And in 30 minutes…


george blood audio


audio
. . . and video

Safe Sound Archive

"Preserving the Sound of History"

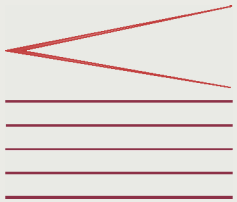
A George Blood Audio, L.P. company

Safe Sound Archive

The Preservation of The World's Memory:
Preservation of Sound Recordings

Compiled by George Blood

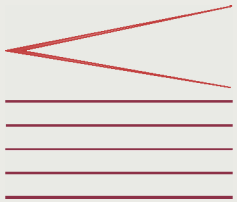
- George Blood Audio, LP
- Safe Sound Archive



Definition by ALA PARS

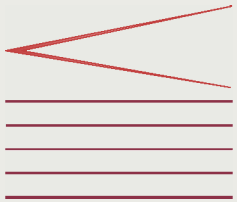
Digital Preservation:

> “Digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time.”



Sustainability

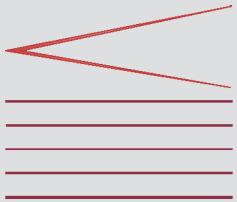
- Resolution, encoding
- File Format
- Carrier
- What can your institution support, now and in the future



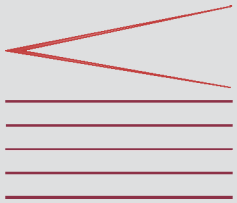

COMO HOPPER

In the words of Grace Hopper..

- “It's easier to ask forgiveness than it is to get permission”
- “A ship in a harbor is safe, but that is not what a ship is built for”
- “From then on, when anything went wrong with a computer, we said it had bugs in it”
- “You manage things; you lead people”



"The great thing about standards is that there are so many to choose from."



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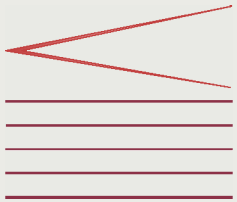
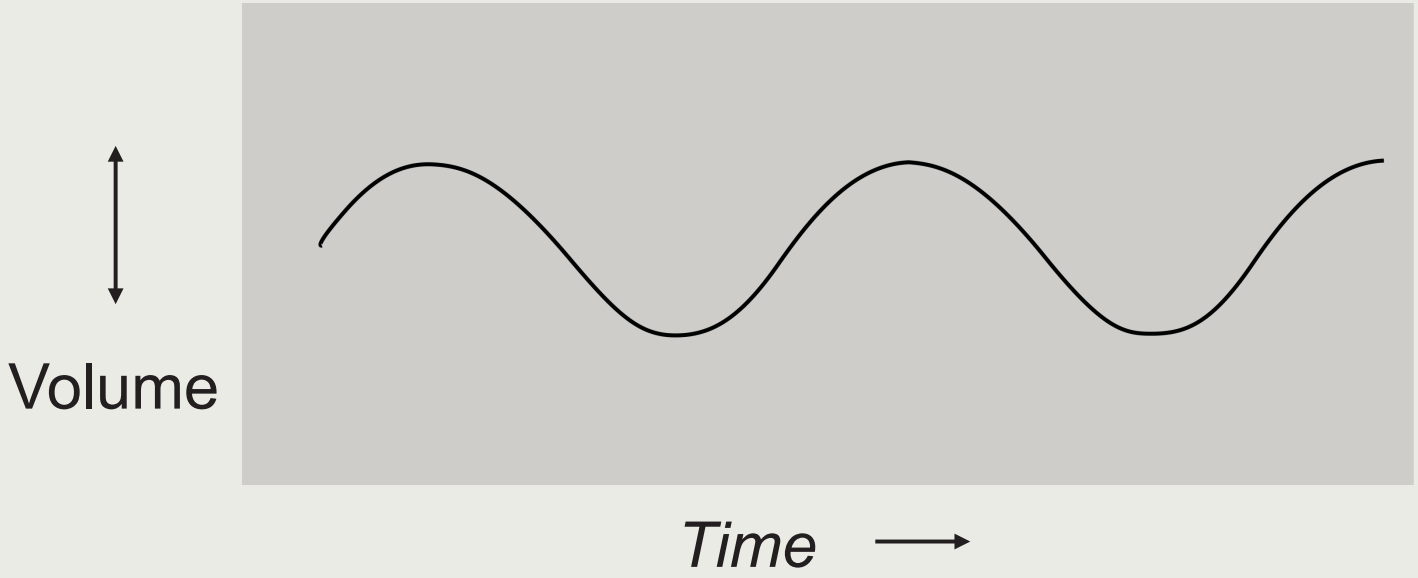
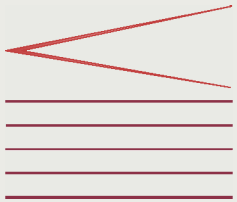
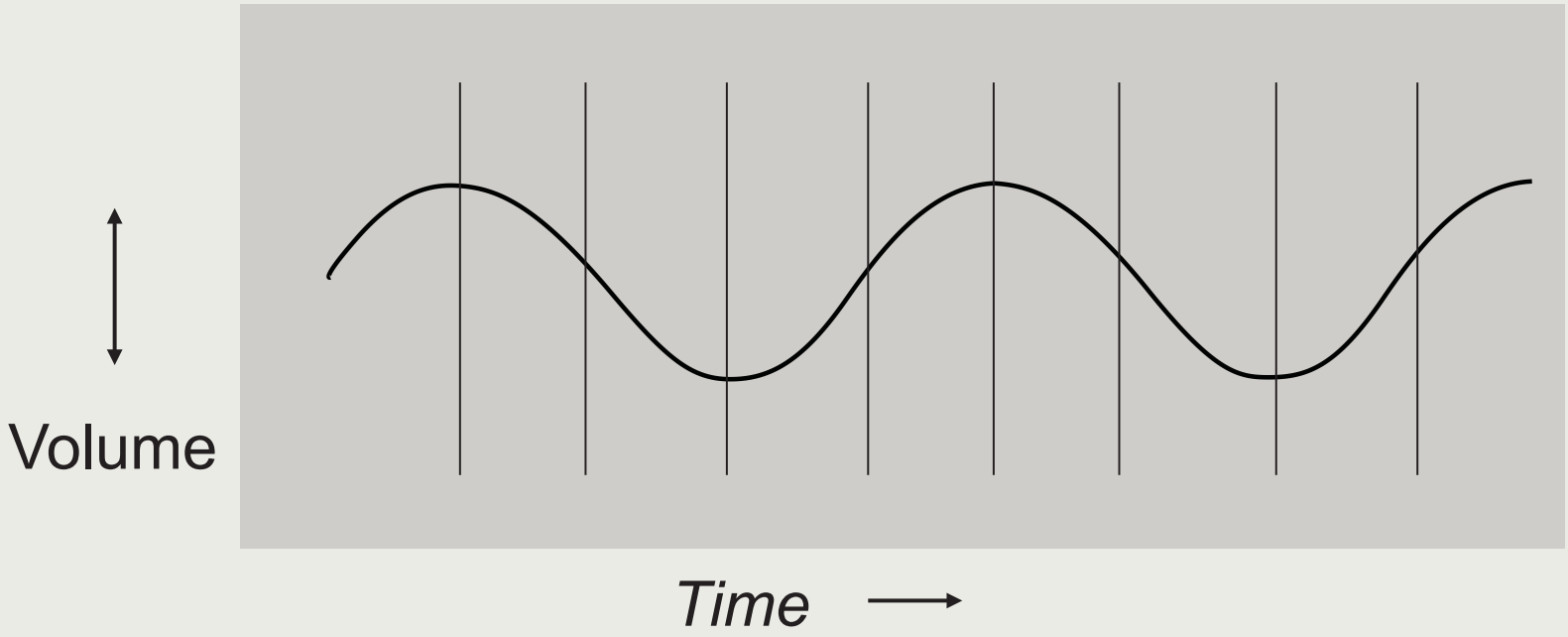


