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SHIFTING EQUIPMENT SIGNIFICANCE IN TIME-BASED MEDIA ART

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ABSTRACT

The playback and display equipment employed in time-based media artworks are subjected to wear and obsolescence, and thereby introduce a dimension of ephemerality to these artworks. In order to appropriately address the replacement of equipment, and detect and determine the degree of change a media artwork may accept without compromising its integrity, conservators have started to investigate the relationship of the artwork to its equipment. Equipment significance is best established in collaboration with the artist and will be specific to each artwork. The status of equipment can range broadly from "variable" and "replaceable" to "unique" and "irreplaceable," and determines the classification and valuation of equipment in a collection context.

However, even if the artist declares the equipment to be variable and entirely open for exchange, technological obsolescence and the advancement of media conservation as a professional field can lead to a shift of equipment significance that was neither foreseen by the artist, nor by the collection caretaker, and might require a revision of previously established preservation and display strategies. This case is studied using two examples from the collection of the Solomon R. Guggenheim Museum, New York: the interactive audio installation *Random Access* (1963/1999) by Nam June Paik (1932–2006) and the five-channel video sculpture *Cleaning the Mirror I* (1995) by Marina Abramovic (b. 1946). A third example from the Guggenheim's collection, Paul Chan's (b. 1973) flash-animated projection *6th ~~Light~~* (2007) serves to demonstrate that work-defining equipment properties are

difficult to determine without the artist, especially if the artwork is still in a stage of "infancy," thus in the process of forming its identity.

THREE TECHNICAL CONSTITUENTS, SUBJECT TO CHANGE

The majority of time-based media works share three common and basic technical constituents: (1) the information carrier (2) the playback equipment, and (3) the display equipment. The information carrier holds the recorded sound and image data, the playback equipment is needed to access, read, and process this data, and the display equipment renders the processed data visible and audible to the viewer. To illustrate this "dynamic system" (Laurenson 2004, 49), we can imagine a VHS video tape, played back on a VHS device, and displayed on a CRT video monitor. Or, a DVD optical disk played back on a DVD player, and displayed on an LCD television set. Or, a compact flash memory card in a media player, displayed on a plasma screen. Or, a custom file running on a computer with special software, displayed with an LCD projector. If the artwork is a projection, the projector and the projection surface form a conceptual entity. In the case of analog film and slide works, the playback and the display equipment comprise one device.

Due to technological obsolescence and the resulting, eventual loss of replacement parts and repair skills, time-based media works cannot survive for an extended period of time in their original configuration of information carrier, playback, and display equipment. Unless the equipment undergoes continuous and carefully managed change, the nature of these artworks is inherently short-lived.

Over the past decade, different approaches have been taken on how to handle the exchange of devices and technologies in media artworks. Comparing the range of these approaches to the movement of a pendulum, one could place the United States and Canadian Variable Media Approach (Depocas, Ippolito, and Jones 2003, 2004), active between 1999 and 2004, and its succeeding platform Forging the Future (Ippolito 2010) on one end of a pendulum. In contrast, the German research project Record > Again! 40yearsvideoart.de Part 2 (Blase and Weibel 2009, 2010) would be on the other far end. The first mentioned approach not only addresses media artworks but also unstable works of contemporary art, in general, that are considered to be variable. By promoting a medium-independent preservation strategy focused on the artwork's underlying concepts or behaviors, this approach aims to establish a maximum flexibility of the artwork for future change, which is ideally guided by the creator of the work. In contrast, the German research project promoted and demonstrated the historic staging of early video art with period equipment, claiming to deliver a more authentic presentation of the works by evoking the Zeitgeist of the time of their creation.[1]

On its swing back, the pendulum passes a less nostalgic approach advocated by the Swiss research project AktiveArchive (2005), which in 2008 explored the reconstruction of 1970s and 1980s video installations by employing historical equipment of a make and model that was identical (or similar) to the equipment used in photo-documented historical iterations of the artworks. By demonstrating a "historically well-informed re-performance" (Gfeller 2009, 166), AktiveArchive aimed to emphasize the relevance of the artwork's "historicity and the anchorage to a particular period" (Phillips 2009, 164) established by the constituent technical devices.

Most useful to the practice of time-based media conservation are approaches balanced around the pendulum at rest, which take into account the whole range of described concepts—from variability to historicity—and employ decision-making processes on a case-by-case basis. Along this line, major advancements have been accomplished by conservators collaborating in research projects such as Inside Installations (INCCA 2005; Scholte and Wharton 2011), conducted between 2004 and 2007; DOCAM (2007), conducted between 2005 and 2010; and Matters in Media Art (New Art Trust et

al. 2005a), active since 2004. Particularly useful is the conceptual framework that conservator Pip Laurenson, Tate, London, has established with a number of key articles referred to in this paper.

A BALANCED APPROACH TO CHANGE

In choosing a balanced approach, one central task of time-based media conservation becomes the determination and oversight of acceptable degrees of short-, mid- and long-term change that an artwork may undergo in response to a changing context. This can include different display environments, ongoing technological developments, curatorial and exhibition design concepts, or a technician's preferences. In this paradigm, a conservator looks at the concept of the artwork—as well as its technical constituents—and analyzes the relationship between the two. The way in which devices and technologies *may or may not* be exchanged is dependent on their significance in relation to the identity of the individual artwork.

