Broadcasting and Taping Loops, Feedback, Delays, and Noises: Tele-Presence as a Time Machine*

Maria Teresa Soldani
(University of Milan)
ORCID: https://orcid.org/0000-0002-2480-4391

DOI: 10.54103/milanoup.232.c664

Abstract

This chapter explores the key role of sound technologies in art experiments with telepresence between the 1960s and the 1990s, with a focus on early electronic arts. With a media archaeological approach, it will show that practices and machines activated in video and telematic arts have a common origin and intrinsic relation with sound media, a technological and artistic realm often investigated by female artists. The contribution will first conduct a historical investigation on electronic spaces, machines, and actions between 1963 and 1974; then, it will conduct a media-ar(t)chaeological excavation in which experiments with electronic devices will reveal telepresence operations and strategies related to temporality, to face the times in which "new media" flatten distances and chase simultaneity.

Keywords: Video Art; Telematic Art; Tape; Broadcast; Media Archaeology

---

* This research was funded under the Project PRIN 2022 PNRR (Code G53D23007070001) awarded by the Ministry of University and Research (MUR) and was developed within EXT – Coordinated Research Center "Extended Realities" of the Department of Philosophy "Piero Martinetti" of the University of Milan in the frame of the project "Department of Excellence 2023-2027." The PRIN 2022 PNRR project is titled *ARTCHAE. Rediscovering video and installation art as an archaeology of telepresence* and is conducted in collaboration with the archive *Le Radici del Nuovo* (MEET | Digital Culture Center, Milan). The author expresses her deepest gratitude to Benjamin Piekut for generously discussing the ideas in this chapter and for kindly facilitating significant connections for this research. The most sincere gratitude to Kelly Filreis, Karl McCool, and Jooyoung Park of Electronic Arts Intermix, to Emily Faith Martin of Video Data Bank, to Louie Fleck of BAM Hamm Archives–Brooklyn Academy of Music, to Julia Gardner and Elizabeth Haven Hawley of the Division of Rare and Manuscript Collections at Cornell University, to Maria Grazia Mattei of MEET | Digital Culture Center, to Bernard Gendron, and to all librarians of the Special Collections at the New York Public Library for the Performing Arts–Dorothy and Lewis B. Cullman Center for their invaluable assistance, expertise, and availability.

Abstract

Il capitolo esplora il ruolo centrale che hanno avuto le tecnologie sonore negli esperimenti artistici con la telepresenza tra gli anni '60 e '90, con un focus sulle prime arti elettroniche. Con un approccio mediarcheologico, mostrerà come le pratiche e le macchine usate nelle arti video e telematiche abbiano un'origine comune e relazioni intrinseche con i media sonori, un ambito esplorato dalle artiste. Il saggio condurrà prima un'indagine storica sugli spazi elettronici, le macchine e le azioni attivate tra 1963–74; poi condurrà uno scavo mediar(t)cheologico in cui gli esperimenti con i dispositivi elettronici riveleranno operazioni e strategie di telepresenza legate alla temporalità, per fronteggiare tempi in cui i "nuovi media" hanno annullato le distanze e inseguito la simultaneità.

Parole chiave: Videoarte; Arte telematica; Tape; Broadcast; Archeologia dei media

1. Introduction: on Electronics, Telepresence, and Art-based Archaeology

In 1963 the guests of Nam June Paik's exhibition "Exposition of Music. Electronic Television" in Wuppertal had been captivated by 12 prepared televisions (Medien Kunst Netz, n.d.), a practice used for altering instruments in music that can be considered a sort of "hacking" of the original set-up and functioning. One of the devices required the participants to talk into a microphone directly connected to the TV set, while watching the resulting electronic image modulated by the quality of their voices on the screen. This artwork was titled *Participation TV*. In 1967, during a live broadcast of sound art performed by Maryanne Amacher, the auditors in Buffalo were able to switch on the local radio channel and listen to a mix of eight sonic viewpoints of the urban environment in which they were immersed. During the 28-hour flow, a speaker seldom interfered in the sonic flux revealing the operation behind that unusual experience.[1] In 1968 Allan Kaprow connected several locations in the Boston area via CCTV, managing a rudimentary "two-way transmission" from the control room of a local TV station and then broadcasting its recording. He and other participants surprisingly communicated with each other mainly using their voices, often looking for the eyes of the other on a monitor rather than on the camera that was capturing them, as the apparatus was designed not to allow such encounter: "I see you," "I don't see anybody," "Hello, I see you," "Hi guys, where are you?," "I see you! I see you! Hi!"—a circuit of missing gazes that still happens today with teleconference platforms (Dalmasso and Grespi, *infra*).

1 WBFO Buffalo circa 1967. 5 audio recordings: 516573, 516574, 516575, 516576, M 22-25. Maryanne Amacher papers, Katharine Cornell-Guthrie McClintic Special Collections of the New York Public Library for the Performing Arts, Dorothy and Lewis B. Cullman Center.

From these prominent examples, a set of issues emerges: artists used broadcasting technologies to communicate in real time on a mass level, to alter them, and to show the communicative dead-ends that were inscribed in the non-interactive technology of "one-way transmission"; artists aimed to involve spectators and turn them into participants, looking for fruitful relations between subjects to be mediated in real time at a distance—the key property of tele media—by using electronics; these expressions for co-presence and encouragement of responses into a productive feedback by technical means were mainly developed in the realm of sound strategies and tools, and in what was soon after labelled as "video art" (Schneider and Korot 1976; London 2022). Today, in a warfare of frequencies and vibrations (Goodman 2012), we can excavate to those early times of experimentations in "electronic arts" (Soldani 2025) to analyze plans and failures of artists that used and subverted industrial technologies while creating further machines and networks.

The essay explores how the materiality of electronic sound contributes to constructing the sense of telepresence, that is "the feeling of being present at a remote location by means of real-time telecommunications devices" (Paulsen 2017a), in art works mostly accounted in visual terms. It will prove how, in video and telematic arts, "the creation of presence is actually most successful in the signal-acoustic channel" (Ernst 2016a, 114), and how female artists have been crucial in attaining this. Accordingly, the essay deals with the sonic aspects that informed video practices, which were activated with closed-circuit systems of transmission and taping. Techniques like feedback, playback, and delay will reveal hidden connections with the concepts of acoustic, electronic, and cyber spaces, especially considering how the notion of "image as a place" was outlined in the experiments with telepresence (Galloway and Rabinowitz in Paulsen 2017a, 110). Thus, processes of mixing and taping will reveal how the involved machines were able not only to manage space and visuality, but mostly to manipulate time and create multiple temporalities, as in the works of Amacher and Steina Vasulka.

The emergence and spread of tele media, with the contextual produced art projects, is interpreted here as a moment of rupture in the history of media, in accordance with the media-archaeological approach (Ernst 2013). In this respect, two key periods will be considered: from the mid-1960s to the mid-1970s—when intense experiments occurred with radio and television broadcasting (Churner et al. 2024), like those at WGBH-TV (Barzyk 2001), as well as with electronic tools mostly developed from audio technologies, such as the synthesizers designed by Don Buchla and Robert Moog (High et al. 2014); and from the late 1970s to the early 1990s—when media events labelled as "telematic art" (Ascott 2003) settled highly hybridized systems and networks that involved telecommunications, tested satellite technologies, and experimented with virtual reality and the net still using such electronic devices as the telephone.

Our media-archaeological methodology, between history and theory, will investigate the materiality of electronic media (Ernst 2013, 2016b), the concepts of "delayed time" and "tempor(e)alities" (Virilio 1992, [1988] 1994, [1995] 1997; Ernst 2016a, 2016b), plus the idea of "temporal delay [as] the technological alternative to emphatic permanent storage" (Ernst 2016a, 9) that challenges the archival processes established by power structures (Foucault [1969] 1972, [1976] 1978; Kittler [1986] 1999; Bohlman and McMurray 2017). Today, the everyday experience of telepresence is to be continuously online and detected through wireless smart media, which arises as a chronophagic, controlling, centralized system (Galibert 2013; Crary 2014; Estremo et al 2024). Differently, the archaeology of telepresence that will be sketched here will explore bottom-up, alternative forms of communication and networks that expressed the potential of electronic arts with tele media. These practices dealt not only with space but mostly with time, by generating and manipulating the im-materiality of waves and frequencies into audiovisual contents, structuring circuits, and activating precise media operations.

The essay is divided in two parts: the first part presents a historical investigation on places of production, machines, and early experiments with broadcasting and taping in electronic arts (sound, TV, and video arts) between 1963–74, when artists triggered actions that aimed at viewers' participation in public or private environments that were heavily mediated by technology; the second part proposes a media ar(t)chaeological excavation from early digital art, especially telematic art, back to those electronic experiments, casting the idea of cyber/electronic/acoustic spaces into transmission and tape operations, to understand a series of perceptive strategies for productive uses of such technologies in the frame of telepresence.

