



*Please consider the environment before printing this.*

## Synopsis

A long piece of rope represents three dimensionally a series of waves floating in space, as well as producing sounds from the physical action of their movement: the rope which creates the volume also simultaneously creates the sound by cutting through the air, making up a single element.

Depending on how we may act in front of it, according to the number of observers and their movements, it will pass from a steady line without sound to chaotic shapes of irregular sounds (the more movement there is around the installation) through the different phases of sinusoidal waves and harmonic sounds.

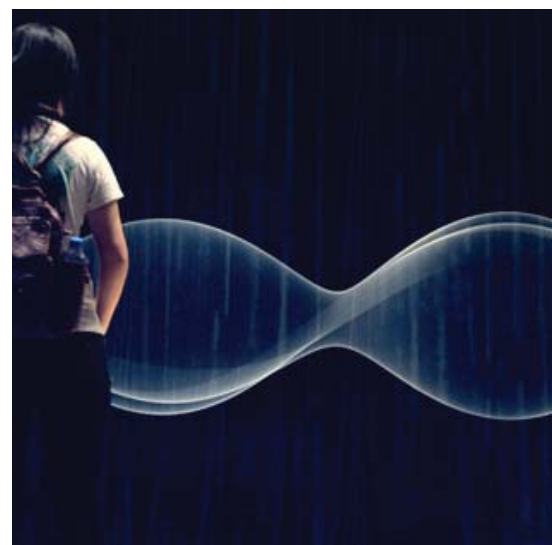
These kinds of action-reaction influences applied to sound and space are the basis of this installation.

Due to its particular features, a space has a way of relating with sound, understanding sound as a series of compressions and decompressions which move through the air, so that the geometry of the space itself and the elements in it will influence the movements of the sound and finally our perception of the sound; adding to this entire stationary system a chaos of infinite variables from the most minimal movement on our part.

But even though this could seem like a mere representation of what we can't see for ourselves, beyond the persistence of vision, it connects with our most visceral side, combining the intangible beauty of the represented graphic with the brutality of the sound it produces, creating a hypnotic environment of audible results and unique visual stimulations.

Tangibly, the installation is made up of two turbines, supported by a tuning fork structure between which the waves are created.

Nonetheless, it is the intangible, the process created there, which provides sense to the space it occupies and establishes a relationship with the public, who begin to discover that their movements have an influence on the space, sound, and alternate states of great agitation with others when they stop to see how the wave disappears in space like a whistle in the wind.



## Technical Sheet

### Title

Waves.

### Year

Prototype 2006.

Actual production 2007.

### Use

The installation has a security switch, which activates and deactivates it.

It is totally independent and does not need maintenance.

### Operation

The rope stays in constant movement from the rotation of its anchoring points. Depending on the presence of the public, the frequency of rotation at each end is varied, which causes some visible and audible alterations in the wave.

When no presence is detected, the installation goes into 'rest' mode, disconnecting the engines which create the waves in the rope and thus creating a line between both modules.

The vibration produced in the rope is amplified as it cuts through the air at high speed, creating the sound environment depending on the activity of the piece (the movements of the public) as a result.

The more immobile and still we are in front of the piece, the more harmonious the waves and sounds will be, but when the public moves more, it will create more irregular graphics at the same time as stronger, more abrupt sounds.

### Construction

Two closed PVC tubes and two polished steel cylinders for the engine module, two 12V fans for internal ventilation, pieces of wood for the base of the mechanisms, axial bearings to avoid torsion and deterioration of the rope, gauze fabric to protect the air intakes for ventilations, five metres of elastic rope 3 mm in diameter and a base of MDF.

### Hardware

Arduino I/O board, triacs panel, two 220V 170W three-velocity engines, eight PIR sensors.

### Image

Three dimensional waves floating between both modules, created by the movement of the rope at high speed.

### Sound

Whistles created by the cord cutting through the air.

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## Technical Sheet

### Interface

Detection of movements of public through PIR sensors inlaid in the base.

### Programming

Arduino IDE.

### Exhibition Requirements

10 x 5 m space for mounting the installation.

