

**A Preservation Survey Report:
Recorded Sound and Moving Image Materials
in Special Collections & University Archives
at the University of Oregon Libraries**

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Author's Preface

The preservation survey described in this report was initiated by the author in January 2005 with the permission of Carol Hixson, Head of Metadata & Digital Library Services, and James Fox, Head of Special Collections & University Archives. The author would like to thank the staff and students of Special Collections & University Archives, Media Services, Metadata & Digital Library Services, and Image Services for their help.

Executive Summary

All recorded sound and moving image materials are at risk to degradation and loss due to inherent instabilities and sensitivity to mishandling and poor storage conditions. The long-term survival of these materials depends on an informed and active management program. The first step in establishing such a program is to survey the materials to determine their condition, content and extent. This information will allow collection managers to prioritize materials for preservation, plan preservation projects, and apply successfully for preservation funding. Toward this end, a preservation survey of the recorded sound and moving image materials in Special Collections & University Archives was undertaken from January 2005 to January 2006. The goals of the survey were to:

- Identify all collections containing recorded sound and moving image materials
- Survey the condition, content, extent of materials
- Assess intellectual and physical access to materials
- Create collection-level survey reports, including content descriptions and preservation risk assessments, in order to facilitate the prioritization of materials for preservation
- Identify local processing, storage, and handling practices for recorded sound and moving image materials

The survey identified 175 collections, accessions, and miscellaneous groups of materials comprising about 18,500 recorded sound and moving image items in Special Collections & University Archives. These 18,500 items, containing roughly 12,000 hours of content created from 1925 to present, document the University of Oregon, state government and politics, Oregon authors, and Native Americans of the Pacific Northwest, among many other subjects. The collections comprise materials in a range of formats, from acetate discs and 35mm films to compact discs and DVDs. Most materials are the following formats: open reels (ca. 6,500 items), films (3,600 items), analog cassettes (3,000 items), videotapes (2,750 items), sound discs (2,150 items), wire recordings (192 items), CDs (725 items), DVDs (35 items), and DATs (140 items).

Intellectual access to materials varies widely. Access to some materials is made possible by searchable, electronic finding aids with item-level descriptions of recorded sound and moving image materials. Access to other materials is limited or non-existent. Physical access to materials varies by collection and by format, but very few materials are readily accessible to collection managers or researchers. Physical access to most materials is limited for one or more of the following reasons: lack of equipment and facilities for preparation, playback, and preservation of materials; limited staff training and experience in handling materials and using equipment; and misplacement and loss of materials due to past processing and storage practices. Access to some materials is also limited by the poor physical condition of materials.

Most collections evidence storage problems of some severity, including loosely contained materials, improper disposition of materials within containers, and materials with inadequate housing or acidic enclosures. Collections with significant storage problems include those with conditions that place materials at elevated risk, including one or more of the following: open storage cartons; materials without housing; materials with severely degraded housing; and mixed storage cartons.

The physical condition of materials ranges widely. The survey identified several items in very poor condition, including a 35mm nitrate film with advanced nitrate rot that was removed from the collections, and 8mm and 16mm films with severe vinegar syndrome or similar; many items in poor physical condition, including films and reels with possible vinegar syndrome, broken cassettes, and brittle and broken discs; many items in somewhat poor condition, including degraded reels, damaged films, and dusty materials; many items in generally good physical condition, including cassettes, videotapes, reels, and some discs; and several items seemingly in very good physical condition, including discs, CDs, DVDs, and videotapes.

The survey identified two conditions common among the recorded sound and moving image materials in Special Collections & University Archives: surface contamination and physical damage due to processing and storage practices; and physical degradation due to inherent instabilities in format materials. Collections generally do not include materials with physical damage from overuse or poor handling practices; physical damage from water or fire; or physical damage from biological infestation, with some exceptions.

In 2004, the Council on Library and Information Resources (CLIR) published the results of a survey of the state of audio collections in academic libraries. The report concluded that recorded sound collections in academic repositories are rich, but barriers to using them are high and institutional readiness to manage them is low. This survey reached a similar conclusion concerning the state of recorded sound and moving image materials in Special Collections & University Archives. The collections include materials with significant research and instructional value, but access to them is severely limited by several factors, primarily a lack of facilities and human resources for preservation and access work.

The purpose of the survey was to gather information required by Special Collections to make informed decisions concerning the management of its materials. The recommendations in the conclusion to the survey report identify ways in which Special Collections can address the issues documented during the survey and improve the management of its materials. Recommendations include the following:

Preservation Survey Follow Up

- Use survey results to assess the research value of collections and prioritize collections for preservation.
- Review collections with significant storage and access issues and take basic measures to remediate
- Conduct further preservation assessment and ranking of moving image materials

Processing, Storage and Handling Procedures Development

- Develop minimal processing, storage and handling procedures for recorded sound and moving image materials
- Incorporate guidelines for processing materials into collections processing instructions and records management instructions and outreach

Preservation Program Planning and Development

- Review physical access issues and other issues; determine level of commitment to preservation and access of recorded sound and moving image formats; outline investment in technology and human resources to meet that commitment.
- Arrange formal training for staff in the management of recorded sound and moving image collections.
- Research grants, funding opportunities, and potential donor support for training, preservation program development and preservation project work

Digital Repository Planning and Development

- In cooperation with Media Services staff and others, research, develop, and implement preservation guidelines for recorded sound and moving image materials, in keeping with preservation guidelines
- In cooperation with Media Services, MDLS, staff and others, research, develop and implement a metadata structure and digital repository for digital preservation copies of recorded sound materials

Preservation and Access Pilot Project

- In cooperation with concerned departments, plan and execute a pilot preservation and access project for recorded sound and moving image materials in keeping with preservation guidelines.

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Purpose

All recorded sound and moving image materials are at risk to degradation and loss due to their inherent instability and their sensitivity to mishandling and poor storage conditions. The long-term survival of these materials and their contents depends on an informed and active management program. The first step in establishing such a program is to survey the materials to determine their condition, content and extent. This information will allow collection managers to prioritize materials for preservation, plan preservation projects, and apply successfully for preservation funding. A second step is to review processing, storage and handling procedures. This will help collection managers improve local practices, increase use of materials, and develop a trusted repository for recorded sound and moving image collections.

With these ends in mind, a preservation survey of the recorded sound and moving image materials in Special Collections & University Archives was undertaken from January 2005 to January 2006. The specific goals of the survey were to:

- Identify all collections in Special Collections & University Archives containing recorded sound and moving image materials
- Survey the condition, content, and extent of recorded sound and moving image materials
- Assess intellectual and physical access to recorded sound and moving image materials
- Provide Special Collections & University Archives staff with collection-level survey reports, including content descriptions and preservation risk assessments, in order to facilitate the prioritization of collections for preservation
- Identify local practices and procedures for handling recorded sound and moving image materials
- Report the findings of the survey and offer practicable recommendations for improving the management of recorded sound and moving image materials

Methodology

The methods of the survey are described below under the following headings for primary survey activities: Identification of Collections, Survey of Collections, and Review of Practices and Procedures.

Identification of Collections:

The survey employed several methods to identify collections containing recorded sound and moving image materials. University Archives collections containing these materials were identified through keyword searches of brief bibliographic records in the local catalog and consultation with University Historian & Archivist Heather Briston. The use of controlled vocabulary terms for the description of recorded sound and moving image materials during the 2004 Archives inventory project facilitated this process.

Special collections containing recorded sound and moving image materials were identified through a review of finding aids, container lists, and inventories, and through consultation with Manuscripts Librarian Linda Long and Access & Preservation Officer Normandy Helmer. Additional unprocessed special collections and recent accessions containing these materials were identified through keyword searches in the Manuscripts Locator Guide and a review of the Quick Accessions List. Still additional materials were located during a search of staff offices, working spaces, and storage areas. Finally, Music Services staff and MDLS Materials Processing and Conservation Unit staff identified two additional groups of materials currently stored outside of Special Collections & University Archives.

With the exception of School of Music collection in Music Services, the survey did not identify recorded sound and moving image materials in other library departments or University of Oregon schools, departments, or organizations, which may include materials scheduled for retention in University Archives, deposit in Special Collections, or inclusion in other library collections.

Survey of Collections:

The condition, content, format and extent of recorded sound and moving image materials were determined through basic, item-level physical inspection and review of available metadata, such as finding aids, inventories and catalog records. Due to a lack of equipment and supplies, films were not measured for shrinkage and acid detection strips were not used to evaluate the condition of housing materials or the degradation of materials with possibly vinegar syndrome. For a number of reasons, including limited playback equipment and the instability of some materials, items were not played back in order to determine the condition of their contents. Consequently, the survey did not note some conditions common to recorded sound and moving image materials unless they were obviously manifest, including sticky shed syndrome, loss of lubricant, and groove damage.

