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COMMONWEALTH OF MASSACHUSETTS

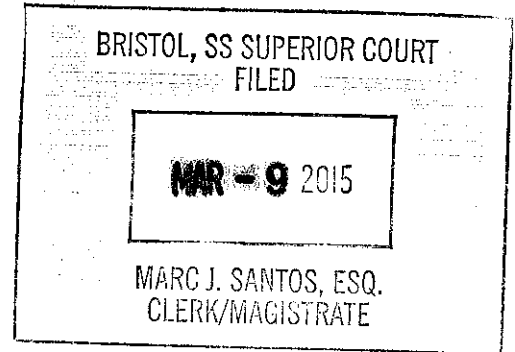
BRISTOL, ss

SUPERIOR COURT NO. 13-983

COMMONWEALTH

v.

AARON HERNANDEZ



**DEFENDANT'S OPPOSITION TO
COMMONWEALTH'S MOTION IN LIMINE
REGARDING VIDEO
AND REQUEST FOR OTHER RELIEF**

Procedural Background and Statement of Relevant Facts

Prior to trial, the Commonwealth notified the defendant that it intended to offer excerpts of the home surveillance system by recording segments of the video as it played through the DVR from a "cloned" copy of the original hard drive that had been made by Trooper Condon following its seizure on June 18, 2013. The report of Trooper Daniel Giossi, dated November 26, 2014, detailing this process attached hereto as *Exhibit 1*, was furnished to defendant, along with copies of 27 separate exhibits. Trooper Giossi's excerpts showed the system time in the segments, allowing the jury to understand the time of the recording.¹ Moreover, the segments prepared by Trooper Giossi also flowed sequentially from one camera to another. For instance, Jennifer Fortier is shown walking up the driveway of the house on one camera, up the path to the front door on another camera, and being allowed into the house on yet another camera.

Following the testimony of Dorothy Stout on *voir dire* on February 19, 2015, in response

¹ According to Trooper Condon's testimony, the system time was 2 minutes and 46 seconds slower than the actual time, but it should be relatively easy for the jury to understand the adjustment that needed to be made.

to counsel asking further questions about how the video would be displayed, Mr. Racette and Mr. Griffin disclosed for the first time that the video had been exported from the “cloned” hard drive into another program, and that the portions of the video that had been recorded by the digital cameras had been slowed down by the Commonwealth to make the skips and freezes that appear on the “cloned” hard drive less noticeable. In fact, one of the video clips of officers walking around the backyard entered into evidence and played to the jury had been slowed down in such a fashion, without defense counsel or the Court having been advised that the Commonwealth had done so. That conversation prompted the defense to file “Defendant’s Motion for Order Regarding Display of Home Video Surveillance” on February 20, 2015.

On March 2, 2015, the Commonwealth responded with its “Motion in Limine Regarding Video.” Having had an opportunity to review the Commonwealth’s motion, the defendant opposes it. First, using a software program to export the video is not a forensically reliable manner of proceeding when both the authenticity and the details of the video shown to the jury are at issue. The exported material is not a “clone” or digitally exact copy of the “cloned” hard drive created by Trooper Condon. The program used, and other types of screen capture programs, routinely drop or double up frames. It is impossible to verify the accuracy of the exported software using the methodology described by Trooper Condon. The only way to verify it would be to make a frame-by-frame comparison. That is extremely time-consuming, and in this case, given the volume of video, impossible. In general, the digital video cameras recorded at a rate of 30 frames per second. Those frames would have to be compared to the frames on the original (or “cloned” copy created by Trooper Condon). A mere one minute of video would have 1,800 frames. An hour of video would have 108,000 frames.

Still Photographs

At the same time, on March 1, 2015, the Commonwealth notified defendant that it intended to use 38 still images captured from the video during the testimony of Kyle Aspinwall, an employee of Glock. The images will be shown to Mr. Aspinwall in an effort to elicit testimony from him that the object in defendant's hands looks like a Glock firearm.

Three of the stills are in the "BMP" (or bitmap format) and have a dimension of 704 pixels by 480 pixels. That is the frame/image resolution of the original video, and the defendant has no objection to the use of those still images, since they accurately reflect the pixel ratio of the video.

The other 35 stills, however, have a very different pixel ratio than the actual video. The video frame/image resolution for those 35 images is 320 x 240. The stills, however, are in PNG format and the resolution is either 1280 x 960 pixels or 1920 x 1440 pixels. In short, the Commonwealth added material to the actual surveillance video in order to produce the still photographs it seeks to display to the jury.

Affidavit of Bruce E. Koenig

Bruce E. Koenig is an expert audio and video recording analyst. He was employed as a Supervisory Special Agent of the Federal Bureau of Investigation ("FBI") for over twenty years. When he retired from the FBI in 1995, he was manager and senior audio examiner for the Audio/Video Signal Processing Program of the FBI. After his retirement, he has continued in the audio/video analysis field on a wide variety of matters. He has published over 40 peer-reviewed papers and testified as an expert witness on over 390 occasions.

According to Mr. Koenig, screen capture software, such as Movavi Screen Capture, “often drops (fails to copy) or adds duplicate frames.” *See Exhibit 2*. It does not produce a “clone” or bit-by-bit image of the original hard drive. Rather, the software is dependent upon “the computer system’s ability to perfectly capture the video images.” A particular problem in this case, according to Mr. Koenig, is the inability to accurately synchronize the capture rate of the screen capture software with video clips that have non-consistent frame rates and random occurrences of skipped images. This is a problem because the software wants to adjust for the irregularities in the original recording. According to Mr. Koenig, because of these shortcomings, it is considered only as a last resort in the video forensic discipline. The only way to determine if all the video frames were accurately captured, with no drops or duplicates, is to conduct an incredibly time-consuming, frame-by-frame review of the screen capture copy compared to the original version.

With respect to the still photographs it hopes to use with Mr. Aspinwall, Mr. Koenig states that the use of the PNG format, with the dramatic increase in the number of pixels, changes the way the stills appear. There are programs which allow for the enlargement of images without adding new pixels. Those programs are faithful to the original image, without altering the appearance. But the Commonwealth has elected not to use them.

Summary of Applicable Law

Authentication generally.

Mass. G. Evid. 901 provides that authenticity may be proved by testimony of a qualified witness that the item sought to be introduced is what the proponent represents it to be. The Supreme

Judicial Court has applied this foundational requirement to surveillance video, finding no abuse of discretion in the trial judge's admission of a copy of a surveillance video from a pet store. A witness who was depicted in the video testified that it was a fair and accurate representation of the visit to the store. *Commonwealth v. Pytou Heang*, 458 Mass. 827, 855-856 (2011). See *Commonwealth v. Leneski*, 66 Mass. App. Ct. 291 (2006)(discussing admissibility of authenticated surveillance video and explaining that defendant's concerns about surveillance procedures, methods of storing and reproducing video, and completeness of reproduction of video to CD were matters for cross-examination that went to weight of evidence, not admissibility).

Special considerations come into play when no witness is available to testify that a surveillance video is what the proponent represents it to be -- like the owner or operator of the system. Many jurisdictions refer to this as the "silent witness theory." See the New Hampshire Supreme Court's recent discussion in *State v. Strangle*, 166 N.H. 407 (2014), for an overview, which cites *Leneski* in adopting a non-formulaic approach to the foundational requirements under the "silent witness theory."

