



NATIA 2007 Edition

CEDAR Audio Ltd will be exhibiting at NATIA (Pittsburgh, PA) this month, showing the latest version of CEDAR Cambridge, the most powerful audio filtering and enhancement system for forensic audio investigation, plus a selection of the company's hardware modules used in audio forensic investigation, including the DNS1000 dialogue noise suppressor.

CEDAR Cambridge Forensic Systems offer all the fundamental tools required for noise cancellation and noise elimination in the fields of law enforcement, covert surveillance and terrorism countermeasures.

If you are unable to visit NATIA, we would be happy to demonstrate our products to you at our studio in Cambridge, or to arrange a visit to your premises. We hope to see you soon.

CEDAR Cambridge v4: Setting new standards for Forensic Audio

CEDAR Audio is pleased to announce the latest generation (version 4) of CEDAR Cambridge.

After a complete rewrite of its file processing capabilities, this now offers off-line processing, with the three most frequently requested audio restoration modules immediately available: Manual Declick, the dedicated Dethump process for eliminating low-frequency problems, and a completely new version of Retouch™ (pat. pending), now upgraded to Retouch 4.

Ease, speed, and productivity

CEDAR Cambridge v4 offers many improvements that make the system easier and quicker to use, and more productive than ever before.

Incorporating numerous features requested by forensic professionals, it has been designed for use by police forces as well as government and surveillance agencies, and sets new standards in forensic audio restoration.

Retouch v4

With numerous tools for identifying, modifying and eliminating audio, Retouch allows you to identify the temporal and spectral content of unwanted sounds and eliminate them seamlessly. Alternatively, it can help reveal wanted sounds buried in background noises. All other audio remains untouched.

Manual Declick

This simple process identifies and removes the widest possible range of impulsive noises, including all forms of ticks and clicks.

Dethump

This eliminates the low frequency thumps and disturbances that cannot be restored by other methods.

CEDAR's Forensic Bureau

As well as manufacturing and supplying audio restoration equipment, CEDAR Audio provides forensic audio bureau services for police, military and intelligence services.

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See CEDAR at...

CEDAR Forensic carries out numerous presentations to UK and foreign Police Forces, and has recently exhibited at:

- February 7 - HOVC, UK
- March 21-22 - HOSDB, UK
- March 27-29 - GSA Asia
- April 17-18 - CIAS Madrid

The company will be exhibiting at the following exhibitions in 2007 and 2008:

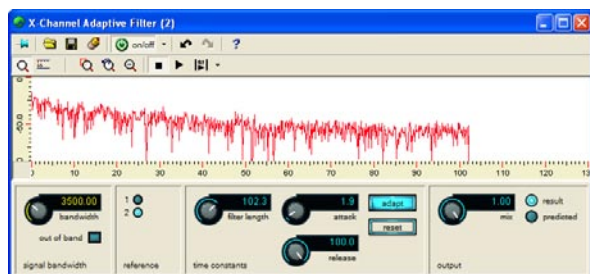
- July 21-27 - NATIA USA
- Oct 5-8 - AES Convention
- March 2008 - HOSDB, UK

**The Association of
Police and Public
Security Suppliers**



CEDAR Audio Limited is proud to be a member of The Association of Police and Public Security Suppliers (APPSS).

Adaptive Filters (part 3):



Cross Channel Adaptive and Lattice Filters

Some experienced criminals set up a face-to-face meeting in a hotel room. You have prior knowledge of the meeting and have placed an audio probe in the room.

Being surveillance aware, the criminals immediately switch on the television (or radio) after entering, and turn up the volume. For the next hour, rather than monitor the conversation that you wanted, you hear little more than the dialogue and backing music from the TV.

If you try to eliminate the interfering signal (the TV programme) using conventional filters you will probably be unsuccessful. Conventional filters attack the wanted signal (the targets' speech) just as much as the unwanted interference, and they will not reveal any obscured speech or improve its intelligibility. Fortunately, there is a class of filter that can identify those elements of the surveillance audio that are due to the interference and remove them. These are the cross channel adaptive filters.

Reference signals

To use cross channel filters, you require two recordings: the surveillance audio and a reference that contains just the interference.

The ideal technique is to record the probe audio onto one channel of a digital recorder and record a feed from a TV or radio receiver onto another.

(This means that you have to monitor the probe and be aware of any channel changes that the criminals may make.) If you are studying an existing recording in the laboratory, you might be able to download the programme from the web or obtain a recording from the broadcaster. It may even be possible to obtain suitable recordings from commercial CDs, videos or DVDs.

You might think that it would now be possible to use a digital audio workstation to subtract the interference from the surveillance signal to reveal the speech that it had obscured. (You would do this by lining up the two recordings, reversing the phase of one, and then summing them to mono.) Unfortunately, the interference signal in the hotel room is not the same as the original audio. It has been modified by the broadcast equipment, the TV receiver, the amplifier and speaker(s) in the TV, and the walls and contents of the room itself. This means that the resulting waveform is very different from the original, thus making it impossible to cancel out the interference in a simple fashion.

Cross channel filters

Once you have obtained the reference, a cross channel filter will attempt to identify and eliminate any elements in the surveillance recording that are due to the interference, irrespective of the changes caused by broadcasting and reproduction. The elements that are not due to the TV are deemed to be the required signal and are presented to you for monitoring.

Cross channel filters are not limited to revealing conversations in hotel rooms. You can use them to reduce the obscuring effects of any type of interference, provided that you can obtain a reference recording of the interference alone. You can even use multi-channel implementations to eliminate the interference on signals recorded by multiple surveillance microphones and probes, which may have additional benefits in fields such as speaker identification.

In Use

Once you have obtained the two recordings, you must be able to align them very precisely in time, and to monitor the wanted channels individually without the reference being heard. This means that you need to run three processes simultaneously: an alignment module, the filter itself, and some form of soloing module.

Next time we will show how these can be combined to obtain exceptional results from recordings made in severely adverse conditions.

STOP PRESS: CEDAR Audio Announces DNS2000 v3.1 for Intel-based Macs plus Windows PCs

The DNS2000 is now compatible with all versions of the Macintosh (PPC and Intel) plus Windows XP based PCs. Existing systems can be upgraded without charge, and all new units are supplied with universal software that makes it possible to run them on all suitable Pro Tools hosts. Contact support@cedaraudio.com.

We welcome your questions, comments and feedback. Please write to Alan French: forensic@cedaraudio.com