Preserving Polarities: Conservation of Amie Siegel's Double Negative and

Multi-Component Time-Based Media Installations

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1) Conserving Multi-Component Time-Based Media

Abstract

Due to the variable nature of time-based media installations, conservation is a challenging and evolving process. It requires interviews from the artist, their assistants, and those involved in producing exhibitions of their installations. This process of research and documentation aims to capture the intent of the artist to inform a given work's conservation and future exhibition. Working with Amie Siegel's *Double Negative* (2015), this paper chronicles the creation of each of its components (16mm film and HD digital video), the artist's installation specifications, and details from four exhibitions in order to document its exhibition history and examine models for time-based media documentation. An edition of *Double Negative* was recently acquired by the Museum of Modern Art (MoMA). While editioned artwork fits well into institutional conservation workflows, it also leaves to the artist the responsibility of conserving the elements used in creating the work. With that in mind, I review methods for audiovisual preservation utilized by MoMA and provide information about best practices that individual artists can employ with 16mm film, digital video, and digital objects in a collection.

Introduction

The website for the London-based contemporary art institution, the Tate, has an "art term" glossary entry for time-based media as "art that is dependent on technology and has a durational dimension. Usually time-based media are video, slide, film, audio or computer based." Part of what it means to experience the art is to watch it unfold over time according to the temporal logic of the medium as it is played back."[1] The word 'usually' gives a good

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[1] Tate website, "Time-Based Media – Art Term." Accessed April 8, 2018.
http://www.tate.org.uk/art/art-terms/t/time-based-media.

indication of the wide categorization of artwork that can be considered time-based media. But art intended to 'unfold over time according to the temporal logic of the medium' a fairly concrete notion to ground artwork that can be seen as time-based media. The Tate's definition for installation art has a more comprehensive history cited in its glossary entry, but it defines the term being used to "describe large-scale, mixed-media constructions, often designed for a specific place or for a temporary period of time."[2] So time-based media installation art could be described as being artwork created for a specific place, for a temporary period of time, using mediums that are intended to be observed as they unfold over time.

Films have been shown in gallery environments since artists have created artwork using film as a medium. As more time-based mediums and exhibition technology became more accessible to artists and galleries, more and more complex contemporary artwork was able to be shown. Present day galleries and museums struggle with being able to show emerging complex time-based media as well as installing artwork using media that has become or is becoming obsolete. In many cases, decisions need to be made when acquiring or exhibiting artwork about how to consider its conservation and how to maintain the artist's original intent. The practice of performing artist interviews or interviews with individuals involved in the production or exhibition has become a key part of documenting complex and variable artwork. Seeking information about specific exhibitions of time-based media installations is also seen as critical to documenting choices made at specific times and in specific sites.

Throughout the next several chapters, I'm going to look at Amie Siegel's *Double Negative* as a case study for time-based media installation conservation. I'll be giving

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[2] Ibid. Accessed April 8, 2018. http://www.tate.org.uk/art/art-terms/i/installation-art.

background on the artist and her work, look at the concept and production of *Double Negative*, and will review its exhibition history to date. Then, I'll go over frameworks and documentation models for time-based media installations including the ones I've used for *Double Negative*. After that, I'll review potential conservation scenarios for the media components and exhibition equipment that the piece is comprised of. Finally, will spend time discussing methods for preserving production elements of the components as an action that the artist herself can take.

2) About the Artist

Contexts

Amie Siegel was born in 1974 and grew up in Chicago. Since 1999, she has worked and lived in New York City, aside from 2003 to 2008, when she lived in Berlin during a residency. She received her undergraduate degree at Bard College in 1996, where she studied poetry and 16mm and video production and post-production. She earned a Master's degree from the School of the Art Institute of Chicago in 1999. Over the course of her career, she was a Fulton Fellow at The Film Study Center at Harvard University, a DAAD Berliner-Künstlerprogramm fellow, a Guggenheim Foundation fellow, received an ICA Boston Foster Prize, a Creative Capital Award, as well as a Sundance Institute Film Fund Award. Siegel published several books since the late 1990's,[3] created photographic, graphic arts, and sculptural works, and produced over 20 time-based media artworks[4]. Her time-based corpus comprises both single and multi-channel work, but some are best-known work are multi-component pieces for galleries and museums, which will be detailed in this chapter, as well as three films that had theatrical

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[3] OCLC World Cat Amie Siegel Author Query, Accessed January 8, 2018, https://www.worldcat.org/search?q=au%3Asiegel%2C+amie&qt=results_page.
[4] Amie Siegel website. "Chronology." Accessed January 10, 2018. http://amiesiegel.net/chronology.

distribution: *The Sleepers* (1999), and two feature-length works, *Empathy* (2003) and *DDR/DDR* (2005). She describes herself as a visual artist who works with film.

Her films and single-channels from multi-component works have screened at the Berlin, Cannes, New York, and Toronto Film Festivals; the Museum of Modern Art in New York (MoMA); and The National Gallery of Art in Washington, D.C. Siegel's time-based media artworks have exhibited at the Guggenheim Museum, Bilbao; and the Metropolitan Museum of Art, New York. Her solo shows span Europe and the U.S., including at the The Frye Art Museum in Seattle and the South London Gallery. Group shows she participated in have included: Whitney Museum of Art (The Whitney); MoMA; the Walker Art Center, Minneapolis; the Hayward Gallery, London; and Haus der Kulturen der Welt, Berlin.[5] Her time-based media artwork is held by MoMA, the Tate Modern; the Metropolitan Museum of Art; the Whitney; the Guggenheim, and private collections around the world.

Siegel cited Chantal Akerman, Valie Export, Harun Farocki, and Jean-Luc Godard as influences on her during the late-1990s[6]. Similar to her, each of these artists worked with narrative and non-fiction cinema and created self-reflexive films and videos that were exhibited in installations. In an artist's interview with me, held in January 2018, she explained her consideration for where and when her work gets shown is "not about the physical place so much as the art historical dialogue and context in which the work is shown and therefore is contextualized." She feels that often people focus too much on looking at how the work was created, rather than the context in which it will be shown, i.e. presumably single-channel could, therefore were intended to be shown in a theatrical setting, and multi-channel or

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[5] Siegel website. "Biography." Accessed January 10, 2018. http://amiesiegel.net/biography.
[6] Stillman, Steel. "Amie Siegel in the Studio." Art in America, 2015. p. 147.

multi-component works could only be shown in a gallery setting, "these physical spaces are merely a physicalization an entire history, methodology, ways of thinking that artists and filmmakers are engaging with," The context of each environment means engaging with the entire history of art, or the history of cinema that overlaps it. Considering how her work is exhibited "is more or of a philosophical orientation than anything else. And playing with the associations that come with each space is obviously of interest to me."

As an example, she pointed to a film of hers like *Empathy*, a self-reflexive essay film that defies genres while examining both filmmaking practices and the relationship between psychoanalyst and patient, and filmmaker and subject. When the film was shown at Film Forum in New York City, it could be viewed within the history of documentary or nonfiction cinema narratives. In a gallery environment, the same film could prompt the audience to think of "direct-address video art" performances, like Yvonne Rainer or Godard. Perhaps the sequences in the film focusing on the Eames chair and Modernist architecture could be seen in the context of a particular museum's architecture or collection. She does not see or want her work to be seen as being created to be shown in a specific environment, but rather is herself interested in the various contexts for how it could be seen. In a 2015 interview with "Cinema Scope," she spoke about theatrical distribution versus museum exhibition, "how is the exhibition framed, what are the other works included? If in a festival, will it be in a section of artists' films, will it have its own screening? Proper context for the work as an artwork is the most important thing."[7]

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[7] Picard, Andrea. "Provenance: The Artist (Amie Siegel)," p 71.

Multi-Channel to Multi-Component

Growing up in Chicago, Siegel's father was passionate about making Super-8 movies of

family vacations and events. He shot, and then spent hours editing the original home movies

with a small Super-8 viewer, so he could present them to the family. In a 2015 profile by "Art in

America," Siegel stated she began to use his Super-8 equipment in her teens, noting that

perhaps her father's yearly screening of the previous year's birthday during each subsequent

birthday might prove an inherited passion for reiteration. Her mother owned a high-end

women's boutique and "as a small child, I was preoccupied with the visual, in particular the

theatricality of display.[8]" She would arrange mannequins and window displays for her mother's

store window, which by the mid-1980s was located in the Near North neighborhood, then

Chicago's gallery district.

Multi-channel works for gallery environments have been an early part of Siegel's

professional career. Soon after grad school, she created a three-channel video installation in

New York City called *Establishing Shots* (2001). In it, a triptych of three high-definition (HD)

monitors, with varying montages of panoramic shots from Hollywood movies, shot in New York

City prior to September 11, 2001, depicting the World Trade Center Towers in the frame, are

mounted on a gallery wall. During her first residency in Berlin, one of the first works she

exhibited was a two-channel video installation *Berlin Remake* (2005). Here, two standard

definition (SD) videos are set-by-side and a montage of clips, chosen from movies made from

the early 1950s through 1989 by East German Studios (DEFA), are juxtaposed with Siegel's

shot-by-shot recreation, of the scenes, actors, and settings of the DEFA clips, in the same

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[8] Stillman. "Amie Siegel in the Studio," p 146.

locations in Berlin at that time. Soon after returning to the United States, Siegel began to

develop multi-part or multi-component gallery installations. Her first was *The Modernists*

(2010), where two Cibachrome prints filled with various stills from Super-8 travel movies from

an art-loving husband in wife in the 70s and 80s, are paired with a silent video projection of the

source Super-8, transferred to SD video.

A multi-component project exhibited the same year as *The Modernists* marked a new,

more complex method of installation that Siegel would begin to employ several times after.

Black Moon (2010) includes one component, which is a two-channel video, its own

juxtaposition, within the larger three part installation. The main part is a super-16mm remake

of Louis Malle's film *Black Moon* (1975) transferred to video, featuring a group of armed,

fatigue-clad women, making their way through a post-apocalyptic desert community of

abandoned homes in southern California, created by the wake of the 2007 foreclosure crisis.

The second component is a series of 15 13.5" x 24" Cibachrome prints of single taken from

16mm frames from the heads of production rolls, called *Black Moon / Punch Hole 1-15*,

respectively. Each image is composed of an image with a circular punch-hole mark made by a

lab technician during the processing of the footage. The third component is a two-channel

video pairing of a 1975 interview of Louis Malle on an SD television monitor, placed next to an

identical monitor with a recorded restaging of Malle's interview by Siegel herself, reinterpreting

the transcription of the male director's over-confident text via her performance.

She followed *Black Moon* with two of the most ambitious multi-component installations

at that point of her career, each exhibiting in the same year. The first, *Provenance* (2013),

whose main part is an HD video, with the same title as the overall work, was shot on the

digital-cinema Red camera, using slow, revealing tracking shots, no voice-over and no text other than the title. The video follows the path of chairs designed by Charles-Édouard Jeanneret (Le Corbusier) and Pierre Jeanneret from a gallery floor in London, in reverse order to their origin. We see a chair auctioned at Christie's in London, getting photographed for the Christie's catalog, one getting refurbished, then transported on a ship, all the way to the source of chairs, in Chandigarh, India. Finally, in India, after slowly making our way through the Le Corbusier designed Mill Owners' Association Building, we see the source of the chairs stacked in a pile outside underneath the awning of the Le Corbusier building. This main component of *Provenance*, a forty-minute video called *Provenance*, is exhibited with a second video, *Lot 248,* shot in the same manner and as the main part. This video depicts the auction of the number one edition of *Provenance*, a copy of the main video itself, at the same Christie's London auction house depicted in the main video in October, 2013. A printed catalog page encased in Lucite from Christie's of the listing of the main video in *Provenance*, catalogued as lot 248, is the final component of *Provenance*.

Produced in the same year as *Provenance*, her second ambitious multi-component installation, *Winter* (2013), combines a looping HD video projection with live performance. The video, shot on super-16mm during an artist's residency in New Zealand, captures the biomorphic design of the late architect, Ian Athfield's home, as well as the community within it, in the lush mountain forests above Wellington. Siegel's depiction of the community evokes a post-apocalyptic scene of humans living off in a remote natural locale after some great calamity. While the video component has its own soundtrack, the work is intended to have live voice-over, sound effects, and varying musical live accompaniment when exhibited. Music

performed with *Winter* has varied from a string quartet, percussion, and synthesizer compositions, to live DJ mixing sound and music elements. A carpet is placed in front of the projection where the musicians sit during the performance. This carpet is loaned from the artist for each exhibition.

After 2013, Siegel created several HD video works using the Red Camera and tracking style she utilized for the main video of *Provenance*. Her next major multi-component installation, however, *Double Negative* (2015), will be the time-based media installation project discussed in detail in the next chapter.

3) About the Work

Double Savoye to Double Negative

Siegel was preparing for *Winter*, just prior to going to India to scout final locations for the last sequence of *Provenance*, and took a side trip to Australia to follow up on an idea for a potential new project. In 2001, on a peninsula in Canberra that is home to the National Museum of Australia, architects built a near replica of the iconic Villa Savoye in Poissy, France. Designed by Le Corbusier and Pierre Jeanneret in 1927, and built in 1931, the white Villa Savoye, stands as a monument of Modernist architecture. The design of the Australian version of the Villa, however, was created with an all-black exterior. Siegel had conceived of two films with the same duration, and identical sequence of shots, depicting each version of the Villa Savoye. She was only able to visit Canberra for a short period of time when the facility within the black Villa was closed. So, she captured preliminary photos and sketch videos of the exterior, unable to see exactly what was inside the black windows of the building. In our January 2018 interview, Siegel said she knew from her research, and seeing signage around the

building, that some sort of ethnographic institute was inside the building. She just assumed it would be a research library with videotapes on a shelf and decks for playing them.

