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# *Switch* by Benjamin Thigpen and Darren Copeland: a hybrid case of electro-acoustic live performance work

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## Abstract

*Switch* by Benjamin Thigpen and Darren Copeland is a multi-channel piece realised in 2011, which combines the characteristics of electroacoustic composition, site-specific work and, partly, sound installation. The work requires a dual spatialization system: a fixed spatialization (8 loudspeakers settled around the audience), and a mobile one (one or two Audio Spotlights – hand-held directional speakers) for the live spatialization. The performer interacts with the space and the audience by holding and directing the speaker's soundbeam towards walls and other flat surfaces during the performance.

The physical space of the performance becomes a new central parameter for the choices concerning the spatialization of the sounds. Moreover, Thigpen and Copeland shape the piece taking into account the acoustic characteristics of the concert space. The performance of *Switch* is also built around the listener: the spatialization is conceived on the base of a "democratic" managing of the sound, with the Audio Spotlight pointed directly towards (or on the back, or on the side of) any member of the public, in turn, regardless of their position in the room.

*Switch* features an interest dichotomy between both fixed and variable elements; nevertheless it has a pre-defined general plan that can be freely followed by the performers. The piece has not a linear form, but more a three-dimensional form: every listener, depending on the place where seated, in each moment listens to something different to the others, but each experiences the same piece, the same event.

To better frame *Switch*, it could be interesting to compare it with two other works of the same composers: *Still* by Benjamin Thigpen and *Streams of Whispers* by Darren Copeland. *Still* is a multichannel piece composed in 2009. The sound material comes from recordings of actions and movements within different environmental contexts and his spatialization is defined during the recording of the sounds, integrated with the distribution on 5.1 channels created in studio for the live performance. Copeland's *Streams of Whispers* is a piece that went through two different stages: it was originally composed as sound installation for a stairwell of a palace in Toronto, and then converted in a 12' concert piece. In this process of adaptation, Copeland maintains the characteristics of the original sound installation.

On one hand the spatialization, intended as strict relationship between movement and sound as cause-and-effect process, and the intrinsic narrative in the use of distinctive sound materials (*Still*), on the other the cohabitation of different categories in the same work (*Streams of Whispers*), influenced the compositional idea underlying *Switch*: a composition conceived as a live performance work, which features both an acoustmatic electroacoustic

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piece, with its own identity, but also an open and context-specific one, including the concepts of improvisation and sound installation.

## Introduction

In contemporary practice, the performance of electroacoustic music features a broad array of different situations, challenging the idea of "concert" as the core moment of music consumption in Western society. Although the institution of the concert is contested, not all the new compositions are dismissing it altogether; instead, some works are creating brand-new hybrid contexts that deserve a deeper insight.

This dichotomy between traditional performance practices and venues, and new conceptions going beyond conventional concert spaces for electroacoustic music is particularly clear in the catalogues of Benjamin Thigpen and Darren Copeland[1]. Thigpen is an American composer based in Paris. He makes music for loudspeakers, considering space as a primary compositional parameter. In collaboration with Darren Copeland – Canadian sound artist and artistic director of NAISA (New Adventures in Sound Art), Toronto[2] – he has been exploring new methods of spatialization in live performance. In the frame of this prolific relationship between development of new technologies and musical ideas, in 2011 Thigpen and Copeland realised *Switch*, a multi-channel piece (8 channels) for live solo computer, hand-held Holosonic Audio Spotlight speakers and low-level automated multi-channel spatialization. This work presents a series of interesting features that are typical not just of a concert piece, but also of a work with strong improvisational elements, and with some characteristics of a sound installation.

In *Switch*, the production of the sound materials as well as their transformation/manipulation, the sound spatialization, the behaviour of the two performers during the concert is produced and largely defined live, in real time, during the performance.

This text will frame *Switch* taking into consideration the following aspects:

- Sound materials;
- Spatialization;
- Performance: "score"; behaviour of the performers; rules to follow.

## 1. Sound materials/sound sources

*Switch* is a work that has evolved through several stages: it grew out of two other works of Thigpen's: *head transplant experiment* (for solo computer, composed in 2008) and *erosion* (a piece he performs in duo with Jean-François Laporte, realised in 2012).

