

# Game Changing DAC

THE METRUM ACOUSTICS OCTAVE DAC FROM THE NETHERLANDS DELIVERS EXTRAORDINARY PERFORMANCE FOR ITS PRICE

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Metrum Acoustics has been receiving some web attention lately, and a contact suggested that its DACs were worth examining. Upon request an *Octave* review sample appeared, almost by return. Manufactured by Dutch-based Acelec Engineering, it comes as a pair of neat and ultra compact, anodised silver alloy generic cases and is one of three Metrum models that also include the *Duo* and the *Quad*, the names referring to the number of paralleled industrial grade high speed ladder type DAC chips fitted. As is not uncommon these days, the marketing is direct sale from the manufacturer and the products arrived well packed and with full instructions. 110V versions are available too.

After some years striving to produce the perfect electrostatic loudspeaker panel, Cees Ruijtenberg, Acelec's chief engineer, long a fan of non-oversampled digital decoding, turned his attention towards designing a moderate cost DAC of this type. His aim was to step beyond the ubiquitous (and frequently worthy) implementations based on the venerable (20+ year old) Philips *TDA1541A*, a multi-bit ladder DAC chip that's still capable of very good sounds in the right hands (eg Zanden and Vertex AQ to name but two). Many modern ICs were tried before arriving at the present choice – after much searching, their discovery was described as a 'stroke of luck'. The sound quality and measured performance of the three models are said to scale commensurately with the number of paralleled DAC chips being used.

Ruijtenberg is no newcomer to electronics, and is up to date with ultrasonics and advanced digital circuits. For example, the *Octave* DAC uses a six-layer printed circuit board to achieve the optimal pulse bandwidth and grounding. And the ultra fast DACs themselves can sample at up to 15MHz if required. In conjunction with the resistive DAC ladder employed, this ensures very low levels of high frequency 'spike' energy, leading to low radio frequency interference (RFI). Consequently the designer has chosen to avoid the usual oversampling and digital filtering stages. Custom programmed IC gate arrays interface the acquired S/PDIF digital audio signals to the DAC arrays.

This DAC handles only S/PDIF type signals. In optical format it handles up to 24/96kHz sampling rate; the transformer isolated 75ohm coaxial RCA is rated to 24/176kHz (although the odd example may in fact do 196kHz, mine did not). The line output is a standard 2V from a low, direct coupled 82ohm impedance *via* single-ended RCA/phono sockets, and jitter is specified at a very low 40ps.

Better than 0.04% distortion (frequency unspecified), and in-band noise alone -130dB (ref full-scale output) are claimed. As is common for non-oversampling converters, the high frequency response is related to the sample rate, so for the 44.1kHz CD rate it is potentially -3dB at 22kHz (possibly audible for some listeners). This corner frequency raises proportionately with higher sample rate material.

Dimensions are a diminutive 30.5x103x240mm, while the DAC and the matching separate 14VA power supply that was used weigh a combined 1.3kg. Although it's said to work fine 'right out of the box', optimum performance is achieved after a few weeks of use, which was confirmed.

## Sound Quality

Meridian *200* and Marantz *CD7* units were both used as CD disc drives, while the bulk of material (including hi res up to 96kHz sampling) emanated from a Naim *UnitiServe*. While the reviewing began with modest ancillaries (cables and the like), it was clear that good things were possible and it was hard to resist using better mains, S/PDIF and signal cables in a high end audio system including an Audio Research *Reference 5*, a Krell *Evo 402e* and Wilson Audio *Sophia 3s*.

Initially noting a hint of chromium brightness and some fine grain sheen in the high treble, the Metrum was left on for a week or two. However, it also immediately delivered a strong sense of direct coupled, communicative immediacy, with a definite promise of something very special. Formal tests were then delayed, so a month had passed before it was put seriously to the test.

