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## **Electric Circuit as a Musical Instrument and a Graphic Score**

### **Peter Vogel's Sound Sculptures.**

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#### **Abstract**

The article investigates sound sculptures of the German artist Peter Vogel, who uses electric circuits as a sound-producing mechanism, which at the same time also serves as a sculptural form. As a result of such unity of form and function, Vogel's sound sculptures function as both musical instruments and graphic scores. Two main functions of a graphic score—the aesthetic and instructive ones—also become inseparable. Interacting with such an instrument-score the viewer becomes a performer and a listener.

#### **Introduction**

The art of the German artist Peter Vogel (b. 1937) can be situated across several trends of contemporary art. Most obviously his works belong to kinetic and sound sculpture; however the artist also often defines his works as 'materialized scores'. He also bases the ways his sculptures operate on cybernetic behavioral models, which makes them akin to artificial life artworks. Finally, the essential interactivity of Vogel's sculptures allows approaching them as experimental musical instruments. My aim in this article is to investigate the way all these trends

interrelate within the confines of a single artwork and the questions their interaction raises.

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I will focus on those Vogel's sculptures that employ sound.

## 1. Forms and Functions

The roots of the interdisciplinary nature of Vogel's art can be traced to the diverse interests he had in his formative years. His original intent was to follow his father's steps and become a painter. However economic hardships of the post-war Germany made him change his plans and study physics and engineering instead. At the same time he extracurricularly practiced music and choreography and developed an interest in psychology. By Vogel's own account he had problems with reading scores, which led him to electronic music and *musique concrete*. One can speculate that it could also have influenced the artist's interest in the more immediate ways to work with sound, namely the graphic notation and aleatoric musical forms. By 1970s he got interested in minimal music and developed his own 'polyrhythmic' technique that involved superimposing repeating patterns of different periodicity. It is worth noting that the music most of Vogel's sound sculptures produce also conforms to this principle. (Vogel 2007: 13-14)

There is a single thread that goes through all of Vogel's works from both his early and mature years: his aspiration to introduce a temporal dimension to visual arts. Thus in late 1950s he tried his hand at action painting, using the technique as a way to depict the passing of time. Later he painted a series of works that had groups of figures resembling musical signs form some kind of landscape. These paintings, as the artist intended, could be both exhibited in a gallery and used as scores for music or dance performances. (Ibid: 18)

The quest for visual time led Vogel to experiment with interactivity. His signature technique is to use photosensitive elements that register the viewer's shadow. Electrical impulses generated by these elements make the artwork react to the viewer's presence with sound, movement or light. In the artist's early interactive works the electrical circuits that facilitated the reactions were hidden behind the painting's surface, but later he started to create sculptures from the circuitry itself. (Ibid: 31)

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Vogel's sound sculptures can be roughly classified into three categories. Using the artist's own terms they are: sound objects (*Klangobjekte*), sound walls (*Klangwände*) and orchestras (*Kellerorchester*, *Schattenorchester I-III*). Sound objects are relatively small sculptures, wherein the circuit that defines both the visual and sonic components of the work is usually shaped in

three dimensions. Sound walls are works of larger, installation-like scale. The circuit here is stretched into a long (up to several meters long) band and resembles a stave. It is worth noting that the distinction between these two kinds of sculptures is rather tentative, as there are works that Vogel himself classifies as sound objects but that look exactly like sound walls, only smaller. Orchestras differ in two ways: first, the circuit is arranged in a horizontal fashion; second, the sound source here is not the electronics itself but traditional musical instruments<sup>1</sup>. The orchestras thus substitute the immediate physical interaction between the viewer and the instrument with the incorporeal interaction between her shadow and the circuit that controls the cybernetic 'limbs'. (Ibid: 47, 57, 84-6, 93-4)

