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See No Evil, Hear No Evil?
Audiovisual evidence, forensics, and preservation in law enforcement

Abstract: A growing inclination among state governments to mandate comprehensive audio and video recording of law enforcement activities such as traffic stops and suspect interrogations is generating a massive body of recorded material—a good portion of which must remain both secure and accessible indefinitely. The rapid proliferation of consumer-grade audiovisual technologies also means that more and more criminal evidence is created in proprietary—and quickly outdated—digital video formats. Clearly, law enforcement agencies are engaging with audiovisual preservation and management issues of a scope, scale, and urgency that far exceed those encountered in most traditional audiovisual archives. This paper examines aspects of police work with recorded evidence and its implications for the preservation community and presents a case study of one local police department's audiovisual collections. It also explores the relevance of archival theory and practice to police evidence handling, and suggests ways in which archives and law enforcement communities may work to mutual advantage.

Introduction

After World War II, magnetic recording media began to establish a substantial presence in American courtrooms. Legal scholar Edwin Conrad wrote in 1954 that the "characteristics of portability and simplicity of operation made it inevitable" that magnetic media would be used "as an instrument of proof" (p. 23). Ideas about the reliability and evidentiary value of audiovisual recordings continue to develop half a century later, in the digital era. As of January, 2007, seven states have either legislative or court mandates requiring that custodial interrogations of suspects be recorded. Many cities and counties have instituted similar policies in the absence (or anticipation) of statewide recording mandates. 238 local law enforcement agencies surveyed in 2004 recorded their custodial interrogations; of these, 213, or nearly 90%, used video and audio in preference to audio alone (Sullivan, 2004). 15 of those departments had been taping for a

decade or more—up to 25 years, in the case of the El Cajon Police Department in California. Other police activities such as traffic stops and crime scene investigations are increasingly committed to tape as well. This policy trend is, of course, creating a massive body of recorded material—much of which has to remain both secure and accessible.

Add to this the fact that police departments must handle all criminal evidence in its native form, and consider the rapid proliferation of consumer-grade audiovisual technologies. It is quite clear that law enforcement agencies are engaging with audiovisual preservation and management issues of a scope, scale, and urgency far greater than what is encountered in traditional audiovisual archives—few of which have any input on death-penalty cases. Police work with audiovisual evidence certainly has implications for the archival community, but archival theory and practice just as surely have relevance to police audiovisual records preservation.

Recorded media in archives and in the legal system

Since the middle of the twentieth century, many articles in law reviews and professional journals have discussed the admissibility of audiovisual evidence (see for instance Murphy, 1999, and Tallifer, et al., 1974). The legal literature of the last two decades or so also reflects ongoing debate over the merits of recording police activities such as interrogations and traffic stops. Similarly, archivists since the 1950s have devoted increased attention to the importance of historic audiovisual recordings, and they have conducted important research into the requirements of a/v media retained for posterity. Examined together, the two fields of archives and law enforcement show some key areas mutual awareness—and mutual ignorance.

Common ground for archivists and police

One of the areas of overlap is the basic acceptance of audiovisual media as part of regular practice. While in taped evidence in some cases was rendered inadmissible, analyses of these cases support the idea that the courts are generally inclined to accept a "recording's accuracy and reliability, and [do] not discuss [the] novelty" of the format in which it is presented (Conrad, 1954, p. 25). Likewise, while "only a handful" of institutions collected and preserved motion

pictures in the first half-century after film's invention, "a broad spectrum of custodial institutions" now engage more seriously with the preservation of audiovisual materials as an important element of cultural heritage (Kula, p.3).

Another area of common interest is the trustworthiness and accuracy of recordings. Documents' qualities of authenticity and reliability have always been significant to archivists, the custodians of a documentary heritage that is worthless if it cannot be trusted. These qualities are now also considered by juries and the judiciary—increasingly so in the case of digital recordings, where virtually seamless alterations are easier to achieve than with analog media (Murphy, 1999, p. 399). The decision of *United States v. McKeever* in 1958 established seven essential criteria for determining audio authenticity; after this, "authenticity analysis" began to emerge as a subfield of audio forensics. The forensic audio field advanced considerably in the 1970's—most notably through the examination of the famously missing 18.5 minutes of audiotape footage from the Nixon White House recordings (Catoggio, 2001)—and it continues to develop with today's digital technologies.

