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Lectio Praecursoria: User stories of Erkki Kurenniemi's electronic musical instruments, 1961–1978

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Lectio praecursoria: Erkki Kurenniemen
sähkösoitinten käyttäjätarinoita, 1961–1978

Tämä lectio praecursoria pohjustaa väitöstutkimusta, joka käsittelee elektroakustisen musiikin historiaa sekä sähkösoitinsuunnittelua Suomessa 1960- ja 1970-luvuilla. Tutkimuksen kohteena ovat suomalaisen elektronisen musiikin pioneerin Erkki Kurenniemen (1941– 2017) ainutlaatuiset sähkösoittimet sekä erityisesti näillä soittimilla tuotettu musiikki. Tutkimus pohjautuu historiallisesti merkittävään kulttuuriperintöaineistoon, joka koostuu musiikkiteoksista (noin 100 teosta), historiallista media- ja arkistoaineistosta, valokuvista, soittimista ja muistitiedosta. Historianäkökulmasta väitöstutkimus haastaa ja tarkentaa aiempaa kuvaa elektroakustisen musiikin tilanteesta Suomessa 1960- ja 1970-luvuilla. Teknologiatutkimuksen näkökulmasta työ osoittaa, kuinka teknologiset artefaktit kehittyvät pikemminkin alkuperäisen suunnittelijan, niiden käyttäjien ja itse artefaktin välisessä monimutkaisessa vuorovaikutuksessa kuin yksinäisen suunnittelijan keksintöinä, muusta maailmasta eristetyssä laboratoriossa.

# User stories of Erkki Kurenniemi's electronic musical instruments, 1961–1978[1]

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The history of electronic musical instruments and their design is characterized by intensive interplay between technological idealism and realism, in other words between utopian visions of future sound machines – and their feasible implementation on a concrete level – however sometimes modest. In this respect, the 1960s marked an especially significant period. Great expectations were laid upon technological development and the forthcoming instrument of the future was widely anticipated. Both the transistor-based integrated circuits and their digital-logic applications in sound synthesis, sound processing and sequencing methods challenged earlier designs.

The new technology provided new opportunities, which motivated designers and artists to reach for novel solutions. Designers of electronic instruments tried – at least to some extent – to break free from traditional user interfaces and musical expressions. Nevertheless, the designs were also tied to the tradition, especially when assessed and received. The development occurred widely in international contexts – as well as locally at the grassroots level. From the perspective of historical research, ruptures of these kinds give significant insights into the technological developments and reveal details that would otherwise be hidden.

In Finland, this music technological rupture inspired Mr. Erkki Kurenniemi, one of the pioneers in the field of electronic musical instrument design and electronic music, to seek new means of implementing the novel technology in his search for utopia. For Kurenniemi in particular, the electronic musical instrument of the future was a tool for realizing automated and algorithmic musical processes. During the 1960s and the 1970s Kurenniemi built and maintained the University of Helsinki Electronic Music Studio – the first permanent facility of its
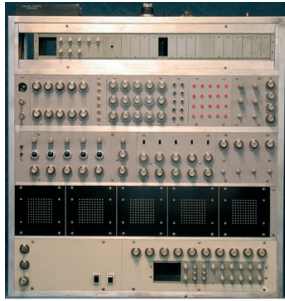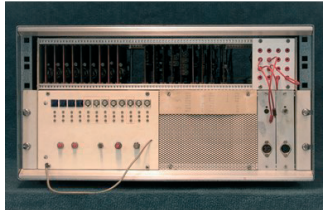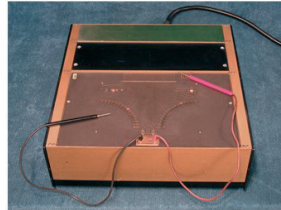
Integrated synthesizer (1964)
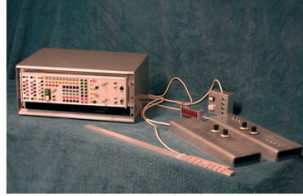
Electric Quartet (1968)
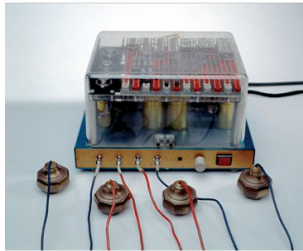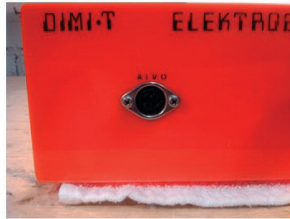
Andromatic (1968)

DICO (1969)

DIMI-A (1970)

DIMI-O (1971)

DIMI-S (1972)

DIMI-T (1973)

DIMI 6000 (1975)

Figure 1. Erkki Kurenniemi's instruments: an overview. Figure: Mikko Ojanen. (Photos: Mikko Ojanen & Jari Suominen 2004; Perttu Rastas/Kiasma 2007; Jari Lehtinen 2014; DEF 1972.)

kind in Finland – and he designed approximately ten electronic musical instruments (Figure 1). In addition to designing instruments, Kurenniemi had also embarked on a career as an artist. He produced both standalone tape music works – and electronic music and sound design for various purposes, including films and documentaries, radio and theater plays, and exhibitions.