Vogel bares the technological skeleton of his works and imbues it with aesthetic content of its own. His approach is similar to the one of another pioneer of sound sculpture, Jean Tinguely<sup>2</sup>, who has been creating monstrous machines that produced noise since late 1950s. Both artists present the viewers with the technological underside of the contemporary world that is hidden behind the elegant shapes of industrial design. However, as Nye Parry says in the *Peter Vogel: The Sound of Shadows* exhibition catalogue: 'whereas in a Tinguely the recycled wheels and levers reveal a world of motion, a complex network of cause and effect, Vogel's bare circuitry frequently sits motionless, revealing its activity only through the resulting play of lights, sound, or at most an individual moving part that forms the physical output of the system'. (Parry 2011)

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1 Some sound objects also employ traditional instruments as their sound source.

2 According to the artist, some gallery curators have even called him 'electronic Tinguely'. See Nakagawa 1992

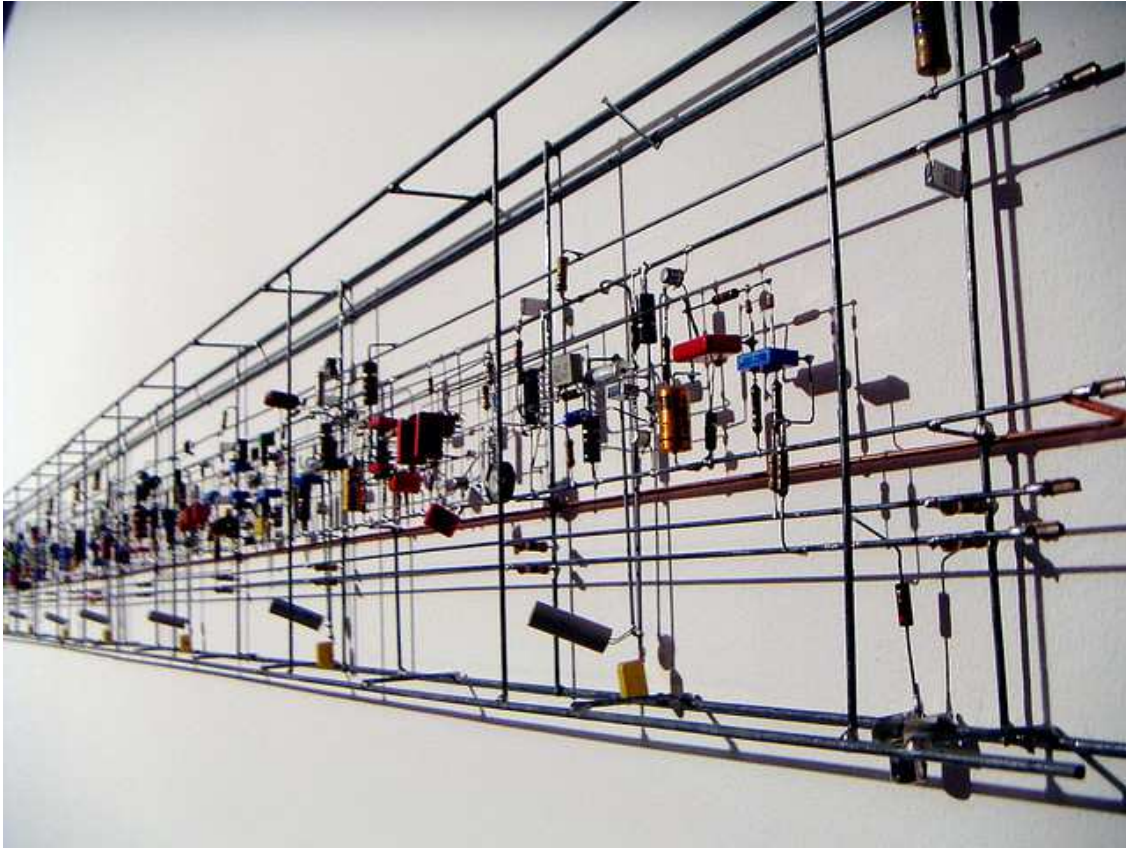


Fig. 1. Peter Vogel. Sound Wall (fragment). Photo by Oliver Keller

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The two artists differ the most in how they regard the aforementioned underside. For Tinguely technology is a source of potential threats, both physical and cultural: meaningless, often self-destructive motions and chaotic noises that his machines produce are intended as a warning for the viewer. (Gertich 1999: 146) Conversely, electronic components in Vogel's works compose visually pleasing shapes and the sounds his sculptures produce, while distinctly synthetic, are still fairly musical. The artist invites the viewer to accept technology as an essential – and essentially beautiful – part of contemporary world and to enter a dialog with it. (Archer 2011)