Expert witnesses who work in audiovisual forensics must clearly describe their technology, methodology, and conclusions to the court (Owen, et al., 2005). Removing background noise, clarifying speech, sharpening frames, or filtering out artifacts of the recording process can substantially alter the original audiovisual recording. Cases may be compromised if a witness cannot readily affirm that the enhanced version of a piece of evidence conveys a "fair and accurate" representation of the incident recorded (Galves & Galves, 2004, p. 8). Digitally enhanced recordings are comparable in this context to digitally enhanced still images; namely, the exact steps and processes involved in the enhancement must be documented and, if necessary, explained by the enhancer (ABRE, 1997; Murphy, 1999, p. 400; SWGIT, 2002). Preservationists would find many similarities between their own technical description of treatments applied to museum objects or historic motion pictures and an expert witness's description of his or her forensic enhancement of an audio file or videotape.

Some other management questions specific to a/v evidence parallel the issues of surrogacy and scarce resources encountered in archives. The oral historian knows the subtle differences

between a recorded interview and a transcript of that interview; similarly, the courts have grappled with the admissibility and utility of transcribed recordings. One British murder case, *R. v. Maqsud Ali* of 1965, relied on an audiotape recording of the accused conspirators. The participants in the conversation were speaking an obscure Punjabi dialect, and four varying translations were made of their conversation—only two of which were submitted to the jury as evidence (Murphy, 1999, p. 397). The tape itself was never actually entered into evidence, but the necessity of retaining the original recording in the event of appeals that challenged the several translated versions is obvious. There are also ample accounts of evidentiary recordings being lost, destroyed or taped over (McGough, pp. 206-208)—the last of which is a great possibility in departments where supplies and funds are lacking. Surveillance tapes are clearly thought of as reusable resources in agencies that have recording programs in place. A 2001 survey conducted by the International Association of Chiefs of Police indicates that although 71% of responding departments retain their tapes for over 30 days, a large percentage also habitually re-record their videotapes (Nichols, 2001, p. 9). The conflict between preserving important records and minimizing costs and storage needs is surely as familiar to the records manager as it is to the surveillance supervisor.

Where archives differ from law enforcement

It may be with storage and retention standards that the parallels between archives and police departments end. Archivists generally, and audiovisual archivists particularly, focus on recorded media's unique preservation requirements. Film, audio, video, and digital media are best known in archives for their inherent instability, their dependence on specific (or obsolete) technologies for access, and their cold-and-dry storage requirements. The functional longevity of audiovisual recordings, particularly tape media, is brief: some estimates place the lifespan of tapes under normal use and room-temperature storage conditions at well under a decade. What is more, the trained a/v archivist accepts "the inherent instability of all audio carriers in one respect or another" (Schűller, 2004), and conscientious archival planning for audiovisual materials includes prioritizing items for migration and reformatting. This practice is less common—indeed, virtually unheard of—in the law enforcement community.

Archivists also consider factors such as provenance, function, and form in their appraisal decisions on audiovisual materials (Kula, 2002, 53-58). The origins of a particular recording, its relationship to other materials, and its physical characteristics all influence determinations of its value, authenticity, reliability, and accessibility. While criteria for acquiring materials in audiovisual collections vary widely, archivists do have established community standards for the assessment, storage, and maintenance of film, tape, and other recordings. The body of information science literature that deals with intensely technical aspects of media preservation and restoration in archives is large and growing.

Audiovisual archives clearly consider themselves supporters of the many disciplines that depend on the survival of motion pictures and recorded sound—fields like cinema studies, advertising and communications, visual anthropology, history, and sociology. When it comes to managing audiovisual records as a form of legal (rather than historical or cultural) evidence, however, preservationists and the police are less active partners. Police audiovisual evidence collections probably fall somewhere between television news and cultural heritage collections in terms of size, number of tapes processed per year, length of time materials are preserved, and the amount and types of access they provide to their collections. Nevertheless, searches for "police department," "law enforcement," "criminal evidence," "interrogations," or similar terms in the indexed archival literature will return no results. Articles on forensic audiovisual analysis and restoration techniques are largely confined to technical journals and conference proceedings.

Where law enforcement agencies differ from archives

The gaps in the archival literature where criminal evidence should be, however, are mirrored by blanks in the legal literature where preservation (and, to a lesser extent, access) should be. Proponents of police taping argue that it increases the transparency, efficiency, and consistency of police work, while strengthening case evidence and reducing the need to rely on human memory. Arguments against police videotaping generally hinge on the desire to keep police procedures secret, or on the cost and logistical difficulty of implementing new technology-based programs. A device operator's competency being one of the criteria for authenticity of evidentiary recordings (Owen, et al., 2005), opponents of state- and county-wide taping

mandates express a reasonable concern that officers will not be adequately trained to use new equipment. Some critics also fear that insufficient funds will exist for departments to set up recording programs and procedures in compliance with new laws (See Furnell, n.d.; IACP, 2001; Slobogin, 2003; Spiridigliozzi, 2006; Sullivan, 2004; Taillefer, et al., 1974; and others).

