‘The public is entitled to access, learn about and enjoy its rich screen heritage wherever they live and wherever the materials are held.’

Vision Statement, Screen Heritage UK
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PREFACE

[Images of various scenes and people]
All over the UK, there is buried treasure. Archives, museums, charities, universities, libraries, arts centres, institutions of all shapes and colours have been carefully storing film and video charting their own and their communities' pasts. From public document to home movie, extravagant fictions to reportage, this material is a precious and priceless store of historical detail, social understanding and powerful connections to other times, places and lives. Scarcity of resources has too often prevented these moving images from being made as available to the public as their holders would like. Now, new digital technologies are raising expectations that such material should be viewable, and lowering many barriers to sharing films with select or global audiences.

In London alone, the last few years have seen archive film used in a miraculous range of contexts. Screening events from the gigantic (5,000 people in Trafalgar Square) to the intimate have taken place in ever-increasing numbers. Health and social projects with the elderly have used heritage film; young people have learned about the past and gained filmmaking skills using the same footage. A YouTube site dedicated to film about London has received hundreds of thousands of views, and a groundbreaking online creative project shaped new stories of London from films of the city’s past. Moving image material from the city’s collections has been used to discuss urban planning, connect local groups, promote tourism, and contest established versions of regional history.

None of this richness would be possible without the dedication of the organisations in whose care these films are held. Preserving moving images is a complex and painstaking business, beset with obstacles that are seldom appreciated by the eager researcher keen to see some particular gem. What the present moment makes plainer than ever before is the immeasurable value of this preservation work, as the varied treasures of archive film collections delight, inspire and elucidate. This Handbook is intended to support collection holders to continue this work, ensuring the knowledge and pleasure of both current and future generations.

Rebekah Polding
London’s Screen Archives, September 2011
INTRODUCTION
Using this handbook

This Handbook has been produced by Film London on behalf of London’s Screen Archives with funding from the Screen Heritage UK programme (‘Revitalising the Regions’ (RtR) strand). The Screen Heritage UK Programme is a Partnership between the British Film Institute (BFI), Screen Yorkshire and English regional film archives to safeguard the future of the UK’s national and regional film archives, funded by Department for Culture, Media and Sport (DCMS).

The Screen Heritage UK Film and Video Collections Care Policy defines ‘preservation’ as including:

- **Acquisition**: identifying and acquitting (physically and legally) the materials that make up the collection
- **Collections care**: Prevention of deterioration through environmentally controlled storage; protection against damage, theft and disaster
- **Conservation**: Work on items that are damaged and in need of copying and/or restoration
- **Documentation**: Inventory for accountability, access and rights management; cataloguing to explain cultural meaning; recording of technical data to inform physical care
- **Access**: Both physical and intellectual, by providing appropriate materials, information and interpretation

This handbook seeks to address all of these issues and provide a basic ‘starter’s guide’ to key aspects of moving image (mi) archives management, preservation and access.

It has been commissioned by London’s Screen Archives: The regional network in response to the needs of the over 100 organisations within London that hold significant collections of mi material but that do not have specialist mi expertise. Although it is written with the London context in mind it is by no means a London-specific publication, and is intended to bring together the essential information which any UK archivist would need when addressing an existing (or potential) mi collection. As it is written for professionals in the field, we have assumed an interest in understanding the issues rather than simply receiving the answers. It can be read as a whole, or consulted section-by-section on specific topics. We hope it is a useful resource to keep close at hand.
This edition covers film and video formats only; it is hoped that ‘born digital’ formats can be added in future versions.

Advice and information given is of three types:

**Primary** – explanations of core aspects of mi archiving, offering best practice and pragmatic advice in line with the current UK-wide Screen Heritage (SHUK) standards (available to download at [www.londonsscreenarchives.org.uk](http://www.londonsscreenarchives.org.uk)). Mi archiving is not a precise science, but where definitive answers are not possible we have outlined the parameters which govern the decision-making process.

- **Historical or contextual** – additional, in-depth information; these texts will be highlighted in orange and by this symbol

- **From an archivist** – additional notes, comments and personal perspectives from specialist mi archivists; these texts will be boxed in yellow and highlighted by this symbol

We have also provided a Resources* section listing contacts and a wide range of further information available online.

To accompany this handbook, we’ve also commissioned two additional guides for non-specialist organisations holding mi material which are available free online from [www.londonsscreenarchives.org.uk](http://www.londonsscreenarchives.org.uk):

- **Rights Toolkit** – detailing the legal and ethical context for determining rights in mi material, practical guidance on how to clear rights to use your mi holdings, and sample letters and contracts

- **Collection Assessment Toolkit** – two practical, guided tools to assist in better caring for and managing mi collections. The Significance Assessment Process helps you to understand and express your mi collections’ meaning and value for a variety of audiences and their importance in the context of your organisation’s wider archival and object collections. The Collections Review Process offers a method of assessing current levels of care and management and reviewing both how your collections are used now and their potential for future use. Real-world case studies on the use of both processes are also included. Used separately or together, both are invaluable tools when preparing internal or external funding bids, producing new collections care or exhibition policies, or contributing to regional and national strategies.
The most valuable source of further help and guidance when dealing with mi material is the UK’s network of publicly funded mi archives. There are national film archives in Scotland and Wales, and Regional Film Archives (RFAs) covering eight of the nine English regions. The ninth region, Greater London, has no single dedicated publicly funded audiovisual archive. It is instead served by a regional network, London’s Screen Archives, which supports London-based organisations in working together to locate, preserve and bring to the heart of the city’s cultural life moving image material made in or about Greater London and its communities. Contact details for all these organisations are given in Resources.*

Each of these archives/this network supports other local organisations as an important part of its remit. Being in contact with your local public film archive is also valuable for its own sake. All public sector mi archives collaborate with the aim of offering the public the best possible access to the widest possible range of screen heritage material. We encourage your organisation to join in the sharing of best practice, standards and information that is key to achieving this ambition.

We hope you find this handbook gives you what you need to approach preservation of your mi collection with confidence, and allows your organisation and its audiences to fully enjoy the mi material in your care.

*p.112
1

COLLECTING POLICY, ACQUISITION AND COLLECTION DEVELOPMENT
Film and moving image has the power to conjure up over a hundred years of our past with remarkable vitality, engaging the viewer with a sense of place, time and shared humanity. Yet this most vibrant of records is frighteningly fragile. Archives, museums and libraries need to be proactive about collecting and preserving our screen heritage both because of its vulnerability to physical decay and its history of loss through being regarded as insignificant or ephemeral, or simply through neglect.

The national and regional context for collecting moving image material

The UK is served by a network of publicly funded mi specialist archives:

- The British Film Institute (BFI) develops, promotes and cares for a collection that illustrates the art, history and impact of film. Its collection includes feature films, documentary and factual films, television programmes, books, journals, photographs, audio recordings, scripts, designs, press books, posters and personal papers.

- The National Libraries of Scotland and Wales collect films related to the history and filmmaking activity of their nations.

- The Regional Film Archives (RFAs: East Anglian Film Archive; Media Archive for Central England; North West Film Archive; Northern Region Film and Television Archive; Screen Archive South East; South West Film and Television Archive; Wessex Film and Sound Archive; Yorkshire Film Archive) collect, preserve and provide access to material relating to the history of their regions and their communities.

- London’s Screen Archives: The regional network (LSA) supports the many organisations in the region with mi collections to collaborate on the creation of a ‘virtual collection’ of mi material relating to Greater London and its communities. It assists the organisations within the network in collection, but does not collect as a separate entity.
These organisations are jointly launching an exciting new service in 2011 which will enable the public to search across all of their catalogues simultaneously online. It will therefore be possible to locate items held by any of these organisations (or the network members of LSA) without having to consult each individually. Where physical items are held therefore becomes less important, as researchers will be able to locate materials no matter in which organisation they are preserved.

Other national bodies also play a role in preserving the UK’s screen heritage and have specialist mi facilities:

- The British Library collects some mi material useful as a resource for research communities whose primary interest is in the content
- The BBC and other broadcasters hold extensive archives of their own production
- The Imperial War Museum collects films relating to the history of conflict involving British and Commonwealth countries
- The National Archives (TNA) collect films designated as public records (of which some are deposited with BFI)
- The National Media Museum – part of the National Museum of Science and Industry (NMSI) – collects the technology of film and television
- Tate collects limited edition mi works intended for gallery presentation
- The Theatre Museum – part of the V&A – is the centre for creating filmed records of live performances
- Many other organisations collect records on film relating to their subject areas. The National Railway Museum (also part of the NMSI) for example is creating a record of railway operations in the UK

Many museums, libraries and archives have it in their remit to acquire mi material that falls outside the scope of specialist mi archives, or that complements or forms an integral part of their own, mixed media collections. It may be mi material of very specific organisational, subject, local or community interest. It may be acquired as part of a larger collection from a single source, or to complement and contextualise other elements of the archival or object collections.
When and what to collect

The principle of best practice that applies throughout the heritage sector is that all archival material or objects should only be acquired if the host organisation has the will and the means to provide access to both material and contextual information now and to ensure preservation into the future.

Caring for mi collections and making them accessible can be demanding, and transfer to a specialist archive better able to preserve the original material, catalogue it, generate viewing copies and make information and viewing facilities available to the general public may serve the material well. Organisations’ collecting policies need to take account of this and very careful consideration should always be given to the option for deposit with a film specialist archive either by transfer or on loan. However it is important to balance this against the potential for loss of context and local or specialist understanding of the content. If this can be negotiated, the solution that best serves the public interest will often be the transfer of original material to a specialist mi archive coupled with the retention of good quality viewing copies at the original museum, library or archive.

The key questions that any organisation needs to ask when considering acquiring moving image material are:

- Does it fall within your collecting policy?
- Would it support and enrich public understanding of other material in your collections – or fill a gap?
- Is a copy of the same material already preserved in another publicly accessible collection?
- Can your organisation provide the appropriate skills, resources and facilities to care for the material and provide access to it?
- Are there copyright or other complications that might prevent your using the material if acquired?
- Does the depositor have the legal right to donate or lend the material?
- Would it be appropriate to retain just a sample of the material?
- Would it be better cared for, or more relevant to the collecting policy of another public institution?
If you decide to offer material to another institution, you should ensure that you note any specialist knowledge that your own organisation can offer so that this can be added to the catalogue record (see Section 7*).

Once you have decided to acquire material as a donation or loan the key first steps should be:

- Researching the copyright situation and exploring the possibility of rights being transferred to your institution (information on copyright is available in the Rights Toolkit);
- Researching whether copies or alternative versions of the material exist in your own or other collections;
- Drafting a formal agreement that addresses both the depositor’s and your institution’s requirements and rights including: permission to make preservation and access copies, identification, provision of contextual information, copyright and permissions, funding and any potential for additional deposits in the future. (A sample rights agreement is included in the Rights Toolkit.) In the short term it may be necessary to issue a ‘holding’ receipt for material to the depositor pending viewing and appraisal.

⚠️ We recommend that organisations use the Significance Assessment Process described in the Collection Assessment Toolkit when considering material for acquisition, retention or disposal.

**Acquiring film – the process**

**Appraisal and selection** As with any acquisition, understanding material’s provenance and production history is key to appraisal. It is vital to glean as much information as possible from the potential depositor and any further contacts they might have. Sometimes, further contextual material or missing elements can be recovered as a result of these discussions.

You will need to check, as far as possible, that the depositor has proper authority to donate or lend the material. A director or producer may own a copy of their film, but still need permission from the original commissioning body or employer before transferring ownership to you. Of course, the physical ownership of material...
does not necessarily imply ownership of rights in the content; again, see the Rights Toolkit for more detail.

When assessing material, whether for acquisition, long-term retention or transfer, it is important to examine apparent ‘duplicates’ very carefully – they may be true copies, but they could be subtly different versions of the same title – made for different audiences or including additional material. It may be important to retain multiple, different versions of an item as they can provide an insight to its production and the nature of its distribution. The archivist should also look for cross-references from one item or set of records to another, to ensure continuity or completion of related material. This often involves identifying different elements of a production, from original recording to intermediary editing and final version, as well as its related documentation.

Similarly, it is important to check your copy against any held in other publicly accessible collections as listed above (see Resources for contact details); resources are scarce, and duplication of specialist storage or digitisation should be avoided wherever possible.
An archivist’s view

Assessing multiple copies of moving image film titles

What appear to be duplicate copies may not always be so. Films of the same title and the same length and in the same type of can should always be examined closely. Release copies can vary in their condition after numerous projections. Damage may have occurred at the beginning, during, or at the end of the film, with splices indicating frames or even longer lengths of film missing due to perforation or other damage. Of course when a frame or two, or longer length is missing, so too is the sound at that point. Often, by holding the reel of film sideways to a light, splices can be seen through the roll. The more splices, the more mutilated the film may be. The fewer joins the better. (Release prints were normally produced by the film labs on one continuous piece of film.)

Some films might be foreign versions. Outwardly they will look identical to the normal UK (domestic) release print – though if the original leader [protective strip of film at the beginning of a reel] is still attached, ‘French’ or ‘Spanish’ might be seen indicating an overseas version. If the can does not say anything, or there is no information on the leader, then only by running the film can a foreign soundtrack be detected. What is written on the film can, or even on a leader which has been joined onto the film (in other words, not the original leader), should always be confirmed by running the film.

The same thing can happen with English soundtracks – they could have been updated, either with different words or even with a different commentator. Also the picture could have been updated somewhere during the film. This writer once came across a well known British firm’s film which appeared outwardly to be several copies of the same title. The opening was the same, the length of the film was the same, but slight differences had been made to some of the shots in the film when updating the company’s premises and logo design. One copy had scenes of the head office decorated with flags for coronation year in 1953, but this magic moment wasn’t present in other versions. Always need to check!
Assessing the likely uniqueness of film materials

The source for this table is The Film Preservation Guide: The Basics for Archives, Libraries, and Museums, produced by the National Film Preservation Foundation (see Resources for full reference*). Our amendments for UK application are given in square brackets. It should also be noted that the likelihood of your material being the original or best available copy will depend on the nature of the film, and of your organisation. A local authority archive, for example, might very well hold original copies of material commissioned by that local authority, its departments or its predecessors; copies of Disney cartoons held by the same repository, however, are almost certainly duplicated elsewhere.

<table>
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<tr>
<th>Film material or type</th>
<th>Does your institution have the 'best' surviving source material?</th>
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<tr>
<td>Production element (A and B rolls, interpositive(^1), negative or magnetic track)</td>
<td>Probably yes, if materials are complete and in good physical condition</td>
</tr>
<tr>
<td>Reversal original</td>
<td>Probably yes, if materials are complete and in good physical condition</td>
</tr>
<tr>
<td>Hand coloured artist print</td>
<td>Probably yes, although similar copies may exist</td>
</tr>
<tr>
<td>Amateur film or home movie</td>
<td>Probably yes, if material is reversal original. If a print, [to find out you could] check institutional records and contact filmmaker or heirs.</td>
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<tr>
<td>Reduction print(^2) of Hollywood [or other commercial] feature or short</td>
<td>If 8mm [almost certainly] no. If 16mm sound print, probably not. If 28mm or 16mm print of a silent film, perhaps. More research required(^3).</td>
</tr>
<tr>
<td>Print of [national] government [sponsored] film</td>
<td>Probably not</td>
</tr>
<tr>
<td>Print of film produced by [regional] or local government</td>
<td>Perhaps. Likelihood increases if 35mm print. More research required.</td>
</tr>
<tr>
<td>Print of specialised subject film with limited circulation</td>
<td>Perhaps. Likelihood increases if 35mm print. More research required.</td>
</tr>
<tr>
<td>Print of regionally produced film with limited distribution</td>
<td>Perhaps. Likelihood increases if 35mm print. More research required.</td>
</tr>
<tr>
<td>Print of nationally distributed educational or industrial film</td>
<td>Unlikely. Difficult to document. More research required</td>
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An interpositive is a colour production or preservation element made from a negative original and then used to create a duplicate negative from which many prints can be generated. An interpositive is not intended for projection.

A reduction print is a positive made in smaller format than the original. With some 75% of American silent feature production thought to be lost, a vintage reduction print could be a valuable source. For such prints, it is worth calling an archive specialising in silent film or checking the silent film database of the International Federation of Film Archives (FIAF) (See Resources).

Assessing video material

Collections of video tapes are often a mixture of off-air recordings, copies of material from an obsolete format and in-house or local productions etc. The thing to worry about here is the off-air recording. This may be a complete programme from one of the broadcasters, or a segment from a news or feature programme. It might be that the archive or the archive's parent company was involved in the making - perhaps supplying material. The programme might contain archive material from your own archive, supplied to the programme or archive material from another archive. It may be just an interview with the CEO or the Public Relations Department - but it is still the copyright of the broadcaster alone and not to their contributors. The broadcaster therefore has to be contacted for permission to use the material for anything other than in-house access viewing.

The TV company may have kept the feature or news item in their archive, in which case yours is just a viewing copy. If they have not kept the item, yours could be the only extant copy - in which case it should be treated as an original and a sub-master and access copy made. It is in all cases however still copyright to the broadcaster.
2

INSPECTING AND IDENTIFYING MOTION PICTURE FILM
As objects all items are enigmatic—apparently unable to reveal much about their content and meaning until shown on a screen. In this section, we show how physical inspection of items can however tell you a great deal about the media on which they have been made, their condition, their storage and preservation needs and perhaps something about their provenance and likely content. The chapter provides general notes on the identification of film stock with notes on their chronology and any specific vulnerabilities. The Resources section lists sites and sources giving much more detailed information on format recognition.

**Motion picture film – a guide to formats**

Motion picture film is fast becoming an obsolete system. Of the film gauge formats listed below, Standard 8mm and 9.5mm are no longer manufactured. Super 8mm is still used, but rarely and only on a small scale. 16mm is still occasionally used in professional, amateur and artists’ filmmaking, and 35mm is still part of the cinema experience, though rapidly being replaced with digital production and projection.

Regardless of the gauge, all motion picture films have the same basic structure. Film stock has three layers: base, binder, and emulsion. The thickest is the transparent plastic base, which provides support. A binder joins the base to the gelatin emulsion. The emulsion carries photosensitive materials, either color dyes or, in the case of black-and-white film, silver halides (very small particles of silver). After exposure, the emulsion holds the image.

There are crucial chemical differences between black & white and colour film. In black & white when the film is developed in a chemical solution, the exposed silver halides turn into dark metallic silver, revealing the monochrome image. Unless it was poorly processed at the outset, the silver image will remain stable unless exposed to high humidity or contaminants.

Most colour processes are much less stable. In most forms of colour film, the colours are formed by dyes, either already in the film, or added later during processing. Colour films are especially susceptible to poor storage conditions.
Both the base and the emulsion are subject to decay. The goal of preservation is to avoid deterioration in any of the film components.

**Film bases**

Most people’s immediate concern when dealing with motion picture material is about the inherent dangers of nitrate film stock, which is highly flammable. The great majority of pre-1951 35mm film has a cellulose nitrate base (often called by the trade name Celluloid). Virtually all post-1951 35mm film, almost all 16mm and smaller gauge film used by amateur and independent filmmakers is ‘safety’ with an acetate or polyester base.

The majority of motion picture film held in non-specialist museum, library and archive collections is likely to be safety film made on acetate or polyester stock. However, any 35mm film made before 1951 might be nitrate and needs to be checked carefully. This can include short film strips, often made to support teaching or presentations. Identifying and dealing with nitrate stock has to be the first priority of any inspection. A recent survey in London found hitherto unrecognised nitrate material in 11 out of 32 collections.

Nitrate, acetate and polyester stocks have specific properties that affect how they should be stored and cared for. We address this in Section 4, Storing and Handling Motion Picture Film, below.

**Nitrate**

When motion picture film was introduced in the 1890s, cellulose nitrate was the only available transparent plastic durable enough for movie cameras and projectors. It was robust and flexible, with good translucent properties. It was used as the base for all 35mm motion picture film manufactured for the commercial cinema industry until a satisfactory tri-acetate safety film base was introduced in the 1940s. Production of nitrate ceased in 1951.

