

The pipe organ and real time digital signal processing: a performer's perspective.

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Abstract

Pipe organs are often perceived as musically reactionary sites, housed in churches, town halls or major performance centres under the auspices of conservative structures. Contrary to this perception, over the last six hundred years, there have always been composers using the instrument as a vehicle for musically 'avant-garde' expression. Recently, composers have incorporated realtime digital signal processing (DSP) into works with pipe organ. Preparing two such works *Vanitas* (2005), Steve Everett, and *Eight Panels* (2007 rev 2010), Lawrence Harvey, has altered many of the understandings of this organist as performer.

This paper will position these works within the pipe organ canon, focussing on the new performative techniques required of the organist bringing both pieces to performance. As a practice-led research methodology, this project was illuminating – both of new processes, relationships and performance techniques which evolved during development and rehearsal stages and reflection on the more traditional performance paradigms of the pipe organ.

Introduction

Pipe organs are often perceived as musically reactionary sites, usually housed in churches, town halls or major performance centres under the auspices of conservative civic structures. There is, however, a contrary historical view that subverts this perception. Over the last six hundred years, there have always been significant composers using the instrument as a vehicle for musically 'avant-garde' expression. A brief overview of some diverse historical developments makes this quite evident, and forms the first part of this paper. This serves to contextualize the posture that underpins a major argument of the paper: that recent compositions for pipe organ with real time digital signal processing (DSP) has an historical dimension, and is one of many new and radical paths being followed by composers as they reinvigorate the musical life of the instrument. Being located in a Performance Network Conference, and the focus in my recent Doctor of Musical Arts submission, the historical, compositional and analytical elements are all viewed through the prism of the performance perspective. Much of the research contained in this paper is drawn from this doctoral submission, which may be accessed online at https://www120.secure.griffith.edu.au/rch/file/685b1a2e-d1f6-572a-52ee-4e83cb30b19c/1/Blackburn_2011_01Abstract.pdf or in its interactive form at <http://www.hutes.com.au/PipeOrgan/index.html> which contains audio and video examples and content.

With more than thirty years experience as a traditional concert and church organist (albeit with a passion for new and experimental music), at this personal, performative level, preparing such works altered many of my understandings of what it means to be an organist and how I am as

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP a performer. I shall relate these changes focussing on the preparation for performance of two works for organ with realtime DSP - *Vanitas* (2005) by Steve Everett, and *Eight Panels* (2007 rev 2010) by Lawrence Harvey.

The incorporation of realtime digital signal processing (DSP) as a compositional element is a natural extension of historical interplay that has always existed between organ composers, performers and builders. Though not unique to the organ, it is significant in this context. For example, the relationship between the builders and composer/organists of North Germany during the seventeenth and eighteenth centuries is an excellent and well understood partnership, and explored in great detail by Snyder (2002).

In this presentation, I will briefly locate *Vanitas* and *Eight Panels* within the overall pipe organ canon, and consider the constantly evolving performative techniques required of the organist to bring both pieces to performance. As a practice-led research methodology, this project was illuminating – both of new processes, relationships and performance techniques which evolved during development and rehearsal stages with reflections on the more traditional pipe organ performance paradigms.

When discussing the pipe organ in new and experimental music and contexts, one must first acknowledge that it has a certain 'Persona' in the eyes of many people. Being a major purchase for any institution, it seems the whole range of that institution's community also have a sense of ownership. In many instances this materialises as a desire that the organ is as traditionally and conservatively as ever for that place.

Some attitudes that I have personally encountered: the organ is inescapably and intrinsically associated with the church, worship and robed choirs, and may only be used in this context.

In Western societies this maybe the most common association of the pipe organ. As Snyder (2002) discusses, the organ in Europe (and I suspect the UK and Australia in the nineteenth century with the building of so many large Town Hall organs) is seen as a status symbol for large churches, educational and civic institutions. It is a semiotic role that is explored in detail by various writers in Snyder(ed) (2002), detailing the significant role of the organ in the civic lives of many cities and churches in Northern Europe during the seventeenth and eighteenth centuries, and how it's music reflected this. A further point made by Gary Verkade (cited in video interview by Blackburn, 2011) is that during this period, the town organist was, other than the clergy, one of the more highly educated individuals in the towns of Europe, providing a certain gravitas and status to the organists' position and and, by implication, the instrument.

Another, relatively recent and contemporary attitude encountered by organists is that their instrument has a gothic semiology, and is played by monsters, murderers and psychopaths. In a more benign iteration, this materialises as the somewhat comical 'count' of Sesame Street!

