Reconstructing sound and music in a multimedia installation - authenticity and conflicting sources

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ABSTRACT

This article describes the challenges of establishing authenticity in reconstruction of sound and music in the multimedia installation Blikk (The Gaze) from 1970. The reconstruction was made at the behest of the National Museum for Art and Architecture in Oslo for the opening exhibition of their new building in June 2022. During the reconstruction, it became clear that written, visual and sounding sources often conflicted, and that different types of authenticity had to be negotiated in order to meet the goal of authenticity.

Understanding and preserving the heritage of technology-dependent music [1] is a growing field, as evidenced in broad historical accounts such as [1], [2] and [3], in specific analyses of works such as [4], [5] and [6], in articles on specific works such as John Chowning's Stria (in Computer Music Journal, 31:3), and in conference presentations such as [7].

A central impulse in music restoration and preservation is the desire for authenticity. But how should we think about authenticity when sources are conflicting and/or in poor condition? Which aspects in a work are essential and need to be brought forward? And how should we balance different aspects of authenticity - material, historical/functional, and conceptual/interpretational? These questions emerged as work with the multimedia installation progressed, and as what at the onset looked like relatively trivial restoration took on the character of a research project.

1. *BLIKK* AND ITS CONTEXT

Blikk (Figure 1) is a multimedia work from 1970, created by composer Sigurd Berge (1929-2002), visual artist Irma Salo Jæger (b. 1928) and poet Jan Erik Vold (b. 1939). Sigurd Berge was arguably the most experimental composer of the pioneering generation in Norwegian electroacoustic music, often experimenting and playing with different sound material where other composers made more straightforward use of sound archives and conventional musical

sounds. Irma Salo Jæger was a large artistic presence at this time, known for her sculpture, painting and kinetic works, and Jan Erik Vold had published challenging concrete poetry since the mid 1960s. The installation was commissioned by the newly opened Henie Onstad Art Center (HOK), and director Ole Henrik Moe describes the work as an example of integration of "visual, plastic and light-technological expressions with sounding material based on the texts of an author." The work "pointed to the future," and was commissioned to fit the center's ambition and profile of being a location where art *happened*, and was not merely *exhibited*. [2]

The installation consisted of five identical sections organised as a pentangle. Each section included a rotating aluminium frame with a paddle wheel freely rotating inside. Plexiglass paddle wings were foliated with circles in primary colours, and a floor mounted fan drove the rotation of both paddle wheel and aluminium frame. The five sections were lit separately with spotlights above and below, and according to the program booklet the lights would be turned on and off according to a permutation pattern derived from all possible combinations of the five words in the poem *Blikket* - 320 in all [8]. Halfway into the program, the lights were turned off, and a laser would 'draw' a picture on a wall, driven by the vibration of a loudspeaker cone.

The sound consisted of recorded text and electroacoustic music, and was delivered by twenty loudspeakers surrounding the installation. Sigurd Berge combined recordings of Jan Erik Vold's readings with electroacoustic compositions, and the sound material ranged from purely synthetic sounds via recordings from nature, to layered montages of the readings. For a more detailed description of the installation as it appeared in 1970, see [9] and [10].

Sigurd Berge was well informed about electronic music internationally, having recently visited studios in Poland and Holland, where he also worked in the Gaudeamus foundation studio at Bilthoven near Utrecht for nine months. From Berge's letters written while in Holland, we know that he made use of the advanced equipment of the studio, and in his notebooks he listed the electronic tools that had been made available to him. The studios in Bilthoven and Warsaw were on the top tier as far as composers' studios went in the 1960s and 1970s, and while Berge chose to work in Holland, his composer colleagues Arne Nordheim and Kåre Kolberg worked in the experimental studio of the Polish radio in Warsaw. These three composers spearheaded technology-based music in Norway [3].

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[1] The term technology-dependent music refers here to music that could not be composed or performed without electronic technology, and not music that is merely supported by technology for notation, amplification or distribution. The term aims to be inclusive, and not only refer to the canon of electroacoustic and acousmatic music.