Siegel was awarded a residency in Melbourne in early 2014, after *Winter* and *Provenance* were completed, and she began work on her double Savoye project. Early on, she arranged to visit the facility within the building in Canberra. In fact, the black Savoye exterior was built as a wing for one of the main centers of ethnographic study in the country, the Australian Institute of Aboriginal and Torres Strait Islanders Studies (AIATSIS). The Torres Strait is a narrow body of water separating Australia from Papua New Guinea, and is home to an aboriginal community related to, but distinct from the main continent of Australia.

Siegel was taken aback by what she saw inside. The Institute houses a 60 year archive of ethnographic artifacts, photos, film, video, and audio along with space dedicated for research of the collection. The collection holds "more than 8,000 video titles and 830 film titles or over 6.5 million feet of motion picture film (as of the end of 2013)."[9] A full audiovisual preservation lab dedicated to the digitization of the objects is onsite, complete with cold storage for film and cool storage for video. Siegel viewed technicians working on digital audio workstations digitizing analog audio field recordings; digital camera setups for photographing rare books, objects and letters from the 19th century onward; large flatbed scanners for capturing printed images and large sheets of slide photographs; a film telecine machine to capture 16mm film negatives and prints; and multiple analog video decks for reformatting to accessible digital video files.[10]

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[9] AIATSIS Collection Management Plan 2013 -2016, 2016, p. 16. Accessed January 20, 2018.
http://aiatsis.gov.au/sites/default/files/docs/about-us/collection-management-plan.pdf.
[10] Australian Institute of Aboriginal and Torres Strait Islander Studies website. "About Us", Accessed January 20, 2018. https://aiatsis.gov.au/about-collections.

Siegel saw all the layers of doubling and copying occurring within this black copy of a canonized pillar of Western Modernism. Rather than it being empty, like the Villa Savoye in France (devoid of any human activity, apart from its visitors), the black Savoye has equipment and staff dedicated to the preservation and research of the collection within it. The material held in that collection was created to document the aboriginal peoples and culture of on a former Western colony on the other side of the world.

Once she saw inside the institute, Siegel knew there needed to be a third component for the project, a high-definition digital video of the activity performed by AIATSIS within it. In an interview with Australian anthropologist and professor Michael Taussig for the book *Double Negative / Double Negative* (published by the Museum Villa Stuck, who also commissioned the work itself), she recalled, "it was very strange to me that what was inside the black copy of the Villa Savoye is this space of anthropological study and repository. It was both entirely familiar to me, as someone who works with media, and utterly strange."[11] The video would feature the activities of the institute and would also serve as the digital opposite to her analog 16mm films.

She continued her research in Australia for the rest of the residency, learning about the film collection within it, including meeting with some of the ethnographers associated with the institute. During part of her research, she learned how the region around Melbourne and Canberra are native breeding grounds for a species of black swans. Knowing that black swans were on a lake within walking distance to the black Villa, Siegel decided to add another white and black doubling sequence to the 16mm component of the work. She returned to the U.S.

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[11] Siegel, Amie. *Double Negative / Double Negative*. Mousse Publishing, 2016. p 151.

with her full plan to shoot in France and Australia in 16mm black and white, as well as in HD video.

Mirrored Polarity Prints

After her initial scouting in Canberra in 2013, Siegel realized each of the films for the two Villas would be shown in their negative image, flipping the whites and blacks of what was captured. Before Siegel shot any film, she had long discussions with two film laboratories about the best way to achieve projection prints with a negative image. She contacted Fotokem, a lab in Los Angeles she used for past projects, and Colorlab, a lab in Rockville, Maryland used by many artists working with film. After long conversations with each lab film about the best way to achieve projection prints with a negative image, she decided to go with Colorlab and their idea for what they termed polarity prints.

They recommended shooting Kodak Double-X 7222 negative film as the first step. After processing the camera negative, the second step is to create an intermediate print step, an interpositive, on acetate stock. This stock is made of the same base as the camera stock, and would result in a positive image. In a normal print process, a positive print would be the final desired result. But in this case, it generated a positive image, which then could be printed again onto the final, negative image, polyester print that Siegel wanted. Due to the base of the polyester stock, each print would be suitable for multiple projections. In the case of a three to four month exhibition of *Double Negative*, prints run on a loop the entire day the gallery is open and generally swapped out every two weeks.

In March 2014, using the Double-X film, Siegel shot the series of shots and angles of the white Villa she knew she would replicate in Canberra for the black Villa exterior, including a

series of shots of white swans swimming in a nearby Parisian park. Using the digital-cinema Red

Camera, she also shot video of the inside of the white Villa, and its grounds. To complete her

concept for the beginning of the video component of the piece, she also captured natural

surroundings near Paris, and a shot of the coast of France. In the summer of 2014, she went

back to Canberra to copy her choreography of 16mm shots of the black Villa's exterior and

black swans swimming in the lake surrounding the peninsula where AIATSIS resides. She then

recorded outside shots of the black Villa in video, along with some of its natural surroundings,

finishing the production of the video with a shot of the coast of Australia to match the one she

captured in France.

Once processed, the 16mm rolls were then scanned to a 2K QuickTime video by

Colorlab, from which, an Apple ProRes video was generated. 2K just means a resulting video

that is two-thousand pixels in its vertical aspect ratio, a common size for theater exhibition. The

video was transcoded to ProRes codec to a file with a lower data rate more suited for the digital

editing process. Most importantly, however, the ProRes digital video itself had the key code

numbers from the 16mm original 'burned in' to the image. On all camera stock, letters, and

numbers corresponding to feet and frames called key code is made by each film manufacturer.

In a traditional film workflow, the key code numbers are used by negative cutters to match an

edited work print to the original negative, leaving the original negative untouched by the

editing process. In this case, using this ProRes video file, Siegel edited each Villa montage using

the digital editing program, Final Cut Pro 7, mirroring her edits in each video precisely to the

frame. She then manually wrote down the key code numbers which appeared at each splice in

the video edit to create an 'edit decision list.' This is just a text file listing the beginning and

ending key code numbers in order, corresponding to key code on the frames in the original

negative. This list becomes a guide for the negative cutter to match all Siegel's video edits to

cut the original negative. Siegel had not worked with a negative cutter since 1999, her last

project finished on film, *The Sleepers*.

The negative cutter recommended to her by the Colorlab created the conformed rolls of

original negative, following her video edits, and preparing them for the printing process. The

interpositive and final polarity prints were generated by Colorlab in the print stage process

outlined above. Some contrast is naturally introduced in process due to going from the

interpositive print to the final polarity prints. Any time a print is made, contrast will be

introduced. This particularly occurs when printing from an inherently higher contrast positive

original, instead of a lower contrast negative original. Adjustments were made from the initial

print called the 'answer' print, and final 'release prints' were made with an acceptable level of

contrast.
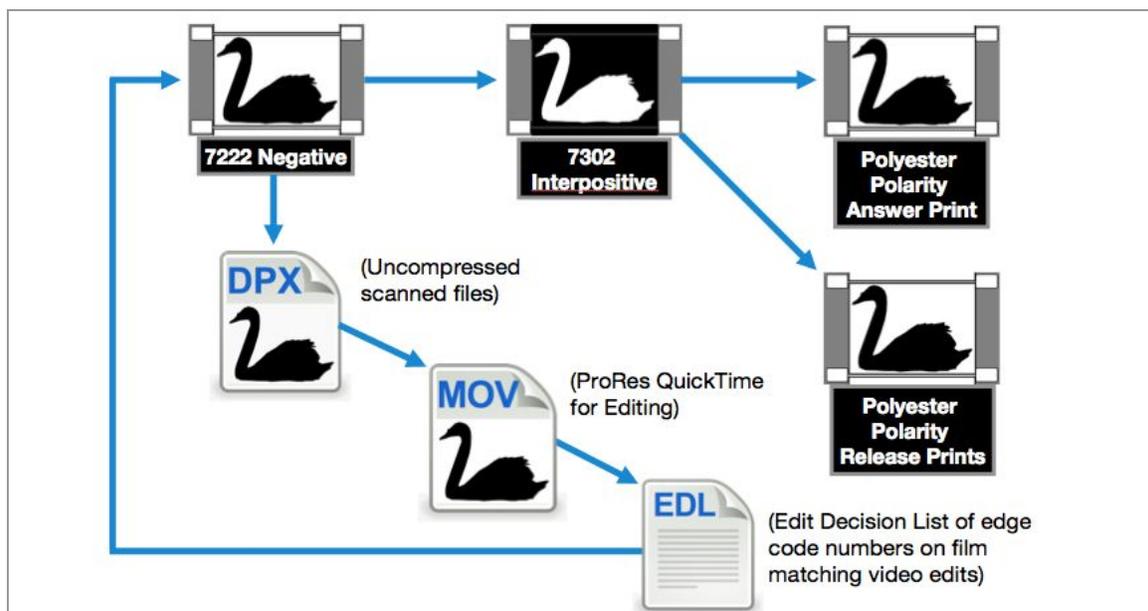
Simplified workflow of 16mm post-production process for "Double Negative - France."

The 2K QuickTime created by Colorlab was a higher quality source that Siegel needed for her digital editing process, but 2K was the lowest resolution that their scanners can create. It proved to be a fruitful source for creating high resolution digital images. Siegel wanted to create photographic prints of the swans and of the Villas and did so using this high resolution scan from her camera negatives. These prints became two additional works distinct from, but related to *Double Negative*. They will be discussed in the following chapters about the exhibition and documentation for *Double Negative*.

Layers of Reflexive Copies

When Siegel first did a test shoot with a small crew within the black Savoye during her residency, she knew immediately that the HD video component for *Double Negative* could not be shot with the same tracking shot style she utilized on her other videos shot with the Red camera since *Provenance*. Her camera needed to stay fixed on a tripod. This would match the black and white 16mm film component, but more importantly, it would mimic the style of the direct or observational cinema utilized by the ethnographic films at the institute. In our January 2018 interview, Siegel described an immediate and eerie understanding of herself and her crew acting like cultural anthropologists recording the culture of the diligent, fastidious behavior of the archival technicians in the preservation lab of AIATSIS, during her initial test shoot. She saw herself and her crew "appropriating the role of ethnographer" while recording the archival technicians also "appropriating" the same role while they digitized, photographed, scanned, and transferred the collection of objects and audiovisual recordings.

For the production of the video component, Siegel positioned her camera on a tripod and used a 4 by 3 aspect ratio and let the action unfold in front of it. This more square-like

aspect ratio is very uncommon for high-definition video, but is the standard aspect ratio for

early 35mm film, 16mm film and standard definition television. The soundtrack of the video,

whether shooting outside or within each Villa is the specific ambient sound around her camera

while recording. She explained in her interview for the book on *Double Negative*, "I'm kind of a

minimalist when it comes to sound. I like there to be what Straub and Huillet call 'direct sound':

the sound that is there in the moment of viewing."[12] Jean-Marie Straub and Danièle Huillet

were a husband and wife filmmaking team known for intellectually rigorous film practices that

eschewed convention such as leaving wind rustling in the microphone or background noises in

their films rather than overdubbing or removing them.[13] This use of the sound directly in the

environment has been employed by Siegel for her other time-based work, but it becomes

central to the experience of the video component of *Double Negative*. In the exterior shots,

each edit is punctuated by the abrupt shifts in sound. Once inside the Villas, the interior sound

along with the camera's gaze emphasizes the observational nature of each moment.

Inside AIATSIS, Siegel's sequence of shots begins in a soundproofed digital audio

transfer room watching a technician digitize an audio field recording. We hear a female

anthropologist asking an aboriginal man to repeat words and phrases in a particular language

while watching the quarter-inch, open reel audio cassette move through the heads of an analog

tape machine. Digital meters representing audio frequency spectrums light up as the

anthropologist and her subject speak. This is followed by a series of shots depicting artifacts laid

down on a pristine white backdrop next to a color chip chart as they are digitally photographed.

The camera is attached to a robotic arm to move closer and further away from objects on the

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[12] Siegel, *Double Negative / Double Negative*, p 150.
[13] Daniel Fairfax. "Jean-Marie Straub and Danièle Huillet." *Senses of Cinema*, September 6, 2009. Accessed January 27, 2018. http://sensesofcinema.com/2009/great-directors/jean-marie-straub-and-daniele-huillet.

backdrop. Next, we see a film is placed on the telecine transfer machine by a technician, who like the other workers in the lab, keeps a calm, precise demeanor, while averting their gaze from Siegel's camera. Then, we see a videotape transfer of a 16mm film with subtitles playing on a monitor of a digital transfer station. It depicts aboriginal men in a quarry, with one of them explaining how he was taught that certain rocks were "pregnant" (meaning not ready to make rocks for spears from it). His explanation is followed by a sequence of the anthropologists clarifying which areas near the quarry can be filmed and which cannot.

The culmination for the video component of Double Negative happens back in the telecine room. The same telecine technician we've seen before places a roll of the 16mm positive print of the film Siegel shot in France of the white Villa Savoye on the institute's telecine. We see frames of the image of the white Villa in France, roll over the wheels of the high-tension film rollers and wheels. The positive copy of Siegel's negative original photography of the white Villa Savoye was then copied to a digital form within the preservation lab housed inside the black, negative copy of the Villa Savoye, 10,000 miles away.

