The Preservation Re-recording of Audio Materials In Sound Archives

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The purpose of this study was to survey preservation re-recording practices in sound archives and to compare them to the professional literature generated on the subject. This research paper describes interviews conducted with sound archivists to determine the practice of preservation re-recording of audio materials at their respective institutions.

Each of the institutions visited carry out some form of preservation re-recording. All of the institutions, however, exhibited large gaps between accepted practice and their own practice. Examples of the gaps were a lack of professional staff familiar with re-recording procedures, insufficient institutional support for re-recording programs, and a shortage of high quality studio equipment.

Subject Headings:

Recorded Sound Archives—Conservation and Restoration

Sound--Recording and Reproducing

Sound--Recording and Reproducing--Equipment and Supplies

Introduction and Overview

The advent of recorded sound materials has provided America with some of its greatest artistic and cultural treasures. Folklore researcher Barre Toelken has noted that sound recordings are able "to capture all of the stylistic and intonational sounds that would be difficult or impossible to note by hand."[1] In other words the depth of the information held in audio materials adds greatly to the depth of our cultural heritage.

For example, the folk music field recordings of Alan Lomax that Rounder Records are releasing contain some of the most vibrant voices in American song. They also embody a vision of a rural southern culture that has seldom been reflected by print media. If it were not for the Lomax field tapes, the world would have lost these performances or they would only be available in the form of written notes. Many other voices of artistic, historic and cultural relevance also would be lost. The cultural importance of these materials is clear; the survival of these documents should be insured by archival institutions.

Audio materials are quickly becoming a major preservation concern for archivists. Recorded sound archivist George Brock-Nannestad has defined audio preservation in the Association of

Recorded Sound Collection's *Audio Preservation: A Planning Guide.* He describes the preservation process as

> ensuring for all time access to as much information as possible that may be extracted from the recording… Thus the term encompasses storage, restoration, a source-critical approach to utilization, assurance of minimization of degradation by handling, and transfer to other media as well as making of later-generation copies.[2]

The re-recording of materials is an essential part of the preservation of our audio heritage.

The very nature of recorded sound materials makes it essential that they be re-recorded for their survival. First, the physical materials that the sound is recorded upon are decaying at a rate that will make them un-playable in the future. The other phenomenon that also endangers recorded sound materials is the obsolescence of the format and our inability to find suitable playback equipment in the future. Since recorded sound materials need technological devices to reproduce sound, they are exposed to what I will refer to as format obsolescence: when the commercial life of a format is no longer supported by the industry. Because of the speed at which these challenges to preservation occur, it takes deliberate institutional action to ensure the item's survival. Because of format obsolescence or degradation of the physical materials or both, recorded sound materials are dependent upon the re-recording process for their long term survival.

Audio materials, and audio preservation in particular, often have been overlooked in archival programs. Many an

archivist's preference for print and paper materials has doomed many recordings to oblivion because the materials did not receive appropriate care. Although audio materials have existed for over a century, it was not until *Preservation and Storage of Sound Recordings* by A.G. Pickett and M.M. Lemcoe that archivists were made aware of the rate at which they were deteriorating. This text still serves as basic reading for archivists who work with recorded sound collections.[3] It is troubling that research on the preservation of sound has advanced little in the forty years since its publication.

Today, the preservation of recorded sound materials is not receiving adequate attention. If it were not for the efforts of organizations such as the Association of Recorded Sound Collections(ARSC) and the International Association of Sound Archives(IASA), the preservation of audio materials would seldom be mentioned.

Developing a preservation re-recording program is a daunting task. It is an extremely time consuming and expensive responsibility, out of the range of many institutions with limited budgets. Among the costs that can grow exponentially are staff time, studio equipment costs, and professional standard media for re-recordings. Preservation re-recording also is a highly technical process. Many archivists find that their training has not prepared them to handle re-recording projects.

Two Types of Re-recording

There are two types of preservation re-recording. Both have the overall goal of preserving the original sound, but their methodologies to preserve recorded sound are quite distinct. Type I preservation re-recording involves the creation of a preservation master. In this instance a new copy is meant to replace the deteriorating or obsolete item. This is comparable to a library making a microfilm copy of a newspaper, or a durable paper copy of a deteriorating text. Creating type I re-recordings is a long, difficult, and expensive process. Recordings should only be made by experienced staff on a suitable medium.

A type II re-recording often is referred to as a "listening" or "patron" copy. Ray Edmondson has outlined the reason for type II re-recording in "AV Archiving Philosophy – the Technical Dimension," and notes that "an AV archive does not put at risk the survival of a work which it is preserving in order to meet short term access needs."[4] A recording is subject to damage every time it is re-played. Under no circumstances should patrons be allowed to handle or play original recordings. The use of listening copies minimizes the damage done to items by reducing the number of times they are played.

