

The Eye in the Sky

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The Eye in the Sky:

Digital Closed Circuit TV Security Systems, Seen or Obscene

By Edward J Primeau

Remember the 1970's song by The Alan Parsons Project, "The Eye in the Sky"? The lyrics were, "I am the Eye in the sky looking at you; I can read your mind". Perhaps with today's digital technology, reviewing citizen's actions, body language and local circumstances, we may not be far behind his lyrics.

Have you ever walked down a city street and noticed video cameras on the top of light posts and telephone poles?

Why on earth would anybody want to see that city street let alone **you** walking down that street? Are public cameras an invasion of privacy or are they "The Eye in the Sky" making adjustments to extraneous elements while making your life easier or are they an invasion of privacy?

Either way, video cameras in public places have become a way of life and you better get use to them because, well just because.

They are part of a closed circuit (instead of broadcast) digital video system that has the capability to control your life by regulating extraneous conditions of a given environment around the clock while controlling crime.

That digital video you see literally everywhere is a part of a system known as a closed circuit television system (CCTV) and helps keep our busy world safe and hassle free-well at least in theory.

A city CCTV system is a huge network of cameras, computers and cable that can regulate traffic signals, alert police to automobile accidents, deter crime, solve crime and even save lives.

Indoors, those same camera systems do similar activity as well as many others like keep baby's safe in hospital nursery's and monitor critical care units.

The city of Denver Colorado has the most intricate, complicated and largest CCTV system in place in its downtown district. Hundreds of closed circuit cameras in dozens of municipal locations both indoor and outdoor all connected to a very large computer system that can be monitored in many different locations. Eventually, it is this author's belief that with in five years, every major city across America will have a surveillance system similar to Denver's in place. This is the major digital

video application.

There are two formats for Closed Circuit TV security systems (CCTV) for smaller business applications. They operate similar to the big city wide systems and all have cameras, computers and cabling. One type is a digital system which incorporates a computer (DVR or digital video recorder) as it's recording device and the other is analogue which incorporates an analogue video recorder or VCR. Both serve the business owner by recording events in their businesses while they are closed after hours or while their backs are turned during business hours.

Both formats are capable to record multiple camera views onto their system and store them for later viewing, reviewing or in the case of a crime committed, identifying criminals.

Multiple cameras can be installed at a large or small location and viewed as well as recorded simultaneously on both formats. Analog incorporating multiplexers that switch camera perspectives, digital incorporates software programs that function similarly. The more sophisticated systems like the ones Indianapolis manufacturer Pelco carries, and has in place in Denver, have many adjustments, settings, frame options and video export options as well as signal routing features. The lower end VHS systems are pretty straight forward and easy to operate but have less features and options but can still guard a business like the more sophisticated ones.

Both systems can incorporate point, tilt and zoom cameras or steady non moving static view cameras. The point tilt zoom cameras (PTZ) can move to follow action both automatically and manually. Non moving cameras capture the area under security in a stationary fashion.

The advantage of digital systems is that the quality is far superior to analogue (especially when images must be retrieved for identification purposes). Digital formats and compressions make the recorded files smaller so more of the video will fit for longer periods of time in the computer or DVR. Tape or analogue systems have limited storage capacity and need to have new tapes inserted which can be costly especially when a tape becomes worn and a crime scene is not recoverable.

Digital video systems use a process called compression which reduces the file size of high quality digital video and can be burned and backed up onto a CD Rom right in the DVR of the CCTV system. Once these files

have been identified and isolated, they can be kept forever until deleted.

I have worked as a video forensic expert on cases where analogue video was entered as evidence on time lapse VHS tape that has been recycled many times. The examination and authentication process is much different and more difficult for analogue than it is for digital. I am expected to produce a high quality image of the crime for the court from a worn out pixelated low resolution analogue tape.

When you factor how much it could cost to recover from the crime, pay a forensic expert to try and recover an image, purchasing a digital CCTV system is a much better investment and will produce better forensic results.

Once a crime has been committed and caught on a digital recording device (DVR), a back up digital video can immediately be made of the crime using digital video technology. This back up often called "book marking" or "Alarm File" is immediately taken out of the normal refresh cue and stored in a safe area for further forensic examination.

What could a court do with an analogue video surveillance tape? Make copies for all parties with generation loss? Factor in the video tape has been used for 18 months on a one month recycle process? Try to lift a frame of video off the tape and compare it to a frame of digital video?

There is no comparison. The digital video proves time and time again a much clearer image.

Here are some suggested maintenance tips for both Analogue and Digital CCTV security systems:

Clean your camera lenses and weather proof housings monthly. Outdoor cameras and weatherproof housings can become especially dirty and be moved by birds, weather and other unexpected elements. Housings have seals that can become worn out and break to let in vapor that can blur video images.

Test your digital or analogue recorder monthly to assure all cameras look good and are pointed at the appropriate areas and replace any poorly functioning cameras or recording equipment. Clean the tape heads of your analogue video record deck with a head cleaner that can be purchased from Radio Shack or on line from many vendors that still carry analogue head cleaning tapes. In addition, demagnetize your analogue video recorder tape heads. This will remove magnetic build up that can cause poor record quality.

