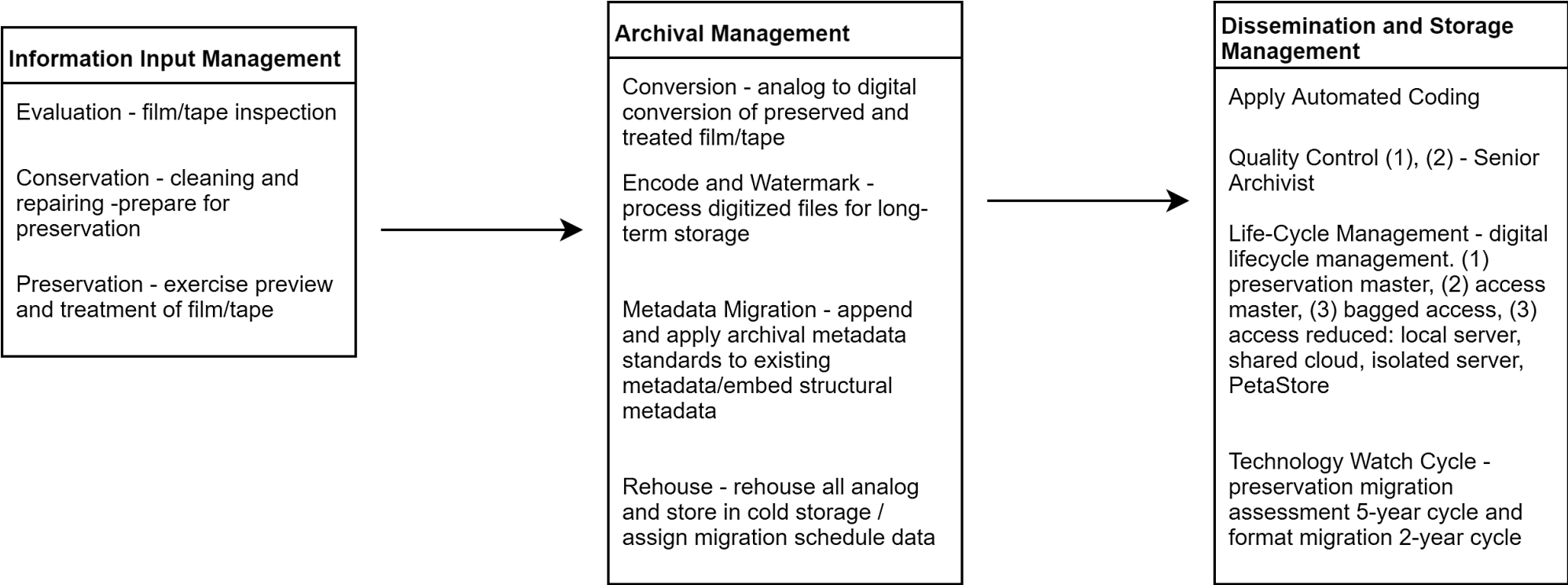


Workflow

Workflow – all media



Workflow – Information Input

Information Input Management
Evaluation - film/tape inspection
Conservation - cleaning and repairing -prepare for preservation
Preservation - exercise preview and treatment of film/tape

Evaluate: All tapes should be visually inspected before they are played. This is necessary to identify tapes that could be damaged if played and those that could damage the playback equipment.

- Inspect for visual contaminants – fungus, mold, separation, stains, dust, dirt, debris, glue, labels, splicing
- Inspect for degradation – smell, chemical residue
- Inspect for physical damage – breakage, wrinkling, curving, edges curled

Workflow – Information Input

Information Input Management
Evaluation - film/tape inspection
Conservation - cleaning and repairing -prepare for preservation
Preservation - exercise preview and treatment of film/tape

Conservation: Sound cleaning procedures for audio visual materials is different for each format. Extensive or specialized conservation activities must be provided by those trained in the field. Basic tasks that can be completed in-house:

- Identify the format and refer to the proper handling guides:
 - [Preservation Assessment Program Cheat Sheet](#)
 - [Guidelines on the Production and Preservation of Digital Audio Objects](#)
 - [The Safeguarding of the Audiovisual Heritage: Ethics, Principles and Preservation Strategy](#)

Workflow – Information Input

Information Input Management
Evaluation - film/tape inspection
Conservation - cleaning and repairing -prepare for preservation
Preservation - exercise preview and treatment of film/tape

Preservation: Audio-visual collections include a wide range of formats (e.g., discs, tapes, films, records, cylinders) and materials (e.g., plastics, metals, wax, shellac).

