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Sound Installation: Blurring the Boundaries of the Eye, the Ear, Space and Time

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Sound installation interfaces musical and visual art through time and space. It is a sonic intermedia practice, which blurs the boundaries of the visual and aural and includes the spatial, the temporal and the haptic. Since 1977 I have been designing sound installations that merge the senses, offering unique experiences for the listener as participating auditor. In the discussion of several of these works the conceptual considerations in the design of cross-disciplinary works are addressed. These include the parameters derived from the disciplines of sculpture, sound, temporal composition, spatial architecture and audience interactivity. Some works merge many interdisciplinary elements such as sculptural forms, video, photography, radio and performance as well as sound, while others may appear almost invisible. The degree of musical composition and sound design features vary from work to work. Sound installations are rarely static, having many possible outcomes and many works have a high degree of immersive and interactive charac- teristics. As such they are difficult to document. This article will look at representative examples of my sound installations since 1977 showing diverse approaches to sound installation. It is a potent artform, which has stretched the boundaries of the disciplines of fine art and music, merging sound, time and space in new ways.

Keywords: Installation; Sound; Space; Time; Interactivity; Technology

Sound installation can be defined as a place, which has been articulated spatially with sounding elements for the purpose of listening over a long time span.[1] It defines the exhibiting place as an acoustic space where sound, space and time converge in interesting and challenging ways for the listener/perceiver. Unlike other forms of installation, sound installation gives primacy to the sonic aspects of the work, yet the spatial and dimensional characteristics engage with the eye as well as the ear. As sound inhabits space, filling height, width and depth with its presence, there are haptic concerns in the perception of it. Like sculpture, sound is visceral and embodies space, despite being invisible. Sound installation surrounds and immerses the

perceiver's entire being in a way that no other artform can. Sound can be felt through the skin and invades the body whether we like it or not. Sound installation is not confined to blurring of the boundaries of the visual, the aural and the haptic. Sound installation's most important dimension, that of time, can take the consciousness into the familiar and non-familiar, the present and past, reality and memory at the same time as its presence is felt as a visceral physical phenomenon. Here lies its power. Sound installations merge the eye and the ear, the haptic, the spatial and the temporal, dissolving the boundaries articulated by all other fine and musical arts. Sound installation is a non-linear, flexible and temporal hybrid artform, with many entrances and exits. It is not surprising that sound installations exist in many forms.

On Time and Space

The temporal aspect of sound installation distinguishes it from other audible genres because the works are intentionally installed for much longer durations, inviting numerous visits. Sound installations do not necessarily remain the same over the period of installation, be it a few days, weeks or months. They can be ephemeral, temporary, or semi-permanent, engaging with the perception of time in creative ways.

My recent publications, Bandt (2001) and the www.sounddesign.unimelb.edu.au website,[2] have documented over one hundred and fifty recent sound installations in Australia in audio-visual formats in the online gallery and audio CD.[3] Unlike other listening experiences, which are usually short and from a fixed point in the room, sound installations invite the auditor to move around and through the space to consider the different behaviours and perspectives of the sound installed. Sound pathways become the desired lines in the space rather than the visually derived desire-pathways common in architectural practice. Sound installation artists and designers carefully consider the intersections of the spatial and temporal for the visitor, through intentional placement of speakers in relation to the points of audition. Proximity to the speakers and acoustic reflections have to be balanced. Safe passage through a space also must embrace all elements of public passage and crowd control. The density of the audience, being variable, is a major factor in shaping audible artworks and is often built in to become a major shaping controller in many installations. Les Gilbert, one of the first Australian artists to become an international professional sound design company, was quick to seize on this element in the early Eighties, building elaborate museum designs that responded differently according to the movement and number of people present as well to changes in environmental conditions. A vast array of sensing devices, cameras and weather stations gathered data which were programmed to control computerised sound files defining the position and density of speakers at a given point in time as well as timbral spectral and dynamic changes in the sound itself. His installations at Melbourne's Southgate (see Figure 1) and the Sydney and Osaka Aquariums are cases in point.

