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**Archival Time-based Media:
Topologies of Preservation and Access**

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Dedication

To Heath, for patience and shelter and good faith.

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**Archival Time-based Media:
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The University of Texas at Austin, 2015

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The analog time-based media of film, videotape, grooved sound recordings and audiotape have emerged as a growing area of concern for cultural institutions. Collectively, these media constitute a rich body of historical evidence and intangible cultural heritage whose varied physical and technological components incur a wide range of preservation needs. The current moment is also one where digitally-enabled technologies for migrating and sharing time-based media appear to hold infinite promise, even as the most vulnerable elements of the historical record embodied in moving images and recorded sound threaten to disappear. This study investigates the preservation of analog time-based media as it exists in local repositories. The study was formed in response to the needs of a specific collection of analog audio open reels containing music recorded at Houston's Andrus Studios dating from the 1960s and early 1970s, and to the task of finding an appropriate repository to acquire the collection. Physical, technological and intellectual aspects of time-based media are articulated in the literature review, study criteria and semi-structured interview questions employed for the study. The findings form a topology of preservation and access activities that exist in local repositories and that contribute to the sustainability of acquiring substantial collections of obsolete time-based media such as the Andrus Studios collection.

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Chapter One: Introduction

The analog time-based media of film, videotape, mechanical and magnetic sound recordings have emerged as a growing area of concern for cultural institutions. Collectively, these media constitute a rich body of historical evidence and intangible cultural heritage whose varied physical and technological components incur a wide range of preservation needs (Ivey, 2004; Bamberger & Brylawski, 2010). A central dilemma of these disparate physical carriers of durational content is that access to their recorded contents necessarily accelerates their physical deterioration due to the stresses that are exerted on the carriers by playback equipment. In many cases this predicament is made worse by the impending extinction of technologically outmoded playback equipment that threatens to render content trapped on obsolete native formats. A rising awareness of the need to preserve the contents of increasingly fragile and obsolescent carriers has been articulated in a number of recent publications on the subject (Lacinak, 2014; Wengstöm, 2013; Bamberger & Brylawski, 2010; Singh, 2009; Casey & Gordon, 2007; CLIR, 2004; Ivey, 2004; Danielson, 2001). Much of the literature conveys a sense of urgency, and many formats are cited as being at risk of technological extinction within the next two decades regardless of their physical stability (Lacinak, 2014; Wengstöm, 2013; Bamberger & Brylawski, 2010). With the new century, the immediate need to migrate a vast number of analog formats, long dormant from inattention, has brought time-based media preservation into sharp focus even as the most vulnerable elements of the historical record embodied in moving images and recorded sound threaten to disappear.

Despite these ominous predictions, the current moment is also one where digitally enabled opportunities for migrating and sharing time-based media appear to hold infinite promise. In recent years technologies for digitizing analog time-based media have emerged as a viable means of retrieving content from dying native carriers and mass digitization projects have been initiated by prominent institutions with large and distinguished time-based media collections (Danielson, 2001; Casey & Gordon, 2007; van Gompel & Hugenholz, 2010; Wengstöm, 2013). These advances have occurred in tandem with an overall rising demand for digital access to research materials, and, in response, digital collections created and hosted by cultural institutions have proliferated (Novara, 2010; Thorman, 2012).

This study takes as its subject the preservation of analog time-based media as it exists in local repositories. For the purpose of the study I define local repositories as repositories that are not time-based media-oriented (as film and music archives are) but whose collecting practices are broadly oriented towards local history and culture. In doing so, the study seeks to answer several interrelated research questions: 1) Given the mounting evidence of the need to preserve time-based media and the ever-dynamic state of technological advances in the digital realm, what is the response in local repositories? 2) Which preservation and access barriers posed by analog time-based media most impact the activities of repository staff? 3) What does access to time-based media look like on the ground?

The study was formed in response to the needs of a specific collection of analog audio open reels extant of Houston's Andrus Studios dating from the 1960s and early 1970s, and to the task of finding an appropriate repository to acquire the collection. Each of the methodologies employed for this study were tailored to the collection's particularities. The literature review was conducted to establish how the preservation of time-based media has historically evolved in response to access barriers and technological advances. The selection criteria set forth for identifying repositories to study correlate to the intellectual, physical and technological aspects of the Andrus Studios collection and with infrastructures available for promoting access. The interview guide and semi-structured interviews address how barriers to preservation and access, identified in the literature review, can affect specific institutional activities and priorities, including those that have direct bearing on analog music recordings. Finally, the findings of the study form a topology of preservation and access activities that exist in local repositories and that contribute to their suitability for acquiring substantial collections of obsolete time-based media such as the Andrus Studios collection.

Chapter Two: Andrus Studios Collection

The Andrus Studios collection consists of extant reels from Andrus Studios, a small independent recording studio that operated in Houston, Texas from 1966 to 1972. The audio recordings in the Andrus Studios Collection contain local and regional musicians performing original popular music of the day. The many genres represented in the collection are a direct reflection of the vibrant and varied music scenes that coexisted in Houston at the time, as well as regional influences that developed due to the city's proximity to Austin and the general ubiquity of national trends. The recordings also bear witness to emerging analog production practices such as multi-track recording and editing, and the experimental practices developed by the studio's sound engineers (Morton, 2004; Bradley & Wood, 2010). Other materials in the collection such as administrative records, promotional materials and recordings of radio advertisements evidence the business practices of a burgeoning but volatile music industry that had developed in the region (Bradley & Wood, 2010; Gart & Ames, 1990).

The Project

My involvement with the Andrus Studios collection came about through my friendship with Frank Davis, a musician, artist and former recording engineer and producer at Andrus Studios. Davis had inherited the collection from the studio's owner and head producer Walt Andrus in 2009 and in 2010 he asked for my assistance in caring for the sizable collection which was then occupying several industrial cabinets in his warehouse. After performing an initial inventory with the help of our mutual friend David Feil, I applied to the Idea Fund for a grant that would cover the cost of digitizing the recordings with the objective of making obscure recordings and information on their historical context available through an online Wiki. David and I were awarded the grant in 2011 and the project to digitize the collection began in earnest thereafter.

Barriers

Several intellectual, physical and technological factors stymied the progress of this project from the outset. As a result I became aware of the myriad problems that can impact the digitization of analog magnetic sound recordings.

Analog Playback Equipment and Expertise

Some of the greatest hurdles to digitizing the collection were the technological aspects of the tapes. The ¼-, ½- and 1-inch audio reels were each recorded with 2-, 4- and 8-track configurations, and might be stored heads out (forwards) or tails out (backwards). In order to playback the tapes and digitally capture their contents playback equipment in good working condition had to be obtained for each size and configuration. Stereo (2-track) reel-to-reel playback decks for ¼-inch tape were relatively easy to locate. Quarter inch tape had found broad application as an archival format for musical and non-musical recordings, as well as an industrial and consumer format for music recordings, however the grade of the tapes and the playback decks varied widely due to its professional and amateur uses (Bradley, 2004). Tape playback speed and signal quality were considerations in locating a deck. Most of the ¼" tapes were recorded at 15 IPS, a speed rarely available on consumer grade playback decks, and the high quality of professional grade playback heads for reading the tapes was preferred. It was explained to me by our recording engineer Rock Romano that multitrack reel-to-reel playback decks for ½- inch and 1- inch tapes had been used exclusively in recording studios to record instruments at different levels and blend together multiple takes. The rapid technological advances in the size of tapes and number of tracks that the decks could handle, and the attendant eagerness of recording studios to exploit new technologies, meant that the production and use of intermediary decks and formats (1/2-inch and 1-inch) was far more limited. It took several months of reaching out to recording studios in Houston and Austin to locate ½- and 1- inch decks in good condition that could be used for digitizing the collection.

Technological expertise was also a consideration. In this respect I was fortunate to have located sound engineer Rock Romano. Romano had worked at the studio during its operation and who had maintained his own independent recording studio in the years after Andrus Studios closed. Romano's studio practice now utilized digital recording and

editing platforms, but he had retained the knowledge of how to operate analog equipment and had even done much smaller analog-to-digital conversion projects on a contract basis. His advice was vital to the initial phases of the project. With Romano's help I procured analog equipment, learned how to convert analog signals to digital, and maintained the reel-to-reel decks needed for the process.

Physical Factors

To play open reel recordings the tapes must be threaded through the machine and spooled up under tension so that the magnetic surface is flush to the playback head. During the playback of the Andrus tapes dust was a concern because it interfered with the signal extraction from the tapes (Bradley, 2004; CLIR, 2004). The reels were cleaned along the outside of the tape pack to reduce the amount of dust and debris. The condition of the tapes themselves was also a concern. Most of the tapes were in remarkably good condition from having been stored in the dry climate of New Mexico. However, some of the tapes with older cellulose acetate substrates had over-dried, resulting in tapes with wavy edges that were extremely fragile. These tapes could not be placed under the tension of the playback deck without further conservation treatment. Other, younger, polyester tapes exhibited evidence of sticky shed syndrome, where the binder of the tape had become soft, allowing magnetic pigments to fleck off during playback and causing permanent losses of information (Hess, 2008). Tapes that exhibited sticky shed syndrome were also set aside for conservation treatment.

Other physical aspects that affected the playback of the tapes could be treated on the spot. Numerous tapes exhibited uneven spooling of the tape, resulting in tapes that wobbled when played back. These tapes had to be completely unspooled and re-spooled in order to be played without distortion. Many recordings had been spliced together by sound engineers to merge content from various takes and sessions, resulting in recordings that had numerous weak points where the aging splicing tape held together separate segments of audiotape. Under the tension of the playback deck these splices tended to pop off and the audiotapes had to be cleaned of adhesive residue and re-attached with new tape at each splice. Some recordings had nearly a hundred splices, slowing the digitization process to a crawl.

Conversely, the stresses placed on the playback equipment by playing numerous tapes were also a consideration. In addition to muddying signal extraction, the friction created by dust particles against the playback head of the deck as the tapes moved past could wear down the material on the head, a component that could be difficult or impossible to replace. Worse, tapes with sticky shed issues shed magnetic pigments and gooey binder materials that then re-glued themselves to the various components in the tape path. Uneven tape packs interfered with the machines operating smoothly. To minimize the impact of dust and shedding materials all of the components along the tape path were cleaned between each pass.