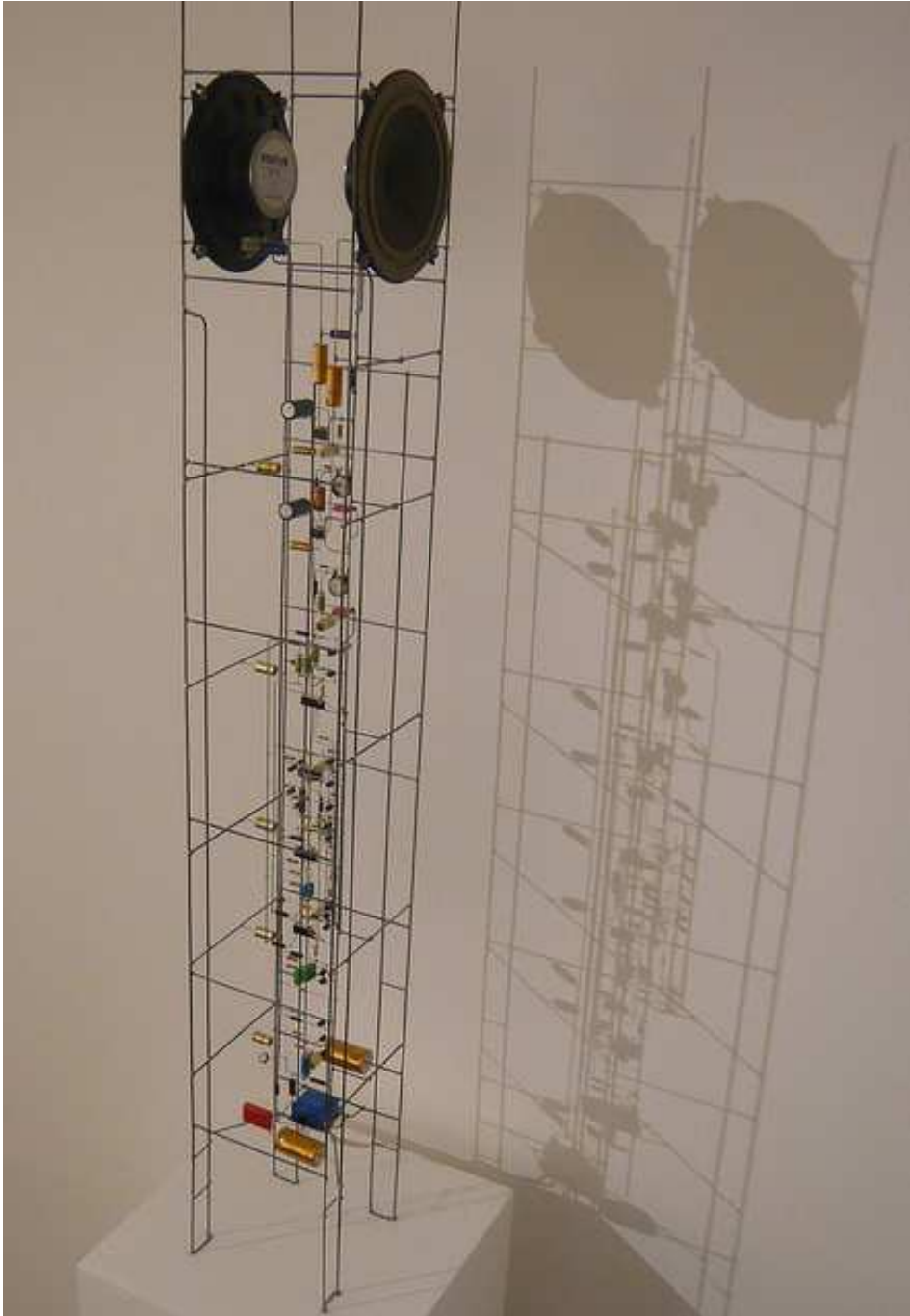


Fig. 2. Peter Vogel. Sound Object. Photo by Sven Nevenn

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## 2. Instruments and Scores

In Peter Vogel's works technologies of sound synthesis are ascribed aesthetic value of their own. His approach can thus be situated within a larger development of the emancipation of the metamusical\*. I use this term to designate the late 20th century trend of transforming those elements of musical art that were previously considered instrumental or peripheral into art practices in their own right. Sound sculpture as a whole can serve as an example of such emancipation as its origin lies with experimental musical instruments.

The main milestones of the development of sound sculpture can be summed up as follows. Starting in mid-1930s the American composer Harry Partch created an ensemble of musical instruments that would not only be used to produce sounds but also served as elements of the stage setting, adding a visual dimension to music. In 1950s French sculptors Bernard and François Baschet start building experimental instruments for performing music (*structures sonores*) and sculptures-instruments to be exhibited in museums and galleries, where audiences could play them (*sculptures sonores*). However the line between the two categories was by the Baschets own account rather blurred. The sound sculptures built in 1960s by the American artist Harry Bertoia did not require involved performing any more: his works produced sounds by way of swinging metallic rods that struck each other. This way musical instrument gradually gained independence from the composer's and performer's intent and became an art form in its own right.

Usually European musical instruments have been artfully decorated: the ascetic shapes of the instruments of the contemporary symphonic orchestra are more of an exception to this tradition. However there is a fundamental difference between the antique decorations and the visual shape of a sound sculpture. In this