Guidelines for Audiovisual and Multimedia Collection Management in Libraries

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with contributions from the Audiovisual and Multimedia Section Standing Committee

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TABLE OF CONTENTS

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FOREWORD

This set of Guidelines updates the IFLA Audiovisual and Multimedia Section (AVMS) Guidelines document originally developed and shared in 1982 and updated in 2003.

The scope of consideration and application has been narrowed to libraries only, as per the core objectives of the parent organization. They have been updated in format to conform with a table of contents endorsed by the now current members of the AVMS Standing Committee.

IFLA AVMS continues to provide an international leadership forum which considers the ongoing concerns of libraries having to do with audiovisual and multimedia content and services.

As audiovisual and multimedia formats advance and emerge as the now dominant carrier of expression of cultural heritage, the IFLA AVMS has needed to further consider advances in content carrier types and the corollary adjustments in managing collecting, description, access, storage, and preservation of audiovisual and multimedia works. Born-digital materials, now a staple of AV content demanded in libraries of all types, are now considered by these guidelines.

The current Guidelines revision has been led by our colleague, Sonia Gherdevich from the National Film and Sound Archive of Australia with comment and guidance from the balance of the 2016 AVMS Standing Committee membership.

I am most pleased to have collaborated with and offer thanks to these colleagues as we release the updated Guidelines.

Prof. Michael J. Miller, MLS, MA
IFLA AVMS Chairperson, 2014-2017

1.1 Background

The value of audiovisual works is formally recognised in several UNESCO[1] conventions, namely:

- *Recommendation for the Safeguarding and Preservation of Moving Images*[2] adopted by the General Council in 1980;
- *Memory of the World: General Guidelines to Safeguard Documentary Heritage*, 2002[3];
- *Convention for Safeguarding the Intangible Cultural Heritage of 2003;*[4] and
- *World Day for Audiovisual Heritage* approved by the UNESCO General Assembly in 2005.[5]

Collectively, these protocols place a cultural standing on the audiovisual work, its integrity as an artefact and its inherent significance in capturing the stories that form national identity. To this end, audiovisual works are considered an authentic record of knowledge and creative endeavour, integral to the user's experience of a library's collection.

Whilst audiovisual works have been present in library collections since their mass production and public availability, they have often been regarded as the anomaly given the complexities associated with non-print material and the specialist skills need to manage them. In the digital age of production, the collecting landscape continues to swiftly change and libraries need to adjust accordingly.

Audiovisual and multimedia works continue to be part of the collecting fold and regardless of their original format require libraries to focus specifically on managing their permanence and accessibility.

1.2 Scope

Whilst this document draws on its predecessor, it is a contemporary approach that offers better practice guidance for libraries to manage the audiovisual and multimedia materials in their collections, represented in both physical and digital formats.

These guidelines aim to assist in decision making and need to be applied as best suited depending on the nature of the library and its legal obligations. The document also assumes some basic familiarity with audiovisual material and a core understanding of professional terminology used in the audiovisual context.

[1] United Nations Educational, Scientific and Cultural Organization
[2] http://portal.unesco.org/en/ev.php-URL_ID=13139&URL_DO=DO_TOPIC&URL_SECTION=201.html
[3] http://unesdoc.unesco.org/images/0012/001256/125637e.pdf
[4] http://portal.unesco.org/en/ev.php-URL_ID=17716&URL_DO=DO_TOPIC&URL_SECTION=201.html
[5] http://unesdoc.unesco.org/images/0014/001469/146936e.pdf

1.3 Key Definitions

In referring to audiovisual and multimedia collection works, the AVMS applies the following definitions throughout these guidelines:

- **Audiovisual**

  Audiovisual mworks are to be understood as:

  (i) visual recordings (with or without soundtrack) irrespective of their physical base and recording process used, such as films, filmstrips, microfilms, slides, magnetic tapes, kinescopes, videograms (videotapes, videodiscs), optically readable laser discs;

  (a) intended for public reception either by television or by means of projection on screens or by any other means,

  (b) intended to be made available to the public,

  (ii) sound recordings irrespective of their physical base and the recording process used, such as magnetic tapes, discs, soundtracks or audiovisual recordings, optically read laser discs;

  (a) intended for public reception by means of broadcasting or any other means,

  (b) intended to be made available to the public.

  All these materials are cultural materials.

