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**A Portfolio of Original Compositions (Andrew Dolphin)**

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## 4.6 Spatial scaling and containment

### Enclosed Pteron Friction (09:34)

*Enclosed Pteron Friction* is a multichannel fixed media work for 24 channels, (24.0). The piece has also been realised in 8.0, 5.1 and stereo formats.<sup>179</sup>

### Programme Note

Enforced enclosure in a glassy chamber, and a paper bag that previously contained doughnuts. Sugar crystals, fluttering, and futile attempts at escape amplified and transformed.

### Overview of Work

*Enclosed Pteron Friction* is a large scale multichannel work created using close proximity recordings of a wasp enclosed within a drinking glass, and doughnut packaging (a sugar crystal filled paper bag) as its primary source.<sup>180</sup> In both cases, microphones are placed within the enclosure containing the wasp. The recorded materials appear raw, extended and transformed in the piece, with minuscule sounds being significantly amplified and intensified. The piece explores themes relating to distorted senses of scale, and presents a form of suggestive and ambiguous narrative that plays on human referential associations with the subject. Source recordings are subjected to a variety of spatial and spectral transformations to further abstract and extend the materials.

The programme note for the work deliberately avoids explicit identification of the source, and is designed to provide some insight in to the themes and materials in the piece once the source is revealed during a performance.<sup>181</sup>

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<sup>179</sup> A stereo binaural recording is provided which is recorded in the sonic laboratory at SARC. This recording attempts to give some sense of the spatial effect of the full 24 channel version. A studio stereo reduction is also included to provide a representation which more accurately conveys the fidelity and clarity of the piece, as the performance space colours the binaural recording.

<sup>180</sup> Original source recordings captured by Andrew Dolphin and Ben Ramsay. Composition by Andrew Dolphin.

<sup>181</sup> Programme notes avoid the technical, and aim to provide some insight into the broader themes of the work. "When there is a program, it is not always useful. Christian Clozier has suggested: "The information given in programme notes deals with 'how' (technical), and sometimes with 'for whom' (place, year, commission), but only rarely with 'what' and 'why', that is with the conditions of the 'message' rather than its nature" (Clozier 1996, 31)." Cited by Landy (2007), pp 36.

## Referential and Suggestive Narrative

Whilst composition of the work did not initially begin with any clear predefined narrative structure, narrative is a suggestive structural feature of the work. The representation of a recognisable life form, and the frequent shifts between explicit, lucid, referential sounds, and suggestive abstractions creates a form of ambiguous and incoherent narrative. The work's narrative is often unclear, vague and sometimes contradictory. The compositional approach to narrative is not literal, and is more appropriately described as impressionistic and connotative. The sound of flying insects, and maybe wasps in particular, have specific associations for many listeners, which depending upon individual disposition may evoke an unsettled response.<sup>182</sup> It is likely that personal associations with the subject will invariably have an impact on the listening experience.<sup>183</sup>

## Scale and Space

A form of rescaling of perspective is a central characteristic of the piece. Presenting a close proximity recording of a small space within a larger performance space in itself creates a form of spatial scaling, as does the significant amplification of low level micro sounds derived from the wasp's movement within the enclosures. Transformations of the materials attempt to enhance the allusion to extended scale and size. The piece makes use of a broad dynamic range to provide contrast and expand the scale and extremities of the work, from the more intimate microscopic sections, to the dense claustrophobic, loud and intense swarms.

An imaginary and ambiguous three dimensional space is presented. Acoustic characteristics of the glass and doughnut bag are embedded in the sound materials, and evident in the work. When combined, these create a hybrid imaginary space, with two environments and perspectives distilled together. A particularly evident resonant frequency can be heard in some of the sound materials. This is the natural resonance of the glass in which the wasp is enclosed, and provides a distinct identifier of this specific space. The resonances of the glass distinctly colours some of the materials heard in the piece.

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<sup>182</sup> This is most likely related to an association with a fear of being stung, an association that may well be reinforced if the listener has been previously stung by a wasp.

<sup>183</sup> These possible associations with the subject and subsequent responses will of course be individual for each listener.

