

Material tape as a piece of art: case studies of an inconstant work-concept in Erkki Kurenniemi's Electroacoustic Music

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Abstract

Erkki Kurenniemi was a central figure in the Finnish experimental and avant-garde scene during the 1960s and early 1970s. He collaborated with several Finnish and Swedish composers and artists, designed a series of unique electronic instruments and founded the first electronic music studio in Finland in 1962. Kurenniemi's technologically oriented approach to the composition process challenges the traditional idea of the realization of a musical work – and blurs the definition and meaning of the work-concept.

Kurenniemi's compositions can be roughly divided into two categories: "official" pre-planned works and material tapes. Kurenniemi produced a large amount of electroacoustic material to be used in compositions by him or other composers. Some of this material ended up on audio releases as such and gained the status of a musical work. The use of raw, unedited and unprocessed material gives an interesting starting point in analyzing the definition and meaning of the work-concept in electroacoustic music.

Here, an overview of Kurenniemi's electroacoustic music is presented with special interest in material tapes and instrument demonstrations that either have so far remained as such or that have been considered as musical works. Recently, there has been a growing international interest in Kurenniemi's work, both in the form of art exhibition exposure, audio releases, academic research as well as a film documentary by Mika Taanila. The transformation process of material tapes into pieces of art still continues due to audio releases of previously unpublished material.

1. Erkki Kurenniemi in the field of electroacoustic music

A Finnish pioneer of electronic music, multimedia artist, experimental filmmaker, researcher of the future and nuclear physicist Erkki Kurenniemi (b. 1941) started his career in the field of electronic music at the Department of Musicology in the University of Helsinki during the academic year 1961–62. He was invited to build the first Finnish electronic music studio for the Department by Professor Erik Tawaststjerna, who was convinced that to keep up with the modern musical trends the Department should have an electronic music studio as in the main music centers of Europe. Kurenniemi designed and maintained the university studio as "Voluntary Assistant" until the early 1970s. By that time, his electronic musical instrument

design had evolved to a serious business and he founded Digelius Electronics Finland Ltd. to design and manufacture his instruments. However, for several reasons this enterprise failed commercially and Kurenniemi moved on to design industrial manufacturing technology.

During his active years in the field of electronic music, Kurenniemi completed approximately 20–30 musical works of different types (see Appendix 1), designed ten electronic musical instruments and studio devices (see Table 1) and worked in a close collaboration with many Finnish and Swedish composers and performance artists. Most of the master tapes of his electronic musical works and most of his electronic musical instruments are stored in the Electronic Music Studio of the University of Helsinki. The rest of the instruments are located in the Museum of Contemporary Art Kiasma in Helsinki, Ralph Lundsten’s private Andromeda studio and the Music and Theatre Museum in Stockholm as well as in the InterMedia at the Faculty of Educational Sciences in the University of Oslo.

Instrument	Year	Qty	Description	Working condition
Integrated synthesizer	1964-68	1	Modular synthesizer with digital and analog modules	Out of order
Electric quartet	1968	1	Collective instrument for four players.	Good
Andromatic	1968	1	Polyphonic synthesizer with 10-step sequencer	Full
DICO	1969	1	Synthesizer with 12-step sequencer and digital memory	Full
DIMI-A	1970	2	Synthesizer with 256-step sequencer with digital memory	Good
DIMI-O	1971	1	Synthesizer with a video interface	Good
DIMIX	1972	1	Digitally controlled mixing console and patchbay with video output.	Poor
DIMI-S	1972	2	Synthesizer controlled by skin resistance of players.	Full
DIMI-T	1973	1	Synthesizer controlled by the EEG-signal of the player.	Out of order
DIMI-U	–	0	Modular synthesizer system. Combination of Dimi-A and Dimi-O.	Not completed
DIMI 6000	1973	2	Computer controlled analog synthesizer.	OS destroyed
DIMI-H	2005	1	Software instrument based on Kurenniemi’s mathematical theory of harmonies	Full

Table 1: Overview of Kurenniemi’s electronic musical instruments (Ojanen et al. 2007, 89, with some updates)

Kurenniemi’s historical instruments are frequently played in concerts and displayed in art exhibitions around the world. Like his electroacoustic music, his instruments are also regarded as works of art. However, according to Kurenniemi (2004), his early electronic musical instrument design work was merely a research project of how to apply electronic components and digital technology in the musical context. (For more detailed introduction to

the early years of Finnish electronic music and Kurenniemi's instrument design see e.g. Kuljuntausta 2008 or Ojanen et al. 2007.)

