Finn, Heinen, Holbrook, Nabasny, Sutton, Vizner
Video Preservation 1
December 11, 2013

Orson Welles Video Collection - Cinema Studies - Study Center Digitization Project

1. Project Background & Introduction

"Orson Welles: Theatre, Radio, Film. A Major Retrospective and Critical Examination" was a conference and exhibition planned and executed by a group of staff and students in the Tisch School of the Arts, New York University, lead by Professor William G. Simon. Simon, along with a group of graduate students conducted the interviews and compiled the content into two documentary compilations – 1 video, 1 audio - to be played during the conference. Two documentary compilations were created and screened/played during the course of the conference.

Orson Welles is one of the best known and celebrated American directors. While Welles is widely known for his role as director of Citizen Kane, his involvement and impact on the arts and entertainment industry spans genres and forms. However, in a 2013 interview, Professor Simon reiterated a statement made twenty-five years ago during the original conference: "I don't think there's anything like a full appreciation of [Welles's] accomplishments in the public eye" ("New Look at Orson Welles"). Today, 25 years after this retrospective, we believe it is necessary to make accessible a collection that offers a deep insight of Welles' work and importance for the film world.

The tapes in this collection contain interviews with some of Welles' associates - including acclaimed actor Vincent Price and choral director Leonard de Paur – discussing Welles, his work, and their experiences working alongside him. In addition to interviews there are two tapes with the recordings of "War of the Worlds Press Conference" and the documentary "We Work Again" that includes a stage production of "Macbeth" directed by Welles in 1937. These two productions were copies provided by other archives for study and both are available online via YouTube.

On behalf of New York University's Cinema Studies Department Study Center, we are working on a project to preserve the Welles Radio Collection of 21 U-matic and 1 VHS tape used in a collaborative project between Tisch School of the Arts and the Orson Welles Research Project for the "Orson Welles: Theatre, Radio, Film: A Major Retrospective and Critical Examination" conference. The goal of this project is to create digital files of that content - following internationally-accepted best practices for video digitization - which will remain available and accessible to future students and researchers. In addition, we will provide recommendations for future digitizations, based on the results of this project.

2. Project Scope and Description

2.1 Description

As this collection was part of an NYU Cinema Studies initiative, our curator for the project is Bill Simon, Cinema Studies faculty, who oversaw this student-led project. The process is being carried out by NYU Moving Image Archiving and Preservation students, under the supervision of Mona Jimenez, Associate Director of the MIAP Program, and Peter Oleksik, Adjunct Professor of Video Preservation; in conjunction with the Cinema Studies Study Center archive, represented by Ann Harris.

The process of information gathering, particularly coordination with Bill Simon and the background of the collection was conducted in coordination with another MIAP group who are focusing on the preservation of the audio material. Both groups also kept communication in order to determine parts of the project that required unified decision-making, such as file naming conventions and basic metadata requirements.

2.2 Selection Process and Results

For this project, we intend to transfer as many of the 22 video tapes as possible. In a recent discussion with Bill Simon, he indicated that all taped interviews are of equal significance - none are to his knowledge more important than the others - and therefore tapes chosen for transfer have been selected based on visual inspection, information from Bill, and the results of the tape cleaning. (See below sections 4.2.1 and 4.2.2 on *Inspection* and *Tape Cleaning*). After playing back the two tapes labeled as “Welles Retrospective Video Documentary” (R6020 and R6021) we noticed that their content was a compilation of all the other interviews in the collection, therefore we decided that the digitization of the full interviews was a priority. Additionally, the tapes containing “War of the Worlds Press Conference” and “We Work Again” (R6018 and R6019) will not be considered for digitization, since these are copies from other archives provided for study.

Listed below is the selection of tapes chosen for transfer, any videos that are not completed or added will be noted in our final report for on-going work (see Section 4.4.3).