Kurenniemi's first instrument design projects were commissioned by specific artists and composers. In 1970, together with Jouko Kottila and

Peter Frisk, he founded a company called Digelius Electronics Finland to further develop his instrument design – even as commercial products. Eventually, this rapidly growing enterprise focused on large-scale industrial technology and the design of musical instruments assumed a minor role. After a short and eventful period, Kurenniemi declared Digelius Electronics Finland bankrupt in 1976. This also marked the end of his intensive instrument-design projects, but not of his involvement in the Finnish art scene or in industrial technology.

At the time when technology dedicated to electronic music production was practically nonexistent, and the building of studio facilities required specialized resources, Kurenniemi's designs enabled the work of several composers and artists in Finland and Sweden to be realized, including in various experimental art genres beyond the field of music. He was designing his instruments at the same time as Robert Moog, Donald Buchla, and Peter Zinovieff, pioneers in the design of the synthesizer, as well as experimental instrument builders Hugh Le Caine and Hugh Davies were active. This was when what is recognized nowadays as a plethora of sub-genres of electroacoustic music was in its infancy, and when such music was heard for the first time in Finland.

With this study, I wanted to take a closer look at the kind of environment in which electronic musical instruments develop, and how they develop. After reading previous research more carefully I realized that this kind of description was either non-existent or inadequate. Thus far the otherwise wonderful research conducted in Finland had focused on the general history of electronic music, the instruments as physical artifacts, or the various actors as isolated individuals. Only rarely has anyone taken a closer look at how these actors used these instruments. And beyond – Is there something in the findings that will help us to understand this field from another angle?

Therefore, my research is not only about Kurenniemi, and even though I retain his name in the title of my study, several actors in the Finnish and Swedish scenes play significant roles. My research material consists primarily of Kurenniemi's unique instruments, as well as approximately 100 musical works by several Finnish and Swedish composers and artists realized with them. I chose twelve composers with first-hand contact with Kurenniemi's instruments for closer examination – some of them even closely collaborated with Kurenniemi in the design of his instruments. The works of people who used Kurenniemi's instruments provide the point of departure for this interdisciplinary study, in which I consider the phenomenon from historical, technological and musical

perspectives. My analyses of the user interfaces of Kurenniemi's instruments and the stories of their users reveal a complex network of three components: 1) technological artifacts with their explicit and implicit features and functionalities; 2) users with their attitudes and value assessments; and 3) cultural and historical contexts such as musical traditions and genres. These three components are seamlessly intertwined.

From the *historical perspective*, I show how all understanding of the past is relative, and that constant re-evaluation based on new discoveries in the source material is needed. I present a large amount of new and significant documentary evidence. As I point out, for example, previous interpretations of the phased development of electroacoustic music in Finland are tenable only within a certain scale of observation. The idea that there were two waves of electroacoustic music here in the 1960s is a later construct that is detached from the target of this study. Upon closer examination of Kurenniemi's oeuvre, based on Giovanni Levi's (1991, 97) scale of observation, it seems that he was working continuously on his designs throughout the 1960s, and that they were then utilized by composers and artists in various art works – across genres.

Furthermore, the division into two periods reflects the researcher's choice to classify the musical genre according the production methods used to create the works. Research results vary depending on the assumed role of technology in music production. The adoption of production technology as a point of departure for the classification points the research in a different direction than starting from the pure aesthetic output of music. Neither is wrong, but each produces a different result.

Such choices also influence the definition of and discussion about electroacoustic music. To relate the musical genre entirely to the production technology is to dismiss both the intention of the composer and the interpretation of the listener. The value of an instrument or a production is defined by its users, not by the medium per se. Researchers whose goal is to trace works produced by electronic means form a different picture of the period than those who wish to trace the overall stylistic development of a certain group of composers. Tracking the use of electronic technology in music production and composition without proper musical and cultural-historical analysis may even skew the conception of the music culture of the time. As composer and researcher Leigh Landy (1999, 64) points out, the history of electroacoustic music is "not solely technology based or even necessarily technologically driven."