2. Historical Investigations (1963–74): Electronic Spaces, Machines, and Actions

2.1 The Lab Mindset Meets Tinkering Approach, Cultural Scenes, and Intermedia Events

The twentieth century was marked by an intense activity in designing devices and licensing patents related to electronics and telecommunications. This industrial excitement, represented in the issues of the *Bell Labs Monthly Bulletin* from 1925 onwards,[2] is well expressed at Expo 1970 Osaka, where the design of Pepsi Pavilion and its multimedia performance were entrusted to the group Experiments in Art and Technology led by Bell Labs' engineer Billy Klüver and artists Robert Rauschenberg and Robert Whitman. Bell Labs encouraged

2 Cf. *Bell Laboratories Record* (1922-83) and *Record - AT&T Bell Laboratories* (from 1984).

such collaborations in the form of art residencies, which involved Paik, Lillian Schwartz, Stan VanDerBeek, and Laurie Spiegel. Thus, working spaces were formed to experiment with electronics, revealing the lab mindset of those years (Wershler et al. 2022). We can find projects supported by the public sphere, such as national broadcasts and state universities, and by the private sphere, such as corporate research centers, facilities and studios independently formed by artists and engineers. (Dunn 1992)

Local radio stations and TV channels promoted electronic experiments. At WBFO FM in Buffalo Amacher performed *City-Links #1* (1967), a 28-hour broadcast, and at KPFA FM in Berkeley Suzanne Ciani created the tracks for the exhibition *Voices of Packaged Souls* (1970). KQED in 1969 formalized the experimental TV workshop National Center for Experiments in Television (NCET), the context where Terry Riley broadcasted his video-performance *Music with Balls* (1969), and Stephen Beck prototyped the Beck Direct Video Synthesizer (1970) testing it in video-performances like *Synthesis* (1971). WGBH collaborated with sound artists: in 1972 Ron Hays employed the Paik-Abe synthesizer and started the Music-Image Workshop, hosting in 1973 *Sea Legs* by Amacher (Hays 1974). From 1972 to 1984 WNET developed the TV Lab division and employed the Paik-Abe and Rutt-Etra devices, funding Shirley Clarke and Joan Jonas, as well as producing works as Paik's *Global Groove* (1974). Universities covered a special role, particularly in the New York state: since 1969 SUNY Binghamton housed the Experimental Television Center, founded by Ralph Hocking, where Paik and Abe implemented their machines; at Syracuse University Bill Viola joined the Synapse studio and collaborated with David Ross at Everson Museum; at SUNY Buffalo Steina, Woody Vasulka and Peter Weibel taught and established their studios. The spirit of the artists' network is well depicted in *Everson Museum: Video and the Museum Conference* (1974), the video documentation of the event collected by Videofreex, in which is collectively shown and experienced the functioning of several video systems and settings.

Independent facilities, basically studios that arose out of artists' initiative, became hubs for expanding tools and operations. In the mid–1950s the studio of the Barrons in New York City rented electronic technologies, largely customized by Louis for Bebe's compositions, to artists like John Cage. In 1962 composers Ramon Sender and Morton Subotnick founded the San Francisco Tape Music Center, a studio soon enlivened by the activities of Pauline Oliveros and performances as the premiere of Riley's *In C* in 1964. In 1966 Subotnik moved to New York City and founded a studio at NYU where artists – as the Vasulkas, who directed the no-profit space The Kitchen from 1971 to 1973 – learnt how to use electronic machines (Bernard Gendron, email to author, June 17, 2025). Still in 1971 Howard Wise converted his gallery in the video facility and distribution Electronic Arts Intermix, which supported Charlotte's Moorman's Annual Avant Garde Festival, The Kitchen, and Eric Siegel's machines. These

three places flourished in a few blocks of downtown Manhattan, where venues, studios, rehearsal, and exhibition spaces had been interlacing interdisciplinary collaborations (Gendron 2002; Hoberman 2025). This mapping brings us to the concept of cultural scene (Straw 1991, 2004; Shank 1994), employed in popular music and cultural studies to frame intermedia art experiences, particularly from the 1960s, that establish a key relation between music practices and visual media (Soldani 2017). According to Will Straw, a scene is a situated context within a city where an assemblage of activities is shared in spaces and evolves through connections and interactions, due to processes of "differentiation" and "crossfertilization" (Straw 1991). These sites for experimentations and nexus of strategies are documented by programs of venues that include "intermedia events" such as INTERMEDIA '68 (Fig. 1), a festival staged at Brooklyn Academy of Music with artists that, according to the producer John Brockman, "have abandoned the notion of art as metaphor to deal with man in time and space."[3]

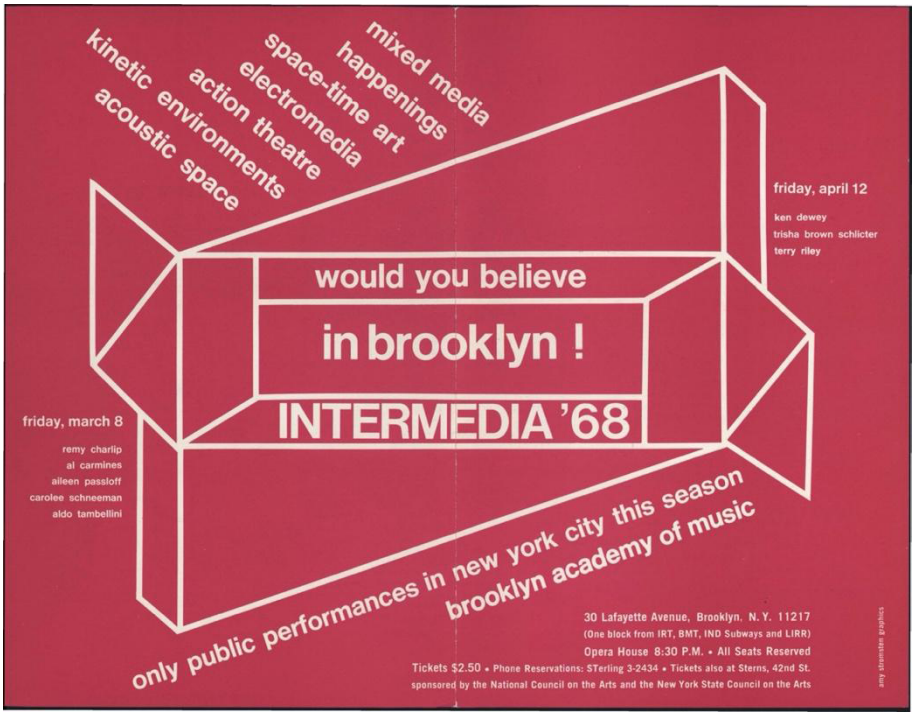

Figure 1. Handbill from "INTERMEDIA '68" During BAM Spring Series, 1968. Courtesy of BAM Hamm Archives

3 Cf. Doc. "10646_ca_object_representations_media_73322_original," BAM Hamm Archives.

2.2 Crafting Electronic Machines

The introduction of electronic technologies represented a turning point for the conception of media art works, starting by the fact that they were designed for "temporary storage rather than for archiving" (Ernst 2016a, 99). For sure, these devices requested different approaches and outcomes, given their structural differences, from that of traditional music instruments or film devices, such as super8 and 16mm film cameras. According to Viola: "All video has its roots in the live. This vibrational acoustic character of video as a virtual image is the essence of its 'liveness'. […] The video camera […] bears a closer original relation to the microphone than it does to the film camera" (1990).

Actually, two key methods that characterize the use of those tools from music to video productions are the modular thinking, which consists in creating a chain of interchangeable tools that process the signal and contribute to a specific A/V result, and the practice of mixing rather than editing (Dubois 1995), which is strictly connected to music practices that cross avant-garde music, electronic jazz, as well as, later, EDM and jazz. The analyses of a series of signal transmission and recording devices will highlight these aspects and put them in relation to telepresence.

For MIT A.I. Lab director Marvin Minsky, telepresence is chiefly connected to the idea of creating media that are able to "feel and work so much like our own hands" by using "remote control tools" and "sensory feedback" (Minsky 1980). Instead, for artist and theorist Roy Ascott telepresence is enliven by a holistic nature, a form of expanding perception and consciousness beyond bodies and individualities as the condition of being "both here and there… whether mediated by" electronics and telecommunications (Ascott 1991, 116). The following machines, derived from audio system and expanded into video tool, can be framed within these characteristics of telepresence.

Tape systems are based on the laws of electromagnetism, in which the magnetic force itself is seen as an "*action at a distance*," as much as "electronic charge and gravity" (Camras 1988, 15). The magnetic circuit, which is a "closed magnetic path" (Camras 1988, 17), is the basis of magnetic tape formats (e.g., reels, cassettes) and decks (e.g., recorder, player) that enable the taping actions (e.g., record, playback, rewind, fast-forward). Tape machines have multiple magnetic heads, unique or combined, for recording, playing back, and erasing signals while spooling the tape. By putting tapes in a chain of decks that manage the distance between recording and playback, it is possible to generate effects based on repetitions like echo and delay. From the 1950s tape machines became a trademark for composers and artists that worked on temporality, since these "electronic storage media" created "a form of decelerated, temporally extended present" (Ernst 2016a, 104). Performer-composers implemented electronic systems in collaboration with engineers, two of them resulting particularly relevant to our scope: Oliveros' Expanded Instrument System (EIS) and Riley's

Time Lag Accumulator. Their role in the Bay Area cultural scene, including the collaboration with KQED, is historically acknowledged, also in Robert Ashley's video portraits *Music with Roots in the Aether* (1976) premiered at The Kitchen.