Equipment significance is usually identified in collaboration with the artist, preferably on the occasion of the work's acquisition, when conservators and other collection caretakers are proactively involved in turning an ephemeral time-based media artwork into a collection piece. During this process, the artist is needed to provide crucial information on whether the equipment has a purely functional value or if there are additional "conceptual, aesthetical or historical values" (Laurenson 2004, 50) attached to a specific device or technology that are guiding and restricting future replacements. In a balanced conservation approach, the identification of "work-defining properties" (Laurenson 2008, 158) and the development of preservation strategies are not left to the creator alone; his or her statement is essential, but needs to be contextualized in a broader framework of collection care ethics and interests. Even the most technically knowledgeable artist may be biased and cannot be expected to provide the conservation expertise and perspective required for responsible decision-making. Historical values, for example, are more commonly identified by conservators or other stakeholders than by an artist, and in some cases, conflicts of interest may arise when an artist wants to update, re-edit, or otherwise change artwork that dates back to an earlier, now historic, period of creation. While a living artist's main interest may lie in keeping their work exhibitable and up-to-date with their current artistic developments, the museum is also involved in contextualizing an artwork within an artist's career (e.g., when they could only afford a low-budget technology); within the history of art (e.g., when the use of a low-budget technology was an artistic statement); and within the history of technology (e.g., when a more sophisticated technology was not yet accessible to the consumer market). Since in ". . . the case of time-based media works, display equipment often represents the strongest link to the time in which the work was made . . ." (Laurenson 2008, 160), the museum may be inclined to approach equipment replacement more conservatively than would the artist.

Following the investigation of equipment significance, some artworks may prove to be highly dependent on aesthetic or conceptual qualities delivered by a specific device group or technology, while other artworks may not face any limitations in variability. This is often the case when the equipment is hidden and the technical features can easily be recreated by a variety of generic equipment. The most vulnerable works are those that are reliant on individual devices, which are unique due to their artist-designed or manipulated nature, or their historic value (e.g., as a performance relic).

Generally, the information carrier and playback equipment are perceived to be more variable than the display equipment, and the migration of exhibition (and archival) copies and their consequential playback equipment to appropriate contemporary formats is commonly accepted as being necessary, and even beneficial.[2] This difference in valuation is mainly due to the fact that the playback equipment is often hidden behind the scenes

of a media artwork with little or no visual impact on the artwork's overall appearance. (However, the impact of different playback systems on the quality and structure of image and sound is still widely neglected by conservators.) In contrast, the failure and obsolescence of display equipment can trigger a larger decision-making process and potential controversy, if the variability is limited, but repair is no longer an option. A useful tool for guiding this decision-making process, known as the "decision tree" for equipment replacement, has been developed by DOCAM researchers, and was published online in 2010 (DOCAM 2010).

The degree of change induced by the replacement of equipment is quantified by the current research initiative Matters in Media Art, which states, "There are degrees of change: changing a particular item of equipment for one of the same make and model; changing the make and model but keeping the technology the same; [and] changing the technology" (New Art Trust et al. 2005b). Even if no active equipment exchange is made (e.g., if unique qualities make a device irreplaceable), change and loss will still be introduced to the artwork when the equipment fails to function or it is decided to be switched off while remaining on display.

The playback and display equipment purchased, stored, and used in the context of an art collection can be categorized according to its significance for collection works, taking into account its degree of replaceability. At the Guggenheim Museum, three equipment categories have been established: (1) dedicated equipment, (2) shared, obsolete equipment, and (3) non-dedicated, variable equipment. The first category describes the equipment dedicated to a particular artwork due to its unique features. The second category comprises obsolete equipment that might be generic and unmodified, but has become increasingly rare and therefore more valuable. Rather than being dedicated to a single artwork, equipment of this category is shared by a group of collection works that rely on a particular equipment type or technology. Typical members of this group include cathode ray tube (CRT) monitors and television sets, 16 mm film projectors, or 35 mm slide projectors. The third category summarizes the large quantity of undedicated exhibition equipment that is variable and exchangeable. These devices are donated, sold, or discarded when no longer useful and do not necessarily have to be stored, tracked, and handled using standards that apply to art components.

SHIFTING SIGNIFICANCE PART 1: WHEN VARIABLE EQUIPMENT BECOMES DEDICATED

Once identified, equipment significance can still change in reaction to evolving conservation ethics and practices or shifts in contemporary technology. The latter can become particularly true when an entire technology—rather than one particular type of device—becomes obsolete. Artworks previously determined for installation with non-dedicated and variable equipment can suddenly face threatening limitations in their variability when functional, aesthetic, or conceptual features prove incompatible to succeeding technologies. Equipment significance is always established in reference to a contemporary landscape of existing and available technologies, the rapid advances of which can hardly be foreseen by more than a few years. This is best illustrated by the recent groundbreaking technological shift terminating the analog era and turning all playback and display technologies to digital. Although the advent of digitization was not unexpected, its instant and colossal impact on time-based media works was certainly underestimated by most custodians. These caretakers are now confronted with enormous amounts of formerly variable artworks, which are now trapped in their functional, conceptual, or aesthetical dependence on CRT monitors and projectors, film and slide technology, or other equipment that was, until recently, considered to be generic, mass-produced, and ubiquitous.

This case will be demonstrated using two examples from the Guggenheim Museum collection: the interactive au-

dio installation *Random Access* by Nam June Paik, and the five-channel video sculpture *Cleaning the Mirror I* by Marina Abramovic.

EXAMPLE 1: *RANDOM ACCESS* BY NAM JUNE PAIK

For the major retrospective *The Worlds of Nam June Paik*, at the Solomon R. Guggenheim Museum in New York in 2000 and at the Guggenheim Museum Bilbao in 2001, curator John Hanhardt commissioned Paik's New York studio to reconstruct a number of the artist's seminal works, including *Random Access*. This interactive audio installation was initially installed in 1963, in the basement of Galerie Parnass in Wuppertal, Germany, during Paik's famous solo exhibition, *Exposition of Music–Electronic Television* (fig. 1).

