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FORENSIC AUDIO REPORT

Client

STEVE ESDALE

MURRAY COHEN DEATH INVESTIGATION

Forensic Analysis of Audio Recording

March 3, 2007

I have been asked by Steve Esdale to provide expert forensic audio services in the enhancement and analysis of a 911 call. The call was recorded on an audiocassette tape identified as Tape # 2 as I have marked it. Esdale sent 4 tapes to my office for analysis. Upon Esdale's request, I emailed the Sarasota County Sheriff's Office and requested copies be sent directly to my lab. All of these recordings contained the 911 call placed by Maria Cohen on the day of Cohen's death. Esdale sent me a total of 4 audiocassette tapes and the S.C.S.O. sent me a total of 2 audiocassettes and a single CDR recording of the same incident. This report is based on one of these tapes primarily Tape #2, which I have clearly marked as Tape #2 and initialed. However, I will reference the other recordings in an attempt to answer fundamental questions that have arisen in regards to these recordings.

My usual fee is an hourly rate of \$225.00 per hour. I do from time to time offer my services to clients without attaching any fees. After reviewing Esdale's case and request for services, I agreed to help him in the matter at no charge. I have kept track of the hours and the services for my records and will submit an invoice to Mr. Esdale marked with a \$0 balance due. Attached to this report is a list of cases that I have worked on or provided expert testimony in the last five years.

STATE OF MAINE v. DANIEL ROBERTS (homicide)
STATE OF MASSACHUSETTS v. MARK FOSTER (rape)
STATE OF IDAHO v. SARAH JOHNSON (homicide)
STATE OF ALASKA – JIM CRANE v. LOGAN CRANE (custody)
UNITED STATES v. RICARDO CORDOBA-RAMIREZ (federal drug case)
STATE OF W. VIRGINIA v. ORLANDO DAILEY (controlled substance)
STATE OF NEW HAMPSHIRE v TRAVIS MAIERS (dui)
STATE OF MAINE - ANTHEM v. WELLS (litigation)
STATE OF MAINE v. SARAH ALLEN (manslaughter)
UNITED STATES v. SANDOKO BRANDON (federal drug case)
U.S. FEDERAL COURT VALDA JOHNSON v. DAVID HOLWAY (discrimination)

Introduction

My name is Arlo E. West. I am the President and owner of a forensic audio/video laboratory located in Auburn, Maine. I am a Forensic Audio/Video Expert. I am a member of the AES (Audio Engineering Society), ACFEI (American College of Forensic Examiners International) and a board member of the PPSC (Police Policy Studies Council). I am a board certified Forensic Audio/Video Expert with over 30 years experience.

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Nature of Retention

In December of 2006, I was contacted by Steve Esdale and asked to forensically examine an audiocassette recording of a 911 call. Murray Cohen's wife Maria Cohen on 1/13/2003 placed the emergency call. The report below is a summary of my conclusions and opinions based on the recorded evidence in question. Esdale asked several questions pertaining to this audio recording and its content. The questions were as follows.

1. Were the audiotapes submitted to the FBI, Bob Sherin and FOX Networks tampered with?
2. Why were the audiotapes different? In specific, why did some versions contain gaps in one area and a different version sent on a separate occasion contain gaps or transients in other areas? Also why was the signal to noise ratio so different with each tape?
3. Was my father conscious and speaking during the 911 call, placed by Maria Cohen on January 3, 2003? If my father was engaged in dialog can it be rendered intelligible with enhancement for transcription?

Examination:

Mark Log and Examine

My first course of action is to photograph or scan the tape. I make a record of the identifying serial numbers and markings. Examining the tape for any broken areas or signs of tampering. If the record tabs have not been removed I do so at that time to prevent accidental erasure and attach them to the case with Evidence tape. I also mark the tape with my initials and the date.

Critical Listening:

Critical listening is the first phase of analysis and is done by aural examination. Playing the tape, I listen and take notes as to the recording and its content to get a clear idea of what it contains and how I will proceed. When performing the aural examination, I note the quality of the recording to understand what type of enhancements it may require. I determine what type of recording it is and other important facts. I also listen for transients, gaps, discontinuance or other audible clues as to how the tape was made.

Digitizing Audio:

After the critical listening phase, the source audio is recorded into the forensic audio computer. The file is then saved and stored in a folder for later analysis.

