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Documentary Heritage & Preservation Services

FOR NEW YORK

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DOCUMENTARY HERITAGE & PRESERVATION SERVICES FOR NEW YORK

A/V Collections: Planning a Reformatting Project

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Media Preservation Initiative, Whitney Museum of American Art

Spring 2019

Documentary Heritage and Preservation Services for New York is a five year initiative to deliver collections-related training, preservation surveys, archival assessments, and other services to the historical records community in New York.

New York State Library

New York State Archives

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Documentary Heritage & Preservation Services

for New York

Website: dhpsny.org

The University of the State of New York — The State Education Department — 1784

Conservation Center

for art & historic artifacts

Analog media in the archive

- Millions of tapes and reels sitting on shelves in archives around the world
- Dozens of format types
- Demand for access continues to grow
- Growing awareness of concerns around the longevity of media collections
- Reformatting to digital assets provides preservation backup of media while allowing for easy access

Attributes of analog media

- Audiovisual records creating the illusion of continuous image and/or sound
- Compact
- Durable
- Playback
- Provided that:
  - Media carrier can still be read
  - Media player is still working/available

Credit: https://newstreamsstudio.com/transfer-old-videotapes-film-photos-slides-audio-tapes-dvd-digital-format/

Attributes of analog media (cont.)

- Encoded signal (analog or digital)
- Chemical (in)stability
- Endangered by temperature, humidity
- Obsolescence
- More than 100 years of media collections at risk
- Some of the more recent formats are the most endangered

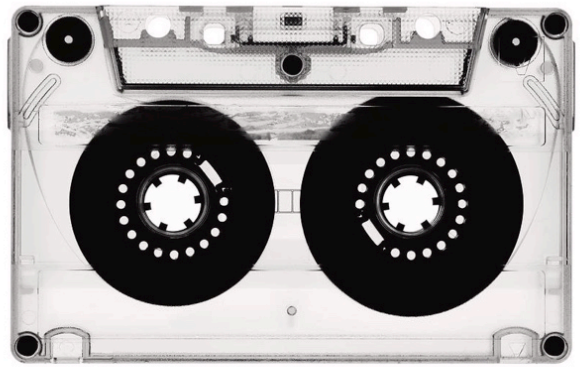
Types of media

Film

Video

Credit: http://www.rutlandproductions.co.uk/cine-to-dvd-why-transfer-your-old-film/
http://bigeggmedia.com.au/audio-video-conversion/transfer-video-tape-to-dvd-conversion-adelaide

Types of media



Audiotape

Grooved media

Credit: https://photos.com/featured/old-audio-tape-olive.html
https://www.cnet.com/pictures/how-a-vinyl-record-is-made-pictures/

Types of media

Optical media

Memory disks

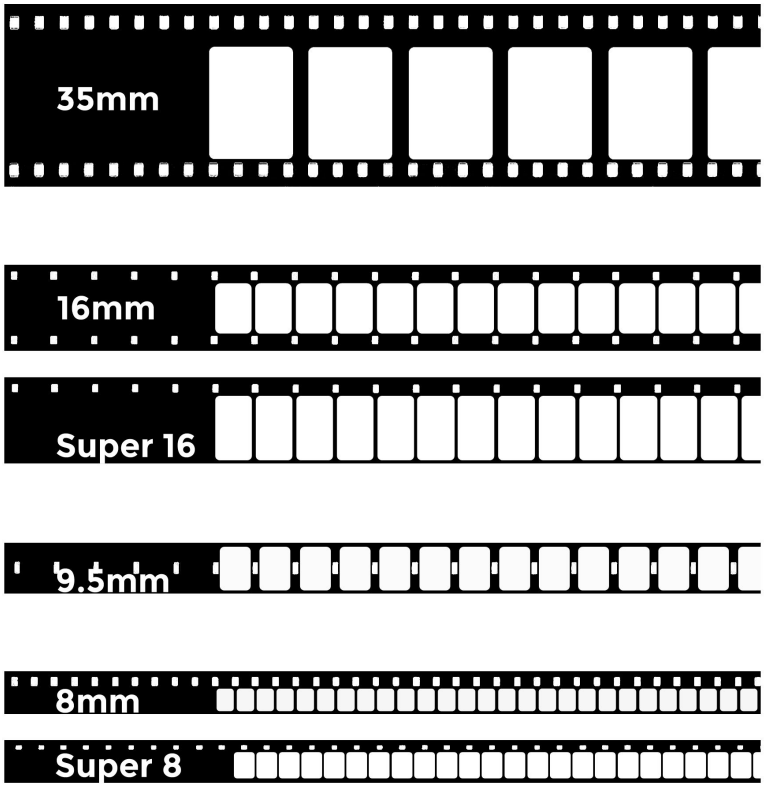
Credit: http://www.networkset.net/wp-content/uploads/2011/09/
https://shop.cintrexav.com/floppy-disc-and-zip-drive-transfer-p28.aspx