In 1963, the work consisted of a modified open-reel audio deck, from which Paik had removed the audio head and had extended it by means of a cable connecting the head back to the deck. Visitors of the exhibition were invited to take the extended audio head and drag it across an arrangement of ½ in. audio tape strips that were glued to the gallery wall. By doing so, the visitor could "randomly access" the recorded content on the tape, which became audible in various distortions, depending on the speed and direction in which the head was moved across the audio tracks. Extant image material from the 1963 installation does not provide evidence of external speakers, but a tube amplifier can be located near the audio deck and may have been part of this piece, or of adjacent variations on the *Random Access* theme that were installed in close proximity (Schmitt [1976] 2009, 132–133). After its de-installation in 1963, *Random Access* ceased to exist in physical form, except for the remains of the audiotape that are still, to this day, adhered to the basement wall (Neuburger and MUMOK 2009, 197 and Neuburger 2011), and a nonfunctional fragment consisting of an extended audio head, a circuit board, and a plastic cover.[3] The work's title re-surfaced 12 years later, in 1975, when Paik re-executed his concept for the exhibition *Sehen um zu hören* at the Städtische

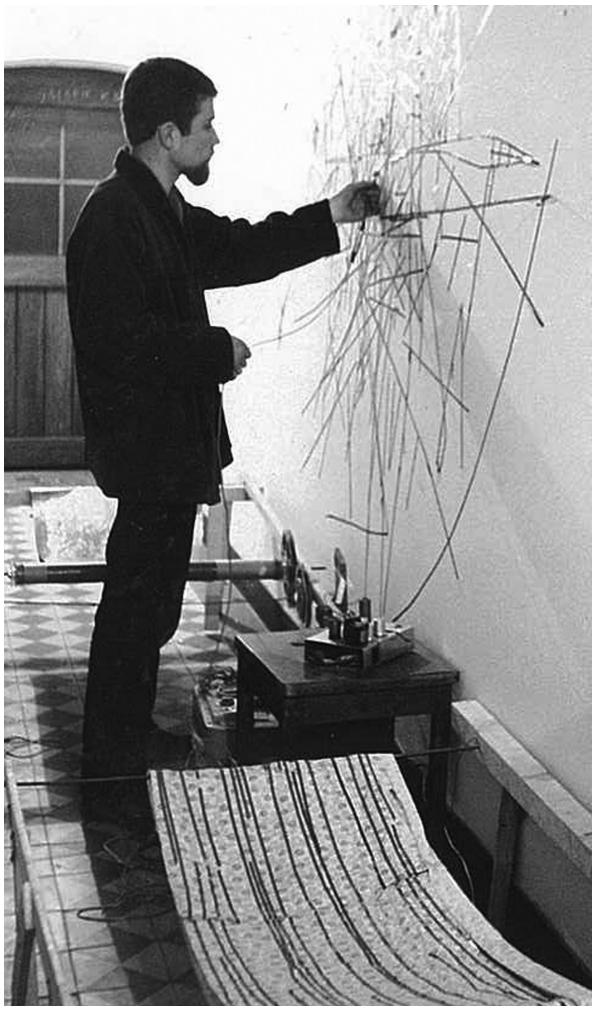

Fig. 1. *Random Access* by Nam June Paik in its original 1963 installation at the Galerie Parnass in Wuppertal, Germany. © The Nam June Paik Estate. Courtesy of Manfred Montwé.

Kunsthalle Düsseldorf, using a contemporary, small portable German cassette player by UNIVERSUM and a wooden chipboard covered with plastic foil and strips of audiotape. Both items from 1975 entered the private collection of Hermann Braun, and subsequently that of Dieter Daniels[4] (figs. 2, 3). One year later, in 1976, Paik recreated a second version of the piece for his solo show at the Kölnischer Kunstverein, aiming for a closer resemblance to the 1963 original by using an open-reel audio deck (fig. 4). This second version—referred to in this paper as the Paik and Saueracker version—was never acquired by a collection, but was repeatedly displayed after 1976 and installed with different equipment each

time. Paik's former assistant, Jochen Saueracker, recalls at least two further presentations of this version during Paik's lifetime, at the Kunsthalle Bremen in 1999 and at the Wilhelm-Lehmbruck Museum in Duisburg in 2002. After Paik's death in 2006, Saueracker continued to recreate this version on request of several exhibition venues, e.g. for the Lentos Kunstmuseum, Linz, in 2009 and for the MUMOK in Vienna in 2009. However, Saueracker emphasizes that these representations of *Random Access* were not created as artworks, but rather as installation versions or exhibition copies, to offer museum visitors the experience of the original interactive function of *Random Access* (Saueracker 2009).

In 1999, Paik finally authorized the third and last version of the piece for the Guggenheim Museum retrospective and collection (fig. 5). It consists of a modified 1970s RCA open-reel audio deck (model YZG-565J), as well as a 1990s amplifier and two speakers. A Paik studio-fabricated acrylic housing covers both devices and features a cradle for the extended audio head which is fitted with an acrylic cover and wand. By placing his signature and two dates on the front of the acrylic housing, Paik referenced the original version from 1963 and acknowledged the new 1999 version with "PAIK 63/99."

All three recreated versions of *Random Access*—the Paik and Saueracker version and the two collected versions—have lead very different and independent lives, representing a broad range of possible approaches to handling equipment in media art. The Paik and Saueracker version has always been treated as a conceptual artwork not tied to a specific device. Even today, Saueracker assembles the piece from scratch for each presentation, with different open-reel audio decks sourced from the second-hand market, and modified for interactive display (Saueracker 2009). In contrast, the display mode of the Daniels version represents the opposite approach; here, the portable cassette player—presumably provided and modified by Paik himself—is valued as a unique object, and has never been exchanged. Although still in working order, it has been suspended from interactive use since 1998, in order to protect the fragile original device as well as the 1975 audiotape strips on the chipboard (Daniels 2011).[5] Displayed out of the reach of visitors or within a vitrine, the tape recorder in this version of *Random Access* has turned into a non-functioning and non-interactive museum object.

The Guggenheim Museum's version has also never changed its original equipment grouping, but its interac-

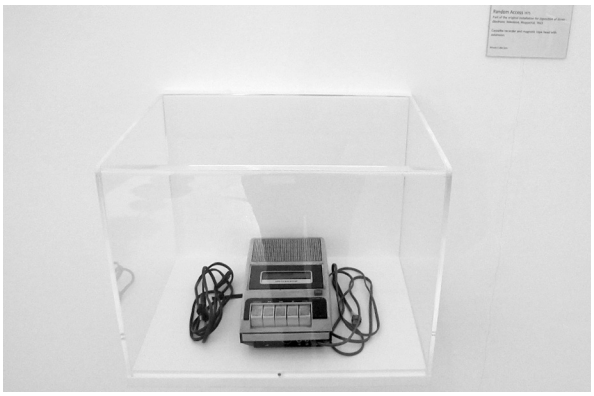

Fig. 2. The first recreated version of Nam June Paik's *Random Access*, dating 1975, formerly in the collection of Herman Braun and today in Dieter Daniel's collection. The portable cassette player is still functioning, but suspended from public use for preservation reasons. Installation view 2011 at Tate Liverpool. © The Nam June Paik Estate. Photo: Joanna Phillips. Courtesy of Dieter Daniels and Tate Liverpool.

