

The Imperfect Copy: Role Playing Reenactments of Historical Electronic Sound Instruments

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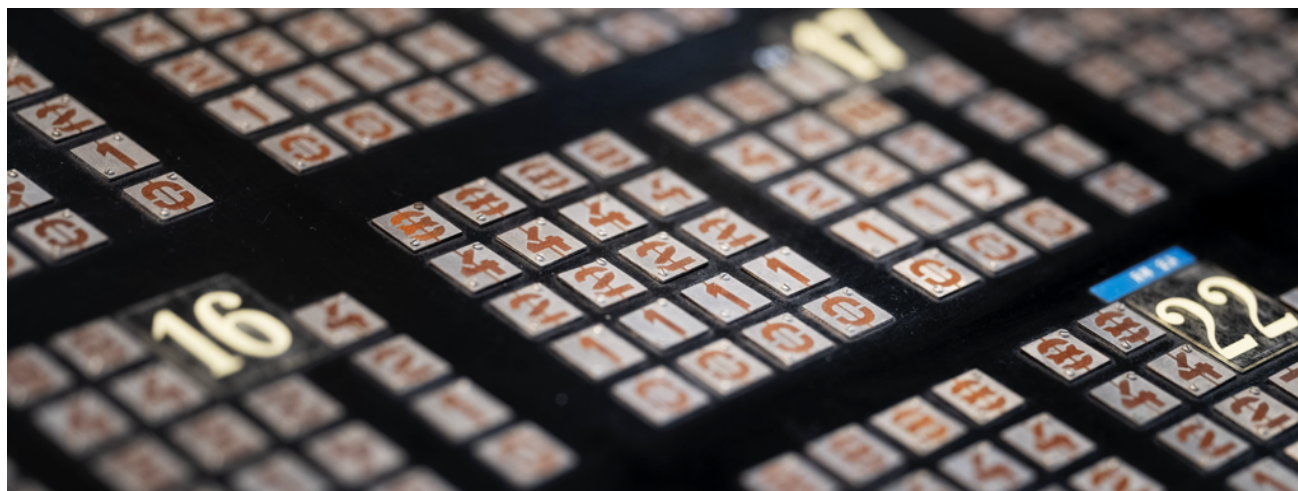


Figure 1: Detail of EMS studio console (1970). Photo: Pär Fredin / The Swedish Museum of Performing Arts, used with permission.

Abstract

Reenactment forms a unique method of exploring the social, political, historical, conceptual, contextual and other aspects of electronic sound instruments from the past, without necessarily reproducing the instrument's physical, functional or sonic characteristics. Rather, the reenactment presents a novel instrument, realized through contemporary means, reflecting on contemporary concerns and within a contemporary context. We find reenactment complementary to conservation, maintenance, reconstruction and emulation in working with archival and museum objects. Our paper presents an analytic framework developed for use in workshop scenarios. The series of questions within this framework helps determine and understand which aspects of an instrument might be reenacted. To illustrate the process in action, we describe an example workshop wherein participants use methods of media archaeology, design fiction and role playing to imagine and reenact new features, affordances, contexts and applications of electronic instruments from a museum exhibition.

Keywords

media archaeology, workshop, reenactment, design fiction, role playing

1 Introduction

The preservation of historical electronic sound instruments involves planning a future for objects from the past. Instruments are preserved for study, exhibition and continued use through a variety of strategies, including conservation, maintenance and reproduction through physical reconstruction, digital emulation or a combination of both. Each method holds its own measure of fidelity to aspects of the original instrument – such as its material, functional or artistic authenticity – by which the success of the method can be evaluated. This paper concerns fidelity to the “non-cochlear” [20] aspects of sound instruments: the social, political, historical, conceptual, contextual and other factors that influence the creation and use of a sound instrument, but remain largely unmeasurable in its sonic output alone.

The sociological aspects of music performance and listening are discussed within the concept of “musicking” [40], while Science and Technology Studies (STS) literature can address historical, social, and economic factors in the design and propagation of new musical technologies [36]. Recent music technology literature has also discussed the combined roles of sociology, psychology, aesthetics and technology in contemporary musicking practice [17], as well as the frameworks and affordances specific to music-making tools [33].

