

Knut Wiggen – Electronic works 1972-1975

As a pioneer of computer music, Knut Wiggen (1927-2016) was hugely important in reshaping the Swedish music community from 1959, when he became chairman of Fylkingen Concert Society, until he left his position as the founding director of the Electronic Music Studio (EMS) in 1975. There was a red thread running through Knut Wiggins work that led up to the five pieces that comprises this album.

Wiggen had studied piano in Oslo with Robert Riefeling, and moved to Sweden in 1950, where he studied piano with Gottfrid Boon and Hans Leygraf, and composition with Karl-Birger Blomdahl. Leygraf brought him to the Darmstadt summer courses, and Wiggen ended up living in Darmstadt from 1952 to 1955, immersing himself in the continental musical development and in particular the new electronic music. At the time, studios were emerging at radio stations across Europe, and electronic means brought great promise of a music that would represent the new times that followed in the wake of WWII.

This new music met with different kinds of challenges – political, technical and what Wiggen called psychological. Politically, electronic tools were thought of as an enabling technology; with electronic tools anybody with an interest and access to tools could make and perform music without having conventional training in the virtuoso musical culture. It was expected that the growing economy would result in a higher demand for cultural participation, and that the rapid deployment of new technologies would require the populace to familiarize themselves with them in order to not become alienated. Wiggen also believed that the new mass media of radio and television required a new type of music.

Analog techniques could require weeks and months for completion of a complex piece, so the production of the new music needed to become more efficient. The new digital means of computers for composition showed great promise for speeding up the process, and there was significant pressure for developing new and more precise tools that would open the field up for new generations of composers.

The psychological challenges reached beyond appreciation of new sounds. *Sound montages* were for the most part composed by ear, while *electronic music* was more often constructed from principles organizing frequencies and amplitudes. The new technology of computers opened up for more complex algorithmic composition than had been heard in music previously, and by making sets of rules that the computer could operate on, composers could manage to take a step back from the actual sounding result. Principles and complexity could be explored without the interference of human intent, at least on a timbral level. And to Wiggen, this was absolute key in developing the new music.

When Wiggen was entrusted with the construction of EMS in 1964, he had already travelled extensively in Europe, and developed his ideas for a new, computer-based instrument. At the time, computer synthesis was being explored, but was only useful for research – the processing speed and storage possibilities were too small for professional studio use. The hybrid studio where a computer controlled the analog sound equipment was the only viable alternative to the analog studio. While this was at the center of development in several locations around the planet, EMS was the first complete realization of an entire functioning studio based on this model. The equipment list was impressive: 24 oscillators, a noise generator, four reverb modules, two filter banks with settings for each third, three ring modulators, two envelope generators, two digital and several analog tape recorders.

In order to control this equipment in real time, EMS developed an approximately 9 meter long control console, and the console interfaced with a PDP 15 computer so that realtime adjustments could be recorded on the digital tape that stored the performance data. Programming could be done 1) directly on the machine, 2) on paper tape later to be transferred to digital tape, or 3) on the control console. The console and the scope of the installation made EMS a marvel in computer music, and the stream of visiting computer music notorieties confirms this status. Max Mathews, Jean-Claude Risset, Iannis Xenakis, Gottfried Michael Koenig, Pierre Schaeffer, Jozef Patkowski, Dmitrij Sjostakovitj and many others visited the studio for meetings and conferences, and as composers.

With the hardware in place, the programming concepts could be realized, and in order to transgress the procedure-based, linear approach of the Music N-family of languages, Wiggen envisioned an object-oriented programming where the mathematical operations were encapsulated in "boxes" that could be connected in multiple ways, on micro- or macro-levels. By connecting boxes, the composer would not need to control the details in the composition, and the music could be based in logic and not on personal taste to the same degree as in the analog days.

Wiggen implemented this idea in the software *MusicBox* which at the time was a revolutionary language, and the next development along this line of object-oriented programming for music was *Max*, launched approximately 15 years later at the research center Ircam in Paris.

Given how much *MusicBox* broke away from the deterministic methods used nearly everywhere else in computer music at the time, Wiggen did not want to publicize the software until he felt certain that it had proven its value. And to him, this value could only be proved by music and its ability to resound and create emotional responses in the listener. Wiggen composed five studies, and has explained that when he managed to create atmospheres that evoked emotional responses and could see that his logic successfully connected to this type of psychological experience, he felt that the software had proven itself. He could make music with *MusicBox*, not only sounds.

His five studies were written over the course of three years: *Sommarmorgon* (1972), *Etyd* (1972), *Resa* (1972), *Masse* (1974) and *EMS för sig själv* (1975). Where *Sommarmorgon* is a poetic piece, intervallic, detailed and with huge dynamic variation, *Etyd* focuses on speed, movement, abrupt changes and eruptions in a stronger formal construction. Both pieces are tonal in essence, and the use of randomness seems controlled and limited. Of his five works, *Resa* has been performed the most, and Wiggen combines approaches from both *Sommarmorgon* and *Etyd* in this piece that oscillates between intense sections and carefully Doppler-treated timbres. Spatial movement is essential for the atmosphere of *Resa*, in particular for the "walking" voice that directs the attention of the listener towards directions and distances. Both pitch and articulation of this voice is randomized, and it retains its position as a "theme" throughout the layered environment of the piece.

Massa is a study of sound masses and walls of sound. Walls like these were known to Wiggen particularly from Xenakis' works, and *MusicBox* would not be complete if it was unable to provide this kind of intensity. Wailing glissandi throughout creates large movements in the concert spaces, and the dramaturgy reminds us of John Chowning's *Stria*, written three years later. Of Wiggen's five works, this is the one where four-channel performance would create an overwhelming experience. The last piece on this LP is *EMS för sig själv*, and according to Wiggen, it was a chance happening from when he one night accidentally started a performance of some unfinished programming. The piece stands out as different from the other four.

It is important to remember that computer music sounds at the time were simple, and that conventional expressivity was rare. With this as a backdrop, it is striking how full of timbral nuance Wiggen's pieces are, and how refined they sound, perhaps particularly in *Sommarmorgon*, *Resa* and *EMS för sig själv*. It is also important to remember that Wiggen did not control the individual sonic events in the same way as most other composers did at the time. He set processes of signal flow in motion, and with this backdrop, the sounding results become even more impressive. Perhaps his pieces sound fresh because they are composed with a distance to the sound itself, and not based on the composer's exploration of personal taste in sonic properties.

One more thing needs to be mentioned. From early on, Wiggen believed that electroacoustic tools would liberate music from the acoustical confines of the concert hall. *MusicBox* was built to simulate music from constructed models, and for moving sound in simulated space as well. Spatialization was and is an important idea in computer music, and Wiggen's pieces on this LP were originally composed for quadrophonic playback. The sensation of speed that Wiggen augmented by using Doppler shifts is easily noticeable also in the stereo versions on this album.