

Audio Digitization

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Agenda

- Introductions
- Audio Digitization Project Planning
- Analog Media
- Quality and Technical Specifications
- Filenaming and File Management

Agenda

- Digitization Equipment
- Activity: Cassette Digitization
- Preservation and Access
- Activity: Audio Editing
- Quality Control
- Questions and Wrap-up

Introductions

- What audio formats do you have?
- What audio digitization projects are you planning?
- What do you hope to get out of this workshop?

Audio Digitization Project Planning

Project Scenario

- You are planning to start an audio digitization project...

Planning a Digitization Project

Step One: Define the materials to be digitized

- What type of materials?
- How many items?
- What extents?
- *Small collection of 24 audio cassettes. Each 45 minutes per side*

Planning a Digitization Project

Step Two: Decide on the method of digitization and technical specifications for the project

- In-house or outsourcing?
- What equipment do you have and what do you need?
- What file types and formats?
- *Digitizing in-house, on a budget. Digitizing WAV files at 96000 kHz, 24 bits. Access MP3 files at 192 Kbps.*

Planning a Digitization Project

Step Three: Decide how you will provide access to materials

- What dissemination platform?
- Workflow for transferring, saving, uploading?
- Does your digitization workflow support access goals?
- *Access copies with basic metadata will be made available publicly online*

Planning a Digitization Project

Step Four: Define a metadata scheme and workflow

- Choose a metadata scheme and define fields
- How will you enter metadata?
- When/where will metadata be collected/created?
- *Modified Dublin Core. On a spreadsheet record initial metadata collected before digitizing, and additional information collected during digitization*

Planning a Digitization Project

Step Five: Define a file naming convention and folder structure for the project

- It should be unique and consistent.
- File names should map back to the original item.
- Create a folder structure that will keep files organized as the project grows.

Planning a Digitization Project

Step Six: Define steps for quality control in the project

- QC takes places at all stages of the project.
- Multiple people will be responsible for QC.
- Establish procedures as part of planning, and follow them
- *QC will be performed on all files by the digitizer when first digitized, and then on 20% of files generated weekly by the project supervisor, and at major events.*

Planning a Digitization Project

Step Seven: Establish a digitization log or tracking sheet(s) for documentation purposes

- What is digitized
- By whom
- When
- What files were created
- Where the files are stored

Planning a Digitization Project

Step Eight: Gather and define written procedures

- Each step must be clearly defined, documented, and shared with project staff
- May include a step-by-step manual covering
 - Digitizing and saving files, entering metadata, editing/uploading/preparing files for access, and conducting quality control