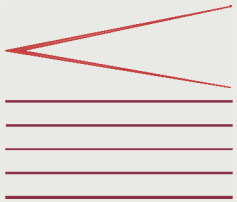
Sine Wave



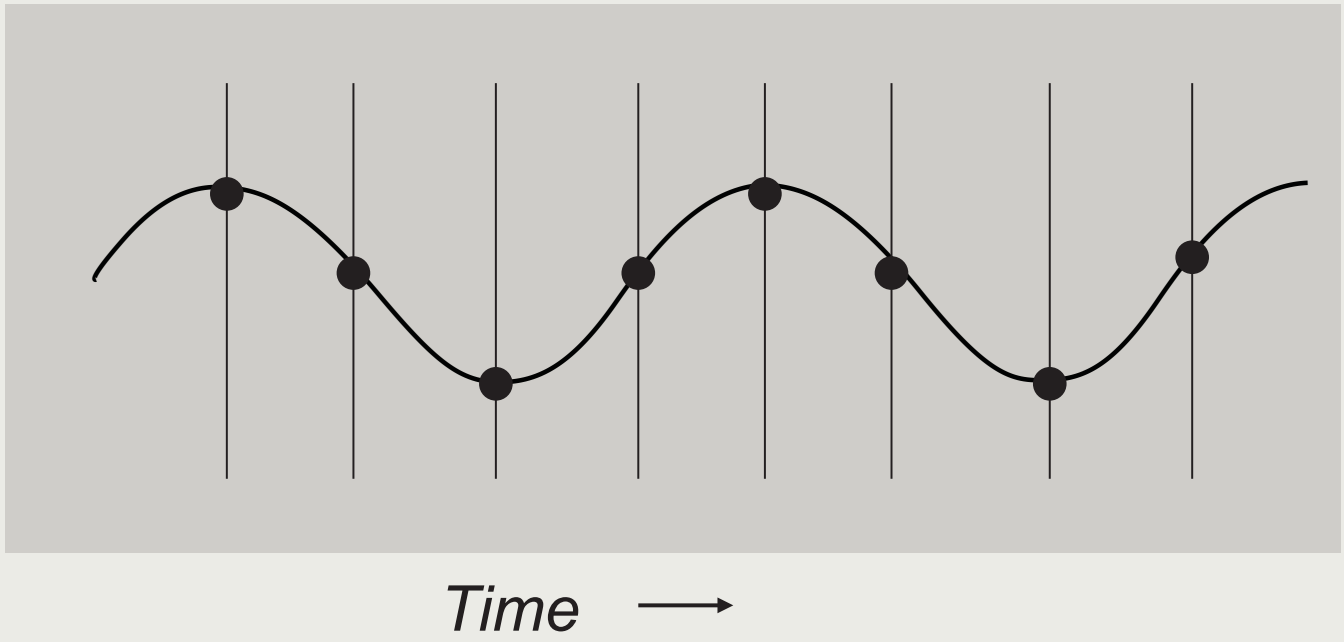


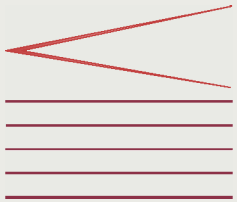
Sine Wave sampled at regular intervals
PCM - “pulse code modulation”





Sine Wave Quantized





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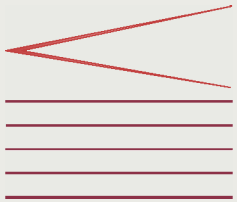
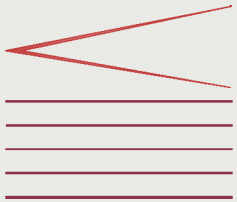


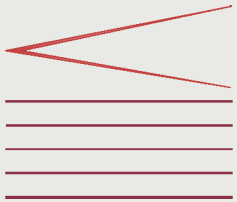
Archival Set

- Preservation Master
- Use & Access Copy
- Web-Accessible Copy



Preservation Master

- Key Traits
  - Rarely accessed
  - Most important to manage
  - Typically 96kHz/24bit or 44.1kHz/16bit
    - kHz of PCM = dpi of TIFF
    - bit resolution (in volume or amplitude)
      = bit of TIFF (range of colors)



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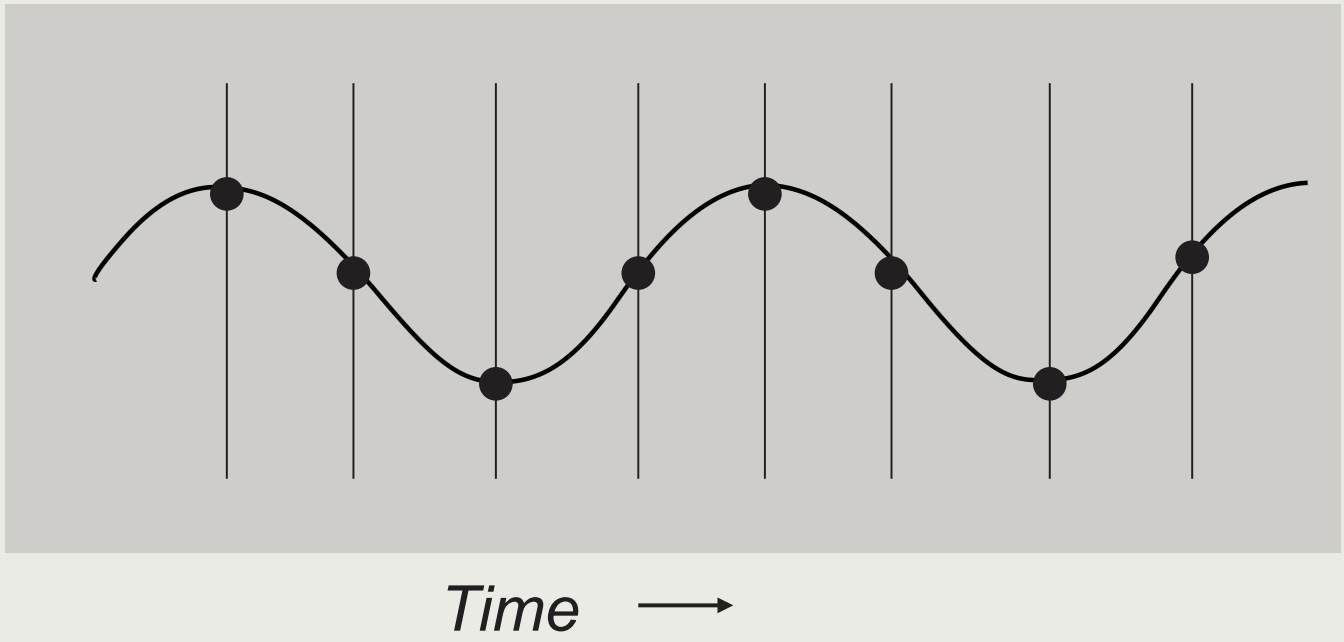

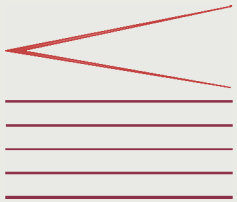

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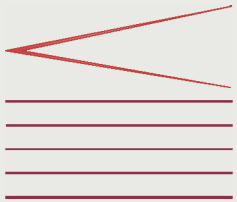
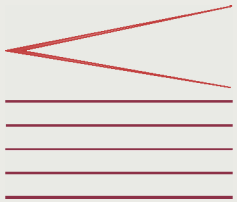
  - Typically 96kHz/24bit or 44.1kHz/16bit
    - kHz of PCM = dpi of TIFF
    - bit resolution (in volume or amplitude)
      = bit of TIFF (range of colors)
  - .WAV or .BWF
    - “wave” or “broadcast wave”
  - Rarely, though sometimes still 1/4” analog



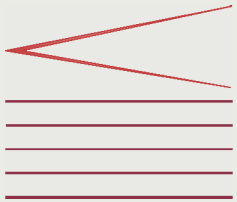
Preservation Master

- Key Advantages of broadcast wave
  - Widely used
  - Higher resolution than 99+% of sources
  - Better than most playback chains
  - Derivatives easily created
  - EBU standard
  - Think of PCM like a sound TIFF



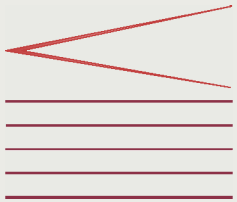
Preservation Master

- Key Difficulties of files
  - No standard storage medium
  - Data tapes expensive to maintain
  - Too big for CD-ROM
  - On-line storage requires ongoing maintenance
  - Internet delivery impractical
    - 5x play time for T1 .ftp



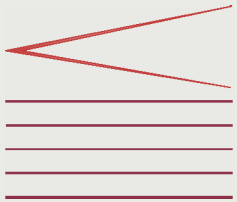
Use & Access Copy

- Key Traits (and Advantages!)
  - Readily accessible
  - User-friendly format
  - Good enough to substitute if Preservation Master is lost
  - Nearly always CD-Audio
  - Sometimes Same as Web-Accessible Copy
  - Sometimes same as Preservation Master



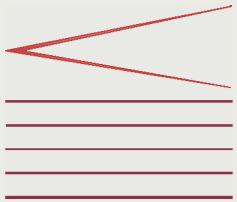
Use & Access Copy

- Key Difficulties (CD-Audio vs. CD-ROM)
  - CD-DA (digital audio)
    - Pure serial-read (can't re-read to correct errors, even transient errors)
  - CD-ROM (digital audio as data)
    - Sector-based, so can re-read (more reliable)
    - Requires computers (software, OS, etc.) to retrieve
  - CD-DA more widely playable
  - CD-ROM more reliably played



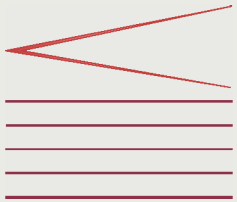
Use & Access Copy

- Typical Solutions (depend somewhat on Preservation Master)
  - CD-DA for near-universal playability
  - Multiple copies
    - CD-DA, one copy on “gold”, one on “green”
    - CD-ROM (gold?) and CD-DA (green)
  - Gold CD-R for Preservation Master, Green for U&A



Web-Accessible Copy

- Depends on Rights
  - RA & AAC more secure than MP3 or WMA
- Depends on Needs
  - Too restricted to put on-line
  - Beyond institutional abilities or needs
- Perhaps as-needed only



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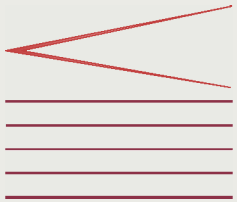
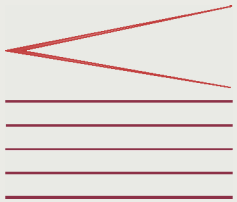


Where are the files stored?

