

Videography Techniques

for the Incident Scene Investigator

Presented by: *Imprimus Forensic Services, LLC*
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Incident Scene Videography

Produced by
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General Considerations

Policy Statement

Once an agency has made the decision to implement video into its scene documentation procedures, a written SOP should be established to identify

- Appropriate scene usage
- Appropriate procedures
- Require proficiency and training
- Steps for video preservation & storage
- Procedure for video disposal
- Procedure for digital video transfer

There is a suggested equipment list at the end of this section.

Video applications in law enforcement settings are becoming commonplace. As video equipment improves in quality, becomes more affordable and portable, police agencies are adapting this equipment to a wide variety of applications. Examples include:

- WEB PREVIEW**
- Crime Scenes
 - Accident Scenes
 - Suspect Interviews & Statements
 - Training
 - Warrant Executions
 - S.W.A.T. Operations
 - Overt & Covert Surveillance
 - Squad Car Video

In all of the instances listed above, any agency looking to integrate video into its operations should give careful consideration to the type and quality of the equipment purchased. A department may “make do” with budget purchases, but in the long run this equipment may end up not being utilized because it does not meet the department’s needs. Quality equipment will be more versatile, rugged and provide a high quality end product that is crucial in a law enforcement environment.

Video Formats

The various video formats available are as follows:

- VHS
- VHS-C
- S-VHS
- 8mm
- Digital 8
- Mini DV
- Mini DVD
- SD Card / HDD
- Hi-8mm

Of the formats listed, cameras that record to SD cards (video & DSLR) are the most common and the only real consideration for agency use today. Video is recorded in a digital format that

Other forms of auxiliary lighting may be available (e.g. lights from fire department rigs), but it may not be possible to position these for the best lighting of the scene. These types of lights cannot also readily move with the technician. Even if they are used, they will create harsh shadows that need to be softened by a light on the camera.

- ✓ Buy a high quality LED light with a dimmer that can control the light output. Include a daylight balancing attachment and a diffuser screen. Be sure to purchase at least one extra battery.
- ✓ Lights that can use standard AA batteries for power are a good bet as a backup source but they will not equal the light output of a light designed for use with rechargeable batteries.

Power

Police agencies generally do not have the luxury of deciding when and where their video is going to be shot. And unlike media professionals who use their equipment on a daily basis, an agency's video camera may sit for weeks or even months before it is used. When the camera is needed, it must be ready to go on a moment's notice, and that requires fully charged batteries!

One advantage of using a DSLR for recording video is the fact that camera multiple camera batteries should be readily available and charges. Because these batteries are used on a more frequent basis, bad batteries will be identified and replaced more quickly.

Battery Tips

- ✓ Have batteries available that can power your equipment for 2 to 3 times the expected run time.
- ✓ Choose batteries and a charging unit that will keep the batteries fully charged and ready to use.
- ✓ Mark batteries with their purchase date and evaluate their condition at least every two years.
- ✓ Do not drop batteries or place them with their terminals exposed into a bag or pocket with loose metal items.
- ✓ Batteries should not get hot while charging. If they are warm after discharging let them cool before recharging.
- ✓ Unless the battery is being left in the camera for charging purposes, do not store the camera with the battery attached.
- ✓ Include extra batteries for your light.
- ✓ Purchase at least one extra charger so a minimum of two batteries can be kept ready to go.

There are four types of batteries available to power video/lighting equipment

- Lead Acid / Gel Cell

- Ni-Cad
- NMh (Nickel Metalhydride)
- Lithium Ion

Lead Acid / Gel Cell

This type of power supply is generally not recommended for crime scene use. Disadvantages of these batteries include:

- Heavy weight - These batteries have the lowest power to weight ratio of the types listed
- Constantly declining voltage output- This will cause the video light to get progressively dimmer causing a shift in light color. If running a camera, the camera will shut off once the power level of the battery drops below the operating voltage of the camera

Advantages of this type of power source include:

- Low Cost – This is the cheapest type of power available
- Available Power – These batteries can be left on a trickle charge system so they are always ready to use.