Some collections, unprocessed accessions and miscellaneous groups of materials containing sound recordings and moving images were identified but not surveyed due

to the difficulty of locating the collections, locating materials within large unprocessed accessions, or handling materials safely.

The findings of the survey were collected in a Survey Form created by the author and approved by Special Collections staff (Appendix A). Selected data from the survey forms were compiled in a Survey Spreadsheet, two views of which are provided in Appendix B. The survey sought to determine the following information about each collection: identification and physical location, formats and quantities, recording specifications and duration, contents and subjects, bibliographic access and available metadata, physical condition and preservation risk assessment.

Subject headings from the Northwest Digital Archives (NWDA) Browsing Terms were assigned to collections based on information available in finding aids, catalog records, and other sources. Additional, uncontrolled subject headings, such as names of athletics programs, were assigned to University Archives materials for convenience.

Preservation risk assessment is the evaluation of materials for risk of loss based on format, condition, age, obsolescence, copies and other criteria. Preservation risk assessment and other factors, chiefly collection research value and estimated preservation costs, determine the priority of materials for preservation.

Preservation risk assessment for recorded sound materials was based on the Field Audio Collection Evaluation Tool (FACET). A beta version of FACET was made available by Mike Casey at the Indiana University's Archives of Traditional Music in exchange for feedback concerning its effectiveness (Folder C). Using FACET, materials were assigned points for risk by format and ranked on a preservation scale of 1 to 6. FACET worksheets for collection materials are included with the collection survey forms in Folders A and B. FACET does not address some formats, such as cylinders, shellac and vinyl discs, CDs and DVDs. These materials are not widely represented in the collections, with the exception of shellac and vinyl discs, which are relatively stable if housed and stored properly. Therefore, they were not ranked for preservation risk.

For several reasons, preservation risk assessment of moving image materials was not completed during this survey, although the condition of all materials was documented in survey forms. One collection of materials, 8mm and 16mm films in the Bill Bowerman papers (Up 685, Up 686, 2002s-179), was evaluated and determined to be at high risk due to vinegar syndrome, or similar, or hub degradation. Further preservation risk assessment of moving image materials is noted as a follow-up task in the conclusion to this report.

Review of Practices and Procedures:

Processing, storage, and handling procedures were identified by the following means: physical inspection of collection housing and disposition; review of the Special Collections & University Archives Manuscripts Processing Manual and other documents; discussions with Linda Long, Heather Briston and Erin O'Meara; informal interviews with Media Services Equipment Systems Specialist Chris Lundberg, Instructional Equipment Manager Stan Hall, and Audiovisual Technician Stacy DeHart; and inspection of Media Services Audio Production Room equipment.

Findings

The preservation survey yielded valuable information concerning the state of recorded sound and moving image materials in Special Collections & University Archives. These findings are summarized below under the following headings:

- Part A. Overview of Materials in Special Collections & University Archives
- Part B. Intellectual and Physical Access to Collection Materials
- Part C. Housing and Storage of Materials
- Part D. Condition of Materials and Risk Assessment
- Part E. Processing, Storage, and Handling Practices



Advanced nitrate rot.

Photograph by Rick Gersbach

NOTE: Photographs of materials are presented in Appendix C: Survey Images and are referred to by photo number throughout the findings. For background information on selected formats and preservation issues see Appendix D: Overview of Formats and Modes of Degradation.

A. Overview of Materials in Special Collections & University Archives

Special Collections & University Archives includes 175 collections, accessions, and miscellaneous groups of materials comprising about 18,500 recorded sound and moving image items. These 18,500 items, containing roughly 12,000 hours of content created from 1925 to present, document the University of Oregon, state government and politics, Oregon authors, and Native Americans of the Pacific Northwest, among many other subjects.

The general distribution of materials within Special Collections & University Archives is summarized below:

Special Collections: 175 collections w/ Sound Recordings or Moving Images			
Sound Recordings	65 collections	4,000 items	6,400 hours
Moving Images	20 collections	1,100 items	950 hours
Mixed	26 collections	4,000 items	1,800 hours

University Archives: 63 collections w/ Sound Recordings or Moving Images			
Sound Recordings	33 collections	5,600 items	4,900 hours
Moving Images	21 collections	3,500 items	2,300 hours
Mixed	8 collections	225 items	175 hours

Many collections, including 40 special collections and 30 archives collections, comprise 10 or fewer recorded sound or moving image items. About 17 special collections and 12 archives collections comprise 100 items or more, including 5 special collections and 6 archives collections with more than 500 items.

These collections comprise recorded sound and moving image materials in a range of formats, from acetate discs and 35mm films to compact discs and DVDs. However, most collection materials are concentrated on a few, relatively common formats, including:

open reels (ca. 6,500 items) ca. 1950-1980

- > ¼-inch analog audiotape, polyester base, acetate base, several paper base
- > primarily two track, mono and stereo
- > mostly 3.75 ips and 7.5 ips, some 15 ips and 1.875 ips
- > all reel sizes, from 3-inch to 10-inch, few NAB hubs

films (3,600 items) ca. 1940-1980

- > Super 8mm and 8mm films
- > 16mm films, several 35mm films

analog cassettes (3,000 items) ca. 1970-1995

- > various brands and products; few microcassettes, minicassettes

videotapes (2,750 items) ca. 1970-present

- > ¾-inch U-matic videotapes
- > VHS and Beta videotapes
- > some ½-inch videotapes, few Hi8 videotapes and digital videotapes

sound discs (2,150 items) ca. 1930-1980

- > instantaneous recordings, radio broadcast transcription discs, dictation discs
- > 7-in., 10-in., 12-in. and 16-in. discs
- > various groove dimensions, tracking direction
- > acetate discs, aluminum and glass base, 78 rpm
- > shellac discs, 33 1/3 rpm, 78 rpm
- > vinyl discs, 45 rpm, 78 rpm

wire recordings (192 items) and cylinders (6 items)

- > Photo 1, Photo 2

CDs (725 items), DVDs (35 items), and DATs (140 items)

The materials in Special Collections concern a range of subjects, including: Pacific Northwest history; local, regional, and national government and politics; and the radio, television and film industries. The following general subjects are areas in which Special Collections includes extensive or notable recordings:

Literature; Oregon Authors

Jack Olsen papers (39 open reels)

Ken Kesey papers (36 cassettes)

Elizabeth Orton Jones papers (1 cassette, 1 open reel, 2 discs, 1 film)

Ruth Mountaingrove papers (21 videotapes, 9 CDs)

Ursula K. Le Guin papers (15 videotapes, 61 cassettes)

Conservative and Libertarian Politics, 1950-

James C. Ingebretsen papers (350 open reels, 180 cassettes)

Howard Kershner papers (371 open reels, 89 cassettes, 14 discs)

Tom Anderson papers (266 open reels, 62 cassettes, 4 films, 30 discs)

Circuit Riders, Inc. records (91 open reels, 1 cassette, 1 film)

Tonie Nathan papers (85 cassettes, 48 videotapes)

John Zerzan papers (8 cassettes, 9 CDs)

Oregon Government and Politics, 1950-1970

Wayne Morse papers (500 acetate discs, 175 open reels, 150 films)

Richard Neuberger papers (42 open reels, 11 discs, 2 films)

Maurine Neuberger papers (1 disc, 1 film)

Charles O. Porter papers (12 open reels)

Rajneesh materials, 1976-1990

Rajneesh Legal Services Corp. records (160 cassettes, 28 videotapes)

Rajneesh Foundation, Int. records (12 cassettes)

Norm Sundberg papers (5 cassettes, 2 videotapes)

Pat Lear papers (318 cassettes, 49 videotapes, 2 DVDs)

Ethnography; Anthropology;

Alvin Josephy papers (51 cassettes)

SWORP collection (38 cassettes, 23 open reels, 61 discs)
Christine Price papers (28 cassettes, 19 open reels)

Film and Television Industries; Arts and Entertainment

Henry J. Beau papers (95 discs, 80 open reels)
Peg Lynch papers (365 reels, 125 cassette copies of reels, 7 discs, 4 films)
Ernest F. Nichols papers (200+ discs, 3 open reels, 30 cassettes)
Bernard Green papers (122 open reels, 6 cassettes, 25 discs)

General and Other

Edward A. Schaper papers (475 open reels, 325 discs, 192 wires)
KMTR records (650 videotapes)
KVAL records (1260 films; 145 videotapes)
Cascadia Alive! (215 videotapes)
Bob Zagorin papers (108 analog cassettes, 9 open reels, ca. 115 CD copies)