Negative and Positive Representation

In the interview for the *Double Negative* book, Siegel points out the contrast "between the so-called 'primitive' as represented in images and artifacts of indigenous Australian culture, and the extremely 'advanced' technology used to transfer that representational image and sound material"[14] used to preserve it. This contrast, she explained, presented a "paradoxical scenario as an artist," who when viewing objects being conserved in a museum setting, "you see the practices, and you see the social construction of the practice around objects, and you

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[14] Siegel, *Double Negative / Double Negative*, p 145.

see the investment into objects as meaningful, and you see your own complicity and

participation in that." When seeing ethnographic material being treated with similar

technological conservation methods, however, she additionally describes seeing "the latent

guilt, the history of colonialism" operating with the practices of conservation.[15]

During the exhibition of *Double Negative* in a group show at The Museum of Monash

(MUMA) in Melbourne, the museum interviewed the lead design architect of the black Villa,

Howard Raggatt (who also designed the National Museum of Australia). His firm, Ashton

Raggatt McDougall (ARA), conceived the design of the wing after consultation with the AIATSIS

board. They sought to create an antithesis to "Aboriginal Architecture considered appropriate

at the time," and saw the reference to the iconic white Villa in black as a "as an understanding

of a local version—an inversion, a reflection of Aboriginal architecture, culture or perceived

attitudes.[16]" Raggatt describes the black Villa as being designed in an inverted way from the

design of white Villa as inspired by seeing a photograph of the white Villa printed backwards

horizontally in an architecture magazine. Raggatt describes this choice as partly accepting "our

knowledge is based on the idea of photographs disseminated to us," and that the building was

"some kind of an inversion, of Europe and the upside-down country, Australia." He also felt the

black could symbolize a future other than the European Modernist "white utopia," where the

black could symbolize "another way of looking at the future.[17]"

The collection of AIATSIS began with its predecessor organization, the Australian

Institute of Aboriginal Studies (AIAS), and its production Film Unit, which operated between

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[15] Siegel, *Double Negative / Double Negative*, p 148.
[16] ARM Architecture website. "Australian Institute of Aboriginal and Torres Strait Islander Studies." Accessed January 14, 2018.
http://armarchitecture.com.au/projects/australian-institute-of-aboriginal-and-torres-strait-islander-studies.
[17] MUMAmonash. *Howard Raggatt on Amie Siegel's Double Negative 2015*, 2016. https://vimeo.com/191928364.

1961 and 1991. Material shot by the AIAS Film Unit as well as amateur films documenting all aspects of Aboriginal and Torres Strait Islander societies" are the core of the moving image collection at the institute.[18] Among the collection of films at AIATSIS are the Australian work of the American-born visual anthropologists, David and Judith MacDougall. David was the Director of the production component of AIAS from 1975 until 1987[19]. The film shown on the transfer station monitor in *Double Negative*'s video component is *The Spear in the Stone* (1983), produced and directed by Kim MacKenzie.[20] He was an original member of the institute's Film Unit and a collaborator with the MacDougalls. Siegel had dinner with the MacDougalls during her residency in Melbourne and they discussed their reasons for stopping to make films for the institute and eventually leaving it in the early 1990s.

The MacDougall's began to feel the Film Unit was "an anachronism," by the late 1980s and early 1990s, and "wasn't really viable in terms of changes that had occurred in aboriginal and Australian society"[21] They encouraged the institute to fund productions by aboriginal filmmakers, initiated some film and video production workshops for the aboriginal community, and continued to create ethnographic films outside of Australia.

In our January 2018 interview, Siegel described the work the archival technicians were performing, as an "act of media salvaging" (playing off the term utilized by voices critical of traditional visual anthropologists' practices as acts of preserving cultural traditions). Siegel witnessed in the preservation lab of the Institute of what she termed as "the archivist's

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[18] AIATSIS Collection Management Plan 2013 -2016. p 17.
[19] "David MacDougall | LinkedIn." Accessed January 20, 2018.
   https://www.linkedin.com/in/david-macdougall-07687814.
[20] Ronin Films website. "Spear in the Stone [from the AIATSIS Collection]." Accessed January 20, 2018.
https://www.roninfilms.com.au/feature/12161/spear-in-stone-from-aiatsis-collection.html.
[21] "The MacDougall Tapes Now: A Conversation with David MacDougall," Andrew Pike, Ronin Films, 2017.

compulsion: the need to salvage media," while observing each archival technician's interaction with ethnographic or anthropological artifacts. She doesn't feel this is a criticism of archivists, but rather some of the "unconscious things" she sees and "as very latent" in the behavior of the technicians. This is an idea she explored further in her single-channel video *Fetish* (2016), where she follows the repetitive and meticulous actions of the object conservators at the Freud Museum in London, who work with objects collected by Sigmund Freud from around the world, which are shown in a preserved part of his home in the museum. Siegel certainly does not see herself as a visual anthropologist, but rather only an artist. However, she did describe the video component in *Double Negative* as the most "ethnographic work - in the sense of an observational cinematic practice" she's ever made.[22]

4) Exhibition of Double Negative

A Minimum Set of Constraints

Frieze Art Fair, London (October 14- 17, 2015)[23]

Museum Villa Stuck, Munich (March 12 - June 4, 2016)[24]

Simon Preston Gallery, New York (May 1 – June 19, 2016)[25]

MUMA Monash, Melbourne (October 1 - December, 10, 2016)[26]

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[22] Siegel, Amie. *Double Negative / Double Negative*, p 150.
[23] Artsy website. "Amie Siegel - 33 Artworks, Bio & Shows." Accessed January 16, 2018. https://www.artsy.net/artist/amie-siegel.
[24] Museum Villa Stuck website "RICOCHET #10. Amie Siegel." Accessed January 19, 2018. http://www.villastuck.de/ausstellungen/2016/ricochet_10/index.htm.
[25] Simon Preston Gallery website. "The Spear in the Stone." Accessed January 19, 2018. http://simonprestongallery.com/?gallery_exhibition=3860.
[26] Monash University Museum of Art website. "Life Inside an Image." Accessed January 19, 2018. https://www.monash.edu/muma/exhibitions/exhibition-archive/2016/gerard-byrne-and-others.

Frye Art Museum, Seattle (May 20 - September 3, 2017)[27]

Collaborative Decision Making

[The chapter detailing the artist's installation specifications and the decision making process for the initial exhibitions of *Double Negative* has been omitted from the publicly available version of this document. The primary rationale behind not including this chapter online is consideration for the fact that these decisions were made at a specific point in time in the life of this artwork. Publication of specification details and opinions of particular installations could unfairly affect future installations of it.

As a short summary, this chapter reviews the installation specifications for *Double Negative* document provided by the Simon Preston Gallery in 2018. The specifications were informed by the first installation and public exhibition of *Double Negative* at the 2015 Frieze Art Fair in London, then evolved after further its first formal installation at the Museum Villa Stuck, and then further refined after exhibitions at the Simon Preston Gallery in New York City, in Melbourne, Australia at the MUMA Monash, and in the Frye Art Museum in Seattle, Washington in 2018. Key collaborations, such as with the 16mm projection technician David Lester, from Kino Klub in London, as well as with curators, and exhibition technicians at the aforementioned exhibition spaces, all contributed to the specifications outlined the document and to the realization of each exhibition iteration].

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[27] Frye Art Museum website. "Amie Siegel: Interiors." Accessed January 16, 2018.
http://fryemuseum.org//exhibition/6584.

5) Identity, Iterations, and Documentation

Capturing Allographicity

In 2006, then the Head of Time-Based Media Conservation at the Tate Modern, Pip Laurenson, borrowed an ontology described by two American philosophers to help identify a conceptual framework for conserving time-based media installations. In her seminal essay "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations," she utilizes philosopher Nelson Goodman's 1968 categorization of performed art, such as music or theater, as allographic art. The word allograph describes signature on a document written by someone other than who wrote it, as opposed to an autograph.[28] Goodman utilized the term allographic to distinguish art he deemed as forgeable, such as painting or sculpture, as autographic. Art that he deemed unfakeable, such as a musical performance following a score, in order to distinguish art produced out of an artist's notation from object produced by the hand of the artist themselves[29].

Laurenson argued that unlike traditional art objects, "time-based media installations exist on the ontological continuum somewhere between performance and sculpture."[30] She posited a new framework was needed to describe and conserve them and noted the allographic similarity to a western notated music and time-based media installations. Each needs to expressed as an "installed event"[31] with temporal and physical elements in order to be fully experienced as an artwork. Goodman classified this as a "two-stage" artwork, where "an

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[28] "Allography." Wikipedia, January 28, 2018. Accessed February 11, 2018.
https://en.wikipedia.org/w/index.php?title=Allography&oldid=822840844.
[29] Goodman, Nelson. *Languages of Art: An Approach to a Theory of Symbols*. Hackett Publishing, 1968, p. 113.
[30] Laurenson, Pip. "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations." Tate Papers, no. 6, October 15, 2006, p. 4.
[31] Ibid

accurate copy" of a written text or score is "as much the original as work as any other."[32] For notated music, Laurenson wrote, the "parameters of acceptable change" becomes discussed as "'identity' rather than conservation's material notion of the 'state' of an object."[33]

To further refine her framework, Laurenson looked to philosopher Stephen Davies' 2001 book *Musical Works and Performance: A Philosophical Exploration*. Davies writes of "thinly" and "thickly" specified musical notation in the western tradition. Questions about interpreting a composer's work "requires knowledge both of conventions for the notation and of the performance practice shared by the composer with the musicians to whom the score is directed."[34] Throughout his book, Davies uses the term 'thin' to describe instructions left by the composer which give a lot of leeway to the performer, while 'thick' instructions as very specific in terms of performance and instrumentation from the composer. Laurenson observed in the tradition of western notated music, "in the performance of a musical work it is recognised that there is a gap between a work as represented as a score and its performance."[35] For her, the concept of 'thinly' or 'thickly' specified instructions given by the composer through their notation could be applied to time-based media installations with instructions coming from the artist. Authenticity for time-based media installations, Laurenson concluded the description of her framework, depends on the informed process of installing a work, based on the available documentation, thus creating "an obligation for the museum or custodian to faithfully realise those aspects of the work which are important to its meaning."[36]

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[32] Goodman, Nelson. *Languages of Art: An Approach to a Theory of Symbols*, p. 114
[33] Laurenson, Pip. "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations," p. 4
[34] Davies, Stephen. *Musical Works and Performances: A Philosophical Exploration*. Oxford University Press, 2001, p. 4
[35] Laurenson, Pip. Laurenson, Pip. "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations," p. 5.
[36] Ibid, p. 6

A Documentation Model for Time-Based Media Art

In 2015, the Lisbon-based Instituto de História da Arte published updated and expanded

papers presented at a 2013 conference held in Lisbon, Portugal entitled "Performing

Documentation in the Conservation of Contemporary Art."[37] One of the papers included in the

publication was entitled "Reporting Iterations: A Documentation Model For Time-based Media

Art," by Joanna Phillips, the Time-Based Media Conservator at the Solomon R. Guggenheim

Museum. In her paper, Phillips created a bridge from Laurenson's framework of describing

authenticity and change in a time-based media installation to propose a structure of

documenting the iteration, media components within an installation, and identity of the

artwork.

Phillips begins her discussion of the collaborative nature of interpreting allographic

artwork, with a quote from Vivian Van Saaze, museum studies researcher, professor, and a

member of the Scientific Committee at the 2013 Lisbon conference[38]: "'artist intention' is not

simply derived from the artist or the artwork, a view still commonly held in conservation

practice, but is *produced* instead. Artist's intent, in other words, is the result of what is done in

knowledge and documentation practices. This implies that rather than being a facilitator or

'passive custodian', the curator or conservator of contemporary art can be considered an

interpreter, mediator or even a co-producer of what is designated as 'the artist's intention'"

(emphasis in original).[39] Time-based media artwork, Phillips then argued "cannot be fully

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[37] Instituto de História Da Arte website "Nº 4 RHA – Série W." *Instituto de História Da Arte* (blog), November 2, 2015. Accessed February 20, 2018.
https://institutodehistoriadaarte.wordpress.com/2015/11/02/no-4-rha-serie-w/.
[38] Performing Documentation website. "Home." Accessed February 20, 2018.
http://performingdocumentation.fcsh.unl.pt/Site/home.html.
[39] Saaze, Vivian van. Installation Art and the Museum : Presentation and Conservation of Changing Artworks. Amsterdam University Press, 2014, p. 115.

understood or managed unless the underlying institutional decision-making processes are also considered and documented."[40]

Looking to Laurenson's time-based media installation framework, Phillips wrote "in the paradigm of allographicity, damage and loss to the artwork occur when the work is poorly installed."[41] In Laurenson's words, "this could lead to erosion of the identity of the work through its presentation in the gallery."[42] For her documentation model, Phillips "integrates several aspects of allographicity: the identified two-stage nature of allographic artworks; their exclusive existence as performed/installed systems; the notion that interpretation is necessary to realize the artwork; and the consideration that interpretation can lead to a successful or less successful representation of the work's identity."[43] Key to the documentation structure Phillips proposed is the "Identity Report." This report incorporates information from the artist installation instructions, artist interviews, exhibition history, and as Phillips explained "specifies the intended experience of the piece, outlines its variability parameters and provides guidance for future preservation"[44] This report could be amended as new information about variations in installations and artist guidelines emerge an installation is exhibited.

