

**Luc Rondeleux**

### **1957-1997: The Digital Computer as an Instrument of the Musical Creation.**

Computer music was first projected onto the scene, forty years ago. The growth of digital technology in the mid-1950s reflected an important meeting of four fundamental fields of knowledge: first, the field of acoustics, description of physical data; second, the field of hearing, and the whole psychological data of perception; third, sound synthesis and digital signal processing, this being the technological field; and, last, musical formalization, an unlimited artistic field whose definition is, and will remain, impossible because of the need for constant development in musical theory. Those four fields appear to have benefited mutually from their respective advances. (Rondeleux, Laliberté, 1997)

Originating with electrical production of sound, subsequently amplified by the arrival of the tape recorder and its spatial transcription capabilities, this area of musical experimentation has become more and more technological. Immediately after the Second World War, technological musical production, bringing *Musique concrète* in France, *elektronische Musik* in Germany and “tape music” in United States, demonstrated the importance of a definition of musicality. The confrontation with this new area obliged every composer to restructure the conception of his art. The introduction of digital sound synthesis (Mathews, Bell Telephone Laboratories, 1957), whose discovery was simultaneous with the start of experiments in computer music formalization (Hiller and Isaacson, *Illiad Suite*, 1956), constitutes the most important technological breakthrough. The computer has enabled composers to work concurrently on the macroformal structure level and the microscopic quality level. This technological leap forward was particularly remarkable for the new scope of aesthetic inspiration it opened up.

But computer-aided formalization has never produced a general definition of artistic structure. Nobody has been able to measure the quality of musical sounds, even less the aesthetic relevance of some musical constructions. The most important question has now become: “how does technological art function in the perceptual processes?”. Musical aesthetics has been induced to extend his field of investigation to the understanding of music’s meaning (Minsky, 1981). Some statistical evaluation have translated this subjective perception into an algorithmic model grounded on the tonality structure (Lerdahl & Jackendorff, 1983). Mediocre results have suggested that the computer offers truly functional tools only when it can overshoot a simple sequential treatment, and when it interacts with the composition. “Art of sounds” has then become the most interesting practical application of a science devoted to the analysis and description of sound quality. This creative application is part of most of the great computer compositions. These include: J.-C. Risset’s *Computer Suite for Little Boy* (1968) and *Mutations* (1969), J. Chowning’s *Sabelithe* (1971) and *Turenas* (1972), or, later, Tristan Murail’s *Désintégrations* (1982), using “spectral” writing, or Philippe Manoury’s *Jupiter* (1986), using “neo-serial” rules of composition. Such works are often the result of research in acoustics. The arrival of real-time synthesis and MIDI control (1982) transformed the whole world of technological music. In regard to this utilisation of digital technology, *Répons* by P. Boulez constitutes a turning point of the 1980s. With this work, technological investigation has become an instrument of modelling for new musical conceptions. The aesthetic focus is now on controlling the principal parameters of musical perception (space, time, timbre recognition...) and so transforming functionalities into compositionnal tools. José-Manuel Lopez-Lopez’s *Lituus*, or Philippe Hurel’s *Miniatures* explore some ideas of possible interaction between timbre of instruments and macroformal innovation.

The emphasis, as we approach the turn of the century, is on widespread extension of the Internet network and on-line synthesis algorithms. Those options are currently being demonstrated in Berkeley, Stanford or San Diego. But major companies are interested in using the Internet, and they have started with the diffusion of video-clips. Shall we now see a commercial development of music via the Net? The composers must resist this phenomenon and their tools must remain a vehicle for an imaginative representation of the world rather than for a world trade exchange.

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### **References**

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