- The most effective and economical preservation measures for saving the physical objects are preventive: proper storage, storage environment, and handling;
- Once the materials are conserved and playback equipment is clean, place the media on the machine and slowly exercise the tape or film;
- Notice any disruption in playback: noise, shaking, curling

Workflow – Archival Management

Archival Management
Conversion - analog to digital conversion of preserved and treated film/tape
Encode and Watermark - process digitized files for long-term storage
Metadata Migration - append and apply archival metadata standards to existing metadata/embed structural metadata
Rehouse - rehouse all analog and store in cold storage / assign migration schedule data

Conversion: To protect the film original and the information it carries, the media is replicated and use the new duplicates for many uses.

- **Preservation master** – the original media is directly backed up onto multiple resources (see storage slides)
- **Preservation access** – a duplication of the original backed up onto multiple resources **and** used for making additional formats and copies
- **Access copy** – trimmed and basic edits applied and used for sharing for exhibits, patron research, viewing
- **Optimized access** – web-optimized format for social media, emails, and other viewing platforms
- **Thumbnail copy** – grab of scene or clip for thumbnail viewing

Workflow – Archival Management

Archival Management

Conversion - analog to digital conversion of preserved and treated film/tape

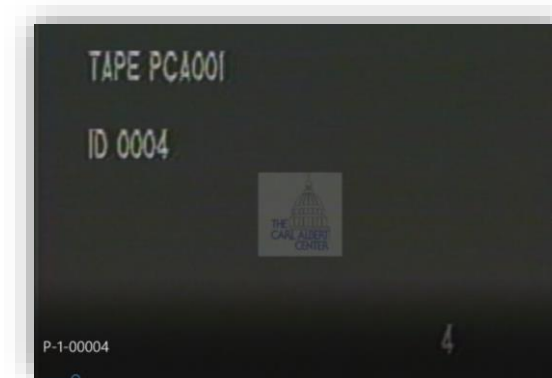
Encode and Watermark - process digitized files for long-term storage

Metadata Migration - append and apply archival metadata standards to existing metadata/embed structural metadata

Rehouse - rehouse all analog and store in cold storage / assign migration schedule data

Encode and Watermark – Media which has been converted to access or web-optimized access copies must be encoded and watermarked encode means to convert for storage or transmission, particularly when the new file uses a lower data rate than the original, or a more lossy codec before importing to social media or other viewing platforms.

- **Adobe Media Encoder** is the premiere software to conduct both tasks and to create a side-car txt file to travel with all media;
- **Watermarks** should be high resolution and placed according to digital policy.



Workflow – Archival Management

Archival Management

Conversion - analog to digital
conversion of preserved and
treated film/tape

Encode and Watermark -
process digitized files for long-
term storage

Metadata Migration - append
and apply archival metadata
standards to existing
metadata/embed structural
metadata

Rehouse - rehouse all analog
and store in cold storage /
assign migration schedule data

Metadata and Migration: Hundreds of metadata standards exist within the broader cultural heritage community. (see: Metadata)

Workflow – Archival Management

Archival Management

Conversion - analog to digital conversion of preserved and treated film/tape

Encode and Watermark - process digitized files for long-term storage

Metadata Migration - append and apply archival metadata standards to existing metadata/embed structural metadata

Rehouse - rehouse all analog and store in cold storage / assign migration schedule data

Rehouse and Store: Completing the replication or format conversion steps, all media must be stored in clean archival containers. A migration schedule must always be added to the metadata files that travel with each formatted version. A good standard is a **2-year cycle**. (see Risks and Conservation)

- Conditions for general storage analog media-
 - Recommended range: 70°F +/- 10°F and 50% RH +/- 10% RH. If possible, working at lower temperatures and relative humidity is desirable.
 - Daily storage (on the shelf) at 85°F and 60% RH will lower permanence to 25% of the recommended conditions.
- Conditions for cold storage analog media: 38-50°F and 25-40%RH is the common recommendation.

