

**Final Paper:**

***Uncovering CUNY's Audiovisual Heritage***

LBSCI 733: Preservation of Cultural Heritage Materials

Graduate School of Library and Information Science

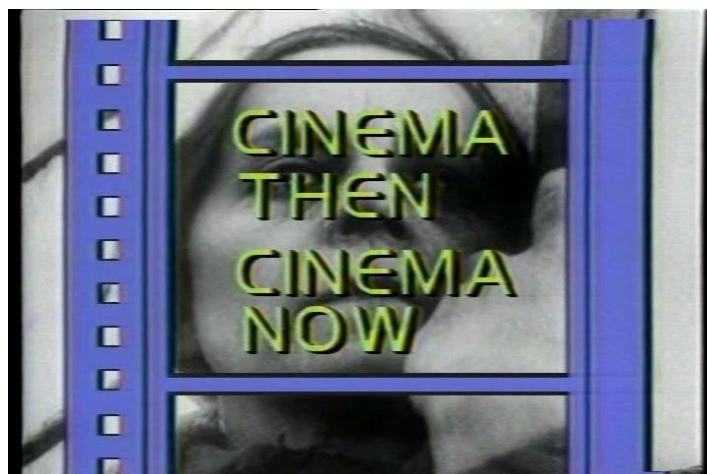
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## UNCOVERING CUNY'S AUDIOVISUAL HERITAGE

### 1. Narrative

#### 1.1 Importance of the collection

City University Television (CUNY TV) requires support from the Council on Library and Information Resources (CLIR) for a project to describe, digitize, caption, and make publicly accessible on the internet 1,277 video tapes found in the archival collections of eight colleges in the City University of New York (CUNY) system. This paper will focus on the 173 U-matic tapes of *Cinema Then, Cinema Now* (CTCN) which aired from 1986 to 1993.

In the age before streaming, CTCN was a gem of late night television that brought hard to find foreign films and expert film criticism into New Yorkers' living rooms free of charge over the airwaves. It was a rare few hours when television lived up to its potential as a medium that could respect the intelligence of viewers; it offered political, experimental, and cultural viewpoints from around the world. Despite the amount of content that streaming services offer today, university quality film and media education for the general public remains elusive.

*Uncovering CUNY's Audiovisual History* seeks to unlock rare conversations with screenwriters, directors, artists, activists, and academics who shaped film culture in their respective countries and live up to CUNY's mandate to serve as a leading institution of public education.

Furthermore, the series aired without accessibility considerations such as captioning. The digitization process will include the automation of captions and their standardization, according to CUNY accessibility guidelines, by CUNY TV staff. The hope is that an even larger public will be able to enjoy the educational content contained in the series.

## 1.2 Nature, size, and intellectual content

CTCN was created by Professor Jerry Carlson and filmed at the Borough of Manhattan Community College Media Center from 1986-1994. Each episode follows the same structure: a film screening followed by a thirty minute discussion in which Carlson was joined by writers, directors, and academics from a variety of cinematic traditions. Over its lifetime, the program was sponsored by several cultural centers and consulates. Also of note, is that in the pre-streaming era, CTCN was one of the only television programs in the U.S. showing international films. The tapes in the collection contain Carlson's introduction and discussion, but do not have the featured film due to licensing restrictions. As with other collections in the project, CTCN has been in off-site storage at Iron Mountain. The 173 tapes are housed in 1LF Bankers Boxes and the total collection measures approximately 19 linear feet.

The intrinsic value of archival items is derived from those "qualities and characteristics that make the records in their original physical form the only archivally acceptable form for preservation" (National Archives, 1999). Given that U-matic tapes were commercially produced for twenty-five years and are an unstable archival medium, the tapes hold little intrinsic value. CTCN was placed on U-matic tapes because they were the professional video format that CUNY invested in at that time. The tapes do not represent a creative or historic choice of medium.

The informational value of archival records describes the research value found in the content of the records (Schellenberg, 1996, p. 140). CTCN's informational value aligns with CUNY TV's institutional mission "to [extend] the academic mission of the university [and] to offer lifelong learning opportunities to all New Yorkers" (CUNY TV, 2021). As Carlson explains, "the university invested a lot in the creation of the program, and it is now able to

extract even more benefit from its initial investment” (J. Carlson, personal communication, March 10, 2021).

There are two main ways that CTCN manifests its informational value. First, the program features rare and in depth conversations with leading directors, screenwriters, artists, activists, and academics from the world of cinema in the 1980s and 1990s. Carlson dedicated a considerable amount of research into selecting films and guests and received funding from several offices of the cultural attachés at the consulates in New York City. Each season focused on the cinematic traditions from a specific region of the world. Some of the themes that researchers, students, and the public will be able to explore within the CTCN collection once it is preserved and made accessible include:

Latin America – Several seasons explore the New Latin American Cinema movement and cinema about the Cuban diaspora. Argentine director Héctor Olivera appears to reflect on his film “Rebellion in Patagonia,” Chilean director Andrés Racz describes the impact of the 1974 Chilean coup d’état on the film “The Promised Land,” and author Edmundo Desnoes and artist Coco Fusco comment on the origins of the Cuban diaspora as reflected in “Memories of Underdevelopment.”