As a precaution, from the mid 1920s on, Kodak and some other manufacturers labelled much of their nitrate stock with the words NITRATE FILM along the outside edge of the film in black letters. Sometimes there was a small symbol rather like an explosion. However, the practice of marking nitrate stock was not universal and sometimes there is absolutely nothing to identify the film base. If in doubt always treat pre-1951 35mm film stock as nitrate until proven otherwise. Contact a film archive to get expert identification.

As late as the 1930s there is evidence of small cheap film projectors being sold as toys and old nitrate films from the cinema being cut up and sold in short lengths to be used with them.
Any small tins containing 50ft or 100ft of 35mm film should be checked very carefully – especially if they are labelled e.g. ‘real cinema film’!

Nitrate base film stock was never used for 16mm and 8mm film (although a seemingly unique a roll of 16mm film from the Far East was once found to be on nitrate base).

**Acetate** Manufacturers found a safe substitute for cellulose nitrate by exploring plastics in the cellulose acetate family. Beginning in 1909, a number of new acetate bases were introduced. Cellulose diacetate was used from the 1920s, cellulose acetate propionate and cellulose acetate butyrate in the 1930s and cellulose triacetate, in the late 1940s. These acetate bases were used for narrow gauge film mainly for amateur use: 28mm home cinema (from 1912); 9.5mm (from 1922); 16mm (from 1923); 8mm from 1932. A very small amount of acetate based 35mm safety film was produced, mostly for educational use outside commercial cinemas, from 1909 onwards.

Generally speaking, all relatively non-flammable substitutes for nitrate are called ‘safety film’. As noted above Kodak and other acetate film stock often has the words SAFETY FILM printed along the edge.

**Polyester** In the mid 1950s, Kodak developed a new type of safety film made of polyester. Polyester is the toughest and most chemically stable film base used today. Because of its strength, polyester can be made thinner than other types of motion picture stock and is less vulnerable to physical damage caused by bad handling. The downside of this strength is that playback equipment can be damaged in the event of a jam.

Polyester was used for some Super 8mm film from 1965 and, from about 1990, for 35mm release prints shown in cinemas. Under similar storage conditions, polyester appears to outlast other types of film stock. Polyester has been sold under various trade names, such as Cronar (Dupont) and ESTAR (Kodak).

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**Film gauges and perforations**

**35mm** Film that is 35mm wide. The stock has four perforations (sprocket holes) per frame on both edges.

Used for various professional, including all theatrical, production and distribution, from c.1895.
**28mm film** Film that is 28mm wide. Recognisable as a small version of 35mm film, with three perforations per frame on one side and one on the other.

In 1912 the French company Pathescope (part of Pathé), marketed a hand-turned projector that took film stock 28mm wide. Intended for amateur use (e.g. in the in the home or school) this used acetate based safety film. 28mm became quite a popular ‘home cinema’ system for screening entertainment and educational films ‘printed down’ from commercial cinema productions.

**16mm** Film that is 16mm wide. The 16mm silent stock introduced in 1923 had one perforation per frame on each edge and is often referred to as ‘double perf’. For amateur filming, this continued right through to the early 2000s. With the advent of sound in 1931, ‘single perf’, with perforations on only edge, was developed so that an optical soundtrack could be accommodated on the other (usually the right edge as you look at the film with image, text etc the right way round).

So, 16mm can either have perforations on both sides (‘double perf’) or one side only (‘single perf’) with or without a soundtrack.

Introduced primarily as a medium for home movies and other non-professional filmmaking, 16mm has been used extensively for some forms of professional production (including television) and for distributing ‘printed down’ versions of commercial productions originally shot on 35mm. Professionals often shot and edited rushes on film that only had single perforations. In television film production the final 16mm transmission copy might be on single perforated film, with the soundtrack on fully coated magnetic stock running in synchronisation.

**9.5mm** Film that is 9.5mm wide, easily recognised by the central perforation between each frame.

Introduced in 1922 for home cinema and amateur filmmaking. Many cinema films were ‘printed down’ in shortened versions to this gauge for home use. Popular in the 1930s for home movies
because of its relative cheapness and simple equipment, 9.5mm lasted through to 1960 when Pathescope, the company that promoted the gauge in the UK, went out of business. This is now an obsolete gauge with only a few transfer houses capable of copying the film onto video or digital formats.

**8mm**—8mm wide Standard 8 is recognisable because it is actually 16mm cut in half. It has the same size perforations as 16mm, but the perforations are one per frame so more closely spaced than on 16mm. They run down the left hand edge when viewed with the image the right way round. Standard 8mm is now an obsolete gauge.

Introduced by Kodak in 1932 as a cheap alternative to 16mm. Originally known as ‘Cine Kodak 8’, it is now usually referred to as ‘Standard 8’—sometimes as ‘Regular 8’.

**Super 8**—Also 8mm wide. Like Standard 8, the perforations are on one edge, but much smaller, allowing more space for the image.

Introduced by Kodak in 1965 as an improved 8mm filmmaking system. From 1973 it was possible to buy Super 8mm cameras that took film with a magnetic stripe incorporated, so that sound could be recorded at the same time as the picture. Super 8mm was largely replaced by video for home movie making in the 1980s and ’90s. It is still used very occasionally in universities, colleges, advertising agencies etc. to create a ‘home movie’ look.
Film gauge identification

Examples of film gauges are to scale; place your film beside examples to find match

35mm. Introduced c.1895. Made on nitrate stock until 1952. 1952-present, produced on safety stock. To identify nitrate you will have to look along the edge markings beside the perforations. Nitrate will either have the word ‘nitrate’ written along the edge, or a small star/explosion symbol will be present. If there are no markings present and the images appear to date from between 1895 and 1952, presume the film is nitrate and the Archive will conduct tests to confirm whether the film is nitrate or safety stock. For more information please see www.hse.gov.uk/spd/sear.htm


9.5mm. Introduced 1922. Always produced on safety stock.

std.8mm. Introduced 1932. Always produced on safety stock.

super.8mm. Introduced 1965. Always produced on safety stock.

Inspecting and identifying motion picture film
Soundtracks

Before the advent of digital technology, soundtracks came in two types: optical and magnetic.

**Optical** An optical track is a photographic record of the sound modulations photographically exposed directly onto the film during printing. In projection, light passing through the track is read and translated as sound. Optical tracks appear along the edge of the film as either high-contrast wavy lines or a grey stripe of varying lightness/darkness (density).

**Magnetic** Magnetic tracks work on a different principle from optical tracks. The magnetic track operates like an audiotape fixed to the film. During projection the track is read by the projector’s playback head. Magnetic tracks appear as a dull brown stripe, usually running down the right hand edge when viewing with the image the right way round. It is applied to the base side of the film (not the emulsion side). Particularly on small gauge films, a second stripe is often added along the opposite film edge for physical balance, so that the film produces a more even roll when wound. This balance stripe was not intended for recording, but some filmmakers have used this as a second audio track.

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**Soundtracks – a short history**

Early innovators strove to integrate sound into the motion picture viewing experience from as early as 1900. Hollywood and worldwide commercial production finally converted to sound in the late 1920s when a wholly workable system was devised.

The first experiments in commercial cinema were with soundtracks supplied on an accompanying audio disc. These were quite quickly superseded by optical soundtracks on 35mm film – the first synchronised sound actually integrated into the film itself.

Similarly, for the home user, the only sound available at first for 16mm and 9.5mm was an accompanying disc of a soundtrack or music, sometimes connected to the projector to maintain synchronisation. The first 16mm projector that could show films with an optical soundtrack was produced in 1931. 35mm sound films from the cinema were printed down to this gauge. The high-end amateur filmmaking market followed, with the Radio Corporation of America (RCA) and a British company called Marshall of Nottingham introducing the first 16mm sound...
cameras in 1934. This enabled the amateur and or semi professional filmmakers to record an optical soundtrack whilst filming. It could be used to pick up natural sounds or a live commentary. Costing c.£100, these sound cameras were too expensive for most amateurs, and tended to be used by semi-professionals – e.g. by an enterprising cinema owner making local newsreels.

In 1938 Pathescope, the company that promoted 9.5mm in the UK, marketed a 9.5mm optical sound projector, and supplied a catalogue of printed down sound films from the cinema. Because the perforation was in the middle on 9.5mm, the picture area had to be reduced to accommodate the soundtrack on the left-hand side.

For the amateur throughout the 1950s and '60s, a functional approach to adding a soundtrack was to compile it on a quarter-inch reel-to-reel tape recorder that ran in synchronisation with the picture. Films, particularly 8mm films, often arrive in an archive with a separate reel of soundtrack. Copying these with the picture poses a problem, but can be overcome by a film laboratory or specialised film archive.

A more sophisticated approach introduced in 1953 for amateur production, was to have the film ‘striped’ – that is have a thin magnetic stripe added to the side of the film which, with the right projector, could be recorded onto by the filmmaker at home. This then was played back on the projector, was always in synchronisation, and was quite good quality. Magnetic stripe could be applied to 16mm, 9.5mm, Standard 8mm and Super 8mm, after editing the picture. This was quite popular with amateur filmmakers.

For 8mm and 16mm distribution of films for home and commercial use, magnetic stripe soundtracks were often used in the 1960s.

In the professional world of filmmaking on 35mm and 16mm, where sound was always compiled separately from the picture, a magnetic soundtrack on the same size film running in level synchronisation was used. This was known as separate magnetic track – or ‘sepmag’. For example, if a 16mm film was being made, the picture would be edited (full of joins) and the soundtrack compiled from one or more 16mm ‘sepmag’ tracks. These were 16mm film base stock coated with magnetic material. These ‘fully coated’ (or ‘mag’) soundtracks were then mixed together to produce a final soundtrack, which would be transferred to optical track and printed with the cut negative of the film to produce a release print.
Common types of damage and decay to motion picture film

Film was originally conceived as a short-term exhibition medium. It was assumed that early motion pictures would have little value after their initial commercial release. Huge numbers have been lost forever and many of the examples now preserved in our archives are the lucky survivors of decades of neglect. We list here the most common types of film damage and decay.

An archivist's view

Maintaining an inspection cycle

As a general rule museums, libraries and archives with motion picture film collections should plan to re-wind and inspect their whole film collection on a five-year rotation if at all possible.

Film is basically a plastic, and all plastic materials give off a small amount of gas (you can smell plastic!) and this needs to be removed. This best way is to open the can regularly (say once every five years) and wind the film from end to end. This exercise will flex the film as well, so that it does not assume the shape of the spool over time. For example, where film has been wound on a small centre spool or bobbin for many years, the end of the film close to the small centre always springs back to this small curve when wound. Over time it becomes more difficult to handle this springy film, and it can easily break. So winding the film once from end to end gives a chance for the curly film to flatten out, and for the other end to have a period close to the small centre. It is also just good for the film to be aired, and the general condition of the film noted. This regular inspection should include an A-D test [see below].

Stored films should not be wound so tightly that there is no way for the gases they give off to escape. However, too loose a wind will allow the roll of film to shift on the core during handling, resulting in abrasions, and the possibility of the middle dropping out if the film is on a core. An ‘archive wind’ is somewhere between the two – not too tight, not too loose. It is important that the film is wound evenly, so that there are no proud edges that could become damaged.

When handling film it is critical to keep work surfaces and equipment clean. Any handling equipment must be kept in good condition and handling of the picture-bearing surface of the film or tape kept to a minimum.
**Mechanical damage** Motion picture film is vulnerable. During their pre-archive life most films will have been run on a variety of projectors, and each time a small amount of damage is likely to have happened. If a film is incorrectly threaded in the projector, perforations can be stretched, ripped, or torn apart. Tears can occur if the film is stressed or mishandled. Many films will have poorly made splices, or have lost their protective leader (strip of blank or marked film at the beginning of a reel) or tail. Worn rollers, untrained operators, poorly maintained projectors, and dirty conditions all add to the deterioration of the film. Films unspooled on a dirty worktable or passed through worn or unmaintained machinery can pick up dust, dirt, scratches, and abrasions.

Skilled conservators can usually repair tears, weak or damaged splices, and broken sprocket holes. Scratches are permanent, though they sometimes can be minimised in the laboratory during copying and can even be removed by digital restoration.

⚠️ **As a general rule, never project original archive film!**

**Mould, mildew, and fungus** A film stored under humid conditions can become a host for mould and mildew. Small white spots visible on the exposed edges of a spool of film are the first indication of mould damage. These can be wiped off, but if the film continues to be kept in inappropriate storage conditions, the mould will re-occur. Generally the organisms start the attack from the outside edge and make their way into the film roll. If left to develop the mould will spread to the actual picture area, eat into the emulsion and destroy the image.

**Nitrate decay** The most notorious form of film deterioration is nitrate decay. All nitrate film has the potential to decay and decompose. The speed of the process depends very much on the original make up of the product, and the way it has been handled and stored throughout its life.

There are several signs that a roll of nitrate is beginning to decompose. There may be rust marks inside the can, a slight fading of the picture or a pungent smell. First indicators may be the smell and some inflexibility in the roll. The next stage is that the film, or parts of the film, becomes sticky. This will be revealed as the film is being wound for inspection.

Like other forms of chemical film decay, nitrate deterioration cannot be reversed but can be retarded by improving storage. Nitrate film should be copied before degradation affects the image. Generally, once nitrate film reaches the third stage, it cannot be...
copied. Severely decomposed nitrate film is defined as hazardous waste and should be transferred to an authorised facility for disposal.

**Nitrate decomposition**

Nitrate decomposition is a chemical process that occurs because of two factors: the nature of cellulose nitrate plastic itself and the way that the film is stored. The International Federation of Film Archives (FIAF) defines ‘telltale’ criteria that distinguish a five-stage process of decay:

4. Film congeals into a solid mass. Strong noxious odor.
5. Film disintegrates into brownish powder.

Nitrate is a chemically unstable material and highly flammable. Once ignited it is impossible to extinguish. Nitrate film should be treated as a hazardous material. If identified in your collection it should be kept as cool as possible, be stored in a vented container and stored well away from any other collections, preferably in a fireproof safe. Arrangements should be made at once to have it removed to a suitably equipped film laboratory for copying and/or transfer to an archive or commercial facility able to offer safe storage.

**Vinegar Syndrome**

One of the biggest problems faced by archives responsible for my collections is acetate (safety) film base acetic degradation, often known as ‘vinegar syndrome’ because of the strongly vinegary smell given off by affected material. Acetic breakdown is most commonly found in films printed on 35mm or 16mm safety film stock from the 1950s to the 1970s, though some earlier narrow gauge films on safety base can be affected. Vinegar syndrome can be triggered by poor make up of the base at time of manufacture or even by reaction with a film’s container, but the condition is often caused and always exacerbated by poor storage. High humidity and heat can break down the plastic base of acetate film. During this process the acetate catalyses into acetic acid vapours and cause shrinkage, acidification of the base and eventually of the emulsion. The base becomes ‘wavy’, then limp, it can shrink and eventually begins to liquefy. While this is a relatively...
slow process, it cannot be reversed once started. It can be slowed by improving storage conditions. If unchecked, the chemical reaction accelerates as decomposition advances.

The problem is usually detected by the vinegar smell. However, it is not safe practice to check for vinegar syndrome by sniffing the films. Off gassing plastics can cause health problems. The syndrome can be tested for and monitored by using A-D (Acid Detection) strips (see ‘Monitoring for vinegar syndrome’ below).

At the early decay stages, the film content can be rescued by transferring it to new film stock or a digital medium. Generally once the film becomes too limp or distorted, it cannot be copied in its entirety, although less damaged sections may be salvageable. If no action is taken, the film will eventually become unusable.

Typically the decay process follows this pattern:
1. The film begins to smell like vinegar
2. The film base begins to shrink. As the base shrinks irregularly, the film resists being laid flat. It curls and warps along both length and width
3. The film becomes limp
4. The emulsion may crack and eventually flake off
5. White powder may appear along the edges and surface of the film.

**Vinegar syndrome and magnetic track deterioration** Acetate films with magnetic soundtracks are especially vulnerable to vinegar syndrome. As the film base shrinks and becomes wavy and limp, support of the magnetic sound stripe is compromised. The magnetic track can shed oxide and become sticky. Particularly on 8mm, where the brown magnetic stripe is very narrow, it can become completely detached from the base. When this happens the sound is effectively lost, as there is no practical way to re-attach the stripe.

Separate magnetic soundtracks, whether on 16mm or 35mm, are even more susceptible to acetic breakdown. The first signs are rust marks corresponding to the circular roll of film inside the can. Then comes the smell, followed by the limpness and waviness of the fully coated (or part coated in some cases of 35mm) magnetic tracks. The leader is often affected as well.

To prevent sound loss, it is important to copy the sound as soon as vinegar syndrome is detected. In general films with magnetic stripe soundtracks should be prioritised when planning a digitisation programme. The films should not be stored close to heavy electrical equipment or cables.
Monitoring for vinegar syndrome—as described above, all acetate-base materials are prone to vinegar syndrome. It is important to inform preservation planning by monitoring for the condition. Even if the tell tale smell of vinegar syndrome is present in a collection, it is not always easy to identify which films are decaying. The best way to check for acetate decay is to use A-D (Acid-Detection) strips, which can identify the problem even in advance of the smell stage. The Image Permanence Institute and a commercial company, Danchek, both offer these for sale online (see Resources*). They are strips of paper that have been soaked in Bromocresol Green, an acid/base indicator. The strips change colour as the acidity increases, turning from blue, through shades of green, to yellow in the presence of the increasing amounts of acidic vapor given off by decaying acetate.

The testing method is simple. An A-D Strip is placed in a confined space with the item to be tested, usually directly in the film can on top of the film. After exposure, the resulting strip colour is compared to the A-D Strip colour scale. At room temperature, the strips can be examined after a minimum of 24 hours. At lower temperatures the indicators work progressively more slowly. Further information on A-D Strips and their use can be found on the IPI website (see Resources*).

* p.116

Vinegar syndrome film: first signs are rusting in the can
The Image Permanence Institute method is to compare the colour of the strip to the colours on a reference pencil (supplied). The pencils have a reading range of 1 to 3, the intermediate steps (0.5, 1.5 and 2.5 can be estimated). The reading indicates the degradation as follows:

- Level 0.0 to 0.5 – good condition
- Level 1.0 to 1.5 – some degradation, not serious but films should be watched.
- Level above 1.5 – films are seriously degrading and have reached the autocatalytic point, and they require duplication or segregation.

The Danchek method is indicated as below:

<table>
<thead>
<tr>
<th>Danchek colour shift</th>
<th>Smell</th>
<th>IPI reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH 6.0</td>
<td>No smell</td>
<td>Level 0 Fresh film</td>
</tr>
<tr>
<td>pH 5.5</td>
<td>No smell</td>
<td>Level 0 Degradation is beginning</td>
</tr>
<tr>
<td>pH 5.0</td>
<td>No smell</td>
<td>Level 1 Degradation is increasing</td>
</tr>
<tr>
<td>pH 4.8</td>
<td>Weak smell</td>
<td>Level 1 Degradation is more increasing</td>
</tr>
<tr>
<td>pH 4.6</td>
<td>Weak smell</td>
<td>Level 2 Autocatalytic Point From now film should be watched</td>
</tr>
<tr>
<td>pH 4.4</td>
<td>Stronger smell</td>
<td>Level 3 The film should be duplicated</td>
</tr>
<tr>
<td>pH 4.0</td>
<td>Strong smell</td>
<td>Level 3 The film has a very high priority for duplication</td>
</tr>
</tbody>
</table>

*Source: The guide issued with Danchek A-D strips.*

In a small collection it would be sensible to test every item. In larger collections it is best to start by testing a random sample. If pockets of materials are found to be affected by acetate decay, these could be tested further, if desired, after the overall condition is assessed or whenever institution resources make it possible.

It is critical to act on your survey results. Your survey data will tell you whether and how much of the collection is in critical condition. Films with an A-D measurement less than 1.5 are often still useable, but need to be transferred to the coldest possible storage and copied as soon as possible. Acetate materials displaying A-D Strip level 2 or above are considered to be in poor to critical condition and should be stored under FROZEN conditions and/or duplicated.
Motion picture film that begins to deteriorate can still be copied. However, because of the state of the film and the health and safety issues, it needs to be handled, conserved, and copied by professional archivists and technicians who have the experience and right equipment.