[2] Ole Henrik Moe in "Et museum for fremtiden." In *Prisma* 1/1968. Høvikodden: Henie Onstad Kunstsenter, pp. 18–24.
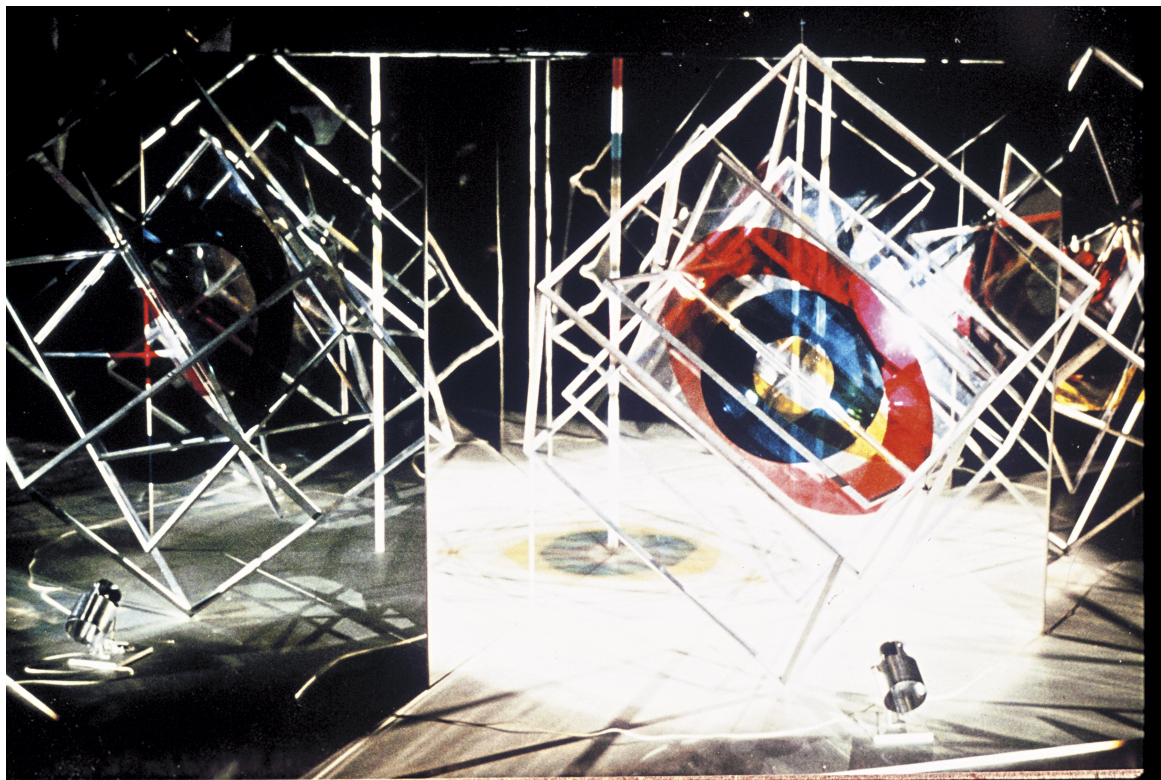
Figure 1. A section of *Blikk* as it appeared 1970. Photographer unknown.

2. WHAT IS AUTHENTICITY, AND CAN IT BE ATTAINED?

Restoring and reconstructing music poses challenges regarding accuracy and authenticity. Textual and visual information must be interpreted, physical artefacts, electronic instruments or computing equipment might be missing or be in bad shape, analog or digital media and recordings might be of such low quality that they cannot be presented without disregarding today's expectations and possibly embarrassing the composer.

To appear authentic, restoration and reconstruction relies on a high degree of similarity to the original idea and/or physical artefact. But does authenticity depend on the original sounding material or equipment, does it necessitate a focus on the historical function of the works, or do we need to make adaptions to make sure that the artistic ideas communicate as clearly today as when they were formulated? Conservator Jonathan Kemp [11] suggests that authenticity can be discussed along three axes, in effect turning the focus somewhat away from material facts and towards considering the artwork as one element in a social network defined by interpretation, function and material. However, when different multimedia sources are integrated in one work, how do we balance these different axes of authenticity - material, historical/functional, and conceptual/interpretational? What are the essential aspects in the work that need to be brought forward? Pianist Peter Hill (1986) asks even more fundamental questions: "Is authenticity attainable? Is it desirable? And (most fundamentally) does authenticity exist?" [12, p. 2].