Film

- Images captured in a light-sensitive emulsion coated on a strip of acetate or polyester
- Image is either negative or positive
- Viewed at 24 frames per second to create a coherent moving image
- Individual frames can be viewed and documented without complex equipment
- Projector or viewer (such as flatbed editor) required to view the work

Film (cont.)

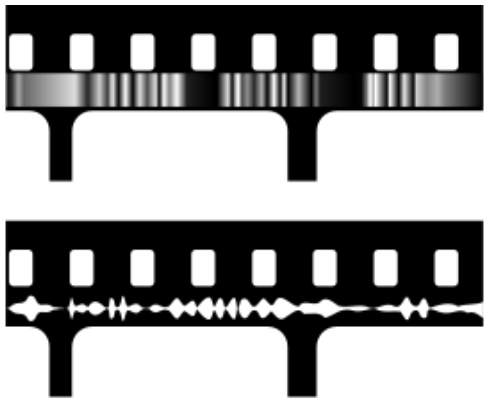
- Film comes in a variety of formats, called gauges
  - 35mm
  - 16mm
  - 8mm
  - Super8
- Refers to the width of the frame on the film reel
- Helps identify the number of sprockets per image



Credit: https://psap.library.illinois.edu/collection-id-guide/film

Film (cont.)

- Substrate or film base
  - Acetate (safety)
  - Polyester (since 1990s)
  - Nitrate (35mm only, discontinued 1952)
  - Diacetate (less common, discontinued 1957)
- Audio (soundtrack) may be found in margins of the film strip
  - Optical
  - Magnetic
  - Digital



Credit: https://en.wikipedia.org/wiki/Sound-on-film

Magnetic media

- Reel or cassette
- Strip of thin plastic coated in a binder that contains magnetic particles
- Video and/or audio recorder arranges particles into a pattern that can be read back by suitable player
- Signal may be analog (similar to traditional TV or radio signal)
- or digital (DVCAM, MiniDV, DigiBeta, DAT)

Magnetic media (cont.)

- Variety of formats prevalent from 1950s until present, ubiquitous from 1970s-90s
- Integrity of tape can differ dramatically
- Prone to binder hydrolysis (sticky shed syndrome)
- Obsolete equipment rapidly becoming harder to find and prone to small parts breaking down
- Image encoding can be NTSC (the Americas), PAL (Europe, East and South Asia, Brazil, Argentina, Africa, Australia), or SECAM (France, Russia, Central Africa)

Magnetic video

2" Open Reel
"Quad"
(1950s-80s)

1" Open Reel
(1960s-90s,
Various formats)

Credit: https://www.dcvideo.com/videotape-identifier
https://psap.library.illinois.edu/collection-id-guide/videotape

Magnetic video (cont.)

¾" U-matic
(1971-2000)

VHS
(1976- present)

Credit: https://statelibrarync.org/news/2015/04/obsolete-media-highlight-u-matic-tapes/
https://en.wiktionary.org/wiki/VHS

Magnetic video (cont.)