Intellectual Considerations

The boxes containing the music recordings were often the only external clue to the identity of each recording. These were inconsistently and often sparsely labeled, making it difficult to ascertain which bands, musicians and producers were involved with each session and which sessions were on each tape. Dates, in particular, were frequently left off of session descriptions. Sometimes, when the recordings could be traced as source material for commercial releases, it was possible to decode partially inscribed information based on the liner notes of the LPs. However many of the recordings featured local acts that had only performed in local clubs and had never attained commercial success. Unlike the 1960s music scene in Austin, the music scene in Houston from that era has remained largely un-documented and has only occasionally received revived interest from scholars and enthusiasts (Bradley & Wood, 2010; Gart & Ames, 1990). In the absence of historical documentation, the task of locating information on the musical contents of the recordings required tracking down and interviewing local musicians and recording engineers who could remember first hand accounts relating to the bands and their recordings.

The process of identifying recordings was also complicated by the fact that most of the recordings were created before February 1972, when federal copyright was first extended to protect sound recordings. Because these recordings were fixed before they were eligible for copyright protection there was no registration information on their

creators and no clear path for ascertaining who held the rights to their intellectual properties (Besek, 2005). Without being able to ascertain and locate rights holders, the task of obtaining permissions for any kind of online access had to be shelved until further resources could be devoted to researching the matter.

Summary

The Andrus Studios collection presented numerous technological, physical and intellectual barriers to its preservation. By performing the digitization of the reels I became intimately acquainted with many of the setbacks that can hinder the preservation of obsolete analog audio recordings. At the time I recognized that these aspects would affect the long-term preservation of the recordings within a repository setting but I, then a novice to archival practice, could not know how seriously these factors impacted repositories. I also suspected that the barriers I'd encountered were not altogether unique to analog multitrack recordings and could likely be generalized to the larger body of time-based media preservation. To further investigate the role of various preservation barriers within the context of cultural institutions I conducted a review of the literature regarding the evolution of time-based media preservation dating back to the inventions of moving images and recorded sound.

Chapter Three: Literature Review

This literature review chronicles the development of moving image and recorded sound preservation in the United States through three critical phases. Time-based media preservation developed in response to cultural shifts in the value assigned to these media that emerged in confluence with technological advancements. This development unfolded largely as a progression from establishing collections to addressing the material and technological properties of native analog carriers, leading up to current strategies of ongoing digital migration and refreshment. Over time, the changing values assigned to time-based media dictated their inclusion or exclusion in the collecting practices of cultural institutions, while the changing material and technological landscape of time-based media held in these institutions continued to redefine what constituted preservation.

Establishing Collections and the Notion of Art

The first step in the development of time-based media preservation was the establishment collections of these media for study and reuse, much as the establishment of library and archival collections had in centuries past. In the case of early cinema, commercial production and distribution chains restricted access to films, often ensuring their destruction and replacement with newer features. Short screening runs dictated by profit motives impeded scholarship and critique from developing around the new medium. Commercial sound recordings had limited distribution and unique sound recordings, dispersed in private collections, might never be publically accessible. When television broadcasts were later invented they too had a limited existence in the public eye. Early time-based media preservation was equated with collection building of motion pictures and sound recordings that fixed these fleeting carriers within an institutional context so that they could be held up for study and enjoyed repeatedly, rather than disappear from the cultural record.

The early establishment of collections hinged upon their merits as artistic and cultural documents. Film and mechanical sound recordings, the earliest time-based media, had a substantial image problem to overcome in this respect. These media were perceived as ephemeral and disposable, their enduring value was undermined by the spectacle and perfunctory novelty of their content. Sound and moving image recordings

evolved technologically during the second half of the 19th century in Europe and the United States, first as inscriptions of sound waves produced by French inventor Leon Scott's phonautograph in 1857, the motion-capturing serialized photographs of English photographer Eadweard Muybridge in 1878, and the first motion pictures by Louis le Prince shot on Eastman's paper film (Morton, 2004; McKinney, 2014; Howells, 2006). But it was American inventor Thomas Edison who first developed and patented equipment that could record *and* playback sound and images, producing the phonograph, a device that recorded and played back sound by mechanically embossing sound waveforms to a tin foil cylinder, in 1877 and the kinoscope and kinetograph, a camera and motion picture viewing station respectively, in 1891. By the time that magnetic sound recording was introduced in the form of Valdemar Poulsen's telegraphone, in Paris in 1900, burgeoning entertainment industries in sound recording and cinema were already vying for the public's attention and expendable income on the other side of the Atlantic.

Film

In "From ephemera to art: the birth of film preservation and the Museum of Modern Art Film Library" McKinney traces the shifting consciousness around film during the late 19th and early 20th centuries leading to its recognition as an artistic medium worthy of preservation (2014). Film was not initially construed as an artistic vehicle and any long-term value associated with it was framed around its unique properties as a documentary medium. As a historical document film was thought to be unblemished by human biases, providing an un-slanted record of historical events. This argument for film's lasting value was outweighed by its commercial value, so much so that by 1915 film had already become so thoroughly exploited as an entertainment medium the US Supreme Court ruled that the commercial spectacle of motion pictures precluded its application to the constitutional right to freedom of speech and press.

Yet even as the courts consigned film to commodity status the public perception of film was undergoing a significant change. The release of D.W. Griffith's *Birth of a Nation*, one of the earliest feature length films, in the same year illustrated the technical rigor and narrative scope that film was capable of embodying. Hailed at the time as a commercial and artistic success, the film achieved widespread popularity while elevating

film's status above that of a cheap amusement. The year 1915 also marked the first literature theorizing film as art in the American context. Vachel Lindsey's *The Art of the Moving Picture* placed film amongst other traditional art forms and even extended its cultural relevance to the primitive technologies of early films. Shifts in public sentiment nevertheless had little effect on American legislators who continued to vote down proposals for a national film collection. Instead, the first American film library emerged outside of the national dialogue, taking its cues from niche film preservation that was already occurring abroad.

By the 1920's film societies had come into vogue in Germany, France and the United Kingdom. These societies rejected the commoditization and mass appeal that had come to define cinema generally and American cinema in particular. Film society enthusiasts sought out features that had gone out of distribution, an activity made all the more challenging in the late twenties as the advent of "talking pictures" instantaneously made even recent silent films obsolete. The rise of European film culture in opposition to mainstream cinema resonated with American fine art audiences to such a degree that when the Museum of Modern Art was founded in 1929, film was included as one of the Museum's prospective collecting areas. In a further nod toward European precedent, British film critic Iris Barry was hired as the Film Library's first curator in 1935, effectively transplanting film culture to American soil. Yet while the conceptual foundations of the MoMA Film Library borrowed heavily from those of European film societies, Barry's programming underscored film's place, not just as an art form, but a uniquely American art form. As such, the MoMA Film Library became an early forerunner of American film preservation and advocacy, which would continue to coalesce around the notion of film as a form of art.

Sound Recordings

The practice of collecting and thereby preserving sound recordings was also slow to evolve. The first collections of commercial recordings were comprised largely of Western art music, which, as the name denotes, was already considered an art form and was situated within long historical and cultural traditions. Carol Bradley's dissertation *The genesis of American music librarianship, 1902-1942*, which details the development

of music librarianship and of rationales concerning the collection of sound recordings, dates the birth of American music librarianship to the creation of the Music Division at the Library of Congress (LOC) in 1902 (1978). At the time the Division consisted almost entirely of copyright deposits of music literature and scores; music recordings were not initially a consideration because they were not protected by copyright.

Western art music recorded on 78 rpm discs were the first sound recordings to be incorporated under the aegis of library collecting, guided by musicologist Carl Engel, the second head of the LOC's Music Division. Engel believed that the experience of hearing music performed was vital to developing the public's appreciation of the musical arts and his acquisitions of sound recordings were complemented by live performances held in the Library as well. Smart describes how Engel sought out the Victor Talking Machine Company in order to build the Library's music collections, acquiring the LOC's first sound recording and playback equipment in 1925 (1983). The majority of the 412 records selected in the initial gift and subsequent donations were "Red Seal Records," from Victor's classical music label, to be used as reference copies for scholars.

Western art music recordings were readily included within the LOC's collecting scope because they derived from music traditions that had already achieved status as high art, but changing social and technological factors would gradually broaden the definition of cultural materials to include recordings that fell outside the high art canon. Rapid urbanization had resulted in a new imperative, taken up by museums and historical societies, to preserve dwindling traditional cultures (Bartis, 1982). This shift was accompanied by a growing populist sentiment that knowledge itself was the property of all citizens and not simply the domain of scholarly elites. Responding to the increasingly liberal academic context and a sense of responsibility to preserve traditional cultures, Engel began pressing for a centralized collection of American folk songs at the LOC in 1928, and later that year the Archive of American Folk-Song was inaugurated as a collection within the Music Division (Bradley, 1978).

Bartis' *A History of the Archive of Folk Song at the Library of Congress: the first fifty years* describes how the notion of collection as preservation was taken to a new level (1982). Empowered by populist currents within academia, the Archive played an active role in facilitating the creation of an American aural cultural record by loaning sound

recording equipment to folklorists for field expeditions and sponsoring experimental research. In a departure from the rest of the LOC, the Archive's first director, folklorist Robert Gordon, emphasized the importance of preserving raw data captured in the field rather than the published works that populated the rest of the Music Division. During the 1930's the collecting scope was further expanded by the inclusion of Bahaman, Spanish and Mexican folk recordings acquired by John and Alan Lomax - folkway traditions with which American folkways shared its roots. And as American folklorists increasingly looked to the Archive as a repository for their fieldwork, recordings of native cultures from other parts of the world began to trickle in. This decade witnessed a dramatic increase in accessions due to concomitant programming of the Resettlement Administration and the Works Progress Administration. The Archive also began collaborating with the LOC's Recording Laboratory to record music performances and oral histories on-site, what Alan Lomax described as "bringing together the basic oral culture of the United States" by which the American people might "speak their own history," and as the 1940's progressed spoken word recordings played an increasingly prominent role.