Europe – In one of the most emotional episodes, writer Arnošt Lustig reflects on how his experience during the Holocaust informed the production of “Diamonds of the Night,” which at the time was banned in Czechoslovakia. A number of widely published U.S. and European film historians discuss the cinema of the Soviet Union, Spanish film under the Francoist regime, and the films of Bernardo Bertolucci and the Taviani brothers from Italy in the 1970s.

West Africa – CTCN was one of the very few programs to bring commentary about this cinematic tradition to television in the U.S. To this day there are few sources of commentary on film from the region outside academia. There is an especially profound episode on the 1966 film “Black Girl” and the Senegalese film industry.

East Asia – CTCN presents a comprehensive look at several works from celebrated Japanese director Akira Kurosawa. Guests include film experts from Japan and the United States.

Second, CTCN holds tremendous potential in the area of Open Educational Resources, which “are teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with free and perpetual permission to engage [with them]” (Creative Commons, 2012). It is currently uncommon to find commentary about the films discussed on CTCN outside of academic journals or university classrooms. The half-hour television format of CTCN makes it accessible to the general public. High school and undergraduate teachers may also find the program a useful supplement as a kind of classroom discussion primer when screening one of the featured films in their classes. The plan to digitize the series and make it accessible on YouTube, the Internet Archive, and the Archive of American Broadcast Television will help to realize the full informational value of the series.

### 1.3 Relationship to other collections

The CTCN collection is one of six collections to be digitized in this project along with:

- City Club from Baruch College
- Criminal Justice CloseUp from John Jay College
- HoMoVisiones from Centro de Estudios Puertorriqueños at Hunter College
- Politics con sabor from Centro de Estudios Puertorriqueños at Hunter College
- Hall of Fame for Great Americans from Bronx Community College

Taken as a whole, these collections tell a rich and complex story of New York City that includes public policy debates, criminal justice reform, the gay Latino experience, film culture, and the legacy of institutional racism. CUNY TV is also working to make its current programming available online, which will lead to a tremendous publicly-financed, publicly-focused, and publicly-accessible television archive.

The spirit of CTCN lives on in a current series also produced by Jerry Carlson, *City Cinematheque*. This archive of this program is also in the process of being made available online.

There are few comparable, external examples to the *Uncovering CUNY's Audiovisual Heritage* project. In the world of educational television, CUNY TV is unique in terms of funding and production. In the eastern U.S., the largest university-based television stations, such as Penn State's WPSU and University of North Carolina's UNC-TV, are PBS affiliates that carry in-house and PBS programming. University of Connecticut's UCTV is largely student run and designed as a means to educate students on broadcast technologies. Also significant is that CUNY is not an actively collecting institution. Most audiovisual collections at large, public

universities are the result of active collections development, *Uncovering CUNY's Audiovisual Heritage* seeks to digitize original content developed around CUNY (American Archive of Public Broadcasting).

#### **1.4 Preservation challenges**

The fact that CTCN is currently stored on U-matic tape is cause for great alarm. These tapes, produced from 1986 to 1993, are rapidly reaching the end of their shelf life and all their content is at high risk for total loss due to unstable binders. This section will explain the major inherent vices of U-matic tape and their implication for the *Uncovering CUNY's Audiovisual Heritage* project.

In order to address the preservation challenges associated with U-matic tape, it is first important to understand the production history and structure of the medium. In 1964, the Sony Corporation pioneered video tape recorders (VTR) for the consumer market with the CV-2000. It was reel-to-reel and restricted to black and white. Sony's co-founder Masaru Ibuka began pushing the company's top engineer, Nobutoshi Kihara, to develop a video tape system that would capitalize on the burgeoning color video technologies and offer a more user-friendly experience by enclosing the video within a cassette instead of open reels.

Kihara and his team came back with three key innovations. First, they reduced the amount of video tape needed for playback, which they achieved through chrome-oxidized tape. Second, they created a new color system that recorded color and luminance signals on the same track while previous attempts had recorded these two signals on separate tracks. This "Color-Under System" would continue throughout much of video's history. And third, they developed a new take-up method by which the tape passed by the video head in a "U" shape. This minimized the tension applied to the tape during recording and playback, and gave the new



format its name: U-matic (Sony Corporation). The U-matic hit the market in 1970, and while it was not a popular consumer medium, it achieved wide use in television production. Even into the 1990s, Major League Baseball, NBC affiliates, and CUNY TV used variants of the U-matic systems (Equipment News 1988; 1987).

Though Kihara's team revolutionized magnetic media and made videotape the most economical and widespread video format of the 20th century, each of their three innovations present a unique challenge to preservation projects today.