Betacam and
DigiBeta
(1982/93-present,
S and L formats)

Video8, Hi8, and
Digital8
(1980s/99- 2000s)

Credit: http://www.fujifilm.com/products/professional_av/lineup/digitalbetacam/
https://www.imaginevideo.net/hi8

Magnetic video (cont.)

MiniDV
(1995/2000s)

Other formats include: DVCAM, ½" inch open reel, Betamax, and others

Credit: https://www.youtube.com/watch?v=UcBcDVKqsQ0

Magnetic audio

Reel-to-reel audiotape (2"/1"/½"/¼")

Credit: https://psap.library.illinois.edu/collection-id-guide/audiotape#audioquarterinOR

Magnetic video (cont.)

Compact Cassette

Digital Audio Tape (DAT)

Credit: https://zstereo.co.uk/2017/07/07/a-compact-cassette-rival/
https://blogs.library.duke.edu/bitstreams/2014/10/10/dat-sound/

Other media types

Phonograph Records
(Vinyl, Lacquer,
Shellac)

LaserDisc

Credit: https://psap.library.illinois.edu/collection-id-guide/phonodisc
https://www.slashgear.com/laserdisc-pronounces-dead-in-japan-1430479/

Caring for your assets

- Temperature and humidity control
- ISO standards for color film
  - 36°F at 20%-30%RH
  - 27°F at 20%-40%RH
  - 14°F at 20%-50%RH
- ISO standards for magnetic media
  - 68°F at 20%-30%RH
  - 59°F at 20%-40%RH
  - 50°F at 20%-50%RH

Credit: https://amianet.org/wp-content/uploads/Resources-Storage-Standards-2000.pdf

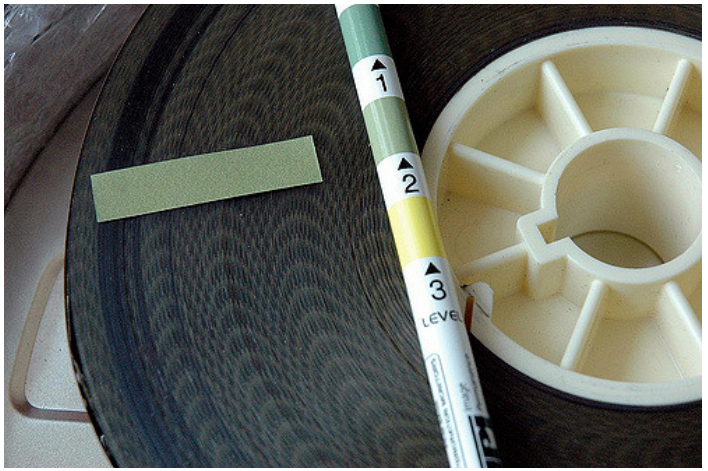
Caring for your assets (cont.)

- Dust-free environment
- Shelve correctly
- Film
  - Film reels stored flat
  - On cores
  - In ventilated cans
- Cassettes
  - Stand upright
  - In suitable containers

Credit: https://eyeondesign.aiga.org/from-ignored-ubiquity-to-design-classic-the-art-of-blank-vhs-tape/

Caring for your assets (cont.)

- Your nose is your best tool
- Binder hydrolysis (sticky shed) in magnetic media carriers smells waxy; severe cases like dirty socks
- Vinegar syndrome in acetate film – you should know the moment you open the can
- Can be tested using A-D strips



Credit: https://www.flickr.com/photos/pulp-o-rama/3520041024/in/photostream/

Viewing your collection

- Unless you have to, don't
- Puts unnecessary wear on tapes and reels
- Important to inspect both the media carrier and the equipment before use
- Film can be looked at (but not viewed) on a rewind with subjecting it to stress of projection
- Argument for winding through film years once a year – exercising them