As mentioned above, in *Switch* every sound is produced and performed live: there is no pre-recorded or pre-composed material. The sounds are produced by Benjamin Thigpen performing destructive processes on the signal: this destructive actions cause all perceptual connection with the original non-transformed signal to be totally obliterated.

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[1] For a complete biography of the two composers, see their official websites (last accessed 09/14): Benjamin Thigpen, www.benjaminthigpen.net; Darren Copeland, www.darrencopeland.net/web2/.
[2] See website *New Adventures In Sound Art*: http://naisa.ca (last accessed 09/14).

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The "destructive" sound processes imply starting with 2 short sound files, playing them forwards or backwards at very short speed rates (about one thousand times slower), applying a series of arbitrary mathematical operations, and filtering the result.

The compositional process, in combination with the potential of the audio spotlight speakers, explores in which way the sound materials can live and grow in the most organic and natural way possible.

It is significant what Benjamin Thigpen wrote in the programme notes for a concert held in Bruxelles on 29 May 2013, both to introduce the work and to provide the audience with a possible guideline for their listening experience during the performance of *Switch*[3]:

> While we wait for something to happen, the space comes to be inhabited by a quiet clicking.
> Slowly it is joined by others. They move around. Everywhere: behind, in front, across all the walls, the ceiling, the floor. Across the furniture, the people. They come in a variety of shapes and sizes, they have different characters and rhythms. They pass very close, they glide far away, they disappear into the distance. They also move through the centre of our heads. They don't seem to respect the boundary of inside and outside. Nor do they reveal themselves in the same way to each of us.
> Independent and interconnected, they come and go, swell and turn, speed up and slow down, float about, spin around, move on. They ignore us, or maybe they observe us with disinterest. Exploring "this" space, they seem to open up another. As if they inhabited another kind of space, as if their space were moving somehow diagonally thru our own.[4]

## 2. Spatialization

As already mentioned, *Switch* requires a dual spatialization system: a fixed settlement (loudspeakers arranged around the audience)[5], combined with a mobile one (one hand-held Audio Spotlight) for the live spatialization.

The main characteristics of the sound spatialization in *Switch* are two tools/elements/features: the software "spit" and the Audio Spotlight.

The spit is a software developed by Thigpen in 2000 by taking the features he considered the most interesting of Ircam's "Spatialisateur".

As he explains:

> […] I wrote a program for multi-channel spatialization called the spit. I made it for a piece I was composing at the time (*balagan*) and used it in the studio. Later I developed it as a live performance spatialization tool, a kind of alternative to traditional mixer diffusion, with gestural control by a 3-D position sensor. It was developed for, and is used extensively by, New Adventures in Sound Art, in Toronto. My program spit is essentially a stripped-down adaptation of the Ircam Spat~ with an original generative/gestural control interface for multi-channel panning, distance control and Doppler effect.[6]

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[3] Recording of *Switch*: https://soundcloud.com/benjamin-thigpen/switch-toronto-25nov2011?in=benjamin-thigpen/sets/live-performance (last accessed 09/14); live performance at the Fast Forward festival in Toronto, 25 November 2011.
[4] Benjamin Thigpen, programme notes for the concert held in Bruxelles on 29 May 2013, in the frame of the festival "Deux Visage de la musique électroacoustique" organised by Musique et Recherche.
[5] In Bruxelles *Switch* was diffused through 24 channels by the acousmonium of Musique et Recherche.
[6] Benjamin Thigpen, email message to Luisa Santacesaria, 13 January 2013.

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In fact, although the settlement of the loudspeakers is fixed, the spatialization is live – produced algorithmically during the concert. Thigpen controls the overall parameters of the spatial activity but not the specific movements, in a game of action-reaction with Copeland's manual spatialization[7].



**Photo 1 and 2:** Benjamin Thigpen with the Audio Spotlight during a demonstration before the concert (Espace Senghor, Bruxelles, May 2013), © Luisa Santacesaria.



**Photo 3 and 4:** Audio Spotlight, details (Espace Senghor[8], Bruxelles, May 2013), © Luisa Santacesaria.

The Audio Spotlight is an ultra directional speaker manufactured by Holosonics in Watertown, Massachusetts[9], and designed by F. Joseph Pompei. It features a very punctual

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[7] During all the past performances of *Switch*, Darren Copeland has been the performer of the Audio Spotlight.
[8] Photos of Salle 1900, Espace Senghor, Bruxelles: http://www.senghor.be/?page=100055 (last accessed 09/14).
[9] See website *Holosonics*: www.holosonics.com (last accessed 09/14).

