Proposed

SMPTE RECOMMENDED PRACTICE — RP 132

Storage of Edit Decision Lists on 8-in Flexible Diskette Media

1 *Scope*

This practice specifies the file and directory structure of an 8-in flexible diskette used for the interchange of edit decision lists (EDL).

2 *Format*

The diskette is a random-access device which allows for the processing of blocks of data independent of the data's physical or relative location. Each EDL is stored in a group of one or more blocks selected to act as a file and identified by a unique file name. A directory of files is written at a particular location on the diskette and contains file name, length and optional user-defined information.

3 *Definitions*

BPR: Bits per radian

Block: 4 sectors (512 bytes)

Byte: 8 bits

Data entry: Information entered in data form for computer processing

Directory entry: Directory information for a specified file

Directory segment: 2 blocks (1024 bytes, commonly referred to as 1k bytes) dedicated to directory information

File: One or more blocks of user data

Interleaving: Relationship of physical to logical sector numbers within a track

Logical sector address: Software assigned number to organize physical sectors to read and write data

Minimal directory: One directory segment

Octal values: Numbers having base 8

Physical sector number: Sector address recorded in byte 3 of the ID record

Sector: 128 bytes of information

Skew: Relationship of physical to logical sector numbers between tracks

Track: One of the concentric paths for the recording of data on the surface of a direct-access storage device, such as a diskette, accessible by one read/write

Word: 2 bytes (16 bits)

4 *Media—Physical and Magnetic Characteristics*

Edit decision lists shall be recorded on an 8-in single-sided diskette as defined by American National Standard Single-Sided Unformatted Flexible Disk Cartridge (for 6631-BPR (Bits Per Radian) Use), ANSI X3.73-1980.

5 *Recording Method and Track Format*

The recording method, track, and sector formatting for EDL shall be such as described for single-density diskettes in IBM document GA21-9[illegible], IBM Diskettes 1, 2, and 2D Original Equipment Manufacturers' Information, and GA21-9182, the IBM Diskette General Information Manual.

6 *Logical Sector Numbering (see Table 1)*

Logical sector numbers are assigned to physical sectors in the following method:

(1) The first logical sector (sector 0) is physical sector 1 on track 1.

(2) Interleaving: Use all odd-numbered physical sectors, add 13, and use all even-numbered physical sectors.

(3) Skew: Logical numbering on each track begins with the physical sector 6 greater than the previous track as specified in the formula:

First physical sector used = ((6 × track number) − 5) modulo 26

7 *Data Organization*

Data is organized in consecutive blocks of four logical sectors each in ascending order of logical sector number.

8 *Diskette Organization*

8.1 Directory Location and Size. The directory begins at logical block 0 and consists of a linked list of directory segments.

8.2 Files. The files referred to by a particular directory segment shall be contained in contiguous logical blocks.

9 *Directory*

9.1 Directory Structure. A linked list of 1 to 31 directory segments. Each segment begins with a header of 5 16-bit words. Carrying header information is valid only in the first directory segment. There can be 72 directory entries per segment. The last directory entry must have an end-of-segment status word.

9.2 Directory Segment Header:

Number of segments available for directory — 1 word

Segment number of next logical segment — 1 word

Segment number of last segment in use — 1 word

Number of extra bytes per entry — 1 word

Logical block number for start of data on diskette — 1 word

9.2.1 Number of Directory Segments. The first word of the directory header contains the number of directory segments available. This value is only valid in the first directory segment. Allowable values are 1 to 31.

9.2.2 Next Logical Segment. The second word of the directory header contains the segment number of the next logical directory segment. Allowable values are 2 to 31, and 0 which indicates no additional segments.

Table 1

Physical to Logical Sector Numbering

Track 1

Physical Sector Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Logical Sector Number	0	13	1	14	2	15	3	16	4	17	5	18	6	19	7	20	8	21	9	22	10	23	11	24	12	25
Logical Block Number	0	3	0	3	0	3	0	4	1	4	1	4	1	4	1	5	2	5	2	5	2	5	2	6	3	6

Track 2

Physical Sector Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Logical Sector Number	10	23	11	24	12	25	0	13	1	14	2	15	3	16	4	17	5	18	6	19	7	20	8	21	9	22
Logical Block Number	9	12	9	12	9	12	6	9	6	10	7	10	7	10	7	10	7	11	8	11	8	11	8	11	8	12

Track 3

Physical Sector Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Logical Sector Number	7	20	8	21	9	22	10	23	11	24	12	25	0	13	1	14	2	15	3	16	4	17	5	18	6	19
Logical Block Number	14	18	15	18	15	18	15	18	15	19	16	19	13	16	13	16	13	16	13	17	14	17	14	17	14	17

9.2.3 Last Segment Number. The third word of the directory header contains the number of the last directory segment opened. Each time a new directory segment is opened, this number must be updated. This value is only valid in the first directory segment. Allowable values are 1 to 37.