The electronic means used in music production and composition vary from one composer to another. Kurenniemi was deeply involved in

his instrument design, for example, whereas Henrik Otto Donner, his close collaborator, was mainly interested in the sonic outcome of a musical work: for him, the production methods and media were secondary to the musical expression. Classifying both in the electroacoustic music category reveals little about their musical similarities and differences.

From the *technological perspective*, in studying both the development and the use of Kurenniemi's electronic musical instruments – again – I show how the target of a study can dictate the research results. This is exemplified in the current study in the assessment of Kurenniemi's designs and their implementation. Here, I provide a framework for future studies. There is a difference depending on whether research on historical musical instruments focuses on the utopian visions of its designer and on the initial idea for the instrument, or on what was materialized concretely at the time on a component and interface level. The musical instrument as a physical artifact may look significantly different than its implementation, in other words when one considers how the composers and artists eventually used it. It is also worth pointing out that what was realized 60 years ago is now significantly different after years of deterioration. Again, from the technological perspective, Kurenniemi was a successful designer of musical instruments, finding solutions that facilitated the work of several composers and artists in various fields of music, art and technology during the 1960s and 1970s. His utopian dreams were welcomed enthusiastically by his contemporaries, but their implementation, the materialized version of his designs, remained only half-completed.

Here, my analysis strengthens the notion that processes of instrument design are socially constructed, and that the implementation of new technology is significantly dependent on the users' willingness to engage with the equipment at hand. The willingness to engage with the technological solutions, on the other hand, is affected by the background of the users. I therefore argue that Kurenniemi did not invent and develop his instruments in an isolated laboratory. His social network – the relevant social groups, to borrow the concept from Science and Technology Studies (STS) and especially from the Social Construction of Technology (SCOT) – played a significant role in both the successes and the failures of his musical adventure (Figure 2). Here, assessment of Kurenniemi's work depends on whether his designs are considered case-specific electronic musical instruments and outcomes of a DIY culture, or prototypes of viable commercial products. In fact, they were both. At least, Kurenniemi was aiming in both directions – if he even made this kind of distinction in the first place.
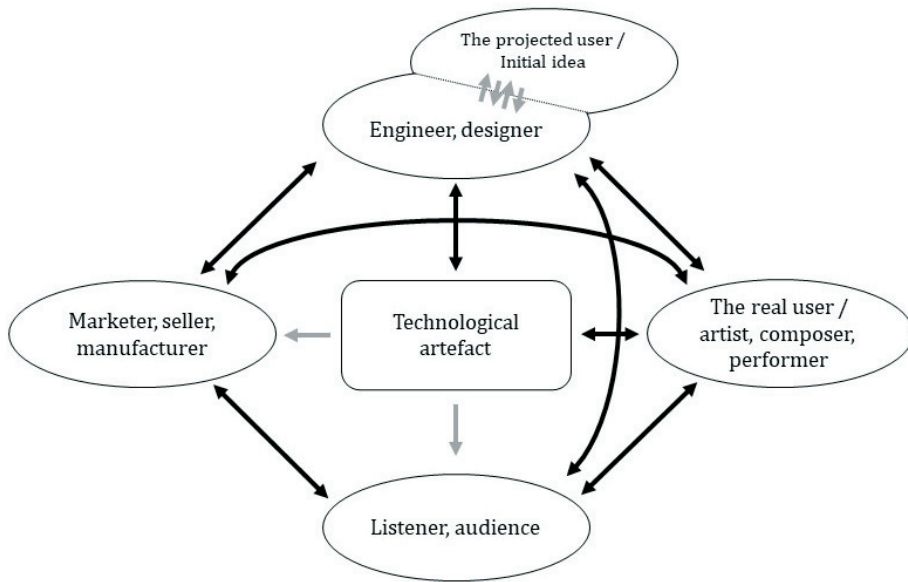
Figure 2. Stakeholders of instruments design. Figure: Mikko Ojanen.

Depending on the points of departure for their artistic work, composers and artists either accepted Kurenniemi's designs as is – at least at first – or rejected them altogether. They typically started to test the instruments with their hopes high, and sometimes they used them for several works, but eventually when they could not get beyond the constraints they rejected them – with one exception. Swedish composer Ralph Lundsten used three of Kurenniemi's instruments during his active period, which did not end until 2014. There was a two-decade hiatus when these instruments were stored in cellars in various locations in Finland. Therefore, the user experiences did not circulate back to Kurenniemi's design process and he could not take full advantage of the relevant social groups who appreciated his work and looked forward to the next invention.

