

TC Electronic PowerCore FireWire and Restoration Suite

Adding audio horsepower to computers through external DSP boxes is not a new idea but hanging it on a FireWire still is. **ROB JAMES** journeys to the heart of the core and investigates the Restoration Suite along the way.



TC ELECTRONIC'S EFFECTS, dynamics and reverb are so well known that they need no introduction from me. The company's strategy is an object lesson in covering the entire market. Hardware units run from low cost, such as the M-One, to the state of the art System 6000. Software plug-ins are equally broad in scope and were joined some while ago by the PowerCore PCI accelerator card.

PowerCore provides extra DSP horsepower (in the shape of four Motorola 56362 chips and a 200MHz Motorola 8240 PowerPC) for running specially developed or adapted plug-ins. On PCs these are available to any VST compatible application and on Macs to any VST or Audio Units application. Up to four cards may be used in one system assuming you have enough slots, although PowerCore is not approved for installation in PCI expansion chassis. This left laptop users and those with no spare slots with no way of accessing these goodies – hence PowerCore FireWire.

As the name implies, this 1U processor connects to the computer via FireWire. Although this unit uses the same number of processors, these are the later, more powerful Motorola 56367 versions with a Motorola 8245 266MHz Power PC in charge of the housekeeping. Together these endow PowerCore FireWire with almost twice the capacity of a single PowerCore PCI card. If this is still not enough, then two can be daisy-chained on a single 400Mbit connection. (PowerCore FireWire has three FireWire sockets to make this simple.)

Installation proved to be the most drama-free of any FireWire device I've used to date. PowerCore FireWire also masquerades as a giant dongle, so there is no copy protection to worry about. Turn it on and the blue power pulse logo fires up and pulses menacingly until a plug-in is loaded when it flashes once then goes solid. If the unit crashes, it flashes once then goes black. Once I managed to tear my gaze away from the mesmeric logo, I plugged the unit, loaded the drivers and plug-ins from the CD-ROM and, seconds later, I was enjoying the creamy smoothness of MegaReverb tails in Wavelab.

In the PC environment, PowerCore effects are presented as VST plug-ins. For the Mac there is the choice of VST or Apple's Audio Units. Some indication of capacity can be taken from the fact that 8 MegaReverbs only used half the available DSP and a

quarter of the memory. Not at all bad for UK£999 (+ VAT). The PowerCore Control Panel enables you to check on resources, change parameters and check version information.

Powercore's bundled plug-ins in combination with Wavelab's fluid interface makes for a very powerful mastering solution. On stereo material I found I was working faster with better results than ever before. The two reverbs have quite distinct characters. MegaReverb is great for adding a little space around things without imposing it's own personality. Classic Verb is a different animal, capable of adding a really lush character to otherwise lacklustre material. The various dynamics behave exactly as you would expect. Tight but transparent control or something a little more creative if you feel the need.

With native plug-ins I always have a slight sensation of being short-changed somehow and of being close to the edge of the system's capabilities, no matter how powerful the processor. With the extra horsepower provided by PowerCore FireWire, these misgivings are noticeable only by their absence. The difference between native reverbs and those that use DSP acceleration is tangible. Since no PCI slot is required, the benefits are equally available to laptop users and owners of Macs without PCI slots.

I think the marketing department missed a trick though, I've been calling this unit 'FireCore' since I first heard about it. 'PowerCore FireWire' doesn't have quite the same ring to it, but maybe somebody else already has a claim to 'FireCore'.

More than worth the money for the reverbs and dynamics alone, further 'free' plug-ins are in the pipeline (the first of which is the Voltronics guitar amp simulator). Optional plug-ins extend the reach. Already available from TC is the Assimilator. This claims to analyse the EQ of one mix and apply it to another, or morph between two EQ curves. If it works well, this alone could be reason enough to buy the unit. Also available or imminent are a Dynamic EQ and Filtroid, a simulation of an analogue filter bank. There is also a 5-band version of the Mastering processor and a Surround reverb specifically for Nuendo. The TC Restoration Suite has just been released.

From third-party developers the estimable Sony Oxford EQ, Dynamics and Inflator are already

available along with the TC-Helicon VoiceModeler, Waldorf's D-Coder, a synthesiser/vocoder, and DSound's VL2, 8-channel virtual valve interface.

Software and personal computers themselves have much in common with the Mayfly (*Bugs? Ed*). People seeking something with greater longevity will be attracted like moths to the flame of the PowerCore FireWire's light display. All the advantages of software upgrades and new, exciting effects, but a lot less ephemeral than a CD-ROM or PCI card.

