Re-constructions: Preserving the Video Installations of Buky Schwartz

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Introduction

A closed-circuit camera system or CCTV, often used in surveillance technology, sends the "feed," or video signal, from a camera directly to a monitor. We now often see these in supermarkets and gas stations. Because we are accustomed to the constant presence of video in our daily lives, the aesthetic implications of our interaction with this technology--the psychological feedback loop created as "I" look at a camera's view of "me" in this "space," rendered flat into a plane on the monitor--often goes unscrutinized or unquestioned. That is "me," "here. " The artist Buky Schwartz interrogates these assumptions of video technology's seemingly objective reproduction of space through his video installations.

Buky Schwartz (1932-2009) was an Israeli-American conceptual artist whose work focused on the nature of perspective and perception. Schwartz worked in many different art forms, but he is best known for his single-channel video works and video installations. With studios in Manhattan and Tel Aviv, Schwartz was active all over the world until his death in 2009.

Biography

Buky Schwartz was born in Jerusalem in 1932, and moved to Tel Aviv with his family as a child. Despite some resistance from his parents, Schwartz enrolled in the Avni School of Art at the young age of 15. This training, as well as his subsequent apprenticeship to Israeli sculptor Yitzhak Danziger, was fairly traditional, rooting Schwartz in technical craftsmanship and classical art education in perspective, composition, and scale. Schwartz desired a more progressive arts education, seeking out Eduardo Paolozzi at the St. Martin's School of Art in

London, hoping that the sculptor, whose works were often indebted to surrealism and cubism, could teach Schwartz welding. However, by the time Schwartz reached the sculpture department at St. Martin's, Paolozzi had left, replaced by Anthony Caro.[1]

From 1952 to 1979, Frank Martin was head of the sculpture department at St. Martin's. Martin, a sculptor as well as an educator, was heavily influenced by the work of David Smith, and began shaping the department to respond to Smith's innovations in the artform, which applied constructivist philosophy to sculpture. Smith's work features an "embrace of open space," which contrasts to the representations of linear planes featured in his sculptures, highlighting the tension between two-dimensional representation in a three-dimensional medium, or, in the artist's words, somewhere between "painted sculpture or paintings in form."[2] The result of Smith's influence on artists and educators like Frank Martin and Anthony Caro was a generation of sculptors known for their "concern for linear geometric forms, smooth, colored surfaces, and a new relationship to the ground," typically foregoing a pedestal in preference of building the support of the sculpture in to the work itself, inviting a more interactive examination of the piece.[3] Schwartz graduated St. Martin's in 1962, after welding some of Anthony Caro's first sculptures made of steel, a material Caro and Schwartz continued to use throughout their careers.[4]

Following Schwartz's education, his sculptures were shown primarily in London, Tel Aviv and Jerusalem. In 1966, Schwartz exhibited a sculpture at the Venice Biennale. This work

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[1] Pincus-Witten, Robert. "Buky Schwartz: Video as Sculpture." In *Buky Schwartz, Videoconstructions*, edited by William D. Judson, 19-22. Pittsburgh, PA: Carnegie Museum of Art, 1992.
[2] Foster, Hal. "At the Guggenheim: David Smith." *London Review of Books*. N.p., 9 Mar. 2006. Web. 06 May 2016.
[3] Weyl, Martin. "The Art of Buky Schwartz." In *Buky Schwartz: Sculptures*. Jerusalem: Israel Museum, 1970.
[4] Ramos, Maria Elena. "Interventions in Space: An Interview with Buky Schwartz by Maria Elena Ramos." In *The Seeing I*, edited by Ted Perry. Chicago: Olive, 2004.

resembled a set of pillars composed entirely of mirrors. In her essay *Buky Schwartz: Mirrors and Interactivity*, Ann Sargent-Wooster describes the piece:

> "The sculptural pillars were dematerialized by the mirrors, which in turn incorporated the room and its occupants into their surface, thereby reducing the distinction between viewer and sculpture."[5]

This implication of space and audience into the piece is certainly reminiscent of sculptor David Smith's work, thinking of a sculpture as an intervention into space, but also is closely aligned with the conceptual art movement of the 1970s, which emphasized the role of the viewer in interpreting and processing a work. When Schwartz moved to New York in 1970, he quickly became influenced by New York art scene's interest in what he called "reasons:"

> "Before I came to New York City, I made shapes, set limitations without specific purpose, discovering valuable relationships, but relationships based unawares on sensibility. In 1970, I realized that sculpture was not just structure for the sake of structure. That's being expressive without intellective. The big change occurred when I was confronted by the conceptual thinking of New York. There were reasons, had to be reasons, for doing things and I realized that I could get at sensibility while still retaining my structural vocabulary. Before this I thought that it was not sanctioned for sculptures to be smart."[6]

This influence of the conceptual art movement and Schwartz's now significant "structural vocabulary" inspired several works made of paper and colored string. The 1972 work *Fold*, is simply a piece of paper with the corner folded over and the phrase "Fold - from two to three

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[5] Wooster, Ann-Sargent. "Buky Schwartz: Mirrors and Interactivity." In *Videoconstructions*, edited by William D. Judson, 13-18. Pittsburgh, PA: Carnegie Museum of Art, 1992.
[6] Pincus-Witten, Robert. "Buky Schwartz: Video as Sculpture." In *Buky Schwartz, Videoconstructions*, edited by William D. Judson, 19-22. Pittsburgh, PA: Carnegie Museum of Art, 1992.

dimensions" stamped on to the paper so that the text crosses from the folded corner (the back of the page) onto the front facing side of the paper. The works incorporating string, similarly deal with representations of three dimensional space rendered into a two dimensional plane (a fascination of Schwartz's that he will return to in his video installations), this time by creating geometric patterns in string, stretched tightly across a grid, with one section left intentionally loose, drooping down below the grid. This loose section emphasizes the materiality of the string and its limitation in representing a two dimensional shape. Schwartz would go on to create an installation that made use of string in a similar fashion. This tendency to work ideas out on paper, and then later realize the concept as an installation was a technique Schwartz employed throughout his career.

In 1976, Schwartz had the first of what became several solo shows at the O.K. Harris Gallery in the SoHo neighborhood of Manhattan. The sculptures Schwartz created for this exhibition again incorporated mirrors, this time to create a type of optical illusion. The resulting effect of the work was the appearance of a wooden beam hovering in space. Schwartz noticed that visitors to the gallery spent much more time with these works than they had with sculptures he had created previously. Likely due to viewers' interest in interacting with this work, and the need to view the work from multiple angles to understand its illusionistic qualities, Schwartz turned to video to document this exhibition at O.K. Harris Gallery. In the mid-1970s acquiring a camera was not an inexpensive proposition. For example the Sony AV-3400 Porta Pak was sold in 1972 for $1,650,[7] the 2016 equivalent of $9,700 when adjusted for inflation.[8] Schwartz borrowed a video camera from video artist Wendy Clarke (the daughter of renowned filmmaker

[7] "Sony AV-3400 Porta Pak." Experimental Television Center The Video History Project. Accessed May 06, 2016. http://www.experimentaltvcenter.org/sony-av-3400-porta-pak.
[8] http://www.calculator.net/inflation-calculator.html?cstartingamount1=1650&cinyear1=1972&coutyear1=2016&calctype=1&x=95&y=8

Shirley Clarke). His first experience with video, Schwartz found that the technology did not serve well for documenting his exhibition. Schwartz had hoped to document the way the piece manipulated perception of space through reflection in the mirror. Investigation of the sculpture in physical space would demonstrate the artifice of the sculpture. Yet the illusion intrinsic to the work, which made the construction of the piece difficult to understand from a particular vantage point, was still captured by the camera. This revelation, that a camera retained the illusory qualities that a physical investigation would not, inspired Schwartz to work with a camera again, this time as "a more sophisticated mirror" in his installations.[9]

Media Installation Art

The practice of art making in the late 20th century, particularly the conceptual art movement of the 1970s, famously described in Lucy Lippard's 1973 article *Dematerialization of the Art Object*, challenges traditional assumptions of art conservation. As artists increasingly worked in ephemeral forms, the significance of the physical objects that were used to manifest a work decreased. Pip Laurenson, the current Head of Collection Care Research for the Tate, describes the shift in conservation practice, necessary when dealing with media works and conceptual art more broadly, as using the identity of a work as the metric of authenticity, rather than the state of a physical object.[10] This focus on the identity of an artwork reflects contemporary art's investment in the underpinning concept of the artwork, the impetus of the work as the central factor of the piece. Therefore the collection and conservation of such an

[9] *Video Space For a Blue House*. Directed by Ralph Busch. Performed by Buky Schwartz and Richard Twedt. Spokane, Washington: Eastern Washington University, 1990.
[10] Pip Laurenson, 'Authenticity, Change and Loss in the Conservation of Time-Based Media Installations', *Tate Papers*, no.6, Autumn 2006. Accessed 2 May 2016. http://www.tate.org.uk/research/publications/tate-papers/06/authenticity-change-and-loss-conservation-of-time-based-media-installations.

artwork stems from a deep understanding of the work.

The installations of Buky Schwartz are often realized for a particular exhibition and then disposed of entirely. The paint, steel, mirrors or wood that are used to produce a Schwartz installation are replaceable and ephemeral. These materials are not intended to stand the test of time. When a work is comprised of materials that can, or must be replaced to realize the work, as is the case with Schwartz's installations, the work lives on through its documentation. Re-installation of the work is dictated by photographs, installation manuals and recordings of the artist's intention. Media conservator Glenn Wharton, and sociologist Harvey Molotch, describe the value of such documentation in their article *The Challenge of Installation Art*. "This accumulation of text, images, and instructions can sometimes communicate more about the work than its physical manifestation."[11] This is especially true of variable artworks, which take on a different arrangement or appearance in different iterations, as is the case with Schwartz's installations, which commonly respond to, and incorporate, the architecture of the gallery space.[12]

When Schwartz's installations have entered a museum collection, the acquisition has often included documentation of the installation and instructions from the artist, or his estate, on how to install the work. This process has codified the work, defining its elements, and clarifying essential qualities. Laurenson describes this process as a "formalisation" of the work, which is intended to make a work that may at first seem difficult to define easier to understand. It is "a

[11] Wharton, Glenn & Harvey Molotch. The Challenge of Installation Art. In (A. Bracker & A. Richmond eds.) *Conservation: Principles, Dilemmas, and Uncomfortable Truths.* London: Elvsevier. 2009. 210-222.
[12] Goldstaub, Edna Russak. "The Videoconstructions." In *Buky Schwartz, Videoconstructions*, edited by William D. Judson, 56. Pittsburgh, PA: Carnegie Museum of Art, 1992.

matter of optimising the work [rather] than falsely constraining it."[13] This is especially important for video installations that do not have a substantial exhibition history, or are still in their infancy. As Joanna Phillips, media conservator of the Guggenheim museum, points out, "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."[14]

In the following section, two of Schwartz's installations that have been collected by art museums will be detailed. These acquisitions, and the way in which these institutions represent the work in their collection, highlight the significance of documentation when acquiring a Schwartz installation. This discussion will then underline the value of the materials in the collection of the estate of Buky Schwartz, described later in this report.

Painted Projection

The Smithsonian American Art Museum (SAAM) acquired Buky Schwartz's first video installation *Painted Projection* (1977), in 2014. The work consists of a strategically placed camera, monitor, and paint on the gallery floors and walls. The effect of the work is a seemingly abstract or incoherent pattern on the walls and floors of the gallery in physical space, and the confrontation of the same space represented on the monitor, but with the pattern presented as a coherent representation of a geometric form, a cube. The realized acquisition consisted of three sets of triptychs - nine black and white prints total - of Schwartz standing in, and walking through, a cube painted on the walls and floors of his studio, as well as a set of instructions for

[13] Pip Laurenson, 'Authenticity, Change and Loss in the Conservation of Time-Based Media Installations', *Tate Papers*, no.6, Autumn 2006. Accessed May 2, 2016. http://www.tate.org.uk/research/publications/tate-papers/06/authenticity-change-and-loss-conservation-of-time-based-media-installations.
[14] Phillips, Joanna (2012). "Shifting Equipment Significance in Time-based Media Art" in *The Electronic Media Review*, Electronic Media Group, Vol. 1, p. 139-154.

realizing the work, and an agreement between the museum and the estate. This acquisition demonstrates the significance of documentation when attempting to preserve video installations.

The museum's approach to the work is rooted in research based on documentation of the 1977 exhibition *Painted Projections* at Julie M. gallery (which was the first and only public exhibition of the piece), dialogue with the estate, and documentation of Schwartz's studio study, that was created immediately after the exhibition. Through this research, the SAAM hopes to develop an understanding of the work's identity.