In the text *The Complexity of Authenticity*, Jukka Jokilehto describes different notions of authenticity and writes:

"It is not easy to define authenticity in music. Certainly, this definition depends on various aspects, partly related to the original composition, partly to the interpretation, [and] it also depends on the instrument and the audience. Music is a holistic phenomenon which can leave issues to be debated."[13] Further arguments for a socio-cultural perspective can be found in [14, pp. 29-30] where Lisa Giombini paraphrases Timothy Binkley [15]: "Artworks are social objects in the sense that they are what they are because of a network of conventions that determine the parameters we use to identify them". This focus on a broader context is much in line with the reference David Scott [16, p. 3] makes to Funk, Groß and Huber [17] about authenticity being performative and creative because an "aesthetic construct is deeply implicated in the process of communication that is realised in the relationships between production, aesthetic object, context, and reception."

Music historian John Butt (2002) states that there must be a balance between deadly accuracy and historical flavour. [18] This concern is shared between acoustic and technology-based music, and in her article on historically informed performance practice (HIPP) in early mixed music, Miriam Akkermann (2018) expands: "How can or should this composition be played? How to deal with the old (outdated) technology? Reconstructing, updating, substituting, simulating or emulating? How to interpret the score and what about the author's intention?" [19, p.39] Butt and Akkerman point to the focus on physical authenticity often found in performance of music; the work should sound the same as it did when it was written. This opens up a discussion of acoustics, technology and artifacts. The combination of acoustics and electro-acoustics is sensitive, and room resonances and loudspeaker types can reduce and augment

frequency areas so that the balance of elements and legibility of speech is significantly disturbed. However, sound quality is not only a question of signal to noise ratio: critical sound evaluation and analysis also has musicological aspects, and a more holistic approach to the restoration of sound is clearly necessary, taking material, experience, context and technical tools into consideration.

In this project, I drew on Jonathan Kemp's three types of authenticity. I consider material, conceptual and functional concerns in my navigation of inconsistent and lacking sources, and found this helpful in making decisions where several pathways seem possible. Familiarity with sound technology up until 1970 was helpful in negotiating sound quality concerns, helping to preserve a sense of authenticity and historical flavour while applying modern digital techniques for approaching the sound quality modern listeners expect.

3. SOURCES, IDEAS AND PRINCIPLES

The artists had not provided an installation guide or maintained the physical elements systematically. Only one of the five physical sections of cube and paddle wheel existed, and the only surviving sound material at the arts centre was a 2-track magnetic tape with the right and left tracks going in different directions on both sides of the tape, making it unlikely that this tape had ever been used for performance. Two additional tape boxes marked 'control signals' were also found, but without indication of how sound and light had been combined during performances.

The most important primary source was a program booklet from 1970, containing 1) a short introduction to the artistic intentions, 2) a text about the formal ideas in the work, 3) a brief description of the recorded poetry and music, 4) a program for the performance with timing of the different elements, and 5) a diagram describing the light sequence (Figure 2). In addition, a brief description of the different musical elements and a number of drawings seemingly describing different permutation patterns for the light sequence. A number of photos was also made available by the art center. Two secondary sources were helpful: [10] described how the installation had appeared to the visitors in 1970, and [20] expanded on Salo Jæger's life, context and works. These sources did however not contain any necessary detail for the actual reconstruction of sound, movement or light.

The artists were influenced by (at the time) contemporary media theoreticians Norbert Wiener and Marshall McLuhan who were grappling with questions arising from use of technology in the arts [10, p. 135]. In the program booklet, the artists express their concern that the complexity of a multimedia work could become too large for full audience perception, and that they had decided to use only "simple colours and forms, simple music and simple words" in order to avoid sensory overload.

Jan Erik Vold often unfolded his poetry according to systems he created. In *Blikket* for example, the five words in the poem "Blikk du fanger ikke meg" (The gaze, you don't/can't catch me) changed order according to a permutation principle, leaving the content of the poem in flow with new nuances of intention and meaning thus constantly re-articulated. The artists decided to develop the formal as-
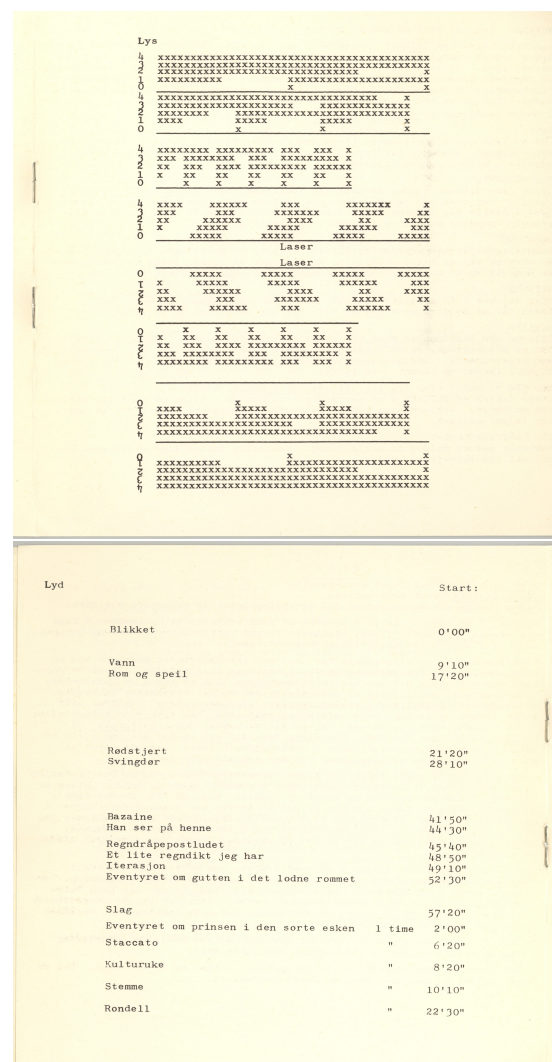
Figure 2. The score for the light changes, and a listing of the audio content.