The creation of type II re-recordings is not as technical as type I re-recordings, because these recordings are not meant to replace an original sound source for future generations.

Listening copies of not-at-risk materials can be produced by staff members with little training. The quality of the sound should be tailored to the needs of the user rather than the condition of the original. Type II re-recordings are usually made upon cassette tapes due to their ease of use and the availability of the playback equipment.

The difference between how and why these two types of preservation re-recording are performed is evident, but they have essentially the same target. Sound archives will need to utilize both in order to properly handle the long-term preservation and continued use of recorded sound materials.

The Carrier versus the Content

When discussing preservation re-recording it is important to separate the concept of the "carrier" from that of the "content" of the recording. The carrier is the physical item upon which the sound is recorded. The content is the information contained in that recording. The instability of all audio carriers requires that the content eventually must be transferred to a new carrier in order to ensure its survival.

In *Philosophy of Audiovisual Archiving*, Ray Edmondson calls preservation re-recording the "least worst" solution to a major problem. Information inevitably is lost in the re-recording process. In many instances this information must be sacrificed for the recorded sound's survival. Although re-recording

technology cannot be described as perfect, audio technicians must be careful to transfer information from the original as faithfully and thoroughly as possible. This includes the transfer of sound as well as the information written upon labels or containers.[5]

One interesting footnote to this debate concerns the advent of digital re-recording. Since it is recorded in a series of binary digits, digital sound should have the advantage of being reproducible without any loss or alteration. This would be of great advantage to the effectiveness of preservation re-recording, but research in this area is young and still requires testing in order for it to be accepted as fact.

The Ethics of Preservation Re-Recording

What exactly is the function of re-recording? The Technical Committee of the International Association of Sound Archives has observed that

> "the archivist's function is to preserve history, not rewrite it. Given this precept, the archivist must always strive to maintain objectivity in the application of various re-recording techniques."[6]

The replication of the audio signal must be copied as faithfully as re-recording technology makes possible. A subjectively created type I re-recording is never an adequate substitution for its original recording, because if the original carrier is lost, that original objectivity can never be re-created in the future.

Audio preservation expert Christopher Ann Paton says that if objective re-recording is carried out, the original sound will neither be improved nor infected by new flaws.[7] Maintaining this objectivity and fidelity, however, is easier said than done.

Standardizing Re-recording Procedures

William D. Storm has contributed several works to the professional literature attempting to standardize the re-recording process. Storm claims that before objective preservation re-recording can take place, the archivist must first decide what is being preserved: the audio history contained in the recording or the sound of the artist. Two preservation re-recordings faithful to the audio history of the document should produce two identical copies. If guided by standards, two copies faithful to an artist's sound also should result in similar copies. They will not, however, be identical to each other.

Preserving the audio history of a recorded sound strives to replicate the recording as it was originally perceived by the people of the era in which the recording was produced. Storm lists five standard operations for the re-recording of audio history: 1) indexing identifying characteristics of a sound recording; 2) playback should be conducted on the originally intended machine; 3) selection of the appropriate process based upon whether the carrier was intended to be played with or

without amplification; 4) precise calibration of the recording equipment; and 5) use of a standardized reference speaker.[8]

Faithfully re-recording the sound of the artist is a more difficult process than preserving audio history. Nevertheless, its procedures are still grounded in the audio-history preservation process and involve: 1) indexing the characteristics of the record; 2) the precise calibration of the recording equipment; 3) use of a standard reference speaker; 4) documentation of the process used to re-create the sound of the artist; and 5) scientific proof that the process is valid, verifiable and objective.[9]

ARSC and IASA, the two major professional organizations in the field, have yet to adopt specific re-recording standards. The institution of standards should increase the validity of preservation re-recording. Standards will allow sound archivists to carry out re-recording processes objectively. Until re-recording standards are accepted throughout the profession, archives are advised to create specific procedure manuals to guide their archivists. Not only will this allow objective re-recording to take place, but it will document the procedures used so future researchers can recognize any differences between the original and the preservation master.

What to Re-record

When it comes to Type II preservation re-recording, all materials should be copied when needed by patrons. As noted earlier, the sound archive's primary duty is to preserve the physical integrity of the original documents.[10] A sound archive should never satisfy short term access needs at the expense of the survival of the item. Under no circumstances should patrons be allowed to handle the original item, instead, a listening copy (Type II preservation re-recording) should be made. Listening copies are usually made as items are requested by patrons. Some archives also may decide to target certain parts of their collection that they feel will be heavily used.