We propose that one way of studying and presenting an instrument from the past is to examine these non-cochlear aspects, centered around the *features*, *affordances*, *contexts* and *applications* of the instrument. Through a combination of media archaeological archival work and workshops focused on instrument analysis, design fiction and co-creation through imaginative role playing, we have developed a method of reenacting historical electronic sound instruments described in this paper.



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We begin by briefly discussing methods of conservation, maintenance, and reproduction. These are not intended as fixed categories, and preservation efforts often employ combinations of these methods to ensure both the historical authenticity and the accessibility of an instrument. The background section provides examples from a museum archive, a state-sponsored electronic music studio, the music software and hardware industries, and the forefront of engineering research, and discusses the strengths and weaknesses of each approach.

We then turn to a definition of reenactment, and how it differs from other methods in terms of the focus of its fidelity and the flexibility of its execution. We illustrate this section with the example of reenacted instruments based on very limited material evidence within a composer's archive, but still maintaining a strong sense of fidelity to that composer's intentions and ideas. This leads to questions of how one determines which aspects of an instrument can be reenacted. In response, we offer an analytical framework designed specifically for use in workshop situations. It asks questions such as: *what is the instrument?*, *how is it used?*, *for whom is the instrument intended?*, and *why was the instrument made?* The responses to these prompts provide material for subsequent stages of the reenactment.

Following this, we present practical strategies intended for use in workshop scenarios. The paired futuring practices of design fiction and role playing frame these questions and give form to the responses. While reenactments can take the form of fully designed and functional instruments used in studio or performance settings, here we opt for more intangible results in our workshops. We suggest a set of rules for use in a game that imagines non-functional, diegetic prototypes through a communal storytelling process, and give a set of example reenactments from one such game. The paper concludes with a discussion of the example results and suggestions of how they could be further expanded.

2 Background

2.1 Conservation

The primary aim of conservation in a museum or archival context is the preservation of an object in its historical state. This often involves striking a balance between fidelity to the original materiality of the object and fidelity to its intended functions, depending on the context. Which aspects of that object are to be preserved depends on the discipline involved. As such, conservation's definition of fidelity relates to what Pip Laurenson calls "authenticity", specific to each field. Within history, the material authenticity of historical evidence is paramount. Within the sciences, the demonstration of function ensures authenticity. Finally, within the arts, the intentions of the artist demand authentic display. Laurenson further notes that within an art-historical context, authenticity is rooted in the "uniqueness and physical integrity" of an object. Changes to the object are assumed to diminish that authenticity in some way [25].

As an example, the policy of the Swedish Museum of Performing Arts is that a music instrument becomes a historical document upon entering its collection [23]. Measurement-making is permitted in order to 'read' these documents, but playing them is prohibited. Every instrument is preserved in its acquired state, with no further replacement of parts or repairs of previous damages. Some policies aimed at material preservation can be functionally problematic, however. The removal of batteries to avoid acid leaks, for example, renders the instrument 'illegible' since

all its saved settings are lost when the internal memory chips lose power.

2.2 Maintenance

While archival conservation concerns itself with the material integrity of an instrument, conservation in other settings may involve keeping the original instrument in working order. Here, Laurenson differentiates between the functional and integral components of a museum piece. Equipment whose value is purely functional, and whose appearance is often unseen by a museum visitor, can be easily replaced or substituted. Equipment whose conceptual, aesthetic and historical aspects are integral to the work becomes far more difficult to replace without compromising authenticity. The conservator of an exhibit which requires functionality must carefully decide whether to acquire spare original components, manufacture new components, modify a similar piece of equipment to suit the required function, or recreate key functions of the work through "inexact substitution" [24].

In Sweden, for example, Elektronmusikstudion EMS (EMS) provides working studios with both historical and contemporary electronic music equipment for the composers who make up its membership. While they have decided not to modernize certain equipment, and would prefer to service their Serge and Buchla synthesizers with the most historically correct parts possible, director Mats Lindström insists that they are not "vintage religious" [29]. Lindström stresses that EMS is not a museum, and that their fidelity is towards functionality over historical integrity.

