sound.garden.scape: Gastown, a Virtual Soundwalk

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Abstract

As the urban soundscape gets louder, many listeners are exchanging their acoustic soundscape for an electro-acoustic one. This sonic mediation is made mobile through the use of personal portable audio (ppa) devices such as the iPod. This project seeks to understand where technology connects acoustic and virtual soundscapes using the tradition of soundwalking. sound.garden.scape: Gastown, used ppa devices to create an interactive immersive aural environment that re-presented Vancouver's Gastown area. Using compositional methods and the dedicated attention to listening found in soundwalking practice, the project functioned as a virtual soundwalk, allowing listeners to move through space and time reacting and interacting with an aural space completely separate from the installation venue. Within this installation listeners used their ppa devices actively to seek out and listen to the same urban noise they normally use ppa to block out.
Dedication

For my parents:

David Powell and
Dr. Barbara Powell
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Introduction

Immediately before writing this, I stood in the Pacific Ocean, thinking and listening. As I listened to all the sound events around me: the swelling waves, the crash of hammers from a neighbouring construction project, I became increasingly aware of my own presence in the environment. I noticed acutely the pressure of the surging water around my rubber boots, the arrival of a pair of cormorants, and the drop in air pressure immediately before a light rain began to fall. As I stood – aware – I began to think about other sounds I had heard in this place, then remembrances of some of my favourite sounds and other intense listening experiences crossed my mind. All of a sudden, a loud ferry horn resounded over the hill and around the bay I was inhabiting, snapping me back into my present. It is this direct, engaged relationship with an environment that has fuelled my research and creative practice. It is the dedicated attention to the act of listening that attracted me to soundwalking and Acoustic Ecology. Understanding our place within the series of interconnected elements that compose our perceptual reality and our surrounding environment.

I have been actively soundwalking for several years, and composing soundwalks individually and collectively for the two years I have been in Vancouver. In this time, my work with the Soundwalking Collective has expanded to include leading walks, integrating soundscape composition within walks, and even extending soundwalking practice into canoe-based 'soundpaddles'. I have also been researching
the relationship we as listeners are developing with personal portable audio devices. It is this spread between an active, embodied listening within a space and a form of listening that seeks to remove the sensation of space that has inspired my MFA Graduating Project, sound.garden.scape: Gastown, an interactive installation that is best described as a virtual soundwalk.

In our current age of increased mediation, and with the explosion of individuated aural experience through the widespread use of personal portable audio (ppa), the noise that listeners must learn to decode is no longer radio static or poor telephony, but the interrelationship of the listener, sound, and the space(s) they occupy. This is not a case of re-integrating natural sounds into the everyday soundscape. Purely natural sounds may be seldom heard – they have been driven out of our aural experience by the technological advancements of the machine and digital ages. Even the naturally occurring, possibly pastoral sound events we may encounter far from the city in pristine or remote locations, like the tuneful songs of early morning larks or the cyclical drone of cicadas, will be heard through our 'modern ear' – one which has adapted to electroacoustic listening, and accepted the schizophonic relationship with the surrounding environment made possible through sound-reproduction technology.

This noise we must learn to decode is, in part, ourselves. As we move through space, we introduce energy in a variety of forms. Here I will only focus on sound events generated or triggered by a listener's presence in a space or spaces. In order to situate my MFA project, it is necessary first to explore the relationship between sound and space, and how this relationship has changed listening and artistic practices. I will examine listening in acoustic and electroacoustic space, as well as the impact personal portable audio devices have had on the listener's perception of space. This exploration will conclude with a look at audio artists who are using the relationship between sound, space and technology to create unique experiences for their audiences. As soon as a listener/participant enters a performance or installation

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1R. Murray Schafer defines schizophonia as: “refer[ring] to the split between an original sound and its electroacoustic reproduction. Original sounds are tied to the mechanisms that produce them. Electroacoustically reproduced sounds are copies and they may be restated at other times or places” (273).
space, they are integrated into a unique (for each individual) intersection of time, space and event. With the acceptance of personal portable audio devices as a means to exercise control over our individual sounding space, I ask: where does technology connect acoustic and virtual soundscapes? Where does the sonic mediation of personal portable audio place the listener in space?

I have decided to use the less specific but more graceful 'they' or 'their' in place of his/her, she/he.
2 Acoustic Listening

Listening is the active interface mediating our individual experience and the sounding environment surrounding us. Listening is distinguished from hearing with listening defined as the active form of apprehending sonic information. Barry Truax elaborates: “Whereas hearing can be regarded as a somewhat passive ability that seems to work with or without conscious effort, listening implies an active role involving differing levels of attention – 'listening for,' not just 'listening to.' The level of attention may be casual and distracted, or in a state of readiness, and its scope may be global (a general 'scan' of the entire environment) or focused on a particular source to the exclusion of other sounds. However, in each case, listening can be consciously controlled” (18).

The World Soundscape Project (WSP) came into existence in 1971 at Simon Fraser University’s School of Communication. The WSP’s focus was a comparative study of the world soundscape: researching aural perception, noise pollution and sound symbolism among many other fields, in an attempt to unite the arts and sciences of sound studies in preparation for a study of acoustic design (Schafer). The WSP also developed the field of Acoustic Ecology, defined by R. Murray Schafer as “the study of the effects of the acoustic environment or soundscape on the physical responses or behavioural characteristics of creatures living within it. Its particular
aim is to draw attention to imbalances which may have unhealthy or inimical effects” (271).

The understanding of an acoustic ecology has since expanded, with many contesting Schafer’s aesthetic standpoint (Wagstaff), or seeking to include the technological mediation that Schafer implicates in creating this ‘unhealthy imbalance’ (Tim Buell, in the preface to the *Tuning of the World Proceedings, 1993*). It is best to understand Acoustic Ecology as the study of our position inside the soundscape – the interaction between individual, sound, and environment.

### 2.1 Soundwalking

A soundwalk is framed as a time of dedicated listening. Allowing all sounds of the surrounding environment to be heard equally, without bias. Hildegard Westerkamp writes: “soundwalking is a practice that wants to bring our position-inside-the-soundscape to full consciousness. ... Or, to put it another way, it is worthwhile to devote a certain timespan to the act of listening, no matter what may meet the ear” (12, 2008). The practice of soundwalking developed out of the WSP, as a response to the lo-fi sounding environment and as an educational method to encourage refined listening. Initially, soundwalks were designed as exercises, a means to reinforce Schafer’s idea of ‘ear cleaning.’ Early soundwalks were also scored prior to walking, with more emphasis on a repeatable individual experience in understanding the sounds of an environment.

Each performance of a soundwalk exists as a singularity – a one-time intersection of time, space and event. An ‘average’ soundwalk consists of a group of people moving through an urban or rural environment with a focus on the act of listening. The route is predetermined by a composer/leader to explore or highlight the unique acoustic character of the area. In an urban setting, sounds encountered

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*Schafer defines ear cleaning as “a systematic program for training the ears to listen more discriminatingly to sounds, particularly those of the environment” (272).*
include traffic, weather (in Vancouver, rain is a common addition to many soundwalks) other people, ambient electroacoustic and acoustic music and, of course, each participant's internal monologue.

By focusing on the listener's interaction with their surrounding environments during a period of dedicated listening, soundwalks are a fairly simple entry point to ideas of acoustic ecology, as well as opening the listener's ears to a heightened engagement with the everyday sounds that he or she may gloss over or filter out in their regular experience. Group soundwalks create the rare experience of a social activity that exists without speaking. To move through an environment, and spend an hour or so together in silence creates a strong sense of community and the feeling of having shared something profound with the rest of the group, despite the unique experience of each individual. After a soundwalk, it is common practice to sit and discuss the walk, sharing experiences, reflections, and giving the group a chance to reflect upon the experience.

Through soundwalking, listeners become participants – moving through the performance area, contributing to the sound field they are investigating through footfalls, bodily sounds, or other activation of the space such as clapping, singing, or instrumental sounds. It is up to the individual to 'take' and contribute as much or as little from the experience as they like.

2.2 Soundwalk Composition

Composing or leading a soundwalk is a very different experience from participating in one. The leader's attention shifts from an experience of self-in-relation-to-environment, to one encompassing the entire group, monitoring pace, traffic, and the welfare and safety of all the soundwalkers present. In the composition of a walk, it is up to the individual composer to decide how he or she wants to express the sonic qualities of a location. Time and day are important factors. A site will not always sound the same, sometimes sounding in a completely different way than it
has before, right in the middle of a public walk — even after an exhaustive exploratory
and scoring process. A score for a soundwalk is generated in a number of ways. Some
soundwalkers use maps, charting their route after a walk, others navigate at street
level, moving from one landmark (or soundmark) to the next. Without exception, a
soundwalk composition begins with exploratory walks. The composer must begin to
understand the sounding space by experiencing it. Once the sounds of the space have
been identified, it is possible for the leader/composer to begin arranging the route.
Despite the many approaches possible, it is most important to understand a
soundwalk as primarily consisting of two elements: a dedicated period of listening,
and a one-time intersection of time, space and event. Westerkamp writes: “one can
attempt to find a route that keeps the ears alert, i.e. that offers changes and contrasts,
opportunities to rest overburdened ears, etc. But what occurs during the planning of
a soundwalk route may not happen at all during the final group walk. There will
always be unexpected changes such as weather or other occurrences of more or less
significance onto which the listener/composer has little or no influence. Crucial then
for a well-led soundwalk that encourages an atmosphere of deep listening and allows
participants to feel safe, is the leaders’ ability to stay present in their own listening,
no matter what surprises or changes may occur” (2008; 16).