According to the publication produced by the gallery as part of the show, *Painted Projections* consisted of two works, *Closed Circuit* (1977) and *One Variation* (1977). *One Variation* is two patterns painted directly on the wall and floor of the gallery that, from a certain angle, ressemble cubes. Schwartz described his process for creating this work in an interview with Robert Harris:

> "I built a frame of a box, photographed it and made a slide out of it. Then I projected the slide on the gallery's surfaces, and painted the walls and the adjacent floor, guided by the projection."[15]

The same process was used for *Closed Circuit*, but in the case of this work, after the shape had been painted on the surfaces of the gallery, the slide projector was replaced by a black-and-white video camera. Therefore the privileged perspective that revealed the representation of the cube was occupied by the camera, and reproduced on a monitor through a closed-circuit feed (hence the title).

When Schwartz returned to New York, he continued to expand on the ideas he set in motion as part of the Painted Projections exhibition.

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[15] Schwartz, Buky, and Robert Harris. "An Interview with Buky Schwartz." In *Buky Schwartz: 1990*, compiled by Miriam Tovia Boneh and John G. Hanhardt, 37-43. Ramat Gan: Museum of Israeli Art, 1990.

> "I knew that I had something...I saw something that was very important in terms of sculpture/video participation. I set up a large cube in my studio, painted on the walls and the floor."[16]

The three triptychs included in the SAAM acquisition are documentation of this large cube created in the artist's studio. Not surprisingly, then, the SAAM's exhibition of the work, which occurred in the summer and fall of 2015 as part of the exhibition *Watch This! Revelations in Media Art*, more closely resembles the cube studio study than the *Closed Circuit* of the *Painted Projections* exhibition at Julie M. in 1977. Moreover, the title of the SAAM acquisition is not taken from the *Closed Circuit* iteration from the *Painted Projections* exhibition, rather the work is now titled *Painted Projection*, dated 1977.

These installations that Schwartz created in 1977, the two works featured in the *Painted Projections* exhibition, and the cube study, all function as expressions of the same concept, an idea Schwartz was working out over the course of a year. The SAAM acquisition reflects this thinking, incorporating the multiple iterations of the work into the acquisition, rather than arbitrarily relying on one instantiation. And, at least based on the 2015 exhibition, preferencing the latter form of the work. This form of the work was never truly "fixed" in an exhibition, or in formal documentation such as installation instructions crafted by the artist, leaving this process of determining the identity of the work to the curators and conservators of the SAAM.

An example of this is the development of the installation instructions for *Painted Projection*. The instructions evolved through the practical experience of realizing the work in the gallery. The museum initially attempted a methodology similar to the one Schwartz's described, using a slide projector to cast a pattern onto the walls and floor of the gallery. This was found to

[16] Schwartz, Buky, and Robert Harris.

be imprecise. Through dialog with the estate and further research, the "script" for realizing the work (the installation instructions), developed, and continues to develop as the work is "formalised" in the collection.[17]

Yellow Triangle

Yellow Triangle (1979) was acquired by the Whitney in 1992, under the guidance of John Hanhardt. Similarly to the SAAM's acquisition of *Painted Projection*, the Whitney received a set of instructions for realizing the work and photo documentation of the piece's initial installation. The difference being, these instructions were drafted under the supervision of the artist. The instructions, therefore, are far more specific and refined. No longer is the shape projected onto a wall and used as a guide. Rather, the shape is drawn on the monitor and then, through a collaborative process with an assistant or art preparer, Schwartz would dictate how to tape out the painted figure. The other significant difference in the acquisition is the inclusion of a recording from the camera's perspective during the installation, presumably created by simply including a VTR (Video Tape Recorder) in the closed-circuit signal path. This recording is used to demonstrate the size and location of the desired triangle that ought to be realized on the monitors in the gallery, as well as having incredible value as documentation of museum attendees' interaction with the installation.

In the *Yellow Triangle* installation instructions, Schwartz asks that the recording be used as a guide, and that the technician installing the work trace the triangle directly on the monitor using a felt pen. Then, this traced pattern is superimposed on to the space, by sending the signal from a camera, positioned in the gallery according to Schwartz's specifications, directly to the

[17] Mansfield, Michael. "Interview with Michael Mansfield." Telephone interview by author. December 09, 2016.

monitor (the closed-circuit that will be used in the installation). From this point, one technician should "sit directly in front of the screen" and guide a second technician "in marking the walls and floor at key points in the room as identified along the triangle on the screen."[18] In this way, the pattern is taped out in physical space, and then painted in. Schwartz adopted this process early in his career and continued to practice this methodology thereafter. This technique has been described by several of the artist's former assistants and in a published account as well.[19] The methodology the SAAM has developed also closely resembles this prescribed method. The instructions also detail the type of paint (Cadmium Yellow acrylic), with a 50% mixture of the acrylic paint and liquid latex rubber for painting the floor, to protect the paint from scuffing, and ruining the illusion of a solid form on the monitor.

Aside from the installation instructions, the Whitney's artist file also includes the museum institutional records related to the work, including correspondence. Significant properties of the work can be gleaned from correspondence between the artist and curators who installed the work following this acquisition. Notably, in an exhibition of the work by the San Jose Museum in 1997, Schwartz requested that the space that would become the "area of activity" - Schwartz's personal term for the physical space that would be captured by the camera - be larger, allowing the painted area in the gallery to breathe. He also expresses an opinion about the placement of the monitors. Interpreting this second concern, in a Buky Schwartz installation, with the exception of his first attempt in 1977, which the artist admits was "a little clumsy," the viewer

[18] Schwartz, Buky. "Instructions for the Installation of Yellow Triangle." *Buky Schwartz Artist File*. The Whitney Museum, April 2, 1992.
[19] Pincus-Witten, Robert. "Buky Schwartz: Video as Sculpture." In *Buky Schwartz, Videoconstructions*, edited by William D. Judson, 19-22. Pittsburgh, PA: Carnegie Museum of Art, 1992.

must be able to see themselves on the monitor when occupying the area of activity.[20]

The Legacy of Buky Schwartz

After Schwartz passed away in 2009, Odelia Schwartz and Shlomi Ron, the artist's daughter and son-in-law, and now the stewards of the estate of Buky Schwartz, inherited the materials that were previously stored in the artist's New York studio. Schwartz split his time between New York and Tel Aviv for most of his life, maintaining studios in both cities, only closing his New York studio and permanently moving to Israel in the early 2000s. Before moving, Schwartz packed up the materials in his studio, organizing photographs and other documentation of his large scale outdoor sculptures, video installations and exhibitions, grouping these 2D materials in large manilla envelopes and labeling them with a black sharpie. The 3D models that Schwartz created as pre-visualizations of sculptures, and scale-models for working out the mechanics of video installations were also packed, but with less organization. All of these items were then stored at a warehouse space in New Jersey, loaned to the artist by a family friend who used the warehouse to store surplus inventory from a toy manufacturing business. Recognizing the value of these materials, the estate has since moved the collection, and is taking steps to organize and preserve them.

The collection of the estate of Buky Schwartz, occupying approximately 1,200 cubic feet, is now stored at Schwartz and Ron's residential home in Miami. In January of 2016 a collection assessment was performed on the materials in the collection. The resulting assessment report is attached to this document as an appendix. The materials in the estate's collection are of significant value, not only for understanding the artist's career, but also for preserving Schwartz's

[20] Schwartz, Buky, and Robert Harris. "An Interview with Buky Schwartz." In *Buky Schwartz: 1990*, compiled by Miriam Tovia Boneh and John G. Hanhardt, 37-43. Ramat Gan: Museum of Israeli Art, 1990.

work. Given the significance of documentation in acquiring media installations, the collection is not only an “archive” of content from the artist’s career, but also the source material necessary for realizing the artist’s installations. The content and organization of the collection suggests Schwartz was aware of the importance of documentation in re-installing his work. The artist collected negatives, prints, analog video tapes, and correspondence that documented his career. This included grouping materials that pertained to the same work, such as handwritten installation manuals, correspondence, prints, negatives, and other documentation, into the aforementioned manilla envelopes. However, not all material in the collection relevant or related to a particular work or exhibition is grouped in the envelopes. Letters, photographs, sketches, invitations to exhibitions, and other items of interest, are dispersed across the less organized binders and boxes Schwartz stowed away before leaving New York, which now reside in Odelia Schwartz and Shlomi Ron’s garage, along with the artist’s 3D models of installations and sculptures. The 3D models Schwartz created as a tool for understanding and visualizing his installations offer some of the most interesting insights into the artist's process, exposing a work in its early stages, just taking form, yet clearly recognizable, with all of the components that later defined the work already present. These models, in combination with the other documentation in the collection, including Schwartz’s analog video tapes, provide a thorough depiction of the artist’s work spanning his entire career.

The content of the estate’s analog video collection consists of original single-channel video works, documentation of video installations, works in progress, and press coverage including interviews with the artist. The video documentation of Schwartz’s installations illustrates the mechanics of the work, and the impact the work had on viewers during its previous incarnations. The interviews with the artist are similarly valuable. Again, given that the

conservation of media installations must first come from an in-depth understanding of the work - its historical context, the aesthetic implications of the work, the technological underpinnings of the components, and the artist's intent - interviews with the artist that describe the process and impetus for a particular work are extremely valuable. For example, Schwartz's comment that the visible cables that hang above his installation *Three Angles of Coordination for Monitoring the Labyrinthian Space* (1986) are "like Ariadne's threads" (in Greek mythology Ariadne gives Theseus a ball of yarn to aid his escape from the labyrinth), makes it clear that the cables are significant both aesthetically and functionally.[21] Similarly, the feed from the closed-circuit camera system throughout the construction of the installation *Buky's Box* (1984), which is in the estate's collection on a Umatic video tape, could be particularly valuable for re-installing the work, in the same way that the *Yellow Triangle* camera feed recording can be used as a template for the installation of that work (as described in the *Yellow Triangle* section of this document).

Potential of the Collection

To demonstrate the ability to reconstruct Schwartz's installations from the documentation in the collection, two works were selected based on the amount of material in the estate's collection and the availability of published information describing the works. The "maturity" of the works was another factor in selection, ensuring that the installations had multiple iterations, and had formalized organically. While a substantial amount of documentation exists in the collection for many of the artist's video installations, the two installations described in detail below, *Spring 1981* (1981) and *Three Angles of Coordination for Monitoring the Labyrinthian Space* (1986), allow for the opportunity to explore defining a work through different forms of

[21] "Three Angles of Coordination for Monitoring the Labyrinthian Space / Buky Schwartz." Mattress Factory: ActiveArchive. Accessed May 01, 2016. http://www.mattress.org/archive/index.php/Detail/Collections/30.

documentation. *Spring 1981* was well represented in the estate's collection of 2D materials, with prints, negatives, and installation manuals of the work offering a valuable perspective on the work's creation and realization. *Three Angles of Coordination* on the other hand, while well documented in the artist's collection of photographs, blueprints, and sketches, is also represented in the estate's collection in a series of models. The models were instrumental in defining the scale of the work and relative size of the installation's different components. Interviews with Schwartz's collaborators was another asset in performing research on these works, and the artist's oeuvre more broadly.

Spring 1981, is the first in a series of three installations, including *Fall 1981* (1981) and *Summer 1981* (1981). These works all have a similar structure. A group of tree stumps (15-25) of varying height are arranged in the gallery, with an easily recognizable geometric pattern (or patterns) painted on them. However, as is the case with many of Schwartz's video installations, the pattern is only recognizable from the privileged perspective of the video camera, delivered to monitors in the gallery via a closed-circuit system. Schwartz's interest in imposing rigid geometric forms on uneven natural surfaces was inspired by a work he did the previous year in Tel Hai, Israel, titled *White Flag Triangle* (1980). The site-specific piece, akin to land art, used 300 white flags over an area of two and a half square miles, to create the image of a triangle from a designated vantage point. Schwartz's inspiration for the piece is steeped in his youth:

> "When I was on the kibbutz I used a tractor to plow fields; it would take 20 minutes to do a furrow. I looked at the top of the mountains changing their positions from my moving point of observation."[22]

Schwartz kept a series of 3.5" x 5" prints of the first installation of *Spring 1981*, which

[22] Goldstaub, Edna Russak. "The Videoconstructions." In *Buky Schwartz, Videoconstructions*, edited by William D. Judson, 56. Pittsburgh, PA: Carnegie Museum of Art, 1992.

show the artist and various assistants arranging the tree stumps, setting up the closed-circuit camera and painting out the two geometric patterns, a square and a triangle, onto the stumps. Stored with these prints is an installation manual, with the title *Timber* written at the top, which closely resemble the three works in the "Seasons 1981" series. There is no documentation or publication that mentions *Timber*, therefore it appears this was a working title, a concept that eventually was realized as *Spring 1981*. These documents demonstrate how the physical components that are necessary to the work are arranged. There are also several published accounts and descriptions of this work, which provide the dimensions of the initial incarnation of the installations, quotes from Schwartz about the work, and also detail the series' exhibition history.