By the 1940's the cultural significance of time-based media as embodiments of traditional and emerging art forms was reflected in an increasing number collections established within cultural institutions. Sound recordings had become thoroughly inscribed within folklorist fieldwork and the larger movement to preserve American traditional culture by means of building collections in cultural institutions. Western art music continued to occupy a privileged space in libraries, and sound recordings of Western art music continued to be incorporated into library collections under that rationale. Moving images, then limited to film, had transcended their commodity status and forged an identity as a new, uniquely American art form amongst more traditional art forms worthy of scholarship and preservation. As cultural institutions continued to amass time-based mediums material aging and technological change would impact their physical integrity and accessibility, bringing these aspects to the fore and challenging the existing definition of preservation.

Technological and Material Concerns

As collections of time-based media became more established material and technological factors emerged that affected their long-term preservation and accessibility. Unlike print materials and photographs that could be studied with the naked eye, time-based media required playback equipment in order for their contents to be viewed and heard. As these technologies aged and were replaced by more advanced equipment the accessibility of early time-based media became reliant on content migration to contemporary formats. Aging time-based media were also more vulnerable to physical deterioration due to environmental factors and the stresses of playback use. In the years following World War II these aspects redefined preservation for time-based media from its early interpretation of establishing and acquiring collections to one that emphasized the technological dependencies and physical vulnerabilities of time-based media.

Sound Recordings

Bartis' account of the Archive of American Folk-Song illustrates how the proactive collecting practices of the Archive eventually became the technological foundation of its preservation and distribution activities (1982). Rapid technological advances leading up to and following World War II, and the obsolescing of early recording formats, began reshaping the access practices of the Archive. By 1941 the LOC Recording Laboratory had amassed numerous recording and sound production devices and technical expertise for handling recordings on mechanical and magnetic sound recording formats. This equipment could be loaned out for fieldwork, used in the service of state-sponsored radio programming, or employed for use on the ongoing production of oral history recordings. Content migration from older to contemporary formats was initially construed solely as an access measure, performed in the service of creating reference copies for researchers. Experimentation in the Lab had led to the invention of a cylinder-transcribing machine that re-recorded cylinders to discs and, later, to magnetic tape. Duplication could also be employed for broader access to collections materials via commercial distribution of LPs for projects such as the Steele-Clovis Gift Fund for the Preservation of Indian Music. As the Archive began to actively seek out and acquire

existing folklore recordings held by scholars the duplication of outmoded recordings onto contemporary formats became a central role of the Lab. Improvements to sound engineering equipment encouraged duplication as they provided better fidelity for migrating recorded content and early formats were quickly becoming regarded as obsolete.

By the 1950's aggressive acquisitions policies had swelled the Archive's holdings, but the introspective focus of recently appointed director Rae Korson would open a new line of inquiry regarding preservation beyond simply building the collections. In 1957 Korson proposed two novel remedies to the troubling state of sound recordings in the Archive: 1) that a survey be conducted to determine how many records were in poor condition and 2) that glass-based recordings be prioritized for transfer to magnetic tape. Never before had preservation involved addressing the physical vulnerabilities of collections materials rather than mere acquisition, nor had the physical composition of a record been given priority over reference requests for duplication. This new materially-centered stance on preserving sound recordings soon spread to the Music Division which, with the aid of a Rockefeller grant, launched a study to examine modes of deterioration in sound recordings and proper storage conditions. Conducted over two years by two engineers, *Preservation and storage of sound recordings* identified atmospheric and chemical conditions that affect the stability of acetate, shellac, and vinyl discs, and acetate and polyester-based magnetic tape (Pickett & Lemcoe, 1959). In light of these findings the LOC established a Preservation Laboratory in 1961 and in 1963 air conditioners were placed in the stacks. The report soon found audiences outside the LOC in Germany, France, Japan, England, Switzerland and Australia, where it became the authoritative text on sound preservation.

Meanwhile, under Korson's materially oriented preservation stance, the Archive became even more desirable to domestic and international folklorists seeking a repository for their aging collections and acquisition continued to increase. Granting agencies also took note of the Archive's new vein of preservation work, funding large-scale content migration initiatives in 1967. In the decade following Korson's first proposal to assess collections and prioritize duplication based on the material vulnerabilities of specific formats recorded sound preservation had been redefined to address the material and

technological compositions of collections holdings by implementing climate controls to arrest deterioration and targeting content migration for fragile and obsolete carriers.

Film

For moving images materially oriented preservation measures would initially develop outside of the domain of cultural institutions and would remain largely invisible until the establishment of the American Film Institute's archival program in 1967. In "Moving image preservation work: the evolution and integration of moving image preservation work into cultural heritage institutions," Gracy describes the prominent role of the movie industry in the early preservation of film (2013). Even as the conception of film's artistic value was still germinating within American cultural institutions preceding the establishment of film collections, the material preservation of filmic works was taken up by within the industry, albeit with very different goals from those cultural institutions would later adopt. Advances in film care and handling originated amongst industry professionals operating at different points in the production chain (manufacturers, distributors, and projectionists) as a way of maximizing the useful life of films and extracting the most profit. Unlike the concerns of cultural institutions, which would encompass long-term preservation strategies, the scope of industry preservation was limited to the short lifespan of a film's commercial run. Cinematic releases rarely extended past a few months of showing before being replaced by another new feature. Though shortsighted, industry practices became the foundation of what would later become archival film preservation practice.

Part of the necessity for developing care and handling practices was the chemical instability of nitrocellulose film substrates. Though prized for their superior optical qualities, these early films were highly flammable and prone to a number of other degradation modalities (see also McKinney, 2014). Care and handling practices served to protect audiences, projectionists and other film workers, while also safeguarding filmic corporate assets. Film exchanges bore much of the burden of repairing films that circulated from their storehouses to exhibitors but due to the demand for new releases, these exchanges rarely held or cared for material that was more than a year old. The condition of films rented out by exchanges directly impacted projectionists, who ran the

risk of having films spontaneously ignite while they worked if films that were in poor condition fed through the projector improperly.

As early as 1916 industry standardization and best practice guides, created by the Society of Motion Picture and Television Engineers (SMPTE), reduced the risks associated with film's distribution and presentation. Research produced by the SMPTE examined numerous aspects of film preservation, including the decomposition and spontaneous ignition of nitrate films, shrinkage and dye stability became specific areas of study. Despite this growing body of research, industry studies and guidelines seldom appeared in the discourse surrounding film archiving. A rare crossover article from Eastman Kodak, which appeared in *Special Libraries* in 1971, articulated material and environmental factors that lead to film deterioration in cultural institutions, yet such pieces remained an anomaly. However, veteran film archivists occasionally contributed to motion picture engineering literature suggesting that archives specializing in film were keeping abreast of industry research developments. When the American Film Institute was established in 1967 with the onus to coordinate archival film preservation the proceedings referred to materially oriented practice that had been developing within individual collections (Mann, 2001).

Television

During the same postwar period the development of broadcast television began to diversify the moving image landscape. Fay C. Schreibman's article "A succinct history of American television archives," gives an account of how television archives emerged both as outgrowths of existing film archives and as independent entities (1991). Television followed a similar trajectory to that which film had taken during the first half of the century. Early television was broadcast live and was considered ephemeral, resulting in recordings of broadcasts being frequently discarded or erased so that costly tape stocks could be reused. Rationales for television's long-term value and collection centered on its value as cultural artifact, such as the collection of Peabody award-winning programs at the University of Georgia beginning in 1940, followed later in the 1950's with film collections at the University of Wisconsin, the George Eastman House and UCLA expanding their collecting focus to include recordings of television programs.

In 1968 television collecting diverged from its artistic/cultural orientation to a more politically driven stance when Paul Simpson, a retired business executive, brought his concerns over the impermanence of such a powerful propaganda medium to the attention of his *alma mater*, Vanderbilt University. Simpson argued that without any record of what had been broadcast to the nation, there was no way to scrutinize political discourse and news reporting, which, in 1968, was fraught over the Vietnam War. Upon receiving the University's approval Simpson began making the off-air recordings of presidential conventions, nightly newscasts and public affairs programs that would become the Vanderbilt Television News Archive.

The challenges faced by television archives differed significantly from those of film due to the prolific use of rapidly changing technologies and the creation of consumer video formats. The advent of professional grade videotape and cheaply produced videocassettes saw widespread adoption by broadcasters and amateurs alike. The plethora of early video formats that emerged during this time complicated the work of archives as they often did not have the equipment or expertise to deal with obsolescent video broadcast equipment. The establishment of the Vanderbilt Television News Archive, concurrent to congressional drafting of copyright reforms, resulted in the protection of recording televised broadcasts for educational purposes, giving rise to an immediate upsurge of copyright deposits at the LOC as networks rushed to protect their assets from unlawful copying. Like other magnetic recording media, videotapes are sensitive to fluctuations of heat and humidity. Yet unlike film preservation, which had developed slowly and selectively over the previous half century, the sheer volume of incoming video materials and their technological diversity soon strained television archives' resources.

Dislodging Content from Carrier

In 1993 the impacts of digital technologies were also being felt across cultural institutions and long-static organizational structures were being pressured to adapt. These technologies, themselves in a state of flux, were affecting all aspects of the information life cycle, from capture and storage, to the manipulation, presentation and distribution of

text, images and sound. In her paper “From preservation to access: paradigm for the nineties,” delivered before an international audience, Patricia Battin, president of the Commission on Preservation and Access, articulated the challenges faced by cultural institutions charged with managing analog and digital resources and the new meaning that preservation would assume in this complex hybrid environment (1993). In light of the ever-accelerating trajectory of knowledge creation and dissemination from one of material stability and low access to one of low stability and high access Battin argued that a new concept of preservation was needed, one that comprehended the fluid techno-social environment enabled by digital means. Preservation had to grow to encompass “those strategies and actions necessary to provide access to the accumulated human record as far into the future as possible.”