Courts that have adopted more formulaic approaches to the foundational requirements under this theory typically consider as one factor whether changes, additions, or deletions have been made to the video in determining, generally, whether its "substance and the circumstances under which it was obtained provide sufficient proof of its reliability." E.g., *United States v. Oslund*, 453 F.3d 1048, 1054 (8th Cir. 2006)(listing nonexclusive factors to determine admissibility of tape-recorded conversations: "(1) That the recording device was capable of taking the conversation now offered in evidence. (2) That the operator of the device was competent to operate the device. (3) That the recording is authentic and correct. (4) **That changes, additions or deletions have not been made**

in the recording. (5) That the recording has been preserved in a manner that is shown to the court. (6) That the speakers are identified. (7) That the conversation elicited was made voluntarily and in good faith, without any kind of inducement”)(*citations and punctuation omitted*)(*emphasis supplied*). See also *State v. Cook*, 210 N.C.App. 245, 721 S.E.2d 741, 746 (2012)(“The prerequisite that the offeror lay a proper foundation for the videotape can be met by” any of the following: “(1) testimony that the motion picture or videotape fairly and accurately illustrates the events filmed”; “(2) proper testimony concerning the checking and operation of the video camera and the chain of evidence concerning the videotape”; “(3) testimony that the photographs introduced at trial were the same as those [the witness] had inspected immediately after processing”; or “(4) **testimony that the videotape had not been edited, and that the picture fairly and accurately recorded the actual appearance of the area photographed....** Thus, there are “three significant areas of inquiry” for a court “reviewing the foundation for admissibility of a videotape: (1) whether the camera and taping system in question were properly maintained and were properly operating when the tape was made, (2) whether the videotape accurately presents the events depicted, and (3) whether there is an unbroken chain of custody”)(*citations omitted*)(*emphasis supplied*).

When a surveillance video has actually been modified.

People v. Flores, 941 N.E.2d 375, 406 Ill.App.3d 566 (2010), from the Second District of the Appellate Court of Illinois, is helpful in analyzing the factors that should guide the Court’s discretion in deciding whether video that has been modified should be admitted. The creator of a duplicate of a video (who was a neighbor of the defendant’s with a grievance against him) testified that the duplicate was “altered by omitting portions of the original.” Beyond that, according to the

court, he “seemed to go out of his way to make obscure the process by which he produced the evidence tape, so reconstructing the process that he used is a matter of guesswork.” The *Flores* court ultimately held that the government failed to lay an adequate foundation for admission. It stated:

An altered copy produced by an unexplained process is not acceptable as substantive evidence. In addition, the technological shift to digital visual recordings, with the prevalence of image-altering computer programs, puts a burden on the trial court to apply real-evidence standards in a way that responds to the technological context. **We therefore hold that an adequate foundation must show that the original has been preserved without change, addition, or deletion and that, if a copy is introduced into evidence, there must be cogent explanation of any copying such that the court is satisfied that during the copying process there were no changes, additions, or deletions.**

941 N.E.2d at 385 (emphasis supplied).

Although not directly on point, the SJC’s recent decision in *Commonwealth v. Corliss*, 470 Mass. 443 (Jan. 20, 2015), provides some guidance, where it found no abuse of discretion in the exclusion of the defendant’s modified video (which it analyzed as a kind of courtroom experiment). The Court reviewed the factors bearing on the trial court’s exercise of discretion.

Application of Law to Facts

In this case, the video surveillance will show the defendant at various times carrying an iPad, a cell phone, or similar device, at times with the screens illuminated, at other times not illuminated. The Commonwealth contends that the object he is carrying is a firearm. The jury’s ability to assess the clarity of the video and the accuracy of what the jury sees is of obvious importance. In its presentation of the evidence, the Commonwealth should not be permitted to present evidence that is derived from something that is not a cloned or bit-by-bit copy of the original hard drive. To do so risks the video having been altered, not by any intentional action of

the police or the District Attorney's Office, but by the imperfect operation of the screen capture software it proposes to use.

The Commonwealth has gone to great lengths to demonstrate to the Court and the jury that the "gold standard" of duplication is to work with a bit-by-bit copy. Trooper Condon testified about this process. He also testified that the export feature of the DVR was problematic. A month before the start of trial, the Commonwealth notified defendant of its intention to use Trooper Giossi's method of presentation. That would solve all of the problems addressed by the Commonwealth's motion in limine. The system time (off by a mere two minutes and 46 seconds) is displayed in the DVR player. Clips of the video can be pasted together so that movement can be followed from one camera to the next. The resolution is at it appears on the DVR player.

Two of the "problems" cited by the Commonwealth are not problems at all. Slowing down or stopping the digital video to synchronize it for simultaneous, side-by-side display, is unnecessary to the presentation of the evidence. It results in a distortion of the evidence in that the video appears to stop when in reality, Mr. Racette has caused it to stop.


The other problem identified by the Commonwealth – the incorrect time displayed on the screen of the images from the digital cameras – is remedied by Trooper Giossi's presentation. By recording the DVR, he captures the system time, so the jury can follow along without confusion.

For these reasons, the Court should reject the Commonwealth's proposal that it be permitted to play the video segments that were created under circumstances where it cannot be certain that the copies are faithful reproductions of the "cloned" version.

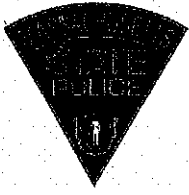
The Still Photographs

CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon counsel of record by hand delivering a copy to Brian Griffin on March 9, 2015.



Charles W. Rankin



Massachusetts State Police

11/26

ACISS INVESTIGATIVE REPORT 2013-104-0367/512

Report Date: 11/26/2014

Primary Information	
Description:	Creation of Power Point style exhibits of video from Hernandez House
Dissemination Code:	report respect the security of its associated case
Reporting LEO:	Giossi, Daniel (msp2627 / Bristol Homicide Squad / Massachusetts State Police)
Approval Status:	Approved
Approved Date:	11/26/2014
Approved By:	Thom, Daniel (msp2684 / Bristol Homicide Squad / Massachusetts State Police)

Record Status Information	
Record Origination Operator:	Giossi, Daniel (msp2627 / Bristol Homicide Squad / Massachusetts State Police)
Record Origination Date:	11/26/2014 07:31
Last Update Operator:	Thom, Daniel (msp2684 / Bristol Homicide Squad / Massachusetts State Police)
Last Update Date:	11/26/2014 09:50

Reporting LEO	Date	Supervisor	Date
Giossi, Daniel (msp2627 / Bristol Homicide Squad / Massachusetts State Police)		Thom, Daniel (msp2684 / Bristol Homicide Squad / Massachusetts State Police)	11/26/2014

Narrative begins on the following page.

Exhibit 1

1. As part of the investigation into the death of Odin Lloyd I was tasked by ADA McCauley with creating several power point style exhibits depicting events that were recorded by the home video surveillance system at the home of Aaron Hernandez. In order to create the exhibits I utilized the DVR system from the Hernandez house that had a duplicate hard drive installed in it. The original hard drive was retained as evidence after being imaged.

2. To create the exhibits several photographs of the screen were taken while reviewing the recorded images of the cameras on the DVR system from June 16, 2013 to June 18, 2013. The photographs were then used to create slides. The cameras used to take the images were a Canon Model PC1585 with s/n: 292064053175 and a Kodak play/sport (ZX5) with s/n: KCTPB12721383. The metadata for each image used was also saved with the image. The images were not altered and the image files names were not changed, the file names can be found on the exhibit slides. A brief description of each image was included in the exhibit. The times indicated on the slides indicate when the image was captured by the DVR and reflect the system time not the actual time. The system time was found to be 2 minutes and 46 seconds slow when the system was seized on June 18, 2013. The displayed time is the time that appears on the image as seen when viewing the DVR and is not always the same as the system time as the time can vary depending on individual camera settings. The system time can be found on the green bar that is visible on the bottom of the pictures.

3. Video clips were also recorded by the same cameras while viewing and playing the DVR system. The video clips were then converted short movies with the Windows Movie Maker program. The movies were then saved as MPEG files and used as part of the exhibits. The sound was muted for the movies to eliminate background noises made when the screen was recorded. The DVR system did not record sound and therefore no sound files were present when viewing the DVR system. Some of the clips were shortened to allow them to flow with the clips of different cameras (ie: subject walks from one camera to the next so two clips were matched up to depict the movement). No editing to the content of the videos were made except as noted above.