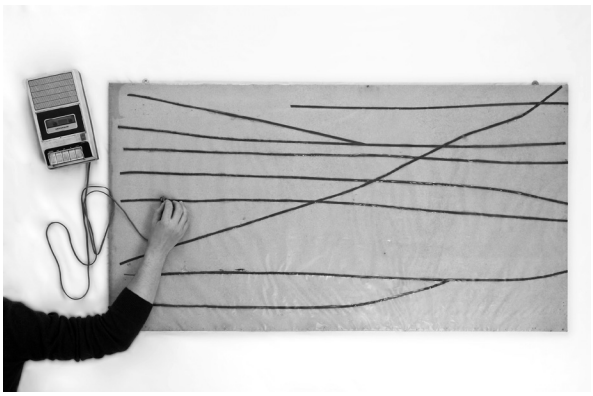

Fig. 3. The 1975 version of Nam June Paik's *Random Access* in use at the collector's home. The version consists of both the portable cassette player and a 1975 wooden chipboard covered with plastic foil and strips of audio tape. © The Nam June Paik Estate. Photo: Sebastian Kissel and Sascha Herrman. Courtesy of Dieter Daniels.

tive functionality has always been considered to be a key behavior of the work that should be retained during display. A presentation of the inoperative equipment has never been considered a viable option.

When the Guggenheim's audio deck and extended head fell into disrepair, obliterating its sound output and interactivity, a discussion was raised on how to approach the failed equipment. Could it be repaired or should it simply be replaced? If replaced, what kind of device would be appropriate? Which feature is more important to preserve: the full sound and interactive function or the historicity of the Paik-provided equipment?

Since the artist had passed away, he could no longer be consulted but a single clue on the significance of the equipment could be found in the conservation department's files, captured on a Variable Media Questionnaire (Guggenheim 2001). Paik's studio representative at that time, Blair Thurman, had stipulated that "period equipment" should be used for future "recreations" of the piece. That is to say, that at the point of creation of the Guggenheim's version, the creator considered the equipment to be non-dedicated, and replaceable. It was considered variable in regard to the device's make and model, but confined within the boundaries of an unspecified "period" technology.

Thurman did not reason or detail his stipulation, leaving the field wide open for later speculation. Such as, how closely should a replacement device resemble the 1963 original? Should the make and model reference the time and country of the original display? (Saueracker always uses European devices for his exhibition copies of *Random Access*, referencing the original 1963 version installed in Wuppertal, Germany.) Or, would an arbitrarily vintage looking device be sufficiently reminiscent of the 1963 original? Paik's own reconstructions of his earlier works tend to exemplify the latter, and much evidence of his openness and flexibility towards equipment replacement has been witnessed and published. To Paik, the artistic idea was much broader than its manifestation in a single artwork or a particular set of devices, and his approach to duplications, reconstructions, and copies of his artworks is famous. "Everybody can make such a sculpture, but I sign it. When I am dead, it is your prob-

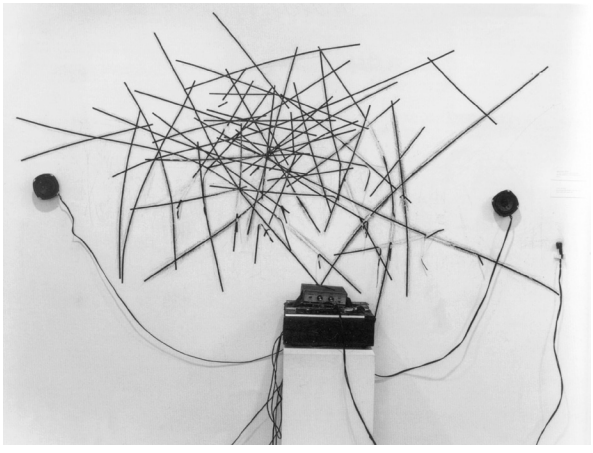

Fig. 4. The second recreated version of Nam June Paik's *Random Access* from 1976 never entered a collection, but has repeatedly been reconstructed by Paik or his assistant using different equipment. Installation view 1976 at Kölnischer Kunstverein. © The Nam June Paik Estate. Courtesy of Wolf Herzogenrath and Kölnischer Kunstverein.

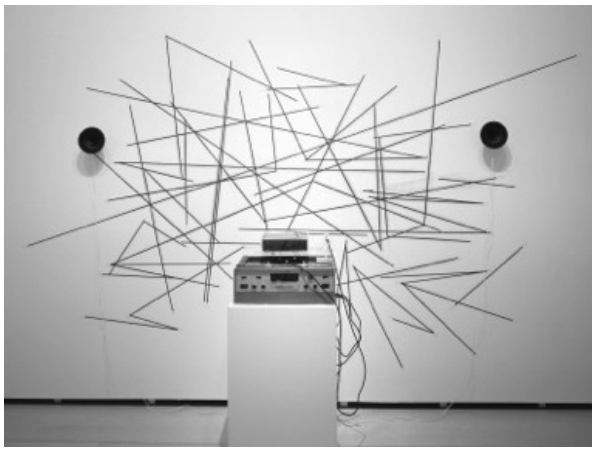

Fig. 5. The third recreated version of Nam June Paik's *Random Access* from 1999 in the Guggenheim Museum collection. Nam June Paik, *Random Access*, 1963/1999, audiodeck, extended playback head, strips of audiotape and speakers, Solomon R. Guggenheim Museum, New York, acc. no. 2001.5. Installation view in 2001 during *The Words of Nam June Paik* at the Guggenheim Museo Bilbao. Photo: Erika Barahona Ede. Courtesy of the Guggenheim Museo, Bilbao.

lem to find out which is the original. I have two originals: one piece and one copy of a better quality" (Scheidemann and Otterbeck 1997, 107).