This was a radical reframing of preservation. While content migration was clearly not a new strategy for preserving fragile and obsolescing library materials, the common practice of preserving materials by analog duplication centered on the notion of medium permanence, utilizing unwieldy “archival” mediums such as microfilm and analog magnetic tape. Digital technologies proposed to upend this orientation by placing libraries and their contents in “a ceaseless spiral of change.” And as Battin acknowledged, digital technologies would not so much be incorporated into existing paper-based systems, as they would reshape previously analog-bound institutional operations. The emphasis on physical information carriers was beginning to give way to permanence of access in an evolving digital environment.

Sound Recordings

Eight years later cultural institutions were still struggling with the dichotomy of the analog past and the digital future, resulting in paralysis rather than innovation (Cohen, 2001). The instability of digital formats was continuing to meet resistance from a preservation community with deeply held tenets regarding material permanence and “archival” analog formats. In her paper delivered at the *Folk Heritage Collections in Crisis* conference co-sponsored by the American Folklore Society and American Folklore Center Elizabeth Cohen interrogated the social barriers to adopting digitization as a preservation strategy for sound recordings. Citing the uncompromised fidelity afforded

by digital audio (as compared to the generational losses incurred via analog migration), she warned against delaying the digitization of deteriorating analog materials while waiting for a permanent digital medium and further critiqued the “cult of the original” that she saw as impeding the adoption of digitization. As the conference’s name implied, the state of audio collections was becoming increasingly worrisome as collections materials on fragile and obsolete formats continued to be acquired with no permanent solution for their preservation at hand.

In “throw[ing] down the gauntlet” Cohen contended for an even broader interpretation of preservation than mere migration to the digital: preservation as distribution. While this strategy extended Battin’s proposal of access permanence rather than carrier permanence, an accompanying paper by Anthony Seeger, “Intellectual property and audiovisual archives and collections,” delivered at the same conference, suggested that such a preservation strategy would have limited application under current intellectual property rights regimes governing sound recordings. For commercial recordings copyrights continued to pose barriers to access due to the difficulty of locating and obtaining permissions from rights holders and legal ambiguities regarding the rights status of recordings fixed before federal copyright protection was extended to sound recordings in 1972. For unpublished, unique recordings, particularly those containing ethnographic material, the rights status and ethical implications of distribution were even more fraught. Arguing that artists’ rights and cultural patrimony should take precedence over dissemination, Seeger warned that the evolution of digital technologies had outstripped archives’ ability to legally take advantage of enhanced access.

Moving Images

In moving image archives the transition from analog to digital began later than that of audio but resulted in a similar ideological schism. Many archivists continued to align their priorities with analog films to the point of rejecting any other medium including digital, while a minority of archivists maintained that the evolution of digital was just one of a plethora of mediums that constitute moving image heritage. Fossati’s *From grain to pixel: the archival life of film in transition* suggests that practical and theoretical changes in the production, exhibition and preservation of moving images

warrant a corresponding reconceptualization of the role that moving image archives and archivists must play as the hybrid analog and digital present gives way to increasingly digital future (2009).

Echoing Gracy's observations of early film preservation, Fossati notes that moving image archives continue to be dependent upon and intertwined with industries of production and exhibition. These industries continued to forge the technical direction of film production and in so doing determine the products and services available to archives as well as the form of contemporary features yet to be archived. Contemporary film production has evolved into a hybrid process. Digital technologies have been slowly integrated into every step of the motion picture production process but have not yet displaced all of the analog processes they emulate. For instance, despite the development DLP projectors capable of rivaling the resolution of traditional film projection, digital films are still printed to 35mm analog for exhibition. The purpose of this practice is twofold: analog projection is still considered by many to be optically superior to digital and the distribution of analog screening prints reduces the risk of films being digitally pirated and leaked. Thus analog and digital processes and products continue to coexist in a nevertheless increasingly digital motion picture production and exhibition chain. The implications of this hybrid ecology for moving image archivists are many.

Film, the oldest moving image medium for public exhibition, was also the last medium to embrace digitization as a preservation strategy. By 2009 broadcast archives with video holdings had adopted digital migration on a massive scale but film archives continued to hold out. The objections raised by archivists to film digitization - lack of standards, costs, and technological obsolescence - mirrored concerns voiced earlier by audio archivists but on a greater scale. The advantages of analog film were stark, with film life expectancy exceeding one hundred years under proper conditions, as opposed to digital carriers' life expectancy of only a few years. The costs of scanning and storing digital masters from analog were high and "never-ending" as compared with their analog precursors, and the necessity of ongoing data migration called into question who best to ensure that the integrity of the original survives each migratory step. Rights status also impaired both restoration and access activities to the extent that film archives often would not even publish complete catalogues of their holdings much less screen films with

uncertain provenance or copyright status. Hence, the reality for many moving image archives remained far closer to older archival models.

The resistance to film digitization and digital exhibition by film archivists hinged on more than financial and technological sustainability. Film had evolved as an art form in its own right, more so than sound recordings and television broadcasts had, and that artistic status complicated the ethics of preservation practice. Filmic originals exist simultaneously as both material artifacts and conceptual works, and any preservation interventions must address medium specificity and the *auteur's* creative intent in order to be regarded as authentic. Medium specificity seemingly militates against digitization, although it does not necessarily elide digital-born film from film archives' charge. Where film is the expression of an *auteur* (often the director), the importance of medium specificity depends on the *auteur's* engagement with a particular medium (including digital) and its attendant technologies (including analog/digital hybrids) as expressed through a visual style. Concerns about the authenticity of a film and its restoration are crucial within archives because decisions made by archivists determine which artifacts survive and in what form.

The notion of film as art can result in preservation practices that are liberal and inclusive rather than conservative and exclusive. Archives with film holdings that hew most closely to the definition of film as art, such as Anthology Film Archives and the MoMA Film Library, tend to be pluralist in their definition of which filmic cultural materials qualify as art, accepting digital formats and orphan works into their holdings. These institutions still pursue photochemical preservation in the interest of medium specificity for high profile works and maintain traditional exhibition settings, but they employ digitization for the preservation of heterogeneous orphan works. In this way digitization ameliorates for the dearth of resources for photochemical preserving of orphan works, and digital access, rather than divorcing a work from its intended context, serves as a node of entry that draws the viewer to seek out a more authentic experience with the work. Although the adoption of digitization for moving image preservation has been

Literature Review Summary

This literature review has chronicled the development of time-based media preservation in the United States from early collecting practices to materially oriented preservation to the current hybrid analog-digital context. Preservation of time-based media began as the establishment of collections, fixing of ephemeral recordings of moving images and sound in a permanent location where they could be accessed for cultural edification. Early preservation efforts hinged upon the recognition of time-based media as embodiments of art and grew to encompass a broad array of cultural documents. With the passage of time and the growth of these collections the definition of preservation shifted to emphasize material deterioration and technological obsolescence, aspects that still shape preservation practice. More recently, digitization has emerged as a preservation strategy for saving materials on obsolescing analog formats, shifting the definition of time-based media preservation from one of material permanence to one of access permanence. Yet cultural institutions have resisted fully adopting this option on a variety of practical and ethical grounds. Enhanced access has given rise to concerns over antiquated rights regimes, while the immateriality and instability of digital formats pose the burden of continuous migration. The ethical implications of disembodied cultural artifacts have yet to be fully realized in this transitional moment, even as the urgent need to migrate rapidly decaying and obsolescing formats becomes increasingly clear and born-digital media have become the norm.

Chapter Four: Study Design

The object of this study was to perform an in-depth evaluation of the state of time-based media preservation in local repositories that contain analog time-based media formats similar to those in the Andrus Studios Collection with the objective of also locating potential candidate repositories for acquiring the collection. To this end selection criteria were established that parallel with the progression of time-based media preservation outlined in the literature review as a means of designating which repositories would be considered for closer study. An online search was conducted based on these criteria that narrowed down the field of prospective repositories to four candidates, of which three agreed to participate. An interview guide was likewise developed around the preservation concerns identified in the literature review and echoed elsewhere in preservation literature. Using the interview guide, semi-structured interviews were then conducted with relevant repository staff to develop a comprehensive portrait of each repository's time-based media holdings, the preservation activities engaged in for their longevity and the types of access afforded to researchers. Finally, the responses from these interviews were evaluated against institutional policies regarding collections development, preservation and access, so as to articulate the influence of such policies on the formation and application of such practices, and their implications for preservation and access in the future.

Repository Selection Criteria

The repositories chosen for inclusion in this study were selected due to their potential for acquiring, preserving and maintaining access to the Andrus Studios Collection or any comparable time-based media collection. To that end criteria were established to guide the selection of these repositories based on the intellectual, physical and technological makeup of the Andrus Studios Collection, and the presence of digital access to collections materials. These facets mirror the progression of preservation from collection to materially oriented preservation measures to technological migration to digital access, and thus convey a holistic sense of the preservation capabilities available to prospective repositories for such materials.

Intellectual Factors

The intellectual contents of the audio recordings in the Andrus Studios Collection are distinguished for containing local and regional musicians performing original popular music of the day. The many genres represented in the collection are a direct reflection of the vibrant and varied music scenes that coexisted in Houston at the time, as well as regional influences that developed due to the city's proximity to Austin and the general ubiquity of national trends. The recordings also bear witness to emerging analog production practices such as multi-track recording and editing, and the experimental practices developed by the studio's sound engineers (Bradley & Wood, 2010). Other materials in the collection such as administrative records, promotional materials and recordings of radio advertisements evidence the business practices of a burgeoning but volatile music industry that had developed in the region.

The first criterion was that the repositories contain collections materials related to the intellectual content of the Andrus Studios Collection. These included local and/or regional historical materials relating to the performing arts and industry development, research materials relating to popular music genres, especially of the 1960s and 1970s, and music recordings, particularly rare and unique recordings.

Physical Factors

The physical aspects of the audio recordings were considered according to their material composition and their volume. The material composition of the magnetic tapes in the Andrus Studios Collection is a critical aspect of their preservation, particularly the substrate material that supports the information-bearing magnetic pigments and the binder materials that fix them to each other. If one of these components fails the information contained in a recording can be irrevocably lost (Hess, 2008). Thus, the material composition correlates to the environmental conditions that must be maintained for their safekeeping and the volume of the collection describes the amount of space requiring these climate controls.