Overhead directional light to brightly illuminate the rope.

Black backdrop to make the rope more easily visible.

Six sacks of ballast to place inside the bases to avoid vibrations.

110/220v 50/60Hz electrical connection.

### Assembly

Assemble the base and position the ballast.

Position the turbines and connect the wiring.

Put the rope in place.

### Transport

Two 52 x 54 x 46 cm cases for the turbines.

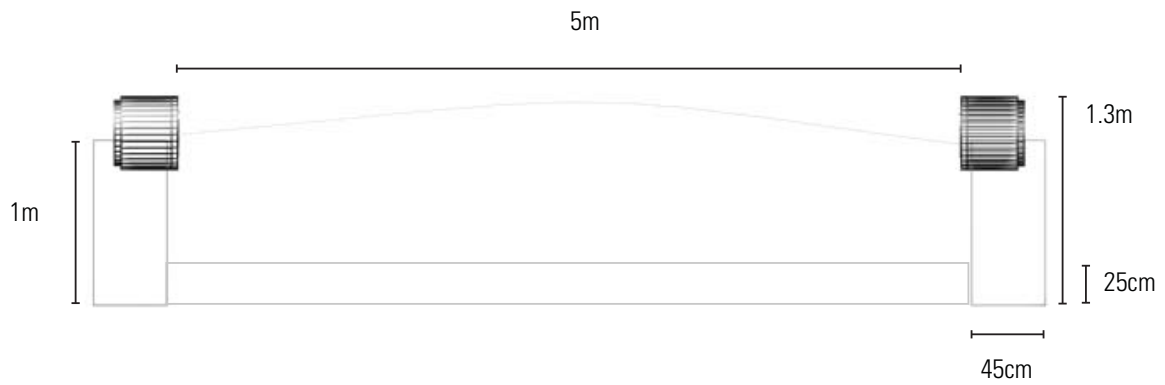
Two 103 x 50 x 30cm cases for the bases.

One 105 x 30 x 80cm case for the base of assembly.

Total weight of 87 Kg.