Then again, for many people, the organ is an incredibly beautiful visual feature in a large civic building, architecturally intrinsic and seamlessly incorporated into the space, usually silent and, although visually arresting, ignored in its primary role, as a musical instrument.

As for the player ... best avoid them: a populist text from the 1990's, *Bluff your way in Music* (Gammond, P. 1996) advises ... 'never talk to an organist - they actually know about JS Bach and fugues!' I'm not sure if this is a compliment, but the sentiment exemplifies the fact that the instrument (and its players) need some work to bring it back to a more mainstream, musical and creative society. Significantly, it is only in the last (mis)understanding that the most important 'raison d'etre' of the pipe organ is mentioned - the music, acknowledging the fact that many of the most significant creators in the western musical canon used it as the vehicle for some of their most profound and significant musical thoughts.

The organ as avant-garde - a literature review

One focus of this paper is to consider recent compositional practices for the organ and its potential significance for profound musical thought when combined with realtime DSP. In light of the preceding comments about the organ, its reputation and music, this may appear to be quite a leap. Andrew Blackburn (in Docherty, M. & Rosin, D. (ed) 2009 and Blackburn 2011) has shown that composers of new and, for their era, advanced music have frequently turned to the organ as a vehicle for this expression. Some of the earliest examples include the specific keyboard organ writing found in Codex Faenza (reprinted in Wollenberg, S 1989), as the modern keyboard was developing, or in the sixteenth century, Arnoldt Schlick's 'vornitiation' chorale preludes with their solo parts that show off the contrast between several keyboards and pedals. In the nineteenth century, the combining of sacred and secular melodies in the Sonatas of Mendelssohn and the octatonic tonality (or lack of it) in organ music of Liszt from the early 1840's, provide several examples where the organ has been used for radical, or even avant-garde music writing. In Liszt's time, the organ was becoming much larger was a result of various technological developments associated with the industrial revolution, and his organ compositions take full advantage of this. In the twentieth century, organist composer Olivier Messiaen, incorporated various forms of serialism in organ works from 1937 (*La Nativite du Seigneur*) in addition to exploring new timbral possibilities, as he extended registration ideas and practices of Charles Tournemire (1870 - 1939). This argument is detailed in Blackburn (2011), but for the purposes of this paper, a definition may be given as:

Music that is investigative, experimenting with new techniques, permanently moving forward, and inseparable from the idea of progress. Avant-garde musical compositions that encompass this concept reach beyond the musical language and techniques of that which has been seen or heard before. By definition, avant-garde music is always at the forefront of musical progress (Blackburn, 2011, p 39 - 40).

The definition, though covering a wider time period than is normally associated with the avant-garde, also provides an historical method of viewing the wide range of music composed for the organ. Although the vast majority of music that was composed for the instrument over the 600 years of notated organ music does not meet this criterion, there are sufficient examples beyond the few alluded to in this paper to make this a reasonable conclusion. In viewing the exploration from an early twenty-first century, location, it is intended to provide a context for and an understanding of the place of repertoire for organ and realtime DSP. Considering the whole of the organ repertoire from this stance, it offers a background that in the words of Warren Burt

... [gives] people freedom and tools to explore that freedom - that seems to be one thing that being quote- avant- garde - unquote- is about today. ... But certainly, at the turn of the 21st century, I find that to be an extremely valid and relevant and challenging place to be. It seems to me urgent work that needs doing (Burt, 2002, para. 31).

For the pipe organ and organist this is indeed 'urgent work'.

Two works for organ and realtime DSP

The two exemplars under discussion in this paper, for acoustic pipe organ with realtime digital signal processing are Steve Everett's *Vanitas* (2007, rev 2010), and Lawrence Harvey *Eight Panels* (2007).

Before discussing the actual works in some detail, an explanation of what is involved in presenting these works is relevant. It will be seen that the physical setup of the electronics system, from capturing sounds from within the organ, it's processing and diffusion back into the room all affect how one plays and responds musically to the created environment.

In simple terms, the first stage is to capture acoustic sounds from within the organ case,

and each division.

This is achieved by positioning microphones over the top of the pipes, inside each section of the case. The microphones act as an input to the processing system, usually a computer, and then the processed sounds are distributed to a mixing console for routing to line speakers - be they two, four, sixteen, or sixty-four or even more.