Through this dedication toward listening, soundwalking draws the listener
into a more active engagement with the acoustic environment, re-integrating all
sounds into the realm of the listener’s perception. By actively engaging with the
acoustic environment, the soundwalker can begin to understand their role within it,
gaining a heightened awareness of the spaces they occupy and what goes on within
them. Taking the ‘noise’ of the world and accepting it as signal – something worth
listening to. In contrast, electro-acoustic listeners often respond negatively to the
‘noise’ of the acoustic soundscape, using music or other sounds to create surrogate
environments for themselves. In these surrogate environments, the listener
maintains control over most elements: what to listen to, how loud to play it, even the
ability to block out other ‘unwanted’ sounds from their aural environment.
3 Electro-Acoustic Listening

The technological interventions that provoked the WSP and its concern for Acoustic Ecology have not only fuelled the omni-present 'noise' of the world, but have fundamentally altered the way we choose to listen. Specialized listening practices have been developing over the past century (and even before) to incorporate technological mediation. From speakers to headphones, listening has changed to incorporate electroacoustic transduction of audio signals. This shift has created a schizophonic relationship between sound and space, with listeners often experiencing one aural space encoded in their reproduced soundscape overlapping the acoustic space they are inhabiting. With electroacoustic technology came the ability to record and represent sounds. This ability frees sound from its source and has led to sound existing as a commodity. As listeners accept sound freed from space, and commodified sounds on demand, their understanding of the soundscape shifts — necessarily, as the soundscape now includes elements generated outside the immediate environment, and accessible to the listener, at any time, in any place.
3.1 Audile Technique

To begin, I feel it is most important to define terms. Jonathan Sterne provides excellent support for his choice to use the slightly anachronistic “audile technique” in *The Audible Past*. He separates audile and listening, with audile functioning as an adverb or adjective, and listening as a verb. ‘Audile’ itself can be defined in two ways: (n) a person for whom ‘auditory images’ are predominant over tactile and visual stimuli and (adj) of, pertaining to, or received through the auditory nerves. He uses audile to “connote hearing and listening as developed and specialized practices, rather than inherent capacities” (96). In this paper I will be adopting his usage of the term. Sterne further defines listening in an extremely practical way to allow for analysis of developing practices with four implications:

1. Listening becomes a technical skill, a skill that can be developed and used toward instrumental ends.
2. In order to be a tool of rationality (and for itself to be rationalized), it [has] to be constructed as a discrete activity.¹
3. Concurrent with the separation of hearing from the other senses is a reconstruction of the shape of acoustic space. Audile technique [is] not simply a representation of acoustic space; it [aims] actively to transform acoustic space. The space occupied by sounds becomes something to be formed, molded, oriented, and made useful for the purposes of listening techniques.
4. Audile technique problematizes the shape [and content] of acoustic space. On the basis of their sonic character, sounds become signs – they come to mean certain things. Technical notations of listening depend on the establishment of a code for what is heard, but exist without an effective metalanguage. A metalanguage of sound would consist of a non-specialized set of terms that [enables] people to describe the details of audile experience in a purely abstract manner. ... Audile technique would come to stress practice and practical knowledge rather than formal and abstract definitions of sounds (93-4).

Sterne touches on some very important distinctions in this definition: the separation of sound and space and the necessity of practice and practical knowledge.

¹Thus separating listening from hearing.
In the development of the modern listener, the telephone provides an excellent example. Early users had a difficult time deciphering the sound of the voice from the other sounds present on the telephone line. As the technology developed, specialized listeners developed alongside. Now, we find listeners embracing an extremely isolating individuated audile technique, one that sends audio signal almost directly into the ear canal. These listeners accept the technological mediation necessary for this technique effortlessly, as though it has always been done this way. In some form or another, audile technique has always been mediated. As Sterne describes, “techniques of listening are based on and described through a language of mediation. Audile technique is premised on some form of physical distance and some mediating practice or technology whereby proximal sounds become indices of events otherwise absent to the other senses” (92).

Through this individuated audile technique, listeners are able to create a much stronger, more direct surrogate aural environment for themselves, effectively removing themselves from the sounding world around them. This surrogate environment is made mobile through the use of personal portable audio devices.

### 3.2 Personal Portable Audio

Personal portable audio (ppa) systems such as the Sony Walkman, Discman and the Apple iPod have created the ability to experience music in contexts that are uniquely detached from the material spaces listeners inhabit, the ambient soundscape environment, and the acoustic conditions of the music’s production. By allowing listeners to define the sounds they choose to experience in any location, ppa helps people to transport themselves into what can be identified as a virtual aural space, one which is accessible only to the individual using the ppa device. As listeners move through the world in these virtual sonic venues, their perception of acoustic aural information and material space is constantly mediated through ppa technology.

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*I use the term ‘virtual’ here to mean something existing in essence or effect, though not in form.
Any person moving through space generates sound, creating an aural feedback loop between themselves and their surrounding environment. Models of acoustic communication (Truax) can be applied to the flow of sonic information between the individuated audile technique of the ppa listener and their environment, both inside and outside their headphones. The standard model of acoustic informational flow:

\[
\text{Sound} \quad \text{Listener} \leftrightarrow \text{Environment}
\]

becomes:

\[
\text{Sound} \quad \text{Listener} \leftarrow [\text{Masking}] \quad \text{PPA} \leftrightarrow \text{Environment} \quad [\text{Filtration}]
\]

where the direct flow of acoustic information from the environment is interrupted by ppa, reducing the listener's direct, ambient acoustic horizon to what may be termed the intimate sphere,\(^3\) and causing all other environmental feedback to be mediated by the ppa. Two types of mediation occur, filtration and masking. Filtration occurs as the listener blocks the ear canal with a listening device (e.g. earbuds, headphones, etc.). Occlusion, i.e. placing a physical object (e.g. earplugs) between the ear and the acoustic environment, attenuates the sound and alters the range or spectrum of frequencies the listener experiences. Generally speaking, occlusion attenuates the high frequencies, as well as making low frequency internal body sounds and vibrations more apparent. This mediation is not cognitive or perceptual, but physical. Masking occurs when two sound sources have a similar

---

\(^3\)This sphere is very similar to the “Intimate” proximal distance zone described by Edward Hall in *The Hidden Dimension*, but in this case is used to define only an aural demarcation of space.
frequency spectrum. The ear analyzes these two similar frequencies in the same way, causing the perception of independent sound sources to overlap. As a result, the louder or more direct sound source overpowers (masks) the other and the brain perceives that signal as the only source. In this way, a ppa user is using their music to overpower any sounds outside the intimate sphere, thus 'removing' ambient sounds from their perception of the sonic environment.

Ppa technology creates an extreme example of a schizophonic experience for the listener, isolating their personal sphere from the rest of the soundscape, and separating their perceived aural environment from the physical one surrounding them. Westerkamp (1988) identifies this separation, and, more importantly, a desire for this separation, as existing not only in the perception of the environment, but also on a social level. Writing here about the Walkman:

The effort or desire for selective listening, however, remains directed away from the environment, away from community. The Walkman creates an extreme social separation from community. Music-as-environment does the same thing in a less obvious fashion. But when we consider that most public indoor environments contain music and when we consider that most people put music into their private living space as an acoustic backdrop to their life, it becomes obvious that music-as-environment has the same function of Walkman listening: that of social separation (32).

Michael Bull has gone further, interviewing ppa users around the globe and examining how and why people listen to portable audio. In his 2006 paper, “Investigating the Culture of Mobile Listening: From Walkman to iPod”, Bull outlines 9 social usage patterns of ppa use which I have paraphrased here as:

1. Blocking out any external sound
2. Moving through space and time with accompanying soundtrack
3. Aestheticising the environment
4. Immersion in own auditory world
But is the function of the music separate from the function of the mobile technologies? In his analysis of ppa users, Bull examines only the how and why of their usage patterns, not the content. Andrew Williams re-examines the mobile listener and their relationship to specific musics. He reworks Bull's patterns of use, with the focus on the act of listening. Through this attention to the listener he identifies a secondary mode of environmental aestheticisation, one “where listeners recounted experiencing portable music in combination with the sounds, not just the sights, of their environments” (26, my emphasis). Williams goes on to quote Steve Connor, who writes: “the Walkman-user is often creating a kind of a chance collage between the sounds that are filtering through and are purely contingent and the organized sounds that they're hearing” (43). This is the only interaction between ambient sound sources (and potential auditory spatial information) that Williams mentions. However, this function of use, despite the inclusion of environmental sound, is primarily about the listener placing themselves in a detached or virtual space with any synchronicities between recorded sound and environment existing as irregular, fleeting moments. What makes the synchronicities interesting is the unexpected correlation between two very different aural spaces, sounding together in harmony, and the listeners willingness to create a relationship between the two, as if the world were unknowingly performing along with their personal soundtrack.

Williams discusses boundary demarcation as another function of ppa use, adding that the stereo space encoded in the recordings listened to by ppa users can provide them with a virtual venue, one where “listeners perceive the effect of sound coming from different directions in three-dimensional space, apparently larger than the real space defined by their headphones” (43). Michael Chanan (1995) attributes the capacity of portable music to create a virtual space similar to its stereo image, suggesting listeners understand their music's stereo image to correspond to their
own personal space. Williams reinforces the idea that ppa listeners' experiential perspective of space exists in a virtual plane – to the point where their definition of personal space in public interactions is defined by their auditory perception of virtually produced, digitally encoded stereo space.

Modern digital processing allows engineers to use complex algorithms to create artificial spaces that allow sound to behave within them as it would in real acoustic spaces (Blesser). The virtual auditory spaces created may be nearly indistinguishable from real spaces, and because their perceptual information is transmitted directly to the ear canal – overriding any ambient spatial information – these virtual spaces come to exist as personal space for ppa users. These artificial spaces may provide virtual venues for physical bodies seeking respite from crowded transit and noisy streets or simply the opportunity to control their immediate environment.

This immersion into virtual space results from the separation of the intimate sphere from conventional modes of auditory feedback through continued use of ppa. These listeners disengage from noisy sound environments, immersing themselves into a schizophonic soundscape of their own construction, thus mediating all interaction with the lifeworld both socially and acoustically. Through functions of control, environmental aestheticisation and boundary demarcation, listeners create a new relationship between their personal experience and the external environment. This relationship reduces the possibility of apprehending ambient sonic information through the use of direct signal transfer to the ear canal, and uses virtual spatial information encoded in their chosen musics as surrogate venues for their public personal space. By limiting their engagement of sonic feedback within a space, despite their unintended soundmaking (footfalls, etc.), and by exchanging virtual spaces for acoustic ones, ppa listeners further disrupt the natural balance between soundmaking and listening in their acoustic environment. Listeners use ppa technology and the virtual spaces encoded in contemporary recordings to create a non-stop, seamless, virtual spatial accompaniment to their lives – a venue that exists outside of material space and purely for use by the individual.
It is important to note that even though it may seem that background music has prepared the way for the individuated audile technique of ppa, the essential difference is the amount of choice the listener has over their accompanying soundscape. The electroacoustic listener's lack of control over their acoustic environment is counteracted by their increased control over their surrogate, virtual environment. How will listeners react to environments presented through this technological mediation that are beyond their realm of control? Can artistic practice utilize ppa technology to transport listeners to designed or re-presented spaces?
4 Listening and Art Practices

Over the last four decades, audio artists and composers such as R. Murray Schafer, Hildegard Westerkamp, Steve Heimbecker, Christina Kubisch, and Janet Cardiff have been creating work that has changed the way we listen. This new type of audile technique involves the audience as a Listener/Participant, which is an extension of the mobile listener, which itself evolved from the electroacoustic listener. The key distinction of the Listener/Participant is the integration of their active presence and participation as a necessary element in the generation or actualization of the piece of art. Much of my own artistic practice is dedicated to exploring this relationship between a piece or project and an active, engaged listener.