Enhancement:

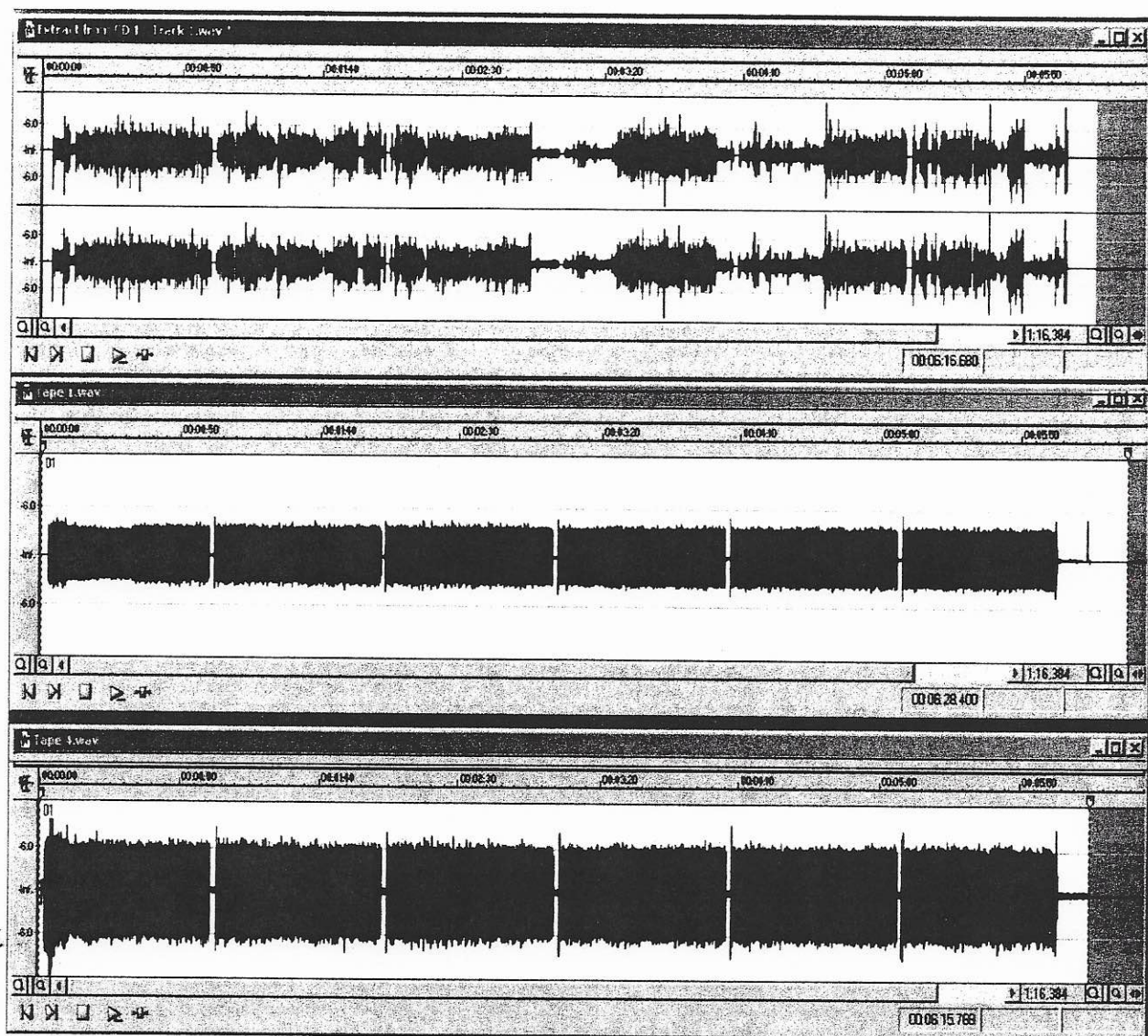
I used the following software for enhancement.

Sony Sound Forge
Sony Vegas 7
DC Live Forensic 6
Sony Noise Reduction
Waves X Noise
Bias Sound Soap

Question 1:

In my opinion, these Tapes were impossible to determine if they had been tampered with because they are copies. Authentication can only be proven with the original recording. A tape can be ruled as not authentic based on several factors. I did discover transients and gaps on some of the recordings submitted to me by both Esdale and S.C.S.O. However the transients contained on some of these recordings appear to be segmented digital audio. In my opinion the equally spaced transients and gaps contained on two tapes sent to me by the S.C.S.O. were identical. The gaps of audio were not suspicious because the audio was not missing. I will explain this later in the report and the CDR also had the same gaps that did not appear suspicious. When one looks at the transients in the waveform they appear to be equally spaced apart. In other words approximately every fifty-nine seconds there would be a gap or transient of approximately 2 seconds. I have prepared a JPG capture of three audio wave files opened in Sony Sound forge. The three audio wave files are the 2 tapes and the CDR submitted by the S.C.S.O. placing them all in alignment clearly shows the gaps and their locations.