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Ni-Cad

These batteries should be the starting point for an agency looking for a portable power supply. Advantages for these types of cells include

- Lighter Weight – These batteries will provide more power with less weight than lead acid cells.
- Flat Voltage Output Curve – Ni-Cad batteries will put out a constant voltage for almost the entire discharge cycle. This will keep a light source at a constant brightness and keep the video camera from shutting down prematurely.
- Moderate Cost – While more expensive than lead acid cells, Ni-cad power packs are reasonably priced.
- Longer life expectancy than NiMh and Li-Ion batteries¹

Disadvantages of these cells are:

- Easily Damaged by Overcharging – Most manufacturers provide chargers for these batteries that require removing the battery after it is fully charged. If the battery is left on the charger damage will result. Trickle charging units may be available from the manufacturer or secondary sources but these will add to the cost of the system.
- Self-Discharging – Ni-Cad batteries will self discharge over a relatively short period of time once they are removed from a charger. This discharge rate may

¹ Buchmann, Isidor “Batteries in a Portable World.” 2001. <http://www.buchmann.ca/article9-page2.asp>

- Overcharge Protection – Li-Ion batteries and their chargers are designed to protect the battery from over charging. Li-Ion batteries can be left on the charger.
- Li-Ion batteries have the flattest discharge curve of all battery types. This means that they will do the best job at delivering a constant voltage to equipment for the duration of the charge.

Disadvantages of these batteries include:

- Cost – These are the most costly of the power sources available, particularly in a battery pack or battery belt configuration.
- Short Life Cycle – Li-Ion batteries will exhibit shorter life cycles (replace after two years) especially when kept in a fully charged condition.⁶

Technical Tip

With today's cameras and LED lighting systems, all should be powered by lithium ion batteries.

Audio

Depending on the shooting situation, the video camera operator may or may not want to record audio.

Recording audio is not recommended for general crime scene and surveillance work. Unwanted comments and conversations between investigators at the scene or the camera operator and his /her assistant will be recorded if the audio is not disabled. If the video camera has a removable microphone, keep the mic off the camera unless audio is needed. If the camera has a built in microphone, use an audio “knock out” plug to disable the audio. When audio is needed for surveillance, a wireless microphone will typically be used.

Warrant execution, active fire scenes and interviews/interrogations are situations where audio will be needed. Warrants and fire scenes will require a mic on the camera. A zoom type microphone will do a better job of recording voices and sounds away from the camera. When outdoors, a wind cover over the mic will cut down on wind noise.



Example of a camera mountable zoom microphone along with a foam cover to reduce wind noise.

⁶ Buchmann, /article9-page3.asp

Getting Started

Prior to shooting video of any scene, the camera operator should follow this checklist:

- Prepare the tape (tape based cameras only)
- Determine audio needs
- Determine focusing and exposure needs
- If needed, manually set the white balance
- Check the accuracy of the date and time stamp
- Check the cleanliness of the lens
- Run a test record for several seconds then playback the tape to verify that the camera is recording properly (tape based cameras only)
- Complete a scene walkthrough and plan the videotaping

Preparing a Video Tape (tape based cameras only)

A fresh tape should be used for each shooting situation. Do not re-use tapes from previous incidents. Once a tape is no longer needed as evidence it should be destroyed.

✓ Never leave tapes exposed to heat, bright sunlight, extreme cold, dirty or wet environments
✓ If a tape based camera is being used to record an interview, make certain that enough tapes are on hand to cover a significant time period.

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Prior to using any videotape two steps are necessary to prepare the tape:

- First, after opening a new tape, the tape needs to be labeled. There are three steps that should be used:
 1. Carbide scribe used to scribe the case
 2. Adhesive labels that accompany the tape
- Second, the tape should be placed into the camera, fast forwarded and then rewound. This process is called “packing the tape”. Doing this will even out the tension on the tape and help keep it from jamming or breaking. This process will also knock loose excess oxide particles that may be present on the tape. These particles can cause the video heads to get clogged. Evening out the tape tension and keeping the heads clean will result in better video.

