

# INTERFACING HUMAN NERVOUS SYSTEM AND COMPUTING TECHNOLOGY FOR MUSIC PERFORMANCE:

## Mapping the Innovations of David Rosenboom, 1970-2023

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[blog about biofeedback & art](#)



# SUBJECT

Biofeedback music of David Rosenboom, whose archive I recently put together ([Finding Aid](#)) and whose [performances](#) and [lectures](#) dealing with **neuromusic** I produced in 2022.

In collaboration with Rosenboom, I had plans to

- work collaboratively on an installation
- develop a comprehensive course on the theory and practice of biofeedback music
- issue a new edition of the '75 book *Biofeedback and the Arts*

These plans are on hold, in favor of theoretical investigations.

# THEORETICAL BACKGROUND

Brainwave music as a practice rests on the backs of 3 whales:

- **Cybernetics** – “the science of control and communications in the animal and machine.” (Wiener, 1948)
- **Biofeedback** – a practice of conscious control over bodily autoregulation. Usually, biofeedback training is supplied by an instrument providing information about a condition of the body. (Brown, 1974)
- **Brain Computer Interface** – a “direct link between the inductive mental processes used in solving problems and the symbol-manipulating, deductive capabilities of the computer. <...>The Brain Computer Interface system is geared to the use of both the spontaneous EEG and the specific evoked responses triggered by time-dependent (visual) sensory stimulation under various conditions.” (Vidal, 1973)

If S is listening to a random stimulus (ex. white noise, max. neg. entropy), his EEG should reflect patterns, according to auditory images this “hallucinates” or “resonates”, as if the hallucinations were “real” stimuli with the same concomitant modifications from conditioning for the particular S. (See: Roy John, SCIENCE, Vol. 177, No. 4052, 8 Sept. 1972) Also the AER to the stimulus imagined should correlate positively to the AER of the “real” stimulus. This should offer one explanation for “ghost potentials” (we have seen in auditory sequences. This should apply to the late components (output releasing - exogenous) of the AER. Study relationship of early (endogenous - effluent) components.)

In a sequence of equally stressed auditory signals, AERs should differ according to chunking or grouping S performs on the sequence.

Present sequence of equally stressed rhythmic sounds and ask populations of S to select a time signature they believe applies to the sequence (ie.  $\frac{4}{4}$ ,  $\frac{3}{4}$ , etc.) (both

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new critical scholarship

Status Quo

source of the problem canon





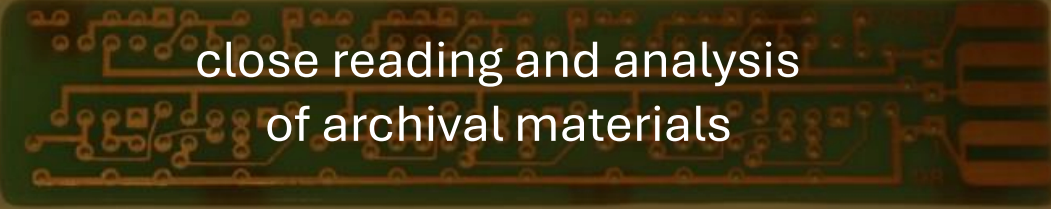
## RESEARCH QUESTIONS

- I. How does the biofeedback music of Rosenboom **qualitatively differ** from that of Alvin Lucier and Richard Teitelbaum?
- II. What **historical factors** made Rosenboom's innovation possible? Who facilitated his biofeedback music practice?
- III. What are the **deficiencies of biofeedback music canon** sourced from "Biofeedback and the Arts"?
- IV. What can today's practitioners learn from **historical (and) critical analysis** of Rosenboom's biofeedback music?

# METHODOLOGY



interview  
(qualitative)



close reading and analysis  
of archival materials



comparative analysis of artwork  
and technology



# QUESTIONS FOR THE CONSORTIUM

- I. How may practitioners benefit from exploring Rosenboom's practice? Do you find the critique of the canon useful?
- II. What other problems with the biofeedback music canon do you see?
- III. Who shall benefit from the perpetuation of the canon (status quo)? Do you see any issues with the power dynamics in the field of biofeedback music/art? What are they?
- IV. What do you see as reasons for biofeedback music not becoming, like electronic music, part of mainstream music culture or musical training/education?
- V. What may be the next frontier of biofeedback music as a hybrid practice (aesthetic+research tool)? In other words, what kind of creative or research challenge you could offer to practitioners?
- VI. How to make biofeedback music practice and scholarship more relevant/engaging/relatable for a greater audience? (Avoiding fallacies and spirituality catch-phrases)