Approximately 75% of the tapes in the Andrus Studios Collection are composed with acetate substrates and the remaining tapes made with polyethylene terephthalate (PET) substrates. These two types of substrate composition have differing deterioration

modalities that can impact their accessibility. Acetate tapes are prone to non-linear shrinkage, brittleness due to desiccation, and vinegar syndrome. Vinegar syndrome is an autocatalytic (self-accelerating) process that occurs when humidity and heat cause acetate to irreversibly decompose, forming acetic acid, which then serves to accelerate deterioration and may spread to other acetate materials (St. Laurent, 1991). PET substrates are more chemically stable than acetate, however its high tensile strength can cause the base film to stretch irreparably if inappropriately stressed, distorting its contents. However, the polyurethane binder used with many PET tapes can hydrolyze (absorb moisture), causing sticky shed syndrome. The softened binder can loosen itself and the magnetic pigments from the substrate and re-adhere to playback equipment and other tape surfaces causing losses of information (Hess, 2008). It is recommended that magnetic tapes be held in a dust-free environment with proper ventilation at 59° - 68°F and 24-45% relative humidity with very slight fluctuation, and any tapes exhibiting symptoms of vinegar syndrome be stored in a separate vault (St. Laurent, 1991).

Accordingly, the second criterion was the presence of materials with similar material properties and environmental needs (cellulose acetate magnetic tapes and films, polyester audiotapes and videotapes) that were roughly as large or larger than the volume of the Andrus Studios Collection. The audiotapes in the Andrus Studios Collection are comprised of ¼”, ½” and 1” tapes spooled on 5”, 7” and 10” hubs housed in 32 cartons encompassing roughly 40 linear feet. Thus, only repositories that indicated substantial audiovisual holdings were given serious consideration.

Technological Factors

The presence of technological facets akin to those of the audio recordings in the Andrus Studios Collection formed the third criterion in the selection of repositories for the study. The ¼”, ½” and 1” audio reels each have 2-, 3- and 8-track configurations, respectively, and each format requires a different playback deck and auxiliary listening equipment. Playback hardware for open reel tapes, long out of production, is expensive and difficult to locate, and the expertise for maintaining and operating this equipment is quickly dwindling (Bamberger & Brylawski, 2010; Lacinak, 2014).

Open reel audio recordings are not the only obsolescent time-based media formats to present difficulties for locating playback equipment. Gracy notes that the adoption of consumer video formats by cultural institutions in the 1980's resulted in the replacement of aging film projection equipment with VHS decks, rendering films un-viewable (2013). Broadcast-standard videotapes likewise require specialized equipment and expertise that are difficult to procure (Singh, 2009) and magnetic wire sound recordings are some of the most expensive to access and preserve due to the extreme rarity of working playback equipment (Bamberger & Brylawski, 2010). Thus, while the presence of analog open reel audio recordings was of primary concern, the inclusion of other rare time-based media formats was also a factor during the selection.

Digital Access

The final criterion for the selection of repositories was the presence of digital access to time-based media. The priority of digital access follows from Battin's emphasis on the importance of access permanence and Cohen's contention that distribution is preservation, both culturally and materially (1993, 2001). The long-term access to and cultural relevance of the Andrus Studios audio recordings is intimately tied to their ability to be discovered and heard. This presupposes, not merely the migration of their contents to the digital domain, but their continued migration to contemporary formats to maintain access, as well as their visibility to potential researchers. The presence of streaming audio and video content was preferred amongst prospective repositories, however, given the lack of a coherent rights regime for sound recordings fixed before 1972, this was not necessarily considered prerequisite (Seeger, 2001).

Selection Process

Once the selection criteria for choosing repositories were established, I conducted an online search to identify potential candidates for the study. I used the Texas Music Office's registry of libraries and archives to locate an initial pool of repositories with music holdings that contained intellectual content related to that of the Andrus Studios Archive (TMO, u.d.). I then visited repositories' institutional websites to glean a better sense of each institution's collections development priorities and digital access

mechanisms. Finally, I used the Texas Archival Resources Online portal to examine finding aids of various repositories in order to identify the types of recording formats present in collections and their physical extent (TARO, u.d.). With this array of resources I was able to locate four repositories whose collections bore distinct affinities to the audio recordings in the Andrus Studios Collection.

Texas Music Office, Registry of Libraries and Archives

To gain an overview of the types of repositories containing music recordings across the state I first turned to the website of the Texas Music Office (TMO). A subdivision of the Office of the Governor since 1990, the TMO is a state-funded business promotion office and resource for information regarding the Texas music history, education and industry. The TMO hosts a registry of music libraries and archives in collaboration with the Texas State Library and Archives Commission with entries that contain contact information, information on the music genres represented, the year the repository was established and a brief collections overview. The registry covers a diverse array of historical research centers, library special collections, regional, genre-specific and niche museums, and music archives housed within larger research institutions, all of which are organized alphabetically by city name.

Using the TMO's registry of libraries and archives I was able to gather an initial pool of repositories that held music recordings and historical materials from Houston, Texas and the Gulf Coast Region. However, the individual institutions submitted most of the information contained in the registry and there were several instances of the information on an institution being outdated. The information hosted in the registry rarely offered details regarding carrier formats, much less playback equipment and other access mechanisms. Nevertheless, this resource was helpful for developing a broad selection of music repositories with collecting areas akin to the Andrus Studios Collection.

Institutional Websites

Having located a number of candidates for closer study, I began examining the institutional websites of these prospective repositories for further evidence of their collections development priorities. These websites frequently featured specific

collections prominently on the website's main page, as well as other guides such as subject indices and overviews of collecting areas. These features conveyed a deeper and more nuanced sense of each institution's collecting focus and the collections considered to be of high research value. Institutional websites also contained instructions for research access, which sometimes included special instructions for scholars wishing to access time-based media.

In addition to offering a more comprehensive look at the collections held by individual repositories, the institutional websites hosted digital collections of born-digital and digitized materials. Unlike the aggregate inclusiveness that often characterizes materials held in archives, these digital collections were curated to highlight particular aspects of the research collections. However some websites also hosted openly accessible databases of records relating to collections and individual recordings, offering another avenue for discovering research materials. The records for individual recordings varied in the amount of detail contained regarding recording formats and only rarely mentioned the availability of playback equipment.

Using institutional websites I was able to eliminate several repositories from my study due to lack of music recordings, collecting focuses that excluded local or popular music forms, often for falling outside of the Western art music canon, or narrowly defined collections development (such as those devoted to a specific subgenre or era or music production) that could not accommodate the full scope of the Andrus Studios recordings. I was also able to eliminate institutions that despite housing music-oriented materials showed no evidence of containing time-based media, whether in database records or as streaming digital surrogates hosted online. Websites that hosted streaming audio and visual recordings tended not to stream creative works, however oral histories were prevalent as digitally accessible resources and some of these related to the Houston's creative development contemporaneous to the operation of Andrus Studios.

Texas Archival Resources Online

I finally consulted the Texas Archival Resources Online (TARO) web portal to find more granular information regarding time-based media collections held by prospective repositories. TARO is an online resource hosted by the University of Texas

Libraries that displays finding aids of archival, manuscript and museum collections held by numerous repositories across the state that can be searched according to repository, subject, name, location or media format. These finding aids can be useful for determining the extent of media rich collections (usually described in linear feet) and the format types they include, as well as biographical information about creators, and historical context.

TARO is not a comprehensive resource for locating collections housed in any of its participating repositories. The site is dependent on EAD encoding to render repositories' finding aids and, thus, only displays recently processed collections and legacy finding aids that have been converted to EAD. The finding aids also exhibit inconsistencies with regards to format terminologies, which may vary from institution to institution and even from collection to collection. Indications regarding the types of access available to researchers are also frequently missing. Despite these drawbacks, TARO was useful for ascertaining whether repositories held time-based media and to what extent.

Repository Candidates

Using the resources available through the TMO registry of libraries and archives, TARO and the institutional websites of repositories I was able to locate four repositories that met the criteria of containing sizable collections of regional and local historical materials of, and pertaining to, music, that were embodied to some degree on time-based media formats. These repositories also made portions of their collections accessible online via EAD-encoded finding aids, databases of records, and streaming audio and video utilizing rich media platforms.

The four repositories that met these criteria included 1) a municipal archives and local historical research center, 2) a university special collections with collecting areas reflecting departmental specializations as well as local history, 3) a museum devoted to regional music heritage and performance, and 4) a historical research center which explores national themes through local and regional collections. I approached these repositories with requests to conduct interviews with members of repository staff who were responsible for various aspects of the preservation process, and secured permission for all but one of the repositories, the regional music heritage museum.

Interview Guide

I conducted my interviews with a variety of members of repository staff, with roles including special collections curator, sound archivist, preservation manager, and digital repositories manager. In preparation for these semi-structured interviews I developed an interview guide to address various barriers that impact the activities occurring throughout the process of preserving time-based media (See Appendix A). Like the selection criteria, the questions follow the progression of time-based media preservation, revealing the contours of how each phase manifests within differing institutional contexts.

Collections Development

The literature review demonstrates that collection is the first step to preserving vulnerable cultural materials, and it is the collections development priorities of cultural institutions that shape the nature and scope collecting practices. The first section of the interview guide contains questions that investigate the value assigned to time-based media within collections development and whether these types of artifacts are sought after, avoided or merely overlooked. Do non-specialized repositories seek out time-based media? If not, what are the implications for time-based media collections that enter the repository incidentally?

Time-Based Media Formats

The material and technological properties of time-based media and their attendant vulnerabilities informed the formulation of the next section of my interview guide. The questions in this section delve into the specific formats that exist in the repository and the rarity or uniqueness of the intellectual content of the recordings (if these are known). This section also addresses access to functioning playback equipment and the expertise to operate and maintain this equipment. Questions in this section further explore the research demand that exists for time-based media and preservation policies that are adhered to.