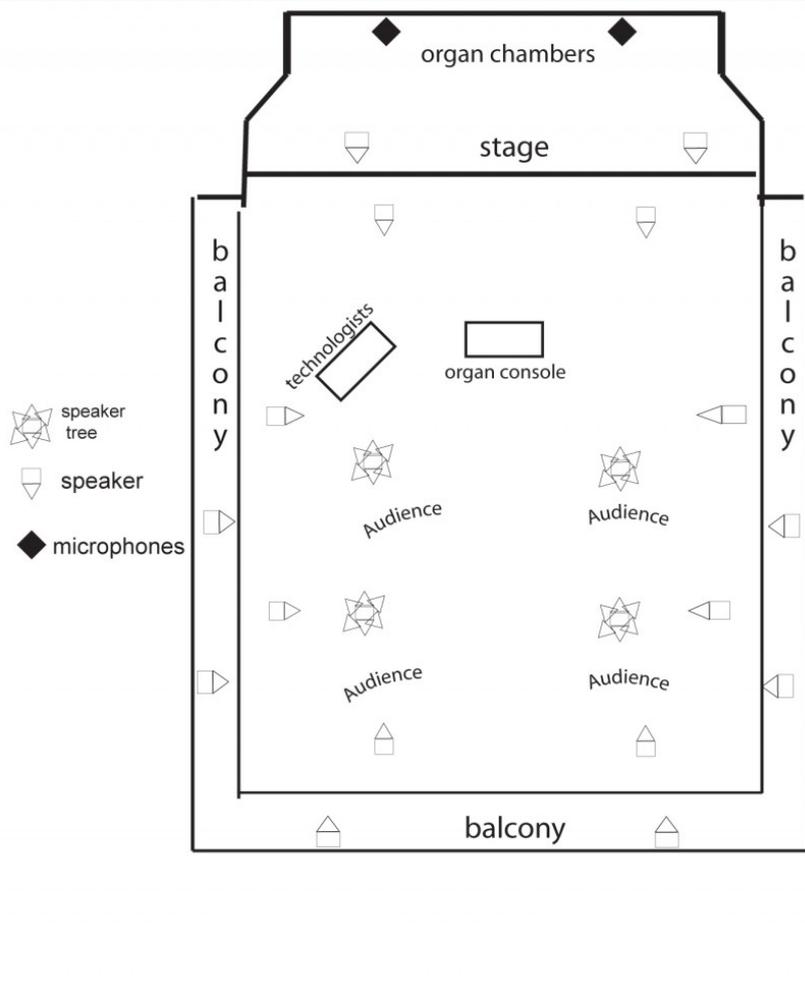
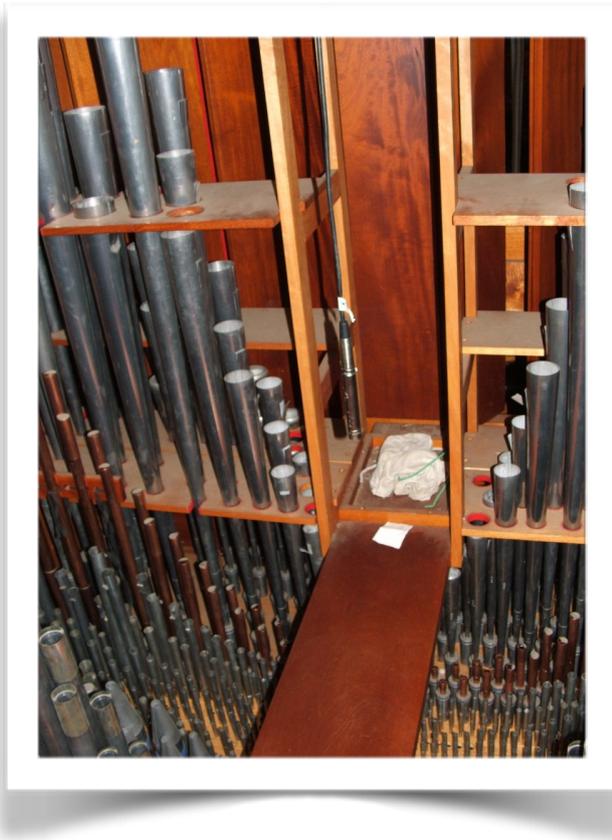


Figure 1. DSP capture and diffusion setup as used for first performance of Harvey, *Eight Panels* 2007. Cited from Blackburn (2011) Appendix 11.

Figure 1 shows the schematic layout of the three main components - microphones,



technology and speakers in relation to the audience. In Figure 2 below, the technique and placement of one of several microphones inside the organ is evident.

Figure 2. Microphone placed above the mutation pipes in the Swell Organ division as used in Vanitas performance 2010.

