Gordon Reid Celebrating milestones

Interview by Dave Robinson

Gordon Reid, 50 this month ("and still playing footie twice a week"), is managing director of CEDAR Audio, which celebrates the 20th anniversary of receiving its first invoice this month too. A first-class honours degree student in astrophysics, Reid managed a cluster of nascent computer companies for several years before meeting Dr Christopher Roads, director of the National Sound Archive, in 1998. Roads was looking for someone who understood technology, had business experience, and had knowledge of the audio industry. "The day we met, he offered me the opportunity to help create CEDAR Audio, and the rest is history," says Reid.

He's well-known in synth circles as a collector and player of vintage electronic instruments, and recently joined a Pink Floyd tribute band, The Floyd Effect, in order to pursue his love of all things Prog.

Where did the notion for CEDAR's restoration tools spring from?

"In 1983, Dr Christopher Roads, initiated a project of transferring audio from decaying analogue media such as cylinders, 78s and tapes to digital media. He then had the radical thought that, if one was going to digitise the audio, it would be a super idea to get rid of the clicks and hiss while doing so. Raising a research budget of... well, a considerable amount, he approach Neve Electronics, who used it to help fund the development of the Neve DSP desk, but never succeeded in addressing the issue of audio restoration.

"After two years, Neve put Christopher in touch with the Signal Processing Laboratory at Cambridge University, and a further grant lead to the software that would evolve into the prototype CEDAR system. This prototype ran at approximately 7,000 times real-time (ie, it took two hours to process a single second of audio) but this was fast enough to prepare a demonstration for BBC TV's technology programme, *Tomorrow's World*. This in turn unleashed a torrent of enquiries, and the library and the university realised that they had a 'tiger by its tail'. However, neither was in a position to set up and manage the small company needed to bring the research to the market, so Christopher registered a company, changed its name to CEDAR, and then set out to find staff, premises, customers, and start-up funds (in that order)."

CEDAR stands for what exactly?

"The original concept was for the company to be called DAR, for Digital Audio Restoration, but by the time that Christopher created the legal entity, there was already a company in the UK with the name Digital Audio Research. So he added the 'C' to the front, thus creating C-DAR, or Computerised Digital Audio Restoration. The 'E' was not far behind, thus giving the world Computer Enhanced Digital Audio Restoration. Then I came along and pointed out that enhancement (usually adding something to the signal) is the opposite of restoration (usually taking something away),

and decided to collapse the name to the acronym before the world heard the full version. In this, I was singularly unsuccessful, as evidenced by you asking the question when I know that you already know the answer."

You've come along way from two hours to process one second of audio.

"Indeed. There was a time not so long ago when making a process run in real-time entailed a lot of work, optimising code and ensuring that every stage of the process was as efficient as possible. Today, we retain our lust for tight, efficient code, but placing a process in real-time now entails slowing it down sufficiently for us poor, plodding humans to be able to hear it. Depending upon the process invoked, the latest Cambridge Series III will process eight channels of audio at speeds approaching 100 times faster than real-time. In real terms, this is of the order 5,000,000 – five million! – times faster than just 20 years ago."

Tell us about the differences between CEDAR's main business streams, namely restoration work and forensic work.

"When you are cleaning audio for use in the entertainment industries, the overriding criterion is to ask, 'How much noise can I remove before I unacceptably affect the signal?' A crass demonstration of this is to reduce the replay volume of an audio system fully so that silence results. This represents perfect removal of all the unwanted noise, but with an unacceptable side effect: no noise equals no signal. Therefore, a compromise must be found, and this boils down to finding the maximum amount of noise reduction (of whatever form) that can be applied before the signal is affected beyond acceptable limits.

"In audio forensics and surveillance, any tonal changes to the input signal are [basically] irrelevant. All we care about is intelligibility, so if an unintelligible seven-foot-tall male speaker with a voice like Darth Vader chewing gravel can be turned into a chipmunk who can be heard clearly to say, 'The bomb will be placed on the train at one o'clock', the job has been done."

Retouch is a very clever tool. How does that work?

"Very well, thank you."

What would you like the technology to achieve that is still some way off, do you think?

"Some restoration processes are close to, or have passed, the point of diminishing returns.

For example, the most sophisticated declickers can now eliminate clicks in high-quality audio without perceptible changes to the wanted signal. Our algorithm designers are aware of areas in which the current generation of declickers could be improved, but if the only benefit would be an advance from no perceptible errors to fewer instances of imperceptible errors, listeners would hear no difference, and we would have wasted valuable resources.

"In contrast, there's huge scope for improving broadband noise reduction and the extraction of wanted signals in the presence of non-stationary background interference such as babble, traffic noise and waterfalls. If you try to clean up a recording of a solo violin played in the presence of dozens of shouting people sitting under a waterfall next to a motorway, you're currently doomed to failure."

What does the Cinema Audio Society Award, which you won last month, mean to you and CEDAR?

"These are the guys who record and mix the audio for film and television, and by honouring us in this way they're saying, 'You've designed a product that really helps us to make movies and TV shows.' It's a great feeling."

What award are you most proud of?

"Over the years, we have been fortunate and privileged to win numerous awards, but there was something special about collecting our Academy Awards in 2005."

The Gordon Reid many people don't know is an avid synth and keyboard collector. So tell us about your GX1.

"That's a huge, three-manual synthesizer that was made by Yamaha in 1975/6. Its console weighs 300kg, and it comes complete with a seat and pedal board (another 87kg) and a pair of TXII speakers (141kg each). If you planned to buy one of the seven known examples, ship it all the way from Australia to the UK and, once here, bribe your colleagues to help shift it, then I think a date with a psychiatrist would be in order. Unfortunately, I was busy that day and cancelled the appointment."

When's the next Floyd Effect gig?

"We already have bookings reaching into 2010, so it seems that I will have to continue to juggle my role as an international jetsetter for CEDAR with the demands of being a hapless, penniless (and incipiently hairless) rock star for a while longer yet." ◓