9.2.4 Extra User Bytes. Provision is made for the inclusion of optional user-defined words in addition to the seven specified below in each directory entry. The fourth word of the header specifies how many extra bytes are included in each of this segment's directory entries. This must be an even number and be the same value in all segments of the directory.

9.2.5 Starting Block Number. The fifth and last word of the directory segment header contains the logical block number of the start of the entries in this segment.

9.3 Directory Entry Format. The remainder of the directory segment is filled with directory entries. An entry consists of words containing the following information:

status
file name (char 1-3)
file name (char 4-6)
file name extension (1-3 characters)
total file length
reserved
reserved
optional user bytes

9.3.1 Status. All values given below are octal numbers. Valid types of status words are as follows:

400	Tentative file
1000	Empty file. The name and file extension fields are not used. The length of the empty file must be included.
2000	Permanent file. The name of the permanent file must be unique.
4000	End of segment marker. The last entry in a segment must have such a status word, and its remaining 6 words are not required.
102000	Permanent file with the "protect" bit set. This may be used to inhibit deletion of a file.

9.3.2 File Name. This two-word value contains the symbolic name of the file. An encoding scheme referred to as RADIX-50 is used to pack three ASCII characters into one word. A limited character set (A-Z and 0-9) is allowed in this name. The file name may be 1 to 6 characters in length. Names of less than 6 characters must be padded with trailing spaces.

9.3.3 File Extension. This word value contains the packed representation of the file extension "EDL" (017754).

9.3.4 Length. The number of logical blocks used by the file.

9.3.5 Reserved Words. The directory entry contains two reserved words allowing for compatibility.

9.3.6 User Bytes. Any even number of extra bytes as specified in the directory segment header.

Appendix

(The Appendix is not a part of the SMPTE Recommended Practice, but is included for information purposes only.)

A1. Minimal Directory

Systems without file management capabilities may produce single edit decision list disks using the following minimal directory:

Header	1	One directory segment
	0	No next segment
	1	Highest open segment used
	0	No extra bytes per entry
	10	Starting block number
Entry 1	2000	Permanent entry
	71550	RADIX-50 for "SMP"
	76210	RADIX-50 for "TE(space)"
	17754	RADIX-50 for "EDL"
	536	Total file length (logical blocks)
	0	Reserved
	0	Reserved
Entry 2	4000	End of segment marker

All preceding numbers are shown as octal values. This is a suggested single file directory allowing the entire disk area to the edit decision list file. The file name "SMPTE" is shown for example only, and may be any valid 6-character file name, as described in 9.3.2.

A2. ASCII to RADIX-50 Conversion

Each ASCII character is translated into its RADIX-50 equivalent as follows:

Character	ASCII Octal Equivalent	RADIX-50 Octal Equivalent
(space)	40	0
A-Z	101-132	1-32
$	44	33
.	56	34
(undefined)	35	35
0-9	60-71	36-47

The RADIX-50 equivalents of three characters, C1, C2, and C3, are combined as follows:

$$\text{RADIX-50 Value} = ((C1 * 50) + C2) * 50) + C3$$

Example:

$$\text{RADIX-50 Value of "EDL"} = ((5 * 50) + 4) * 50) + 14 = 017754$$

Table 2 provides an alternate method of translating from the ASCII character to its RADIX-50 equivalents.