Deciding when to conduct Type I preservation re-recording of an item can be more challenging. Creating preservation masters will be a last ditch effort, since the new recording takes the place of the original. Some information, possibly not even apparent to the archivist, will be lost if the original item is discarded. This lost information may become historically valuable and even technically recoverable as playback technologies improve in the future.

All materials for which it is impossible to acquire playback hardware are an immediate candidate for type I re-recording. One example of a format of this type is the recorded cylinder. Cylinders were produced from 1890 to 1929. They are

commonly found in archives, but the hardware to play them is rare. Another example of an obsolete format is magnetic wire recordings.[11]

The examples listed above are usually re-recorded due to format obsolescence. The physical decay of materials is a distinctly different problem. The two most common types of deteriorating media that sound archivists encounter are “acetate” discs and magnetic tape.

The highest priority for type I re-recording is the “instantaneous” or “acetate” grooved phonodisc. Unlike 78rpm, 45rpm and LP records, acetate discs present serious preservation concerns. Acetate discs came into common usage in the 1930’s.[12] Unlike cylinder recordings or 78’s, they are most likely to be non-commercial. Thus, there usually are not multiple copies of the material, which makes them all the more valuable.

Acetate discs are often composed of an aluminum backing material (cardboard, glass, and rubber also were used) coated with a polymer material soft enough to be etched but rigid enough to be replayed.[13] A number of different preservation problems are associated with acetate discs. It is common for the backing material to degrade. Even more common, however, the coating is found to deteriorate. It can become separated from the backing because the polymers shrink, due to improper storage.[14] The coating’s plasticizers also may deteriorate, producing a white powder. Even under optimal conditions acetate discs are likely

to deteriorate beyond use, making them suitable candidates for Type I preservation re-recording.

As we discuss below, magnetic tape is the accepted standard for preservation master recording media. However, it is also subject to serious deterioration. Deterioration is especially common in tape that was produced in previous decades. Magnetic tape consists of three distinct parts: the backing which provides structure to the tape, magnetic particles (oxides) that are recorded with, and the binder which attaches these particles to the backing. All three elements are prone to degradation. The base and binder are the most common areas of decay. Dr. John W.C. Van *Bogart's Magnetic Tape Storage and Handling* is a helpful, concise guide for the sound archivist to understand the most common problems that may occur with magnetic tape. According to Van Bogart, the longest we can expect any magnetic tape to last is approximately 60 years. Most estimates are closer to 30 years.[15] This short lifespan makes it clear that preservation re-recording will be needed eventually for the recorded sound's survival.

The International Association of Sound Archives' Technical Committee has released a document entitled *The Safeguarding of the Audio Heritage: Ethics, Principles and Preservation Strategy,* in which they list five analogue carriers that they consider inherently unstable and would recommend for immediate copying:

1. cylinders
2. instantaneous discs of all types and especially "acetate" discs
3. acetate tapes

> 4. all long/double/triple play open reel tape and all cassette tape
> 5. any carrier that shows obvious signs of decay either by inherent instability or by deterioration caused by improper handling.[16]

This provides a good guideline for archivists who are in the process of appraising their collection and establishing priorities for re-recording.

According to George Boston's "Survey of Endangered Audio Carriers", "the most endangered audio carriers are not necessarily the oldest."[17] He characterizes both digital audio tape and compact disc holdings as unstable, due to concerns about the life of the format. This he attributes to the unstable support of manufacturers.

Sound archivists should not accept these recommendations blindly. Each archive has unique requirements that need to be addressed by the re-recording of sound materials. In an ideal world materials would be preserved comprehensively. Due to time and money constraints, certain materials will have precedence over others. It is important for archivists to appraise their collections to determine the proper course of action.

The Appraisal

The best way for a sound archivist to determine his re-recording needs is to conduct an appraisal of his collection. Most archives are not able to re-record everything, so they must determine which parts of their collection are most important to

them. An appraisal will also help in designing an archive's re-recording procedures.

Sound archivist Steven Smolian outlines the purposes of conducting an archival preservation appraisal (APA) in his article "Technical Appraisal of Tape Collections." Even though his work is dealing essentially with magnetic tape collections, it conveys some basic principles that translate to all sound archives. First is the identification of the format and content of the recordings. The format needs to be identified so that an institution can determine if it has the proper playback equipment for re-recording. Content identification will allow the sound archive to decide whether it is suitable for the institution to devote its time to the item. It is important to consider the mission of the organization when determining re-recording priorities. Next the sound archive must determine the physical condition of each item. A choice must be made between saving items with important content and those in grave condition.[18]

Conducting an audio preservation appraisal will allow sound archives to quantify their preservation needs, so they will be able to calculate the time it will take to conduct a preservation re-recording plan. They then will be able to design processes to fit the needs of their specific collection and determine their studio equipment needs. An APA is also useful when writing a budget and considering funding resources. If the archive conducts an APA with its organizational mission firmly in place,

it should be able to produce a preservation re-recording project that best serves their collection.