Other, larger problems with taping and recorded evidence are mentioned rarely, if at all, in the literature. The ability to play tapes for the purpose of expert analysis, or to construct a prosecution case, is no more important than the ability to play some version of them in court for a judge or jury's consideration. A state may mandate taping even when its courts are not furnished with playback equipment on which judges and juries can view those tapes. When courtrooms are properly equipped, the hardware may be quickly outdated or incompatible with formats provided by police. Not only that, but defense and prosecuting attorneys require the most accurate copies possible for independent forensic analysis—a purpose for which low-grade CD or DVD copies furnished by underfunded police departments or lowest-bid service providers may not be adequate (Cain, 2004).

Standards for the forensic analysis of recordings are precise and numerous (see ABRE, 1997; Beser, et al., 2003; Koenig, 1998 and 1990; SWGIT, 2003), and recommendations for the collection, handling, and protection of audiovisual evidence (particularly in digital formats) certainly exist (see Galves & Galves, 2004; IOCE, n.d.; SWDGE, 2000). The many consumer audio and video formats that archivists may anticipate receiving years from now as part of personal collections, the police routinely accept today. But whereas law enforcement professionals have clearly written guidelines for, say, setting up a forensic audio analysis lab (Koenig, et al., 2003), they still appear to have no published guidelines for securing, storing, and preserving any kind of evidentiary recordings in the police system, regardless of their origin or format.

The essential requirement that evidence be maintained for the life of a case is fundamentally at odds with the known lifespan of audiovisual storage media. DVDs and DNA are close cousins in their need for careful storage and handling, as well as their evolving power to exonerate or exculpate the accused. It is in homicide cases and felonies that mandatory taping of suspect

interrogations is most common; DNA evidence is similarly crucial in the most serious cases. However, it is not unusual for homicide convictions to be appealed years—even decades—down the road, so the need for access to a taped confession or a sample endures long after the original conviction is achieved. Refinements in forensic DNA analysis and in audiovisual technology alike have resulted in new verdicts based on the same case evidence. Nevertheless, while evidence storage rooms in police stations will often have a refrigerator for storage of rape kits and other biological evidence, they will very rarely have a temperature- and humidity-controlled room for tape storage. And finally, concerns are seldom voiced about jurisdiction and custodial responsibility for recordings in areas where district attorneys, not police, take confessions (Baer, 2002).

This lack of standards contributes to the largest blind spot in cost-based assessments of taping mandates. Cost impact estimates for police taping requirements are usually limited to the initial outlay for purchasing and installing equipment. The staffing and training expenses involved in adopting new technologies will only occasionally be highlighted. On the other hand, trial and settlement costs for wrongful convictions are high, but increasingly avoidable when video evidence is available; recordings also contribute greatly to convictions in important cases (Furnell, n.d.; Slobogin, 2003; Sullivan, 2004, p. 23). When measured as a percentage of the entire annual budget for a county sheriff's department (Mayo, 2003) or as savings from reduced frivolous lawsuits and failures to convict criminals, recording programs seem to be well worth the up-front expenses. But the aggregate costs of storage facilities, climate control, duplication and transfers, and restoration or enhancement by outside agencies are routinely ignored.

To date there have been no studies that quantify the actual costs of maintaining audiovisual collections in law enforcement agencies, or the financial impact of bringing police tape storage conditions up to archival standards. There have also been no studies of costs incurred when audiovisual evidence is lost, destroyed, or rendered inaccessible through deterioration or obsolescence—perhaps because it is still too early for us to have encountered this problem. The fact remains that settlement costs for coerced confessions, police misconduct, and wrongful convictions, which are apparently reduced by videotaped interrogations, may simply be replaced by settlement costs for police negligence and destruction of evidence in the near future.

Case study: The San Antonio Police Department

The legal and professional literature can provide only so much insight into the practices of law enforcement agencies with respect to audiovisual evidence. In November 2006, I contacted the San Antonio Police Department's Technical Investigation Unit and invited myself to their facility to learn more about their history, operations, and function within the SAPD. The information that follows was gathered during my visit, and in preceding phone conversations with unit staffers, including commanding officer Sergeant Mike Peters, video investigations Detective Mike Kubena, and audio surveillance Detective Jeff Trout.