As with other magnetic media, the structure of U-matic tape is built on a polyester substrate. This layer provides structure and reduces friction as the tape passes through a video cassette recorder (VCR). Sitting on the substrate is the top coat where magnetic particles, sometimes called pigment, are suspended in a polymer binder. During recording, the video head stores information in the tape by magnetically aligning these particles. During reading, the reverse occurs, and the alignment of the magnetic particles produces a unique electrical signal as the tape passes along the tape head. The player interprets this electric signal as video and audio (Weise, 2007, p. 184). The binder also contains a lubricant and head cleaning agent to facilitate the tape's safe transport through the VCR (Van Bogart, 1995, p. 2).

To promote consumer adoption of the medium, Sony licensed the production of U-matic tapes to several manufacturers including Fuji and Ampex in hopes of driving down costs. As a result of this decision, the chemical makeup of the binders vary greatly. Thiébaud et al. (2008) determined under laboratory conditions that no less than eight different polyester-polyurethane binder formulas were used over the course of U-matic's history. They also determined that tape binders made of PBA polyurethane are "the most fragile" (p. 196). This diversity of tape stock

makes preservation extremely complicated as each U-matic recipe has a slightly different tolerance to temperature and humidity.

Two major inherent vices of U-matic tape are centered on the degradation of the binder. First, with each play, the tape expends its lubricant, which can cause the binder to become brittle over time.

Second, if a tape is stored under high relative humidity or comes into contact with water particles, this can trigger hydrolysis, which breaks apart the polymer chains in the binder (Thiébaud, 2008, p. 184). Hydrolysis leads to the infamous sticky-shed syndrome, where the binder softens and begins to peel away from the substrate and wreak havoc on VCRs by gumming up its interior components (Van Bogart, 1995, p. 4). Gfeller et al. (2013) caution that squealing, stick slip, or complete standstill during playback are all indications of sticky tape syndrome. Under any one of these conditions, the tape should be removed immediately, as the continued playback of a sticky tape could permanently destroy its content and the U-matic deck (p. 30). Many audiovisual archivists resort to “baking” tapes at around 122°F as an economical way of firming up the soft binder.

Van Bogart (1995) argues that in most cases, the binder will degrade long before the magnetic particles (p. 6). However, if a tape is ever demagnetized, it would result in a total loss of the recording in one section or the entirety of a tape.

The other major inherent vice facing U-matic tape is the deformation of the substrate, which is a vulnerability of the medium given the “U” shaped uptake system developed by Kihara’s team. Poor tape wind, high tension, or abrupt stops during playback will stretch the substrate and cause issues during playback (Gfeller et al., 2013, p. 100). As Van Bogart (1995) illustrates:

Tracks are recorded diagonally on a helical scan tape at small scan angles. When the dimensions of the [substrate] change disproportionately, the track angle will change for a helical scan recording. The scan angle for the record/playback head is fixed. If the angle that the recorded tracks make to the edge of the tape do not correspond with the scan angle of the head, mistracking and information loss can occur (p. 9).

If the dimensions of the substrate are altered, the tape will not advance in sync with the video heads in the VCR and cause misreading of the video and audio tracks. These are collectively called skew errors and manifest as “flagging” or “skewing” where the video is distorted at the top or bottom of the screen respectively (Stanco et al., 2016, p. 3734; AV Artifact Atlas).

Up until the *Uncovering CUNY's Audiovisual Heritage* project, the only viable preservation strategy for CTCN has been total isolation at Iron Mountain. As with other magnetic media, U-matic decks are increasingly rare and temperamental. Thus, CUNY TV has reserved them for official use as not to risk their damage through public use. Additionally, there exists only a single copy of each episode. As Phillips et al. (2013) caution, this is an extremely precarious position for an audiovisual archive as any damage to a tape could result in the total loss of the episode. (p. 4). For this reason, very few if any institutions today permit public usage of U-matic tape. In the 1990s, the Library of Congress called for a “universal format for archival tape” and floated U-matic as an economic solution. However, the same reasons that Wheeler (1996) cited during his plea to the archival community then to adopt U-matic as an archival standard are the exact same that compel archivists today to pursue digitization: temperamental players and unstable binders.

## 1.5 Mission of CUNY TV

Established in 1985, CUNY TV serves as the public television station for the nation's largest urban university system. The station draws on the incredible talent of the university faculty and is committed to "extending the academic mission of the university to offer lifelong learning opportunities to all New Yorkers" (CUNY TV, 2021). Its award winning programming is available to the public free of charge over-the-air and as a public service to cable subscribers. The *Uncovering CUNY's Audiovisual Heritage* and other archival initiatives are working to broaden the station's reach by making its captioned programming available online. CUNY TV archive is a respected leader in the creation of free and open source software, which is used and adapted by audiovisual archives internationally.

## 2. Preservation Strategy

### 2.1 Storage environment

As discussed in the previous section, archives of magnetic media are rapidly approaching the apocalypse. Video experts previously recommended transcribing collections on a regular basis, about every ten years, to head off the loss of information due to binder degradation (Van Bogart, 1995, 15). For CUNY TV, this option is too expensive and the station does not have a media research room where the public could come to view the tapes. Furthermore, everytime magnetic media is played, it degrades slightly, a process known as generational decay. From a production standpoint, it is impractical today for producers to scan through U-matic tapes for specific segments or interviews. The station is already in the business of creating digital access

copies when the public inquires about specific material. Digitization will accelerate public reference services.