R 6001 - DePaur Interview #1
R 6002 - DePaur Interview #2
R 6003 - DePaur Interview #3
R 6004 - DePaur Interview #4
R 6005 - Depaur Interview #5
R 6006 - Fanto Interview #1
R 6007 - Fanto Interview #2
R 6008 - Fanto Interview #3
R 6014 - Price Interview #1
R 6015 - Price Interview #2
R 6016 - Thompson Interview #1
R 6017 - Thompson Interview #2

2.3 Decisions on Storage and File Formats

As the saying goes, preservation without access is pointless. Currently the Study Center embarks on digitization projects based mainly on the needs of Cinema Studies faculty. In the past these projects are most often embarked on when the processing of print material collections, or access copies of films are required for in-class viewing.

However, a long-range solution for storage and access is still developing since there is limited capacity in the archive's current storage environment. Knowing that currently any ideas about storage are temporary solutions, we will conduct all processes of video transfer considering possible future solutions, and the Digital Library Technology Services at Bobst Library (DLTS) is one of the only options that we have at this point.

The DLTS offers storage solutions for NYU-based audiovisual collection provided the DLTS conducts the digitization process themselves, or that the respective archive digitizes the video based on the precise standards required by the DLTS for their normalized workflow. Not all projects are accepted into the DLTS, some require a proposal which includes the size, scope, and significance/research value of the collection. Though we have no way of knowing whether this particular collection will be accepted into the DLTS workflow, we will transfer the videos according to the requirements of the DLTS to enhance the likelihood of its being accepted.

Since DLTS also offers web-streaming access, we will create access copies of the digitized tapes according to their specifications for web access. (See sections 4.3.3 on *Storage* and 5.1 on *File Formats*).

2.4 Copyright

While the DLTS also offers web-streaming access, there are copyright issues associated with this collection of video. The Study Center will not be able to stream any of this material unless they can clear all associated copyrights. However, research on copyright is out of the scope of this project and we recommend the Study Center to conduct a copyright audit to determine the status of the collection.

3. Timeline

The application of the digitization plan will begin on November 11, 2013. Each member of the team will digitize at least one videotape. If time and the condition of the tapes permit, the team will transfer more than one tape per person. Details of the amount of tapes digitized will be presented in the final report, which will be submitted on December 13, 2013 along with the digital files created during this project.

4. Workflow

This section describes all actions performed before, during and after digitization. We also provide a list of the equipment used.

4.1 Study Center Set-up

To complete this project we will use the equipment in the Study Center Archives, which is listed below. For a detailed signal path see *Appendix 1*.

4.1.1 Video Rack 1

U-matic Playback Deck Sony BVU-950
Distribution Amplifier Pro Plus RA163
Video Component Distributor Kramer VM-1044

TBC/Synchronizer Digital Processing Systems Inc. DPS-290
Waveform/Vector Monitor Tektronics 1740
Video Monitor Sony HR Trinitron 1954Q
Video Monitor JVC TM-1650SU
Video/Audio Generator Kramer 811
Audio Delay Box Datavideo AD100
Mac Computer OSX 10.8.3 (Workstation 2)
Capture Card Black Magic Design 9.7 (Workstation 2)
Software Media Express Version 3.2 (Workstation 2)

4.1.2 Video Rack 2

U-matic Playback Deck Sony BVU-950
Video Component Distributor Kramer VM-1044
TBC/Synchronizer Digital Processing Systems Inc. DPS-290
Waveform/Vector Monitor Tektronics 1730
Video Monitor JVC TM-H1750C
Color/Sync Generator Herita CSG
Black/Sync Generator Herita BSG
Audio Delay Box Datavideo AD100
VU Meter MB4 Coleman Audio
Balanced Audio Matrix Kramer VP-1608
Mac Computer OSX 10.8.3 (Workstation 3)
Capture Card Black Magic Design 9.7 (Workstation 3)
Software Media Express Version 3.2 (Workstation 3)

4.2 Pre-Digitization

4.2.1 Inspection

Basic inspection of the videotapes will occur before the digitization process begins. We will perform a basic physical inspection to detect any problems that would impede a proper digitization, such as pack problems, tape and cassette condition, or any other signs of degradation. This is a fundamental evaluation since these problems can not only impede digitization but also cause damage to the tape or playback machines.