Figure 1 Les Gilbert Southgate sound installation, Melbourne, 1992 (Photo by Ros Bandt).

Original Sound Installation Practices

It is easy today to define sound installation as a hybrid artform, offering many blends of design practices, but in 1975 the term wasn't coined and I merely made sound-focused artworks in large spaces. Composition, performance, instrument building, found object sculpture and mixed electronic media were my first tools. In 1977 I began to explore sound installation as a vehicle to provide sonic experiences that would be multi-sensory, immersing the visitor in exciting audio-visual phenomena. The idea of allowing the audience to participate in the creation of the work was an underlying objective in my approach from the outset, so that the act of listening would be creative, engaging and meaningful for them (*The Sound Playground*, 1981,[4] *Touch Sound*, 1985,[5] *The SSIIPP Sound Sculptural Interactive Installation Performance Playback*,[6] a system which has powered some thirty exhibitions since 1987). Participation through responsiveness and interaction could all be designed into the work in a variety of ways for both the individual and the group, both acoustically and electronically. The idea of a sociable listening experience that people could collectively create and share if they wished was also appealing. This is not the case in most public auditions where listening is an individual act, perceiving a frozen linear musical product which is repeatable. A free unhurried listening event could then be determined by the listener at his/her discretion and desire, free of the pressure of programming and the cost of concerts. In sound installation the listener drives his or her own listening pathway and determines how long each area of the space is experienced and audited. Coming and going, staying or stopping is a free choice at

any given moment. This freedom for the audience to engage with the artwork in many ways was one of the reasons I found myself creating sound installations with their open-ended form.

In 1977, after being handed a sock and a wire coat hanger in a composition class at the University of Illinois and told to improvise on it for ten minutes, I returned to Melbourne and mounted the *Coat Hanger Exhibition*, a double exhibition of two sound installations derived from wire coat hangers (Figure 2). This sound installation provided a free playground for people to experiment and experience sound, physically and internally. Two adjoining rooms were installed in the first-floor loft of an old organ factory, used by the Clifton Hill Community Music Centre, Melbourne. The first room, *Winds and Circuits*, was filled with suspended large coat-hanger mobiles connected to each other with steel coil slinkies. Polystyrene sheets were affixed to the suspended wooden rails to amplify the sound. Each mobile was then electrified with Piezo pickups that were connected to black-and-white television sets so that the random sound would control the visual component. The scientist Martin Harris hardwired the TVs with a Lissajous image that would distort, morph and dance when sound was transferred from the coat hangers. Colour wheels spun in front of the screens. Small amplifiers were provided on each of the TVs so people could play and interact with the sound produced, making it louder or softer or non-existent. Children played the space like experienced DJs while watching the Aeolian

Figure 2 Ros Bandt, *The Coat Hanger Exhibition: Winds & Circuits*. Melbourne, 1977 (Photo by Ros Bandt).

elements of the mobiles and moving the large mobile by hand. The space became audible and playable. The kinetic elements of the mobiles together took on elaborate variations of visual shapes and densities as they moved around or behind each other, as they swung from the ceiling or were activated by the air from the open door of the warehouse.

The sound this emitted was constantly changing according to a range of influences. First, the room provided wind power as there was a large door for loading organs, which allowed the breeze to enter, setting off the coat-hanger mobiles in variable relationships. Second, the frames of the mobiles were suspended, causing further kinetic relationships between the mobiles. The third feature affecting the sound was human intervention. Audience/viewers reacted and played the mobiles or individual hanger harps, using their fingers on the strings, or hitting the coat hangers with other coat hangers to create clusters and phrases that were utterly unpredictable. If all the mobiles were activated simultaneously it took over twenty minutes for the sound to die away, due to the interrelationship of the mobiles and their many and varied kinetic behaviours throughout the room. To watch this dancing decay piece was as intriguing as listening to it. A fourth sound-shaping factor was the electronic modification of what was in motion. Amplified sound would be present or absent, loud or soft, according to which amplifiers were on or off, or whether they were being played by passers by.