Defragment your digital video recorder regularly like you do your computer so your digital system has the available space to function properly and provide a clear clean image.

Next time you walk down the street and see a camera on top of a light pole, or visit a business and see the cameras on the wall, feel good about them because they have the potential of saving you some time when traffic becomes congested. They can also save a life when a baby's vital signs become out of range or deter crime when a crime might have been committed.

Now I hope you have a better understanding of the perplexity and complexity of CCTV systems. The Eye in the Sky has become a way of life. Look for them when you cruise the streets of any major city. Feel free to contact me with any questions or concerns.

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Curriculum Vitae



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Since 1984, I have concentrated on diverse set of skills acquired within the audio visual field as an audio engineer, video director and producer, and have a strong background in audio video production on various editing formats and systems.

In 1979, I began as an apprentice audio engineer and was trained to record and edit spoken word recordings such as training tapes and audio books. I remained a dialog editor using razor blade editing as the only form of audio editing available back then. I used my audio perception (not visual perception which is how audio editing is executed today) to match voice tone and levels as well as create smooth content and flow for these products.

That apprenticeship led me to becoming a full time audio engineer for nearly 8 years. In 1986 I left Ambience Recordings where I completed my apprenticeship and worked as a full time audio engineer and began to work for my part time business Primeau Productions.

I attended the University of Detroit from 1979 to 1985 with my major in communication studies and a minor in criminal justice. While at the University, I was a volunteer probation officer for the 53rd district court in Troy Michigan under judge Drewery.

Since then, I have completed dozens of audio and video evidence based cases for many courts and attorneys across the United States. I have authored several articles that have been published by LEVA, NSA, TASA, and Midwest Meetings. I authored the book "The Art of Production" as well as the E Book "The Video Revolution".

I am a member of AES, ACFE, IAI, and NSA.. I earned a merit award in 1993 from the Michigan chapter of The National Academy of Television Arts and Sciences for sound restoration on an NBC show "Peter and the Wolf".

I help courts and law enforcement agencies understand the science and technology of voice identification. We all have distinctive characteristics to our voice and words as well as how we pronounce those words. Each of us has a unique nasal cavity, larynx, teeth, tongue, and mouth. These distinct characteristics all come together and create a unique sounding voice that can be examined and analyzed using computer software and auditory perception to determine if voices in question are from the same person.

My philosophy is that forensics examination and restoration of audio/video media ideally combines art as well as science. The methods that an expert uses require attention to detail and scientific principles, complemented by an appreciation for clarity and aesthetics. My techniques are derived from both formal education and application of skills gained by working in many forensics situations.

To present a few milestones: I have provided audio restoration of informant wire recordings that served as key evidence in convictions involving two Detroit area judges. In the course of my career, I have completed dozens of forensics-focused assignments for attorneys throughout the United States.

- 1979-1985: University of Detroit (Communications major, Criminal Justice minor)
- 1978-1981: Probation officer, 52nd District Court, Troy, Michigan

- 1980-1988: Ambience Recording Studio, audio engineer/national sales manager
- 1984-present: Primeau Productions, Inc., President; focusing on marketing videos for professional speakers, audio/video editing, convention/conference production
- 1996-present: TASA audio and video identification/restoration/authentication expert
- 2006-Member of International Association for Identification
- 2005 Member Audio Engineering Society
- 2006 Member American College of Forensic Examiners
- 1998-1999: National Speakers Association of Michigan, President
- 2000-present: Member of Law Enforcement/Emergency Services Video Association (LEVA)
- Certified Digital Video Expert at Pelco Global Training Institute
- Member American Society of Information
- ASI (SIG) Visual Image and Sound
- Established expert with acetate and vinyl restoration – Primeau Productions, Inc.
- Hundreds of spoken-word recordings analyzed, clarified and/or restored using computer technology and visual examination of audio and videotape
- Experienced in court testimony and pre-trial preparation of counsel
- Published author, audio and video forensics articles (LEVA, National Speakers Association)
- Author of the book "The Art of Production"
- Resource Audio and Video Forensics for *Dateline NBC*.
- Appointed to the Office of Drug Control Policy of the State of Michigan under State Drug Czar

AUDIO FORENSIC SERVICES*

- Background noise removal/sound clarification
- Voice identification
- Audio recording authentication
- Micro cassette transfers to any format audio
- Audio conversion to compact disc
- Courtroom Testimony

VIDEO FORENSIC SERVICES*

- Video Authentication and restoration
- Video image clarification
- Frame capture from video
- Video conversion to DVD
- CD ROM and DVD design and programming
- Courtroom Testimony

***Any and all formats of audio and video accepted**

The following is a partial list of cases I have worked on and/or testified in.

1. William Richmond
121 2nd St.
Beckley, WV 25801

Beckley Steel Inc.

Ex-employee recorded conversations of Beckley Steel management with employee. I analyzed recordings on behalf of plaintiff Beckley Steel and was deposed via the telephone. The case never went to court.