If after inspection tapes present some evidence of degradation the process will be stopped and that tape will not be digitized. Further restoration treatments - such as baking - are out of the scope of this project.

4.2.2 Tape Cleaning

Prior to transfer, all of the tapes in the collection were cleaned by Mona Jimenez with the Samma Cleaner at DLTS laboratory (see *Appendix 3* for the detailed cleaning report).

The process of cleaning the tapes was fundamental in determining which tapes would be transferred for this initial project. It is the cleaning process itself that helps determine if the tapes will present with any problems during transfer, as any problems or noises that would occur during playback may also occur during cleaning. The cleaning report that Mona compiled,

reveals that while a few tapes passed through the deck without issue, a majority of the tapes were fairly noisy during transport, and tapes R 6001, R 6020, and R 6021 presented more noise than most and will not be digitized to avoid further tape and equipment damage.

Any tapes that present further problems during transfer will be made note of in the final report and set aside to be sent out to be more thoroughly inspected and/or sent out to a vendor (which is out of the scope of this project).

4.3 Digitization

4.3.1 Calibration and signal adjustments

Before the transfer of each tape begins, the system will be calibrated by sending calibration bars from the signal generators to the CRT monitor, the time-based corrector and oscilloscopes. The calibration signal would help us identify and correct any signal problems as well as make sure all equipment is standardized and the signal is as faithful to the original recording as possible.

Monitors will be calibrated using the blue screen to adjust chroma (matching the two outside bars) and hue (matching the two middle bars). Oscilloscopes and time-based correctors will be set to null values (which will be recorded on the *Welles_Video_Metadata_Spreadsheet*) considering that those not always correspond to zero on the machine's display.

The signal path diagram for calibration can be found in *Appendix 1*.

After the calibration, playback equipment will be cleaned. Cleaning of the U-Matic deck will occur after each transfer, using isopropyl alcohol and swabs to manually clean the heads and drum.

Following calibration and cleaning, tapes will first be played back to search for any recorded calibration signal, such as color bars or reference tone, in which case video and audio signals will be adjusted accordingly using the TBC and oscilloscopes. The TBC allows to modify the signal adjusting video, hue, chroma and black; while the oscilloscopes help monitoring those changes. All adjustments will be recorded on *Welles_Video_Metadata_Spreadsheet.*

In the absence of any reference signal we will adjust the video signal according to the tape's content using well known references such as black and white objects or skin tone.

For audio, levels will be adjusted using a VU meter (Video Rack 1 doesn't have an external VU meter, therefore we will use the one available on the U-matic deck). Audio levels must be adjusted during playback, such that the audio remains at 0 VU.

Pre-digitized audio signal will be monitored using headphones connected to the playback decks. Post-digitized audio will be monitored connecting the headphones to the computer audio output.

4.3.2 Transfer

Digitization of the tapes will occur utilizing both racks in the media lab. Rack 1 utilizes a patch bay system, whereas Rack 2 utilizes a switcher. After calibration, the video signal will be routed from the deck (U-matic) to the time-base corrector. The signal path will then be routed from the time-base corrector to the oscilloscopes/monitor and to the Black Magic station via the distribution amplifier. For a detailed diagram of the signal path see *Appendix 1.*

4.3.3 Storage

The digital file deliverables will be stored on the Cinema Studies Archive network attached storage (NAS) for short-term storage, and on a G-Raid drive for backup. Unfortunately, none of these options are for long-term storage since they are destined for student work and all information gets deleted once a year. There are also currently no other back-up options. Since storage is currently inadequate for full long-term digital preservation up to best practice standards, it is recommended that the Cinema Studies Archive upgrade storage capabilities in the future or use a third-party for storage, like Bobst Library DLTS. (See above DLTS discussion on section 2.3).