The second installation, entitled *Surfaces and Cavities*, was a maze of screens covered in different materials with varying degrees of absorption and reflection, from metal to fur. People were invited to strike objects with their suspended coat hangers held by string to their ears as listening ports. They served as transducers, carrying the internal resonances of the sounds to the internal cavities of the body so the entire person becomes a listening post. The members of the audience were invited to engage with the sounds through the maze, and contemplate and develop their listening through their inner cavities of their own resonating bodies. From these events several recordings were made on reel-to-reel tape recorders and broadcast on the radio, a stereo documentation which can never fully render the much more complex spatial sound experience that sound installation offers.

Mixed Media and Technological Considerations

Many of the features of this early work have continued in my practice and are common to many sound-installation artists. These include the use of audio-visual materials including multiple screens, sculptures, found objects, original acoustic sound sources, electronically modified sounds, real-time and interactive sound processes, environmental modifiers, audience participation, original electronic processes and instruments and controlling devices. A high dependence on technology was clear from the outset. Similarly, it could be said that the history of sound installation as a genre parallels that of technology. In the main, the digital revolution has almost subverted the acoustic and analogue in sound installation at the present time.

Sound-installation artists have always been at the forefront of electronic sound production because the emission of sound through multiple speakers is sound installation's most common trope. Innovative recording techniques, synthesis, transformation and spatialisation systems and softwares have been part of sound installation's history. Many artists have devised their own multi-channel playback systems, codes and controllers to effect original methods of sound dispersion. This is usually an ongoing process in tandem with the technological opportunities. In my own case, for some works I still use my original *SSIIPP* system for interactive eight-channel playback; it has been my standard since 1987 as it has many features, which allow me to mix the outputs on site, and it is very reliable. Very recently I have used it in sound installations *Silo Stories* (Bandt, 2003b) and *Mack Memories* (Bandt, 2003a). Many other works have demanded new technologies, such as the international satellite link from Frankfurt to the Grainger Museum for the real-time installation and performance *A Global Garden for Percy* (Bandt & Sistermans, 1997) with German sound artist Johannes S. Sistermanns. Custom-made digital controllers were devised by the Austrian sound group *Transit* for my sound installation *Pillars of Memory*, which they commissioned for the *Zeitgleich* ('Sametime') sound-installation festival in Innsbruck in 1994 (Figure 3). Sensors on each of the seven pillars would respond to the presence of people calling up seven discreet compositions on themes of the old salt warehouse's salt-mining history in different ways. The controllers automated sound levels and densities according to the number of people in the space and their proximity to the hidden architectural speakers. This was also moderated by the overall curatorial program that gave prominence to various installations installed in the salt warehouse at various times. In this case the overall levels could be dropped or raised in relation to other sound installations in the adjoining rooms.

The relationships between the columns and speakers were by no means obvious. Sound pathways and the audio material were arranged in a spatial scenario similar to dramaturgy. Walking in from the subterranean sounds of Bill Fontana's underground microphone, the sounds of horses on cobblestones would follow you into the space as if being carried. The ecology of the miners and community was spatially collaged throughout the columns and the river Inn's water could be heard flowing on floor speakers at the same time as Andres de Bossard's Alpine recordings flew overhead in the same space. On leaving the space, the voices of the gold-mining elders, the 90-year-old Wick sisters, could be heard coming out of the high walls of the room as if the spirit of *Das Weiss Gold*, the white gold of the salt, were resident in the building.