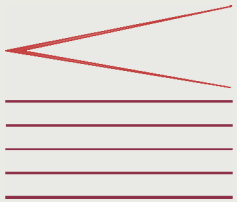
- Optical discs
- Data Tape
- Spinning discs

  …HSM (hierarchical systems manager)

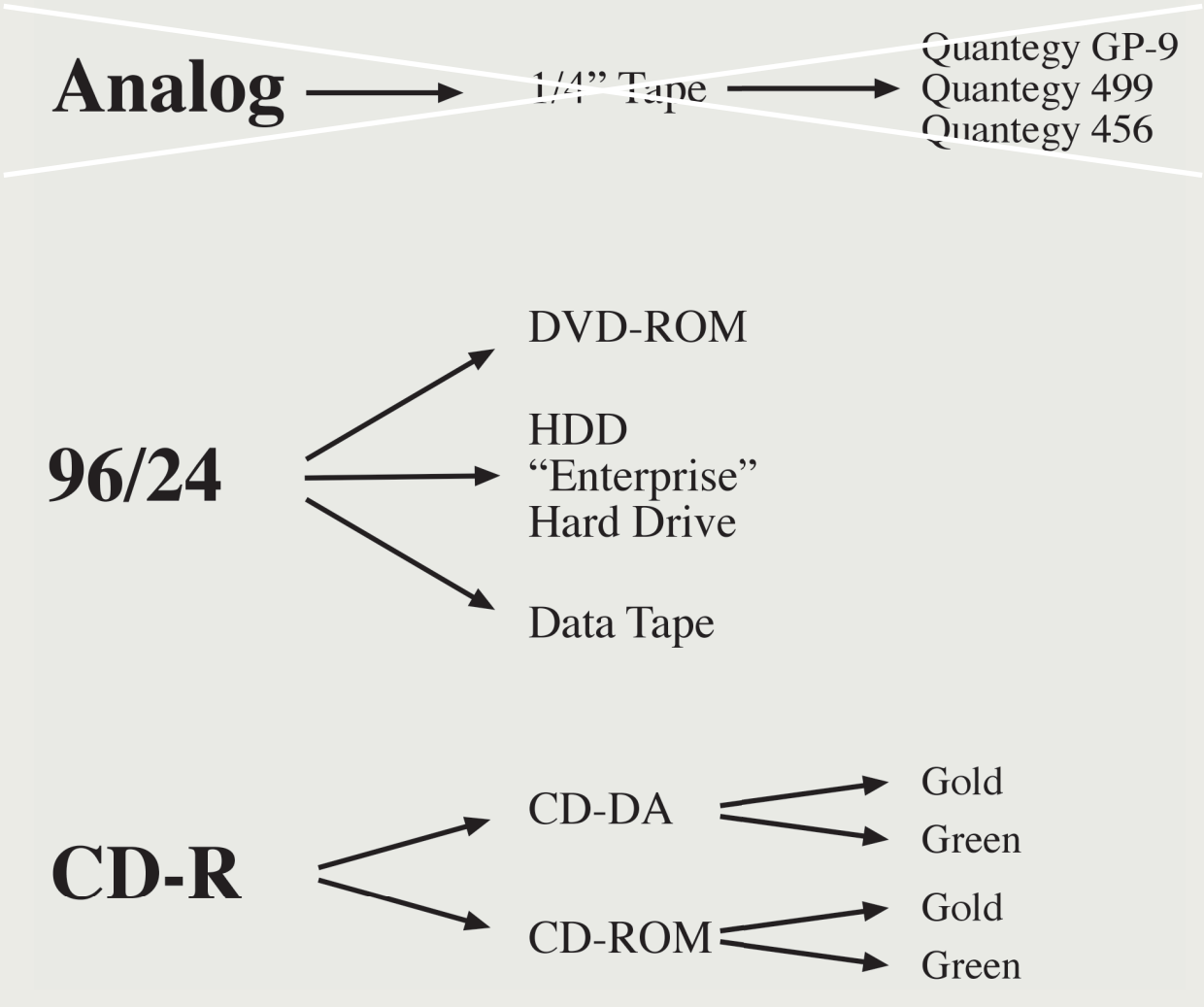


Preservation Master

- Typical Solution
  - 96/24 on hard drive to digital library
    - Enterprise-level storage
  - 96/24 on DVD-ROM
    - Can be migrated easily to HDD when available
  - Do something else
    - Gold CD-R
    - CD-ROM
    - LTO-4 data tape

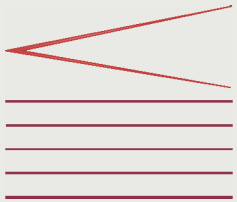


Preservation Master



The “Catch”

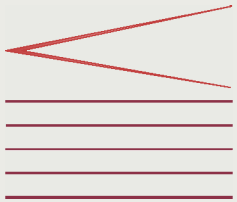
“regardless of the challenges of media failure and technological change”



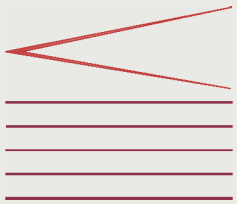
The “Catch”

“regardless of the challenges of media failure and technological change”

Digital makes migration a way of life!

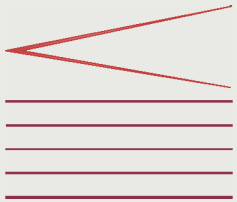


Migration



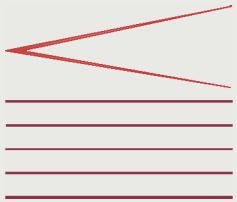
Migration

- How frequent? (How long will it last?)
- What determines when?
  - Format obsolescence [WAV or BWAV]
    - Not such a big problem
  - Carrier obsolescence [LTO, HDD, CD]
    - Really big problem



What is Obsolescence?

- CD-R vs. LTO
- “Bunch of Drives on a Shelf” (BODOAS) vs. IT support for “enterprise-level” storage

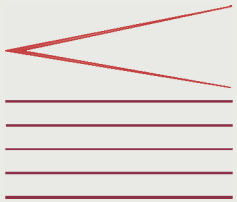


What can your institution support?

- LTO: cheap, reliable, high density, high resolution
- LTO: IT intensive, short life cycles, complex machine-dependency

- CDs: cheap(ish), widely available, mid-resolution
- CDs: lots of handling to migrate, (audio CDs) no metadata (except label)

- “BODOAS”: cheap, fast, familiar
- “BODOAS”: cheap, fragile (die easily & easily erased)

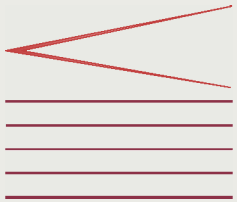


Migration Considerations:

- IT gets ever cheaper, ever more quickly.
- IT gets obsolete ever more quickly

- What is the life-cycle cost, over multiple migrations?

- What ability will your institution have at any given future time to support the migration of digital content? The decisions you make today are governed by that future ability.



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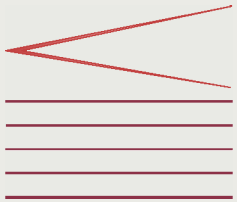
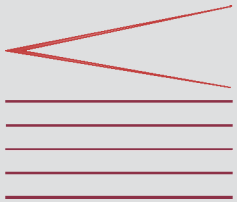


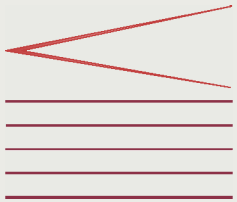
- "Standards are like toothbrushes. Everyone agrees they're a good idea; but nobody wants to use someone else's”

  –Rachel Frick



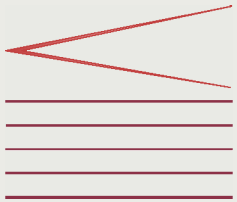
Preservation Master

- Key Advantages 96kHz/24bit PCM
  - Think of PCM like a sound TIFF
  - EBU standard
  - Higher resolution than 99+% of sources
  - Better than most playback chains
  - Derivatives easily created
  - Widely used