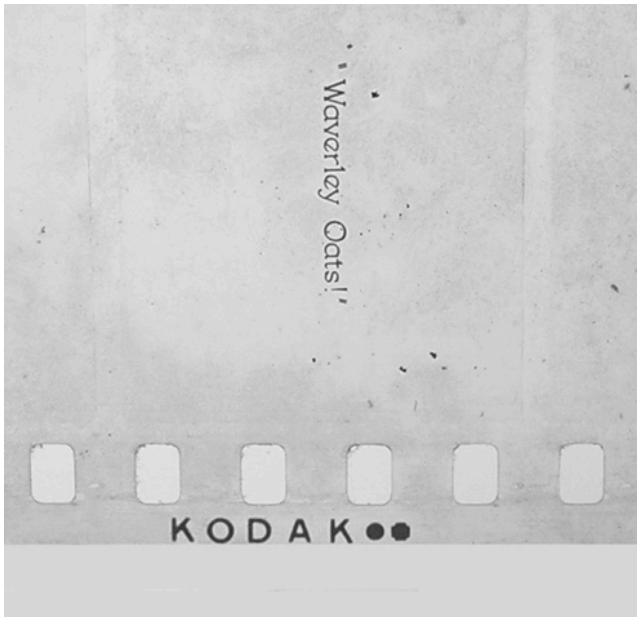
Inspecting film

- Basic equipment:
  - Rewind
  - Lightbox
  - Reels (split reels)
  - Gloves
  - Loupe
- Advanced equipment:
  - Splicers
  - Shrinkage gauge