Various installations of the artwork will have comprehensive details of installations captured in separate Iteration Reports. These reports inform the Identity Report, but each one specifies details from the collaboration of individuals involved in planning and producing a single installation. Each Iteration Report would also capture reactions from individuals ranging

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[40] Phillips, Joanna. "Reporting Iterations: A Documentation Model For Time-Based Media Art." In Performing Documentation, Revista de História Da Arte, no. 04, p. 171
[41] Ibid, p. 173.
[42] Laurenson, Pip. "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations," p. 5
[43] Phillips, Joanna, p. 174.
[44] Ibid, p. 175.

from the artist, to visitors who experienced the work, to press reviews and coverage of the iteration. For this, Phillips explained how "contemporary statements and opinions on the success of an iteration, and records of noteworthy visitor reactions, allow future interpreters and scholars to evaluate previous interpretations critically."[45] An Iteration Report "specifies all team members involved in the interpretation and realization process and tracks their partaking in determining specific media and hardware components, design and space parameters, iteration-specific problem-solving, and modifications of the work," with the goal of each report creating "a history of change, which is related to the history of decision-making that determines the 'career' of unstable, changing artworks such as time-based media works of art."[46] Connected to both the Identity and Iteration report would be a report at the level of the components of the installation, each depending on the time-based media or dedicated equipment within that component. These could take the form of "Condition and Treatment Reports, Equipment Reports, Digitization Reports, and Metadata Reports for video files."[47]

For the purposes and processes of this paper, I have filled out Identity, Media, and Iteration reports for *Double Negative*. The exhibitions in the Museum Villa Stuck, Simon Preston Gallery, the MUMA Monash, and the Frye Art Museum each have Iteration Reports prepared. The specific templates I used were from MoMA, each one being adapted from the report model Phillips laid out in her paper. The previous chapters of "About the Work" and "Exhibition History" represent a summary of the details captured through the creation of these reports.

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[45]Phillips, Joanna. "Reporting Iterations: A Documentation Model For Time-Based Media Art," p. 177.
[46]Ibid.
[47]Ibid, p. 176.

Prior Models for Time-Based Media Documentation

Before going through her proposed model for documentation, Phillips provided a brief

overview of three prior models for capturing documentation and structure information

time-based media installation. Each of these models sought to document variable media

installations and exhibition history to fill in gaps in databases employed by museums to catalog

complex artworks, such as The Museum System (TMS). She examined three models developed

by research consortiums and museum collaborations: Matters in Media Art (2005), Inside

Installations 2iDM (2007), and the Documentation and Conservation of the Media Arts Heritage

(DOCAM) documentation model (2010) and discussed how they fall short in capturing the

"decision-making" methodology behind time-based media installations.[48]

Phillips pointed out that The Media in Matters Art (MMA) website was "probably the

most frequently consulted online resource for collection caretakers wanting to introduce best

practices to acquiring and loaning time-based media art."[49] It was created in 2005 through a

collaboration between MoMA, the San Francisco Museum of Modern Art, the Tate museums in

London, along with the New Art Trust.[50] The website lists four main topics: Acquisition,

Documentation, Loan, and Digital Preservation with procedures, guidelines, and templates

under each category. Phillips wrote that the available MMA guidelines and template for

documentation are very good for "capturing all conceptual and technical aspects of an artwork

as a multi-component system. However, the MMA model is not designed to capture change or

decision-making processes, mainly because it does not offer an informational hierarchy to

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[48] Phillips, Joanna. "Reporting Iterations: A Documentation Model For Time-Based Media Art,", p. 173
[49] Ibid, p. 172.
[50] Matters in Media Art website, "About Media Matters in Art." http://mattersinmediaart.org. Accessed Accessed
February 24, 2018.

distinguish permanent from temporary, iterational, and decision-based artwork components and parameters."[51]

The Inside Installations 2iDM model was part of a larger European research project funded by the European Commission focused on conserving installation art, led by the Tate Conservation department beginning in 2004.[52] The DOCAM Research Alliance was created by the Daniel Langlois Foundation for Art, Science and Technology in 2005 and funded by a Canadian research council with multiple university research partners around the world.[53] Each of these projects mainly looked at how to describe and structure artwork with multiple components in a database or content management system. Of all the prior models, Phillips concludes the Inside Installations model as providing "the most versatile and inclusive documentation structure," as it "supports the entry of detailed data on a component level, and all constituents relevant to collection environments."[54] Phillips points out the DOCAM and 2iDM are built to capture records of iterations of the artwork which the MMA model does not, however, she writes "just like MMA and the DOCAM model, the 2IDM lacks support for component-based reporting of decision-making processes."[55]

The 2iDM model offers extremely detailed visualizations of models for mapping data about artwork into a database structure, to loan request procedures, as well as checklists for

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[51]Phillips, Joanna. "Reporting Iterations: A Documentation Model For Time-Based Media Art," p.172.
[52] Inside Installations Archived website "Introduction to the Project." Accessed February 24, 2018. http://collections.europarchive.org/rce/20120208162002/http://www.inside-installations.org/project/detail.php?r_id=643&ct=introduction
[53] Documentation and Conservation of the Media Arts Heritage (DOCAM) website, "Background." http://www.docam.ca/en/docam/background.html. Accessed February 24, 2018
[54] Ibid
[55] Phillips, Joanna, p. 172.

various types of contemporary art categories.[56] It is a thorough approach to documenting

complex and variable work into a database environment and providing guidelines for museum

staff. The 2009 website has been archived in a Europeana Collection and numerous publications

have been produced from it including a book by Tatja Sholte and Glenn Wharton in 2011.[57]

For the purpose of documenting of *Double Negative*, I'm interested in combining

Phillips' documentation model with a conceptual model shown on the DOCAM website. I think

it can add the support for the decision making process that Phillips found in her model with a

hierarchical framework and provide a helpful way of understanding the connections the

documentation reports with the components and stages of time-based installation artwork.

**FRBR and the DOCAM Documentation Model**

The model created by the DOCAM Research Alliance developed a framework for the

digital representation of a media artwork through considering four parameters: "completeness

of sources, range of document types, and agents (producers and users); distinctive nature of

media artworks; lifecycle of the artwork; and hierarchical description of the work."[58] The model

breaks down the lifecycle of an artwork into four categories: Creation, Dissemination, Research,

and Custody. Under Creation, Dissemination, and Custody, there are subcategories, while

Research has none. Below is an illustration of the lifecycle of a work in the DOCAM model:

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[56] Inside Installations Archived website "Inside Installations Documentation Model." Accessed February 24, 2018. http://collections.europarchive.org/rce/20120208162002/http://www.inside-installations.org/research/detail.php?r_id=482&ct=model.

[57] Tatja Scholte and Glenn Wharton, *Inside Installations: Theory and Practice in the Care of Complex Artworks* (Amsterdam University Press, 2011), http://www.oapen.org/download?type=document&docid=467012.

[58] Documentation and Conservation of the Media Arts Heritage (DOCAM) website, "Presentation of the Model." http://www.docam.ca/en/documentation-model.html. Accessed February 24, 2018.
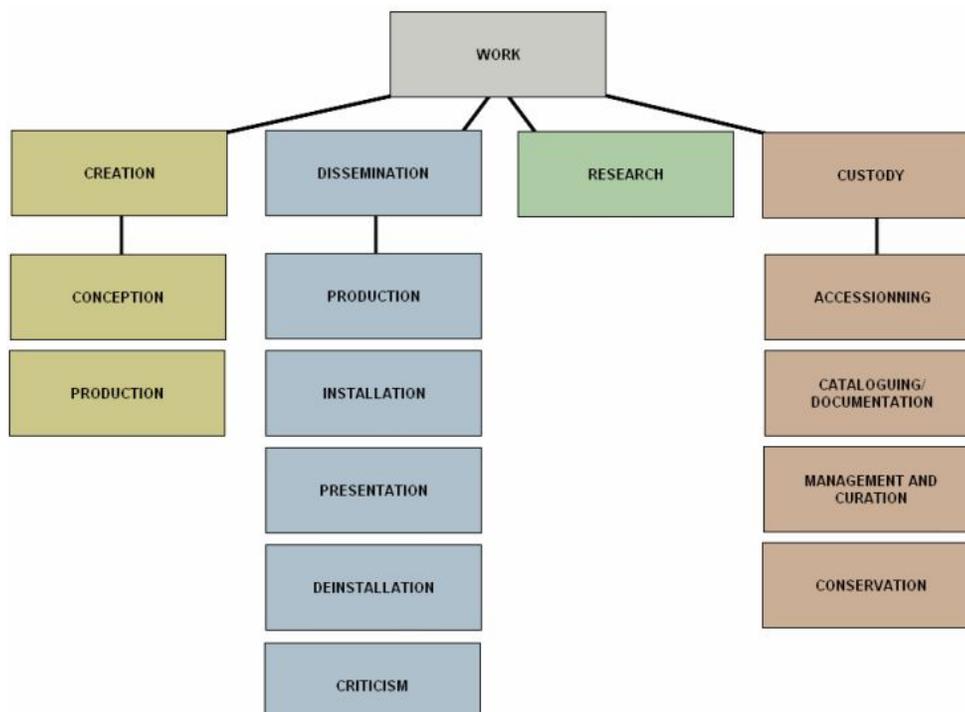
Lifecycle of a Work flowchart. From "Presentation of the Model" page of DOCAM website.

The DOCAM website provides a Visualization Interface illustrating three media works used as a case study with the model. The Flash based interface highlights images, documents, and URLs related to the categories and subcategories above.[59] When it comes to describing iterations of works, the DOCAM model looks at a hierarchical description model developed by the International Federation of Library Associations and Institutions (IFLA). The model is called Functional Requirements for Bibliographic Records, but known by its acronym FRBR. Developed after a multi-year IFLA working group process in 1999, FRBR provided a framework of relationships between entities and as described in a pamphlet about FRBR from the Library of Congress, "a more precise vocabulary to help future cataloging rule makers and system designers in meeting user needs."[60]

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[59] Documentation and Conservation of the Media Arts Heritage (DOCAM) website, ", "Visualization Interface." http://www.docam.ca/en/visualisation-interface.html. Accessed February 24, 2018

[60] Tillett, Barbara. *A Conceptual Model for the Bibliographic Universe*. Vol. 25. 5. Library of Congress, 2003. https://www.loc.gov/cds/downloads/FRBR.PDF.

NYU Professor Howard Besser, a participant in the DOCAM Research Alliance, wrote about the use of FRBR in distinguishing between iterations of contemporary artwork. Besser has argued since 2000 that the FRBR model "would provide a conceptual structure for handling the variant forms that one might find in each re-installation of a contemporary art piece."[61] In 2012, he described the basic use of FRBR to describe the relationships between lower entities in the hierarchy inheriting metadata from higher entities in a paper for an ILFA conference. He used the following example for an entity relationship that could appear in a library:

> "We could place the written fable of 'La Belle et la Bête' (Beauty and the Beast) by Garbrielle-Suzanne Barbot (1740) at the top of the hierarchy, and describe the basic plot and characters. We'd place the 1756 abridgement and the 1757 English translation below Barbot's, and they would inherit metadata about the plot and characters, though the English translation would have different names for the characters. Cocteau's 1946 film would inherit the metadata from one of the French versions, and Disney's 1991 film would inherit most metadata from the earlier English translation. The Disney film would add metadata concerning the songs to that particular version (it was a musical), and that metadata, in turn, would be inherited by the Disney theatrical production that played on Broadway from 1994-2007."[62]

The framework of FRBR, Besser explains, should allow for metadata or additional description about an artwork to be "passed" from the "parent" or "grandparent" level of the
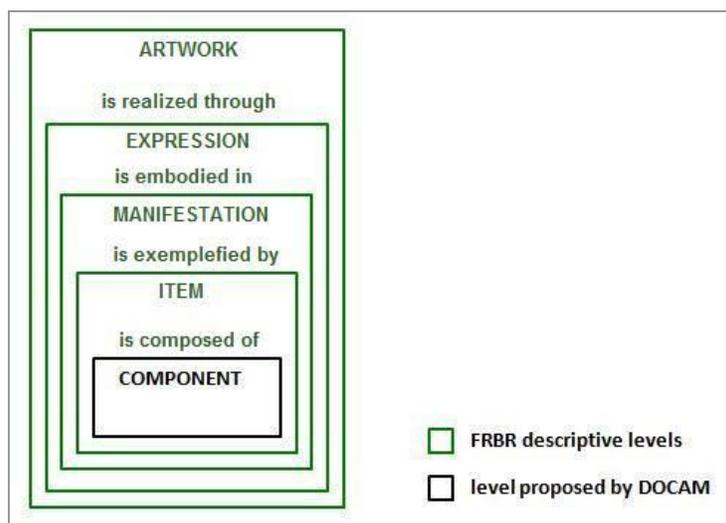
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[61] Besser, Howard. "Contemporary Art That Does Not Last Without Being Changed: Issues for Librarians." 2012, p. 8 http://www.arlisnorden.org/uploads/6/0/9/2/6092407/art-now-paper-besser.doc.
[62] Ibid

hierarchy to the "child" level of the hierarchy and "each child only needs the metadata that describes the ways in which it differs from its parent."[63]

The DOCAM model website explains the levels of FRBR for artwork simply: the first level, the Artwork, is "a distinct intellectual or artistic creation;" the second level, Expression, is "the intellectual or artistic realization of the work;" the third level of Manifestation is "the physical embodiment of an expression of a work;" and the fourth level, the Item is "a single exemplar of a manifestation." The model proposes the addition of a Component level to the FRBR framework to describe media installations, which is deemed as "necessary because components are at the very heart of the changes affecting most media artworks. The addition of this level promotes the identification and collection of documents that make reference to a specific component in the item, which in turn facilitates the tracking of changes made to the work throughout its lifecycle." [64]

Below is a visualization of the hierarchical model from the DOCAM website:

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[63] Besser, Howard. "Contemporary Art That Does Not Last Without Being Changed: Issues for Librarians." 2012, p. 8 http://www.arlisnorden.org/uploads/6/0/9/2/6092407/art-now-paper-besser.doc. Accessed February 24, 2018.
[64] Documentation and Conservation of the Media Arts Heritage (DOCAM) website, "Presentation of the Model." http://www.docam.ca/en/documentation-model.html. Accessed February 24, 2018.