The acetic vapour released by films with vinegar syndrome can infect other acetate based material stored nearby, particularly in a poorly ventilated storage area. It is vital that when decaying films are found they are isolated as soon as possible.

If film is suffering badly from vinegar syndrome, seek advice immediately. Acetic acid fumes can cause respiratory problems so exposure to these should be kept to a minimum.

**Colour deterioration** Particularly since the introduction of modern colour motion picture films in the early 1950s, colour fading has become a growing concern. Colour fading is caused by chemical changes in the image dyes of colour films. While varying in stability, nearly all types and brands of colour motion picture film fade over time. The three dye layers lose their original colour at different rates. As dyes break down, the colour balance changes. Contrast is lost, and generally the film begins to acquire a pinkish brown cast. Eventually the film looks washed-out, almost monochrome. Negatives, interpositives and prints are all affected although prints and negatives can experience fading at different rates. The process of colour fading can be slowed by cool and dry storage but not reversed.

Although exposure to light (during repeated projections) can add to colour fading, this is not a key factor – an unused print can also be affected. As with other forms of degradation, the colder the conditions, the slower the fading, and the longer the lifetime of the film.

Once a print has faded its colour cannot be recovered. If however, the original cut negative of the film still exists, it is likely that this will not have faded to such a degree – sometimes not at all, and a new print could be made at the laboratories onto modern polyester stock. This is actually the cheapest method, providing all the elements still exist.

Beyond this, modern digital restoration can have impressive results – restoring faded colour to something much like their original appearance.
Colour film – a short history

The earliest Kodachrome stock for the amateur market was available from 1935 in 16mm and a little later in Standard 8mm. This was 'reversal' film – i.e. there was no colour negative from which prints could be raised. Instead, the original film that ran through the camera was sent away for processing at the laboratories and returned as positive, ready for projection. This early amateur colour film has a tendency to lose greens and blues, leaving a magenta tinge to the colour picture. This reversal process was altered in 1938, and from then on Kodachrome retained its vivid colours across the spectrum. The stock was used for 16mm release (or 'reduction') prints of commercial pictures until the 1970s. Kodak withdrew Kodachrome motion picture camera film in 2006.

Other makes of colour reversal film stocks were less stable than post-1938 Kodachrome and again fade to give a magenta tinge – particularly the cheap 8mm stocks that became available in the 1960s for amateur users.

Colour film for the cinema industry was more complicated, as lots of release prints were required. The most famous was Technicolor, a dye transfer system producing saturated colours; the subsequent prints (both 35mm and 16mm) have not suffered from fading. The Technicolor process ceased to be used for filming in the mid 1950s and for prints in 1977.

In 1951 Kodak introduced Eastman Colour. Any 35mm cine camera could use this system, and release prints could be made cheaply. However Eastman Colour prints (both 35mm and 16mm) have faded over the years, losing the blues and greens and leaving a pinkish picture.

Modern Polyester film stock appears to be less vulnerable to fading.

Shrinkage While shrinkage is often an indicator of acetate decay, all film shrinks, both when originally processed and subsequently in use and storage. Shrinkage will be accelerated by dry storage conditions. If the relative humidity falls below 15% for extended periods, the film loses moisture, contracts, and may become brittle. Shrinkage is a particular problem for small gauge films because of the smaller size of the film frame. The sprocket holes are closer together than on 16mm or 35mm film and so projection and viewing equipment has less tolerance.
Shrinkage can be measured. Specialist film technicians will use a shrinkage gauge, but these are expensive and best used by experts. A quick test for shrinkage is to compare a section of your film with a short section (about one foot) of new, blank, processed, polyester stock of the same gauge. You should be able to obtain this from a film laboratory (see Resources). Lay this against your archive film. Line up the perforations at one end and see how quickly they go out of register. If they are out within a few inches, the film is severely shrunk, and the copying laboratory needs to be briefed to take this into account. If the perforations appear only slightly out of alignment – visible, say after c.100 frames, the film is only slightly shrunk. Over 100 perforations, if the shrunken film goes out of register by one whole frame, then the archive film is 1% shrunk. This applies to whatever gauge of film you are measuring.

Once a film has shrunk beyond 1% it will almost certainly be damaged in normal viewing or projection. Beyond 2%, even skilled laboratories can have trouble copying the film. At this point the film generally exhibits additional decay problems beyond shrinkage.
<table>
<thead>
<tr>
<th>Damage/Decay</th>
<th>Detection Method</th>
<th>Symptoms</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Damage (all film gauges)</td>
<td>Visual Inspection.</td>
<td>Tears, torn or broken perforations, broken splices.</td>
<td>Physical repair by specialist.</td>
</tr>
<tr>
<td>Colour Fading</td>
<td>Visual Inspection.</td>
<td>Shift in colour. Loss of contrast and colour balance. Film looks washed out.</td>
<td>Slow decay by improving storage conditions. Copy content before decay is too advanced.</td>
</tr>
</tbody>
</table>

Summary: Film Damage and Decay
Source: The Film Preservation Guide: The Basics for Archives, Libraries, and Museums. Produced by the National Film Preservation Foundation
Inspecting and identifying film

Here is the US National Film Preservation Foundation’s The Film Preservation Guide (see Resources) standardised inspection work sheet, with a clear listing of what should be checked for and a template for organising note taking. Using a template to collect information during inspection helps an organisation to make informed decisions and document any changes in film condition over time.

Questions to guide the inspection

- How long is the film?
- What is the gauge?
- What is the film base?
- Is the name of the manufacturer printed along the edge? Are there edge codes that might help with identification dating?
- Is the film colour or black & white? If colour, does it display some degree of fading? – Note that sometimes films include both black & white and colour scenes that have been edited together
- Is it silent or sound?
- If sound, what type of soundtrack does it have?
- Is it positive, negative, or reversal film?
- Does it have a title or credits?
- How much mechanical damage exists in terms of splices, scratches, and broken sprocket holes? How many feet from the start does the damage occur?
- Is there evidence of shrinkage?
- Is there observable mould? Has the growth caused lasting damage?
- Does the film smell of vinegar?
- Are there other signs of decay or damage?
Opening the film can_ As the film’s first line of defence, film cans themselves might tell a story of use, wear and neglect. They may be rusted or dented shut.

The US National Film Preservation Foundation’s The Film Preservation Guide advises:

To open a damaged can, bang it gently on a hard surface… If this fails, as a last resort pry open the can with a screwdriver, being careful to prevent the blade from slipping into the can and damaging the film. When handling rusty cans, be sure to wear safety glasses and a mask for protection from fumes and flying particles.

Prints generally come to repositories on projection reels. However, production elements are often acquired on cores, plastic hubs around which film is wound for storage. Films on cores can be difficult to extract from the can, particularly if wound too loosely or packed too tightly into the can. In removing films from stubborn cans, support the roll with your hand or half of the split reel so that it does not unspool when lifted.

General film handling_ Most film archivists recommend wearing clean, lint free cotton or inert vinyl gloves when touching film – although in practice many experienced specialists dislike gloves’ tendency to catch on damaged sprockets etc. Film should be handled as little as possible and always by its edges. The flat sides, especially the emulsion side, should never be touched.

Always ensure that work surfaces are free of dust and liquids. Film has built in static electricity and will attract particles – even human hair – that can get wound into the spool and damage the film and get wound in the roll. Leave any further cleaning to a laboratory.

If there is any mould on the outside of the roll of film a soft disposable cloth should be used to wipe it off. Throw the cloth away after use, so as not to infect other rolls. Do not clean the actual surface of the film with a cloth, this could lead to scratches.

Handling films with vinegar syndrome_ Because of the potential health hazard, if a film is suffering badly from vinegar syndrome and the smell is seeping out, do not open the can, but seek advice immediately. If there is a strong smell of vinegar when you do open a can you should close it immediately, take the can to a well ventilated place – even outdoors – and open to vent it. Acetic acid fumes can cause respiratory problems so do not breathe in the fumes. If the
film appears to be seriously deteriorated, close the can and seek guidance at a film laboratory.

**Spools and cores** There are two ways to store a film: on spools, or on cores.

35mm and 16mm may well be acquired on spools but should preferably be stored wound on undyed, inert plastic cores (or ‘bobbins’). This is better for the film, and also saves space. When a film is on a core, always hold the can as vertically as possible, and take out the roll of film holding it upright, so as not to let the middle drop out onto the bench or floor. For this reason, if the film is long (1600ft+) it may be preferable to store it on a 16mm spool for easier handling.

9.5mm, Standard 8mm, and Super 8mm are usually found on spools (open framed reels) and should be kept that way. Made of metal or plastic these offer very adequate support, but if broken or distorted they can damage a film during projection or even very careful winding. Damaged spools should be replaced as part of the inspection process.

**Using light boxes and film winders** It can be possible to decipher some image content by looking at the film against white paper held in front of a strong light – but beware of exposing the film to a hot light source for more than a few seconds.

A more satisfactory way to examine a film is on the illuminated surface of a light box (i.e. with a cold light source). Light boxes such as the HAMA LP550, which works off batteries or mains, are cheap to buy and very effective. With a powerful magnifying lens you can view the first few frames of a film (hopefully including titles and credits) to enable basic identification. To look at a whole film you will need access to a film winder.

A film winder (sometimes referred to as a ‘rewinder’ or ‘rewind’), is normally a hand-operated tool consisting of two vertical arms each carrying a spindle for the spools. Usually mounted on a board, the right hand arm has a handle for turning the spool to wind the film onto. Winders are available for 35mm, 16mm, 9.5mm, Standard 8mm, and Super 8mm. Unfortunately all the spool centres are different, so a winder is required for each gauge – though there are some 16mm winders that will take Standard 8mm, and Super 8mm with a plastic adaptor.

A hand-turned winder is safer to use than an electrically driven one, as the film can be wound slowly for inspection under complete control. Do not wind fast, or let the film loop down and touch the

Inspecting and identifying motion picture film
Inspecting and identifying motion picture film

Bench – this will add abrasions to the film. Never leave the film half wound on a winder as dust will settle on the film.

If the film to be inspected is wound on a bobbin or core, then a split spool will be needed before you use the winder. This is a spool that comes apart, and can be wrapped around the roll of film, and snapped or screwed shut. The film is now safe to put on a winder. It is always safest to wind the film onto a take up spool slightly larger than the original.

There are also flat-bed winders. These are benches that the operator sits at, either winding a handle or depressing a foot control for the electric motor to drive the plates. These are professional pieces of equipment used in archives and film laboratories, and usually only take film on a plastic bobbin. They are designed to take 35mm or 16mm film only.

To use a rewind with a light box, the US National Film Preservation Foundation’s The Film Preservation Guide advises:

…place the light box between the rewinds and pull the film gently down to the illuminated surface. Use the loupe [hand lens] to examine the film image. Crank the rewind slowly, stopping to sample images with the loupe as you hold your gloved fingers along the film edges to keep the film frame flat on the box. Be particularly careful when winding prints with magnetic soundtracks. If the reel has been stored under damp conditions, the stripe can stick to the next layer and peel off. Also take care not to catch your gloves on broken perforations or splices. Film with extreme perforation damage may be handled without gloves.

Sometimes film may exhibit a slight curl, and it may be necessary to let the film flatten out before viewing. Curl is generally caused by either low humidity (curl toward the emulsion) or extremely high humidity (curl away from the emulsion). If you let the film acclimate under more moderate relative humidity conditions (40% to 60% RH), it will usually flatten out. The key to quick acclimation is to expose as much surface area as possible.

The Film Preservation Guide includes extensive sections on handling, inspection, basic repairs, repairing perforations, splicing, cleaning – on which the non-specialist mi archivist might prefer to take professional advice.
Identifying film base plastics__There are several methods of identifying a film base as nitrate, acetate or polyester. A few examples are given here for reference. For more detail see the ‘Film Handling and Inspection’ section of the US National Film Preservation Foundation’s The Film Preservation Guide for greater depth (in Resources*).

- As noted above, the words ‘nitrate’ or ‘safety’ is often printed on the edge of a film
- Red and green interference colours are visible in polyester film when viewed through cross-polarised filters
- Light will shine through a roll of polyester film when it is held up to the light, but not through acetate.

Reading edge codes__The best indication of a film’s date is going to lie in its content – especially in its credit titles. However, some information is intrinsic and can be detected by careful inspection. The film stock itself may have an edge code that can help identify its year of manufacture.

Kodak employed a series of standardised symbols to indicate manufacturing year. The same codes were used for 16mm and 35mm film and, until the system was revamped in 1982, repeated in 20-year cycles. The film’s style and content, as well as any colour process used, will give clear indicators as to whether it was made in, e.g. 1924, 1944 or 1964. A very useful chart listing most symbols used by Kodak is available for download here: www.filmforever.org/Edgecodes.pdf

Dupont also used a date code between 1956 and 1974. A full listing of the Kodak and Dupont 35mm and 16mm codes is given in Appendix A of the The Film Preservation Guide.

Fuji film uses a four-digit code; the first two numbers represent the year of manufacture.

Note that film copies might carry two or more edge codes: that of the original film stock as well as those of the generations printed from it. Look for the blackest and strongest code. Any code in white rather than black will be from a previous negative original or duplicate print.
Estimating a film’s length and running time

As a very rough guide, the size of a full film spool will give you its approximate running time (at sound speed of 24 frames per second):

<table>
<thead>
<tr>
<th>Spool diameter</th>
<th>Approximate footage</th>
<th>16mm running time</th>
<th>35mm running time</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 inches</td>
<td>400</td>
<td>11 mins</td>
<td>4 mins</td>
</tr>
<tr>
<td>11 inches</td>
<td>1000</td>
<td>27 mins</td>
<td>11 mins</td>
</tr>
<tr>
<td>15 inches</td>
<td>2000</td>
<td>54 mins</td>
<td>22 mins</td>
</tr>
</tbody>
</table>

Many film spools are marked with a gauge along one or more flanges to help you calculate the number of feet of film on the spool.

For measuring film on a core (or ‘bobbin’) it’s easiest to use a purpose-designed measuring stick. This is calibrated with the footage lengths along the side – one side for 2” cores, the other for 3” cores.

Put the end of the film ruler on the center of the core. Then estimate the film’s length by measuring the roll’s radius. Usually the estimate is given in terms of number of feet.

Some 16mm amateur films may be in a box (if Kodak this will be yellow) with the filmmaker’s name and address on it as it was when sent through post after processing. These are either 50ft of film (2 minutes at 16 frames per second) or 100ft (4 minutes at 16 frames per second).

If the yellow boxes contain Standard 8mm, they will be smaller. The 50ft spool inside, if full, will run for 4 minutes at 16 frames per second. If the film roll is of Super 8mm, then a 50ft roll (running at 18 frames per second) will last for 3 minutes and 20 seconds.
Motion picture running speeds – a brief history

The earliest motion picture films were normally shot at c.16 frames per second (fps). This was not always precise, as the cameras were hand turned (or ‘cranked’) and the shooting speed could be adjusted to achieve special effects. Projection was normally at 16 fps, though this varied throughout the silent era, creeping up to faster rates as time went on. When sound arrived in the 1920s, a standard projection speed had to be fixed so that the sound was intelligible and did not ‘wow’ (distort). 24 fps was adopted. All subsequent gauges carrying optical sound run at 24 fps.

For the amateur, 16mm silent home movies continued to be run at a fixed 16 fps. 9.5mm adopted 14 fps at first, and Standard 8mm was fixed at 16 fps. Super 8mm was run at 18 fps.

Some cameras had the ability to run at 8 fps (to achieve the effect of speeded up motion when projected at 16 fps or 24 fps) as well as the facility to run at a higher rate for slow motion. (Of course, filming at fast speed used up much more film!)

Most amateurs who used magnetic stripe sound ran their cameras and projectors at 16 fps (or 18 fps with Super 8), which was quite suitable for home sound reproduction. More expensive 16mm cameras could be adjusted to shoot normal action at the professional speed of 24 fps. This was normally used by advanced amateurs who wanted to achieve a smoother motion and be able to add either a magnetic stripe or optical sound track for better quality sound. However, amateur optical sound films are rare because of the high cost of making a sound negative and a combined print.

So, to estimate the running time of a 16mm film it is helpful to know if it is an amateur film or professionally made as this could affect whether it was shot at 16 fps or 24 fps. Great care must be taken to run equipment at the right speed when projecting or copying motion picture film.
## Footage/Time Film Conversion Chart

<table>
<thead>
<tr>
<th>FEET</th>
<th>35mm</th>
<th>16mm &amp; 9.5mm</th>
<th>Standard 8mm</th>
<th>Super 8mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16 fps</td>
<td>24 fps</td>
<td>16 fps</td>
<td>24 fps</td>
</tr>
<tr>
<td>25</td>
<td>25s</td>
<td>17s</td>
<td>1m 3s</td>
<td>42s</td>
</tr>
<tr>
<td>50</td>
<td>50s</td>
<td>33s</td>
<td>2m 5s</td>
<td>1m 23s</td>
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<tr>
<td>75</td>
<td>1m 15s</td>
<td>50s</td>
<td>3m 8s</td>
<td>2m 5s</td>
</tr>
<tr>
<td>100</td>
<td>1m 40s</td>
<td>1m 7s</td>
<td>4m 10s</td>
<td>2m 47s</td>
</tr>
<tr>
<td>200</td>
<td>3m 20s</td>
<td>2m 13s</td>
<td>8m 20s</td>
<td>5m 33s</td>
</tr>
<tr>
<td>300</td>
<td>5m</td>
<td>3m 20s</td>
<td>12m 30s</td>
<td>8m 20s</td>
</tr>
<tr>
<td>400</td>
<td>6m 40s</td>
<td>4m 27s</td>
<td>16m 40s</td>
<td>11m 7s</td>
</tr>
<tr>
<td>500</td>
<td>8m 20s</td>
<td>5m 33s</td>
<td>20m 50s</td>
<td>13m 53s</td>
</tr>
<tr>
<td>600</td>
<td>10m</td>
<td>6m 40s</td>
<td>25m</td>
<td>16m 40s</td>
</tr>
<tr>
<td>700</td>
<td>11m 40s</td>
<td>7m 47s</td>
<td>29m 10s</td>
<td>19m 27s</td>
</tr>
<tr>
<td>800</td>
<td>13m 20s</td>
<td>8m 53s</td>
<td>33m 20s</td>
<td>22m 13s</td>
</tr>
<tr>
<td>900</td>
<td>15m</td>
<td>10m</td>
<td>37m 30s</td>
<td>25m</td>
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<tr>
<td>1000</td>
<td>16m 40s</td>
<td>11m 7s</td>
<td>41m 40s</td>
<td>27m 47s</td>
</tr>
</tbody>
</table>
An Archivist's View

Inventory Consultants Visit ‘The People’s Happiness Museum’*

*“The People’s Happiness Museum’ is a fictional composite organisation. This case study is based upon interviews with consultant film archivists and edited to offer a general picture of what the process of creating an inventory involves, rather than a specific picture of working with any one institution.

“The Happiness Museum had told us that they had about 150 cans of film and a couple of boxes of videotapes. We started with the video. We should point out that, like most of the non-mi-specialist organisations we visit, there isn’t even a VHS player on site and the inventory is compiled from information gleaned from existing records and what is written on the tapes. Archivists can typically play DVDs on their computers but they’re absolutely not resourced to show mi material (though interestingly, we have found that public libraries are often well equipped). We can usually find enough information to complete an adequate basic record in any case, and the organisation are then set up to add to or correct this by viewing their material when they are able.