The schematic layout of Figure 1 shows a change - partly intended in planning, but very evident in its impact in the space - in the relationship of the audience to the organ itself, and subsequently the organ's relationship to the room in which it is located. The sonic or aural location of the organ is dramatically changed, with its sound and quality made more flexible by the incorporation of realtime DSP to the timbral palette. In the 2010 performances of both *Vanitas* and *Eight Panels* this was a musical and compositional element that was explored in considerable detail by me as player with both composers, as they revised the DSP for their pieces to take advantage of the location and technical setup available.

The process of inserting the microphones into the organ chambers is a practical and creative aspect that is present for every performance. With the exception of the organ of Sainte Elisabeth in Paris where Christophe d'Alessandro has installed microphones and speakers all around the organ this is an initial task of the collaborative process. Building

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP the confidence of owners/custodians of organs in the skills of the people involved, and demonstrating due safety and care when positioning microphones, has proved to be a crucial element of the practice of organ and DSP.

Vanitas

Vanitas (Everett, 2005) is a work for organ and live electronics (Kyma) that takes as its point of departure the visual art genre of 'Vanitas'. Kyma is a hardware sound processing system which allows sounds to be morphed or changed in real time and applied in an immersive or spatialized environment. In this performance, the DSP parameters were controlled through a Max/MSP patch, with the sound processing and variable changes carried through Kyma. The sound processing is set out on a timeline allowing dynamic changes to occur within real time. Preparing for the 2010 workshop and performance, Everett adjusted the parameters and effects to take advantage of the local conditions and performance environment. This generated considerable discussion during the preparation, allowing me as performer into the compositional process, and influencing how the sounds were being distributed throughout the performance space. (A video recording of the performance is accessible at http://www.hutes.com.au/hutes/Vanitas_Performance_-_Toorak_May_2010.html). The intention behind the electronic processing in this instance is to create an impression of the decay and ephemeral nature of life, as depicted in the Vanitas paintings, through effects used in the electronics including timbral shift, spatial re-location and tuning and detuning of the organ sound.

Steve Everett introduced this work with the following remarks, particularly commenting on his rationale for combining acoustic pipe organ and electronics (see video 14 <http://www.hutes.com.au/PipeOrgan/496/section-3/chapter-8/vanitas-2005-steve-everett/index.html>). He spoke particularly about his approach to writing for the, already very rich sounds of the organ and what he felt the use of electronics added to his compositional process.

The score of *Vanitas* is a combination of quite traditional organ-music notation (ie. three staves with regular time signatures, etc) and a number of less conventional performance techniques, such as at B26 where keys are rhythmically played and stops are randomly drawn on and immediately off. This provides a percussive pulse from the (amplified) action sounds and sudden pitched sounds. Otherwise, the performance techniques required of the organist are identical to those of any late 19th or 20th century composition. Technically, *Vanitas* is quite demanding in some sections with, for example,

extended syncopated rhythms in which the accent is moved forward by a semiquaver over different sections, and there are several sections of highly disjunct writing (Figure 3).



Figure 3: Everett *S Vanitas* bars 106 to 111.

An important relationship is established between the acoustic organ and the processed sounds in *Vanitas*. In the original quadraphonic setup which requested that the speakers be concealed, Everett sought to create a blend of acoustic and electronic sounds, blurring the boundaries between them. “The goal of the live electronic processing is to subtly enhance timbral shifts, spatial location and tuning of the organ sounds” (Everett, 2005, p. 2). Which sound source is responsible for each timbre or effect is rendered indistinguishable by the concealment of the speakers in and around the organ, and the mixing of this combination of sounds in the performance room. It is a compositional device that distinguishes *Vanitas* from *Eight Panels* in this paper.

The original performance input setup (at Emory University, Atlanta, Georgia) allowed for microphones to be positioned outside the organ case – in front of each division. This quite general input arrangement helped allow for a straightforward substitution of the two-manual organ used in Melbourne as opposed to the Emory University three-manual organ, as each input was not discretely positioned within the organ case. In the Melbourne workshop environment, two microphones were placed inside each division, and an individual (large diaphragm) microphone placed in front of one of the largest pipes, Pedal Principal C#1. Electronically, Everett featured this pipe as the lowest note of a cluster in the Melbourne performance and directed a dramatic octave pitch dropping through a sub-woofer speaker. During the workshop and rehearsal period, Everett (who was operating the technology) re-configured the inputs within the software to accommodate and take advantage of this situation. It allowed him to lift the level and focus to found sounds in this location far more than the more general inputs of the original setup. The ability for this to occur became evident in the rehearsal process and the advantage of the Toorak microphone placement within the organ case, just above the pipes of each division emerged. The composer’s direction for the placement of the microphones is “Four to eight