For time-based media installations with multiple components, information documented about the creation of artworks (Artwork) can carry over to the (Expression) realization of that artwork to component parts with artist provided installation specifications, which are then produced (Manifestation) in each installation of the piece. An edition or a specific successful installation could be seen as an exemplar of the work (Item). Then the Component level could be component, integration, and component reports in an acquired work.

Combined with Phillips' documentation model, Iteration Reports would be generated from each of the work's Manifestations. All reports, including Component Media Reports and Identity Report would reside at the Component Level of the DOCAM model. The Identity Report would be informed by all the documentation about the iterations and media.

**Visualizing Documentation Models through Double Negative**

The Artwork *Double Negative* would be the first level of the DOCAM model.

It is realized through the Expression levels of the two 16mm parts as one component, the HD video as the other component, and the installation specifications document.
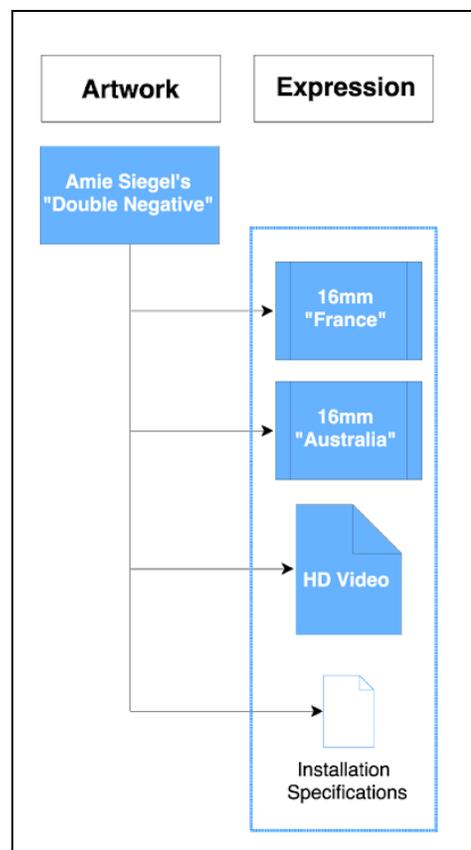
Each produced iteration at the Museum Villa Stuck, Simon Preston Gallery, Monash MUMA, and the Frye Art Museum are the Manifestations to date.
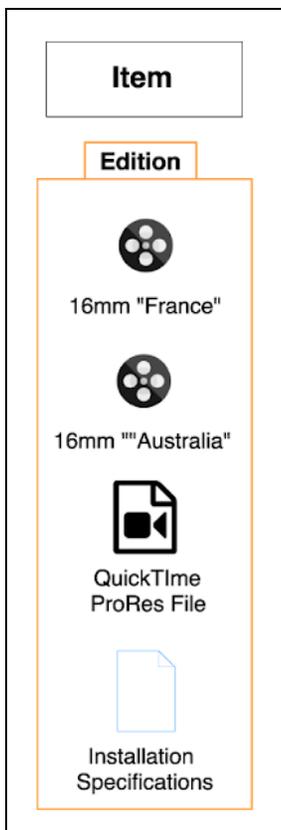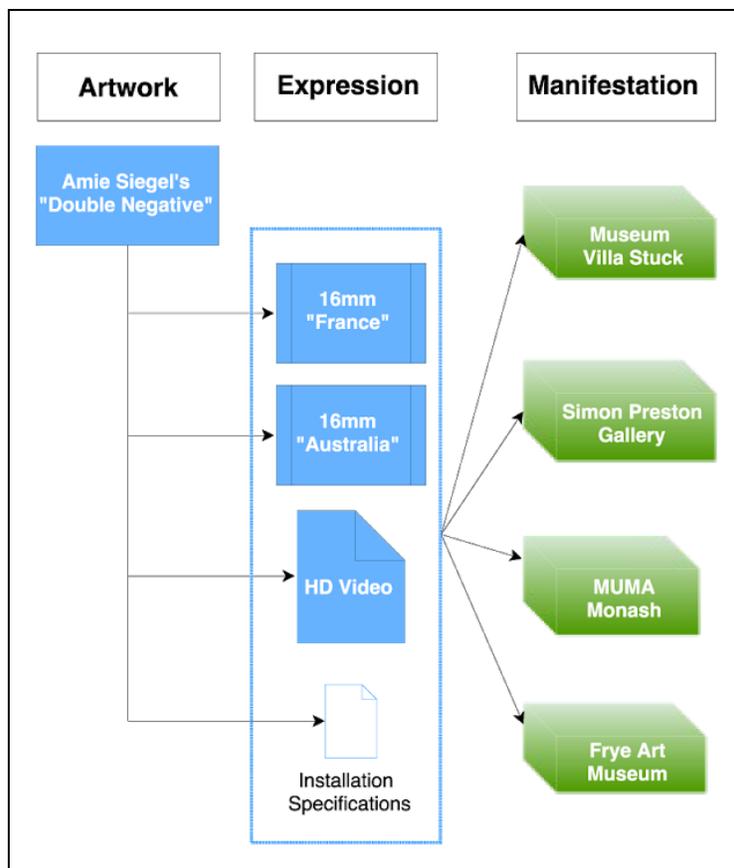
The edition of *Double Negative* that an acquisition is based on would be the exemplar example of Item level.

The Component level of the DOCAM model would be each 16mm object, and related elements, the HD video file, and Component reports describing those objects. Iteration reports from each exhibition would also be included in this level. Finally, the Identity report, which relates to the Component and Iteration reports, would be at this level as well. The Component level of DOCAM maps out objects that would be identified and stored in a content management system. The digital objects would be stored in a digital repository. No dedicated equipment is part of an acquired edition of *Double Negative*, as shown in the Item level of this model. If dedicated exhibition equipment is acquired, it would be mapped at the Component Level.
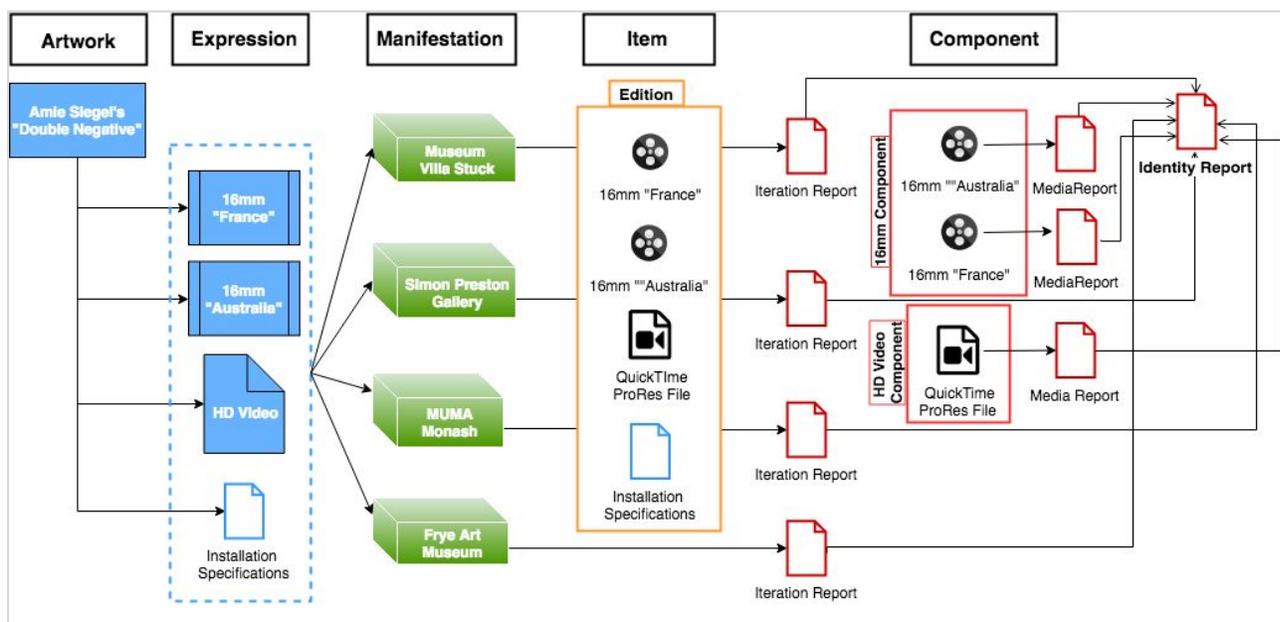
The DOCAM / FRBR model could be used to think about artwork related to ideas from *Double Negative* such at the *Jumeaux Twins* and *Polarity Prints* series of photographs derived from the 16mm component's production footage. They are different Expressions of the same concept of the Artwork, even though they are separate works of their own and available as separate editions. Collectors and institutions have acquired prints from the *Jumeaux Twins* and

Polarity Prints series. While these works have not always shown with *Double Negative*, such as

for the MUMA Monash show, it would be unlikely they would be shown without the 16mm and

HD video components of *Double Negative*.

A visualization of the *Jumeaux Twins* and *Polarity Prints* series could appear like this:
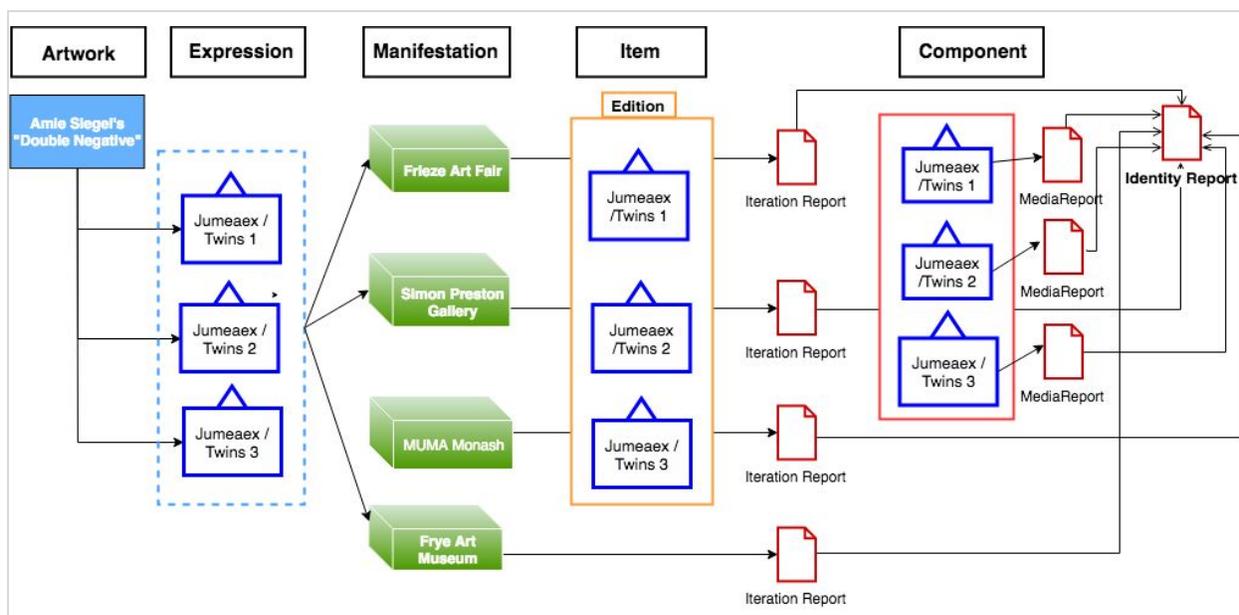
Each work would show up at the Expression level. When they appeared with an iteration

of *Double Negative*'s 16mm and HD Video Component, it would be recorded on those iteration

reports. Each series would have its own edition at the Item level (only *Jumeaux Twins* is

showing in this visualization for simplicity sake). Each print in the series would get their own

Component / Media Report, which informs the Identity Report of *Double Negative*. Each object

would then get identified in the museum's content management system.

6) Conservation of Components Objects and Files

Elements and Editions

The previous chapter focused on the conservation of the collaborative nature involved in installations of *Double Negative*. It follows a framework and documentation process outlined by time-based media conservators to capture the identity of the work as it develops by being exhibited. This informs its conservation and future installations. This chapter focuses on the media objects themselves within the installation. For the analog and digital objects in components of *Double Negative* I'm going to look at preservation risks for specific formats involved, current best practices for mitigating them, and potential future conservation scenarios. For the purposes of this chapter, I'll be referring to the 'preservation' of audiovisual and digital objects as the practices stem from the audiovisual archiving and preservation discipline in film, video, and digital archives, rather than the art conservation discipline developed in museums. I will continue to use the term 'conservation' when discussing the entire artwork or identity of the installation. When relating to contemporary works of art, particularly time-based media, museums utilize both terms and traditions in their practice of describing, archiving, and developing procedures for the custodial care of contemporary art.

