

**MMIE SOP-11 Enhancement of Audio Files or Audio  
Tapes**

*Approved by Director: Dr. Guy Vallaro*

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**A. Purpose:**

Audio evidence when submitted to the Division of Scientific Services may be in a format or quality that is unable to be played or audibly intelligible to the submitting agency. The purpose of enhancing audio is to make the sound of interest more intelligible to the listener. This generally includes digitally capturing an audio segment of interest. The enhancement can be accomplished by capturing, isolating, adjusting the playback speed, bandwidth or decibel levels of the signal to provide the best quality audio sound for the submitting agency.

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

- Adobe Soundbooth /Photoshop / Audition / Audacity
- Adobe Premiere
- DC Live 7.5
- Izotope

**B. Responsibility:**

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

**C. Procedure:**

1. Inspect the analog or digital media to ensure that there is no damage and that it is in good working condition.
2. If the media is damaged, note the damage on the appropriate worksheet (MMIE: General) and contact the submitting agency. If possible, photograph the damage for the case notes. Repair the damage if possible and note the repairing measures on the applicable worksheet. If necessary, the submitting agency/customer may be notified of such repairs.
3. After implementing erasure prevention practices, insert the analog/digital media into the appropriate player (standard audio player, microcassette player, compact disk player).

If the media is to be inserted into a computer, the media should be checked to ensure that it is virus-free and malware-free.

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4. Verify that the input/output signals are operating correctly.
5. Import/capture the audio signal using at least 44,100Hz (44.1kHz) as the sampling rate.
6. Designate the imported with the laboratory case number and save this as a duplicate/working copy of the submitted media and all work performed will be made off of this copy.
7. In the examiner's computer documents, a working folder should be created with the laboratory case number as the identifier for all files/media generated.
8. Adjustments to the audio files may comprise but are not limited to the following:
  - Decibel (dB) level adjustments may be applied to make the audio intelligible.
  - Extraction of interfering signals
  - Application of filters to reduce hum, hiss or other interference
  - Application of filters to clarify specific wavelengths
9. Specific audio duplications or redactions can also be made off the working copy.
10. Any files generated from the digital media should be saved using the highest quality setting.
11. Save the captured segment as a Windows® Media Audio (wma) or waveform audio format (wav) file using the Laboratory case number, case specific identification or other case descriptor.  
*e.g. ID-06-12345 capture 1.avi*
12. Desktop file folders will be created and labeled in the following manner: Lab case number (YY-NNNNNN) and if multiple submissions are present, each submission will have a separate folder labeled Submission number (S00# or Sub #)) and then followed by the numerical order or other descriptor of files created. *Examples: S001 1.wav (audio files) or 11\_1 1.wma*
13. After analysis of the audio evidence is completed, save any audio or waveform 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.
14. If any media containing electronic files are generated to be disseminated to the requesting agency or archived internally, a sub-item will be created in the *LIMS JusticeTrax System*. This sub-item will be filed as Submission #-M# (*e.g. 1-M1*).

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**D. Sources of Error:**

Equipment failure or condition of evidence

**E. References:**

- Adobe Corporation. (2005). *Adobe Premiere Pro 2.0 User Guide*. San Jose: Adobe Systems Incorporated.
- Adobe Corporation. Adobe Production Suite CS5 on-line help. [www.adobe.com](http://www.adobe.com)
- Diamond Cut Productions Corporation. (2009). *User's Manual for DC Live/Forensics and Diamond Cut DC 7* (13<sup>th</sup> ed.). Hibernia: Diamond Cut Productions Inc.
- Izotope RX2: <http://www.izotope.com/support/portal/index.php/kb/browse/32>
- Pohlmann, K. C. (2005). *Principles of Digital Audio* (5<sup>th</sup> ed.). New York: McGraw-Hill.
- Salient Stills Corporation. (2006). *Video Focus Version 2.0 Windows User Guide*. Cambridge: Salient Stills Inc.
- SWGDE Guidelines. (2013). Special Working Group of Digital Evidence
- SWGIT Guidelines. (2013). Special Working Group of Imaging Technology