After the exhibition of *Spring 1981* at the Thorpe Intermedia Gallery, Schwartz installed *Summer 1981* and *Fall 1981* at the Carnegie Museum of Art and the Israel Museum, respectively. Both works are quite similar to *Spring 1981*, but feature the shape of a house on the logs rather than a square or triangle. Schwartz would continue to work with tree stumps following this series, including a piece title *Diptych* (~1982) at the University of Akron, Ohio. The president of the student art league at the time was David Eubank, who acted as Schwartz's assistant during the installation process. Eubank published a blog post in 2009 about his experience working with Schwartz. This blog post, in addition to private correspondence with Eubank detailed the specifics of installing the work.[23] Eubank confirmed that Schwartz used the same methodology for realizing the work as he had in the past, drawing the desired pattern first on the monitor and then directing an assistant to realize the pattern in physical space.

Finally, *Spring 1981* was re-installed at the Bryce Wolkowitz gallery in New York as

[23] Eubank, David. "Buky Schwartz (1932–2009)." David Eubank on Art. September 07, 2009. Accessed May 01, 2016. https://davideubank.wordpress.com/2009/09/08/buky-schwartz-1932–2009/.

part of the gallery's *Natural Circuits* show in 2007.[24] Just two years before the artist's death, this iteration of the work is particularly illuminating, as it was constructed in a smaller space and with new equipment. Sadly, some of the accommodations necessary to make the work function in this space were not ideal, specifically the inability of the viewer to walk through the cluster of tree stumps, and the inclusion of flat-screen monitors in the closed-circuit system. Schwartz's work has always been realized using CRT (cathode ray tube) monitors. These monitors were the only ones available at the time, and the continued use of CRT monitors in Schwartz's installations provide historical context for the installation. However, the artist's approval of the installation demonstrates his willingness to adjust the parameters of a work to accommodate for the intended gallery space.

Schwartz's flexibility is made explicit in the display specifications created as a result of this project. While establishing thorough guidelines and instructions for installing the piece, the variability of several elements is emphasized, with the intent of making it clear that each iteration of the piece will be unique. The goal of the display specification (attached to this document as an appendix) is to codify the identity of the artwork, much as the museums that have collected *Painted Projection* and *Yellow Triangle* have done.

Three Angles of Coordination for Monitoring the Labyrinthian Space (1986) has had several iterations, making the work attractive for this project, as it has had the opportunity to develop. This maturation of the installation should prevent the display specifications from prematurely formalizing the work. The first iteration of the piece, exhibited as *Untitled 1986* (1986) or referred to under its working title *Maze*, is modest in scale in comparison to the subsequent versions. However, the basic functionality and intent of the work remains. *Three*

[24] "Natural Circuits Group Show." Bryce Wolkowitz Gallery. 2007. Accessed May 01, 2016. http://brycewolkowitz.com/h/exhibition_images.php?e=10.

Angles of Coordination is made up of thin walls that rise above eye level, arranged in a maze composed of three-wall modules, each 120° apart. In order to navigate the maze, the viewer must rely on monitors placed above the maze walls, displaying a bird's eye view of the structure, fed live to the monitors from a camera hung from the ceiling. While this initial version used monitors hung from the walls around the edges of the gallery, all of the later iterations of the installation mounted the monitors on to the junctions of the three-wall modules, dispersing them across the maze.

The estate holds a large amount of documentation of *Three Angles of Coordination*, including prints of the realized work (especially in its second iteration at the Mattress Factory in Pittsburgh), a floor plan of the maze, sketches of the monitor mounts, and 3D models of the work. Shlomit Lehavi, a lifelong friend to Schwartz, and at one time the artist's assistant, was interviewed about the artist's process in January of 2016. Schwartz would first sketch ideas out on paper, then work out the mechanics of a particular installation by building scale models. The 3D models in the collection, then, have significant value, as they can be used as a basis to "scale up" an installation. There are several models of *Three Angles of Coordination*, in varying condition. However, each provides insights into the scale and layout of the installation. Each of the models is consistent to the proportions of the others, as well. The display specification for *Three Angles of Coordination* are based on measurements of the models, documentation of the installation, published information describing the work (such as dimensions, the artist's statement, interviews that discuss the installation, etc.), and the artist's sketches and floor plans. Just as was the case with the "Seasons 1981" series, the specifications are designed to allow for variability, as the work never had the exact same dimensions or layout.

While this research has focused on *Spring 1981* and *Three Angles of Coordination for*

Monitoring the Labyrinthian Space, much of this type of documentation exists for many of Schwartz's installations. The following works are notably represented in the collection, and would be ideal for further research and a similar approach to further formalize their specifications: *Buky's Box* (1984), *Yellow Gate* (1984), *Through the Looking Glass* (1986), and *Relay Stations* (1987). For more information about the content of the estate's collection see the Collection Assessment appendix.

Conclusion

The estate of Buky Schwartz's mission is "to raise public awareness, outreach, understanding and the enjoyment of Buky Schwartz's video art legacy and to support exhibits and collections, education, research, conservation and historical restoration and preservation." To this end, the estate hopes to deposit much of the collection, particularly the 3D models, the artist's notebooks, negatives and prints, at a cultural heritage institution. Here, the materials can be appropriately housed in archival containers in climate controlled storage, and made accessible to researchers. Similarly, the estate hopes to garner interest from art museums that collect contemporary art to acquire and exhibit Schwartz's art work. To aid in this goal, this project has resulted in a collection assessment that describes the materials in the collection, as well as display specifications for two of the artist's video installations. The display specifications are designed to make the installations straightforward to a collecting institution, detailing the components of the work as well as the installation procedure. Schwartz's work adds value to art history narratives, and greater recognition of his work would be of benefit to a fuller understanding of the 1970s and 80s media art movements.

Schwartz's career has all of the makings of a canonical conceptual artist. From his education in London, to his participation in the New York art movements of the 1970s, to his

complex, large-scale video installations exhibited around the world in the 1980s, Schwartz's work occupies a notable part of art history. While Schwartz received multiple retrospectives and large solo shows in his home country of Israel in the 1990s, his legacy in the United States has faded over time. This project will hopefully move the conversation about Buky Schwartz's art forward, so that more people can enjoy the artist's work, and so that his legacy, as well as his video installations, can be preserved.

Collection Assessment

Introduction

The artist Buky Schwartz's work is concerned with the psychological process of perceiving three dimensional space, explored through video installations commonly utilizing mirrors and a closed-circuit camera system. These complex works are often large, made up of a variety of materials, and must be installed to be appropriately studied and experienced. Trained as a sculptor at the Saint Martin's School of Art, Schwartz began working with video in 1976. His work was quickly noticed by John Hanhardt,[25] a curator at the Whitney Museum of American Art, who included Schwartz's *Yellow Triangle* (1979) in the Whitney's *Re-Visions* exhibition in 1979.[26] Like many conceptual artists of his generation, Schwartz simultaneously worked in a variety of media throughout his career, creating photographs, sculptures, paintings, drawings and installations.

As a graduate student in the Moving Image Archiving and Preservation program at New York University, I conducted an assessment of the materials in the estate of Buky Schwartz's collection over the course of two weeks in January of 2016. My research on Schwartz was focused on the artist's video installations, and this assessment reflects that focus, with more attention spent on the studies, documentation, and models of Schwartz's installations.

This assessment will summarize the quantity, condition, and significance of the analog video, photographs, slides, sketches, studies, correspondence, 3D models and other materials in

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[25] *Buky Schwartz: Video Constructions*. Prod. Dan Fine. Perf. John G. Hanhardt and Buky Schwartz. *Curator John G. Hanhardt Discusses Buky Schwartz's Work*. N.p., 2007. Web. 23 Sept. 2015. Accessed May 2, 2016. http://www.bukyschwartz.com/projects/curator-john-g-hanhardt-discusses-buky-schwartzs-work/.

[26] "About - Select Group Exhibitions." *Buky Schwartz Official Website*. The Estate of Buky Schwartz. 20 Oct. 2015. Accessed May 2, 2016. http://www.bukyschwartz.com/about/

the estate of Buky Schwartz's collection, providing context for the materials role in the artist's process and career.

Background of Collection

Buky Schwartz moved to New York and set up a studio in the SoHo neighborhood of Manhattan in 1970. In this studio, Schwartz developed ideas for video installations, first sketching them out on paper, then building scale models of the installations before realizing them in physical space. Schwartz used the studio to store materials that would be incorporated into sculptures and installations, and also his personal archive of his work, such as photographs of realized pieces, publications and articles his art was featured in, and correspondence between himself and curators, other artists, and vendors that helped him realize his works.

Schwartz also maintained a studio in Tel Aviv, Israel, splitting his time between these two continents for most of his life, before closing his New York studio in the early 2000s. Before moving, Schwartz packed up the materials in his studio, organizing photographs and other documentation of his large scale outdoor sculptures, video installations and exhibitions, grouping these 2D materials in large manilla envelopes and labeling them with a black sharpie. The 3D models that Schwartz would create as pre-visualizations of sculptures, and scale-models for working out the mechanics of video installations were also packed and stored, but with less organization. All of these items were then stored at a warehouse space in New Jersey, loaned to the artist's by a family friend who used the warehouse to store surplus inventory from their toy manufacturing business.

After Schwartz passed away in 2009, Shlomi Ron and Odelia Schwartz, the artist's son-in-law and daughter, and now the stewards of the estate of Buky Schwartz, inherited the materials. During this time John Hanhardt, a curator and longtime friend of Schwartz's, with

Michael Mansfield, the associate curator of the Smithsonian American Art Museum, visited the warehouse and inspected materials in the collection. Under the advice of Hanhardt, Shlomi Ron and Odelia Schwartz contracted Gary Wright to perform an assessment on the materials, which was completed in 2010. The entire collection moved with Ron and Schwartz to their residential home in Miami in 2014. This move was performed by commercial movers that transported all of the couple's things including the collection. Comparing the condition of the materials as I found them with the condition described in Wright's report, it is evident that the collection sustained damage during the move. This damage will be detailed more thoroughly in the Status of Collection section of this report.

Content of the Collection

List of Select Materials

- Multiple scale models of *Three Angles of Coordination for Monitoring the Labyrinthian Space* (1986), and *Buky's Box* (1984).
- Pristine enclosed scale models of *Relay Stations* (1987) and *Through the Looking Glass* (1986).
- Umatic ¾" videotape masters of *Unison* (1980), *The Chair* (1980), *Yellow Diagonal* (1983), and *Red Flags on the Snow* (1993).
- Vide documentation of *Through the Looking Glass* (1986), *Yellow Triangle* (1979), and *Buky's Box* (1984)
- Installation manuals for *Box #1* (1978) and *Closed-Circuit (Painted Projections)* (1977).
- Proposals for unrealized video installations including *Pegasus* (1992), *Human Energy* (1981), and *Tennis Video* (1992).

- Publications from the *Painted Projections* exhibition at Julie M. gallery in 1977, the *Videoconsturctions* book on Schwartz's ouvre published by the Carnegie Museum of Art in 1992, and *Buky Schwartz Videotapes* exhibition catalog published by the Israel Museum, Jerusalem in 1980.
- The artist's cameras - a Panasonic PK450B and a Sony AVC-3450.
- Assorted resumes, descriptions of work, and exhibition histories arranged by the artist.

The collection of the estate of Buky Schwartz, occupying approximately 1,200 cubic feet, is described in several lists and spreadsheets. The inventory that describes the materials at the highest level, that is to say the most complete but least specific, is titled Schwartz Collection Garage Inventory. This spreadsheet lists the boxes that are currently stored in Odelia Schwartz and Shlomi Ron's garage, and briefly describes the content of the box, and the condition of those contents. Descriptions of condition were limited to broad categories: excellent, good, fair, poor, and disassembled. "Disassembled" pertains to scale models the artist would create as a method of visualizing and conceptualizing an installation or sculpture. Many of the models were made for this short term goal and therefore made from inexpensive and ephemeral materials such as cardboard, paper, and glue. The glue has, unsurprisingly, not stood the test of time and many of the models have begun to loose pieces or become disassembled, as the spreadsheet details. As part of the assessment, some materials were rehoused into plastic bins, and this movement was also tracked in the spreadsheet. Therefore, were one of the disassembled models that had previously been stored in a larger box with other materials to be re-assembled, and missing pieces were erroneously moved to separate boxes as part of the rehousing, those pieces would still be able to be located.

