

Aural Representations of Room Tones in Architectural Space.

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ABSTRACT

Architecture is not only a visual and physical phenomenon but also an instrument that tempers and constructs our sound perceptions of the world. My recently completed PhD contains a number of projects drawing attention to the significance of what I have termed ‘aural representation’ as being a contribution in forming an understanding of a work of architecture and how architectural space conditions not only how we see the world but also how we hear it.

My PhD asked the question ‘Can sound be used to tell audience things about space that, perhaps, images cannot?’ The findings from this question interact with, and extend, an internationally recognised body of scholarly work. The PhD projects led to a final project involving a substantive body of creative work to help to make the knowledge gained in the PhD more explicit.

This paper will present composed music, ‘aural representations’ for selected spaces based on my perceptions of their spatial sound characteristics. Each individual piece of music is based on the aural characteristics of the spaces it is created for, and in some cases, within. The pieces wrap themselves around the ‘room tone’ of the space. This process demands that the space is ‘listened’ to and this paper describes different modes of listening and how this was approached in the creation of the ‘aural representations’.

INTRODUCTION

The perception of architectural space engages more than just our visual sense. It is my hypothesis that sound can offer information about architectural space that images may not be able to, as it has particular affordances that images do not. My doctoral research in my PhD examined how these possibilities may manifest themselves in some useful manner to an audience of architects and those who may be interested in the sound of spaces. The work was embodied in a series of creative projects in the PhD rather than an analytical, scientific work.

Architecture is not only a visual and physical phenomena but it is also an instrument that tempers and constructs our sound perceptions of the world. The projects in this paper draw our attention to the significance of aural representation as being a contribution in forming an understanding of a work of architecture and how architectural space conditions not only how we see the world but also how we hear it.

I do not assert that we privilege the visual as much as Jay (1994) in *Downcast Eyes* suggests; rather I am suggesting that the ‘aural environment’ is an important part of the combination of things that go together to contribute to our perception of space. This is, in itself, nothing new as it has been clearly suggested in the work of Blesser & Salter (2007), Scruton (1997), Schafer (1977), Chion (1983), and Schaeffer (1983) that the concept of the ‘aural environment’ has been validated, but also that not enough attention has been placed on its importance in the world that we are forced to live in, and what the ramifications might be.

All of these authors suggest more work is needed in the area and this has been one of the stimuli for my investigation. I have found that the available vocabulary dealing with sound is extremely limited, even though the experience can be profound. Scholars including Blesser & Salter (2007), Scruton (1997), and Schafer (1977) agree that it is very difficult to speak about sound.

AURAL REPRESENTATIONS

The pieces I have called ‘Aural Representations’ involve performing music for specific spaces, responding to ‘room tones’ with both improvisational as well as composed pieces. They draw the listener’s attention to the individual spaces’ unique tonal characteristics. These are one of the parts that affect our perception of the space. A drawing cannot convey this information. The space, and its acoustic properties, becomes a major part of the performance and composition. The works are termed ‘aural representations’ as they are used to communicate information about spaces by bringing to the audience’s attention the room tone of that particular space. It does this by wrapping a piece of music around the space’s room tone.

I acknowledge that our perceptual senses have atrophied with time, particularly our ability to listen. Schafer (1977) offers reasons for this, mainly inactivity. This project encourages their return to active service. This encouraging the extension of receptive aural perception should also be regarded as a contribution to knowledge alongside the primary outcome of the project itself.

ROOM TONES

Having used the term more than once already, it is important to discuss what is meant by the term. Each room has a tone. A room will emphasize certain frequencies within it; this means certain frequencies will resonate more than others within that particular space. Each room also has its own reverberant quality. Sounds will take longer to decay in some rooms than in others.

If we sit and actively listen we can hear the room tone. Many of the scholars listed earlier agree that active listening is not something at which many people are particularly adept. Active listening is described later in this paper.

A simple method to recognize the room tone is to try the following simple, but quite powerful, exercise. Put on some noise cancelling headphones. As they are turned on the listener is immediately aware of the room tone being cancelled; that is what they do. The exercise informs the listener what is (not) there. The listener may be surprised how much there is to the room tone. It is my suggestion that the listener did not notice the room tone before because they weren't offered the opportunity of listening. It is one of my assertions that we don't actively listen – and one of the tasks of the aural representation is to make the listener aware of that. Architecture is an: '...instrument that tempers and constructs our sound perceptions of the world'.

How might we begin to listen to a space to examine what the space may have to offer? The section titled 'process' later in this paper describes how I listen to the space, and what actions this precipitates, how I move forward from there

For reasons of clarity, a slight distinction should be made between room tones and room modes.