At the end of the 1950s Oliveros started to work with tape delay techniques (Oliveros [1969] 1984) with the idea of creating a performance system for manipulating the sound of instruments while interacting with what was already performed and transformed, and what would be performed in response to those past sonic events re-presented in playback. Since 1983, she had developed the EIS, a complex and flexible "performance environment constituting of a network of time delays, mixing routes, microphones and a multichannel speaker configuration" (Oliveros and Panaiotis 1991), which progressively involved electronics and programming such as in the album *The Roots of the Moment* (1988) or in performance with dancer Paula Josa–Jones for *Ghostdance* (1998). So, for her delay is a crucial condition for exploring a form of embodied knowledge through the processes of listening and playing, such as the memories of hands and feet that a musician matured in years.

At the beginning of the 1960s Riley also composed for dance performance and, to deal with the movements of bodies and the idea of layering temporalities, he started to use tapes, as in *Mescalin Mix* (1960), a piece created for Anna Halprins Dance Company that reworked various real-world sounds in closed tape loops. In 1963 in Paris, while rehearsing for Ken Dewey's play *Music for The Gift*, he and an anonymous sound engineer created a tape delay module with a feedback system based on two open-reel tape recorders, one to record and one to playback (Carl 2009, 22–40). The Time Lag Accumulator was a machine basically able to loop, manipulate, and propose again sounds at different times and pitch, so it was at the same time an opened-circuit, a feedback system—and a time machine. In fact, this device was able to assemble and overlay recordings made at different times, and, through the playback function, to re-present and mix these at different durations, while other live sounds were produced during the performance. These machines could open the circuit among transmission and recording technologies, which were originally designed as closed-circuit between microphones and amplification system, by using multiple open-reel tape decks in recording and playback modes, plus other echo or delay effects that were included in the modular chain. For instance, in the broadcasted work *Music with Balls*, the optical manipulation expands the tempor(e)alities when Riley mixes live his played instruments, looping and feedbacking its recordings with two open-reel tapes, while the director created a unique flux of mixed images that doubled the sonic processuality. Thus, these systems contemporaneously stressed the feeling of being present with the feeling of relating with that same presence later in the performance, since tapes were looping past events and performers responded live to those taped "ghosts."

Avant-garde music, especially from Cage, introduced mixer, radios, and other electronic devices in performance and studio works (Piekut 2011). Don Buchla was a key figure for this sonic machines: he produced the Buchla 100 (1963), a commission by Subotnick and Ramon Sender that was also used by Oliveros, Riley and Ciani, and Buchla 200 (1970), influencing the production of several video synthesizer, such as Bill Hearn's Vidium (1969—see Dunn 1992, 104–107) and Beck's Direct Video Synthesizer (1970—see Dunn 1992, 122–125), which included a TV set and a Buchla machine (Dreher 2020, 141). Thus, there is a parallelism between Buchla and video devices, and it was explored in the improvised music-video performances at the Exploratorium between Ciani and Hearn (1969—see Soldani 2025) and at NCET between Beck and Warner Jepson, known as *Illuminated Music II* and *Illuminated Music III* (1972–73), in which, as the speaker reveals, "the image is controlled precisely by the artist, by manipulating knobs, switches, and dials as he performs his composition. In the same way the Buchla audio synthesizer allows composer […] to generate forms, textures, and colors in sounds." According to Beck, a synthesizer can be conceived "as a generative device" that processes signals, or "as a filtration device" that manipulates a given sound or image producing infinite outcomes (Dunn 1992, 162).

Eric Siegel created the Processing Chrominance Synthesizer (PCS, 1968–69) and the video installation *Psychedelevision in Color* (1968), presented in the exhibition *TV as a Creative Medium* (1969) at Howard Wise Gallery, later providing it with a tape deck to record it as *Einstine* (1968). Siegel manipulated the iconic image of Albert Einstein mixing it with color feedback through the effect of chroma-key. In 1970 he produced the Electronic Video Synthesizer (EVS, Fig. 2) with the idea of reconnecting personal perceptions in a wider collective circuit, a machine that could enable of being together in a loop of stimuli beyond rationality, since "each human being is enshelled in his own perception of reality. […] We all perceive different worlds, in the same world."[4] Meanwhile, the Paik/Abe synth was developed in varied prototypes at WGBH (1970), Experimental Television Center (1972) and WNET (1972). These machines were able to "generate and mix signals" (Vidium, PCS, EVS) or "to mix signals received by cameras" (Paik/Abe synth) (Dreher 2020, 139-140) into a modular system, becoming operations that defined electronic technologies and practices.

4 Doc. "Whitney Museum of American Art. New American Filmmakers Series presents A Special Videotape Show: VIDEO PROGRAM II". Electronic Arts Intermix. Box 5, Folder Eric Siegel Literature.

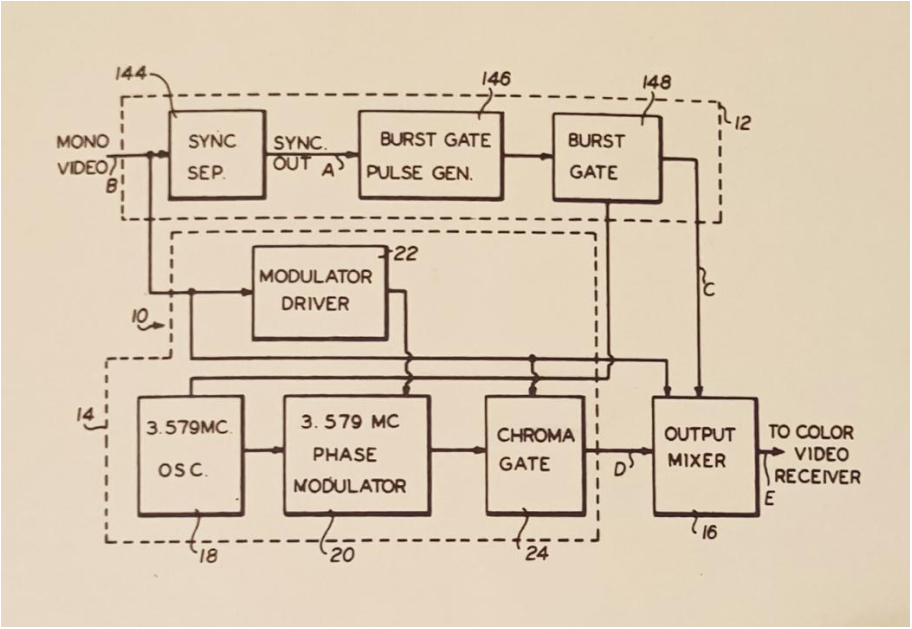

Figure 2. Siegel Electronic Synthesizer. U.S. Patent #3,647,942. March 7, 1972. Box 5, Electronic Arts Intermix. Courtesy of Electronic Arts Intermix. Public Domain.

2.3 Creating Multiple Tempor(e)alities with Electronic Practices

In the mid-60s, together with "offline" experimentations with TV-sets and video technologies, a series of musical projects reworked the perceptual involvement of the spectators by using electronic media and broadcasting. For artists, to be involved with TV and the network system, or to be involved with video and the gallery system, meant to test and act in different ways and operate with different formats that could not easily be moved from one technological system to another (Paulsen 2017b). In this section we will review some key experimentations on broadcasting made by artists in Europe and US between 1963 and 1972 that involve the use of tape recording. According to Ernst, these technologies produce "the intensification of the temporal moment" (2016a, 12) and enlighten "a new temporal reality (*Zeitreal*) based on the microtemporal logic of electronic circuits" (2016a, 114), which questions the notion, established in Western cultures, of a chronological time subdivided in past, present, and future. Furthermore, these projects were accomplished by using radio and TV apparatus that included broadcasting on public-access channels and working with well-equipped studios and skilled producers and technicians, such as Fred Barzyk.

Cage's *Variations V* (1965–66), composed for the Merce Cunningham Company, and Amacher *City–Links* (1967–88) were situated tele–events.

Premiered in 1965, *Variation V* was produced by Nordeutscher Rundfunk (NDR) and Sveriges Radio Television as a multimedia performance in Studio Hamburg in 1966. Within an electronic environment designed by Klüver and Mathews with Moog, it was performed live by Cage with David Tudor and Gordon Mumma on electronics, including short-wave radios and tapes with pre-recorded materials, by VanDerBeek on film and slide projectors, and by Paik on TV signal (Experiments in Art and Technology, n.d.). The studio was settled as follows: a desk of electronic equipment in front, including radios and oscillators, that received live signals by devices located in the stage, while a set of multiple screens showed multiple streams of images from real world in the fashion of "expanded cinema" (VanDerBeek 1966). Dancers generated sonic interventions by moving in the space through two different systems, which were ten photocells that activated tape recorders and shortwave radios and a series of antennas that created variations in tones functioning as sorts of theremins,[5] while musicians controlled the result. On this interactive field of signals and feedback among the participants on stage was applied a further intervention by Paik, who manipulated the electronic transmission on a TV set. His actions appeared in acutely noisy moments in the sonic performance, when machines revealed more clearly the pink noise of their functioning and the over-saturation of multiple feedback as resulting from bodies and gestures' interactions in that electronic circuit. These noises and drones,[6] which are long and sustained tones and images obtained by manipulating the transmissions, created an uncanny suspension within the performance—a kind of "hole in space" on which we will return later. Different interactions from varied sound and visual devices suggest us an interacting use of telecommunications purposely controlled by musicians. Their live dynamics are recorded in the moment, while past, pre-recorded presences appear due to tape playback within the same shared space.