A warren of rooms houses in an anonymous-looking high-rise in San Antonio houses the SAPD Technical Investigation Unit (TIU): a current staff of four detectives and their sergeant, stacks of video and audio equipment, and over 14,000 videotapes and audiorecordings amassed since the department was officially opened in 1994. The scope of activities undertaken by the department is remarkable—they work frequently with the Vice and Narcotics units to set up covert surveillance operations; they receive daily deposits of audiovisual evidence from the Robbery and Homicide units; and as one of the fifteen largest dedicated technical units in the nation, they also assist federal agencies like the FBI and ATF in regional investigations.

The TIU's procedures for handling tape evidence are clear and straightforward. Every call for police assistance is assigned a numeric ID number in the SAPD logs, and if the call results in the opening of a case file, this ID becomes the case number. All crime scenes are now videotaped by the investigating officers; that tape, plus any audio or videotape evidence from the scene, including surveillance recordings from nearby establishments, is sealed in an envelope with a copy of the case report and left in a secure deposit box downtown for the TIU staff to retrieve. Incoming tapes are labeled with the case number, and are reviewed immediately on the department's equipment to assess playability and determine whether the tape includes any evidence of the crime. Typically, tapes are reviewed on more than one machine. For the 2,382 tapes turned in during 2006, there were 4,429 reviews—just under two plays per tape—according to statistics maintained by Det. Kubena. Occasionally, a tape that refuses to play on

any of the department's equipment will require a "remote," when an officer will take the tape back to wherever the original recording device is and attempt to get a successful playback there. In these cases, the TIU will attempt to make a duplicate recording using the outputs from the original recorder, or, in the worst case scenario, videotaping off the local monitor or recording audio directly from the playback device's speakers.

According to Sgt. Peters, this procedure is carefully documented and, with the limitations of the technology explained, judges have so far rendered no objections to the use of these "secondhand" recordings in trial. In addition to these new recordings, the TIU generated 1,726 copies or partial copies of tapes in 2006 for use by the media (in "Crimestoppers"-type segments on local news, primarily), for the District Attorney's office, and for detectives pursuing ongoing investigations.[1] For court purposes, Sgt. Peters noted that edited versions of both video and audiotapes are submitted in favor of the full original tapes—typically because the length of the originals is prohibitive, and the incriminating or exculpatory evidence is usually captured in only a few seconds of speech or video footage. The courts rarely require them to send complete tapes, and it is rarer still for complete tapes to be played to a jury.

When asked about the department's experience with unusual formats, Det. Trout said that "the weirdest formats, we don't get." He referred again to those cases where officers would do a "remote" to record directly from a recorder or playback device, but also noted that memory cards from cell phones and other digital devices are currently sent to the SAPD's Computer Forensics division, a separate department. It is unclear if the work of the department will someday become part of a centralized branch specializing in digital technologies of all kinds (including data and audiovisual recordings). However, in the small room that contains the unit's audio forensics equipment, Trout showed me several shelves where legacy playback equipment was stored, and said that they made an effort to have one or more players for every kind of carrier in their

[1] It should be noted here that the department was working with a significant reduction in staff during this period, as one of the two video unit detectives was on extended medical leave for most of the year. Det. Kubena indicated that their department was experiencing a backlog of tapes to be viewed and duplicated for the first time in their existence—they were about four days behind when I visited, but had been as much as ten days behind at other points in the year.

evidence collection. DAT recorders, several different MP3 and minidisc players, and a digital microcassette recorder were all there, some still sealed in their original packaging.

To the archivist's eye, the TIU is doing some things right, and some things wrong. The storage area for the tapes they manage—which is the only offsite evidence storage facility for the entire SAPD—is separately keyed and located on a secured hallway inside a gated building, but is on the same air-conditioning system as the rest of the building. It is cool, but not cold and dry, where the tapes are stored. Sgt. Peters did note that the room was in the center of the building, and thus somewhat insulated against temperature and humidity increases in the event that the building's systems were ever shut off. He also noted that older and "minor" (theft and burglary) cases are moved to a room upstairs after six years, but recordings related to homicides are never removed or thrown away. Videotapes and CDs were held together with rubber bands if they were associated with the same case number, and many tapes were stored flat, rather than on edge. Intellectual controls are another matter for possible concern. The Excel database that the TIU uses to track all of their tapes is strictly internal, and not linked in any way to the SAPD's central data systems; this is conceivably both a positive and a negative factor, as accountability for missing or lost evidence would be difficult to establish if their database was tampered with.