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP microphones are placed as close as possible to the organ case in a vertical array on both sides of the performer [or] inside the organ case” (Everett, 2005, p. 2). It is a matter of conjecture whether – in its reconfigured shape and without the presence of the composer at the performance – the software would be as flexible in another performance situation. It is also quite common in situations that “important patch revisions for technical reasons are [regarded by the composer as] opportunities for musical transformations” (Bonardi & Barthélemy, 2008, pp. 7 – 8).

Where *Eight Panels* explores the potential for re-spatializing the organ and its relationship to the performance, the original configuration of electronic sounds in *Vanitas* is such that they all appeared to emanate from the organ itself. At the Melbourne performance, a similar shift of ‘spatial location’ became a significant compositional element. With the surround sound (8.1) setup available, the potential to relocate the sound was explicit with all speakers clearly visible, so each audience member had a clear sonic and physical spatial relationship to them as well as the organ. The audio narrative of *Vanitas* places the work in the category of an ‘acousmatic tale,’ a blurring of sound source which extends the seemingly invisible and static sound source which is typically characteristic of the pipe organ. For most listeners, the organ is undemonstrative in performance. The organist, often in an organ loft, has at their fingertips and feet control of considerable pitch and audio spatialisation that is inherent in design, making the organ seem to play itself. In the original performance, positioning the speakers at the front of the case or concealed behind the organ case exaggerated this quality. Furthermore, the effect of the dsp is such that the precise origin of sound is always ambiguous.

In the Melbourne workshop process, this was explored, but the potential of the additional speakers within the space allowed Everett to extend the sound diffusion. It quickly became a compositional experiment and development, which may be used in later performances of the work. The effect was still a blurring of the live and processed sounds in some sections, and in others, the sound was drawn into and surrounded the audience. This occurrence is an example of the changes in performative practice and ‘embodiment’ workshop based experimentation and development brought about in the organists’ performance practice and self understanding. So the acousmatic elements of the composition were dynamically enhanced and a surround sound drew the listener into a different relationship to the acoustic and electronic sound field. This concept and practice has also been explored by Christophe d’Alessandro et al, in a paper delivered at the 2009 ICMC in Montreal: *The Ora Project: Audio-Visual Live Electronics and the Pipe Organ*, in

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP which the participants sought to 'augment' the musical and visual dimensions of the pipe organ through the development of new hardware and software configurations.

The effect of the electronics, particularly in this second performance of *Vanitas*, was to re-spatialize the organ in the building. With the speakers surrounding the listener, the 'spatial location' (Everett, 2005, p. 2) of the organ itself is changed. As organist, this establishes a sense of collaboration with the composer/technician in the creation of the sound but also some confusion and loss of control. In an acoustic environment, all the organ's stops have a clearly defined timbre and timbral relationship to every other stop – within, for example, a principal chorus or a compound solo stop or single solo. The sounds may be forward within the organ case as a mounted cornet, or positive organ (in a separate organ case at the front) or moving between the pedal pipe towers on either side of the organ case. The organist may create a 'wall of sound' with organo pleno or the remote sounds from a recit organ high in the case and at the rear of the organ. As an organist, all this, and the placement and musical meaning of these relationships is clear, and their selection and use musically and physically intuitive.

The introduction of microphones, speakers and a trusted technician changes all. Timbres and stops that were quiet, may now be loud. The sound no longer emanates from the physical case, and the organ now infiltrates the whole hall. The sounds and articulation one uses now may be varied with the radical delay pitch bending which all occurs just as one lifts off the key. It's as if the act of lifting away from the keyboard on a loud trumpet stop is what is required to bend the note up or down. Though achieved electronically, the timing and placement of the effect is one that 'humanizes' the instrument giving it some of the timbral and articulation flexibility it inherently lacks. It is a development that answers Schoenberg's complaint that "on the organ it was impossible to change the volume of a single tone or musical phrase gradually, as on a violin or a flute" (Herchenröder, in Snyder (ed), 2002, p. 305).