University Archives collections include recorded sound and moving image materials of various record types, including meeting minutes and organizational records; athletic recruitment videotapes; intercollegiate athletic event recordings; athletic training films and videotapes; School of Music recitals and events; human subject research interviews; and historical recordings of University of Oregon events. Much of the materials may be grouped under the following general headings:

University of Oregon events, 1947-1981

1996-275 (ca. 950 open reels); 1996-793 (ca. 1000 open reels);
1996-201 (ca. 15 cassettes); 2002-48 (8 cassettes)

Intercollegiate Athletics, 1930s-1990s

Football, Track and Field, Men's and Women's Basketball, etc.
U of O. Dept. of Intercollegiate Athletics (ca. 1872 films, ca. 1379 videotapes)
1996-188, 2002s-26, 2002s-298, 2002s-279, 2002-46, 1997-33, 1996-181, 2002s-211
Bill Bowerman papers (ca. 375 films, 1 cassettes, 1 videotape)
Up 685, 2002s-179, 1996-795, 2002s-29

School of Music recitals, events, etc., 1950s-2005

1999-10 (1700 open reels, 160 cassettes, 500 CDs, 140 DATs)

University of Oregon department or organization records

U of O. Associated Students (292 cassettes, 81 open reels, 1 digital videotape)
11431, 1996-642, 1996-692, 1996-526
U of O. Career Center (14 videotapes, 2 films, 43 cassettes)
11008, 2002s-89, 10652, 2000-06
U of O. Dept. of Special Education (200 cassettes) 2002s-249

Faculty Papers

Robert Trotter (381 cassettes) 2005-104; Norm Sundberg (4 open reels) 2005-113
Susan Barry (22 cassettes) 1996-461

B. Intellectual and Physical Access to Collection Materials

Intellectual Access:

Intellectual access to recorded sound and moving image materials in Special Collections & University Archives varies by unit and by collection. Library staff may access most University Archives collections through brief bibliographic records in the local catalog, but these records are suppressed from public view. The records include controlled vocabulary terms for the description of recorded sound and moving image materials to facilitate keyword retrieval. They were created during the Archives Inventory project and were current as of August 2004. Access to collections accessioned since then is provided through the Active Transmittal Log and University Archives accessions records. Access to several collections in University Archives is augmented by item-level inventories or card indexes, notably University of Oregon events (1996-275). In one instance, the collection of School of Music recitals (1999-10), access to most materials is facilitated by item-level records in the catalog for accompanying scores.

Intellectual access to recorded sound and moving image materials in Special Collections varies widely. Access to some materials is made possible by searchable, electronic finding aids with item-level descriptions of recorded sound and moving image materials. These finding aids, marked up in Encoded Archival Description (EAD), are remotely accessible to researchers around the world on the Northwest Digital Archives website. They include item-level descriptions of materials and could possibly provide access to digital surrogates of items. Access to other materials is limited to entries in the Manuscripts Locator Guide or Quick Accessions Log.

Bibliographic Access to Special Collections: 175 collections, accessions	
Locator Guide, Accession Log, None	39 collections, accessions, misc. groups
Finding Aid	62 collections
MARC record	25 collections
EAD Finding Aid	10 collections

For most special collections, access is provided through paper finding aids or inventories which include series-level descriptions and, in some cases, item-level descriptions of recorded sound and moving image materials. Finding aids or indexes for very few collections, including the Ken Kesey papers (Ax 279) and the Edward A. Schaper papers (Coll. 218), include descriptions of materials beyond the item level, such as abstracts or rundowns with time code. Access to several collections is augmented by collection-level entries in the *Catalogue of Manuscripts in the University of Oregon Library* and the *National Inventory of Documentary Sources in the United States*.

Several collections, primarily miscellaneous groups of materials or very recent accessions, lack locator guide entries. Collections and groups of materials without locator guide entries also include: the William Fluhrer papers (Ax 035/Ph 100); several instantaneous discs associated with Frederick K. Davis that were discovered during the survey; and several blank, wax phonograph cylinders in the Photo Vault.

Finding aids or inventories for the following six collections do not include all of the recorded sound or moving image materials contained in those collections: the Richard Neuberger papers (Ax 278), the Noel Loomis papers (Ax 643), the Lucille Cummins papers (Ax 786), the Henry J. Beau papers (Ax 499), the Dean S. Jennings papers (Ax 734), and the Victoria Case papers (Up 649).

Physical Access:

Physical access to recorded sound and moving image materials in Special Collections & University Archives varies by collection and by format, but very few materials are readily accessible to collection managers or researchers. Access to most materials is limited for one or more of the following reasons: lack of equipment and facilities for preparation, playback, and preservation of materials; limited staff training and experience in handling materials and using equipment; and misplacement and loss of materials due to past processing and storage practices. Access to some materials is also limited by poor physical condition, as discussed in Part D: Condition of Materials.

The survey identified nine collections that appear to be missing recorded sound and moving image materials, possibly as a result of past processing and storage practices or other factors: the Peggy Blocklinger papers (Ax 297), the Wally Butterworth papers (Coll. 129), the Ken Kesey papers (Ax 279), the Vera S. Nelson papers (Ax 662), the Charles Orlando Porter papers (Ax 088), the Mary King Ruhtenberg papers (Coll. 081), the Peter Steele papers (Ax 829), the Axel Stordahl papers (Ax 528), and the Charles Stuart papers (Ax 415). In some cases, materials may have been separated from collections for reasons of housing or storage and subsequently misplaced or lost. In the instance of the Ken Kesey papers, open reels on loan to Special Collections were returned to the donor's family after they were duplicated on analog cassettes. One collection could not be located, the Walt Curtis papers (Up 035).

Access to recorded sound and moving image materials is also limited by a lack of facilities and equipment for proper playback, duplication, and preservation of materials. Special Collections staff currently contact Media Services or Video Reserves staff to arrange use of playback or duplication facilities or services when researchers request access to recorded sound or moving image items. These facilities include some but not all of the equipment and supplies required to calibrate and maintain playback equipment and prepare and playback materials.

Media Services' basic playback capabilities are summarized below and presented in full for reference in Appendix E and F.

Formats with Playback Equipment

open reels – four track, 7.5 and 15 ips
open reels – two track, 7.5 and 15 ips
analog cassettes
discs – plastic
16mm films
VHS videotapes
¾-inch U-matic videotapes

Formats without Playback Equipment

open reels – two track, 3.75 and 7.5 ips
cylinders and wire recordings
discs – acetate and shellac
Beta videotapes
35mm films
8mm films (projection only)

The facilities in Media Services include the equipment required to create access copies of recorded sound and moving image materials on digital formats, such as CDs or DVDs. However, the facilities generally do not include all of the equipment required to prepare digital audio files of sound recordings for preservation in a digital archive or delivery online, principally an analog-to-digital (A/D) converter and a designated digital audio workstation, but also cleaning equipment, additional supplies, and human resources.

Media Services staff recently developed a proposal to upgrade the Audio Production Room to include a digital audio workstation for use by students and faculty for academic and instructional purposes, and for use by library staff in creating streaming audio reserves and preserving Special Collections materials. A copy of that proposal, prepared by Stacy DeHart in Media Services and reviewed by others, is provided for reference purposes in Appendix G: Audio Production Room Upgrade Proposal. The proposal, which calls for \$9,000 in additional equipment, will enable access to most, but not all, recorded sound materials in Special Collections. [This proposal was approved recently.]

Finally, access to recorded sound and moving image materials in Special Collections is limited by the experience of staff in handling materials and using playback equipment. As discussed further in Part E: Review of Practices and Procedures, Special Collections staff generally do not receive training or instruction in handling recorded sound and moving image materials or operating playback equipment. Consequently, access to most recorded sound and moving image materials depends in large part on the extent to which Special Collections staff can enlist Media Services or other library staff to determine recording specifications, operate playback equipment, and duplicate materials.

C. Housing and Storage of Collection Materials

Recorded sound and moving image materials in Special Collections & University Archives are housed in a variety of container types, including: plastic and metal film cans, paperboard boxes and sleeves, and plastic cases for moving image materials; and paper envelopes, paper and plastic boxes, and metal cases for recorded sound materials. The majority of collection materials are housed, but a significant number of collections include materials that lack housing, to the severe detriment of some materials.

Few materials are housed in archival containers and the condition of other housing varies widely. Most collection materials are housed in original containers, some of which are significantly degraded, including torn or acidic record sleeves (Photo 3), torn or acidic reel boxes (Photo 4), and rusted metal film cans.