2. Challenges for research and analysis

In the turn of the 1970s, Kurenniemi started a manic archiving project in order to store all his memories. In addition to aforementioned music-related work, his vast output includes approximately 80.000 film photographs, over 20.000 digital photos per year during the digital photography era, countless hours of video and audio diaries, over 100 paintings, 14 experimental and avant-garde films during 1964-1971, computer graphics and demonstrations as well as several visionary writings on technology, music, future, etc. The wide variety of material and the vast size of his archive, currently maintained by the Finnish National Gallery, set certain challenges for the research of Kurenniemi's work. His technologically oriented lifetime work navigates researchers easily to focus only on his innovative ideas on technical inventions and visions on the future. Yet, much of the material could equally attract ethnographers, art historians or sociologists. In fact, a multidisciplinary approach, beyond the scope of music analysis, would be needed to construct a comprehensive picture of his work and interpret his musical works from the right perspective. One specifically interesting and challenging aspect for research is Kurenniemi's double role as a composer and instrument designer, which appears as an integral relationship between music and technology in many of his musical works. Kurenniemi's early works were completed in a close interaction with music technology, i.e., with electronic musical instruments and studio equipment built from the scratch. This has a strong influence on his output as a composer.

3. Analysis of Kurenniemi's selected works

Here, four examples, *On-Off* (1963), *Antropoidien tanssi* (1968), *Improvisaatio* (1969), and the "J.S.B Inventio a-molli / Dimi-1" tape (1970), are used to present the impulsive and sporadic nature of Kurenniemi's composition process. Apart from *On-Off*, the works presented here were initially instrument tests but each of them gained the status of a musical work later on when published on records, i.e., not by the intention of the composer but instead as an outcome of a later process. The distinctive features for all of these pieces are that they have been composed and realized more or less in real time and they were composed for – or with – one specific instrument each.

***On-Off* (1963, mono, 12'45")**

The first surviving work from the university studio is also Kurenniemi's first electronic work *On-Off* (1963). The work is regarded as one of the seminal compositions of the Finnish electronic music. Kurenniemi recalled that the work is a sort of rebellion against the "clean, clear and ethereal" sound ideal of the Cologne studio and, for example, Stockhausen's compositions. (Ruohomäki [s.a.], EH22/5.) According to the only surviving text document of the work "– the starting point for the piece was a static hum, the duration of which wouldn't [otherwise] have any creative meaning" (Programme text for an electronic music seminar (1978) in the archive of YLE's experimental studio as in Kuljuntausta 2008, 205).

The program text also mentions that the inspiration for the work was an acoustic phenomenon that Kurenniemi experienced in a power plant generator hall. However, it is likely that the actual sound sources of the work were the electronic equipment of the studio such as a tone generator, ring modulator, spring reverb and tape echo. It is also known that Kurenniemi completed the work in real time on tape and used the whole electronic music studio as a one musical instrument. In this respect, *On-Off* is an early example of a technologically oriented composition process, in which the composer works in close interaction with technology without a strict predetermined plan. The score of the work, in this case, equals the patching of the studio and since it has not been written down, it is almost impossible to do a comprehensive analysis of the origin of the work. *On-Off* has been approached by several scholars, but the more detailed history of the work remains unresolved (E.g. Kuljuntausta 2008, 205-207, Lassfolk 2012, 59–60; Tiits 1990, 41; Ruohomäki [s.a.] EH22/3-5).

