

AES standard for audio preservation and restoration - Magnetic tape - Care and handling practices for extended usage

Published by
Audio Engineering Society, Inc.
Copyright ©2005 by the Audio Engineering Society

Abstract

This standard provides recommendations for the care and handling of magnetic tape in order to optimise the life of the medium and its recorded content. It covers analog and digital tape and includes tape made for audio, video, instrumentation and computer use.

An AES standard implies a consensus of those directly and materially affected by its scope and provisions and is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an AES standard does not in any respect preclude anyone, whether or not he or she has approved the document, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in agreement with the standard. Prior to approval, all parties were provided opportunities to comment or object to any provision. Attention is drawn to the possibility that some of the elements of this AES standard or information document may be the subject of patent rights. AES shall not be held responsible for identifying any or all such patents. Approval does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the standards document. This document is subject to periodic review and users are cautioned to obtain the latest printing. Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document preview:
for full document, go to
www.aes.org/publications/standards

Contents

Contents.....2

Foreword.....4

0 Introduction.....5

1 Scope.....6

2 Normative references.....6

3 Terms and definitions.....7

4 Tape pack integrity11

 4.1 General.....11

 4.2 Common pack problems11

 4.3 Pack tension11

 4.4 Tape winding speed12

 4.5 Tape, hub and reel design12

5 Contamination.....13

 5.1 General.....13

 5.2 Particulate contaminants.....15

 5.3 Gaseous contaminants15

 5.4 Organic contaminants15

 5.5 Protective cases15

 5.6 Field usage.....15

6 Handling techniques.....16

 6.1 General.....16

 6.2 Vertical/horizontal tape orientation16

 6.3 Handling access16

 6.4 Use of force.....16

 6.5 Tape condition17

 6.6 General handling17

7 Environment.....18

 7.1 General.....18

 7.2 Temperature and humidity18

 7.3 Air quality.....19

 7.4 Magnetic fields19

 7.5 Light exposure19

 7.6 Acclimatization20

 7.7 Marginal environments.....20

8 Inspection21

 8.1 General.....21

 8.2 Seven-step physical inspection21

Document preview:
for full document, go to
www.aes.org/publications/standards

9 Cleaning and maintenance	23
9.1 General.....	23
9.2 Tape cleaning indicators.....	23
9.3 Tape cleaning frequency.....	23
9.4 Debris removal from tape.....	23
9.5 Adhesive contaminants on tape.....	24
9.6 Biological contaminants on tape.....	24
9.7 Record/playback machine maintenance.....	24
9.8 Transports for master tapes.....	24
9.9 Manufacturers recommendations.....	24
9.10 Cleaning cassettes.....	24
9.11 Hand cleaning.....	24
10 Transportation	25
10.1 General.....	25
10.2 Tape preparation before transport.....	25
10.3 Transport methods.....	25
10.4 General exposure.....	26
10.5 External fields and security scanning of material.....	26
11 Disasters	26
11.1 General.....	26
11.2 Water.....	27
11.3 Fire.....	27
11.4 Dry debris.....	27
11.5 Disaster response.....	27
12 Staff training	28
12.1 Purpose.....	28
12.2 Training paths.....	28
12.3 Schedule for training.....	29
12.4 Update of training.....	29
12.5 Content of training.....	29
Annex A	30
A.1 General.....	30
A.2 Do.....	30
A.3 Do not.....	30
Annex B	31

Foreword

This foreword is not part of AES49-2005, *AES standard for audio preservation and restoration - Magnetic Tape - Care and handling practices for extended usage*.

This standard is concerned with the care and handling of magnetic tape in roll form and covers analog and digital tape without regard to the format of data encoded upon it. It includes tape made for audio, video, instrumentation, and computer use. Topics covered include tape pack integrity, contamination, handling techniques, environments, inspection, cleaning and maintenance, transportation, disasters, and staff training. A minimum handling requirements checklist is provided. While it stands as an independent standard, it is intended to complement *AES Recommended Practice for Preservation and Restoration of Audio – Storage and Handling – Storage of Polyester-based Magnetic Tape*, AES22-1997 r2002.

This standard was prepared by a Joint Technical Commission of the Audio Engineering Society Standards Committee SC-03 Subcommittee on Preservation and Restoration of Audio, and the International Imaging Industry Association (i3a) Technical Committee IT-9 on Image Permanence. At the time of completion the commission was co-chaired by Peter Adelstein and Ted Sheldon and included: Richard Billeaud, Peter Brothers, Alan Calmes, Gerd Cyrener, Del Eilers, Jean Marc Fontaine, Lars Gaustad, Gerald Gibson, Ian Gilmour, Allan Goodrich, Chris Lacinak, Fred Layn, Jim Lindner, Jay McKnight, William Murray, Mick Newnham, Dietrich Schueller, Carl Talkington, Jim Wheeler, Joe Wrobel, Edward Zwanefeld,

Ted Sheldon
Chair, SC-03-04 Working Group on Preservation and Restoration of Audio
2004-08-20

NOTE In AES standards documents, sentences containing the verb "shall" are requirements for compliance with the standard. Sentences containing the verb "should" are strong suggestions (recommendations). Sentences giving permission use the verb "may." Sentences expressing a possibility use the verb "can".