The Re-recording Studio

The ARSC survey conducted in *Audio Preservation: A Planning Study* revealed several shocking statistics. Fifty percent of institutions conduct preservation master re-recording and seventy-five make service copies. Only thirty-one percent of these same institutions have the proper re-recording equipment.[19] The obvious implication of these numbers is that inferior copies of recordings are being used to preserve the national audio heritage at many institutions.

It is important that institutions that are conducting preservation re-recording have the proper studio equipment at their disposal. The equipment should be of professional quality, able to precisely reproduce, record and measure audio signals. It should be professionally calibrated to insure that the audio signal that goes in comes out at the other end.

The ARSC *Planning Study* mentions some essential elements of a re-recording studio:

Cleaning equipment: all materials should be cleaned in order to minimize damage during playback.
Source equipment: professional grade technology to handle the various formats held in the collection.
Monitor: a loudspeaker to accurately convey the signal to the technician's ears. This helps the technician to make proper decisions during the re-recording process.
Recording equipment: should be of professional quality, able to record upon professional grade audio preservation carriers.

Just as important as the studio's technical equipment is the employment of a re-recording expert. The ARSC survey again revealed these dismal numbers. Sixty-seven percent of the institutions surveyed did not employ technical staff to handle the preservation of recorded sound materials. Only three percent of sound archive employees would be classified as audio engineers.[20] During a re-recording project, problems will occur that, if not handled correctly, will be disastrous to the recorded sound that the archive is attempting to preserve. It takes a well-educated engineer to handle all aspects of the program. Even the most technically elaborate studio will not yield satisfactory results if the equipment is not operated properly.

The Selection of Type I Re-recording Formats

The current standard for Type I preservation re-recording media is ¼ inch x 10 inch open reel magnetic tape, but Christopher Ann Paton has suggested that the days of analog preservation masters may be numbered. Both Ampex and 3M (the two major U.S. manufacturers) have withdrawn their lines of from the market. BASF, the major European manufacturer, also has withdrawn its product. Paton observes that this is just another step in magnetic tape's replacement by digital audio carriers in the industry.[21] This replacement may force sound archives to

reconsider their recommendation of magnetic tape for preservation re-recording purposes.

Paton points out that there are distinct advantages and disadvantages of analog and digital carriers. Analog carriers have the benefit of being fully mature and standardized in the archival profession. The replay procedure is understood well enough by audio engineers that the proper equipment can be built. The number of engineers who can perform this task is small, however, and certainly will not be able to keep up with the demand if the technology is no longer available on the market.

Magnetic analog tape is also subject to several types of distortion that affect the quality of the sound during playback. One type, tape hiss, increases as the information is transferred from one carrier to another, but if the proper equipment is used during re-recording this loss of quality over generations can be minimized.

Many engineers prefer working with digital audio materials. The engineers find them easier to edit and control noise. Also, many generations of recordings should be able to be created without loss of quality during the recording. Due to the infancy of the technology, these benefits have not yet been properly tested.

Unlike analog recording, digital audio is a rapidly advancing field and many archivists are hesitant to embrace the change. The difference in sampling rates and storage carriers has yet to be standardized. For example, there was a time when

digital audio tape (DAT) was touted by the industry as being a suitable preservation medium. After the apparent failure of DAT to live up to its billing, recordable compact discs (CDR) have been instituted in several archival institutions to serve as preservation master carriers.

Martin L. Levitt contributed a piece to *College and Research Library News* on the American Philosphical Society's transfer of its one-of-a-kind audio recordings to digital audio tape.[22] In hindsight, this project was most certainly a disaster. Levitt describes being assured by the computer and hardware consultants that DAT would insure the survival of the information. Since his article was written DAT has been classified as a major preservation hazard. Mr. Levitt and the American Philosophical Society would have been better off had they been more reluctant to follow current trends in their selection of an audio preservation carrier. This incident should serve as a cautionary tale to all archivists.

Australian sound archivist Ian Gilmour lists several criteria that need to be met before digital audio can serve as a suitable preservation medium. First, the audio performance of the medium must be able to handle the richness of recorded sound. It also must provide both physical and format stability. The information on a carrier must be rapidly accessible. A carrier should also be able to hold an adequate amount of information. Finally, the equipment and materials must be affordable to a broad range of institutions.[23] Until these criteria are met,

sound archivists will avoid using digital audio as a carrier for the preservation of their recorded sound materials. It is the current demise of magnetic tape in the commercial industry that dictates the rapid investigation of digital audio as a suitable replacement.