RADIX-50 Value = The sum of the first character entry + the second character entry + the third character entry

Example:

RADIX-50 Value of "EDL" = 017500 + 000240 + 000014 = 017754

A3. RADIX-50 to ASCII Conversion

To convert from the packed RADIX-50 value to the RADIX-50 octal equivalents of the three characters, C1, C2, and C3, the following rules are followed:

C1 = RADIX-50 Value / 3100
C2 = [RADIX-50 Value − ((RADIX-50 Value / 3100) * 3100)] / 50
C3 = RADIX-50 Value − ((RADIX-50 Value / 50) * 50)

Example:

RADIX-50 Value = 71550 (SMP)

C1 = 71550 / 3100 = 23 = "S"
C2 = [71550 − ((71550 / 3100) * 3100)] / 50 = 15 = "M"
C3 = 71550 − ((71550 / 50) * 50) = 20 = "P"

All preceding numbers of A2 and A3 are octal values (see Table 2).

Table 2
Alternate Conversion of ASCII to RADIX-50

Single Character or First Character		Second Character		Third Character	
Space	000000	Space	000000	Space	000000
A	003100	A	000050	A	000001
B	006200	B	000120	B	000002
C	011300	C	000170	C	000003
D	014400	D	000240	D	000004
E	017500	E	000310	E	000005
F	022600	F	000360	F	000006
G	025700	G	000430	G	000007
H	031000	H	000500	H	000010
I	034100	I	000550	I	000011
J	037200	J	000620	J	000012
K	042300	K	000670	K	000013
L	045400	L	000740	L	000014
M	050500	M	001010	M	000015
N	053600	N	001060	N	000016
O	056700	O	001130	O	000017
P	062000	P	001200	P	000020
Q	065100	Q	001250	Q	000021
R	070200	R	001320	R	000022
S	073300	S	001370	S	000023
T	076400	T	001440	T	000024
U	101500	U	001510	U	000025
V	104600	V	001560	V	000026
W	107700	W	001630	W	000027
X	113000	X	001700	X	000030
Y	116100	Y	001750	Y	000031
Z	121200	Z	002020	Z	000032
$	124300	$	002070	$	000033
.	127400	.	002140	.	000034
Unused	132500	Unused	002210	Unused	000035
0	135600	0	002260	0	000036
1	140700	1	002330	1	000037
2	144000	2	002400	2	000040
3	147100	3	002450	3	000041
4	152200	4	002520	4	000042
5	155300	5	002570	5	000043
6	160400	6	002640	6	000044
7	163500	7	002710	7	000045
8	166600	8	002760	8	000046
9	171700	9	003030	9	000047

PROPOSED

SMPTE RECOMMENDED PRACTICE — RP 131

Storage of Motion-Picture Films

1. Introduction

It is impossible to estimate the value of the motion-picture films that have been produced during the life of this industry. These films are a rich resource representing both historical events and a unique art form. When one realizes that a major portion of the motion pictures and television programs produced in this century have been lost or destroyed already, the importance and urgency of preserving those still existing is underscored.

The relatively recent conversion of motion pictures and television programs to color films has raised concern about the long-term stability of the dye images. Attention to this question has contributed to a general renewal of interest in the preservation of all motion pictures, both black-and-white and color.

Long-term preservation of almost any human artifact is a challenging and costly effort. There are no simple, inexpensive methods that are satisfactory for this purpose. Furthermore, archival storage, particularly, implies that the preserved artifact is rarely, if ever, removed from storage for examination. Proper storage of motion-picture films requires that a sufficient number of working copies be available so that the original films are put into storage.

Proper storage is not a new subject and a variety of documents on the preservation of motion-picture films already exist. These include ANSI and ISO standards,[2-4] an EBU Technical Bulletin,[5] a report of the International Broadcasting Commission of FIAF,[6] several SMPTE and SPSE articles,[1-7] and a national report.[8] Nevertheless, there is still a recognized need for guidelines for proper film storage and an SMPTE practice to fill this need.

Basic recommendations for the storage of all types of processed safety photographic film are contained in American National Standard Practice for Storage of Processed Safety Photographic Film, ANSI/ASC PH1.43-1985. The procedures discussed in this practice are an expansion or amplification of that document.

2 Scope

This practice defines terms, classifications, and conditions for storage of motion-picture materials.

3 Definitions

3.1 *Medium-Term Film:* Medium-term film is a photographic film which is suitable for the preservation of records for a minimum of 10 years when stored under medium-term conditions, providing the original images are of suitable quality.

3.2 *Long-Term Film:* Long-term is a photographic film which is suitable for the preservation of records for a minimum of 100 years when stored under archival conditions, providing the original images are of suitable quality.