City–Links is a long-time project conceived and performed to dissolve the spatial boundaries in which musicians usually find themselves when playing in a single location, using "remote circuitry."[7] Since the *City–Links #1* experience as Creative Associate at SUNY Buffalo, Amacher started to call these projects

5 The "space–controlled ether–wave theremin" is a primary electronic music instrument patented by Russian physicist Lev Sergeevič Termen in 1920. It enables to play without any contact by moving the body in the air, "an electro-conductor […] in the electro-magnetic field" (Rockmore 1998, 2).

6 "[T]he drone as sustained vibration with only minimal frequency variations represents a significant shift of conventional thought patterns in Western culture. Such sound is based on positive feedback. In its purest sense of short wave reception, radio is a drone device that makes audible the electromagnetic wave reflections in the ionosphere. Drone suspends the arrow of time; sustained sound freezes sonic time into veritable acoustic space" (Ernst 2016b, 39).

7 Cf. documents in Boxes 1, 2, 182, Maryanne Amacher papers, Katharine Cornell-Guthrie McClintic Special Collections of New York Public Library for the Performing Arts, Dorothy and Lewis B. Cullman Center.

"long distance music."[8] She accomplished them by using telecommunications, a technology explored in the same year by Guggenheim Fellow Marta Minujín with the *Minuphone Booth* (1967—see Grespi, *infra*). In *City-Links*, the circuit among transmission and recording technologies was "opened" by telephone links that connected remote locations (sounds on input) and by telephone or wireless radio system that reconnected them to listeners (sounds output). All sources were mediated by the artist in real-time, with a multitrack mixer that is a non-linear circuit into which signals at specific frequencies are fed and from which, through the manipulation of levels and the addition of effects, a sound flow at different frequencies emerges. In terms of telepresence, in *City–Links #1* multiple tempor(e)alities coexisted in the present moment, which originated from the processes of transmitting and receiving those signals: the sonic dimension of each of the eight locations that presented sounds, with human and non-human apparitions, close or at a distance; the mixing of these sonic viewpoints as a flux; the overlapping of the broadcasted track on the sonic environment of the perceiver, that is the listener who was immersed with their body in another time-reality. Moreover, the layering of these sounds discloses different temporalities: they were broadcasted in their original duration when transmitted live from mics; they can be manipulated live in speed, this way altering the duration and changing pitch, when pre-recorded on tape; they are perceived live in a portion of their daily time and space by listeners. With the *long distance music* Amacher developed a process of being "awar[e] of presence"[9] that started from interacting from the place one was situated to another: this expanded mode of listening fosters mutual receptivity, transforming sound into a form of relational presence and communication. Later chapters of *City–Links* introduced, event by event, further types of interactions, such as musicians that were playing together in remote locations connected by telephones (*#18*, with Cage), and people that were present in different locations, in the same city (*#9, #10, #11*) or in different cities (*#15*), that were transmitted live reciprocally. Thus, the project's electronic and tele apparatus proposed to extend our receptiveness in a network of perceivers, through the exchange of multiple signals in a circuit that allowed to feel each other's presence. For Amacher, we become aware of ourselves into personal spaces while connecting with others by tele media links, a circuit that prefigures the peer-to-peer decentralized network made of connections among people in the Internet era.

8 *Ibidem*.

9 *Ibidem*.

2.4 Tele-happening: To Open the "Closed" Circuit of Mainstream Networks

Artists' experimentations with TV, such as the WGBH show *The Medium is the Medium* (1969), tested "how unidirectional broadcast television (rather than the potentially cybernetic systems of portable video) has altered human culture and behavior" (Paulsen 2017b, 30) in light of the theories of Marshall McLuhan (1964). So tele-happenings aimed to question the audience's subject position and create a differentiated perceptual experience, mostly uncomfortable, by using effects of disturbance and noise. In 1970 WGBH broadcasted Paik's *Video Commune (Beatles Beginning to End)*, a four-hour interactive television "performance" in a TV studio documented on film by Jud Yalkut. Using the Paik-Abe video synth, the first use of that kind of machine in broadcasting (Atwood 2002), the artist mixed recorded images taken by TV programming and images processed with "Beatles music played chronologically from quarter-inch audio tape" and "live vocal inserts" (Electronic Arts Intermix, n.d.). Manipulations and vocal interferences were strategies that aimed at opening the "closed circuit" of the TV network to involve differently the spectators at a perceptual dimension, altered by the formal qualities of these sonic images. This strategy became clear in Cage's *Catch 44* (1971), directed by David Atwood and co-produced by Paik, in which the first five minutes broadcasted the artist while already composing on paper during the technical test on studio, with off-screen vocal interventions by the crew and tapes that were rewinding. All these experiments grasped the "in-betweenness" of an open-ended process.

In these years, conceptual and environmental art develop similar issues, as it is documented by Nancy Holt's films and videos with Robert Smithson, or E.A.T. multimedia performances *9 Evenings* (1966) with interdisciplinary artists such as Cage and Yvonne Rainer using technologies purpose-built by Bell Labs' engineers (Piekut 2024). Artists involved in conceptual and performance arts worked with television questioning the topic of presence as participation by drawing strategies such as the system of feedback, the possibilities of the two-way transmissions, and the use of delay. They tried to accomplish interactive telepresence among subjects even if it was technically hard to accomplish with the tools of the time. In VALIE EXPORT, *Facing a Family (TV-Aktion I*, 1971), broadcasted on ORF, a family at home watching TV was actually looking the spectators off the screen, this way generating "feedback" of gazes between people seen and seeing in similar domestic set-ups. Two further points can be highlighted: the work was considered "disturbing" in the frame of TV programming ("The viewers did not expect to see themselves on television and thought it might be a malfunction in the broadcast", VALIE EXPORT 2021); initially, the artist proposed to have a two-way transmission between two families, putting themselves into the TV feedback generated by tele technologies. In Peter Weibel's *The Endless Sandwich (Tele-Aktion I*, 1969–72), a performance

later staged and still broadcasted on ORF, in a feedback of gazes the artist encouraged the spectator to stand up and repair the damaged TV that already affected the other spectators on screen, assuming the telepresence as "teleaction" (Virilio 1992, 84; Manovich 2001, 150–161). This action is possible thanks to the "time delay" created in transmission, as pointed out by the artist (Weibel 1969), that put the emphasis on the possibility of re-watching and re-mediating. Even if viewer's interaction can't be transmitted live, it can be imagined while producing such tele-actions through a conscious use of the medium made by artists, as Fabio Mauri explained during the tele-happening *Il televisore che piange* (1972) broadcasted on RAI.

The missing node with spectators in these closed circuits may produce "alienation" (Spampinato 2021, 77) or encourage connections and community-building by decentralizing the means of production with the development of DIY studios and the use of Portapak, as happened in the guerrilla television activities of Ant Farm, Videofreex, and Raindance. A special tele-happening is VanDerBeek's *Violence Sonata* (1969–70), broadcasted on WGBH, that included a spectatorial response by involving various media (two TV channels, telephones, and letters) to collect audience reactions and engage people in interacting about a critical topic in the American public debate, that of violence; unluckily, the result was contested (Paulsen 2017b). Hence, most of the strategies enacted in these years defined the meta-discursive feature of the video art, admirably highlighted in Richard Serra and Carlota Schoolman's *Television Delivers People* (1973) and widely developed in the 1980s, as acts of self-reflexivity that disclose the discursive techniques of TV apparatus (Joselit 2007; Spielmann 2008). In addition, artists showed and explained operations and tools to "make" television art to the spectators, seen as potential practitioners that were able to create a personal electronic experience. This objective of the alternative television and communities is addressed through: workshops at local TV channels and centers (e.g. Experimental Television Center); shows dedicated to video tools (e.g., *Vasulka Video* on WNED–TV Buffalo); print media written by TV artists such as journals (e.g., *Radical Software*) and manuals (e.g., *Guerrilla TV*, Shamberg 1971). These places and spaces of productions became hubs as well as alternative networks that were investing in experimentation, confirming the theoretical framework of the cultural scene.

3. A Media Ar(t)cheological Excavation: Play(it)back!

3.1 Tempor(e)al Operations with Signals and Loops: Noise, Feedback, Delay

From this second part, our research objects move from the historical exploration to the media archaeological excavation related to art practices. We

recreated contexts of production and distribution as much as of collaborations in light of a lab mindset; we explored the materiality of a series of electronic devices of signal transmission and recording from sound to video systems, which highlighted the modular thinking and the process of mixing; we analyzed two early media events that were emblematic of the use of tele media, which highlighted the issue of managing multiple presences and tempor(e)alities through techniques of broadcasting and taping; lastly, we created a gateway for a methodological move, from history to archeology, by analyzing a type of situated events that were tele-happenings, which were experimented mostly by public broadcasts in Europe and US, and by extending this action conceptually to the closed/open circuits.