As U-matic tapes do approach the end of their lives, an archive can take certain palliative measures to ensure that the tapes do survive as long as possible. The tapes should be properly wound and placed on their edge when shelved “with the weight of the tape pack being supported by the reel hub” (Ibid, 18).

In the storage environment, the temperature should be set to 20°C (68°F). This prevents tape pack tightening or layer to layer adhesion, also called tape blocking, both of which occur at high temperatures. Temperatures below freezing are also dangerous as they risk shrinking the binder and discharging its lubricant (Ibid). The relative humidity (RH) of the storage environment should be confined to 40%. This deters fungal growth which can cause signal dropout (Ibid, 20). Temperature and RH should be monitored to avoid fluctuations, which stress the tape binder over successive expansions and contractions.

A final important condition for the storage environment is that it is free from large magnetic fields. In an audiovisual archive, the most common source of this threat is studio monitors, which contain large, powerful magnets in their speakers.

## **2.2 Digital capture**

Comparatively, the process for digitally capturing video is more complex than that for audio. Audio production software samples audio frequencies at a consistent rate to construct a digital version of the analog recording. Capturing analog video, on the other hand, is complicated by the fact that video capture software needs to read through the rapid succession of still images (frame rate) as well as the further division of the image into alternatively active horizontal bands (interlacing) to produce digital video. On top of all that, it is necessary to maintain synchronicity

between the audio and video channels. Furthermore, archivists need to decide if the resulting digital video file should maintain interlacing or deinterlace it to create a progressive scan file (Weise & Waynand, 2007, 126).

To digitally capture content from U-matic tapes in the “Uncovering CUNY’s Audiovisual Heritage” project, the following hardware is in place. From the U-matic tape deck, the video signal first passes into a time base corrector (TBC), which ensures that the video and audio channels are in sync and that the video is playing at a consistent frame rate. An archivist may need to adjust the tension and angle (azimuth) of the tape as it travels through the U-matic deck. Additional adjustments may be made to the lumosity (brightness) and chroma (color) in the TBC (Van Bogart, 1995). The guiding philosophy of digitization in this project will be to honestly capture the video information as it exists on the tape. This means that any adjustments in the TBC should be aimed at producing the image as it exists and not to correct or compensate for tape degradation or below standards engineering from the original broadcast and recording. Continuing on, the TBC will mux the video and audio channels into a single SDI transmission, which is then sent to the capture device. The capture device reads the frame rate and interlacing and creates a digital signal, which is then sent to the computer via thunderbolt.

Once the signal reaches the computer, software called Vrecord takes over in order to create a digital file. Vrecord is a free, open source program developed collaboratively by a group of audiovisual archivists and it relies on the program FFmpeg, among other dependencies, to do the heavy lifting. Vrecord is set up to create the archival master file using the FFV1 video codec in a MKV container. Additionally, a series of transfer logs are generated for later quality control and verification (AMIA Open Source, 2020). If the archival master file passes quality control, a second piece of software developed by CUNY TV, and reliant on FFmpeg, will create a series of

access files: a mp4 video and mp3 audio track, which are used for uploading to the internet or providing copies to public requests for specific programs. These access files are created to protect the archival master file from the human errors that come with moving, manipulating, or playing digital files.

### **2.3 Digital technology standards**

According to The Association for Library Collections and Technical Services Preservation and Reformatting Section, analog video should be, at a minimum, digitized at 720 x 486 resolution and 8-bit color depth (Bogus et al., 2013).

There is currently no universal standard file format for archiving digital video. SMPTE has recommended Material Exchange Format (MXF), though it concedes that this is only a recommendation and not a standard (Murray, 2018). CUNY TV has selected to use the FFV1 video codec in a Matroska (MKV) container. The following section will explain the rationale for this choice.

A video codec is a computer program that applies a specific algorithm to encode and decode video during capture and reproduction (Weise & Waynand, 2007, 173). The FFV1 video codec, developed as part of the broader FFmpeg software project, provides lossless compression (Library of Congress, 2020). Video compression reduces the number of bytes needed to recreate an image with the intent of making video files easier to move, manipulate, and play. lossless and lossy compression are the two main types of digital compression. Lossless compression reduces file size without removing bits by removing redundant information, such as static parts of the image. Lossy compression creates an approximation of the original file, not an exact duplicate, to save file space (Weise & Waynand, 2007, 157). Lossless is a better choice for archival master file in that the full data for a video file is preserved.

In addition to the FFV1 codec, the project will apply the MKV container standard to all archival master files. While codecs are applied to encode and compress video information, a video container is an envelope used to package all different streams associated with a video. These include the video, audio, metadata, subtitles, chapter markings, etc. MKV is a free, open source container that “aims to become THE standard of multimedia container formats” and has been adopted by a variety of audiovisual archives and cultural institutions due to the range of streams that can be packaged along with the video (Mastroka, 2020).