[See graphic illustration on the following page.]



In my opinion these do not appear to be caused by tampering. I reached this opinion because they were equally spaced and not in a random pattern. They are caused by CD audio burning software that has automatically placed a two second gap in between each section of audio. This is common in music CD's you buy in a retail shop. In between each song there is an intentional gap of approximately two seconds. This is a standard setting.

The audio cassette's #1 and #4 were obviously made from the audio on the CDR. These are not authentic recordings they are clearly copies of the CDR audio. I would also point out that they are all three different lengths and would appear to be different attenuation. The tapes have the appearance of being amplified or possibly rendered noisy due to poor duplicating equipment and practice. One can easily see a significant difference in the signal to noise ration between the 3 examples above. The top waveform is from the CDR,

middle Tape #1 and last the bottom Tape # 4.

The recording equipment at the time the copies were produced probably played a major part in the poor quality copies. In my opinion a thorough examination utilizing magnetic development should be performed on each one to determine the cause. Comparing the results to the original recording should yield the answer to the question posed by Esdale.

"Are these tapes tampered with based on the gaps?"

In a federal case I worked on last year where the authentication of a tape was in question, I found that an individual had used multi generation tape copies to mask gaps and obscurations. This person had intentionally masked the gaps and obscurations in key areas with the poor quality noisy copies. He stated that the tape submitted was the original on two separate occasions. Neither of these statements was true. Once I did get access to the original recording many hidden facts were revealed. The masking attempt was obvious but what was more important than that was the dialog contained in the masked and definitely tampered with recording. The recording once enhanced and intelligible enough for transcription was crucial and significant in the outcome of the trial. It completely changed the scope and focus of suspicious behavior one hundred and eighty degrees. Discontinuance of dialog played a major part in understanding what really happened during the recording of the event.

The original Cohen recording was allegedly made on a Dictaphone Freedom system used for emergency dispatch recordings. The system involved recorded incoming calls that utilize a hard drive based audio system. The hard drive should be examined and analyzed to see if the original recording can be retrieved. According to Esdale, this has been partially addressed and that he has retained an expert to examine the hard drives content. His expert was one who knew the system well, according to Esdale. Esdale placed a conference call and asked that I speak with Mr. Tidwell. Tidwell explained that not only do they record to a hard drive but they have been trained to back up the recording regularly to DVD. He further stated to me that the recordings that were made on that day, 1/13/2003, have since been deleted from the hard drive. It was also brought to my attention on 2/28/2007 that there are DVD backups of all the dates surrounding the date in question but that none exist for the date of Murray Cohen's death, 1/13/2003. One has to ask the question why? Why would it be missing from the hard drive? Why is there no backup DVD? What happened to them? These are questions that are pertinent and crucial to this investigation in my opinion.

A forensic examination of the hard drive should be done to attempt to recover the audio recording of the 911 call placed by Maria Cohen on that day. I would recommend to the involved parties that, Thomas J. Owen of Owl Investigations do the analysis. He is a leading expert in recovering audio and video evidence from a hard drive. This would answer many questions and give the forensic examiner the best possible quality recording with which to analyze if it can be recovered. To my knowledge this has not been done. It is my opinion as an expert in forensic audio that the analysis of the recording from the hard drive would yield the best possible results in recovering the dialog of the participants on the day in question and recovering the intelligibility of that dialog.

Question 2:

Often the original recording is used to make multiple copies that are supplied to the agencies involved. The original is usually kept in a safe location so that the copies can be verified and made to a high degree of accuracy. When different versions start appearing in different states of quality and length it raises many questions as to their authenticity and accuracy.

Examples of Tampering

- 1) **Gap** segments in a recording, which represents unexplained changes in content or context. A gap can contain buzzing, hum, or silence.
- 2) **Transients** - short, abrupt sounds exemplified by clicks, pops, etc. Transients may indicate tape splicing or some other interruption of the recording process.
- 3) **Fades** - gradual loss of volume. Fades can cause inaudibility and are considered gaps when the recording becomes fully inaudible.
- 4) **Equipment sounds** - inconsistencies of context caused by the recording equipment itself. Common equipment sounds include hum, static, whistles, and varying pitches.
- 5) **Obscuration** - distortion of a recorded signal with the purpose of rendering selective portions unintelligible (i.e. the eighteen-minute gap in the infamous Watergate tapes). This technique can also be used to mask splices, clicks, or suspicious transients.