Special Collections includes:

- 35 collections with materials that lack housing
- 30 collections with materials with significantly degraded housing
- 27 collections with significant storage problems

University Archives includes:

- 12 collections with materials that lack housing
- 17 collections with materials with significantly degraded housing
- 4 collections with significant storage problems

Most collections evidence storage problems of some severity, including loosely contained materials, improper disposition of materials within containers, and materials with inadequate housing or acidic enclosures. Collections with significant storage problems include those with conditions that place materials at elevated risk, including one or more of the following: open storage cartons (Photo 5); materials without housing (Photo 6); materials with severely degraded housing; and mixed storage cartons (Photo 7). Housing and storage conditions are described fully in the collection survey forms. The following examples illustrate the range of issues encountered during the survey.

Several collections, including the Jack Olsen papers (Ax 322) and the recordings of University of Oregon events (1996-275, 1996-793), include open reels with loose tape packs and damaged ends (Photo 14). Many of these are housed in original paperboard boxes and stacked horizontally in record storage cartons or archival clamshell boxes. In poor storage conditions, acidic housing may hasten the degradation of some materials. However, the disposition of these materials poses a greater risk to their condition. Reels stored horizontally with loose tape packs are prone to shift during routine handling of tapes or storage containers, causing crimps in tapes and windows in tape packs. Stacking tapes stored in degraded boxes may cause flange pack and tape damage (Photo 15). These conditions, observed in some collections but not in the Olsen tapes, must be addressed prior to playback in order to ensure accurate duplication and avoid further damage to materials or equipment. Other formats face similar housing and disposition concerns, including acetate and shellac discs, many of which are stored horizontally in degraded sleeves and under weight.

Collections with more significant storage problems include the Henry J. Beau papers (Ax 499), the Wayne Morse papers and accessions (Coll. 001), the KVAL records (Acc. 03-009), the University of Oregon Associated Students records (11431), and miscellaneous materials on Deck 6. These collections include quantities of open reels, films or cassettes stored without housing, in damaged storage boxes, or in open cartons (Photo 8). The University of Oregon Associated Students records (11431), for example, includes around 250 analog cassettes stacked four rows deep in a single record storage carton. Approximately 125 of these cassettes lack housing, exposing them to physical damage from neighboring materials. Not surprisingly, storage in this manner has resulted in damaged and broken tapes, degraded and dislodged pressure pads, and surface contamination. Access to some materials may require complete disassembly of cassettes.

D. Physical Condition of Collection Materials and Preservation Risk Assessment

The physical condition of recorded sound and moving image materials in Special Collections & University Archives ranges widely. The survey identified several items in very poor condition, including a 35mm nitrate film with advanced nitrate rot that was removed from the collections (Photo 9), and 8mm and 16mm films with severe vinegar syndrome or similar; many items in poor physical condition, including films and reels with possible vinegar syndrome (Photo 10), broken cassettes (Photo 11), and brittle and broken discs; many items in somewhat poor condition, including degraded reels, damaged films, and dusty materials; many items in generally good physical condition, including cassettes, videotapes, reels, and some discs; and several items seemingly in very good physical condition, including discs, CDs, DVDs, and videotapes.

The survey identified two conditions common among the recorded sound and moving image materials in Special Collections & University Archives: surface contamination and physical damage due to processing and storage practices; and physical degradation due to inherent instabilities in format materials. Collections generally do not include materials with physical damage from overuse or poor handling practices; physical damage from water or fire; or physical damage from biological infestation. One notable exception is the Janet Marshall Stevenson papers (Ax 265), which includes several reels with evidence of biological infestation, perhaps mold (Photo 12).

Materials with surface contamination due to poor housing and storage practices include discs, open reels, analog cassettes, and films with dusty or dirty surfaces. Most collections include some materials in this condition and several include materials with elevated surface contamination due to lack of housing or storage in open containers (Photo 8). Few collections, however, include materials with significant, concomitant physical damage, such as excessive scratches from dust and debris, surface degradation due to deposits of finger oils (Photo 11), and physical damage from housing materials. However, surface contamination in itself is a significant obstacle to access because materials must be cleaned before playback in order to prevent damage to materials and equipment.

Materials with physical damage due to past processing, storage and handling practices include: open reels and films with loose packs, windows, and damaged ends (Photo 14, 15); open reels, films, and cassettes with physical deformation due to thermal cycling or poor storage conditions (Photo 16); and cassettes with broken tapes and missing pressure pads due to poor housing and storage practices (Photo 10). In some instances, physical damage to collection materials may be the result of storage and handling practices prior to accession. For example, the unprocessed KVAL collection (Acc. 03-009) described above includes many films stored on hubs without reel flanges and housing, most likely by KVAL itself (Photo 8). Likewise, the Christine Price papers (Ax 448) includes travel tape recordings that evidence physical distortion due to storage in periodically hot and humid environments, perhaps initially by the creator.

Materials with physical degradation due to inherent instabilities in material formats include acetate discs with plasticizer loss and palmitic acid accretions (Photo 17); 8mm

and 16mm films with possible vinegar syndrome (Photo 10); open reels with possible vinegar syndrome, sticky shed syndrome, or loss of lubricant; and films with shrinkage or other degradation. The following examples illustrate some of the conditions that were observed in multiple collections.

The Eloise and William McGraw papers (Ax 243) includes several instantaneous recordings of interviews and readings by Eloise McGraw in the 1950s on 10-inch and 12-inch acetate discs, one of which evidences severe plasticizer loss (Photo 17). The surface of the 10-inch disc is coated with palmitic acid, a white waxy substance resulting from the reaction of castor oil or other plasticizers in lacquer with water vapor in air. These discs should be cleaned directly before preservation recording as removal of the substance leads to further plasticizer loss and disc degradation.

Collections containing open reels with possible vinegar syndrome, sticky shed syndrome, or loss of lubricant include the University of Oregon events recordings (1996-275, 1996-793), the James C. Ingebretsen papers (Coll. 147), and the Howard Kershner papers (Coll. 128), among several others. As described in Appendix D, these conditions are believed to be endemic to certain types of tapes from certain manufacturers in certain years. Although they are difficult to detect through basic physical inspection, these conditions are likely to be encountered in large collections of mixed reels or cassettes from different eras, especially those that have been stored in hot or humid environments. There are a number of strategies for addressing these conditions during preservation.

One collection in particular, the William J. Bowerman papers (Up 686, 2002s-179), includes films with significant degradation, probably as a result of vinegar syndrome or the degradation of the hubs. The collection includes 8mm, Super8mm, 16mm, and 35mm films of track and field events from the 1940s to the 1970s. Several 8mm and 16mm films from the 1950s are in very poor condition, with deposits of a white, crystalline substance on films, hubs and housing (Photo 10).

Preservation Risk Assessment:

Preservation risk assessment is the evaluation of materials for risk of loss based on format characteristics, physical condition, equipment obsolescence, preservation and access copies, and other criteria. Preservation risk assessment and other factors, chiefly collection research value and estimated preservation costs, determine the priority of materials for preservation and provide justification for preservation funds.

Preservation risk assessment for recorded sound materials was based on the Field Audio Collection Evaluation Tool (FACET), which facilitates the ranking of materials by format for risk of loss on a preservation scale of 1 to 6, where 6 indicates high risk. A copy of FACET is provided in Folder C and FACET worksheets for collections are attached to collection survey forms in Folders A and B. FACET does not facilitate the assessment of some recorded sound formats, including plastic discs, shellac discs, CDs, and DVDs, so these materials were not assessed. Selected collections are described below in order of preservation ranking to illustrate the range of risk to different materials in the collections. A complete list of collections, preservation rankings, and condition information is included in Appendix B: Survey Spreadsheet – View 2.

FACET Preservation Ranking Scale

Format Base Scores (1=Low Risk : 6=High Risk)

Acetate discs	4.25	Analog cassette	2.75
DAT	4.00	Open reels, paper	2.75
Open reels, acetate	3.00	Open reels, polyester	2.50

0.0-1.9 Collection is in very good shape and there is little risk to it at present

Collection is relatively stable and considered to be at little risk. Recordings are carried on formats that are considered relatively stable at present. None exhibit problems with deterioration and copies of originals have been made.

Condition of materials presents no compelling reasons to take preservation action.

No materials are in this range of preservation risk.

2.0-2.9 Collection is in good shape but there is a small risk to it at present

Collection is relatively stable and safe but has some minor to moderate risk factors present. It may also be appropriate for collections in poorer condition that already have multiple, high-quality copies.

