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The Audience in the Center:

Diffusion Practice at Sound Travels

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Sound Travels is a concert series using live and automated eight-channel diffusion to question electroacoustic practice and enhance the concert listening experience. Outlined are performance strategies utilizing the Richmond Sound Design Audiobox, the aXi0 midi

(1) Spatial movement and placement is expressed polyphonically through a matrix of eight inputs and eight outputs. To creatively access all combinations of the 8X8 matrix necessitates the use of computer automation. By programming the automation, sound artists are able to conceive of their diffusion as an extension of the composition process with a week or more devoted to its refinement.

(2) The economic portability of the Audiobox and the eight-channel playback configuration makes repeat appearances of a composer's

organization was fairly compact and dense. Sounds that lend themselves to dynamic spatial movement, such as seagulls, vehicles, and percussive gestures were mixed together in my case with contextual soundscape recordings of parks, city streets, shopping malls, and so on. Moving a stereo mix of these sounds to an array of multiple loudspeakers was extremely inhibiting, and even arbitrary, because I could not express the intentions of one without contradicting the nature of the other. In my radiophonic works Life Unseen and Lapse in Perception, the multi-channel medium enabled me to position the text and associated sounds in different locations without sacrificing the stereo imaging inherent in any source. This differentiation in spatial placement minimized the effect of masking and expanded the dynamic range available to both elements.

In addition, one can achieve a greater integration of sound and text by using the movement of (or stillness of) sounds to illustrate or counterpoint spatially an idea conveyed in the text. Such spatial interrelationships whether involving text or not are not possible when everything is mixed down to stereo before being distributed to an array of loudspeakers (Truax, 1999).

The recent drop in price for eight-channel sound cards has created a proliferation of eight-channel works and concerts in the electroacoustic field since the start of Sound Travels in 1998. Therefore, what I have illustrated in the above is already widely available to sound artists today, which is fantastic, because the multi-channel format has provided a low cost alternative for concert producers that do not have the resources to assemble over sixteen loudspeakers. However, patching eight outputs from a recorded diffusion to eight loudspeakers in a small enclosed studio does not necessarily translate into the same experience when it is played back in a concert hall, no matter how small the venue.

The concert hall is a very different listening space than the studio. For one thing, the increased or decreased reverberation in the concert hall might hide spatial movement or reveal elements of the mix that were not noticed in the studio. Secondly, the sweet spot in the studio might only be available to a small minority of the concert audience. And finally, the resonant peaks of the hall and equalization characteristics of the loudspeakers will be different than those of the studio and again will influence not only the rendering of spatial movement but may upset the relative balance of input levels. Therefore, to simply play an eight-channel mix without further alterations prevents the work from adapting to the particular nature of its presentation context, which can result in a loss of spatial definition and signal clarity.

With the Richmond Sound Design Audiobox, there is the opportunity in rehearsal to make alterations to spatial movement and placement, input and output mix levels, equalization curves and even delay settings on all individual inputs and outputs. These alterations can be programmed into a sequence and/or controlled live in performance.

One other aspect of multi-channel diffusion that can be altered with the Audiobox is the specification of speaker positions, which are expressed in the ABControl software user interface as an angle around a 360° horizontal axis (Rolfe, 1999). The conventional speaker layout for Sound Travels is a circle of eight speakers positioned every forty-five degrees. However, some concert halls have shapes, seating arrangements, or other physical limitations that require different angle positions for loudspeakers than those used in the studio where the diffusion was realized. By changing the angle positions of loudspeakers plotted in the software in what it is called a Speaker Map, one affects how the output levels are distributed proportionately to render the desired angle position for a point source. In other words, a speaker close to the desired angle position will proportionately receive more of the output signal than an adjacent speaker that is further away. This is calculated by determining the angle programmed by the composer for that input channel relative to

where loudspeakers are plotted around the 360° horizontal speaker map. The speaker map also makes it possible to adapt diffusions between double diamond, four pairs, (Copeland and Rolfe, 1999) and twisted cube eight-channel configurations, as well as to adapt for spaces that have greater or less than eight discreet outputs available for playback.

By making such adjustments to the automated multi-channel mix in ABControl, the diffusion realized by the composer is not obliterated by the presentation context, nor is it presented with disregard to the particularities of the context. However, proper adaptation of a piece to a context necessitates careful and repeated listening in rehearsal. Therefore, the luxury of automation is that one can listen in rehearsal as a critical audience member and make adjustments that are guided by judicious listening and knowledge of the diffusion and techniques employed. By following this principal, Sound Travels operates a systematic dissemination mechanism for a travelling concert repertoire that is portable, inexpensive, and of course, fully adaptable (Copeland and Rolfe, 1999).

Technology aside, there is an important element to consider in eight-channel presentations: the arrangement of loudspeakers in relationship to where the audience is positioned in the concert hall. With the eight loudspeakers in a circle surrounding the audience on all sides, the audience finds itself at the center of the experience. Ideally, when logistics permit it, the audience is seated at Sound Travels not in the conventional shoebox configuration, but in concentric circles facing inward to the central core of the hall.

Although it looks strange at first and requires audience members to make some adjustments, this alternative seating arrangement increases significantly the number of quality listening positions. In the conventional shoebox configuration, the listening experience is

severely compromised if one is not located in the sweet spot, or what is generally the middle of the seating area. If this fact is not properly addressed, than such presentations run a great risk of alienating the majority of its audience that can not sit in the middle. For further discussion about maintaining the stereo images for different listening areas outside of the sweet-spot I refer you to a recent article by Jonty Harrison about diffusion practice with the BEAST system (Harrison, 1999). Alternatively, we have found at Sound Travels that if you turn an audience member's back to the closest loudspeaker than you reduce the precedence effect. In other words, you correct the relative balance between close and far point sources, because the closer point source is diminished by having to travel around the back of the head. Sound Travels concerts generally take place in smaller concert venues of less than a hundred seats, so this fact might have a

effect and masking, and to orchestrate the polyphonic placement of sounds in space with enough variation that any one listener is not stuck with one sound all the time while missing out on others. This challenge is not unlike the differences between staging a play in the round versus the proscenium. If you apply the thinking of one onto the other without accounting for the limitations and possibilities inherent in the audience's experiences, then one will likely have some problems. However, if one works with those inherent limitations and possibilities in mind than new ideas and constructs emerge and allow for a completely different path of discovery.

After having discussed the virtues of an automated system for eight-channel diffusion, I want to address the issue of live performance in electroacoustic sound art, which has been a contentious issue for the contemporary music community since the pioneering days of musique concrète in France. By relying almost entirely on automation to diffuse sound polyphonically, the limited role of live performance in our practice becomes awkward for an audience who is not familiar with the acousmatic lore of listening without seeing. This is particularly the case in our home base of Toronto, which is a city that has not cultivated electroacoustic practice to nearly the same degree as Montréal (Copeland, 2000).

We have addressed this problem a number of ways in the past by shaping the audience's expectations when they arrive at the concert venue. First, we shift their visual focus from the outward void to the inward assembly of listeners. Second, we present our local concerts outdoors on Toronto Island, which is a vehicle-free park land located 15 minutes by ferry from the downtown core of Toronto. This way people do not just come to hear the music on the concert, but also come for the experience of the environment in which the concert takes place.

However attractive these alterations to standard practice might or might not be they do not deal wholeheartedly with the fact that audiences expect music in the concert hall to be a form of social

Rolfe, C. 1999. A Practical Guide to Diffusion. eContact 2.4, ix.