Preservation Action Plan for Moving Image/Digital Cinema Records National Archives and Records Administration (NARA)

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Electronic Record or Digital Surrogate Types and Associated Formats

Digital moving images consist of bitmap digital images or “frames” displayed in rapid succession at a constant rate, giving the appearance of movement. Digital Cinema generally refers to the technology and file formats used to create, distribute, and project motion pictures. Digital Cinema is distinct from digital video (SD, HD, UHD) and does not necessarily use standards pertaining to television or other video standards in regards to aspect ratios, frame rates, and resolution.

Resolution is determined by pixel count, usually 2K or 4K, although higher resolutions are possible. Digital cinema formats are composed of raw camera (multiple formats) or scanned film formats (DPX, TIFF), production formats (Digital Source Master (DSM), Digital Cinema Distribution Master (DCDM), Academy Color Encoding Specification (ACES)), and a delivery format (Digital Cinema Package (DCP) - JPEG2000 and WAV wrapped in MXF).

Essential Characteristics of Digital Cinema Records

To render an authentic digital cinema file one must preserve the structural and technical metadata that allows for proper transmission of the video stream (size, codec, frame rate, interlacing, chroma subsampling, duration, channels, and bit depth).

General requirements for digital video records: Digitize to standards appropriate for the accurate preservation of the original video, when converting analog material (e.g., video cassettes, open reel video, etc.). For reformatted video, 8-bit is acceptable but 10-bit is preferred.

Appearance

Name	Definition	Function Description
Size	Determined by bit depth, frame rate, compression, sub/sampling rate, and duration.	

Structure

Name	Definition	Function Description
Layout Structure	Embedded technical metadata describing, among other things: GUID, file size, format, duration, codec, frame rate, frame width, frame height, bit depth, and bit rate for video and audio components.	

Behavior

Name	Definition	Function Description
Display	Image	Video signal is made up of Luminance, Chrominance, and frame rate.
Audio	Sounds is an audio waveform that has been created as, or converted into digital form and can be heard during playback of the video.	

Context

Name	Definition	Function Description
Descriptive Metadata	This includes but is not limited to: Unique identification number assigned by creator; Title; Creator; Copyright: Summary.	Digital Cinema Files could contain, or link to: metadata that describes any attribute that could be seen in a recording or provides information about the recording.
Technical Metadata	This includes but is not limited to: Originator: Unique identification number assigned by creator; origination date; coding history; levels.	Digital Cinema Files could contain or link to: data on the recording/ digitizing process.

Administrative Metadata	This includes but is not limited to: catalog URL; classification or access level.	Digital Cinema Files could contain, or link to: metadata that describes how/ where to access the record.

Current NARA Transfer Guidance for Digital Cinema Records
Bulletin 2014-04

- Preferred:
    - Digital Picture Exchange (DPX)

- Acceptable:
    - None specified

Current NARA Format(s) for Public Access and Reference for Digital Cinema
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 4 (H.264)