  The definition of audiovisual materials is intended to cover a maximum of forms and formats, trying to leave it open for further technical developments.[6]

- **Multimedia**

  A combination of two or more digital media (text, graphics, audio, animation, video, etc.) used in a computer application or data file, such as an online encyclopedia, computer game, or Web site (example: A 2 Z 4 Birders Online Guide). Multimedia applications are often interactive, synonymous in this sense with digital media.

  In a more general sense, any program, presentation, or computer application in which two or more communication media are used simultaneously or in close association, for example, slides with recorded sound. Still images accompanying text are considered illustration. [7]

[6] http://www.unesco.org/webworld/ramp/html/r9704e/r9704e09.htm
[7] http://www.abc-clio.com/ODLIS/odlis_m.aspx. Online Dictionary for Library and Information Science by Joan M. Reitz

1.4 Professional Associations

In referring to audiovisual and multimedia collection works, there is a range of specialist and peak bodies that offer a wealth of information and provide professional opportunities to network and engage with audiovisual experts of international standing.

Many associations have local chapters where staff working with audiovisual materials across and beyond the Galleries, Libraries, Archives and Museum (GLAM[8]) sector can meet with a common sense of purpose.

see: Attachment A for a list of international professional audiovisual associations.

[8] GLAM is an acronym for galleries, libraries, archives, and museums, although other versions of the acronym exist, such as LAM, which incorporates only libraries, archives, and museums. More generally, GLAMs are publicly funded, publicly accountable institutions collecting cultural heritage materials. (https://en.wikipedia.org/wiki/GLAM_%28industry_sector%29)

A.1 ACQUISITIONS

Librarians develop collections in alignment with their organisational goals. In doing so, they should be aware of content available and often, originally created, on audiovisual and multimedia formats.

The library's collection policy should be explicit in its intention to include media resources, articulating a selection criteria based on content and commitment to the preservation of the original format where collected.

Libraries collecting audiovisual works will also need to be aware of the equipment required to store, preserve and access the work.

There is a wide range of sources for acquiring audiovisual media. These include, but are not limited to:

- commercial outlets;
- via the Internet;
- broadcast industries;
- production and recording companies;
- funding bodies; and
- private collectors.

Acquisitions can be received through:

- donation;
- purchase;
- exchange;
- gift;
- bequest; or
- legal deposit.

Each acquisition needs be fully documented recording relevant detail and provenance related to the work. The key fields of information include, but not limited to:

Table 1: Key fields of acquisition information

Administrative	Content
Client Contact Details	Statement of Significance
Provenance History	Item Description
Date Received	Item Format
Rights Details	Quantity
Disposal Authority	Condition Assessment

In all, libraries need to determine the reasons why they are collecting audiovisual and multimedia works and their intended use and give due consideration to how they will strategically manage these collections and associated equipment in a sustainable way.

A.2 CATALOGUING

As a general approach media resources should be included in the central catalogue of the library to provide maximum access and provide the user with the widest experience that the collection has to offer.

In documenting an audiovisual or multimedia work, cataloguing practices and data models should support the choice of shared and recognised standards. The depth of audiovisual cataloguing is dependent on the library type, services and resources. Notwithstanding, a meaningful intellectual and technical description of the work must be captured in the catalogue record.

The audiovisual work needs to be catalogued as per the work in hand. This principal also applies to digital files. Cataloguers need to audition the work in its entirety then, catalogue each element of the work ensuring that the relationship between content and carrier is maintained.

The content informs the intellectual description of the work and the format informs the technical description of the work. If the work is made up of multiple components and/or carriers, each of these should be catalogued individually.

No one set of data fields will apply to all audiovisual works and some fields relate only to a specific format or generation of the work. The following table provides a selection of key data fields for audiovisual catalogue records:

Table 2: Key fields for audiovisual and multimedia description

INTELLECTUAL DESCRIPTION	TECHNICAL DESCRIPTION
Title	Item Format
Alternative Title	Item Type
Related Title	Item Usage Category
Version	Item Number
Series Title	Technical Code
Episode Number	Carrier Duration
Summary	Condition Assessment
Medium	Carrier Treatment
Genre	Copy History
Country Of Origin	Format Technical Information: Diameter
Language	Format Technical Information: Width
Date Type	Format Technical Information: Material
Duration	Analogue Technical Information: Size
Matrix | Catalogue Number	Analogue Technical Information: Stock Details
Credit Name	Digital Technical Information: File Format
Credit Role	Digital Technical Information: File Size
Record Label	Digital Technical Information: Input File
Rights | Restrictions	Storage Location

Audiovisual and multimedia works require a specific approach to cataloguing and an understanding that certain fields of information correspond to specific components of the work.