pects of the installation by combining the number five with the permutation principle from the poem.

Berge experimented with running, dripping and splashing water, bird song and sound synthesis, and when composing with Vold's texts, he flirted with the text/sound-tradition that was important in Sweden at the time [21]. One of Berge's aims, stated in his notes, was to create spatial images and movement, highlighting the possibilities afforded by the new technology. Berge describes *Blikk* as a minimalist work, in the sense that variation within a small material was controlled by a set of principles. From this perspective, *Blikk* can also be described as a type of generative art or system art, taking the lead from the concrete poetry of Jan Erik Vold.

4. RESTORATION AND RECONSTRUCTION OF THE SOUND

Nadja Wallaszkovits raises questions about noise, dropouts and other artifacts: "Where do artefacts originate from? Can signal artefacts be identified unambiguously? Is it ok to correct drop-outs? Are signal artefacts possibly a result of the history of origin and/or use of the recording?"

[22, p. 288] However, if the goal is that the sound should function the same for today's audiences as it did originally, some concessions must be made to today's expectations, and the focus must shift from a pure material authenticity to include degrees of historical/functional authenticity.

Restoring and reconstructing sound is challenging; when removing noise one can easily add artifacts, or parts of the musical signal can disappear together with the noise. The sound quality on the first tape used for restoration of *Blikk* was quite uneven and low; the elements on the tape sounded like patchwork quilts with rapidly changing noise types. The poetry readings had clearly been recorded in several locations and with different equipment, and the efforts in making them acceptable for today's expectations were time-consuming and not very successful. However, at the beginning of the project there were no other sources known, and retaining a historical flavor was attempted through relatively careful filtering, disregarding the material state of the tape in favour of a functional and conceptual authenticity.

In the program booklet, Berge writes how sound "wanders in the room," and is "thrown from loudspeaker to loudspeaker in several layers," alternately coming from different directions. Given the emphasis on principles in the artists' conceptual description of *Blikk*, it seemed reasonable to consider the time axis, duration and movement as absolutely critical for the integrity of the work. However, the tape was in mono, and it seemed necessary to create an automatic spatialisation, remembering that the performances in 1970 had been done without a sound engineer at the projection desk. No concrete descriptions of the diffusion could be found, so a simulation was made based on moving the recorded speech between semantic blocks; a complete sentence always emerged from the same place, while the next sentence would come from a slightly new location. This was a clear artistic interpretation of the composer's intentions and a creative reconstruction of a stated artistic concept. We overruled the material (mono) fact, in order to approach conceptual authenticity.

The program booklet stated clearly that the performance lasted 40+3+40 minutes. However, the durations on the tape did not correspond with these durations. The overall duration was roughly one and a half minutes longer, too long to be explained by drift in tape machine speed. Where was the error? On the tape or in the program booklet? Or perhaps the artist's relationship to time was more relaxed than how many of us think about time today; so that the duration was more an approximation than an exact measured portion of time? In this situation, we chose material authenticity to be most important, and decided to use the durations and pauses from the tape. Thus, we avoided disturbing the dramaturgic development of the work, where intervals for reflection is key. Somewhat paradoxically, we found support for this solution also in the program booklet, where all durations had been rounded off to the nearest 10 seconds. This is rare in any music, and close to impossible with seventeen different elements in a row.