latter case the very sounding mechanism of the instrument becomes the sculpture, inextricably tying the visual with the acoustic. In that regard Peter Vogel's works relate to the electronic musical instruments in much the same way that the Baschets' and Bertoia's sculptures relate to traditional acoustic ones. The artist composes an elegant futuristic ornament from the very electronic elements that synthesize sounds and the wire fragments connecting them.

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\* After the paper was published, it was brought to my attention that the term 'metamusical' has already been introduced by Eddie Prevost to describe some sort of future music, based on free improvisation. In subsequent publications I no longer use this term.

However there is a fundamental difference between the sculptures of the Baschets and Bertoia and Vogel's works that stems from the difference in the way acoustic and electronic musical instruments function. The way a traditional instrument sounds is defined, first, by the qualities of the materials it is built from and, second, the interplay of its structural parts. In other words it is a product of the instrument's material and its form that in the case of sound sculpture also determine its visual shape. Electrical circuit on the other hand is composed of a multitude of standardized electronic elements of different types, each of which controls a single sound or an aspect thereof, depending on their position within the circuit space. The visual shape of such an element does not define its function but rather signifies it. This makes it akin to a musical score, as the score is also composed of a multitude of standardized elements that are signs of sounds. However, as the arrangement of the elements in Vogel's sculptures is not merely functional but realizes an aesthetic idea, his works can be regarded not as traditional scores but as graphic ones. Coincidentally graphic notation is also one of the most important trends in the emancipation of the metamusical.