Following the impetus of Paik's proclaimed indifference towards the original, and inspired by his philosophy of "indeterminacy" and "maximum decontrol," many collectors and caretakers have perceived his equipment to be exchangeable, regardless of the nature of the artwork. The dependence of Paik's works on specific devices or technologies often remains undiscovered by caretakers, and an assumed open-ended variability of these artworks has prevented many custodians from taking more conservative steps, such as stockpiling replacement devices and parts or even acquiring the necessary equipment to install the work.

Today, in the light of an abrupt end to the analog era and the unavailability of the artist to authorize reinterpretations that would significantly change a work, this approach has proven unsustainable. The majority of Paik's media artworks are based on—and conceptually are closely tied to—*analog* technologies. This is also true for *Random Access*, the concept and functionality of which is provided by analog audio tape recording technology. This work could not be recreated with a different or contemporary technology; no digital disk or file-based audio technology provides a physical audio head that is removable from the machine and operable by a human hand to achieve an audible output.

The identification of the conceptual value of this analog technology for the artwork is narrowing the variability from "period equipment" to "analog audio tape recording technology." And yet, another limitation in variability has emerged since 2001, when Paik's representative first assessed the flexibility of the piece. While only ten years ago, functioning analog equipment was still commonly available through a second-hand consumer market. Today, it can either be found discarded on sidewalks, or absorbed by a small and specialized collector's market.

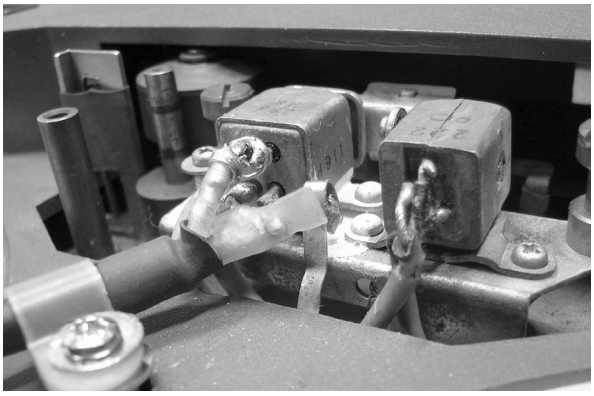

Fig. 6. Close-up of the audio heads that remained in the original RCA deck of the Guggenheim's version. The extension cable is soldered to the back of the audio heads. Photo: Joanna Phillips. Courtesy of the Solomon R. Guggenheim Foundation, New York.

Acquiring a comparable, functioning replacement device today can prove even more difficult than simply maintaining and repairing an existent device.

In summary, the significance of the existing 1970s audio deck for the Guggenheim's version of *Random Access* has shifted due to equipment obsolescence. Previously declared variable by the creator (within the unspecified range of period equipment), it has now become a precious piece of equipment on which the artwork is reliant.

This reality, accompanied by the awareness that repair was possible, lead to the decision by the Guggenheim Museum to retain the original equipment and dedicate it to the artwork. Furthermore, additional important criteria can be identified today that were not considered ten years ago. From a contemporary conservation perspective, the original equipment confers unique values to the artwork. These include:

1. When compared to the other two versions, the Guggenheim's set-up is the only version that combines both original, artist-approved equipment, and full interactive functionality while on display. In contrast, the Paik and Saueracker version is functioning, but not as an original (or even an artwork anymore)

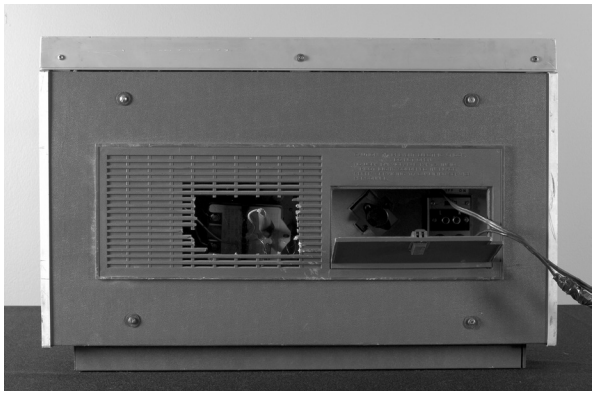

Fig. 7. The bottom side of the original RCA deck of the Guggenheim's version, displaying the repair of a transformer that was performed through a hole cracked into the housing. Photo: Joanna Phillips. Courtesy of the Solomon R. Guggenheim Foundation, New York.

Fig. 8. The equipment of the Guggenheim's version after restoration. The acrylic housing accommodates the devices and is signed by the artist. Photo: Joanna Phillips. Courtesy of the Solomon R. Guggenheim Foundation, New York.

and the Daniels version is an original artwork, and functional, but suspended from interactive use.

2. The Guggenheim's version is unique in the sense that it is not the most proper or conceptually "clean" manifestation of the work. Paik's collaborator (in this case CTL Electronics, New York) did not remove the audio head from the machine; instead, an available head from a completely different (video) machine was used by soldering it to a cable and connecting it to the back of the heads in the audio deck (fig. 6).
3. The RCA audio deck displays a unique visible modification on its back, where the machine was repaired by the artist's collaborator in preparation for use in *Random Access*. To deal with a dead transformer inside, a hole was cracked into the housing and space for a new transformer was made by removing the machine's motor through the hole—the function of tape transport was dispensable for *Random Access*. A new transformer was placed through the hole, and casually secured with cable ties and hot melt glue, restoring all functions necessary for the artwork. Even though this modification does not impact the discernible output of the machine in the context of the work, its "handwriting" is representative for the technical confidence and efficient improvisation practiced by Paik and his collaborators (fig. 7).
4. Last, but not least, the equipment dimensions are defined by the acrylic housing that Paik's studio custom fit precisely to accommodate the 1970s RCA deck and the 1990s amplifier. Any replacement equipment with different dimensions would be incompatible with the acrylic construction, which must be accepted as inseparable from this version due to the presence of Paik's signature (fig. 8).