A more granular description of a select number of the 3D models in the collection is detailed in the Models Measurements document. Shlomit Lehavi, a lifelong friend of Buky Schwartz, and former studio assistant to the artist, explained to me in an interview that the models were made to scale so that Schwartz could test the mathematics of a given work before realizing it at full-scale.[27] This is corroborated by several of the models that have a key written on the bottom or side of the model indicating the scale (typically ¼" = 1'). Selections for which models were measured, and how thoroughly they were measured, was based on the condition of the work (for instance were a model damaged and missing pieces, measurements would not be accurate, nor would they completely represent all of the components), the accessibility of the components of the work (some models are in sealed vitrines, making individual components difficult to reach), and time (a limited resource).

A spreadsheet detailing the video materials was also created as part of my research. This document details the amount, format, condition (as best could be determined through a visual inspection), and generation of the tapes that Schwartz recorded to create and document his artworks.

Finally, many of the photographs and publications that Schwartz collected have been digitized and are now in the possession of the estate. The estate and I are working towards making much of that material available publicly. At this time, the directory structure of the digital material acts as a kind of intellectual control, detailing the materials in the collection, and organizing the documentation of the materials I created as I was inspecting them.

Status of Collection: Physical Appraisal

Analog Video

[27] Lehavi, Slomit. "Interview with Shlomit Lehavi." Skype interview by author. January 12, 2016.

The analog video tape in the collection, approximately 100 tapes, is made up primarily of U-matic (or ¾"), VHS, S-VHS, and Betamax formats. Additionally there is one ½" open reel video tape, the earliest video format available to consumers and amateurs, which may mean that some of the U-matic tape contains transfers from early works, while the original tapes have since been lost. In the analog video collection, almost every work exists in more than one instantiation - that is to say, there is more than one tape with the same content on it, typically on the same format. For example, there are eight copies of *Videoconstructions* (1978) and *The Chair* (1978), the artist's most popular single-channel works. Twenty-five of the tapes in the collection are labeled master. Outside of the more rigorous environment of a commercial production, sometimes terms like master are written on tapes, though it may not actually be a technical "master." That being said, Schwartz's process seems to have been very organized, and at this time there is no reason to assume any of those are not in fact master tapes.

The approaching obsolescence of magnetic media is considered a crisis by the Association of Moving Image Archivists (AMIA)[28]. The Association for Recorded Sound Collections (ARSC) stated in 2009 that it is "no longer practical to make archival analog copies of… recordings to preserve their content."[29] Similarly, The Library of Congress has urged institutions to prioritize the digitization of magnetic media, stating in 2012 that magnetic media must be migrated to digital formats within 15–20 years, before "the challenges of acquiring and maintaining playback equipment make the success of these efforts too expensive or

[28] Brothers, Peter, and Melitte Buchman. "New Committee of the Membership: Magnetic Tape Crisis Committee." *AMIA Newsletter* 100 (Spring, 2013): 5.
[29] ARSC Technical Committee. Preservation of Archival Sound Recordings. Silver Spring, MD: Association for Recorded Sound Collections, 2009. Accessed May 10, 2016. http://www.arsc-audio.org/pdf/ARSCTC_preservation.pdf.

unattainable."[30] Moreover, analog video tapes has a limited lifespan (30 years, conservatively). The chemical components in the binder of the tape breakdown over time, particularly when those materials are exposed to humidity.[31] Best practices of video preservation now dictate that analog video content be migrated to uncompressed digital formats, and the resulting digital video be preserved, as the loss of access to the original magnetic material is inevitable.[32] To this end, a Request For Proposals (RFP) for creating preservation quality digital copies of the analog video in the estate's collection is included in this document as an appendix.

Of the many tapes in the collection, the estate has created digital copies of 13. These transfers were created by a commercial vendor, Miami DVD Solutions, which does not specialize in media preservation, per se. The resulting video files are compressed, encoded with the H.264 video codec and AAC (Advanced Audio Codec), commonly used for streaming media online. Neither encoding is ideal for preservation, as H.264, being a lossy compression format, inherently does not represent the full video signal, and with the Library of Congress stating that, compared to AAC, "the Broadcast WAVE format (either version, WAVE_BWF_1 or WAVE_BWF_2), wrapping LPCM, is preferred as the archival master format for mono and stereo audio when reformatting analog sound recordings."[33] However, these digital surrogates are far from insignificant. In fact, they have been monumentally helpful for performing research

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[30] Nelson-Strauss, Brenda, Alan Gevinson, and Sam Brylawski. "The Library of Congress National Recording Preservation Plan." Edited by Patrick Loughney. 2012. Accessed May 10, 2016. http://www.loc.gov/programs/static/national-recording-preservation-plan/publications-and-reports/documents/NRPPLANCLIRpdfpub156.pdf.

[31] Jimenez, Mona, and Liss Platt. *Texas Commission on the Arts Videotape Identification and Assessment Guide*. Texas: Texas Commission on the Arts, 1997. Accessed May 10, 2016. http://www.arts.texas.gov/wp-content/uploads/2012/04/video.pdf.

[32] Casey, Mike. "Why Media Preservation Can't Wait: The Gathering Storm."*IASA Journal*, no. 44 (January 2015): 14-22. Accessed May 10, 2016. http://www.avpreserve.com/wp-content/uploads/2015/04/casey_iasa_journal_44_part3.pdf.

[33] "Sustainability of Digital Formats Planning for Library of Congress Collections." QuickTime Audio, AAC Codec. February 15, 2015. Accessed May 01, 2016. http://www.digitalpreservation.gov/formats/fdd/fdd000110.shtml.

on this collection. The estate has made the exemplary decision to provide free public access to several of the artist's works and interviews on their website, bukyschwartz.com, which allows anyone with an internet connection to learn more about the artist and his work.

Photographs: Slides, Negatives and Prints

The photographs in the collection are in varying condition. As mentioned earlier Schwartz worked in a variety of formats, one of which is photography. The vast majority of the photographic materials in the collection are documentation of the artist's work in other media, however, some of the photographs are fine art objects and have been previously exhibited and sold as such.

The artist's Nikon camera was with him often, as Lehavi attests, and photographs of the artist, with the camera strapped around his shoulder, confirm. Schwartz's organized and thorough photographic records of his work suggests that he understood the significance of documenting his installations, which were often ephemeral and would need to be recreated to be exhibited. The photographic materials in the collection are dispersed across the aforementioned manilla envelopes which are organized by specific works or exhibitions, and binders and envelopes in cardboard boxes, currently residing in Shlomi Ron and Odelia Schwartz's garage. Some of the materials in the garage are framed, others are in plastic sheets contained in three-ring binders, while some large format photographs are stored in stacks. All of the materials in the garage are then housed inside cardboard boxes.

Common issues with the slides, prints, and negatives in the collection are color fading, and gelatin breakdown in the emulsion of the prints, which causes them to stick together. The temperature and relative humidity (or RH) of the environment these photographs have been stored in likely contributed to both the fading and the sticky emulsion. Heat encourages chemical

reactions, which in the case of photographs will cause degradation. “Black-and-white images do fade (rather a lot), and chemical reactions involving metallic silver are the root cause,” however temperature is not the only motivator for such reactions, and therefore heat’s relationship with fading most explicitly pertains to the fading in the color photographs in the collection. Humidity is necessary for the preservation of photographic material, given that “without some water present, gelatin… would contract” and become brittle. Yet, too much humidity will expose the prints to great risk. Humidity can cause mold to develop, feeding off of the gelatin in the emulsion, but thankfully no mold was discovered in the collection during this assessment. Humidity will also contribute to the chemical degradation of gelatin in the emulsion, which is often influenced by pollutants in the air, but “without the presence of water, even the most aggressive pollutants don□’t have much effect.”[34] As the gelatin breaks down it softens, hence the sticky quality to the surface of the images. Oils and dirt from people’s hands can additionally contribute to curling, and other degradation.[35] Last but not least, the paper base of the prints in the collection can introduce additional acidity into the chemical makeup of the print, again attacking the gelatin and accelerating degradation.[36]

Temperature and humidity control, in addition to proper handling and enclosures for the materials can prevent such degradation. While ideal storage conditions are outlined later in this report, it is important to remember that the collection is currently stored in a residential home. The cost, complexity, and inconvenience of complying with archival best standards, then, is not truly an option. This will be discussed further in the Recommended Actions section of the report.

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[34] Reilly, James M. "IPI Storage Guide for Acetate Film." Image Permanence Institute. Accessed May 1, 2016. https://www.imagepermanenceinstitute.org/webfm_send/299.
[35] Fischer, Monique, and Gary Albright. "Care of Photographs." Northeast Document Conservation Center. Accessed May 01, 2016. https://www.nedcc.org/free-resources/preservation-leaflets/5.-photographs/5.3-care-of-photographs.
[36] "The Deterioration and Preservation of Paper: Some Essential Facts." Library of Congress. Accessed May 01, 2016. http://www.loc.gov/preservation/care/deterioratebrochure.html.

3D Models

_____The models are by their very nature at risk for long-term preservation. Created as a tool for realizing a work as a part of the artist's process, they were never intended to last long periods of time or be particularly sturdy. However, given that these models are to scale, they have significant value as they can be used to learn the dimensions of a work and the relative sizes of the components that make up Schwartz's installations. Schwartz would use the process of building the models to understand the mechanics of an installation, and so the models can also be helpful for interpreting things like camera placement, or the angle at which a mirror ought to be placed to appropriately realize an installation. While many of the models have sustained damage, they continue to hold value even when disassembled, as scale and relative size can still be gleaned from the remaining components. Given the value of these objects, their further deterioration should be avoided. Composed of inexpensive materials such as cardboard, paper, plywood, and glue, the models face risks at various fronts.

The paper, cardboard, and plywood are all highly acidic, and if they have not already, will suffer from acid-catalysed hydrolysis and/or oxidation, the "two principal chemical degradation pathways of paper."[37] Again humidity will exacerbate this degradation. "In the presence of moisture, acids from within the paper (e.g., from the raw materials, manufacturing process, deterioration products)," will break down the chemical structure of gelatin and other organic binding in paper and similar materials, like cardboard.[38] This process, called acid hydrolysis, produces more acids, creating an autocatalytic effect, preventing the damaging

[37] "Saving Paper." Royal Society of Chemistry. March 2013. Accessed May 01, 2016. http://www.rsc.org/education/eic/issues/2013March/paper-conservation-cellulose-acid-hydrolysis.asp.
[38]"The Deterioration and Preservation of Paper: Some Essential Facts." Library of Congress. Accessed May 01, 2016. http://www.loc.gov/preservation/care/deterioratebrochure.html.

process from halting. As with photographs, pollutants increase the risk of degradation. Oxidation occurs when paper absorbs pollutants, mainly sulfur and nitrogen oxides.[39] This is a particularly pertinent risk for the materials that are stored in the garage, as they could potentially absorb the exhaust from the vehicles parked there.

This risk of acidity and degradation from chemical decomposition can be considered a secondary threat however, as the fragility of the models means it is unlikely they will last long enough for the instability of the materials which compose the models to be a factor. The models are almost exclusively held together with glue, which by its appearance seems to have been from a hot glue gun. This adhesive will inevitably break down, causing pieces of the model to fall off, as they already have in many cases. Moreover, the adhesion between these materials, and the weight distribution of materials that are "grounded" to others, is highly susceptible to damage due to mishandling, falling, or improper storage. Due to space concerns, the cardboard boxes that house many of these models must be stacked on top of one another. Pressure from the heavier boxes could potentially be a risk, although they were stacked with care, and with this concern in mind.

Digitized materials

The preservation of many forms of 2D materials, particularly paper documents, but in some cases photographic prints as well, calls for digitization. In the case of 35mm slides, as photochemical duplication of slide transparencies is nigh impossible (as documented by art conservator Tina Weidner), the best solution is to create high resolution scans of the slides and

[39] "Saving Paper." Royal Society of Chemistry. March 2013. Accessed May 01, 2016. http://www.rsc.org/education/eic/issues/2013March/paper-conservation-cellulose-acid-hydrolysis.asp.

reprint new slides from the scan.[40] Ephemeral 3D objects that cannot be, or will not be (either due to difficulty, cost, or opportunity) physically preserved, are often documented as a way of allowing for future study. An unintended byproduct of this collection assessment is a substantial digital archive, made up of scans of varying quality, and documentation of materials in the form of digital images taken on an iPhone. Given the current state of the collection, these digital files have the potential to outlive the materials they depict. This is by no means ideal, and the digital files created as part of this assessment were created to facilitate research, not for preservation. That being said, the majority of the scans were performed at a minimum of 300dpi (with the 35mm slides being scanned at a much higher resolution, with a minimum of 2,400dpi) and stored in an open file format (tiff), in keeping with the Library of Congress's recommendations for scanning photographs and paper documents.[41] The files have the potential to provide significant insight into the collection, and the estate is currently exploring avenues for providing public access to the materials.

