

**MOVING IMAGE ARCHIVING & PRESERVATION PROGRAM  
VIDEO RESTORATION LAB I, H72.3403**

Fall 2011

Mondays, 1:30 pm - 4:30 pm, 665 Broadway, Rm. 643.

Instructors:

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**OFFICE HOURS:** We are both available anytime to meet but will not hold regular office hours. Please feel free to contact us by any of the above methods with any questions or concerns or to set up an appointment to meet in person.

**GOALS:** This class is the first of two courses will give students direct experience with the process of re-formatting of magnetic media for preservation and access. Addressing in-house, the class will increase knowledge in areas of archival standards, prioritization and decision-making, source and destination formats, technical requirements and systems, preparation and workflow, documentation and metadata capture, quality assurance, and overall project management. Students will have hands-on experience with tape preparation and re-formatting using equipment in the MIAP Lab and will interact with experts from preservation vendors and other NYU departments.

**EXPECTATIONS:** Each student will do two assignments, as outlined below. Additional tasks will be required as we go through the course. Attendance at all classes is mandatory and the student must make arrangements ahead for classes missed, except in the case of illness and other unexpected absences, when the student must notify by email or phone the instructor before class time. It is the responsibility of the student to follow through on making up for missed classes, excused or unexcused. Unexcused absences will substantially affect grades. Grades will be based on a combination of class attendance, preparedness and participation (40%) and assignments (60%).

A Dropbox will be used for any class documents, assignments or further information. It is expected that students will check the Dropbox regularly for any updates. In addition, the Dropbox can be used to share resources and information with your fellow classmates.

MIAP Digital Archive: In addition to assignments submitted in print form, all course papers/projects will be submitted in electronic form by the beginning of the class period on the due date. (Please also bring a hard copy to class on the due date.) These will be submitted via email to both instructors.

Please submit word-processed documents as Rich Text Format files (.rtf). Your papers will be made part of the MIAP Digital Archive in a private space for faculty use, and on the MIAP web site, where appropriate. Please inform me of any papers that cannot be published on the web due to confidentiality restrictions or other reasons, or if you have other concerns about your work being posted. In some cases, the title of a paper will be published, but access to the paper will be restricted to selected MIAP faculty and staff. When electronic files are submitted, the file names must conform to the standard format (please see end of syllabus for instructions on file naming.)

**Texts:**

Required text is How Video Works by Marcus Weise and Diana Weynard. Since this was a required text for a first year class, I assume all students have it. Additional readings will be provided as handouts or are available on the web. Some texts will be ones that you have read in previous classes – when they are assigned, please review those prior to class as a refresher. For texts on video from the 1970s and 1980s the following books are recommended (they are out of print):

Bensinger, Charles. The Video Guide. Santa Barbara, CA: Video-Info Publications. 1981.

Media Bus, Inc. The Spaghetti City Video Manual. New York and Washington: Praeger Publications. 1973.

**Helpful resources:**

- Bachman, Rebecca, et al. "Glossary" in Video Preservation Resources on the web site of the Bay Area Video Coalition. San Francisco: Bay Area Video Coalition. 2003. Retrieved 1/19/05 at <<http://www.bavc.org/preservation/dvd/resources/gloss.htm>>.
- ScreenSound Australia. "Technical Glossary of Common Audiovisual Terms" in Preservation on the ScreenSound Australia web site. Canberra, Australia: ScreenSound Australia. 2000-2003. Retrieved 1/19/05 at <<http://www.screensound.gov.au/glossary.nsf/Main/Glossary+Index?OpenDocument>>.
- Wheeler, Jim and Peter Brothers. "Video Preservation Fact Sheets." Los Angeles: Association of Moving Image Archivists. 2003. Retrieved 1/19/05 at <<http://www.amianet.org/publication/resources/guidelines/videofacts/about.html>>.
- Milner, Greg. Perfecting Sound Forever. New York, NY. Faber and Faber Inc. 2009.

Please note: The Video Guide (see cites below) is also available on the web at [http://videopreservation.stanford.edu/vid\\_guide/index.html](http://videopreservation.stanford.edu/vid_guide/index.html)

**Assignments:****Assignment #1**

Researching Production History. Each student will be assigned a type of media production from a particular era. Using primary and secondary resources, each student will research the production process, detailing the workflows and associated elements from creation through distribution using narrative and visual diagrams. The narrative should go on to identify and discuss the priorities for each of the elements produced in the context of preservation and archiving. The rationale provided should include a comparative analysis of elements in the studied workflow as well as a general comparison speaking to prioritization when considered against other media types and formats. On October 31, everyone will give a short presentation on their production process and submit a written report (5 page minimum) including the details above. Due in class on October 31.

