transmission+interference: noise, resonance and territory

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Abstract

This paper details the project "transmission+interference" by David Strang and Vincent Van Uffelen. We look into ideas around the creation and use of noise in performance and installation uses devices that are generated through open workshops. Thoughts around the usage and impact of resonance on these systems are discussed along with concepts of encoding and decoding to define territories of noise, interference and interaction. The project is documented here: http://www.transmit-interfere.com/

Keywords

Noise, interference, resonance, territory, transmission, performance, hacking.

Introduction

transmission+interference (T+I) is the on-going, collaborative project between David Strang and Vincent Van Uffelen. The project has taken on many shapes since 2009 consisting of installations, workshops (both practice and theory) and performances. Devices / tools / instruments are developed and discussed in open workshops where participants play with the interactive potential between sound and light.

The workshops encourage a mixing of skills and knowledge where we try to expand beyond the practices of not only doing it ourselves (D.I.Y) but also aim to engage others by explaining our ideas and the used technologies and always asking for feedback. The workshops are setup to show work developed whilst provoking thought for adapting and appropriating the technology; thus, to do it together (DIT) or to keep on doing it with others (DIWO).

Figure 1. transmission+interference workshop at Contemporary Music Festival, Plymouth (2013). ©David Strang.

'This develops in them a sensitivity or alertness to the diverse, world-forming properties of the art-tech imaginary: material, social and political. By sharing their processes and tools with artists, and audiences alike they hack and reclaim the contexts in which culture is created.' [1]

Noise

'Noise, noise, noise – the greatest single disease vector of civilization.' [2]

T+I approaches ideas around noise, waves, light, memory, interference (physical and signal), electromagnetics (EM), radio, steganography and territory through the uses of hacked and appropriated tools. The core tool (which is a starting point for T+I workshops) is a sound transmitter and receiver which uses light as the transmitter or broadcaster of sound and a solar cell as the receiver. Using the light as carrier of sound we can broadcast across small, dark spaces letting the project touch on the edges of Radio-art; in particular the work of Tetsuo Kogawa and Mini FM developed in the late 1980s in Japan. Mini FM explored aspects of narrowcasting, was influenced by Felix Guattari's concept of 'micro politics' and 'molecular revolution', and allowed small communities to create and communicate. [3] T+I can be seen to reduce this narrowcast approach to the micro level using low powered devices where communicating across a building stretches the limits of the device.

Within the transmission and the system of tools / devices is a complexity of noise and signal. Noise is not unwanted – it becomes signal and acts as carrier of signal throughout the system – thus without noise there is no signal. More than a parasitic artefact that is inherent in all the tools of T+I it is encouraged to flow between system parts to increase signal and even develop new potential in the signal. White noise is traditionally used in the exploration of EVP (electronic voice phenomena) to uncover sounds in the aether; ghost voices from the past invoking memory through radio and EM. Spaces filled with noise are picked up on radio sets to listen for disturbances in the aether with the noise providing a body for the EM signals to shape. 'EVP methodologies and custom hint at an aether practice which offers a more definitive other side to the radio days;

an aetheric noise which is neither transmission nor reception.' [4] This approach to uncovering hidden sounds / potential is relevant within more modern approaches with technology under the term of Stochastic Resonance where noise is purposefully added to signals to increase the signal strength whilst also allowing for other, imperceptible sounds to be heard.

'We are surrounded by noise. And this noise is inextinguishable. It is outside – it is the world itself – and it is inside, produced by our living body.' [5]

Resonance

'All interaction rest, in the last analysis, upon a phenomenon of resonance.' [6]

The system / devices explores aspects of memory covering the human, the computer, and the (physical) devices. The use of microprocessors apply small amounts of memory capable within the system itself to adapt and respond to occurring events according to programmed states. This learning and remembering of the system builds up slight resonances between the parts that can build to point of collapse and then re-build from memory. The objects between the microprocessors carry their own memories according to their past existence – the turntable recalls playing records, the laser pointer recalls detailing information, kinetically moving parts retain past momentum. Movement created within the system is used to create visual shape / order where rapidity creates memory upon the retina of the viewer – POV (persistence of vision). A single light point (or laser pixel) streaming across the retina is recalled as a line or circle.