4. As an example of the above procedure; in the exhibit depicting the arrival of the babysitter to the home of Aaron Hernandez on June 16, 2013 the first image used is from Camera #3 at system time 19:39:09 on June 16, 2013. The actual time is 19:41:55 when corrected with the addition of 2

minutes and 46 seconds. The babysitter can be seen walking up the driveway towards the path that leads to the front door. The displayed date/time is 06-16-2013 07:39:09 PM. The image is identified as (120_0624). Later in that same exhibit a movie is shown, the movie was created from image files (120_0629, 120_0630, 120_0631 and 120_0632). That movie showed the babysitter walking up the driveway, along the front path and in the front door of the house. The movie was titled "Babysitter Movie".

5. The procedure explained above was used to create all of the exhibits and in each exhibit the file name of the image and/or video clip(s) is indicated on each slide in the exhibit. The movie(s) saved name is also indicated on the applicable slide.

6. There were 27 separate exhibits made using the above procedure. The image files used are saved in a folder with the power point exhibit.

COMMONWEALTH OF MASSACHUSETTS

BRISTOL, ss.

SUPERIOR COURT No. 13-983

COMMONWEALTH OF MASSACHUSETTS

v.

AARON HERNANDEZ

AFFIDAVIT OF BRUCE E. KOENIG

Being duly sworn, Bruce E. Koenig states:

1. My name is Bruce E. Koenig, I live in Clifton, Virginia.
2. I am the senior examiner and founder of BEK TEK LLC. BEK TEK LLC is an organization founded in 1996 that provides consultations, examinations, research, and instruction in criminal, civil, investigative, administrative, and Foreign Counterintelligence matters involving laboratory analyses of audio/video recordings (both analog and digital) and digital still images, and onsite evaluations of acoustical information. Our facilities are located just outside Washington, D.C. Our clients have included:

- U.S. Department of Justice
- Federal Bureau of Investigation
- Drug Enforcement Administration
- U.S. Congress
- Office of Independent Counsel
- U.S. Securities and Exchange Commission
- Federal Trade Commission
- U.S. Department of Defense
- U.S. Department of Energy
- U.S. Customs Service
- United Nations Criminal Tribunal
- National Academy of Sciences
- District attorney's offices
- Public defender's offices
- Police departments, prosecuting attorney's offices, law school legal clinics, sheriff's departments, state attorney general's offices, bar associations, private investigators, the news media, private law firms, insurance companies, accounting firms, major corporations, labor unions, and small businesses.

Exhibit 2

I and other associates of BEK TEK LLC have conducted forensic examinations in numerous significant investigations, including:

- The Linda Tripp/Monica Lewinski recordings in the Independent Counsel investigation of President Clinton
- Numerous recordings involving former Housing and Urban Development Secretary Henry G. Cisneros
- The Archer Daniels Midland antitrust cases
- The Branch Davidian occurrence in Waco, Texas
- The United Nations Criminal Tribunal trials for the former Republic of Yugoslavia
- The Sabrina Aisenberg kidnapping case
- The U.S. Congress investigation of presidential campaign financing in the Clinton Administration
- The former Ukrainian President Leonid Kuchma office recordings
- The \$2.7 billion fraud investigation of Richard M. Scrushy, former CEO of HealthSouth Corporation
- The Duke University lacrosse team case
- The Canadian Prime Minister Stephen Harper vs. The Liberal Party of Canada civil case
- The Sikorsky helicopter crash near Weaverville, California resulting in the death of seven firefighters, the pilot, and the safety officer

I have been involved in the forensic analysis of audio and, later, video recordings and digital still images on a full-time basis since 1974. I was a Supervisory Special Agent for the Federal Bureau of Investigation ("FBI") from 1974 through my retirement at the end of 1995, ending my career as manager and senior audio examiner for the Audio/Video Signal Processing program. My formal education includes a B.S. degree with majors in Physics and Mathematics, and an M.F.S. degree in Forensic Science. I have published over 40 scientifically peer-reviewed papers in my fields of expertise, testified as an expert witness on over 390 occasions, and attended numerous seminars and specialized short courses. Attached hereto as Exhibit A is a copy of my current Curriculum Vitae ("CV").

3. BEK TEK LLC HAS been retained to consult with the attorneys for Mr. Hernandez in this matter.

4. On March 2, 2015 I received an Adobe Portable Document Format (PDF) file named "Commonwealth video motion.pdf", which is a six-page "COMMONWEALTH'S MOTION IN LIMINE REGARDING VIDEO", dated February 28, 2015. This document reflects, in part:

"VIDEO EXPORTING/CONVERSION

Robert Racette of the Bristol County District Attorney's Office will testify that he used the backup function of the DVR itself to export the entire contents of the DVR onto a portable hard drive. The backup copy on the portable hard drive remains in a proprietary format and can only be viewed within the proprietary viewer that was included on the portable hard drive in the backup process. That proprietary player has the capacity to export segments of video into an open format called AVI but the video quality diminishes noticeably.

In order to take video from the proprietary format on the external hard drive and convert to an open format without losing video quality, Mr. Racette played the video on his computer from the external drive while running a program called 'Movavi Screen Capture version 6.' ('Movavi') Movavi captures the played images as they are sent to the screen and saves the video in MP4 format. MP4 format is an open format that is recognizable by standard video editing tools. Using this software to capture to MP4 format causes no appreciable loss in video quality and does not change the images themselves. It is capturing software as contrasted with processing or editing software."

5. Since screen capture software, such as Movavi Screen Capture, often drops (fails to copy) or adds duplicate frames, and is dependent upon the computer system's ability to perfectly capture the video images from the monitor, it is considered a last resort in the video forensic discipline. A specific problem in this case would be the inability to accurately synchronize the capture rate of the screen capture software with video clips that have non-consistent frame rates and random occurrences of skipped images. The only way to determine if all the video frames were accurately captured, with no duplication or skips, is to conduct a very time consuming, frame-by-frame review of the screen capture copy and compare it to the proprietary Player software version, while also evaluating any quality losses.

6. Based on the well-accepted practices of forensic video examinations, screen capture software acquisition is an often flawed methodology if the purpose is to produce an accurate, or clone duplication of the original surveillance video information.

7. On March 2, 2015 I downloaded from the Internet site "Dropbox.com" a digital ZIP file named "Home Surveillance Still Images.zip," which contained three Bitmap (BMP) and 35 Portable Network Graphics (PNG) images. The names of all the PNG image files start with the letters "vlsnap" and are followed by the date and time when they were produced using the "snapshot" feature in VLC Media Player software.

8. The following eight, downloaded PNG images had pixel dimensions of 1280 (width) by 960 (height):

- a. vlcsnap-2015-02-25-21h08m23s82.png
- b. vlcsnap-2015-02-25-21h08m41s96.png
- c. vlcsnap-2015-02-25-21h09m29s98.png
- d. vlcsnap-2015-02-25-21h09m40s99.png
- e. vlcsnap-2015-02-25-21h09m56s101.png
- f. vlcsnap-2015-02-25-21h10m08s102.png
- g. vlcsnap-2015-02-25-21h10m26s118.png
- h. vlcsnap-2015-02-25-21h10m33s118.png

A review of the matching video frames in the original surveillance file

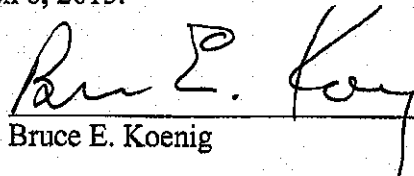
“774_13_R_06172013030011AM.dav” revealed that the actual pixel dimensions, when the images were originally captured, was 320 (width) by 240 (height), for a total of 76,800 pixels, reflecting that the above eight PNG images have been enlarged by a factor of 16. This enlargement was accomplished by adding 1,152,000 new pixels that were not present in the original images, which produced the above PNG images that only contain 6.25% of original pixels and 93.75% of added pixels.