**Types of Production:**

- Multi-track Audio Studio Recording: 1960s/1970s (e.g. Beatles, Kraftwerk), 1990s (e.g. Radiohead, Wu-Tang), 2000s (e.g. LCD Soundsystem)
- Broadcast News (CBS, CNN): 1960s, 1970s, 1990s, 2000s
- Local Access Television (e.g. BCAT, MNN): 1980s, 2000s
- Video Production (Documentaries, Feature Films, Television): 1980s, 1990s, 2000s
- 2" Quad studio recording (e.g. The Tonight Show with Johnny Carson, Honeymooners, Twilight Zone)

**Possible resources include:**

- Books and journals on the topic of media production
- Archival collections representing a production type and era
- People involved in a particular production type and era

## **Assignment #2**

Completing a Re-formatting Project: Each student will be responsible for managing the preservation of a tape, beginning with the visual inspection through the creation of preservation and access files and associated metadata. In addition to producing files and metadata, students will detail decisions made in such areas as destination format, file naming, plans for creation of derivatives, and documentation of preservation actions. On December 14th, each student will present the methodology used for their transfer, the reasoning behind the methodology and their findings. Each student will also submit a written report of the above (7 pages minimum). You will be assigned lab time for the transfer with both instructors present to assist and answer any questions.

Students will be given scenarios to perform as a basis of comparative analysis. These will include:

- Signal Comparison: Composite vs. S-Video vs. Component
- Compression Comparison: Compression ratios vs. Uncompressed
- Set-up Comparison: Set-up vs. No set-up
- Time-based correction comparison: TBC vs. No TBC
- Audio A/D comparison: Low quality A/D vs. High quality A/D
- Video A/D comparison: Blackmagic vs. ADVC
- Bit-depth comparison: Uncompressed 10-bit vs 8-bit
- Audio Sample Rate Comparison: 96Khz/24-bit vs 44.1Khz/16-bit

## **Classes:**

### **Class 1: September 12, 1:30 – 4:30 pm**

(Recommended follow-up reading for class 1)

- Martin, Jeff. "The Dawn of Tape: Transmission Device as Preservation Medium." *The Moving Image*. Spring 2005. p. 35-66.
- Suyaga, Hiroshi. "The Past Quarter-century and the Next Decade of Videotape Recording." *SMPTE Journal*. No. 101: 10-13. January 1992.
- Hocking, Sherry Miller. "Principles of Electronic Image Processing: Signals". Owego, NY: Experimental Television Center. n.d. Retrieved 1/16/05 at [http://www.experimental-tv-center.org/history/tools/tools\\_texts.php3](http://www.experimental-tv-center.org/history/tools/tools_texts.php3)
- "TV Technology" on the web site The Pamela Nash Experience. Retrieved 1/25/06 at <http://archive.whoniversity.co.uk/tech/index.html> (for quad)

### **Topics/activities:**

- Introductions (10min)
- Syllabus Review (10min)
- Discussion of Assignment #1 (10min)
- Aesthetic History of Magnetic Media
  - The Signal (30min)
  - Characteristics and the transmission of the signal (15min)
  - Capture of the Signal (30 min)
- History of tape and reproducer technology (30min)
- Discussion of Preservation/Restoration/Enhancement (20min)

### **Class 2: September 19, 1:30 – 4:30 pm**

Read/due this class:

- "Electronic Photography"; "Scanning"; and "The Transmitted Signal" in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 5-38.

- “Color Video” in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 53-67.
- “Magnetic Media” in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 161-173.
- “Overview of Operations” in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 207-221.
- “Audio for Video” in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 193-205.

Recommended:

- “The VTR” in Bensinger, Charles. The Video Guide, 2nd ed. 1981. Santa Barbara, CA: Video Info Publications. p. 60-70.
- “VTR Interchangeability” in Bensinger, Charles. The Video Guide, 2nd ed. 1981. Santa Barbara, CA: Video Info Publications. p. 101-114.
- Excerpt from Bensinger, Charles. The Video Guide, 2nd ed. 1981. Santa Barbara, CA: Video Info Publications. p. 236-238.
- “Timecode” in Weise, Marcus and Diana Weyland. How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 183-191.