In all instances, authority control must be practiced where applicable and subject indexing should be consistently applied serving the purpose of access as well as data quality. Depending on the library type, they will need to determine which subject headings or controlled vocabularies they need to apply to their cataloguing records.

Whilst there are international standards for cataloguing multimedia and audiovisual works, **see: Attachment B for a list of cataloguing standards relating to audiovisual material,** the library will need to determine their applicability to the collection.

A.3 ACCESS

The ability to access audiovisual materials will depend on the library's purpose and resources. The Library will need to determine what formats the library will use for access. In doing so, the library will also need to establish its policy on replacing access copies.

For on-site use, the library will need to provide a suite of well-maintained equipment to audition physical material and technical services for digital material.

For online access, libraries will need to enter into licencing arrangements and ensure security measures are in place to protect the content from unlawful use.

Lending policies for audiovisual works will need to be tailored depending on the library service and the nature of the collection. Formats for lending need to be considered as do transportation options. Risk management strategies may need to be applied when lending original works.

Weather a collection work is digitised or born digital, preservation or access category materials, protocols covering accessibility to the audiovisual collection are required. They speak to the importance of file security which is fundamental in the digital content domain of collection management.

A.4 RIGHTS

In the area of rights, there are specific legal constraints in relation to sound and moving images. In addition to copyright, there are producers' rights, performers' rights, mechanical rights and other related rights which relate specifically to audiovisual media.

The legal position for each work must be clearly established and documented for every item in the collection. As laws differ from country to country, seeking professional legal advice is recommended.

Licensing options are available to libraries to facilitate access to audiovisual works. Attention must be paid to the restrictions of licenses and as such contracts should be actively managed and kept current.

A.5 DISASTER RECOVERY MANAGEMENT

Even with the best preventative measures and risk mitigation strategies in place, the possibility of a collection emergency occurring is always present. To this end, libraries should operate with an updated collection disaster response and recovery plan for their audiovisual and multimedia collection that covers both analogue and digital material.

A plan of this nature should include, but not be limited to, the following procedures:

- emergency identification;
- response to a minor emergency;
- response to a major emergency;
- handling instructions for affected material;
- collection evacuations; and
- salvage prioritisation and treatment.

Library staff, working with the collection, are to be appointed disaster recovery coordinators. They need to be supported and provided with training. Working within teams, the plan should be tested annually and reviewed accordingly.

A.6 STAFF SKILLS

Library staff working with audiovisual and multimedia resources require as range of specialised skills and knowledge in terms of:

- acquisition selection;
- format handling;
- cataloguing;
- rights management;
- disaster management;
- preservation treatment; and
- storage facilities.

A heightened level of technical skill is needed when managing born-digital or digitised works.

Managing audiovisual and multimedia collections requires extensive collaboration and openness to change across a number of service areas in the library. Often the best solutions come from a collective approach where expertise can be shared and solutions agreed to. Staff roles and responsibilities concerning audiovisual and multimedia resources should be clearly defined within the organisation of the library.

Ongoing training and continued professional development should be made available to library staff and opportunities to seek assistance or professional exchange programs with specialist institutions should be pursued. Online courses, seminars and training information are also very helpful as is active engagement with peak bodies and discussion groups.

A.7 BUDGET

Budgets for audiovisual collections need to include, but not be limited to:

- acquisition;
- packaging;
- preservation;
- storage;
- equipment;
- transportation;
- security; and
- insurance.

As libraries build their digital collection infrastructure, network and systems, these also require an ongoing budgetary assignment. Many libraries manage hybrid audiovisual collections (both physical and digital formats) which requires a higher level of ongoing investment.

Library budgets vary significantly, and while a percentage will need to be assigned to audiovisual and multimedia collections, sustainability is the key financial factor in providing a quality service.

B.1 FORMAT TYPES

Audiovisual and multimedia collection works exist in a range of formats captured on one or more carriers. Libraries need to be able to identify each format and determine which will be included in the collection.

