



**QUEEN'S
UNIVERSITY
BELFAST**

DOCTOR OF PHILOSOPHY

A Portfolio of Original Compositions (Andrew Dolphin)

Dolphin, Andrew

Award date:
2011

Awarding institution:
Queen's University Belfast

[Link to publication](#)

Terms of use

All those accessing thesis content in Queen's University Belfast Research Portal are subject to the following terms and conditions of use

- Copyright is subject to the Copyright, Designs and Patent Act 1988, or as modified by any successor legislation
- Copyright and moral rights for thesis content are retained by the author and/or other copyright owners
- A copy of a thesis may be downloaded for personal non-commercial research/study without the need for permission or charge
- Distribution or reproduction of thesis content in any format is not permitted without the permission of the copyright holder
- When citing this work, full bibliographic details should be supplied, including the author, title, awarding institution and date of thesis

Take down policy

A thesis can be removed from the Research Portal if there has been a breach of copyright, or a similarly robust reason. If you believe this document breaches copyright, or there is sufficient cause to take down, please contact us, citing details. Email: openaccess@qub.ac.uk

Supplementary materials

Where possible, we endeavour to provide supplementary materials to theses. This may include video, audio and other types of files. We endeavour to capture all content and upload as part of the Pure record for each thesis.

Note, it may not be possible in all instances to convert analogue formats to usable digital formats for some supplementary materials. We exercise best efforts on our behalf and, in such instances, encourage the individual to consult the physical thesis for further information.

4.1 Multichannel composition, rationale and approaches

Flexibility and Coherence

A multichannel composition approach is adopted in the fixed media electroacoustic works presented. A variety of spatial approaches and techniques for multichannel composition are explored in these pieces, and spatiality is largely pre-composed.¹⁰⁹

In performance it is possible to reproduce a spatial-gestural counterpoint featuring multiple independent motion trajectories. Independent motion is a feature of the real world as much as correlated motion, but is tricky to project in a concert hall via traditional sound diffusion of the stereo field. Whether the material is intended to be equivalent to reality or only imply some aspects of reality, the creation of independent motion gestures will be clearer and therefore allow new exploration of the composed space.¹¹⁰

Diffusion practice allows the re-spatialization of a piece originally realised in stereo,¹¹¹ creating a live spatial reinterpretation of a work in a larger performance space. Diffusion practice also provides scope to enhance the level of listener immersion and envelopment in a work.¹¹² From a personal perspective, works that seem particularly well suited to this technique often contain a single monophonic line, or one dominant morphological line. Polyphonic works that use a number of layered parts, each with different trajectories, or patterns of motion, can sometimes become more problematic for diffusion when originally realised in a stereo format. Imposed spatial motion through diffusion of a stereo piece comprising of multiple lines can be less convincing in some contexts, as each line's trajectory is forced to move together in spatial unison, which may well contradict the various actual and implied trajectories of each component, line, or part in the piece. This may result in some level of spatial incoherence, contradictory spatial motion, and a sense of forcibly imposed spatiality, which may interrupt the immersive experience. Contrary trajectories moving in unison spatially can be particularly unconvincing, and this specific example

¹⁰⁹ The investigation of multichannel methodologies for the composition of fixed media works resulted in a number of technical and compositional challenges that required the development of specialist software, sound design tools, and techniques for realising larger scale multichannel works. The sound toy *Cyclical Flow* documented in 3.2 is one example.

¹¹⁰ Barrett (2002), pp. 313-23.

¹¹¹ Still a prevalent format for the presentation of fixed media electroacoustic compositions.

¹¹² The author acknowledges the potential of diffused space. "...there are many composers who remain ignorant of superimposed space and the potential of diffused space... because they possess a fixed 'image' of their music as conceived and perceived within the composed space of recorded formats". Smalley (1991).

attempts to highlight some of the inherent limitations of diffusion for certain types of polyphonic works originally realised in a stereo format.¹¹³ Individual elements of a multi-layered stereo work are bound together, making their isolation and individual distribution around a multichannel performance space challenging.

Sound diffusion¹¹⁴ requires consideration and appropriate technique to achieve an effective spatial interpretation, or representation of a work. Whilst live diffusion offers great scope for presenting a stereo piece within a larger performance space, and many composers diffuse their stereo works convincingly, with some works there is potential for incoherent spatial projection which may work against the materials, trajectories and structure of the piece.¹¹⁵ Berezan (2008) acknowledges this in his comments relating to the *FLUX* diffusion system.

The risks are clear. Like traditional diffusion practice, there is the chance that a FLUX diffusion interpretation that is not well-planned, or that is executed poorly, will work against a piece.¹¹⁶

Live diffusion practice offers a performative dimension to the presentation of acousmatic works, with certain types of stereo works being better suited to diffusion than others. Berezan (2008) also acknowledges the varied suitability of fixed acousmatic works for live diffusion.

It is fairly widely accepted that acousmatic works vary in their suitability to the application of diffusion practice.¹¹⁷

This thinking is fundamental to the multichannel approach and rationale adopted in the composition of the fixed media works presented in the portfolio. From a personal perspective, sound diffusion practice is deemed less suited to personal compositional style and spatial intentions. As a result, the fixed media pieces composed for a concert performance setting are presented in a multichannel format.

¹¹³ It should be noted that these observations are presented as a current personal creative perspective, and are not intended as a wider value judgement. The purpose here is to highlight observations which have informed personal composition practice.

¹¹⁴ "Sound diffusion - the real-time (usually manual) control of the relative levels and spatial deployment during performance" Harrison (1999).

¹¹⁵ Containing multiple loudspeakers.