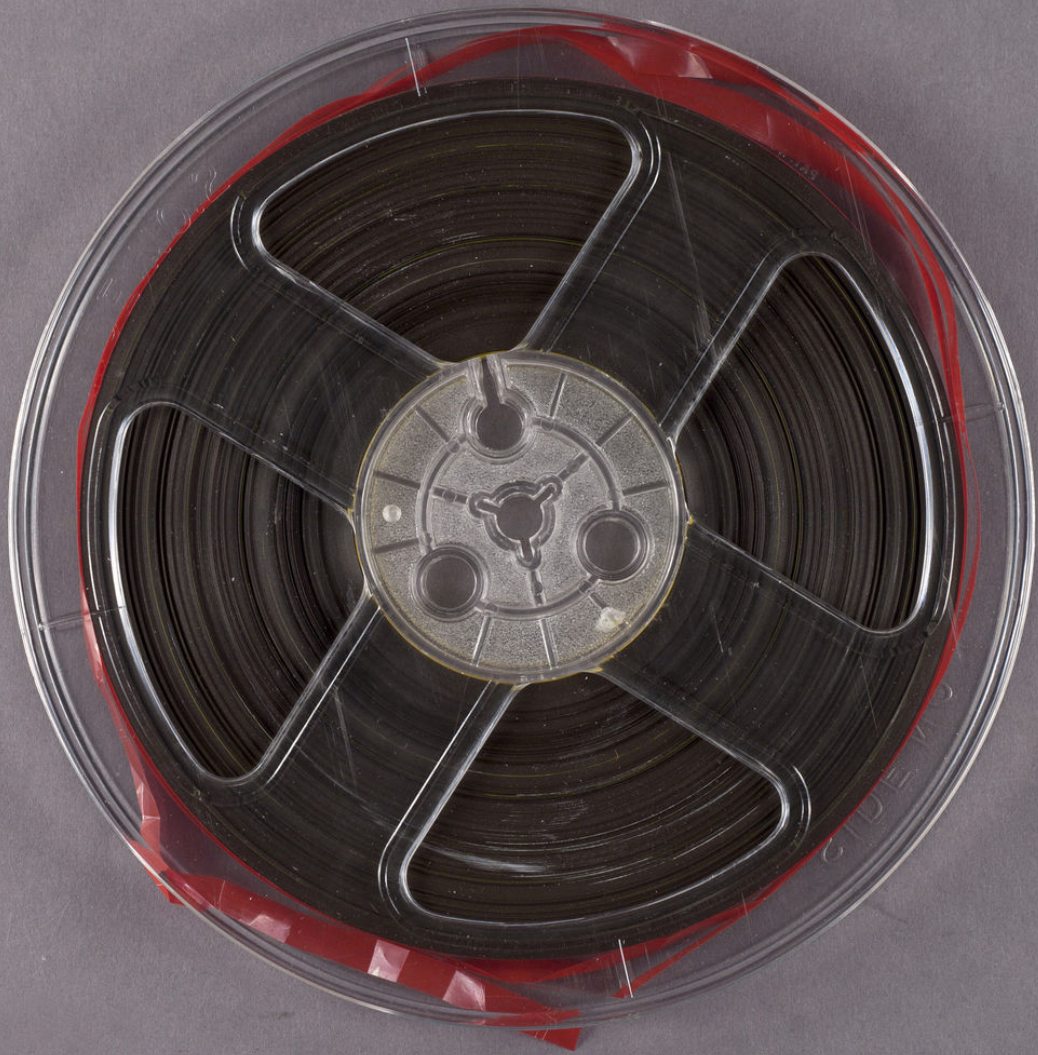
Analog Audio Media

Analog Audio Formats

- **Cassettes**
 - Other tape (open reel)
- Grooved Media (vinyl, wax cylinders)
- Optical Media (CDs)

Magnetic Media

- Open reel, Cassettes, Digital Audio Tape, Wire Recordings
- Include a base, binder and metal particles that hold the sound recording



NO LIVES NO
Robin Williamson & his Merry Band American StoneHENg

A
XLII
POSITION HIGH
90


maxell



Magnetic Media Preservation Concerns

- Lack of (working) playback equipment
- Brittleness, physical damage
- Demagnetization over time
- Mold
- Substrate and recording media delamination
- Cool storage is best

Care, Handling, Storage of Cassettes

- Don't touch the recording media
 - Handle discs by edges
- Store in cool, dry, dark place
- Handle with clean hands (or gloves)
- Store media on-edge/upright
- Use acid-free/archival cases to store
 - Re-house if necessary
 - Use the right size cases