9. The remaining 27 downloaded, PNG files had pixel dimensions of 1920 (width) by 1440 (height). A review of the matching video frames in the original surveillance files “775_13_R_06172013013346PM.dav”, “827_14_R_06172013120002AM.dav”, and “830_14_R_06172013030007AM.dav” revealed that the actual pixel dimensions, when the images were originally captured, was 320 (width) by 240 (height), or a total of 76,800 pixels, reflecting that these 27 PNG images have been enlarged by a factor of 36. This enlargement was accomplished by adding 2,688,000 new pixels that were not present in the original images, which produced these 27 PNG images that only contain 2.78% of original pixels, and 97.22% of added pixels.

10. Based on the above enlargement processes, which improperly added a large number of artificial, software-produced pixels, I believe that none of these PNG images should be utilized at trial, since they are mostly composed of non-original information, which can easily misrepresent objects and individuals in the individual video images. Instead, either the original images from the system player should be utilized, or enlargements should be prepared without adding new pixels by duplicating the original, individual pixels in square sets of 2 pixels on a side, 3 pixels on a side, 4 pixels on a side, and so forth. This enlargement process will produce, respectively, 4 times, 9 times, 16 times, and so on enlargements, but with the same resolution and visual characteristics as the original images.

11. It also noted that none of the 35 PNG files reflect the actual frame number in either the file name or within the image itself.

Signed under the penalty of perjury on March 8, 2015.


Bruce E. Koenig

Attachments:

Exhibit A: The CV for Bruce E. Koenig

BEK TEK LLC

Forensic Audio/Video/Image Consultants

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(540) 602-2706

Bruce E. Koenig
bruce@bekteklc.com

CURRICULUM VITAE OF BRUCE E. KOENIG

Professional Positions

1996-Present Private consultant, examiner, researcher, and founder of the forensic, audio/video/image consulting company BEK TEK LLC. Conducts forensic examinations of audio, video and still image media, both analog and digital, to authenticate recordings, improve intelligibility, identify/classify voice and non-voice signals, and compare voice samples; analyzes digital images to authenticate, enhance quality and review metadata information; conducts measurements of objects/individuals in images; provides on-site evaluations of acoustical sounds and environments; prepares transcriptions; presents expert testimony and assists attorneys in preparing for cross-examination of opposing experts and lay witnesses; evaluates appropriate recording and analysis equipment; provides forensic training in audio/video analysis; conducts research regarding forensic applications; and directs the forensic work of other consultants.

1974-1995 Supervisory Special Agent, Engineering Section, Federal Bureau of Investigation (FBI), Washington, D.C., Newington, VA, and Quantico, VA. Conducted examinations of audio and video recordings, both analog and digital, produced or collected by Federal, state, local, and foreign law enforcement and judicial agencies. These forensic analyses included authentication of recordings, intelligibility enhancement, voice comparisons, identification/classification of voice and non-voice signals, and other related examinations. Additional duties included analyses of room acoustics; on-site evaluations of sound pressure levels, gunshot events, and other sounds of interest; testing of audio tapes, tape recorders, laboratory analysis equipment; the presentation of expert testimony in criminal, civil, and administrative matters; training of FBI and other law enforcement personnel in forensic audio analysis; and conducting research. At retirement, was the manager and senior audio examiner of the FBI's Audio/Video Signal Processing program.

1970-1974 Special Agent, FBI. Investigative responsibilities in the Atlanta and Detroit Divisions involving bank robberies, prison escapes, terrorism, and other violations of Federal law. Also the technical coordinator of the photographic laboratory in the Detroit FBI Division.

Formal Education

Bachelor of Science degree, University of Maryland, majors of Physics and Mathematics.

Certificate, DeVry Institute of Technology (now called DeVry University), electronics curriculum on the theory and circuitry design of audio and video components, including tape recorders, radios, and stereo equipment, with an emphasis on televisions and the associated video signal.

Master's degree, George Washington University, major of Forensic Science.

Additional graduate level courses at George Mason University, Massachusetts Institute of Technology, University of Colorado and University of Utah.

Work Experience

Has conducted examinations on over 17,500 separate audio and video recordings, and separate images, in over 5,700 criminal, civil, and administrative matters, including over 2800 authenticity analyses, the enhancement of over 9000 recordings, over 5700 signal analysis determinations, and over 2100 voice comparisons/examinations. Submissions have been received from clients in private and governmental organizations from all 50 states within the United States of America, the Commonwealth of the Northern Mariana Islands, the District of Columbia, Guam, Puerto Rico, the U.S. Virgin Islands (both St. Croix and St. Thomas), Argentina, Australia, Canada, Cayman Islands, Colombia, Costa Rica, Croatia, Denmark, El Salvador, Ecuador, England, Eritrea, Germany, Hong Kong, India, Indonesia, Israel, Italy, Japan, Kenya, Mexico, the Netherlands, New Zealand, Nicaragua, Panama, Philippines, Romania, Singapore, Switzerland, Turkey, Turks and Caicos Islands, Ukraine, and Venezuela.

Has instructed personnel in the FBI, other Federal agencies, state, local, and foreign law enforcement departments, and private consultants in forensic analysis procedures.

On hundreds of occasions has lectured and presented papers before scientific, forensic and legal organizations regarding forensic examinations.

Peer-reviews scientific/technical articles, presentations, books, and doctoral theses in the audio/video signal processing fields.

Member of the Ad Hoc Subcommittee on "The 18½-Minute Erased Portion of Nixon White House Tape 342," Advisory Committee on Preservation, National Archives and Records Administration (2000).

While chairperson of the Voice Identification and Acoustical Analysis Subcommittee, of the International Association for Identification, was responsible for writing and having approved the first comprehensive standards on spectrographic voice identification, outside the FBI (effective January 1, 1992).

FBI's project manager to the National Research Council, National Academy of Sciences, for their evaluation of spectrographic voice identification, titled "On the Theory and Practice of Voice Identification" (1979).

Assisted the members of the National Research Council, National Academy of Sciences' Committee on Ballistics Acoustics, in the examination of the acoustic information in the assassination of President John F. Kennedy (late 1970s).

Clients, since establishing BEK TEK LLC, have included the U.S. Department of Justice; Federal Bureau of Investigation; U.S. Congress; Office of Independent Counsel, Bureau of Alcohol, Tobacco, Firearms and Explosives; Drug Enforcement Administration; Security and Exchange Commission; U.S. Department of Defense; U.S. Department of Energy; U.S. Customs Service; Federal Trade Commission; United Nations Criminal Tribunal; National Academy of Sciences; U.S. Agency for International Development; district attorney's offices; public defender's offices; police departments; prosecuting attorney's offices; law school legal clinics; ombudsmen; sheriff's departments; state attorney general's offices; bar associations; city & county attorney's offices; private investigators; universities/colleges; the news media; private law firms; insurance companies; major corporations; utilities; labor unions; magazine editors; and small businesses.

Work Experience (continued)

Has conducted forensic examinations in numerous significant investigations, including: the authenticity analysis of the Linda Tripp telephone recordings involving the investigation of President William J. Clinton; the authenticity analysis of the telephone recordings concerning Housing and Urban Development Secretary Henry G. Cisneros; the enhancement examination of President Richard M. Nixon's White House recordings, including the "Watergate tapes"; the gunshot analyses in the assassination of President John F. Kennedy and the attempted assassination of Ronald W. Reagan; the authenticity and enhancement analyses of the undercover informant's recordings in the Archer Daniels Midland antitrust cases; the authenticity and enhancement examinations in the John Gotti and other high-profile organized crime cases; the authenticity determination and identification of gunshot sounds on audio and video tapes involved in the burning of the Branch Davidian complex in Waco, Texas; the authenticity and voice comparison analyses of audio recordings involved in three criminal trials before the United Nations Criminal Tribunal for the former Republic of Yugoslavia; the intelligibility determination and transcript preparation of U.S. government recordings in the Sabrina Aisenberg kidnapping investigation; the video authenticity analyses involved in the investigation by the U.S. Congress of presidential campaign financing in the Clinton administration; the authenticity examination of digital audio recordings from the office of Ukrainian President Leonid Kuchma; the authenticity examination of the FBI's undercover analog and digital recordings in the \$2.7 billion fraud prosecution of Richard M. Scrushy, former CEO of HealthSouth Corporation; the analysis of the gunshots fired by members of the Ku Klux Klan, the American Nazi Party, the Communist Workers Party, and the Socialist Workers Party during a "Death to the Klan" demonstration in Greensboro, NC; the authenticity analysis of audio microcassette recordings in the Canadian Prime Minister Stephen Harper vs. The Liberal Party of Canada civil case; the authenticity analysis of 35 digital audio recordings in the conspiracy and interception of wire communications prosecution in the U.S. vs. Anthony Pellicano and Terry Christensen case; the authenticity and enhancement of air traffic control recordings involved in the destruction of Korean Airlines Flight 007 by a Russian missile; many espionage cases and other major airplane crashes since the late 1970s; the audio and image enhancement analyses plus transcription preparation in the Duke University Lacrosse Team case; the signal analysis examination of the engine, rotor and electrical system sounds of the Sikorsky helicopter crash near Weaverville, CA resulting in the death of seven firefighters, the pilot and the safety officer.