Effects of Cold Storage on Generic Organic Materials

85°F at 80% yields	1/7-times improvement of lifetime
85°F at 60% yields	1/4-times improvement of lifetime
75°F at 60% yields	1/2-times improvement of lifetime
70°F at 50% yields	1 times improvement of lifetime
60°F at 50% yields	2 times improvement of lifetime
60°F at 40% yields	4 times improvement of lifetime
40°F at 40% yields	8 times improvement of lifetime
40°F at 30% yields	18 times improvement of lifetime
-4°F at 40% yields	380 times improvement of lifetime
-4°F at 25% yields	690 times improvement of lifetime
-15°F at 40% yields	10000 times improvement of lifetime
-15°F at 25% yields	12500 times improvement of lifetime
-20°F at 30% yields	13000 times improvement of lifetime
-25°F at 40% yields	13500 times improvement of lifetime
-25°F at 30% yields	14000 times improvement of lifetime

Workflow – Dissemination and Storage

Dissemination and Storage Management

Quality Control (1), (2)

Life-Cycle Management - digital lifecycle management. (1) preservation master, (2) access master, (3) bagged access, (3) access reduced: local server, shared cloud, isolated server, PetaStore

Technology Watch Cycle - preservation migration assessment 5-year cycle and format migration 2-year cycle

Quality Control: A reactive procedure used to check products for adherence to a defined specification or digital collection policy. QC performed on digital media and all formats, metadata files, validation of metadata manifest, checksum application, and preservation procedures appended. All QC measures must be documented in the preservation metadata.

- **Automated QC** – scripts or applications;
- **Human Intensive QC** - viewing digital files to judge the accuracy of characteristics that are typically not assessed well by machine;
- **Risk-based QC** – identification of potential risk and prevention (this process will be the final review for migration scheduling)

[Specific QA Measures found in Workflow-Quality Control](#)

Workflow – Dissemination and Storage

Dissemination and Storage Management

Quality Control (1), (2)

Life-Cycle Management - digital lifecycle management. (1) preservation master, (2) access master, (3) bagged access, (3) access reduced: local server, shared cloud, isolated server, PetaStore

Technology Watch Cycle - preservation migration assessment 5-year cycle and format migration 2-year cycle

Life-Cycle Management: actively managing media at each stage of its life-cycle and to recognize the inter-dependencies between each stage (ingest, storage, dissemination) and commence preservation activities as early as practicable.

- **Maintain migration scheduling** and media analysis throughout life-time of the collection.
- **Storage location management** and update life-cycle management details in all preservation metadata files.
- **Validate checksum/fixity checks** – document all details

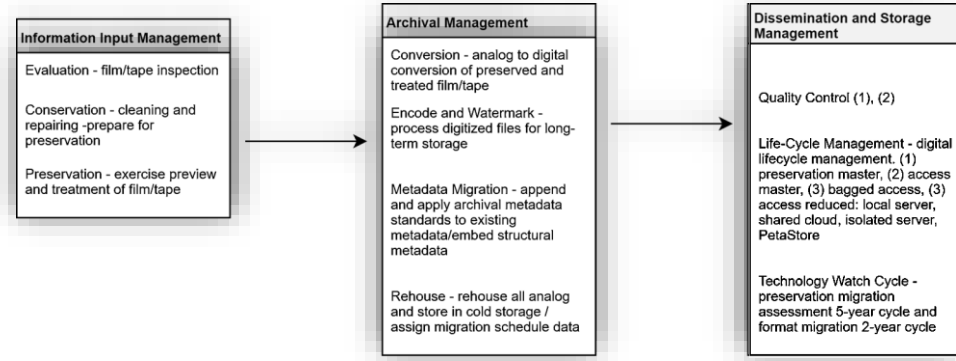
Workflow – Dissemination and Storage

Dissemination and Storage Management
Quality Control (1), (2)
Life-Cycle Management - digital lifecycle management. (1) preservation master, (2) access master, (3) bagged access, (3) access reduced: local server, shared cloud, isolated server, PetaStore
Technology Watch Cycle - preservation migration assessment 5-year cycle and format migration 2-year cycle