Through the integration of the ambient soundscape into art practices with soundscape composition¹ and the move toward an active, mobile ear with soundwalks, the contemporary listener has been invited to accept the “Big Noise” (Thompson, 2002, 120) of the urban soundscape into the ‘musical’ genre. This invitation has been extended to include the audile technique developed by ppa users. Some audio artists have begun re-appropriating the isolating, individuated listening of ppa devices to capture a unique intersection between time, space, and event — creating an individuated, yet collective experience for their listeners.

¹Truax, http://www.sfu.ca/~truax/scomp.html
It is clear that noise created a problem for the modern listener. Be it the din of the city, the overly reverberant space of lecture and concert halls or the static on the radio, the modern listener was called upon to be very discriminating in separating signal from noise. R. Murray Schafer (1977) defines noise as:

1. *Unwanted sound.* The Oxford English Dictionary contains references to noise as unwanted sound dating back as far as 1225.

2. *Unmusical sound.* The 19th C. Physicist, Hermann Helmholtz employed the expression 'Noise' to describe sound composed of non-periodic vibrations, by comparison with musical sounds, which consist of periodic vibrations.

3. *Any loud sound.* In general usage today, noise often refers to particularly loud sounds. In this sense a noise abatement by-law prohibits certain loud sounds or establishes their permissible limits in decibels.

4. *Disturbance in any signalling system.* In electronics and engineering, noise refers to any disturbances which do not represent part of the signal, such as static on a telephone or snow on a television screen.

Each of Schafer's definitions is well suited for integration into Douglas Kahn's discussion of the 'line' from *Noise, Water Meat* (1999), but *unmusical sound*, and *disturbance in any signalling system* have the most direct application to the evolving (and often subjective) relationship between music and noise. Kahn begins by describing the line as "exist[ing] as a reservoir and not a residue, and as a reservoir and a residue. . . . The trade-off is that the line contains noise, in both senses of the word contain. It stores noise in its intensification while suppressing noise in the purity and simplicity of the line, and a similar process takes place when noise is controlled discursively by a line of demarcation, whether posing as a considered theoretical position or appearing as plain common sense" (72-3, original emphasis).

He goes further into a musical analysis of the line, using it to divide sounds within western art-music into noise and music. He traces the history of the privileged sound of music from Pythagorean thought, where periodicity within the rhythm of speech and the generation of tones gave these types of sound special importance on a personal and cosmological scale, through Helmholtz and his work *On the Sensations of Tone*, where 'noise and noisy figures' (crashing waves) were an enemy in the
understanding and appreciation of the privileged, periodic sounds (the vibration of a violin string). As Kahn describes, the line became muddled over time, with noisy elements such as the dissonances generated by the glissandi of sirens (Varèse) or mimicry of environmental elements in programmatic music (Grainger) slowly finding their way toward being accepted into western art-music practice.

Kahn's concept of the line between signal and noise exists in other forms. The noise of the world inspired the concept of an Acoustic Ecology, leading to soundwalking and soundscape composition, both of which exist within the line between signal and noise; embracing the noise, containing it, while still retaining an otherness or some separation from it.

The noise of particip/action is the perceived interference of one's action or activation within an art work or installation. I would like to explore this noise further, as it relates to my work. There are three excellent examples of art practices that exist in the line surrounding this type of noise, Janet Cardiff, Christina Kubisch and Steve Heimbecker. In addition to these three, many other artists are engaged in the relationship between sound-installation and the listener/participant. These artists are exploring the audile technique developed for ppa, often subverting it, re-appropriating the individuated audile technique and combining it with mobile sound-art with an attempt to integrate the listener and their environment.

### 4.1 Soundscape Composition

Soundscape composition developed in parallel with the work of the WSP, as a means of exploring and re-presentation the sounding environment in another context. It is best characterized by the use of recognizable sounds and acoustic contexts. Through the use of environmental sound, often with minimal electro-acoustic processing, soundscape composition draws attention to environmental sound by presenting it in a more formal presentation format (e.g. concert hall, compact disc).
Initially, soundscape composition techniques were minimal, using crossfading and transparent editing to simply take a slice of a sound environment and re-present it. As the field developed, composers such as Barry Truax and Hildegard Westerkamp began exploring alternate and/or imagined spaces created through more complex editing and processing. With the development of digital and computer technologies, soundscape composers are able to manipulate time and space through multi-octave pitch shifting, granulation and artificial reverberation. However, despite the increased possibility for abstraction, the intent within soundscape composition is always to reference a specific context, and “to reveal a deeper level of signification inherent within the sound and to invoke the listener’s semantic associations without obliterating the sound’s recognizability.”

Barry Truax outlines four principles of soundscape composition:

1. Listener recognizability of the source material is maintained
2. Listener’s knowledge of the environmental and psychological context is invoked
3. Composer’s knowledge of the environmental and psychological context influences the shape of the composition at every level
4. The work enhances our understanding of the world and its influence carries over into everyday perceptual habits

It is important to note the importance given to the listener’s participation in soundscape composition. The composer should keep these principles in mind when creating, but it is up to the listener to recognize and understand the composition’s context.

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4.2 Technologically Mediated Composition

Christina Kubisch and Janet Cardiff are both working with ppa devices and the individuated audile technique that has developed alongside. Both artists use ppa

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2www.sfu.ca/~truax/scomp.html
3Ibid.
devices as a medium with which to explore a space. Their listeners must (as with soundwalking) be active or mobile in the space, but use the ppa device to extend their awareness into the surrounding environment – a technologically mediated soundwalk. The use of ppa as medium is contrary to the expected usage pattern of these devices. In fact, this function of ppa is contrary to the definitions of listening (specifically listening as a private act, existing outside of acoustic space) that Sterne wrote about. Paul du Gay (1997) describes the cultural impact of the Sony Walkman, beginning with some of the initial negative reactions toward the integration of the private act of individual listening into the public sphere. Quoting the writing of Iain Chambers (1990): “its uncanny quality lies in the deliberate confusion of earlier boundaries, in its provocative appearance 'out of place'”. It is interesting for a mobile device, one that allows users to move freely through space, to be considered 'out of place'. There was simply no conceptual framework within the existing social structure that allowed this new type of activity to take place. du Gay continues: “the Walkman took those elements associated with private listening and allowed them to leave their normal position within social space, and enter a domain where they were socially and symbolically 'out of place'. . . . [T]he Walkman created something of a 'moral panic' when it appeared, precisely because of its transgression of established symbolic boundaries” (116).

Despite this 'moral panic', the use of ppa devices as a form of boundary demarcation or as a vehicle for immersion into a virtual venue became extremely popular. As I have previously discussed, ppa users enjoy the sensation of three-dimensional space expanding past the real space defined by their headphones (Williams). It is also important to reiterate Chanan's writing regarding the capacity of portable music to create a virtual space similar to its stereo image. He suggests listeners understand their music's stereo image to correspond to their own personal space. Williams and Chanan reinforce the idea of a specific audile technique developing for ppa users where the listener's experiential perspective of space exists in a virtual plane – to the point where their definition of personal space in public interactions is defined by their exchange of the acoustic environment for a virtual, encoded stereo space.
In contradicting this accepted practice, Cardiff and Kubisch treat the noise of the environment the listener occupies no longer as the disruption of a signal, but as a way of drawing their listeners outside the convention of individual isolation within ppa-based audile technique. Carolyn Christov-Bakargiev writes about experiencing one of Cardiff’s Audio Walks:

Cardiff layers sounds over the real perceptions one experiences while walking in a specific environment. ... Her voice seems to emerge from within your own body. You slip in and out of 'being her' as the sounds swirl around you. Her own and other voices are layered with sounds – birds chirping, gunshots, footsteps, music and singing – so that the artificial environment produced by the binaural recording blends with the real environment in which the person is immersed (22).

It is this interplay between the real and the composed spaces that make Cardiff’s works so interesting – utilizing the conventional audile technique associated with ppa devices to transport the listener to a heightened perception of their surrounding environment. In fact, the Audio Walks counter the listening convention that problematizes acoustic space, while simultaneously embracing the function of the device and our audile technique that allows her to create this intimacy, this ability to 'be her'. As with Schafer and Westerkamp, Cardiff’s work contains elements of acoustic ecology. “She acutely perceives the excess of noise in most urban environments as a sensory overload, and she finds the cacophony painful. By layering her meaningful binaural soundtracks over the environmental noise, she literally shapes sound, and her Walks restore a sense of auditory pleasure, reawakening senses that had become numbed” (Christov-Bakargiev, 23).

These Audio Walks place the individual experience of the listener in relationship with two intersections of time, space and event: one being Cardiff’s prerecorded time/space, and one unfolding in front of the listener. (In fact, there is a third space, existing in the unique combination of the previous two.) By having each individual move along with Cardiff’s narration, the listener becomes participant. Their actions are necessary for the piece of art to function properly. Other works by
Cardiff integrate the listener on a more tactile level. Her installation *To Touch* requires hands-on activation.

[The piece] is visually simple: a darkened room with a central wooden table. Hidden wires connect the table to speakers lining the gallery’s upper perimeter. Drawn to the only object in the room, the viewer touches the table, activating a series of sounds that change with the movement of the hand: whispers, stories, sighs, and other sounds triggered by various areas of the surface. ... The installation remains passive and mute, a table in an empty room, without the viewer’s participation” (Sherry Gaché from Christov-Bakargiev, 48).

Here, Cardiff is drawing listeners into a dialogue between the sounds they are triggering and their tactile interaction with the table. With this type of interactive installation, it becomes easier to apply the listener/participant label. The piece cannot function until someone interacts with it, and as the listener engages with the piece, they begin to uncover narrative fragments and other sounds that tell the story of the piece so that their internal engagement is dependent on their external engagement with the physical object in physical space.

