ProAudio Review

The Review Resource for Sound Professionals

DARTECH DART Pro 24 Restoration Software

This affordable 24-bit/96-kHz processing package cleans up almost any audio PC users can throw at it.

by **Bruce Bartlett**

If your audio is "broke," this program can fix it. DART Pro 24 is the newest version of DARTECH's popular audio restoration software, and you can consider it a Swiss army knife of audio processing for PC users.

The program supports both 16- and 24-bit sound files with sampling frequencies up to 96 kHz, and includes nine new tools and functions compared to the previous version, DART XP Pro. Running on Intel Pentium PCs with Win XP, NT, ME or 2000, DART Pro 24 sells for $299, while Dart XP Pro (16-bit only) costs $99. Upgrades from previous versions are available at lower cost.

FAST FACTS

APPLICATIONS
Studio, project studio, mastering, post, broadcast, audio-for-video

KEY FEATURES
Many audio restoration functions including MaskNoise, DeHiss Plus and DeHum; many audio processing tools; works with up to 24-bit/96-kHz audio files

PRICE
$299 (DART Pro 24), $99 (Dart XP Pro, 16-bit only)

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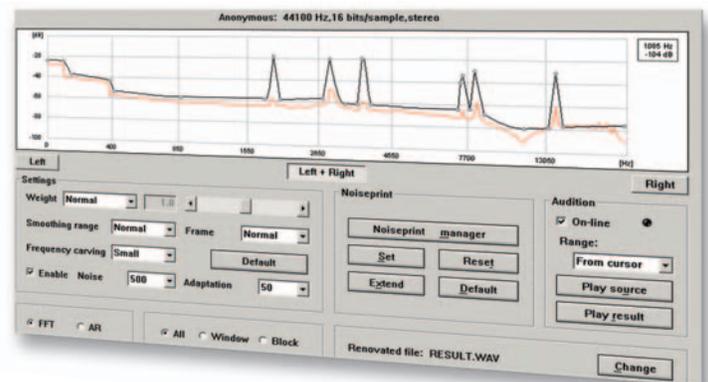↻ www.dartpro.com

| FEATURES

DART Pro 24 lets you record any audio source, clean up and improve the audio, and burn CDs with custom playlists. Use it to restore old 78's, film and video soundtracks, or old voice tapes. Clean up surveillance/security recordings as part of forensic work. Improve music recordings made with old or low-quality equipment or restore and save an LP collection on CDs.

Here are the steps in a typical DART Pro 24 restoration job: Import the sound file that you want to work on. This is called the Source file. Its waveform shows up on your screen. Select "Restore" and choose an appropriate process. Set parameters then preview the result. This takes a few seconds. After you click on "Process," the Destination file's waveform appears on screen below the Source file. Save the destination file for more processing or burn a CD.

| IN USE

DART Pro 24 offers a wide range of audio restoration functions. DeClick Plus removes impulsive disturbances (clicks) and low-level wideband noise. It gets rid of most clicks on 78's and LPs. DeCrackle removes clicks by using forward-time and backward-time signal analysis. It totally removes crackles on vinyl sources without affecting the music; processing

time is a little longer than with DeClick Plus. ReTouch allows manually removal of overlooked clicks, or keeps signals that were misclassified as clicks. It works well to repair dropouts caused by DeClick. NoisePrint is a feature where you select a short piece of background noise before or after a recorded signal, then take a "noiseprint," or sample, of the noise. This noise is then removed from the entire program, using the DeNoise Plus algorithm that, when applied to an entire audio recording, reduces broadband noise that has the same spectrum as the sampled Noiseprint. Alternatively, you can extract the NoisePrint from one recording and use it in another.

With any de-noise algorithm, there is a tradeoff between noise reduction and artifacts. The cleaner the processed sound, the more you hear artifacts, such as swishing noise and filtered speech. Typically you can reduce noise up to about 10 dB before artifacts become audible. You need to set the processing parameters carefully to get an artifact-free sound with adequate noise reduction.

Fortunately, DeNoise Plus lets you do that with surgical precision. The graphic below shows a NoisePrint spectrum taken from an audio recording using a digital camera's built-in microphone. Note the frequency spikes in the bottom red curve. Just above that curve is the noise-reduction threshold curve. You can set the threshold to work just on those frequency spikes. The result of this is less-audible arti-

facts in the processed audio than if you applied uniform processing to the entire spectrum.