Credit: https://pushcartcatalog.wordpress.com/2016/04/06/1615/

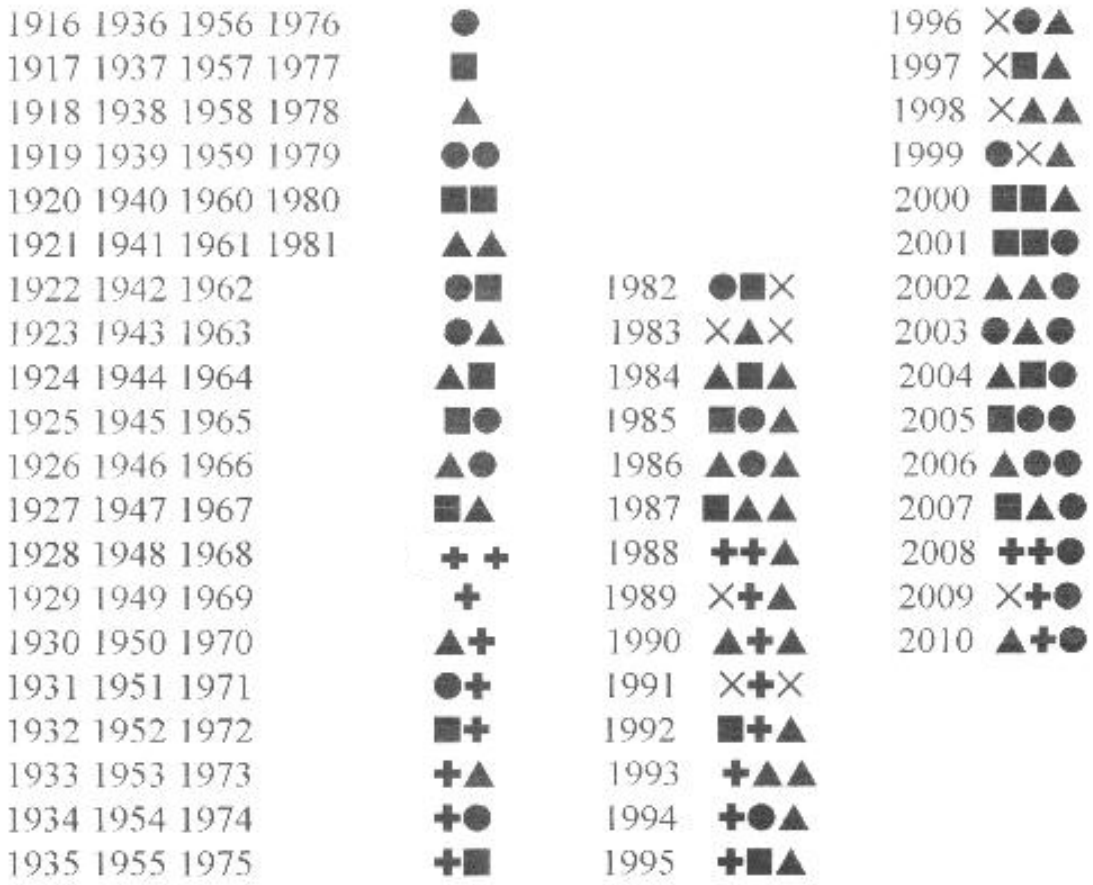
Inspecting film – metadata

- Gauge
- Positive/negative
- Length (footage) of the reel
- Condition/damage
- Mold/decomposition
- Edgecode
  - Stock brand/type
  - Filmbase (nitrate/safety)
  - Kodak codes



Credit: http://www.brianpritchard.com/Date%20Codes.htm

Inspecting film – edgecodes



Credit: https://16mmfilminfo.com/dates.html

Inspecting video

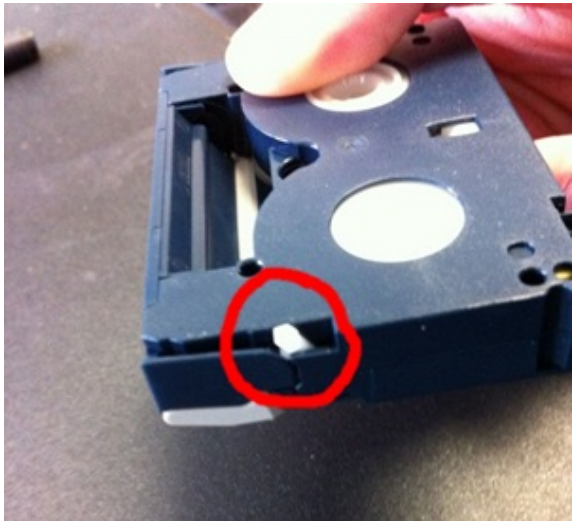
- Identify format
- Identify brand
- View through window for mold
- Open latch on cassette to inspect ribbon and perform smell test

VHS

Credit: https://goughlui.com/the-vhs-corner/intro-inside-the-vhs-cassette-vcr/

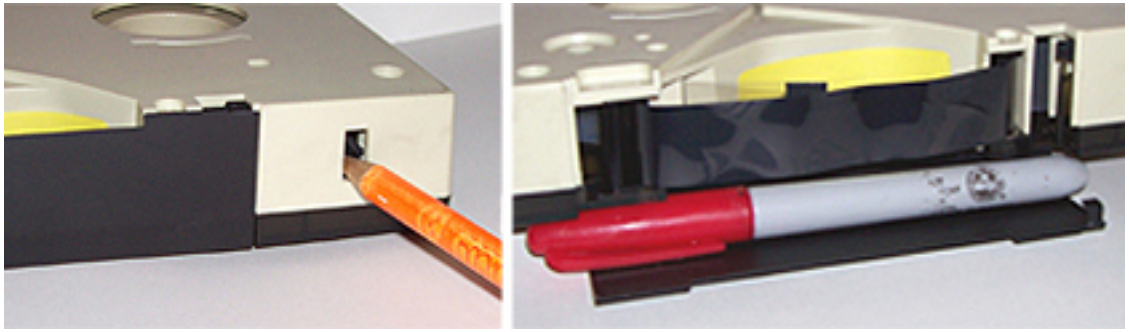
Inspecting video (cont.)

- Each format has a different release to inspect the ribbon
- Always consult resources online if in doubt