The remaining descriptions of the work heavily indicate that it is a live improvisation with the studio equipment and the starting point of the composer was, indeed, “static hum”, possibly played from a pre-prepared background tape but without any strict structural form or detailed plan. *On-Off* consists of at least two layers of sonic material; different sound gestures laid on the top of a humming noise texture. This hum, which gives the work its static nature, is visible in the spectrogram of the work as dark and light horizontal stripes (see Figure 1). According to Lassfolk (2012, 60) this noise texture serves as an intensive pedal point on top of which different sound gestures are laid upon. These gestures occur in the spectrogram as dark vertical bars. In the certain passages the hectic action of the sound gestures disappears and the background noise texture is left alone (e.g. for over a minute in 4’40”-5’55”). Probably Kurenniemi was preparing some new maneuvers or he was just waiting for some interesting sonic events to appear on the background tape. These kinds of structural details underline the casual nature of the work.

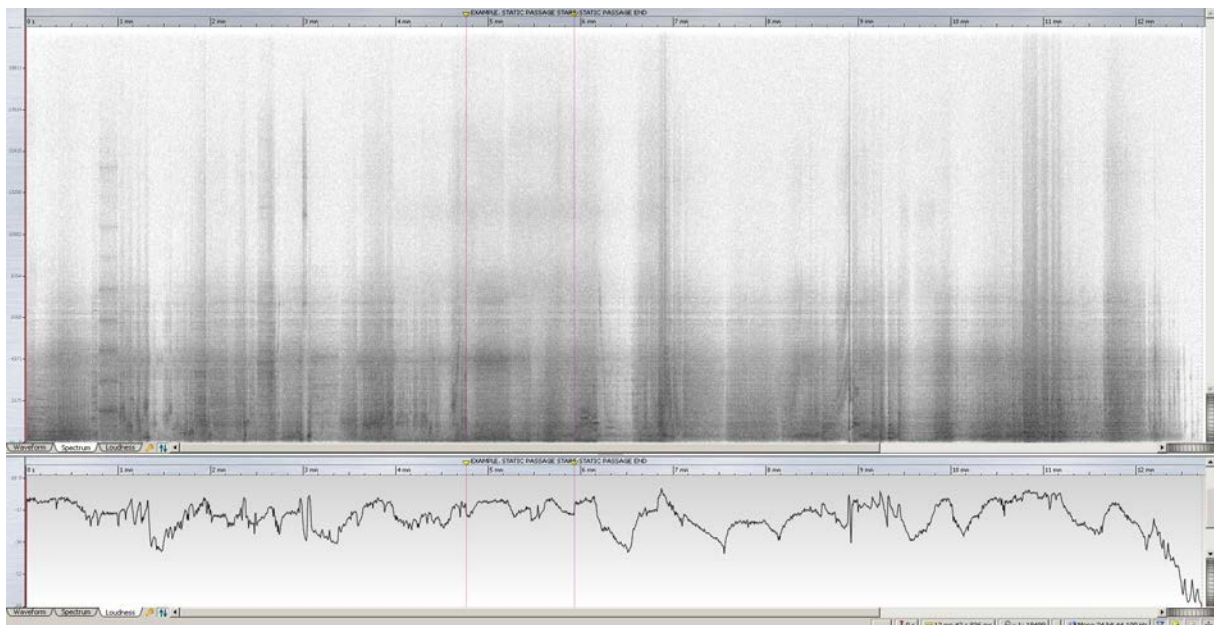


Figure 1: Spectrogram of *On-Off* (1963, mono, 12’45’’)

***Antropoidien tanssi* (1968, mono, 4'37")**

The sound material which turned out to be *Antropoidien tanssi* (Dance of the Anthropoids, 1968) was originally a test tape recorded with the *Andromatic* synthesizer (1968, see Figure 2). Kurenniemi recorded the material to test the instrument just before he travelled to Stockholm and delivered the instrument to Swedish composer Ralph Lundsten. *Andromatic* is a 10-step sequencer/synthesizer and Kurenniemi designed it in collaboration with Lundsten. To what extent Lundsten took part in the design process and which ideas were initiated by Kurenniemi is not fully known. At least the name of the instrument is derived from Lundsten's Andromeda studio (Städje 2012). The first public appearance of the instrument was in the *Feel It* exhibition in the Samlaren art gallery in Stockholm where it produced the music and controlled the lights of a plexiglass sculpture.