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diffusion of the sound: it is light enough to be hand-held and moved around in concert by a performer, it allows for another completely different kind of spatialization (which is integrated into the normal-speaker spatialization setup), actually a manual, moving-speaker spatialization. The spotlights are preferably used in venues that have some reflective surfaces and that are not too small, like art galleries, museums, and spaces with an irregular architecture.

One of the main characteristics of the Audio Spotlight, is that it can diffuse a limited range of frequencies, i.e. it cannot spread sounds below the limit of approximately 800 Hz. Darren Copeland describes this tool as a "tweeter"[10], and he considers its technical characteristics both as limitations but also as richness in terms of the peculiarity of the grain and timbre of the projected sounds:

> In a solo performance using just Audio Spotlights, this limited bandwidth is not a problem. In terms of spatialization, a solo Audio Spotlight performance would be like attending a flute recital. However, not unlike the orchestration challenges of incorporating a solo part for a flute in an orchestral work, the Audio Spotlights also requires specific orchestration strategies when incorporating them into systems with full-range loudspeaker systems. One rather extreme strategy is to diminish the amplitude of presence band frequencies in the full-range loudspeakers.

> However, more interesting solutions can arise when artists begin composing pieces with the Audio Spotlights in mind and assign content appropriate for their unique characteristics.[11]

Therefore, the Audio Spotlight takes on the characteristics both of sound diffusor and, in a way, of musical instrument, emerging from the sound environment of *Switch* as a "distinctive solo voice"[12].

# 3. Performance[13]

Concerning the performance of *Switch*, there is no formally written score, but there's a general plan to follow, that becomes every performance more and more clear and explicit for the two performers. The two composers take fundamental decisions during the rehearsals before the performance, in particular while exploring the acoustical qualities of the concert space.

The duration of the work is not fixed: in every performance the duration will depend on the sounds, the space, the public, the state of mind of the composers, the concert situation. A possible interpretation of the idea behind the concept of the piece is to consider this work as something "alive" (like a free living creature), with its evolution, or "breathing"; the two performers can control this course of events or they can choose to let this organic process of natural sounds follow its course.

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[10] Darren Copeland, "The Audio Spotlight in Electroacoustic Performance Spatialization", *CEC / eContact!* 14.4, March 2013, http://cec.sonus.ca/econtact/14_4/copeland_spotlight. html (last accessed 09/14).

[11] *Ibid*.

[12] *Ibid*.

[13] Performance occurred during NAISA's SOUNDplay festival at Christie Studio, Wychwood Barns, Toronto 2011, with Benjamin Thigpen and Darren Copeland improvising with the Audio Spotlight: http://youtu.be/wHT1UsROLMw?t=4m12s (last accessed 09/14).

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Concerning the behaviour and attitude during the performance, Thigpen explains:

> I do not have *direct* control over the sound produced. When there is a click, it is not because I pressed a button at that instant. I control more global parameters that create the conditions in which a certain type of sound is likely to emerge. And then I react to what happens. That is, I react both to what sounds the computer generates and how those sounds interact with the space; and how those sounds interact with the space depends of course on what Darren is doing; and he is also freely reacting to the sounds generated and to their interaction with the space. How I react and how he reacts will result in other sounds to which we will each react. So the piece is a continuously on-going process of adaptation and each performance will necessarily be different.[14]

He also adds:

> […] There are specific notes that I take during rehearsal regarding particular settings or sounds or gestures or sequences of events or juxtapositions or… Things that seem to work well in that space on that day and that I want to return to and work with and develop during the concert.
> For Darren as well – a general path, a general shape, a general form. But much more free and open. He discovers the space during rehearsal, and we listen together and discuss. And during the concert, following the general plan and the specific refinements he has made during the rehearsal, he explores and unveils the space and the sounds (and the sounds in the space and the space in the sounds).[15]

During the performance of *Switch*, Darren Copeland makes a soundwalk concert, interacting with the space and the audience by holding and directing the speaker's soundbeam towards walls and other flat and reflecting surfaces. He actually "plays" the space of the performance inspired by its physical and architectural characteristics.