Digital Media Projects

The third section is comprised of questions regarding digitization and digital access. These questions are directed at defining the rationale behind digitization and digital access projects, the infrastructure (including funding) that exists for such projects, and the priority they are given within the larger scope of the repository's activities. The questions in this section also establish the role of time-based media in digital access projects and the specific ways in which that access is implemented.

Copyrights

The final section concerns the intellectual property rights affixed to time-based media and their impact on all aspects of collection, preservation and access. The distribution capabilities of born-digital and digitized materials via online access have brought copyright concerns to the fore as the security afforded by on site reference has ceased to apply. The questions in this section investigate the availability of expertise regarding copyrights to both users and staffs, whether and to what extent repositories hold time-based media materials that have unclear rights statuses (potentially orphaned works), and how copyrights impact preservation and access activities and priorities.

Semi-structured Interviews

The interviews were conducted in person (for two of the repositories) and by phone (for the remaining repository), and follow up questions were coordinated via email. Due to the semi-structured nature of the interviews, respondents were allowed to expand upon any of the questions as they saw fit. As a result, the information obtained from respondents underscored the prerogatives emphasized by each institution, whether at a departmental level or an organizational level. Aspects that were not given high priority elicited brief responses, whereas those that were prioritized evoked lengthy descriptive responses that often contextualized operations and policies within each specific institutional setting. These responses richly demonstrated the different approaches adopted by each institution.

Policy Documents

Institutional policy documents were the final source of data collected for the study. These included policies regarding collections development, reference services, duplication of materials, preservation policies, and protocols for prioritizing collections for digitization. Grant application requirements for applying for public funding were also brought under examination.

The policy documents codify current institutional prerogatives and priorities. Institutional policies were analyzed against the responses from repository staffs regarding the composition of their collections (particularly time-based media holdings), the infrastructure available for on-site and online access, and the projected research demand for time-based media to identify the degree to which the preservation and access needs of time-based media were recognized within institutional policies and how these policies reflected on the nature of their holdings. The inclusion of grant application requirements served to further illustrate the public funding resources available to repositories for launching time-based media digitization projects and to underscore the limitations placed on those resources regarding works restricted under copyright or having ambiguous rights status.

Chapter Five: Findings

The data collected during semi-structured interviews with repository staffs, and gathered from policy documents and institutional websites produced a set of portraits or topologies of the collections held by each repository and the institutional prerogatives that guided their care. Taken together, these data demonstrate commonalities and emerging trends across these local repositories, significant points of difference, and a few notable outliers.

All of the respondents remarked on a growing awareness of the need to preserve time-based media and an acknowledgement of the special needs presented by various formats, where previously there had been little thought given to the long-term protection of these items. Respondents also described contemporary collections that were being acquired as being increasingly media-rich. No significant increase in the demand for time-based media collections had been witnessed at any of the repositories, however this lagging interest was expected to accelerate as historical research begins to focus on more recent periods that produced greater quantities of time-based media documentation.

All of the repositories were actively engaged in digitization projects and had made investments in digital access to collections materials. The scope of these projects and their preservation implications varied dramatically between institutions. Differences in approaches to preservation and digital access were reflected in varying approaches to handling users' permissions and duplication requests. However all of the repositories' staffs conceded that copyright restrictions would not deter them from digitizing valuable collections materials when the state of their deterioration threatened loss.

Growing Awareness of Need

Staffs from all of the repositories remarked on a growing awareness of the need to preserve time-based media items in their collections. The repositories that were studied for this report all share one key feature; none of them were established as specialized institutions for collecting and preserving time-based media but, rather, had originally developed collections of books and paper-based records. The responses from each staff suggested that, in keeping with Gracy's finding that most cultural institutions have given little attention to the preservation needs of non-book formats in the past, as each

repository was in the process of evolving away from a heavily paper-oriented state and towards a more comprehensive preservation stance (2013). Yet, while the objective of a more media-comprehensive stance was common among respondents, the activities taken to preserve time-based media varied greatly from institution to institution. If, as I have suggested in the literature review, preservation can be thought of as a progression from collecting materials, to physically stabilizing them, to migrating their contents, the three repositories were each positioned at different points within that trajectory, collectively illustrating how each preceding phase influenced the adoption of those following. Collections development policies played a primary role in shaping the priority assigned to time-based media materials and, thus, their prominence as research materials worthy of preservation.

At the university library this increased awareness had resulted in the staff undertaking a comprehensive inventory and assessment of collections to determine the extent of the formats in their holdings as a basis for future preservation planning. Assessments of this kind are a valuable first step for evaluating the effects of storage environments and the state of collections (Harvey & Mahard, 2014). This data can then be used in concert with collections policies to develop preservation priorities. The implementation of such a survey indicates that the library is still in the beginning phases of bringing time-based media under its preservation purview, while the scope and dispersal of the collections, spanning a large library system, suggest that this work may prove to be quite extensive.

In contrast, the regional history center was the most advanced of the three. This was due, in a large part, to the decisive incorporation of time-based media (recorded sound) within its collecting scope several decades previous in recognition of recording media's unique ability to document regional music styles and cultures. One member of staff described a definitive turning point when the center brought on a media-oriented director, whereas the previous director had shown little interest in the unique documentary properties of time-based media. As the center began establish its recorded sound collections by proactively acquiring rare and unique recordings, the incentive for preserving these recordings increased. This commitment to recorded sound was evidenced in the repository's preservation practices, which comprehended the entire

spectrum of preservation from proactive acquisition to stabilization and systematic digitization. In addition to on-going digitization projects conducted in-house, the center's staff had also developed a rapport with local experts in the digitizing of rare and damaged media. These relationships augmented the center's ability to expeditiously respond to reference requests for materials embodied in rare formats and to consult on acquisitions and preservation strategies. Center staff similarly described a cadre of record collectors who helped to foster the development of regional music collections by alerting staff when rare works became available.

The local historical collection's preservation initiatives were seen as falling between the established sound preservation activities of the regional history center and the incipient efforts of the university library. The acquisition of time-based media was not specifically codified in this institution's collections development policy, yet as early as the 1970s members of staff initiated the collection of oral history interviews with notable members of the community, thereby bringing time-based media within the scope of this proactive documentation strategy, and other materials such as local television footage and films had since been acquired. Like the regional history center, this repository participated in acquisition, stabilization and digitization of time-based media, but the extent to which this was pursued was much less comprehensive. Digitization of time-based media, in particular, was characterized as taking place on a project basis dependent on grant funding, rather than an on-going systematic migration of collections holdings.

Media-rich Collections

Despite the aforementioned fact that none of the institutions was established as a media-specific repository and only one had enacted a collections development policy that was deliberately inclusive of durational media, respondents indicated that their collections contained a broad array of time-based media items, with instances of every known legacy format. This included early formats such as wax cylinders; rare broadcast formats such as glass-based radio transcription discs and video recordings of television programming; films, discs, magnetic audio reels and cassettes, and oddities such as wire recordings.

The structure of the institutions was a factor in the types of time-based media collections that each repository acquired and the diversity of formats within these collections. The circulating collections of the university library were largely reflective of the academic departments within the university and the materials held in special collections mirrored the research interests of faculty members in those departments. Although the television production and music education departments regularly produced and acquired collections of time-based media, most of the time-based media items throughout the library and special collections were more incidentally acquired. As a result these items were randomly dispersed within collections and were considered “one-offs” by library staff.

The dual structure of the local history collection as both research collection and municipal archives also played a determining role in the types of time-based media that entered the collection. Oral history recordings and local media broadcasts proactively acquired by staff reflect research areas defined in its collections development policies, whereas recordings of municipal proceedings stemming from administrative policies enacted outside the repository’s purview constitute an ongoing influx of materials whose intellectual cohesiveness arises from their shared provenance.

The historical span of the regional history center’s music acquisitions and the institution mandate supporting their development resulted in substantial collections containing a diverse array of time-based media formats. These included commercial recordings on consumer formats, early broadcast formats and idiosyncratic formats improvised during wartime shortages. The center exists as a collection of research units within a public university and many of the materials in its collections directly reflect that association. The music department holds numerous recordings of research collections deposited by retired faculty members of folklore and ethnomusicology as well as archived recordings of radio programming produced by the university’s radio station. Oral histories make up another area of collecting focus separate from the music division and many of these recordings relate to the history of the university and notable alumni.

The progression of time was also noted as influencing the nature of the collections being acquired and the research value attributed to them. Respondents observed that, with the passage of time, the historical collections being acquired increasingly containing

contemporary materials embodied in time-based media formats. Due to the growing ubiquity of electronic media, this trend is expected to escalate.

Research Demand

Repository staffs noted that this uptick in time-based media presence was expected coincide with an increased research demand for historical materials from eras that witnessed increasing documentation and creative works that utilize time-based media formats. Examples of this trend included the increased academic interest in and demand for films produced during World War II from the university library's special collections concurrent with the dwindling population of aging veterans from whom to gather information. Conversely, the opening of municipal recordings created during the tenure of a popular mayor, though relatively recent, was expected to generate research demand amongst local biographers and political researchers at the local history collection. Current events were also noted as prompting research interest in broadcast recordings held at the regional research center as past programming could be repurposed to contextualize current events and memorialize the passing of important political actors.

The overall presence of and research demand for time-based media for all of the repositories was anticipated to increase, yet the demand for these materials remained slight compared to other holdings. This lagging demand was attributed to a number of factors. Lack of awareness that time-based media holdings exist as research materials was cited as a common barrier to time-based media holdings being put to research use. One staff member at the regional history center, whose collections of regional music recordings and oral histories were generally more developed and prominent than the time-based collections of other repositories, noted that visitors often expressed surprise upon learning of these collections. Outmoded notions that archives consist of only paper-based records were suspected as being the cause of this lacuna.

Lacking visibility of time-based media items due to inadequate cataloging was also suggested as a barrier to awareness and research use at. The inconsistencies I encountered during my online research of institutional websites and electronic finding aids supports this conclusion. At the university library the collection-wide assessment of the library's holdings, concurrent with increased use of online catalogs by students, was

expected to ameliorate this situation. At the local historical collection the reverse was true as visibility was given low priority due to lacking access facilities. In this case the fragility of analog time-based media frequently precluded its use and playback equipment was not available for many of the formats in their holdings. Lagging research demand, then, was thought to be a consequence of researchers correctly assuming that time-based media could not be accessed even when their presence was known.