All four aspects add unique significance, not only to the technology, but also to the particular equipment employed in the Guggenheim's version. The devices, their combination, and the specific modifications (supported by the artist-signed acrylic housing) embody authorship and authenticity within this 1999 version of *Random Access*—qualities that would be lost if the equipment was exchanged. Luckily, in this particular case, the repair and stabilization of the functionality could be accomplished without complications,[6] sparing the conservator a painful decision-making process over the question of what to preserve: the interactivity of the work or its historicity.

EXAMPLE 2: *CLEANING THE MIRROR* / BY MARINA ABRAMOVIC

"I sit with a skeleton on my lap, next to me is a bucket filled with soapy water. With my right hand I vigorously

brush different parts of the skeleton." So the score reads for Maria Abramovic's three-hour performance, *Cleaning the Mirror I*, which she conducted on camera at Modern Art Oxford, UK, in 1995. The video of the performance was subsequently edited into five separate videos, and was turned into an editioned 5-channel video sculpture, one of which entered the Solomon R. Guggenheim Museum collection in 1998. The five stacked monitors, forming a human-sized column, display the videos of separate sections of the human skeleton, featuring the head at the top, followed in downward order by the neck, the hands, the pelvis, and the feet (fig. 9).

Both the hidden playback and the visible display equipment have always been considered completely variable; since the work's creation 16 years ago, the artist has approved numerous manifestations that were installed with different models of CRT video monitors or television sets. With the variability of the equipment in mind, the Guggenheim collection never held on to any display devices for this piece. Storage space in New York City is expensive and acquired equipment can become outdated and less reliable in storage. Thus, new equipment was organized for each installation, e.g., by renting it or accepting sponsored loans from equipment manufacturers.

This strategy can no longer be practiced after the end of CRT production in the years between 2006 and 2010. Due to this major shift in technology, time-based media works dependent on CRT technology can no longer be installed with replaceable, off-the-shelf equipment, and

Fig. 9. Marina Abramovic, *Cleaning the Mirror I*, 1995, five-channel video installation with stacked monitors, with sound, Solomon R. Guggenheim Museum, New York, acc. no. 98.4626. Installation view with Sony PVM monitors in 2010 during *Haunted. Contemporary Photography/Video/Performance* at the Solomon R. Guggenheim Museum, New York. Photo: David Heald. Courtesy of Marina Abramovic and the Solomon R. Guggenheim Foundation, New York.

have become reliant on a rapidly shrinking second-hand market. When *Cleaning the Mirror I* was scheduled for a Guggenheim exhibition in 2010 (its first display after the end of CRT production) the artist was contacted to reassess her specifications for equipment selection in the light of the recent technological shift. Abramovic confirmed that a presentation with CRT monitors was crucial for the video sculpture and emphasized the aesthetical value of CRT monitors for her piece.

> *Cleaning the Mirror I* should be installed with five identical, cube-like CRT monitors. . . . It has only been shown with TV sets, when monitors were not available. I prefer monitors. . . . As long as the monitors are dark-grey or black, it's OK. Do not use beige, or light grey. It should remind you of a minimalist sculpture, like a Donald Judd. I don't want any brand names to be seen, they should be taped over. The monitors should look "anonymous." . . . The piece was perceived as a sculpture, in space. . . . It is important that the sculpture is of human life-size, around 1.78 meters. The monitor sizes should be chosen accordingly. (Abramovic 2010)

It is imaginable that in the future, when CRTs are no longer available, Abramovic might agree to recreate a free-standing sculpture, ". . . like a Donald Judd," by means of a boxed support structure accommodating flat screen displays. However, the bigger concern to her is the loss of the 4:3 aspect ratio, which is native to her video and to CRT monitors, but which is being replaced in modern screens with the 16:9 ratio.

For the time being, it was decided to accommodate the artist's request for CRT monitors, and the Guggenheim began to source suitable equipment for the piece. A model of Sony's PVM series was identified due to its

Fig. 10. The video, Preparing Aged CRTs, documents the work conducted on the PVM monitors and is shared on YouTube.com. Video: Joanna Phillips and Record-installations.com. Courtesy of the Solomon R. Guggenheim Foundation, New York.

establishment as a neutral "museum monitor," and its commonness and wide circulation over many years increased the likelihood of finding at least six identical units (including an extra back-up device). Nevertheless, considerable effort was made to find the monitors, and even more time and labor was invested towards the maintenance and preparation of the aged CRTs for a five-month exhibition. The condition of the aged monitors varied greatly, but all had to be dismantled, cleaned, and re-adjusted to calibrate their presets of hue and color, focus, brightness, convergence, and white balance (Phillips 2010) (fig. 10).

As a result of this unexpected experience, the museum acknowledged the increasing rarity and value of PVM monitors, and decided to retain them permanently. The preservation and presentation strategy was updated accordingly, planning for more PVM monitors, or similar models to be purchased as back-ups, and to be maintained and stored in the newly founded pool of shared, obsolete equipment.

SHIFTING SIGNIFICANCE PART 2: WHEN A WORK-DEFINING TECHNOLOGY BECOMES VARIABLE

When conservators identify and document equipment properties that define a time-based media artwork, they

take into account not only the visual and audible characteristics consciously intended and actively realized by the artist, but also more peripheral and unintended specifics that contribute to the artwork's overall appearance. Eventually, those peripheral features become distinct when their respective technology turns obsolete and substituting technologies no longer offer the specific feature. A prominent example is the "true" black that three-tube projectors—commonly used to install media works in the 1980s and 1990s—were able to project. Although many artworks depend on this feature (or are less successfully installed without it), "true" black was rarely identified as a work-defining property before LCD projectors were introduced that famously lacked a dark black in their low-contrast output.

However useful the consideration of these unintended, work-defining properties may be for conservation purposes, different rules apply to artworks that are very young and still in the stage of forming their identity.