2.3 Reproduction

While conservation methods ensure the existence of original instruments in varying degrees of historical fidelity, they generally do not improve accessibility outside the context of the institution which conserves them. Reproduction addresses this issue by creating new, functional instruments which mimic aspects of the original using physical reconstruction, digital emulation, or some combination of both. The commercial marketplace holds many examples of reproduction, with companies such as Arturia producing photorealistic virtual emulations of well known historical music synthesizers, and Behringer manufacturing hardware 'clones' of classic instruments designed by other firms. Recent machine learning engineering approaches to audio synthesis have also focused on reproducing or matching sounds of existing instruments (see [26], [32]), and in creating invertible mappings between the latent audio feature space and the control parameter space of the synthesizer the model has been trained on [9]. Hardware and software reproductions are normally evaluated in terms of their fidelity to functional and aesthetic aspects of the instrument: the degree of similarity between the reproduction's appearance, musical playability and/or sonic outputs compared with those of the original.

The primary advantage of this approach is accessibility. Rare, expensive, one of a kind or non-functional instruments gain a 'second life' through reproduction, making such instruments playable in a virtual setting [38] and supporting live performances of electronic music pieces requiring these instruments [3]. The reproduction process itself also holds educational value by facilitating the investigation and alteration of specific historical instrument designs [46], providing a learning framework for the study of "digital lutherie" [19] and informing the design of Digital Music Instruments (DMIs) in general [15]. However,

reconstructions and emulations that prioritize fidelity to the original instrument's features may reflect only very limited aspects of that instrument's historical contexts and applications. Additionally, a reproduction's convergence on specific, previously-documented audio/visual results does not represent the full spectrum of affordances discovered by different users of these instruments throughout their history [13].

3 Methods

3.1 Reenactment

In contrast to the previous approaches, reenactment begins from the premise that fidelity to the material, functional and aesthetic qualities of the original instrument is not the only evaluation criteria. Instead, it engages with the instrument's non-cochlear aspects [20]. In our practice, reenactment often employs media archaeological methods of uncovering and working through the latent historical conditions within the technology itself [35], and presents its discoveries through contemporary means, reflecting on contemporary concerns and within a contemporary context. Due to its orientation towards research and investigation, the reenactment process lends itself well to educational applications as well as artistic production. Section 3.2 suggests a number of analysis areas for reenactment.

As with reenactments of historical events and performance art [4], in the reenactment of an instrument, the original supplies prompts for actions whose results may differ substantially. Fluxus text scores and performance art scripts also provide inspiration for the concept of reenactment. La Monte Young's *Composition 1960 # 10 to Bob Morris* reads:

Draw a straight line and follow it [51]

while Allison Knowles's *The Identical Lunch* from 1973 instructs:

a tunafish sandwich on wheat toast with lettuce and butter and a large glass of buttermilk or a cup of soup was and is eaten many days of each week at the same place and at approximately the same time [22].

These open-ended scores and scripts offer an infinite flexibility of execution, while maintaining fidelity to both the spirit and letter of the piece.

The Touched by Sound [42] project for the 2024 Sonic Acts Festival in Amsterdam provides an illustrative example of reenactment. Through a series of instrument and concert commissions, Touched by Sound invited a number of performers, artists and designers to engage with the archives of experimental musician and instrument builder Michel Waisvisz in a freely associative and recombinative manner. Organizers Kristina Andersen and Tarek Atoui sought to embody Waisvisz's playful improvisational spirit through reenactments (or "re-editions") of the historical material, rather than striving for historically accurate reproductions.

While the *Wirwarp* [43] instrument commission was grounded in Waisvisz's 1996 *Belly Web* [49], Gökem Arkan's team quickly departed from any need of fidelity to the original to strike their own path from historical past to lived present. A second instrument, entitled *AudioPuller* [41], was inspired by a Waisvisz design from approximately 1970 called *TapePuller*. However, while the *Belly Web* instrument still exists in a semi-functional state, *TapePuller* exists only in archival memory. Ultimately, it was reimagined by designer Boris Shershenkov through the inspiration of a single photograph. Both instruments emphasize a complex

and sometimes unpredictable response to touch which explicitly links them to Waisvisz's concept of "composing the now" [50].