The equipment we take with us is minimal. I have a small lightbox that I bought on Amazon – the internet is a great source, and you can also find them more cheaply in art shops and stationery shops rather than archive sources and camera shops; mine is a HAMA LP550. It runs off both batteries and mains which is handy, as power isn’t always available in vaults. I don’t always carry a measuring stick these days (they cost about £50 so I don’t want to lose it!) and as with a bit of practice it’s easy to tell based on the diameter of the can; if I ever find I need one, I have a picture of one from the internet which I print out to scale. Not sure if that’s a top tip or breaking the law, but it works – very Blue Peter! I also take a spyglass magnifier that I bought from Jessops the camera shop; it’s a fold-out gadget that self-stands over the film stock and is framed to 35mm. It’s designed for studying negatives but works just as well for film – an ordinary, traditional magnifier is just as good though. We both use white gloves – very important for handling negatives; craft knife and scissors (for treating messy and badly made splices); a couple of empty film cores to wind things out onto if you need to wind off more than a few feet of film; a screwdriver to tease open those rusty cans that just won’t open; a roll of white leader
(not necessarily to leader up the film, but if you have a roll that's
very important with no leader on it then I lose wind a strip of
leader and stick it down with a bit of camera tape just so it has
a band of protection around the outer edge); camera tape for
sticking down loose ends and labels that are coming unstuck;
chiragaph pencils to write info on the leader, e.g. 1 of 2, Head,
Tail etc; sticky label sheets that can be cut to any size, for sticking
notes on cans; acid-free envelopes for any paperwork that is
found loose in cans and a roll of Perfix from www.pec.co.uk.
This is a roll of clear splicing tape that has perforations already
punched in. It's used to repair perforation that are split, damaged
or just plain not there – quite handy for emergency saves.
We keep all this gear (except for the lightbox) in a 35mm 400ft
film can, but the number of times I have given the can away when
an archive had something that was in need of a can is amazing!

The PHM's tape collection was interesting for two reasons.
First of all, it included some very strange formats which we
haven't seen anywhere else. It remains to be seen how easy it will
be to have these transferred, though we know that one or two
facilities houses which specialise in non-standard tape materials
and will help the Museum make enquiries. Second, it contained
a number of local history productions made in the 1970s and
1980s which, as far as one could tell from the information
on the cases, contained footage of many parts of London in
those decades as well as interviews with people in the different
localities, reminiscing about life in their own time and that of their
parents and even grandparents.

When the inventory of tape-based material was complete,
we moved on to the film. The few cans they had already processed
demonstrated a tendency in museums to treat the entire object,
can and all, as a single artefact: each one was carefully tied up
with white tape to which was attached a luggage label bearing
the title and assumed date. Finding items in this state much
increases the time needed to process them as they have to
be untied and carefully retied after examination of the contents.
It doesn't do any harm to the film, and I guess it does look pretty!
When looking at frames, I either use the lightbox or even the
screen on my laptop – this lets me have my working spreadsheet
in front of me whilst examining the film. We've both got our own
method of winding film off the roll to find opening credits. I use
a big film can, lay the film flat inside and turn so that the layers
Inspecting and identifying motion picture film roll out; the other method is to put the film inside a cloth laundry bag (or posh lint-free editing bag). Film is static so it can pick up dust when you wind it out if you’re not careful; both these methods are designed to save you from dropping the film on the floor. If it does fall, pick it up quickly! Seriously though, it is always good to be prepared for the middle of a roll of film dropping out. If this happens then a smaller film core can be used to wind up from the end; this can then be dropped back in the centre; after which you’ll need to wind it all the way through to get it tightly wound again. Funny, you don’t always find film in film cans. In the PHM we found various quantities of old money (none of which we could spend, unfortunately!), whiskey miniatures, theatre tickets that were never used, photographs (some of a nature that would make you blush) and even the drawings for a new heating system in a public library!

Most of the film material in the PHM turned out to be production material from two television programmes the PHM had collaborated on some years previously. As the programmes are very clearly London-focused, we recommended that someone sort through this material quite rigorously – there may well be shots of places that didn’t make it into the final cut. The production material from a production on the police force also looks interesting – we couldn’t find any evidence that the film was ever completed. On the other hand, the two reels of acetic magnetic track that we found, we recommended for immediate disposal – if you stagger back with watering eyes when you open the cans, you can be sure that the reels are likely contaminate any others kept nearby!

A couple of archivists were very keen to sit with us while we worked through their material, and these sessions enabled us to benefit from their knowledge of what is in their collections while they received some basic training in handling film and how to gather useful information without having to view anything. Many archivists seem to prefer to keep a distance, which we feel is more from embarrassment (unnecessary) than anything else. Training in best practice of mi archiving has tended to be an add-on for most people working in organisations which are not mi specific; that, combined with the usual scarcity of resources, tends to push work on non-book and non-three-dimensional materials into the background. The archivists know they are not dealing with the materials as well as they might, and all those we’ve spoken to
Labelling

Before returning the inspected film to the shelf, check the film leader. This is a protective piece of cinefilm or tape joined to the beginning or end of a reel; it may be blank or have countdown, synchronisation marks (for sound film) or other basic markings. The leader protects the film and is the place to write unique identification data for the reel. If there is no protective leader at the beginning, or at the end, new leader should be joined on.

An Archivist’s View

Tips on film inspection – Condition of the print

The condition of a film print needs to be recorded. This can only be done by examining the film on a winder carefully and noting what is found.

Things to look for:

• Has the film got a countdown leader on?
• Is it the original leader (with no join between it and the picture)?
• Is it a new leader (i.e. with a join where it meets the actual picture)?

If it is a new leader then this indicates the film has been used many times – the poor handling or even damage when lacing of the original protective leader has resulted in a replacement. If it is the original leader it may indicate that the film has been rarely played, and is liable to be in better condition.

When you have wound past the leader, the film itself should be examined closely.

have been very happy that London’s Screen Archives is helping redress this balance. They know we’re here to help, not judge them.”
• Are the perforations damaged or strained?
• Are there any scratches on the emulsion (dull) side?
• Are there any marks on the shiny (base) side?

Scratches can come in various forms. They may be deep into the emulsion causing a white (severe) scratch, or black (where the scratch has been filled in with dirt). On a colour film a severe scratch might be coloured – say green – where the scratch has penetrated as far as the green layer. Scratches can be seen by eye or with the aid of a powerful magnifying glass. Remember to look at both sides of the film, to see if the base is scratched also.

The film may be dirty. This can also be detected with a magnifying glass, or by gently running the film through a folded lint cloth (do not hold tight as this might scratch the film) as you wind for a few feet. The state of the cloth will tell how dirty the film is.

In some cases the film might be covered with oil. This would have happened in the past (typically the 1950s) when a projectionist has been over-zealous with the oil can on the projector. Don’t try and clean it yourself: the only remedy is to have the film ultrasonically cleaned at a film lab or telecine house that has this facility.

Joins There are two types of join. The traditional method of joining a film was to provide a narrow overlap (scraping off the emulsion on one of the two pieces to be joined) and welding these two sides together with a chemical called ‘film cement’. Cement joins, if well made, will last as long as the film. If not well made, they can dry out and just peel apart.

Since the 1960s tape splicers have been extensively used. These use a special adhesive tape. The film is cut straight across on the frame line, and the two ends abutted together. The tape is pulled over the two pieces of film held in the channel of the tape splicer, pressed down to make good contact, then the handle of the joiner is closed down firmly, with sharp knives and penetrators cutting the tape and perforating it to correspond with the perforations. When the handle is lifted the film is joined on that side. The film is turned over and round on the joiner to repeat the process so that there is tape on each side to prevent the film folding when being run through a mechanism. Tape joins are really only temporary, with the tape drying out and just falling off (rather like old Sellotape – sometimes leaving a discoloured patch on the film), or oozing adhesive and become sticky.
Examine every join you come across:
  - Is it well made and fully stuck together?
  - Is part of the overlap lifting away?
  - Is the tape of the splice falling off – or sticky?

Try to work out how much film had been removed before the join was made. If the film just broke, then possibly only a frame or two are missing. If a long tear happened, or a length of film became damaged, quite a number of frames, possibly several feet of film, could be missing. Working out what is missing can be done by looking at the action within the frames – how different it is either side of the join. It might be a complete change of shot – which does suggest quite a lot has gone.

Some prints may have a consecutive number every foot in faint numerals along the side of the film (known as footage numbers), and from these the length removed can be worked out. These footage numbers are normally a set distance apart.

If the film has a lot of joins, it is not a good copy of the complete film. If a substantial amount has been removed between joins it could be even worse, and not offer anything like the film in its entirety.

The fewer joins the better. If there are no joins at all and no scratches, then it could be the print to keep – the master copy. It is always advisable to keep two of the best prints if copies are available and resources permit.
Production Materials

With professional productions, lots of different elements are produced in order to create the finished print of a film. You might find that you have any or all of the following:

- Original or ‘camera’ negatives
- ¼" wide audio track (if sound was recorded at the same time)
- Rush print – made from the camera negatives for the editor to work on
- Soundtracks transferred from the audio track to fully coated magnetic stock for the editor to work with; effects soundtracks may also be used
- Dubbing tracks – rolls of soundtrack, probably inter-spliced with pieces of blank or discarded film, containing just one element of the sound mix, e.g. music, dialogue, effects, used by the editor
- ‘Trims’, ‘loops’ and ‘off cuts’ of picture and sound material, used by the editor in the process of composing the finished film
- Editor’s cutting copy or ‘work print’ – film which will be full of joins, dirty, and pencil marked with instructions to the laboratories
- ‘Cut negative’ – made by the negative cutter using the editor’s cutting copy as a guide to how to cut the original negative
- ‘Final mix’ soundtrack – a fully coated magnetic soundtrack used by the labs to transfer to a sound negative; can sometimes be called an ‘M & E’ (music and effects) track. You may find versions in a range of languages.
- Sound negative – final mix soundtrack transferred onto a piece of film with only the photographic soundtrack on
- ‘Final cut’ picture negative (or final cut positive if reversal film has been used); you might also have a Duplicate negative (‘dupe neg’) made as a back-up
- ‘A’ and ‘B’ rolls – negatives without soundtrack carrying alternating sequences of the final edit of the film. These would be printed together onto a single piece of film stock to produce the final film negative; using the two rolls masks joins in the editing and facilitates the process of creating fade-outs and dissolves between shots. The method was used mainly in the 1960s and ’70s. Often, especially in
news items or documentary, the ‘B’ roll carried scene setting context shots while interviews, action shots etc were on the ‘A’ roll. Occasionally there is a third, ‘C’ roll – normally just titles to be superimposed over the picture.

- ‘Answer print’ – the first print made from the final sound and film negatives. There may be several of these, depending on how satisfactory the grading and colour of the first answer print are felt to be.
- ‘Reduction print’ – a 16mm version of a film originally shot on 35mm.
- Release prints – copies of the final film made to be distributed for exhibition.

If no good quality master or release print exists then assembling the film and sound negatives to create a new print, or combining the ‘A’ and ‘B’ rolls along with a corresponding sound negative, might provide the only means of recreating a lost film.

None of these elements can be used alone and many of them are particularly susceptible to vinegar syndrome (which might infect other films in your collection) or to damage, and you may feel you do not need or wish to retain space-consuming production materials if you hold a good quality master. If you are considering disposing of material always take advice from an experienced film archivist first though, just in case!

Comparing ‘A’ and ‘B’ rolls on a lightbox
3

INSPECTING AND IDENTIFYING VIDEOTAPE
As videotape is not readable by eye, physical examination is limited to identifying technical characteristics and finding any available information on accompanying labels and documentation. This section provides pointers to the identification of different video formats with notes on their chronology and any specific vulnerabilities. The Resources section lists sites and sources giving further in-depth information on format recognition.

As with film, organisations with video collections should plan to re-wind and inspect them on a five-year rotation.

When handling video it is critical to keep work surfaces and equipment clean. Equipment must be kept in good condition and handling of the picture-bearing surface of the tape kept to a minimum.

### Videotape formats – a brief history

Videotape was originally manufactured for short-term production use, not as an archival medium for the long-term.

Videotape as a visual recording medium goes back to the late 1950s. The BBC began using tape to record programmes in 1958. Two inch wide videotape, commonly referred to as ‘2 inch’, was used by television throughout the 1960s and '70s. As technicalities improved, the size of the tape was reduced to 1 inch. Both these sizes of videotape come on open spools within a large plastic case, and are heavy. Only a few places can now copy from these obsolete analogue broadcast videotapes.

In the early 1960s small reel-to-reel video recorder/players were marketed for largely educational use. Initially these used half-inch wide tape, could only record in black & white, and not at a high quality. Machines made by Sony, Shibaden, Phillips etc. were incompatible with one another, and the tapes today are quite often unplayable because of their deteriorated condition (usually drying out of the tape or stickiness) and the lack of working machines. There are a few specialist archives and commercial laboratories that do have machines and can transfer the images, but it is costly.

The broadcast market went over to cassette videotapes in the late 1970s and early '80s. Different manufacturers had their own formats and again these analogue systems were incompatible with one another and are today largely obsolete.
Many archives will have examples in their collections: U-Matic, Beta, M11, Beta SP (Superior Performance), U-Matic HB (High Band), U-Matic SP etc. In the 1990s digital systems began to be used by the broadcasters, and analogue videotapes fell out of use. At the time of writing (June 2011) most of the early digital systems are now obsolete. Digital Betacam (known as DigiBeta) is still in current use by the broadcast media as are HDCAM and HDCAM SR digital HD systems.

For the domestic market, machines that recorded in colour off air became available from 1971: Phillips VCR from 1971; Betamax 1975; VHS 1976; Phillips 2000 in 1980; and Super VHS in 1987. For shooting there was Video 8 – 1983, Hi 8 in 1989, and others. All these analogue tapes are now obsolete.

Dr. John W.C. Van Bogart, in the 1995 publication ‘Magnetic Tape Storage and Handling: A Guide for Libraries and Archives,’ estimates a maximum life expectancy of thirty years for magnetic tape. In practice, useful shelf life depends on such variables as tape format and/or brand, storage conditions, number of recordings, tape handling, and conditions of playback. Periodic condition assessments and conservation actions can help slow deterioration and improve the chances of retaining viable information.

**Videotape formats**

Videotape comprises a thin strip of polyester on to which a layer of magnetic particles (the information-carrying layer) is held by a binder. The binder creates a smooth surface so that the tape can run easily though playback equipment. Numerous different types of videotape have been created and used in different contexts over the years.

**Open Reel Broadcast:**

- 1958–1980s 2" The tape is two inches wide and on a spool, which came in various sizes, small medium and large.
- 1965–1990s 1" One inch wide on a spool. There were several versions – the commonest standard is 1 inch ‘C’ format.

**Cassette Broadcast:**

- 1982–1990s Betacam (‘Betacam’ is often contracted to ‘Beta’) First used for television, but soon superseded by BetaSP (Superior Performance).
• 1986–c.2000 MII. Used for television programmes. This was an improved version of MI (1982), which is rare.

• 1987 –c.2005 Betacam SP. The most popular of the analogue broadcast quality systems.

**Open Reel Non Broadcast and Domestic:**

• c.1965 Several black and white half-inch open reel tape formats on the market including Sony CV 2000, (CV stood for Consumer Video); JVC (1966); Akai (1968); Shibaden (1968); Ikegami (1969); Phillips (1969); IVC (1970); Grundig (1970); etc. All made open reel machines for non-broadcast b/w recording between 1966 and 1970 – mostly not compatible with one another.

**Cassette Non-Broadcast and Domestic:**


• 1971 Low Band U-Matic. Video recorders for schools, colleges, etc. Very popular in organisations.

• 1975 Betamax. An early competitor to VHS for off-air recordings in the home. Did not prove popular.

• 1976 VHS Video Home System for off-air recording and for transferring and shooting on to. Very popular.

• 1977 U-Matic (High Band) Used by colleges, schools, advertising etc. Not compatible with Low Band.

• 1983 Video 8. Introduced for domestic use by Sony. The tape was 8mm wide in a smallish cassette.

• 1983 U-Matic High Band SP. Improved U-Matic system. SP stands for Superior Performance.

• 1987 Super VHS. Also known as SVHS. Significantly higher-quality version of VHS format for organisations. Not compatible with ordinary VHS. Never used in professional production, but commonly used for amateur production into 1990s.

• 1989 Hi 8. An improved 8mm wide tape system for the domestic market. High-quality amateur format, commonly used for more advanced or semi-professional amateur production from late 1980s. Cassette is very small, and the tape is fragile.
Digital Video Tape Cassettes formats:
• ‘DV’ identifies a family of popular and relatively high-quality digital formats (including DV-Cam, DVC-Pro and mini-DV) used both for less expensive professional production and amateur production from the mid-1990s.

Digital Cassette Broadcast:
• 1986 D1. The first broadcast quality un-compressed video tape recording system. Used for production only. Rare.
• 1988 D2. Another large format system broadcast videotape. Used for production only. Rare.
• 1991 D3. This format adopted by the BBC for archiving programmes. These, and other D formats, now obsolete.
• 1993 Digital Betacam. Also known as DigiBeta. Popular digital format still in use.
• 1995 DVC PRO. A professional small cassette production system.
• 1995 Mini-DV. Used occasionally for broadcast use.
• 1996 DV-Cam. Another small professional production system used mainly for news gathering.
• 1996 Betacam SX For production use only.
• 1997 HD-Cam Sony High Definition digital television.

Digital Cassette Non-Broadcast and Domestic:
• 1995 Mini-DV. Domestic, industrial and broadcast use. Very popular domestic system.
• 1999 Digital 8 Sony for the amateur market.
• 2003 Mini-DV HD. High Definition arrives for the amateur and professional market.

Other multimedia formats include Laserdiscs, CD-ROMs and DVDs, as well as digital files stored on hard drives or networks.

A useful visual identification guidance chart and notes are given in the Video Conservation Guide downloadable from the Texas Commission on the Arts website at www.arts.state.tx.us/video/identify.asp.
Common types of decay and damage

In many ways, videotapes are more fragile than film and retrieving their content requires well-maintained playback equipment compatible with a range of increasingly obsolescent formats. The mechanical process of putting a tape through a playback machine always poses a risk. Smaller archives should prioritise the production of digital copies while appropriate equipment for all formats is still held by specialised transfer laboratories (see Resources). Further information on digitisation is given in Section 5, below.

As described above, videotape has a polyester film base and a layer of magnetic particles held together by a binder. The binder is the weakest link. It absorbs moisture and, especially when exposed to fluctuating or high temperatures and relative humidity, can become sticky, adhering to the playback heads and causing tape damage (and potentially a jammed machine). It is susceptible to mould and mildew.

It is possible for sections of the magnetic particle layer of videotape to become dirty or to fall off, causing ‘dropout’ if the tape is run, and in extreme cases, completely blocking the playback heads. Dropout is signal loss caused by a tape head clog, defect in the tape, or dirt, causing an increase in the head-to-tape spacing. A video dropout generally appears as a white spot or streak on the video monitor. When several video dropouts occur per frame, the TV monitor will appear snowy. The frequent appearance of dropouts on playback is an indication that the tape or recorder is contaminated with debris and/or that the tape binder is deteriorating. Dropout caused by dirt can be eliminated by running through a tape cleaning machine; dropout caused by lost or missing magnetic material can be automatically filled in during playback by specialist electronic equipment. It is nonetheless important to note dropout as an indicator of the condition of the tape.

High temperatures can also cause damage such as increased tape tightness, pressure, distortion, layer-to-layer adhesion and changes in tape dimension. Beyond this, key factors in videotape damage are exposure to liquid; stretching, creasing or other playback damage; inadvertent erasure or re-recording; and exposure to magnetic fields. A tape’s signal (which gives both picture and sound) is represented on a tape by the arrangement of the magnetic particles into a particular pattern. Strong magnetic fields can affect the signal on a tape, causing it to become unreadable or adding to errors in playback.
The plastics used in the manufacture of the videotape cassettes and boxes give off pollutants, which tend to accumulate. This can impact on the long-term preservation of the material and/or the health and safety of staff.

Traditionally, original tapes have been seen as artefacts and were always carefully preserved. In recent years, however, the archival viewpoint has shifted and preserving the content of tapes as digital files, while disposing of all but five per cent of the master materials, has become the preference. This is because of the low life expectancy of video formats, the difficulty in maintaining machines for playback, and the large amount of storage space that tapes require. The decision as to whether or not to retain the originals will depend on the nature of the material, the quality of digital storage available, and the overall preservation policy of the archive.

Advice on storage for videotape is given in Section 4.