Mapping the Sound Design in Installations

The high degree of invention and innovation of this artform means that there is no common methodology in designing sound. Many sound artists use commercially available softwares to arrange the multi-track sound to be installed, such as *ProTools*, *CuBase*, *Logic*, as well as *Max DSP Jitter* for the sound dispersion design. Many artists simply use architectural maps with the speaker arrays plotted. Australian Artists such
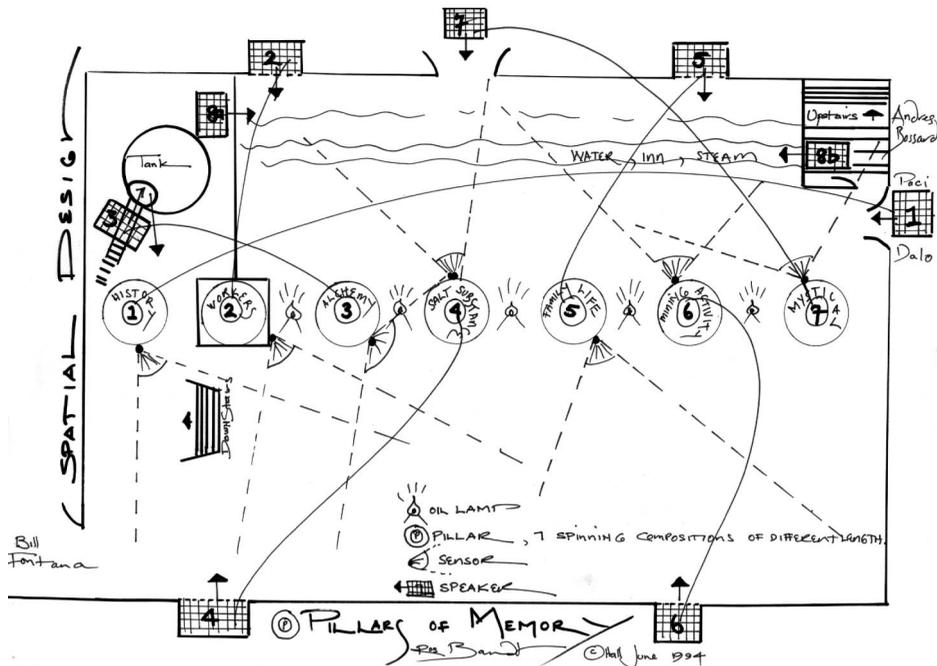
Figure 3 Ros Bandt, *Pillars of Memory*, Innsbruck, Austria, 1994. Map of the spatial design of sensor/speakers/audience relationships. See: http://kunstradio.at/ZEITGLEICH/INSTALLATIONS/BANDT/

as Warren Burt, Iain Mott and Garth Paine work entirely within their own coding practices, so that the design information is embedded in the programming of the sound output devices. In my own case I have developed an elaborate multi-channel notation system not only for the content of the sound but also for the spatialisation of the sound events through graphic means. When there are complex elements to be integrated including projections, performance and live events, then multiple flow diagrams are used. In some cases this notation has been exhibited as part of the sound installations, as in *Mack Memories* and *Stack* (Bandt, 2002, 2003a).

More important than the tools and technology are the aesthetic considerations, and the way in which sound installation engages with culture and life in its broadest sense. All sound is site specific and the designed sounds need to take this on board. The sound should be tailor made to the site. Sound installations that tour can lessen their impact if the new sites aren't integral to the work's aesthetic.

Aesthetic Considerations in Integrating the Elements

The way the artist integrates the sculpting of sound, its dispersion in the space and the overall visual integration to the architectural space and cultural precinct makes or breaks a work. Often that which works visually may not be so good for the sound so

there is constant tension between all the elements to achieve a balance. In *Altars of Power and Desire* (Figure 4) in Ball State University's architecture gallery, Muncie Indiana, an interdisciplinary team was established from the faculties of architecture, electroacoustic music, theatre and lighting, and fine arts (sculpture) to help render the work. As the inaugural Benjamin Cohen Peace Fellow, my brief was to challenge the entire university community. This was the first sound installation at this university so the excitement of interrogating the provocative subject was just as challenging as implementing the sound and making the eight responsive sensor-activated sculptures under Kenton Hall's excellent direction. My design was clear but

Figure 4 Ros Bandt, *Altars of Power and Desire,* Ball State University, USA, 1994 (Photo by Ros Bandt).

sourced with the students who from the start came in to chart the details of sculpture design, audio composition, printing and scanning of images for speaker apertures and building the electronic interactive sensor system.