Knowing the nature of the audiovisual collection will assist the library staff in making decisions to serve the collection best. Many formats require specialist handling skills for acquisition, cataloguing, storage, access and transportation tasks.

Understanding the format will also assist library staff learning about play back equipment. Equipment needs to be considered an integral part of the collection given that some formats require specific equipment to access the content.

Collections may include multiple format families reflecting generations of technical development. Content on physical carriers may be captured using either analogue or digital signals.

see: Attachment C for a list of audiovisual physical formats

B.2 PACKAGING

Packaging audiovisual carriers using professional packaging material is integral to passive preservation practice. By packaging an audiovisual collection correctly, it will ensure the longevity of the format thereby keeping the content accessible.

Libraries will need to keep a minimal stock of packaging materials in store. Specific archival materials include, but are not limited to:

- polypropylene film cans, cores and reels;
- polyethylene record sleeves;
- card inserts for records;
- un-slotted hubs for reel tape;
- jewel cases for optical discs;
- acid and lignin-free storage boxes and document holders;
- interleaving paper;
- corrugated board;
- negative protectors;
- transparency holders;
- plastic fasteners; and
- cotton and latex gloves.

Libraries also need to consider that not all formats can be packaged with commercially available products and that, in some instances, collection material may require custom-made specialist packaging.

B.3 PRESERVATION

Libraries undertaking the preservation of audiovisual and multimedia materials should make themselves aware of the developing standards and practices, and model themselves on institutions recognised for their good practice or long experiences in the field.

As libraries differ in their legal obligations to actively preserve collections in their care, no single approach can be universally applied, each library will need to have a preservation plan in place that serves the need its collection.

There are, however, some key concepts that need to be taken into account when considering the level of preservation activity required to ensure ongoing access to the audiovisual or multimedia work.

Preservation practices need to maintain the integrity of the material and aim to restore, or stabilise, its content with a view of providing access to the material.

The physical composition and vulnerability of audiovisual formats must also be taken into account. Deterioration of audiovisual works is influenced by the inherent durability of the format itself. The rate of deterioration differs across physical formats and while active and passive preventative measures may be practiced, deterioration is inevitable over time.

To this end, regular condition assessments need to be undertaken and the findings fully documented. Condition assessments and risk management inform preservation priorities and strategies.

Preservation prioritisation may include, but are not limited to:

- cultural significance of the content;
- format obsolescence;
- equipment obsolescence; and
- usage category.

Preservation strategies that reduce risk to the collection may include, but are not limited to:

- arranging the collection according to medium, carrier type and condition;
- creating duplicate components or copies;
- digitisation;
- preserving on stable formats
- migrating content to viable carriers; and
- evaluating outsourcing options.

Preservation treatments or restoration processes are applied to bring the carrier closer to its original condition and need to be fully documented for each carrier. In the instance a work is copied, a record of its copy history must be kept.

Many libraries adopt digitisation as their principal form of preservation. Standards for digitisation of physical media need to be set prior to the procurement of equipment or external services. Simultaneously, information technology infrastructure, networks and systems all need to be in place. Network speed and storage requirements are also prime considerations.

see: Attachment D for a list of preservation standards for digitising audiovisual works

B.4 STORAGE

Storage of audiovisual collections needs to be approached both in terms of the facility itself and the way the collection is stored within it.

It is indifferent to weather a work is a commercial release, home movie, in-house compilation, professional or amateur in quality. If an audiovisual work is part of the library collection, it matters how the format is stored so that content can be accessed.

The audiovisual and multimedia vault is integral to the longevity and permanence of a collection work. Storage conditions for audiovisual and multimedia carriers are specific to their format and libraries need to be aware of international standards that apply.

see: Attachment E for a list of storage standards and best practices for physical formats

Audiovisual storage standard prescribes the optimal temperature and relative humidity levels required to store audiovisual formats. In many cases, libraries will not be resourced to strictly adhere to these standards and will need to take a risk management approach to determine how the prescribed environmental conditions can be sustainably applied.

The storage containers themselves vary in size and shape according to the diversity of the carriers, and this has implications for the organisation of the storage area.

Vaults must be kept clean and designed such that collection movement is easily achieved.

Storage facilities must be appropriately secure to minimise the risk of theft of, or damage to, collection material. To this end, library staff with access to the vaults needs to be limited.