Condition of materials present few compelling reasons to take preservation action. Other factors, such as high collection use and high research value, may justify preservation action.

2.75 Acc. 03-023: Zagorin (Bob) papers

News interviews by Zagorin, 1975-1979

108 analog cassettes, mostly TDK 60 and 90 min., some off brands,

All cassettes have been copied onto CD

2.75 Acc. 05-008: Zerzan (John) papers

Recordings of radio programs featuring Zerzan, 2002-2006

8 analog cassettes, including Maxell Type I 60 and Sony HF 60

2.75 Up 061: Oregon's Land Development and Conservation Act oral histories

Oral histories concerning Oregon's Conservation and Development Act, 1997

8 analog cassettes, TDK Type I D90

2.75 1996-543: Erb Memorial Union (University of Oregon)

Recordings of Erb Memorial Union Board meetings, 1994-1995

19 analog cassettes, Maxell C90

2.75 1996-642: University of Oregon. Associated Students

Recordings of negotiations and member surveys, 1986-1987

6 analog cassettes, TDK D60, Sony HF90

3.0-3.9 Collection is in decent shape but is at some risk

Collection is carried on formats that are known to be somewhat unstable and not completely safe. Recordings are *not* exhibiting signs of severe deterioration but may have minor to moderate problems or potential for severe problems that are not manifest.

Collection is at some risk and could be a candidate for preservation action depending on other priorities as well as outside factors such as potential use or research value.

- 3.00 1999-10b: U of O. Library System. Music Services Part 2: Cassettes
School of Music recitals, events, etc.
ca. 160 analog cassettes, TDK SA-C90, ca. 1979-1980

- 3.00 Acc. 02-007 and Acc. 04-062: Le Guin (Ursula K.) papers
Recordings of Le Guin readings, lectures, interviews, etc.
51 analog cassettes, some off brands; few 120 min. and metal tapes; ca. 1980-1992
10 analog cassettes, various brands including off brands, ca. 1985-1997

- 3.10 1996-461: Barry (Susan) papers
Recordings of interviews
22 analog cassettes, various brands including off brands, ca. 1981-1984.

- 3.40 Ax 322: Olsen (Jack) papers
Recordings of interviews with subjects of Olsen's books, including Cassius Clay
39 open reels, ¼-inch analog tape, mostly polyester base, some off brands like Melody 166; some visible tape pack problems, dust; ca. 1950s-1960s

- 3.50 Acc. 05-020: Lear (Pat) papers
Published recordings of teachings, meditations, lectures by Rajneesh
318 analog cassettes, various brands; some show signs of cupping and physical distortion to tapes indicative of past storage in poor conditions; ca. 1976-1984.

- 3.50 Ax 279: Kesey (Ken) papers
Recordings of raps, music, readings, recollections by Ken Kesey and friends
36 analog cassettes, off brand, ca. 1980s
Copies of open reels, ca. 1967, on loan to Kesey family.

- 3.65 Coll. 157: Anderson (Tom) papers
Recordings of radio programs, speeches, interviews, and meetings, including John Birch Society meetings and American Party conventions. ca. 1959-1977
62 analog cassettes, various brands, including off brands; likely past storage in poor conditions

4.0-4.9 Collection is in poor shape or format is nearly obsolete; moderate to severe risk

Collection is carried on formats known to be unstable and/or recordings are known to be actively deteriorating. Recordings exhibit signs of moderate to severe deterioration or have other serious problems.

Collection is at moderate to severe risk and is a solid candidate for preservation action.

- 4.00 1999-10b: U of O. Library System. Music Services Part 3: DATs
School of Music recitals, events, etc.
ca. 140 DATs, mostly HHB 120 min., ca. 1993-1997
- 4.00 Acc. 03-036: Kershner (Howard) papers
Recordings of speeches and radio programs by Kershner and his organizations
89 analog cassettes, some off brands; tapes are dusty, some lack housing; some missing and damaged pressure pads; past storage in poor conditions; 1975-1980
- 4.05 Coll. 128: Kershner (Howard) papers
Recordings of Kershner's "Commentary on the News" radio program
ca. 370 open reels, mostly acetate base, some polyester base; includes off brands;
some visible tape pack problems and surface contamination; ca. 1950-1967
- 4.10 Coll. 147: Ingebretsen (James C.) papers
Recordings of radio programs, lectures, conservative commentary
350 open reels, acetate and polyester base, some off brands; some pack problems;
some in poor condition; likely past storage in poor conditions; ca. 1955-1967
- 4.25 Coll. 218: Schaper (Edward A.) papers
Recordings of radio programs, presidential speeches, news events
ca. 325 acetate discs, aluminum base, some plasticizer migration, 1930s-1964.
Discs copied to open reels of ¼-inch analog tape, acetate and polyester base.
- 4.40 1999-10: U of O. Library System. Music Services Part 1: Open reels
School of Music recitals, events, etc.
1700 open reels, acetate base and polyester base, various brands and dimensions;
some visible tape pack problems, most in good condition; likely past storage in
poor conditions; ca. 1950s-1970s
- 4.45 Ax 265: Stevenson (Janet Marshall) papers
Recordings of radio programs and interviews with subjects of books
18 open reels, polyester and acetate base, some off brands, some tape pack
problems; some with biological infestation, possibly mold; ca. 1956-1968
- 4.50 Ax 415: Stuart (Charles) papers
Recordings of radio news broadcasts and cultural programs from China
25 acetate discs, glass base and aluminum base, some discs have surface
contamination and scratches, 1943-1949

- 4.65 Coll. 001: Morse (Wayne) papers Part 1: Open reels
Recordings of speeches, interviews, etc., 1952-1968
ca. 175 open reels, acetate and polyester base, various brands including off brands; some reels in poor condition with damaged ends, loose packs, physical distortion to tape; indications of past storage in poor conditions; ca. 1952-1968

5+ Collection is in very poor shape or rapidly deteriorating, has extensive damage or significant deteriorative forces at work. Collection is at serious risk and requires attention soon.

Collection is carried on formats known to be highly unstable or obsolete and/or its recordings are known to be in very poor shape or rapidly deteriorating.

Collection is in serious trouble and is a prime candidate for preservation action. If the content of the collection is to survive with highest quality possible, preservation action must be taken soon.

- 5.00 Coll. 120: McMillen (Wheeler) papers
Recordings of McMillen speeches, interviews, radio programs, ca. 1941-1956
17 discs, mostly acetate, some vinyl; most discs in good condition, some stored in degraded sleeves; some plasticizer migration; stored in open storage carton; possible past storage in poor conditions
- 5.20 Coll. 172: Karczag (Leo) papers
Recordings of music composed by Karczag
2 acetate discs, aluminum base; surface contamination, significant degradation to disc surfaces from poor handling; stored in degraded sleeves; ca. 1950s?
- 5.25 Coll. 001: Morse (Wayne) papers Part 2: Acetate discs
Recordings of speeches, radio program "Senator Morse Reports," 1944-1961
Phonograph records of speeches and broadcasts, 1944-1961ca. 500 acetate discs; 8-inch, 12-inch, and 16-inch discs; some discs with plasticizer loss; discs poorly housed and stored; likely past storage in poor conditions
- 5.50 1996-275: U of O. Library System. Special Collections and University Archives
Recordings of University events, lectures, recitals, interviews, etc., 1948-1976
ca. 950 open reels; mostly polyester base, some acetate, several paper tapes; various brands including off brands; some visible tape pack problems, collection stored in poor conditions for over ten years; possible vinegar syndrome and loss of lubricant; some materials in freezer possibly as a result of water damage
- 5.55 1996-793: U of O. Library System. Special Collections and University Archives
Recordings of University events, lectures, recitals, performances, interviews, etc.
ca. 1000 open reels, mostly polyester, some acetate, several paper base; some off brands; some tape pack problems; collection stored in poor conditions for over ten years; possible vinegar syndrome and loss of lubricant, ca. 1950-1980

E. Processing, Storage, and Handling Procedures

Special Collections & University Archives staff have basic understanding of best practices for processing, storing, and handling recorded sound and moving image materials. In most cases, this understanding is based on personal and professional experience with formats and playback equipment, rather than formal training or established procedures. Not surprisingly, the survey revealed that past and present practices of managing materials have varied widely, seldom in keeping with best practices.

The following section presents a discussion of selected local practices under headings for collection management activities. It includes examples from the survey to illustrate the implications of local practices for intellectual and physical access to materials. It is not intended to be a review of all relevant practices and procedures, but rather a discussion of several important issues noted during the survey.