Collaboration as a Creative Method

In working collaboratively it is important that the aesthetic goals and the various skills are delegated very clearly. This was extremely important in this work as there were over forty people involved in the entire production and many of them met for the first time at the opening of the exhibition. In 1997, I made an interactive CD-ROM of this work in Mtropolis with John Drummond. I wanted sound-installation documentation that would provide spatialised sound driven by the computer user's pathway through the space. This was achieved through simulated spatial stereo sound because the technology was really behind the genre of sound installation at this point. The gaming industry has now achieved a state of cheap high-level interactive multimedia objects, which could realise such a system of documentation for the genre in the future. I decided that a book with audio CD and a website were more within the public's grasp to afford and access. I didn't see the point of making an aesthetic object that did not have easy public dissemination. We are still a long way off having interactive multi-channel audio-visual documentation of sound installations, although there has been an increasing tendency for some sound installations to be created within the domain of the computer screen. When this occurs, many of the architectural and spatial sound features are lost and the work collapses into a video or multimedia animation preferencing the eye over the ear.

In other collaborations I have helped to interpret another artist's aesthetic intention rather than my own. In *The White Room* in Poland in 1992 (Figure 5), I was the visual installation designer for Vineta Lagzdina's *Dream* as well as directing the balance and overall implementation of the contribution of five sound artists, Alan Lamb, Warren Burt, Ernie Althoff, Vineta and myself. As a sound designer I was briefed to help balance the sound components of the installation in collaboration with the mixer, composer and performer, Warren Burt. Vineta's performance included activating the wired room and playing live flute which emitted loud kookaburras laughing, which disturbed Burt's serene sine waves and the menacing repetitive rhythms of Althoff's automata. The sound was transferred into an illuminated water bath, which was projected on the wall to reveal the ripples of the sound waves caught from the miked automata. Vineta could interfere and play the wired sound through aerials on the lit wall. The relationship between the visual, the aural, the installed and the performed is extremely complex in this work (Bandt, 2001, pp. 122 – 126, track 29 of audio CD, *The White Room* (Althoff, Bandt, Burt, Lamb, Lagzdina)).

The Spirit of Place: Sound or Silence? Public or Private?

It is important that every sound installation relate to the cultural and social context of the precinct in a sensitive way. First, traditional owners should be consulted, as in
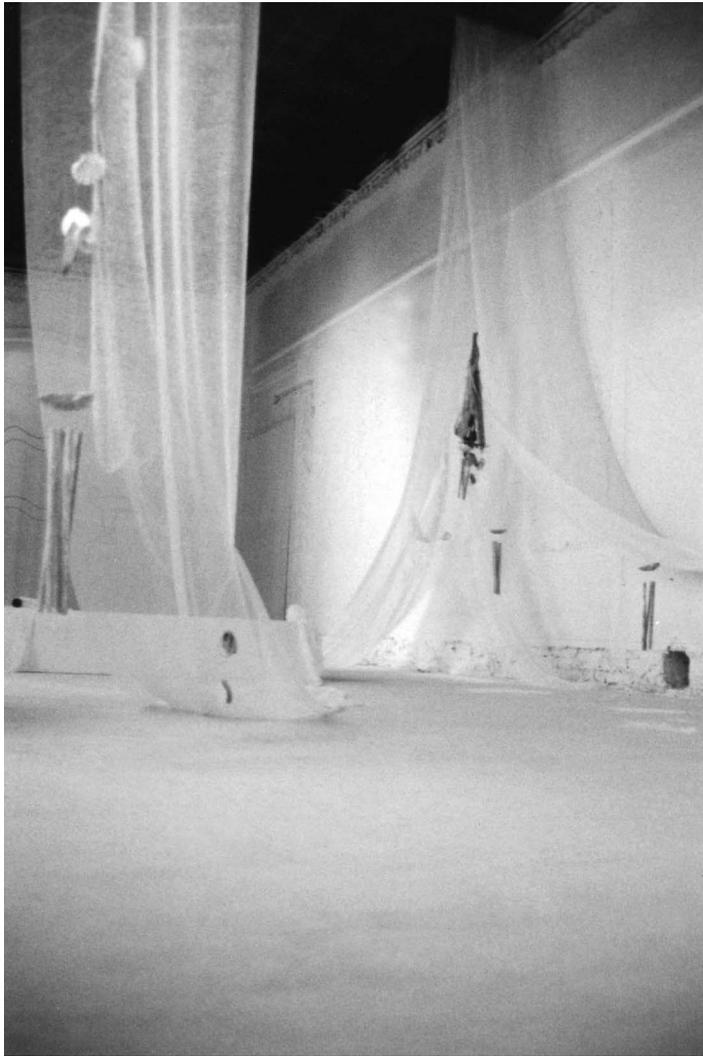
Figure 5 Lagzdina/Burt/Bandt/Althoff/Lamb, *The White Room*, Centrum Ujadowsky, Poland, 1992 (Photo by Ros Bandt).

