first came across Benchmark via high-end hi-fi. In recording, digital converters are often considered as sexy as bantam plugs, but in the audiophile world, arguments rage over the importance of jitter and clocking capabilities – areas that lie at the heart of the ADC16. There's much misunderstanding of jitter's importance in digital interfaces – though if you take the stance that any distortion in the audio stream is undesirable, Benchmark's jitter elimination will float your boat.

The ADC16 incorporates Benchmark's UltraLockDDS clock technology; a proprietary system that the company claims eliminates all jitter-induced distortions. Taking its lead from the high-frequency RF communications industry, its high stability clock oscillator drives an

The former allows up to four channels of audio per output at sample rates of 88.2 and 96kHz, while the latter allows for two channels of audio to be carried at sample rates of 176.4 and 192kHz. In this mode, eight optical channels will be required to output sixteen channels of converted audio. Several of the LEDs also act as warning indicators, for example if there are any clocking or sample rate issues.

In Use
As I already have 16 channels of analogue inputs wired to D-Sub connectors, hooking up the ADC16 to my studio was relatively easy. Critical listening was performed via a Bryston 4B/PMC TB-2 combo and ATC SMC50a speakers, using both Metric Halo ULN-2 and Apogee I/O interfaces

Supermen and sex-bombs around the world have something in common with Benchmark – they have a lot to live up to, says STEPHEN BENNETT. Will the ADC16 fly beyond expectation, or bomb out completely?

BENCHMARK ADC16

Multi-Channel A-D Converter

oscillator controlled 500MHz Direct Digital Synthesis (DDS) system (via a custom FPGA) which generates a 3072xWC system wordclock. This system drags the jitter distortion to at least 135dB below the audio level – and thus well below audibility. Benchmark's UltraLockDDS system is able to achieve these jitter specifications by isolating the conversion clock from the digital audio interface clock and, because the system doesn't use Asynchronous Sample Rate Conversion (ASRC), latency is significantly reduced – it's 0.34ms at 192 kHz rising to 1.49ms at CD sample rates.

The Ins And Outs
The unit under review has been designed simply to move audio between the analogue and digital domains while maintaining its quality. It offers 16 channels of A to D conversion and can generate 24-bit audio at sample rates up to 192kHz, via a variety of interfaces and protocols. Housed in a sturdy 1U rack, the ADC16 is rather deep – Benchmark recommends a rack depth of 12.5-inches if you want to make sure cables are cleared. The rear panel sports 16 channels of transformerless balanced analogue inputs via two D-Sub Tascam connectors, 16 channels of AES digital I/O (again on two D-Subs), 16 channels of S/PDIF digital outs on eight RCA sockets, and eight optical digital outs – which can be configured in various ways. Between these lie the sixteen input trim pots, each offering a 23dB gain range – though the ADC16 comes preset for +4dBU usage. Two BNCs provide clocking facilities. The Clock reference input accepts Word Clock, Super Clock, and AES with an auto recognition feature, while the Word clock reference output can be used to synchronise other units connected to the ADC16. A blank panel on the review unit is designed to accommodate the optional DAW interface.

Most of the front panel is taken up by 16 horizontal multi-function LED meters, each with peak hold and scaling controls – the latter being adjustable in 1 or 6dB steps. To the right of the power switch are buttons for selecting Clock source (Internal, WordClock, AES or DAW), sample rate, AES output source (DAW or A/D, where the 16 analogue inputs are routed directly to the digital outputs.), S/PDIF source (DAW or A/D), optical out source (DAW or A/D) and finally, the optical output's format. In S/PDIF mode, two channels of audio are transmitted in AES format via each optical output, while in ADAT mode, each optical output can route eight channels at up to 48kHz sample rates – so two outputs will be required for sixteen channels of audio. If you've chosen sample rates above this value, the optical outs will switch to S/MUX2 or S/MUX4 formats.

to capture the multiple channels of digital audio converted by the Benchmark. Close listening at 44.1kHz revealed the ADC16 a competent performer, the digital conversion easily on a par with the Metric Halo and Apogee units and audibly superior to the low cost interface I threw in there as a reference. As I took the sample rate higher, differences between the analogue conversions of the various units became more obvious – though at this level of quality, it's hard to choose which is 'best'. I'm not entirely convinced that jitter issues in these interfaces are going to cause grossly audible distortions under normal listening, but I do accept that any attempts to remove errors in digital conversion is a laudable (and measurable) aim.

During the review period, the ADC16 performed flawlessly. Because the routing and settings are performed from the front panel, set-up was simple. My only recourse to the manual was for the information it contained regarding Benchmark's philosophy on conversion and to examine the extensive specification sheets.

The optional DAW card allows the ADC16 to act somewhat as a 'traditional' Firewire audio interface, providing 16 channels of bidirectional audio – so the DAW return path can be routed, via the digital audio outputs, to external D/A converters. Though I didn't get the chance to try out the card, it will be a useful addition to the ADC16's feature set, especially as the variety of digital connections should slip in nicely to existing digital based studios.

Conclusion
I almost forgot that I had the ADC16 patched into my system over the review period – which is possibly the most flattering thing you can say about a unit designed to be transparent in use. For those requiring the highest quality analogue to digital conversion, the Benchmark unit delivers exactly what it says on the box. With an ADC16 converting your current into digits, you need to have no worries that you're losing any important information along the way. AM

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THE REVIEWER
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