Andersen insists that they are "not looking for a final truth" of the archival instruments, since "it doesn't really exist." Similarly, Atoui draws parallels with the orality of Arabic culture, noting that historical Arab poets and musicians "did not feel compelled to transmit fixated works to future generations," but instead sought to communicate ideas whose manifest form could be adapted over time [34]. Thus, the fidelity of the Touched by Sound commissions to Waisvisz's artistic intentions — reenacted through contemporary means to address contemporary concerns for a contemporary audience — is far more important to the project than fidelity to any material product of those intentions.

3.2 Analysis Areas for Reenactment

If a reenactment includes communicating inaudible and conceptual aspects of a historical electronic sound instrument along with some of its sonic and material qualities, how does one determine precisely which aspects to reenact? The organology proposed by Tresch and Dolan [47] provides a starting point for the analysis of instruments of both science and music by taking ethical categories constructed by Foucault [10] to examine how the self relates to the self, and adapting them to describe relationships between instruments and the persons who use them. Tresch and Dolan emphasize that the instrument cannot be considered passive or inert in this relationship, but rather is an active agent that participates in its own use.

Table 1 shows how concepts devised by Foucault and adapted by Tresch and Dolan are further modified to become the categories we employ for analysis during our workshops. While Tresch and Dolan's writing can be applied to design concepts, the language of philosophy they employ has limited pedagogical value for workshop situations due to its complexity. We employ a series of substitutions in our work, listed on the third section of Table 1, "Reenactment areas of analysis". We find that these substitutions capture the essence of Tresch and Dolan's categories, present them in a less cumbersome manner, and relate directly to terms commonly used in design research.

Each reenactment area contains initial questions focusing on specific question words: *what*, *how*, (*for*) *whom*, and *why*. These questions provide workshop participants with initial prompts for their inquiries. Follow-up questions need not explicitly repeat the wording of the initial question, and quickly return to the depth intended by Tresch and Dolan. For example, questions in the *Contexts* area of analysis might include:

Initial question	<i>For whom is the instrument intended?</i>
Follow-up questions	<i>To what institutional and social structures does the instrument relate?</i>
	<i>What social relationships does the instrument enable?</i>
	<i>For whom is the instrument to be reenacted?</i>
	<i>What if the context of the reenactment is different?</i>

A key aspect of these questions is that their answers are not absolute, fixed truths. As our previous work with the affordances of audio/visual technologies demonstrates [13], the same instruments may present vastly different experiences and understandings to different persons within different contexts. Their reenactments can therefore result in both things and practices that are radically changed through the process of reenacting them.

Foucault (1990)	ETHICAL SUBSTANCE	ETHICAL ACTIVITY	MODE OF SUBJECTION	TELOS
Questions	What parts of the self are addressed by ethics?	What activities constitute the ethical self?	What are the self's relationships to rules & obligations?	To what ends is the ethical work of the self directed?
Tresch & Dolan (2013)	MATERIAL DISPOSITION	MODES of MEDIATION	MAP of MEDIATIONS	TELOS
Questions	What makes up the instrument, and makes it different from other instruments?	Are the instrument's actions autonomous or passive, hidden or visible?	To what rules, methods and institutions does the instrument relate?	To what ends is the instrument directed?
Reenactment areas of analysis (2025)	FEATURES	AFFORDANCES	CONTEXTS	APPLICATIONS
Questions	What is the instrument?	How is the instrument used?	For whom is the instrument intended?	Why was the instrument made?
Areas of interest	Construction and functions	Actions and mediation	History and context	Intentions and uses

Table 1: The genealogy of our analytic areas for the reenactment process, from Foucault's [10] ethical inquiries of the self through Tresch and Dolan's [47] organology of musical and scientific instruments.

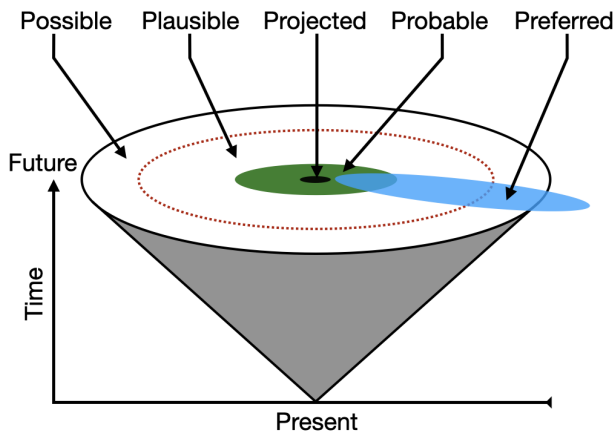


Figure 2: A number of potential futures extending from the present moment in the Futures Cone. (Image by the authors, based on [48]).