One interesting finding in my research material, and something I think at least partially explains this rejection, was that Kurenniemi's instrument design was directed by something I call a computer metaphor. Why this new concept? First of all, computers in the 1960s were somewhat different than how we define or consider them today. Secondly, having taken a closer look at my documentary evidence – interviews, media sources including a few hundred magazine and newspaper articles, and contemporary TV and radio documentaries and so on – I concluded that even in the 1960s there was no unequivocal definition of a computer.

At that point I realized that it was not my task retrospectively to invent one.

For some, computer meant automation, in other words a program-mable calculator that could follow a predetermined set of rules, whereas for others it meant a machine capable of making decisions. It simply was not fruitful to hunt for one definition, therefore I use the concept of computer metaphor, which refers to all the hopes, wishes, anticipations, expectations and even fears and threats that Kurenniemi's contemporar-ies entertained about the new – and future – technology. We have to keep in mind that Kurenniemi was clearly envisioning future technology. So it seems, based on my research, that both design and use of his instru-ments were directed by the computer metaphor – an idea of a computer - and it was this computer metaphor that also severely hindered their use. They were not understood as musical instruments. At a time when the computer was a rare tool and people could not understand how it could be used, Kurenniemi's instruments were stranded between two worlds – so to speak.
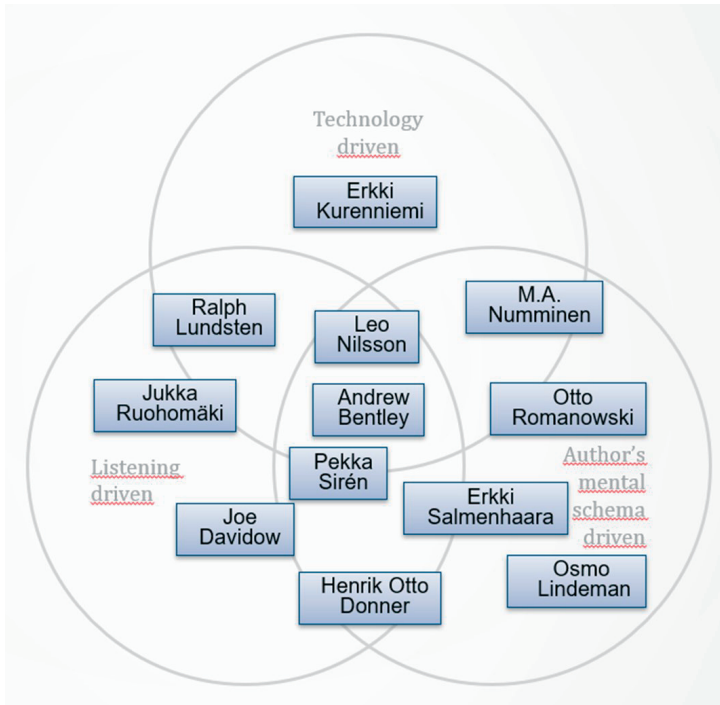

Figure 3. Composers' and artists' points of departure for their work. Figure: Mikko Ojanen.

Thirdly, from the perspective of *music aesthetics*, it is more fruitful to ask how technology diversified music-production processes and their valuation rather than how it changed music. Based on this study, I argue that technological development did not change music or musical practices. It was the various actors – designers, composers, users, artists, listeners, and even audiences – who decided whether or not they accepted the new means. Technology only sets the framework within which users operate, guided by their attitudes and points of departure. Aesthetics is also socially constructed.

I recognized at least three attitudes among the composers and artists I encountered in this study (Figure 3). In other words, I found three points of departure for their artistic work, based on 1) fully technologically oriented processes, in which the technological solution played the most significant role; 2) listening-based creative processes employed in real-time interaction with the technology; and 3) the initial ideas of the composers and artists for their artworks, which were then materialized or produced by means of the current technological solution.

This is where the valuation of music production diversified along with the technological development. Kurenniemi, for example, was more willing to accept a fully technologically oriented approach to music production than many others – such as composer Osmo Lindeman who had a background as a classically trained composer. It seems from several examples in my research material that only a few composers and artists were ready to accept the new, radical method in which the composer's mental schema and educational background, or even their real-time interaction with the production technology did not play a key role: value judgements are ubiquitous.

My study merely scratches the surface of the vast cultural heritage located in various collections of both private actors and responsible public organizations. I am looking forward to something called digital history as a tool or research method – something that is actually quite close to what Kurenniemi was aiming at – but that is a completely different story.

References

Landy, Leigh. 1999. "Reviewing the musicology of electroacoustic music: A plea for greater triangulation". *Organised Sound*, 4 (1): 61–70.

Levi, Giovanni. 1991. "On Microhistory". In *New Perspectives on Historical Writing*, ed. P. Burke, 93–113. Cambridge: Polity Press.