Methodology

Preservation re-recording can be a formidable task; both expensive and time consuming to undertake. In order to conduct a successful re-recording project, the archives must have staff expertise in the area of re-recording. To make matters worse, the volatility of the recording medium places the longevity of the newly recorded preservation masters in doubt.

Due to limited budgets and a lack of personnel, most sound archives are unable to carry out programs that meet the standards listed in the preceding section. In order to gauge the level at which sound archives are performing preservation re-recording, I conducted interviews with sound archivists at three institutions.

The selection of the repositories was an important first step. The selections reflect a range of sound archives that have carried out either Type I or Type II preservation re-recording. I selected institutions from listings in *Folklife Sourcebook: A Directory of Folklife Resources in the United States.* Initially I contacted institutions by phone or email to arrange an interview date.

I spoke with the archivist who was most familiar with the archive's audio preservation program at each institution. The interviews were 20-30 minutes in length and included eleven questions. Each interview was conducted during an on-site visit to the sound archive. The questions I asked in the interview were:

1. What is the size of your audio collection? (broken down by type of media)
2. What are the contents of your collection? (music, interviews, spoken word, etc.)
3. Does your archive have a statement in its preservation plan concerning the re-recording of sound materials?
4. When are materials in your collection re-recorded? (listening copies, preservation masters, etc.)
5. Do you have a studio set up specifically for the re-recording of sound materials? If yes, what equipment do you have in the studio?
6. What materials are you able to transfer in the studio? (78 rpm records, reel to reel tapes, wax cylinders, etc.) What materials do you have that you are not able to transfer?
7. What materials do you transfer onto and for what reasons? Have you experimented with new digital technologies for re-recording?
8. What staff expertise are you able to take advantage of at your institution?
9. Have you ever outsourced/considered outsourcing materials for re-recording purposes?
10. What copyright concerns do you have when it comes to re-recording? How do you address these problems?
11. Do you alter materials at all when they are copied? (noise reduction, etc.)

The interviews were based upon a study conducted by University of North Carolina SILS graduate Cathy Mundale. In her masters paper, "The Sound of Silence: Preservation Problems in Sound Archives," she sought to uncover the preservation problems in "extensive" collections, noting "Since the majority of preservation challenges experienced by all sound archives are a

result of the inherent degeneracy of the media, I concluded a small sample of these comprehensive sound archives would sufficiently represent the population at large."[24]

Since I am looking at specific solutions to the problems discussed in "Sounds of Silence," I do not feel that studying only a few "extensive collections" adequately portrays the sound archives community. The re-recording process is such an expensive and seldom understood process that institutions of different sizes and resources are forced to handle the process differently. In order to represent the sound archive community better, I visited three archives of differing sizes and capabilities.

Interview Results

Archive "A" is a medium sized sound archive. It is part of a research institute and museum. The archive holds commercial LP's, 78s, compact discs, etc. The bulk of the collection, however, is over 1000 unpublished audio tapes. The archive also houses print and photographic materials. The materials in the audio collection include music, spoken word, and oral histories relating to local folk culture. This archive has no official statement dealing with its practices of re-recording materials.

This archive has been fortunate enough to have re-recorded all of its reel to reel tapes. At one point they brought in a specialist for a fixed period of time to handle the technical

work. Listening copies, or Type II re-recordings, also were produced at this time. All of the tapes were re-recorded on to preservation quality reel to reel magnetic tapes. Several of their recordings also have been issued commercially on the BRI Recording Label.

For the commercial holdings, however, the archive does not engineer Type II re-recordings. Patrons are allowed to listen to the original materials on the institution's equipment. They currently have experienced no problems with this practice.

Archive A has re-recording and playback equipment set up in the corner of its archival storage room. Here they are able to handle the majority of their holdings for re-recording: 78rpm records, LPs, CD's, reel-to-reel tapes, cassettes. They also have some wax cylinders that they are unable to play back.

For Type I preservation re-recording, Archive A has used reel to reel magnetic mastering tape. The listening copies were produced upon cassette tapes. The archive has stayed away from using digital techniques due to the uncertainty of the medium. They feel the industry is not trustworthy enough to commit their recordings to digital preservation.

Archive A has had a successful experience in outsourcing materials for re-recording purposes. Due to the technical constraints in their own studio, they have sent delicate recordings to the Country Music Federation in Nashville, Tennessee.

Archive A also employs noise reduction techniques in their

re-recording practices. When re-recording, the archivist looks at the process from the user's perspective. The user is trying to listen to the recordings, so removing such things as static is permissible. If the static was not in the original recording, the technician should attempt to remove it.