Berge writes that the laser light in the central part of the timeline draws two sections from the work *Bazaine* (named after the painter Jean Bazaine, represented in the HOK collection) and *Han ser på henne*, but this does not add up to the given duration of 3 minutes. The duration of these two parts is 3:50; close to a minute longer. *Bazaine* alone does not last longer than 2:30, so again, there is a discrepancy in the sources, and a decision on authenticity type needed to be made. A reasonable interpretation is that only one element had been drawn that way, and the decision was to use the laser light only during *Bazaine*, because of the match in intensity of sound and light. Here, the materiality of the tape durations helped us resolve an inconsistency in the conceptual descriptions.

Ironically, more than one year after all this work on restoring sound quality, creating spatialisation and deliberating timeline had been done, another tape from *Blikk* was located by a member of Berge's family. This tape was in stereo and with significantly better sound quality, almost certainly the master tape. Our assumptions about the diffusion had been correct, however the new tape featured stronger and more dramatic movement than the version we had created. The first tape was set aside, and our work on spatialisation was scrapped. The new tape did, however, needed some improvement of the noise/signal ratio and adjustment to the room acoustics.

Every space has an acoustic character which reduces some frequency areas and amplifies others. The shape of a room can also add echoes where the sound is reflected back and forth between walls, ceilings and floors. In the original version of *Blikk* this was probably not the case, due to the shape of HOK's studio where no walls are parallel and the ceiling is treated for sound. However, the space in the new National Museum is shaped like a rectangular box, and some echoes and challenging room resonances in certain frequency areas were detected. In sum, our work on the sound quality can be considered an adaption towards historical authenticity while the timeline was kept close to material authenticity.

For delivering the sound, fourteen speakers were used instead of the original twenty. The new exhibition space was smaller than the original, and speakers were mounted to the walls with a distance allowing for a continual sound movement without gaps. This type of exactness is crucial, and although no record exists on how this was done at HOK in 1970, we know that spatiality and sound distribution was at the forefront of the composers' attention. In order to keep the stereo effect from the new master tape, it was decided to divide the room into four and have the top left and bottom right corners received one channel, while the top right and bottom left corners received the other one, in effect dividing the room into four sections. With this distribution, visitors in any location in the room would hear the stereo effects that Berge had composed, even with the installation occupying the normal stereo "sweet spot". The sound delivery combined conceptual and historical authenticity.

5. ADAPTING TECHNICAL COMPONENTS

Blikk was a technically complex installation to reconstruct, and the engineers have explained that it was not an easy task, mechanically, to get the cubes and paddle wheels to rotate with only fans to drive them. Although a full discussion of the reconstructed mechanics goes beyond the scope of this text, it is important to mention the new control system for the installation, as it connected light and sound.

In 1970, each section of the installation was lit from above

and below, and custom-made relays turned the lights on and off automatically. The relays reacted to five specific sound frequencies that had been recorded onto a magnetic tape, which in effect controlled the entire light sequence. Digitisation of the control tape confirmed that it contained five different frequencies, and that they appeared according to specific patterns. However, these patterns changed much more often than in the program booklet score. Also, the duration of the control tape was only 40 minutes, half of the performance requirement. Therefore, we decided to flip the file and make it run backwards for the second half (Figure 3). This was in keeping with the mirroring principle described in the program booklet, maintaining conceptual authenticity.
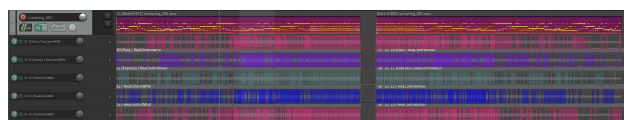

Figure 3. Screenshot of the light sequence from the control tape. Programming by Thom Johansen.

In the reconstruction, the control of sound, light, rotation and fans is executed in the Reaper digital audio workstation, running on a Raspberry Pi minicomputer. A custom graphic controller has been programmed for the installation, allowing direct access to each of the elements.

6. SUMMARY

The restoration and reconstruction process of *Blikk* was based on few primary and secondary sources. The written documentation contained inconsistencies, and few details on how the installation was performed and technically set up were available. This necessitated resolving inconsistencies, carefully evaluating different solutions, and constantly revisiting and reconsidering decisions already made during the reconstruction process. We found significant support in the idea of authenticity as a flexible ideal - material, historical and conceptual, and our choices in the restoration process aimed at retaining a balance between conceptual and physical accuracy, while retaining historical flavor.

Acknowledgments

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