Arrangement and Description:

The Special Collections & University Archives Manuscripts Processing Manual is the primary source of instruction to Special Collections & University Archives staff and students who process and store collections. The document includes general guidance in the arrangement and housing of materials, but does not include minimal processing procedures or descriptive practices for recorded sound and moving image materials. Collection managers and staff and students who process collections generally address these materials as they encounter them in collections.

The University Archives website document, *Instructions for Transferring Records*, is the primary source of guidance to University faculty and staff who prepare collections for storage in University Archives. This document includes basic processing instructions, but it does not include specific guidance on preparing recorded sound or moving image materials for storage. University staff and students who prepare collections for transfer generally exercise their own judgment when making decisions concerning housing, disposition and storage.

As with all materials, access to recorded sound and moving image materials is determined in large part by the manner in which they are processed, stored, and described. In the past, collection managers often relegated recorded sound and moving image materials to miscellaneous series at the ends of collections. These series generally received minimal description in collection finding aids and were at times stored separately from collections for reasons of size, weight, or convenience.

This approach to managing recorded sound and moving image materials, once common to repositories of primarily printed materials, is problematic for several reasons. First, technical access to the contents of recorded sound and moving image materials necessitates additional description of materials in collection records and finding aids, although not necessarily at the item level. In order to select playback equipment and access materials, collection managers must know format types and recording specifications, information that should be included in accession records and collection finding aids.

Second, the separation of materials by format, although ideal for preservation and storage purposes, imposes additional record keeping demands on collection managers. If these demands are not met, the separation of materials increases the risk of misplacement and loss, as noted earlier. In short, the separation of materials from collections must be coordinated and thoroughly documented in order to realize economies in storage and gains in preservation without losing materials.

The Tom Anderson papers (Coll. 157), for example, includes one box of discs and other miscellaneous materials that is too large for storage with other collection materials. This box is shelved separately but its location has not been added to the collection record in the Manuscripts Locator Guide. Consequently, this box remained at large throughout the survey despite determined efforts to locate it by Special Collections students and staff.

Storage Environment:

Recorded sound and moving image materials are generally stored in three locations in Special Collections & University Archives: Baker Downtown Center, Special Collections stacks, and the Photo Vault. There is also one group of materials currently in storage in the Materials Processing and Conservation Unit preservation freezer. The environments in these storage areas are relatively stable, but the Photo Vault is the only storage area, excepting the freezer, that is climate controlled for temperature and relative humidity. Before the move to the Baker Downtown Center in 2004, University Archives collections containing recorded sound and moving image materials were stored on shelves or in boxes in Fenton Hall, where they likely experienced extreme storage conditions. These conditions were considered during the risk assessment of these collections.

Handling and Playback:

Special Collections & University Archives staff generally have not received formal training in handling recorded sound and moving image materials or operating playback equipment, in large part because the department does not manage listening and viewing facilities. Special Collections staff contact Media Services or Video Reserves to arrange use of playback or duplication facilities or services when researchers request access to recorded sound or moving image items. There are no formal procedures in place for playback or duplication of collection materials or the disposition of access or preservation copies.

Among Media Services staff who at times take responsibility for playing and duplicating materials, there is good understanding of general handling procedures for most recorded sound and moving image formats. As a result of the interest of Chris Lundberg, Stan Hall and Stacy DeHart, this understanding is continually improving.

Playback and preservation of recorded sound and moving image formats in good condition can be performed easily by staff or students with some training. However, successful playback and preservation of materials in poor condition requires study and practice. In many instances, it is work best left to those with significant experience as poor practices will result in damage to materials.

Conclusion and Recommendations

In 2004, the Council on Library and Information Resources published the results of a survey of the state of audio collections in academic libraries. The report concluded that recorded sound collections in academic repositories are rich, but barriers to using them are high and institutional readiness to manage them is low. This survey reached a similar conclusion concerning the state of recorded sound and moving image materials in Special Collections & University Archives. The collections include materials with significant research and instructional value, but access to them is severely limited by several factors, primarily a lack of facilities and human resources for preservation and access work.

The purpose of this survey was to gather information required by Special Collections & University Archives to make informed decisions concerning the management of its recorded sound and moving image materials. This information is presented in full in the survey spreadsheet (Appendix B) and in the folders of collection survey forms and risk assessment worksheets that accompany this report (Folders A and B). The recommendations included below note ways in which Special Collections can address the issues documented during the survey and improve the management of its recorded sound and moving image materials.

Preservation Survey Follow Up

1. Assess the research value of collections and prioritize collections for preservation.

The folders that accompany this report include survey forms for all collections containing recorded sound and moving image materials. Copies of collection descriptions and container lists from finding aids and inventories are attached to most survey forms to aid in the assessment of collection research value. The Survey Spreadsheet in Appendix B includes a column in which to note to collection research value.

2. Extend basic intellectual and physical control to outstanding materials

Correct collection finding aids and inventories that do not include recorded sound and moving image materials contained in collections. In addition, note location information for outstanding collections and materials in the Manuscripts Locator Guide. These collections are identified in Part B: Intellectual and Physical Access to Materials.

3. Review collections with significant storage issues and take basic measures to remediate those issues, if possible.
4. Review collections of miscellaneous materials noted in the survey spreadsheet, determine status, and take basic measures to remediate housing and storage issues.
5. Conduct further preservation assessment and ranking of moving image materials

Obtain acid detection strips and film shrinkage gauge and perform follow-up inspection of moving image and recorded sound materials determined to be at risk to vinegar syndrome or similar. Consult Sarah Stauderman's Video Format Identification Guide Website and similar resources to determine moving image formats at highest risk of loss to format obsolescence and other factors.

Processing, Storage and Handling Procedures Development

6. Develop minimal processing, storage and handling procedures for recorded sound and moving image materials; update *Special Collections & University Archives Manuscripts Processing Manual* and other documentation, as necessary; incorporate guidelines for recorded sound and moving image materials into records management instructions and outreach, including University Archives Instructions for Transferring Records web page.

Preservation Program Planning and Development

7. Review physical access issues and other issues; determine level of commitment to preservation and access of recorded sound and moving image formats; outline investment in technology and human resources to meet that commitment.

8. Arrange formal training for staff in the management of recorded sound and moving image collections.

9. Research grants, funding opportunities, and potential donor support for training, preservation program development and preservation project work

Digital Repository Planning and Development

10. In cooperation with Media Services staff and others, research, develop, and implement preservation guidelines for recorded sound and moving image materials, in keeping with preservation guidelines, particularly the following documents by the Technical Committee of the International Association of Sound and Audiovisual Archives: *IASA-TC04 Guidelines on the production and preservation of digital audio objects* (August 2004) and *IASA-TC03 The safeguarding of the audio heritage: ethics principles, and preservation strategies*, (Version 2, September, 2001); as well as *Capturing analog sound for digital preservation: Report of a roundtable discussion of best practices for transferring analog discs and tapes* (March 2006), by the Council on Library and Information Resources and commissioned by the National Recording Preservation Board of the Library of Congress.

11. In cooperation with Media Services, MDLS, staff and others, research, develop and implement a metadata structure and digital repository for digital preservation copies of recorded sound materials

Appendix A: Survey Form

Collection Author:

Collection ID:

Box Numbers:

Location: Special Collections / University Archives

Floor Location:

Bibliographic Access:

Physical Extent:

Estimated Duration:

General Contents:

Date Range:

Formats:

Recording Specs:

Brands and Products:

Physical Condition:

Available Metadata:

Housing Type:

Housing Condition:

Storage Conditions:

Subject Headings:

Research Rating:

Appendix C: Survey Images

All photographs by Lesli Larson.