In the following example from the Guggenheim collection, Paul Chan's projected flash animation *6th ~~Light~~* will serve to demonstrate the case where a conservator detected a work-defining feature produced by an employed technology that was subsequently declared insignificant by the artist, who deems the loss of this feature irrelevant to the meaning of his work.

EXAMPLE 3: *6TH ~~LIGHT~~* BY PAUL CHAN

Projected onto the gallery floor is the shadow of a window cross, creating the impression of white light falling through a window at night. In slow motion, silhouettes of small and eventually larger objects rise up through the air until finally the cross of the window itself deteriorates and drifts off along with the other fragments.

This four-year-old artwork, part of Paul Chan's series *The 7 ~~Lights~~*, consists of an executable flash file, played back on a computer with Adobe Flash software, and displayed with a video projector. All of the earliest instances of this artwork have been installed with LCD projectors, which add a very specific, aesthetical component to the appearance of the piece. Featured in all published images of the artwork, the adjacent wall displays a strong green reflection mirroring the white window on the floor (fig. 11).

Although it might look as if the artist intended for it, the green reflection is, in fact, a bi-product of LCD technology. Within an LCD projector, light is divided by dichroic mirrors and polarized by filters. When the polarized light passes the projector lens and hits the projection surface at an angle, the wavelength (and consequently the color of the projected light) are changed; in this case, white light bouncing off the floor becomes green before hitting the adjacent wall. Interestingly, if the projector is turned on its side, the reflection on the wall becomes purple.

From the perspective of a collection caretaker, where "an accidental detail can define the work" (Laurenson 2008, 161), the green wall reflection might be considered an important aesthetical and thereby work-defining aspect of the piece. Even though the product of a specific technology rather than the result of active artistic creation (e.g., a double projection), the green wall reflection has been perceived by a contemporary audience and published in print and online. Following through with this approach, the caretaker would identify the aesthetical, conceptual, and ultimately the historical significance of LCD projection technology for this artwork. While the device would be considered exchangeable, the display technology itself would have to be retained. In consideration of the future obsolescence of LCD projection technology, conservation strategies would probably include the purchase and stockpiling of replacement projectors and parts, and ultimately, after the extinction of LCD projectors, would possibly explore the re-creation of the green reflection by other means.

However, a quick email exchange with the artist put an abrupt end to these speculations, and turned the assumingly "work-defining" technology entirely variable:

> **Joanna Phillips**: The green reflection on the wall is specific to LCD projectors. Was the reflection always intended?
>
> **Paul Chan**: The green reflection was a welcome side-effect.
>
> **JP**: If you tip the LCD projector, the reflection shifts from green to purple. Is green the preferred color?
>
> **PC**: There is no preference for the reflected color.
>
> **JP**: What happens if LCD technology becomes obsolete, and the green reflection can no longer be achieved? Should it be re-created by other means (e.g., a second video source)?
>
> **PC**: The reflected color should NOT be reproduced. . . . The piece can be projected with a DLP projector. . . . The green reflection is of secondary concern. (Chan 2010)

According to the artist, the green reflection was an unintended but welcome side-effect that can be disregarded in later iterations of the piece. And indeed, for the work's most recent installation at the Guggenheim Museum in 2010, Chan chose to direct the projection towards a

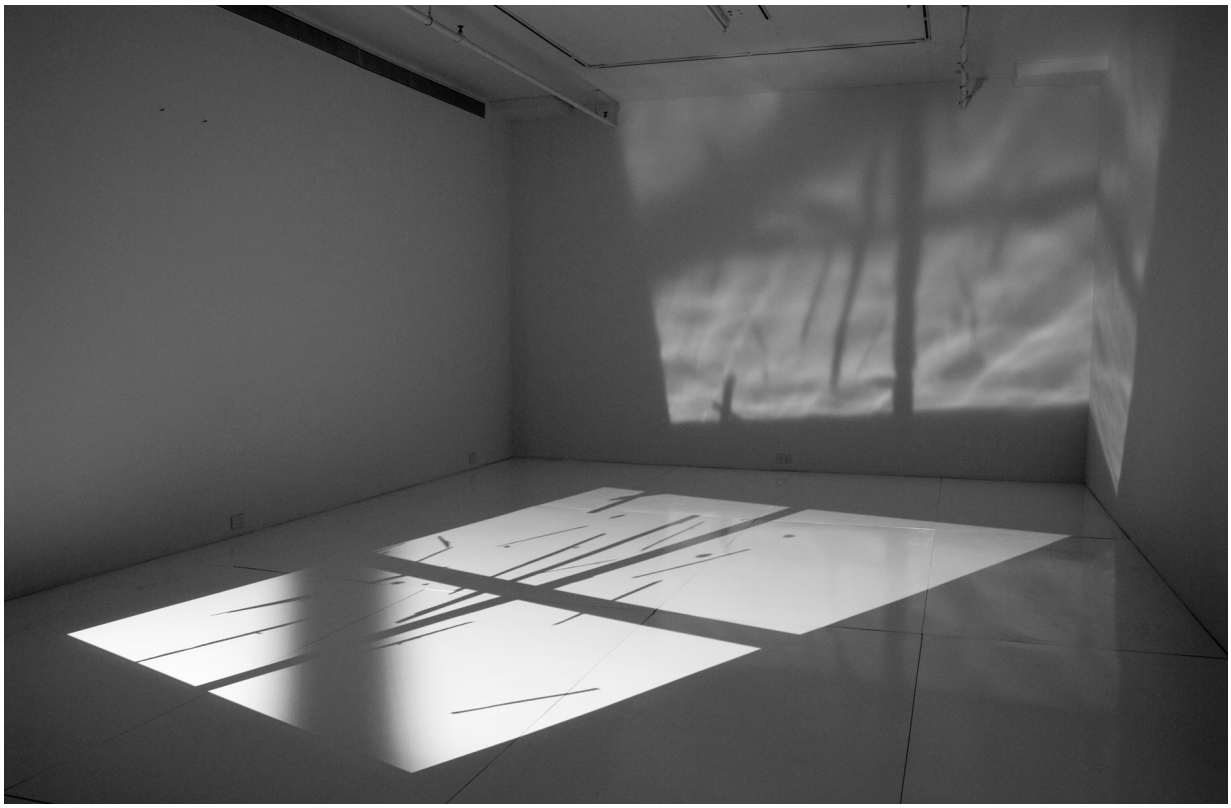

Fig. 11. Paul Chan, *6th Light*, 2007, flash animation projection, silent, 14 min., Solomon R. Guggenheim Museum, New York, acc. no. 2007.31. Installation view at Greene Naftali, New York, in 2007. The green reflection on the wall is a bi-product of LCD projection technology. Photo: Jean Vong. Courtesy of Paul Chan and Greene Naftali Gallery, New York.

large opening to the gallery, eliminating the green reflection almost entirely.