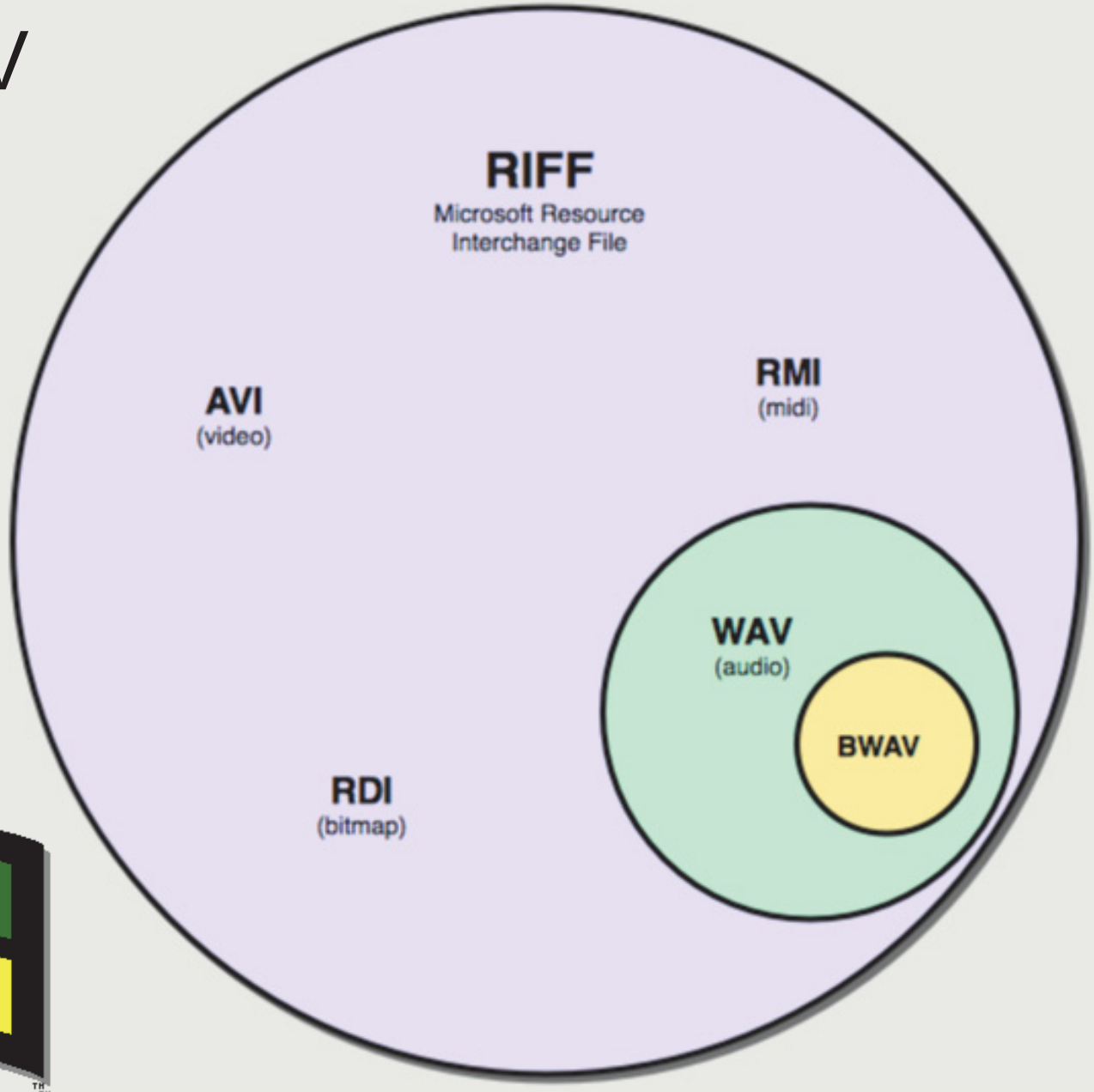
Wrappers

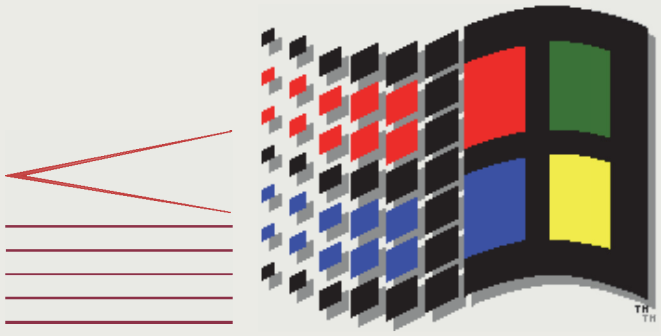
- Designated by file extensions (your first metadata)
  - .wav = “sound file”, not PCM, not preservation
- What all is in the wrapper (other “chunks”)?
  - Sound data
  - Metadata
    - Format
    - Descriptive
    - Control
    - Technical
      - Where does this metadata live in the wrapper?



WAV / BWAV

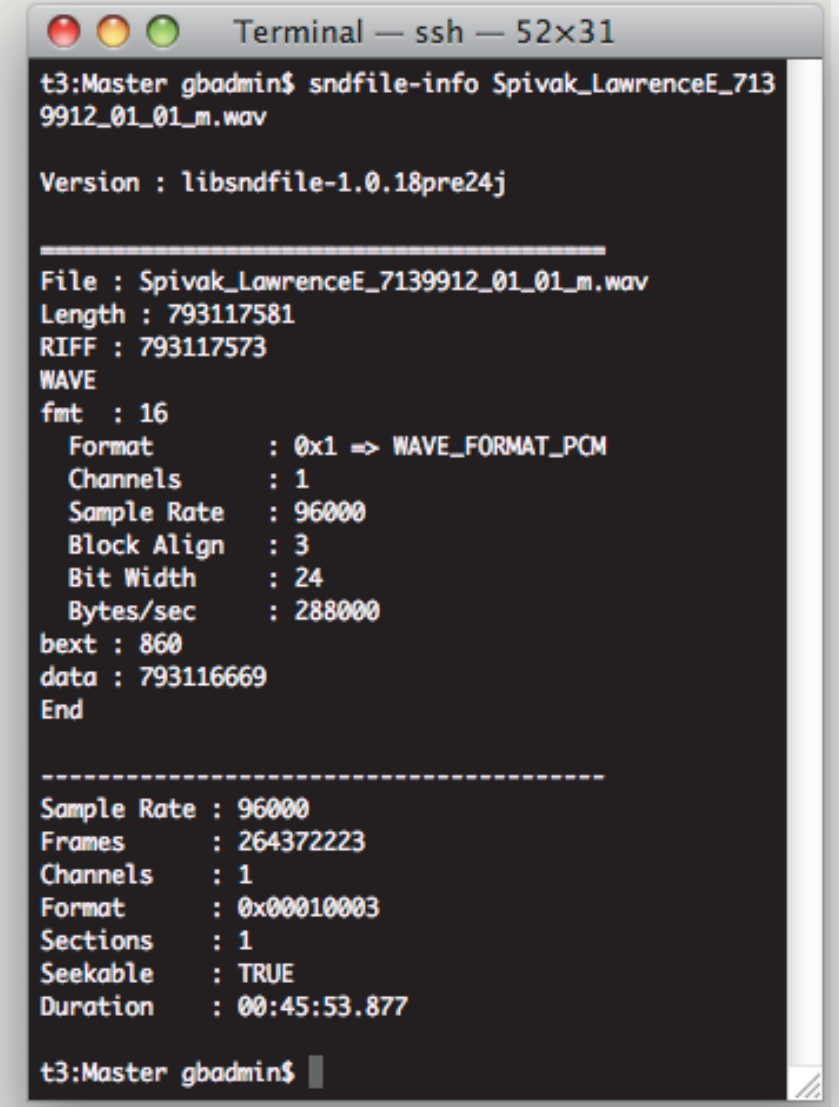
- Part of the RIFF Standard (Resource Interchange File Format)
- Released in 1992 as a part of Windows 3.1





Standard : B/WAV

- SOX - SOund eXchange
  - "Swiss Army Knife of sound processing"
  - Sample rate and format conversion
  - http://sox.sourceforge.net/
- libsndfile
  - "C" library
  - Contains an example program that gives a lot of useful info about files "sndfile-info"
  - BEXT embedding
  - http://www.mega-nerd.com

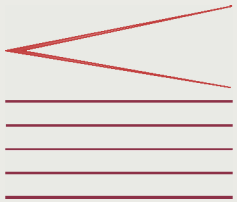


Standard : WAV

- Mandatory WAV Chunks
  - "FMT " - Describes the contents of the WAV file
    - Format
    - Number of Channels
    - Sample Rate
    - Bit Depth
    - Streaming Info
  - "DATA" - Audio data
    - WAV PCM - no compressions
    - WAV PCM EX - Extensible. Handles higher resolution audio files, multi channel formats and 64 bit audio
    - Many others

Standard : WAV

- Optional WAV Chunks
  - LIST (INFO) Chunk
    - Stores Metadata in a WAV file
    - Any new INFO field may be defined, but an application should ignore any chunk it doesn't understand
    - Common registered INFO fields
      - » name
      - » artist
      - » date
      - » genre
      - » comments
      - » copyright

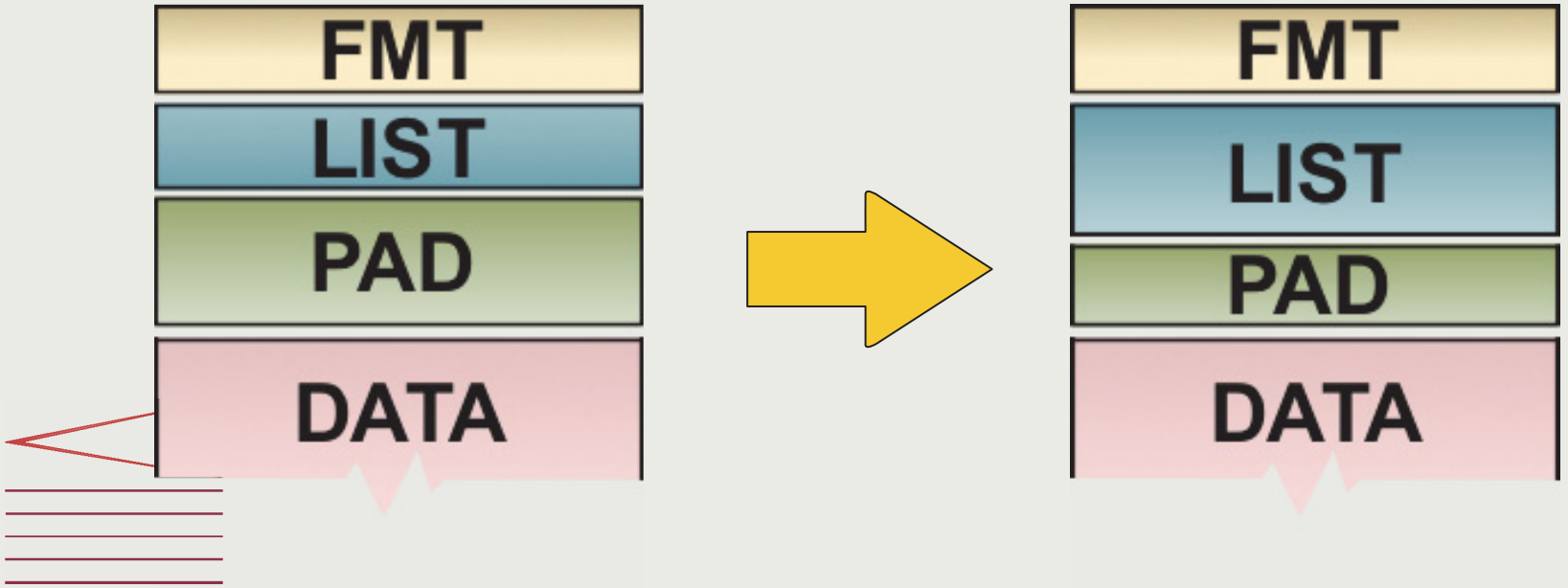


Standard : WAV

- Optional WAV Chunks (continued)
  - SMPL Chunk
    - info useful when data is used in samplers
    - Rarely holds value in the preservation world
  - PEAK (all versions) inserts a SMPL chunk in every WAV file it saves!