## **2.4 Digital preservation plan**

Given that the U-matic tapes will return to their home institution after digitization, CUNY TV is very concerned with effectively managing the preservation of digital video files. Furthermore, digitization is not preservation, and as stewards of the new digital versions, CUNY TV is responsible for their continued viability and accessibility. A guiding principle for the preservation of audiovisual collections is the NDSA Levels of Digital Preservation. This document identifies storage and geographic location, file fixity, information security, metadata, and file formats as distinct areas that deserve attention when formulating a digital preservation plan (Phillips et al., 2013):

- (a) CUNY TV will employ the highest level of preservation for storage and geographic location, which dictates that a digital collection should have at least three copies in different geographic locations that face different disaster threats and includes plans to periodically migrate files to current media. Archival master files will be stored locally on LTO tape, which is less expensive per terabyte than hard drives. Currently, LTO 8 is being produced. When LTO 9 is released, archivists will automate the migration to the new format and the LTO 8 tapes will



be sent to Iron Mountain as a backup. The episodes will also be uploaded to YouTube and Internet Archive, which operate servers in different locations under corporate and nonprofit funding structures. Lastly, the original hard copy (U-matic tape) will stay at its home institution.

- (b) CUNY TV will follow level 2 preservation standard for file fixity, which will occur during ingest and data migration. As an added precaution, the physical write-blocker will be engaged on LTO tapes.
- (c) For information security, level 3 will be appropriate. This requires that a log of “who performed what actions on files, including deletions and preservation actions.”
- (d) Metadata will be stored in log files within the MKV archival master container as well as in the File Maker system.
- (e) File formats are a major concern for digital preservation where obsolescence is a continual threat to cultural heritage archives. CUNY TV has made a conscious decision to use the free and open source file container MKV for three reasons. First, it cuts down software licensing costs. Second, it allows CUNY TV archivists to develop project-specific scripts and workflows. Third, when a vendor decides that it will no longer support a file format, archivists have a short period to investigate other options. Conversely, when a free and open source file format begins to decline in popularity (and support), it is usually a slow process that affords archivists more time to migrate their records to new formats.

## 2.5 Metadata standards

The PBCore metadata standards were originally developed by public broadcasting stations to manage their audiovisual content and have since seen wider adoption among audiovisual archives. As a public broadcaster, CUNY TV uses PBCore to manage its current programs. It is then in the interest of the station to apply the PBCore standards to the *Uncovering CUNY's Audiovisual Heritage* project to maintain consistency across the station's departments and activities. PBCore provides for elements that describe assets, which represent the intellectual content of a work, and instantiations, which describe the technical properties of analog and digital items that house a work (PBCore).

UCLA Libraries (2015) argues that metadata creation occurs at different points during the digital project life cycle and requires two levels of quality control to ensure consistency and quality (3). During the digitization process, metadata will be collected using Airtable to ensure all archivists have quick and easy access to the metadata. During digitization, information will be gathered from the U-matic tape, including manufacturer, production date, guests, episode name, and any other notes written on the tape. During quality control and captioning, more descriptive metadata will be collected. After metadata for a large number of tapes is entered into Airtable and passed review, it is then exported to the File Maker system, which is the station-wide database for program metadata. It is also from this system that archivists search for materials to satisfy research and production requests for episodes.

## 2.6 Intellectual property and privacy concerns

The feature films that aired as part of the original *Cinema Then*, *Cinema Now* broadcasts are not included in the archival master files. Otherwise, there is little concern of violations of

intellectual property given that CUNY TV originally produced the program in conjunction with the College of Staten Island. All guests signed releases when the programs originally aired, though these have not survived in the archival record. The institutions that participate in the project (College of Staten Island, Centro para los estudios puertorriqueños at Hunter College, Bronx Community College, and Baruch College) will retain ownership of the physical media. CUNY TV will take temporary custody of the audiovisual items for the duration of the digitization process and then return them to their home institution. As an extra precaution, a boilerplate “take down notice” will accompany all episodes that are made available online.

## **2.7 Accessibility standards and public access**

To make the collection known and accessible to the public, four policies will accompany the digitization project. First, all episodes will undergo captioning using automated captioning software followed by human review. These captions will be aligned to CUNY's accessibility standards. Second, the episodes will be made available on YouTube, Internet Archive, and the American Archive of Public Broadcasting. Third, CUNY TV will include metadata about episodes on its online catalog, which is accessible through the station's website. And forth, members of the archival team will reach out to appropriate subject librarians at regional universities about specific subseries of programs, such as Latin American, Japanese, or Soviet cinema. Eric Silberberg will present on the potential of the collection as an Open Education Resource at the 66th conference of Seminar on the Acquisition of Latin American Library Materials (SALALM), the premier international body for Latin American research resources, as part of the scholarship he received from the organization.

### **3. Workplan**

#### **3.1 Staff**

Collections Coordinator, Kelly Haydon, 100% time.

The Collections Coordinator will liaison with archivists at the participating CUNY institutions, develop a project management system, perform digital transfers of magnetic media, caption digitized episodes, assess state of degraded U-matic tapes, address U-matic deck malfunctions, write monthly progress reports for CLIR, supervise Graduate Student Intern.