**Inspection, cleaning and repairs**

As with film, winding a videotape will help gases escape and maintain flexibility. Specialist equipment for this purpose is available (e.g. from Research Technology International, listed in Resources). However, unless you have access to a specialist mi conservator and equipment, even basic on site cleaning and repairs should be kept to an absolute minimum. The most any non-specialist archivist or conservator should attempt is to clean off very obvious dirt and mould from the external edges surfaces of exposed videotape with a soft brush or lint-free cloth and, if necessary, using small amounts of very mild solvent, detergent or purified water.

⚠️ If in any doubt it is always safest to take advice from colleagues in a specialist mi archive or consult a specialist laboratory competent to deal with handling archive material and obsolete formats.
4

STORING AND HANDLING MI COLLECTIONS
This section provides pointers to best practice on the storage conditions that will help defend mi material against most of the threats to survival outlined in the preceding chapters. It addresses the key factors that can impact on preservation: environmental monitoring and management, packaging materials and storage.

Storage of film, video and mixed media collections

Cool, dry, clean, well-ventilated storage is vital to the preservation of moving image material. All film, video and digital media carriers should be stored at low temperatures and at lower relative humidity (RH) levels than those required by paper records and most museum objects. Stability is important: rapid fluctuations can speed up deterioration.

Places not to store mi material

- Anywhere prone to high humidity levels and/or high temperatures. Basements and attics should be avoided.
- In direct sunlight or next to a window
- Near heaters, radiators, or sprinklers
- Near chemical, paint, or exhaust fumes
- For videotape and film with magnetic soundtrack: Near magnetic fields such as those produced by heavy-duty electrical cables, electrical equipment, and transformers.

Optimum temperature and RH levels

Readers looking at the guidance sources we recommend in Resources will find some minor variations in the specific recommendations regarding temperature and RH levels given for each type of mi media.
The SHUK Film and Video Collections Care Policy states:

The ideal storage environment for film, as well as with most composite materials, can only be a compromise, although it can be summarised as cold and dry with controlled airflow to inhibit mould growth. While it is possible to fine-tune different environments for different types of film, it is simpler and more flexible to aim for the smallest possible number of environments. Preferred conditions are:

<table>
<thead>
<tr>
<th>Stock type</th>
<th>Temperature °c</th>
<th>Relative Humidity RH %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master status film elements</td>
<td>-5</td>
<td>35</td>
</tr>
<tr>
<td>Deteriorating viewing status film elements and magnetic sound tracks</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>Stable viewing status film elements</td>
<td>15</td>
<td>35</td>
</tr>
</tbody>
</table>

With regard to video the policy says:

Magnetic audio and videotapes are also susceptible to physical deterioration, so a cool, dry and dust-free environment is required. Preferred storage conditions for magnetic tapes is +15°C 35% RH with appropriate air conditioning.

For those able to store different formats individually, the following guidelines developed by London’s Screen Archives in 2005 give a useful overview:

<table>
<thead>
<tr>
<th>Stock type</th>
<th>Recommended temp range °c</th>
<th>Recommended RH %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetate*: Colour</td>
<td>0–5</td>
<td>35</td>
</tr>
<tr>
<td>Acetate*: B/W</td>
<td>10–15</td>
<td>35</td>
</tr>
<tr>
<td>Nitrate*</td>
<td>5–8</td>
<td>35</td>
</tr>
<tr>
<td>Polyester</td>
<td>15–18</td>
<td>40</td>
</tr>
<tr>
<td>Video / Magnetic</td>
<td>10–15</td>
<td>35–40</td>
</tr>
<tr>
<td>DVD</td>
<td>4–12</td>
<td>35–45</td>
</tr>
</tbody>
</table>

*Nitrate and acetate based film should ideally be frozen if there are signs of decay.
Refrigerators and freezers—Small collections of particularly vulnerable mi material (e.g. acetate film affected by vinegar syndrome) can be accommodated in off-the-shelf frost-free freezers or refrigerators. A major challenge in using freezers and refrigerators is protecting film from high humidity during storage. This can be achieved by careful preparation and packaging. Film Forever: The Home Film Preservation Guide (www.filmforever.org) illustrates the steps in packaging a film for refrigeration or freezing.

The Swedish FICA system (www.dancan.dk/FICA.html) uses a sealed aluminium bag to keep the film in, which is then ready for freezing.

Ideally an archive will have made viewing copies of any item being transferred into cold storage for its long-term preservation. Occasionally, however, films in cold storage will be needed for public or research access or preservation work. Films will need to be acclimatised before use. This should be done slowly in an intermediate environment. Condensation can occur on film and videotapes taken from cool to warm areas, and so they may require a 24-hour period of acclimatisation at a relatively cool temperature (i.e. not a warm office) before they can safely used.

While technically, as a short term measure, a few reels of nitrate film can be stored in a frost-free freezer, most responsible organisations prefer to arrange for off-site commercial storage of nitrate motion picture films or transfer to archives with specialised facilities in line with government guidelines (see Resources*).

*P.112
Image Permanence Institute (IPI) at the Rochester Institute of Technology (USA)

For nearly two decades the Image Permanence Institute (IPI) has studied the effect of light, heat, pollutants, and humidity on film and paper decay and developed tools to diagnose and measure these problems. The IPI Media Storage Quick Reference (see Resources*) brings together information on storing photographs, audiotapes, videotapes, CDs, and DVDs, as well as motion picture film. Recognising that many repositories house these media together, IPI has developed climate condition charts to enable preservationists to choose storage solutions that maximise benefits to a fuller range of their collections. This section draws extensively on their findings.

The IPI Media Storage Quick Reference identifies three major categories of environmentally induced deterioration: biological, chemical, and mechanical (or physical).

**Biological decay** Biological decay includes all the living organisms that can harm media. Mould, insects, rodents, bacteria, and algae all have a strong dependence on temperature and RH. Mould and mildew are serious dangers to media collections. Sustained high RH (above 70% or so for more than a few days) should be avoided.

**Chemical decay** Chemical decay is due to spontaneous chemical change. Fading of color dyes in photographs and degradation of binder layers in magnetic tape are examples of decay caused by chemical reactions occurring within the materials themselves. The speed of these reactions depends primarily on temperature, but moisture also plays a role. In general, the warmer the temperature of the storage area, and the higher the RH, the faster the media collection will be affected by chemical decay. Chemical decay is a major threat to media that have colour dyes and/or nitrate or acetate plastic supports. COLD storage is recommended for these materials; FROZEN is recommended [for motion picture film] when signs of deterioration are present.

**Mechanical decay** Mechanical forms of decay are related to the changes in size and shape of water-absorbing materials such as cellulosic plastic film supports or the gelatin binder in photographic materials. RH is the environmental variable that determines how much water is absorbed into collection objects.
When the RH is very low (below about 15%) for long periods of time, objects lose moisture and shrink. The opposite is true when RH remains high (above 70%). Expansion due to extreme dampness and contraction due to extreme dryness cause stresses among the layers of media objects, which can lead to permanent deformation and layer separation. Excessive dampness is a very serious environmental threat to media collections, because it contributes not only to mechanical decay but to biological and chemical decay as well.

As indicated by the table below an ideal situation for storing mixed media mi collections would provide multiple, separately controlled secure environments to suit different media. The available guidance documents cited throughout this section and in Part 2 differ slightly in their specific recommendations for specific media types. The IPI Media Storage Quick Reference does indicate that some compromises can be reached (see below), but a museum, library or archive that cannot provide reasonably well controlled environmental conditions for its mi collection should seriously consider transfer or deposit in a specialist archive.

The IPI Media Storage Quick Reference recommends categorising your store by average temperature.

To simplify the evaluation and planning of storage conditions for mixed media collections, Media Storage Quick Reference divides the range of possible temperatures into four categories. It notes that the effect of temperature on decay rate is a continuum. The higher the temperature, the faster the decay, and vice versa. Each of the four categories represents a range of temperatures on either side of the ‘anchor-point’ quoted (except ‘frozen’, which indicates 0°C or below):

- **ROOM** 20°C
- **COOL** 12°C
- **COLD** 4°C
- **FROZEN** 0°C

<table>
<thead>
<tr>
<th>Storage conditions</th>
<th>Room</th>
<th>Cool</th>
<th>Cold</th>
<th>Frozen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass Plates</td>
<td>Fair</td>
<td>Good</td>
<td>Very</td>
<td>No</td>
</tr>
<tr>
<td>Nitrate</td>
<td>No</td>
<td>No</td>
<td>Good</td>
<td>Very good</td>
</tr>
<tr>
<td>Acetate BW &amp; colour</td>
<td>No</td>
<td>No</td>
<td>Good</td>
<td>Very good</td>
</tr>
</tbody>
</table>
Storing and handling mi collections

For most film materials IPI finds that frozen temperatures extend useful life, if RH is held between 30% and 50%. However, DVDs and materials having a magnetic layer — magnetic soundtrack and videotape — may be damaged under freezing conditions. For mixed collections that include all types of mi media, COLD (4°C) seems preferable.

Re fluctuation in temperature and RH the IPI Media Storage Quick Reference notes:

Fluctuations in temperature and RH, are always a concern in environmental assessment. Fortunately, short-term RH fluctuations generally are not much of a threat to media collections and should not cause alarm. The level of sensitivity to environmentally induced mechanical damage is fairly low for most media. In addition, enclosures such as boxes and cans tend to buffer fast RH changes. Maintaining steady conditions should not be the objective, if it must be achieved at the cost of low temperature and RH. For the stability of media collections, the key concerns are long-term average temperature and RH and the profile of seasonal changes. The most important environmental trends are usually seasonal in nature.
Prolonging Active Life! The Image Permanence Institute recommendations for film materials

Temperature and moisture are the two key factors affecting the rate of film deterioration. The IPI estimates that fresh acetate film stored at a ROOM temperature of c.20°C and 50% RH will last approximately 5 years before the onset of vinegar syndrome. Just reducing the temperature to COOL, while keeping the humidity at the same level, can delay the first signs dramatically. Together, low temperature and low relative humidity levels slow chemical decay and increase the stability of motion picture film. Mould spores will not germinate if the relative humidity is below 65%. Air circulation also discourages mould growth.

As noted above, for all motion picture film types except those with magnetic soundtracks the IPI recommends that frozen temperatures, with RH held between 30% and 50%, extend useful life.

For composite prints with magnetic soundtracks the situation is more complex. If a print in advanced decay is frozen to conserve the film base, there is a risk of damage to the soundtrack. However, if the film base succumbs to vinegar syndrome, the entire artifact is lost. Until more scientific research has been completed on magnetic track damage, IPI recommends considering the film base as the determining factor and freezing the original. This should only be done after a digital copy has been made of the soundtrack.

Air quality__Mi collections need protection from airborne pollutants as well as good airflow and ventilation to prevent the build-up of gasses coming from the material itself.

Solid pollutants__Most mi media have an inherent static electrical charge which attracts any dust in the atmosphere. Even very small quantities of small-diameter solids (dust, grit etc) can cause major surface abrasion and damage picture quality. These tiny solid pollutants can come from outside (if no filtration is provided) or be produced inside (e.g. debris from deteriorating materials within the store, or human activity).

Gaseous pollutants__These come mostly from outside sources, such as car exhaust fumes and industrial processes, but they can be produced inside by deteriorating materials or inappropriate storage units and packaging materials (see below). Pollutants released
by a degrading material (e.g. acetate film suffering from vinegar syndrome) will affect adjacent materials in a storage area. Activities such as photocopying, general maintenance, or construction can introduce ozone, formaldehydes, ammonia, and other pollutants. Ozone and nitrogen dioxide are oxidising pollutants that are damaging to organic dyes, silver images and image binders.

**Dealing with pollutants** Most large commercial buildings and archival stores have filtered air conditioning that captures solid particulates as they enter the building. Internally produced particulates are also reduced by these filters as the air is re-circulated. Filters to remove gaseous pollutants from the outside are less common. Charcoal filters remove ozone and some other gaseous pollutants fairly efficiently, but they are less effective with nitrogen dioxide (NO₂). Potassium permanganate media can remove NO₂.

Closed storage units and packaging will act as a buffer, but it is important to ensure a level of air circulation in mi storage spaces to discourage mould growth and reduce the impact of any unchecked off gassing from vinegar syndrome and non-inert plastic storage materials.

**Storage units** Shelving must be strong and preferably made of coated metal. Depending on the timber used and its treatment, wood shelving can release gases and could be seen as a fire hazard. If mobile shelving units are used gentle handling is essential to avoid damage to fragile items. Shelves should be open to allow for free circulation of air – not only to avoid ‘pocket’ microclimates, but because plastic media ‘off-gas’. As film and sound collections tend to be heavier than paper, consideration must be given to floor loading and the height of racks. Health and safety risk assessment is a strong factor here, concerning the weight of items, loaded boxes and the sensible use of steps and trolleys. Similar size items requiring the same environmental conditions should be stored together even when this means splitting up a linked group of material.

**Storage containers for motion picture film – stacking and sealing** For long-term storage, films must be stored horizontally. Storing the cans horizontally evens the weight of the film over the whole surface area of the side of the film pack.

Metal or plastic cans are safe for film, provided that the containers are not rusty or broken. Plastic cans should be made of inert polypropylene or polyethylene. Neutral or buffered, lignin-free archival-quality cardboard boxes are also safe. Film containers—boxes or cans—should be convenient to use and should protect
the film from dust and physical damage. Containers should not include glues or additives that might have a chemical reaction with the film. Containers should provide a rigid surface for shelving and give some measure of fire and water protection.

Film is always giving off small amounts of gasses, and these need to escape. Cans or boxes should not be sealed with tape or enclosed in airtight containers e.g. plastic bags. At room temperature a sealed container will speed the deterioration of both acetate and nitrate film. As the ambient storage temperature decreases, however, the chemical reaction slows and venting makes less difference. When storing films in frost-free freezers, an airtight seal is necessary to protect film from the incursion of moisture (see above).

Storage cassettes and containers for videotape

Tapes should be stored upright, standing on their short edge, away from magnetic fields and bright light. They should always be rewound (back to the beginning) and returned to their containers after use. Tapes that are not re-wound after use, or those that are stacked horizontally instead of stored on edge, are subject to pack problems. Overtime, the tape pack can become uneven, exposing tape edges to possible damage, and making playback more difficult. Important information is held near the edges of magnetic tape.

It is helpful to spool tapes at low speed or run from start to finish before storage to ensure that the tape is correctly wound inside the cassette. Ideally tapes should be rewound or played at least every five years to reduce pack stresses.

In the case of open reel tapes, those not taped down at the end will become loose over time. These loose ends tend to fold over or deform. Loose tapes are also more susceptible to dirt and dust. Most archivists tape down the end of open reel tapes with a very small piece of acid-free removable tape. Non-archive-quality tape can dry out leaving a dust deposit. An alternative is to tie a thin strip of acid free paper round the whole reel — as with microfilms.

All cassette videotapes are designed to have a mode in which they can be recorded, and one in which they cannot. This is accomplished through a movable button or tab on the side or bottom of a tape whose position is detected by the video recorder. Often many tapes in a collection will come from the donor unprotected, and could be inadvertently recorded over; it is important that this is checked and where necessary, tabs should be removed by inserting a pen, small screwdriver or fingernail and pushing the tab out frontwards.
Storing and handling DVDs

CDs and DVDs should be stored in the same environment as video. The DVD format has a high degree of compression and has been found to be not especially durable. DVDs are made up of a reflective aluminium layer, a polycarbonate substrate, a dye layer and a clear lacquer. The aluminium layer is highly susceptible to pollution and the lacquer layer does not sufficiently protect the aluminium layer to prevent degradation through oxidation. Deterioration of this material is the primary cause for disc degradation and, ultimately, ‘end of life’ for the disc (assuming proper physical handling in the interim).

The life expectancy of optical discs depends on many factors, some controllable by the user, others not. Factors that affect disc life expectancy include the following: type, manufacturing quality, condition of the disc before recording, quality of the disc recording, handling and maintenance, as well as environmental conditions. It should be noted also that there is widespread concern that light has a detrimental effect upon optical disc formats, particularly on the recordable/rewritable varieties.

Although excellent for access purposes, as above, DVD is not recommended as a satisfactory format for long term preservation. Original master material should always be retained, even if in ‘deep’ storage or transferred for long term retention in a specialist archive.

Handling discs

1. Handle discs by the outer edge or the centre hole.
2. Use a non-solvent-based felt-tip permanent marker to label the disc.
3. Keep dirt or other foreign matter from the disc.
4. Store discs upright (book style) in plastic cases specified for CDs and DVDs.
5. Return discs to storage cases immediately after use.
6. Leave discs in their cases to minimise the effects of environmental changes.
7. Open a recordable disc package only when you are ready to record data on that disc.
8. Store discs in a cool, dry, dark environment in which the air is clean.

Do not:

1. Touch the surface of the disc.
2. Bend the disc.
3. Use adhesive labels.
4. Store discs horizontally for a long time.
5. Open a recordable optical disc package if you are not ready to record.
6. Expose discs to extreme heat or high humidity.
7. Expose discs to extremely rapid temperature or humidity changes.
8. Expose recordable discs to prolonged sunlight or other sources of ultraviolet light.

**Disaster planning**

Not surprisingly mi collections can be severely damaged by disasters such as fire or flooding (the most common problem) and also by extreme short-term conditions, such as periods of excessive humidity or heat.

Disaster planning should be a very high priority with staff trained and plans reviewed on a regular basis. Equipment and external services required for recovery should be regularly reviewed and maintained. Staff should be familiar with the elements of the plan, especially their own areas of responsibility and a 24-hour call-out rota should be in place.

Some basic elements of good collection management (e.g. regular inspection and condition reporting and having all items and their containers marked with a unique identifier) are critical to effective disaster planning and procedures. Each storage area should be covered by an easily retrievable shelf plan and it should have a 'grab list' of items clearly marked for prioritised salvage.

An essential factor of any disaster recovery is the ability to re-house the collection rapidly in a safe and stabilising environment. For mi collections this must mean cool, dry conditions. An important first stage of disaster planning is identifying partner archives, courier services and specialist commercial recovery services that can provide assistance at short notice. A list of suggestions is included in Resources.

The Australian National Film and Sound Archive website has a very helpful section on disaster planning for mi collections (see [www.screensound.gov.au/preservation/](http://www.screensound.gov.au/preservation/)). It offers a list of questions covering likely disaster scenarios that will support disaster planning or plan review.
Viewing and screening equipment

As noted above, original mi visual in all media is likely to be fragile and hugely vulnerable to mechanical damage. Original material whether newly acquired or part of a long standing archival collection should never be viewed or projected except under very carefully controlled conditions, by trained staff or volunteers, using well maintained equipment with which they are thoroughly familiar.

In general, most non-specialist collections will find it resource-effective to rely on sourcing viewing services from specialists on an ad hoc basis. In London, some viewing equipment is held by London Metropolitan Archives for the use of public sector archives in the region. Other regional film archives will similarly assist collections local to them.

Archives with larger mi collections that are committed to preserving and managing original material on site however may wish to develop and maintain a range of high-quality viewing equipment reflecting the range of mi media in their collection. This is no small undertaking. In the case of video and digital media, maintaining viewing equipment as each generation of media becomes obsolete will be the only way of accessing the content of your material on-site in its original format. You will need expert advice from an in-house or consultant technician with experience in using the equipment in question to ensure its continued safe running. Such technicians skilled in using older projection equipment are increasingly hard to find; your regional film archive will be a good starting point in finding someone suitable.

You can use eBay to source playback equipment but never assume that something you buy from a private seller will be in good working order. Make sure that the equipment is fully serviced by a qualified technician before use. You should also make sure that all your equipment is regularly cleaned and serviced.