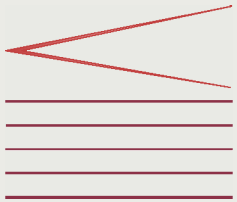
Standard : WAV

- Optional WAV Chunks (continued)
  - PAD or JUNK Chunks
    - Place holder chunks
    - Allows quick expansion of any header chunks
    - WavLab inserts pad chunks in all saved WAV files



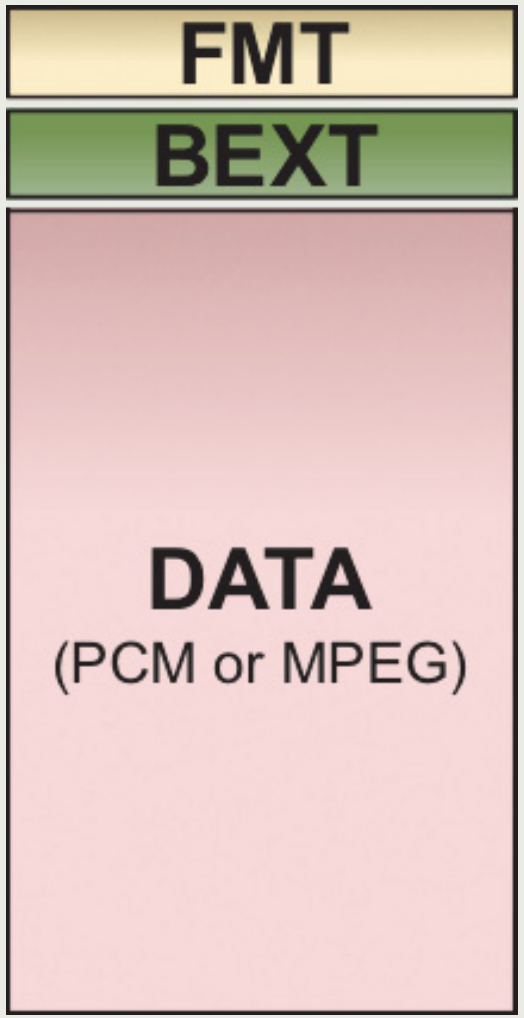
WAV vs BWF/BWAV

- Broadcast Wave limits coding forms
  - PCM
  - MPEG1
- Adds a chunk
  - BEXT (“Broadcast EXTension”)
  - structured metadata



Standard : BWAV

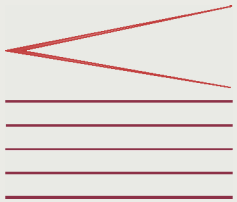
- Includes mandatory BEXT chunk
  - Defined Metadata Fields
  - Controlled and Suggested vocabulary for most fields
    - Description
    - Originator
    - Originator Reference
    - Origination Date
    - Origination Time
    - Time Reference
    - Coding History
- Limits DATA chunk to PCM or MPEG formats



Standard : BWAV

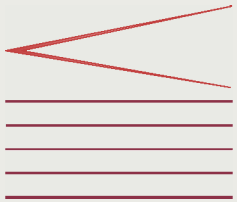
- BEXT chunk:

```
Description      : Ross Lee Finney; String Quartet No. 6 in
E: 2. Allegro Scherzando
Originator       : Safe Sound Archive
Origination ref  : New World Records CRI DRAM
Origination date : 2009-04-16
Origination time : 08-16-04
Time ref         : 0
BWF version      : 1
UMID             :
Coding history   :
A=ANALOG,M=stereo,T=Studer_A-80RC; 21569; Scotch_111A-24R
A=PCM,F=96000,W=24,M=stereo,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=dual-mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=stereo,T=SoX14.1; DAE
A=PCM,F=96000,W=24,M=stereo,T=libsndfile-1.0.18pre24j
```



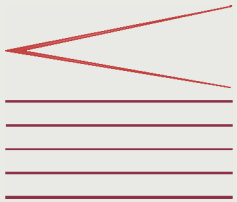
Chunk order from our tools

- Format
- Bext
- Data
- List (INFO)



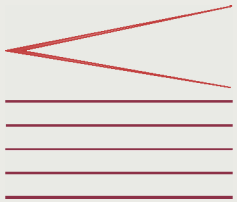
Chunk order from WaveLab

- Format
- List (INFO)
- Bext
- Pad (filler space in case Bext chunk would expand)
- Data



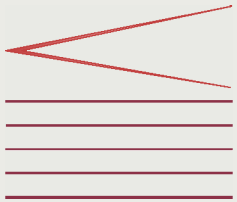
Chunk order from SoundForge8

- Format
- Data
- List



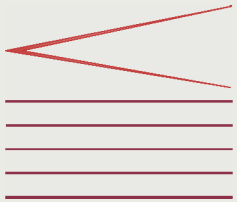
Chunk order from SoundForge10

- Format
- Data
- List
- Bext



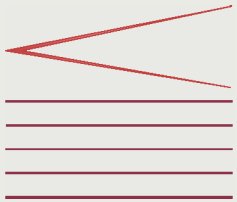
Chunk order from Adobe Audition (before)

- Format
- List
- Bext
- Data



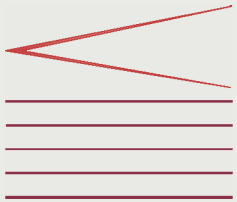
Chunk order from Adobe Audition (after)

- Format
- Data
- List
- Bext



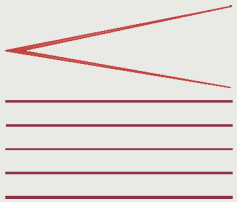
External metadata

- = Cataloging and Description
- How much is enough?
- Is it possible to have too much?
- Why do we need more than we did before?
  - Are we moving the goal posts?
  - To what extent are our neuroses about digital preservation a reflection of our failures in analog preservation?
  - Is more metadata less product? By doing “better” for one object are we preserving less overall?
- Has anyone asked the users what they need?



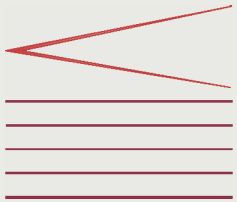
Organizing metadata

- “Standards”
- Toothbrushes



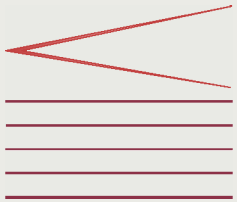
What is a standard?

- How widely adopted?
- If everyone is doing something... is that good enough to be a “standard”?
- Does a standard have to be perfect?
- Does one size fit all?
- If there’s a standard and no one uses it, what’s it matter?
- What are the implications if there’s a standard and it is “locally modified”?
- If you make your own “standard”, in what ways does this enhance or inhibit preservation and long-term access?
  - Aren’t we taught to avoid proprietary solutions? Why not for metadata?

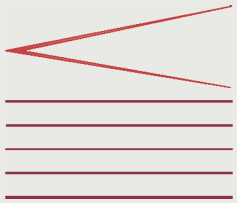


Why are we collecting all this metadata?

- To provide for discovery
- To manage the files
- To provide provenance
- To provide authenticity
- Etc.

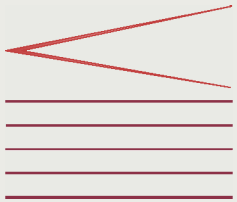


How?



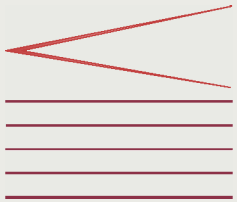
How much work is it to collect and organize metadata?

- a lot!

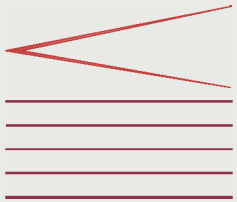


How do we..

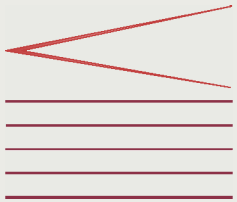
- Provide for discovery
- Manage the files
- Provide provenance
- Provide authenticity
- Etc.