The development of graphic notation was driven by two main reasons: on the one hand it was the sophistication of the musical writing in the 20th century, on the other hand – the rethinking of the relationship between the composer and the performer, the development of aleatoric music, that gave the performer more creative freedom. (Dubinets 1999: 11-16) In the latter case the graphic score gradually ceases to instruct the performer and strives to stimulate her musical intuition instead. (Ibid: 40)

As a result aesthetic side of the score gradually supersedes its instructive function. Visual score becomes an art form in its own right alongside such interdisciplinary graphic genres as visual poetry, artist's book etc. Henceforth the textual nature of the score becomes less and less pronounced, up to the point of emergence of what can be called sculptural or object-based scores. A characteristic example of such score is Jennifer Walshe's work *My Extensive Relationships with Mr. Stephen Patrick M. (I)*. It takes form of a set of ribbons made from different fabrics that are to lead the performer's musical intuition through tactile sensations. An essential quality of metamusical art practices manifests in such works – the transition from the abstract to the corporeal: whereas sound sculpture makes musical sound corporeal, graphic score does this to musical text.

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### 3. Sculptures and Viewers

In the context of graphic notation Vogel's sound sculptures can also be regarded as a kind of sculptural scores, a follow-up to his earlier attempts at score-paintings. However the fact that they also function as musical instruments fundamentally changes the relationship between the sculpture and the viewer who thus becomes also a listener and a performer. Traditional graphic scores work differently depending on whether they are employed in a concert performance or exhibited in a gallery space. In the latter case the score appears as a piece of visual art, not intended to be performed, only viewed. Conversely, in a concert hall a graphic score is performed, but cannot be viewed. Vogel's works, however, merge these two contexts; his sculptures can be viewed and performed simultaneously.

Moreover, these two actions are essentially one and the same. The act of viewing such score-sculpture is the act of performing it by virtue of the viewer's shadow inevitably falling on the photosensitive elements and thus starting sound generation. Still, this does not exclude the possibility of consciously performing the sculpture, which can be undertaken both by viewers or professional musicians (which actually took place on a number of occasions). Furthermore, these two kinds of performers work with the score-sculpture in two different ways.

Musicologist Elena Dubinets distinguishes two kinds of graphic scores: discursive and suggestive. Discursive kind 'suggest at least some, even if very tentative, presence of visual relations characteristic of traditional notation' while 'suggestive notation lacks even a hint of tradition, it is a piece of visual art, but with a possible sonic realization'. (Ibid) Electrical circuits in Vogel's works can serve as either discursive or suggestive scores, depending on who their viewer-performer is. They can be divided into separate repeating elements and strongly resemble traditional scores visually (in case of sound walls and orchestras the circuit is even laid out in such a way so as to look like a staff). Therefore a professional musician could read a circuit-score as a rather distinct temporal structure.

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For a layperson such a score would not bear any specific musical meaning. Essentially this can be said of any exhibited score, as in such cases they are not intended to be performed. However in case of Vogel's works any viewer becomes a performer, thus the circuit becomes a suggestive score.

Furthermore, if a professional performer knows her instrument and her goals, Vogel's viewer meets the artist's sculptures-instruments for the first time and does not know their sonic



possibilities. The way the viewer interacts with the work is through experimentation and intuitive exploration, that are driven in part by her perception of the work's sculptural shape, but at the same time (and probably to a greater degree) by its feedback, i.e. the sonic result itself. In other words, the music that the viewer creates through her interaction with the sculpture also becomes a part of a suggestive score.

Of particular interest here is the question of what kind of instructions such a suggestive score conveys. Since the listener, as noted above, has no preliminary idea of the sculpture's musical possibilities, she cannot consciously control its sounds, only her own movements and gestures. Vogel at times describes his sculptures in similar terms: 'The cybernetic objects as "game systems" are an invitation to movement, a prompt to simultaneously receiving and generating, the interplay between sensuous perception and physical action. Without the actions of the viewer the object remains dead. Only through movement is it stimulated into a reaction, which in turn challenges the viewer into ever new movements'. (Vogel 1996: 92)\* Therefore Vogel's sculptures can be regarded as both music and dance scores. It is no coincidence that one of the sound walls, built by the artist for the *Sonambient* festival of 1996, was designed specifically with dancers in mind and was named *Techno-Wall*, after a dance music style popular in 1990s. A parallel also can be found with Leon Theremin's instruments: the theremin, which used the position of the performer's hand in relation to the instrument to control the pitch, and, to an even greater degree, the terpsitone, which used the dancer's whole body in the same way.