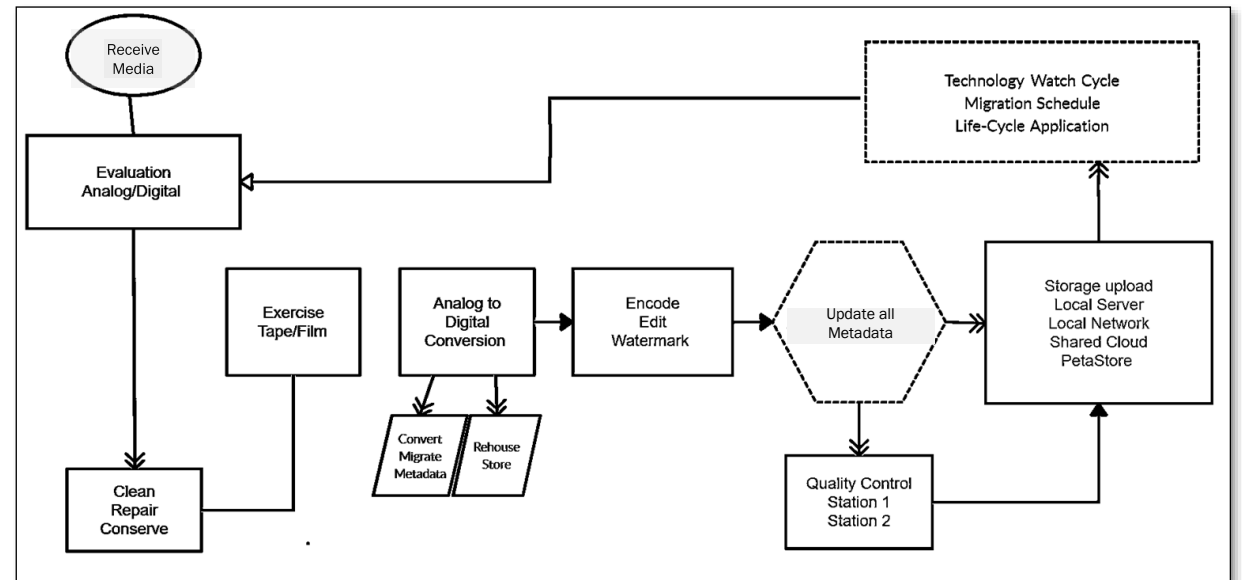
Technology Watch Cycle: Monitor, delineate, and address, changes in standards, media format changes, playback equipment modification technology, and storage media changes to ensure long-term accessibility of all collection materials over the life-cycle.

- Create a **Tech-Watch schedule** to append to each collection:
 - **5-Year** – preservation assessment
 - **2-Year** – format migration assessment

Workflow – Example of basic workflow



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Workflow – Example of initial checklist

Prioritization checklist:

Basic Condition Assessment	Damage or Occurrence
Does the analog media show any symptoms of:	
<ul style="list-style-type: none"> • "sticky shed syndrome" 	No
<ul style="list-style-type: none"> • mold or fungus 	No
<ul style="list-style-type: none"> • dust or debris 	No
<ul style="list-style-type: none"> • squealing during playback 	Yes –tape spool is squeaking but not catching or disturbing playback
<ul style="list-style-type: none"> • head clogging, 	No
<ul style="list-style-type: none"> • flaking or sticky surfaces 	No
<ul style="list-style-type: none"> • other abnormalities 	No
Is the tape a single copy	Yes – Home video from James Jones personal collection
Is the tape an obsolete format	Yes – yes VHS tape (1986 Sony T-130)
Is the tape physically damage	Yes – right side front corner has significant broken plastic
Is the tape the highest quality element in the production	No – standard VHS for personal or at home use
Is the tape 10 years old or younger	No – the date of the material is 1986 (date captured 2021-04-17)
Is the tape between 10 and 15 years old	No – the date of the material is 1986 (date captured 2021-04-17)
Is the tape between 15 and 20 years old	No – the date of the material is 1986 (date captured 2021-04-17)
Is the tape 20 years or older	Yes - the date of the material is 1986 (date captured 2021-04-17) 35 years old
Has the tape been in a stable environment with proper temperature and humidity control	No – tape has been stored in home attic with temperature fluctuation