Figure 2: Andromatic sequencer/synthesizer (1968) in Andromeda-studio (photo Ojanen 2012)

Antropoidien tanssi has been released several times on records and during the years it gained the status of a pioneering electronic musical work in Finland. The first public appearance of the work was on a record which was released to celebrate the 100th anniversary of the Student Union of the University of Helsinki. For this purpose Kurenniemi completed *Antropoidien tanssi* only by editing three passages from the *Andromatic* test tape. No other sound processing methods were used. Later this record was heard by American music producer Kim Fowley, who was working with a Finnish psychedelic progressive group Wigwam at the time. Fowley was inspired by *Antropoidien tanssi* and wanted to include an excerpt of the work on the forthcoming album entitled *Tombstone Valentine* (1970, Love Records, LRLP 19). The one minute excerpt on the Wigwam album is the start of the third passage (see Figure 3).

Between the second and the third passage, a seemingly unintentional sound gesture consisting of a human-like voice is heard (in 1'59", duration approx. 400 ms). It was typical for Kurenniemi to record instrument tests on old tapes. Due to this and careless tape editing, the above-mentioned unintentional sound samples are very common in his works.

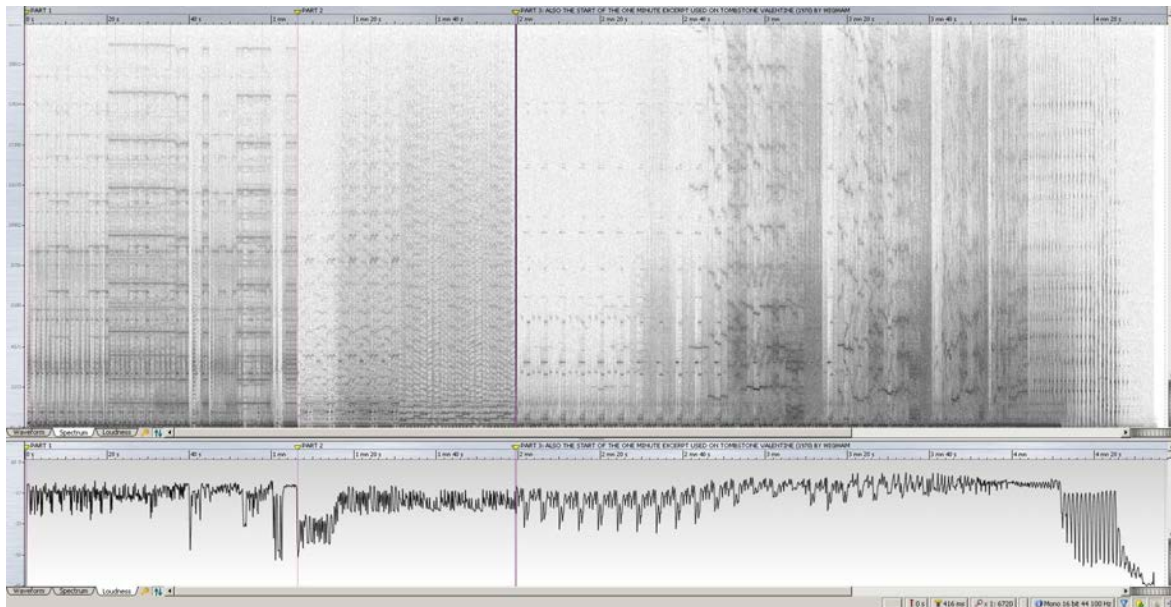


Figure 3: Three passages of *Antropoidien tanssi* (1968, mono, 4'37'')

3.3 *Improvisaatio* (1969, mono, 5'20'')

Improvisaatio (1969) is originally an improvised session by Kurenniemi with *DICO* synthesizer (1969, see Figure 4). It was a demonstration of the instrument during an electronic music seminar organized and recorded by the Finnish Broadcasting Company YLE. *DICO* is a 12-step sequencer/synthesizer custom-built for Finnish composer Osmo Lindeman. Formerly a composer of modern instrumental music, Lindeman switched entirely to electronic music in the late 1960s. For his newly built home studio he needed a tone generator. Kurenniemi designed the instrument together with Lindeman, yet it is not known to what extent Lindeman contributed to the design process.

