback speed. All of these effects combined allow the material to be examined as a sonic object.

Track 4

Isaac: 'hundreds of hundreds of hundreds of years ago'

I used Evolution to sample the track at three points continuously during playback and recorded to the Akai. The effect allows words to become time-stretched and become disguised to a greater or lesser extent. The effect of moving the speed parameter allows more or less of the meaning to be revealed.

The sounds produced are textural and convey hidden meanings that have psychological implications – we listen for meaning in the confusion of the sound object but can't detect any – Smalley would have this as background, motional and perhaps a *canopy* effect at floor level. For me I like the hidden meanings and difficulty in apprehending meaning – a reference to the difficulty of truly understanding and remembering what it is to be seven years old.

Track 5

Isaac: 'its really hot'

Using the Bandpass to filter frequencies on this short sample to provide dislocation and maybe some sound stage mapping in conjunction with further processes using panning type effects. This will have movement but is middle ground material that can come to the foreground occasionally.

I used this effect quite simply just moving the 2D trackball in real time to make the effect. I tried to match some of the processing to the sample so it became rhythmic – starting on the word 'really'.

Track 6

Isaac: 'Oh and its made of rock'

I used the GRM CombFilter to change the frequencies in passes. I don't know much about how the CombFilter works at present so went on subjective evaluation of the sounds produced. I choose sounds that were by degrees metallic and also expanded the soundstage of the voice. I think this is a clear example of a track that has been processed with further processing in mind – as it stands it does not offer much sonic development that I think I will use but with further cutting and looping and processes the filters could yield sonically rich results that might lend themselves to strong midground textural motions signifying trajectories that Smalley speaks of. The sound might be a little clichéd to be unsettling on a psychological plane but further experimentation may make this useful in that way too.

Track 7

Isaac: 'Um sonic screwdriver'

This Shuffling tool from GRM subjectively offers an effect of displacement and hiding of the original content. I used the 2d controller to move the sound fragments and delays to give different repeats of different lengths of the loop.

Track 8

Isaac: 'Hal, Imo, no, Hal, Imo, Jimmy, Finn and Danny'

The warp tool transforms the voice into metallic noise and the 2d controller allows this to manipulated in real time. There is a sonogram of output to read to the left and input signal underneath the controller so you can select the most appropriate node to change. Sweeping gestures are easily found and the unsettling edge of understanding the voice and moving from voice to noise is achieved also. Trajectories are created with real-time sweeps of the controller. A midi controller or some automation would help smooth the sweeps for slower effects.

Track 9

Isaac: 'And play around'

Used shift tool to change the voice to produce tones and then gestural sweeps of sounds – passes through the short loop that have momentum, trajectory etc.

Track 10

Isaac: 'So what's it like being a seven year old – weird'

I chose to setup some reverb and EQ on this track. The reverb accentuates the space of the track and makes the soundstage much bigger. The EQ is set to make the overtones much stronger and resonate more. The shift program picks out frequencies and accentuates them in the way I have used it. I use the real time controller to change the settings to produce a Theremin sound. The voice is still present but the effect is a ghostly *canopy* or a fragment of forgotten melody – could be used in conjunction with the piano to produce some interesting melody with psychological subtexts of past events – half remembered dream like 'things' that Bachelard mentions throughout *Poetics of Space.*

Track 11

Isaac: 'Six'

I used the real time control to manipulate delays in an attempt to get glitching and other displacement results from the short loop. Quickly moving the controller along the bottom of the matrix left to right and vice versa gives a stuttering effect that can then be amalgamated with vertical movements of the controller that then introduce delays of the sound, beginning to give texture.

Track 12

Isaac: 'feels like 5'

I just switched between the presets 5 and 6 on this loop switch rapidly so the word 5 had setting 6 applied. The loops starts with setting 5 applied. The effect is one of panning motion which is very trajectorial and carries momentum.

Track 13

Isaac: '(laughs) cause it still feels – it feels like you're still four'

Back to the PitchAccum – to create movement. This setting – 6 on the scale in the interface allows you to create energy movements that can perform all sorts of functions in the composition from breaks and delineation functions.

Track 14

Isaac: ' guns cars playmobile army stuff power rangers'

Using the circle amplitude and frequency control to affect Isaac's speech – getting morphing tremolo effects.

Track 15

Isaac: 'yeah'

A short sample that I used rhythmically by changing paramaters at the end of full cycles. I increased the amount of signal let through on the final preset to give a volume swell to end the treatment. The subjective effect of Contrast is of poor reception – almost like a digital radio not quite receiving clearly. This gives a sense of dislocation from the spoken word - like dimly recalling a past event. This is introducing a space that does not sit in the present as fully comprehensible and happening in real time – the feeling is that there is a space opening to memory – first Bachalard chapter.