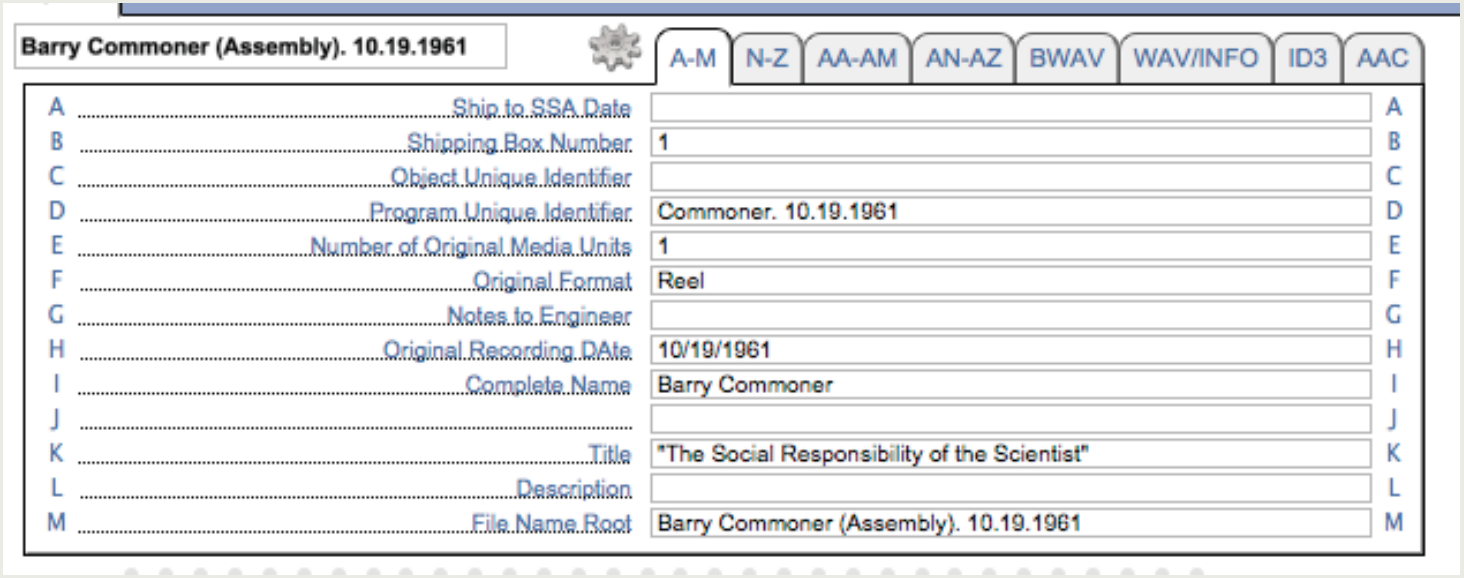
Use standards!



- Is it widely adopted?
- Is it locally modified?



Oberlin metadata



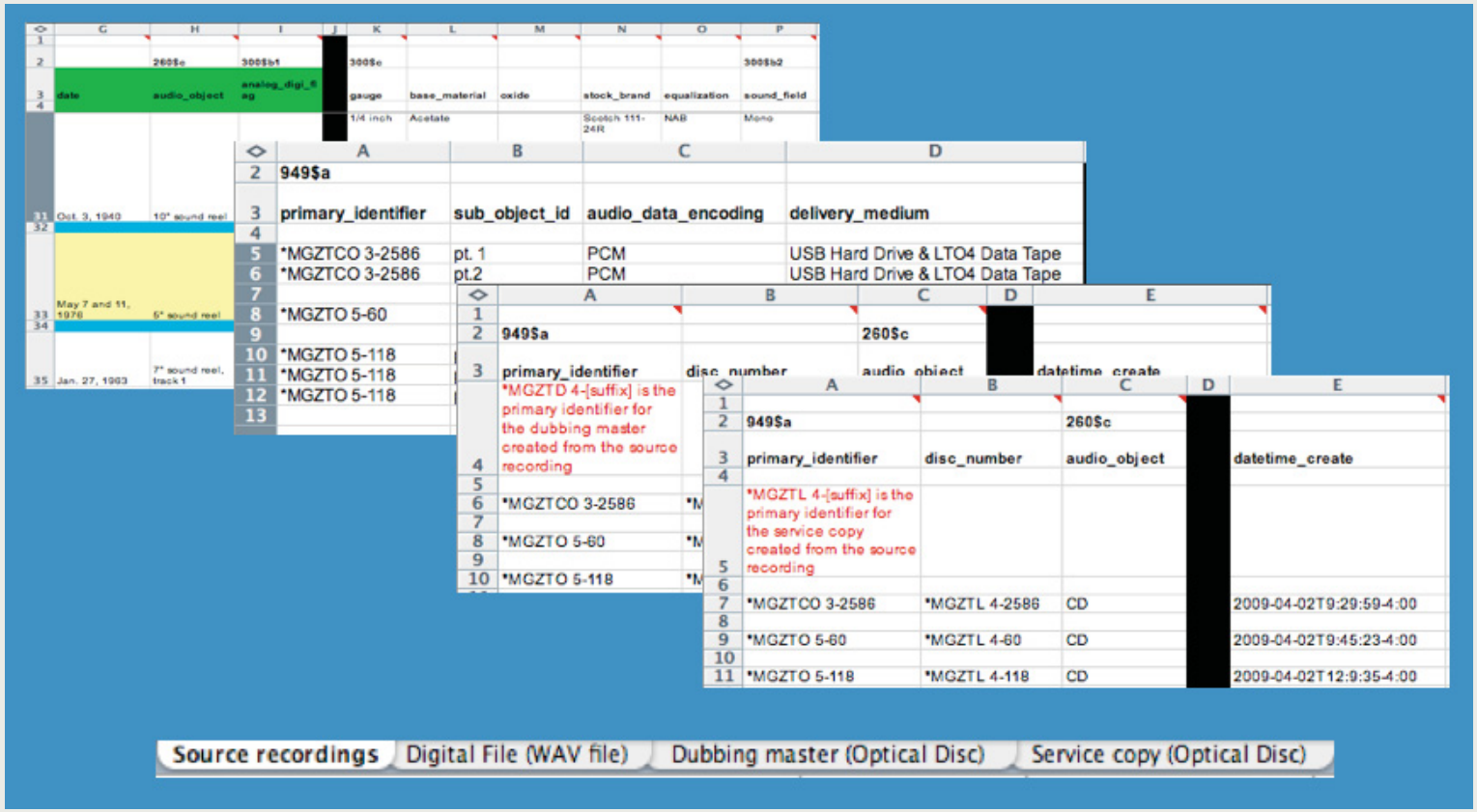
Barry Commoner (Assembly). 10.19.1961

A-M | N-Z | AA-AM | AN-AZ | BWAV | WAV/INFO | ID3 | AAC

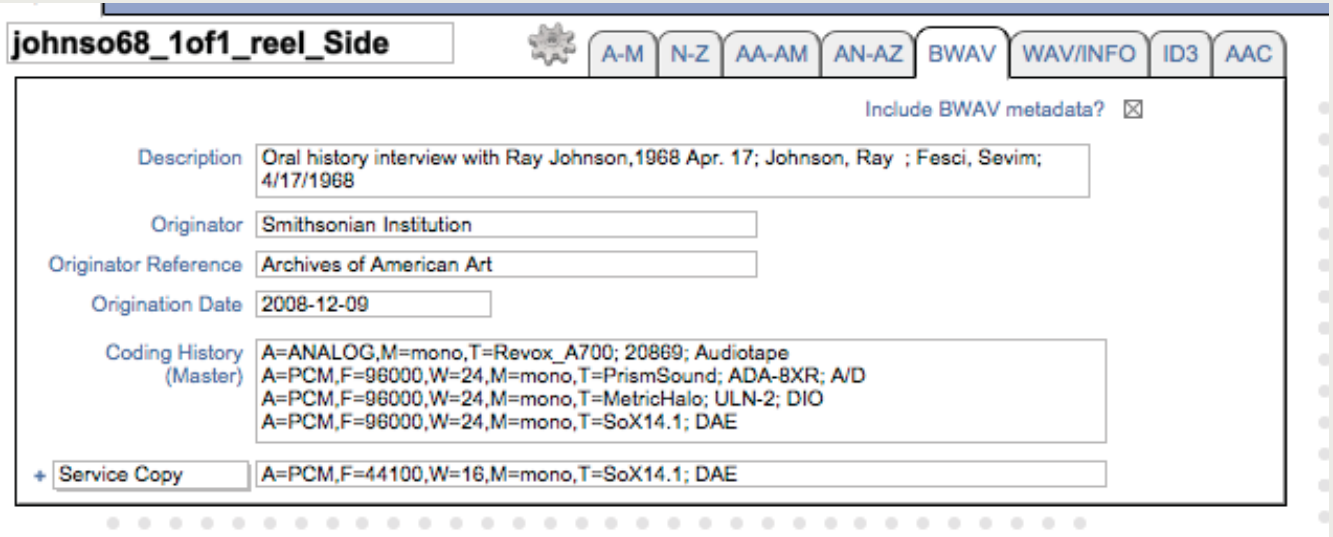
A	Ship to SSA Date	
B	Shipping Box Number	1
C	Object Unique Identifier	
D	Program Unique Identifier	Commoner. 10.19.1961
E	Number of Original Media Units	1
F	Original Format	Reel
G	Notes to Engineer	
H	Original Recording DAte	10/19/1961
I	Complete Name	Barry Commoner
J		
K	Title	"The Social Responsibility of the Scientist"
L	Description	
M	File Name Root	Barry Commoner (Assembly). 10.19.1961