Photo 1

Wire recordings

Coll. 218 / Edward A. Schaper papers

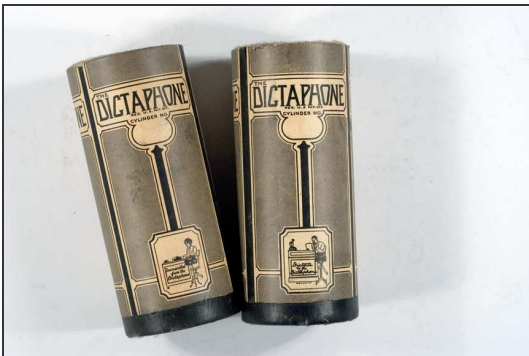


Photo 2

Cylinder records



Photo 3

Torn and degraded record sleeves

Ax 499 / Henry J. Beau papers



Photo 4

Torn and degraded reel boxes
Ax 398 / Hans E. Heller papers



Photo 5

Open storage carton
Deck 6, Row R / Miscellaneous



Photo 6

Cassettes stored without housing
Acc. 03-036 / Howard Kershner papers



Photo 7

Mixed storage carton: discs stored with files
Ax 734 / Dean S. Jennings papers



Photo 8

Materials without housing
Acc. 03-009 / KVAL collection



Photo 9

35mm film with advanced nitrate rot
Photo by Rick Gersbach



Photo 10
8mm films with possible vinegar syndrome
Up 686 / William J. Bowerman papers

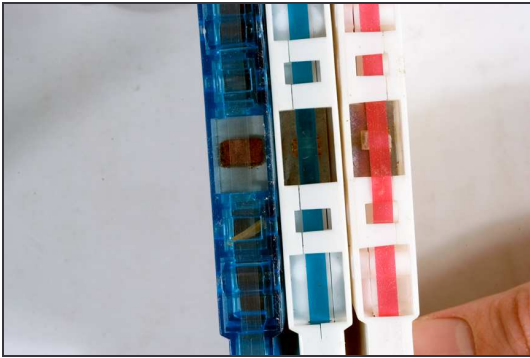


Photo 11
Damaged cassettes
Acc. 03-036 / Howard Kershner papers



Photo 12
Biological infestation, probably mold
Ax 265 / Janet Marshall Stevenson papers



Photo 13
Disc damaged by handling, finger oils
Coll. 172 / Leo Karczag papers



Photo 14
Reels with loose tape packs, damaged ends



Photo 15
Reel with flange pack, cupping, loose ends
Ax 078 / Richard Neuberger papers



Photo 16

Spoking, or radial distortions in the tape pack, due to thermal cycling
Up 723 / Brian Garfield papers



Photo 17

Discs with plasticizer loss and palmitic acid
Ax 243 / Eloise and William McGraw papers

Appendix D: Overview of Selected Formats and Modes of Degradation

Described below are selected recorded sound and moving image formats in Special Collections & University Archives and their common modes of degradation.

Acetate Discs:

Acetate discs are composed of a base, usually aluminum, which is coated with nitrocellulose lacquer plasticized with castor oil (St. Laurent, 1993). The inherent instability of the lacquer coating makes acetate discs the least stable of the sound discs. The loss of plasticizer causes the lacquer coating to shrink, yielding embrittlement and possibly a loss of sound information. Because the coating is bound to a stable base, internal stresses often develop over time which result in the cracking and peeling of the lacquer coating.

Acetate discs are vulnerable excess humidity and elevated temperatures. Excess moisture accelerates the loss of the castor oil plasticizer and the accretion of palmitic acid on the disc surface, which has a white powdery appearance. The nitrocellulose in the lacquer coating decomposes over time and reacts with water vapor or oxygen to yield acids, which catalyze other degrading chemical reactions. The rates of these reactions are increased with temperature and humidity (St. Laurent, 1993). Acetate discs are also vulnerable to fungus growth, which increases with temperature and humidity.

Shellac Discs:

Shellac discs are relatively stable but their composition varies widely. Most shellac discs are only 19% shellac. The remaining 81% is mainly mineral aggregate "filler" used to lower manufacturing costs. The varying stability of these "fillers" makes the degradation of shellac discs difficult to predict.

During manufacture, raw shellac is cooled under applied stress to make a disc. This process triggers a condensation reaction between the organic components of the shellac, which increases its density. After the shellac has cooled, this "curing" continues at a much reduced rate and results in the increasing embrittlement of the disc. The rate at which this embrittlement occurs increases with temperature and humidity. Shellac itself is resistance to fungal growth, but the organic materials in the fillers are not.

Plastic (Vinyl) Discs :

Plastic discs are the most stable of the discs chemically. They are composed of a resin of polyvinyl chloride and "fillers". Ultraviolet light and heat trigger chemical degradation of polyvinyl chloride. The reaction yields hydrochloric acid, which is highly destructive to the disc surface. To combat this, a chemical buffer is added to the resin, which controls but does not stop degradation by consuming the free HCl. In library environments, vinyl discs may survive well over a century before succumbing to chemical failure (Picket and Lemcoe, 1959).

Physical degradation is the leading cause of failure in plastic discs. Physical degradation is most often the result of mishandling but is also dependent upon storage conditions. Plastics have very large coefficients of expansion and are poor conductors of

heat. When subjected to elevated temperatures, plastic discs soften and expand. If they do so under contact stress from housing materials or load stress from other discs, deformation of disc surfaces will occur. These deformations are cumulative and irreversible. Elevated humidity and fungal growth do not pose threats to plastic discs.

Open Reels:

Open reel magnetic tape is composed of two layers- a base layer and a thin binder layer that contains ferromagnetic particles and is bonded to the base. Sound information is recorded in the alignment of the magnetic particles within the binder layer. Both magnetic fields and impact shock can rearrange these magnetic particles and result in the loss of sound information.

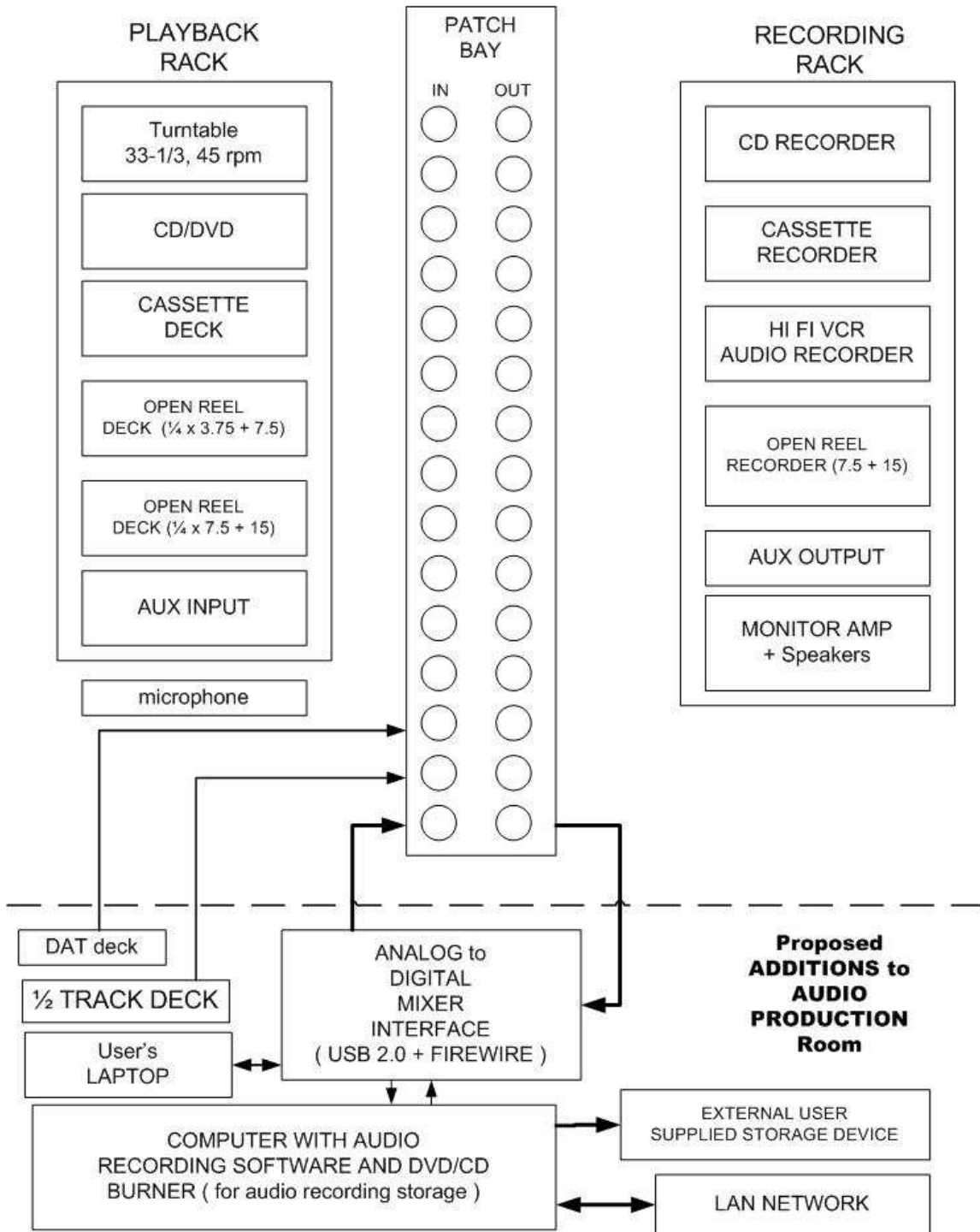
The most common form of degradation in magnetic tape is hydrolysis, in which elements of the binder resin react with water vapor to yield carboxylic acid and alcohol. Hydrolysis in magnetic tape causes the binder to shed a gummy and tacky substance, which can adhere layers of tape together and inhibit playback. Hydrolysis also causes the bond between the binder and the base to weaken and can result in the shedding or flaking of the binder layer and the sound information it contains. The reaction rate of hydrolysis increases with temperature and humidity and also with the presence of foreign deposits. Dust attracts and traps moisture and will increase the rate of hydrolysis (St. Laurent, 1993).