Between 1963-1974 artists frequently reflected on being recorded, or recognizing themselves on a TV screen when recorded images were playback, or understanding what mean "being there or here" and in which ways we can be "here and there". They were learning, with hands-on practice, which operations were inscribed in the materiality of these technologies, since "every transmission of a signal, no matter how fast, is a temporal process" (Ernst 2016, 30). Self-mediation and time passing were explored in Lynda Benglis' *Now* (1973), where the artist shows the attempt to control the medium by commanding the operations on devices: "I said: 'Start recording,' 'Start recording,' I said: 'Start recording,' 'This image here, good,' 'Start recording, we are recording now.'" Her face and voice on screen are layered and mixed with her recorded and live actions, blurring boundaries between temporalities, and suggesting an ambiguous experience of interactivity, until the two Benglis – one live and the other recorded – question: "Now? Now! Now! Now? Is it Now?" The artist checks her presence on the image on screen, on the right, and on off screen monitor, on the left, engaging a performance through CCTV in which the "live" Benglis often repeats gestures and statements of the "recorded" Benglis, in a loop of blurred, deferred temporalities (Fig. 3). Hence, this section examines a few critical and recurrent operations with electronic media, which are noise, feedback, and delay, whose purposes were to shadow space-time coordinates, create an uncommon eerie experience, and *hack* the technological apparatus until its materiality. Even if these operations were mostly activated and processed in conjunction, I will highlight one operation at a time by exploring a selection of "video art" cases that worked on multiplying tempor(e)alities, since in video "the divisions into lines and frames are solely divisions in time […] within the flowing stream of electrons. Thus, the video image is a living dynamic energy field, a vibration appearing solid only because it exceeds our ability to discern such fine slices of time." (Viola 1990).

Figure 3. *Now* (Lynda Benglis, 1973, color, sound). Video still. Image copyright of the artist, courtesy of Video Data Bank, School of the Art Institute of Chicago.

As seen, in early times of electromagnetic transmission, disturbance characterized tele events. This also happened when experiments were conducted within the frame of a studio, for instance a technical accident was the source for Viola's *Information* (1973), "when the output of a videotape recorder was accidentally routed through the studio switcher and back into its own input. When the record button was pressed, the machine tried to record itself" (London 1987, 24). Suddenly all equipment had been oddly animated, revealing a technical dead-end and the possibility of breaking the circuit. Art critic Donald Kuspit considered this as part of the artist's general strategies to "[deconstruct] presence" through signal machines (1987, 73-80). Generally speaking, we use to ask a device to be efficient in its functioning. For this reason, noise reveals the "non-performativity" of the device as an option, something to be engaged with. Its understanding depends by the context in which noise manifests: within the narrative of a performance or a tape, it is an event of disruption, as in the aforementioned experiments with broadcasting; while, if noise is the matter of soundtrack, it is a steady parameter that stresses the absence of vectorial time. This latter is the case of *Noisefields* (1974), a piece of pure buzz in which "colorized video noise (or snow) is keyed through a circle, producing a rich static

sound that is modulated by the energy content of the video" (Electronic Arts Intermix, n.d.). Vasulkas' works were characterized by feeding sonic machine into video machine, and vice versa (Soldani 2025), and resulted from testing different chains of devices with a modular approach and a mixing practice. For them, time became a matter to deal with while processing signals, like in Woody's *C-Trend* (1973) and the duo's *Telc* (1974), made with Rutt-Etra Scan Processor (1973) to directly "manipulat[e] images in time" through manual operations (Etra in Miller Hocking 1986): here, "disturbances in multiple layers appearing simultaneously or following in short distances one after another provoke the impression of moving bodies" (Dreher 2020, 154). Thus, noise opens to indetermination in the tempor(e)ality, whether it is technological, formal, temporal, spatial, or all of these. Such artists spring noise from the materiality of machines and from feeding back systems to stretch their limits, a process of circuiting that can be compared with media-artcheological strategies such as hacking and circuit bending (Parikka and Hertz 2012; Strauven 2014). Furthermore, as evoked by Burroughs, noise is a political tool: "with noise is born disorder and its opposite: the world. […] Everywhere we look, the monopolization of the broadcast of the message, the control of noise, and the institutionalization of the silence of other assure the durability of power" (Attali [1977] 1985, 6).

Feedback is a definite form of noise connected to electronics, which is an operation experimented in music and video. "If a microphone is placed too close to its amplifier it squeals. If a television camera is positioned too close to its monitor it squeals also, but it squeals visually. This visual noise, like audio noise, is called 'feedback'" (Youngblood 1970, 174). We can think about feedback when it is injected within a network in two ways, which can overlap: feedback of concept and feedback of matter. The first one creates a short-circuit through language in the information system (*Violence Sonata*), the second one creates a short-circuit through the electronics in the perception system (*Einstine* – Fig. 4). The former often shows the framed monitor, disclosing it as a non-neutral and non-transparent *apparatus* (Videofreex, *Knitting and Feedback*, 1970; Benglis, *Noise*, 1972; Robert Morris, *Exchange*, 1973); the latter doesn't show the edges of the frame, being a technique that encourages immersion (*Global Groove*). Feedback is not only a practice of disruption, but also a strategy of connecting alternative communities by customizing technologies, as we can notice in the growth of electronic devices' patents (Dunn 1992). This has been both a way of appropriating the tools of productions, in a Marxist fashion, and a way of creating awareness on technologies in the audience, encouraging them to critically thinking and making.

Feedback is widely used and recalled in these years, especially by Vasulka and Paik. According to Hays, who worked with artists at WGBH using the Paik-Abe synth, it is "the most dynamic image" that becomes a "medium of light" (1974, 7), pure "cosmic […] energy" as Woody stated (Bell 2025, 16). Feedback

dematerializes and flattens signals: in music, the saturation of feedback creates drones, while on video that saturation generates blue light, so the (closed) circuit saturates its input with its output overlapping its own acts of presences to an infinite point. Thus, within feedback the self-circulation of presences happens in form of signals as overrun delays that compress the linearity of time. For Beck, it is "the television set in a self-meditative state. […] Input is focused on output, its eye focuses on its vision, and in this meditative state it creates specific graphic imagery. […] The role that spiritualism, mysticism, esotericism play in social and political change is crucial" (1977, 52).

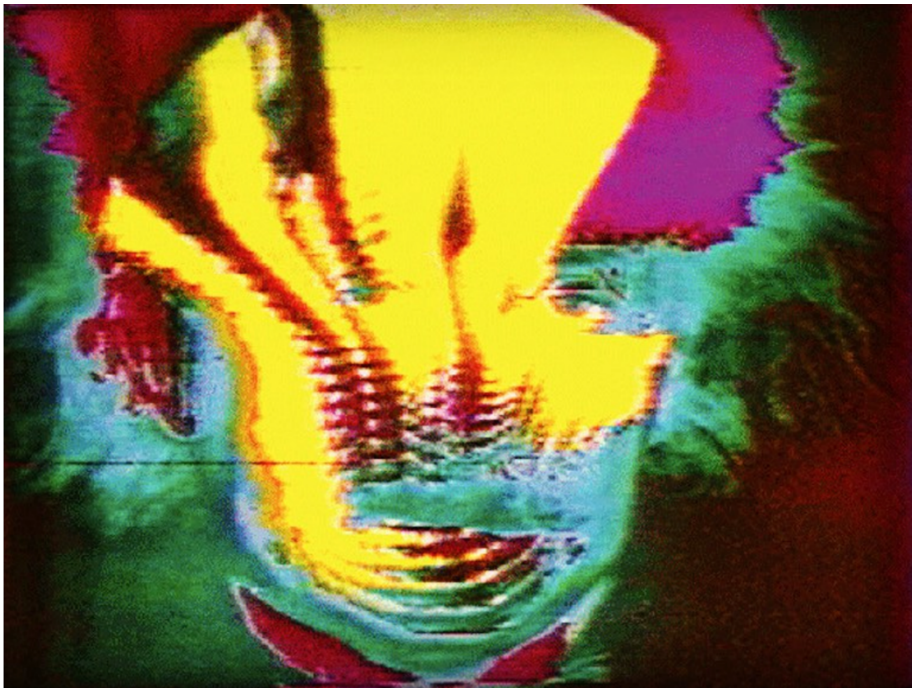

Figure 4. *Einstine* (Eric Siegel, 1968, color, sound). Video still. Image copyright of the artist, courtesy of Video Data Bank, School of the Art Institute of Chicago.

The work that made an exemplary use of delay techniques is Ed Emshwiller's *Crossing and Meetings* (1974 – Fig. 5), broadcasted on WNET, in which images were elaborated as they were affected by sound effects based on micro-repetitions, such as echo, delay, and tremolo. As Ernst puts it: "delay time […] describes the effective time consumption of every act of signal transmission" (2016a, 26). In the first part, the video complexifies the action of a performer that crosses an image from left to right, by using video mix and effects. His

doubles begin to appear repeating actions and often looking like figures echoed by the first presence; some doubles are slightly out of phase (delay or phaser effect), while others appear and disappear quickly (tremolo effect); some change colors (color parameter). A mass of his echoed presences suddenly appears as if the rate of repetitions in the delay effect is highly increased. When the female alter ego appears, the inlaid sequences play on characters reappearing in delay; when the couple is alone, both stage the synthesis of an encounter, Then the scene is repeated in playback with dissimilar outcomes: with their speech is in reverse; with his voice at normal duration while her in reverse; with voices in slow motion and then sped up; with normal duration and reduced duration mixed by changing tape speed; with the three temporalities of multiple speeds superimposed. These processes are "chrono-techniques:" "freezing, fixing, replaying, decelerating, and accelerating are practiced with the stop, play, rewind, and fast-forward buttons on tape recorders, video recorders, and their iconic emulation as software" (Ernst 2016a, 8). This formal experiment not only reinforces the inner relation between sonic and video technologies, but mostly shows video's ability to create "an intensification of the temporal moment" (Ernst 2016a, 12).