Specialized Short Courses Attended (partial listing)

- Acoustics and Electroacoustic Measurement, presented by Brüel & Kjær, in Marietta, GA
- Applications of Modern Image Processing Systems, presented by The International Society for Optical Engineering, Bellingham, WA
- Cellular Telephone System, presented by Douglas A. Kerr, in Dallas, TX
- Computer Science Technology, University of Utah, Salt Lake City, UT
- Digital Signal Analysis for Applications in Sound and Vibration, presented by Pope Engineering Company and Brüel & Kjær, in Norcross, GA
- Electroacoustic Measurements on Telephones, presented by Brüel & Kjær, in Marietta, GA
- Essentials of Industrial Security Management, presented by the Army Institute for Professional Development, Fort Eustis, VA
- Fast Fourier Analysis, presented by Spectral Dynamics, in San Diego, CA
- FBI Laboratory Quality Assurance Training on Evidence Submission, Examination, and Return, presented by the FBI Laboratory Division, Quantico, VA
- File Systems Revealed, presented by X-Ways Software Technology AG, in Seattle, WA
- Forensic Authentication of Digital Audio, presented by the National Center for Media Forensics, University of Colorado, Denver, CO
- Forensic Authentication of Digital Images, presented by the National Center for Media Forensics, University of Colorado, Denver, CO
- Image and Video Processing Using MATLAB, presented by MathWorks, in Vienna, VA
- Image Processing and Analysis, presented by The International Society for Optical Engineering, Bellingham, WA
- Mastering Analog Video Technology, presented by The Sony Video Institute, in San Jose, CA
- Mastering Digital Video Technology, presented by the Sony Training Institute, in San Jose, CA
- Mastering Telecommunications Fundamentals, presented by Two Rivers Technologies, in Washington, D.C.
- Presenting Data and Information, presented by Edward R. Tufte, in Arlington, VA
- Professional Photography, presented by New York Institute of Photography, New York, NY
- Selected Topics in Acoustics, presented by George Mason University, Fairfax, VA

Specialized Short Courses Attended (partial listing - continued)

Signal and Image Processing and Analysis for Scientists and Engineers, presented by Applied Technology Institute, Laurel, MD

Sonic Boom: Prediction and Effects, presented by American Institute of Aeronautics and Astronautics, in Tallahassee, FL

Speech Enhancement, presented by The University of Utah, Salt Lake City, UT

Speech Spectrogram Reading: An Acoustic Study of English Words and Sentences, presented by the Massachusetts Institute of Technology, Cambridge, MA

Video Analyst System Training, presented by Intergraph, Huntsville, AL

Video Capture, Enhancement and Analysis, presented by The Institute for Forensic Imaging (in association with Indiana University and Purdue University), Indianapolis, IN

Voice Identification, presented by Voice Identification, Inc., in Manville, NJ

X-Ways Forensics, presented by X-ways Software Technology AG, in Seattle, WA

Professional Society Memberships

Acoustical Society of America – member. Member of the Subcommittee on Forensic Acoustics.

Audio Engineering Society – member. Member of the Technical Committee on Audio Forensics.

International Association for Identification – Distinguished and Life Active member. Member of the Editorial Board for the *Journal of Forensic Identification*. Former chairperson of both the Voice Identification and the Acoustical Analysis Subcommittee plus the Voice Identification Certification Board; former board member of the Forensic Video Analysis Certification Study Committee.

Institute of Electrical and Electronic Engineers (IEEE) – member. Member of the IEEE Signal Processing Society.

National Technical Investigators Association – member.

Society of Former Special Agents of the Federal Bureau of Investigation – member.

Society of Motion Picture and Television Engineers – member.

SPIE [formerly known as The International Society for Optical Engineering] – former member (2000-2010).

Testimony

Has testified as an expert in the fields of audio/video/image analyses in judicial proceedings, including trials, hearings, and depositions on over 390 occasions in: The Netherlands, Singapore, Turks and Caicos Islands, District of Columbia, Guam, Puerto Rico, U.S. Virgin Islands, Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia.

Seminars

Have attended numerous seminars, conventions, conferences, and workshops of organizations including the Acoustical Society of America, Audio Engineering Society, DSP Expo, International Association for Identification, International Society for Optical Engineering, Institute of Electrical and Electronic Engineers, International Speech Communication Association, National Association of Broadcasting, and National Technical Investigators Association.

Miscellaneous

Full-field, TOP SECRET clearance (1970-2004).

Reviewer/limited contributor for a number of legal papers and books, including the second and third editions of Scientific Evidence by Paul C. Giannelli and Edward J. Imwinkelried.

First-hand account regarding some FBI experiences appears in the chapter entitled "Best Work in Law Enforcement" in the book *Guide to Careers in the FBI*, 2nd edition by John Douglas, published in 2005 by Simon & Schuster.

Scientific Publications

Koenig, Bruce E.; Lacey, Douglas S. Forensic Authentication of Digital Audio and Video Files, which will be a chapter in the book entitled *Handbook of Digital Forensics of Multimedia Data and Devices*. Peer reviewed and accepted for inclusion in the book, with an expected publication date of August 2015.

Koenig, Bruce E.; Lacey, Douglas S. The Average Direct Current Offset Values for Small Digital Audio Recorders in an Acoustically Consistent Environment. *Journal of Forensic Sciences* 2014, 59(4), pp 960-966.

Lacey, Douglas S.; Koenig, Bruce E.; Reimond, Christina E. The Effect of Sample Length on Cross-Correlation Comparisons of Recorded Gunshot Sounds. *The Proceedings of the AES 54th International Conference - Audio Forensics: Techniques, Technologies and Practice*, London, UK, 2014, pp 122-129.

Koenig, Bruce E.; Lacey, Douglas S. Forensic Authenticity Analyses of the Metadata in Re-Encoded WAV Files. *The Proceedings of the AES 54th International Conference - Audio Forensics: Techniques, Technologies and Practice*, London, UK, 2014 pp 77-84.

Koenig, Bruce E.; Lacey, Douglas S.; Reimond, Christina E. Selected Characteristics of MP3 Files Re-Encoded With Audio Editing Software. *Journal of Forensic Identification* 2014, 64(3), pp 304-321.

Koenig, Bruce E.; Lacey, Douglas S.; Grigoras, Catalin; Price, Suzana Galić; Smith, Jeff M. Evaluation of the Average DC Offset Values for Nine Small Digital Audio Recorders. *Journal of the Audio Engineering Society* 2013, 61(6), pp 439-448.

Koenig, Bruce E.; Lacey, Douglas S. Forensic Authenticity Analyses of the Header Data in Re-Encoded WMA Files from Small Olympus Audio Recorders. *Journal of the Audio Engineering Society* 2012, 60(4), pp 255-265.

Koenig, Bruce E.; Lacey, Douglas S.; Richards, Gerald B. Video Frame Comparisons in Digital Video Authenticity Analyses. *Journal of Forensic Identification* 2012, 62(2), pp 165-182; 62(3), p 189.