MiniDV

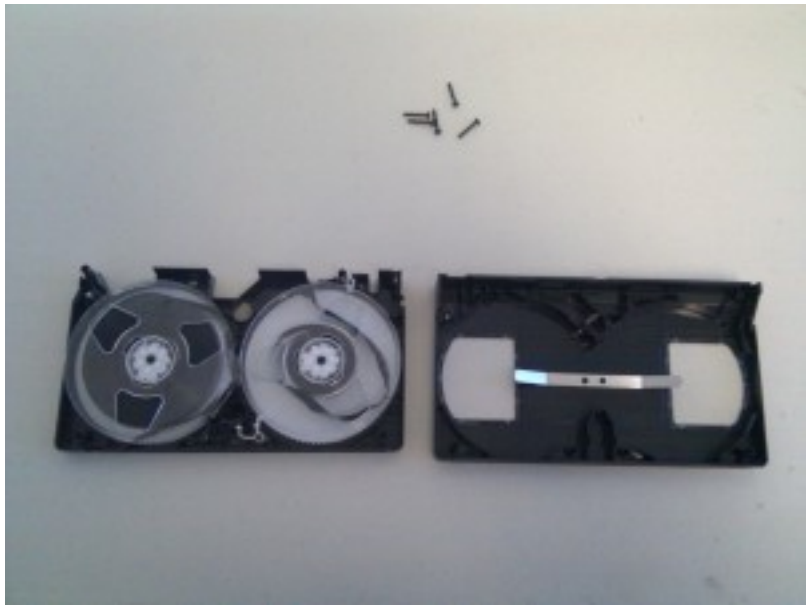
U-matic



Credit: https://goughlui.com/the-vhs-corner/intro-inside-the-vhs-cassette-vcr/
http://www.dvdyourmemories.com/blog/minidv-tape-repair-guide-repair-minidv-tape/

Inspecting video (cont.)

- Tapes can be opened with little difficulty for further inspection
- Further smell testing, splicing, or removal of mold
- May need to cut through label
- Consult online guides

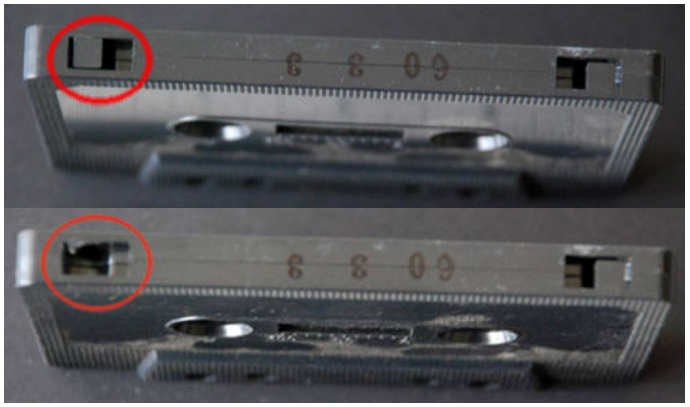


Credit: http://www.dvdyourmemories.com/blog/how-to-repair-a-video-tape-a-vhs-repair-guide/

Inspecting video (cont.)

- Set all cassettes in your archive to “Safe” mode in order to prevent them from being recorded over during playback or digitization

VHS



Audiocassette

U-matic

Credit: https://www.instructables.com/topics/HOW-TO-BYPASS-COPYRIGHT-ON-VHS-TO-RECORD-TO-DVD/
https://psap.library.illinois.edu/collection-id-guide/recordprotection