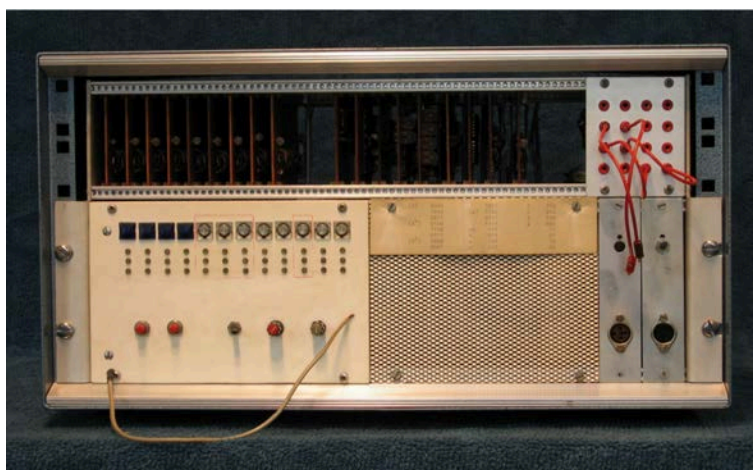


Figure 4: *DICO* sequencer/synthesizer (1969) (photo Ojanen & Suominen 2004)

Improvisaatio (see Figure 5) includes only the sound of the instrument accompanied by a distinctive spring reverb effect. Whether Kurenniemi presented the instrument also by

speaking while playing or not, has not yet been confirmed. A few details underline the documentary nature of the recording. Characteristic features of the piece are its intuitive structure and Kurenniemi's spontaneous style of playing. The first part consists of a typical twelve tone DICO sequence with long passages of little alteration of the instrument parameters. The unexpected 12'' pause divides the first part from the second half of the piece. The latter part consists of more adventurous experimenting with different features. Despite the fact that one of the essential features of the instrument is its two channel output, the recording is monophonic. Considering the impressive stereo effect in other works composed with DICO, e.g. Lindeman's *Mechanical Music for Stereophonic Tape* (1969) or his ISCMaward-winning *Ritual* (1972), it is surprising that this feature is not demonstrated in *Improvisaatio*.

The undistorted and unprocessed sound (spring reverb excluded) underlines the nature of the piece as an instrument demonstration even further. Such a clean sonic character is quite rare in Kurenniemi's musical expression. Despite the documentary nature of the recording, it is acknowledged as *a piece* (Kuljuntausta 2008, 199–200), entitled as *Improvisaatio* and also released on *Äänityksiä / Recordings 1963–1973* (2002, Love Records, LXCD 637). *Improvisaatio* was approached from a musicological angle by Lassfolk (2012, 62) with focus on sonic characteristics of Kurenniemi's music.