## Diagrams

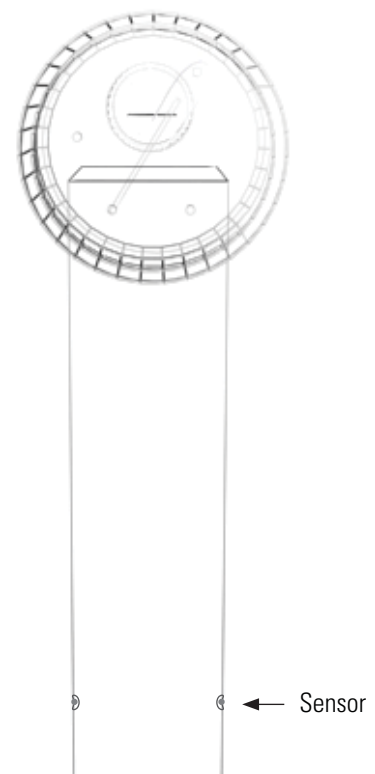
Lateral view



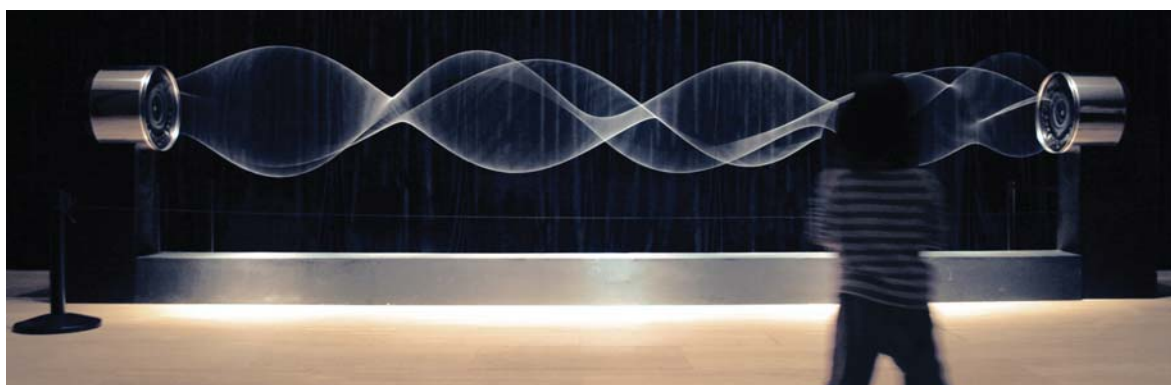
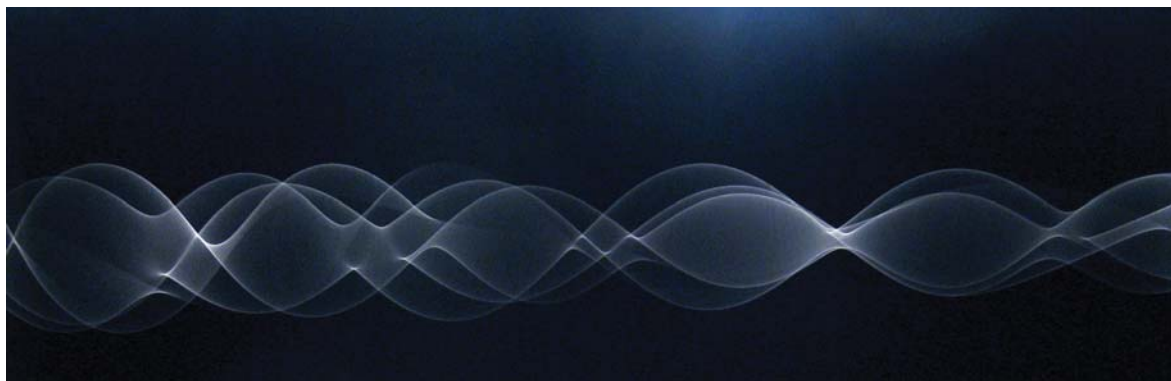
Top view