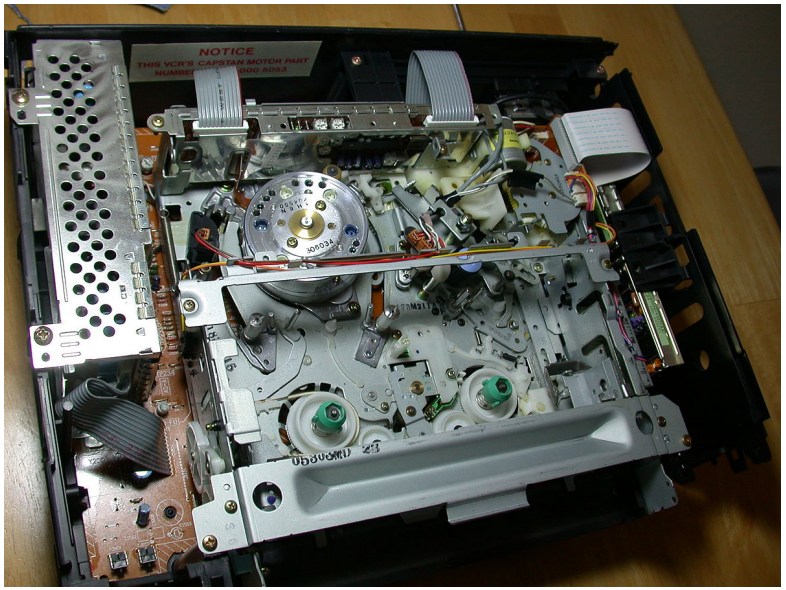
Inspecting video – metadata

- Format
- Brand – look for known brands
  - Video: Sony, Basf, Maxell, Fuji, etc.
  - Audio: 3M, Bush, TDK, Ampex, etc.
- Tape length
- Condition/damage
- Odor

Inspecting video – equipment

- Handle all devices (VCRs, tape decks) with extraordinary care – parts are becoming harder and more expensive to replace
- Major repairs should always be carried out by professionals
- However, many issues with playback can be solved by cleaning video heads
- Requires: screwdriver, 90+% isopropyl, Q-tips

Inspecting video – equipment



Credit: https://en.wikipedia.org/wiki/Videocassette_recorder
http://www.mrbetamax.com/CleaningVideoHeads.htm

Beginning to reformat

- Identify the copies you wish to digitize
- Document using inspection forms, spreadsheets, or collections management system
- Consider:
  - Generation of the media
  - Condition of the media
  - Ease and cost of digitization
  - Required deliverables
  - Copyright
  - Underlying rights

Identifying key works for reformatting

- How does this work fit into your collection?
- What is the demand for access?
- Do you have masters/negatives?
- If not, who does? Are they available?
- Will additional preservation/restoration efforts be required after digitization?
  - Editing
  - Color correction
  - Sound editing/cleaning/combining

Inhouse reformatting

- Make sure media and equipment have been inspected, cleaned, and repaired as needed
- Consider all costs:
  - Equipment and maintenance
  - Archive man-hours and workload
  - Specialists
  - Increased digital memory space
- **Important:** Digitization ≠ deaccessioning

Inhouse: film

- Motion picture film scanners come in two types:
  - Intermittent pull-down scanner
  - Continuous motion scanner
- Ultrasonic cleaning
- Wet-gate scanning
- Prohibitively expensive for smaller archives

Film scanners

Scanity HDR

ArriScan XT

Credit: https://twitter.com/CinelabLondon/status/958407042104004608
https://www.arri.com/en/camera-systems/archive-solutions/arriscan-xt

Film scanners (cont.)

Wolverine Data
Film2Digital
MovieMaker-PRO
(8mm and Super8)

Elmo 16mm Telecine/Sniper

Credit: https://www.bhphotovideo.com/c/product/1371442-REG/wolverine_data_f2dmmpro_moviemaker_pro_8mm_and_super_8.html
https://www.ebay.com/itm/Elmo-Movie-Projector-Telecine-Video-Transfer-Unit-Dual-8-Full-HD-NTSC-Camera/131837968225

Inhouse: video

- The complexities of analog signal can require an extraordinary amount of equipment to digitize to an acceptable standard
- Like building your own mini TV studio
- Contents of a video rack are dependent on the needs of your collection
- Costs can run high, but for large video collections that demand digitization the benefits are huge

Building out a video rack

- Make sure you have the decks you need
- CRT monitor shows what the raw analog signal looks like
- Time Base Corrector steadies rate of signal
- Computer needed to receive digitized video
- Note: Digital video formats do not require this process

Credit: http://lgbtqdigitalcollaboratory.org/2016/10/building-our-racks-obsolete-tech-and-digital-archives/

Hardware

Time Base Corrector

CRT

Switcher box

Blackmagic analog-to-digital converter

Credit: http://www.tvone.com/time-base-corrector
http://pro.jvc.com/prof/attributes/tech_desc.jsp?model_id=MDL101336&feature_id=02
https://www.adorama.com/krvp1608.html
https://www.amazon.com/Blackmagic-Design-UltraStudio-Thunderbolt-Interface/dp/B0718YGLMH

