

Preservation Action Plan for Digital Audio

National Archives and Records Administration (NARA)

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Digital Audio

The Digital Audio category encompasses formats used to encode recorded sound as machine readable files by converting acoustic sound waves into digital signals. Digital audio formats are generally composed of both a wrapper format, usually the common name associated with the file extension, and an encoding method or codec.

Digital audio is defined as an audio waveform that has been created as, or converted into, digital form encoded as numerical samples in continuous sequence (i.e. sample depth over samples per second).

Significant Properties of Digital Audio

To render an authentic digital audio file one must preserve the structural and technical metadata that allows for proper transmission of the audio signal (duration, channels, channel mapping, sampling frequency, and bit depth).

General requirements for digital audio records: Digitize to standards appropriate for the accurate preservation of the original audio when converting analog material (e.g., audio cassettes, record albums, and reel-to-reel audio tapes, etc.). Transfer digital audio at a minimum of 16 bits per sample, but 24 bits per sample is encouraged; and transfer digital audio at a minimum sample rate of at least 44.1 KHz, but sampling at 96 KHz is encouraged.

Appearance

Name	Definition	Function Description
Size	Determined by bit depth, sampling rate, number of channels, and duration.	

Structure

Name	Definition	Function Description
Layout Structure	Embedded technical metadata describing, among other things: format, interleaved channels, samples per second, data rate, data block size, bits per sample, and GUID.	

Behavior

Name	Definition	Function Description
Display	Waveform	Audio signal is visually represented as a waveform, or data elements that characterize a sound.

Context

Name	Definition	Function Description
Descriptive Metadata	This includes but is not limited to: Unique identification number assigned by the creator; Title; Creator; Copyright; Summary.	Digital Audio Files could contain, or link to: metadata that describes any attribute that could be heard in a recording or provides information about the recording.
Technical Metadata	This includes but is not limited to: Originator: Unique identification number assigned by the creator; origination date; coding history; levels.	Digital Audio Files could contain or link to: data on the recording/ digitizing process including signal chain specifics, sample rate and bit depth, and other elements.
Administrative Metadata	This includes but is not limited to: catalog URL; classification or access level.	Digital Audio Files could contain, or link to: metadata that describes how/ where to access the record.

Current NARA Transfer Guidance for Digital Audio

[Bulletin 2014-04](#)

- Preferred:
 - Broadcast Wave (BWF)
 - Free Lossless Audio Codec (FLAC)
- Acceptable:
 - Audio Interchange Format (AIFF)
 - MPEG Audio Layer III (MP3)
 - Wave Waveform Audio File Format (Wave, WAV)

Current NARA Format(s) for Public Access and Reference for Digital Audio

Formats for Public Access are those made available online through the National Archives Catalog. Formats for Reference are defined as those made available to researchers upon direct requests for digital copies.

Formats Available for Public Access: Content created or delivered for public access in the Catalog is delivered primarily in the following file formats: PDF (Textual and Image), JPEG (Textual and Image), MP3 (Audio), and MP4 (Audio/Video) and ASCII (Datasets). Other file formats may be present depending on when they were added to the Catalog.

Format(s) Available for Reference: MPEG Audio Layer III (MP3)