Security and surveillance needs to apply to both manned and unmanned areas. Fire detection and suppression services need to be in place and building management systems that control heating, ventilation and air conditioning need to be regularly serviced.

C.1 BORN-DIGITAL COLLECTION WORKS

The trend for audiovisual and multimedia works to be created in a digital format only is on the rise and a future where all works are born-digital is expected.

As physical audiovisual formats have changed over the generations, the digital format is the dominant content delivery format today. Accordingly, library operations need to reflect this change mindful that there are multitudes of digital image, audio, video and film formats available for content creation.

Regardless of the format, the emphasis remains on the significance of the content and its relevance to the library's collection policy when considering material for acquisition.

Born digital collection works can be created in a variety of file formats both open standard and proprietary. The library will need to have a clear understanding of the range of file types they prefer and are able to support.

Born-digital collection works can also be received through a range of channels - from digital content arriving on a physical carrier to direct ingest from the original source. For audiovisual and multimedia acquisitions, the digital files need to be quarantined for anti-virus inspection and quality control before being introduced into the library network and collection management systems.

C.2 INFRASTRUCTURE AND SYSTEMS

Current trends in digital systems designs support end-to-end workflows, that is, from acquisition to access. The result being that systems are integrated and the information technology and communication (ICT) infrastructure provides a robust environment, delivering speedy connectivity for file ingest, preservation and transaction across the network.

In managing a digital audiovisual collection, ICT matters come heavily into play. Hardware, software and systems will need to be implemented taking a holistic approach and applied to each step of the collection management process. This means there will be a network of systems needed for acquisitions, preservation, cataloguing, storage and access.

Infrastructure also includes a suite of documentation articulating policies, protocols and practices so that the collection is managed in a consistent and standardised manner.

To successfully manage digital collections, an extensive range of staff expertise is needed. Drawing on in-house resources and building on professional relationships often results in the most suitable solutions. In some instances, expertise can be contracted to provide the service needed.

C.3 PRESERVATION

For the preservation of digitised or born-digital works, solutions for long-term access to the file format needs to be considered. In terms of audiovisual collection management, this challenge is continuously present as technology advances at an increasing rate. Libraries will need to consider a range of options when developing a digital preservation strategy taking into account:

- authentication - ensuring that original files have the attributes of standard file formats;
- sustainable file formats which enable control and standardisation;
- preservation metadata - capturing the technical features of the file and content;
- replication - the creation of multiple copies of data at one or more locations and on one or more systems;
- refreshing - the transfer of data between two types of the same storage medium while monitoring and maintaining data integrity;
- migration - the transferring of data to a newer hardware and/or software environment;
- emulating the look, feel and functionality of legacy datasets/application or websites can be crucial to the value of them as digital objects;
- technical obsolescence both in terms of software and hardware;
- data quality standards;
- unique identification numbers for each file.

Libraries also need to consider that multiple strategies may apply to suit the needs of their audiovisual and multimedia collection.

C.4 STORAGE

Digital collection storage solutions range from external hard drives to cloud computing. Each solution incurs a degree of risk. As such, when considering storage options the risk mitigating controls and measures that will need to be put in place, continuously maintained and monitored must also be taken into account. Storage capacity and growth rate of the digital collection are also prime considerations.

Currently, the most common approach is to store digital collections using disk storage and a tape library robot to ensure the digital collection's safety and security. Risk management strategies include that the digital collection be backed up on Linear Tape Open (LTO) tapes and 3 copies stored: online, onsite and offsite.

In some instances, a secondary digital storage site is also maintained to ensure business continuity in times of unplanned service disruption. More recently, cloud storage solutions is increasing in popularity. Factors to consider with this option include: performance, reliability, security and cost.

By incorporating tape backup into digital preservation practices, migrating the digital collection from one tape generation to the new generation is a proven sustainable option in many instances. Collection emergency management must also include provisions for the digital collection and its storage.