Eight Panels

Eight Panels is a structured improvisation conceived by Lawrence Harvey in conjunction with Andrew Blackburn. In the preceding discussion of *Vanitas*, the performance and its preparation were considered from the perspective of the performative interaction between organ, and DSP. In *Eight Panels* there is greater focus on the process of creation, preparation and performance, and the changing performative sphere which is engendered by the piece through a structured, joint improvisation created in collaboration with the

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP music technologists. *Eight Panels* is significant in the canon of works for organ and live dsp because it develops performative and interactive practices, particularly the performance practice of the organist. It draws further significance from the unique construction of the piece, being a structured improvisation for organist and technologists.

As elsewhere in this study, the work is explored from the perspective and changing practice of the organist, rather than that of the technologists, for whom there is already a substantial, established practice for live performance with acoustic instruments (see Jo, 2009 and Dean (ed), 2009).

For the organist, performing *Eight Panels* requires new, significant performative interaction, through joint improvisation with the technologists. It results in rich musical interaction with the organ, as the organist provides the source gestural material for the performance of the technologists who respond with further timbres, musical gestures and content. This circular process continues as the processed sound subsequently influences the musical output of the organist. It is described by Lawrence Harvey in his introduction to the Toorak performance as “a set of agreements ... taking what is improvised and what the electronic processing will do” (Harvey, 2010).

The original performance was at the Melbourne Town in 2007 (Video of this performance is accessible from <http://www.hutes.com.au/PipeOrgan/533/section-3/chapter-10/eight-panels-lawrence-harvey/index.html>). The speaker setup for this performance was 16 speakers surrounding the audience configured in two concentric circles of 8, each at a different height, and four ‘speaker trees’ each with 16 speakers (See Figure 1) arranged within. With the organ in the Melbourne Town Hall positioned high on the wall behind the main stage, two circles of speakers with differing vertical placement and four speaker trees allowed spatialisation and a repositioning and re-imaging of the organ within the room.

One of the musical intentions agreed upon by composer and organist, and which underpins the work, was to draw the organ from its physical location (the organ is housed a very large chamber across the full width of the stage) into and around the audience, changing their aural interaction with the performance space of the instrument. This was further elaborated in the second performance at the Melbourne (Toorak) performance in May 2010, with changes to the DSP patches that facilitated the diffusion.

The notation of *Eight Panels* is graphic, and the score is divided into eight sections, each quite different in character and of (up to) 5 minutes duration. As may be seen in the score example from Panel 4 (see Figure 4, next page), the organ score is at the top of the page and below are two further systems for the technologists – processing in the middle,

and spatialisation at the bottom. There is a horizontal timeline across the top of the page which indicates approximate timings. The temporal movement is less controlled by the clock, than the collaboration between musicians and a shared sense of when one musical gesture should move to the next. For this reason, good visual contact is required between all performers.

The organ part contains detailed gestural instructions – single short notes over lower pitched notes, either in the pedals or manuals. Pitch ranges are approximated by the