Macro Environment

As described in the Physical Appraisal section of this report, the temperature and humidity of a storage environment can influence the rate and extent to which materials age and degrade. The variety of locations the collection has been stored in, from the artist's studio, to a warehouse, and now in a garage in Miami, needless to say, do not meet prescribed ideal storage environments for archival materials. For example, the Image Permanence Institute (IPI) recommends cool storage (approximately 54° F) with 50% maximum RH for photographic paper

[40] Weidner, Tina. "Dying Technologies: The End of 35 Mm Slide Transparencies." Tate. December 2012. Accessed May 01, 2016. http://www.tate.org.uk/about/projects/dying-technologies-end-35-mm-slide-transparencies.
[41] "Scanning Your Personal Collections." Library of Congress. http://www.digitalpreservation.gov/personalarchiving/documents/PA_scanning.pdf.

prints, and even cooler and dryer (40° F and 40% RH) for negatives.[42] This is not a reasonable expectation for the stewards of this collection at this time. It is only cited here as an example to demonstrate that the current macro-environment of the collections storage is potentially contributing to the degradation of some of the materials in the collection.

Given that the materials are stored in the garage, the temperature and humidity will fluctuate significantly. The washer and dryer are also located in the garage, which will contribute to fluctuations in humidity. A lesser concern, but certainly still a factor in the collection's environment, are the fumes in the car exhaust, which could carry pollutants into some of the materials. However, moving the materials is not an option for the estate, rather, depositing materials in an archival or museum collection is the most practical solution to these risks.

Micro Environment

The collection is housed in a variety of containers, but the majority of the materials are stored in either cardboard boxes or manilla envelopes. Some of the 3D models are wrapped in bubble wrap, particularly those that are framed, but some remain loose in their boxes. Dust had accumulated on much of the materials, especially the 2D materials stored in the garage. Light cleaning was performed as part of the assessment, but dust still represents a risk to materials in the collection.

To suggest archival best-practice for the storage of this material would not be pragmatic. Ideally, photosensitive materials would be stored in containers that pass the IPI's Photographic Activity Test,[43] and made up of non-acidic plastics to protect against acid-catalysed hydrolysis or

[42] Adelstein, Peter Z. "IPI Media Storage Quick Reference." Image Permanence Institute. 2009. Accessed May 2, 2016. https://www.imagepermanenceinstitute.org/webfm_send/301.
[43] Venosa, Andrea. "Photographic Activity Test (PAT)." Image Permanence Institute. Accessed May 02, 2016. https://www.imagepermanenceinstitute.org/testing/pat.

oxidation (as described in the Status of Collection section of the report). Yet, rehousing this amount of material is not feasible at this time as it would be incredibly expensive and time consuming. The recommended actions section at the end of this report will detail viable procedures for caring for this collection.

Intellectual Control

Intellectual control of a collection refers to "the creation of tools such as catalogs, finding aids, or other guides that enable researchers to locate materials relevant to their interests."[44] At this time intellectual control of the collection is limited to the multiple spreadsheets and inventories that are described in the Content of the Collection section of this report. Greater intellectual control of specific materials deemed by the estate to be of high value to the collection would be of great benefit to those wishing to learn more about the collection, but were not feasible during the short period in which the assessment was performed. However, the box-level descriptions of the 2D and 3D objects in the collection can hopefully provide a springboard for identifying such high value materials.

Unique identifiers are a helpful tool for organizing materials in a large collection and help provide intellectual control of the collection. Identifiers were assigned to the analog video tape in the collection by Shlomi Ron and Odelia Schwartz, using a letter and a string of three digits, and were applied to the inventory created as part of this assessment. The other items in the collection, including the recently created digital files, do not have unique identifiers, as this task would quickly become untenable. There are thousands of digital files in the collection, and easily hundreds of thousands of individual objects in the collection. Creating higher-level identifiers, as

[44] "Glossary of Archival and Records Terminology." Society of American Archivists. Accessed May 02, 2016. http://www2.archivists.org/glossary/terms/i/intellectual-control#.VybR06MrKL5.

was the case for the Schwartz Collection Garage Inventory, is a solution to this issue of establishing intellectual control of such a large amount of materials.

The Schwartz Collection Garage Inventory uses numbers to identify boxes that contain 3D models of installations, and the inventory uses letters to identify boxes that contain miscellaneous material. For example, "Box 9" contains a model of one of Schwartz's video installations, *Three Angles of Coordination for Monitoring the Labyrinthian Space* (1986), whereas "Box E" contains one of Schwartz's video cameras, multiple lenses for the camera, and a binder containing audiovisual equipment catalogs.

The directory structure of the digital files in the collection is organized at two levels. First, the device used for creating the image, either a flatbed scanner or an iPhone, and second, the work, exhibition, or publication the file pertains to. In this way a user can search for a specific work by name, or browse by quality of image (as scanned images will obviously be of a higher quality).

Physical Control

The physical control of the collection refers to the organization of the physical materials and the labeling on those items. The manila envelopes, described earlier, have a form of physical control dictated by the artist through his, at times inconsistent, labeling. This organization is archivally relevant as it can reveal the artist's thinking about certain items, and the relationship between those items. Some 2D objects were stored with the manila envelopes but not grouped in any fashion. When the relationship between these materials was clear, those materials were grouped and put into similar envelopes and stored with the others. A notable example of this is documentation, including sketches, pre-visualizations, and correspondence between the artist and several individuals, pertaining to an unrealized work Schwartz developed in the 1990s titled

Pegasus, were haphazardly stored between manilla envelopes, but are now housed together in their own container.

The boxes described in the Schwartz Collection Garage Inventory were physically labeled with the corresponding number or letter, and a brief description of the contents of the box, which mimics the descriptions on the inventory. This should, at least somewhat, facilitate ease of finding certain materials, although the boxes are not arranged by number or letter, as the structural integrity of the boxes was the priority, given the need to stack the boxes.

Recommended Actions

- In order to better care for the materials in the collection, and to allow broader access to the content of the collection, a cultural heritage institution or institutions should be identified where the materials can be deposited. Preference should be given to an institution that already holds work by Schwartz, as this will facilitate ease of research for those interested in the artist's work.
    - As much of the collection is documentation of work, or material related to the artist's process, but was not exhibited or sold as fine art, consider an art museum's study collection or an archive that collects material related to artists, such as the Smithsonian Archives of American Art for these materials.
    - Discuss with the collecting institution the accessibility of documentation of artworks before depositing them, as this material is of the utmost importance to realizing Schwartz's installations.
- Through consultation with experts in Schwartz's work, and museum professionals, identify materials that are of the most value to the estate. Place these materials indoors,

rehouse them, and assure they are easily locatable, by instituting higher levels of intellectual and physical control.

- Continue to discuss the role of the digital material in the collection with those that are knowledgeable of Schwartz's career, or have experience in providing arts education using primary source documents.

Spring 1981 Display Specifications

ARTWORK	
Artist: Buky Schwartz	**Title:** *Spring 1981*
Year: 1981	Estate of Buky Schwartz, Private Collection
Medium: Two color video cameras and monitors, 15-25 tree trunks, green paint.	
Dimensions: Variable. The work is ideally installed in its own space, but can be installed in a space with other works. Interactivity is important to the work so the viewer must be able to walk around the piece. Ideal room size of 30' x 30'. Minimum of 15' x 15'. Tree stumps should vary in height (2'-4'), approximately 2' in diameter. and also angle (approx. 5°-55°), the tops of the tree stumps ought to not be parallel to the ground. CRT Monitors should be 20" minimum.	
Requirements: It is recommended that a representative of the estate of Buky Schwartz be present for the installation. Regardless, the estate must be involved with installation and exhibition of the work throughout the process. Gallery space must be approved by the estate, and documentation of the installation process must be forwarded to the estate if a representative cannot be present. The final installation must be approved by the estate before the work can go on view.	

Description:
Spring 1981 consists of roughly 15-25 tree stumps of varying height (2'-4'), and varying diameter (approximately 2') arranged in no particular order, with green paint brushed on the tops and sides of the logs, and 2 color closed-circuit camera systems. When the viewer

enters the gallery the green paint may appear to be random, but from the perspective of two video cameras, placed on opposite sides of the gallery near the ceiling, the lines form clear geometric patterns, a triangle and a square. The viewer can walk around and through the stumps, while watching themselves on the two monitors that display the feed from the two aforementioned cameras.

"Spring 1981 was a commentary on the ambivalence of perception. The spectator's role in the work was to follow the camera's lead in making order out of chaos. The marking on the trees made sense only when the viewer identified them as belonging to either geometric form. Looking beyond this "forest" to the monitors, the visitors tried to follow the boundaries defined by the shapes and to locate their own shifting positions within these circumferences." - Edna Russak Goldstaub, *Videconstructions*, 1992

Space Requirements:
No seating. Must be well lit.

Lighting Requirements:
Light levels should be low or natural, if there are windows.

Power Requirements:
For two CRT monitors: Voltage: 240VDC ± 10%, Power: 200 watts nominal
For two video cameras: Variable
Lighting: Variable

Media:
There is no recorded media for this work. While the work is a video installation, it uses live feeds from cameras placed in the gallery.

Equipment List:
All equipment for the installation is variable, different makes and models that conform to the following specification can be used. Two video cameras of the same make and model that output a standard definition color video signal with a 4:3 aspect ration. The cameras must have a zoom lens and ought to handle a variety of light levels. Two 20" CRT monitors of the same make and model, preferably from the Sony PVM series. 15-25 tree stumps (2'-4' in height, approximately 2' in diameter). Tree stumps should vary in height (2'-4'), approximately 2' in diameter. and also angle (approx. 5°-55°), the tops of the tree stumps ought to not be parallel to the ground.

Details of Installation:
Installation of the piece cannot be carried out by an individual. At least two technicians are

required. Begin by drawing the desired shapes on the monitors, a canted square and downward pointing triangle, using these images as a guide for the amount of space on the screen the shapes should occupy. The lines that make this shape should be drawn thickly and precisely using a straight edge.

Next, position two cameras on opposite sides of the space, pointing downward. Cameras should be tilted both horizontally and vertically. Do not center the cameras in relation to where the logs will be (the "area of activity"). Both cameras should be to one side or the other of the area of activity in order to achieve the desired horizontal angle. The combined distance and angle of the camera placement "stretches" the geometric form over a wider space, which is ideal.

Connect the cameras to the monitors, and turn the cameras on, so that the space is displayed with the geometric pattern drawn on to it.

Arrange the stumps in the room so that they occupy the space that corresponds to the lines drawn on the monitor. When the stumps are appropriately placed, the lines on the monitor should not go over the floor. No paint should be applied to the floor, and there should be no gaps in the lines which form the shapes. However, do not arrange the stumps in a triangle and a square, arrangement should appear random. Ensure that the lines will strike the sides of some stumps and the tops of others, shapes should not be depicted exclusively on exposed tops of logs, variety is important. Remember to adjust the zoom length of the camera's lens to aid in this process.

Next begin to tape out the shapes. It is recommended that one technician watch the monitor and give direction to the other(s). It may be easier to move the monitors around during this process, rather than leaving them in their place. Begin by marking key points in the shapes, such as intersections or angles. Connecting the key points on the stumps with tape then creates an image from the camera that precisely matches the triangle/square drawn on the screens. After both edges of the lines have been taped out, fill the space between the tape out with green paint. Ensure that the lines are thick and have a sharp, well-defined edge.