Workflow – AUDIO Example of secondary checklist

Documentation for adding to metadata checklist:

ID	Audio Format	Condition: Degradation/Decomposition: housing: dirty, damaged, acidic, edges of tape patterned black, brown, or mustard colored, fuzzy/ thread-like growths that indicate the presence of fungus, smell: pungent, acidic, staining, tape edge for white powder, tape wind: spoking, popped strand(s), flange pack, edge damage, reel to reel tape: sticks to pack or twists
	Open Reel	
CAC_CC_109_17_2_0001 CAC_CC_109_17_2_0002 CAC_CC_109_17_2_0003	1/4" open reel	0001 - ¼" reel in good condition, tape and leader removed, all glue materials removed, no outside container – rehoused 0002 – ¼" reel in good condition, tape and leader removed, all glue materials removed, no outside container – rehoused 0003 - ¼" reel in poor condition, sticky tape all over tape, all glue materials removed, no outside container – rehoused
	1/2"	
	1"	
	2"	
	Cassette	
	Compact cassettes	
	8 Track	
CAC_CC_109_17_2_0004	Microcassette	good condition no issues, no need to re-house
	DAT (Digital Audio Tape)	
	DCC (Digital compact cassette)	
	Cartridge - Continuous Loop	
	Phonograph Record	Deterioration/Degradation: (delamination, exudation, breakage, groove wear, pits, scratches, cracks, surface contamination (dirt, dust, mold))
	Aluminum disc 10", 12" 16"	
	Lacquer disc (also referred to as Transcription disc, instantaneous disc, 'acetate' disc, direct-cut disc) 7", 8", 10", 12", 13" 16" diameter	0002 – scratches all over disc – dusted and rehoused 0003 – scratches and glue on edge of discs, middle label shows signs of mold – cleaned and removed all harming materials – rehoused
	Shellac disc (30, 70, 78 rpm) 7", 10", 12", 16"	
	Vinyl disc (also referred to as 'LP') 7", 10", 12"	
	Wire Recording	Damage (tangled wire, rusting (steel wires), print-through)
	Stainless steel	
	Steel	
	Grooved cylinder	Deterioration/Degradation: (warping, breakage, groove wear, surface contamination)
	Wax cylinder	
	Plastic cylinder	

Workflow – AUDIO Example of secondary checklist

Metadata from previous table added:

digital_object_id	digital_object_title	digital_object_description	phy_object_creator	phys_object_description	phys_obj_condition	date
CAC_CC_109_17_2_001	Congressman James R. Jones and Bill Bradley Interview	Congressman James R. Jones with Bryant Gumbel and Bill Bradley speaking about lower tax rates and Reagans new economic package.	NBC Corporation	ATR Master Tape - 1/4" x 1200 FT on Professional 7" Reel	1/4" reel in good condition, tape and leader removed, all glue materials removed, no outside container - rehoused	January 15, 1972
CAC_CC_109_17_2_002	It's Your Business with Moderator Karna Small interviewing Orrin Hatch. Audio Only	It's Your Business with Moderator Karna Small interviewing Senator Orrin Hatch of Utah, Donald Elisburg, Assistant Secretary of Labor (Employment Standards), Richard Leshner.	Personal assistant (unk) copied for Jones	Maxwell UD 35-90 7" Reel	1/4" reel in good condition, tape and leader removed, all glue materials removed, no outside container - rehoused	March 15, 1971
CAC_CC_109_17_2_003	Congressman James R. Jones, Felix Rohatyn, about the economy	This Week with David Brinkley interviewing Senator Pete Domenici (Chairman of the Senate Budget Committee), Representative Congressman James R. Jones	NBC Corporation	Maxwell UD 35-90 7" Reel	1/4" reel in poor condition, sticky tape all over tape, all glue materials removed, no outside container - rehoused	March 21, 1971
CAC_CC_109_17_2_004	Congressman James R. Jones (Jimmy Jones on tape) makes a statement on the NBC nightly news. Audio Copy	Congressman James R. Jones (Jimmy Jones on tape) makes a statement on the Economic Recovery Tax Act of 1981 (ERTA).	Audio recorded by US House of Representatives	Olympus X60 Microcassette	good condition no issues, no need to re-house	April 23, 1972