⚠️ If in any doubt it is always safest to take advice from colleagues in a specialist mi archive or consult a specialist laboratory competent to deal with handling archive material and obsolete formats.
Standard viewing equipment includes:

**Film projectors**—Motion picture film projectors can still be sourced for all gauges, with 16mm projectors being by far the most common. Until very recently projection remained the standard method for screening all gauges of film. It is now being very rapidly superseded by digital media. However, it should be noted that standard projectors are not designed to handle archival material. Unless a projector has, for example, specially adjusted sprockets for handling shrunken film stock, projection can cause major damage. Projection should only be used when screening viewing copies to audiences, and never with original or master material.
**Film viewing machines** For 35mm and 16mm, viewing on editing tables (often called ‘Steenbecks’ after one of the leading manufacturers) is by far the safest method for individual researchers and staff to view film. Most specialist film archives have viewing tables and the in-house expertise to use them. The equipment needs careful handling by trained staff and should only be used for viewing master copies when absolutely necessary. A variety of editing and viewing machines for home use were commercially available during the heyday of the various smaller amateur formats and, if you can source and maintain these they can be used with extreme care for viewing 8mm, Super 8mm and 9.5mm.

**Videotape viewing equipment** At the time of writing, recording and playback equipment is still available for the most recent current video formats. Combined DVD/VHS playback and record machines (c.£200) are simple to use and allow VHS to be recorded to DVD at the touch of a button. This can be safely used for viewing. Video projectors are also still quite widely available, though rapidly being superseded by digital projectors. The cost of good, specialist video equipment (e.g. DigiBeta) can be high. Equipment for most obsolete formats is being preserved and maintained in the larger mi archives and some specialist laboratories. For some older broadcast quality formats only a few machines are still extant, usually in specialist video and television archives. Often, they require specialist engineering skills to maintain.
5

MAKING COPIES FOR PRESERVATION AND ACCESS
Access can be defined as any process that supports sharing the content of mi collections – or an understanding of mi media – with any section of the public. Depending on the resources and mission of the archive, this might range from simply making material available on site to researchers, through screenings and outreach programmes, to making material available for streaming or even download via the Internet.

In this section we will discuss how to decide on a suitable approach for your archive and collection.

Because of the inherent instability of mi media, preserving mi collections includes

- conservation of original material as master and artefact
- the generation of high-quality intermediate copies from which subsequent access copies will be raised; in the context of digital this is sometimes referred to as a ‘mezzanine’ format
- creation of ‘access’ copies – nowadays generally in a compressed digital file format.

⚠️ Before investing time and resources in the generation of either preservation or access copies of any material a holding archive should make every effort to discover whether preservation and/or digital copies of the material might already exist elsewhere. (See Resources for information on the major national and English regional archives.) In a sector with limited resources, it is essential to avoid duplication and to share the results of work already achieved wherever possible.
Preservation and preservation ‘master’ copies for film

Where material has been collected by an archive for preservation, the objective is to ensure that it remains available indefinitely for future generations to use and enjoy. As copying is rarely without loss of quality or information and the particular nature of specific moving image media is integral to the viewing experience, the most original, complete and best quality item should be selected for preservation. The preservation material should be carefully stored, protected from disposal and have its integrity maintained. It should be handled as little as possible to prevent mechanical damage, and handling for conservation or access should be carried out with due care.

To minimise risk to the original, traditional best practice requires the generation of a preservation master copy in a format that captures the essence of the original material as accurately as possible – copying a film onto film, for example. As an alternative, some archivists now see digital scanning as a very acceptable preservation path for 35mm, 16mm prints and smaller gauge film. Scanning enables high-quality restoration work, and has recently been used to excellent effect for some high profile feature films.

Film-to-film copying and digital scanning, however, are extremely costly, and the creation of additional film prints places extra pressure on the limited availability of specialist storage. The popular workable solution, therefore, is long-term passive preservation of film materials at low temperatures and humidity, and the creation of preservation ‘intermediate’ copies not on film but on Digital Betacam (‘DigiBeta’), HD or digital files. These do not capture the original material without loss, but are high-quality, affordable and easily used for the creation of additional lower-quality viewing copies. Each format has its pros and cons:
<table>
<thead>
<tr>
<th>Quality</th>
<th>DigiBeta</th>
<th>HD Videotape</th>
<th>Digital File</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The least compressed of all digital video formats; broadcast quality</td>
<td>Current production format and preferred by broadcasters licensing clips; generally only recommended for materials originating on 35mm or professionally-made 16mm*</td>
<td>Quality dependent on type and size of file chosen</td>
</tr>
<tr>
<td>Cost</td>
<td>DigiBeta tape costs in the region of £12 – £15 per hour depending on brand and quantity purchased</td>
<td>Currently an expensive option</td>
<td>Digital file should always be made as part of any transfer; additional costs dependent on choice of storage</td>
</tr>
<tr>
<td>Security</td>
<td>Physical item, subject to damage and decay</td>
<td>Physical item, subject to damage and decay</td>
<td>May or may not have physical carrier; digital files subject to corruption; ease of distribution adds convenience but diminishes security</td>
</tr>
<tr>
<td>Storage</td>
<td>Requires stable temperature and humidity (see Chapter 4)</td>
<td>Requires stable temperature and humidity (see Chapter 4)</td>
<td>Can be stored on computer or hard drive; ideally transferred to LTO data tape kept in specialist facility with automatic back-ups and regular format migration</td>
</tr>
<tr>
<td>Playback</td>
<td>Viewing equipment available but expensive</td>
<td>Viewing equipment expensive</td>
<td>Allows for range of computer-based viewing options; convenient for printing new access copies</td>
</tr>
<tr>
<td>Future proof?</td>
<td>Experience shows obsolescence of proprietary formats is inevitable within 10 – 20 years (cf vhs)</td>
<td>Currently in use for new productions; long-term future unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

*Other formats can of course be transferred to HD, but as their picture quality is lower, they do not present enough information to justify the cost of transferring to this higher quality format

Making copies for preservation and access
Each archive should consider the nature of the original materials, planned usage and available financial and storage resources in the context of their overall approach to preservation in order to select the most appropriate strategy. While current digital technology has advanced significantly in recent years there is always a theoretical loss of information through any copying process. However, for most non-mi specialist archives transfer of original material to specialist mi storage coupled with creation of mezzanine formats provides an acceptable solution. The full range of digital formats and process of commissioning digitisation work is discussed in more detail below.

As always, your regional film archive will be happy to discuss options with you and offer further advice.

**Preservation ‘master’ copies for video**

Where a master is being made to preserve content from video formats it needs to be made on to a current format of equivalent or greater quality. Recent standard practice for standard definition videotape has been to transfer to DigiBeta as this is broadcast quality, and the least compressed of digital video formats. As noted above however, DigiBeta is already being superseded by HD in broadcast media and is not expected to be a current format in 10 years time. To avoid simply exchanging one obsolete tape format for another, the better choice for making preservation master copies of material that originates on video is therefore transfer to high-quality digital file format.

While wherever possible original master film material should be kept by default, many specialist film archives no longer apply this rule to material that originates on video. Video formats, even when well stored, do not have the life expectancy of film. Video tapes are bulky to store (particularly open-reel broadcast formats such as 1” and 2”) and offer less as artefacts than do reels of film. In archives where the decision is made to dispose of original master video material, a representative five per cent selection of the originals are typically retained as a viable volume for future reference.
An archivist’s view

Transferring to HD from old video masters, e.g. 1”, doesn’t improve quality, raises issues of format (4:3 to 16:9) and results in significant files with a lot of empty data (increasing storage costs). If I were to make a recommendation it would be to avoid DigiBeta (it is a compressed format) and transfer to Standard Definition (SD) uncompressed files or lossless compressed in an AVI format. A full backup copy of all files will need to be maintained. We are currently going a step further with our archive and its strategic partners, as we will also hold a further backup at another location (on further disks or in the Cloud).

Restoration

Restoration goes beyond the physical copying of original materials surviving within one archive. A restoration project will often attempt to locate material from across a number of organisations in the attempt to recreate a specific, ‘complete’ version of the material. Ideally this involves comparing all known surviving source materials, piecing footage together into the order suggested by production records and exhibition history and, in some cases, enhancing image and sound to compensate for past damage. Film and video restoration always involves duplicating or digitally encoding the original artefact.

Digitisation

User access to archival moving image should always be to viewing copies (also known as ‘surrogate’, ‘reference’ or ‘access’). Until recently archives have commonly generated viewing copies on video. Many archives will already hold video copies of much or all of their motion picture film holdings – made in various formats and not always to the highest standard. These provide a level of access to otherwise unviewable material, but as video formats become obsolete and video players increasingly difficult to obtain or maintain, it is critical to plan for digitisation.

Digital access is key to allowing people to enjoy their film and video heritage now and in the long term. As the capacity and universality of digital media increases and the costs of digital
copying come down, there is an increased expectation that material will be made available in digital formats. Archives which own video copies of their motion film holdings may wish to consider a ‘quick fix’ solution of buying a domestic combined DVD/VHS playback and record machine to convert video holdings to DVD (see Section 6), but properly ‘digitisation’ refers to the creation of a digital format directly from original materials.

The quickest and cheapest lab-based method for producing a digital viewing copy from film is ‘telecine’. This is a real-time transfer system. There are several commercial or non-commercial transfer houses that will do this work, some capable of dealing with Standard 8mm, Super 8mm, and 9.5mm as well as 16mm and 35mm (see Resources). When inviting quotes for transfer services it is important to specify the current format and condition of the material and to be clear about the digital format(s) in which you wish to receive the output (e.g. digital files, DVD); further guidance on commissioning telecine work is given below.

Most places can offer a digital file for direct loading into a hard drive. It is always advisable to request a digital file as well as a physical format to enable easy distribution and copying. The great advantage of digital files is that they can be accessed through a PC and are easy to distribute through the Internet or on DVD. However, even a short film is likely to create a very large digital file. Ultimately a Digital Mass Storage system may be the most economic solution for the long-term management of a digital moving image collection. Commercial facilities offer digital storage solutions; local public organisations (archives, museums, libraries, HE institutions) may offer digital storage for other not-for-profit organisations.

Best practices in digitisation are still being developed and will continue to evolve as technologies change and hard disc and solid-state storage becomes more affordable. An excellent resource for practical applications and costs of digital storage technology for moving image collections is available online at www.prestospace.org/.

Telecine can be an expensive process, particularly for older formats. One way to reduce the cost is to process bulk orders. If your own archive has only a single item or a small amount of material to transfer, you may want to consider approaching other organisations to discuss a co-operative approach. London’s Screen Archives regularly brokers such deals across its network; your regional film archive may well be able to help similarly.
Digital formats

‘Digital’ refers to a bewildering array of tape and file formats. Digital technologies evolve very rapidly and the selection of the best format for any given situation is complex. Instead of publishing guidelines here, we recommend considering the questions given below and then consulting the most recent version of the Screen Heritage UK Digital Media Standards Guidance alongside discussion with your regional film archive.

Planning for digitisation:

• what is the format and condition of the original material?
• do you have a preservation master copy?
• are you digitising primarily for preservation, for access, or both?
• how significant is this material? (The Significance Assessment tools in the Screen Heritage UK Collections Care Toolkit will help you clarify your thoughts on this)
• what money do you have available?
• do you have other digitised material in your collection? What format(s) is it on?
• where do you want to use your material? e.g. on small screens within the archive, online, projected on cinema screens, for licensing to broadcasters, on commercial DVDs, in creative film projects
• are you digitising material for a specific partner or licensee? Do they have particular requirements?
• are you digitising one or more items on a one-off basis, or is this part of a wider plan to digitise your collection? When might you expect to be able to repeat this work?
• to what in-house digital expertise do you have access? e.g. technology manager familiar with manipulating a range of digital files
• how will you store any digital tapes?
• how will you store any digital files? Do you have money to purchase hard drives or space in an external digital storage facility?
• are there other collections with which it would be advantageous for yours to be interoperable? (The Screen Heritage UK guidelines aim to maximise the interoperability of moving image collections in the SHUK network).

Digital copies made for access are expensive and should be made to an appropriate standard. They should also be treated with due care and protected against loss or degradation.
An archivist’s view

Some cautionary notes on digital copying

Conventionally, archivists work to ensure the survival and protection of an original carrier on the shelf. Because there is no permanent carrier for digital content, they must also engage with the concept of eternal migration from one carrier to the next as format and hardware obsolescence becomes ever more rapid.

The big problem of copying digital material is that there is the possibility of loss of information. Digital systems are compressed, but it is important to aim for the least compression possible. Copying to a DVD from master tape results in steep compression – throwing away much information. DVDs are for access, not as masters for keeping material.

As new systems with higher quality become available, material continues to be transferred from format to format. Film can now be scanned to HD with little loss: the scanning takes slightly longer than real time and is ‘progressive’, meaning each frame is recorded in total instead of interlacing as in the PAL system of television. The resulting files are kept on HDCAM or HDCAM SR (‘Super Resolution’), videotapes made especially for HD recording. If possible always create two master copies and store them in separate places, with viewing copies stored in yet another location.

If in any doubt it is always safest to take advice from colleagues in a specialist archive or consult a specialist laboratory competent to deal with handling archive material and obsolete formats.
Working with film laboratories

With archive film, it is always advisable to use a specialist facilities house with a record of high-quality work; see Resources for recommendations. You should brief them with information about what you have and what you want done with it. If you are unsure about format or condition your chosen company should be happy to carry out any necessary identification for you. Charges for work are typically per foot of film for printing and processing and per hour for labour. For telecine, the charges are usually based on the running time of the film.

The facilities house may ask if you require 'one light' or 'best light' transfer; this is the standard procedure, and means that the film is transferred using a single colour setting based on the first scene. The alternative is scene-by-scene colour-correction. This would be a very expensive option and is rarely used.

If the film you wish to have processed is suffering from vinegar syndrome, it is important to tell the film laboratory so that they can ascertain the extent of the damage. It may be that they reject the acetic film and recommend an alternative laboratory with specialist equipment.

You may consider requesting some of the following services:

**Repairs, splicing and cleaning** Repairs and splicing should be done for you as a matter of course, but you should nonetheless specify that you require this service. Motion picture film breaks are often caused by dry or faulty joins (splices) or projection damage and may be repaired with a film splicer of the correct gauge and, where necessary adjusted sprockets for shrunken film. Other kinds of mechanical damage include tears, lifted emulsion and sprocket hole rips. Special, optically clear adhesive tape supplied for film splicing should generally be used for temporary repairs only, prior to making copies. Laboratories can also make permanent 'cement' joints. Both tape and 'cement' splicing require skill and practice and can result in the loss of film frames. Modern polyester stock must be spliced using special heat welding film splicers, for permanence. Film may also benefit from cleaning to obtain the best picture quality; you should specify that you require this service.

**Re-canning and cores** If the current can is rusty or broken, it is a good idea to use the opportunity of sending film to a transfer facility to have it re-canned. This may well be cheaper than buying new cans yourself. Old cans often carry archival information and should...
be kept; you should specify that you wish to have the original can returned to you. You can also request that your film is transferred onto plastic cores for safe storage.

**Wet-gate printing** Scratches and abrasions are almost always present on older film materials. The damage may occur on either the film’s base or its emulsion side. With standard ‘dry printing’, some defects can be carried over in duplication and appear on the new print. The ‘wet-gate’ process reduces this problem. During printing the film is temporarily immersed in a solvent, which reduces the appearance of scratches in the new copy. Often there is no extra cost for wet-gate printing and it can have excellent results, although the film image produced loses a small amount of sharpness. An alternative (more expensive) option is to remove scratches digitally at a later date.

**Grading and colour-correcting** When a film is made, the lab which prints it will automatically have undertaken grading and colour-correcting. Grading means balancing the brightness so there is no glaringly bright or dull shot. Colour-correcting means balancing the colours. If a series of shots of a sunlit beach have been taken, for example, a shot taken against the sun may be of a different brightness, or may have a different colour cast. This can be corrected so that all shots appear to have been taken at the same time. When making a new print, a lab will automatically grade and colour-correct. This has to be undertaken with care, as it is not always clear with archive films what the original would have looked like.

**Digital image and sound restoration** For all audiovisual media, dirt, scratches, and other imperfections in the original can be corrected digitally once the image has been scanned to a digital file. Similarly, deteriorated sound quality can be digitally re-mastered and anomalies corrected. How much or how little work you commission will depend upon budget, but also upon your archival code of practice. Digital restoration can include many things, from correcting faded colour to removing visual imperfections, re-recording the sound track and steadying images – potentially losing the original film feel.

**Redimensioning** This is an invasive process and only appropriate for severely shrunken film. Through a chemical treatment affecting the plastic, the shrunken film is brought to a state closer to its original dimensions. The treated film is then fed through the printer. As the chemical reaction wears off, the film reshrinks.
Redimensioning may permanently damage the original and should only be used in extreme cases.

**Optical printing** Optical printing has long been used to copy film to film in a format different from the original and has become a common tool for transferring 8mm and Super 8mm to 16mm. Unlike contact printers, which print by direct physical contact between the master and raw film stock, optical printers work like projectors. The printer projects the image through a lens and copies it onto the unexposed stock, frame by frame. Optical printers with adjusted sprockets are also employed for duplicating shrunken film. This service would only be employed for making preservation master copies of film onto film.

**Stills** Having a still image (or ‘frame enlargement’) from your film can be very useful in aiding identification, for sharing with researchers and in publicity. There are two ways this can be done. The best quality is produced by scanning or taking a photograph of an individual film frame, but this method is undeniably costly. For most purposes, a ‘screen grab’ from a digital copy will suffice and a facilities house can be commissioned to do this for you. You can also do this yourself; many PCs now come with simple movie edit packages and these usually have an easy-to-use frame grab facility built in, producing image good enough for print reproduction. Care should be taken in selecting suitable images which represent the film well and engage the viewer.

**Titling, logos and watermarking** If creating digital copies of your film for access, you may wish to consider including an identifying title, logo or watermark. London Metropolitan Archives, for example, place their name and logo at the front of each of their films on YouTube (a selection is available at [www.youtube.com/londonsscreenarchive](http://www.youtube.com/londonsscreenarchive)). For older amateur films, it can be particularly useful to add a title screen to help orient the viewer.
An archivist's view

Can you telecine a film negative?

On a number of occasions I’ve been asked if you can telecine a film negative. Here's a practical opinion that addresses the need to get a neg onto a useful convenience format for a non-specialist archive – it doesn't obviously address the concern about securing longevity.

In my opinion – not a problem at all.

On the Plus Sides: The negative is by far the best and most original source material and will give the best image for the transfer. If it is being scanned at a facilities house then it is likely it will be on a sprocket-less system so I wouldn’t be worried at all about mechanical damage. I have telecined oodles of negative for archives and institutions and the picture quality can be stunning. As long as it's not done at a back street one-hour-photo centre that projects the image on to the wall and points a camera at it then it should be fine.

The Downsides: The only hiccup comes when telecineing soundtracks from a negative. The contrast in the track is so harsh that is gives an awful reproduction – it's always ideal to take a soundtrack from a pos not a neg. If you are using a commercial firm to do the transfer (as opposed to a film archive) then obviously you need to be happy you can trust them with your film as this is your original, master material. Ideally you should stay with your material and sit in on the transfer. This helps build a relationship, too, rather than just a job sheet.

A practical rule is that negs are for very limited use in copying machines and not in projectors – a telecine machine is just another type of copying machine.

That's the practical advice – the archivist in me says if you can afford it then you should make a new print as well whilst the machinery and knowledge still exist.
INVENTORY, CATALOGUING AND SUPPORT DOCUMENTATION
For all archive, library and museum collections, rich, full and complete catalogues are a vital tool for research and public access. Cataloguing moving image collection is demanding and time consuming, but essential to any organisation that wants to see its collections used, valued and understood.

It is impossible to catalogue mi material fully until viewing copies have been produced or safe viewing conditions provided for original material. As indicated in Chapter 2, it is possible to glean very useful information for inventory purposes from scrutinising the first few frames of a motion picture film using a powerful magnifying lens and a light box. The original film container, leader, and reel may also hold valuable information. Beyond being able to identify their format (see Chapter 3) videotapes reveal very little until they are viewed. For both film and video, however, information is usually available from the original cans and packaging in which material is received and of course, by asking appropriate questions of the depositor at the time of acquisition. Be sure to copy down any titles, dates, or production data found and save notes housed in the video box or film can. Always remove such material from the box or can – mark it clearly with a unique identifier and store separately under archival conditions suitable for paper. The container's label may also carry information, but use it with caution. Cans and boxes are frequently reused or switched by accident.