The preservation files would take up a maximum of 2.04 TB of data and the access files would take up a maximum of 295.66 GB.

4.4 Post-Digitization

4.4.1 Quality Control

After the video content has been transferred to the computer we will perform quality control, looking at the beginning, middle, and end of the video file to make sure that content was transferred correctly. If any errors are found, the videotape will be transferred again with necessary corrections.

4.4.2 Generating checksums and file transfer

Immediately after the files have been created we will generate checksums using the MD5 algorithm on the Terminal. Checksums will be recorded on the project spreadsheet. To transfer the files we will use BagIt, a packaging and transfer format which automatically generates metadata about the files. This tool creates a special folder structure that contains the files (payload) and a text file titled “manifest.txt” that contains a list of the files in the payload and their corresponding checksums.

Once files are transferred to the final storage and stored in their appropriate directories (described in section 5.2) on the NAS, checksums will be validated to ensure proper transfer of the files.

4.4.3 Final Digitization Report

Post-digitization the technician will make any necessary notes or comments regarding the transfer on the spreadsheet (*Welles_Video_Metadata_Spreadsheet*), which will be stored in the same folder with the digital files. The spreadsheet will contain all comments and decisions made during the transfer, such as signal adjustments, playback problems, machine errors, etc. A summary of signal adjustments and transfer problems will also be available through the final report (*Welles_Video_Digitization_Final_Report*) in the same folder.

5. Deliverables and Specifications

5.1 File Formats

For preservation master files, we will create 10-bit uncompressed YUV 4:2:2 Quicktime (.mov) files with uncompressed PCM, 48 kHz, 24-bit audio stream.

Access master files will be H.264/MPEG-4 part 10, 2500kbit/s Quicktime (.mov) files with AAC audio at 320kbits/s, normally used for streaming purposes. Access masters will be created doing a transcoding from the preservation masters using ffmpeg on the terminal. Transcoding will be done using constant bit rate one-pass encoding. Constant bit rate can cause problems during compression when images have more motion (which demands less compressed data, therefore a higher bit rate). Two-pass encoding is normally used when transcoding using variable bit rate. Due to the fact that there is not really motion in the frame for the interviews contained in the collection, two-pass variable bit encoding was not needed.

These file formats and wrappers fit the requirements of DLTS for long-term storage and possible video streaming. The Digital Library over at Elmer Bobst Library will only accept the 10-bit uncompressed YUV files. 10-bit uncompressed video files capture the entirety of the analog video signal including important sync signals and closed captioning information, specifically the horizontal and vertical sync of the front porch, back porch, and closed captioning information on line 21.

5.2 File naming conventions and directory structure

For this digitization project we will use the following human-readable file name conventions:

Video:
RXXXX_Welles_Title_XofX_P/A

Where RXXXX is the current ID used in the archive, P is used for preservation master files and A for access masters. Title will be limited to 20 characters and it will be assigned by the technician.

Documents:
Welles_Video_Digitization_Plan/Report/Etc. for text and other documents.
Directory Structure: All files created during this project and the audio digitization project will be stored under the following directory structure on the NAS and G drive:

```
Welles_Digitization_Project
    Welles_Video
        Welles_Video_Preservation_Files
            R0001_Welles_Title_1of1_P.mov
            R0002_Welles_Title_1of2_P.mov
            …
        Welles_Video_Access_Files
            R0001_Welles_Title_1of1_A.mov
            …
        Welles_Video_Documentation
            Welles_Video_Digitization_Plan.pdf
            Welles_Video_Metadata_Spreadsheet.xls
```