A **room tone** is made up of resonant frequencies of a space and the reverberant quality of the space; it also has a tonal centre forming a part of the room tone. The **room mode** of a space is the collection of resonances that exist in a room which respond when the room is excited by an acoustic source such as a loudspeaker.

The room tone is affected by the type things that are likely to occur within the space. I found the best results I got were when I worked [playing a guitar] in the space, rather than listening to a recording of the space and responding to that.

PRECEDENT

Precedents, as discussed by Forsyth (1985), include the following musical composers: Bach, Varese, Xenakis, Stockhausen, Boulez, Ives, Schoffer and Henry, Cage, Fripp + Travis. The work of these composers demonstrates the validity of creating music for specific spaces. I have made no attempt to emulate the style of work of any of the composers.

In terms of sound artists, this project is informed by the work of Alvin Lucier's 'I am Sitting in a Room' (1969) as well as the Dream House by La Monte Young [an avant-garde composer in his own right] with Marian Zazeela. Both of these projects speak about the tone of spaces. Certain frequencies will be emphasised within spaces, and each space is different, due to its size, shape and materials within the space.

Schafer's (1977) nomenclature regarding 'keynote sounds', is relevant to the concept of room tones. The room tone, to use his visual analogy, is the 'ground' of the aural environment in

which gives the 'figure' its substance. Here is where I must draw away from Schafer's term, as he is thinking about the keynote sounds of a landscape which are often those created by its geography and climate: water, wind, forests, plains, birds, insects and mammals. I am directing the project toward interior sounds in a building and it is important that I make this distinction. I am also working with the sounds **OF** spaces rather than the sounds **IN** spaces.

LISTENING

It is important to discuss what 'listening' involves for the work undertaken, as it is a crucial part of the process. My understanding is, and this view is shared by a number of authors following, is that listening happens at a number of different levels of engagement.

The term 'active' listening was mentioned earlier. This is where we apply our intention to gain something from the act.

Of the *Four Listening Modes* suggested by Pierre Schaeffer (translated by Chion (1983)) in Section C *The Circuits of 'Ordinary' Listening* - Écouter, Ouir, Entendre and Comprendre, active listening would be Entendre This means showing an intention to listen (écouter), choosing from what we hear (ouïr) what particularly interests us, thus "determining" what we hear.

Blessner and Salter (2007) offer quite a number of terms to do with listening, some of which they invented, but they also draw from Truax (2001), Schaeffer (1983), and Rasmussen (1962). They suggest that 'auditory spatial awareness' includes all parts of aural experience: sensation (detection), perception (recognition), and affect (meaningfulness). They clarify the terms they are using by suggesting listening as an 'active attention or reaction to the meaning, emotions and symbolism contained within sound.' The key words here are 'active' coupled with 'attention' which indicates an intention on the part of the listener.

Robert Fripp (note that he is discussing music and not soundscapes) mentions Scruton (1997) as well as offering his own insights based on many years of professional experience in his diary August 26, 1998. He suggests the issue, interest and concern in listening / hearing is how to move from the outside of music to its inside, where the listener is (really, truly) part of the music: mother to the music: co-creator in the creative impulse's movement into form and limitation. He lists four stages; the first is passive then moving on to basic active listening where the listener's attention is engaged. The third stage is a deeper practice of active listening which involves understanding what we hear and a final level of where we are what we hear, a communion of the music and the listener.

So we have a number of positions on how we listen. The following section describes the listening I used when I worked in the spaces I did. It will be seen as 'active listening' and how it influenced my actions as I proceeded with the work.

PROCESS

These works that I have made are what I call 'aural representations' of space. Sound can tell us things about space which images cannot. Amongst the things that sound can offer is that it can tell us what the 'room tone' of a space is. This is a function of the room size, room materials, room shape, its resonant frequencies and the reverberation times of the room.

No visual image can communicate this information but these sound pieces do.

The way these sound pieces have been approached is as follows; I start with rhythm and then move to tonality. Once a space has been selected, the reverb and delay (echo) time of the space are scrutinized by making sounds in the space and listening to how they work in that particular space. This will affect the rhythm of the piece of music to be created. I do this by playing sequences of notes at different speeds to find what rates of echo (or delay times) are actively working in the space. I used the type of listening referred to as 'active listening' or what Schaeffer would call 'Entendre'.

The next selection is to do with the resonant frequency of the space. Every space that resonates has a tonal centre which it will emphasize, this is a major part of the 'room tone', and I start with that note. To find this I commence by playing many notes until I find the one that resonates. I then build a series of notes that belong to the same tonal centre. As the tonal family of notes varies (major minor etc) from space to space, different pieces of music will occur. Some pieces presented here have something approaching a melody and this melody uses the available notes that are being accentuated within the space. Different spaces emphasising different frequencies have a tonality. This tonality is the starting point of making a melody. To summarize I start with rhythm and then move to tonality. There is 'active listening' and there are responses to the listening. There is a dialogue between the sound of the space and the aural representation.