2. DiGiacomo & Baffa
16th Floor
1601 Market Street
Philadelphia, PA 19103

Fitzgerald v. Skobeloff

I represented the plaintiff with counsel DiGiacomo in a medial malpractice suit against a doctor (Skobeloff) and hospital. The case involved a phone answering machine tape erasure - accidentally erased by court reporter. I confirmed the erasure and explained the information could not be recovered. **I testified in this case in Delaware County, Pennsylvania.**

3. Camile Conway
Pugh, Jones & Johnson
180 N. LaSalle St.
Suite 2910
Chicago, IL 60601

This was the well-publicized Chicago nightclub stampede disaster that made national news. I was retained by the city attorney of Chicago to examine a nightclub's digital surveillance system. The system had been tampered with and the original footage was not available to examine.

Several people were trampled while trying to evacuate a nightclub on Michigan Avenue. The surveillance system incorporated a digital video

recorder. One of the owners was behind the accidental erasure of all video evidence.

4. Patrick Coolihan
Coolihan, DeMeo & Beard, P.C.
1900 Spring Rd., Suite 508
Oak Brook, IL 60523

People of the State of Illinois v. Michael Hay:

I represented the defendant as a video expert. A CCTV video tape of a (jewelry store) robbery was provided and I captured some frames from the surveillance video and clarified them. I then made several prints of the captured video frames and sent the prints and video files (on a CD). **I testified to my findings in the DuPage County courthouse, 1900 Spring Rd., Oak Brook, IL 60523.**

5. Mark Bendure
Bendure & Thomas
577 E. Larned, Suite 210
Detroit, MI 48226

The Judicial Tenure Commission v. Ferrara

I represented the defendant, Judge Ferrara, with counsel Mark Bendure. My responsibilities included voice identification and examining the tapes for tampering. The Executive Director, Allen Sobel, represented the JTC. I testified in this case here in Detroit in front of the Judicial Tenure Commission.

6. Jeff Ogren
Bochetto & Lentz
1524 Locust St.
Philadelphia, PA 19102
Michigan Public Service Commission

Knox v. Pathfinders

I represented the defense, Pathfinders, with Counsel Jeff Ogren. My responsibilities included determining if a third-party verification recording had been tampered with and if the caller's voice matched the defendants. **I testified in front of Judge Goldstein and the Michigan Public Service Commission.**

7. Deborah Marik

Newton Falls, Ohio, Circuit Court

Clark and Langley v. Patrick Layshock

I represented the plaintiff with Counsel Deborah Marik. My responsibilities were to determine whether the (8) audio tapes submitted to me were intercepted phone calls; determine how these calls were made; were they tapes made by anyone involved in the conversations and were the police involved in making the recordings. I was deposed in Michigan for this Ohio case.

8. Margolis Edelstein

1500 Grant Building

Pittsburgh, PA 15219-2203

(412) 281-4256

David Brinker v. Municipality of Marysville

I represented the Municipality of Marysville to analyze general police department tapes for authenticity and possible alteration. I testified via deposition. I was hired by the police department in Marysville, Pennsylvania.

9. Charles McKinney

Columbus, Oh

People of Ohio v. Wendell Jackson

This is a criminal case I testified in where a CI made audio cassette recordings of a police officer during business transactions. He tried to entrap the officer with receiving stolen merchandise. I examined the cassette recordings, **testified in court in Columbus, Ohio** for this criminal case and determined that they could not be authenticated. We won the case which went on to a civil case I also testified in.

10. Michael Gorte

Bay City, Michigan

989-894-670

People v. Edward Murray

In this case, I examined an answering machine recording and compared the voice of the accused with the voice on the evidence recording. This was a parole violation matter. I examined the answering machine and recording under the supervision of the Sheriff's Department as well as the prosecuting attorney. **I testified in court 10/14/05.**

11. Ron Snyder
Columbus, Ohio
614-461-4455
State of Ohio v Wendell Jackson

This is the civil case as described above held in City Hall in Columbus Ohio. **I testified** on behalf of Wendell Jackson, the plaintiff on March 29th 2006.

12. Steven Potter
Auburn Hills Michigan
248-377-1700
(Contact Misty)
Haddad v Indiana Pacers

I was the video expert for the defense, the Indiana Pacers, during this one week trial, took the stand once to explain the video evidence I had assembled from all network sources, including ESPN, Fox Midwest and WB20.

The jury returned a not guilty verdict on behalf of the Pacers.

13. Garry Weiss
Merrillville, Indiana
219-736-5297
State of Indiana V. Wesley English

This is a criminal case in the Circuit Court of Lake County in front of Judge Thomas Stefandaker Jr. I was retained by the defense to prove to the court that video evidence submitted was not reliable as video evidence and should not be used in the trial.

14. U.S. Gold and Diamonds vs. JKD Diamond Brokers.
Dianne Marx
Dayton Ohio
937-222-2500.

This case is in Federal Court in Dayton Ohio November 3rd, 2008. It involves my examination of a Integral Technologies digital video CCTV

system examination and authentication of video evidence and the operational characteristics of the system itself.
The Software is version 4.0. Integral Technologies was sold to Pelco December of 07 and is now known as Pelco; Global Leaders in Security Systems.

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