**New National Standards in MI Cataloguing** In 2009, the Screen Heritage UK programme (SHUK) published its Documentation Best Practice Guidelines and Data Standards Framework. This outlined the minimum data required to catalogue a moving image item. This was further refined by the SHUK partners, including the BFI and all national and regional film archives who now share a common standard of 14 essential fields, with additional fields added by individual archives according to local requirements. This has enabled the creation of online access to the combined catalogues of all participating archives, dramatically improving public access to the UK’s moving image heritage. This search facility is delivered through the existing websites of the SHUK partners.

All organisations holding mi material are encouraged to adopt this new national standard. Only records which include the 14 SHUK fields can be included within this union catalogue of all public film archive holdings. A chart detailing the full list of the fields and their contents used by London’s Screen Archives is available on the LSA website: www.londonsscreenarchives.org.uk.
<table>
<thead>
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<th>Field</th>
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<td>Title</td>
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<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Series</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Date</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Original format</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Sound</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Colour</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Length</td>
<td>Yes, if no duration</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Duration</td>
<td>Yes, if unavailable provide length</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Credits</td>
<td>Yes, if applicable</td>
<td>Yes</td>
</tr>
<tr>
<td>9a</td>
<td>Production company</td>
<td>Yes, if applicable</td>
<td>No</td>
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<tr>
<td>10</td>
<td>Cast (any on-screen contributors)</td>
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<td>Yes</td>
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<td>11</td>
<td>Keywords</td>
<td>Yes, if available</td>
<td>Yes</td>
</tr>
<tr>
<td>11a</td>
<td>Genre</td>
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<td>Source</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

14 SHUK Metadata Fields
Archives, museums, and libraries will find that the fields used in their cataloguing standards and software can contain almost all the information captured by the SHUK and LSA fields. In some cases, the field labels match across the different standards (such as title and date). Mapping across other fields will depend on which fields in your cataloguing software you use and how you use these fields in cataloguing other materials. In many cases the moving image fields will be combined into fewer fields in your catalogue.

An archivist’s view:

Cataloguing Moving Image in Non-MI Catalogues

Inserting the moving image information into their own catalogues will reflect how repositories use those fields in cataloguing other materials.

To take an archive example, five of the six principal ISAD(G) (General International Standard Archival Description) fields are reflected in the moving image field lists. ‘Reference code’, ‘title’, and ‘date’ map across exactly from the ‘source number’, ‘title’, and ‘date’ fields, while ‘extent’ and ‘creator’ use information from fields with different labels. (The sixth principal field, ‘level of description’, does not have an equivalent as the LSA catalogue is not hierarchical.) Much of LSA’s technical information – such as format, colour, sound, length, duration, manufacturer, technical notes – could be entered as a long string into the main ‘physical characteristics/technical requirements’ field in ISAD(G), or as shorter strings into fields under this heading, depending on the cataloguing software’s choice of fields. Format is an interesting case because it might be useful to note format details in the ‘extent’ field for quick reference and more nuanced sorting. For example, rather than simply stating ‘1 film’ or ‘1 videotape’, the extent could specify ‘1 Super 8mm film’ or ‘1 helical scan open-reel videotape’. (ISAD(G) can be downloaded at www.icacds.org.uk/eng/ISAD(G).pdf.)

For museums the best approach is likely to be comparing the required moving image data against the ‘Units of information’ provided by SPECTRUM, the UK national standard for collection management and documentation, published by the Collections Trust. SPECTRUM is available to download at www.collectionstrust.org.uk/spectrum.
Expanding your catalogue to reflect external expertise

Accessible mi collections provide a hugely rich resource for public engagement. As well as enlivening and providing valuable contextual information to support object and paper-based collections, screenings will trigger memories and informative comment from almost any target audience.

Capturing audience responses will provide a rich resource of contextual information that will help the museum, archive or library, future generations of staff and external viewers to understand the layered meaning and significance of mi material. As well as capturing factual information (the names of buildings, people etc), individuals’ and community groups’ emotional and associative responses to material can be very revealing.

Organisations should consider using Revisiting Collections, an innovative methodology developed by the Museums, Libraries, Archives Council (MLA) and Collections Trust to support museums and archives to open up their collections for scrutiny by community groups and external experts, to reveal and record ‘hidden histories’ and to build and share a new understanding of objects and records. Revisiting Collections provides two toolkits: Revisiting Archive Collections and Revisiting Museum Collections. For further information see: www.collectionslink.org.uk

The guided exercises for assessing the significance of collections to a range of different groups in Screen Heritage UK Collections Assessment Toolkit may also be useful in this context. This is available online at www.londonsscreenarchives.org.uk.
An Archivist’s view

Approaching Content-Level Cataloguing

Start With What There Is: Existing Records – the Catalogue
It’s likely that there is some kind of pre-existing record for the moving image item you are looking at, even if it only includes data like a date of acquisition, donor name, or an improvised title. Some may not even have these, but some may have much more and it’s all potentially useful. One caveat however is that it may not all necessarily be correct, it’s easy for previous best guesses and false associations to gain the patina of authority years after they were made. When you view the moving image item itself, keep previously recorded information in mind, but also be prepared for what you see to be something different.

Existing Records – Donor information
Some useful information may not actually come in the form of a record, but in materials related to the donation of the item. At the very least, a record of an item’s acquisition should suggest the date before which a film must have been shot. Correspondence regarding the donation may include some indication of the moving image content, why it was made and by whom. Occasionally there will be more:

A letter dated 1970 from A.C. Toms, donor of the film ‘Harrow Hospital Carnival Procession and Pinner Fair’, to Harrow Archives reveals that he and a friend shot the film in the early 1930s. Some accompanying notes (perhaps by a member of staff) give the names of streets on which various scenes were filmed (which otherwise may have been hard to identify) and that the firemen appearing in the carnival are from the Wealdstone Fire Brigade. These are all great additions to the record.

People
You won’t be the first person that has ever had to deal with these films. You may be fortunate enough to meet the filmmaker or donor yourself; this is an opportunity to mine them for information. If you can view the film(s) with them and capture details as they view the material for perhaps the first time, or the first time in many years, you have a unique opportunity to add value to the cataloguing record.

The films may have entered the repository for the first time before you did, but at some point the repository acquired these films and the person who dealt with it at the time may still work at that repository and be able to tell you something
about the films that the films themselves cannot. Even when the films were acquired before any of the current staff began their employment, subsequent relations with donors, others related to the films, or ‘experts’ may have revealed information that only a staff member knows. Even the smallest fragment of information may help to contextualise the moving images, providing essential clues towards information such as locations, the identity of those featured or the reason why a film was made at all.

Usually the staff will be a fount of useful information, even if they have not had any previous relations with the particular films at all. The films may form part of a larger archive including paperwork, photographs and such-like, that the staff do know about and they may be able to share useful data regarding a company or individuals that may bear fruit in understanding the films.

Sometimes, a word with an 'expert' or enthusiast can bring a set of eyes to a film that will see what you cannot. Where you might write down “steam locomotive on a station platform” a local train buff may tell you exactly what engine it is and which platform at which station it has paused at – information which might further tell you the latest year in which the film could have been made. Those with eyes for the built environment, sports, country practices and any number of other niches might provide a similar service.

The Physical Item__It can be easy to see the moving image item as just a carrier medium for the moving image content we are interested in, but much can often be gleaned from its material form. When it arrives in a box or a can, these may bear inscriptions – penned or pencilled on, on sticky labels, fading tape. These may be unclear, near indecipherable and cryptic – but note them down. When you view the moving image item itself, the odd gnomic word or abbreviation may suddenly make sense. A container may carry other information; many films remain in the box they were posted back from the developers in and carry names, a postal address, perhaps a postal mark with a date, a stamp which might date the item, the date a film should be developed by printed on the side. Inside the container a film may be on a metal or plastic reel; again, check this over for writing, which may be scratched into the surface. A film may have leader, spliced before the moving image starts, and this too may bear writing, penned or scratched into it, not readable when a film is run, only when inspected. The moving image part of the film might tell a physical story too, where splices
may indicate material filmed at different times joined together. Some film manufacturers (like Kodak) have symbols, ‘edge codes’, by the sprocket holes, which indicate the year the film stock was produced.

**The Moving Image Content**

Time permitting, it’s generally worth watching something all the way through once before you start taking notes. This will let you experience it as a complete item, get a feel for its natural pace and will generally make more sense. A second viewing, stopping to make notes and capture details, can follow this.

A film with commentary may use unfamiliar names that take a few hearings to make a good guess at. Films with and without commentary may include pieces of on-screen text that can be useful to note down. These may be credits at the start and or end of the film, or ‘intertitles’ (frames of text that come between different shots and explain them), but they also include incidental pieces of text seen in the film – street signs, shop names, posters and advertising etc. All may help locate and or date what you are viewing.

For example in the film ‘Sutton Carnival Procession’ from Sutton Archives a bus passes by quickly and incidentally in one shot. Reviewing that scene at a slower pace, it is discernible that the bus carries advertising for ‘The Calendar’ at the Lyceum Theatre. A check in the online archive of The Times quickly reveals that this play opened at the Lyceum on 19th April, 1930 and was replaced by another play ‘Traffic’ by July 24th the same year. So it is a fair bet that this film was shot between those dates. Young women with spring flowers in their hair give an impression of May Day (and a decorated car has ‘Mayfly’ written on it), but it’s also interesting to see women carrying banners reading “Learn to Think Imperially”. This quote from Joseph Chamberlain suggests another event later in the month: Empire Day. This is compounded by others dressed as Britannia and in costumes associated with peoples across the British Empire. All of which points us to a clearer date: Saturday 24th May, 1930.

The milieu of the action in the film can be an important guide to its interpretation. Some elements of what is seen, like the style of clothes worn by people or the type of vehicles driven, can give a general pointer towards the date of the film; the architecture of houses and the general character of the built environment can help locate what you are seeing. Buildings have a relative degree
of permanence and perceived significance, so ecclesiastical and civic buildings are both more likely to remain, looking similar, and to have been recorded and photographed elsewhere. Fixed elements such as canals, railways and railway bridges can really begin to limit the number of possible positions the action is taking place in. Other public transport seen can also be useful: bus, tram and trolleybus numbers can indicate routes. Identifying the old course of the number 6 bus you see pass by in a film could suggest where exactly it is passing.

If more than one item comes from a single collection, or is on a single theme, it’s worth watching them together. You may recognise faces and places appearing again, helping you identify them, especially where they are named in one item and not the other!

Secondary Sources By now, you’ll have seen the physical item, the moving image content and gathered information from previous catalogue records and other people. Some things may not make sense and you’ll have some notes to follow up on.

Use the repository’s resources, they will have specialised material related to their area of collecting: books, magazines photos etc. Local history libraries can also be useful. Odd names you came across in the films are also worth searching for in the repositories catalogue/database. Shop names seen in films can be checked in Post Office and Kelly’s trade directories, which may reveal street addresses.

Of course, many online resources can also help – names can be looked up using search engines, more directed searches might be made in databases such as the National Register of Archives. Online mapping services can be invaluable – Google Maps and Bing Maps, especially in their ‘satellite view’, can help identify parks, odd street shapes, and junctions. Google Street View is incredibly useful for checking guessed locations (and how they look now-ish) against what you have viewed. Other online photo resources can help to identify buildings, such as www.francisfrith.com and www.gettyimages.co.uk/EditorialImages/Archival.

Also useful, but with more care, are: www.flickr.com, and Google Images. Judicious searching with Boolean operators will help to limit the returned results.

Names and events shown may usefully be searched for in the Times Digital Archive, the searchable facsimile archives of the Guardian, the Observer, the Illustrated London News and UK Press Online (searchable facsimiles of the Daily Mirror,
Daily & Sunday Express and Daily Star). All of these should be available through library membership. The wealthier, titled and more famous appearing in the moving images may be found in Who Was Who and the Oxford Dictionary of National Biography. Information gleaned in these sources can help provide context and shape further researches in libraries and archives.

**Recording Locations** The controlled list of geographic names provided by the Getty Thesaurus of Geographic Names (www.getty.edu/research/tools/vocabularies/tgn/) supplies a common vocabulary for describing location that aligns our indexing with national and international colleagues and assists the future interoperability of our collected data with others. But Getty drills down so far and no further. To really place these films we can and should do more.

Viewing the 1950s compilation film [Various scenes including Metropolitan Borough of Hackney housing estates] from Hackney Archives, I index the locations of London, Hackney, Homerton and Clapton from the Getty hierarchy but in the description I also note not only the housing blocks featured (Mapledene Estate, Lenthall House, Elm House, Maury House, the Somerton Estate, Florence Court and Tower Court) and other significant or distinguishing buildings (Hackney Town Hall, the Middleton Arms pub and Millfields Power Station) but also the streets and greens which locate the film within the indexed areas: Homerton Road, Mayfield Close, Middleton Road, Queensbridge Road, Shacklewell Road and Clapton Common. A free text search can find all these names, and because they have all been noted many more searches will return this film in results, the number of entrance points to this film has been multiplied, as has the value of the description. So we can think (and index) globally and we can also act (and describe) locally. This is essential to a regionally orientated collection, and valuable in any case.

This granularity of place better evokes the particularity of what has been captured, provides many more hooks to capture the interest and excitement of the reader and often provides supporting detail not necessarily obvious to the film’s viewer. And where you can’t identify a place for sure, but you have a feeling of where it might be, write that place down and put your uncertainty in a question mark in brackets following (?). If a future viewer disagrees and tells the repository, then you may have facilitated more accuracy in the record in future than if you had kept your hunch to yourself.
How to write this all up

When choosing how to describe what you have seen, you have of course to consider your audience – your choice of vocabulary and phrasing has to be comprehensible to the general reader, but where it features specialised activities you want to capture that too. This means your description may at times need some explanation along with it; sometimes this will naturally flow in the same piece of text, other times you may want to shift the explanation into a separate database field for ‘further information’. I would say that there isn’t a hard and fast rule for which you choose, but the overriding factor must be the readability of what you are saying. This isn’t just data about data, in many cases your text is going to be a surrogate for the reader actually viewing the piece of moving image in question, and it’s certainly going to be one of the key factors in the reader deciding whether they want to go on to view those moving images. So some interesting adjectives here and there won’t hurt, and recording some of the incidental details that caught your eye may also encourage the reader to become viewer.

So what is the Value of this?

It will come as no surprise to learn that I think that cataloguing this material is important. It is key to making our heritage accessible to newer and wider audiences; it provides reasons for why we preserve these materials. In the most extreme (but by no means uncommon) scenario we have, before cataloguing, a largely forgotten reel of celluloid or plastic cased roll of magnetic tape noted in a folder or on a card file by a few words and numbers giving the scantest indication of content, significance or provenance. After cataloguing we may have a title, a date, locations featured, an understanding of why it was made, and by whom for whom, the connections it has with other materials. We may have a unique visual record of past behaviour, activity and the changing face of the places in which we live, an illustrative aid to any number of other records, something that captures the imagination, an evocation of the past and an invitation to delve further and deeper.
7

RESOURCES
This section provides a guidance listing of resources available online at the time of writing (June 2011), including pointers to relevant professional support networks and a current list of service and product suppliers. Web addresses do tend to change rapidly; we apologise in advance if any of the content signposted here has moved or being taken down.

1.1 National and Regional Film Archives in the UK

British Film Institute (BFI)*
www.bfi.org.uk

The BFI promotes appreciation and understanding of the art, history and impact of film – where “film” signifies moving image works crafted to express an idea or tell a story – fictional, factual or artistic – regardless of production process, recording medium or distribution channel.

In April 2011, the BFI became the lead body for film in the UK. It runs a range of activities, funds and services and all sections of the BFI website are likely to be of interest. Its Researchers’ guide pages provide a one-stop-shop of resources and information to assist researchers and help answer queries – from identifying and contacting industry organisations to locating academic specialists, and useful websites. They include information on distribution, rights, historic and current UK legislation concerning film and television.

For information on the BFI National Archive, collections and acquisition policy: See: www.bfi.org.uk/nationalarchive/about/whatwedo/

Regional Film Archives

The English regional film archives preserve and offer access to the history of their regions as recorded on film, videotape and other moving image formats. Such archives contain works made by amateur and professional producers for cinema, television and other purposes. These institutions operate for the public good on a ‘not for profit’ basis and work collaboratively with each other and a wide range of local, regional and national partners including educational, exhibition and community and outreach organisations.

East Anglian Film Archive (EAFA)*
www.uea.ac.uk/eafa

Coverage: The East Anglian region, including Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk.
From September 2011, the combined catalogues of each of these organisations will be available by using a search function available through any of these institutional websites.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Coverage</th>
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<tr>
<td><strong>London’s Screen Archives:</strong>&lt;br&gt;The regional network (LSA)**&lt;br&gt;www.londonsscreenarchives.org.uk</td>
<td>LSA is a ‘virtual archive’ which works to support collection holders in the city and bring together their collections to tell the story of London as a region, on film. It is run by a Steering Group of 12 partner organisations and supported by Film London, the region’s strategic agency for film and media. Coverage: All 32 London boroughs and the City of London.</td>
</tr>
<tr>
<td><strong>Screen Archives South East (SASE)</strong>&lt;br&gt;www.brighton.ac.uk/screenarchive</td>
<td>Coverage: The South East region, including Brighton and Hove, East Sussex, Kent, Medway, Surrey, and West Sussex.</td>
</tr>
<tr>
<td><strong>South West Film and Television Archive (SWFTA)</strong>&lt;br&gt;www.swfta.org.uk</td>
<td>Coverage: The South West region, including Devon, Cornwall, Somerset and Dorset.</td>
</tr>
<tr>
<td><strong>Wessex Film and Sound Archive (WFSA)</strong>&lt;br&gt;www3.hants.gov.uk/wfsa.htm</td>
<td>Coverage: Central Southern England, including Hampshire, East Dorset, Berkshire and the Isle of Wight.</td>
</tr>
<tr>
<td><strong>National Screen and Sound Archive of Wales</strong>&lt;br&gt;www.archif.com</td>
<td>Coverage: To promote, preserve and celebrate the sound and moving heritage of Wales.</td>
</tr>
<tr>
<td><strong>Northern Region Film and Television Archive (NRFTA)</strong>&lt;br&gt;www.nrfta.org</td>
<td>Coverage: County Durham, Northumberland, Tees Valley and Tyne and Wear.</td>
</tr>
<tr>
<td><strong>North West Film Archive (NWFA)</strong>&lt;br&gt;www.nwftammu.ac.uk</td>
<td>Coverage: Cheshire, Cumbria, Greater Manchester, Lancashire and Merseyside.</td>
</tr>
<tr>
<td><strong>Scottish Screen Archive</strong>&lt;br&gt;ssanls.uk</td>
<td>Coverage: The nation of Scotland.</td>
</tr>
</tbody>
</table>

*From September 2011, the combined catalogues of each of these organisations will be available by using a search function available through any of these institutional websites.*
1.2 Other Key Organisations and Professional Networks

Archives and Records Association (Film, Sound and Photography Group)
www.archives.org.uk/si-fspg/fspresources.html and: www.archives.org.uk/images/Film_BPG.pdf

The Archives & Records Association is the principal professional body for archivists, archive conservators and records managers in the United Kingdom and Ireland. The ARA came into existence on 1 June, 2010 and is the result of a merger of the National Council on Archives and the Association of Chief Archivists in Local Government with the Society of Archivists (SoA). The Association maintains an excellent selection of resources and guides online including a Glossary of Cinefilm and Video Terms in Common Use and a Best Practice Guideline: Film and Sound Archives in Non-Specialist Repositories.

Association of Moving Image Archivists
www.amianet.org

AMIA is the international, US-based, membership organisation for those with moving image archive interests. Its website contains extensive information on film and video preservation. Under the heading “AMIA Information & Services” relevant sections include: “Storage Standards and Guidelines for Film and Video” and “Videotape Preservation Fact Sheets.” AMIA holds an annual conference and has a listserv, AMIA-L, which is an excellent source of information on media preservation.