In my earliest conversations with Det. Kubena, he indicated that there had been some pressure on the department to migrate all their recordings to DVD to save space and funds, but during my visit Sgt. Peters noted that the quality of currently available DVD technology made them extremely reluctant to consider such a migration project. Under the circumstances, it is impossible for the department to do anything resembling traditional archival appraisal of incoming materials—whatever comes in from the crime scene or the investigating unit, that is what they get and have to keep. The TIU's efforts to retain working hardware for obsolete formats they encounter is the only reasonable course of action under the circumstances.

The unit will need to keep pace with both technological changes and policy shifts that increase the amount and variety of material they manage. Changes in city policy that mandate recording of interrogations, and the installation of video and audio recorders in 16 of the SAPD squad cars, will increase the internally generated recordings. Sgt. Peters notes, however, that the prevalence

of audiovisual technology among the general public means that the ratio of internal to external recordings will likely stay much the same over the long term. The new materials coming in are increasingly coming from digital video recorders (DVRs). Sgt. Peters named the difficulty of working with proprietary digital formats, especially compression and decompression algorithms (codecs), as one of the biggest obstacles in their work. He told me a memorable story about a DVR that was seriously damaged in a fire at a local business, but was believed to have recorded footage of the arsonist committing his crime. When the department contacted the vendor that had originally installed the surveillance system—just three years previously—they found that the company had no records related to *their own* "legacy" programming. The TIU ended up "just plugging the machine in to see what [they] could get out of it"; luckily, they retrieved enough footage to gain a conviction.

Sgt. Peters also points to changes in the police force—older, more conservative officers retiring, younger officers willing to try new techniques coming in—as part of the reason his unit was established in the 1990s. The advent of digital recording technology was once viewed with such distrust that an officer might go into an undercover situation with a digital recorder *and* an analog backup. Older detectives that got used to audiotaping interrogations were still reluctant to go to videorecording, arguing that their normal techniques would appear strange or unacceptable on video. Now, Peters and Trout say, prosecutors and defense attorneys expect video recordings instead of audio alone, "since they know the technology is available." The importance of video recordings, especially in surveillance work, was summarized by Sgt. Peters in this way: "The audio is what actually gets the conviction. Video adds years to the sentence."

Expansion is almost certainly part of the TIU's future, and Sgt. Peters talked in some detail about what the work of the unit required: "Everything we know we learned on the job," he said, but he weighed the idea of hiring a technical expert over someone with a background in police work carefully. Ultimately, he said, there was a "geek factor" that any police officer who took on this work had to have, and an excellent undercover cop without that technical sensibility would not be able to do the work of the unit, regardless of how much audio forensics training they received. Det. Trout put it more succinctly when he said that audio forensics was "less of a science, and more of a black art."

Opportunities for preservationists and police

Surveys and publications from within the law enforcement community have focused largely on the pros and cons of police surveillance, or the up-front costs of policy changes that mandate recording. Very few words are devoted to how the growing quantity of audiovisual evidence will be managed for the long term. Nevertheless, the system as it currently exists, and as exemplified by the San Antonio Police Department's Technical Investigations Unit, seems basically functional. Det. Kubena confirms that they encounter stored tapes and other recordings that are unreadable "all the time," but that the associated cases are typically "tried on their merits" in the absence of that audiovisual evidence. Absent some catastrophe that damages or destroys a number of their evidence recordings, the unit will likely continue to function as it has for the last decade.

The recent rediscovery of another home movie of the Dealey Plaza motorcade, which was donated to the Sixth Floor Museum in Dallas, and which has provided some interesting insight on previously questioned forensic evidence in the JFK assassination case, illustrates how the separate worlds of archives and law enforcement may sometimes intersect. Clearly, the archival community has more than just this one opportunity to share knowledge in a way that can be of benefit to us and others. Firstly, we can expand our perceptions of where, how, and to what purpose audiovisual preservation is being done. Secondly, we can attempt to extend our theoretical and practical knowledge about audiovisual preservation through careful study of evidence collections—especially in the many areas where mandatory recording of police interrogations and activities is newly required by law, and where these policy changes can be assumed to have the greatest impact on existing evidence collection and maintenance systems. New preservation professionals should be encouraged to apply their training in audiovisual materials management to areas outside the traditionally defined archive world. Established audiovisual archivists can work to share their experiences and recommendations with their counterparts in the law enforcement community—through professional presentations, new research projects, and consultation with agencies in need of assistance. Voices from both the archival and law enforcement communities should be heard in the legislature when new laws on

taping are being written. In short, preservationists can embrace and learn from another professional community that does not always do things exactly the way we would, but is nonetheless successful at preserving the great majority of their materials when the stakes are very high indeed.

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