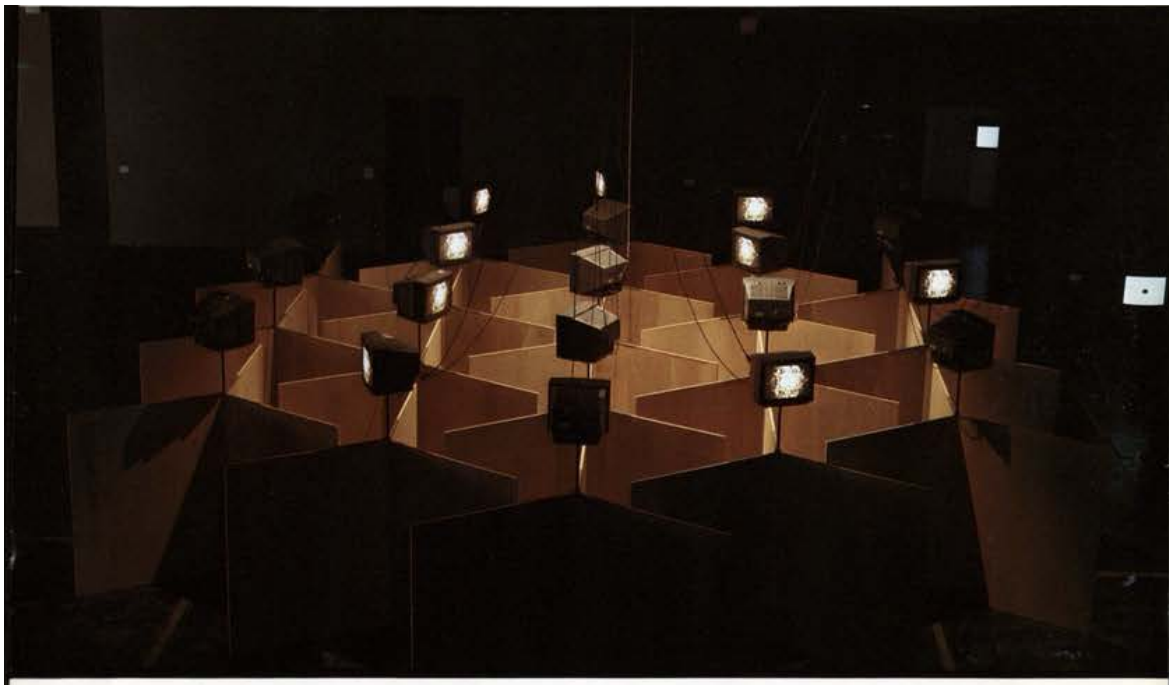
Spares/Consumables:
-Paper tape for outlining shapes on stumps
-Green paint (as needed)
-Spare CRT monitor
-Space video camera

Operation: All equipment should be powered up/down at start/end of day.

Maintenance:
If stumps are not secured to floor (optional), movement of stumps can destroy the impact of the work. Carefully mark outlines of the stumps on the floor (underneath the stumps so that it is not visible to the viewer when the piece is installed), as well as the direction the stump was facing. This can be done with "key marks" along the bottom edge of the stump that align with marks on the ground.

Prepared by: Eddy Colloton, May 2016

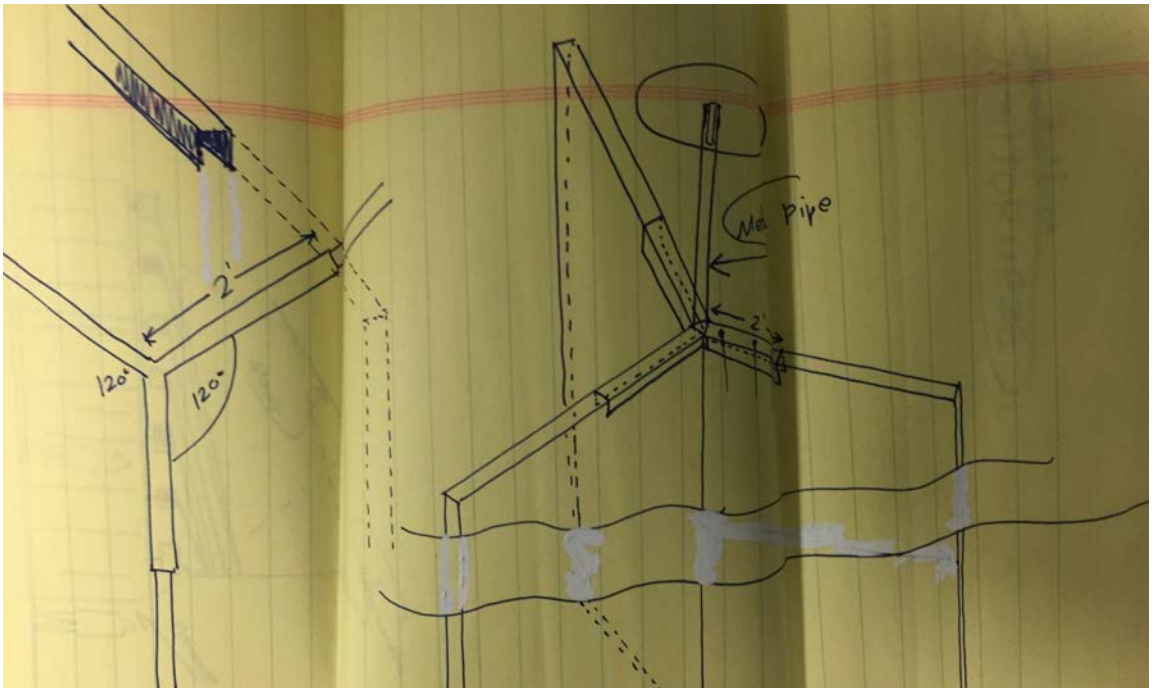
Three Angles of Coordination for Monitoring the Labyrinthian Space Display Specification

ARTWORK	
Artist: Buky Schwartz	**Title:** *Three Angles of Coordination for Monitoring the Labyrinthian Space*
Year: 1986	Estate of Buky Schwartz, Private Collection
Medium: 2 closed circuit camera systems, wood, metal, CRT monitors	
 **Dimensions:** Variable. This work is modular and is made up of wall segments that can be adapted to a particular space. However, for the appropriate effect of the work to be realized a minimum size/number of components must be met. The installation must occupy a minimum space of 15’ wide and 40’ deep. This is not the size of the gallery (see Space Requirements), this is the size of the installation. Previous iterations have occupied the following dimensions:	

- 15’ x 45’ (w x d)
- 15’ x 15’ x 50’ (h x w x d)
- 17’ 17” x 72’ (w x d)

Walls of the maze are 6’ high, and approximately 5’ long.

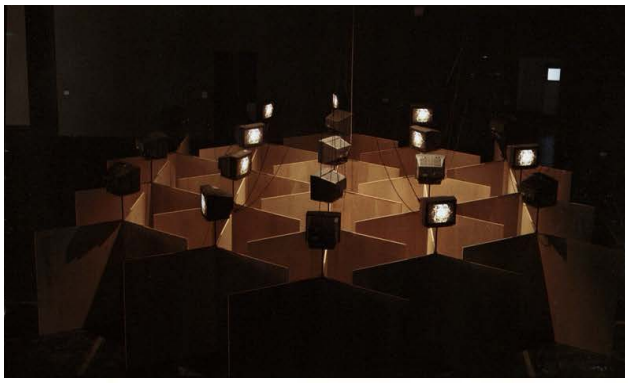
Each “module” of the piece is made up of three walls, each 120° apart. At the center of this module a CRT monitor is affixed to the walls 1’ above the center point (this places the bottom of the monitor at 7’). The mounts for the monitors must be custom made, and extend two feet out on the top of each of the walls for support, before extending up to support the base of the monitor. See the artist’s schematic for the mounts below:

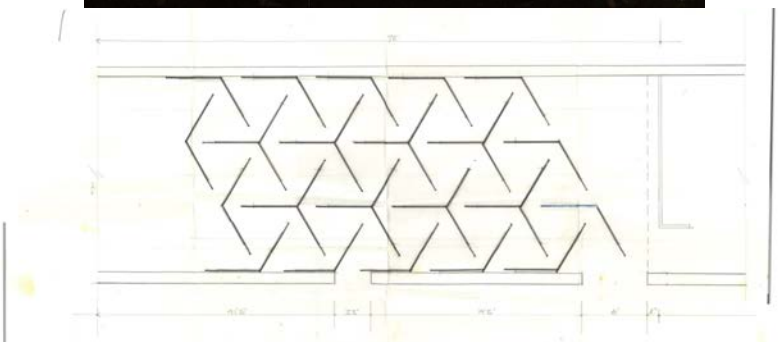


Requirements:

As of June of 2016, this work has not been installed since the late 1980s and all materials from the installation must be remade in order to realize the work. The materials for the components of the work are not specific, the walls were originally made of pressed wood, and could be remade with other materials with similar aesthetic appearance, such as plywood, or more sturdy lumber. It is recommended that a representative of the estate of Buky Schwartz be present for the install. The estate must be involved in the realization of this work to ensure that it is aligned with the previous iterations of the work, and must approve the final installation after it has been assembled.

Description:





“In this piece a labyrinth is formed of identical triangularly shaped rooms. All the walls are above eye level and overhead cameras transmit the image of the maze and the activity taking place within to monitors, thus guiding participants through the maze.” - Wall text from Mattress Factory, likely written by Buky Schwartz.

Three Angles of Coordination for Monitoring the Labyrinthian Space (1986) is a video installation made up of 6’ high, 5’ wide “maze” walls that are arranged in modules of three walls, extending away from each other from a central point, each 120° apart. The work is variable and has been adopted for multiple spaces.

The image of the work above is from *Three Angles* final iteration at the Church of St. Roman in Ferrara, Italy in 1989 (all images are attached to this document, full-size). This version, which used 19 CRT monitors, is entirely made of the three-wall modules mentioned above.

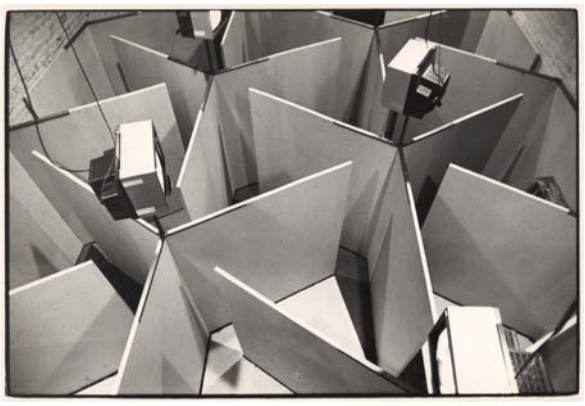
The blueprint above demonstrates the layout of the work in the Mattress Factory, the second iteration of the work in 1986. This work compensated for the Mattress Factory gallery space, which is particularly deep but not wide. Several of the three wall modules were modified for this iteration to only have two walls. Such modifications are possible to accommodate the space the work occupies.

The work requires two cameras hung from the ceiling of the gallery, feeding their signal to the monitors below in a closed circuit. Video signal is carrier over cables hung from the ceiling down to the monitors. Power cables are similarly hung from the ceiling and fed down to the monitors. The cabling holds aesthetic value and should not be re-routed.

There is an optional monitor at the entrance and exit of the maze, preferably placed on the floor. The cable run for these two monitors does not have to be visible in the way that the other monitors need.

Space Requirements:
Space should exceed size of installation by minimum of 10’ at the entrance and exit of the “maze” (front and back) and a minimum of 5’ on either side (left and right). Ceilings must be at least 20’ high. Light locks should be constructed to block all light from entering the space. In most cases, the work should be in its own room. The work can be installed in a gallery with other works, given enough space. When this has been done in the past, it has been in large warehouse-like spaces. As the work is modular, space is flexible, and gallery spaces that do not meet these requirements can be reviewed by the estate, but are not ideal.

Lighting Requirements:
The work uses dramatic lighting to enhance the effects of alienation and tension that are inherent to the piece. However, the work must be well-lit, foremost for safety, but also for the image of the “maze,” captured by the camera hung above the structure, to be clear and easily identifiable (participants rely on the image from the video cameras, displayed on the monitors, to navigate the maze). To this end, spot lights should be used to illuminate the work, focusing most brightly on the center of the work and extending from there. Lighting should be hung from the ceiling, striking the work from above. Refer to images below for ideal examples of light and shadow in the maze.

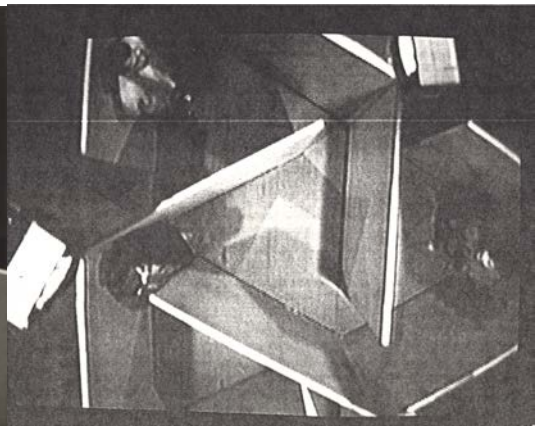



Power Requirements:
For a single CRT monitor: Voltage: 120VDC ± 10%, Power: 100 watts nominal
For Kramer VM-1021N: Voltage 1 Vpp, Impedance: 75 ohms
Video Camera: Variable
Lighting: Variable

Media:
There is no recorded media for this work. While the work is a video installation, it uses live feeds from cameras placed in the gallery.

Equipment List:
All equipment for the installation is variable, different makes and models that conform to the following specification can be used. Two video cameras of the same make and model that output a standard definition color video signal with a 4:3 aspect ration. The cameras must have a zoom lens and ought to handle a variety of light levels. 10-20 20" CRT monitors of the same make and model, preferably from the Sony PVM series. Video signal distribution amplifier, the Kramer VM-1021N Composite/SDI Video distribution amplifier is recommended but not required. Do not "daisy-chain" video distribution amps, one amplifier should be used, per camera, maximum.