SD Cards and Expected Run Times

The table below is provided by SanDisk Memory devices as a guide to how much video of various types can be stored on different size SD cards.

*GB cards will provide sufficient storage space for most crime scene videos. 64GB cards or larger should be kept available for dynamic video situations such as public demonstrations or interviews.

Considerations & Problems

There are several basic considerations and techniques that need to be applied to produce a professional looking videotape. Prosecutors will not want to introduce poor quality videotape as evidence.

Video situations will typically fall into one of two categories:

- Controlled Action
- Uncontrolled Action

Controlled Action

Controlled action video is a situation where the videographer has complete control over the subject as well as how the video is recorded. Generally the videographer does not have to worry about sudden changes in the recording environment. Examples of controlled action include:

- Crime Scenes
- Search Warrants (static environment)
- Victim / Witness / Suspect Interviews

Uncontrolled Action

Uncontrolled action situations are dynamic environments where the videographer is likely to have little or no control over the shooting environment. Examples include:

- Search & Arrest Warrants (dynamic)
- In Progress Fire Scenes
- Public Demonstrations

Because the camera operator has complete control over what is happening (and the viewer will recognize this) controlled action video will demand proper application of videography technique.

There are several specific techniques that the camera operator can utilize to produce a professional looking video. In general, the video operator will want to capture video in a manner that closely follows the way that the human eye would view a scene. To do this the operator should employ:

- Proper “panning” (side to side camera movement)
- Proper “tilt” (up and down camera movement)
- Continuity of images
- Proper linkage of sequences
- Smooth camera movement
- Taping from a normal viewing angle

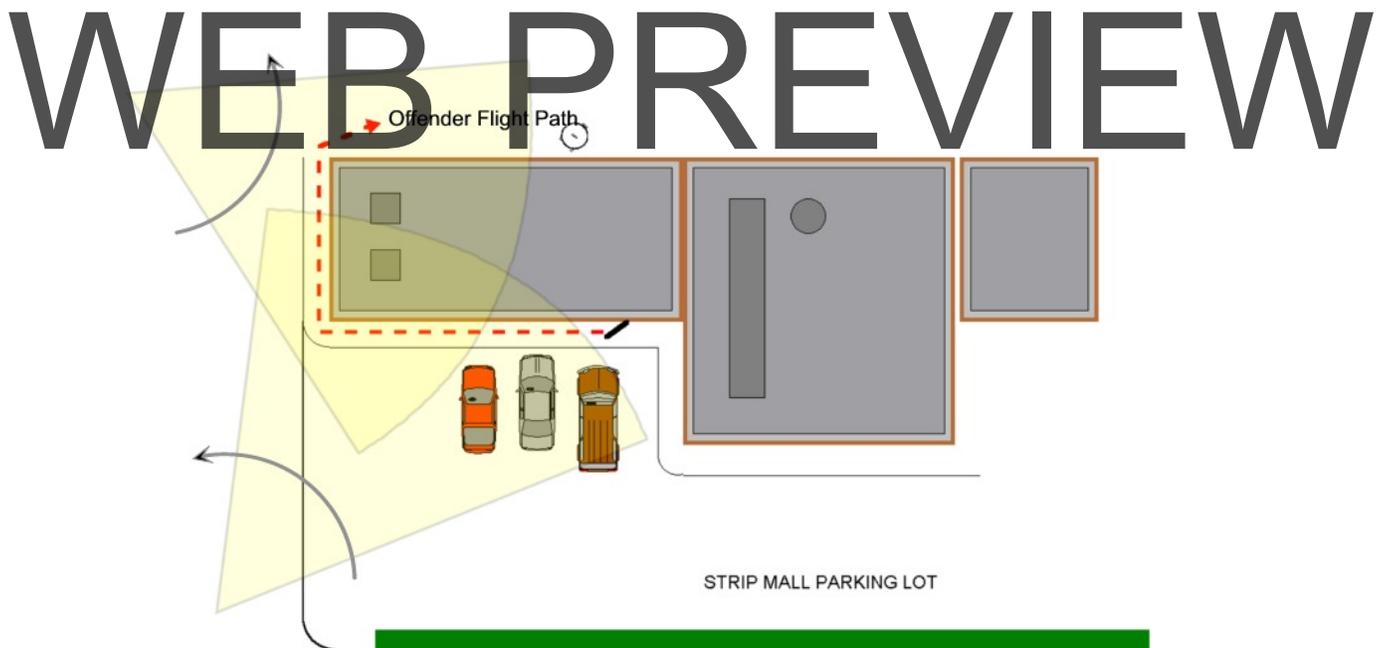
The camera operator should also avoid these common errors:

- Excessive use of the zoom
- Unnecessary items and persons in the video tape
- Exposure problems caused by backlighting

Panning

The term “pan” or “panning” refers to the side-to-side movement of the camera across a scene. Because we read from left to right, the general rule for completing a pan is that the camera movement should be from left to right. This movement holds to the idea that videotape should be shot in a manner that replicates the action of the eye. There are three exceptions to this general rule:

1. When both fixed and moveable objects of interest exist in the scene, pan from fixed to moveable
2. If the operator is documenting the movement of persons or objects involved in the incident
3. When continuity of the video image and the scene layout require panning from right to left as shown below where the pan follows the action (flight path) of the offender



At the beginning and the end of a pan shot the camera should remain stationary long enough for the viewer to understand what they are seeing. A minimum of four seconds of video should be shot before the pan movement is started and after the pan movement ends. Additionally, the camera operator must remember to pan slow enough to give the viewer time to absorb the information that is being recorded on the tape.

General Requirements

Various video applications have different procedural requirements for taping, however all will require:

- Identifying card at the beginning
- “End of video” card at the end of the recorded video
- Written documentation for
 1. Length of video(s) / number of tapes (report or log sheet)
 2. Duplication and distribution of copies
 3. Evidence inventory and chain of custody

Crime Scenes

Crime scene videography is not unlike crime scene photography in terms of what is needed to produce a crime scene video that is acceptable in court. Specific requirements include:

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- A fair and accurate representation of the scene
 - No extraneous objects or persons in the video
 - Video shot from a normal viewing angle
 - Appropriate application of professional videography techniques
 - Identifying shots establishing the location / subject matter being recorded
 - Overall, midrange and close-up shots where applicable
 - Identifying slate cards at the beginning and end of the tape, as well as any time there is a change in location or a significant time gap in the recording

Just as with still photography, crime scene video should progress from the general to the specific.

Other requirements for crime scene video include:

- No audio – the camera mic should be removed, turned off, or disabled through the use of an “audio knock out plug”
- If appropriate, the white balance level of the camera should be adjusted to provide accurate color rendition
- Generally the use of the date and time stamp is not recommended. Individual agencies will want to get an opinion on this from their prosecutor

Using video to document the removal of vehicles from the scene in cases of serious and fatal accidents can be beneficial to the accident reconstructionist. The video will help to identify marks and damage to the roadway that occurs as a result of the removal.

Interrogations / Confessions

Practices surrounding the use of video/audio recording to document suspect statements and/or interrogations vary widely. Not all states have laws requiring that video be used for this purpose.⁷ There are however many individuals that are advocating the use of video and pushing for laws to mandate video recordings. There are pros and cons to both sides of the issue.