3.3 *Archival Film:* Archival film is a photographic film which, when stored under archival storage conditions and providing the original images are of suitable quality, is suitable for the preservation of records having permanent value.[2] Films suitable for archival records are described in American National Standards for Photography (Film) —Archival Records, Silver-Gelatin Type, on Cellulose Ester Base—Specifications, ANSI/ASC PH1.28-1984 and Archival Records, Silver-Gelatin Type, on Polyester Base—Specifications, ANSI/ASC PH1.41-1984.

3.4 *Medium-Term Storage Conditions:* Medium-term storage conditions are those which are suitable for ensuring a minimum useful life of 10 years for medium-term photographic films.

3.5 *Archival Storage Conditions:* Archival storage conditions are those which are suitable for the preservation of photographic film having permanent value. Archival storage conditions will prolong the useful life of archival and nonarchival films.

3.6 *Film Enclosure:* A film enclosure is any item in close or direct contact with the film, such as reels, cores, spools, cassettes, magazines, cartridges, cans, containers, envelopes, and cartons.

3.7 *Storage Housing:* A storage housing is a physical structure supporting the film enclosures and may consist of drawers, racks, shelves, or cabinets.

3.8 *Film Vault:* A room or area designed for film storage and separated from temporary storage facilities, offices, or work areas. Preferably, the vault shall have both air temperature and humidity controls.

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4 Description

In order for motion-picture film to be protected, it must be properly stored and handled throughout its life. For convenience, the life cycle has been divided into three sections: Prior to Processing, After Processing, and In Collections.

Although processing is not covered in this practice, it is imperative that black-and-white films be properly washed to prevent stains, etc., and that color films be properly washed and stabilized to prevent stains, dye fading, etc. The manufacturer's processing recommendations should be carefully followed for both black-and-white and color films.

4.1 *Prior to Processing*

4.1.1 *Environmental Conditions:* During manufacture, the raw stock is equilibrated at the appropriate relative humidity, placed in sealed cans, carefully taped to provide a vapor barrier, and sold. The cans should be kept sealed until the film is to be used (exposed) to maintain the proper moisture level in the film during pre-exposure storage. High relative humidity should be avoided to prevent rusting of cans and deterioration of labels, tapes, and cartons.

The raw stock should be kept at 13°C (55°F) or lower until exposure. If the raw stock must be kept for periods longer than six months, it should be stored at −18°C (0°F) or lower. Once the film is exposed, it should be processed as soon as possible. If the film must be stored, even temporarily, after exposure and prior to processing, it should be kept at −18°C (0°F) to prevent any loss of the latent image.

Raw stock must also be protected against harmful gases such as hydrogen sulfide, sulfur dioxide, and peroxide, and radiation. Since some gases may slowly penetrate the tape that seals the cans, even unopened raw stock should not be stored in an area where harmful gases are present, even in small amounts.

As the speed of motion-picture camera films increased, its sensitivity to radiation (X-rays, gamma rays) increased. Some stone aggregate in the concrete used to build film storage rooms can emit sufficient radiation to fog these sensitive films. All storage rooms should be measured for their radiation levels prior to being used to store raw stock.

4.1.2 *Storage Enclosures:* Raw stock should be kept in the original manufacturer's can until exposed. After exposure it is suggested that the film be placed in the original polyethylene bag and can and retaped. The time between taking the film out of its original can and replacing the film in its bag and can should be kept as short as possible.

4.1.3 *Storage Rooms:* As long as the raw stock is sealed in its original can, the relative humidity of the storage room should not exceed 60 percent. Above 60 percent, iron will rust and fungi will grow. Provisions should be made against damage by water or exposure to harmful gases.

4.1.4 *Handling Techniques:* Raw stock or exposed unprocessed film should be handled as little as possible, and great care should be taken to keep all camera, threading, lab, and handling equipment scrupulously clean. If the unprocessed film is stored at 13°C (55°F) or lower, it should be allowed to come up to room temperature before unwinding or handling the film to prevent moisture condensation which may lead to spotting of the film.

4.2 *After Processing*

4.2.1 *Environmental Conditions:* Processed film is no longer light sensitive, but is still subject to change over a period of time. After processing and prior to placing the film in its final storage location, processed film should be carefully handled and prepared for storage. Whenever possible, films selected for long-term storage should contain a minimum of splices. The film should be handled at controlled room temperature and relative humidity, and short periods of high temperature or low or high humidity should be avoided. High temperatures can hasten the fading of dye images and cause film shrinkage and physical distortions. Low humidity can cause brittleness, while high humidities can accelerate dye fading, film shrinkage, and cause mold and bacteria growth.