Details of Installation:
Installation of *Three Angles* will take roughly one week. No first hand accounts of installing the work have yet been acquired, so this time estimate should be considered "loose."
Begin by identifying the amount of space the work will occupy. This will determine the placement of the two video cameras which will be hung from the ceiling. The two cameras should capture the center of the space, with the resulting frames only overlapping very slightly. The desired effect is for the viewer to be able to watch their image travel from one camera's field of view to the next. The very entrance of the work can be included in the frame but this is not a requirement. Slightly different angles have been chosen in different iterations of the work, with two examples below:

Spares/Consumables:
-Spare CRT monitors, be prepared to replace 20% of the monitors used in the installation, if necessary.
-3 spare "maze" walls.
-Spare parts for at least 3 monitor mounts.
-Spare video camera.
-Space composite video cables with bnc connectors, amount needed will vary with configuration of installation.

Operation: CRT monitors should be powered up/down at start/end of day. Camera and distribution amplifier operation is left to the discretion of host institution.

Maintenance:
There are records of the work inspiring a claustrophobic reaction from some viewers. Security or gallery attendants should be trained to safely accompany someone out of the work if they have a negative reaction to the confined space. Buky Schwartz has commented that the feeling of anxiety some viewers have is an intended part of the installation:
"It was frightening, even to me. Trying to walk through the maze, feeling very trapped, then having to look on a monitor overhead to see where I was. The monitor is very logical, but my fear and claustrophobia are emotional." -Schwartz, 1990
Depending on the length of the exhibition, walls will need to be cleaned as viewers will touch walls as they navigate the space. Signage discouraging viewers from touching the walls is allowed, but not necessary.

Artist's Statement:
The central issue in a labyrinth is presence, it is more important than image. The observer goes into the maze (labyrinth) and can only find the way out with the aid of monitors. The cables that hang overhead are like Ariadne's threads.
What is a labyrinth? A form of incarceration, a person inside can have only one agenda. Those aspects of the stimulus situation may be repressed and may appear under altered designations. The labyrinth is also a game, a theatrical proposition into a charmed microcosm with another set of rules and scale and hierarchy.

What is the relationship between the participant (audience) and the video monitor? The monitor is a guide like the mythical Virgil. The remote control exerted by the electronic device upon the human being, in an environment which is mechanistic. Which conditions promote what sort of conceptual attitude towards oneself and towards the situation? Imprisonment presents a form of disowning responsibility, one must assume the role by rules decided by the master.

The logic of the imprisoned is one of self-rationalization. How can I sell myself? How can I save myself? Subject to the monitor I must find a form of ingratiating myself, I must find a benevolent moment in the electronic circuit. I must align myself to the 'other.' In this instance, the 'other' is a monitor and its view of the environment. The situation suspends a human reality and because the participant is the ghost inside the machine, a repression of concern creates a lacuna of 'normalcy.'

Another issue in the labyrinth is direction. The participant must locate himself in the monitor and then rotate his direction to compile a reality.

Prepared by: Eddy Colloton, May 2016

Request For Proposals
Preservation and digitization of analog video
in the collection of the estate of Buky Schwartz

Prepared by Eddy Colloton
May 12, 2016

1. Introduction

Buky Schwartz (1932-2009) is an Israeli-American conceptual artist whose work focuses on the nature of perspective, while challenging traditional relationships between artwork and spectator. Schwartz was a sculptor, photographer, and painter, but he is best known for his single-channel video works, and video installations. Trained as a sculptor in Tel Aviv, Schwartz studied at St. Martin's in London during the 1960s, and moved to New York in the late 1970s where he began experimenting with video in his SoHo studio. These experiments led to a lifelong fascination with video's ability to manipulate and misrepresent three dimensional space.

Following this breakthrough, Schwartz would go on to exhibit video installations at the Museum of Modern Art (New York), the Museum of the Moving Image, the Israel Museum, Documenta, and many more world-renowned art institutions and events. In the United States, his worked has been collected by the Smithsonian American Art Museum, the Whitney Museum, and the Carnegie Museum of Art.

The Estate of Buky Schwartz is seeking proposals for preserving Buky Schwartz's analog video collection, an important part of his legacy. The collection consists of single-channel video works, documentation of video installations, elements from works in progress, and press coverage of the artist's exhibitions.

1.1 Project Background

- The Estate of Buky Schwartz strives to raise public awareness, outreach, understanding and the enjoyment of Buky Schwartz's video art legacy and to support exhibits and collections, education, research, conservation and historical restoration and preservation.
- The Estate's analog video collection consists of original single-channel video works, documentation of video installations, works in progress, and press coverage including interviews with the artists.
- As part of an ongoing project to preserve Buky Schwartz legacy and provide broader access to his work, the Estate plans to digitize 100 analog video tapes for preservation. This tape collection, accumulated by the artists, has been in the possession of the Estate since the artist's passing. The collection was recently assessed by an NYU graduate student, and appears to be in good condition.
- The purpose of this Request for Proposals is to identify and select a vendor who can facilitate the following:
    - Digitization of the analog U-matic, Betamax, VHS and S-VHS tapes to the following deliverables:
    - **Preservation Master File:**
      Container: QuickTime
      Video codec: 10 bit uncompressed
      Audio codec: PCM, 24 bit, 48 kHz
      Chroma subsampling: 4:2:2
      Frame size: 720x486

- **Access File:**
  Container: MP4
  Video codec: h264
  Audio codec: aac, 16 bit, 48 kHz
  Chroma subsampling: 4:2:0
  Frame size: 640x480

2. Project Scope (Technical Requirements)

The transfer of this analog video material to digital formats is being performed to preserve the content on the tapes. Therefore, the best possible analog signal, which most accurately represents the original presentation of the material, must be captured. This entails a well maintained, well calibrated system, with precise adjustments made for each tape, without the introduction of tools that manipulate the original signal, such as video filters or "up-resing."

Set-up

Audio and video set-up must be performed for each tape to ensure that the tape is captured faithfully and accurately with no information loss or degradation. If there are bars/tone present on the source tape, and the bars appropriately represent the color of the content on the tape, the luminance and chrominance should be adjusted using a processing amplifier (proc amp) to bring the levels within line to Engineering Guideline EG 25 1-1990 SMPTE reference bars. The tone shall be set to zero VU on a VU meter and - 20dBFS on a digital/peak meter. These requirements must be monitored using oscilloscope meters to measure each aspect of the signal. It is prudent that the engineer confirm that the bars and tone at the head of the tape are reliable and representative of the content. Much of this material was made outside of a professional production workflow, and should not be treated as broadcast content. The camera recording the content may not have been appropriately calibrated. Proc amp adjustments should be made to ensure that the content is well represented.

If there are no bars/tone at the head of the tape, *or the content of the tape is not representative of the bars/tone at the head*, the levels should be set to the content of the tape. Using known references (for example: blue sky, known blacks and whites, flesh tone, etc.), levels should be set to prevent any clipping or crushing of the luminance or chrominance, while still capturing a dynamic signal. The vendor must set the audio level so that the content averages zero VU and -20dBFS with levels not exceeding zero VU to ensure that the audio does not suffer from distortion or clipping. All audio tracks must be checked for content and transferred in full, maintaining the channel assignment. No image/sound processing should be introduced to the signal chain at any point in the creation of preservation and mezzanine copies. This includes, but is not limited to, drop-out compensation, noise reduction, audio equalization, limiting and filters.

Signal Path

All components in the signal path must be calibrated and tested to pass the audio/video signal without distortion or interference. At all times, the shortest signal chain must be used in transferring the signal from the source to the destination. There may be no components in the signal chain that are not necessary. The highest quality output available to the source format shall be used for transferring the signal. Signal should be sent from the VTR to a Time Base Corrector (TBC) and Proc Amp before being sent to the capture card. To avoid signal loss, other equipment in the signal path, such as waveform monitors, should not be a part of the captured signal's path, but rather "split" from the path using a distribution amplifier.

Equipment

All equipment shall be of the highest grade and quality. A broadcast-level analog to digital (A/D) converter must be used for all transfers. The vendor should be prepared to detail the equipment that will be used in the transfer, and be able to present evidence of the equipment's regular maintenance.

2.1 Deliverable File Formats

- **Preservation Master File:**
  Container: QuickTime
  Video codec: 10 bit uncompressed
  Audio codec: PCM, 24 bit, 48 kHz
  Chroma subsampling: 4:2:2
  Frame size: 720x486
- **Access File:**
  Container: MP4
  Video codec: h264
  Audio codec: aac, 16 bit, 48 kHz
  Chroma subsampling: 4:2:0
  Frame size: 640x480

2.2. Metadata Requirements

An item level inventory of the analog tapes in the collection was created as part of a collection assessment performed by an NYU graduate student. This inventory will be sent to the vendor with the tapes, or ahead of time upon request. Additional fields will be created in the existing spreadsheet to allow the engineer(s) performing the transfer to record information about the tapes playback and condition. Additional fields to be recorded by the vendor include:

- Reproduction Device (Video Deck):
  - Device Type (i.e. U-matic VTR)
  - Device Manufacturer
  - Device Model Name

    - Device Model Version
    - Device Model Serial Number
- Correction Device:
    - Device Type (i.e. TBC)
    - Device Manufacturer
    - Device Model Name
    - Device Model Version
    - Device Model Serial Number
- Capture Device
    - Device Type (i.e. U-matic VTR)
    - Device Manufacturer
    - Device Model Name
    - Device Model Version
    - Device Model Serial Number
- Capture Software
    - Software Name
    - Software Proprietor
    - Software Version
- Technician Name
- Capture Date
- Technician Notes (describe quality of playback, any dropouts or other analog artifacts)

Following digitization, technical metadata describing the digital files should be extracted using the free open-source MediaInfo software (https://mediaarea.net/en/MediaInfo). Generate MediaInfo reports on each file and export them as XML files. These reports can be generated relatively easily using the command line interface version of the software. The estate can refer the vendor to instructions on this process if necessary. The XML reports should include the following fields, at minimum:

Format
Format profile
Codec ID
File size
Duration
Overall bit rate mode
Overall bit rate
Encoded date
Tagged date

Video
Format

Format/Info
Codec ID
Codec ID/Info
Duration
Bit rate
Width
Height
Display aspect ratio
Frame rate mode
Frame rate
Standard
Color space
Chroma subsampling
Bit depth
Scan type
Bits/(Pixel*Frame)

Audio
Format
Format/Info
Codec ID
Duration
Source duration
Bit rate mode
Bit rate
Maximum bit rate
Channel(s)
Channel positions
Sampling rate
Frame rate
Compression mode
Encoded date
Tagged date

See the **File Naming Conventions** section of this report for information on how these XML files, and the digital video files, will be named.

If a vendor's practices capture the same information in a different fashion, or this prescribed metadata delivery methodology is unreasonably cumbersome for a vendor's workflow, metadata delivery methods can be discussed with the estate. There is flexibility to how metadata can be delivered, especially if all of the above information is being recorded.

3. Vendor Workflow Specifications

As stated previously, the vendor will receive U-matic, VHS, S-VHS, and Betamax video tapes. The vendor will inspect the tapes, transfer the analog signal off of the tapes to digital formats, and return the original tapes to estate, with the resulting digital video files on a hard drive. The following sections detail the vendor's responsibilities and provide guidelines for how the tapes should be transferred, and how the estate should be contacted in the event of complications regarding the transfer. All communication and/or changes to plan or price must be in written (email) communication between the estate and the vendor. No spoken word agreements will be honored.

Registrar

When the tapes are received by the vendor, the estate should be contacted. At this time, the vendor must confirm that all tapes were received, labeled as described in the provided metadata document, and not damaged in transit. Any treatment to tapes that were damaged in transit must be approved by the estate.

Care and Handling

It is expected that all tapes and peripheral materials (such as cases, labels, etc.) be treated with the utmost care by trained professionals. Materials should only be handled by qualified technicians and engineers. Tapes are to be stored in their cases, stood upright (vertically), in a controlled environment, when not in use (see Environmental Control section for more details). Tapes should never be stored in areas where food and drink are consumed.

Environmental Control

The vendor's facility must be outfitted with climate control, and must be able to demonstrate temperature and relative humidity levels of the storage area and transfer station area. PEMdata or another data logger/data tracker readout is preferred. Any area where the tapes will be stored must remain within 63 - 68 degrees Fahrenheit with relative humidity of 30-35%, in keeping with the Image Permanence Institute's recommendations, found on their website.[45] Tapes should always be stored vertically, spine out, in low traffic areas where they are not at risk of falling or being knocked over.