Name	Website
Association for Audiovisual and Education Technology Management	https://www.aetm.org/
Association for Recorded Sound Collections	http://www.arsc-audio.org/index.php
Association of Moving Image Archivists	http://www.amianet.org/
Audio Engineering Society	http://www.aes.org/
Coordinating Council of Audiovisual Archive Associations	http://www.ccaaa.org/
European Audiovisual Observatory	http://www.obs.coe.int/en/home
International Association of Broadcasters	http://www.airiab.com/en/
International Association of Sound and Audiovisual Archives	http://www.iasa-web.org/
International Council of Museums	http://icom.museum/
International Council on Archives	http://www.ica.org/
International Federation of Film Archives	http://www.fiafnet.org/
International Federation of Television Archives	http://fiatifta.org/
Society of Motion Picture and Television Engineers	https://www.smpte.org/
Southeast Asia-Pacific Audiovisual Archive Association	http://seapavaa.net/

RESOURCE LIST
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• National Film and Sound Archive of Australia, Accessioning Policy and Data Entry Guidelines 2016.

		AUDIO
Carrier Type	**Year**	**Medium**
1/2" super vhs (alesis digital audio tape)	1991-	magnetic tape
1/2" vhs (pcm audio)	1977-1990s	magnetic tape
3/4" u-matic (pcm audio)	1978-1990s	magnetic tape
celluloid cylinder	1900-1929	mechanical
cellulose acetate based open reel audio	1935 - 1960	magnetic tape
coarse groove disc	1887 - 1960	mechanical
compact cassette	1962 -	magnetic tape
compact disk recordable	1992 -	optical
compact disk replicated	1981 -	optical
compact disk rewritable	1996 -	optical
cylinder recordable	1886 - 1950s	mechanical
cylinder replicated	1902 - 1929	mechanical
digital audio stationary head (dash) tape	1982-	magnetic tape
digital audio tape	1992 -	magnetic tape
digital compact cassette	1992-1996	magnetic tape
dvd replicated (dvd audio)	1997 -	optical
elcaset	1976-1980	magnetic tape
hi8 (tascam digital tape recording system)	1993-2012	magnetic tape
lacquer disc	1920-1970s	mechanical
microcassette	1969-	magnetic tape
microgroove disc	1948 -	mechanical
mini cassette	1967-	magnetic tape
mini disc recordable	1992-2013	magneto-optical
mini disc replicated	1992-2013	magneto-optical
piano roll	1896-2000s	mechanical
polyester based open reel audio	1959 -	magnetic tape
pvc based open reel audio	1944 - 1960	magnetic tape
recordable coarse	1930 -	mechanical
shellac disc	1987-1950s	mechanical
steel tape	1924-1940s	magnetic tape
timex magnetic disk recorder	1954-1957	magnetic disk
vinyl disc	1940-	mechanical
wax cylinder	1887-1950s	mechanical
wire	1890s-1960s	magnetic wire

		FILM
Carrier Type	**Year**	**Medium**
acetate based	1910s-	photochemical
nitrate based	1889-1950s	photochemical
polyester, based	1950s-	photochemical

DOCUMENTATION		
Carrier Type	**Year**	**Medium**
animation cel (traditional)	1915-	paper (transparent)
glass negatives	1855-1920s	glass
glass slides	1855-1920s	glass
lobby cards	1910s-	paper
magic lantern slides (photographic)	1850s-1950s	glass
microfiche	1960s-2000s	photochemical
microfilm	1930s-1980s	photochemical
photographic negatives	1889-	photochemical
photographic print	1889-	photochemical
posters	1900s-	paper
scripts	1910s-	paper
sheet music	1470s-	paper
transparencies (reversal film)	1907-1990s	photochemical

MULTIPLE		
Carrier Type	**Year**	**Medium**
compact disk recordable	1992-	optical
compact disk rewritable	1996-	optical
digital linear tape	1984-	magnetic tape
dvd recordable	1997-	optical
dvd rewritable	1998-	optical
floppy disks: 3.0, 3.5, 5.25, 8.0 inch	1971-2000s	magnetic disk
hard disk drive	1956-	magnetic disk
jaz disk	1996-2002	magnetic disk
linear tape-open	1990s-	magnetic tape
magneto-optical disc	1985-	magneto-optical
memory card	1994-	flash memory
syquest cartridge	1986-1998	magnetic disk
usb flash drive	2000-	flash memory
zip disk	1994-	magnetic disk

