

Forensic Audio- Now Affordable and Sophisticated

Recently, there have been articles in the news about the famous 18 minute erased Richard Nixon tape. It seems that technology has improved to the point where it might be possible to recover the speech that was once on the tape and there are those who argue that it should be tried. While recording speech and other audio on analog tape is 50-year-old technology, today many police and other investigative agencies are finding that they have more recordings than ever to deal with.

Frequently these recordings are not perfect – pocket tape recorders or hidden mics trying to pick up sound from across a room, noisy background environments and poor recording techniques result in many audiotapes that need to be cleaned of noise and enhanced so that the audio information on them can be understood. This process of audio enhancement and restoration has always been the purview of large and expensively equipped centralized audio forensics laboratories.

But like the situation with the Nixon tapes, technology has now improved to the point where incredibly sophisticated audio forensics capabilities can now be added as an asset to local or state police agencies, 911 centers, lawyers offices, etc. Because these new technologies take advantage of faster computers that are now on most desktops, prices have dropped to the point where it's affordable to have an audio forensics lab for even small organizations.

I have been working in the Forensic Audio field for over 30 years and have made it my business to provide my clients with sophisticated results and expert testimony. I have tried virtually every system on the market and was most amazed by a new product from Enhancedaudio.com called Diamond Cut LIVE/Forensics. Not only is this the most affordable science I've come across in my investigations, it may well likely be the most powerful and flexible solution I've seen.

The program is deceptively simple to use. After a 30 second install, you just record in the audio from a tape or any other source, choose the tools you want to apply to the audio and start listening to cleaned up audio. DCLIVE/Forensics is great in that you can adjust the filters while you simply listen to the audio. You hear the results of your efforts instantly and this makes it super easy to use.

Forensic analog cassette recordings requiring Forensic enhancement invariably are off azimuth, resulting in poor intelligibility. My initial use of DCLIVE/Forensics involves utilizing the Time Offset feature to correct azimuth problems.

As high-speed cassette tape copies often contain 60-cycle hum and harmonic signals, I found the Harmonic Reject Filter to be an excellent notch filter. I further found the Virtual Valve Amplifier (especially in "exciter mode") allows for

enhancement of upper frequency speech parameters. This function aids in voice identification comparisons when increased bandwidth is necessary for speech format comparisons.

The File Conversion option has proven especially useful in making mono recordings into stereo files. This increases speaker intelligibility due to the time offset effects. If a Forensic stereo recording contains music/vocals in the background, the File conversion option has also proven helpful in increasing the amplitude of the evidentiary conversation while dampening the vocals.

The Speed Change tool can be extremely effective at correcting off speed recordings without affecting the pitch of the speaker's voice.

The use of the DCLIVE/Forensics Multi-filter provides a great advantage to field examination situations where multiple filters can be cascaded in real time.

The Spectral Analyzer can provide instantaneous graphic display of frequency gain/reduction while using various filters.

Increased amplitude for low-level recordings can also be enhanced through the use of the Gain Riding option.

The Punch and Crunch filter is one of the newest and most amazing developments and has proven extremely valuable in improving intelligibility of Forensic recordings. It basically is a four band dynamic expander and compressor that allows independent control over the signal, depending on threshold levels.

The How To or Help menu is an excellent resource containing Tutorials for the various filters and is readily available through the Help Menu. The manual also is over 300 pages and full of useful examples.

For Optimum recording and playback functions, I highly recommend the Ego-Sys Waveterminal-2496 sound card. For laptop use, I use the Ego-Sys WaMi Box. Both of these products offer excellent results and are also available from Enhancedaudio.com.

In order to set up an Audio Forensics lab, you'll need (at a minimum) a Pentium 500mhz PC or better running Windows 95, 98, ME, 2000 or NT. You'll also need a full duplex (can record and play at the same time) sound card in the PC and a hard drive big enough to hold the audio you want to process – usually about 10mb per minute of audio. Since most agencies already have a perfectly usable PC, the real incremental cost to enter the audio forensics world is the cost of the Diamond Cut Live Forensics software - \$999 and possibly a sound card.

In summary, I found the DCLIVE/Forensics Noise Reduction/Analysis/Enhancement program to be the most flexible and economical software program on the market. It seems that I learn almost daily more uses for its variety of filter applications.

Steve Cain is the President of Applied Forensic Technologies International Inc. He has over 30 years of experience in Forensic Analysis and effective court testimony...including CBS News Consultant in the JonBenet Ramsey case, World Trade Center Bombing, U.S. versus Koresh (Waco) case, CNN's expert for the "Flowers/Clinton" Audiotapes and over 300 other court cases or depositions. For the last 25 years, he has been examining audio and video tapes for the U.S. Department of Justice, U.S. Attorneys Office, over 100 public defenders offices, F.B.I., S.E.C., D.E.A., Customs, I.R.S., Secret Service, A.T.F., and over 1000 law firms in both criminal and civil cases in the U. S. and overseas.