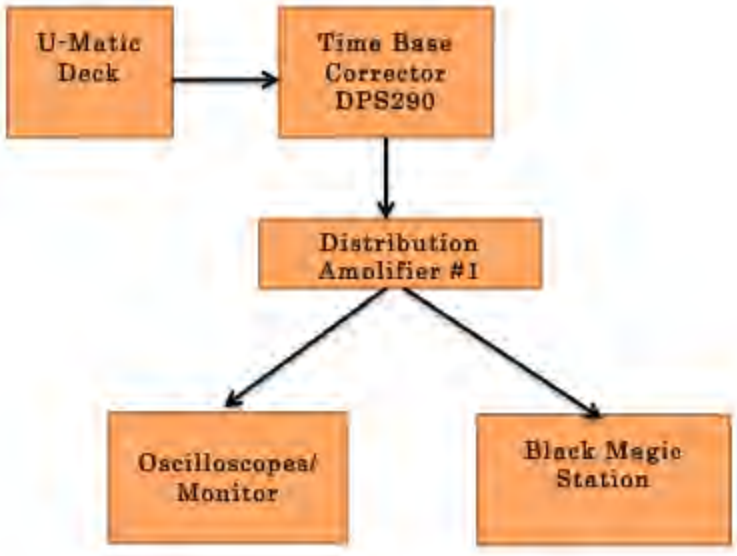
6. Metadata Requirements

Metadata will be gathered throughout the digitization process from pre-digitization, digitization, and post-digitization (see *Appendix 2* for details). This includes only technical information and any comments about the transfer. All this information will be recorded on the file *Welles_Video_Metadata_Spreadsheet.xls*.

Appendix 1: Signal Path Diagrams

Rack 1 [Patch Bay]:

Video Signal Path

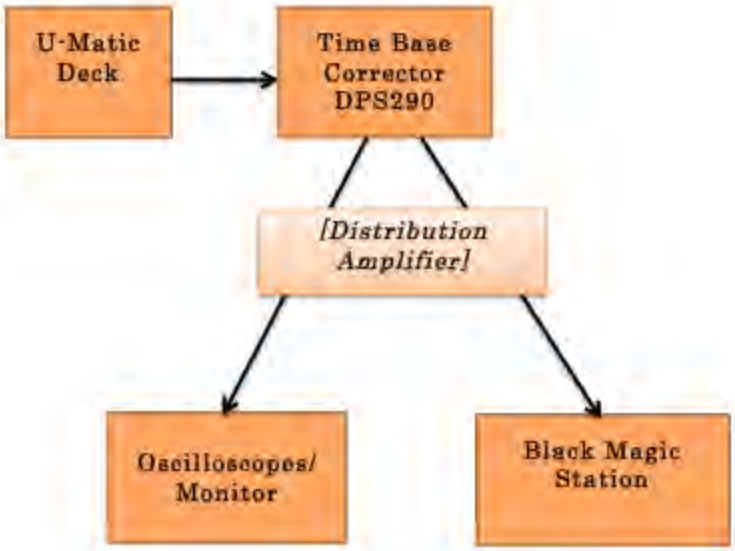


Audio Signal Path

Calibration

Rack 2 [Switcher]:

Video Signal Path



	SWITCHER							
OUTPUT	1	2	3	4	5	6	7	8
* INPUT	0	2	5	0	5	0	0	0

**This is how the switcher should be configured for a U-Matic transfer. The red numbers represent the signal path of the U-matic deck, Time Base Corrector, Oscilloscopes/Monitor, and Black Magic Station. The audio is normalized when the switcher is set to "AFV" - "Audio Follows Video".*

Appendix 2: Metadata Fields for Digitization

The following metadata fields will be used for this project, which will be delivered on an excel spreadsheet named *Welles_Video_Metadata_Spreadsheet.* This document will be available on the folder *Welles_Digitization_Project/Welles_Video_Documentation.*

- Name of operator
- Directory/Folder
- Unique ID (R Number)
- Title
- Format Type Wrapper
- Sound
  - Sound/Silent
  - Number of Channels
  - Sound Field
- Date Created (mm-dd-yyyy)
- Source deck manufacturer/model