Archive "B" is a large sound archive at a major research university. The archive holds sound materials from a number of different areas at its institution. Included are a University archive, a historical manuscripts collection, a folk music archive, and an oral history program. Its recorded sound formats are as varied as its subject areas. Some of the formats found in the collection are wire recordings, acetate discs, wax cylinders, long playing records, 78 records, reel-to-reel magnetic tapes and compact discs.

Archive B has produced several documents to guide their re-recording efforts. One such document was produced for a grant proposal that involved the transfer of a large portion of its collection to preservation master tapes. These procedures are no longer in use.

Materials undergo Type I preservation re-recording on a project by project basis. Since a full time engineer is no longer employed, a contracted engineer is brought in when materials need to be re-recorded.

Type II re-recording is conducted as researchers request materials. Under no circumstances are users allowed to handle

original recordings. The listening copies are then kept by the archive to provide immediate access to those materials in the future.

Archive B currently has two studios in operation. One studio is in constant use for the creation of listening copies to serve researchers. Another studio was constructed during the previously mentioned grant. This studio is capable of high quality preservation master re-recording. The archive also has equipment that is used to clean the materials before they are played back.

All preservation masters are re-recorded upon the professional standard reel-to-reel magnetic tape. The archivist recognizes the imminent disappearance of this technology. Archive B has invested in a compact disc recorder for its studio. The archivist views this technology as the future for the preservation of sound materials. No materials, however, are currently being switched to CD-R for long term storage.

A rarity in sound archives, archive B has the technology to play back their wire recordings. Currently, the only materials that they cannot play are the wax cylinders.

The greatest obstacle facing archive B is the lack of an audio engineer on the full-time staff. The majority of the time, the mastering studio is not in use. Students are trained to transfer structurally sound materials for listening copies.

Archive B has stated in its procedures that no noise reduction techniques are to be used during Type I preservation

re-recording. They will clean up listening copies if noise becomes a nuisance during playback.

Archive "C" is a small sound archive at a small university. It is housed in the main library on campus. The archive houses a small recorded sound collection. Included are music recordings, oral histories and spoken word pieces. The unpublished holdings consist of over 1000 magnetic tape recordings (reel to reel and cassette), instantaneous discs and wire recordings. The archive also holds commercially released 78 rpm discs, LPs, cassettes and compact discs.

Archive C conducts only type II preservation re-recording within its collection. As commercially released materials come into the collection, they are immediately re-recorded onto cassette tapes to serve as listening copies. The original copies are then stored until the listening copy wears out from use. Many of the unpublished field recordings have been re-recorded on to cassettes and the rest are transferred as they are requested by researchers.

Archive C has no formal statement concerning its re-recording procedures. The archive has an adequate array of equipment to handle type II re-recording. Their equipment, however, does not support several of their formats, including wire recordings, 78rpm records and instantaneous discs.

The listening copies in archive C are made by students. Currently there is no one on staff who is considered an audio

preservation expert.

Archive C was included on a grant application by a neighboring institution to construct a regional studio to handle the preservation re-recording of audio materials. Nothing has yet materialized with this project and no alternative outsourcing projects have been attempted.

Conclusion and Analysis

At first glance there seems to be a correlation between the size of an archive and the quality of re-recording being carried out. Only the medium and large sized institutions have participated in type I preservation re-recording. Only the large archive is able to investigate new digital methods of sound storage. Due to the budgeting constraints of these activities, it is expected that only institutions of substantial size would be able to execute these programs. In actuality, the difference in re-recording capabilities between large and small archives is not as striking as might be expected. Certain missing factors in the re-recording process seem to put all archives on shaky ground.

All of the institutions that I visited participate in some form of preservation re-recording. The majority of the projects are simply the construction of listening copies to meet the daily demand of researchers. This effort should not be underestimated. Continually handling and re-playing these original sound

recordings could prove to be devastating. This is a good sign that many institutions are including preservation in their priorities and are recognizing the importance of re-recording as a part of this process. Due to the fragility of most listening copy carriers and the process by which they were recorded, however, type II preservation re-recording does not provide an adequate means of preserving sound recordings for the long term. There exists a serious lack of type I preservation re-recording in the sound archives I visited.

The critical element missing from the three archives was an audio preservation expert on staff. It is impossible for someone to make correct decisions if he/she has not been given the proper training. If the proper decisions are not made, our audio heritage will suffer as a result. With an audio preservation expert on the staff, institutions could create written guidelines concerning re-recording, conduct an audio preservation appraisal, select the proper re-recording media and equipment, and lobby the archive administration for proper funding. This places most sound archives in a Catch-22 situation. Archive administrators will probably not hire an audio preservation expert without understanding the importance of preserving the materials, but it is the audio preservation expert who can best articulate the importance of audio preservation.