Lacey, Douglas S.; Koenig, Bruce E. Identification of Identical and Nearly-Identical Frames from a Lawmate PV-500 Digital Video-Audio Recorder. *Journal of Forensic Identification* 2012, 62(1), pp 36-46.

Koenig, Bruce E.; Lacey, Douglas S. An Inconclusive Digital Audio Authenticity Examination: A Unique Case. *Journal of Forensic Sciences* 2012, 57(1), pp 239-245.

Lacey, Douglas S.; Koenig, Bruce E. Audio Extraction from Silicor Technologies' Digital Video Recorder File Format. *Journal of Forensic Identification* 2010, 60(5), pp 573-588.

Koenig, Bruce E.; Lacey, Douglas S. Evaluation of Clipped Sample Restoration Software. *FBI's Forensic Science Communications* 2010, 12(2).

Koenig, Bruce E.; Lacey, Douglas S. Forensic Authentication of Digital Audio Recordings. *Journal of the Audio Engineering Society* 2009, 57(9), pp 662-695.

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- Koenig, Bruce E.; Lacey, Douglas S. Distinctiveness of Non-Standard VHS Head Parameters. *Journal of Forensic Identification* **2009**, 59(1), pp 97-126.
- Lacey, Douglas S.; Koenig, Bruce E. Identification of an Eccentricity in the Date/Time Metadata of a PAL MiniDV Recording. *Journal of Forensic Sciences* **2008**, 53(6), pp 1417-1423.
- Koenig, Bruce E.; Lacey, Douglas S.; Killion, Steven A. A Digital System for Imaging Bitter Patterns. *Journal of Forensic Identification* **2008**, 58(2), pp 238-264; 58(3), pp 281-282.
- Koenig, Bruce E.; Lacey, Douglas S. Audio Record and Playback Characteristics of Small Solid-State Recorders. *Journal of Forensic Identification* **2007**, 57(4), pp 582-598.
- Koenig, Bruce E.; Lacey, Douglas S.; Killion, Steven A. Forensic Enhancement of Digital Audio Recordings. *Journal of the Audio Engineering Society* **2007**, 55(5), pp 352-371.
- Marr, Kenneth W.; Koenig, Bruce E. Fundamental Frequency Analysis of a Metal Baseball Bat. *Forensic Science Communications* **2007**, 9(1).
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- Koenig, Bruce E.; Lacey, Douglas S.; Herold, Noel. Equipping the Modern Audio-Video Forensic Laboratory. *FBI's Forensic Science Communications* **2003**, 5(2).
- Koenig, Bruce E.; Hoffman, Shawn M.; Nakasone, Hirotaka; Beck, Steven D. Signal Convolution of Recorded Free-Field Gunshot Sounds. *Journal of the Audio Engineering Society* **1998**, 46(7/8), pp 634-653.
- Merrill, Steven B.; Koenig, Bruce E. Analysis of Hang-up Transients for the Same Model Telephone. *Journal of Forensic Identification* **1996**, 46(3), pp 294-321.
- Koenig, Bruce E.; Merrill, Steven B. Determination of the Frequency Characteristics of Filters. *Journal of Forensic Identification* **1995**, 45(1), pp 51-68.
- Koenig, Bruce E. Selected Topics in Forensic Voice Identification. *Crime Laboratory Digest* **1993**, 20(4), pp 78-81. Reprinted in *Methods and Metrics of Voice Communications* **1996**; B. G. Kanki; O. V. Prinzo, eds; Federal Aviation Administration, DOT/FAA/AM-96/10.
- Koenig, Bruce E. Frequency Measurement of Alternating Current. *Journal of Forensic Identification* **1992**, 42(5), pp 408-411.
- Koenig, Bruce E. Reel Periodicity Determinations in Authenticity Examinations. *Journal of Forensic Identification* **1992**, 42(3), pp 237-247.
- Koenig, Bruce E. Voiceprints - Believe It or Not. *Detective* **1991**, Spring/Summer issue, pp 8-11.

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- Koenig, Bruce E.; Ryan, James John, Jr. Diagonal Erase Head Marks - An Anomaly. *Journal of Forensic Identification* **1991**, 41(2), pp 96-101.
- Koenig, Bruce E. Tape Duplication Determination in Authenticity Examinations through Analysis of AC Frequencies. *FBI's Crime Laboratory Digest* **1990**, 17(4), pp 78-81.
- Koenig, Bruce E. Authentication of Forensic Audio Recordings. *Journal of the Audio Engineering Society* **1990**, 38(1/2), pp 3-33.
- Wallace, Albert Jr.; Koenig, Bruce E. An Introduction to Single Channel FFT Analysis. *FBI's Crime Laboratory Digest* **1989**, 16(2), pp 33-39.
- Koenig, Bruce E. Enhancement of Forensic Audio Recordings. *Journal of the Audio Engineering Society* **1988**, 36(11), pp 884-894. Reprinted in *Methods and Metrics of Voice Communications* **1996**; B. G. Kanki; O. V. Prinzo, eds; Federal Aviation Administration, DOT/FAA/AM-96/10.
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Updated 1/25/2015

RECENT EXPERT TESTIMONY OF BRUCE E. KOENIG

Number	Date	City	State	P**	Court	Judge	Court#	Defendant or Case	Exam*
396	1/22+23/15	Columbus	IN	CRT	Circuit	Stephen R. Heimann	03C01-1308-FD-4512	Donald R. Bailey	AU
395	11/17/14	Detroit	MI	CRT	Circuit	Daniel A. Hathaway	14-3105-01	Terrill Ian Hardaway	VI
394	10/04/14	Greensboro	NC	DEP	NC Ind Comm	Robert Harris	13-759003	Hill v. Hill Enterprise	AU
393	08/05/14	Salt Lake City	UT	HRG	District	Royal L. Hansen	111903200	Eugene Christopher Wright	VC
392	07/22/14	Chicago	IL	DEP	Fed Dist	Joan Humphrey Lefkow	12CV0771	Jones v. Union Pacific	AU
391	04/30/14	Marion	VA	CRT	Circuit	Deanis L. Simmons	CR13000296	Gary Wayne Brown	SA
390	03/25/14	North Haverhill	NH	CRT	Superior	Peter H. Bornstein	2013CR244	Parker C. Gilbert	MS
389	03/18/14	Chicago	IL	CVT	Circuit	Lorna E. Propes	10 L 1245	Cole v. Apex Material Hdlg.	IM
388	02/18/14	Wilkes-Barre	PA	HRG	Com Pleas	Michael T. Vough	46 of 2013	Daniel Loughnane	AU;VI;IM
387	01/23/14	Chattanooga	TN	HRG	Fed Dist	Harry S. Mattice, Jr.	1:12-CR-144	Terry Michael Honeycutt	AU
386	01/06/14	Kew Gardens	NY	HRG	Supreme	Charles S. Lopresto	2928/12	Ramon Villalta	AU
385	09/19/13	Chicago	IL	DEP	Circuit	Kathy M. Flanagan	10 L 1245	Cole v. Apex Material Hdlg.	IM
384	08/14+10/28/2013	Highland Hills	OH	HRG	Arbitration	Robert G. Stein	35032011072100220610	Jennette Wilch	VI
383	04/03/13	Sacramento	CA	DEP	Superior	Ira Kaufman	CV09-00205	CAL FIRE	EN
382	01/23/13	Markham	IL	CRT	Circuit	Michele M. Simmons	06CR-13932	Jerry Henderson	SA
381	01/10/13	Asheville	NC	DEP	Superior	Marvin P. Pope, Jr.	11CVS1888	Smith v. Biltmore Forest CC	VI
380	08/23/12	Portland	OR	CVT	Fed Dist	Michael W. Mosman	CV08-950-MO	Glenn v. Washington Co.	SA; MS
379	05/09/12	Chicago	IL	DEP	Circuit	Michael Panter	08 L 12028	Gallo v. Dominick's	VI; AU
378	05/02/12	Washington	DC	HRG	Superior	Danya A. Dayson	2012CPO791	Taye v. Ashine	SA; AU
377	2/28-29/12	Portland	OR	CVT	Circuit	Kelly Skye	1002-02743	Coultas v. Columbia Helicopters	SA
376	10/13/11	Sacramento	CA	DEP	Fed Dist	Kimberly J. Mueller	2:09:CV-02445	US v. Sierra Pacific Indust.	EN
375	09/29/11	Tampa	FL	CVT	Fed Dist	Virginia M. H. Covington	8:09-CV-02465	Hiscox v. Matrix Group	VI
374	06/02/11	Tampa	FL	DEP	Fed Dist	Virginia M. H. Covington	8:09-CV-02465	Hiscox v. Matrix Group	VI
373	02/15/11	Cambridge	MA	CVT	Prob/Family	Spencer M. Kagan	09D-2294-DV1	Kelso v. Kelso	VI
372	07/20/10	Orlando	FL	DEP	Circuit	Robert M. Evans	05-CA-001210	Dreggors v. Wausau	AU
371	06/08/10	Upper Marlboro	MD	CVT	Circuit	Michele D. Hottel	CAL09-09876	Charles Williamson v PG Co.	AU
370	04/20/10	Alexandria	VA	CRT	Fed Dist	Anthony J. Trenga	1:09CR477	Richard L. Rockett, Jr.	MS
369	11/06/09	Washington	DC	HRG	ICSID	World Bank Tribunal	ARB/06/08	Libananco v. Turkey	AU
368	11/03/09	New York	NY	CRT	Fed Dist	Deborah A. Batts	03-CR-987	Jorge Paredes-Cordova	VC
367	04/15/09	San Francisco	CA	DEP	Superior	Unassigned	1-01-CV801411	Jasmine v. Marvell	AU
366	03/13/09	Coushatta	LA	HRG	District	Lewis O. Sams	101993	Terrance Carter	VC; SA
365	08/19-20/08	Los Angeles	CA	CRT	Fed Dist	Dale S. Fischer	CR05-1046(F)	Pellicano & Christensen	AU
364	06/26/08	Chicago	IL	DEP	District	Susan E. Cox	07 C 0088	Plunk v. Elwood, IL	AU
363	04/23-24/08	Rockville	MD	CVT	Circuit	John W. Debelius, III	271993-V	Bigelow v. Garfinkel	EN;MS;IM;VC
362	04/14/08	Clifton	VA	DEP	Circuit	John W. Debelius, III	271993-V	Bigelow v. Garfinkel	IM
361	02/01/08	Washington	DC	DEP	Circuit	John W. Debelius, III	271993-V	Bigelow v. Garfinkel	EN;MS;VC
360	12/19/07	Raleigh	NC	HRG	Adm Hrg	Joe Webster	07 OSP 0135	Foard v NC Highway Patrol	VC; AU

