

## Intelligence of Sound

Research project in the field of Computer-Music

The project "Intelligence of Sound" is based on a music-compositional concept, leading to hitherto unthinkable music constellations. Computer-technology paved the way in giving instrumental help to the daring explorer who searches for undetected regions, so far existing only in his imagination. It is well possible, that what he will find may be something very different, or even opposite, to the expected. But even such a surprising and nevertheless valuable find, shall spur him to continue with the original expectation.

As a precondition for reaching such targets in multidirectional steps, the computer has had to be specially programmed to be in full command of all parameters in sound. This has been achieved through a ~~MMX~~ development, based on constant dialogue between composer and computer-engineer, provided that the composer's mind strives for homogeneity with the computer's abilities.

Sounds are no longer presynthesized. They must be composed from their smallest particles. This wealth of information accumulated in a composition, demands a level of human memory, which as such is again in need of external help. A long time ago - a thousand years back - this necessity produced already the musical notation of Western Music. Of all parameters, only 'pitch' and 'time' could be almost precisely notated. All other parameters are either verbally or graphically symbolised.

The quantity of precise information becomes now incomparably higher with the possibilities offered by the computer. Memory must store an enormous multitude of data. It became of vital importance to find a solution to this problem; otherwise no further dialogue between composer and computer could develop. The result of this research is the iconographic notation, called "Talmark" ('Tal' ~~for~~ Josef Tal, the initiator<sup>a</sup> of this research and 'Mark' for Shlomo Markel, the chief-engineer of the electronic per-

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formance). Having accomplished this part of the realisation of an adequate musical notation to visualize the composer- computer relationship, musical composition proper now moves to the centre of the project as a whole. Technical preparation enables us to take position from a new point of departure.

Here we shall start with the main part of the research project. The technological achievements oblige us to draw musical consequences.

First, we shall make a careful selection of events, otherwise we will be lost in the seemingly chaotic acoustical phenomenon. Any sound-event is the result of the context within its smallest components. The creation of this context is the genesis of the resulting complete composition. All new contexts do relate to the first sound, either in discovering not yet utilized inner constellations or asserting contradictory constellations.

All those contexts are now liberated from the mechanical limitations of the human interpreter's body, who can not play on a computer the same as on a musical instrument. This demands from the composer exploitation of higher intellectual levels, vitalizing new emotional reactions, expanding meaningful formulations in hitherto unknown musical regions.

One of the first music-theoretical consequences is the final abolishment of sound-organisation in western scales or eastern melodic patterns, as well as the fundamental tone-principle in classic harmony, leading to atonal harmony. The early recognized danger in this anarchic potential led to the rigorous discipline of the total serial music, the last phase of the 12tone-systematization, still holding to the division of the octave into 12 well-tempered half-tone intervals.

After this we will reach the so-called "Computer-Music", in which any trace of an Eastern or and Western-musical grammar is completely disrupted. I may be permitted to quote the closing words of Bertrand Russel's "Sceptical Essays": " Into every tidy scheme for arranging the pattern of human life

it is necessary to inject a certain dose of anarchism, enough to prevent immobility leading to decay, but not enough to bring about disruption. This is a delicate problem, not theoretically insoluble, but hardly likely to be solved in the rough-and-tumble of practical affairs. "

As a matter of fact, in Rameau's "Traité de l'Harmonie" (16th century) lies already the inherent disruption of the future "functional" system of tonal harmony. The principle of inversions of the triad, itself based on the fundamental tone, cancels the notion of the very fundament. In the inversion the chord is based on substitutes, searching for new functions in musical space. The notion "Fundament" will change in future to the notion "point of radiation" in multidirectional references. This probably will lead to a point of departure for a future discipline in theoretical considerations for the upbuilding of a creative grammar in computer-music, leaving room for anarchy and avoiding unbridled freedom.

The close connection between the iconographic notation and the establishment of a new order is obvious.

Josef Tal