TC has tapped an interesting vein. The psychology is persuasive. Not only do you get state-of-the-art effects but also something tangible you can show off to the clients. I can see these units achieving cult status in a decade or so. Partly because PowerCore FireWire offers compulsive effects and tools unobtainable elsewhere but also because, even if these are or become available as DAW plug-ins, they will still lack the chutzpah of a rackmounting unit.

I would say – watch out for imitators. But with the renowned TC Electronics proprietary algorithms and healthy third-party support, this isn't going to be an easy act for anyone to follow. ■

PROS

A lot of bang for the buck; excellent bundled reverb and dynamics plug-ins; adds considerable 'presence' to the rack.

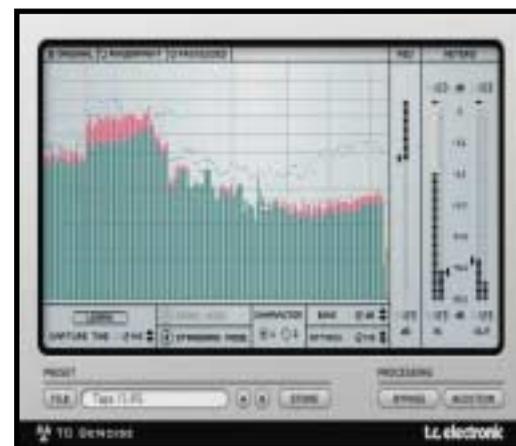
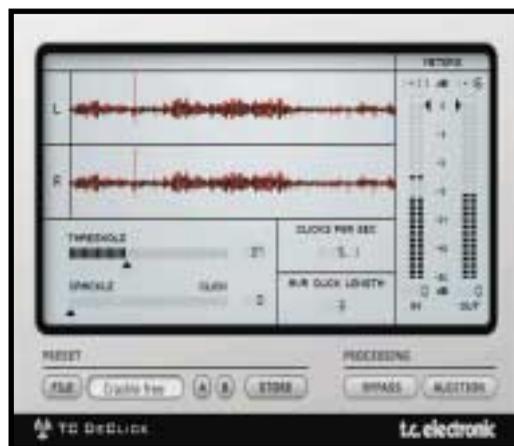
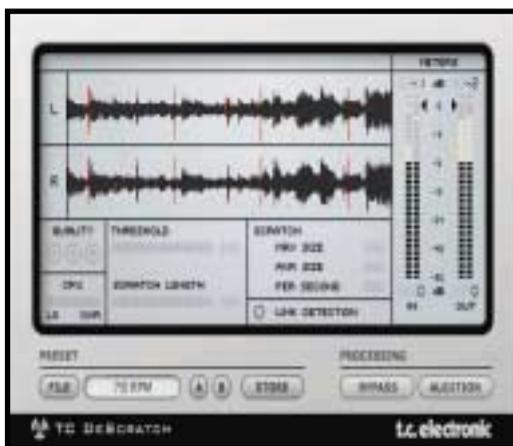
CONS

Not it's fault, but latency may be an issue in some circumstances; VST and Audio Units only; Windows XP highly recommended due to better FireWire implementation.

Restoration suite

FOR SOME YEARS NOW, the majority of affordable clean-up solutions have contained three elements; declick, decrackle and denoise. Most are based on substantially the same algorithms with only the packaging and a few minor wrinkles to separate them.

The TC Restoration Suite also includes three elements (UK£649 + VAT) but there is a highly significant difference. The really clever bit is DeScratcher, based on new research by Noveltech in Finland. Denoise is a broadband, fingerprint type



denoiser with an added mode that allows the curve to be fine tuned by drawing. DeClick combines declick and decrackle functions in a single plug-in.

I hoped that installation would be as straightforward as PowerCore FireWire, however, thanks to the chosen copy protection method it was somewhat tortuous. The process ought to be reasonably simple. The installed program interrogates the PowerCore and certain hardware elements of the host PC to generate a unique authorisation number. This is then emailed automatically to TC Electronic where an automated system generates customised software specifically for your installation. You receive an email with links to download these customised plug-ins. This is very similar to the system used by Sony. My install happened before the product was officially released so hopefully the problems I encountered should be fixed by now. In any case, TC Electronic support was extremely helpful and I was not unduly inconvenienced.

