David Steven, dCS

Hi-Fi+: How did you become interested in digital audio design?

David Steven: My Father spent his career in the audio industry and after a number of years working in software development and product management I joined dCS in 2009. It's such an exciting company as we develop our own proprietary hardware and software that is truly state of the art. I see my role at dCS being more focused on developing the product vision and managing/enabling the development process so we continue to innovate and improve our technologies. The real clever digital audio design goes on in our R&D department.

When you are developing top-tier digital audio products, which performance parameters do you think have the greatest overall impact on sound quality?

That's easy! Linearity first, as poor linearity results in a loss of fine detail and a system that is not musical. This is actually very difficult for standard measurement equipment to measure at very low levels, for example −120dB0 and below. Secondly, jitter rejection, as any variations in a DAC's timing accuracy results in distortion of the output signal – i.e., the music. This is bad! Next it would be filter performance. Unfortunately, there is no "perfect" filter that will be optimum for all recordings but in essence the DAC filter you use affects amplitude response, phase response

(transient performance) and image rejection. All of this is less of a problem at higher sample rates, which is why we lead the market in that direction. Finally, it would be the analogue output performance and specifically you are looking to achieve a low noise floor, low harmonics, but also ensuring that higher order harmonics are not present.

In simple terms, what do you feel sets your designs and products apart from most other ones on the market?

It's easy to be good but there are very few truly great companies. Just like Rolls Royce and Patek Philippe, great companies—no matter what the industry—offer discerning customers a combination of technological excellence, unparalleled quality, and timeless products. In the world of music recording and digital playback we believe dCS is that company. We are innovators, constantly improving the state of the art in digital, manufacturing and testing to astonishingly high standards, and as a result our products are timeless in their performance and design.

What do you consider your top one or two product digital audio design achievements thus far? What makes those products special from your point of view?

We have been at the forefront of digital audio for over 25 years and pioneered many breakthrough technologies in digital audio. That is down to the flexibility of our hardware and software but also our ability to anticipate the future. I'm not sure where to begin here but when you look at the revolutionary path our company took in the

recording world you can then start to see the effect these innovations had on the industry as a whole. For example, here is a list of some of our industry 'firsts':

- dCS 900 and 950 - World's first 24-bit Analogue to Digital Converter and Digital to Analogue Converter.
- dCS 904 and 954 - World's first 24/192 capable Analogue to Digital Converter and Digital to Analogue Converter.

- dCS 972 - World's first high res Digital to Digital Converter – enabling the 'Upsampling' effect to be discovered.

In the audiophile world you only have to look at the pages of *Hi-Fi+* to see that every digital component now embraces the very technologies we brought to the market. Our finest moment to date was probably the launch of Vivaldi as it was a culmination of our years of technological achievements and sounds absolutely wonderful.

Above: dCS' newest digital audio products comprise two Rossini-series models: a Player (shown here) and a DAC

What are two or three key aspects of digital audio that you wish consumers (and perhaps audio journalists, as well) better understood? Why?

Measurements are often quoted, but misunderstood or misused. For example, some people work out a DAC's resolution from the audio-band noise specification as perhaps 19 bits. That's not how it works; if the DAC can genuinely reproduce signals down to the 24-bit level, then that is the effective resolution. The importance and usage of a top-rate Master Clock is another area of confusion. The system must be designed with the Clock as an integral part, so that all the sources can lock to it in some way.

What do you see as the comparative merits of higher-than-CD resolution PCM, DXD, and DSD digital audio file formats? Which of these formats do your top products support and why?

We try to avoid getting dragged into the arms race of chasing ever higher sample rates! We all know high res material sounds fantastic and our products support both DSD and DXD, but often it's the recording itself that determines how enjoyable our listening experience is.

A well-recorded CD can give excellent results on a top-quality system, but the fine detail and presentation will always be limited by the level of detail in the data.

Native DXD offers incredible crystalline clarity, revealing amazing depths of detail, but also laying bare flaws in the recording and mastering process. In comparison, native DSD has a more rounded and often more musical presentation, unveiling nuances you want to hear while concealing flaws that might detract from the pleasure.

Consumers can potentially deliver digital audio files to their systems in a number of ways. How do you assess the relative benefits of streaming devices, dedicated music servers, or PC-based servers—especially in terms of sound quality?

At heart we are a converter company so we have always tried to remain agnostic to how we receive the data. In the early days it was purely silver disc and then we saw a move to computer audio where audio was received via USB. Now we have embraced network streaming from NAS devices and are moving towards Apple Airplay, subscription streaming services and the like. Our challenge as a manufacturer is to make sure that no matter how we receive the 1's and 0's we deliver fantastic sound. In theory, streaming high res audio over a home network should have less jitter and many performance benefits over silver disc, for example, but we all know that there are many variables in a playback system that affect the sound quality so it is impossible to guarantee superior performance 100% of the time.

Right: dCS Rossini DAC

If you are at liberty to say, what will be the next digital audio products from your company, and when?

We have invested a huge amount of resource in our hardware and software. The last few years we have really tried to improve our user interface, network streaming capability and supporting the emerging methods of streaming audio such as Apple Airplay and subscription services. All of this work has been in parallel with our continued efforts to improve the performance of our unique technologies, the dCS Ring DAC and dCS Processing Platform.

I'm happy to say that we have just launched Rossini DAC and Player and these products will ship in September 2015. Rossini has been designed with the future in mind and will make superb sounding digital music from any source more easily accessible.

What do you think the high-performance digital audio marketplace will look like five years from now?

There is definitely an increasing momentum toward streaming and subscription based music services. Bandwidth and connectivity is no longer an issue for most music lovers so I think I speak for most of us when I say I really hope that in the next five years the major labels and streaming services start offering us high res (or even 24/44.1!) on demand. If we can stream 4k videos into our home then why can't we make high res music available on demand too?

When you listen for personal enjoyment, what types of music do you most enjoy?

I have a real eclectic taste in music (it goes with the territory!) and if listening at home I tend to listen to indie rock, pop, and electronic music. However, one of side benefits of this job is that I travel the world listening to and sharing wonderful music. As a result my collection includes all genres from blues to classical to jazz. +

Right: Many regard the dCS Vivaldi digital playback system as the 'gold standard' against which all others must be compared