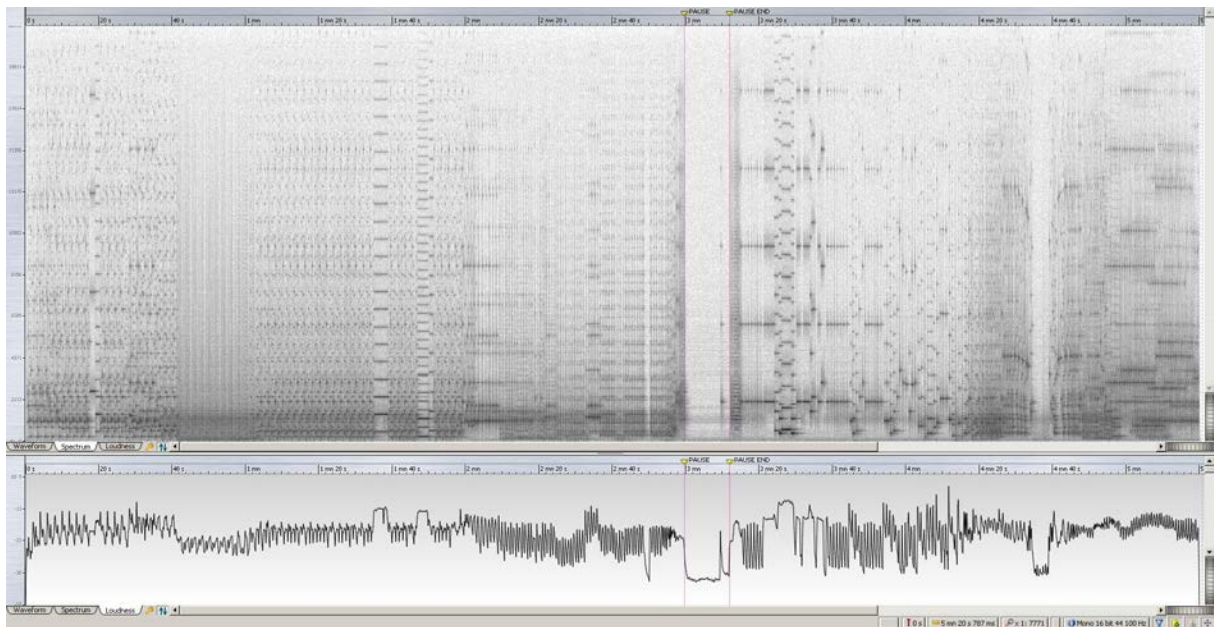


Figure 5: *Improvisaatio* (1969, mono, 5'20'') with DICO by Kurenniemi

3.4 “J.S.B Inventio a-molli / Dimi-1” tape (1970, stereo, 7'50’)

“J.S.B Inventio a-molli / Dimi-1” tape (named here according to text on the tape box) is most likely an instrument test made with DIMI-A sequencer/synthesizer in the fall of 1970. In this respect the content of the tape can be compared with the original material of *Antropoidien tanssi*. In this case, however, the test material was not processed further or released on an album until the recent double LP *Rules* (2012, Full Contact / Ektro Records, KRYPT-022), where an excerpt of *Dimi-1* was placed as a separate album track.

The tape opens with an arrangement of Johann Sebastian Bach's Invention n° 13 in A minor (BWV 784) for DIMI-A (1970, see Figure 6). Bach's Inventions provided a suitable material for demonstrating the two-voice programmable instrument. The same arrangement, named *Inventio* is usually presented together with the piece *Outventio* composed collaboratively by Kurenniemi and Jukka Ruohomäki in a separate session. Together they form a two-part work *Inventio-Outventio* which was released on a 7" vinyl single record *DIMI 1: Dimi is born* (Musica DSS-1) for marketing the instrument.

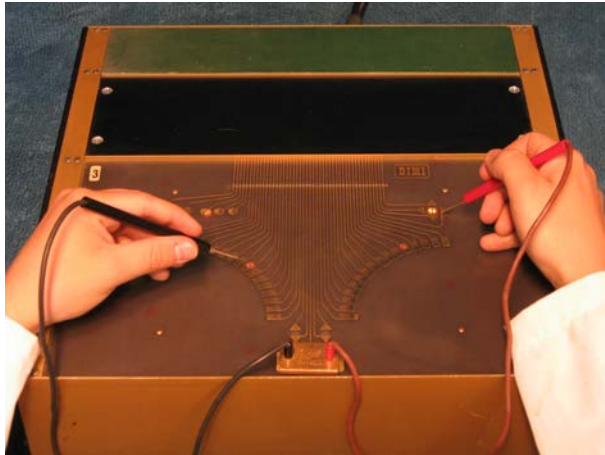


Figure 6: DIMI-A sequencer/synthesizer (1970) (photo Ojanen & Suominen 2004)

On this particular tape, *Inventio* is succeeded by six minutes of testing DIMI-A partly recorded on top of a classical work (in this case the first movement of the Piano Concerto n° 4 in G major, op. 58 by Ludwig van Beethoven). During the first half of the instrument test, DIMI-A is heard only on the left channel while the Piano Concerto is on the right channel in double speed. Around 4'30" after a sharp edit the sound of DIMI-A appears on both channels as stereo (see Figure 7). The chaotic jamming session with the instrument resembles *Antropoidien tanssi* or *Improvisaatio*, although the sound gestures and the structure of the improvisation are more hectic and surprising than in the other examples.

