

**MMIE SOP-09 Analysis & Enhancement of Video from
DVRs**

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Approved by Director: Dr. Guy Vallaro

A. Purpose:

Standard operating procedures for analysis and enhancement of video from digital video recorders.

B. Responsibility:

Forensic Science Examiners

C. Procedure:

1. Inspect the digital video recorder to ensure that there is no damage present and it is in good working condition.
2. If the digital video recorder is damaged, note the damage and contact the submitting agency. Repair the damage if possible and note the repairing measures on the applicable worksheet. Communication with the submitting agency/customer should be documented according the GL-1 Section 4.4.2.
3. If possible obtain an operations manual for the Digital Video Recorder prior to operating. Obtain any necessary passwords/codes for the operation of the equipment.
4. If possible, export the requested video using the DVR's export menu and appropriate recording media.

If the DVR does not have the appropriate output slots or is not able to make an exported copy, the examiner may make a working copy of the video segment by transferring the video information onto a miniDV tape on into a capture device using firewire (IEEE) or analog/BNC connections to obtain the signal. The examiner may also capture the video signal using Camtasia or Canopus software if needed.

5. After collecting the required segment of video, document the segments captured on the appropriate worksheet.
6. If the video must be captured onto a miniDV tape, import and analyze the digital video using the Adobe Premiere Pro software application in the following manner:

Using a miniDV tape:

**State of Connecticut Department of Emergency Services and Public Protection
Division of Scientific Services**

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- a. Attach the firewire (IEEE 1394) cable from the capture device to the firewire import slot on the computer.
- b. Open Adobe Premiere Pro and input the project name and destination files.
- c. Turn on the capture device, the computer will recognize the device and Adobe Premiere Pro will display a monitor with the video contents located on the capture device.
- d. Using Adobe Premiere Pro, set the Capture: In/Out.
- e. After capturing the video segment, name the .avi file with the Lab Identifier and any other descriptor.

If not using the miniDV tape, open the exported file(s) using Adobe Premiere Pro import option or use the DVR's proprietary player if downloaded at time of export and select the appropriate media (CD, DVD, Memory Stick, External Hard Drive, etc). Prior to opening the file in the computer, every effort should be made to ensure that the media is virus-free.

7. After importing the .avi/.mov/.wmv or other compatible video files, analyze the digital files using one of the following software applications but not limited to:
 - Adobe Photoshop
 - Adobe Premiere Pro
 - Camtasia
 - Cognitech
 - dTective

These software applications may be used to apply the following filters: adjusting audio levels, deinterlacing, demultiplexing, exporting single or multiple frames, changing fields to frames, playback speed adjustment, frame averaging, sharpening, levels or brightness/contrast adjustment, highlighting, magnifying, inverting or inserting informational text into a video or photographic file.

8. Any files generated from the digital media should be saved using the highest quality setting, unless the resulting video file is too large to fit on standard recording media (CD/DVD). In such case, the submitting agency can be contacted to request a larger storage media device or the file may be saved at a lower compression as required.
9. Save the any captured segment as a video file using a Laboratory identification number or other identifier as the video name. *e.g. ID-06-12345 capture 1.avi or bankrobbery.avi*

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10. Desktop file folders will be created and labeled in the following manner: Laboratory case number (eg. 11-000123) and then if there are multiple submissions, the submissions will be placed in a separate electronic folder designated by the submission number (S00# or Sub #).
11. After analysis of the video evidence is completed, save any image or video files in the examiner's case folder on the computer and a copy of this file should be transferred onto a CD/DVD for archiving in the case folder.
12. Exported files should be created and labeled in the following manner: camera/time/date stamp information (*c# mmddy hmmmss.tif*, *c# hmmmss.tif*, *mmddy hmmmss.tif* or *hmmmss.tif*) or submission number (*Example: S001 1.tif (graphic files)*) or any other designator description.
13. Any photographs generated will be printed according to the Noritsu Procedures listed in the user manual. The submitting agency may receive a set of printed images or a compact disk containing the image files.
14. If photographs or a media containing electronic files are generated to be disseminated to the requesting agency or retained in as archives, a sub-item will be created in the *LIMS JusticeTrax System*. This sub-item will be filed as Submission #-M# (*e.g. 1-M1*).

D. Sources of Error:

Equipment malfunction or condition of evidence submitted

E. References:

- Adobe Corporation. (2005). *Adobe Photoshop CS2 User Guide*. San Jose: Adobe Systems Incorporated.
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- Adobe Corporation. Adobe Production Suite CS5 on-line help. www.adobe.com
- Ang, T. (1999). *The Art of Digital Photography*. New York: Octopus Publishing Group.
- Camtasia Online Help: <http://techsmith.custhelp.com>
- Cognitech Corporation. (1998). *Cognitech Video Investigator User Guide*. Pasadena: Cognitech Inc.
- Corel Corporation. (2008). *Corel Draw Graphics Suite X4 User Guide*. Ottawa: Corel Corporation.
- Diamond Cut Productions Corporation. (2009). *User's Manual for DC Live/Forensics and Diamond Cut DC 7* (13th ed.). Hibernia: Diamond Cut Productions Inc.

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Johnson, S. (2006). *On Digital Photography*. Cambridge: O'Reilly Media Inc.
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