Quality and Technical Specifications

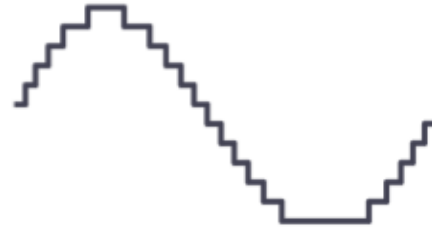
Analog and Digital Audio Signals



ORIGINAL SOUND WAVE



ANALOG SOUND WAVE



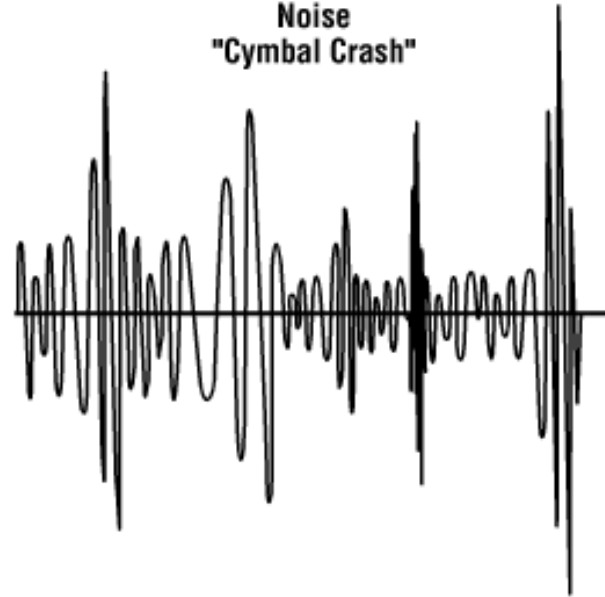
DIGITAL SOUND WAVE

Analog and Digital Audio Signals

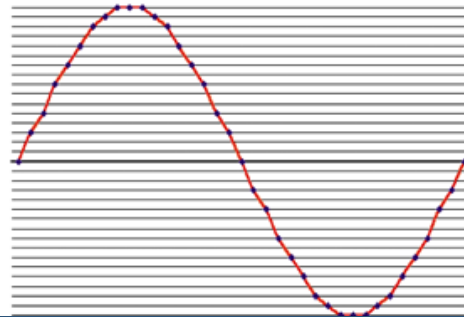
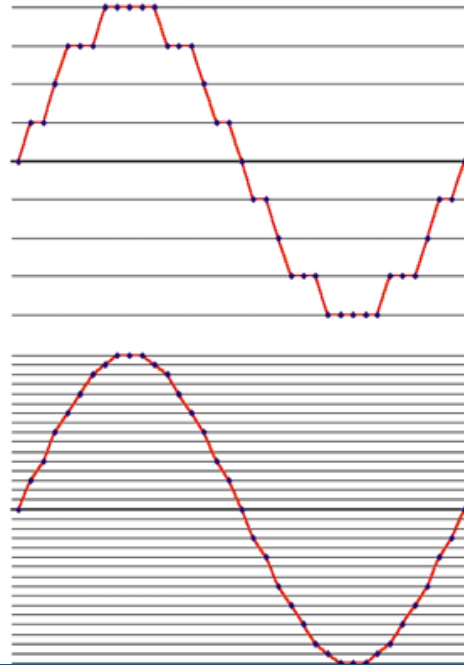
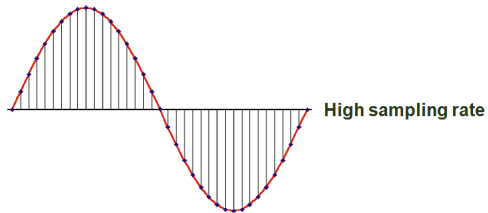
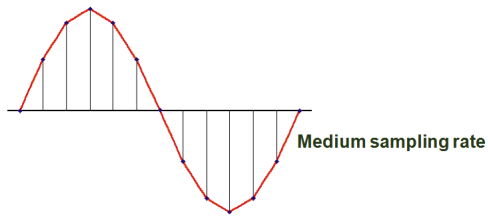
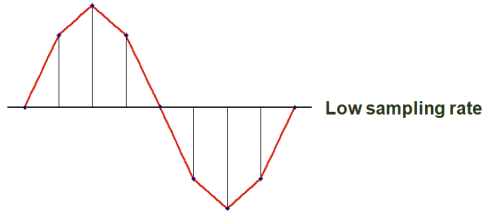
**Musical Note
"Plucked Guitar String"**