Christina Kubisch’s *Electrical Walks* embrace a noise similar to Cardiff’s *Audio Walks*, but instead of using prerecorded sound heard through ppa devices to bring the listener/participant into a new relationship with their environment, Kubisch draws the listener into the aurally un-hearable world of electromagnetic frequencies. Rob Young describes Kubisch’s work in the collection *Her Noise*:

Her *Electrical Walks* source their raw material from electromagnetic waves, the foundation of most practical uses of electricity since its discovery at the dawn of the Industrial era. The piece takes sounding of ambient electromagnetic waves, giving participating listeners the opportunity to put

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4This internal engagement is something that could be experienced in a more physically passive art-experience, such as sitting in a concert hall, or observing a piece of visual art from an aesthetic distance. It is still possible to engage with the artwork, but there is a physical separation between art and the person experiencing it.
on a pair of wireless headphones and step instantly into the hidden
dimension of universal noise. Experiencing one of her wireless headphonic
installations, one walks beneath electric wires strung across a room or
forming a lattice above an open space, is a little like crossing the threshold
into another dimension – a humming, buzzing aural environment that
registers the inaudible range of clashing magnetic fields. These signals are
emitted constantly from a wide range of sources including fluorescent
lighting, electric transformers, burglar alarms, CCTV, mobile phones,
computers, antennae, satellite navigation systems, electronic cash registers,
etc. Transmitted to the ears by a process of electromagnetic induction, these
sounds reveal the breadth of information and power flow that is ever-present
in the environment but unlegislated due to its invisibility (35-6).

Kubisch utilizes many forms of noise in her work: the noise of participatory
action, subversion of the conventional, internalized headphone/listener relationship,
not to mention the audio content itself, which would be considered by most art-
music listeners to be vile, unwanted sound. Kubisch gracefully soars across the line
separating noise and music, and the line between listening and participating by
drawing people into this alternate sonic dimension – one that brings new depth to
their experience of the world and allows them to realize the beautiful (and terrible)
sounds produced by the electronic devices we surround ourselves with. Her works
have gone the farthest in the integration of these noises into the listener/participant’s
experience. Both content and form embrace this new type of audile technique.

As gallery-goers learn to hear the forms of noise generated by these artists,
the audile technique necessary to create the listener/participant has already
developed. With the knowledge of these techniques, artists are able to create
interesting and challenging pieces that involve the listener in a way where the
individual is personally responsible for activating and/or actualizing any or all of the
sonic possibilities in the installation or experience. As the listener/participant moves
through the presentation space, it is their choice that determines the intensity or
level of involvement with which they will experience the piece. Linking participatory
installation with the act of listening heightens the experience, drawing the
listener/participant deeper into the soundscape that they have, in part, control over. This heightened sensation of listening (brought about by the knowledge of and ability to actively manipulate the installation as a participant) could encourage transubstantiative, transcendent and/or immersive qualities and possibilities in the reception of the work.

4.3 Process-Based Composition

Steve Heimbecker approaches the ambient sounding-environment in a very different way than the aestheticized ear of soundscape composition or the attentive ear developed though soundwalking practice. With his series Songs of Place (2005), Heimbecker explores an abstracted series of processes to uncover the unique sonic quality of a place. The series creates audio and video portraits of 4 Canadian cities: Vancouver BC, Springwater SK, Montréal QC, and Halifax NS. The audio portraits are composed of recordings made using a process Heimbecker calls “squaring the circle,” where multi-channel “Acoustic Mapping Process” (Heimbecker, 25) recordings are made at 8-10 locations around the city all predetermined by an arbitrary paper-and-pen mapping process. Heimbecker “implements a grid-like network or mapping to capture a representation of a complex sound space that is far too large in area to be able to record from a single point of view. ... In the series Songs of Place, [he] first looked at a detailed land map ... second, [he] looked for the centre of the community (always geographical), and expanded [his] view to the outer wall of a circle, which must always be informed or constrained by the geographical. Then [he] divided the circumference of the circle into 8 locations, each representing one of the 8 major directions” (33). The recordings made from these locations were then taken into the studio where “these recordings are layered and edited together with another system of [Heimbecker's], Dynamic Voltage Mapping. ... DVM is a surround sound editing technique using analogue and digital technologies. The surround sound complexities of one set of sounds can be used as an 'invisible' amplitude editing template on another set of surround sounds, tonal patterns, or noises, to create spatial illusions in the second set of recorded surround sounds which refer to the spatial movement of the first set” (29-31).
These audio portraits complement the visual accompaniment of video shot at each surround-sound recording location and edited together using a system similar to DVM. These pieces are chaotic and jagged, and listeners often react unfavourably to the noisy content or to the way the sounds of their city are presented. His process brings unwanted sounds to the forefront of the listener's experience. He creates an unbiased audio portrait – showing the good features of these sounding-environments equally alongside the bad. What separates Heimbecker's work from Schafer's is the amount of abstraction used in the creation of these portraits. Heimbecker's compositions are more about the process than the product. In this way, he is playing not only with the noise of the ambient sound environment, but also with technological noise – using computers and compositional structures like AMP and DVM to generate a new layer of noise within the sound field he is creating. His process exists as a noisy means toward abstraction of content.

4.4 Conclusions

Heimbecker's work is important to include as a contrast to Cardiff and Kubisch's work, which, like more traditional soundwalks, are composed through a longer process of movement through the space to be recorded or presented. In Songs of Place, the compositional methodology is pen-and-paper, using only a map to set his recording locations. It is this abstraction, this freedom from aestheticisation that distinguishes his work. In ceding his compositional choice to his various processes, he is opening up the possibility for the essence of the sounding space to come through. The soundwalk-based methodology approaches this same pursuit of the essence through the subjective mediation of the individual composing within the space. In my own project, sound.garden.scape: Gostown, I approached the sounding space with a combination of map (abstract) and foot (direct) based exploration. This combination continued throughout the project, using a paper-based mapping system to define my recording locations, which I then explored with the more direct soundwalking method. Compositionally, I embraced the early style of soundscape composition, using only a small amount of transparent editing, and no processing whatsoever.
Cardiff and Kubisch are both exploring technological mediation and the 'noiseless audio' created by ppa's individuated audile technique through direct signal transfer to the ears, placing their listener in an active role within the work itself. Seen in an artistic context, these devices and listening practices allow the artist to place their listeners in any environment imaginable. It is no longer necessary to restrict sonic art to a gallery or concert hall. Site-specific works can become a self-directed activity for listeners, taking their ppa device to a location along with a copy of the artist's work, and activating their own experience. It is also possible to appropriate these conventions of use to place a listener in an alternate environment. This is something I approached with my project – using the mobile, individuated listener as an instrument within my composition, and letting the listener use the installation I created around this composition as their instrument to explore, interact and engage with. What makes this effective is the ability of the listener to be comfortable enough with the technology to allow themselves to forget about it – ppa listeners are already comfortable with accepting the spaces they hear through these devices as an extension of their personal space (Chanan), so they are quick to accept what they hear as representing an alternate interactive space and are eager to explore it.
My creative work focuses on utilizing this interaction between listener and environment as a means for greater artistic expression. The traditional soundscape model of the relationship between listener, sound and environment needs to be extended to include the listening practices and audile technique developed for ppa – listening as a mobile, individuated experience. Here it is important to continue this extension into terminology. The terms Soundscape or Sound Field include all ambient aural events and sensations, but with the introduction of individuated listeners, the term Aural Environment is best suited to describe the listener’s relationship between sound and space. With individuated listening, the ppa user is actively constructing and manipulating what they hear, fabricating their involvement in the relationship between time, space and event. By describing what they hear as a unique aural environment gives the listener credit (or responsibility) over the choice of the dominant sonic elements surrounding them. I seek to create new links between personal portable audio devices, soundscape composition and soundwalking, allowing listeners to explore sonic spaces through technological mediation. This project inverts the conventional use of these devices, creating a shared experience of a unique aural space for the listener/participants engaged in the installation.
5.1 *Previous Work*

In order to situate my current project, and to provide a background of my artistic practice, I would like to describe two previous projects. The first work I would like to discuss is my composition *NO.10 Granville*. This work was composed as underscoring for a portion of Vancouver's 10 GRANVILLE bus line, travelling from Princess Street to Robson Square downtown. Each listener heard the composition on a ppa device while walking up Princess Street from SFU's 611 Alexander Street studio space, while waiting for the bus on Hastings, and through the duration of the bus ride. The composition was designed to challenge the listener's ear, blending both processed and unprocessed prerecorded sounds collected from other bus rides with the ambient texture of the actual bus the listeners were on. In addition, landmarks along the route acted as compositional triggers for musical electroacoustic compositions: Chinatown, The Only Seafood, the Cenotaph and the entrance to the skyscrapers of downtown all have specific compositions. There was a series of 16 Polaroid photographs accompanying the composition. Each of the landmarks was documented as well as photographs detailing the route, the method of transportation, the destination and the street intersections.

With *NO.10 Granville*, my focus was on using ppa's individuated, mobile, audile technique as a means of composing an aural environment that included both the sounds inside and outside the headphones. In fact, it is the interplay between these two sets of sounds that makes the piece work. By integrating the ambient sounding space, *NO.10 Granville* asks the listener to begin treating the noise of the world around them as something other than noise – to begin thinking outside the accepted audile technique for these devices. Their embodied interrelationship with the sound and space they are occupying is essential for the piece to function properly. To listen to *NO.10 Granville* at home is possible, but it would be like listening to a symphony without the violin section.

This piece is an ongoing work. Listeners are free to take a copy of the piece and perform it themselves at any time. In this way, each iteration exists as its own
singular intersection not only between time, space, and event, but also between the prerecorded sound and those being ‘performed’ live.

The next project I would like to discuss is Sound Canoe, presented at 11:30pm, August 12, 2007 on Regina’s Wascana Creek during the height of the Perseid meteor shower. This project consisted of a silent canoe trip along a portion of Wascana Creek (part of Regina’s urban waterway and multi-use pathway system), followed by a site-specific musical performance underneath the Elphinstone St. bridge. The work took place on a stretch of the creek between Elphinstone street and Lewvan Drive. The participants met at a nearby street address, where they were given life jackets and paddles. As a group, the participants and the performers all walked into the park where the canoes had already been unloaded. Once everyone was in their boats and on the water, the group paddled in silence, using the soundwalking model of a period of time dedicated to intense listening. Instead of the syncopation of footfalls normally associated with public soundwalks, this event featured the drip, swish, and gurgle of paddle strokes.

Following this first section, the group floated into the darkness underneath the Elphinstone Street bridge. Here the participants and performers separated, with the participants holding on to lengths of rope strung under the bridge, while the performers tied on to one of the walls. The performance section began with the burning of sage and sweetgrass. The piece featured four instrumentalists/vocalists performing a scored improvisation based on material developed under the bridge. The drive behind this work was to accentuate and bring to life the unique architectural acoustics underneath the Elphinstone Street bridge, to create something beautiful out of this under-heard sounding space. This bridge is an amazing venue for sonic experimentation: the acoustic properties of the unique shape of the bridge (a parabolic arch with parallel walls) are further amplified by the reflective ‘floor’ of the creek. The acoustic reflections in the space are beautiful: long, reverberation and slap-back echo blend together, creating the sensation of an alternately vast and compact space. The resulting sound within this space cannot be digitally or ‘virtually’ reproduced – this is a one-of-a-kind sonic experience.
The composition was created in the space and for the space, utilizing percussion, brass, woodwind, string and vocal sources, separated in six sections, each highlighting a different quality of the space or combination of instruments. The most effective devices were repeated pulsing sounds, such as shakers, rattles or fast clapping. These could be performed at a speed to correspond with the echo within the bridge and (when clapping or drumming) tuned to activate fundamental resonances. The instrumental sections were also tuned to the space, and consisted of longer, more melodic figures contrasted by short, sharp attacks to accent the quality of the echo.