4.2.2 *Storage Enclosures:* Motion-picture films are normally wound on cores if they are preprint materials, and on reels if they are release prints. The rolls should not be wound with high tension, nor should they be loose enough to allow movement of the film within the roll. The rolls should be stored in closed containers to protect the film from dirt and physical damage.

4.2.3 *Storage Rooms:* If possible, vaults and areas used for film storage should be located near the areas where the film is being used. Provisions should be made against damage by water or fire associated hazards.

4.2.4 *Handling Techniques:* Proper handling of film, whether unexposed, exposed, or processed, is critical. Cleanliness and good housekeeping procedures are essential if dirt or the results of dirt are to be kept out of the final screen image. Whenever possible, film should be handled in a work area provided with positive pressure and a filtered, conditioned (for temperature and humidity) air supply. Any equipment or surface that may come in contact with the film should be cleaned frequently. The film itself should be handled as little as possible, only by the edges, and with gloves to protect it.

4.3 *In Collections*

4.3.1 *Environmental Conditions:* After motion-picture film, whether preprint or print, has been assigned to a collection, it should be stored under controlled relative humidity and temperature conditions. The relative humidity and temperature selected depend on the length of time the film is to be preserved. (See Table 1.) The recommended conditions are essentially the same as those in ANSI/ASC PH1.43-1985.

Table 1
Environmental Conditions

		Medium-Term Storage		Archival Storage	
Sensitive Layer	Base Type	Relative Humidity Range (percent)	Temp. C°	Relative Humidity Range (percent)	Temp. C°
Silver-gelatin	Cellulose ester	15-60	25	15-50	21
Silver-gelatin	Polyester	30-60	25	30-50	21
Color	Cellulose ester	15-50	10	15-50	2
Color	Polyester	25-50	10	25-50	2

The effects of environmental conditions on the storage of motion-picture film are presented in the appendix. Additional information may be available from manufacturers of motion-picture film.

4.5.2 *Storage Enclosures.* The recommendations in this section are taken from section 5.1 of ANSI/ASC PH1.43-1985, and are slightly modified. Refer to that document for additional information.

Motion-picture film is wound on reels or cores and stored in roll form. Rolls should be wound emulsion-in and wound tightly but not under excessive tension. Rolls mounted on cores, particularly those longer than 500 feet, should be stored flat (horizontally) unless the core itself is carried on a horizontal spindle that prevents the lower part of the film from supporting the load of the core.

Storage enclosures for motion-picture films should preferably be steel reels and cans. Steel reels may be coated, but not lacquered or laminated. Preferred plastic enclosure materials (cores and reels) are cellulose esters and polyolefins (polypropylene). Acceptable plastic materials are polystyrene and polyacrylates. Polyvinylchloride is not recommended for this use. Use of steel for reels is permissible providing the reels are well protected by enamel, tinning, or other corrosion-resistant finish. Plastics that might give off reactive fumes or exudations during storage, such as peroxides or chlorides, shall not be used.

Rolls of photographic film preferably should be stored in closed containers for protection against dirt and physical damage. Color films shall be stored in closed, opaque containers or otherwise protected from light exposure. Suitable containers are those with telescoping, slip-type or threaded twist-on lids. The materials used shall meet the same requirements as those for cores and reels. Closed containers are not air tight and may give limited access to ambient air. Therefore, if they are used, the humidity of the ambient air must not exceed recommended limits.

Sealed containers made from moisture-impervious materials shall be used, where needed, to maintain the humidity limits of the film, to protect against gaseous impurities in the atmosphere, or when low-temperature storage is used. Suitable sealed containers are closed containers with friction-type or threaded twist-on lids. Flip-top, hinged, or telescoping lids may be used, but the joint shall be sealed by several wraps of pressure-sensitive adhesive tape having low permeability to gas. Taped cans within heat-sealed foil bags provide additional protection from high humidity. An ideal storage method is to seal the roll of film in a heat-sealed foil bag and then seal this package inside a second foil bag. This combined package is then put into a metal can that is taped. If tape is used, routine retaping of joints every two years is recommended; in any case, if the tape seal is observably deficient, it should be replaced.