**Noise
"Cymbal Crash"**



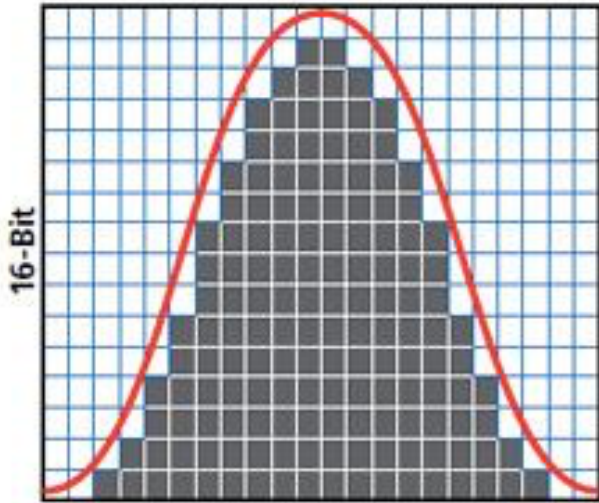
Sampling Rate and Bit Depth



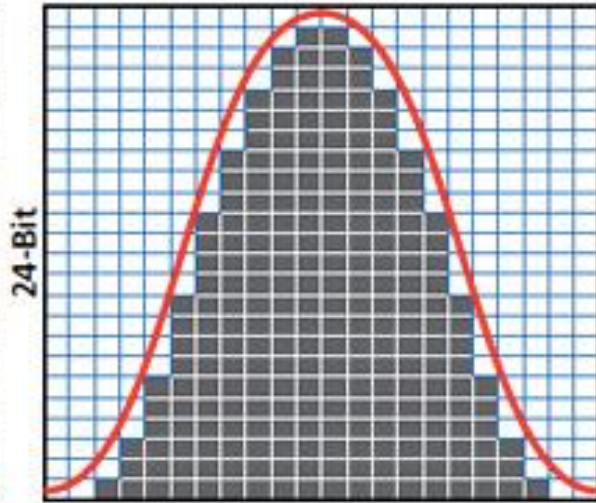
Low sample resolution

High sample resolution

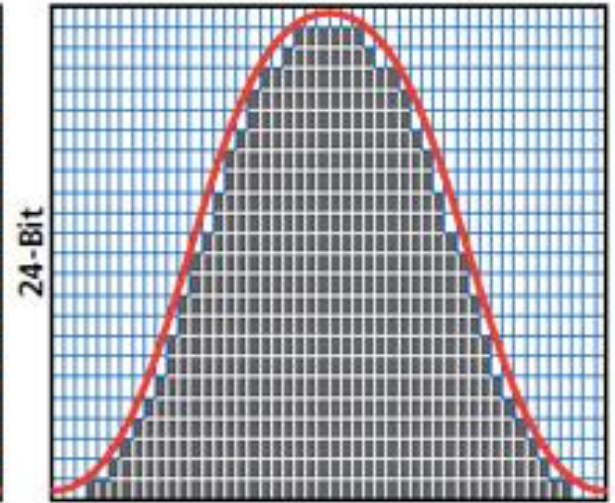
Sampling Rate and Bit Depth



48 kHz



48 kHz



96 kHz

As Bit depth and sample rate increase, more information is captured, this resulting in higher quality audio.

Preservation File Recommendations

Recommendation Level	File Format	Sample Rate	File Bit-depth	Usage Example
Minimum	WAV/AIFF	44,100	16	Audio from commercial CD
Special Consideration	WAV/AIFF	48,000	24	Human voice only, no instrumental music
<i>Recommended</i>	<i>WAV/AIFF</i>	<i>96,000</i>	<i>24</i>	<i>Oral History recording, especially if there is music. Natural sounds or sounds from nature.</i>

Recommendation Level	File Format	Bit Rate	Usage Example
Minimum	MP3	128 Kbps	Oral history, without music
<i>Recommended</i>	<i>MP3</i>	<i>192 Kbps</i>	<i>Most audio</i>
Special	MP3	320 Kbps	Very high fidelity required

Digital File Formats

We recommend:

- WAV for Preservation
 - Sample rate: 48 or 96 kHz
 - Bit depth: 24 bits
- MP3 for Access
 - Bit rate: 192 Kbps

Metadata for Audio

Metadata for Audio

- Many “standards” ...
 - How to choose one?
- Keeping it simple: Dublin Core

Dublin Core

- Title
- Creator
- Subject
- Description
- Publisher
- Contributor
- Date
- Type
- Format
- *Extents
- Identifier
- Source
- Language
- Relation
- Coverage
- Rights
- *Date Digitized
- *Digitizer
- *Digitization Equipment
- *Filename
- *Notes

Metadata for Audio

- Fields that need special consideration
 - Extent
 - Release forms/permissions

INTERVIEW RELEASE FORM

Project name: _____

Date: _____

Interviewer: _____

Tape number: _____

Name of person(s) interviewed: _____

Address: _____

Telephone number: _____

Date of birth: _____

By signing the form below, you give your permission for any tapes and/or photographs made during this project to be used by researchers and the public for educational purposes including publications, exhibitions, World Wide Web, and presentations.

By giving your permission, you do not give up any copyright or performance rights that you may hold.

I agree to the uses of these materials described above, except for any restrictions, noted below.