Topics/activities:

- Overview of equipment mechanics (45min)
- Hands on analysis of U-matic VTR in comparison to open-reel reproducer (60min)
- Discussion of calibrated reproduction vs. faithful reproduction (45min)

**Class 3: September 26, 1:30 – 4:30 pm**

Read/Due this class:

- “NTSC Video Measurement” on Tektronix website. Retrieved 09/11/2011:  
[http://www.tek.com/Measurement/App\\_Notes/NTSC\\_Video\\_Msmt/25W\\_7247\\_1.pdf](http://www.tek.com/Measurement/App_Notes/NTSC_Video_Msmt/25W_7247_1.pdf)

Topics/activities:

- Role of equipment in signal integrity. (60 min)
- Signal Reformatting/Signal Path (60 min).
  - Role of different signal input/outputs in relation to reproduction.
  - Wiring diagram explanation and discussion.

**Class 4: October 17, 1:30 – 4:30 pm**

Read/Due this class:

**Video**

- “Analog Waveform Monitors”, “Analog Vectorscopes”, and “The Encoded Signal” in How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 75-102.
- Tektronix. Waveform Monitor Techniques, Vectorscope Techniques, and Setting up a Genlocked Studio in “Video Measurement: The Basics”, Retrieved 9/6/07 at  
[http://www.tek.com/Measurement/App\\_Notes/NTSC\\_Video\\_Msmt/25W\\_7247\\_1.pdf](http://www.tek.com/Measurement/App_Notes/NTSC_Video_Msmt/25W_7247_1.pdf)

**Audio**

- McKnight, John. “Tape Reproducer Response Measurements With a Reproducer Test Tape”. Journal of the Audio Engineering Society. Retrieved 9/6/07 at  
[http://home.flash.net/%7Emrltapes/mcknight\\_tape-reproducer-response.pdf](http://home.flash.net/%7Emrltapes/mcknight_tape-reproducer-response.pdf)
- Obtaining an Accurate Transfer (pp. 8-10) and Configuring, Calibrating Playback Equipment (pp. 21-23), and Configuring and Calibrating Playback Equipment (pp. 28-30) in “Capturing Analog Sound for Digital Preservation: Report of a Roundtable Discussion of Best Practices for Transferring Analog Discs and Tapes”. 2006. Washington, D.C., Council on Library and Information Resources and Library of Congress. Retrieved 9/6/07 at  
<http://www.clir.org/pubs/reports/pub137/pub137.pdf>

Topics/activities:

- Audio and video setup for playback – alignment, level setting, calibration, and the role of reference signals. Azimuth, Skew, Tracking, etc.(60 minutes)
- Role of the TBC, Proc Amp and Frame Synchronizer, EQ curves
- Role of audio meters, waveform monitors, vectorscopes, video monitors and audio monitors
- Monitor Calibration

**Class 5: October 31, 1:30 – 4:30 pm**

Read/Due this class:

- Research Technology International. The Videotape Cassette Care Handbook. 1999. Lincolnwood, IL: Research Technology International. p. 3-9. (handout)
- Bigourdan, Jean-Louis, Jame M. Reilly, Karen Santoro and Gene Salesin. The Preservation of Magnetic Tape Collections: A Perspective. Rochester, NY: Image Permanence Institute. 2006. Accessed 9/8/08 at [http://64.233.169.104/search?q=cache:jCwVQCMGSu0J:www.imagepermanenceinstitute.org/shtml\\_sub/NEHTapeFinalReport.pdf+The+Preservation+of+Magnetic+Tape+Collections:+A+Perspective+ipi&hl=en&ct=clnk&cd=1&gl=us&client=firefox-a](http://64.233.169.104/search?q=cache:jCwVQCMGSu0J:www.imagepermanenceinstitute.org/shtml_sub/NEHTapeFinalReport.pdf+The+Preservation+of+Magnetic+Tape+Collections:+A+Perspective+ipi&hl=en&ct=clnk&cd=1&gl=us&client=firefox-a)
- “All About Videotape” in Bensinger, Charles. The Video Guide, 2nd ed. 1981. Santa Barbara, CA: Video Info Publications. p. 71-75.
- Spec Bros. “White Paper: Basic Inspection Techniques to Sample the Condition of Magnetic Tape” on the web site of Spec Bros. Lodi, NJ: Spec Bros. 2002. Retrieved 1/25/06 at <http://www.specsbros.com/whitepaper.html>.
- Excerpt of “Chapter 4” in White, Gordon. Video Techniques. 1982. London, Sydney, Toronto, Wellington, Durban and Boston: Butterworth and Co. p. 103-116. (handout)
- “Introduction”, “Open Reel Tape”, “Analog Audio Cassettes”, “DAT” Casey, Mike. FACET: Format Characteristics and Preservation Problems Version 1.0 2007. Indiana University. pp. 1-54. Available at: [http://www.dlib.indiana.edu/projects/sounddirections/facet/facet\\_formats.pdf](http://www.dlib.indiana.edu/projects/sounddirections/facet/facet_formats.pdf)