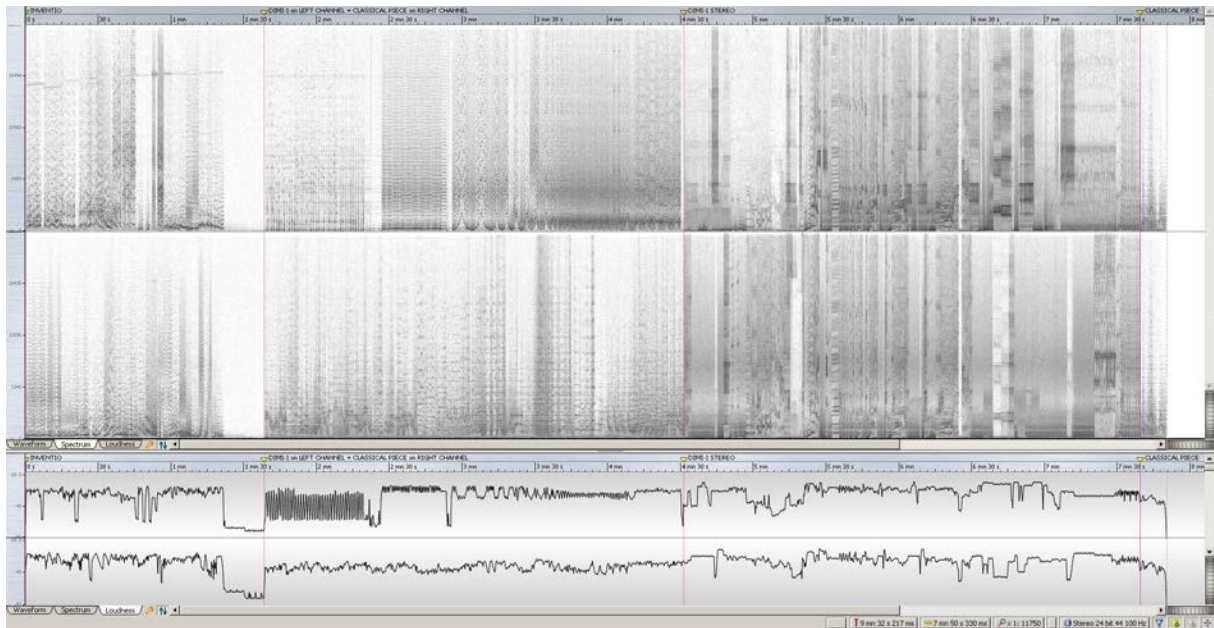


Figure 7: The J.S.B Invention and Dimi-I instrument test (1970, stereo, 7'50")

4. Conclusions

A distinctive feature of Kurenniemi's work is certain unfinishedness. Undoubtedly this is due to his impulsive and intuitive working style. Most of this material lacks a "final touch". For example his films lack a soundtrack and most of his musical instruments are quite austere with little consideration paid to user interface design or aesthetics. Furthermore, his master tapes lack reference tones and information in the tape boxes is sporadic and incomplete.

The musical expression in these works is defined in great extent by the features and functionalities of the instruments they are completed with. In the case of *Andromatic*, for example, due to its mechanical interface, the interaction between the user and the instrument is more straightforward and immediate than in *DICO* or especially in *DIMI-A*. In some cases even the meaningfulness of describing the sonic outcome in separation from the whole process of instrument design, building, testing and playing can be questioned.

Both *Improvisaatio* and *Antropoidien tanssi*, which started off as instrument tests or demonstrations, gained the status of a musical work only after their completion. However, we argue that there is more reason for their recognition than mere chance or purely technological interest. While both pieces are improvisatory and lack a predetermined musical form, they hold lasting musical value, which lies partly in their organic relationship with technology. *Improvisaatio* can be seen as an early example of sequencing, a common form of expression in the 1970s synthesizer pop while *Antropoidien tanssi*, especially its electric drum-like 2/4 beat opening passage, can easily be associated with modern techno. Nevertheless, perhaps due to Kurenniemi's impatience or his sense of humor, both pieces quickly break out of the constraints of fixed metric form.