Throughout the chapter I will be discussing conservation and preservation of both an acquired edition of *Double Negative* as well as steps towards preserving original audiovisual elements. All of Siegel's work for gallery exhibition has limited editions, a practice long adopted by visual artists and used by many contemporary visual artists working in time-based media. This has its function in the marketplace for creating scarcity, creating exclusive rights for exhibition of her work and prompts collectors and institutions to consider Siegel's entire body

of work, if a popular artwork has been sold out. Acquiring editions of artworks, rather than all the elements used to create it, is also preferred by museums as it allows them to focus their storage and preservation resources. Erika Balsom, Senior Lecturer in Film Studies at King's College London, stated in a talk she gave at LOOP Barcelona, that "the editioning model is about the future of the work," and not merely a function of the marketplace, additionally a way to ensure "the artwork is amenable to the institutional structures that participate in preservation and acquisition."[65] In her chapter on limited editions in her 2017 book, "After Uniqueness: A History of Film and Video Art in Circulation," she explains due to the costs involved with preservation, "an institution is more likely to invest in a given work if it has secure knowledge that it is one of a limited number of stakeholders in it. For many moving image art-works, editioning is perhaps the best way to ensure long-term safekeeping."[66] For artists, she sees "the increased embrace of the limited edition model is representative of a situation where artists are beginning to meet these institutions halfway."[67]

Conservation of Exhibition Hardware for Double Negative

No equipment is part of the acquired edition of the *Double Negative*. It is likely that institutions acquiring the work would seek to acquire dedicated projectors for the 16mm component synchronization. Acquiring dedicated equipment such as this ought to look at the Kino Club setup installed by David Leister as an example. The Kino Club web page, "Looper

[65] Loop Barcelona website, "'Editioning the Moving Image: Old Problems and New Possibilities' – A Talk by Erika Balsom – Loop Barcelona" June 5, 2015. Accessed February 5, 2018. https://loop-barcelona.com/video-conference/editioning-the-moving-image-old-problems-and-new-possibilities-a-talk-by-erika-balsom.

[66] Balsom, Erika. After Uniqueness: A History of Film and Video Art in Circulation. Columbia University Press, 2017, p, 155.

[67] Loop Barcelona website, "'Editioning the Moving Image: Old Problems and New Possibilities' – A Talk by Erika Balsom – Loop Barcelona."

Services," mentions "the standard NT1 and SL range of EIKI /ELF projectors" as ones that the looper match with.[68] From photos from *Double Negative* installation, it appears Leister used an Eiki / Elf NT-1 and not an SL model as its playback controls are towards the rear of the projector. User instruction manuals can help in identifying projectors, setting them up, and understanding their operation and maintenance. More complex understanding of the mechanical and electrical setup can be discovered from service manuals. The Film Tech website has both operators' and service manuals for Eiki "N" series projectors.[69] Each manual states that it applies to the whole "N" series of Eiki projectors models. The name "Elf" appears to have been a branding for Eiki projectors in the United Kingdom, as some users reported in this 8mm Film Tech forum[70]. Eiki prided itself on creating modular units that to make repairs easy, as their website still attests today.[71] Online sellers still allow for the acquisition of belts, lens holders, bulbs, fuses, exciter lamps, and other parts for the N series projectors. Parts like this ought to be acquired to service and maintain this dedicated equipment.

Archivist Matthew Cowan gave a talk called "Installation and Exhibition: Film Projection in the Gallery" in April 2012, at the Hirshhorn Museum and Sculpture Garden, Smithsonian Institution, in Washington D.C. It was part of the *TechFocus II: Caring for Film and Slide Art* conference organized by the American Institute for Conservation (AIC) Electronic Media Group. One common issue he talks about with projecting film in a gallery space is the focal length of

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[68] Kino Club website, "Looper Services." Accessed April 6, 2018. http://www.kinoclub.co.uk/looper.html.
[69] Film-Tech website, "Equipment Manual Warehouse." Accessed April 8, 2018. http://www.film-tech.com/warehouse/index.php?category=2.
[70] 8mm Forum, "Eiki/Elf Lists?" Accessed April 7, 2018. http://8mmforum.film-tech.com/cgi-bin/ubb/ultimatebb.cgi?ubb=print_topic;f=5;t=001399.
[71] Eiki projectors website, "About EIKI." Accessed April 7, 2018. https://www.eiki.com/about-us/.

the lens used.[72] Most 16mm projectors will come with a 50mm or 2-inch lens. This focal length does not allow for placing the projector very close to the projection surface where a 25mm or 1-inch lens would be ideal. Cowan explains these lenses are harder to come by and more expensive. Another issue with seeking something other than a 50mm lens is that sellers will say they have a 1-inch lens that is actually a few millimeters different than 25mm. This would cause a problem for exhibiting a work like Double Negative, where both projected images need to be precisely the same size.

The loopers used by Kino Tech for Double Negative fall into the type of looper that Matthew Cowan calls a 'Handle" type looper. They are designed to physically mount to the projector and use the projector arms to feed the film. The second type of looper Cowan categorized in his talk is the "Tabletop" looper, which has its own arms and mount separate from the projector. Kino Club's design fit the Eiki NT or SL projectors aesthetically and physically and is made for playback films with longer durations than Double Negative. They are a "bespoke" system developed by David Leister in a manner similar to his XLR cable sync-pulse synchronization system. A "Handle" type looper would be key to the visual character of the exhibition of Double Negative. A video on how to set up film with a "Handle" looper can be found on the London-based No.w.here website (currently that is Flash based).[73] Due to the length of the films, about 150 feet each, any quality "Handle" type loopers that fit with an Eiki projector would suffice.

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[72] Cowan, Matthew. "Installation and Exhibition: Film Projection in the Gallery," April 28, 2014. Martha Signer Vimeo page, https://vimeo.com/111421662.
[73] No.w.here website, "16mm Loopers." Accessed April 7, 2018. http://www.no-w-here.org.uk/index.php?cat=4&subCat=docdetail&id=80.

The modular nature of the Eiki "N" series projector allowed David Leister to develop his XLR sync-pulse synchronization system. This would be the greatest technical hurdle to achieve with the *Double Negative's* 16mm component's exhibition. Mechanical synchronization could only work if the sound of the external synchronizing motor has the same or lesser amount of noise as the XLR cable system used by Kino Club. Developing something like this XLR cable based sync-pulse system and its slave and master synchronizing motors would necessitate time, testing, and expertise advice. The resulting system with much quieter than motorized synchronization would be key to presenting *Double Negative*.

The screens for the 16mm component can be constructed with Dibond 3mm White/White material[74] following guidelines set in the artist specifications. Dibond is manufactured by GraphicDisplay, the same company that manufactures Fome-Cor. Samples can be ordered from their website. The Dibond is composed of two pieces of aluminum, with a layer of polyurethane in the middle. Following the installation specifications, the Dibond should have an aluminum frame behind it, which would be where the cables and hooks would be attached. The parts for the screens are readily accessible and still manufactured, but if they were seen to a dedicated piece with exhibiting *Double Negative*, the aluminum frame and Dibond screen are made of extremely durable materials, not readily prone to deterioration from poor storage conditions.

Any video projector used or acquired for the HD video component would need to follow the artist provided installation specifications of being able to project 1920 by 1080 pixels, have a minimum of 5,000 lumens, and be able to mask to the four by three aspect ratio. For audio,

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[74] GraphicDisplay USA website, "Dibond Aluminum Composite Material. Accessed April 7, 2018.
https://graphicdisplayusa.com/products/dibond

just a system capable of left and right channels and a subwoofer is needed. Aside from the Eiki projectors and "Handle" style loopers, other equipment that might be dedicated to *Double Negative*, does not need to be particularly unique or treated differently from other audiovisual or display equipment. For all the equipment related to exhibiting the work, stable temperature and relative humidity levels would be ideal for their conservation.

The 16mm Component Media

When the sea change in digital production, and particularly distribution, of video occurred in the mid-2000s through the early 2010s, film manufacturers began to stop producing certain 16mm film stocks and film labs stopped developing 16mm film. Print stocks and black and white developing were the first to suffer, due to the lack of market demand. In 2015, the same year Double Negative was completed, Kodak stopped manufacturing their 7302 fine grain master print stock. Upon learning this, Siegel purchased several hundred feet of the 16mm stock to use for creating interpositive prints for the two films of Double Negative. The intermediate step is critical to the process of exhibition as all the prints projected during an exhibition run are struck from it and those prints need to be changed after two weeks in each exhibition. Siegel wanted to ensure the prints would maintain the appearance found in initial installations of the work. There is a replacement acetate print stock produced by ORWO, a German film manufacturer. DN21 was one stock Colorlab chose to substitute to the Kodak 7302 stock for the intermediate / interpositive step for *Double Negative*. As of yet, the use of the replacement stock has not been done with any new film elements. All film stocks have different grain structure and the graininess of polarity print is a key to its visual character. The replacement ORWO stock for the intermediate may prove completely satisfactory to Siegel, but

that can only be known through test prints. The approval of this step ensures that the 16mm

component *Double Negative* can continue to be shown in a manner she approves.

Finding a replacement step for the 7302 interpositive is something the artist should

investigate sooner rather than later. There is a reserve of the 7302 stock that Siegel can use,

but preparing *Double Negative* for when the 7302 stock is no longer available is important for

the longevity of the work. If an exhibition runs for three months, and prints need to be changed

every two weeks, which means six prints of one channel of the 16mm component. 12 to 16

prints need to be made for every exhibition. There is a limit to the amount of times an original

element can be used to make prints. The preservation best practices from the International

Federation of Film Archives (FIAF) state "masters and printing elements will not be endangered

by excessive use. The number of times a master element is exposed to such processes should

be strictly regulated, for example by limiting the number of prints that can be made from an

original element before the mandatory production of a duplicate."[75] Various film labs will give

different answers to the question of how many times is too many to run an original element

through a printer, but it lies somewhere between 30 to 50 times. So when 12 to 16 prints are

needed for an exhibition, the reserve of 7302 Siegel possesses could be used up quickly if

Double Negative suddenly get a lot of exhibitions.

An option worth considering is to make a digital intermediate to create exhibition prints

from. This may be difficult to get a film lab to do because of their quality control processes for

making prints. A lab can be precise when creating 12 to 16 prints using their photo-chemical

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[75] Fédération Internationale des Archives du Film (FIAF) website, "FIAF Technical Commission Preservation Best Practice." Accessed April 8, 2018.
http://www.fiafnet.org/images/tinyUpload/E-Resources/Commission-And-PIP-Resources/TC_resources/Preservation%20Best%20Practice%20v4%201%201.pdf

workflow. Creating a "film out" for prints from a digital source with a film recorder, means

exposing and developing film elements without the traditional controls that are in place in the

photochemical process. It is generally reserved for creating intermediate element from digital

sources. The consistent quality needed to make multiple prints isn't inherent in film scanners.

However, Siegel may want to look at scanning a newly struck 7302 interpositive print to capture

the visual character of that print stock. If it was scanned to create DPX files, metadata

information about the 7302 stock could be captured in the DPX headers. This digital

intermediate could then be used on a fine grain print stock to create an interpositive element.

The result would still need to be a film print to maintain the identity of *Double Negative*, but

digitally preserving the 7302 interpositive would capture the visual characteristic used to create

the prints and would capture the same grain structure from the negative to interpostive

printing process.

The HD Video Component

When looking at digital video files, there are risks for obsolescence to look at for the

codec, the compression encoding and decoding technology, and the file wrapper, the actual

container for all the elements used to playback the file. The file wrapper is usually expressed by

the file extension (.mov, .avi, .mp4, etcetera). Both the codec, file wrapper, and other technical

metadata, such as audio properties, frame size, frame rate, and other data, can be discovered

through utilizing open source tools such as MediaInfo,[76] which has a graphic user interface

(GUI) version available for multiple operating systems in multiple languages. Many codecs and

file wrappers are proprietary, or developed by software companies, who do not share much or

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[76] MediaInfo website "About MediaInfo." Accessed March 13, 2018. https://mediaarea.net/en/MediaInfo.

any documentation about how the technology functions or was developed. Non-open source software creates a risk for obsolescence as a developer can decide at any time that they will no longer support or will utilize a codec or file wrapper. This could leave a file unable to playback, or potentially even to open, as computers and operating systems are updated.

Using MediaInfo to extract metadata from the *Double Negative* HD video component exhibition file reveals the following technical metadata: it is 24 frames-per-second; with 24 bit PCM audio (a standard Pulse-Code Modulated uncompressed audio format); in a QuickTime (.mov) wrapper; and an Apple ProRes (HQ) 422 video codec. The QuickTime wrapper and ProRes codec are very widely adopted in cameras for production, editing systems and encoding tools for post-production, and by galleries and museums for exhibition. Wide adoption is a very good protection against obsolescence, but it is not a panacea. The fact that Apple offers little documentation for the source code behind ProRes makes it highly vulnerable to obsolescence if and when they decide to stop supporting it. Support was already discontinued for QuickTime 7 for Windows in 2014. The QuickTime wrapper is also vulnerable to Apple's proprietary control. As for the audio codec, PCM has long been utilized as an uncompressed standard and 24 bit is a very good bit depth for preservation purposes.