Although all published images of *6th ~~Light~~* prominently feature the green wall reflection, it is too early in the artwork's life for conservation to intervene in this matter. In the case of very young artworks, the conservator must avoid determining work-defining properties prematurely, and more importantly, without the artist's consultation, because an overly historically sensitive approach can influence or even hinder the formation of the artwork's identity. Since time-based media artworks cannot be understood unless they are installed, a number of different iterations are often needed to explore and define the variability of the piece in reaction to different spaces, devices or technologies.

Early in the life of the work, attitudes to change are fairly relaxed as the artist experiments with and responds to different spaces and contexts. In most cases, the form of the work becomes determined by the first few installations. During this process, authority lies with the artist. As time passes, the artist may lose interest and become less involved, and ultimately the museum is expected to outlive us all. (Laurenson 2004, 51)

The green reflection, a significant aesthetic feature of the early years of *6th ~~Light~~*, will soon no longer be part of this piece. As technology moves on, LCD projectors are already commonly substituted with DLP projectors, and following the artist's statement, the Guggenheim is documenting the technological changes of the piece, but will make no effort at this time to tie this work to its original technology.

CONCLUSION

Taking a balanced approach to the conservation of time-based media artworks means to actively determine and manage their inherent change over time, while retaining their identity. Important steps in this process are an in-depth understanding of an artwork's constituents and technical anatomy, the identification of intended and contingent work-defining properties, the determination of degrees of acceptable change, and the development of an informed conservation and display strategy. For the detection of equipment significance, the artist's statement is essential but has to be contextualized in a broader framework of collection care approaches and conservation ethics. This case is slightly different for very young artworks, where the power of decision remains with the artist until the work has fully developed its identity.

Three examples from the Guggenheim Museum collection have served to identify a number of factors that can lead to shifts in previously detected significances of devices and technologies. In the case of the artworks by Nam June Paik and Marina Abramovic, a changing technological landscape and the professional advancement of time-based media conservation has lead to a shift in significance of formerly "non-dedicated, variable" equipment to "dedicated" or "shared, obsolete" equipment. In the case of Paul Chan's work, it is the artist's voice that has shifted the equipment significance for this young artwork, turning an assumedly work-defining and "dedicated" technology to a "non-dedicated, variable" classification.

Managing change in media artworks importantly includes monitoring and documenting its reasons and history. This documentation should specify both the core identity of an artwork as well as its possible and realized modifications. To address this need, the Guggenheim conservation department has developed a modular documentation system that captures the general work-defining parameters of a media artwork on one set of central forms and each instance of an artwork on a separate "iteration sheet." To make the cause and meaning of modifications transparent and traceable in the future, the detailed descriptions of an iteration's employed devices, technologies, space characteristics, or other features as installed,

are complemented with decision-making fields. This allows one to track the originator of each decision, as well as the reasoning behind it, which can range broadly from "economical" or "practical" to "artist-stipulated," and may shift from iteration to iteration. Based on such detailed understanding of the behavior of an artwork, conservation can take responsibility and guide the work through its future changes, referring to a system of well-documented significances and relationships over time.

NOTES

1 As a rather speculative starting point for the selection of historic equipment, Christoph Blase chooses the perspective of a "hypothetical collector or curator from the past – someone who over thirty years ago was enthusiastic about video art, who had bought it and exhibited it, and who was also someone that placed great demands on design. From the perspective of such a person, only certain models would be acceptable for showing the video artworks: Braun, Wega, and later Bang & Olufson . . ." (Blase 2010, 381).

2 Currently, all video formats are becoming file-based, ranging from uncompressed encodings for archival purposes, to compressed encodings for access such as exhibition playback. Considered advantages of file-based video are easy mass migrations of archival files, and the centralized controlling of exhibition playback by means of networked media players or computers, as opposed to discrete disk or tape players that require manual operation.

3 This fragment is today part of the "*Random Access* ensemble" owned by private collector Dieter Daniels, and further described in note 4.

4 The UNIVERSUM cassette player and chipboard belong to the "*Random Access* ensemble", four groups of items that were formerly owned by Hermann Braun and are today in Dieter Daniel's collection: (1) the original score of *String Quartet*, Freiburg / Br. from 1957, placed in an acrylic box and covered with strips of audiotape (1978); (2) the mentioned fragment with extended audio head, circuit board, and plastic cover that presumably originates from the 1963 version of *Random Access*; (3) the wooden chipboard with adhered plastic foil and audio tapes (1975); and (4) the UNIVERSUM tape recorder with extended audio head (1975).

5 In the past, the cassette recorder has also been displayed for interactive use in combination with the 1978 audiotape strips (item number 1 in note 4), e.g., at the Whitney Museum of American Art, New York, in 1982, and the Kunsthalle Basel in 1991. More recent displays showed the recorder combined with the 1975 audio strips (item number 3 in note 4), e.g., at Lentos Kunstmuseum Linz in 2009, at the MUMOK Vienna in 2009, or at the Tate Liverpool in 2010 and 2011.

6 The conservation and restoration treatment was conducted by the author in 2009, in collaboration with Maurice Schechter of DuArt, New York. The function of the audio deck within the context of *Random Access* is reduced to that of a pre-amplifier; none of its other native functions need to be maintained, which will reduce future maintenance and repair.

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