Figure 5. *Crossings and Meetings* (Ed Emshwiller, 1974, color, sound). Video still. Image copyright of the artist, courtesy of Video Data Bank, School of the Art Institute of Chicago.

3.2 Sonic Imaginaries and Virtual Experiences

November 23–24, 1990, Italian curator Maria Grazia Mattei organized the conference "Mondi Virtuali: Realtà Virtuali" in Venice, involving key figures of Western cultures such as Paul Virilio, Derrick de Kerchove, Philippe Quéau, and Timothy Leary, to deal with such topics as virtual worlds and artificial reality. Among them, the sci-fi writer William Gibson was called to discuss the concept of cyberspace, which firstly appeared in his short story *Burning Chrome* (1982). The writer recalled that his main reference in imagining the cyberspace was an audio portable device, the Sony Walkman, "a little gadget that plays pre-recorded cassettes of virtual experience."[10] Tape technologies fueled Gibson's sci-fi imaginaries since its first published story, *Fragments of a Hologram Rose* (1977), in which a kind of "domestic tape deck" becomes "a method of recording [stimuli to be] replayed", enabling to experience manifold realities through the sensory feedback: "I turned the vivid portable auditory universe of the Walkman into an identical device replaying the full bandwidth perception."[11] Thus, in the cyberspace a tape recorder, as a portable device of virtual reality, becomes a perception's interface connected with bodies in a circuit. In this way, memories of a recorded event as well as fictional memories inducted by media are looped in a closed circuit, because "consciousness is never solely in the present; rather, the accumulation of past image impressions and remembered sounds modulates the perception of the present" (Ernst 2016a, 159).

Going back to the examined historical period, we can find other sonic imaginaries related to the electromagnetic media of storage and transmission. In *Electronic revolution* (1970), William Burroughs underlines the key role of recording, cutting, and playing-back tapes mostly in the public sphere as a political strategy, since "the control of the mass media depends on laying down lines of association. When the lines are cut the associational connections are broken" (1970, 16). He also explains his method to act with those devices dislocating, in urban spaces, several decks with tapes previously recorded there, to be played loud at different times of the day. Hence, Burroughs advocated for the use of taping techniques to operate a disruption in the semantic order of urban life: he activated a density of multiple critical tempor(e)alities by pressing "record," "rewind," "stop," and "play." In fact, tape technologies are based on gestures and non-linear techniques like rewinding and looping that challenge the "phonographic regime," which considers "sound recording [as] an act of inscription", since tape, erasable and reusable, "order[s] non-chronological events along a narrative to be unspooled, heard closely, and reformatted" (Bohlman and McMurray 2017, 8, 9).

10 Cf. video n. 2169 "Convegno 'Realtà Virtuali' - Fortuny Venezia '90 – II parte", *The Roots of the New* Archive – MEET | Digital Culture Center.

11 *Ibidem*.

We can also recall an essay by Marshall McLuhan with Edmund Carpenter that connects the concept of "electronic space" to that of "acoustic space," because electronic media have an "implicit acoustic structure," which is generated from telephone and radio technologies, and because "auditory space [is] immersive and filled up" (1960, 67–68). Indeed, the transmission on analog TVs was a fact of tuning to the right radio wave and frequencies (VHF, UHF) to broadcast a channel, receiving at home what Viola called "the sound of one line scanning." Thus, presences transmitted through electronic media are originated by means of acoustics, at a distance of space and time.

3.3 Atomizing Nowness: Echoes and Drones as Portals to Alternative Tempor(e)alities

According to Ernst: "electronic storage media create presence, as their updated signals are able to address human sensory nerves. The past is thus operatively sublated […]. Electromagnetic transmission and recording media operate in a transitive, flat time—at the level of their technology (as the sampling of signals in the micromillimeter range) as well as their sensory address to the sense of time" (2016a, 109). By these words, we can see the prefiguration of the overlapping among cyber, electronic, and acoustic spaces through the micro-temporalities of tape technologies and signal treatments in Steina's *Orbital Obsessions* (1975–77; revised 1988).[12] The work was crafted inside her Buffalo's studio—fully equipped with CCTV systems, electronic instruments and modules—and it included excerpts from *Signifying Nothing* (1975), *Sound and Fury* (1975), *Switch! Monitor! Drift!* (1976) and *Snowed Tapes* (1977), all mixed in an indistinct flux. Steina declared: "In this series the camera conforms to a mechanized decision-making of instruments... I am also paying attention to time accumulation, in a mix of real time with time inherited from each previous generation of pre-recorded and then re-taped segments" (Electronic Arts Intermix, n.d.).

In the video, her first action is to explore the CCTV system as a surveillance technology by recording techniques of observation (see Galimi, *infra*). Behind Steina there is a wall of 7–8 monitors connected to Woody's camera that is capturing her while orbiting around a camera that rotates 360° on its tripod. While Steina follows its movement with a CC monitor, below the tripod two open-reel tape records and playbacks. After a few seconds of feedback, disturbance and keyed spectral presences appear randomly. Then the video mixes Steina's front and rear views in real time as she rotates around the camera, concealing her positioning according to the classical perspective (as in *Violin Power*, 1970–78). While the electronic sound generated by the optical machine overlays that of classical music, the image of the rotating camera is mixed with that of the

12 The full version of the work is available here: https://www.fondation-langlois.org/html/e/page.php?NumPage=486 (accessed February 5, 2026).

recorded images in CCTV as it rotates, until Steina stops it with her hand. Then, the noise of the machine's mechanism in rotation blends with the noise of the tapes running. A feedback rotation between the camera and the monitor reveals Steina's figure that moves with a latency—spatial, gravitational, and temporal references become lost.

What is the orbiting camera seeing? Steina explores her bodily presence in this viewing system, on the inlaid images, recorded and reproduced on tape, that belong to another space and time. When the rotating inlaid image passes, it brings to a different shot. Here the sound becomes more electronic and mechanical, while the inserts from the second camera divide the frame more frequently. After an initial, fleeting appearance by Steina, who is checking the audio levels with headphones, the living spaces looks emptied—that studio-home, between monitors and kitchen, where Woody ate a little earlier. Only the machines are still orbiting and interacting within the circuit, including the tools that are mixing the images. The working on luminance key and solarization effects, as processes shaped by machines, renders heterotopic the space, a familiar and unfamiliar locus where Steina's ghostly presence reemerges sometimes. Moreover, the uncanniness and the disorientation of these images are exacerbated by the rapid mix of inlaid and moving scenes.

The manipulation of temporality between transmission and tape reproduction is evident in the segment in which each image oscillates between the moment that precedes it and the moment that comes after it, following its oscillatory nature and denying the idea of present as a stable, unified event. Finally, Steina appears/disappears/reappears to return to the knobs of the workstation, her figure also affected by video scratch (Ravesi 2025). When tape seems to freeze, two Steina appear in two different times: the "live" Steina overlaps the "taped" Steina, and this "echoed" Steina manipulates the time-rate control of tape playback, in a similar way Riley and Oliveros did with their time-machines. Steina has worked with a wired connection camera-monitor, which was a livest technology in the circuit, and with broadcasting and taping, which have displayed a visibile latency in the former case and a deliberate delay in the latter, to operate with on purpose—to navigate this inbetweeness aware of presences.

Between the end of the 1970s and the 1980s, in times of actions with broadcast and CCTV, a series of satellite experiments were attempted, launching telematic art. They were multimedia events centered on hybrid systems of telecommunications that involved mostly analog technologies and a computer. Kit Galloway and Sherrie Rabinowitz created a series of interactive media events by using orbital system of transmission. The analyses of a series of events recorded on the videotaped documentation will follow in relation to key operations that are outlined in this section, also in comparison to *Orbital Obsession. Satellite Arts Project* (1977)—whose video engineer was Bill Hearn—was the first experiment managed in collaboration with NASA. Sequences of dancers in different

locations result in performing together on the screen due to mixing and using effects as chroma key and split screen (Fig. 6). As Paulsen outlined (2017b), the major challenge in the project was latency, which questioned the real possibility of attaining simultaneity in communicating between two distant sites. Then image becomes a place of encounter, for meeting each other in the temporal lag between movements, which is exactly what happened when Steina meets herself at a distance of time rather than of space. Furthermore, the three artists question the extremes of latency since "a spatio-temporal entanglement here comes into play ('live' transmission bridges distance in space, storage bridges distance in time)" (Ernst 2016, 160). What Galloway and Rabinowitz probably were still testing, after they assumed the technical issue, was how they could remotely control bodies in the circuit and perform within the lag. This underlines a subtle difference between latency and delay, where the former manifests an unintentional temporal gap and the latter performs an intentional temporal effect. At almost the end of the video this shift is suggested: a liberating dance in the electro-acoustic space is consumed as the dancer moves in relation with her own delayed feedback; sometimes she moves in unison with her multiples, sometimes, with rapid movements, she creates a choreography taking advantage of the delay and moving with a multitude of herself in virtual space (Fig. 6, last still).