The wasp's wings and flight result in dominant resonant frequencies, and these are enhanced through the treatment of the source recordings to create a pedal, or a form of pitched resonant anchor in the piece. This is particularly evident in the swarm sections. Here source sounds become, to some degree, musically suggestive.

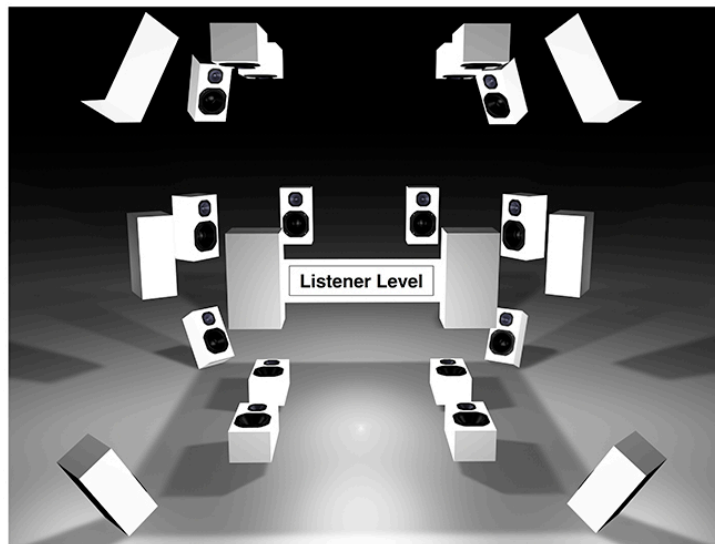


Figure 42. 24 Channel Speaker Configuration (SARC)

The texturally rich swarm effects are key structural and spatial features. Dense layers of wasp materials create an impressionistic sense of swarms of insects. The swarm sections are spatially and spectrally dense, and represent the more intense structural moments in the piece. The swarms often make use of all 24 channels to create dense textural structures that extend to the outer boundaries of the performance space, and are rich in spatial counterpoint. A sense of spatial instability is frequently projected to represent the often erratic natural movements of the wasp subject.

### **Multichannel Technique**

The final piece is realised for 24 channels, using three rings of eight speakers. One lower ring (beneath the listener), one mid level ring (at listener height), and one upper ring (above the listener).<sup>184</sup> Figure 42 represents the intended speaker configuration for the performance the piece in the sonic laboratory at SARC.<sup>185</sup> The selected speakers extend to the extremities of the performance space. Listener level speakers are mixed at a lower amplitude level than the upper and lower rings to accentuate vertical perspective, and compensate for the larger, and more closely situated speakers placed at the listener level.

A preliminary sketch of the work was initially composed in stereo to gain some insight into the possible compositional application of the materials, and how they might be treated and

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<sup>184</sup> The chosen 24 channel configuration provides three levels of possible height. The number of speakers is restricted to 24, as this was considered to be technically achievable with the resources available.

<sup>185</sup> The specialist sonic laboratory performance space at SARC provided the opportunity for exploration of unique larger scale multichannel projects. As a work composed for this specific specialist performance space, the effectiveness of its translation in other large scale performance environments is yet to be determined.

structured. Taking some influence from the stereo sketch, an initial eight channel version was then composed as a developmental stage.<sup>186</sup> Stems from the eight channel version are then developed vertically, either being positioned in the vertical axis, or spatially modulated to add vertical motion.<sup>187</sup> This initial 24 channel version of the piece is then spatially augmented in some sections, and restricted in others to extend the overall level of spatial contrast in the work.<sup>188</sup> Spatial restriction in a number of sections allows sound to move more perceptibly to the extremities of the performance space, without being masked by sounds closer in proximity to the audience. This enhances spatial contrast and intensifies the impact of the spatially denser swarm sections.

The piece is augmented using additional materials spatialized using the *Cyclical Flow* software.<sup>189</sup> The software enabled the creation of more spatially dynamic materials that accentuate sections of the work, and reflect the erratic movements of the wasp.