4 Futuring Practices

4.1 Design Fiction and Critical Design

If the future of an electronic sound instrument involves reenacting archival materials as a new kind of thing within a different context, as seen in the Touched by Sound project [42], then the futuring practices of fictional, speculative and critical design become instructive. The diagrammatic “Futures Cone” (Figure 2), developed within the field of Futures Studies, maps out potential futures which are variously possible, plausible, probable, projected and preferable. Converse “un-preferred futures” [48] can also be imagined – the dystopian scenarios of climate change run amok, for example.

The task of designing objects for these potential futures cannot be viewed as ideologically “neutral, clean and pure”, nor as divorced from “values based on a specific world view” [8]. Liene Jakobsone observes that the majority of designers work

as “trend forecasters” [16] designing for a projected future based on “business as usual” [48], rather than as “game changers” [16] seeking to influence and create a preferable future. Critical design practices, including design fiction, focus on highlighting the “present social, cultural and ethical implications of design objects and practice” [31] rather than on designing products for the marketplace.

Design fiction is a practice which tells stories about potential futures. In this practice, the design object itself is considered diegetic – a thing existing within the bounds of the story world. In cinema, “diegetic prototypes” of near-future technologies not only advance the story, but can also demonstrate their own “need, benevolence and viability” to a wide audience [21], and thereby gain traction towards real world development. The diegetic prototypes found in a design fiction, however, are not intended to become real world design [5]. They are often more improbable than probable, can be radical in their sensibilities, and may depict the exact opposite of the preferable. Rather, a well-conceived design fiction of the future should inspire thought and discussion about how and why it might be socially relevant in the present. It should also inspire consideration of what a preferable future might actually look and sound like.

These futuring practices, whether they result in functional musical technologies or not, are a crucial part of the NIME discourse. Within the wider field of Human Computer Interaction (HCI), “Magic Machines” workshops [1] have become influential through their use of non-functioning prototypes, constructed of everyday materials, as vehicles for exploring personal relationships with technology. Other, NIME-specific publications emphasize the role of design fiction as a method for exploring historical electronic sound instruments and generating ideas for new ones [14], as well as for discovering how design fiction prompts can reveal cultural values within musical communities [28]. Finally, a well-received 2024 NIME paper calls attention to societal attitudes and institutional ethics constraints regarding menstruation through a critical sound instrument design [39].

4.2 Role Playing

Methods for exploring the areas of analysis we propose for electronic sound instruments can be drawn from the artistic strategies of media archaeology [35], from the world-building science fictions of authors such as Ursula K. LeGuin and Octavia Butler (see [27] for example), and from the practices of Live Action Role Playing (LARP) in the Nordic region [45], which often emphasize socio political themes within their fictional game worlds. Johansson et al [18] note the expanding use of role playing in areas of HCI such as research through design, futuring, value-based design research, participatory design and others. Bowman et al [6] further present a framework for the use of role playing games in educational settings. In these contexts, role playing entails a “co-creative improvisational” situation based on “collaborative world building” and “communal storytelling” from a first-person perspective with a high degree of personal agency [18].

We propose a co-creative workshop structured as a world- and instrument-building ‘game’ where ‘players’ can explore aspects of historical instruments within the framework of a fictional world and present their findings as design fictions at the game’s conclusion. To begin the process, the workshop facilitator first imagines (‘builds’) a world prior to game play, laying out the contexts and constraints of this world as a set of ‘rules’. Players are first introduced to the rules of the world as a frame narrative, then they are introduced to the historical instrument as an element within that frame narrative. Players then collaboratively ‘build’ new instruments by speculating on how the historical instrument might exist and be used within the fictional world of the game. Players articulate concepts for instrument-building through the specific analysis areas of reenactment presented in Table 1—*features, affordances, contexts and applications*—using prompts based on their associated question words: *what, how, (for) whom, and why*.

