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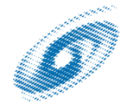
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# SI 678 Preserving Sound and Motion

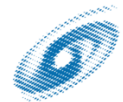
Class 2 – Media and the Environment



# Themes

## Themes

- Media degradation - theory
- Magnetic tape issues
- Motion picture film issues
- Storing tape and film - standards
- Care and handling - guidelines



# Media Degradation

## Media degradation

Magnetic tape

Motion picture film

Storage guidelines

Care and handling

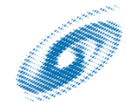
Snippet

- Common media have organic elements
- Some, but not all media behave predictably
- Autocatalytic reactions speed loss
- Very wide variation in manufacturing quality
- History of care and handling is a crucial factor

IPI Media Storage.

[http://www.imagepermanenceinstitute.org/shtml\\_sub/msqr.pdf](http://www.imagepermanenceinstitute.org/shtml_sub/msqr.pdf)

Dead Media Project: <http://www.deadmedia.org/>



# Magnetic Tape

Media degradation

**Magnetic tape**

Motion picture film

Storage guidelines

Care and handling

Snippet

- Magnetic tape behavior is erratic.
- Binder is the culprit (sticky shed)
- Simple diagnostic tool is elusive.
- Preserving the medium may not be feasible.

## Recommendations

- Improve storage environments
- Develop automated tape transfer
- Prioritize transfer based on format obsolescence

Preservation of Magnetic Tape Collections. 2006.

[http://www.imagepermanenceinstitute.org/shtml\\_sub/NEHTapeFinalReport.pdf](http://www.imagepermanenceinstitute.org/shtml_sub/NEHTapeFinalReport.pdf)



# Motion Picture Film

Media degradation

Magnetic tape

**Motion picture film**

Storage guidelines

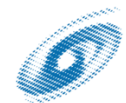
Care and handling

Snippet

- Nitrate, acetate, polyester each exhibit different properties
- Color is a particular challenge
- Sound is a particular challenge
- Playback equipment
- Artifact value of film may be significant

Film Preservation Guide. (2004)

[http://www.filmpreservation.org/preservation/film\\_guide.html](http://www.filmpreservation.org/preservation/film_guide.html)



# Nitrate Film Fires - Early Ones

Media degradation

Magnetic tape

**Motion picture film**

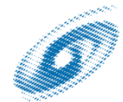
Storage guidelines

Care and handling

Snippet

A list of 76 film-related fires, 1896 - 1993

- 1896: Acres Kineopticon, London UK.
- 1896: Edison Pavilion, Berlin Germany
- 1897: Bazar de la Charite, Paris France
- 1898: Market Place, Bilston UK
- 1898: Salao de Novidades, Rio de Janeiro Brazil
- 1907: Town Hall, Suffolk UK
- 1907: Hepworth Film Studios, Walton-on-Thames UK





# Nitrate Film Fires - Big Ones

Media degradation

Magnetic tape

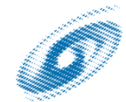
**Motion picture film**

Storage guidelines

Care and handling

Snippet

- 1914: Edison Factory, West Orange NJ
- 1927: Cleveland Clinic, Cleveland OH
- 1929: Consolidated Film Industries, Hollywood CA
- 1934: Warner Bros. Studio, Burbank CA
- 1941: Stockholm Sweden
- 1943: Harold Lloyd Residence, Beverly Hills CA
- 1967: National Film Board Archives, Canada
- 1978: George Eastman House, Rochester NY
- 1978: National Archives, Suitland MD
- 1988: Bundesarchiv, Koblenz Germany
- 1993: Hendersons Laboratories, South Norwood UK



# Potential Value of Storage

Media degradation  
 Magnetic tape  
 Motion picture film  
**Storage guidelines**  
 Care and handling  
 Snippet

**Table IV.** Comparison of five models of chemical decay.

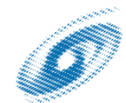
## Life Expectancy Value, Years

Model/Material	70°F 80% RH	70°F 50% RH	70°F 20% RH	50°F 50% RH	30°F 50% RH
IPI/Acetate Film <sup>35</sup>	17	38	87	158	731
Isoperm*/Paper <sup>1</sup>	26	41	92	220	1540
NML/VHS Tape <sup>7</sup>	6	32	>64	>>64	>>64
NYS-IPI/Color Dyes <sup>36</sup>	18	38	182	169	843
<b>Average</b>	<b>17</b>	<b>37</b>	<b>106</b>	<b>182</b>	<b>1038</b>

\*Using 25 kcal/mole, normalized to 44 years at 68°F, 50% RH.



• IPI. *New Tools for Preservation* (1995), p. 29.



# Storage Guidelines

Media degradation

Magnetic tape

Motion picture film

**Storage guidelines**

Care and handling

Snippet

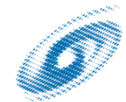
## ■ Film

- Freeze nitrate
- Cool acetate
- Cool polyester

## ■ Magnetic tape

- Distinguish archive from use copy
- Cool archival version
- Room temp for use copy

## ■ CDs and DVDs at room temp



# Care and Handling Guidelines

Media degradation

Magnetic tape

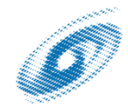
Motion picture film

Storage guidelines

Care and handling

Snippet

- Environmental control is first line of defense
- Appropriate and clean playback equipment is essential
- Pickett and Lemcoe (1959) study deals with historical formats of sound recordings.
- Byers (2003) study covers CDs and DVDs



# Testing Standards

Media degradation

Magnetic tape

Motion picture film

Storage guidelines

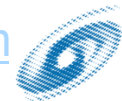
**Care and handling**

Snippet

- Storage and care should be based on a foundation of testing standards
- Lack of uniformity is the rule
- Predictions of EoL drive testing
- Defining EoL is controversial
- Optical Disc Tests as an example

Test Method for Estimation of Archival Lifetime of Optical Media (2007)

<http://www.ecma-international.org/publications/standards/Ecma-379.htm>



# Thank you!

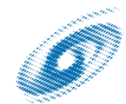
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