Project Tracking

- How do you keep track of what's been done, and by who?
 - Quality Control
 - Accountability
 - Problem Solving

File naming and File Management



The system for numbering each item incorporates four elements:

1. The archival collection number to which the item belongs
2. The general format of the item (graphic, manuscript, sound recording, etc.)
3. The item number
4. The extension, denoting digital file format

example: afc1990035_sr01.wav

afc1990035 = stem

afc = American Folklife Center

1990 = year of accession



35 = sequential order of collection's accession

sr01= the item number

sr = format designation

01 = sequential item number [the number of digits to be defined by the greatest number of items within each material designation for a particular collection]

.wav= extension denoting file format

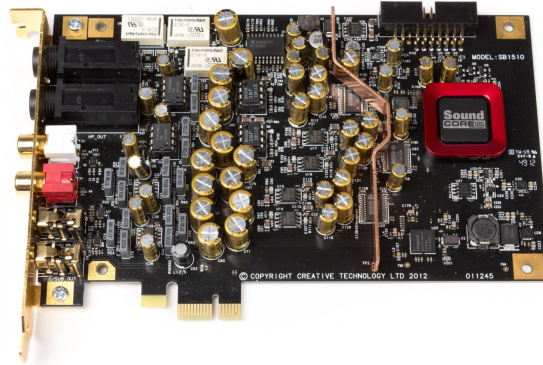


IMPORTANT: the digitized audio file should correspond in naming structure to the original analog source
OR provide a concordance document of some kind that notes the relationship between the two

Digitization Equipment

Audio Digitization Equipment

- Three Components:
 - Cassette Deck
 - Analog to Digital Conversion Unit
 - Digital Capture Device



Good: Combo A/D
Converter
+ Cassette Player

Better: Internal A/D
Sound Card
+ Tape Deck

Best: External A/D
Converter
+ Tape Deck

Activity: Cassette Digitization

Activity: Cassette Digitization

- Digitize part of one cassette
- Refer back to project planning sheet for digitization standards
- Continue to fill out Dublin Core Worksheet and Tracking Log as you go

Preservation and Access

Preservation and Access

- So you've digitized... Now what?
- Files need to be preserved, and accessed

Digital Storage

- **Preservation Masters (.wav)**
 - Best quality, faithful, large files
 - Not accessed or shared on a regular basis
- **Access Copies (.mp3)**
 - Lower (but useful) quality, less detailed, smaller files
 - Easily shared, used for regular access

File Fixity

Generate checksums of the digital file..
Bits and bytes need to be (ac)counted
for in the pas through between
creator/producer and DAM or system

Activity: Audio Editing

Editing for Production

- Why edit?
 - You may want multiple versions
 - Unedited original
 - Full length access copy
 - Edited copies for specific uses

Editing for Production

- Reasons to create multiple access copies:
 - Manage appropriate access
 - Generate short clips for broadcast
 - For clarity
 - Create something larger

Editing for Production

Common editing techniques

- Export selections
- Cut audio
- Separate tracks
- Crossfade tracks

Activity: Audio Editing

Take turns trying different editing techniques

- Export selections
- Cut audio
- Separate and crossfade tracks

Quality Control

What is Quality Control, and Why?

- Ensuring that digital files are:
 - High Quality
 - Accurate
 - Consistent

Quality Control: Key Questions

- When to check?
- Who should check?
- What to check?
- How much to check?

Quality Control: When to check

- At least twice:
 - During digitization
 - Again later (according to your project plan)

Quality Control: Who should check?

- At least two people:
 - Digitizer
 - Project supervisor

Quality Control: What to check?

- File Management and Storage
- Technical Specifications
- Audio Inspection
- Metadata
- Fixity

Quality Control: What to check?

- File Management and Storage
 - Do the files exist?
 - Are they in the right place?
 - Are they the right size?

Quality Control: What to check?

- Technical Specifications
 - Do the files match the specifications outlined in your project plan?
 - If not, why?

Quality Control: What to check?

- Audio Inspection
 - Listen: start, middle, end
 - Does the file play?
 - Are there any audio issues?
 - Visually inspect the waveform

Quality Control: What to check?

- Metadata
 - Is the metadata file in the right place?
 - Check filenames and descriptions against the recording
 - Check other important fields

Quality Control: What to check?

- Run fixity checks at:
 - Creation
 - Regular Intervals
 - When something happens (file relocation, disaster, etc)

Quality Control: How much to check?

- Depends on size, scope, and importance of the project
- May be done in batches, according to workflow
- Identify in your project plan, and follow through with it

Audio Digitization Questions?