Players may present their fictional instrument through written or verbal descriptions; visual depictions of the instrument; combinations of text and graphical elements into the popular formats favored by design fiction, such as catalogs, brochures, advertisements and user’s manuals [5]; non-working physical prototypes (i.e. ‘props’); imagined audio/visual outputs created by other means (vocally, acoustically, electronically); or imagined physical interactions (depicted or enacted, with or without props). The workshop facilitator should be mindful not to create a situation where players attempt to create and demonstrate functional objects [1], as this changes the focus of activity from speculating and storytelling to prototyping and evaluating. The example workshop described in the next section illustrates how the role playing process can be applied to an actual collection of archival electronic sound instruments by a group of student participants.

5 Results

5.1 Example Workshop

To mark the 60th anniversary of their founding, EMS organized an exhibition at the Swedish Museum of Performing Arts. The exhibition was mainly divided into two parts. The first part presented recordings, archival materials and a selection of studio equipment from the beginnings of the studio in the 1970s. The second part incorporated work from electronic music composers, performers and instrument designers working within the Swedish context from the 70s until the present day. During normal operation, the

exhibition featured several active audio/visual displays presenting compositions, artworks and documentary clips containing both music and speech.

The workshop group in this example consisted of approximately a dozen students of media technology and interaction design from KTH Royal Institute of Technology. Before the workshop, the facilitator told them that they would be role playing as “Archaeologists from the Future,” and sent the following text introducing them to the world of the game:

The Tomb and its Contents

You and your team of media archaeologists from the 54th Century have discovered a tomb from the late 20th Century containing objects you believe to be musical instruments. They are inscribed with hiero-glyphics of an ancient language which you have never seen before, and require a power source which you cannot determine. Your challenge is to figure out how they work.

For purposes of the workshop, the museum staff shut off most lighting and all of the audio/visual displays, and participants brought their own lights. Prior to entering the darkened exhibition, the facilitator read the following world-building prompt aloud:

The Great Blackout

1. *Some time in the 21st Century, planet Earth went through the Great Blackout.*
 2. *Whatever source of power ancient humans used to operate their technology and store their memories vanished suddenly.*
 3. *Since then, we have rebuilt society using the light of phosphorescent fungi to show us the way.*
 4. *From time to time, we uncover tombs which ancient humans built for their technology, and this is one of them.*
 5. *We know very little about the 20th Century due to the Great Blackout. You have never seen anything like these objects before, the hieroglyphics on them are illegible, and elements on their surfaces could serve any imaginable function.*
 6. *Let’s go inside!*
-

The participants then separated into four teams. Each team selected an electronic device from the exhibition and began to speculate about it from the perspective of future archaeologists who had never encountered such objects before. They directed special attention towards *what* special features made up the device, *how* the device might have been used (including how different users might have interacted with it), *for whom* the device might have been intended, and *why* it might have been created. All of these questions reflect areas of an instrument’s *features, affordances, contexts and applications* within the reenactment areas of analysis. Crucially, the participants received no instructions regarding any kind of sounds the instruments might have produced.

After a timed brainstorming session, each group presented their findings both verbally and gesturally with the device itself on hand. Following the session, each group designed a short user’s manual for their instrument. These manuals generally consisted of simple annotated photographs of the original instruments, and contained instructions on how to operate the fictional instrument. The following section presents a summary of the historical instruments explored, and the conclusions the groups reached according to the rules of the game.



Figure 3: Instrument 1, a Studer Revox B67 tape machine (1973). Photo: Pär Fredin / The Swedish Museum of Performing Arts, used with permission.