When used to reduce broadband air-handling noise, DeNoise Plus was less effective than the de-noise function in DC-Art 32, a competing product. DC-Art 32 produced a few dB less noise with the same audible artifacts as DART Pro 24. However, DC-Art 32 threshold settings are at fixed frequencies, while DART Pro 24 lets you add as many frequency points as necessary so you can tailor the threshold curve more precisely.

MaskNoise, DeHiss Plus and DeHum are three important new features available in DART Pro 24. MaskNoise is a gentler type of noise suppression based on psychoacoustics. It identifies noise components in the program that are audible because they are not masked by the program. Only the audible noise is

removed. In my tests, this did not work as well as DeNoise Plus. The resulting background noise and audio sounded "swirly."

When a Noiseprint is not available, you can use the DeHiss Plus noise-reduction utility based on a standard noise model. This tool eliminated the entire hiss in a cassette recording with almost no loss of highs in the audio signal.

DeHum applies a comb filter to remove harmonically related interference, such as hum and buzz. I tried it on a cassette recording with a very loud buzz and DeHum totally removed the buzz without affecting the audio. I liked that I could tune the hum frequency slightly below 60 Hz, as the cassette was recorded off-speed.

More new features include the following: Batch processing performs multiple tasks in the background for lengthy unattended processing. Split Frequency separates a sound file into multiple frequency bands and processes each band independently. Add All recombines frequency-split files into a full-range file.

Divide/Combine is time division processing; it separates a sound file into different time segments, and then processes each segment separately. For example, you might apply more de-noising to a quiet part of the program than to loud parts where the noise is masked. Resample converts any input sampling rate to any output sampling rate; this works very quickly and sounds great. Combine All combines multiple files end-to-end, automatically aligning the waveforms where they merge. Multi-cut tool removes a selected fragment from many files. Finally, you have MP3 import — rather self-explanatory one, no?

In addition to the restoration functions, Dart Pro offers a full palette of audio processing tools. In my use, all worked fairly intuitively and did the job quickly.

Here's an additional overview of some of the most notable tools:

Scale (adjust level), Maximize (Normalize), Reverse audio. Add two files (mix), Subtract two files (add in opposite polarity). Split a stereo track into two mono tracks, or mix a stereo track to one mono track.

Editing: cut, copy, paste and multi-cut. Smart Editing: cut, mute or crossfade highlighted sections of the program.

Graphic equalizer: It lacks the precision of a parametric equalizer, but is simpler to use. Low-pass, High-pass, Bandpass, Bandstop and Notch filters. Fade In, Fade Out and Crossfade: This feature's user interface is numeric rather than graphic, making it hard to use.

Change speed (program length) without changing pitch: This works without audible artifacts up to about a four-percent change; beyond that, the sound gets warbly. There are better programs are available for this need. Shift pitch without changing speed: it is transparent up to about a four-percent change; with extreme settings, this is a cool audio effect, creating a harmonically rich signal.

Find Pattern: automatically detects constant noise/signal patterns. Remove vocal, add reverb: the reverb is good enough for Karaoke, but not very smooth. 2D and 3D spectral analysis: I like the Voxengo Span analyzer better because it lets you zoom in on the frequency axis.

Myfilter and Filter Builder: make custom combinations of tools and processing options. CD Rip and Burn: simple, easy and effective. Set/Drop Markers, Set/Remove frames, Divide/Combine time slices. DirectX audio plug-in support. Supports numerous SCSI and EIDE CD-ROM, CD-R and CD-RW devices. CD Player controls are as follows: re-order tracks, add, delete, rename, move, play, pause, loop, etc.

For Realtime processing, DART Pro 24 can process 16-bit/44.1-kHz audio input from a sound card. However, only the fastest computers can enable DART Pro's realtime processing of 24/96 audio.

Last, but not least, DART Pro 24's documentation is context-sensitive as an online Help and electronic manual. It is well written and easy to follow. I found most of the features easy to use after reading the Help files.

| SUMMARY

DART Pro 24 has some restoration tools (DeCrackle, DeHum) that are extremely effective ... and some that are not so effective. To handle every situation, I'd recommend using more than one audio restoration program along with DAW plug-ins and stand-alone applications (such as Harmonic Balancer). Still, DART Pro 24 does a fine job repairing a wide range of audio flaws, and it works with 24-bit/96-kHz audio.

Bruce Bartlett is a recording engineer, musician, tech writer and audio journalist. His latest book is Recording Music on Location published by Focal Press.