To preserve the video file, transcoding (or exporting it into another codec) to an uncompressed codec and open source file format would both be good practice. This would create a version less vulnerable to obsolescence, without adding additional compression from a lossy codec. The uncompressed FFv1 codec is part of the open source FFmpeg open source framework tool for digital audiovisual playback, encoding, and manipulation. The FFmpeg tool itself is a command line utility, but it is also used by developers of the VLC player, Handbrake

.mp4 encoding tool, Audacity audio processing tool, and other web utilities for playing back and

processing audio and video files. The Matroska file wrapper (.mkv) is format advocated by

archivists and libraries due to its open source nature and the robust ability for embedding

metadata attachments within file wrapper. Both FFv1 and Matroska are generally created and

manipulated in the command line protocol of computers, which can make them very

intimidating to use. Since they are open source there is a lot of documentation and instructions

available online. The AMIA Open Source Committee GitHub page[77] is an excellent and growing

resource for open source tools such as FFmpeg, Matroska, and other audiovisual digital tools

and time-based media resources.

When thinking about uncompressed video files, the resulting file size is a major

consideration. When thinking about the Double Negative HD video exhibition file, it has a four

by three image contained within a 16 by 9 (1920 by 1080) aspect ratio. This was a choice Siegel

made during the production, post-production, and exhibition process. When looking at

preserving an uncompressed preservation master, cropping off the black pillar boxes at each

side of the file could save a considerable amount of hard drive space. It could also speed up any

digital preservation processing of the file. The resulting frame size of a four by three file size

would be 1440 by 1080. This type of treatment of the exhibition file submitted by the artist

would need to be approved by them. Any exhibition file generated from the preservation

master could still be made to conform to the four by three image within a 16 by 9 frame in

order to align with installation specifications. Piotr Komarnicki from Eidotech, the Berlin based

company that installed most of Siegel's work, explained via email that the HD resolution of

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[77] AMIA Open Source Github page. Accessed March 12, 2018. https://github.com/amiaopensource.

1920 by 1080 is optimal when using playback equipment such as a Blackmagic Hyperdeck

system. So a 16 by 9 exhibition file would need to be generated from a four by three

preservation master file. Creating a cropped preservation master file would be a reversible

process, adhering to the sixth guideline of the AIC Code of Ethics to ensuring reversibility and

not adversely affecting future treatment, [78] as long as the original exhibition file from the

acquired edition was digitally preserved along with the cropped uncompressed preservation

master file.

I discussed this idea briefly with Siegel and she recalled that a four by three version had

already been created. As part of the deliverables from her post-production house Post-Republic

in Berlin, who color graded and created her final exhibition master, she received DPX files of her

final color graded work. This is something she has done with her post-production since

Provenance. For *Double Negative*, they delivered her DPX files with the image cropped to four

by three. If the exhibition file was all there was to work with, a simple crop command using

FFmpeg could be utilized to set the file to a specific frame size. This process wouldn't re-encode

the file, but would simply create a new file cropped to the new dimensions. On the FFmprovisr

GitHub page there are multiple FFmpeg commands. Under Change Video Properties, there is

the Crop Video command.[79] Going through the command line instructions in Terminal, you can

see how the file isn't re-encoded to a new codec:

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[78] American Institute for Conservation of Historic & Artistic Works (AIC) website, "Code of Ethics and Guidelines for Practice." Accessed March 10, 2018. http://www.conservation-us.org/our-organizations/association-(aic)/governance/code-of-ethics-and-guidelines-for-practice#.WqQBC4JG1p8.

[79] AMIA Open Source Github, "Ffmprovisr." Accessed April 6, 2018. https://amiaopensource.github.io/ffmprovisr/#crop_video.

ffmpeg -i /*[File Path Location]*/Double-Negative_HD-video.mov -vf "crop=1440:1080"

/*[Destination File Path Location]*/Double-Negative_HD-video_4x3.mov

After the command to use FFmpeg [ffmpeg], you tell the tool what file you want to apply commands to [-i] and then you can drag the file itself into Terminal to create the file path [/*[File Path Location]*/Double-Negative_HD-video.mov] and then the crop tool is applied with the command [-vf] for video filter. Using quotes, the desired crop size is indicated [1440:1080] and the tool will crop from the center of the file. The last step is to just indicate to FFmpeg where to send the resulting file and what the new file name will be [/*[Destination File Path Location]*/Double-Negative_HD-video_4x3.mov].

A Case for Artists Preserving Their Own Work

An acquiring institution, such as a museum, is understandably primarily interested in conserving elements acquired. It is in the mission of those institutions to focus on the care of the objects in their collection. Keeping this in mind, I want to discuss preservation of production materials held by Siegel used to create the work. In doing so, I want to explore risks and archival practices that an artist may want to consider for preserving material that may or may not get acquired or accessions in a collecting institution. In the traditional model of editions of an artwork, the artist retains the artist's proof (AP) that could be sold once editions have been sold out. The concept of the artist's proof comes from printmaking and "originally designated a print made to test quality but has since come to refer to copies retained by the artist that exist outside of the numbered edition and are generally not for sale."[80] For *Double Negative*, they would be original production elements and would need to be preserved by the artist herself.

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[80] Balsom, Erika. After Uniqueness: A History of Film and Video Art in Circulation. p, 256.

As I've made clear, conservation of contemporary art relies on material and information from the artist (or their assistants) to fully describe and understand the intention behind the concept and exhibition of a given work of art. The ability for a museum to conserve a contemporary work of art depends on the amount of information available about it as much as its custodial faculties or ability to retain that information. Here is where artists understanding and taking steps toward the conservation of their own work can benefit all parties interested in an artist's work. Artist can participate in gathering information for themselves or a collecting institution. They can capture and retain as much information about the conception, creation, production, and exhibition of an artwork. This allows for the preservation of the artist's intention, as well as collaborations to achieve it, long into the future.

Any preservation steps for identification, storage, and documentation should be seen as aiding in the eventual process of acquisition and accessioning of work. The staff, infrastructure, resources, and mission of museums and archives allow them to conserve and preserve artwork like no other institution. None of the following steps suggest artists precluding their work from being acquired or accessioned into a museum or archive. Some museums lead in the field of conservation of complex and variable artwork with their own digital preservation infrastructure, while many others are unable to develop robust preservation practices. This may be due to limitation of funding, space, infrastructure, and staff. The goal of this chapter is providing information to aid in the preservation of analog and digital elements given the means, ability, and space an artist currently has at their disposal and is in the spirit of the eighth goal in the AMIA Code of Ethics "to share information, expertise and technical knowledge."[81]

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[81] Association of Moving Archivists (AMIA) website, "Code of Ethics" Accessed March 10, 2018. http://deepfocusresource.com/about/code-of-ethics.

In the final chapter of the 2006 *Results You Can't Refuse: Celebrating 30 Years of BB Optics*[82], Bill Brand, artist, filmmaker, and owner of the film preservation lab BB Optics, wrote an essay with Toni Treadway called "A Self-Preservation Guide for Film/Video-Makers." The chapter by itself is available on the Flaherty Film Seminar website in English and Spanish.[83] It begins by acknowledging that most artists and filmmakers "are better at making art than keeping track of the art they make," and that preservation of work can seem overwhelming where "we feel we must make a choice between producing new works and preserving old ones. But doing only a little, or a little at a time, can go a long way toward preserving our work and can actually help set the conditions for completing new projects. With only a little effort we can make it a lot easier for others to preserve our work in the future." The steps outlined are mainly steps that can be taken to preserve film prints and elements, but the model and recommended steps for time-based media artists to take for preserving and preparing their work for collecting institutions is something I'd like to explore.

Preserving 16mm Elements

Aside from any exhibition prints in the artist's possession, there are the original negatives to consider for *Double Negative*. Any intermediate prints, A & B roll conformed negatives, and the raw 7302 stock are with Colorlab for the time being. Eventually all these elements will be part of a collection of 16mm elements that artists would need to store and conserve. To begin with, black and white film is well suited to maintain its integrity for the long-term, given proper storage conditions as there are no color dyes to worry about like in

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[82] Brand, Bill. *Results You Can't Refuse: Celebrating 30 Years of BB Optics*. Edited by Andrew Lampert. New York: Anthology Film Archives, 2006.

[83] Flaherty Film Seminar website, "Self-Preservation Guide for Film/Video Makers." The Flaherty, July 22, 2015. http://flahertyseminar.org/collaborations/preservation-filmvideo-makers/.

color film. But the 7222 camera negative, The Kodak 7302, and the ORWO DN21 intermediate stock are acetate-based stock. Cellulose acetate has been the base of 16mm film since it was invented as it is inflammable, thus given it the name 'safety film' and making it possible for home and amateur use, unlike the previously used film base, nitrate acetate. Unless properly stored, cellulose acetate is vulnerable to a chemical deterioration known as 'vinegar syndrome,' where acid reacts in a manner that is autocatalytic - or it reacts further to the acid already produced.[84] Heat, humidity, and dust increase the chemical reaction to where the base of the film becomes brittle, buckles, and the silver halide which holds the image can fade. The vinegar-like smell of the acid being released by the chemical breakdown is the initial indication of vinegar syndrome.

Any of the *Double Negative* prints used for exhibition are on a polyester-based stock. Introduced in the 1950s, polyester film stock is used primarily for exhibition prints. It is much more durable than acetate, but it requires special equipment for splicing and can damage production and printing equipment. If there is an issue with equipment operation, it will stretch and jam up equipment, not break like acetate does, which is why it is relegated to the last step for the film production and distribution process. More importantly, polyester has much less preservation risk than acetate. The Image Permanence Institute (IPI), the world's largest independent devoted to preservation research,[85] has developed several storage guides for photographic and film materials. In 1993, in their guide for acetate film, they state that "although polyester base is also subject to chemical deterioration (nothing lasts forever), accelerated-aging tests show that it will last five to ten times longer than acetate under

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[84] Reilly, James M. IPI Storage Guide for Acetate Film. Image Permanence Institute Rochester, 1993, p. 13
[85] Image Permanence Institute "About IPI." Accessed March 11, 2018.
https://www.imagepermanenceinstitute.org/about/about-ipi.

comparable storage conditions."[86] The chemical breakdown of polyester base is affected by temperature and relative humidity, just not nearly at the same rate.

In "A Self-Preservation Guide for Film/Video-Makers," Brand and Treadway mention one action to take into consideration is the 'microclimate' the film can is stored in[87]. Any paper or material used to pack the film in the can and, in particular, the plastic bag covering the film roll, should be removed. Plastic bags are very commonly used by film labs when delivering material back to clients because in the developing and production stage of film, keeping dust away from the film elements is paramount. However, those plastic bags can exacerbate an autocatalytic reaction such as vinegar syndrome. Rehousing the film in an inert plastic, vented film can without bags or inserts would be ideal for any film roll, regardless of base, and whether it is black and white or color. The venting allows the film an air flow, minimizing the effects of any microclimate. Inert plastic is best because it will not add to any chemical reaction. These cans can be found through archival storage vendors, which along with archival storage facilities, and archival reformatting vendors, can be found in the Association of Moving Image Archivists (AMIA) supplier directory[88].

The IPI lists the International Standards Organization (ISO) standard for black and white film as being within their "Cold" rating of 36°F (2°C) maximum temperature for 50% maximum relative humidity (RH).[89] As RH goes down, the maximum recommended temperature can go up, as water vapor formation is based on temperature and RH. This type of consistent cold

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[86] Reilly. IPI Storage Guide for Acetate Film, 1993, p. 15.
[87] Brand. *Results You Can't Refuse: Celebrating 30 Years of BB Optics*, 2006, p. 88.
[88] Association of Moving Image Archivists (AMIA) Supplier Directory, July 2017. Accessed March 11, 2018. https://amianet.org/wp-content/uploads/Resources-Supplier-Directory-Current.pdf
[89] Adelstein, Peter Z. "IPI Media Storage Quick Reference, 2nd Edition," 2010. https://www.imagepermanenceinstitute.org/webfm_send/301, p. 4.

storage and relative humidity will likely only be available in an archival storage facility. But

many museums have their own cool and cold storage for photographic conservation. MoMA

has an offsite storage facility for its film elements, The Celeste Bartos Film Preservation Center

in Hamlin, PA. MoMA's offsite facility has tiered levels. Color film is stored just above freezing

and black and white film at 45°F with low, but not too low, relative humidity levels[90].

Brand and Treadway suggest storing analog film and videotape elements in

temperatures of 40 to 54 degrees at 30 to 50% humidity, which is a very good range for

short-term storage of film elements. It should be noted that the IPI lists the ISO standard for

polyester-based film at a maximum temperature of 70°F (21°C) and a maximum RH of 50%,[91] so

there is more leeway with polyester base exhibition prints. The IPI developed vinegar syndrome

detection strips, AD Strips, for vinegar syndrome monitoring. They change color over time, and

can be used to monitor the chemical reaction in acetate film. Moisture-absorbing desiccant

packets, similar to those that ship with dry organic dry goods like vitamin pills or dried food, are

also a measure that can be utilized to store acetate and polyester film objects, but they need to

be monitored and changed over time to ensure their effectiveness in absorbing water vapor.

As part of my internship requirements for the MIAP program, I completed internship

hours with the Simon Preston Gallery and in Siegel's studio. Many original negatives had been

returned to the gallery, since Siegel was out of the country. A large part of my internship

entailed creating a survey of all of her audiovisual materials, and I rehoused nearly all of her

film elements in inert plastic vented cans. Only the prints from Colorlab did not have to be

[90] The Museum of Modern Art website, "The Celeste Bartos Film Preservation Center | MoMA." Accessed April 5, 2018. https://www.moma.org/research-and-learning/film-preservation.
[91] Adelstein, Peter Z. "IPI Media Storage Quick Reference, 2nd Edition," 2010. https://www.imagepermanenceinstitute.org/webfm_send/301, p. 4.   .

rehoused, as they had been shipped in archival, vented cans. Following the Brand/Treadway

immediate tasks to take with analog film objects, I engaged in a process of Locate, List, and

Remove from Harm mixed with Inspect, Label, and Improve Containers. My main task in the

internship was to take their steps of Annotate and Place by gaining intellectual control over

each object, creating a unique ID and capturing as much information as possible from the cans

and containers (item and container metadata) in a Google spreadsheet. I also placed all of the

audiovisual objects in archival bankers boxes and packed them for shipping and eventual

off-site storage in an archival storage facility. I had neither the time nor the means to inspect

every film roll, aside from the headers of the roll, but most of the film objects I handled were

original elements directly from the film lab, which had previously been kept in good storage

conditions and showed no signs of vinegar syndrome.