Figure 6. *Satellite Arts Project* (Kit Galloway and Sherrie Rabinowitz, 1977, color, sound). Video stills. Image copyright of the artist. Source: ResearchGate, image licensed CC BY-SA 4.0 Attribution-ShareAlike 4.0 International (accessed February 5, 2026).

Hole in Space (1980) was a telematic event whose "video tape document[s] an unannounced, live two-way satellite transmission which took place between LA and NYC on November 11.13.14.1980 for two hours each evening,"[13] a tele-happening on screens located in shop windows. In respect to *Hello*, they accomplished a frontal view between distant subjects, even if each other's gazes

13 Opening titles cf. video n. 323 "Hole in Space - Virtual Space Electronic Café", *The Roots of the New Archive* – MEET | Digital Culture Center.

were still unable to meet. The b/w cameras of this closed circuit couldn't properly process low exposed images without adding noise, resulting in unfamiliar images of familiar places that where framing public encounters of strangers and relatives—"just like you see on a telephone," as a guy declared. Latency, noise, and the b/w tint of the surveillance system soaked the electronic images, going beyond the excitement of these meeting "at a distance" and leaving spectators of the recorded event, still "at a distance," a bit in discomfort. In a mediated condition of dromology, the distinction between past, present, and future has been "surreptitiously replaced by two tenses, *real time* and *delayed time*" (Virilio [1988] 1994, 66), and these "two separate time forms of previous vision machines […] entangled in the electromagnetic event of the video image" (Ernst 2016, 114, 163).

But this "hole in space" opens to further possibilities, for autonomously creating close and distant communities and gathering networks through "unannounced" media events, like tele-happening, something similar to what anarchist writer Hakim Bey will later theorized as the "temporary autonomous zones" (1991), a key influence for cyberpunk and hacking movements. Today Goodman (2012), known as the DJ/producer Kode9, recalls actions to be at play in a sonic warfare of military devices: that of EDM vibrations and noises.

4. Conclusions: on "In-betweenness", or Experiencing Audio/Visual Time Lag

Since 2016 Lori Emerson has conducted research on "other networks"—the networks that prefigured the Internet—with the purpose "to examine how they did and still could offer profoundly different experiences of communicating at a distance" (2025). Amid a political paper related to who owns and regulates the power (infra)structures that have been modeling our subjectivities and relations, also with implications in terms of race and gender (see Galimi, *infra*), she enquired: "how do we prevent the 'precorporation' of imaginary networks?" She proposes a handful of case studies that make independent uses of frequencies such as pirate radios (on radio and telepresence see Dotto, *infra*), which are still installed today with FM transmitters, to make community building—using what most of us are considering an "obsolete" technology.

With the first telematic event *Electronic Cafè* '84, and the subsequent chapters as Electronic Cafè International (ECI, 1988–2000), Galloway and Rabinowitz finally created what, in their own words, was an "interactive cyberspace," "a real cafè," "a network," "a global community," "a sort of electronic commune,"[14] a project that remediates the experiences of cable channels and guerrilla television

14 Cf. video n. 322 "Electronic Café", *The Roots of the New* Archive – MEET | Digital Culture Center.

of the 1970s such as Videofreex' Lanesville TV. November 14, 1994, ECI staged what *The New Mexican* journalist Hollis Walker defined a "Cyberspace concert:" "Musicians in California, New York and Santa Fe collaborate with the help of computer and telephones lines […] The event used phones lines to transmit videophone still photos and the musical and spoken audio signals generated at all three sites. Computer modems were used to transmit musical instrument digital interface (MIDI) signals. The musicians performed by triggering electronically produced in music and images" (Walker 1994). The teleconcert involved Subotnik, live from the Kitchen in NY, and Steina, live from Studio X in NM, plus other musicians in CA, and was supported by AT&T (ex-Bell Telephone Co.). It was presented as: "the world's premier electronic musicians performed the first ever simultaneous teleconcert from three locations before audiences in those cities" (Walker 1994),[15] underlining the technical noisiness also recalled by artists and engineers working with signal transmission devices in the 1960s (Piekut 2024). Furthermore, according to *Village Voice*'s journalist Kyle Gunn, "an approximate one-second delay in the signal between New York and California [made] exact synchronization difficult," while "Subotnick ran MIDI pianos at the Kitchen and in Santa Monica by remote control, squeezing sensors in his hands" (1994). *Los Angeles Times* journalist Josef Woodard commented: "Long before the Internet became a household word to be feared and respected, multimedia artists and techno-pioneers were busy trying to connect the dots" (1994).

In fact, 1960s and 1970s performances and videos with tape, delay, and echo systems were able to transfer presences in multiple tempor(e)alities due to electromagnetic technologies. What artists understood while crafting and testing those "other networks" was that electronic media of transmission and recording enable to generate collective temporary-storage actions, in which—close or distant, in space and time—presences were perceived as in-between, mainly due to the act of listening. Even when the operator was a single person, it was possible to re-animate presences through the technical means of signal processing and delayed time. Thus, how do we prevent the precorporation of other networks? These artists suggest(ed) by looping tele-presences and creating redundancies, triggering strategies related to time lag to face dromology.

15 We acknowledge that in November 1991 Oliveros accomplished a tele-performance among six US cities, by connecting the locations via telephone, with a simultaneous collective impro (Oliveros [2007] 2010, 192).

References

Ascott, Roy. 1991. "Connectivity: Art and Interactive Telecommunications." *Leonardo* 24 (2): 115–117.

Ascott, Roy. 2003. *Telematic Embrace. Visionary Theories of Art, Technology, and Consciousness*, University of California Press.

Attali, Jacques. (1977) 1985. *Noise. The Political Economy of Music*. University of Minnesota Press.

Atwood, David. 2002. "Notes on the Paik Abe Video Synthesizer". Doc. n. ETC2838. Experimental Television Center Archive. Archived December 27, 2022. https://archive.org/details/ETC2838/mode/2up?q=paik+abe.

Beck, Stephen. 1977. "Video Synthesis." In *The New Television: A Public/Private Art*, edited by Douglas Davis and Allison Simmons. The MIT Press.

Barzyk, Fred, and Curtis L. Carter. 2001. *Fred Barzyk: The Search for a Personal Vision in Broadcast Television*. Marquette University.

Bey, Hakim. 1991. *T.A.Z.: The Temporary Autonomous Zone, Ontological Anarchy, Poetic Terrorism*. Semiotext (H).

Bohlman, Andrea F., and Peter McMurray. 2017. "Tape: Or, Rewinding the Phonographic Regime." *Twentieth-Century Music* 14 (1): 3–24. https://doi.org/10.1017/S1478572217000032.

Burroughs, William. 1970. *Electronic Revolution*. Expanded Media Editions.

Camras, Marvin. 1988. *The Magnetic Recording Handbook*. Springer.

Carl, Robert. 2009. *Terry Riley's in C*. Oxford Academic.

Carpenter, Edmund, and Marshall McLuhan. 1960. "Acoustic Space." In *Explorations in Communication: An Anthology*, edited by M. McLuhan and E. Carpenter. Beacon Press.

Crary, Jonathan. 2014. *24/7: Late Capitalism and the Ends of Sleep*. Verso Books.

Churner, Rachel, Rebecca Cleman, and Tyler Maxin, eds. 2024. *The New Television. Video After Television*. no place press.

Dalmasso, Anna Caterina, and Barbara Grespi. 2026. "Closed-Circuit Faces: Archaeologies of the Face in Telepresence." In *ARTCHAE: For a Media Ar(t)chaeology of Telepresence*, edited by Barbara Grespi, Miriam De Rosa, Maria Teresa Soldani, and Lorenzo Lazzari. Milano University Press.

Dotto, Simone. 2026. "Being There / Being Then. Rhetoric and Poetics of Tele-Presence from Art Radio to Radio-Art." In *ARTCHAE: For a Media Ar(t)chaeology of Telepresence*, edited by Barbara Grespi, Miriam De Rosa, Maria Teresa Soldani, and Lorenzo Lazzari, Milano University Press.

Dreher, Thomas. 2020. *History of Computer Art*. Lulu.

Dubois, Philippe 1995. "Vidéo et écriture électronique. La question éthique." In *Esthétiques des arts médiatiques*, edited by Louise Poissant. Presses de L'Université du Québec.

Dunn, David (ed.). 1992. *Pioneers of Electronic Art*. Ars Electronica.

Electronic Arts Intermix. n.d. "Noisefields." Accessed June 30, 2025. https://www.eai.org/titles/noisefields.

Electronic Arts Intermix. n.d. "Orbital Obsession." Accessed June 30, 2025. https://www.eai.org/titles/orbital-obsessions.

Electronic Arts Intermix. n.d. "Video Synthesizer and 'TV Cello' Collectibles". Accessed June 30, 2025. https://www.eai.org/titles/video-synthesizer-and-tv-cello-collectibles.

