A. Purpose:

Video evidence when submitted to the Laboratory may be in a format that is unable to be played or viewed by the submitting agency. In cases where the evidence is time-lapsed or multiplexed, the submitting agency may request that procedures be taken to clarify the video evidence for the purpose of viewing and continuing their investigation. In some cases, the video may be difficult to view due to the lighting conditions or other factors. The purpose of enhancing video is primarily to capture, isolate, adjust the speed or camera sequencing and clarify (sharpen, highlight) the video to provide the best quality images for the submitting agency. In some cases, images may be captured from the video and printed for the submitting agency.

There may be cases in which the video with associated audio may need to be captured from a source and then converted to a file format that is able to be enhanced. In this type of case, it is recommended that equipment/software be used that can capture the video with associated audio in a format that has the least amount of compression.

Similarly, there may be occasions in which an audio file associated with a video or free-standing may be of quality that does not lend the listener to understand the content of the audio. Filters may be employed to lessen or remove the interference.

When analyzing a video/audio file, the following software applications (or similar working software) may be used for the purposes of capturing, processing and enhancing the video/audio or photographic file generated from the submitted evidence:

- Adobe Photoshop/Bridge/Clear ID
- Adobe Premiere Pro
- Camtasia
- Corel
- iNPUT Ace
- SnagIt
- StarTech USB 3.0
- Adobe Soundbooth/Audition
- Audacity
- Izotope

These software applications may be used to apply the following filters: capture of video/audio, adjusting audio levels, video de-interlacing, single and multiple frame exporting, playback speed adjustment, frame averaging, levels or brightness/contrast adjustment, highlighting, sharpening, inverting, magnifying or inserting informational text into a video or photographic file and providing

State of Connecticut Department of Emergency Services and Public Protection
Division of Scientific Services
Documents outside of the QMS are considered uncontrolled.

picture-in-picture display. Additional features include the ability to mask or track subject/objects in a video.

The following descriptions are filters and other applications that may be used in the examination of video evidence:

Audio Adjustment: Involves controlling the audio frequency, bandwidth and levels of multiple bands.

Blur/DeBlur: Filters that make pixels in an image or video become unclear/less distinct or improve the sharpness of the edges of objects in an image or video

Brightness & Contrast: This effect adjusts the brightness and contrast of the color tones located in the segment or frame of video.

Canvas Editor: Process of combining files on a canvas to create synchronized side-by-side and multi-file views.

Concatenate: Process of stitching multiple videos together

Crop: Filter that allows an area to be selected and either remove a portion or focus in on an area of the video/image

De-Interlacing: The ability to view either the odd or the even field of a video frame.

De-noise (advanced settings), for finer control over the noise reduction process, including Adaptive noise reduction mode, for accurately tracking a changing noise spectrum.

Dodge/Burn: Traditional photographic technique to light or darken specific areas of a print by regulating the exposure.

Extract Frames: A filter that extracts all frames or specific frame types from a segment of video and saves them individually as a separate file type.

EQ Match/Equalization: Filter to allow for clips recorded differently the same sonic feel as one another .

Fields to Frames: Taking captured video frames and separating them into the odd and even fields and making them a unique frame by themselves to be viewed consecutively and in proper order. This technique, in effect, doubles the size of the video file.

Frame Averaging: Generates an image by adding together selected multiple frames. This technique removes dynamic noise from stationary objects in an image.

Gain/Volume – change in the decibel level of an audio track or segment

Highlighting: To bring out a selected area or zone of a video frame so that it stands out or apart from the non-selected area or zone.

Invert: This effect inverts the color information of an image. This technique may be used to bring out patterns or details from an image.

Levels/Curves: The levels effect adjusts the brightness/contrast of a clip. It combines the functions of the color balance, gamma correction, brightness, contrast and invert effects.

Lucis Pro®: Photographic filter that enhances images by adjusting high, medium and low contrast areas and corrects exposure levels.

Masking – the ability to apply a full blur or a highlight to an subject/object

Multiple or Single Frame Exporting: The function of exporting a video clip as a sequence of still image files or a single still image file.

State of Connecticut Department of Emergency Services and Public Protection
Division of Scientific Services
Documents outside of the QMS are considered uncontrolled.

Noise Removal (audio) – reduction of a frequency or artifact in an audio track. (see De-noise)

Picture in Picture: The ability to display to separate video files or to have a video file in the background and include a still photo image in the foreground to illustrate an area of interest.

Pitch Contour/Pitch: for remapping pitch inconsistencies using variable resampling.

Position: The ability to reposition a video frame to bring an item of interest into view.

Resize: using software to add or subtract pixels, and is called resampling.

Scale or Magnify: The ability to zoom in or zoom out of a video frame.

Sharpen filters: Improves image clarity and emphasizes small details and sharp contrasts.

Sharpen/Focus: Filters that make pixels in an image or video improve the contrast of the edges of objects in an image or video.

Shadow/Highlight: Photographic technique that adjust the exposure levels in highlighted or shadowed area of an image/video.

Silence – removal of audio from a portion of the timeline.

Speed/Duration Adjustment/Timing: The speed of a clip is the playback rate compared to the rate at which it was recorded. Initially, a clip plays back at its normal, 100% speed. Changing a clip's speed causes its source frames to either be omitted or repeated during playback; thereby making the video or audio play faster or slower. A change in speed results in a corresponding change in duration.

Stabilize: process of making a section of video less shaky

Tracking – ability to follow a subject/object and use masking to either obscure or highlight.

Transcoding: process of converting an audio or video file from one encoding format to another in order to increase the number of compatible target devices a media file can be played on.

B. Responsibility:

Forensic Science Examiners assigned to Unit or conducting casework in the Unit

C. Procedure:

Refer to specific standard operating procedure for type of analog or digital evidence received.

D. Sources of Error:

Not applicable

E. References:

See MMIE SOP-24 Multimedia & Image Enhancement References

Appendix: 6.1 "Photoshop CS3 for Forensics Professional"

State of Connecticut Department of Emergency Services and Public Protection
Division of Scientific Services
Documents outside of the QMS are considered uncontrolled.