Workflow – VIDEO Example of secondary checklist

Documentation for adding to metadata checklist:

ID	Video Format	Condition: (Degradation/Decomposition)
	Open reel	
	1/2 "open reel	
	1" open reel	
	2" open reel	
	Cassette	
	3/4" U-Matic: 3/4" U-Matic SP	
CAC_CC_109_17_2_0007 CAC_CC_109_17_2_0008	VHS	0007 - Older VHS tape, shows signs of heavy use, tape in good condition with no wrinkles or physical issues. Playback is smooth. Rehoused. 0008 - Older VHS tape, shows signs of heavy use, tape in good condition with no wrinkles or physical issues. Playback is smooth. Rehoused.
CAC_CC_109_17_2_0009	Betamax	Housing damages, lots of dirt. Some dirt in interior flap where tape is exposed, cleaned and rehouse, plays smoothly after conservation
	Betacam, BetacamSP	
	Video8/Hi-8	
	D2, D3	
	DVCAM, DVCPRO	
	Other Digital video: D-1, Betacam SX,HDCAM/HDCAM SR, HDV	
ID	Other	Condition/Degradation/Decomposition: (perforation damage, base/emulsion scratches, edge weave, splice damage, repairs, shrinkage, color dye fading, b/w stock silver mirroring, acetate base deterioration, "vinegar syndrome", nitrate decomposition, mold, fungus)
	Film strips/slides	
CAC_CC_109_17_2_0010	DVD	

Workflow – VIDEO Example of secondary checklist

Documentation for adding to metadata checklist:

digital_object_id	digital_object_title	digital_object_description	phy_object_creator	phys_object_description	phys_obj_condition	date
CAC_CC_109_17_2_007	Fox News interviews Ambassador James R. Jones, December 5, 1996	Interviews with James Jones (Toshiba Adviser) and Senator Jake Garn (R-UT) about the story. James Jones with former Nixon White house aide Leonard Garment and law partner were hired to represent Toshiba. Senator Garn speaks about the need to sanction Toshiba. . The firm sold secret submarine technology.	Fox News Mexico	Sony ED T-120 VHS Video Tape	Older VHS tape, shows signs of heavy use, tape in good condition with no wrinkles or physical issues. Playback is smooth.	January 1, 1984
CAC_CC_109_17_2_008	Congressman James Jones on MacNeil/Lehrer Report about Toshiba who sold sensitive equipment for military use to the Soviet Union	It's Your Business with Moderator Karna Small interviewing Senator Orrin Hatch of Utah, Donald Elisburg, Assistant Secretary of Labor (Employment Standards), Richard Leshner.	Unknown creator of copy. Original Broadcast was CNN	Maxell STD-T-120 VHS Tape	Older VHS tape, shows signs of heavy use, tape in good condition with no wrinkles or physical issues. Playback is smooth.	March 1, 1991
CAC_CC_109_17_2_009	Congressman James R. Jones, Felix Rohatyn, about the economy	This Week with David Brinkley interviewing Senator Pete Domenici (Chairman of the Senate Budget Committee), Representative Congressman James R. Jones	NBC Corporation	Sony HG Betamax L-750 Tape	Housing damages, lots of dirt. Some dirt in interior flap where tape is exposed, cleaned and rehouse, plays smoothly after conservation	March 21, 1991
CAC_CC_109_17_2_0010	Congressman James R. Jones (Jimmy Jones on tape) makes a statement on the NBC nightly news. Audio Copy	Congressman James R. Jones (Jimmy Jones on tape) makes a statement on the Economic Recovery Tax Act of 1981 (ERTA).	Audio recorded by US House of Representatives	Verbatim DVD+R DVD	good condition no issues, no need to re-house	April 23, 2008