Topics/activities:

- A/V manifestations of degradation.
- Treatment

**Class 6: November 14, 1:30 – 4:30 pm**

Read/Due this class:

- Federal Agencies Audio-Visual Working Group. “Video Digitization Activities, Guidelines and Format Specifications” in Federal Agencies Digitization Guidelines Initiative. 2008. Accessed 8/31/10 at [http://www.digitizationguidelines.gov/audio-visual/documents/Resource\\_Video\\_080812.pdf](http://www.digitizationguidelines.gov/audio-visual/documents/Resource_Video_080812.pdf)
- Lacinak, Chris. A Primer for Codecs for Moving Image and Sound Archives: Ten Recommendations for Codec Selection. 2010. New York: AudioVisual Preservation Solutions. Accessed 8/31/10 at [http://www.avpreserve.com/wp-content/uploads/2010/04/AVPS\\_Codec\\_Primer.pdf](http://www.avpreserve.com/wp-content/uploads/2010/04/AVPS_Codec_Primer.pdf) “Digital Theory”; “Digital Television Standards”; and “High Definition Video” in How Video Works: From Analog to High Definition. 2004. Burlington, MA and Oxford: Focal Press. p. 95-137.
- Graft, Donald. “Data Rates and File Sizes” Retrieved 10/10/07 at <http://neuron2.net/LVG/ratesandsizes.html>

Review:

- Vitale, Tim and Paul Messier. “Video Migration in the Preservation Laboratory: Video Capture Card and External Analog to Digital Converters (ADC.” In Video Preservation Website: Digital Migration Tools and Techniques. 2007. Accessed 8/31/10 at [http://videopreservation.conservation-us.org/dig\\_mig/index.html](http://videopreservation.conservation-us.org/dig_mig/index.html)

AJA Data Rate Calculators:

- For Mac OSX: [http://www.aja.com/ajashare/AJA\\_Data\\_Rate\\_Calculator\\_v2.app.tar](http://www.aja.com/ajashare/AJA_Data_Rate_Calculator_v2.app.tar)
- For Windows: [http://www.aja.com/ajashare/AJA\\_dataratecalculator\\_win\\_10-5.zip](http://www.aja.com/ajashare/AJA_dataratecalculator_win_10-5.zip)

Topics/activities:

- Assignment #1 Presentations.
- Introduction of Assignment #2 Completing a Re-formatting Project and review of concepts and technical specifications in regards to analog to digital migration.

**Lab Time: November 21, 1:30 - 4:30 pm**

**Lab Time: November 28, 1:30 – 4:30 pm**

**Lab Time: December 5, 1:30 - 4:30 pm**

**Final Class: December 14, 1:30 - 4:30 pm**

- Final Project presentations
- Class wrap-up

File submission format for assignments:

year semester\_class number\_author's last name\_assignment number.extension

Example: 05s\_1800\_Smith\_a1.doc

For multiple authors, the two initials of each author will be used, separated from each other by underscores. An underscore and the assignment number will follow this. Assignment numbers are determined by the order in which the assignments are given. They begin with an 'a,' followed by a number between one and ten. For assignments with multiple files, a letter can be added after the number. Thus, one could have 'a1b,' meaning that this is the second of multiple files from one student for one particular assignment. If a student decides to withhold her work from being freely available online, she may alert the professor, as well as by adding "\_x" after the assignment number in file name:

Example: 05s\_1800\_smith\_a1\_x.doc

Otherwise, permission shall be implicitly granted for the student's work to be posted on the digital archive website.