Director of Archives, Dave Rice, 30% time. [in-kind contribution]

Development of open source software solutions for digital transfer, quality control (QC), and ingest.

Archivist, Catriona Schlosser, 20% time. [in-kind contribution]

Development of metadata standards and provide reference services to the public.

Graduate Student Intern, Eric Silberberg, 30% time.

The intern will perform QC on digital transfers created by CC; run ingest scripts to create archival packages of metadata, access files, and archival master file; develop methods to improve automated captioning workflow; research opportunities for and participate in public outreach.

### 3.2 Time assessment

The CTCN collection contains 173 total tapes. Archives staff performed a time assessment where two staff members worked full time on the digitization, quality control (QC), ingest, description, captioning, and uploading to LTO and online repositories.

The results of this trial run indicated that a team could reasonably accomplish the digitization, QC, and ingest of 60 tapes per month. This means that the entire CTCN collection could be completed, with time allocated for baking and cleaning degraded tapes, in three months. General description, including film title, guests, and technical metadata could be completed during this time.

The captioning process was much slower. With two staff members captioning, it is reasonable to expect that 35 tapes could be completed per month. This means that the entire CTCN collection could be captioned according to the CUNY Accessibility Guidelines within five months. Full item description is only possible after captioning, as it allows staff to note more precisely the content of each episode.

### 3.3 Processes

#### Digitization

- *Description:* Requires Vrecord to capture signal from capture device and create archival master file using FFV1 codec.
- *Time:* conducted in real time according to length of tape.
- *Staff responsible:* Collections Coordinator

Quality Control (QC)

- *Description:* Requires examining broadcast range, TOUT, audio level, and hue and saturation with QC Tools software
- *Time:* 5min per tape
- *Staff responsible:* Graduate student intern

Ingest

- *Description:* Requires running ingest script developed by CUNY TV which creates the archival package of archival master, derivatives, and metadata files.
- *Time:* 10min staff attention per tape. Ingest script runs autonomously for 40min.
- *Staff responsible:* Graduate student intern

Captioning

- *Description:* Episode is run through Descript software to automate captions. Staff member then standardizes automated captions to meet CUNY accessibility standards. Finally use FFmpeg to transcribe .srt to .vtt file.
- *Time:* 90min per tape
- *Staff responsible:* Collections Coordinator and Graduate student intern

LTO Upload

- *Description:* Use rsync to safely move archival package to LTO drive
- *Time:* 10min staff attention per tape. Ingest script runs autonomously for 20min.
- *Staff responsible:* Collections Coordinator and Graduate student intern

### 3.4 Budget

#### 3.4.1 Budget for Labor and Supplies

Category	Expenses	Amount (\$)
Salaries/Wages	Collections Coordinator	53,000.00
Fringe benefits		18,000.00
Salaries/Wages	Graduate Student Intern	5,000.00
Supplies/Materials	LTO data tapes	1,000.00
Supplies/Materials	Boxes, labels, containers, hard drives	320.00
Supplies/Materials	Cleaning supplies	80.00
<b>Total</b>		<b>77,400.00</b>

CUNY TV already has appropriate decks, computers, and transfer devices. The budget below looks at what is necessary for an institution without an established production facility to assemble one professional grade U-matic digitization workstation:

#### 3.4.2 Budget for One U-matic Digitization Workstation

Expense	Amount (\$)
U-matic deck	3,000.00
Mac workstation	2,200.00
Time base corrector	1,200.00
Capture device	1,400.00
LTO tape drive	4,000.00
Cables	300.00
<b>Total:</b>	<b>12,100.00</b>

