A. Purpose:

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

B. Responsibility:

Forensic Science Examiners assigned to the Multimedia and Image Enhancement Unit or performing casework in the Unit

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 on the worksheet and photograph if possible. If necessary, contact the submitting agency. Repair the damage if possible and note the repairing measures on the applicable worksheet (DVR 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.

   Note: Some DVRs may begin recording once it is plugged in, if possible, research how to turn off the record mode prior to proceeding with the analysis.

4. Prior to beginning analysis on the DVR, the examiner should try to establish if the time on the working DVR is accurate to real time. This may be accomplished by comparing the time on the DVR to the NIST time by accessing the following website: http://www.time.gov/ or if internet is not accessible when the DVR is being examined (ie scene) then the examiner may use the satellite time displayed on a cellphone. The examiner should indicate which reference was used when assessing any time differences.

5. If possible, export the requested video using the DVR's export menu and appropriate recording media. If a USB drive or other type of rewritable media is being used for the export, this media should be formatted prior to use.

   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 with a capture device using firewire (IEEE) or analog/BNC connections to

obtain the signal. Refer to Section 7 of this SOP for the procedure to import the video from the MiniDV.

Other options that the examiner may use to capture the video signal would be using StarTech, Camtasia or SnagIt software or using the line out/monitor out feed and plugging it into a DVD video recorder.

In the event that the video from the DVR/NVR cannot be exported by menu option, the examiner may proceed with the removal of the hard drive to examine using recovery software such as DVR Examiner or other similar software. Once the hard drive has been removed, a write block device should be used protect the evidence from erasure of data.

The retrieval of video directly from the hard drive using recovery software may be used in the event that the agency is requesting a large time frame of video. It should be noted that when the hard drive has been removed, the submitting agency should be advised that placing the hard drive back into the DVR may lead to reformatting of the hard drive.

6. After collecting the required segment of video/video file, document the segments captured on the appropriate worksheet (DVR worksheet).

7. If the video was captured from the monitor feed and recorded to a miniDV tape and further editing or analysis needs to be conducted in Adobe Premiere Pro software, the following procedure may be used to import the video from miniDVr:

Using a miniDV tape:

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. Select AVI as file type.
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.

Another option is to record directly from the miniDV player output to the input signal of a DVD recorder. The record option should be set to highest quality recording.

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.

8. After importing the .avi/.mov/.wmv or other compatible video files, analyze the digital files using an editing program. Refer to MMIE SOP-06 for guidance on editing software. Record software settings used for enhancements.

9. 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. If the recording is larger than 64 GB, the agency will be notified in the report that a copy is retained at the Laboratory for 6 months. The original evidence would need to be resubmitted if another recording is necessary.

10. Save 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*

11. File folders will be created in a documents folder in a drive that is backed up to a server. These folders should be 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 #).

12. 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.

13. Exported files should be created and labeled in the following manner: camera/time/date stamp information (*c# mmddyy hhmmss.tif, c# hhmmss.tif, mmddyy hhmmss.tif or hhmmss.tif)* or submission number (*Example: S001 1.tif (graphic files)* or any other designator description.

14. The submitting agency may receive a set of printed images or some type of electronic media (*e.g.* CD/DVD, USB drive or external hard drive) containing the image files and video files.

15. If media containing electronic files is generated to be disseminated to the requesting agency or retained as archive files, a sub-item will be created in the *LIMS JusticeTrax System*. This sub-item will be created as designated in GL-4..

16. A report will be generated providing information on any enhancements/clarifications or file information retrieved from the DVR.

D. Sources of Error:

Equipment malfunction or condition of evidence submitted

E. References:

See MMIE SOP-24 Multimedia & Image Enhancement References