the case of Australian sung land, to ensure the installation is appropriate. Installing my Aeolian harps in the Lake Mungo[7] desert, a sacred site that is a vortex of ancient trading routes for over eight aboriginal cultures, took some weeks to negotiate. The help of Alice Kelly, last living elder of the Mutti-Mutti, also Barkindji on her other side, could not be underestimated as she stayed out on the dunes with me for a week. She felt the Aeolian sounds of the wind-driven harps were reaching back to the Dreamtime and the sound was helping to heal the black/white fella relations. She had heard the natural harmonic series in the Casuarina trees and immediately felt

Figure 6 Ros Bandt, *The Listening Place* 2003 (Photo by Ros Bandt).

comfortable with the sound of the strings played by the wind. I had envisioned the shape of the harps watching spiders' webs and listening to the Casuarina trees in Red Cliffs some years before. The sharing of the land, the space and the sound made the installation on site a tremendous experience as well as sourcing wonderful sound for a radiophonic work and performance installation in the studios of the West Deutsche Rundfunk later that year. After a week in the dunes we took up the sound installation without leaving a trace that we had been there. The fragility of the 20,000-year-old fossilised dried lake was undisturbed.

One may well ask if the introduction of sound from an installation is desirable when the overall ecological considerations of the soundscape are considered and if so, what sounds are desirable, for how long and how loud. In Gilbert's *Southgate* installation, pictured in Figure 1, the sounds of the adjoining trains across the river at Flinders Street station were replicated on the boardwalk and I questioned the need for this on a pedestrian walkway. Present owners of a site must be supportive of the idea over the long term if the installation is to be maintained faithfully. Community users also need to be consulted, especially when sound installation occurs in public space.

In my recent public sound installation, *The Listening Place*,[8] in Alma Park, East St Kilda, in 2003 (Figure 6), the community was defined by the progressive Council of Port Phillip, and as an artist my brief was to record the stories of the park users to reflect the demography of the precinct. This included a wide range of racial and linguistic and interest groups, including post-war Polish Jews, the gay beat, cross-cultural martial arts groups and the dog walkers. It was decided to run the soundtrack during daylight hours only, to respect the nocturnal activities in the park and avoid a surreal feeling that people were present when they weren't which could be unnerving. The seat was installed on a bluestone plinth with the word *Listen* etched in several languages.

Conclusion

In the works discussed above, it can be seen that that sound installation is a complex and intricate artform. It unites time with architectural space, the eye with the ear, the past with present, the body and mind, the creator and the perceiver in non-linear

trajectories which must be experienced. The physical dimensions of height, width, length and volume are a small part of the complex spatial and temporal designs involved in each sound work. Once the audience is given freedom to interfere, respond or create in the work, then its outcomes become even more complex and unpredictable. The sound-installation artist must take responsibility for all of these features, those that are controlled, those left to chance and the behaviour of the auditor. This is partially the intrigue of the hybrid artform and why there have been so few attempts to document the works themselves in any depth. Sound is moving all around us all of the time in physical space, indoors and outdoors. We are living an ever-changing polyphonous sound installation daily, whether created or not, yet people are slow to pick up on their audible universe. Sound installation has been in the too-hard basket in music and fine-arts discourse for long enough. Much work is still to be done to interrogate, analyse and interpret the burgeoning and exciting field of sound installation (Bandt, 2003). In galleries and public spaces, sound installations are occurring more frequently. With this increasing familiarity there is becoming a greater consciousness and confidence in the creation, perception and curation of sound installation. The discourse and documentation will continue.