		VIDEO
Carrier Type	**Year**	**Medium**
1" a format	1965-1976	magnetic tape
1" b format	1976-1990s	magnetic tape
1" c format	1976-1990s	magnetic tape
1" open reel el-3400	1964-1970s	magnetic tape
1" open reel el-3402	1968-1970s	magnetic tape
1" open reel ldl-1200	1969-1970s	magnetic tape
1/2" open reel ldl-1000	1969-1970s	magnetic tape
1/2" phillips V2000	1979-1988	magnetic tape
1/2" phillips Video Cassette Recording (vcr, vcr-lp)	1972-1980s	magnetic tape
1/2" super vhs (s-vhs)	1987-2010s	magnetic tape
1/2" vhs domestic	1976-2010s	magnetic tape
2" quadruplex high band	1964-1980s	magnetic tape
2" quadruplex low band	1956-1980s	magnetic tape
3/4" u-matic high band (bvu)	1986-1990s	magnetic tape
3/4" u-matic low band	1971-1990s	magnetic tape
3/4" u-matic sp high band (bvu)	1982-2000s	magnetic tape
betacam 1/2" (oxide)	1982-1990s	magnetic tape
betacam sp 1/2" (metal tape)	1986-1990s	magnetic tape
betacam sx	1996-2000s	magnetic tape
betamax 1/2" (oxide)	1975-2015	magnetic tape
blu-ray disc	2003-	optical
cdv	1987-1991	optical
d1 4:2:2 19mm digital video cassette	1986-2000s	magnetic tape
d2 19mm digital video cassette (composite)	1988-2000s	magnetic tape
digital betacam	1993-2010s	magnetic tape
digital video camera cassette	1999-	magnetic tape
dvcam digital 1/4"	1996-	magnetic tape
dvcpro25 digital 1/4"	1995-	magnetic tape
dvcpro50 digital 1/4"	1997-	magnetic tape
dvd recordable	1997 -	optical
dvd replicated	1997 -	optical
dvd rewritable	1998 -	optical
hdcam	1997-	magnetic tape
hi8 (high eight) professional 8mm (metal-e tape)	1987-	magnetic tape
laserdisc	1978-2000	optical
mpeg imx	2001-	magnetic tape
standard 8 video 8mm (oxide tape)	1985-	magnetic tape
standard size digital video 6mm (consumer tape)	1995-	magnetic tape

COLLECTION USAGE	TECHNICAL STANDARDS	NOTES
AUDIO		
Preservation	• Encoding: BWF • High quality recordings are digitised with sample-rate of 96 kHz, 24 bit quantization • Lower quality recordings are digitised with sample-rate of 48 kHz, 24 bit resolution	• Broadcast Wave Format (BWF) • Standard: EBU 3285- • Digital items, like minidisc and DAT are reformatted with their sample-rate and quantisation preserved
IMAGES		
Preservation	• Encoding: TIFF • DPI: 300 (at 8"x10") • Image bit depth: 16 • Greyscale: 8 bit uncompressed • Colour: 48 bit • Black and white is scanned using adobe RGB) • Negatives and Transparencies: sliding scale of resolution depending on format	• Tagged Image File Format (TIFF): Adobe Standard: ISO 12639 --Graphic Technology -- Prepress digital data exchange -- Tag image file format for image technology (TIFF/IT) (formal name); TIFF/IT (common name
VIDEO		
Preservation	• Encoding: JPEG 2000 lossless compression • Bit rate: Variable (constant quality encoding – normally between 50Mb/s and 100Mb/s	• Joint Photographic Experts Group (JPEG) Standard: ISO/IEC 15444 –--Information technology -- jpeg 2000 image coding system • Material eXchange Format (MXF) used for exchange purposes • Soundtrack digitised as WAV file

COLLECTION USAGE	**TECHNICAL STANDARDS**	**NOTES**
FILM – Small Gauge		
Preservation	• Encoding: JPEG 2000, Capture Rate 50 FPS • Bit rate: Variable (constant quality encoding – normally between 50Mb/s and 100 Mb/s)	• Joint Photographic Experts Group (JPEG) Standard: ISO/IEC 15444--Information technology -- jpeg 2000 image coding system • Material eXchange Format (MXF) used for exchange purposes. • Soundtrack digitised as WAV file
FILM – 16mm		
Preservation	• Encoding: 16-bit Linear or log DPX [Digital Picture eXchange] • RGBA [nfra-red defect-matte in Alpha ch for colour stocks; Grey-scale for monochrome [Black & white silver stocks] • Resolution: 2150 pixels Wide x 1334 pixels High • Frame-rate: As per original camera speed • Soundtrack digitised as .wav [RIFF Wave] file	• SMPTE 268M-1994, File Format for Digital Moving-Picture Exchange • Soundtracks digitised when available