Format obsolescence also is a major problem in all of the sound archives that I visited. Each archive had at least one format that could not be re-played in house. Not only are the

archives unable to re-record these materials, they also are unable to identify the content of some audio recordings. Remember, the identification of the content is an important first step in conducting an appraisal of a recorded sound collection.

One solution to format obsolescence would be for institutions to send materials to companies or other institutions that can copy the items. The outsourcing of materials for re-recording, however, seems to be an inadequate response to the problem of format obsolescence. First of all, there are few institutions and companies that do archival quality work. Secondly, many archives are not comfortable with releasing one of a kind materials from their care.

The strain of conducting a preservation re-recording program affects institutions of all sizes. Developments in the profession should help relieve this strain and will allow archives to better preserve recorded sound materials. First of all, recorded sound materials are being used for serious research studies in a number of different fields. Many of the audio materials held in archives are unpublished and may be one of a kind. As more researchers and historians realize this, perhaps more pressure will be put on sound archives to preserve these materials.

The expansion of membership in the two professional societies (ARSC and IASA) also will also help strengthen the audio preservation movement. All archivists involved with recorded sound materials should belong to one or both of these

societies. As membership expands so will knowledge of re-recording processes, preservation standards and communication between sound archives. A strong professional society also will strengthen the sound archives community in relation to the commercial recorded sound industry. In order to slow format obsolescence, a dialog needs to occur in which sound archivists can explain their need for stable equipment and long-lasting formats.

Increased research will help to establish re-recording standards, including standards of practice and equipment standards. As quality standards are developed, the effectiveness of preservation re-recording will grow. If archival administrators considered re-recording a more viable practice, the number of institutions that perform re-recording would increase.

Hopefully an increased interest in recorded sound materials will lead to wider formal education opportunities in audio preservation. Currently very little is offered at our nation's universities for those interested in pursuing this work. There only are a few short programs for established professionals offered by organizations such as the Society of American Archivists. Advancing the educational opportunities in this field would increase awareness of the profession and provide a forum for improved research.

The purpose of this paper was to survey preservation re-recording practices in sound archives and to compare them to the

professional literature generated on the subject. All of the archivists that I visited are already conducting preservation re-recording. Many of these efforts, however, do not match practices that audio preservation experts recommend. As the profession develops, hopefully the effectiveness of each archive's activities will increase.

Endnotes

[1] Barre Toelken, *The Dynamics of Folklore* (Logan, Utah: Utah State University Press, 1996), 353.
[2] Association for Recorded Sound Collections – Associated Audio Archive Committee. *Audio Preservation: A Planning Study* (Silver Springs, MD: ARSC, 1988): 122.
[3] A.G. Pickett and M.M. Lemcoe, *Preservation and Storage of Sound Recordings* (Washington, DC: Library of Congress, 1991): iii.
[4] Ray Edmondson, "AV Archiving Philosophy- the Technical Dimension." *IASA Journal* (November 1996): 31.
[5] Edmondson, 29.
[6] ARSC, 113.
[7] Christopher Ann Paton, "Preservation Re-Recording of Audio Recordings in Archives: Problems, Priorities, Technologies, and Recommendations" *American Archivist*. 61 (Spring 1998) : 208.
[8] William D. Storm, "A Proposal for the Establishment of International Re-recording Standards." *ARSC Journal* 15 (1983): 33.
[9] Storm 1983, 35.
[10] IASA Technical Committee, *The Safeguarding of the Audio Heritage: Ethics, Principles, and Preservation Strategy* (Budapest: IASA, 1997): 3.
[11] Alan Ward, *A Manual of Sound Archive Administration* (Brookfield, VT: Gower Publishing, 1990): 245.
[12] Christopher Ann Paton, "Preservation Re-recording of Audio Recordings in Archives: Problems, Priorities, Technologies, and Recommendations." *American Archivist* 61 (Spring 1998): 191.
[13] George Boston, " Survey of Endangered Audio Carriers." *IASA Journal* (May 1996): 48.
[14] Boston, 48.
[15] John W.C. Van Bogart, *Magnetic Tape Storage and Handling for Libraries and Archives.* (Washington DC: Commission on Preservation and Access, 1995): 22.
[16] IASA Technical Committee, 11.
[17] Boston, 50.
[18] Steven Smolian, "Technical Appraisal of Tape collections." *IASA Journal* (May 1996): 22.
[19] Association of Recorded Sound Collections, 90-91.
[20] Association of Recorded Sound Collections, 90.
[21] Paton, 209.
[22] Martin L. Levitt, "A Case Study in Audio Tape Transfer." *College and Research Library News* 49 (November 1988)
[23] Ian Gilmour, "Ditial Audio in Archives." *IASA Journal* (Novemer 1994): 39.
[24] Cathy Lynn Mundale, "The Sound of Silence: Preservation Problems in Sound Archives." (University of North Carolina at Chapel Hill, 1996): 31.