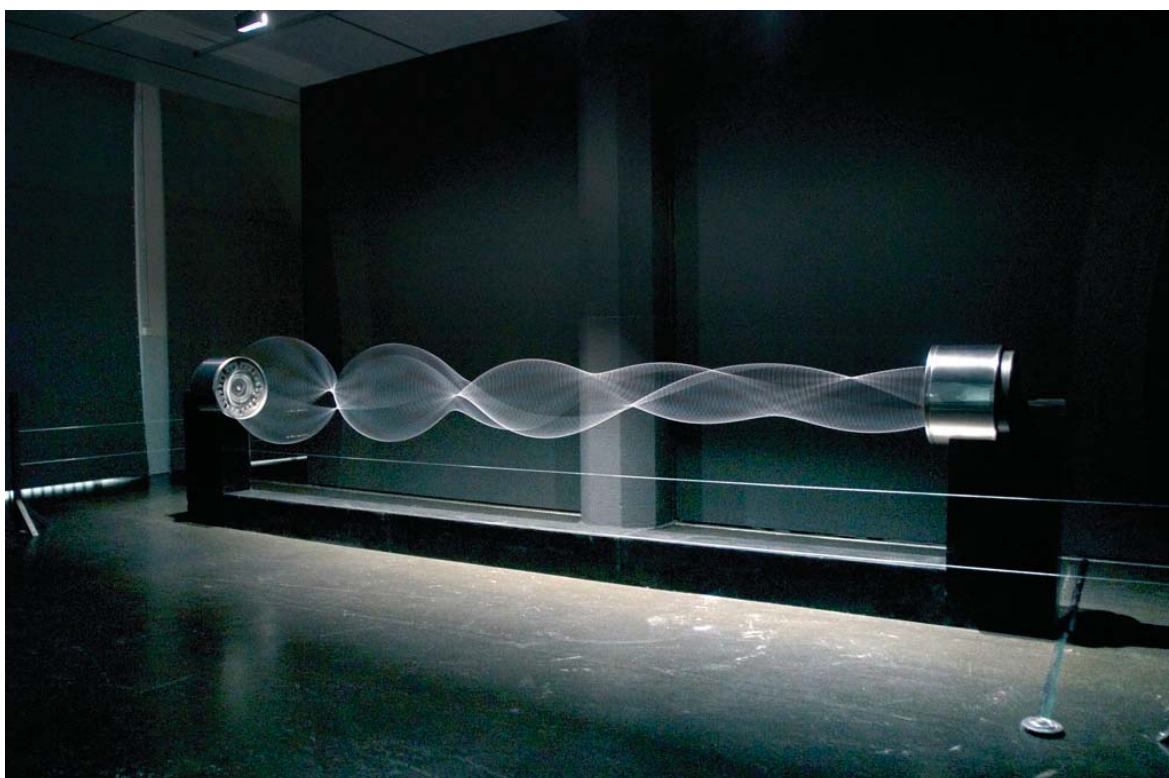
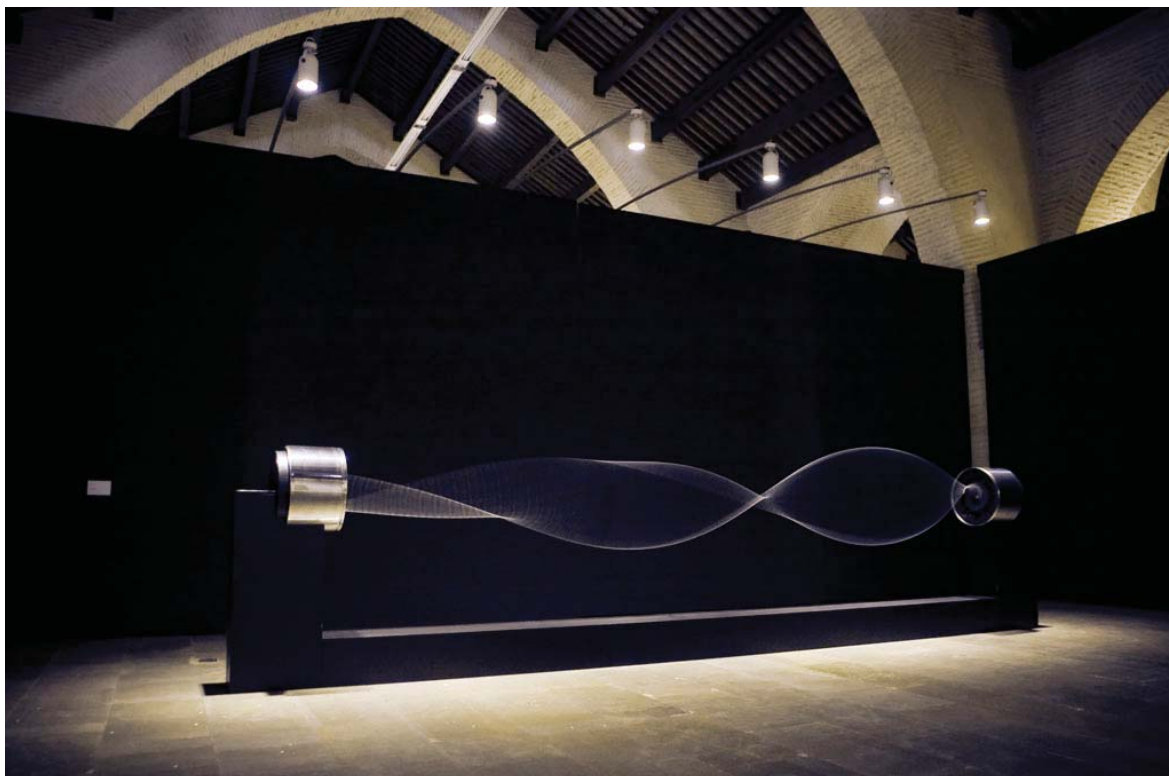
Back side view



## Pictures



## Pictures



*Top. Observatori Festival, Atarazanas (Valencia, Spain)*

*Bottom. ZKM (Karlsruhe, Germany)*

*More info. Photo sets and video available online [www.danielpalacios.info](http://www.danielpalacios.info)*

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