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**Video Forensic Analysis**

**Technical Manual**

**DOCUMENT CONTROL #**

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| Physical Inspection of Video Evidence Protocol |

**1. Purpose**

The purpose of this protocol is to identify evidence received, inspect the evidence for any damage, and protect the evidence from inadvertent alteration or erasure. This protocol applies to all members of the laboratory that perform video forensic analysis.

**2. Equipment Needed**

1. Permanent pen

**3. Calibration**

All hardware and software used in this protocol shall be validated and the validation documented within the [Agency Name] Validation Manual.

**4. Procedures**

1. Evidence should already be appropriately packaged, labeled and entered into evidence prior to any examination taking place per the evidence handling policy.
2. Photograph the evidence in the condition it was delivered to the lab in.
3. Label anything that needs further clarification with a permanent marker.
4. Inspect the evidence for any damage. If the evidence is an optical disc the examiner may attempt to clean it. If the evidence is actual tape, no further examination should be done.
5. Any information available about the evidence should be documented in the analysis report and the records management system.
6. If a write protection device is available (such as a tab on a VHS tape) it should be enabled prior to analysis if not already done so.

**5. Important Notes**

The failure to identify physical damage before playback may further damage the evidence or playback device.

Failure to write protect the evidence can result in alteration or erasure of the evidence.

**6. References**

1. Validation manual
2. Administrative manual

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| Video Acquisition Protocol |

**1. Purpose**

This protocol covers the creation of a digital copy of the submitted video evidence for forensic analysis. The protocol applies to all members of the laboratory that perform video forensic analysis.

**2. Equipment Needed**

1. StarWitness FreezeFrame
2. Playback device
3. Screen capture utility

**3. Calibration**

All hardware and software used in this protocol shall be validated and the validation documented within the [Agency Name] Validation Manual.

**4. Procedures**

1. Preview the video to obtain information important for the acquisition:
   1. Is the video color or black and white?
   2. Does the video contain audio?
   3. Is there a date/time stamp present on the video?
   4. Is the required software viewer included with the submission?
   5. Is the video multiplexed?
2. Locate the area of interest according to the information provided by the case agent. If the area of interest cannot be located, contact the submitting agency for further information.
3. Acquire the video:
   1. Analog: Using the StarWitness FreezeFrame digitize the area of interest from the video. This is accomplished by playing the video in the VHS playback machine while digitally capturing the contents using capture card of the FreezeFrame device.
   2. Digital:
      1. If possible, copy the files directly from the evidence to the hard drive of the StarWitness computer.
      2. Import the digital videos directly into FreezeFrame.
      3. If it is not possible to directly import the videos, follow these steps:
         1. Play the video using the available software or viewer. Use a screen capture utility such as the built-in utility for FreezeFrame or Camtasia.
4. Import the acquired video into StarWitness FreezeFrame.
5. Verify that the acquired video appears to accurately represent the original video.

**5. Important Notes**

Repeatedly paying back or pausing the evidence if on tape may lead to the degradation of the evidence. Failure to correctly acquire the evidence could result in missed frames.

**6. References**

1. Validation manual
2. Administrative manual

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| Video Enhancement Protocol |

**1. Purpose**

The purpose of this protocol is to assist the examiner with the enhancement or clarification of the area of interest of a video while utilizing the digital copy of the video. This protocol applies to all members of the laboratory who perform video forensic analysis.

**2. Equipment Needed**

1. StarWitness FreezeFrame
2. Enhancement Software

**3. Calibration**

All hardware and software used in this protocol shall be validated and the validation documented within the [Agency Name] Validation Manual.

**4. Procedures**

1. Specify the exact start/stop location on the video that is the area of interest. Anything before or after the needed video should be trimmed.
2. Determine whether the video is field or frame based video. This can be determined by advancing the video one field at a time. If each field advance produces a different image, then the video is considered to be field based and must be deinterlaced prior to continuing analysis.
   1. If deinterlacing is required, this can be done directly within FreezeFrame.
3. Determine what, if any, further processing would possibly enhance the video. Any requests made by the submitting agency should be considered as well as any processes that could possibly help enhance the video, but are not specifically requested by the agency. Below is a list of some of the major processes.
   1. Demultiplexing: This isolates camera angles containing areas of interest. Demultiplexing can be done directly within FreezeFrame and the examiner can select what camera angles are relevant to the case and import the specific angles for further enhancement.
   2. Magnification: Enlarges a selected area of the footage. FreezeFrame has a built in magnification tool to be used.
   3. Frame Averaging: Reduces noise in an area of an image that remains stationary for a period of time.
   4. Speed Adjustment: Adjusts the speed of a video by duplicating existing frames, or removing duplicate frames. With an accurate measure of real time, time-lapse video can be adjusted to playback at approximately real time using this method.
   5. Stabilization: Stabilizes video that may be jerky due to being taken in a moving environment.