Preservation of Source Video Elements and Documents Used in Production

With an edition acquired by an institution like MoMA, the exhibition prints, and any

additional film elements, as well as the exhibition HD video file, will be preserved in accordance

with best practices utilizing some of the best infrastructure available in an art museum. But just

like the conformed original negatives and original outtakes, preservation of original digital

elements lies with the artist until and unless they are deposited with an archival institution. For

Double Negative, this could include: the source Red camera files; the files transcoded from the

camera originals for editing; the QuickTime of the 16mm negative used for editing together

video 'work print' for the two films; the EDL text file with the beginning and ending key code

numbers for the negative cutter; and the Final Cut Pro project files used to edit the 'work print'

video and the HD video component of *Double Negative*.

Additionally, Siegel already has taken an archival step with the HD video files by having the post-production house, which finished the final exhibition HD video file, export each frame of the video to a DPX sequence of frames and deliver that sequence on an LTO data tape. This is a process she has undergone with HD video digital masters since *Provenance*. DPX, or digital picture exchange, files are uncompressed files that allow for metadata to be stored in the header of each file. LTO (Linear Open Tape) is a consortium-created data tape storage solution. Data tapes offer more stability than spinning disk hard drive servers, at a lower cost. The LTO tapes and DPX files become additional digital files and storage to manage.

Geographic separation is one of the easiest and most effective ways to preserve digital content. Making exact copies of digital files is simple, and storage on a hard drive or LTO tape is inexpensive compared to other media. Keeping those copies in physically different locations reduces the possibility of losing that information due to poor storage conditions, water damage, fires, or constant handling of storage devices. Ideally, a backup copy of files would not be accessed often, and only when there is a real need to copy files from them. Good storage options for this type of backup copy would be a solid state drive or an LTO tape. Solid state drives have fewer moving parts, so they have less points of physical failure than a mechanical spinning disc drive. Linear open tapes are a less expensive alternative to hard drives, but they are intended to be migrated to newer formats of tape. LTO drives will only read two versions prior to the current version of that drive.[92] This versioning model is a framework to ensure data gets migrated. Data migration is an opportunity to check on the integrity of stored digital files, which is a key component of digital preservation.

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[92] Ultrium FAQ website, "FAQ." Ultrium LTO. Accessed April 1, 2018. https://www.lto.org/about-the-lto-program/faq/.

Fixity is defined as "the quality or state of being fixed or stable," by the Merriam Webster Dictionary.[93] Digital files can have errors upon transfer, and data itself can degrade when stored, in a process referred to as "bit-flipping." It is not a common phenomenon, but can only be known and discovered through checking and monitoring file integrity. There are free and open source tools that can be used to verify the integrity of, and monitor, digital files. Some of these tools can be used via the command-line interface (CLI), and some have graphic user interface (GUI) applications.

Kara Van Malssen, Partner and Senior Consultant with AVPreserve, wrote an article in 2012 for *AV Insider* called "Tools for Smaller Budgets: Using Open Source and Free Tools for AV Digital Preservation Workflows."[94] *AV Insider* was a publication from a collection of European audiovisual archives called PrestoCentre. Van Malssen's article focuses its audience on smaller archives that may not have the infrastructure to deal with the more complex digital preservation and provides an excellent, brief history of and overview of the uses of, open source tools in CLI versus GUI interfaces for Mac, PC, and Linux and UNIX operating systems. AVPreserve was known as AVPS (Audiovisual Preservation Solutions) in 2012. Currently, AVPreserve describes itself as a consulting and software development firm with the mission "to free people from the obstacles of information management."[95] Many of the tools Van Malssen describes are available through the links on the AVPreserve site on their "Products" page. Some applications Van Malssen refers to in the article have had their development suspended. Some key tools have since been developed by AVPreserve since.

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[93] Merriam Webster Dictionary, "Definition of FIXITY." Accessed April 1, 2018. https://www.merriam-webster.com/dictionary/fixity.

[94] Van Malssen, Kara. "AV Insider 2: Preservation in Times of Precarity." PrestoCentre, September 18, 2012. https://www.prestocentre.org/resources/av-insider-2-preservation-times-precarity.

[95] Lacinak, Chris. "About Us." AVPreserve website, January 12, 2017. https://www.weareavp.com/about-us/.

In the section "Tools to Support Activities Related to Ingest and Archival Storage," Van Malssen succinctly describes the key process to verify data integrity, whether the digital file is an audiovisual file, still image, or a text, or data file. She wrote, "in order to monitor and manage the integrity of digital files, archives often generate checksums or hashes of the data. Checksums apply algorithms to data, and produce a unique string of characters that serve as a representation of the data in its current state. If anything about that data were to change, whether through corruption or human error, the checksum value would also change." Generating a checksum is the first step in validating whether a copy of a file in another location is exactly the same as the source file.

Common checksums are referred to by the following names, each one representing a progressively more complicated algorithm and longer string of characters: MD5, SHA1, SHA224, SHA256, SHA384, and SHA512. The longer the string of characters, the more unique the number, which is important for verifying data integrity. But more complex algorithms require more time (and computing power) to generate numbers. Longer checksums mean more secure data integrity, but calculating a SHA256 for large audiovisual files will likely tie up staff and computing resources in smaller collections. The MD5 or SHA1 are perfectly adequate for smaller collections, and a base level MD5 checksum will work fine for most individual artist collections of files. If that collection was part of a larger, networked collection, SHA1 (or higher) checksums would likely be used to ensure unique and secure strings of characters for data integrity.

There are multiple command line tools to generate checksums on Windows, Mac, and Linux. Karen's Hasher[96] is a free older GUI tool for Windows, and QuickHash GUI[97] is a cross platform tool available for a small fee. The Library of Congress has a cross-platform tool called BagIt, which prepares files into packages while generating checksums of the files contained within folders and providing a manifest file for the entire package. The GUI application utilizing the tool is called Bagger[98] and can be used on Mac or Windows, as long as Java is installed on the machine. Van Malssen explains that "'Bags' (the product of the BagIt utility) are directories of files, with an inventory of the files contained, and checksums for each object in the bag," and that they are "generated before a group of files are moved to long-term storage, to provide a consistent structure for content and metadata files, or before transfer to a repository or users."[99] So BagIt will generate checksums for your files and prepare them for transfer and storage in archival repositories. One thing to note about all checksum generation is that it can take a long time, and most open source tools give real-time feedback to indicate progress.

In October 2013, AVPreserve released a cross platform GUI tool for monitoring digital files within specified folders. Called Fixity, the application is free, open source, and available on the AVPreserve website.[100] When set up with your email to monitor a specific folder with files and their checksums, Fixity will create a manifest of items in your folder, then will scan the folder and send an email you provided if anything has changed within that folder. There are two

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[96] Karen's Power Tools and Karen's Power Tools website "Hasher v2.3." Accessed April 2, 2018. https://www.karenware.com/powertools/pthasher.

[97] QuickHash GUI, "Home." Accessed April 2, 2018. https://quickhash-gui.org/.

[98] Library of Congress GitHub page, "Bagger: The Bagger Application Packages Data Files According to the BagIt Specification". Accessed April 1, 2018. https://github.com/LibraryOfCongress/bagger.

[99] Van Malssen. "AV Insider 2: Preservation in Times of Precarity." PrestoCentre, p. 17.

[100] AVPreserve website, "Fixity." Accessed April 5, 2018. https://www.weareavp.com/products/fixity

checksum algorithms that can be scanned: MD5 and SHA256. This is a free solution for monitoring file fixity on hard drives connected to your computer or through local networks.

Van Malssen wrote, "When used in combination, the day-to-day workflows surrounding a digital collection can become even more simplified, automated, and effective."[101] There have been efforts to combine open source tools for metadata extraction, encoding, checksum generation, and many other useful tools for audiovisual preservation into larger tools for large-scale digital preservation processing. One such open source tool, Archivematica, functions as a content management system and archival repository. It is a tool employed by MoMA as a "packager"[102] in their digital preservation workflow, and it is utilized by other museums as their digital repository. Archivematica follows the Open Archival Information System (OAIS) reference model. This model utilizes packages, similar to the ones created by Bagger, for ingest, archiving, and delivery of access files. Archivematica creates archival packages from the packages submitted to it, creating checksums for all the files within. MoMA takes the additional step of storing those packages on LTO tapes, and then stores that information in off-site locations in Queens and Hamlin, PA. They then use another tool called Binder, which they developed with the developers of Archivematica, to monitor their collection. This is digital preservation on a very large scale, which can only be carried out at an institutional level, but the fundamentals and tools behind it are free and utilize open source applications.

7) Conclusion

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[101] Van Malssen. "AV Insider 2: Preservation in Times of Precarity." PrestoCentre, p. 19.
[102] The Museum of Modern Art website, "MoMA | MoMA's Digital Art Vault." Accessed April 5, 2018. https://www.moma.org/explore/inside_out/2015/04/14/momas-digital-art-vault.

The previous chapters followed information-seeking steps involved in variable and time-based media installations. I explored the background and artmaking process of Amie Siegel, as there are echoes throughout all of her work, and her time-based media installations in particular. The following of Le Corbusier's designs in *Double Negative* itself echoes with *Provenance*, and the doubling and following of remaking artwork echoes *Berlin Remake* and *Black Moon*. *Double Negative* is the first multicomponent work of Siegel's to have both analog and digital components. The nested layers of copies and cultural representation within *Double Negative* merited a longer exploration, given its concept and production.

Although it has not been exhibited as much as *Provenance* or *Winter*, an identity for the work has developed through the installations to date. Key to that identity are that the work: (1) has both analog and digital components; (2) the components are in two separate but connected rooms (with no seating in the 16mm room); (3) in the analog component, the 16mm projectors have frame-to-frame synchronization; (4) the 16mm projection screens are opposite one another; (5) the HD video element is projected on a wall. All the choices made for the installations are not captured in the current installation specifications, so the artist interview and interviews with key people involved in its installation are crucial. Current editions do not involve dedicated equipment, so any equipment acquired to install the work should either match setups by David Leister for the 16mm installation and Eidotech for the video installation in order to meet approval of the artist.

In looking at the frameworks and models for documenting time-based media installations, I followed the identity-iteration report model to capture the decision-making process for installing *Double Negative*. This model captures the decision-making process and

variations approved by the artist, and I found it extremely useful for documentation. In a visualization exercise, I used DOCAM/FRBR hierarchical model to separate the stages of how *Double Negative* was conceived, expressed, exhibited, editioned, and finally how its component parts relate to the of the iteration, component, and identity reports. This relational model could be used by anyone trying to map *Double Negative*'s installations and media components an acquired edition. Perhaps the DOCAM/FRBR hierarchical model could help to relate how components of *Double Negative*, *Jumeaux Twins 1 - 3*, *Polarity Prints 1-5*, and all of their documentation relate to each other within the content management system of a collector or cultural institution.

Finally, I discussed how the editioning of *Double Negative* makes it amenable to acquisition and conservation in an institutional environment, but also leaves all of the elements used to produce the work in the hands of the artist to conserve. In the spirit of providing information for artists to deal with the preservation and conservation of media in their control, I walked through best practices and steps artists can take on their own to preserve elements of their work. As for the component media included in the edition, I assessed conservation scenarios for the 16mm film component and the HD video component. Given that the edition does not include any dedicated equipment, I described key issues with acquiring and conserving exhibition equipment. Three conservation and preservation concerns for *Double Negative* that ought to be addressed by Siegel are:

1. *Preservation of Original Production Elements*

As far as media objects are concerned, preservation of the original digital elements should be a high priority. Because they are digital, they are susceptible to immediate loss.

Geographic separation of copies of files and setting up a system of monitoring file integrity ought to be put in place as soon as possible.

2. Replacement of Intermediate Step for Creating Polarity Prints

Active steps to find a replacement of 7302 interpositive 16mm stock should be taken sooner than later. Even if Siegel is able to use the stock she purchased to create interpositive prints to create exhibition prints, it is a supply that will run out. Working with Colorlab to get an idea of what how the intermediate ORWO DN21 stock will affect the final 16mm polarity prints is important for future exhibition of the work. I would recommend scanning a clean 7302 interpositive print to capture the visual properties of the prints Siegel has approved. Working with the scanned files as a possible intermediate step would be a viable possibility in the future.

3. Finding Supplemental 16mm Component Synchronization Installation

The last concern is the reliance on Kino Club / David Leister for the 16mm component installation. There is no reason not to utilize Kino Club or David Leister to install the 16mm component when he or one of his trusted assistants is available. Based on his expertise, knowledge, equipment, and history with performing the installation, it would be hard to match the quality of a Kino Club install. Not many other vendors use the XLR sync-pulse system for 16mm synchronization, but relying only on Kino Club installs risks limiting the amount of exhibitions of *Double Negative* that meet the approval of the artist.

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