14 AUDIO SIGNAL ANALYSES

14.1 Purpose

To detect and identify the time and or frequency characteristics of non-voice sounds on submitted evidence of audio recordings.

14.2 Scope

This procedure applies to all types of audio recordings and all types of video recordings with sound. Non-voice data can include dual multi-frequency signals representing telephone numbers, impulse sounds, horns, machine noise, or transient sounds. It may also include sounds specifically unique to the specific case.

14.3 Materials - Equipment (Hardware/Software)

A typical setup includes a playback device connected to signal analysis equipment and a recording device.

Playback device - Selected by the examiner based on the evidence requirements.

Computer equipment, which exceeds minimum system requirements for hardware and software to record and analyze audio signals, as determined by the examiner.

Recording device - Selected by the examiner based on the evidence requirements.

Headphones - Professional quality.

Cables - Appropriate for the equipment used.

14.4 Limitations

The results of the analysis are dependent on a multitude of factors that may prevent a successful conclusion. These factors include the following:

- Poor signal to noise ratio or insufficient bandwidth.
- Technical limitations of the recording devices/systems utilized to make the submitted recording.
- The physical environment where the submitted recording was produced.

14.5 Safety

None for this procedure

14.6 Procedures

14.6.1 Conduct a preliminary examination and optimize playback.

14.6.2 Convert the analog signal to a digital format.

14.6.3 Determine the exact nature of the request.

14.6.4 Critical listening. Utilizing a digital copy of the submitted evidence, conduct a preliminary overview of the entire recording and the specific area of interest (AOI).

14.6.5 Isolate process and or evaluate the AOI.

14.6.6 Further analysis may be conducted as determined by the examiner.

14.6.7 Record all processes in case file notes. These notes can consist of computer generated printouts.

Care should be taken to avoid circuit overload and injury when using electrical equipment. Gloves should be worn to handle any potentially bio-hazardous evidence, as well as when using chemicals.

14.7 References

Further instruction on specific use of audio equipment and software used in analysis can be found in the Owner's Manuals and User's Manuals for each specific piece of hardware and software.

Ballou, Glen M., ed. Handbook for Sound Engineers the New Audio Cyclopedia. 2nd ed. Carmel, IN: SAMS, 1987.

Koening, Bruce E. "Authentication of Forensic Recordings" Journal of the Audio Engineering society, Vol. 36, No. 36, No. ½, 1990 January/February.

Solari, Stephen J., Digital Video and Audio Compression. New York: McGraw-Hill, 1997.

Watkinson, John. The Art of Digital Audio. 2nd ed. Oxford: Focal Press, 1994.

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