Benefits

- Increased credibility for investigators
- Defendant less likely to recant confession
- Documents visual cues such as body language of defendant
- Can raise the quality of an investigator's interrogation

Drawbacks

- Interrogation may end without confession being obtained – defendant still charged
- Documented incidents of innocent arrestees providing video recorded statements
- Suspects and investigators may not behave naturally in front of a camera
- Investigators may not be as aggressive in the interrogation
- Confessions obtained without the use of video may be suppressed
- Recording an interrogation can be a lengthy process
- Determining when a witness becomes a suspect

If an agency decides that interrogations and/or statements are to be video recorded, several processes should be followed:

- ✓ Test your equipment before starting the interview to make certain that it is working properly
- ✓ Obtain a statement in writing. Use the video as a supplement to the written statement
- ✓ Record the entire process, stopping only to change tapes, SD cards or DVR disks
- ✓ Use the date and time stamp – be certain it is correct
- ✓ In the case of interrogations, consider using a tape deck separate from the camera to make the recording. These decks can be set to an EP (extended play) mode that will allow for a longer uninterrupted recording
- ✓ Stop the interrogation/interview process if the video media need to be changed or if equipment malfunctions

⁷ IACP Training Key #516. "Videotaping Interrogations and Confessions." (Alexandria, VA: International Association of Chiefs of Police. 1999)

- ✓ Have a sufficient supply of video media and back-up equipment ready to go
- ✓ Do not use the microphone of the camera. Have god quality external microphones available
- ✓ Monitor the audio. To be used in court the voices on the video will need to be clear and identifiable
- ✓ If local laws mandate the video recording of certain interrogations and interviews, be familiar with the law and any specific requirements for the taping

Warrant Service

Arrest and search warrant executions are high-risk situations that pose special problems if a videographer is being bought along as part of the entry team. The videographer will not be in a position to adequately protect themselves as their attention will be focused on operating the camera. Each individual agency will have to make a decision as to how adequately they can provide for the safety of the video operator.

After a warrant has been executed, video is an easy method to use for documenting the condition of the premises after the search or arrest to protect the agency against claims of excessive damage.

Tips for warrants include:

- WEB PREVIEW
- ✓ If video is used as part of a dynamic entry, the date and time stamp should be used as well as audio
 - ✓ If the video is used to document the condition of the scene after the warrant, use the date and time stamp; do not use audio
 - ✓ If the video is used to document criminal activity found as a result of the search (crime scene), treat the video as a crime scene video. Do not use audio and follow the recommendations of your local prosecutor for the use of the date and time stamp
 - ✓ Remember to include overall exterior shots of the premises to establish the location. These will normally need to be shot after the execution of the warrant.

General Considerations

Once a video has been completed as part of an investigation, it must be properly cared for during subsequent handling and storage. Videotape and other magnetic media are not considered long term archival storage mediums. With videotape, proper storage conditions are necessary to extend the life of the tape. While absolute ideal storage conditions may prolong the life of a tape to 50+ years, a more realistic life expectancy is 10 – 30 years.

Copying or Duplication

There are a number of reasons why a video needs to be copied once the original is complete. These reasons include:

- Move the digital video to a more permanent storage solution like archival DVR disks
- The possibility of equipment malfunction during playback that may damage a videotape
- The collective effect of wear that occurs on a videotape every time it is played
- The need for others (attorneys, investigators, etc.) to have a copy of the video
- The need to get the video into a format (e.g. VHS or DVR) that can be more easily viewed by others

The Camera Master

The original tape recorded in a tape based camera is referred to as the Camera Master. This tape should be protected just as original still photo negatives need to be protected and preserved. Once completed, the Camera Master tape is used to create a first generation copy referred to as the Duplication Master. This is the only time that the Camera Master is used to make a copy, afterwards it is secured as evidence. The preferred method would be to copy directly to an archival DVD-R or Blu-Ray M-Disc.

Video cameras that record to SD cards or directly to a hard drive should immediately have the video transferred to archival media like archival quality DVD-R disks or Blu-Ray M-Discs. Two copies should be made so one can serve as a duplication master.



