

Unlocking Our Sound Heritage

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How to identify and care for the sound formats in your collection

#SaveOurSounds



How to identify and care for the sound formats in your collection

Since the late 19th century, sound heritage has played a significant and growing role in framing our memory of the past. Despite this, most sound formats face the twin threat of degradation and the obsolescence of access technology. The recordings are held on discs, tapes and other formats for which replay equipment is no longer produced or supported by industry. Archival consensus internationally holds that we have very little time in which to digitise **all** our audio and video material. By around 2030, the scarcity of legacy replay equipment and spare parts will render the process prohibitively expensive or impossible. For some collections, it is already too late.

This booklet will help you identify which formats you hold in your collection, how best to care for them, and how to prioritise their vulnerability when developing a digital preservation plan.

General storage conditions

Commonly accepted archival storage conditions are generally fine – clean, cool and dry with minimal fluctuation (see also the Unlocking Our Sound Heritage leaflet **Storage for Sound Collections**). Discs and tapes should stand vertically on shelves, without having to bear the weight of other items.

Discs

All disc formats should be stored in protective sleeves, and handled without touching the grooved areas of their surface.

Analogue discs: vinyl, shellac & lacquer



Vinyl sleeve and disc

Vinyl: 1940s – present. Usually black, shiny, made of PVA & PVC co-polymer. Generally mass-produced, though some may be rare or unique.

Chemical stability: Generally stable if well stored. PVC sleeves in direct contact with the discs can visibly and audibly damage the disc surface. These were common in 1970s inner sleeves, and remain common in sleeves used to store picture discs.

Other physical vulnerabilities: Prone to wear & tear through repeated playing or handling.

Obsolescence issues: Professional replay equipment is still available.

Preservation risk: Generally low.

Optical discs: Compact Disc (CD) & Recordable Compact Disc (CD-R)



CD logo

CD: Early 1980s – present. Mass-replicated, with recorded information pressed into the silver coloured underside. Initially used to carry audio data in the Compact Disc – Digital Audio (CD-DA) format, later also used to store file-based content of all types.

Chemical stability: Generally stable if well stored. Some discs produced in late 1980s/early 1990s used a defective protective surface, resulting in visible tarnishing in the upper surface, and reduced reflectivity of the lower surface, rendering discs partially or completely unreadable.

Other physical vulnerabilities: Highly vulnerable to scratching of the upper or lower surfaces, as well as dust, fingerprints or other impurities.

Obsolescence issues: Standalone replay equipment and computer optical drives are still available, although increasingly less common.

Preservation risk: Medium, due to likelihood of damage.



CD-R Logo



CD-R yellow dye



CD-R blue dye

CD-R: Late 1980s – present. Recordings are individually burnt into a photosensitive dye layer, though may be mass-duplicated. Increasingly used for short-run production of commercial music, and can be difficult to distinguish from mass-replicated CDs. The dye layer is often coloured, either blue-green or a very pale yellow. The upper surface is less likely to contain mass-printed content information.

Chemical stability: The dye layer is liable to degrade, particularly on exposure to daylight.

Other physical vulnerabilities: The legibility of the data burnt into the disc is notoriously hard to determine. Poorly burnt discs may only play in certain replay devices, be unreadable, or become unreadable in a short period of time.

Obsolescence issues: As per CD.

Preservation risk: High, due to unpredictable legibility of the data and degradation of the dye layer.

Tapes

At their simplest, tapes consist of a base layer, usually plastic, with ferric oxide particles held in a binder layer on one side, magnetically retaining the recorded information.

All tape formats should be stored in protective boxes, away from any form of magnetic interference. The tape itself – as opposed to the reel or cassette – should be handled as little as possible, and only with clean hands.

Open reel: acetate and polyester

Generally held on plastic or metal reels of between three and 10.5 inches diameter. Some tapes also have a back coating, although this cannot contain recorded information. A variety of recording speeds were possible, as were different recording formats, including mono or stereo, full, half or quarter track widths. No single machine is capable of replaying all variants.



Translucent acetate



Degraded acetate



Non-translucent polyester

Acetate base layer: 1930s – 1960s. Identifiable by the translucence of the tape pack when held in front of a strong light source.

Chemical stability: The acetate layer is liable to degrade, off-gassing acetic acid, and thus smelling of vinegar, ultimately causing the base layer to become extremely brittle.

Other physical vulnerabilities: The binder layer may shrink, causing the tape to contort into a warped or cupped shape, negatively impacting replay.

Obsolescence issues: No professional replay equipment has been made for some time, spare parts are increasingly hard to obtain, equipment maintenance expertise is hard to find.

Preservation risk: High.

Polyester base layer: 1960s – 1990s. Identifiable by the opacity of the tape pack when held in front of a strong light source.

Chemical stability: The polyester layer is stable if well stored. The binder layer in tapes made from the 1970s onwards may become sticky, causing audible friction and irreversible shedding of oxide when replayed.

Other physical vulnerabilities: Possible binder shrinkage, as per acetate tape. Polyester tape may irreversibly stretch if mishandled by a poorly performing replay device.

Obsolescence issues: As per acetate tape.

Preservation risk: High.

Cassettes



Compact cassette selection

Compact cassette: 1960s – 2000s. Polyester tape held in a protective shell, generally utilising a single standardised speed and recording format. Widely held in archives both with mass-produced, pre-recorded content, and unique or rare individually recorded content. Many recordings utilise proprietary noise reduction technology, such as Dolby, requiring equivalent technology to be used in order to correctly replay the content.

Chemical stability: As per polyester tape. Shell contains several small moving parts and may be subject to degradation including a loss of adhesion in the glue holding the pressure pad, or loss of lubrication in the so-called “slip sheets” allowing the tape to move freely.

Other physical vulnerabilities: Prone to wear & tear through repeated playing or handling. Longer-duration cassettes are typically made of thinner base material, increasing the risk of irreversible stretching or becoming tangled within a poorly performing replay device.

Obsolescence issues: No professional replay equipment has been made for some time, spare parts are increasingly hard to obtain, equipment maintenance expertise is hard to find.

Preservation risk: High.



Cassette format selection

Mini-cassette, microcassette & stenorette:

All ca. 1960s – 1990s. Similar in construction to compact cassettes, but actually distinct physical formats, each requiring its own dedicated replay equipment.

Chemical stability: As per compact cassette.

Other physical vulnerabilities: As per compact cassette.

Obsolescence issues: No professional replay devices have been made for these formats; domestic-grade equipment is increasingly hard to find and maintain.

Preservation risk: High.



DAT and MiniDV comparison

Digital Audio Tape (DAT): 1980s – 2000s. Similar in construction and recording methodology to videotape, and easy to confuse with the MiniDV video format. DAT dimensions are 73 x 54 x 10.5mm while those for MiniDV are 65 x 48 x 12mm.

Chemical stability: Generally stable if well stored. Other physical vulnerabilities: Highly susceptible to wear & tear through playing or handling, by humans or by poorly maintained replay equipment.

Obsolescence issues: No professional replay equipment has been made for some time, spare parts are increasingly hard to obtain, equipment maintenance expertise is hard to find.

Preservation risk: High.

Less-common formats

Many other more obscure audio formats have come and gone over the years, and your collections may well hold examples of them. Being both less common and obsolescent, the task of finding equipment and expertise to replay and digitise them to an appropriate standard may be correspondingly harder.

Further information

IASA Technical Committee, **Handling and Storage of Audio and Video Carriers**, edited by Dietrich Schüller and Albrecht Häfner (= Standards, Recommended Practices and Strategies, IASA-TC 05)

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