For instance, in the Cohen case, some tapes contained gaps in certain locations and others had gaps in different locations. This is suspect in my opinion. Why would they be different if the original contained the exact same transients and gaps? They could not have come from the original or they would have been located in the same areas on each copy produced. They are not the same on each tape. What could have caused them to be different? Several things can cause this. They could be multi generational copies. In my opinion the tapes sent to the FBI, Bob Sherin and FOX network had to have come from the same source recording. They all had the same gaps and transients in the same locations. In my opinion, they were made from the same source audio and that would not be the original based on my analysis of the recording submitted to me by Esdale labeled Tape # 2.

"[A]n original recording is considered authentic if it starts at the beginning of the tape and does not stop until the end. Any stops or restarts should be announced by the operator. Original recordings should contain all of the audio information recorded at the moment in time that the event occurred. The recording should further not contain any break in its continuity or content, nor should it contain any suspicious signs suggestive of falsification."

S. Cain and M. Chial, *Authentication of Sound Recordings for Evidentiary Purposes*, (Feb. 18, 1994)

The significance of Tape #2:

The significance of Tape #2 in my opinion is the following.

1. It was made directly after the incident.
2. It would appear to be the single best example of the original recording except for the transients that appear to be caused by a human and not malfunction.
3. It does not contain the equally spaced gaps that appear on the latter copies.
4. It was the best continuous example of the audio of any of the versions submitted. However, it was not completely continuous and it contained 3 transients caused by stop start of the copying process.
5. The 3 transients that do appear on Tape #2 are suspicious to me. They would certainly lead any forensic audio expert to question how they got there, who placed them there, what placed them there and were they intentional. They are completely random yet they suspiciously fall into areas where Murray Cohen is clearly trying to speak. To me this is significant.
6. The only way to rule out tampering as a cause is to compare Tape #2, CDR, Tape #1 and Tape #4 to the original recording. A thorough authentication should also be done to prove the generations and the possibility of tampering.

The other recordings were, at minimum, a second or third generation copy. If you compare Tape #2 for instance with the tape submitted to FOX, the gaps are in completely different areas. The gaps on Tape #2 appear to be in key dialog areas of the recording and not random.

This is suspect in my opinion. Were the gaps on the FOX tape, which appeared to be equal in length and placement, a deliberate attempt to mask the ones from Tape #2? It is possible that a masking attempt occurred and again I would recommend that a forensic audio expert magnetically develop the tape with ferro fluids to authenticate the transients and gaps. This would tell us if the transients are deliberate edits. They should then be compared to the hard drive recording of the original call.

The best results would have been to acquire exact digital clones from the hard disk used by the 911 offices on the day of the call. Mr. Esdale has informed me that the files from that day have been deleted. Tidwell's investigation into this has concluded that the files from the prior day and the day after are still intact. This is suspect in my opinion as well. It makes authenticating any of these tape recordings difficult if not impossible.

There are many theories as to how these gaps and transients appear on these recordings. In fairness to Esdale and the S.C.S.O., examination of the hard drive should answer the questions of tampering in this case. The problem is the condition of the hard drive and how the recordings made on that day were erased. If it were accidental then a recovery should be easy. If it were intentional and someone with knowledge of how to securely and completely wipe a drive had access to that drive we may never know the answers.

"There are two generally accepted approaches for establishing the authenticity of a questioned tape recording. Current legal practices normally require that the burden of proof be placed on the attorney seeking to introduce the tape into evidence. This will require that the attorney demonstrate that certain accepted methods designed to protect from any form of tape tampering have been adhered to, and if that is not successful, to submit the tape to a qualified expert for a forensic examination.... Any stops or restarts should be announced by the operator. Original recordings should contain all of the audio information recorded at the moment in time that the event occurred. The recording should further not contain any break in its continuity or content nor should it contain any suspicious signs suggestive of falsification."

S. Cain and M. Chial, *Authentication of Sound Recordings for Evidentiary Purposes*, (Feb. 18, 1994)

Question 3:

In my opinion, Murray Cohen was conscious and alert, based on the statements that I heard contained on these recordings. The recorded evidence proves without a doubt that a male voice can be heard clearly saying the following statements.