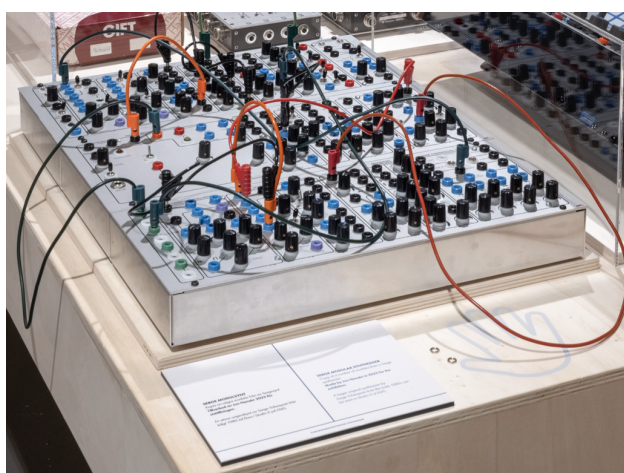


Figure 4: Instrument 2, a reproduction Serge modular synthesizer, Jon Nensén (2023). Photo: Pär Fredin / The Swedish Museum of Performing Arts, used with permission.

5.2 Example Reenacted Instruments

5.2.1 Instrument 1. The first group chose a Studer Revox B67 reel-to-reel tape machine from 1973, housed in an industrial green metal rolling floor rack (Figure 3). The group speculated that this device might have been used for communications, perhaps with different planets over long distances in space, using antennas



Figure 5: Instrument 3, the Programmable Signal Distributor, Göran Svensson (1976). Photo: Pär Fredin / The Swedish Museum of Performing Arts, used with permission.

connected to various ports on the machine and tuned to frequencies determined by various knobs. They further surmised that all in- and out-going communications might be stored on it for great lengths of time, since you never knew when you might receive a reply from an alien world, and that every communication was available as a public record potentially containing great wisdom.

5.2.2 Instrument 2. The second group placed a reproduction Serge modular synthesizer, built by Jon Nensén in 2023 (Figure 4), within a story world influenced by the "sound-houses" of Sir Francis Bacon's 1627 utopian fantasy "New Atlantis" [2]. In this group's version, the synthesizer became a Sound Controller, the central fixture of a giant Sound House where people gathered to listen. Starting from the world-building prompt about unknown power sources, they speculated that the Sound Controller must operate on human bio-energy. The first source of bio-energy would be the instrument players themselves, who would be specially chosen for their remarkable energetic capacity. The Controller would then be further powered by the bio-energy of the audience as well. The greater the crowd, the louder and more complex the sound would become.

5.2.3 Instrument 3. The third group were drawn to a custom electronic device — the Programmable Signal Distributor — installed by engineer Göran Svensson into a leather briefcase in 1976 (Figure 5). Despite its obviously electronic appearance, this group used the device as a springboard to discuss what kinds of acoustic sound-producing elements might be concealed inside the briefcase (strings, for example) and activated by touching the controls on its surface. They also decided that the complexity of playing it required three arms, and furthermore that humans of the 20th Century may have possessed exactly such an anatomy. The form of the briefcase suggested portability to them, so the group concluded by imagining the instrument used in street performances to attract the attention of passers-by.

5.2.4 Instrument 4. The fourth group gathered at the exhibition's centerpiece, the EMS studio control console from 1970. Its futuristic design was intended to evoke science, technology and progress in accordance with cultural policy of the time, even when the interface itself was clumsy to use and difficult to understand [12]. The console includes a large array of copper touch



Figure 6: Instrument 4, the EMS studio console (1970). Photo: Pär Fredin / The Swedish Museum of Performing Arts, used with permission.

plates, originally used to control a massive computer in another part of the EMS studio, as well as illuminated numeric displays of current digital states (Figure 6). The participants in this group proposed a group listening scenario similar to the Sound House of the second group. This instrument's purpose, however, was specifically to bring the audience within the space into a state of religious ecstasy, perhaps over a long distance. They surmised that some of the touch plates on the console were operated by a chief player, while others were delegated to subordinates, and that additional parts of the instrument connected the players with the spiritual feelings of the community. Specifically, the numeric displays provided an indication of the level of “godliness” in the room.

6 Discussion

The outcomes of this speculative game are twofold. Firstly, the game allows participants to better understand the analytical aspects of historical instruments. Secondly, it encourages the creative articulation of a novel, fictional instrument in ways that reflect upon the world of the historical instrument, as well as the world we presently occupy. In an expanded Futures Cone, modeled on the “light cone” concept of causality found in the special theory of relativity [7], the workshop participants role played encountering a point located within the potential pasts from the perspective of a point within the potential futures (Figure 7). Regardless of the improbability of these two distant points, the players' responses reveal aspects of the present moment, located at a third point *P*, the nexus of the two cones: our contemporary cultural dispositions towards sound instruments.