I found the direct interrelationship between the space and the sounds created within it to be the most interesting element in the creation and performance of this piece. In addition, the participants had to be present (in a very physical sense of the word). Because the piece took place late at night, much of the initial section, the 'sound-paddle', was in semi-darkness, and the entire musical performance was pitch black, save for the view of the creek on either end of the bridge. This work demanded much of the participants, not only the physical skill to canoe, but the stamina to stay up late and the presence of mind to stay silent during the nearly two hour duration of the paddle and performance. Those who experienced the work reacted very similarly to those attending other soundwalks, expressing a heightened sensation of the sounding world and a strong reaction to the musical performance as a result of the time spent listening intently to the ambient sonic environment before heading into the unique sounding space of the bridge.

5.2 SGS Project Outline

*sound.garden.scope:* *Gastown* is a virtual soundwalk, presented as an interactive installation. Using portable radios, visitors are free to walk through an interactive re-presentation of Vancouver's Gastown area. This hands-on installation combines the performative singularity and participatory interaction of the soundwalking experience with the intimate sonic relationship we have with personal portable audio to create an alternative, immersive sonic environment for dedicated
listening. The installation was presented at VIVO Media Arts Centre from May 15-17, 2008.

This installation is made up of 8 short-range FM transmitters broadcasting binaural soundscape recordings collected from 8 locations around Gastown. These locations were selected by inscribing a series of circles onto a map, followed by exploratory listening walks and binaural recording sessions in each of the geographic areas within the circles. This mapping system was then applied to the floor space within the VIVO studio, and FM transmitters were placed in the centre of each circle. Each location is broadcast on its own FM frequency and the sound generated by the transmitter gets stronger and clearer as the listener moves closer to the broadcast location. In this way, as the listener scans the FM dial and moves through space to the appropriate location (see frequency listing), these broadcast areas correspond to real space. Each broadcast area features a different hands-on interface, allowing the listener to activate their (and their neighbours’) sound-space. Subverting the conventional schizophonic relationship between the use of personal audio devices and the ambient soundscape, this project uses environmental recordings and electroacoustic compositions as a means for the listener to re-imagine the links between what they hear and the spaces they occupy.

This project is linked to a work I presented Oct 27, 2007 at the Artivistic Festival in Montreal in collaboration with Alison Powell and Will Hall. sound.garden.scape: Montreal presented listeners with five listening stations broadcast on the same FM frequency. The project was presented in a large warehouse location in Montreal’s Mile End, and the idea of imposing an invisible (and, without proper mediation, silent) garden into this space appealed to all three of us. Here listeners could move freely throughout the garden, and take an aural holiday from the otherwise bland and boomy acoustic space within the warehouse. s.g.s: Montreal featured more performative interactive elements than the Gastown iteration, including a station where listeners could whack-a-gnome, triggering samples to play at different frequency or amplitude depending on the velocity with which the gnome was whacked. The installation also included a skipping station, where a simple skipping song would speed up or slow down depending on the rate at
which the listener skipped. Other stations included a faucet interface, used to control
the amplitude of a fountain sample; a tape loop collecting and replaying all the sound
from within the installation venue, rebroadcast into the garden as a means of
integrating the listener into the space, providing them with some kind of acoustic
responsibility even in the virtual aural environment; and a small green area,
featuring potted plants and a small bench where listeners could relax and hear a
recording of men playing boules (or bocce) in Little Italy. The only interaction in this
station was the willingness to sit, reflect and listen.

After completing the Montreal project, I became much more interested in the
idea of using sound and a network of short-range FM transmitters as a means to
create an alternate form of mapping. This followed my research into the relationship
sound creates between space and place, and allowed me to introduce ppa technology
as a mediator in the reception of the piece. I am interested in subverting the
conventions of ppa’s audile technique in relation to the world existing outside the
listener’s headphones. I wanted to create a world that linked the listener to real
places using real sounds, but I wanted them to immerse themselves in this alternate
sonic geography in the same way they immerse themselves in the virtual sound­
spaces more commonly heard through ppa devices.

5.3 Aural Location Mapping

I decided to use a mapping system I have named Aural Location Mapping
(ALM), where a pattern of overlapping circles is applied to a map, with each circle
corresponding to one FM transmitter. This system is flexible, and the inscribing of
the circles can be shifted slightly to allow for the inclusion of unique sounding spaces.
This is a point where my work in using systems differs from other artists, such as
Steve Heimbecker, who is very strict with his use of systems, often employing them
to the point of abstraction. At times, he completely obscures soundscape components
through the layers of abstracting processes (Songs of Place, 2005). Soundwalking
and Acoustic Ecology are very important to me and I felt it was necessary to have an
aesthetic ear, one that was tuned to the variety of strange and wonderful sounds in a
particular place, or series of places.
ALM used the following system:

Figure 1: Aural Mapping System

where each circle represents one transmitter’s broadcast circumference and the area to be recorded when inscribed on a map.

Vancouver’s Gastown area seemed to be the most logical choice in which to try this mapping system. The area has a wide range of sonic environments contained within an area under one square kilometer. There are very distinctive soundmarks (the Steam Clock, for example) and a nice balance of open areas and areas heavily trafficked by vehicles and people.

It was important to keep the links to soundwalking in mind during the planning stages of this project. Vancouver New Music's support was intended to help me compose a soundwalk, so it was necessary to keep this in mind. The basis for my selection of recording locations were solo exploratory soundwalks, beginning with Water Street, between Main Street and Waterfront station. I was looking for unusual
places, or sound fields that included a singular sound event that I felt was indicative or representative of the specific location and its place within Gastown as a whole. Some locations, like the Steam Clock or Waterfront station were already in mind as definite recording locations even before I began soundwalking. Others, like Blood Alley I found by looking at the map, then searching them out on the street.

The 8 locations I chose were:
- Waterfront Station
- Steam Clock (Cambie St & Water St)
- The Cambie (Cambie St & Cordova St)
- Crab Park (also known as Portside Park)
- Blood Alley (or Trounce Alley, between Water St and Cordova St)
- La Casita (Abbott St & Cordova St)
- Abbott St & Hastings St
- The 5 corners at the statue of Gassy Jack

Figure 2: Map of Gastown locations
I visited each of these locations several times during the soundwalking phase, to determine if each area was distinct enough and what sounds could be used as trigger or key sounds within the interactive component of the installation.

I wanted the experience of the installation to reflect that of a traditional soundwalk, the experience of a sounding space, as it exists in the singularity of the walker’s experience. I needed the recording and composition processes to reflect that ideal.

My recording methodology is best described as a phonographic or phenomenological approach. Phenomenological recording involves the placement of a microphone in a space, and allowing whatever sounds that will happen there to be recorded. This can be contrasted with a mediated recording approach which is the act of controlling the microphone: moving it through the space and causing the subject to perform due to its presence. Some elements of my recording process are mediated. I was physically present in the space, wearing the microphones, but I did not activate the space or move through it. I was simply placing myself in each location and allowing it to perform for me.

My goal was to create a ‘living’ aural environment, one that was as close as possible to what could be experienced in Gastown during a soundwalk. Part of my composition was choosing what time and day to visit each location, the more I revisited a site, the more I became aware of how each performs normally, or on an average visit to each location. This helped me avoid extreme subjectivity in the editing process, as I have spent more time listening to each location than the listener/participant in the installation. Some listeners may challenge that, saying I have missed a key sound that he or she finds particularly indicative of a particular Gastown location, and that may be true. I have made every effort to capture as broad a sound palette as possible, but there are many sounds I have heard but was not able to record, simply because I was using this phenomenological approach, where, if a sound did not occur during the recording period, so be it. If I felt very strongly about a sound, I would try to arrange myself to be in the location at a time near when I
hoped that sound would happen again, but there is no way to orchestrate these sound environments, they simply perform – whether I am there or not.

After making initial stereo recordings, helping refine my choice of recording locations, I was lucky enough to have access to Sennheiser’s MK 2002 binaural head-mounted microphones.¹ I immediately switched to recording binaural material, using my own head as the 'dummy'. This means the recorded files sound almost exactly the same as I heard them originally. The benefit to binaural recordings is that they collect an extremely spatialized stereo recording, but only when heard with headphones. This aligned perfectly with my plan to present these recordings via ppa devices (in this case portable stereo radios), where all the listeners would be using headphones or earbuds as they moved through the installation space.

For the sake of continuity throughout the series of recordings and the effectiveness of my mapping system, I maintained a strict North-is-North orientation in all my recordings. This means I was always facing North for each recording session, so any sound moving from right to left in the recording is moving East to West in the real world. Additionally, any side-to-side head movements I made while recording could be confusing when heard by a stationary listener. It was very important for me to collect the sounding spaces as they were, with the intent that someone else would be listening to them, exploring the space. The notion of collecting sound from each of these locations without passing aesthetic judgement on them was important during the collection phase, simply to be in each location and let the sound events occur without looking for the idealized sound of that space, or a moment when there would be only one hi-fi event in the foreground or the sound field.

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¹Binaural microphones use a pair of matched omni-directional microphones to record sound extremely close to the ear canals. This means that the microphones are picking up the direct sound from the source as well as the reflected sound waves bouncing off the folds of the ear (pinnae). These reflected sound waves are the information we use to localize sound, based on the time difference between the direct sound and the reflected waves entering the ear canal.
5.4 Soundscape Composition Methodologies

The composition of these collected sounds was extremely simple. I was engaged in collecting the essence of the singularity: that one-time occasion when I was listening to Gastown with microphones in my ears which would then correspond to the one-time occasion when people visited the installation and heard these sounds. In particular, I was interested in how the listener/participant would move through the space, thus creating a longer, more involved experience – the composition of the installation itself. That being said, I did edit and compile these recordings. Most of them are based on a single linear recording that looped continuously throughout the installation period (which I will refer to as the bed track). The beds were taken from long source recordings, between 8 and 20 minutes long, and edited down to 5-8 minute tracks. The selection process was based on preserving as long a continuous stretch of time as possible, while still capturing the character of the location and any interesting sound events that may have occurred during each recording session.