The DeScratcher plug-in reconstructs long missing signal sections, going beyond the usual interpolation algorithms. The process is based on accurate mathematical modelling of the undamaged signal before and after the damaged signal section with the aim of extrapolating to fill the gaps in between. There are similarities in this approach to certain other high-end systems but this has the considerable virtue of being automatic. Accuracy is further improved by employing forward and backward extrapolation across the damaged area.

This process uses native CPU power to supplement the PowerCore DSP engine, so the faster the PC processor, the better. I used a 2.8GHz P4 to attempt a bit of miracle working on a seriously scratched version of Joan Baez's Silver Dagger that I've previously used for

testing restoration software and a crunchy copy of the Argo recording of Nicol Williamson reading *The Hobbit*.

Whatever restoration software you use it is well worth doing multiple passes rather than attempting to deal with all the problems at once. The normal order of battle is to deal with the scratches first, followed by the clicks then crackle, finishing up with broadband noise. Silver Dagger, with deep, long duration scratches showed an astonishing improvement after the first DeScratch pass. Attempting to remove the remaining clicks in one go resulted in unacceptable artefacts but two passes dealt with all but a few stragglers. With the settings changed to remove crackle, another pass improved things still further.

Broadband noise really wasn't much of an issue with this recording so after grabbing a quick sample noise-print a light denoising finished the job. There were a few remaining disturbances so I minutely examined the waveform with a view to drawing these out. After the first couple of failed attempts I concluded the only way to deal with them would be to either edit one channel into the other where only one was damaged or to edit from elsewhere in the piece. Maybe I'll get around to it sometime. All in all, the TC Restoration Suite produced an excellent result considering what I had asked it to deal with.

The *Hobbit* was far less badly afflicted, but does contain a considerable number of distorted passages. Here the results were impressive if not so definitive. Further proof, if any were needed, that there is no such thing as a magic bullet for all the ills that can affect a recording.

Performance is not the whole story. These plug-ins are easy to understand and simple to adjust for optimum results. This equates to speed and this in turn means money. Changes to parameters are immediately

audible so you are not left wondering if anything is actually happening.

DeScratch and DeClick both have a scrolling waveform display with three display options. Normal, the default, shows a high contrast waveform. Clean material appears in black, while click and scratch artefacts are indicated with red lines, the large individual spikes indicate clicks, scratches and pops, while smaller red lines, or in some case blocks, indicate crackle. Intensity Display is a low contrast waveform. Clean material appears in shades of grey, darker equals higher. Click and scratch artefacts are displayed in red. Intensity of shade indicates the level.

Most suitable for use with low-level signals, Outline Display shows the waveform outline with superimposed red lines, indicating clicks and scratches. DeNoise has a spectrum display showing the input signal as red bars, the noise print as a fixed yellow line, and the processed signal as green bars. The difference between the red and green is the portion of the original signal being removed by the process. In Draw mode, the noise print can be adjusted to better suit the material — useful where a sample cannot be obtained from the subject audio.

The Audition button in each plug-in allows you to hear what is being removed and, crucially, if anything is being removed which shouldn't be.

Perhaps the most impressive common factor shared by all three elements of the TC Restoration Suite is the comparative lack of artefacts for the amount of rubbish removed. There is no such thing as a free lunch so, of course, there are audible changes but these seem much less pronounced than usual.

If Audio Restoration is one of your obsessions, check this out. After some years, the field is becoming more interesting. ■

Bundled effects

Megareverb Uses the Core 1 and 2 algorithms taken from the M5000 with an enhanced tail design and diffusion improvements culled from more recent products. **Classic Verb** is a much less natural but arguably a more creatively interesting proposition. **Rich** and **warm spring** to mind. **EQSAT Custom** is a mastering EQ. The algorithm is borrowed from the Finalizer.

Master X3 is also based on the Finalizer algorithms. **Multiband expansion**, **compression** and **limiting** plus 'Soft Clip' and **dither**. **Chorus-Delay** follows the functionality of the TC 1210 Spatial Expander providing chorus, flange and slap-echo. **PowerCore CL** is a general-purpose compressor.

Voicestrip as the name implies, has the tools commonly used for voice processing. **Compression**, **de-essing**, **EQ**, **low cut filter** and **gate**. **24/7C Limiting Amplifier** is a software homage to one of 'those' compressors, including the '4-button mode'.

PowerCore 01 is a single oscillator synth. **Compensator Native** plug-in provides manual delay compensation for applications that do not include automatic plug-in delay compensation.

PROS

Automatic DeScratch highly effective; fewer artefacts than rivals; simple interface.

CONS

Installation/authorisation procedure; high CPU load in some circumstances; rather dull graphics.

Contact

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