¹¹⁶ Berezan (2007), pp. 8.

¹¹⁷ Berezan (2007), pp. 3.

Observations and Personal Perspectives

When presenting fixed media works in a concert situation, there are evidently distinct differences in the nature of this type of performance compared to more conventional instrumental performance practices.¹¹⁸ Providing an audience with a sonic experience that is not available to them in a standard home listening situation reinforces the legitimacy of presenting fixed media works in a concert setting.¹¹⁹ A concert space provides a unique listening environment that potentially offers the audience improved audio fidelity than they may have available to them at home. Whilst a proportion of the audience may own a conventional surround sound system, such as 5.1, larger scale multichannel concert diffusion/performance systems offer extended scope for varied spatial projections and representations.

Techniques which allow each independent line of a work to be individually positioned, or independently spatially modulated within a physical performance space potentially provide a flexible spatial approach, and offer further opportunities to spatialize and organise sound in space.¹²⁰ Thereby providing additional scope for spatial coherence¹²¹ when working with multiple layers of sound materials, and further opportunities for the exploration of spatial counterpoint as a compositional feature, using multiple perceivable objects or events.¹²² This perspective on spatial composition is central to the compositional approaches adopted in the multichannel works presented in the portfolio,¹²³ and is relevant to personal compositional style, and current interests in spatial counterpoint and textural polyphony.

Aesthetic Approaches

Personal approaches to multichannel spatial composition are largely imaginary. Whilst concrete materials exist in many of the works, these are frequently further abstracted

¹¹⁸ Social and historical preconceptions may lead to the expectation of real-time sound/music creation.

¹¹⁹ A personal viewpoint.

¹²⁰ If this is of interest to the composer.

¹²¹ Or incoherence.

¹²² "In the 3D field the increased number of simultaneously perceptually identifiable sounds allows the composer a richer counterpoint in both spatial and nonspatial terms." Barrett (2002), pp. 318.

¹²³ It is important to note that these are personal perspectives of the composer relating to the portfolio of works being discussed. It is not the intention to devalue, or confront alternative methods of presenting fixed media acousmatic works, or suggest that multichannel spatially pre-composed works are inherently more effective or valuable than live diffused stereo pieces. The intention here is simply to highlight possible limitations of the diffusion of stereo formats for certain compositional styles relevant to personal practice.

through spatial techniques, which extend the materials beyond a spatially realist form. The approach could therefore be considered to be spatially surrealist. Spaces are often scaled and extended, skewed and misrepresented. Spaces are illusory and sometimes alluded to.

When space is implied without a direct illusion, or without a direct connection to the interrelated acoustic laws of objects sounding in spaces, we can begin to discuss the spatial allusion. Under such situations the 'listening imagination' is important: composers need to make assumptions concerning aural interpretation, and listeners have a more active role in the experience. Because the spatial allusion is open to interpretation more than the spatial illusion (due to its images being less precise), it is maybe here that the 'music' begins to emerge.¹²⁴

Realistic representation of specific actual spaces is not a compositional intention in the works presented, instead imaginary spaces are projected, with areas of the concert performance space relating to different areas of perceptual space in works such as *Phase Transitions* and *Enclosed Pteron Friction*. Spatial counterpoint between materials with differing levels of abstraction is explored, combinatorially resulting in abstract surreal spaces.

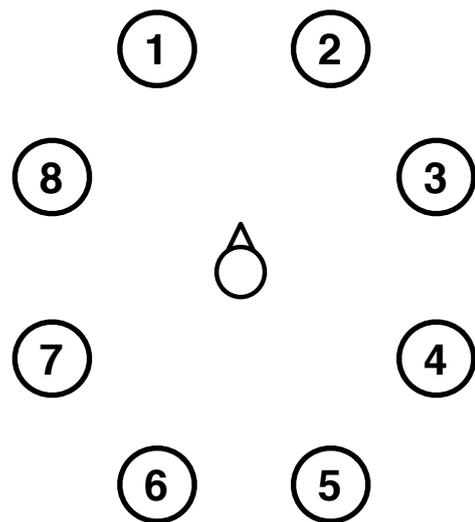


Figure 29. 8 Channel Speaker Configuration

8 Channel Configuration

All eight channel works adopt the speaker configuration and channel labelling convention represented in Figure 29.¹²⁵

¹²⁴ Barrett (2002), pp. 315.

¹²⁵ See 3.2 & 4.6 for information on speaker configurations for the 24 channel works.

Final Comments

The fixed media compositions presented in the portfolio are composed as multichannel works to exploit the spatial potential of specialist electroacoustic concert spaces. Multichannel techniques feature less frequently in the open form sound toy works.¹²⁶ All fixed media works are presented in multiple versions, using different numbers of output channels. A primary consideration resulting in these different versions is one of accessibility. Whilst the opportunity to compose for large multichannel performance systems has proved to be a rich area for exploration, the reliance on playback systems for performance which primarily exist within an academic environment is not ignored. It is for this reason that additional versions of each of the multichannel pieces have been created for a standard surround format (5.1). With ambisonic 5.1 and stereo binaural versions providing home listening friendly representations of each work performed in a specialist performance space. The intention is that these versions will allow the multichannel compositions to be more widely experienced.

¹²⁶ The rationale for this is that an original intention of developing works in this medium was to design creative products that are influenced to some degree by the field of electroacoustic music, but also have the potential to be disseminated to a wider possible audience, including an audience outside of an academic context. As large scale multichannel works generally require specialist performance spaces with a large number of speakers, a larger scale multichannel approach in the sound toy medium does not easily align with this aim.