I have consciously removed myself from these recordings. All my footfalls, breathing and body/clothing noise have been edited out. In removing myself from the tangible elements of the installation composition, I am creating a sounding space that can be accessed by other listeners as a clean slate for their interaction and occupation. The transubstantiative function of an immersive sound environment is a very personal one, and having aural reminders of someone else acting as a first-person listener could pull the listener/participant out of the transubstantiative state. Without my first-person sound artifacts generated during the recording process, these aural locations become more approachable for each individual. This idea is reinforced with the photographic element in the installation architecture (to be discussed in section 5.6). The removal of my personal sounds makes for an interesting parallel within the installation venue, as each listener/participant is removed from their own personal soundmaking through the occlusion of the earbuds.

The idea of immersive sonic environments (including soundwalks) facilitating a transubstantiation (or change of state) appeals to me. Sound moves not only into the ear canals but vibrates the entire body, coming in contact with the skin, muscle and bones. In this way, sound affects us on a cellular level and can cause a physical change in state. Once listeners surrender themselves to the moment and the complete physical change existing within the sensation of sound, they have reached a transubstantiative state.
and direct sound signal from the radios. The installation venue itself was a very interesting sound field, with squeaky footsteps, rustling and radios bleeding out from the earbuds of the listeners in the space.

I collected sounds between 12 noon and 6pm, on almost every day of the week. The collection process was extremely time consuming. I started using the binaural microphones in February, and finished collecting all the sounds I wanted the week before the installation opened. A large part of this time was spent revisiting locations. The expectation of how each sonic location should sound was a difficult obstacle to overcome. For example, I visited the Steam Clock recording location 8 times in order to collect the samples I wanted. Often the clock would not sound, or it would play only the half or quarter-hour melodies, without pulsing the hourly mark. Other locations like Crab Park and La Casita inspired some re-examination of my phenomenological phonographic recording methods. In the case of Crab Park (near the shipping ports on Vancouver harbour), I ended up using multiple recording sessions to create a soundscape composition that was evocative of the location, but not a direct phonographic re-presentation. La Casita, a Mexican restaurant, proved to be an exception to this practice of additively composing each soundscape. The two tracks in La Casita are relatively ambient without many key sounds in the outdoor recording, nor the racket and clatter expected of a busy restaurant in the inside recording, but in this case, I decided to follow my initial methodological approach, and used the first recording sessions I collected at this location.

5.5 Soundscape Composition Descriptions

Waterfront Station was very simple, as the bed track (interior ambience) simply had to be edited for time, starting and stopping at points with two similar sounds to allow the looping of the track to sound seamless. The two key sounds – the Skytrain arriving and departing were edited to include the primary sound event and a small amount of foot traffic to smooth the crossfade back into the station ambience. With both these sounds, and all the other sounds in the installation, the bed track continued to play even though it was not being broadcast, creating a
completely new aural experience with each interaction. This means that a listener moving through the aural environment of the installation will not hear a sound repeatedly playing in the same temporal relationship to any other sound, nor will they hear the 'complete' bed track as they interact. The synchronization between each location (and the key sounds triggered through each interaction) is constantly fluctuating in an attempt to make the aural environment within the installation generate similar singularities to those that would occur naturally at each source location.

The Steam Clock was based on a single recording edited for time, and to place the noon whistle near the middle of the track. I added a sample of the Steam Clock sounding the half hour to the bed track, to 'correct' its absence from the actual sound field. The key sounds were recordings of the Steam Clock sounding the hour (full melody and, in this case, six tones: one long, five short); the half hour (first half of the melody); and the quarter hour (second half of the melody).

The Cambie, an outdoor bar & restaurant was another site that required multiple visits. I could only record one conversation at a time, and suitable recording situations were limited based on the availability of seating, the weather, the time of day, and whether or not the people I was eavesdropping on had anything interesting to say. My goal with the Cambie was to record conversations to the front, left, right and rear of the binaural listener. In this way, the installation listener/participant could not only choose the conversation they wanted to hear, but also control the din of the virtual crowd around them by isolating sounds in any of these directions, similar to the acoustic “cocktail party effect”. These conversations were also edited for time and content. I wanted each conversation to be different enough that listeners could tell them apart and for there to be something interesting drawing them in – some juicy gossip or funny story. This location had no bed track. All four conversations were looping constantly, and would be broadcast only when selected by the listener/participant.

3 The cocktail party effect is the ability to focus our aural attention on a single source in an otherwise dense sound field, e.g. listening to a single conversation at a crowded party.
Crab Park is one of the more heavily composed soundscapes. The location itself is very hi-fi\(^4\) (in Schafer's sense of the word), and the sounds that make it interesting don't necessarily all happen in one 8-minute stretch. To compose the sound for this location, I stacked three different recordings on top of one another, incorporating waves, shipping sounds, people playing on the beach and other harbour sounds (helicopters, float planes, boats, etc). The only element that was edited out was wind noise that broke through the ambient threshold. The key sounds were the Sea Bus horn, a train whistle, a helicopter flying overhead, and a float plane.

Blood Alley, between Cordova St. and Water St., is set apart from these two main thoroughfares, creating another fairly hi-fi sound field. This location was the other heavily composed soundscape, combining the fairly ambient sound of fans, traffic and construction sounds with the rhythm of a street person drumming on his shopping cart while waiting for a handout of empty cans from the back door of a restaurant. This is one of my favourite sounds in the installation, a great example of elements within the soundscape performing in a beautiful synchronicity of space, time and event. All the trigger sounds in Blood Alley were longer tracks incorporating other interesting sound events: construction sounds, cars, heavy machinery, and footsteps are all included.

La Casita featured two looped tracks, inside the restaurant and outside, on the corner of Abbott and Cordova. The inside track is mostly Bossa Nova played through the restaurant's sound system, with a few clinks, clanks and cutlery here and there. There is not much conversation inside the restaurant, and this is another example of Expectation v. Actuality. I feel the quiet restaurant allows the listener to engage without feeling overwhelmed. It also helps separate that sonic location from the Cambie which is abuzz with conversation. The outside track contains a faintly overheard conversation, footsteps and traffic passing behind (the electric buses snap occasionally). The interactive interface (opening or closing a door, crossfading between these two tracks) took over with this location, and I didn't see that many people stopping to really listen in on either of these two soundscapes. However, the

\(^4\)Schafer's applies high-fidelity to soundscape studies, defining a hi-fi environment as "one in which sounds may be heard clearly without crowding or masking" (272).
sensation of moving from inside to outside was dramatically (and physically) represented, making this a particularly successful aural location.

Abbott and Hastings was made up of a bed track containing primarily traffic noise with a few isolated fragments of conversation. There are a few wonderful moments in this track. It is possible to hear quite a bit of the character of this location in the recording. The trigger sound was a bus squealing to a halt, followed by 30 seconds of sound inside a moving electric bus. This trigger sound faded out the bed track, momentarily taking the listener away from the din of the traffic.

The five corners at Gassy Jack were recorded in sequence over a period of 30 minutes on the same day with each corner recorded for 6 minutes. Each location maintains the North-is-North alignment, and the traffic moving along Water Street or up to Hastings moves from sounding in front of the listener to behind as they switch from track to track. There are a few moments here where I spoke in the middle of a continuous take, but due to other interesting or characteristic sound events, I felt it was necessary to keep the remainder of the recording and edit out my voice. A highlight of this location is a tour guide speaking at the statue of Gassy Jack.

5.6 Installation Architecture

The installation was based around the balance between listening and soundmaking (Westerkamp). I wanted the listener/participants moving through the venue (and virtually through Gastown) to be able to affect the sounds within each location's aural environment. In addition, I wanted to create a unified look for the installation, while still allowing the interactive component to reflect the individual character (and the sounds being triggered) within each broadcast location. This required consideration from many angles. The interactive device, or the physical object, had to be simple enough that a user could approach it and immediately understand how to interact with it. The signal generated by the physical object had to interact with the software in a way that allowed the trigger sound to play through, without undue interference from overly zealous interaction, and the venue itself
needed to be arranged in a way to reflect the ALM system while still being easy to navigate and interesting to explore.

A series of 8 11”x17” photographs taken from each of the recording locations were suspended from the lighting grid. In order to correspond with the palette of the interactive devices, the photographs were mounted in simple black frames with a cork backing. The photographic series featured the blue kunstkopf head (which I nicknamed ‘Ian’) produced by Sennheiser to accompany the MK 2002 binaural microphones. Mounted on a microphone stand and wearing a cap and scarf, the head served as an aural flaneur, allowing the listeners in the installation a visual context with which to place themselves in each of the locations. The nondescript features of the head allows the listener to project themselves onto the deaf/mute head and imagine listening in his place. Eavesdropping on a blind man’s world.

The interactive devices and photographs were arranged within the venue with the intent to map the relationship between the real space in Gastown. Each transmitter was given a 10 foot broadcast diameter, which I determined based on my preliminary tests of the transmitters. These 10 foot circles were mapped onto the VIVO Media Arts Centre Studio floor using the ALM system. I was even able to maintain the North-is-North alignment within the venue itself. The photographs were hung in four back-to-back pairs, creating alleyways between the broadcast locations and encouraging fluid movement through the installation.

5.6.1 Interactive Devices

The physical objects inside the installation were constructed using a neutral palette of raw wood, black and blue objects. The 8 broadcast locations were arranged to correspond with their physical location in Gastown, using the ALM system. Five of the interactive devices were housed in plywood boxes (four placed on black plinths, and one larger free standing box), and the other three were installed into larger, free-standing objects in the venue: a door, a PVC pole, and a steel triangle that could be pulled downwards. These interfaces used heavy-duty on/off and momentary switches or potentiometers to send analog information from each individual broadcast location to an iCube analog/midi converter.
The Waterfront Station device was a large yellow button housed in a plywood box 4”x6”x4”. Above the button, the words “Next Train” created the link between the listener participant’s interaction and the sounds they could trigger. This button was a momentary switch which would send a single value to the iCube, thus triggering the Skytrain arrival or departure sample.

The Steam Clock device was also housed in a plywood box 6”x8”x6”. This box contained a large red button with a momentary switch, and a large red illuminated digital clock. The momentary switch operated in the same way as for the Waterfront Station, but, in this case, the switch not only sent a value to the iCube, but also triggered the digital clock inset into the box. Each time the button was pressed the clock would advance one hour.