Realisation of the piece proved to be the most challenging and time consuming of the fixed media works undertaken. Technological, compositional and aesthetic challenges presented themselves at various stages of its construction, requiring the development of new personal methodologies<sup>190</sup> and resulting in a number of revisions.

## Features

In Figure 43, the spectral structure is represented as a sonogram.<sup>191</sup> Spectral contrast and abrupt shifts in spectral density are clearly evident, as are the four spectrally rich swarm sections which are considered to be structurally significant.

The piece opens beneath the listener, with glassy sustained resonances that are accompanied by ambiguous and suggestive resonant micro sounds that hint at the subject.

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<sup>186</sup> Tools from ICST (Institute for Computer Music and Sound Technology) were utilised in the composition of the work. <http://www.icst.net/>

<sup>187</sup> This was partially realised using DAW software, a custom built *Max/MSP* patch and *Jack* (inter-application virtual audio routing software). MIDI control data in the DAW software controls elevation of the eight channel stems, which are routed into *Max/MSP* and vertically positioned, then recorded as 24 channels. The elevation of each stem is independently controlled.

<sup>188</sup> A response to personal observations in listening sessions.

<sup>189</sup> This software is included in the portfolio and is outlined in 3.2.

<sup>190</sup> Also influencing the development of the *Cyclical Flow* software.

<sup>191</sup> This is a spatially reduced sonogram and does not represent the spatial features of the piece.

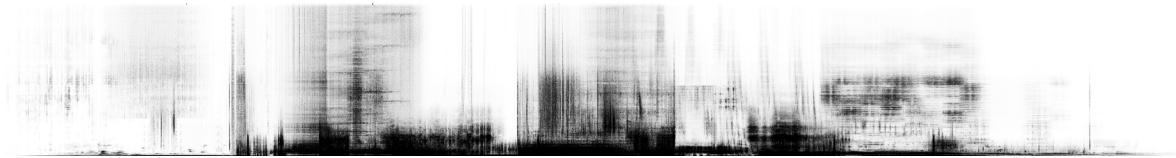


Figure 43. Sonogram I Enclosed Pteron Friction

The sustained resonances heard in the lower area of the performance space are suggestive of an enclosure. In the upper area of the performance space, sounds emerge that are suggestive of an environment outside of the confines of the enclosure. New spatially dynamic resonances are introduced at 01:25, spectrally signifying the wasp, and at this point in the piece these are suggestive of a semi-musical form.<sup>192</sup> In the first two minutes, a sense of tension is established through the use of ambiguous materials. This tension is further enhanced in the structural shift heard at 02:30. Here, a perceptually obscured wasp like sound sweeps beneath the listener, cycling from front to back, moving to the outer perimeters of the performance space, and then quickly moving back through the performance space to the opposite end. Whilst spectrally constrained, this section is spatially dynamic. Clearly recognisable wasps emerge (lucid), and a swarm is attracted which fills the performance space. The swarm intensifies and crescendos, finally quickly disappearing into the distance to be terminated by a smaller group of insects. The sound world moves noticeably to a more intimate space at 04:16 in which micro sounds are significantly amplified, and motion around the space is often exaggerated, creating a dramatically altered sense of scale. Wasps erratically dance and interplay around the space. At 04:45 a new swarm emerges, quickly moving into the space, responding to the low resonant thud. This swarm recedes, and a more intimate space is again established. This is but a brief respite, and a large swarm texture quickly returns at 05:44, and then exits again with an abrupt change in perspective back to the close proximity wasp materials that quickly enter the foreground, snatching attention away from the swarm. The intimate space becomes more frenetic and spatially dynamic, providing a sense of urgency. This urgency recedes, and a percussive glassy texture emerges that is later quickly removed by more erratic insects. The final crescendo in the piece emerges at 07:42. This is the final wasp swarm which fills the space using all 24 channels. New transformed resonances are introduced here, developing the sound world, and increasing intensity in the climax of the work.

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<sup>192</sup> With materials being reminiscent or suggestive of stringed instruments.

The swarm finally disappears into the distance above the listener, with a few remaining wasps lingering. The outdoor environment signified during the opening of the work is again introduced, suggesting an environment outside of the enclosure in which the insects may have escaped.