## 4. Appendices

### Appendix 1: Sample stills from episodes

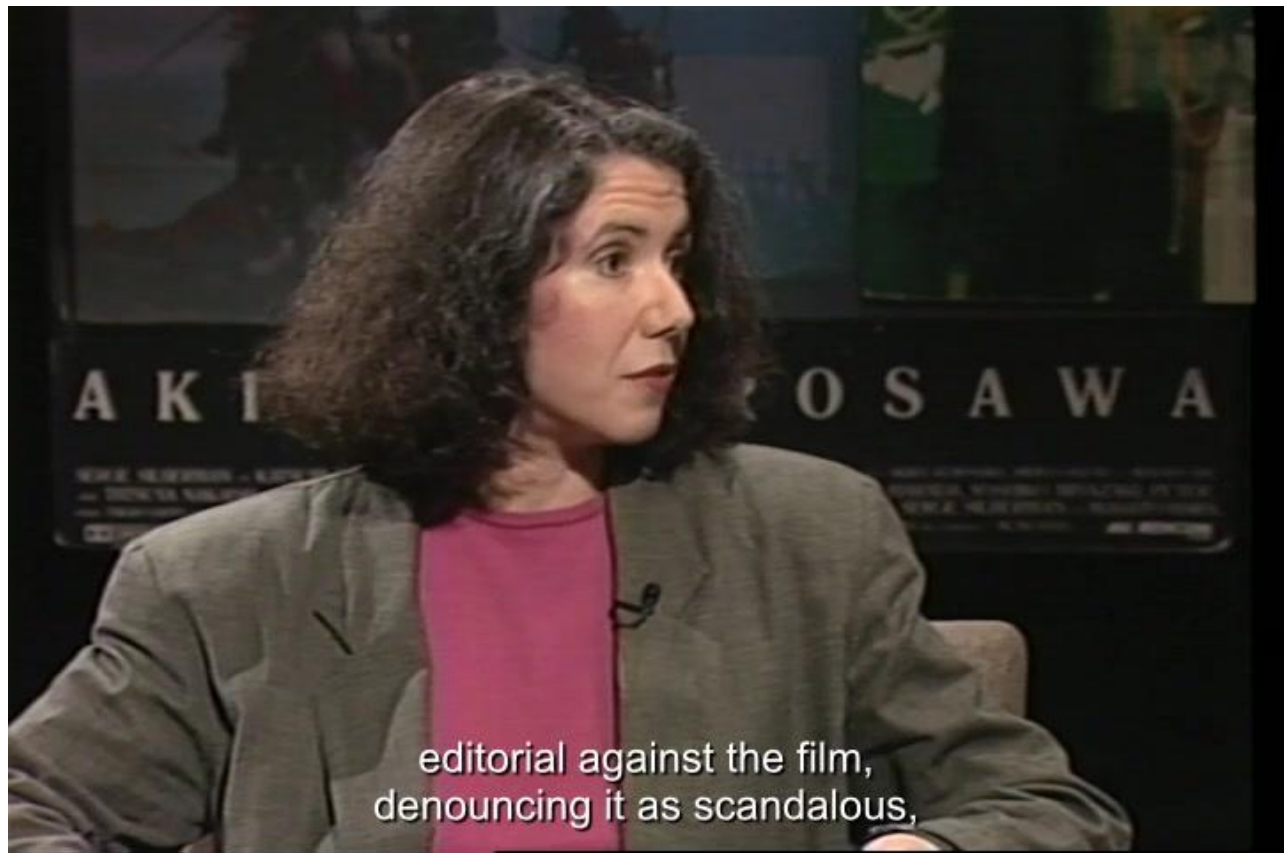
The following stills were generated using two scripts developed by Eric Silberberg that rely on FFmpeg to do their heavy lifting:

- (a) *SubBaker* bakes subtitles on to their corresponding video file.
- (b) *GetStills* prints a jpg from an indicated point in the video file.