In our example workshop, the participant groups articulate a number of themes relevant to understanding the conceptual aspects of electronic sound instruments. Their design fiction

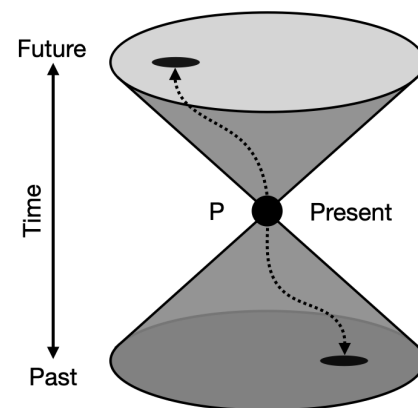


Figure 7: Connection between a potential past and a potential future through *P* the present. (Image by the authors, based on [7])

prototypes address the ways people interact with the defining *features* of an instrument, and how different bodies might offer up different *affordances* in relation with that instrument. Their fictions also draw inspiration from contemporary media such as nightclub sound systems, radio and the internet to evoke the social *applications* of technology in facilitating communication — whether within a single room or across vast interplanetary space — and in providing the means for both communal sonic experiences and communal memory of a culture.

Ultimately, the example participants' fictions also bring their perspectives on an important element of the frame narrative into

the game play: namely the loss of history through environmental, technological and socio political catastrophe. Lost memories render the instruments of the museum archive ahistorical and unreadable for game purposes. This narrative trope was not chosen arbitrarily. The frame narrative invites reflection on what happens when an object loses its own memory and becomes illegible, when the infrastructure of an electronically-mediated society suddenly breaks down [37], or when political regimes attempt to erase existing knowledge [44]. Perhaps deeper inquiry into the fictional instruments' contexts — *for whom* a reliable collective memory should not allow history to be erased, and *for whom* the power of shared experience even over great distances is essential — might indicate values which the participants hold in higher esteem than the individual technologies facilitating these situations.

7 Conclusions

As a research tool, the reenactment game described here does not require functional, feasible, or reality-bound prototypes as its end result [1] [5], but still provides potentially thick descriptions [11] of the co-created game world for qualitative analysis. We further note that the ludic aspects of game-play cannot be neglected. The idea of free play within a guided structure is an important aspect of the methods presented here as a means to free up the imagination.

The game we describe also creates opportunities to examine underlying assumptions of the game players themselves, and this inevitably calls attention to the power and persistence of established social and cultural paradigms within the imagination. Contemporary, modernist, Eurocentric artifacts could be presented as exotic, strange or other within the game by 'reversing the gaze', so to speak. But as Nahed Samour carefully explains, a "gaze regime" (whether male, white, colonial or any other type) is an expression of power and cannot simply be reversed within the context of a power asymmetry [30]. For this reason, we would hesitate to apply this method to artifacts of cultures which have been systematically othered – indigenous peoples, ethnic minorities and migrant groups, for example – without articulating a clear understanding that interpretations within the game may not be accurate reflections of the artifact's actual culture, but rather of the players' own perspectives on that culture.

While we have paid close attention to the framing of the game in terms of creating a clear framework of narrative, rules and lines of inquiry, one element which requires further development is the debriefing, or integration stage of the game experience. As we have demonstrated, the process of reenacting instruments from the past through the use of design fiction involves quite a bit of speculation about the future, and in particular about what the most preferable future might be. A well-developed integration stage at the end of game play aids the transference of concepts, observations and conclusions from the game world into values with the potential to shape actions in everyday life [6]. We see great advantages in this for the development of any new technology, including that of novel electronic sound instruments taking inspiration from those of the past.

8 Ethical Standards

This research took place through a collaboration between KTH Royal Institute of Technology, KMH Royal College of Music, the Swedish Performing Arts Agency, and Elektronmusikstudion EMS, in the context of Derek Holzer's doctoral studies, and with

support from the Swedish Research Council (2019-03694). The authors declare no conflicts of interest. Principles of informed consent were followed.

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