1. "Who is that"
2. "I asked you to call me an ambulance"
3. "You said you were going to get an ambulance"
4. "You're not going to kill me"
5. "You get away from me"

In United States v. Kandiel, the court ruled that any question concerning the credibility of a witness who identifies voices on a tape recording admitted into evidence simply goes to the weight which the jury accords the evidence, not its admissibility.

In my opinion, the male voice stating the above words was that of Murray Cohen based on the following criteria. When voice identification is needed in most courts of law in the United States. Most states will accept a person or relative who has known the persons voice in question when considering a positive identification. In most instances the positive identification is considered even more relevant and substantial when it is a relative of the unknown voice. In this case you have three relatives of Cohen who have claimed since the minute they heard the male voice in this recording that indeed it is Murray Cohen speaking.

I also hear Maria Cohen say the following statements when talking to Murray Cohen.

1. "Give up"
2. "Give it up"
3. "Too late"
4. "Unconscious, totally gone and not breathing"

According to Maria Cohen she and the victim Murray Cohen were the only two people at the location during the call until the Emergency Medical Technician(s) arrived. Clearly Maria Cohen can be heard engaged in conversational dialog with another individual. The dialog would appear to be between Maria Cohen, the dispatcher, and most importantly according to her statements, Murray Cohen since he was the only person there on that day. In my opinion as an expert in audio forensics and based on my experience in transcribing audio these two voices are engaged in direct conversation. Simply stated, they are talking back and forth to each other.

If there were a TV or a Radio playing in the background it would seem unlikely that under the circumstances Maria Cohen would be engaged in conversation with either of those two sources. Further the audio emanating from a source such as that would be a narrow frequency band. It would sound like a TV or a Radio and respond in that narrow band of frequency. The voices I heard are human and very much alive and in the room speaking. The ambient environmental echoes are similar as they would be in an instance where two people are engaged in conversation in the same room. In my opinion, based on the evidence, she was talking to another person present, and that, based on the audio contained in the recording, they are clearly speaking to each other in the same location. This is further evident on at least two occasions based on statements made by the 911 operators. Why did she tell the 911 dispatches on several occasions that Murray was "unconscious, totally gone and not breathing?" Based on the recorded evidence presented to me by both parties how can this be accurate? The F.B.I., Paul Ginzburg, Bob Sherin, Gaidecom, FOX news all say the same thing. A male voice can be heard asking for an ambulance. Cohen was not totally gone in my opinion based on the evidence. I agree with them he was alive and speaking.

Question 3 part 2:

The dialog between Maria Cohen and the unidentified male was rendered intelligible to a certain degree. I logged numerous occasions throughout the recording where dialog could be heard. However, for the majority, it was inaudible. According to Esdale, Murray was found face down on the floor between the bed and a wall at a distance of 20 feet from the phone used during the call. This would account for the faint voice and the difficulty in understanding the dialog coming from the male voice. Even after enhancement it is still extremely difficult to hear. Intelligibility is crucial and to a high degree it was improved significantly, however if one used too much noise reduction intelligibility was significantly reduced. I decided that minimal noise reduction be applied and controlled limiting be applied to increase the gain of the quiet sections. This is problematic as well as it increases the hissing sound or the white noise on the tape.

In certain areas of the recording I was able to hear what would appear to be Murray Cohen say the words "I asked you to call me an ambulance" and "You said you were going to get me an ambulance." These appear after Maria Cohen has specifically told the dispatch that "He is not breathing" and "He is totally gone." Based on the evidence contained in these recordings these would appear to be false statements made by the

caller in my opinion. Cohen is pleading for an ambulance. All one has to do is listen carefully to the recording the evidence is there.

I have prepared a video transcript utilizing the audio enhancement of Tape #2.

I prepared this transcript to the best of my ability. I feel it is a reliable representation of the dialog spoken by all parties on that day to a high degree of accuracy. If I did not hear it I did not include it in my final transcript.

I am a disinterested person in this case and its subsequent outcome. I have only presented my findings of the facts based on the submitted recordings. I have done so to the best of my ability.

Conclusion:

In my opinion to a high degree of certainty two people were engaged in conversation on the day in question at the Cohen residence. I believe that one of them was the caller Maria Cohen and the other is the victim Murray Cohen. Just before the EMT arrives Mr. Cohen can clearly be heard coughing and choking in the background. Indicating that he was indeed breathing. Prior to that last gasp of air, I believe, based on what I have heard, that Murray Cohen was not only alive, but also coherent and capable of speaking. Further, that he was pleading for help based on the dialog contained in this recorded evidence that is intelligible.



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