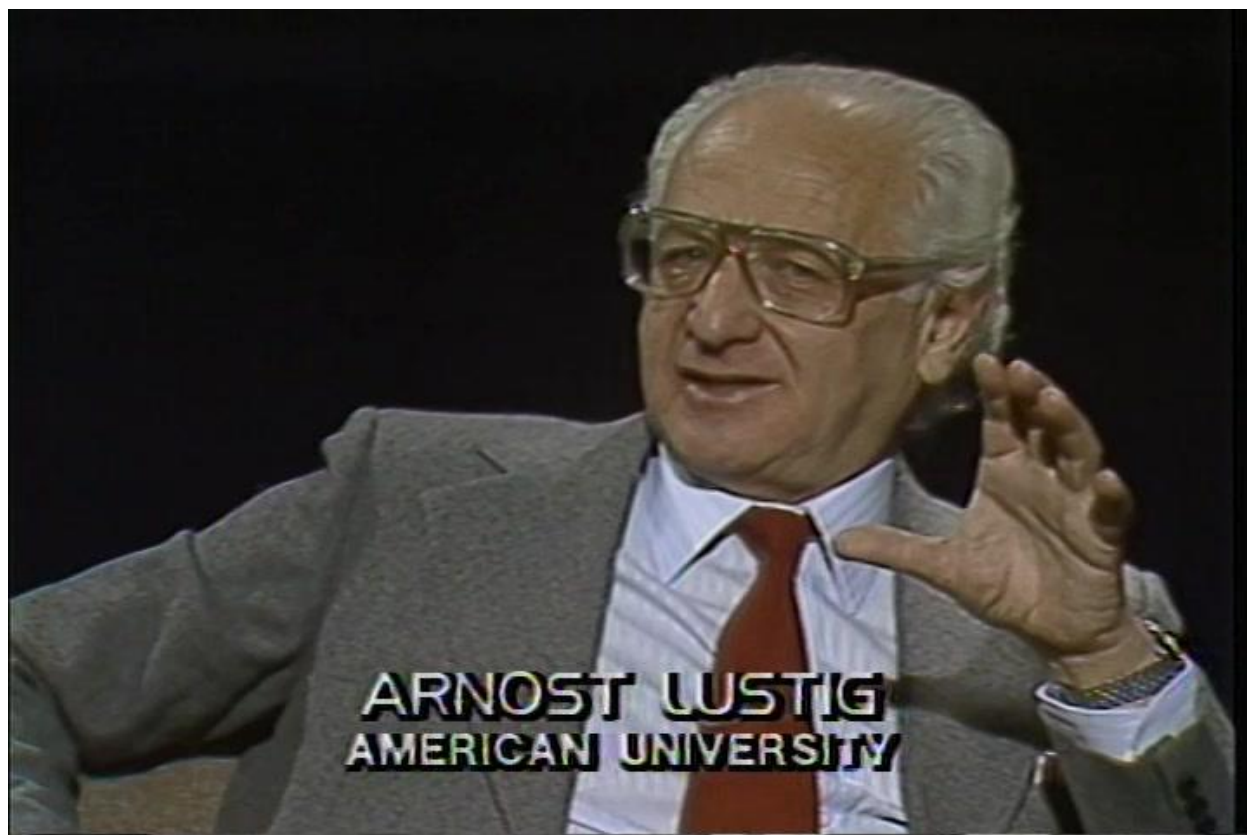


*4.1.1, CTCN Ep. 73 “The Promised Land.” Unit Director Andrés Racz discusses the impact of the 1974 Chilean coup d’état on the production of the film.*

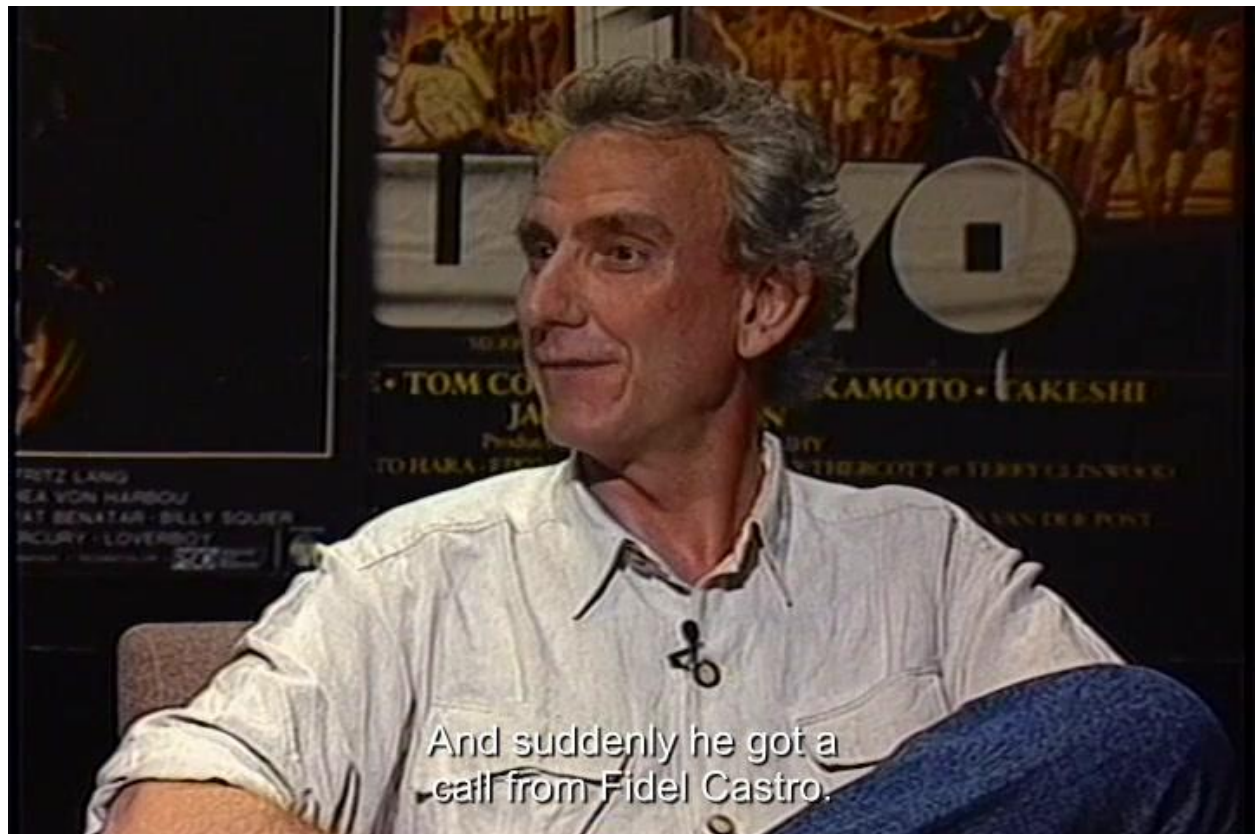




*4.1.2, CTCN Ep. 132 "The Hunt." Professor of Spanish literature Kathleen Vernon recounts an episode of director Luis Buñuel running afoul of Vatican officials and Francoist censors.*



*4.1.3, CTCN Ep. 23 "Diamonds in the Night." Czech author Arnost Lustig describes his experience as a Holocaust survivor.*



*4.1.4, CTCN Ep. 149 "I'm the One You're Looking for." Director Jaime Chávarri describes his working relationship with Gabriel García Márquez and receiving a phone call at his home from Cuban President Fidel Castro looking for the Colombian author.*

## Appendix 2: References

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