



## AGORA: *Boundary Conditions*

An installation by Natasha Barrett and  
OCEAN NORTH  
Oslo Central Station 24<sup>th</sup> May - 19<sup>th</sup> June

**Boundary Conditions** is an installation which transcends the borders between auditory and physical spaces - sound and architecture. The installation spreads above, below and around a bridge, in the centre of the main departure hall at the Oslo Central Station.

**Boundary Conditions** consists of four elements:

- \* A physical construction consisting of five large surfaces and 150 meters of aluminium tubing.
- \* A slowly changing sound composition using ambisonics spatialisation projected over eight loudspeakers located above, and four loudspeakers below the bridge.
- \* Live electronics that turn membranes and aluminium bars into computer controlled acoustic instruments.
- \* An infrared sensor monitors the activity of people on the bridge as a control for the live electronics.

Sound, live electronics, and interaction, are controlled by one central computer.

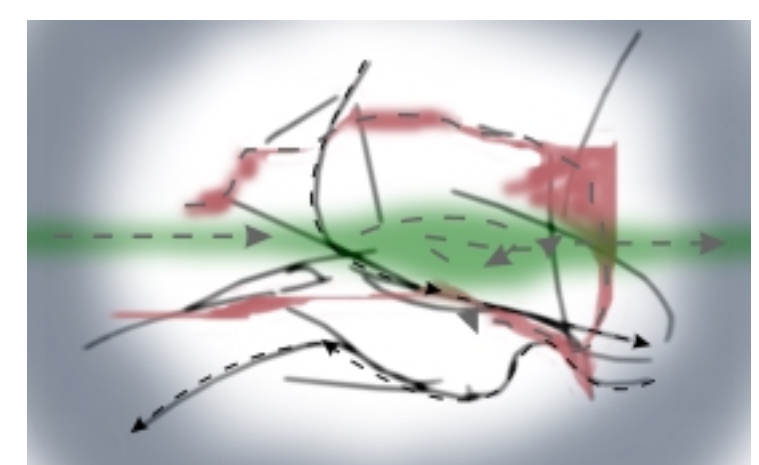
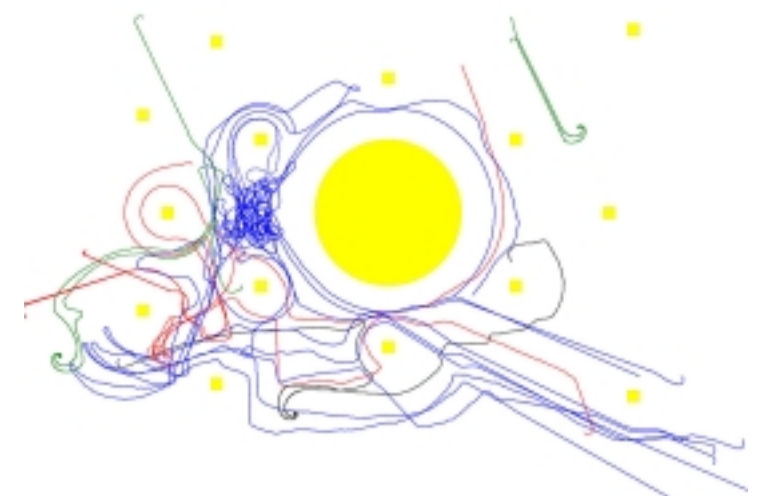
**Boundary Conditions** can be experienced in many ways – by moving around and through the physical structure, by standing in the centre of the eight loudspeakers above the bridge, or by briefly sampling the space on each journey through the station.

### The design

With recent spatialisation techniques it is possible to create a three-dimensional sound environment. In conjunction with physical elements, a new space can be created where sound and architecture reflect each other in time and space. Under this framework grew the idea of the **Agora** project. The **Agora** project is a music-theatre work where sound, physical construction and live performance unfold a multi-layered drama.

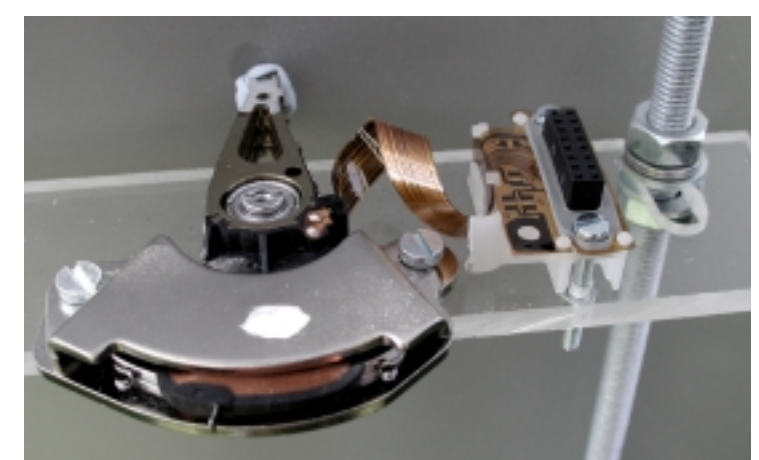
**Boundary Conditions** is the sonic-physical installation aspect from this work. All elements of the design are rooted in a common model. This model is the time evolving 'trace' left by a computer simulation where "agents" or virtual individuals, with different personalities are placed within a virtual space. These "agents" attempt to reach defined goals without colliding with each other or with fixed objects.

The result is then moulded to fuse with each real location of the installation, and the activity within that space – in this instance with the Oslo Central Station. The diagram shows the implementation of the spatial model in the sound space of **Border Conditions**.



### The live electronics

Eight membranes are vibrated by parts from old harddisks; each connected to an amplifier and given a computer controlled audio input. The membranes are designed such that they can be tuned to different resonant frequencies.



Six aluminium bars are struck by computer controlled hammers. The design consists of an electromagnet, a hammer and lever system, and a computer 'relay' card.



**Concept and project leaders:** Natasha Barrett and Birger Sevaldson

**Installation:** OCEAN NORTH : Birger Sevaldson, Tuuli Sotamaa, Michael Hensel

**Composition and programming:** Natasha Barrett

**Project team:** Øyvind Hammer, Are Nielsen, Markus Høy-Pedersen, Hanne Marte Holmøy, Ambjørn Viking, Sylvia LeSoil, Heidi Leren, Dan Sevaldson, Svein Berge.

**Production:** Rom for kunst: Mesén as

**Rigging:** All Productions, Håkon Klemetsen

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