

## " H E X "

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Godfried-Willem RAES

### 1. Concertversion

- a concerto for violin and computercontrolled orchestra composed of electroacoustical self-build instruments.  
Soloist : Moniek Darge

### 2. Audio-Art Installation Project

- for laptopcomputer and eight caged electroacoustical instruments.

### Technical Description

One of the most striking characteristics of Godfried-Willem Raes' oeuvre since 1968 might very well be that most of his works in one way or another make extensive use of new and original instruments and sound sources. Here, most of the time these are fundamentally acoustical instruments and sound sources, this despite the fact that the sounds often reach the audience through loudspeakers. This certainly also applies to his "HEX" : although in both versions of the piece a central computer, controlling the global evolution of the music through time, is being used, all sounds that can be heard originate from physically vibrating objects such as strings, metalblades, springs etc.... No electronic soundoscillators of any kind are used in the piece. This counts for the very fact that the soundmaterial used in the piece never sounds as if it were a caricature of real-world sound, such as it happens to be all too often the case in electronic music. Electronic circuitry nevertheless is both visually and functionally highly present and dominates the whole piece. On the level of the generation of the sounds themselves, small but fast dedicated computersystems are used to strictly controll the vibrational modes of the physical objects incorporated on the printed circuit boards that make up the individual instruments. They are programmed in such a way that no periodic oscillations in the objects will ever occur. The circuit first strikes the object, then reads in any occurring resonances. A numeric calculation follows resulting in the outputting of a sequence of pulses slightly different then the number read in first. From here on the process - in fact some kind of calculated feedback loop is repeated until a stop instruction follows. These circuits - developed and built to this purpose by the author ( in "Hex" they are eight ) - on their turn are individually controlled by a small laptopcomputer serving as a central macro-controller. It is connected to the individual cards with an 8-bit wide parallel bidirectional links. This computer, a modified Epson HX-20, runs the programmes for either the concert-version, or the installation version of the piece. As the vast majority of real-time algorithmic tasks in this setup have been delegated to the individual instruments-on-a-card, the use of a small central computer became possible as its task is limited to the execution and control of the macrostructure of the musical composition. In the concertversion, this programm is made to be interactive such that the central computer has to be operated by the author, who can determine the

expressive course of the piece in real time depending on the performance circumstances. Since any time spent by the computer on performing calculations is lost time for a musical audience, the computer makes extensively use of burned-in Eproms containing lookup-tables for the piece. These chips are an integrating part of the score and turn the computer into a dedicated machine.

In the piece, the computer together with the operator get the role of the orchestra and are used in much the same way in relation to the violin-solo as is the case in a classical concerto. But, the violin does not get a completely individual musical line, since its sounds are made accessible to the computer and can be modulated and integrated in the palette of the orchestra. In this respect the piece becomes really interactive. Since "Hex" in many respects is rather an orchestra than a composition, as an apparatus it renders a whole variety of different 'concertos' possible, which all will be presented under the generic name of "Hex". It is a bit like the Indonesian Gamelan in that way.

In the version of "HEX" as an automated audioinstallation project, the central computer runs a very different program, whilst also the visual presentation of the piece is very distinct. Here all the instruments-on-a-printed-circuit-card are mount in cages, a bit like musicians in an orchestra. They are all connected with the central computer via long flatcables and perform skillfully its commands and programmed wishes. Nevertheless they all have a character of their own, a character on which the central brain has absolutely no controll.

A visual feature of both versions of "HEX" consists of the fact that all the circuits, instruments and boards are left open and bare. Thus all the functioning of the attached physical objects can be perceived by those who watch them closely enough. Thus the setup has on the one hand something quite magic in its general appearance, but at the other hand demystifying for whoever pays attention and comes close.

### Creation and origin

"HEX" was premiered in the capital of Rwanda, Kigali, during march 1988. The piece was on the Logos-Duo's repertoire on their worldtour in that month and was further performed in Nairobi, Bangkok, Wellington (on the computermusic festival), Auckland and Hongkong. (Generic version HEX0388). The first European performance took place in The Hague in june 1988 (version HEX0688) at the occasion of the Audio Arts Festival. A much further developed version has been presented at the 'Audio Arts Symposium' in Linz (HEX0988). Moniek Darge played the role of the soloist in all of these performances.

The installation version has been premiered at the Linz-festival in Austria, together with the older "Holosound"-installation. A new HEX-concerto has also been commissioned for the Brussels University Festival in november 1988.

The U.S.-premiere of the piece is scheduled for march 89.

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