Emerson, Lori. 2025. "How to Activate the Potential of Imaginary Networks." *VIEW Journal of European Television History and Culture* 14 (27). https://doi.org/10.18146/view.349.

Ernst, Wolfgang. 2013. *Digital Memory and the Archive*. University of Minnesota Press.

Ernst, Wolfgang. 2016a. *Chronopoetics: The Temporal Being and Operativity of Technological Media*. Translated by Anthony Enns. Bloomsbury.

Ernst, Wolfgang. 2016b. *Sonic Time Machines. Explicit Sound, Sirenic Voices, and Implicit Sonicity*. Amsterdam University Press.

Estremo, Vincenzo, Federico Giordano, and Maria Teresa Soldani, eds. 2024. *Cronofagia e media. La gestione e il consumo del tempo fra cinema, arti visive, TV e web*. Meltemi.

Experiments in Art and Technology. n.d. "*John Cage: Variations V*. Engineers: Billy Klüver, Cecil Coker, Witt Wittnebert 1965." Accessed April 30, 2025. https://www.experimentsinartandtechnology.org/cage-variations-v.

Foucault, Michel. (1969) 1972. *The Archaeology of Knowledge and the Discourse on Language*. Translated by Alan M. Sheridan Smith. Pantheon Books.

Foucault, Michel. (1976) 1978. *The History of Sexuality. Volume I: An Introduction*. Translated by Robert Hurley. Pantheon Books.

Galibert, Jean-Paul. 2013. *Les chronophages: Sept principes de l'hypercapitalisme*. Éditions Lignes.

Galimi, Rossana. 2026. "Between Surveillance and Self-Surveillance: Feminist (Re) Visions of the Closed Circuit." In *ARTCHAE: For a Media Ar(t)chaeology of Telepresence*, edited by Barbara Grespi, Miriam De Rosa, Maria Teresa Soldani, and Lorenzo Lazzari, Milano University Press.

Gendron, Bernard. 2002. *Between Montmartre and the Mudd Club. Popular Music and the Avant-Garde*. The University of Chicago Press.

Gibson, William. 1977. "Fragments of a Hologram Rose." *Unearth magazine* 3: 72–84.

Gibson, William. 1982. "Burning Chrome." *Omni* July: 72–77.

Goodman, Steven. 2012. *Sonic Warfare. Sound, Affect, and the Ecology of Fear*. The MIT Press.

Grespi, Barbara. 2026. "Telephonic Presence: Marta Minujín's early works." In *ARTCHAE: For a Media Ar(t)chaeology of Telepresence*, edited by Barbara Grespi, Miriam De Rosa, Maria Teresa Soldani, and Lorenzo Lazzari, Milano University Press.

Gunn, Kyle. 1994. "Angels Online." *The Village Voice*, December 6.

Hays, Roy. 1974. "WGBH Music-Image Workshop. Report of Activities: June 1972 through January 1974 by Ron Hays." Doc. n. ETC2517. Experimental Television Center Archive. Archived November 16, 2022. https://archive.org/details/ETC2517/page/n3/mode/2up.

Hertz, Garnet D., and Jussi Parikka. 2012. "Zombie Media: Circuit Bending Media Archaeology into an Art Method." *Leonardo* 45 (5): 424–430.

High, Kathy, Sherry Miller-Hocking, and Mona Jimenez, eds. 2014. *The Emergence of Video Processing Tools*. Intellect Ltd.

Hoberman, J. 2025. *Everything Is Now: The 1960s New York Avant-Garde—Primal Happenings, Underground Movies, Radical Pop*. Verso Books.

Joselit, David. 2007. *Feedback: Television Against Democracy*. The MIT Press.

Kittler, Friedrich A. (1986) 1999. *Gramophone, Film, Typewriter*. Stanford University Press.

Kuspit, Donald. 1987. "Bill Viola: Deconstructing Presence." In *Bill Viola: installations and videotapes*, edited by Barbara London. MoMA.

London, Barbara, ed. 1987. *Bill Viola: installations and videotapes*. MoMA.

London, Barbara. 2022. *Video/Art: The First Fifty Years*. Phaidon.

Manovich, Lev. 2001. *The Language of New Media*, The MIT Press.

McLuhan, Marshall. 1964. *Understanding Media: The Extensions of Man*. McGraw-Hill.

Medien Kunst Netz. n.d. *Nam June Paik «Exposition of Music – Electronic Television»*. Accessed October 28, 2025. http://www.medienkunstnetz.de/works/exposition-of-music/?desc=full.

Miller-Hocking, Sherry 1986. "Rutt/Etra: Notes on Development." https://www.videohistoryproject.org/ruttetra-notes-development.

Minsky, Marvin. 1980. "Telepresence." *Omni* June: 44–52.

Oliveros, Pauline. (1969) 1984. "Tape Delay Techniques for Electronic Music Composers." In *Software for People: Collected Writings 1963-1980*. Smith Publication.

Oliveros, Pauline. (2007) 2010. "From Telephone to High-Speed Internet: A Brief History of My Tele-Musical Performances." In *Sounding the Margins. Collected Writings 1992-2009*, edited by Lawton Hall. Deep Listening Publications.

Oliveros Pauline, and Panaiotis 1991. "Expanded Instrument System (EIS)." In *Proc. of the 1991 International Computer Music Conference (ICMC91), Montreal, QC, Canada*.

Paulsen Kris. 2017a. *Here/There. Telepresence, Touch, and Art at the Interface*. The MIT Press.

Paulsen, Kris. 2017b. "To the Control Tower: WGBH and the Reprograming of American Television." In *Early Video Art and Experimental Film Networks*, edited by Francois Bovier. ECAL/Presses du Reel.

Piekut, Benjamin. 2011. *Experimentalism Otherwise: the New York Avant-Garde and Its Limits*. University of California Press.

Piekut, Benjamin. 2024. "Sound at 9 Evenings: Cage and Beyond," In *Sensing the Future: Experiments in Art and Technology (E.A.T.)*, edited by Michelle Kuo and Nancy Perloff. Getty Research Institute.

Ravesi, Giacomo. 2025. "Stretch, Scratch, and Sampling. Sconfinamenti disciplinari tra pratiche musicali e found footage film." *Imago. Studi di cinema a media* 30: 137–158.

Rockmore, Clara. 1998. *Method for Theremin*, revised transcription by D. Miller, and J. McFarland-Johnson. Silverport.

Shamberg, Michael. 1971. *Guerilla Television*. Henry Holt & Company, Inc.

Schneider, Ira, and Beryl Korot. 1976. *Video Art: An Anthology*. Harcourt Brace Janovich.

Shank, Barry. 1994. *Dissonant Identities: The Rock'n'Roll Scene in Austin, Texas*. Wesleyan University Press.

Soldani, Maria Teresa. 2018. "Within the Ruins of New York City: No Wave as a Paradigm of American Independent Cinema." *Cinergie* 13. https://doi.org/10.6092/issn.2280-9481/7911.

Soldani Maria Teresa. 2025. "Notes for a history of female forms in the electronic arts." *Imago. Studi di cinema a media* 30: 97–120.

Spampinato, Francesco 2021. *Art vs. TV. A Brief History of Contemporary Artists' Responses to Television*. Bloomsbury Academic.

Spielmann, Yvonne. 2008. *Video: The Reflexive Medium*. The MIT Press.

Straw, Will. 1991. "Systems of Articulation, Logics of Change: Communities and Scenes in Popular Music." *Cultural Studies* 5 (3): 368–388. https://doi.org/10.1080/09502389100490311.

Straw, Will. 2004. "Cultural Scenes." *Loisir et société / Society and Leisure* 27 (2): 411–422. https://doi.org/10.1080/07053436.2004.10707657.

Strauven, Wanda. 2014. "The (Noisy) Praxis of Media Archeology." In *At the Borders of (Film) History*, edited by Alberto Beltrame, Giuseppe Fidotta, and Andrea Mariani. Forum.

VALIE EXPORT, and Sophie Cavoulacos. 2021. "VALIE EXPORT's Facing a Family." *MoMA Magazine*, December 21. https://www.moma.org/magazine/articles/676.

VanDerBeek 1966. "CULTURE: Intercom and Expander Cinema. A Proposal and Manifesto." *Film Culture* 40: 15–18.

Viola, Bill. 1990. "The Sound of One Line Scanning." In *Sound by Artists*, edited by Dan Lander and Micah Lexier. Art Metropole and Walter Phillips Gallery.

Virilio, Paul. 1992. "Big Optics." In *On Justifying the Hypothetical Nature of Art and the Nonidenticality within the Object World*, edited by Peter Weibel. König.

Virilio, Paul. (1988) 1994. *The Vision Machine*. Translated by Julie Rose. British Film Institute.

Virilio, Paul. (1995) 1997. *Open Sky*. Translated by Julie Rose. Verso Books.

Youngblood, Gene. 1970. *Expanded Cinema*. E.P. Dutton.

Walker, Hollis. 1994. "Cyberspace Concert." *The Santa Fe New Mexican*, November 14.

Woodward, Joseph. 1994. "Collaboration Gets a Whole New Meaning." *Los Angeles Times*, November 11.