British Universities Film & Video Council
//bufvc.ac.uk/

BUFVC is a representative body that promotes the production, study and use of moving image, sound and related media in higher education and research. The BUFVC promotes and supports the use of moving images and related media in UK higher and further education, and the use of moving images in research generally. It achieves this through delivery of services, databases, publications and a variety of other activities.

BUFVC’s Researcher’s Guide Online to Screen Heritage (RGO) is a directory of film and video libraries and archives and related documentation and artefact collections and is a comprehensive directory of the publicly accessible sources of material related to the history of moving images and sound in the United Kingdom. See: bufvc.ac.uk/archives

The Federation of Commercial Audiovisual Libraries International Ltd
www.focalint.org/

FOCAL is a not-for-profit professional trade association providing networking and marketing opportunities for content industry professionals and giving users easy access to over 300 members worldwide. It represents commercial film/audiovisual, stills and sound libraries as well as facility houses and interested individuals such as professional film researchers and producers working in the industry. FOCAL provides a central point for enquiries relating to the content and stock footage business, information, advice and contacts. Key services are the Footage Finder, Researcher Finder and Facility Finder – all online.

FOCAL International holds regular seminars and workshops on a variety of industry related subjects.

Film Archives UK
www.filmarchives.org.uk

Established in 1987 as the Film Archive Forum, an informal association for moving image archives in the UK, Film Archives UK is now a formal membership body representing film and television archives established in the UK for public benefit.
Film Archives UK works to promote and support strategies for development of the public moving image archive sector and engagement with audiences. Members share expertise in all aspects of film and television archive operations – the preservation of nitrate film, acetate film, and videotape; cataloguing and digitisation of content for access, the training and professional development of archivists; acquisitions policies; management of rights; co-operation with film laboratories and technical facilities, and contacts with foreign archives.

Members include the specialist national and regional archives in the UK already listed plus observer members: Archives and Records Association, BFI National Archive, British Library, British Universities Film & Video Council, Irish Film Institute, London’s Screen Archives, The National Archives, Northern Ireland Film and Television Commission.

Imperial War Museum
Film and Video Archive
collections.iwm.org.uk

The IWM Film and Video Archive was the first moving image archive to be established in the UK and holds some 20,000 hours of unique moving images. A large proportion of material has been transferred to the Museum from the Services as the Archive is the official repository for such public record films and collects any moving image relating to the history of armed conflict.

International Association of Sound and Audiovisual Archivists
www.iasa-web.org

Founded in 1969, IASA has members from more than 60 countries representing a broad palette of audiovisual archives and personal interests which are distinguished by their focus on particular subjects and areas, e.g. archives for all sorts of musical recordings, historic, literary, folkloric and ethnological sound documents, theatre productions and oral history interviews, bio-acoustics, environmental and medical sounds, linguistic and dialect recordings.

International Federation of Film Archives
www.fiafnet.org

FIAF, the International Federation of Film Archives, brings together the world’s leading institutions in the field of moving picture heritage. Its affiliates are the defenders of the Twentieth Century’s own art form. They are dedicated to the rescue, collection, preservation and screening of moving images, which are valued both as works of art and culture and as historical documents. When it was founded in 1938, FIAF had 4 members. Today it comprises more than 150 institutions in over 77 countries – a reflection of the extent to which preservation of moving image heritage has become a worldwide concern. The FIAF website includes online copies of the Journal of Film Preservation.

JISC Digital Media
www.jiscmail.ac.uk/jiscdigitalmedia

The JISC Digital Media mailing list provides a forum for those working with digital media (still images, moving images and audio) to discuss issues with their peers. By signing up to the list (name and email address required), you can draw on the knowledge and practical experience of over 500 members, who work within education and public sector libraries, galleries, museums and archives.

The Moving Image Society
www.bksts.com

The BKSTS – Moving Image Society is a film industry-wide membership organisation which organises seminars, conferences, training courses and special events. Of interest to archivists are their excellent wallcharts illustrating all significant film and video formats; these can be purchased directly from their site.
2.1 Suppliers – Equipment

Conservation by Design  
www.conservation-by-design.co.uk  
Sell archival film, video and audio cans, films cans and other useful equipment.

Other sources of film conservation supplies such as cans, bobbins (cores), leader, cotton gloves etc include:

PEC Video Limited  
www.pec.co.uk

The Widescreen Centre  
www.widescreen-centre.co.uk

Philip Rigby and Sons Limited  
www.philiprigby.co.uk

Specialists in film handling equipment such as splicers and rewinders.

Image Permanence Institute  
www.imagepermanenceinstitute.org/

The IPI's online store supplies a range of specialist environmental monitoring equipment including A-D Strips (dye-coated paper strips that detect and measure the severity of acetate film deterioration, a.k.a. vinegar syndrome, in film collections).

Acid Detection Strips are also available from Dancan International. www.dancan.dk

Research Technology International  
www.rtico.com/contact.html

sell a range of equipment useful to moving image archivists including specialist ‘Tapechek’ machines for cleaning and winding videotape.

Stanley Productions  
www.stanleysonline.co.uk

offer an extensive catalogue of audio and video products available to order online, and a comprehensive range of equipment repair, copying, duplication and conversion services including vintage video format transfers, Standard8 and Super8 transfers. Their website includes downloadable charts giving footage/screening time ratios and standard running times for various video formats.

2.2 Suppliers – Film and Video Transfer  
(Archives and Facilities Houses)

For reasons of space, we have listed here only those suppliers based in London. All of these offer competitive prices that are worth investigating no matter where your organisation is based; there are, however, many other smaller facilities houses based across the country who may offer you better local deals. For organisations outside London, you should in the first instance contact your regional film archive who will be able to advise you on qualified nearby suppliers, and in some cases may be able to carry out the work for you themselves.

If you are transferring film and video, make sure that the company you use has good experience of working with archival material and understands the need for careful handling and use. All the companies listed below have archival experience but you will still need to ensure you are happy with their approach and service; speak to your regional film archive about who they use or would recommend. All contact details are given below.

Companies with telecine machines that can accommodate most current and archival film gauges (including 9.5mm): BBC Resources, Prime Focus.

At the time of writing there are three film laboratories in the UK capable of dealing with film to film copying: Prestech Film Laboratories Ltd, Film and Photo Ltd and Deluxe Soho.

There are several companies now specialising in scanning films. Those offering film scanning who are capable of working with most film gauges include Prime Focus, Prestech Film Laboratories Ltd, and Deluxe Digital.

There are many obsolete video formats, and finding a machine to run them on for transfer is getting more difficult as time goes on. There are transfer houses that have older machines, but none of them have everything. It is best to shop around to see who can transfer what format at the most reasonable price. The South West Film and Television Archive have a very good collection of working machines for broadcast and other video tapes: see contacts above.

Video Ark have a good collection of domestic and other machines for early video systems.
**BBC Resources**
www.bbcstudiosandpostproduction.com
Room 5628, BBC Television Centre, Wood Lane, London W12 7RL
Tel: 020 8225 6000
Contact Tim Emblem-English, tim.emblem.english@bbc.co.uk

**Deluxe Digital**
www.deluxedigital.co.uk
20 Dering Street, London W1S 1AJ
Tel: 020 7493 9998
Contact John Pegg, john.pegg@deluxedigital.co.uk

**Film and Photo Ltd**
www.film-photo.co.uk
3 Colville Road, London W3 8BL
Tel: 020 8992 0037
Contact Tony Scott, info@film-photo.co.uk

**Film Preservation Centre**
www.filmpreservationcentre.com
Tel: 01646 687 737

**PresTech Film Laboratories Limited**
See: www.prestech.biz
Studio 16 – Aberdeen Centre, 22/24 Highbury Grove, London N5 2EA
Tel: 020 7226 5995
Contact Joao oliveira, joao@prestech.biz

**Prime Focus**
www.primefocusworld.com
37 Dean Street, London W1D 4PT
Tel: 020 7565 1000
Contact Martin Rogers, martin.rogers@primefocusworld.com

**Soho Film Lab (formerly Soho Images)**
www.sohofilmlab.com
8-14 Meard Street, London W1F 0EQ
Tel: 020 7468 8600

**Stanley Productions**
www.stanleyonline.com
Sales and Head Office:
147 Wardour Street, London W1F 8WD
Tel: 020 7494 4545
Repairs and Servicing:
55 Fleece Road, Surbiton, Surrey, KT6 5JR
Tel: 020 8398 7843

**The Video Ark**
www.videoark.co.uk
4 Glenfield Road, Ealing, London W13 9JZ
Tel: 020 8840 6293
Contact Lucinda Reeve, lucindareeve@aol.com

Resources
3.1 Further Information On Preservation – all/mixed media

Australia’s National Film and Sound Archive

Through its cutting-edge research and preservation practices, Australia’s National Film and Sound Archive is internationally recognised as a centre of excellence. The preservation pages on the archive’s website provide a rich resource of online information and advice. Areas covered include: Care for audiovisual materials; Preservation and technical research; and a glossary of audiovisual terminology. The site provides a clear, well written online Film Preservation Handbook that covers a wide range of preservation subjects including film construction, base polymers and decomposition; gelatin; image forming materials; damage to films; cold storage of film; preparation for long term storage; occupational health and safety; condition reporting; film identification and handling; and disaster planning.

Columbia University Libraries’ Preservation and Digital Conversion Division
www.columbia.edu/cu/lweb/services/preservation/audiosurvey.html

provides a comprehensive programme to prolong the existence and accessibility of the collections for current and future students and scholars. Developed in 2008, the Division’s Audio/Moving Image Survey (AVDb) is a Microsoft Access based survey tool to aid in setting preservation priorities for unique and rare audio and moving-image materials. It is designed to be used by surveyors who are not experts in audio-visual media, but who have a certain familiarity with broad categories. AVDb data is collected purely through visual inspection. No playback of any medium is required. The survey instrument and instruction manual is available for free download.

Image Permanence Institute
www.imagepermanenceinstitute.org/imaging/storage-guides

The US based Image Permanence Institute provides a very useful downloadable ‘quick reference’ document on storage requirements for a full range of audiovisual media, the IPI Media Storage Quick Reference, in PDF format.

Independent Media Arts Preservation (IMAP)
www.imappreserve.org

is a service, education, and advocacy organization that provides access to information about preservation practices and research. The IMAP website contains a full compliment of information resources on all aspects of media preservation.

Preservation towards storage and access: Standardised Practices for Audiovisual Contents in Europe (Prestospace)
prestospace.org

This European funded project and website is for archive owners and the public alike and provides a first point-of-call for information on audiovisual storage. The site provides information and management tools on digital technology for the storage of film, video and audio content and associated metadata. The information covers the state-of-the-art in storage technology, and includes forecasts of trends over the next twenty years.

The American Institute for Conservation of Historic and Artistic Works (AIC)
cool.conservation-us.org/jaic

is a national membership organization of conservation professionals dedicated to preserving art and historic artefacts. AIC devoted Volume 40 No. 3 (2002) of their journal TechArcheology: Journal of the American Institute for Conservation to the issue of installation art preservation.
3.2 Further Information On Preservation – mainly film

Key sources:

Image Permanence Institute
www.imagepermanenceinstitute.org/shtml_sub/downloads.asp
The US based Image Permanence Institute produce a downloadable calculator for calculating the life of all types of film stock in varying storage conditions.

National Film Preservation Foundation
www.filmpreservation.org/preservation-basics
The US National Film Preservation Foundation website is clear and helpful, although obviously with a strong US focus. The information reachable from the ‘Preservation Basics’ home page includes: why preserve film?; film decay and how to slow it; nitrate degradation; color dye fading; vinegar syndrome; and good storage practices.
All of these topics are covered in more detail in the National Film Preservation Foundation’s The Film Preservation Guide: The Basics for Archives, Libraries, and Museums which is available for free download from the site. The Guide provides basic information for non-specialist collection managers in clear, jargon free language. See: www.filmpreservation.org/preservation-basics/the-film-preservation-guide-download

Additional resources:

The Dangers of Cellulose Nitrate film
www.hse.gov.uk/pubns/cellulose.pdf
This 2003 Health and Safety Executive leaflet is aimed at private individuals and voluntary groups who have or find old film in domestic or other non-workplace premises. It gives advice on: how to identify cellulose nitrate films and negatives; why cellulose nitrate film is hazardous; how to recognise signs of decomposition; what to do if you have cellulose nitrate film; and contact points for information and advice.

The leaflet does not cover requirements for the storage and handling of a large number of cellulose nitrate films and negatives such as may be found in archives on commercial or industrial premises or in museums.
The government act covering legal storage of nitrate film can be viewed here: www.legislation.gov.uk/ukpga/Geo5/12-13/35

Film Forever
www.filmforever.org/
The objective of this web site is to provide simple guidelines for preserving motion picture film materials outside of specialised archives, with a focus on storage at home.

Kodak edge codes
www.filmforever.org/Edgecodes.pdf
The following table has been compiled by Robin Williams of the East Anglian Film Archive. Codes are located outside the perforations of Kodak motion picture film stock and refer to the date the film was manufactured. When possible, codes are taken from Eastman Kodak documentation. When Kodak lists are not available, alternative markings have been established by examining films with known dates.
An alternative chart is available here: www.historicphotoarchive.com/f1/ekcode.html
A very useful site run by Brian R Pritchard – Motion Picture & Film Archive Consultant – gives information on technical film history and types of film including: film length calculator; an historical listing of British film laboratories from 1914 to date; technical section with a well selected listing of downloadable articles on aspects of laboratory and archive work for international sources. www.brianpritchard.com/
3.3
Further Information On Preservation – mainly video

Key sources:

www.amianet.org/resources/guides/WheelerVideo.pdf

Among the helpful list of reference documents available for download from Association of Moving Image Archivists’ website the Videotape Preservation Handbook, by Jim Wheeler (2002) is intended to answer the questions of archivists, librarians, and others who have a collection of videotapes they wish to keep for many years. The guidelines offered touch briefly on each appropriate topic, but do not cover any topic in detail. (Refer to the appendix for sources of more detailed information.)

Magnetic Tape Storage and Handling: A Guide for Libraries and Archives by Dr. John W.C. Van Bogart

www.clir.org/pubs/reports/pub54

National Media Laboratory, June 1995 is a report jointly produced by the US Commission on Preservation and Access and the US National Media Laboratory, developed within the Commission’s Preservation Science Research initiative. The initiative encourages new techniques and technologies to manage chemical deterioration in library and archival collections and to extend their useful life. The report includes a lot of technical detail about tape based media and their potential for deterioration. There is a focus on audio, but much is of equal relevance to video.

www.arts.state.tx.us/video/identify.asp

Video Conservation Guide by the Texas Commission on the Arts is a clear, well presented site with helpful sections on: identifying videotape formats; longevity risks; condition assessment; preservation planning and collection management; online and other resources.

Additional resources:

www.experimentaltvcenter.org/history/preservation/preservation.php3

Video Preservation: the Basics – an on-line resource published as part of the Experimental Television Center’s ‘Video History Project’. This website provides a thorough overview of all aspects of video preservation. Included are preservation terms and definitions, preservation planning and management, handling of tape, storage guidelines, cataloguing, cleaning and re-mastering, disaster planning, and links to additional preservation resources. ETC also published Reel to Real: A Case Study of BAVC’s Re-mastering Model by Luke Hones (2002), which details the process of re-mastering ½" open reel tapes.

The Lab Guys World

See: www.labguysworld.com/

A useful site charting the history of video, before VHS and Betamax. Includes an extensive links page for film and video websites.

www.specsbros.com/whitepaper.html

Basic Inspection Techniques to Sample the Condition of Magnetic Tape is a checklist prepared by the vendor Spec Brothers that is helpful in diagnosing tape problems.

en.wikipedia.org/wiki/Videotape

The Wikipedia page on video includes useful sections on early formats, broadcast video, cassette formats, high definition, home video, VCRs and camcorders.
3.4 Further Information On Preservation – mainly digital media

www.clir.org/pubs/reports/pub121/pub121.pdf

Jointly published in 2003 by the US Council on Library and Information Resources and the National Institute of Standards and Technology, Care and Handling of CDs and DVDs: A Guide for Librarians and Archivists, by Fred. J. Byers, provides guidance on how to maximize the lifetime and usefulness of optical discs, specifically CD and DVD media, by minimising chances of information loss caused by environmental influences or physical handling. Discrete topic areas include prevention of premature degradation, prevention of information loss, CD and DVD structure, disc life expectancy, and conditions that affect optical discs. Downloadable free.


The National Archives is tackling the challenge of digital preservation, ensuring continued access to digital information in the future. They have published a suite of guidance notes which, while not moving image specific, give a clear exposition of the issues involved and how to prepare a digital preservation policy.

www.conservationregister.com/electronic-media.asp?id=4

The Institute of Conservation has published a brief but useful note on the preservation of digital media.

3 Training

www.uea.ac.uk/ftv/courses/ma-film-studies-with-film-archive-option

The key training course in the UK for moving image preservation was until recently the MA in Film Studies with Film Archive Option at the University of East Anglia; this course is currently suspended but is intended to re-open in future years.

Other training providers who may offer courses include Skillset, the sector skills council for the creative industries (www.skillset.org/skillset/archives); BUFVC (bufvc.ac.uk/courses); the Archives and Records Association (wwwarchives.org.uk/training/training.html); and Huntley Film Archives, who offer a regular introductory course to the Principles of Film Archiving (www.huntleyarchives.com). London’s Screen Archives has run a variety of training courses for non-specialist archivists with moving image collections; check their website (www.londonsscreenarchives.org.uk) for forthcoming events.

4 Miscellaneous

www.yorkshirefilmarchive.com/files/yfa/YFALS.pdf

The Yorkshire Film Archive have published a very clear and well structured Learning and Access Strategy which can offers a useful source of ideas for planning access work with the general public.

www.fiafnet.org/uk/members/ethics.cfm

A Code of Ethics for film archives is published online by the International Federation of Film Archives (FIAF).
Credits

This Handbook has been produced by London's Screen Archives with funding from the Screen Heritage UK programme ('Revitalising the Regions' (RtR) strand). The Screen Heritage UK Programme is a Partnership between the British Film Institute (BFI), Screen Yorkshire and English regional film archives to safeguard the future of the UK's national and regional film archives, funded by Department for Culture, Media and Sport (DCMS).

The Handbook was commissioned and edited by Rebekah Polding, London Screen Heritage Manager, Film London; researched and co-written by Museums and Heritage Consultant Caroline Reed; with additional writing and technical oversight by David Cleveland, Founding Director of the East Anglian Film Archive. The original idea for the handbook arose during planning of LSA's extensive RtR project and we gratefully acknowledge the input of Trisha Boland (Film London), Cathy Ross (Museum of London), and the other members of LSA's Steering Group in shaping this work.

Special thanks are due to those film archivists who contributed their expertise as 'Notes from an Archivist': Bob Sharpe (South West Film and Television Archive), Chris Jones (Film London), David Cleveland, Elaine Burrows, James Taylor and Steve Foxon.

Many thanks are due to those film archivist colleagues who offered further specialist advice and assistance: Brian Pritchard, Charles Fairall (BFI), David Lee (Wessex Film and Sound Archive), James Patterson (Media Archive Central England), Lucy Smee, Marion Hewitt (North West Film Archive), Patrick Russell (BFI) and Sue Howard (Yorkshire Film Archive). The writers are grateful to the support and advice of Sue Todd, RtR Programme Manager, Screen Yorkshire.

This publication would not have been possible without the many repositories in London who have contributed questions, ideas, requests and responses both in general and specifically during the piloting of this Handbook and other resources. Their professionalism, dedication and determination to preserve their collections and bring them to new audiences have been the spur to this publication; we can only hope that this meets their consistently high standards.


Thanks to Sutton Local Studies and Archives, Hackney Archives, Haringey Archive Service at Bruce Castle Museum, Harrow Local History Service, Barnet Local Studies and Archives Centre and Nick Bradshaw for permission to use the images which accompany the Preface and Introduction.

Design and layout are by Tom Collins and Heidi Lightfoot of Together Design, www.togetherdesign.co.uk. It has been a pleasure to work with such a hugely skilled team.

All feedback, comments and suggestions are very welcome: please contact screenheritage@filmlondon.org.uk