FORMAT	ENVIRONMENTAL STANDARD		REFERENCE
AUDIO RECORDINGS	**Temperature (Celsius)**	**Relative Humidity**	
CD	21	50%	ISO-18925:2008 Imaging materials - Optical disc media - Storage practices
DAT	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage max. temperature depends of max. RH
	17	30%	
	23	20%	
Shellac Disc	7-10	45-50%	Library of Congress Preservation http://www.loc.gov/preserv/careothr.html
Audio Tape	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage Standard specifies upper limits: max. temperature depends on max. RH
	17	30%	
	23	20%	
Vinyl Disc	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage max. temperature depends of max. RH -same as magnetic within a stricter range
	17	30%	
	23	20%	
Wax Cylinders	7-10	45-50%	Library of Congress Preservation http://www.loc.gov/preserv/careothr.html
Wire Recordings	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage Drier end of magnetic and cooler end of metal Standard specifies upper limits: max. temperature depends on max. RH
	17	30%	
	23	20%	

FORMAT	ENVIRONMENTAL STANDARD		REFERENCE
DOCUMENTATION	**Temperature (Celsius)**	**Relative Humidity**	
Animation Cells	-10 to +7	30-50%	ISO-18911:2000 – Imaging Materials – Processed Safety Photographic Films – Storage Practices.
Black and White Photographic Prints	18	50%	ISO-18920:2000 Imaging materials - Processed photographic reflection prints - Storage practices
Colour Still Photographic Prints	-3	50%	ISO-18920:2000 Imaging materials - Processed photographic reflection prints - Storage practices max. temperature depends of max. RH
	2	40%	
Glass Slides	18	30-40%	ISO-18918:Ed. 1 (2000) Photography - Processed Photographic Plates - Storage Practices.
Negatives	2	50%	ISO-18911:2000 – Imaging Materials – Processed Safety Photographic Films – Storage Practices. max. temperature depends of max. RH
	5	40%	
	7	30%	
Paintings	18-22	45-55%	Heritage Collections Council http://archive.amol.org.au/recollections/index.htm
Paper-based (posters, scripts, scrapbooks)	18-22	45-55%	Heritage Collections Council http://archive.amol.org.au/recollections/index.htm
Textile-based (costumes)	18-22	45-55%	Heritage Collections Council http://archive.amol.org.au/recollections/index.htm
Transparencies	-10	50%	ISO-18911:2000 – Imaging Materials – Processed Safety Photographic Films – Storage Practices. max. temperature depends of max. RH
	-3	40%	
	2	30%	

FORMAT	ENVIRONMENTAL STANDARDS		REFERENCE
MOVING IMAGE	**Temperature (Celsius)**	**Relative Humidity**	
Black and White Film	2	50%	ISO-18911:2000 – Imaging Materials – Processed Safety Photographic Films – Storage Practices. max. temperature depends of max. RH
	5	40%	
	7	30%	
Colour Film	-10	50%	ISO-18911:2000 – Imaging Materials – Processed Safety Photographic Films – Storage Practices. max. temperature depends of max. RH
	-3	40%	
	2	30%	
DVD	21	50%	ISO-18925:2008 Imaging materials - Optical disc media - Storage practices max. temperature depends of max. RH
LTO Tape	16 - 32	20-80%	Imagtion manufacturer recommendations treat as Magnetic Tapes see ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage
Magnetic Film	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage max. temperature depends of max. RH
	17	30%	
	23	20%	

Nitrate	-10	20-50%	ISO-10356:1996 Cinematography - Storage and handling of nitrate-base motion-picture films max. temperature depends of max. RH
	2	20-30%	
Video Tape	11	50%	ISO-18933:2006 Imaging materials - Magnetic tape - Care and handling practices for extended usage max. temperature depends of max. RH
	17	30%	
	23	20%	

FORMAT	ENVIRONMENTAL STANDARD		REFERENCE
VINTAGE EQUIPMENT	**Temperature (Celsius)**	**Relative Humidity**	
Wood based	16-20	45-55%	Heritage Collections Council http://archive.amol.org.au/recollections/index.htm
Metal based	Stable	max.45%	Heritage Collections Council http://archive.amol.org.au/recollections/index.htm