The Question of Digitization

Digitization projects were common to all of the repositories and all had technicians on staff to handle aspects of digitization and digital access initiatives. However, not all digitization was framed as a preservation intervention. Digitization efforts of all of the repositories were frequently employed in support of online digital collections and were thus oriented towards these activities more so than its usefulness as a preservation strategy. Two factors contributed to the orientation of digitization activities towards exhibition rather than preservation, the emergence and development of online digital collections and the need to procure grant funding. Both factors center on the issue of access.

At the university library the state of digitization was described as emerging from nascent digital collections initiatives enacted to explore the efficacy of hosting collections materials online in response to growing demand for online access. The experimental nature of these initiatives and their development under curatorial purview directly shaped the implementation of digitization in service to these projects. The library now has a more systematic process in place by which digitization projects are submitted by curators for departmental review regarding the suitability of their contents and the legal feasibility of the undertaking. The process serves to focus resources on digitization and digital access as a means of promoting departmental prerogatives and contributing to the profile of their resources. Digitization efforts at the regional history center followed a similar tack. The center engages in several digitization projects aimed at harnessing digital technologies in order to highlight its prestigious collections and promote new modes of historical research. Staff at the center noted that the curators of these projects were responsive to current research trends when developing these projects. This focus on

digitization to promote research access and raise the profile of specific collections necessarily excluded many materials regardless of their vulnerability to loss and consequent need of migration.

The necessity of securing grant funding also shaped the use of digitization for time-based media within the repositories. Staffs from each repository acknowledged that project grants had underwritten much of the time-based media digitization that had been conducted. TexTreasures project grants administered by the Texas State Library and Archives Commission comprised the single greatest funding source for digitizing time-based media across the repositories. These grants are administered for narrowly focused projects and cannot be used for overall collections management or the development of facilities' infrastructures. Only the regional research center had the requisite infrastructure to digitize time-based media on-site, so the preservation of time-based media was conducted using vendors and other exterior organizations. The Texas Archive of the Moving Image, a non-profit organization that works to preserve Texas films and videos and make them openly accessible, was noted as a resource for conducting these projects as it has both the equipment and expertise for digitizing film and video formats and making them accessible online. TexTreasures and other publically awarded grants were noted as placing emphasis on the accessibility of the materials being digitized to the public.

The regional research center was a notable exception to the grant-tethered digitization programs of the other repositories. Because the center was equipped with staff and equipment for digitizing time-based media in-house, it was not subject to the prerequisite of online access and could pursue digitization for preservation and on-site digital access. The center did still rely on grant funding for many of its digitization and digital access projects, but these were not the sum of its digitization efforts with regards to time-based media. Yet, while the center maintained on-going systematic digitization of its time-based media holdings, grant funded projects were nevertheless given priority, often appropriating the staff hours allotted for systematic digitization.

Although most of the preservation activities of the three repositories were geared towards building digital collections, a much smaller proportion of items were digitized individually at the request of researchers. Operable playback equipment for all but the

most ubiquitous formats were not available for research use and concerns over media fragility, such as those described by staff at the local history collection, prevented of rare and unique materials regardless of equipment availability. At the regional research center digitization requests for analog media were largely handled in-house, with rare and damaged materials being reformatted by a pool of local experts. The fee for this process also includes the cost of preserving the digital surrogate. Due to the lack of in-house digitization capabilities for time-based media, the other repositories relied on vendors for reformatting materials for researchers. At the university library the terms for reproduction are negotiated between the special collections staff and vendors. Researchers were allowed to specify the resolution they would prefer, as this would affect the cost of the process but, as a result, the digital surrogates were not always of preservation quality.

Copyright Conundrums

The provision of online access shaped in-house digitization initiatives as well as the grant funding available for performing digitization through external means. Both of these processes were required to account for the copyright status of the materials submitted for digitization, as they were intended for online distribution. Materials that were still protected under copyright were considered ineligible for digitization. Hence, only materials where permissions for use existed and materials already in the public domain were considered candidates for preservation.

This milieu effectively disqualified most time-based media from grant-funded digitization as few were within the public domain and permissions procured for older recordings lacked provisions for online access. To accommodate for these barriers repository staffs described building permissions verifications into their grant proposals so that creators and interviewees could be contacted for permissions that explicitly included online access. Acquisitions staffs from the university library and the local historical collection had considered including provisions for digitization in future deeds of gift regarding vulnerable time-based media collections to augment institutions' ability to preserve these assets. Despite the barriers to digitizing time-based media, all of the repositories' staffs confirmed that if valuable collections materials were in dire need of

migration they would not hesitate to have them digitized for preservation, regardless of their copyright status, although none had specific examples to cite.

The repositories tended to take a hands-off approach to aiding users with navigating copyrights and handling reproduction requests of digital and non-digital materials. Staff at the university library emphasized that the onus for investigating and clearing copyrights for its materials was the sole responsibility of the user. However, in the case of digitized items made accessible through the digital library the rights status of digital surrogates and permissions regarding their reproduction are displayed adjacent to the item in the browser window. Its reproduction policy underscores allowances made for private study and research uses of its materials, reflecting the community of students that it serves. The local history collection similarly adopts a hands-off approach to guiding users but provides lengthy descriptions of the various uses to which materials under copyright may and may not be put. The regional research center took a much different tack in regards to users' reproduction requests. Staff at the center recounted liaising between rights holders of creative works and scholars interested in reproducing those works when possible. This approach was described as building rapport with local artists by making the center's transactions with interested parties transparent to artist donors.

Findings Summary

The data collected from the semi-structured interviews and institutional policies illustrated the uneven terrain of time-based media collection and powerful barriers to the digital reformatting of these assets for preservation and access. The institutional structure of each repository and their respective collections development policies were integral to the extent and dispersion of time-based media held in their collections. Collectively the presence of time-based media materials was expected to grow with the acquisition of collections containing contemporary materials and, though lagging behind acquisitions, research demand was also expected to increase as historical research begins to focus on eras where time-based media was increasingly available. Yet despite anticipated growth and research demand, the scope of time-based media preservation via digitization was limited. Digitization was frequently pursued in the service of building online digital collections rather than as a preservation intervention, thereby narrowing the range of

materials that were considered for reformatting. In-house capabilities for digitizing time-based media were only available to one repository, resulting in a dependence on grant funding for outsourcing digitization at the other repositories. Reliance on grant funding further narrowed the scope of eligible materials by privileging public online access and, thus, reinforcing copyright restrictions. The cost of digitization of research access and reproduction was, thus, borne by requestors and did not necessarily entail the production of preservation quality digital surrogates. Hence, although each institution fell differently along the spectrum of preservation, the overall picture of time-based media in local repositories is one of a slowly rising tide of material with few options currently available for their accessibility due to lacking infrastructure and a resulting dependence on grant funding circumscribed by copyright restrictions.

Chapter Six: Discussion

The findings of this study reflect several seemingly contradictory patterns in the way the repositories approach digitization that affected its usefulness as a preservation intervention. Digitization was considered differently for access and preservation. This division obscured the interdependence that exists between preservation and access functions, and the fact that time-based media require digitization for any access to be had long-term, and often in the near term as well. The reliance on project grants impeded the development of infrastructure to preserve time-based media in-house, further narrowing the scope of digitization in regards to these formats. The continuance of this pattern will likely prove problematic, as in-coming collections are increasingly media rich. Unless other funding streams and collaborations can be produced to meet the needs of this growing body of materials, many works on obsolescent formats and restricted under copyright risk becoming permanently inaccessible.

Digitization

Digitization was an established part of all of the repositories' activities. Each repository had curatorial and technical staff devoted to its digitization programs and eager to talk about the role of their departments and the collections that they'd made available digitally. It was clear that online access played a predominant role in the materials selected for digitization; concerns for preserving at risk materials were generally of secondary importance. The prerogative of online access excluded many time-based media holdings from being reformatted due to copyright restrictions barring online distribution. In the case of aging analog materials digitization was frequently the only mode of access available to researchers due to media fragility and lack of functioning playback equipment. Researchers wishing to access time-based media resources had to front the cost of digitizing the materials they desired to use. Yet even this process did not necessarily take preservation into account. At the university library digitization on request for researchers was not required to meet preservation standards.

The practical and nominal division of digitization's preservation and access functions obscured the interdependence that exists between preservation and access, particularly regarding time-based media. In the long-term the stress that playback access

places on analog time-based media and the increasing scarcity of playback equipment necessitate content migration in order for any access to exist. Yet for a large proportion of time-based media in the repositories digitization was the only means of access in both the near- and long- terms. Treating the preservation function of digitization differently than other access initiatives and focusing on near term pressures to furnish online access obscured the long-term access that digitization provides for.

Many influences combined to orient digitization towards near-term online access in all of the repositories. Digitization had emerged internally from access-oriented programs designed to build online digital collections, and it continued to develop in keeping with those priorities. The reliance on external resources such as project grants was a particularly powerful force directing digitization efforts towards online access. The separation of access and preservation functions was most apparent at the university library, where time-based media had largely accrued incidentally. Although lack of playback equipment had rendered most analog formats inaccessible even in the near-term, these “one-off” items were poor candidates for digitization projects to highlight collections holdings, especially where copyright status was concerned. Conversely, digitization as a means of long-term preservation was more apparent in the regional history center, whose preservation activities had evolved from intentional collections development focused on recorded sound. These robust collections created more of an impetus for extending digitization to encompass a range of objectives, including online access, on-going digital reformatting, and the sporadic production of preservation-quality digital surrogate upon request by researchers. Although the center also responded to near-term, grant-funded, online access projects by temporarily siphoning staff away from their routine duties, the incorporation of preservation priorities into all institutional uses of digitization suggests an overall long-term view.