Number	Date	City	State	P**	Court	Judge	Court#	Defendant or Case	Exam*
359	12/07/07	Baltimore	MD	DEP	Circuit	Not assigned	24-C-06-011972	Gray v. P/O Schneider	EN
358	09/13/07	New York	NY	DEP	Fed Dist	Michael M. Baylson	06-CV-1944	Harnelin v. Man Financial	AU
357	04/12/07	Standish	MI	CRT	Circuit	Thomas Evans	06-3175FH	Amy Susan Lynch, et al	AU; MS
356	08/24/06	Tucson	AZ	CVT	Superior	Charles V. Harrington	C 2004 4354	Curtis Est. v. Pima Co.	SA; VI; MS
355	08/22/06	Alexandria	VA	CRT	Fed Dist	James C. Cacheris	1:06-CR205	David A. Kaye	MS
354	07/24/06	Singapore	Disciplinary Trial			Three-Judge Panel	DC/SEC/09/2005	Law Soc. v. Phyllis Tan	AU
353	7/14+8/3/06	Tucson	AZ	DEP	Superior	Michael D. Alfred	C 2004 4354	Curtis v. Pima County	SA; DP
352	05/26/06	Chicago	IL	HRG	Circuit	Robert E. Gordon	00 L 12118	Yang v. Chen, M.D.	AU
351	02/27/06	Fort Lauderdale	FL	DEP	Circuit	Peter Weinstein	0316981CF10A	Claudio Muro	VI
350	02/17/06	Chicago	IL	HRG	Fed Dist	Matthew F. Kennelly	02 C 0372	Steven Manning v. U.S.	AU; MS
349	01/18/06	Chicago	IL	DEP	Fed Dist	Matthew F. Kennelly	02 C 0372	Steven Manning v. U.S.	AU; MS
348	11/11/04	Lumberton	NC	CVT	NLRB	Lawrence Cullen	11CA20241	NLRB v. Smithfield Packing	AU
347	07/16/04	Hartford	CT	HRG	Fed Dist	Alfred V. Covello	3:02CV722	Sever v. Glickman, et al	AU
346	05/25/04	Stamford	CT	DEP	Fed Dist	Alfred V. Covello	3:02CV722	Sever v. Glickman, et al	AU
345	05/20+27/04	Chicago	IL	DEP	Circuit	Lynn Egan	98L5560	Nguyen v. Allen, et al	AU
344	04/28/04	New York	NY	DEP	Fed Dist	Harold Baer, Jr.	02CIV5804	Palmer v. Goss, et al	AU; DP
343	09/05/03	Irvine	CA	HRG	Arb Board	3-Person Panel	N/A	Pac. Amer. Sec adv. McGee	AU
342	04/30/03	Newark	NJ	HRG	Arb Board	3-Person Panel	N/A	Harrison Owens	VC
341	03/05/03	Tacoma	WA	CRT	Superior	Lisa Worswick	01-1-03853-4	Daniel & Carol Carlson	AU; SA
340	02/27/03	Norfolk	VA	CVT	Fed Dist	Rebecca Beach Smith	4:01CV28	Crawford v. Deutsche Bank	AU; EN
339	01/28/03	Homerville	GA	CRT	Superior	Brooks E. Blitch III	01R-227	Carlos Wilcox	AU
338	01/17/03	Santa Ana	CA	CVT	Superior	Stephen J. Sundvoid	00CC0408	Fish v. Paul T. Locke, et al	AU; EN
337	01/17/03	Los Angeles	CA	CRT	Superior	Robert J. Perry	BA240291	Sean O'Donoghue	AU
336	01/08/03	Salisbury	MD	CRT	Circuit	D. William Simpson	22-K-02-0482	Timothy Matthew Voegeli	EN
335	07/01/02	Ocala	FL	DEP	Circuit	Victor J. Musleh	99-2264CPAW	Robert Francis Pitter	EN
334	06/26/01	Montpelier	VT	DEP	Superior	Matthew Katz	261-5-98WnCv	Dwyer v. Dwyer, et al	SA
333	05/21/01	Decatur	AL	CRT	Circuit	Steven E. Haddock	93-1308	Gary Wayne Drinkard	EN
332	05/16/01	Castle Rock	CO	CVT	District	Thomas J. Curry	98-JV-06	Children v. James Garner	SA; VI
331	12/13-14/00	Tampa	FL	HRG	Fed Dist	Mark A. Pizzo	99-324-T-23A	Steven & Marlene Aisenberg	EN; MS
330	11/27/00	Moscow	ID	CRT	District	John R. Stegner	CR-00-00260	Dale C. Shackelford	AU; SA; EN
329	11/17/00	Martinsville	IN	HRG	Superior	G. Thomas Gray	55D01-9607-CF158	Rusty A. Amonette	AU
328	11/01/00	Chattanooga	TN	HRG	Fed Dist	Curtis L. Collier	1-99-CR-71	Norman Sexton, et al	AU; C
327	10/19/00	Scranton	PA	HRG	Fed Dist	Thomas I. Vanaskie	96CV1362	Thomas Edward Schake	AU
326	10/03/00	New York	NY	HRG	Fed Dist	Shirley Wohl Kram	S3 99 Cr. 75	Roberto Beras	AU
325	09/12/00	Raleigh	NC	HRG	Co. Dist	Paul Gessner	96CVD-11317	Buckingham v Buckingham	AU; EN
324	09/07/00	Miami	FL	CRT	Fed Dist	Ursula Ungaro-Benages	99-797CR-UU	Patrick C. Latcham	AU
323	08/30/00	Flint	MI	CRT	Circuit	Archie L. Hayman	99-4968-FH	Donna Deborah Poplar	AU
322	07/19/00	Boise	ID	HRG	Med Board	Roger J. Hales	99-001	Charles W. Suits	AU
321	07/12/00	Alexandria	VA	DEP	Fed Dist	Edmund A. Sargus, Jr.	C2-99-387	Haney, etal v. Zwan, etal	AU
320	07/03/00	The Hague, Netherlands	U.N. International Criminal Tribunal	CRT		Richard May, et al.	IT-95-14/2-T	Dario Kordic, et al.	AU
319	06/05/00	Orlando	FL	HRG	Circuit	Margaret T. Waller	CR99-7123	Kerry Dreggers	AU
318	05/11/00	New City	NY	CRT	County	William Nelson	I118-99	Kenny Rogers	EN; SA; VC
317	04/24/00	Waco	TX	HRG	Fed Dist	Walter S. Smith	W96CA139	Andrade v. Chojnacki	SA; AU; VI
316	04/20/00	Washington	DC	DEP	Fed Dist	Walter S. Smith	W96CA139	Andrade v. Chojnacki	SA; AU; VI

