Forensic Tape Analysis, Inc.

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TASK DESCRIPTION
AUDIO TAPE TAMPERING EXAMINATION

When an audiotape becomes suspected of tampering, it may be forwarded to a qualified forensic audio specialist for authentication. Examples of such problems are: Credibility questions relating to the tape recorder operator, chain-of-custody contradictions, and differences between the content of the tape and testimonies of what was said. Most often, a forensic expert is contacted when the tape is believed to have been altered, or tampered with. Due to the nature of the allegations surrounding tampering issues, the examiner requires specific items from the client. The Federal Bureau of Investigation, for example, has a list of required information including:

1. The original tape.

2. The tape recorders and related components used to produce the recording.

3. Written records of any damage or maintenance done to the recorders, accessories, and other submitted equipment.

4. A detailed statement from the person or persons who made the recording, describing exactly how it was produced and the conditions that existed at the time, such as:

    a. Power source, such as portable generator or dry-cell batteries.
    b. Input, such as telephone, radio frequency transmitter/receiver, miniature microphone, etc.
    c. Environment, such as telephone transmission line, street traffic.
    d. Other background data, such as number of individuals involved in the conversations, enhancement issues etc.
    e. Foreground information, such as number of individuals involved in the conversation, general topics of discussion, closeness to microphone, transcript verification, etc.
    f. Magnetic tape, such as brand, format, when purchased, whether previously used.
    g. Recorder operation, such as number of times turned on and off in the record mode, type of keyboard or remote operations for all known events, uses of voice-active features, etc.

5. A typed transcript of the entire recording or, if that is not available, transcriptions of the portions in question.

The items listed above are examples of what is required by a forensic expert as he begins an examination of questioned audio recordings.

TECHNICAL DEFINITIONS

Falsification of Tapes;

A qualified forensic expert determines authentication by performing a number of scientific tests which detect evidence of tampering or falsification. Four basic types of tampering include:

1. **Deletion**-the elimination of words or sounds by stopping the tape and over-recording unwanted areas.
2. **Obscuration**-the mixing in of sound of amplitude sufficient to mask waveform patterns, which originally would show stops and starts in inappropriate places.
3. **Transformation**-the rearranging of words to change content or context.
4. **Synthesis**-the adding of words or sounds by artificial means or impersonation.

2. **Physical Inspection**-the forensic expert next inspects for tampering with a thorough visual inspection of the tape itself. He inspects the housing for pry marks, welding breaks; size, label and date inconsistent with alleged recording date. He also measures the tape and assures the splicing of the magnetic tape to the leader is consistent with normal manufacturing process. Any other splices are noted as possible alteration.
3. **Magnetic Development**-direct visual observation of the magnetically "developed" tape is conducted to find track widths, the type of recorder used, and the presence or absence of residual speech signals.
4. **Spectrum Analysis**-specialized computer equipment and programs to produce visual interpretation of a frequency-versus-time displays. This allows the expert to view the entire spectrum or to zoom in on an area of particular interest thereby helping to characterize the acoustic quality of anomalies and identify their source.
5. **Waveform Analysis**-a computer generated display representing time-versus-amplitude of recorded sounds in graphic form. With such analysis the expert can sometimes measure signal return time which reveals how long a recorder had been turned off. He can identify record-mode events including the measurement of record-to-erase-head distances, determination of the spacing between gaps in multiple-gap erase heads, and inspection of the signature shape and spacing of various record event signals.
6. **Recorder Performance**-various electrical and mechanical measurements of standard and modified recorders for use in finding possible origins of buzz sounds, hum, etc.

SUMMARY

In order to submit sound recordings as evidence in court proceedings, an attorney must prove that the tape is an authentic representation of the conversation it is said to record. The traditional method of establishing authenticity involves maintaining a chain of custody, which logs all persons, times, and locations concerned in the creation of the tape. Then, the tape must be officially sealed and stored to complete a proper chain. However, even if this procedure is strictly observed, there may still be a challenge to the tape's authenticity.

The recording may contain inconsistencies suggestive of tampering. In such cases, an attorney may consult a qualified forensic examiner to inspect the tape. The examiner would initially listen critically for signs such as gaps, transients, fades, equipment sounds or extraneous voices that indicate tampering. Then he would utilize other methods like physical inspection, magnetic development, spectrum analysis, and waveform analysis to discover anomalies. It is relatively easy to change the content of a recording by deleting words or sections; by obscuring meaning with overcrowded sounds; or by transforming context through rearrangement of selected phrases or by adding additional words through synthesis. Nevertheless, falsifications normally leave detectable magnetic and waveform acoustic signatures which can lead to forensic individualization of the evidential recorders and tapes.