Track 16

Isaac: 'yeah'

The pitch accumulator allows the creation of sound sculptures by transposing pitches and adding to them. I used the process to create a sonic sample with energy and movement that adds *the other* into the piece. This is the uncontrollable outside – the urban landscape of Labelle or the wind of Bachelard, the controlling *other* of post structuralist thought.

Track 17

Isaac: ' Its fun at ...'

Used preset 2 as the base and then manipulated the parameters in real time. This is more dislocation from straight real time apprehension of Isaac meaning. Playing with the controls to produce sibilant sounds in rounds and repeats brings us close to the spoken word without being able to comprehend it – giving this a space of near-distance to our conscious mind but still out of reach.

Track 18

Isaac: ' And its ... up down-up down-up'

The CombFilter on preset 8 gives a perfect root and fith compination (root down to 5th in pitch) that also has a music box type sound that is immediately reminiscent of childhood toys. The rhythm of the up down-up down-up is kept so the CombFilter creates a musical figure that points directly to an ageless childhood of traditional toy sounds. The space is highly figured with contexts that are drawing us away from the present.

Track 19

Isaac: '... bed ...'I controlled the shift parameters buying clicking in the 2d control areas on the left side of the window to control higher frequencies. I moved the scale/shift indicator frequently within each sample to create a whispering process that was mainly not apprehensible as language but had a feeling more of heavy breathing and movement – possibly animal but definitely sinister and something that would scare in a childhood reverie.

Track 20

Isaac: 'meh ... (laughs)'

Set the Evolution to preset 3 then clicked in the controller window to change the position of the crosshair to select different readings. The original source material is totally obliterated by the process leaving a smooth bell like processing that gives a pad like sound. Plenty of harmonic overtones and moving the cross-hair allows

different snapshots to come through. The sound is mysterious but not overly threatening and can suggest physical properties of the sound stage as well as a temporal shift away from the conscious and present. This is a great source sample and could be used with many other processes.

Track 21

Isaac:'(heavy breath)'

Using the freeze to cut up Isaac's breath and get a variety of textures. A lot of these sounds are almost urban in the 'drilling' resonances that can be achieved. This is mid-ground texture that places us in urban contexts but with some displacement due to the unpredictability of the sounds.

Track 22

Isaac: 'yes'

I changed the preset 7 of Warp to produce a sound that is domestic, machine like and repetitive – reminiscent of a washing machine in that it is non threatening and sets a stage for human activity (?) It's a small sound and has something of the breath element of the sample so maybe not so machine like after all.

Track 23

Isaac: 'Harsh'

No effect – a sample that has sonic interest in its pure state with the delivery being guttural and suggestive of a sound object even though the word can be clearly heard.

Track 24

Isaac : 'Awesome'

Taking the awesome vocal and turning it into semi tonal material through Evolution seemed appropriate. Moving the cross-hair to the right of the interface led to the tone clusters that are musical in a tonal sense. They are unexpected from the original sample and are dreamlike in a way that points to Bachelard's introduction.

Track 25

Isaac: 'because she gave me fun stuff'

Using the CombFilter on preset 3 – four on bypass and then four without experimentation on 3 then changing the *res* and *freq* and *lp* sliders to get increasing distorted sample. The voice is lost in resonances and frequency sweeps but can be still heard in hard consonants. The suggestion is separation from now – another memory but distorted – perhaps uncomfortable in association.

Track 26

Isaaac:'(cough (laugh) Grandad'

Using preset delay 1 and the 2d track pad to move the delays. The cough and laugh are percussive and suit the delay effect as a mechanization of the voice well. Glitching and sounds like hard disc read and write functions are achieved by changing parameters continuously. The sound is hard and cold and would sit in foreground territory with trajectories applied as a second process.

Track 27

Isaac: 'Winter'

Using the BandPass to sculpt frequency shaped movement using the 2d controller to manipulate the sound. The first process is static an gentle but further high frequencies are cut progressively changing the sound so it becomes more distant and has similarities with sound heard within your own head and underwater sounds. More extreme manipultions begin to play with the sample so it becomes textural rather than semantic.

Track 28

Isaac: 'Christmas'

The Pitch Accumulator gives rupture to to the rhythmic sample very much in the sidewalk study that Brandon Labelle makes in Acoustic territories. This is interaction with the 'other' but perhaps internalized. Heard it said that we never process the

present in real time – it is analysed afterwards. This is important for my work as it leads to looking at memories as making sense of today.

Track 29

Isaac: 'Christmas (short laugh)

The Shift processor is used to click on the laugh to produce 2 effects on the 'Christmas' part and then the laugh. There is change in the timbre and pitch of the voice and eventually there is movement towards a deeper sound to the sample. This could be coupled with time stretch to slow the sample down to make a track that might look forward to a deeper voice – dreams of growing up?