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#### **4. Movement and Time**

The discussion on movement brings to the fore the issue of relationship between space and time and Vogel's works. On the one hand the quest for 'visual time' is one of the artist's central subjects. On the other hand, according to Dubinets "'graphic music" pieces... essentially refute the idea of music as a time-based art form', and furthermore 'The emancipation of the notation transformed the traditional space-time relationships. Time is not interpreted anymore as linear, conforming to the unidirectional eye movement across the score page from left to right. It ceases to be "calculatable" and to correlate with the page size'. (Dubinets 1999: 38-40)

Indeed, if we regard a sound sculpture as a musical piece, i.e. as a score and its sonic realization, there is no question of it having a definite temporal structure. Different performers-listeners can interpret the visual score differently and the degree of their interaction with it can also vary

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\* English translation quoted from Martin 2011

greatly – up to the point of ignoring it fully<sup>3</sup>. This non-linearity is further strengthened by the work's tree-dimensional structure (be it the sculpture itself or the installation space), that offers more possible ways of reading than any kind of paper score, however unorthodox it might be.

On the other hand, in listener's individual experience such a piece remains time-based and linear: the music she hears is still organized temporally into a certain form. Such contradictions are characteristic of many sound art works. Simultaneous linearity and non-linearity of musical time in Vogel's works can be explained by introducing the concept of participatory music – a music that calls for the listener to co-author what she hears.

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The term 'participatory' suggests that without the viewer's or listener's participation the work is left unfinished, it is realized fully only in individual experience. Vogel himself has on several occasions expressed a similar view of his works. (Parry 2011)

Time in case of sound sculptures exists only for the listener – in the sounds she hears and in the movements she performs to make the sculpture produce those sounds. The work itself at first glance remains static and changeless. However its quiescence is illusionary. As Nye Perry puts it, 'As viewers, we are challenged to relate the timeless constancy of the work's physical manifestation to the extreme temporality of its sonic activity...

Through our experience of our own physical movement in relation to his objects, we become aware of the movement of electrons through the structure and the ultimate impossibility of stasis. The balanced perfection of the visual form is revealed as an illusion of scale behind which lies a vibrant and dynamic world of electrical forces'. (Ibid)

## **Conclusion**

Peter Vogel's art is a complex synthesis of sculpture, technology and music. Building his sculptures from electrical circuits the artist makes the viewer aware of the technological base of contemporary world. However unlike Jean Tinguely who worked with the same subject, Vogel doesn't regard technology as a danger, but sees a kind of posthumanistic beauty in it.

Being simultaneously musical instruments and scores, his works are situated at the center of the emancipation of metamusical. I use this term to designate the process of transformation of the

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3 At least consciously. We can not disregard a possible subconscious influence of an aesthetic experience on the viewer-performer's actions.

secondary elements of music into independent art forms. Vogel's sculptures belong to two trends within this development: graphic notation and sound sculpture.

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Reifying both the musical sound and the musical text, the artist achieves a maximal degree of unity between the sculptural and the acoustic: music itself becomes a part of the score, directing the actions of the performers. This makes his works both music and dance scores at the same time.

As both a musical instrument and a graphic score become fused in the form of a sound sculpture, so do the exhibition and concert situations. Their fusion is realized in the phenomenon of participatory music, where the listener co-authors what she hears. Thus she becomes an integral part of the art work, without which it remains unfinished.

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