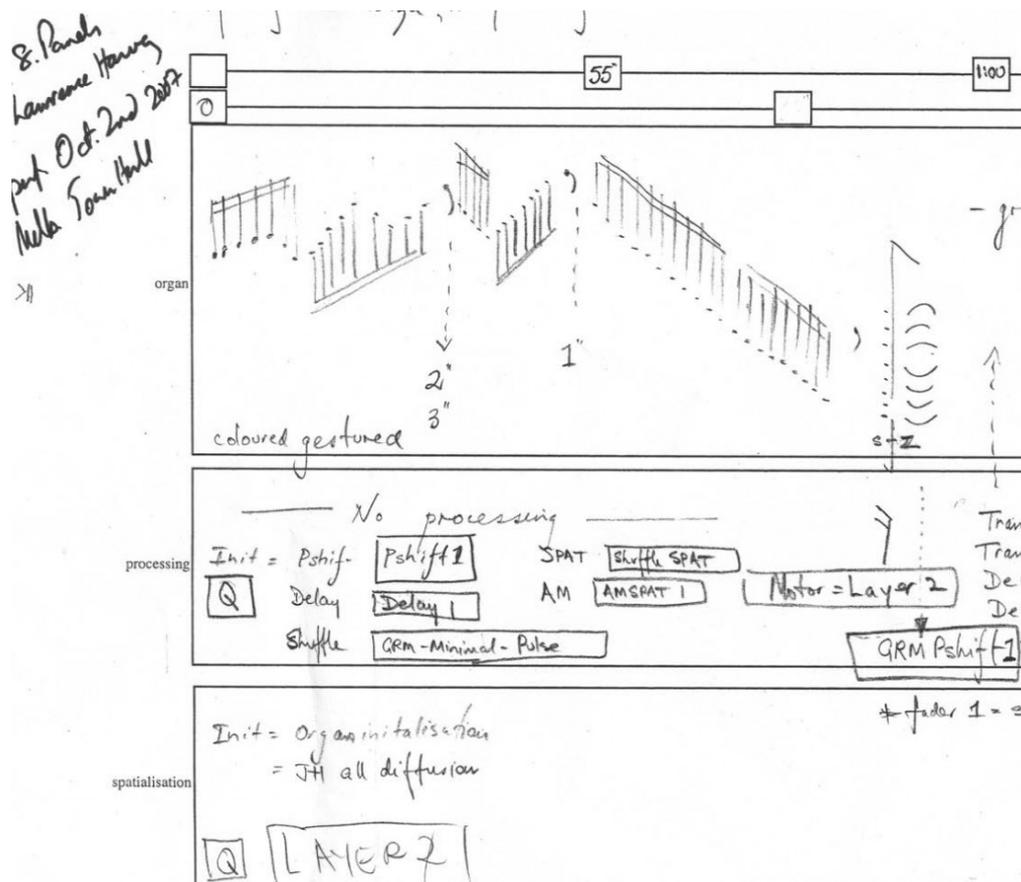


Figure 4 Harvey, Eight Panels. Panel 1.

vertical position of a symbol within the organ ‘system’. Some coordination points with the technologists are further indicated with vertical dotted lines between the systems (see Figure 4). The sound processing score is placed on the middle system of each page and indicates settings (either pre-set or dynamically changing) over the time line of the score.

The first meetings between Andrew Blackburn and Lawrence Harvey, established *Eight Panels* as a structured improvisation, with the overall structure being tied to a sequence of digital sound processes. A variety of musical gestures were then mapped out

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP giving form and shape to the work, and forming the basis of the improvisation. Timbral plans (based on the timbral and registration possibilities of the Schantz Organ of the Melbourne Town Hall) were made and some possible spatialisation and dsp plans were conceived. These were then incorporated into the score, so that both organist and technologist were able to rehearse and perform together. A series of 'scenes' (using a Max/MSP patch) were established with automated settings – dsp, input and output, which were routed through MIDI motor mixers to allow dynamic, interactive operation and manipulation of these settings.

To assist all performers in collaborating effectively, a clear set of musical gestures was given by the organist, providing the technologists with musical signposts to which they could 'hold on'. Equally, from their processing gestures I found myself waiting for certain sounds and types of processing, which in turn shaped to my responses.

The following reflective notes for Panels 1 - 3 extracted from my working journal are clearly from the organist's perspective, briefly describing the structure of the music as it unfolds, providing what are effectively improvising 'notes to self'.

Panel 1

Opens with a dramatic and loud acoustic cadenza, without processing. The cadenza ends on a low fairly quiet cluster providing aural space for the processing to enter and draw the sound into and surrounding the audience. Low shifting chord clusters continue allowing the processing to become increasingly dominant.

Panel 2

A quartel chord opens this panel, changing the feel and mood of the music. The dsp and spatialisation continues its dominance in the sound, processing the acoustic sound and drawing it into the hall. The diffusion of the sound all around the audience changes the perception of the location of the organ as the audience are immersed within the sound in a way that is familiar to organists playing 'en fenêtre' or within the case.

Panel 3

Opens with a recall of the opening cadenza of Panel 1, but now with a little processing – 'Shuffle GRM'. Shuffling, which "plays fragments ... of the source track. There is control over the duration, pitch, delay before playback and how often the fragments play" (Hawkins, 2001). At this point, these parameters being manipulated by hand, which allows the technologist a sense of performance and an aesthetic control in the moment. The ranges used here are: Frag 80 – 500; Delay 50 – 500ms; Init 2.00 – 4.00; Feedback % 0 – 100; Density % 0 – 100.

A question that arose early in the collaborative development of Eight Panels, in meetings between Lawrence Harvey and myself, was "with the alteration of performance

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP space created by Eight Panels, is this a new instrument?" and how is the pipe organ, as a "marriage of industrial design, musical instrument making and architecture" (Harvey, 2010), changed by the work? The question was raised again in the symposium discussion of May 2010, to which Lawrence Harvey observed

"the way that you have to take account of the space in [a] particular way ... and in many ways with the advent of electro-acoustics in that particular way, it's not just a new instrument – you're actually creating a new auditory architecture around the instrument as well. ... There is a concept in architecture called 'programme' ... well two... they have programme and circulation systems. Programme in architecture becomes a part of the brief ... [but then] the programme changed. As you are explaining it, it is just something that happens, but I think also, we're potentially changing instrument and architecture by the addition of electronics in this" (Transcription of Symposium discussion, May, 2010).