Number	Date	City	State	P**	Court	Judge	Court#	Defendant or Case	Exam*
315	3/1+6/00	Covington	KY	CRT	Fed Dist	William Bertelsman	99-3-SSS	Antonio Burns, et al	EN
314	02/23/00	Bryson City	NC	CRT	Fed Dist	Lacy H. Thornburg	2-99CR84,86,87	Walter Samuel French	SA; EN
313	02/10/00	Denver	CO	DEP	Fed Dist	Edward Nottingham	94N-2782	Quigley v. ADL, etal	AU;EN;MS
312	02/03/00	Burley	ID	CRT	District	Monte B. Carlson	CR-99-00024*D	Charles Wesley Suits	AU; MS
311	02/01/00	Martinez	CA	CRT	Superior	Richard S. Flier	951806-9	Gaylan L. Burlison	AU
310	01/27/00	Portland	ME	CRT	Superior	Thomas E. Humphrey	CR-99-611	Deborah A. Hall	SA
309	01/18/00	Morgantown	WV	HRG	Circuit	Russell M. Clawges, Jr.	98-F-80	Roy Ben Helmick	AU
308	12/14/99	Washington	DC	CRT	Superior	Hiram E. Puig-Lugo	J1194-99	Lival Thompson	VC
307	11/15/99	Taylorville	IL	CRT	Circuit	Ronald Spears	99-CF-74	Brockley D. Jackson	AU
306	11/01+19/99	Brooklyn	NY	HRG	Supreme	Michael R. Juwiler	2893/98	Jermaine Archer	AU
305	09/13/99	Orlando	FL	CRT	Fed Dist	Patricia C. Fawcett	98-99-CR-ORL-19A	Sholam Weiss, et al	AU
304	09/01/99	Manassas	VA	HRG	Juvenile	James E. Robeson	J66173-01-00	Liboro v. Liboro	SA
303	08/19/99	Thomasville	GA	CRT	Superior	L. A. McConnell, Jr.	96-CR-17	Michael David Griffin	AU; DP
302	07/22/99	Miami	FL	CRT	Fed Dist	James Lawrence King	98-626-CR	Miguel D. Moya	AU
301	07/14/99	Fresno	CA	HRG	Admin	Leonard L. Scott	N1998080262	Robert Carl Kampf	AU
300	6/30-7/7/99	Washington	DC	HRG	Fed Dist	Stanley Sporkin	97CR485	Henry G. Cisneros	AU; EN
299	06/29/99	New York	NY	HRG	Fed Dist	Leonard B. Sand	96CR1032	Joseph Pignatiello	AU
298	06/01/99	Castle Rock	CO	CRT	District	Thomas J. Curry	98CR30	James Alan Garner	SA; VI
297	05/04/99	Martinez	CA	HRG	Superior	Richard S. Flier	956801-9	Gaylan L. Burlison	AU
296	04/20/99	Albany	VA	CRT	Superior	Loring A. Gray, Jr.	93R-1111	Leronis Walker	EN; SA
295	03/29/99	Hampton	GA	HRG	Circuit	Christopher W. Hutton	CR98-1466	Jay M. Brocks, et al	VI
294	3/3,4+4/8/99	Washington	DC	CVT	Fed Dist	John Garrett Penn	80-3227	Griffin, et al v. USA	EN
293	02/24/99	New Smyrna Beach	FL	CVT	Circuit	Edwin P. B. Sanders	93-10020	Kemp v. Volusia Co., et al	AU
292	11/17/98	Los Angeles	CA	CRT	Fed Dist	Terry J. Hatter, Jr.	CR 98-138	Efren Tinoco	EN
291	11/06/98	Houston	TX	HRG	Fed Dist	Vanessa D. Gilmore	CR H-95-125	Janadruck K. Drones	VC
290	10/30/98	Lexington	KY	DEP	Fed Dist	Henry Wilhoit	97-189	Snowden v. Lexmark, etal	VI
289	10/08/98	Washington	DC	GRJ	Fed Dist	Norma Holloway Johnson	97-2	William J. Clinton, et al	AU
288	10/05/98	Washington	DC	DEP	Fed Dist	John Garrett Penn	80-3227	Griffin, et al v. U.S.	EN; MS
287	08/19/98	Chicago	IL	CRT	Fed Dist	Blanche M. Manning	96-CR-762	Michael D. Andreas, etal	AU
286	04/27/98	White Plains	NY	CRT	Fed Dist	Barrington D. Parker, Jr.	5197CR211	Robert W. Uirich	AU; EN
285	4/13-14/98	Boston	MA	HRG	Fed Dist	Robert E. Keeton	96-10047	Samuel Patrick	AU; VC
284	03/23/98	Holidayberg	PA	HRG	Com Pleas	Norman D. Callan	97CR-1767	David L. Campbell	VC
283	03/02/98	White Plains	NY	CRT	Superior	Kenneth H. Lange	96-1401	Gjelosh Rukaj	SA
282	01/13/98	Springfield	MA	CRT	Fed Dist	Michael A. Ponsor	CRN96-30054	Kristen Gilbert	VC; EN
281	01/12/98	Springfield	MA	HRG	Fed Dist	Michael A. Ponsor	CRN96-30054	Kristen Gilbert	VC; EN
280	10/01/97	Columbus	OH	CRT	Fed Dist	John D. Holschuh	CR-2-96-15	Peter Kevin Langan	AU; DP
279	09/23/97	Albany	GA	HRG	Superior	Herbert Philips	94R-639	Marcus Ray Johnson	AU
278	08/22/97	Mount Vernon	IL	DEP	Circuit	Pat Hitpas	95-L-128	Quandt v. Dewey	VC
277	08/13/97	Ukiah	CA	CRT	Superior	John J. Golden	C12632	Eugene Allon Lincoln	SA
276	07/24/97	Ellicott City	MD	HRG	Circuit	Diane Leasure	11361	Brian Jordan	AU
275	06/06/97	Guthrie Center	IA	CRT	Magistrate	Martin Fisher	SMAC009025	James Griffith	VC
274	2/27-28/97	Ukiah	CA	HRG	Superior	John J. Golden	C12632	Eugene Allon Lincoln	SA

* Examination: AU=Authenticity; EN=Audio Enhancement; IM=Image Analysis; MS=Miscellaneous; SA=Signal Analysis; VI=Video; VC=Voice Comparison
** Proceeding: CVT=Civil Trial; CTM=Court-Martial; CRT=Criminal Trial; DEP=Deposition; GRJ=Grand Jury; HRG=Hearing