The Cambie interface, also a plywood box measuring 6”x6”x4”, had 4 on/off switches with green LEDs that would illuminate when the switch was on. Each of these switches was numbered and the instruction “Select Conversation” directed the listener/participants. The on/off switch would send continuous values to the iCube, and each of the four conversations could be turned on or off independently, allowing the listener/participant some precision in exploring the potentially raucous aural environment. As previously mentioned, each conversation looped independently, so if the listener participant turned the conversation off, it would continue to play without being broadcast until switched on again. This broadcast area utilized additional structural elements. The box was placed on a black cafe table with two metal patio chairs, inviting the listener/participant to relax and immerse themselves in the aural environment. The cafe setting also further evoked the correlative location in Gastown.

Crab Park used the steel triangle interface. The triangle was suspended from a spring-loaded hinge by a length of yellow polyester rope. When the listener/participant pulled down on the triangle, the switch was opened, sending a value to the iCube. This device was problematic only in the zeal with which the listener participants interacted with it. The switch was installed in such a way that it
required the triangle to return back to its initial starting position. Unfortunately, the spring installed to return the triangle to the switch-closed position stretched over the course of the installation period and had to be replaced.

The Blood Alley device was a free-standing plywood box 6”x12”x24” with a green button and the label “Fast-Forward”. This interactive device used a momentary switch and functioned similarly to Waterfront Station and the Steam Clock. When the button was pressed, each trigger sound was broadcast, overlapping the continuous bed track. The concept behind this interaction was the ability to move the listener through time in what was an otherwise ambient soundscape, with few dynamic sound events. This free-standing box was arranged with two black leather easy chairs inviting the listener/participant to relax into the aural environment.

La Casita employed the door interface. The door was free-standing, attached on one side to a structural pillar and braced on the other. A potentiometer was installed in the middle hinge of the door, and the values generated by opening the door were translated by the iCube as a constant stream of data. As the listener/participant opened or closed the door, the samples broadcast would crossfade between the restaurant interior (door closed) and the street sound (door open). This was one of the more successful interfaces, quickly engaging the listeners and drawing them into active exploration of the device, while effectively referencing the original location. Placed near the entrance to the installation, this interface also framed the virtual world being broadcast and helped anchor the installation within the venue.

With the Abbott Street & Hastings Street location, I wanted an interface that would resonate with the triggering of the bus sample. I decided to represent the pole-mounted stop request buttons found on Vancouver’s buses with a length of sanded black PVC pipe. The pipe was anchored to the floor at the bottom and attached to the lighting grid at the top. A large red button with a silver housing protruded from the pipe four feet from the ground.
The 5 corners at the statue of Gassy Jack utilized one of the more complicated interactive devices. A plinth-mounted plywood box 8”x8”x4” housed a potentiometer that was used to crossfade between the audio files for each of the five corners. A map of the intersection was transferred onto the box, along with the word “Spin”. Precise values were logged depending on where the potentiometer’s knob was pointing to cue each recording. As the listener/participant turned the potentiometer, the representative sample would play until a roadway was reached on the transferred map, each road containing a brief silence, to help the listener define which corner of the intersection they were listening to.

5.6.2 Hardware and Software

The entire installation was run off of a single computer sending 16 discrete channels of audio to 8 stereo FM transmitters. The audio was sent to the transmitters via 2 8-channel audio interfaces ganged together to create an aggregate audio device. The audio playback and triggering was managed by a Max/MSP patch designed by Peter Bowles. The Max patch was receiving 11 channels of midi information translated by the iCube. Except for the Cambie, which required 4 midi channels, each broadcast location used only a single midi channel to control the audio interaction. Each midi input was gated to prevent the sample from being re-triggered while it was still playing.

From the Max patch, audio was sent out of the aggregate audio device to the transmitters via balanced TRS-XLR cables. Once the balanced line reached the broadcast point, it was sent through a stereo line transformer, dropping it down to RCA which connected to the FM transmitters. Fidelity was a huge concern in the installation process. FM is, by design, a fickle broadcast medium and it was crucial to send the audio through cable that would minimize, if not eliminate, the possibility of signal interference.

Each location was broadcast on its own FM frequency, allowing the listener to move through Gastown as they moved through the FM dial. Having each location broadcast on a unique frequency eliminated interference (similar to acoustic masking) and crosstalk (sound from location A being picked up and re-modulated by
location B’s transmitter, along with location B’s sound) between the 8 transmitters. Unique FM bands for each location provided listener/participants with an additional level of interaction within the installation – sifting through the FM signals, deciphering which sound signified each location and subtly tuning into each place. Initially I had conceived of all the transmitters broadcasting on the same frequency, allowing the listener/participant to pick up different broadcast locations as they moved to the corresponding space in the installation venue. This was not possible due to the the amount of space at VIVO Media Arts Centre (35 feet x 45 feet).

The list of frequencies is a follows:

- Gassy Jack: 92.8 MHz
- Blood Alley: 93.5 MHz
- La Casita: 94.3 MHz
- Crab Park: 95.8 MHz
- Abbott & Hastings: 101.6 MHz
- Steam Clock: 97.4 MHz
- The Cambie: 98.3 MHz
- Waterfront Station: 100.0 MHz

I assembled all the transmitters by hand from kits, which was an excellent opportunity to refine my soldering technique as well as better understand the transmitters and frequency modulation.

Including the cable from the interactive devices to the iCube, the audio and midi cables, over 900 feet of cable was used in this installation.

5.6.3 Other Considerations

In considering the installation as a soundwalk, the possibility for interaction functioned the same way it would on a conventional walk. If listener/participants interacted too much, constantly pushing buttons and trying to cue new sounds, the installation would not function as effectively. It took a considerable amount of time to hear what each location sounded like without ever triggering the interactive
sounds. If the listener/participant repeatedly pushed a button, the next sound would not trigger until the initial sample had played through. This was an attempt to calm the desire to repeatedly interact, and hopefully encourage thoughtful listening to each broadcast location.

Most listener/participants who visited the installation followed a similar route in exploring the virtual space. Initially, they would move quickly through the 8 locations, identifying the sound of each and happily exploring the sounds that could be triggered. After the initial exploration, the listener/participant would tour the 8 locations again, first returning to a favourite location to spend a more considered period of time listening before moving slowly through the installation again, listening intently for what each location had to offer. For some, this process took upwards of two hours, others returned each day, exploring and understanding the installation on new levels with each visit.

5.7 Radio-as-Diffusion: an Invisible Architecture

Using FM signals creates an additional, invisible architecture to the installation. These signals exist in the space, vibrate through our brains and bodies and react to the space of the venue in a similar way that acoustic sound waves would. I find this silent and invisible architecture fascinating. Here is a sound installation, sending 16 channels of audio, and the room is completely silent (except of course for the sounds generated by the listener/participants as they move through the space and interact with the work). FM radio was the immediate choice for me in the presentation of this piece for a number of reasons: the materials are relatively cheap and receivers are widely available (though now in dwindling numbers due to the widespread use of iPods as the ppa device of choice); FM receivers will automatically jump to the strongest signal – this means that if there were a signal on a neighbouring frequency band or a weaker one on the same bandwidth, the receiver would only tune-in to the strongest, functioning in a vaguely similar way to our own ears; and, in following with the installation as an extension of soundwalking practice, the interface is dynamic, allowing listener/participants to wand their receivers
searching out the strongest signal, or to turn the dial to access a new location. For me, there is a strong correlation between the time involved in taking a physical soundwalk – the time needed for the sounds present to wash over you before you can begin to understand the sounding space – and the time required to learn the mediated interaction presented in the installation. The delicate act of tuning-in to each location heightens the ear, making the listener decide when they have 'arrived', and can begin a deeper form of listening.

There was a sense of occupation in installing the 'invisible architecture' of the project: these frequency bands were filled by the sounds I chose. My broadcasts are overriding any other, weaker signals, and neighbouring FM bands may experience interference from the stronger, more direct signal I am sending out across a widespread range of frequencies. The idea of the garden extends into the realm of radio, with each bandwidth as the fertile soil and the soundscape recordings' tiny seeds, left to grow invisibly and silently until someone comes along to search them out. At first listeners can only hear a weak, distorted signal, but as they nurture it, the sound grows into full strength, revealing its many interesting facets.

One of the interesting elements in the sound.garden.scape:Gastown installation is the interplay between noise and signal. By presenting this work on FM, the listener/participant is forced to decide if what they are listening to is radio static or traffic. This project inverted not only the conventional individuated audile technique associated with ppa, but also the type of signal directly transduced into the listener's ear. Instead of adopting the artificially-produced space encoded within musical content, the listeners had to move past commercial radio stations and the allure of this artificial space-less place, and tune into the re-presented real spaces of Gastown. It is also important to note that within this installation listeners used their ppa devices actively to seek out and listen to the same urban noise they normally use ppa to block out.

This installation also challenged the individuation of ppa audile technique, presenting mediated listening as a shared experience. Most people who attended the installation came with other people, and toured the installation together. This follows
the conventions of soundwalking practice, which are structured around communal activity. What I found interesting about this is that the mediated listeners were still sharing sounding-space the same way they would in an acoustic soundwalk, even though each had their own radio and earbuds, which should, according to conventional usage, isolate them from one another. For the listener/participants, having the chance to use ppa technology to explore the same surrogate aural environment as everyone else occupying the same physical space created a strong sense of aural community. Some were sharing tips on how to better receive signals from problematic transmitters, or expressing joy in discovering a trigger sound in a new aural location. The separation of each location onto its own frequency band also allowed the opportunity for listeners to 'float' across Gastown without moving physically, eavesdropping on other listener/participant's interactions with broadcast locations throughout the entire installation venue.
6 Recommendations and Extensions

I believe my project was extremely successful, not only as proof of concept, but as an aesthetic experience. The work embraced the seemingly disparate elements of soundwalking and the mediated audile experience of personal portable audio to create a re-presentation of a living aural environment that behaved similarly to the real environment from which it was derived, and allowed for apprehension through a dedicated listening experience, while still creating a completely unique intersection of time, space and event for each listener/participant. Many visitors reported experiencing a vivid sensation of place, one that transported them out of the gallery space and into Gastown. The triggered key sounds were particularly evocative of their respective location for some, particularly the movement between the Waterfront Skytrain and the Steam Clock – two easily identifiable and iconic sounds of the area. Others remarked on the realism of the binaural recording, with the spatial quality of the recordings creating an increased stereophonic depth of field and more textured aural environment.