Pressure-sensitive tape, if needed, shall be free from peroxide, and shall not be used in contact with the film, other than on the outer loop to fasten the end.

Films may have possible interactions with other films that are of a different generic type (for example, nitrate versus acetate base). Films of different generic types should not be wound on the same rolls or stored in the same containers.

Cellulose-nitrate film base is relatively unstable and, in considerable quantity, may be a fire hazard. As the film breaks down, it gives off nitric oxide, nitrogen dioxide, and other gases. Films on nitrate base should never be stored with films on acetate base.

Closed containers are required unless the photographic film is protected from dirt and damage by the storage housings. Containers should be made of noncorrosive material such as anodized aluminum, stainless steel, or peroxide- and chlorine-free plastics.

4.5.3 *Storage Rooms.* Motion-picture films having long-term value should be stored in closed housings or on shelves and racks enclosed by doors in a storage room. The shelves or cabinets shall be arranged to permit internal circulation of air to all film containers to provide uniform humidity and temperature conditions. The lowest shelves should be at least six inches above the floor, and other precautions taken against potential water damage. The storage room should be protected against fire and associated hazards as outlined in section 7 of ANSI/ASC PH1.43-1985.

The storage room should be conditioned as described in 4.5.1. Automatic air-conditioning equipment that controls both temperature and humidity is most desirable. A less expensive alternative is to control only the temperature and store the film in moisture-proof containers. Taped cans within heat-sealed aluminum/polyethylene bags should provide protection from high or low humidity. Provisions should be made to clean the air supply of harmful gases and to minimize dust in the room.

4.5.4 *Handling Techniques.* Prior to storage, film should be inspected and cleaned. Wet immersion cleaning is preferred to wiping or dry cleaning. Wet cleaning may not be desirable for some specially treated films: for example, lacquered films. Prepared materials should be wound on suitable cores and placed on cores or reels. If the films are to be stored in a room or vault with controlled temperature and humidity, they should be placed inside clean cans, preferably one roll to a can. If the temperature is controlled but the humidity is not, the film should be preconditioned to the relative humidity recommended in 4.5.1. This may be accomplished by running roll film, as a single strand, through a suitable conditioning cabinet. A conditioning time of 20 minutes is suitable. Rolls of film may also be conditioned to the recommended storage humidity by remaining in the recommended atmosphere 3 days for 16-mm film and 1 week for 35-mm film. After conditioning, the roll should be placed in the can, taped with several wraps of pressure-sensitive tape having low permeability to gas and enclosed in a heat-sealed moisture bag. If a color film which has been kept at a reduced temperature is removed from the storage room, ample warm-up time is necessary to permit the film to reach room ambient temperature before being used. The film should then be reconditioned, as described above, before returning it to the storage room.

4.5.5 *Duplication and Inspection.* When motion-picture films will be duplicated, and the duplicate placed in long-term storage, the copy should be on polyester film base. Color motion-picture film should have a neutral gray strip of identical or, at least, similar type spliced to both ends of the original film prior to duplication. This enables the archivist to record from the duplicate a set of red, green, and blue color densities that can be used for future inspection of the films. A system for routinely sampling and inspecting the films is highly desirable.

5. *References*

1. American National Standard Practice for Storage of Processed Safety Photographic Film, ANSI/ASC PH1.43-1985.

2. American National Standard for Photography (Film) — Archival Records, Silver-Gelatin Type, on Cellulose Ester Base — Specifications, ANSI/ASC PH1.28-1984.

3. American National Standard for Photography (Film) — Archival Records, Silver-Gelatin Type, on Polyester Base — Specifications, ANSI/ASC PH1.41-1984.

4. International Standard ISO 5466-1980, Photography — Practice for the Storage of Processed Safety Photographic Film.

5. European Broadcasting Union Technical Bulletin Tech. 3202-E, Storage of Magnetic Tapes and Cine-films.

6. "Technical Aspects on the Preservation of Moving Images," *International Phenomenon of the International Federation of Film Archives* (FIAF), Nov. 1977.

7. P. Z. Adelstein, C. L. Graham, and L. E. West, "Preservation of Motion Picture Color Films Having Permanent Value," *J. SMPTE*, Vol. 79, No. 11, pp. 1011-1018, Nov. 1970.

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9. *The Book of Film Care*, Eastman Kodak Company Publication No. H-23, Sept. 1983.