Polyester-based magnetic audiotape was produced from the 1960s onward. Polyester, or Mylar, is a relatively stable material. Although it does undergo degradation by hydrolysis, this process occurs at a much-reduced rate. Polyester-based tape has a high tensile strength and will stretch when stressed instead of breaking cleanly. In such instances, it becomes impossible to repair.

Cellulose acetate-based magnetic audiotape was the industry standard between 1935 and the 1960s. These tapes depend on plastic additives for suppleness that tend to evaporate and crystallize. In general, these tapes have very low tensile strength and break easily. The plasticizer additives give cellulose acetate-backed tape a high coefficient of linear expansion in humid or warm conditions. Consequently, temperature and humidity, in addition to mishandling, are the main causes of degradation.

Appendix E: Media Services Recorded Sound Playback and Duplication Capabilities

EXISTING AUDIO PRODUCTION ROOM - JULY 2005



Appendix F: Media Services Moving Image Playback and Duplication Capabilities

Film:

16 mm film to video chain

We have an 8mm film projector purchased from E-bay. To record to video we would have to project onto a wall, and then videotape using a camera.

Video Playback:

8mm video (not film): High 8, and probably Regular 8—**NO Digital** 8mm playback or record capability

Sony Betacam video—not Betamax

$\frac{3}{4}$ " U-Matic video

Digital Video: Mini Digital Video, DV and DVCAM (the difference of these standards is the cassette size, and the speed of tape transport)

VHS PAL/SECAM (European VHS format)

DVD+R

DVD+RW

DVD-R

DVD-RW

Multi Region (foreign standard) DVD

CD-R playback

Video Record:

Betacam SP

DVD-R

DVD+R: may require classroom Tech.deck to be patched in to TV Prod. in Head end

DVD+RW

$\frac{3}{4}$ U-Matic

Digital Video: Mini Digital Video, DV and DVCAM

VHS PAL/SECAM (European VHS)

No conversion capabilities to multi region DVD

CD-R: record capabilities for video CD's

Appendix G: Media Services Audio Production Rooms Upgrade Proposal

Authors:

Stacy DeHart, Media Services Classroom Technology Services
Chris Lundberg, Media Services Equipment Systems Specialist
Andy Kirkpatrick, Media Services Streaming Media

Technical advice and consultation from Digital Audio Initiative Committee Members:
Nathan Georgitis, Metadata Librarian and Special Projects Leader
JD Hauger, Media Services Streaming Media

Project proposal summary:

This is the first of a two-part proposal to upgrade equipment in the Media Services Audio and Video Production Rooms.

The primary purpose of the equipment upgrade is to provide a well-equipped facility available to the entire UO community for use in producing and editing video and audio presentation materials for education use. The improved Audio and Video Production Rooms will also allow the Libraries to access and preserve audio and video resources in Special Collections & University Archives and create electronic reserves of audio resources in Music Services.

Part 1: Audio Production Room

Media Services proposes to upgrade the Audio Production Room equipment in order to provide a facility in which to audition, digitize and edit many analog and digital audio source found on the University of Oregon campus and in the UO Libraries. This facility would be available to any current member of the UO community for purposes related to the delivery or completion of UO CRN credit courses. It would also be available to units within the UO Libraries for the purposes of digitizing audio sources, or creating electronic reserves of Music Services audio sources.

1a. Statement of need:

- With the current equipment configuration it is only possible to make a digital copy of audio sources to compact disc. The improved room would also allow enhanced, easily transferred and accessed computer files to be created from these sources.
- This newly equipped room would be the only such facility available to the general University community. There is no other such facility on campus not specifically dedicated to users affiliated with a department.
- This facility would allow the preservation of not only aging audio sources, but sources for which playback equipment is not generally available and is considered obsolete. These sources are formatted as reel-to-reel tapes, cassettes:

both digital and analog, and phonographs. Other sources may be integrated into the new system by means of a dedicated auxiliary input.

This proposal does not attempt to provide a solution to the need for long-term electronic storage of digital media. Back up of Library sources to servers utilizing RAID storage will be encouraged and should be addressed outside of, or in addition to this proposal.

1b. Anticipated users:

We anticipate users of this facility to include UO students, faculty and staff. The equipment in the room would allow users to produce, digitize and edit audio sources for presentation purposes, lecture transcription, and archival purposes.

UO Libraries staff would use the room to digitize audio to place on reserve or to make available on Blackboard. Staff would also use the equipment to digitally preserve and in some cases enhance audio sources in the Special Collections & University Archives. This preservation and digitization would eventually provide on-line access to previously inaccessible sources.

1c. Impact on Learning:

The configuration of media equipped classrooms demands the use of computer technology for both student and instructor presentations. The majority of general use classrooms on campus are enhanced with media presentation equipment allowing the projection of audio as well as still, video and Internet images. Students and faculty have become familiar with and to a certain extent literate in the operation of this equipment. This literacy increases the probability that presenters will want to use more sophisticated presentation materials. This facility would provide the means to produce such materials.

1d. Support

The precedent for support within the Media Services Production Rooms has allowed a basic level of assistance. Staff has and will continue to provide aid with basic set-up, and cable configurations, patches, verbal and text directions for equipment operation and successful conversion of allowed audio signals.

In the future, Media Services Staff will offer IT Curriculum Workshops in the operation of the Audio and Video Production rooms.

1e. Equipment needs

Equipment already in place includes:

- Turn table
- CD/DVD player for audio sources on disc
- External CD recorder

- 1 1/4 track 4 channel *high/medium* speed reel-to-reel deck
- 1 1/4 track 2 channel *medium/low* speed reel-to-reel deck
- Speakers and amplifier
- VCR for audio sources on VHS video tapes

Equipment needed to complete the project:

- ½ track dual speed reel-to-reel deck
- DAT (digital audiotape) deck
- DVC (digital video cassette) deck for playback and recording of audio to/from digital cassette.
- Mac G5 workstation with 2 levels (basic and advanced) of audio editing software installed. Details of workstation software and configuration are included in attached equipment specification sheet.
- Analog/Digital audio converter
- Audio editing software packages for both beginning and advanced users.

It should be noted that the A/D converter would have a USB connector allowing users to attach their own laptops to the system.

The following specification sheet details the remaining equipment needs for this part of the proposed upgrades.

The diagram on the last page provides a visual reference of the equipment configuration.

Model	Part No.	Qty	Unit Price	Ext. Price
Power Mac G5 Single -No modem +1GB SDRAM (memory) [\$90] +400GB Hard Drive [\$248] 2x500 HD, SuperDrive and CD/DVD Burner	Z0AN	1	\$ 1,997	\$ 1,997.00
				\$ -
Cinema Display (20" flat panel)	M9177LL/A	1	\$ 899	\$ 899.00
Final Cut Studio, includes Final Cut Pro 5, DVD Studio Pro 4, Motion 2, and SoundTrack Pro	M9483Z/A	1	\$ 500	\$ 500.00
Photoshop CS version 8.0 License only	AD3PSP8.0L	1	\$ 134	\$ 134.00
*Digidesign Mbox with ProTools Software, 2-channel USB audio input, 2xXLR (this is the analog/digital converter)	99000924600	1	\$ 449	\$ 449.00
				\$ -
SR-VS30U Mini-DV/S-VHS VCR with Mini DVCAM Playback	SR-VS30U	1	\$ 830	\$ 830.00
				\$ -
Miscellaneous cabling				\$ 350.00
Headphones, 2 pair		2	\$ 100	\$ 200.00
½ Rack for mounting equipment		1	\$ 350	\$ 350.00
Tascam DA-30 DAT tape deck		1	\$ 500	\$ 500.00
Teac A-3300 half track open reel tape deck		1	\$ 550	\$ 550.00
Disc Doctor LP Cleaning System		1	\$ 89	\$ 89.00
				\$ 100.00
Splicing equipment for 1/8" and 1/4" audiotape				
	SUBTOTAL			\$ 6,948.00

***Other AD/DA converters in the same price range are under consideration.**

Undetermined facility Services/Network Serv.
costs of possible computer networking

EXISTING AUDIO PRODUCTION ROOM - JULY 2005