6.1 Diffusion Alternatives

If I had the opportunity to present a sound.garden.scape project again, I would consider refining the broadcast technology. FM is unstable and, through the
very process of broadcasting signal, reduces the quality of the audio. If I were to pursue FM further, I would use higher quality transmitters with digital tuners and manipulable transmission wattage allowing the piece to be tailored to fit each individual venue. In addition, I would provide the listener/participants with only digital receivers, preferably with presets, allowing listener/participants to jump from location to location without the delicate tuning required on analog receivers. This would remove an element that many people who experienced the project found enjoyable, but I feel the commercial band interference detracted from the immersive and transubstantiative potential of the work.

I have also considered broadcasting the sound directly to the individual using other wireless methods, such as infrared or high-frequency wireless. These technologies would allow for the piece to be sent to each listener/participant on their own infrared channel utilizing a tracking system (though this would require considerable research and development capital), using a computer program that would track each listener participant via a unique GPS ID inside the ppa device, and switching the locational recording as they moved through the installation venue. Another option is to present the recordings without the mediation of a ppa device using parabolic reflectors to isolate speakers playing each location’s recorded sound. This option is the least attractive, as I feel this work is best experienced through this technological mediation, and the binaural recordings create a much less effective spatialized sensation without headphones.

6.2 Mapping Alternatives

In thinking about the design of this piece, I considered six possible mapping systems:

1. Aural Mapping (Macro Compression) with Greenspace Permutation
2. Aural Locational Mapping
3. TempAural Mapping
4. TempAural Compression
5. Single, Linear Soundwalk
6. Opening Doors
1. AURAL MAPPING (MACRO COMPRESSION)

This Model is very similar to the one used in the \textit{sound.garden.scape}: \textit{Gastown} installation, and was based on the same ALM system of 8 overlapping circles. In this model, the ALM system was applied to the entire Greater Vancouver Regional District (GVRD), with locations including Whytecliff Park/Horseshoe Bay, Gastown, UBC Endowment Lands/Museum of Archaeology, Queen Elizabeth Park, Fraserview Golf Course, Hastings Park, Burnaby Mountain Park/SFU and Flightpath Park in Richmond. These locations were selected using the "Greenspace Permutation," which would focus collection only from urban greenspace within each inscribed circle, creating a common link throughout the installation. Each greenspace may be more indicative of the place's aural 'character' by combining common sounds – e.g. the natural world, inhabitants at play – as well as limiting compositionally distracting broadband sounds such as traffic or construction which are found throughout the GVRD.

The length of each composition would be randomly generated though chance using dice or cards to determine a total number of minutes for the composition. In this way, the listener/participant would be able to move through the entire installation experiencing a completely new arrangement of the compositions in time (and space, as they explore the installation venue.) This random sequencing function lends itself to other interesting possibilities. In this model, there could be two compositions for each transmitter. One soundscape composition using the above selection parameters, and a more abstracted electroacoustic composition where I would present my own interpretation of inspiration from each inscribed area of the GVRD. For example, a \textit{low and distant roar (Airplane Music)} would be presented in the Richmond broadcast area, or \textit{Floating...} for the Whytecliff Park location, reflecting each composition's source and inspiration. These pairs of compositions would switch only when all of one composition set ended at the same time. For example, if the soundscape compositions were 1, 2, 3, 4, 6, 6, 8 and 12 minutes respectively, the electroacoustic composition set would play after 24 minutes, then revert to the soundscape set after a similar interval.
In this model, the listener participant would be able to explore a representation of the GVRD in a single space with each sound event occurring in a unique arrangement, dependent on their exploration of the space and the amount of time spent in the installation.

2. AURAL LOCATIONAL MAPPING

This model was the one chosen for the installation.

3. TEMPAURAL MAPPING

Presenting geographically linked recordings from the two iterations of the Vancouver Soundscape Project complemented by contemporary recordings of the same locations, this model allows the listener to move through time while the recorded place stays the same.

This model would use three groups of three transmitters:

Figure 3: TempAural Mapping System
with 1, 4, and 7 broadcasting the 1973 Vancouver Soundscape Project recordings, 2, 5 and 8 broadcasting the 1996 recordings and 3, 6, and 9 broadcasting the contemporary recordings.

4. TEMPORAL COMPRESSION

This model would collect sounds from a single location over the course of a day, week or month using a method similar to the WSP’s 24hr recording process, compressing and re-presenting spatially large stretches of time into temporally manageable (and listenable) compositions. In this model, an entire 24 hour stretch could be re-presented through 8 broadcast areas, allowing the listener/participant to move rapidly through time. The transmitters could be plotted similar to the *Mapping* model, with transmitters 1-4 representing a compressed stretch of six hours and the outer four transmitters using compositions derived based on the *Opening Doors* Model.

5. SINGLE, LINEAR SOUNDWALK

This model is quite simply the linear presentation of a single longer walk. Broadcast areas would be representative of walk route:

![Figure 4: Single, Linear Soundwalk Mapping System](image)
each broadcast area could be used to re-present sound from a static point along the route, or replay a 20-30 minute excerpt of a 2-3 hour long walk. This model could easily be combined with the Opening Doors model. However, both the options for this model require the listener/participants to follow a prescribed route and has a finite beginning and ending. It also limits the singularity of each soundwalker’s experience, a central element of soundwalk composition theory.

6. OPENING DOORS

Each outer broadcast area (using the ALM configuration of 8 broadcast areas) 5, 6, 7, and 8 would present more abstract compositions, perhaps representative of altered states. These compositions would take their source material from the recordings presented in the inner broadcast areas. This model is quite similar to the two sets of 8 compositions set out in the Mapping model, except the movement to the outer areas would be triggered through an interactive interface such as a door frame inviting the listener/participant to step through into this altered state. The difficulty in this model lies in the ability to communicate to the listener/participant how or when to enter into these outer, altered states.

These models provide many conceptual bases for extensive exploration. Each, in turn, allows control over a different element within our experience of the sounding world (time, space, etc.). These models create the opportunity to listen to our world in a completely new way. These are not simply a diffusion system to replay excerpted field recordings, but a means of mapping space, time, the inner and outer, and even reality and virtuality. Better yet, the listener/participant is able to navigate through these mapping systems simply by moving through space. These models extend our understanding of the sounding world, creating new links between the soundscape and our place within Acoustic Ecology. The ability to compress space, for example is impossible in the natural acoustic world. To move from Burnaby to Whytecliff takes at least an hour by car, and much longer by transit. Using the Macro Compression model would create a means for the listener to move between these two locations with only a few footsteps. This kind of spatial compression invites the direct
comparison of these acoustic environments – a feat impossible to accomplish in the physical world. The TempAural models allow our ears to move backwards and forwards through time, another feat impossible without recording technology. The TempAural Mapping model, for example creates a venue for the side-by-side comparison of Vancouver’s soundscape as it has evolved (or devolved) over the past 35 years. By presenting multiple streams of audio, accessible through a user-based interface, these models call into question the accepted norms of how we experience the sounding world, removing the limitations of linear time, physical space and states of consciousness. These models provoke increased contemplation of our sounding world and the way we perceive aural information.
7 Conclusion

As listeners exchange their acoustic environment for one featuring electroacoustic mediation (e.g. loudspeakers, headphones, ppa devices), they not only mask the noise of the acoustic soundscape through the creation of their own aural environment, but often choose to engage instead with the virtual spaces they have created. This engagement can lead to an immersion into a surrogate environment, which is becoming increasingly individuated and isolated with the increased usage of ppa technology. Artistic and social practices have developed in response to this shift in audile technique. Soundwalking and soundscape composition seek to reintegrate the sounds of the ambient environment into perceptual, ecological and artistic practice. Other sound artists are integrating the active role of the listener into their works, extending their practices out of the gallery and into the acoustic environment. Many of these artists are using ppa devices, not only to make their work portable, but to use the direct, individuated audile technique developed by listeners for use with these devices.

As artists begin to manipulate this audile technique and the composition of ppa-based aural environments, new relationships between sound and space emerge. Through technological mediation, it is now possible to re-create aural environments,
or to create otherwise physically impossible listening environments (e.g. moving freely through space and/or time). It is also possible to use this technology and accompanying audile technique to re-present real sounding spaces, as I have done with my sound.garden.scape: Gastown project. I was able to use interactive technology and ppa to create an alternate aural environment that presented the listener with an experience extremely similar to that actual location. In addition to exploiting the immersive audile technique associated with this technology, my project provided listeners with the active choice to engage with and to explore the 'noisy' sound environments they would conventionally use ppa devices to block out.

Using the noise of the world and the noise of particip/action, the sound-artist creating interactive work for the listener/participant can create pieces that draw the individual into an active, external engagement with the piece, one that focuses on the unique interrelationship between time/space/event, creating a work of art that exists of and for each individual in a singular way. Instead of sharing in the commonality of a singular experience, listener/participants generate their own singularity of a common experience. My work functions in this realm, creating a work that utilizes means of understanding and listening to the noise of the world (soundwalking, soundscape composition) as a starting point for exploration of the mediatized aural environment. Employing the conventions of these seemingly disparate forms of listening, I am able to construct something new, to act as a bridge between isolated individuated ppa listeners and the direct engagement with the sounding environment encapsulated within acoustic ecology. This work engages the listener participant and allows them the freedom to inhabit an alternate aural environment, at least for a period of time.
8 Appendix DVD-ROM: The Project – sound.garden.scape: Gastown by Eric Powell

Further audio and visual documentation of the project is contained in the DVD-ROM appended to this volume, forming a part of this work and is under the same authorship and copyright.

A desktop version of the project in Max/MSP is included, which will require unzipping either the Mac version (a standalone application) or the PC version, which requires Max Runtime. This program is available for free download from http://www.cycling74.com/downloads/. Once the program is open. It is necessary to load the audio tracks. Click 'Open SoundFiles'. You will then be prompted to open the audio files. Be sure you have copied the GardenScape Audio Files folder onto your computer, and select each track in sequential order (1-31,) clicking on OK after each one. The last step before beginning to interact with the program is to toggle the Audio switch to 'on'. Three of the locations, La Casita, Gassy Jack and The Cambie require interaction after pressing start before audio begins to play.

The Photograph files can be viewed in any Viewer program (e.g. Preview, Photoshop.)

The Max/MSP component of this project was programmed by Peter Bowles.
Data Files:

Max/MSP and Audio

GardenScape Audio

(31 aif and wav files) 1.92 GB

SoundGarden Mac

(zip file of standalone application) 5.2 MB

SoundGarden PC

(zip file of MAX Runtime program) 356 KB

Photographs

Installation Documentation

(12 tif and jpeg files) 182.1 MB

Interactive Interfaces

(8 jpeg files) 35.5 MB

Recording Locations

(8 tif files) 381.4 MB


Connor, Steve. “... or a New Creative Medium?” in *Settling the Score*. M. Oliver, ed. London: Faber & Faber, 1999, 307-8