In both compositions this sense of the creation of a virtual new instrument and virtual performing space generated great interest and excitement. These, and other performance techniques are reflected on in the next section of this paper, but seem to be crucial to a reinvigoration of the pipe organ as an experimental and innovative musical vehicle.

Personal and embodied performative changes

There is little doubt that DSP/organ music and performance practices does cause substantial shifts in the relationship of the organist with the music, the instrument, and co-performers. The performative changes that have occurred as a result of this work are several and significant. They include learning new processes for preparation and performance, the forging of new musical relationships, between player and technologists, as well as to the composer, as the performer takes on a significant role as original creator rather than re-creator within the composition-to-performance paradigm. Finally there is a whole new spatial relationship forged between the organ and its room.

This project has been a journey of discovery, with a number of unexpected findings. During the process, I had the growing realization that performative practices and musical relationships, with which I believed I was familiar, had been changed: the relationship between organist and technologist sharing responsibility for the sound; my relationship with the instrument itself – from how I sit at the organ, even play the organ; the invitation to registration assistants to creatively participate in the performance, and working with their artistry as they contributed to the timbral exploration in *Vanitas*; even the sense I normally feel of being physical disconnected from an audience when sitting with my back to them

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP while playing altered to a greater sense of connection and interaction, as the audience is immersed within the sources of sound.

There is also an implied loss of distinction between the composition and the instrument - and for the organist, a new, creative opportunity. One of the *Eight Panels* technologists, Stephen Adam, pointed out in the symposium held after the presentation in May 2010,

it's not clearly a music composition task, creating music with music technology as trying to design one or more processes that are designed to interact, or work independently. And so it's like you give an input and it creates output – is that an instrument or is that a composition? And where does one start and the other end? (Adam, 2010)

The experience of this study has been that, as new works are created, prepared, rehearsed and performed, there is a constant sense of exploration and the “negotiation” (Harvey 2010) between the organist and composer, technologist, and even registrants, concerning events and interactions required to make the performance happen. It is something which is an aim of all music rehearsals – acoustic or otherwise – as musicians seek to create changes in habit, technique and interaction. As Penny (2011) points out, adding electronics to an acoustic sound creates a complex entity, its presence variously evidenced as transformed sound, as shadow, as multiple characterisation. An unpredictable and expanding element arrives in performance practice: a vehicle for significant freedoms, for new artistic potentials and choices (Penny, 2011, p. 184).

With the addition of live DSP, a whole new realm of possibilities appear, all of which affect the creative and performance practices which underpin the self understanding of the organist. In organ and realtime DSP, these are all performance relationship centered. Besides the relational performance techniques just outlined, technologist(s) join the co-performer ensemble. As responsibility for the timbres is shared further, the sense of joint sound creation is enhanced. In the workshop period, composers and technologists used the potential offered by various surround-sound codecs and layouts, not only changing timbre, but the organ itself by sonically re-locating it for the audience. This is something which (from the opinions expressed in the symposium) appeals strongly to composers and audiences. In pieces such as *Eight Panels* and the Toorak performance of *Vanitas* it is a clear intention of the piece. Sonic immersion of the audience within a circle of speakers is an obvious setup, and effective in every performance that I have given. However, there is a more important presence created by this arrangement. As sound is drawn around the

The Performance Studies Network conference 2013. . Blackburn, A. The Organ and realtime DSP audience, not only can the listener focus on the little sounds and an expanded spatialization of the organ, but a sonic re-location of the organ occurs. It is an invisible but, for the audience, very present event. It leads to the vivification of the organ itself as an active persona in the performance ensemble. No longer a static, perhaps beautiful fixed object at the front or edge of the performance space, the organ becomes a part of the sonic architecture of the room, dynamically moving around the space. For the audience, the sound embodies the breath of the organ, expanding and contracting around them, belying the notion (and previous reality) of sound sources that are normally both fixed and relatively remote.

It is these changes in spatialisation and timbral malleability that generate change in the self-understanding of the organist (See Coessens et al, 2009, pp. 150 – 2). For the organist, traditionally relegated to an organ loft well away from audience and other players, these developments are exciting, challenging and full of potential. The performing insights gained through the learning, workshopping, presentation (and post-presentation reflections) of compositions prepared for the May 2010 research project have added substantially to my performance practice. The musical content of both pieces and how one performs them have been the primary focus of this paper, and there is considerable value in the learning of a new performance practice and ‘behaviour’.

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