Equipment and Maintenance

A list of the equipment used in the transfer process and a description of the maintenance work performed on the equipment should be provided by the vendor. All equipment must be cleaned regularly. A regular maintenance schedule of the facility and equipment should be provided to the estate.

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[45] IPI Media Storage Quick Reference, by Peter Z. Adelstein, Page 7, Image Permanence Institute, 2nd Edition, https://imagepermanenceinstitute.org/webfm_send/301 accessed Feburary 12th 2016

3.1 Guidelines for Transfer

The vendor must provide a description of the workflow. This description should include procedures for receiving and evaluating condition of tapes, the video signal path and monitoring practices. The vendor must adhere to this workflow throughout the course of the project. If any changes or modifications become necessary, they must be communicated to the estate. Significant modifications must be evaluated by the estate to determine if a loss of quality would be incurred by such a change.

Representation of Source Material

The goal of this project is to preserve the material encoded onto the estate's tapes. Therefore, the resulting digital file must resemble the original material as closely as possible. The best possible analog signal should be captured, as a dynamic signal that remains within broadcast range. The color space, frame rate, aspect ratio, interlacement, audio levels, and recording standard (NTSC, PAL, SECAM) of all material should be maintained in the resulting digital file.

Source Head Information

As this is a preservation project, any information on the tape should be considered valuable, be it bars and tone, titles, or slates. Any form of source head information from the analog tape should be included on the resulting digital video file.

Calibration

The vendor's capture station must be well calibrated in order to accurately monitor the audio and video signal. The analog system's studio monitor, waveform monitor and vectorscope must be calibrated to SMPTE Engineering Guideline EG 1-1990 reference bars. The audio monitors and meters should be calibrated using the reference bars' 1k tone.

For all transfers, the video signal should be sent from the playback deck to a Time Based Corrector (TBC) to prevent certain analog video artifacts (such as skew errors), and a processing amplifier (or Proc Amp) in order to adjust the luminance and chrominance levels. In the pre-digitization analog video signal, whites should peak just under 100 IRE and blacks should reach no lower than 7.5 IRE. Post-digitization, these values would correspond to 10-bit digital code values, whites at 940 and blacks no lower than 64.[46] Confirm appropriate levels of digital files using digital waveform monitors and vectorscopes.

While several of the tapes have color bars at the beginning of the tape, the tapes that have been played back do not have pluge bars, which are particularly helpful for setting luminance levels. It is possible that the bars on the tape do not reflect the setting of the camera used to record the content of the tape. Consider using the color bars to help calibrate the Proc Amp for the transfer,

[46] Poynton, Charles. "Raster Images". *Digital Video and HTV: Alogrithms and interfaces.* 2003. p. 13.

but only with the recognition that appropriate appearance of the content is the best metric for evaluating representation of color.

The vendor must locate an appropriate reference within the tape's content (for example, blue sky, skin tone, and known black and/or white objects) and then adjust levels using these references as guides. While Schwartz was a video artist, he did not use video synthesizers or other color manipulation tools one might associate with the genre. That is to say, known references such as blue sky, skin tone, or other objects, should appear as expected.

The widest possible range of IRE values, while staying within the range stated earlier, is preferable. The goal is to capture a dynamic and robust analog signal, without clipping whites or dropping blacks "in the mud."

After a successful transfer of a tape, SMPTE Engineering Guideline EG 1-1990 reference bars should be sent from a signal generator, through the signal path, maintaining the settings on the Proc Amp and TBC used for the tape that was just transferred. This signal should then be captured and appended to the transferred video file. This digitized video signal (which is the signal generated reference bars modulated by the same signal path as the recently transferred tape) will be used to document the adjustments made during the transfer process, and reverse engineer them during Quality Control procedures, if necessary.

As Buky Schwartz was operating in the experimental and avant garde field, professional production techniques may have not been used. If the vendor has any questions, or concerns please contact the estate.

Pre-Roll Requirements

Each digital video file should begin with the following:

- 3 seconds of black
- 30 seconds of SMPTE bars and tone
- 5 seconds of black
- A 10 second title slate indicating the transfer vendor, technician, and date when the transfer was performed
- A 10 Second copyright notice indicating the estate of Buky Schwartz owns all rights to the material
    - There are some exceptions to this, and tapes that contain material that the estate does not own the rights too will be marked as such.
- 10 seconds of black before content

Acceptable Artifacts

Outside of the aforementioned calibration using a TBC and Proc Amp, no error correction should be performed on the material.

Enhancement and Improvements
Similarly, no enhancements or improvements should be made to the preservation masters.

Audio Tracks
All audio tracks present on tapes, be they Stereo or Mono, should be captured during transfer. Tapes should be previewed to reach an ideal audio level, with highest signals peaking just below 0 VU on a calibrated VU meter or -20 dBFS on a calibrated digital peak meter.

Closed Captioning
Few tapes in the collection will contain closed-captioning, but some, for instance Buky Schwartz's appearances on Israeli television, may have them. It is possible the subtitling on these tapes is actually "baked in," however, as opposed to encoded on Line 21 of the analog video signal, in keeping with CEA-608 closed captions standard for analog broadcast television.[47] If closed captions are found on the tape, they should be preserved on Line 21 in the uncompressed video files, and, additionally, delivered as sidecar files. This file format delivery can be as SubRip Caption or .SRT files (preferred), Scenarist Closed Caption (.SCC), or Cheetah Caption files (.CAP). If the vendor has a preferred methodology for capturing closed-captions that does not conform to these specifications please contact the estate. Other techniques may be acceptable.

End of Source Tape
The engineer should continue to play the tape for at least five minutes after the believed end of the tape to ensure that more content is not stored on the tape. The previously mentioned reference bars (see **Calibration** section) will then be added after the end of this period.

Potential Issues with Transfer

- Dropout: Unless entire frames, or prolonged periods of video are unviewable, small instances of dropout, for example, a single line of video in a single field for a single frame, should be considered acceptable. These tapes were not recorded, nor have they been stored in professional environments, and some signal loss has likely occurred on at least some of the tapes. If the TBC the vendor is using does not allow for Dropout Compensation to be turned off, the estate should be made aware before contracts are signed.
    - If the vendor is concerned about the quality of playback, however, please contact the estate immediately. In the event of such a concern images will be appreciated.
- Inaudible Sound: If quietest sections of a tape, the lowest levels of audio, are inaudible at the prescribed calibration (with the highest audio signal registering below 0 VU), then

[47] Griffin, Emily. What Are the Difference Between CEA-608 (Line 21) Captions & CEA-708 Captions? 3play Media. August 11, 2015. Accessed April 24th, 2016. http://www.3playmedia.com/2015/08/11/whats-the-difference-between-cea-608-line-21-captions-cea-708-captions/

two audio transfers should be performed, with the second transfer capturing the audio at a higher level, so that a composite of the two transfers can be created by the estate, if need be.

- Playback Failures: If the tape will not playback through the deck, or either the sound or video is not playing back, contact the estate. Diagnostics and proposed treatments should be discussed with the estate before any action is taken.

Damage and Treatment

The estate should be notified immediately if any tape is found to be damaged or requires treatment. When assessing damage to a tape, evaluate the other instantiations of the same title. Be prepared to notify the estate of other copies of the same material, the additional copies relative condition (visual inspection would suffice) and generation. The estate must be informed of any tapes found to be in poor condition, prior to any treatment to the tape. Proposed treatment methods will be considered in light of the condition of the other copies and their potential generation loss. The estate will advise the vendor on how to proceed.

3.2 Quality Assurance Guidelines

The vendor should be prepared to present a detailed description of their quality assurance procedures. These procedures, some of which have been mentioned in other sections of this report, should include:

- Storage Environment - Documentation of temperature and relative humidity of facilities, preferably from a data logger/tracker.
- System Design - Wiring diagram (or other form of documentation) detailing signal flow during transfer, and equipment to be used.
- Maintenance Schedule - When and how often maintenance is performed on equipment, and what this maintenance entails.
- Alignment and Setup - When and how alignment and calibration are performed.
- Monitoring - A technician must be present the entire time a tape is in a playback deck, and record their observations on playback quality, capture process, etc. in the provided spreadsheet.
- Functionality - All deliverable files must function appropriately (able to be opened and played back).
- Completeness - The amount of material in the resulting digital files must completely match the content on the analog tape.
- Fixity and Chain of Custody - The integrity of the digital files can be monitored using the file's checksum, or hash. See the **Digital Files** section for more information.

3.3 Quality Control Guidelines

The vendor must be able to guarantee that the digital video files accurately represent the material on the analog tapes. While consulting the technician's notes from the transfer, the files will be

screened in full, monitoring for artifacts from the transfer process. This check should also include monitoring for distorted audio or video signals outside of broadcast range.

The preservation master and access file will be analyzed using MediaInfo software to make sure all of the file characteristics (such as codec, bitrate, and the arrangement of audio channels) are correct. This MediaInfo report should be exported as an XML file and delivered to the estate with the video files (see **Digital Files** section).

Estate of Buky Schwartz QC
After receiving the files the estate will perform a fixity check on the material, using the Exactly tool described in the **Digital Files** section. A copy of all of the material will be created as a precaution. This copy will remain untouched, aside from performing regular fixity checks, as to prevent hidden files from being written to the directories (such as _DS.store) which would compromise the Exactly tool's ability to validate the files. With this digital preservation copy put aside, the estate will then use the initial digital copy of the material to assure that the file naming convention and directory structure of the files is accurate, that files playback and function appropriately and that the MediaInfo XML files accurately represent the material received.

5. Delivery of Files
Files should be delivered to the estate in the directory structure and file naming convention detailed below, on a Mac formatted (HFS+) hard drive. The cost of the hard drive should be included in the cost of the project. Vendor should hold copies of the digital files for at least 30 days after delivery, and confirm with the estate before deleting them.

File naming convention
Resulting file names must be uniform and follow these guidelines. There should be no spaces or special characters in the file name. All file names will begin with the tape number, which is adhered to the tape and listed in the inventory. The title will follow the tape number, separated by an underscore. All words in a title should be separated using camel casing (a capital letter at the beginning of each word). Finally, the filename will include whether the file is a preservation level or an access level format.

Tape Number_Title_Preservation or Access

Examples:
B002_VideoconstructionsAndTheChair_Preservation.mov
V010_YellowTriangleCameraFeed_Access.mp4

The XML files that contain the metadata related to the individual files should be named in the same manner as the files they describe. Therefore

“B002_VideoconstructionsAndTheChair_Preservation.mov” will have an acommpanying file named “B002_VideoconstructionsAndTheChair_Preservation.xml.”

Digital Files

Each of the tapes in the collection should be represented as a unique directory named using the file naming convention above, without the “Preservation” or “Access” following the title. The two video files, preservation copy and access copy, will then be stored within this directory, along with the two XML files that describe the video files. For example:

B002_VideoconstructionsAndTheChair (folder)
- B002_VideoconstructionsAndTheChair_Preservation.mov
- B002_VideoconstructionsAndTheChair_Preservation.xml
- B002_VideoconstructionsAndTheChair_Access.mp4
- B002_VideoconstructionsAndTheChair_Access.xml

Once all of these files are complete, have been checked for Quality Control, and are stored in the appropriate directory structure with their corresponding XML files, create a directory to house all of the “tape directories” and the metadata spreadsheet, that will contain the technician's transfer notes. This overarching directory, then, will contain all of the video files and all of the metadata files, including the spreadsheet. For Example:

Directory
- Metadata spreadsheet
- Tape Directory
  - Video files
  - Xml files
- Tape Directory
  - Video files
  - Xml files
- Tape Directory
  - Video files
  - Xml files
- (etc.)

This directory is to be “bagged” in accordance with the Library of Congress’ BagIt specification for transfer for digital content (described here: http://www.digitalpreservation.gov/multimedia/videos/bagit0609.html). There are many tools for creating bags, but the estate recommends using AVPreserve’s tool Exactly. Exactly features an easy to use drag and drop graphical user interface and should be relatively straightforward. Downlaod Exactly from the AVPreserve website here: https://www.avpreserve.com/tools/exactly/

The estate can then use Exactly to validate the Bag upon receiving the files to confirm that the files were not corrupted upon transfer to the harddrive, or after transferring to the estate's digital storage.

6. Failures

Alter the estate, in writing, if any of the tapes fail to playback or cannot be transferred. Explain when the failure occurred, and how it was encountered. If the cause of the failure is unknown, offer possible explanations, or methods for determining the issue. If treatment to the tape is possible to correct the failure, this should be discussed with the estate. No treatment to the tape should be performed without the estate's explicit permission.

7. Subcontracting

All procedures are to be performed in-house by the contracted vendor. Any subcontracting deemed necessary by the vendor must be approved by the estate, and cannot be performed without approval.