Track 30

Isaac: 'Christmas'

There is a slight stuttering effect here – almost tremolo that suggest more displacement.

Track 31

Isaac: '(i-ron) … is that recording right now'

The evolution on preset one produces a white noise that is sculpted and follows the contour of the voice giving textural movement and grain at a background level. I explore the changes that the purity control gives, reducing the output to collections of sign waves that paradoxically sound more traditionally musical than the richer settings because they offer definable tones. The effect is one of shifting perception – things being revealed and then hidden on the edge of our perception.

Track 32

Isaac: 'a .. I would like a … Nintendo ds … full stop. Can you … can I listen to my whisper now please'

The shuffling effect leaves the signal mainly intact except for the stuttering effect it introduces. The process gives a feeling of voices trying to come into focus – not move away so it draws towards the nearfield as we try to decipher the audio and give it meaning.

Track 33

Isaac: 'again'

Using a long reverb and changing the shape and direction of the reverb as well as taking out the dry mix to produce layers and canopy that suggest a depth to this sample that is not in the present. 'Again' becomes an agent of displaced time.

Track 34

Isaac: 'fish … (lots of laughter)'

The breath on the original sample is not controlled and I wanted to get a process that dealt with the breathing. I'm not sure this works but tried a few GRM's.

Track 35

Isaac: '(sounds like 'laugh-sheers')'

Drawing this line using fusion meant that partials of the sound played out as a progression rather than simultaneously. The process suggests a more mechanical rhythm that is behind the random capture of a sound sample. This is moving me away rom meaning towards the rhythm of the sample.

Track 36

Isaac: 'God, Jesus … Jesus Christ'

Using the warp to manipulate the God, Jesus, Jesus Christ whisper to change its context from conversational to disturbing – frightening in its synthesis. Moving the context from intimate to the subconscious other – the Jung layer of understanding that is not conscious but not far from under the surface.

Track 37

Isaac: 'Its rubbish (laugh)'

The grinder separates the sample from the present and veils it with white noise to give the effect of distance both physically and temporally. Changing the bands and selecting samples using the sample button as well as moving the parameters in the grid give a moving texture that will be able to be panned to give disorientation to the speech. Hypnosis tapes use this technique to make people more receptive.

Track 38

Isaac: 'Its all about old days and (makes funny noise)'

The evolution uses the sample as input material that is then transformed to canopy material – a backdrop of sound that has the subjective quality of wide open space and wind – and outside space that is remote and not populated with human activity.

Track 39

Isaac: 'Awesome'

The CombFilter gives an industrial re-synthesis of the sample and when cut up will punctuate the soundscape with an urban mechanic broadcast like sound, a command given through a tannoy by authorities unknown.

Track 40

Isaac: 'um … you could um be wild … you could go to the park … on climbing frames you could go on Tarzan's head you could crush him to death'

The Doppler effect is set up as pictured an allowed to run without intervention to provide a rhythmic process to the rambling sample. Cut up, this will introduce energy and movement in the piece and a more human sample that has original meaning left intact.

Track 41

Isaac: 'Awesome, then I get …. Grab Tarzan, snap him in half … shove him in the killing machine .. make him die even more'

The freeze tool allows total removal from context by multi layered processing of temporal features of the sample. A collage is built of snapshots of the audio – offering a changing result of speech and sound object.

Track 42

Isaac: 'One wish .. something like your holding Daddy. Second wish ….. a … a cat. A cat .. and third wish .. I would like um A soft a very soft dressing gown like mummys coat over there'

The repeats and the band pass nature of the sound picked up places this process underground. It has an element of Brandon Labelle's echoic as well as a textural ripple sound in spectromorphology. It is also a close foreground sound that has intimate properties the whisper and the repeats with the band pass make it a voice that talks quite directly with us.

Track 43

Isaac: 'meer-cat'

The delays are processed by using random settings and pre-sets from the right hand side of the interface. The effect is a textural sound object creation that has some similarities with glitching recording.

Track 44

Isaac: 'yeah, because .. because cats are awesome – they can run faster than dogs'

The Reson gives bell overtones to the sample and a sound object is created which still reveals the whispered original from Isaac. These bell like sounds offer a soft background *canopy* detail that can usher in different parts of the wider piece like walking through door curtails that sound bells – they are space delineators rather than spaces themselves.

Track 45

Isaac: 'Goodbye'

The bells here are more rhythmic and have something of the underground again. The random factor of the effect keeps developing the sound and there is continuous movement and structural changes to the partials in between the big changes which are affected by the 2d controller. The sound lends itself again as a gateway between spaces – spaces that are not always in the present, conscious mind.