Bibliography

Association for Recorded Sound Collections – Associated Audio Archives Committee. *Audio Preservation : A Planning Study. Final Performance Report.* Silver Springs, MD: ARSC, 1988.

Bartis, Peter. *Folklife Sourcebook: A Directory of Folklife Resources in the United States.* Washington, DC: Library of Congress, 1994.

Boston, George. "Survey of Endangered Audio Carriers." *IASA Journal* no. 7 (May 1996): 46-52.

Brock-Nannestad, George. "Methods for the Non-Destructive/Non-Invasive Identification of Sound Recordings. *IASA Journal* vol. 21, no. 3 (May 1994): 56-59.

Brock-Nannestad, George. "A Comment And Further Recommendations on "International Re-Recording Standards." *ARSC Journal.* Vol. 23, no. 3 (Fall 1989): 156-161.

Casey, Mike. "It's Now or Never: A Framework for Making Decisions About Sound Recordings." In *Preservation Papers of the 1991 SAA Annual Conference.* Chicago: Society of American Archivists, 1992.

Edmondson, Ray. "AV Archiving Philosphy-the Technical Dimension." *IASA Journal* no. 6 (1996): 28-35.

Gilmour, Ian. "Ditial Audio in Archives." *IASA Journal* no. 4 (November 1994): 38-52.

Hagen, Carlos B. "The Struggle of Sound Archives in the United States." *Library Trends* 21, no. 1 (July 1972): 29-52.

IASA Technical Committee. *The Safeguarding of the Audio Heritage: Ethics, Principles and Preservation Strategy.* Budapest: IASA, 1997.

Mundale, Cathy Lynn. "The Sound of Silence: Preservation Problems in Sound Archives." Master's Paper, University of North Carolina at chapel Hill, 1996.

Pickett, A.G. and M.M. Lemcoe. *Preservation and Storage of Sound Recordings.* Washington, DC: Library of Congress, 1991.

Paton, Christopher Ann. "Preservation Re-Recording of Audio Recordings in Archives: Problems, Priorities, Technologies, and Recommendations." *American Archivist* 61, no. 1 (Spring

1998): 188-219.

Roosa, Mark. “Audio Tape Transfer.” *College and Research Libraries News.* 50, no. 2 (February 1989): 132-134.

Roosa, Mark. “Preservation and Reformatting Issues for Sound Recordings.” In *Preservation Papers of the 1991 SAA Annual Conference.* Chicago: Society of American Archivists, 1992.

Schuller, Dietrich. “Strategies for the Safeguarding of Audio and Video Materials in the Long Term.” *IASA Journal* no. 4, (November 1994): 58-65.

Smolian, Steven. “Technical Appraisal of Tape Collections.” *IASA Journal* no. 7 (May 1996): 24-34.

Storm, William D. “Audio Equipment Considerations for Sound Archives.” In *Audio Preservation : A Planning Study. Final Performance Report.* Silver Spring, MD: ARSC, 1988.

Storm, William D. “Construction and Rationale of Building the Belfer Audio Laboratory and Archive at Syracuse University," *Phonographic Bulletin* no. 27 (July 1980): 9-18.

Storm, William D. “The Establishment of International Re-recording Standards.” *Phonographic Bulletin* no. 27 (July 1980): 5-12.

Storm, William D. “The Implementation of Proposed Standards for Copying Audio Recordings.” In *Audio Preservation : A Planning Study. Final Performance Report.* Silver Spring, MD: ARSC, 1988.

Storm, William D. “A Proposal for the Establishment of International Re-Recording Standards.” *ARSC Journal* 15, no. 2-3 (1983): 26-37.

Toelken, Barre. *The Dynamics of Folklore.* Logan, Utah: Utah State University Press, 1996.

Van Bogart, John W.C. *Magnetic Tape Storage and Handling: A Guide for Libraries and Archives.* Washington, DC: Commission on Preservation and Access, 1995.

Ward, Alan. *A Manual of Sound Archive Administration.* Brookfield, VT: Gower Publishing, 1990.

Welch, Walter L. “Preservation and Restoration of Authenticity in Sound Recordings.” *Library Trends* 21, no. 1 (July 1972): 83-100.