Document preview:
for full document, go to
www.aes.org/publications/standards

AES standard for audio preservation and restoration - Magnetic tape - Care and handling practices for extended usage

0 Introduction

Magnetic recording tape has served as a major means of processing, distributing and preserving information, including audio data since the 1930s. Unlike earlier data recording media such as paper and photographic material, the information recorded on magnetic tape is not directly human readable and requires a machine interface and interpretation. In addition, the machine/medium interface must occur within precise conditions for the machine interpretation to be accurate. Therefore, the physical integrity of magnetic tape necessary to provide a proper interface with the interpreting machinery is critical. Correct care and handling is essential to preserve the needed physical integrity of magnetic tape both for short-term usage and long-term archiving.

Magnetic tape has proven itself an easy-to-use and versatile medium. Yet, despite the substantial resources put into creating recordings and the historical, intellectual and financial assets they represent, tapes often are not treated as valuable objects. Many important and unique recordings are lost due to inadequate care and handling of the tape. This poses problems for users who wish to preserve content. Among these problems are the following:

- a) Improper handling can damage magnetic tapes and compromise the future ability to retrieve content;
- b) Due to the enormous volume of existing tapes, the impracticality and cost of making copies of each and every one frequently results in large numbers of unique records being subjected to excessive use and wear without any back-up or protection. Repeated use of magnetic tape can cause wear or physical damage that shortens its effective life;
- c) Some magnetic tapes are known to have a finite shelf life and will eventually decay. Recorded tape documents on these tapes must be copied to new media before decay precludes access;
- d) The ability to play back a tape in the future depends on the existence of functional playback equipment. As new tape formats become popular, equipment manufacturers discontinue the production and support of older, superseded equipment. Eventually, usable equipment to play older obsolete magnetic tape formats becomes impossible to find. Before this occurs a migration plan should be in place.

Like all media, magnetic tape is subject to both damage and decay. Consequently, its effective life can increase or decrease significantly depending on the conditions under which it is stored and handled. This document contains recommendations for the care and handling of magnetic tape. Recommendations for the preservation and storage of polyester-base magnetic tape appear in AES22. Following these recommendations promotes the physical integrity of the media and increases the effective life of magnetic tape.

Document preview:
for full document, go to
www.aes.org/publications/standards

1 Scope

This standard concerns the care and handling of magnetic recording tape during use. It addresses the issues of physical integrity of the medium necessary to preserve access to the audio or other data (information) recorded on the tape. This standard recommends handling procedures to maximize the effective life of magnetic tape. Faulty handling, packing and transporting techniques and methods often cause damage to magnetic tape and the content recorded thereon. Extending the longevity of magnetic tape requires the identification of appropriate handling methods and well-developed training programs.

While some of the recommendations in this standard, such as staff training, apply specifically to large-scale or archival usage, the basics of all recommendations in this document can and should be applied in all circumstances where the desired result is long-term usage of the medium whether archival, commercial or personal. This standard is not aimed at casual home users of tapes.

This standard addresses the following subjects:

- * handling techniques, including common hazards and methods to mitigate those hazards;
- * handling environments, including pollutants, temperature and humidity, lighting, magnetic fields, and robotics;
- * use of tape, including inspection, playback, mounting/loading and removing, winding speed, tension, and robotic systems;
- * cleaning and maintenance techniques, including contaminants, cleaning methods and frequency;
- * transportation, both in-house and shipping outside the storage facility;
- * disasters, including water, fire, construction and post-disaster procedures;
- * staff training, including schedule for training and contents of the training program;
- * archival issues.

2 Normative references

The following standard contains provisions that, through reference in this text, constitute provisions of this document. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the indicated standards.

AES22-1997 (r2003) *AES recommended practice for audio preservation and restoration -- Storage and handling -- Storage of polyester-base magnetic tape*. Audio Engineering Society, New York, NY., US.

ISO 14644-1:1999, *Cleanrooms and associated controlled environments - Part 1: Classification of air cleanliness*, International Standards Organisation, Geneva, Switzerland.

ISO 14644-2:2000, *Cleanrooms and associated controlled environments - Part 2: Specifications for testing and monitoring to improve continued compliance with ISO 14644-1*, International Standards Organisation, Geneva, Switzerland.

ISO 18923:2000, *Imaging materials - Polyester-base magnetic film - storage practices*, International Standards Organisation, Geneva, Switzerland.