Blu-Ray M-Discs provide the longest archival storage life and largest storage capacity but will require a Blu Ray recorder in order to make a copy directly from the video camera.

Archival DVD-R disks can be used with a standard DV recorder.

General Considerations

Quality video equipment should hold up well under the typical usage that a police agency will provide. The most frequent maintenance concern is keeping the video heads clean. A “snowy” picture, especially with a tape that has previously played fine, indicates that the video heads are dirty. The three most common methods of head cleaning are:

1. Equipment disassembly and cleaning with a wet solution
2. Dry cleaning tape cartridges that can be inserted into the machine without the need to take the machine apart.
3. Wet cleaning tape cartridges

Equipment Disassembly

The preferred cleaning method is to take the machine (camera) apart to allow access to the video heads & head drum, audio head, capstan and tape guides. Once this is done, a 90% isopropyl alcohol solution and a lint free cloth are used to wipe down the video components previously mentioned. Any other mechanical parts that have accumulated dust or powder should also be cleaned. Note: Rubber parts (pinch rollers) should never be cleaned using any solvent.

Unless someone within the agency has training on disassembly and cleaning, this task should be left to a professional.

Dry Tape Systems

Dry cleaning cartridges that are inserted into the video equipment are a more convenient cleaning method. The drawback to these systems is that they are more abrasive and can cause premature wear on the video heads. The technology of newer cleaning cartridges has reduced this problem somewhat, however these devices should be used sparingly.

The best use for a dry cleaning system is in the field when the camera and/or tape deck is found to be recording or playing back poorly due to dirty heads.

Wet Tape Systems

These are similar to the dry tape systems except for the addition of a small amount of cleaning fluid that is added to the tape. The same precautions should be used with these systems as listed for the dry cleaning systems.

Maintenance Schedule

In most instances, light to moderate users will only need to have the heads cleaned when the playback or recording quality of the tape deteriorates.

If an agency’s video equipment receives heavy use, is exposed frequently to dirty or smoky environments, then the heads will need to be cleaned more often. A maintenance program that gets the equipment in for a once a year cleaning is a good practice.

Analog Video

A recording method where the sound and video signals are recorded directly to the tape as a magnetic signal. The quality of the sound and the video image is directly related to the strength of the magnetic signal recorded on the tape.

AVCHD

Advanced Video Coding, High Definition: A newer file based format that works with the H.264 codec and can be played back and stored on a range of devices. (Sony & Panasonic collaboration) *Opens With: VideoLan VLC Media Player and Apple Quicktime Player.*

AVI

Audiovisual Interleaving; The video file format commonly used by digital video cameras. AVI has a resolution of 352 x 240 pixels and is recorded at 30 frames per second (fps). *Opens With: Microsoft Windows Media player, Apple QuickTime Player and VideoLan VLC Media Player.*

Camera Master

The original video recording, also referred to as the Master Tape.

Chrominance

The color information stored on a videotape.

Composite Video

An analog video transfer method where both signals required for video (chrominance and luminance) are carried together on the cable. Composite video cables are characterized by RCA type connectors on the cable (yellow for video connection). Color modulation schemes like NTSC and PAL are examples of composite video.

Controlled Action

An event where the videographer has control over what is happening in the scene while it is being recorded. Examples include crime scenes and interviews.

Digital 8

A recording technology that records a digital signal to a Hi-8 videotape, developed by the Sony Corporation. Digital 8 video cameras can play back Hi-8 videotapes but Hi-8 cameras cannot play a Digital 8 recording.

Digital Video

A recording method where the audio and video signals are converted to a true binary (1's and 0's) format. Digital video can provide better picture quality (up to 500 lines of vertical resolution), greater color accuracy and CD quality sound.

Duplication Master

A first generation copy of the Master Tape. The Duplication Master will be used to make all other copies of the tape needed for distribution.

Additional support information including

- Video transfer guidelines
- Sample video policy
- Photo/video log sheet example
- Instructions on “knock out” plug assembly

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