Influx and Infrastructure

The regional research center was the exception regarding the comprehensive scope of its time-based media preservation. The other local repositories did not have the technological infrastructure and expertise on site for providing playback access to many analog formats or for creating digital surrogates of obsolete and fragile media. Digital

reformatting of time-based media was largely supported by project grants and many of these project grants were TexTreasures grants subsidized with state funding. While these grants provided crucial resources for preservation in the service of greater access, the discontinuous nature of funding for time-based media preservation and the circumscribed nature of the projects were at odds with the development of a more comprehensive strategy for preserving time-based media holdings.

Lack of infrastructure for preserving time-based media and reliance on project grants will likely prove more challenging in the future. Staff from all of the local repositories indicated that the number of time-based media items was increasing in collections that the repositories were acquiring, a trend that was anticipated to become more prevalent over time. This influx included intentional collecting and incidental acquisitions. Under the current conditions, the growing presence of time-based media in local repositories with no institutional infrastructure for digitally reformatting their contents will result in an increasing proportion of time-based media holdings become inaccessible in the near-term and long-term. The inadequacy of repositories with lacking infrastructure and funding resources is compounded by the increasingly acute vulnerabilities of time-based media. Greater numbers of time-based media materials are entering repositories at a moment when the vulnerabilities of time-based media, particularly magnetic media, are becoming increasingly pronounced. Studies have projected the life expectancy of legacy magnetic media to be less than two decades, suggesting that any reformatting attempted after this period will be extremely costly or impossible (Lacinak, 2014; Bamberger & Brylawski, 2010).

This is a bleak prediction for an entire class of cultural materials, but not an inevitable one. Again, the various levels of preservation – collection, material preservation, and migration – come into play. The preservation activities of the regional research center exemplify how progressive stages of preservation can build towards a sustained preservation program. The center's inclusion of recorded sound in its collections development policy and strategies resulted in a network of collectors and technical experts that helped to facilitate the growth and maintenance of the sound collections. As these collections became more widely known, they drew more deposits from collectors and creators of affiliated materials. A result of the substantiality of these

collections was the provision of institutional resources for preserving these materials, including in-house digitization of many formats.

Local repositories whose time-based media holdings accumulated incidentally did not benefit from informal networks such as those developed at the regional research center. The dispersal of these items in heterogeneous collections and multifariousness of their formats and copyright restrictions impeded the cohesive advancing of awareness of these items' existence to patrons or arguing for devoting digitization resources to their long-term preservation. Indeed, a curator from the university library, reflecting on the accumulation of time-based "one-offs," observed that it may become necessary for the repository to turn these materials away rather than take in media that could not be adequately accessed or preserved.

Advocacy

Time-based media were reported as being underutilized in comparison to other collections holdings at all of the local repositories, regardless of the scope of their digitization activities. This slack research demand was attributed to many factors, including the invisibility of such items in finding aids, the general lack of awareness of archival time-based media on the part of patrons. The lapsing of time was noted as a determining factor in historical interest. Yet unpredictable factors such as current events accounted for idiosyncratic spikes in interest.

For repositories that have invested resources in collecting and preserving time-based media collections, this lacuna on the part of patrons represents a missed opportunity to share their rich cultural sources. As noted in the review of web sources for locating information on repositories and their collections, online findings aids often provide sparse and inconsistent descriptions of time-based media that do little to improve awareness.

Collaborative Solutions and Digital Disembodiment

If a more efficient means of digitizing obsolescing time-based media is to occur, it will almost certainly be the result of institutional collaboration. Casey suggests that partnerships between small and large institutions operating in the public and private

sector may be the best chance for survival of fragile media housed in collections with lacking infrastructure (quoted in Bamberger & Brylawski, 2010). The Sound Directions project undertaken by Indiana University and Harvard University, which focused on critically endangered field recordings, is one example of how the collaboration of very different institutions can produce interoperable results (Casey & Gordon, 2007).

The presence of non-profits such as the Texas Archive of the Moving Image (TAMI) offer a potential model for surmounting the barriers posed by lacking technological infrastructure and technical expertise for reformatting time-based media. For its own collections TAMI serves the manifold roles of advocate, preservation technician, and access platform for moving image formats such as film, VHS, Umatic and Betacam (About, n.d.). TAMI uses a catch-and-release method in which home movies, amateur films, and industrial films are taken in from all over the state, cleaned and repaired by archive staff, digitized and returned to their owners. In return for this free service, TAMI retains a digital surrogate of the original and a license to make that material accessible through its website. Curators from the archive can select from an ever-growing body of digital films for items that reflect aspects of Texas culture, landscape and history to share with their audiences.

The catch-and-release model employed by TAMI has the potential to fill gaps in technological infrastructure and expertise for preserving time-based media that were exhibited by the local repositories. All of the local repositories already had burgeoning digitization and digital access programs, the foundations of which included structures for organizing and delivering digital objects and their accompanying metadata. Less robust were effective means of broadening awareness of the existence and importance of time-based media in their holdings and, often, the technological infrastructure for migrating time-based to accessible formats. My suggestion is that a similarly centralized and technologically equipped non-profit could provide the same service for local repositories that TAMI provides for individuals.

The catch-and-release model is not a perfect fit for the needs of local repositories, due to its own orientation towards online access. This would limit the materials eligible for digitization in much the same way that the stipulations of state-funded project grants already have. Furthermore, what TAMI expends in staff time and equipment maintenance

is counterbalanced by the influx of unique materials that may be used by the archive staff for cultural programming. A similar organization designed to digitize the holdings of repositories would likewise require a platform to justify its existence, but under this model other repositories would have to be amenable to collections materials being displayed by an external organization. Even if the scope of digital reformatting could be extended to materials whose copyrights bar online exhibition, would eligible surrogates be hosted by their parent institutions or the organization that digitized them? This opens an entirely new vein of argument regarding the “disembodiment” of digitized materials and institutional identity, eluded to by Battin (see the Literature Review) and developed by Rayward and Marty (1991, 1993, 2014). It is possible that just as the decoupling of durational content from traditional carriers has challenged and reoriented the experience of time-based media away from the physical carrier, the gravitation of collections towards digitized and born-digital materials may eventually shift the function of the repository away from its physical footprint to virtual space. Indeed, the solutions found during this hybrid analog/digital transitional stage are already be shaping the practical, theoretical and ethical contours of such repositories (Fossati, 2009).

Chapter Seven: Conclusion

Analog time-based media, unique in their ability to capture and reproduce intangible cultural heritage, present an equally unique set of challenges for the archivists, special collections curators, librarians and preservation technicians who are variously charged with their care. Access to these technology-dependent materials is fraught due to the stress it places on physical carriers and dwindling technological apparatuses. Collections such as the Andrus Studios audio collection present myriad physical, intellectual and technological barriers that impact repositories' ability to preserve time-based media collections and make them accessible.

In researching the state of time-based media preservation this study revealed a range of activities undertaken by local repositories. Historically time-based media preservation has evolved in a progression encompassing collections development, care and handling based on material vulnerabilities, and content migration to contemporary formats in advance of technological obsolescence, the latter of which now entails analog-born content crossing the threshold of the digital domain. The preservation activities of repositories studied for this report fall variously along this spectrum. The repository with the longest established collections of time-based media (recorded sound) exhibited the greatest development along this progression, with technological infrastructure, networks of expertise and comprehensive policies to support the on-going preservation of its holdings. Less developed preservation programs were tethered to periodic grant funding due to lacking infrastructure and were underequipped to provide access to rare and fragile formats.

Regardless of the state of these repositories' preservation programs, the volume of time-based media entering collections intentionally and incidentally is increasing. The hybrid environment anticipated by Patricia Battin and later described by Fossati has become the norm (Battin, 1993; Fossati, 2009). Growing numbers of time-based formats are amassing in libraries and historical collections whose policies and infrastructures have traditionally been geared towards books, paper documents and still images, prompting a greater recognition of their unique preservation needs. Yet despite growing recognition of the need to reformat obsolescing materials, digitization, now an established preservation strategy for migrating media, has been broadly construed within

these repositories as a tool for augmenting online access rather than a preservation intervention. As resources are channeled towards online access, the rights statuses of time-based media and the high costs of reformatting these items prevent their digitization, often precluding access altogether. If these trends continue a growing proportion of time-based media content, particularly those recorded with magnetic formats, stand an acute risk of being lost.

The uneven terrain of policies and approaches to preserving and accessing time-based media has serious implications for the future research use of collections such as the Andrus Studios recordings. Yet as repositories and granting agencies embrace digitally enabled access, creating new roles and infrastructures within cultural institutions, new avenues may open for inter-institutional collaboration and advocacy. In this transitional moment marked by proliferating technologies and hybridization one thing is certain: future access to cultural materials embodied in time-based media formats will increasingly depend on the advocacy of archivists, librarians and curators to be sustained in the near- and long-term.

Appendix A

Interview Guide Collections Development, Media Holdings, Copyright

Collections Development:

In what areas is the repository actively collecting?

How would you describe the importance of collecting audio and visual materials to the repository's mission?

Are there any specific formats that are actively avoided regardless of their relation to collecting areas?

Are any special measures taken when acquiring collections that include audio and/or visual media (rights clearance, special deeds of gift, preservation planning)?

Time-Based Media Holdings:

What time-based media formats are in the repository's holdings? Is playback equipment available for all formats?

What percentage of your time-based media holdings is rare, unique or unpublished?

How frequently are time-based media materials requested for research or other purposes?

Does the repository have preservation policies specific to time-based media?

Digital Media Projects:

Have there been any projects to digitize archival materials? If so, have time-based media formats been included?

Has the repository received grant funding for digitization and online access projects?
Other funding?

Are digital objects (born-digital or digitized analog) available for access offsite via access copies, FTP or other means?

Copyright:

Does the repository provide any assistance to users regarding understanding of copyright or research into the copyright status of its holdings?

Does the repository have any policies regarding items where copyright status cannot be determined?

How do access and use policies for time-based media in the public domain differ from policies regarding items that are not?

Does the repository permit commercial use of audio and visual materials in collaboration with artists and/or other rights holders?

Can you describe an occasion of copyright restrictions affecting decisions about collecting, preserving or providing access to materials?

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