Hardware (advanced)

Vectorscope

Waveform Monitor

Audio Mixer

Credit: https://en.wikipedia.org/wiki/Vectorscope
https://www.ebay.com/itm/Tektronix-1735-Analog-Waveform-Monitor-PAL-NTSC-Dual-Standard-Monitoring-/201384995104
https://reverb.com/item/14318707-rane-sm-26b-sm26b-6-channel-splitter-mixer-6x2-or-2x6?gclid=EAIaIQobChMIzOTVlaic4QIVEa_ICh0tWA4fEAQYASABEgIIBPD_BwE&gclsrc=aw.ds&pla=1

Software

- AJA Mini-Config
- Blackmagic Media Express

Digitizing video – things to know

- Turn on all equipment 20mins before using
- Carefully plot out signal path
- Document all decisions
- Have a test tape ready
- For quality control, play file through
  - Or view a minute from beginning, middle and end

Digitizing video on a budget

- Some dual DVD/VHS players allow recording to DVD
- Some digital video players (such as MiniDV players) can have Video In ports
- Standard definition (access) files only

Credit: https://www.usatoday.com/story/tech/columnist/komando/2016/09/02/digitizing-video-tapes/89551880/
https://www.ebay.com/b/sony-mini-dv-player/bn_7024939755

Inhouse: audio

- Less complicated process
- Audio tape deck connected to your computer
- Inspect tape, clean the machine
- Correct tape speed and adjust azimuth
- Affordable software such as Boom Recorder

Credit: https://www.sweetwater.com/store/detail/202mkVII--tascam-202mkvii-dual-cassette-deck-with-usb

Working with vendors

- Shop around – find the right vendor for you
- Shipping distance
- Turnaround and backlog
- Capacity
- Video/audio file quality
- Offer of trial?

Vendor options

- Media Transfer Service (Rochester, NY)
- Preserving the Past (Rochester, NY)
- George Blood (Philadelphia, PA)
- BB Optics (NYC)
- Standby Program/Mercer Media (Long Island, NY)
- Colorlab (NYC)
- Specs Bros. (Lodi, NJ)

RFP process

- Project description
- Number of reels/tapes to be digitized
- Required deliverables
- Desired schedule and turnaround time
- Vendor facility requirements
  - Registrar contact
  - Care and handling
  - Storage, environmental control and security

RFP process (cont.)

- Equipment and maintenance assurances
- Request notification of all treatments
- Calibration for every reel and tape
- Detail all errors
- Continue transfer until the end of tape
- Transfer tapes only once unless archive is consulted
- Record and deliver metadata with files

Packing media components

- Carefully!
- Cassettes are easy to stack
  - Lengthwise, on their side
  - Make sure every cassette is in a case
- Film should be shipped in appropriately sized cans
  - Use acid-free packing paper to prevent shifting
- Fully inventory which tapes/reels are in which shipping boxes

QCing files

- Begin Qcing files as soon as possible
- Look out for errors, particularly digital errors
- Always view at least the first, middle, and final minute of any returned file
- Consider color and sound quality

Deliverables

- Vary depending on the needs and capacity of your digital archive
- Master file
  - Uncompressed preservation file
  - File type and wrapper will depend on your needs and your software/equipment
- Access copy
- Embedded metadata

Some notes on digital storage

- Video files can be enormous
  - A 720p (standard HD) video can take up 10GB per hour
- Be certain your digital archive is equipped to store them
- Consider digital preservation tools such as BagIt
- Always back up files, with at least one copy in a separate location

Inhouse or external vendor?

- All about time and money
- But also the size of the collection
- Is digitization urgent, or can it be performed on request?
- Do you have the capital to digitize? (money, space, staffing)
- Can you meet the costs (and suffer the delays) of outsourcing?

Final thoughts

- There is no wrong or right way to reformat an audiovisual collection, only the wrong or right people doing it
- Small archives can do amazing things with the right equipment
- Digitization vendors are trained specialists – they come with reputations to uphold
- The choice is yours – just be sure to keep the reels and tapes

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Questions?

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