- Software version
- Digitization Station number
- Actions on transfer
    - TBC Null Settings (values obtained after calibration)
    - Video Signal Adjustments (adjustments performed during tape playback)
    - Audio Signal Adjustments (adjustments performed during tape playback)
- Checksum
    - Value
    - Algorithm
- Video Encoding Data Version
- Codec Creator Application
- Codec Quality Lossless/Lossy
- Bit Depth
- Sample Ratio/Color Subsampling
- Data Rate
- Codec Name Version
- Frame Rate
- Scanning Mode (Interlaced/Progressive)
- Aspect Ratio
- Program Duration
- Quality Control Comments
- QC Checked by
- QC date

Appendix 3: Results of Tape Cleaning

Below we present the results of the tape cleaning procedure, using the SAMMA cleaner at DLTS laboratory on November 18th, 2013 by Mona Jimenez.

ID: R6001
Title: DePaur Interview #1
Comments: Noisy transport esp in first 5 minutes, then snapping sound and more quiet. 2nd voice memo. Cleaned successfully one pass forward, one pass back.

ID: R6002
Title: DePaur Interview #2
Comments: Fairly noisy transport. 3rd voice memo. Cleaned successfully one pass forward, one pass back.

ID: R6003
Title: DePaur Interview #3

Comments: Fairly noisy transport. Cleaned successfully one pass forward, one pass back.

ID: R6004
Title: DePaur Interview #4
Comments: Fairly noisy transport. Cleaned successfully one pass forward, one pass back.

ID: R6005
Title: DePaur interview #5
Comments: Fairly noisy transport but only momentarily at around 7 min. Cleaned successfully one pass forward, one pass back.

ID: R6006
Title: Fanto interview #1
Comments: Some noise in forward transport. Cleaned successfully one pass forward, one pass back.

ID: R6007
Title: Fanto Interview #2
Comments: Cleaned successfully one pass forward, one pass back.
ID: R6008
Title: Fanto Interview #3
Comments: Cleaned successfully one pass forward, one pass back.

ID: R6009
Title: Fanto Interview #4
Comments: Noisy transport esp in first 5 min, then snapping sound and more quiet. Cleaned successfully one pass forward, one pass back.

ID: R6010
Title: Fanto Interview #5
Comments: Cleaned successfully one pass forward, one pass back.

ID: R6011
Title: Price Interview, Dupe #1
Comments: Tape not cleaned, it’s not an original recording.

ID: R6012
Title: Price Interview, Dupe #2
Comments: Tape not cleaned, it’s not an original recording.

ID: R6013
Title: Price Interview, Dupe #3
Comments: Tape not cleaned, it's not an original recording.

ID: R6014
Title: Price Interview, Original #1
Comments: Was not rewound. Rewound. Cleaned successfully one pass forward, one pass back.

ID: R6015
Title: Price Interview, Original #2
Comments: Slight noise on transport. Cleaned successfully one pass forward, one pass back.

ID: R6016
Title: Thompson Interview #1
Comments: Slight noise on transport. Cleaned successfully one pass forward, one pass back.
ID: R6017
Title: Thompson Interview #2
Comments: Cleaned successfully one pass forward, one pass back. 1st voice memo.

ID: R6018
Title: War of the Worlds Press Conference
Comments: Not cleaned, video is a copy from other archive.

ID: R6019
Title: We Work Again (1937 Macbeth)
Comments: Not cleaned, video is a copy from other archive.

ID: R6020
Title: Welles Retrospective Video Documentary
Comments: Stopped at first forward pass approx 30:00. Tried eject, it rewound and tried 2nd pass. Intermittent squealing and stopped. Rewound and ejected.

ID: R6021
Title: Welles Retrospective Video Documentary
Comments: Intermittent shuttle noises. Same as above at approx 39:00. Rewound and ejected. No noise on rewind.