In Kurenniemi's music, the concept of work is vague or inconsistent. In *Improvisaatio* the concept is even more disputable than, for instance, in *Antropoidien tanssi*. The latter was

named after an image Kurenniemi conjured up in his mind thinking what kind of alien creatures could dance to these sounds, while *Improvisaatio* (Improvisation) is named simply after a real life event. The difference between *Antropoidien tanssi* and *Dimi-1* is that the latter wasn't issued on an album until four decades later.

Kurenniemi's musical works and their status in the history of electronic music in Finland show clearly how a technologically oriented composition process can challenge the intention of the composer. The traditional intention, i.e. to compose an audible musical work, can be interpreted to be diminished or implicit. Furthermore, the traditional focus of the composer's intention seems to shift from a composition to compositional tools. The sonic outcome is merely a manifestation of testing and playing, while the comprehensive meaning of the work is the process as a whole.

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APPENDIX 1. List of Kurenniemi's electronic musical works

Electroacoustic works

- On-Off* (1963) (Ein-Aus (1964), shortened version of *On-Off*; disappeared)
Saharan Uni I & II (1967, together with Kari Hakala)
Antropoidien tanssi (1968)
Hana (1969)
Preludi (1970)
Virsi (1970)
Inventio (1970, an arrangement of J.S. Bach's Invention 13 A-minor (BWV 784))
Outventio (1970, together with Jukka Ruohomäki)
?Death (1972–75, three versions mainly edited shorter)
Mix Master Universe (1973, three versions mainly edited shorter, together with Jukka Ruohomäki)
Suru (1980)
Slice ([s.a.]; disappeared)

Collective works

- Äänikirje Jan Barkille* (1963, a tape collage, together with Kaj Chydenius, Henrik Otto Donner, Erkki Salmenhaara and Raija Mattila)
Siamfoni (1964, no electronics, together with Henrik Otto Donner, Erkki Salmenhaara, Jan Bark, Arne Mellnäs and Lars Werner)
Odotus (1969, in the YLE seminar, together with Kauko Laurikainen, Markku Mäkelä and Hasse Walli)
Kellot (1969, in the YLE seminar, together with Donner, Osmo Lindeman, Markku Mäkelä and Hasse Walli)
Työn kantaatti (1980, together with Sirén and Kakkori)

Live electronic, improvised works as well as instrument tests and demonstrations

- Improvisaatio* (1968, a live improvisation with Integrated synthesizer)
Improvisaatio (1969, a live improvisation with DICO)
Elektrotapahtuma (17.11.1970, an instrument demonstration with DIMI-A)
Dimi-1 (1970, an instrument test with DIMI-A)
DEAL (1971, an intermedia work for a dancer and DIMI-O)
Untitled (1971, an instrument test with DIMI-O)
DRY '73-9-8 (1973, an instrument test with DIMI-T)
DIMI-H (2005, an instrument demonstration with DIMI-H, together with Thomas Carlsson)

Music and sound design for films, theater and radio plays as well as happenings and exhibitions

Tintagilesin kuolema (1962, music and sound design for theater play, Helsingin Ylioppilasteatteri, no surviving document)

Limppiece (1964, an hour long electronic tape played during a happening)

Hyppy (1964, music for short film, dir. Eino Ruutsalo, together with Henrik Otto Donner)

Spindrifft (1965–66, music for film together with Jan Bark)

Tietokoneet palvelevat (1968, music and sound design for film, dir. Risto Jarva)

Ruusujen aika (1969, music and sound design for film, dir. Risto Jarva)

Pakasteet (1969, music and sound design for film, dir. Risto Jarva)

Suomi rakentaa (1970, a tape collage for exhibition)

Pohjoismaiset rakennuspäivät (1971, music and sound design for a multivisio)

Ruumiinavauspöytäkirja, rakkaani (1971, music and sound design for radio play)