Notes

[1]   The term is often attributed to Max Neuhaus, who began using it in the Seventies. In 1976 he installed the swimming pool with underwater sound at Bremen for the Pro Music Nova Festival but it was called the swimming pool event. Most other works of long duration at the time such as those by Paul de Marinis for the Paris Autumn Festival, the same year, were entitled sound sculptures, 'Scultures sonores'. The art came before the terminology.

[2]   The monograph with audio CD *Sound Sculpture, Intersections in Sound and Sculpture in Australian Artworks*, 2001, is the first in-depth study to interrogate the links between sound and sculpture. Chapters address place as acoustic space, sonic objects, time and motion, human engagement, installations and spatial music.

[3]   Bandt (2004b). Both the book and the website were funded by the Australian Research Council at Monash University and the interdisciplinary Australian Centre, the University of Melbourne respectively.

[4]   The soundplayground was built in 1981. A structural analysis and plans are published in Bandt (1985) and photographs, sound and text can be found at http://www.sounddesign. unimelb.edu.au/web/biogs/P000294b.htm. The sound can be directly accessed in the multi-media gallery http://www.sounddesign.unimelb.edu.au/web/biogs/gallery/P00029.

[5]   Bandt (1985), pp. 23–28. *Touch Sound* was a sound installation commissioned by the Melbourne City Council, the Council of Adult Education and Victorian Arts Council to celebrate Victoria's sesquicentenary. The exhibition, workshops and book *Sounds in Space* travelled the National Gallery of Victoria, Roar Studios, Warrnambool and Mildura regional galleries, among others. It was inspired by twenty Haiku sound poems written by the artist.

[6]   Bandt (1985, 2004, 2004b). The Sound Playground, op.cit. Available online at: http://www.sounddesign.unimelb.edu.au/web/biogs/P000294b.htm

[7]   The Aeolian harps installation and award-winning radiophonic work *Mungo* can be heard at: http://www.sounddesign.unimelb.edu.au/web/biogs/P000354b.htm (it is also published in its entirety on *Sonic Archeologies*, Move Records).

[8]   The Listening Place can be experienced on the sounddesign website at http://www. sounddesign.unimelb.edu.au/web/biogs/P000471b.htm. The sound and photos are accessible in the gallery under headphone icons at http://www.sounddesign.unimelb.edu.au/web/biogs/ gallery/P00047. See also my most recent published articles, Bandt (2004a,b). Regarding the latter (2004b), some 130 sound designs in public space published on the *Australian Sound Design Project Website* have over 70 different descriptors provided from their creators, showing the numerous backgrounds, and styles of artists producing sound installations. See www.sounddesign.unimelb.edu.au. The gallery for each of these works shows in multimedia objects, video, image, sound and text how these works traverse their hybrid elements. Their documentation can be experienced audio-visually. Similarly in *Sound Sculpture: Intersections in Sound and Sculpture in Australian Artworks* with audio CD (Bandt, 2001), the ricochet between the eye and ear is the main structural focus of the entire book. There are over 80 Australian sounding artworks and designs discussed with an entire chapter devoted to installation. The need for researching, documenting and creating an intellectual context for sound installation became apparent through my own practice. In the Seventies, the term and genre were little known. Later, in the Eighties and Nineties, Australia quickly became a leader in sound installation, with many important artists developing the genre and achieving international acclaim both as artists and commercial designers. Nigel Helyer, David Chesworth and Sonia Leber, Garth Paine, Warren Burt, Ernie Althoff, Nigel Frayne, Iain Mott, Alan Lamb and the present writer have substantial careers in the genre, along with their international colleagues such as Bill Fontana, Kristina Kubisch, Max Neuhaus and others.

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