The Audio Spotlight is very effective at creating the illusions of a sound being located in a very precise point on a wall or floor or any flat surface. However, at the same time, in a very reflective environment, the soundbeam from the Audio Spotlight will bounce and reflect off multiple surfaces. This will create different illusions of sound localization for different listeners in the audience. Therefore, the physical space of the performance becomes a new central parameter for the choices concerning the spatialization of the sounds.

As well as the architecture of the concert space, the performance of *Switch* is also built around the listener: the spatialization is conceived on the base of a "democratic" management of the sound, with the Audio Spotlight pointed by Copeland directly towards (or on the back, or on the side of) any member of the public, in turn, regardless of their position in the room. With a tool like this, the possibilities of sound spatialization and interaction with the concert space and the audience becomes manifold and, at times, unpredictable:

> The Audio Spotlight is very effective at creating the illusions of a sound being located in a very precise location on a wall or floor or any flat surface. However, at the same time in a very reflective environment like an art gallery with parallel flat surfaces the sound beam from the Audio Spotlight will bounce and reflect off of multiple surfaces. This will create different illusions of sound localization for different listeners in the audience. Also, the Audio Spotlight may not be audible to every listener in the audience at the same time, which is challenging for the way concert spatialization is conventionally approached. As an interesting contrast to that characteristic is the fact that the Audio Spotlight can produce the impression that the sound is coming from inside the listener's head when it is pointed directly at a listener who is more than six feet from it. Furthermore, the ultrasonic output of the Spotlight makes it impossible for the

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[14] Benjamin Thigpen, email message to Luisa Santacesarai, 4 October 2013.
[15] *Ibid*.

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performer to hear the sound coming from the speaker he or she is operating until it bounces off of a surface.[16]

As the Audio Spotlight projects sounds in a very narrow 5-degree beam, the projected sounds can be very intense when received from the audience. Listening to the soundbeam provokes a very intense physical reaction for the listener: when the Audio Spotlight is pointed directly to someone and the sound arrives, it is really possible to have a little sensory shock.

For Benjamin Thigpen the physical sensation provoked in the listener is very important and he works extensively to obtain that result. This is a characteristic in particular of his multi-channel compositions: in fact, as I mentioned above, one of the main characteristics in Thigpen's aesthetics is that he composes "music for loudspeakers", considering the loudspeaker as a point-source instrument[17].

## 4. Form and conclusions

From the listener's point of view, it may be possible to assert that the piece does not have a linear form of the piece, but rather a three-dimensional form. Each listener, depending on the place where seated, in each moment listens to something different from the others, but at the end he has listened to the same piece. At the basis of the piece there is the idea of an invasion of the space by sounds, different kinds of sounds, with different trajectories and qualities. We could say that there is a slow approach of tiny sounds at the beginning, which start occupying the space, then becoming more and more perceptible and present around the public, until they start moving to other places and slowly leave the hall.

*Switch* combines two signature features of the two composers: the tendency to consider the loudspeaker as a point-source instrument (signature of Thigpen's multi-channel compositions, like *Brief Candle, Balagan, Still*, and others)[18]; and also the idea of cohabitation of different categories in the same work (like Copeland's adaptation of his sound installations into "concert" works, as he did for his *Streams of Whispers*, in 2002)[19].

*Switch* is a live-performance work, which features an organic electroacoustic piece, with its own identity, as well as an open and context-specific composition. Therefore, it can be taken as an example to stimulate a discussion around "hybrid" forms that challenge the traditional categories of concert piece, live improvisation, and – partly – sound installation.

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[16] Darren Copeland, "The NAISA Spatialization System", http://www.darrencopeland.net (last accessed 09/14).

[17] Thigpen explains his aesthetics clearly in his essay "Spatialization Without Panning", *CEC / eContact! / 11.4*, December 2009, http://cec.sonus.ca/econtact/11_4/thigpen_spatialization.html (last accessed09/14).

[18] For an almost complete catalogue of works by Benjamin Thigpen, see his official website: www.benjaminthigpen.net/pages/music/_compositions_index.html (last accessed 09/14).

[19] Copeland's *Streams of Whispers* is a piece that went through two different stages: it was originally composed as sound installation for a stairwell of the Latvian House in Toronto during an audio art residency at Charles Street Video, and then converted in a 12 minutes concert piece. In this process of adaptation, Copeland maintains the characteristics of the original sound installation.

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