As mentioned earlier, I found I achieved the best results when I worked [playing a guitar] in the space and noting which notes were emphasised with the space's room tone, rather than listening to a recording of the space and responding to it.

AURAL REPRESENTATIONS

CASA DEL FASCIO

I created this first piece of music to have a dialogue with the 'room tone' of the building. The room tone comes from a recording I did there. The piece of music is not created real-time within the space, it does, however respond to the tonality of the room tone that I recorded. It would be completely different if I had used another recording of another room tone.

At first the audience is presented with the way sounds are affected by the room tone slamming doors and the guards speaking to each other. This sound is looped (it repeats itself) on purpose to reinforce how the room tone responds to sounds in the space. As the piece proceeds more musical sounds are added to respond to the room tone, finding the tonal centre and then building on it. The musical sounds are then diminished and replaced by others to offer another type of reading of the space. It concludes with room tone as presented at the beginning of the piece. The music is playing the room tone of the space.

The reader is directed to the following file;

CASA Del Fascio May 2012

This can be found at the website

<http://soundcloud.com/errolhtout/casa-del-fascio-may-2010-1>

ASYLUM TONE (IN B)

I acquired this room tone from a sound library (sound-effects-library.com). These sound libraries allow for downloading after payment of a small licence fee and the user is permitted to use the sound in any form they wish, as they have paid the license fee.

This piece of music came from it by finding the tonal centre of the room tone and then building on it. This is a case of playing notes and seeing if they resonate with the room tone, as described earlier. The audience can hear the room tone at the commencement of the piece and then can hear musical parts responding to the room tone. The music listens in an active manner to the room tone. The piece concludes with the room tone reminding the audience of where the piece started.

The reader is directed to the following file:

Asylum Tone in B

This can be found at the website:

<http://soundcloud.com/errolhtout/asylum-tone-in-b>

BUILDING 201 AUGUST 2010

This is four storey void in a one hundred metre long building. I started with rhythm. I did this by playing a series of phrases within the space and listening for the echoes to ascertain what the rhythmic qualities and tempo might be. I found a rhythm in the same way as a person would normally automatically alter the pace at which they speak in a certain space for clarity i.e. by trying fast and slow. This piece was different in that the space was reacting to certain notes and not so much to others. I played many notes until I started to get some that resonated with the tonal centre of the space. Then I commenced recording, and this created the general idea. As it turned out after careful listening I felt myself dissatisfied and I re-recorded all of the parts again in my recording studio, as the timing was less than convincing on the live attempt, I also added some more parts to emphasize the tonal centre a little more. The studio version also includes recordings I made of the room tone of the space. This piece starts and concludes with the room tone.

The reader is directed to the following file:

Building 201 August 11 studio version

This can be found at the website:

<http://soundcloud.com/errolhtout/bdg-201-august-11-studio>

I have only included three pieces in this paper. More can be found at <http://soundcloud.com/errolhtout>

CONCLUSION

This project offers a shift of perception for the listener in terms of thinking about sound in architectural spaces. It takes the essence of a 'room tone' and offers it back to the listener. It shows us what the 'room tone' of a space could be via the researcher's particular interpretation. This 'room tone' is presented in a manner which the audience would not have noticed before. It does this by creating a creative interpretation of the room tone and using it as means of constructing a piece of music.

This project demonstrates one way that sound can be used to convey to an audience information about space that images cannot. It directs our attention to some of the things that

sound confers to us. They are spatial presentations using sound.

A book employs drawings, photographs, models to tell us things about architectural space. If there was a recording of the building, further and different information could be gleaned from that. We could use this recording also as a technique or tool to tell us about existing spaces.

I find this to be in accord with Rasmussen's (1962) thoughts as published via Grueneisen (2003) (p. 00.008):

Can Architecture be heard? Most people would probably say that architecture does not produce sound, it cannot be heard. But neither does it radiate light and yet it can be seen. We see the light it reflects and therefore gain an impression of form and material. In the same way we hear the sounds it reflects and they, too, give us an impression of form and material. Differently shaped rooms and different materials reverberate differently.

The pieces of music, the aural representations, I have composed could be identified as a manifestation of these ideas so eloquently laid out by Rasmussen. They are a way of making architecture be heard. The pieces of music draw the listener's attention to the room tone of the space, which is different for every different space. This extends our understanding of a part of the study of the aural environment.

The works are part of a longer term series of projects in which I plan to do a large amount of recordings of spaces and create musical albums of the work. It would also be very interesting to work with other musicians on longer term projects.

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