Hand made circuits offer the potential to explore resonance through capacitance where flows of signal are stored and released over time. It is clear once we investigate down to the internal working of various integrated circuits that to create sound and rhythms of light we must understand aspects of oscillation where control is establish according to degrees of resistance and capacitance but it may be useful to explode this concept outward to a larger scale that begins to envelop the community of developers and users into the field of signal and flow. The community, via workshops, builds up its knowledge through a similar structure to the working parts of the tools and instruments. The group stores information and releases when it is time to build and create. This develops a resonance between the circuitry and the people; there exists a tension between knowledge and working parts – those involved in the work may not have backgrounds in electronic engineering thus approaching materials with perhaps a more playful attitude involving more risk.

The resonance continues into the field of performance between performer, tools, audience and sound. The sound created is visceral, abrasive and often very loud, filling the space and bodies with waves resonating from the circuits.

Upon this stage the resonance is explored through fields of sonic rhythms and intensities that shift and respond according to the various interactions at play. What is developed is an abstract machine mixing electrical signals, circuits and flesh: "a composite of unformed matters exhibiting only degrees of intensity (resistance, conductivity, heating, stretching, speed or delay, induction, transduction…)" [7]

Territory

'[...] we can scarcely imagine a time when there did not exist a necessity, or at least a desire, of transmitting information from one individual to another, in such a manner as to elude general comprehension [...]' [8]

Working with tools overflowing with EM it is then possible to uncover signal (unknown or known) by probing and modulating the signal into an audible spectrum. In reverse this also enables the hiding of signal or message within the system – the LED looks like a light but carries another message. The practice of steganography originates from the early methods of secret message passing across borders primarily with the use of slaves as the message carrier. A message can be passed and only unpacked / understood by its intended recipient as, to all others, there is no message apparent. The increasing levels of paranoia alongside increasing telecommunications investigated by NASA resulted in the publication of TEMPEST: A Signal Problem in 1972. 'Any time a machine is used to process classified information electrically, the various switches, contacts, relays and other components in that machine may emit radio frequency or acoustic energy. … This problem of compromising radiation we have given the cover name TEMPEST.' [9] Within T+I we pack and unpack signals throughout the system; many are open to all but some remain closed. Part of the creation of image within the project is applied via steganographic methods including the transmission of image within sound within light. Issues of territory or deterritorialization [10] are raised as the transmission is hidden not only within audible noise but also beyond the perception of the unknowing eye or ear.

"Territorialization is an act of rhythm that has become expressive […]. The marking of a territory is dimensional, but it is not a meter, it is a rhythm […] inscribed on a different plane than that of its actions." [11]
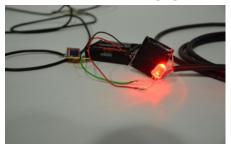

Figure 2. LED transmitter and solar cell receiver (2014). ©David Strang.

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Authors Biographies

David Strang is an artist who works with sound and interactive
elements. His work looks closely at the natural surroundings we
live in and amplifies certain aspects to heighten our perception of
space/place. Recent work includes site-specific installation, per-
formance, field-recording, networks, re-appropriating media ob-
jects, hacking and noise. David works across multiple disci-
plines, such as architecture and sciences, exploring data to create
artistic outputs.

As part of his practice David runs various experimental work-
shops exploring aspects of sonic arts/hacking/sensors in a multi
strand collaborative framework. These workshops are aimed at
the transfer of knowledge throughout the group to create an art-
work/performance/object in a few days. He has collaborated and
exhibited with artists and scientists as well as exhibiting solo
work in the UK, Europe, Iceland, Russia and USA.

He currently lives and works in the UK and is a Lecturer in
Music at Plymouth University.

Vincent van Uffelen was born in 1978. I worked in architecture
long enough to see my visions of it as art of making sculptures-to-
live-in being withered by constraints of money, matter, and client
preconceptions. This made me shift into the virtual to become a
digital crafts man, carving web sites out of the deterministic com-
plexity code. While I thereby gained over the years some sort of
visceral understanding for code I missed the tangible – code
comes close but just not close enough to touch the physical. Apart
from this gap I felt the need to understand more of the implica-
tions of my work as web developer. These have been my motiva-
tions to broaden the field of my study from computer science, to
communication science, cultural studies, and art. Hereby, I gained
the sound theoretical foundation that supports now my critical
research of the murky entanglement of media, computation, and
matter. At present I build and program: devices to act in the phys-
ical domain, probes that reveal, things that mess with communi-
cation processes, objects to make someone think.