**5. Important Notes**

Using software tools available video may be enhanced or clarified by examiners. The video should only be enhanced or clarified enough for the desired results, if they can be obtained at all. Unwarranted and excessive enhancements may cause artifacts from over‐processing.

**6. References**

1. Validation manual
2. Administrative manual

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| Image Export Protocol |

**1. Purpose**

The purpose of this protocol is to assist the examiner with the exportation of still images from video evidence. This protocol applies to all examiners within the laboratory who perform forensic video analysis.

**2. Equipment Needed**

1. StarWitness FreezeFrame

**3. Calibration**

All hardware and software used in this protocol shall be validated and the validation documented within the [Agency Name] Validation Manual.

**4. Procedures**

1. Advance through the video and identify important areas of interest.
2. Using FreezeFrame create still .bmp images of the frames of interest.
3. Save the .bmp images to the hard drive of the forensic computer within the appropriate folder for the case.
4. Maintain the generic filenames provided by FreezeFrame.

**5. Important Notes**

None.

**6. References**

1. Validation manual
2. Administrative manual

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| Creation of Image CD Protocol |

**1. Purpose**

The purpose of this protocol is to provide video forensic analysis within the laboratory with the steps necessary to create a CD containing images processed during a forensic video analysis examination. This protocol applies to all laboratory members performing video forensic analysis.

**2. Equipment Needed**

1. StarWitness FreezeFrame
2. CD/DVD Duplicator Machine
3. Permanent Marker

**3. Calibration**

All hardware and software used in this protocol shall be validated and the validation documented within the [Agency Name] Validation Manual.

**4. Procedures**

1. Place all evidence files within the “CD” folder on the laboratory network under the appropriate case number.
2. A folder should be created containing the original copy of the evidence.
3. A folder should be created for the enhanced copy of the evidence.
4. A folder should be created for all still images created from the video.
5. Create a new CD/DVD recording job with the computer attached to the CD/DVD robot.
6. Copy all necessary files to the CD/DVD authoring software.
7. Create the CD/DVD.
8. Using the built‐in printer, print the standard laboratory label which includes the case number and name of examiner.
9. The CD/DVD should be finalized to prevent any further writing to the disc.

**5. Important Notes**

None.

**6. References**

1. Validation manual
2. Administrative manual

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| Image Printing Protocol |

**1. Purpose**

This protocol describes the steps to be taken when printing image files during a forensic video analysis examination. This protocol applies to all laboratory members who perform video forensic analysis.

**2. Equipment Needed**

1. Printer.

**3. Calibration**

None.

**4. Procedures**

1. Select the images that need to be printed.
2. Select the appropriate printer (generally the lab’s photo printer).
3. Select the appropriate paper.
4. Print the images selected. Unless otherwise requested, images are printed in 8x10 format on photo paper.
5. Ensure that the images printed accurately reflect the original images.
6. Bar-­‐code the back of each picture as evidence. If bar-­‐coding is not available use a permanent marker.

**5. Important Notes**

None.

**6. References**

1. Validation manual
2. Administrative manual

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| Video Duplication and Conversion Protocol |

**1. Purpose**

This protocol describes the steps to be taken when duplicating and/or converting video. This protocol applies to all laboratory members who perform forensic video analysis.

**2. Equipment Needed**

1. Playback device
2. Recording device
3. Permanent marker

**3. Calibration**

None.

**4. Procedures**

1. Determine what the request is (conversion, duplication or both). Also determine if there is only an area of interest or if the entire video is needed.
2. Duplicate the video or portion of video that was requested by playing the original while capturing the digital copy on the hard drive of the forensic computer.
3. Verify the copy appears to accurately represent the original video.
4. Label the copy of the video as a copy of the original and apply the case number.

**5. Important Notes**

None.

**6. References**

1. Validation manual
2. Administrative manual