	A	B	C	D	E	F
1	Key					
2	M=Mandatory					
3	MA=Mandatory if applicable					
4	R=Recommended					
5	O=Optional					
6	Sources					
7	Most field names and definitions are taken from *MDB v4.0 Data Dictionary* (Library of Congress, 2002). Additional field names and definitions have been supplied by Stanford University Libraries and The New York Public Library's Digital Audio Committee Technical Standards Group.					
8	Element Origin Codes:					
9	HVD=Harvard University schema (unpublished)					
10	LC=Library of Congress, MDB v4.0 Data Dictionary, release 10					
11	NY=NYPL Digital Audio Committee					
12	NY*=elements unique to NYPL that map to, singleStateParameter element on the settings of the playback device in processHistory.xsd, in the Harvard University schema					
13	NY**=elements unique to NYPL that map to, device element in the processHistory.xsd, in the Harvard University schema					
14	NY***=element unique to NYPL that maps to, discSurface element in the audioObject.xsd, in the Harvard University schema					
15						
16	FIELD	RELATION	DEFINITION	REQUIRED STATUS	POPULATION	Origin
17	a_to_d_converter_brand	Digital file	Analog to digital converter.	M	Vendor. [For example, Lucid AD9624, Apogee Rosetta A/D.]	NY**
18	analog_digi_flag	Source recording	describes the method by which an audio object was recorded. Valid values = ANALOG or DIGITAL	M	NYPL	LC
19	analog_test_tone_digital_calibration	Digital file	Relationship between the analog_test_tone_frequency as it is generated as an analog signal and as it is calibrated digitally at the analog to digital converter. The relationship will be expressed as dB=dBFS: +4dB=16dBFS			NY*
20	analog_test_tone_frequency	Digital file	test tone frequency used in the analog_test_tone_digital_callibration expressed in hertz or kilohertz: 500hz, 1k, etc.			NY*
21	audio_data_encoding	Digital file	Structure for audio data.	M	NYPL (before project sent out). [All files will be PCM.]	LC
22	audio_object	Source recording	an audio object's generic format name: LP, audio cassette, DAT, cylinder, etc.			HVD
23	band	Digital file	A section within a part.	MA	Vendor. [For example, 1, 2, 3.]	
24	base_material	Source recording	Base material of source recording.	M	Vendor. [For example, Polyester based magnetic tape, Acetate based magnetic tape.]	HVD
25	bits_per_sample	Digital file	Number of bits per audio sample for digital file.	M	Vendor. [For example, 16 bit, 24 bit.]	LC
26	checksum_datetime	Digital file	date and time of checksum value creation			LC
27	checksum_kind	Digital file	name of checksum algorithm used to create the value; MD5, etc.	M		LC
28	checksum_value	Digital file	checksum value generated for the file			LC
29	codec_creator_app	Digital file	application used to encode audio files: Sound Forge, SaDIE, etc.			LC
30	codec_creator_app_version	Digital file	version # of the encoding application: 5.0, 2.5, etc.			LC
31	codec_name	Digital file	valid values would include BWV, WAV, MP3, etc.			LC
32	codec_quality	Digital file	valid values would be LOSSY or LOSSLESS			LC
33	condition_note	Source recording	a description of the state of a source recording's physical condition			HVD
34	data_rate	??	expressed in kbps: 128kbps, N/A, etc.			LC

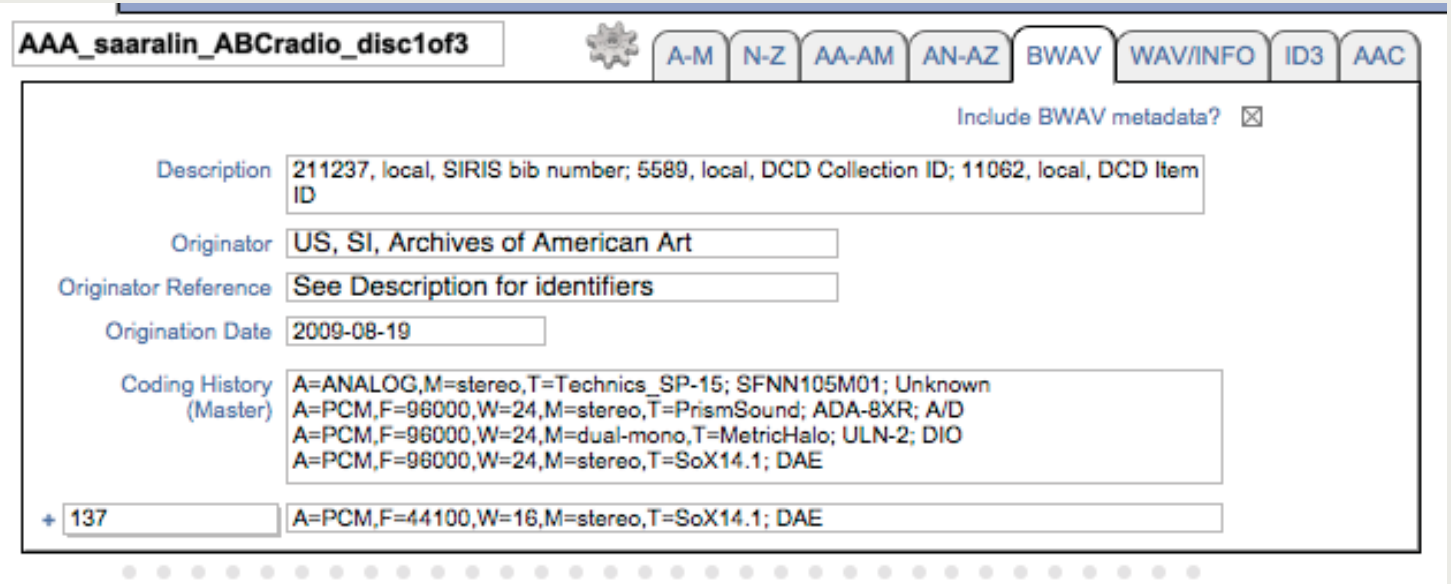
NYPL metadata



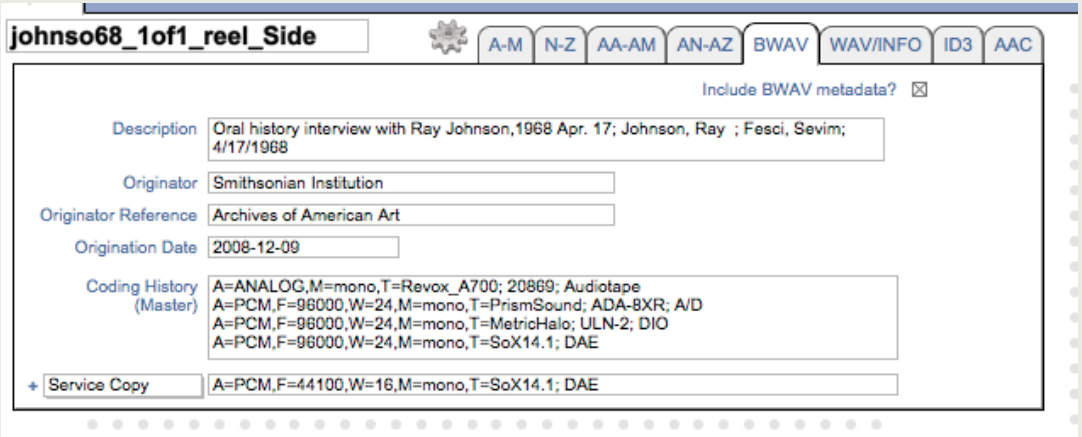
SI AAA Metadata

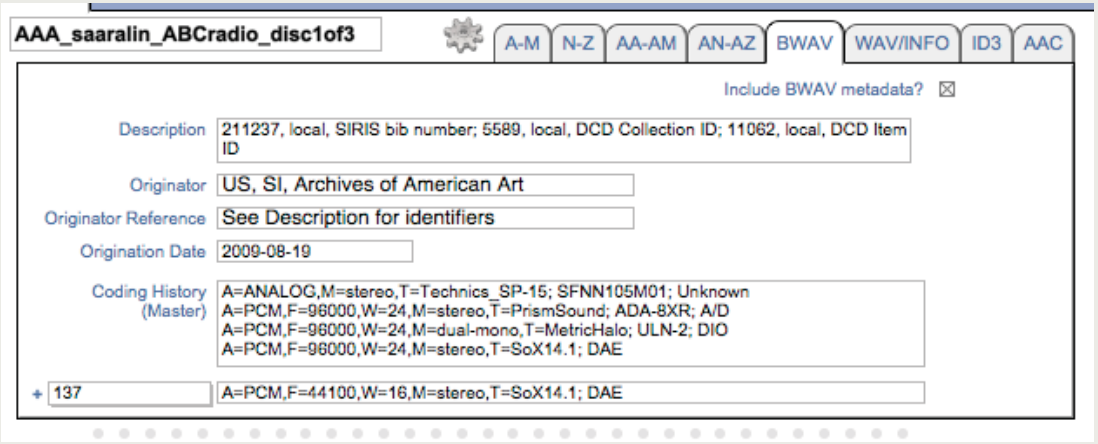


SI AAA Second Project



SI AAA Compared





SI AAA Project One

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Sample Rate:
96000

Bit Depth:
24

Duration:
0:56:32

INFO Name:


INFO Artist:


INFO Date:


INFO Archival Location:


INFO Copyright:


BEXT Description:
Oral history interview with Tony Rosenthal, 1968 May 10-June 29.; Tony; Sevim; 1968 May 10-June 29

BEXT Originator:
Smithsonian Institution

BEXT Originator Reference:
Archives of American Art

BEXT Origination Date:
2009-09-22

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
A=ANALOG,M=mono,T=Revox_A700; 13652; Audiotape_1251
A=PCM,F=96000,W=24,M=mono,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=mono,T=SoX14.1; DAE
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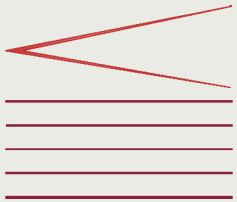

SI AAA Project Two

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Sample Rate:
96000

Bit Depth:
24

Duration:
0:05:29

INFO Name:


INFO Artist:


INFO Date:


INFO Archival Location:


INFO Copyright:


BEXT Description:
211348, local, SIRIS bib number; 9154, local, DCD Collection ID; 11014, local, DCD Item ID

BEXT Originator:
US, SI, Archives of American Art

BEXT Originator Reference:
See Description for identifiers

BEXT Origination Date:
2009-08-06

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
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A=PCM,F=96000,W=24,M=dual-mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=stereo,T=SoX14.1; DAE
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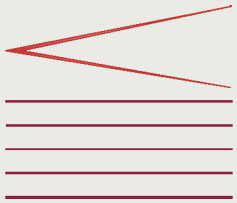

SI AAA One and Two

```
BEXT Description:
Oral history interview with Tony Rosenthal, 1968 May 10-June 29.; Tony; Sevim; 1968 May 10-June 29

BEXT Originator:
Smithsonian Institution

BEXT Originator Reference:
Archives of American Art

BEXT Origination Date:
2009-09-22

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
A=ANALOG,M=mono,T=Revox_A700; 13652; Audiotape_1251
A=PCM,F=96000,W=24,M=mono,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=mono,T=SoX14.1; DAE
```

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BEXT Description:
211348, local, SIRIS bib number; 9154, local, DCD Collection ID; 11014, local, DCD Item ID

BEXT Originator:
US, SI, Archives of American Art

BEXT Originator Reference:
See Description for identifiers

BEXT Origination Date:
2009-08-06

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
A=ANALOG,M=stereo,T=Technics_SP-15; SFNN105M01; Unknown
A=PCM,F=96000,W=24,M=stereo,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=dual-mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=stereo,T=SoX14.1; DAE
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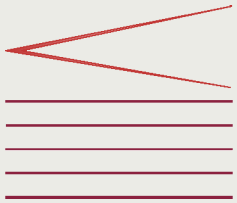

SI Hirshhorn

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Sample Rate:
96000

Bit Depth:
24

Duration:
0:42:19

INFO Name:
Hess, Thomas B. "The Breakthrough of Abstract Expressionism."

INFO Artist:


INFO Date:
20090908

INFO Archival Location:
Smithsonian Institution Libraries, Hirshhorn Museum Library

INFO Copyright:
Material may be protected by copyright. Restrictions may apply.

BEXT Description:
Hess, Thomas B. "The Breakthrough of Abstract Expressionism." Lecture at NGA, 11-4-73: 0001, File Identifier; HMSG0001A-B, Tape Identifier

BEXT Originator:
Hirshhorn Museum Library

BEXT Originator Reference:


BEXT Origination Date:
2009-09-08

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
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A=PCM,F=96000,W=24,M=stereo,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=dual-mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=stereo,T=SoX14.1; DAE
```

SI Hirshhorn and SI AAA

Sample Rate:
96000

Bit Depth:
24

Duration:
0:42:19

INFO Name:
Hess, Thomas B. "The Breakthrough of Abstract Expressionism."

INFO Artist:

INFO Date:
20090908

INFO Archival Location:
Smithsonian Institution Libraries, Hirshhorn Museum Library

INFO Copyright:
Material may be protected by copyright. Restrictions may apply.

BEXT Description:
Hess, Thomas B. "The Breakthrough of Abstract Expressionism."
Lecture at NGA, 11-4-73: 0001, File Identifier; HMSG0001A-B, Tape Identifier

BEXT Originator:
Hirshhorn Museum Library

BEXT Originator Reference:

BEXT Origination Date:
2009-09-08

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
A=ANALOG,M=stereo,T=Nakamichi_Dragon; 09095; TDK_C90
A=PCM,F=96000,W=24,M=stereo,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=dual-mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=stereo,T=SoX14.1; DAE

Sample Rate:
96000

Bit Depth:
24

Duration:
0:56:32

INFO Name:

INFO Artist:

INFO Date:

INFO Archival Location:

INFO Copyright:

BEXT Description:
Oral history interview with Tony Rosenthal, 1968 May 10-June 29.; Tony; Sevim; 1968 May 10-June 29

BEXT Originator:
Smithsonian Institution

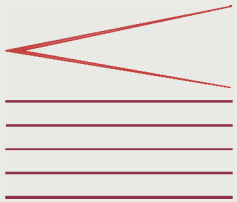
BEXT Originator Reference:
Archives of American Art

BEXT Origination Date:
2009-09-22

BEXT Time Reference:
0

BEXT Version:
1

BEXT Coding History:
A=ANALOG,M=mono,T=Revox_A700; 13652; Audiotape_1251
A=PCM,F=96000,W=24,M=mono,T=PrismSound; ADA-8XR; A/D
A=PCM,F=96000,W=24,M=mono,T=MetricHalo; ULN-2; DIO
A=PCM,F=96000,W=24,M=mono,T=SoX14.1; DAE



CUL METS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      - <mets:mdWrap MDTYPE="OTHER" OTHERMDTYPE="JhoveXMLOutput">
        - <mets:xmlData>
          - <jhove xsi:schemaLocation="http://hul.harvard.edu/ois/xml/ns/jhove http://hul.harvard.edu/ois/xml/xsd/jhove/1.5/jhove.xsd"
            name="Jhove" release="1.1" date="2008-02-21">
              <date>2009-10-15T15:22:19-04:00</date>
            - <repInfo uri="/Volumes/GBAUDIO/SSA/2007511%20CUL/Production/Goldstein_JonahJ_7139260/Master
              /Goldstein_JonahJ_7139260_01_01_m.wav">
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                <lastModified>2009-08-12T14:45:39-04:00</lastModified>
                <size>2057587049</size>
                <format>WAVE</format>
                <status>Well-Formed and valid</status>
              - <sigMatch>
                  <module>WAVE-hul</module>
                </sigMatch>
              - <messages>
                  <message offset="848" severity="info">Chunk type 'PAD ' ignored</message>
                </messages>
                <mimeType>audio/x-wave</mimeType>
```
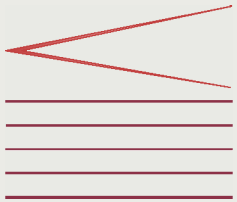

UMichigan RFI

University of Michigan Library	Audio Digitization Metadata List		Updated July 21, 2009			
Field	**Relation**	**Definition**	**Example**	**Required Status**	**Population**	**Origin**
analog_digi_flag	Source recording	describes the method by which a physical audio object was recorded	Analog or Digital	Mandatory	U of M	LC
dimensions_diameter	Source recording	audio object's diameter (in inches)	10 inches	Mandatory, if applicable	U of M	LC
dimensions_height	Source recording	audio object's height (in inches)	4 inches	Mandatory, if applicable	U of M	LC
dimensions_width	Source recording	audio object's width (in inches)	3 inches	Mandatory, if applicable	U of M	LC
originating_library	Source recording	Library from U of M of which the source recording is a part.	SCL (Special Collections)	Mandatory	U of M	UM
originating_collection	Source recording	Collection from U of M of which the source recording is a part	Rossiter, Wilson/Welles	Mandatory	U of M	UM
generation	Source recording	describes the physical audio object	studio master, master, dub, original disc, etc.	Optional	U of M	LC
audio_object	Source recording	an audio object's generic format name	LP, audio cassette, DAT, etc.	Mandatory	U of M (with vendor override)	HVD
condition_note	Source recording	description of the state of a source recording's physical condition		Mandatory	U of M (with vendor override)	HVD
audio_data_encoding	Digital file	structure for digital audio data	Pulse Code Modulated (PCM)	Mandatory	U of M	LC
file_locat_value	Digital file	location of digital file within U of M	TBD	Mandatory	U of M	LC
file_name	Digital file	Identifier of digital file	Barcode + face/track (39015123456789001)	Mandatory	U of M provides barcode / Vendor generates the latter	UM
base_material	Source recording	a recording's base material	glass, aluminum, polycarbonate, unknown, etc.	Mandatory	Vendor	HVD
dye_layer	Source recording	describes the dye present in recordable optical discs	phthalocyanine, cyanine	Mandatory if applicable	Vendor	NYPL
equalization	Source recording	specific name of recording's inherent equalization (pre-emphasis)	NAB, Type I, Type II, unknown, etc.	Mandatory if applicable	Vendor	HVD
gauge	Source recording	pertains to audio tape (expressed in inches)	1/4", 1/2", etc.	Mandatory if applicable	Vendor	HVD
groove_orientation	Source recording	pertains to analog grooved media	Lateral or Vertical	Mandatory if applicable	Vendor	HVD
sampling frequency	Digital file	rate at which audio was sampled for digital file	96K, 48K, 44.1K, etc.	Mandatory	Vendor	LC
format_name	Digital file	official name of the file format	Broadcast Wave Format	Mandatory	Vendor	
note		any additional notes about the source recoding, the preservation master file, production master file or access copy	tracks, titles, timing, editing, processing	As necessary	Vendor	LC

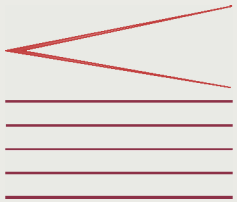
How will any of this provide for discovery, management, provenance, etc?

- It all has to be done manually.
- It is just as much work to create software tools to read the metadata as to make it.
- It costs more to do the metadata work on some projects than the digitization.
- What will be the cost to reformat the metadata when the digital file is migrated?



Is this a wise use of our limited resources?

- High “value added” work
- Vendors on standards committees
- Vendors pushing standards
- Pushing STANDARDIZATION
- Streamlining of work flows so resources have higher impact



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