Grace Design m900 DAC/Headphone Amp

Reference replay — NIGEL JOPSON finds good things come in small packages.

The m900 is a portable DAC and headphone amplifier, with a desktop friendly design, offering multi-sample rate audio playback from USB, S/PDIF or optical sources. The m900 DAC uses the latest generation AKM 4490 chip, which features 32-bit processing and supports sample rates up to 384kHz PCM or 256x DSD. The S/PDIF input handles sample rates from 44.1kHz to 192kHz, whilst the optical TOSLINK input will handle 44.1kHz to 96kHz. The USB interface operates in asynchronous mode, allowing the m900 to be the clock master, which makes the system immune to USB bus jitter.

The m900 can operate as a USB Audio Class 1 or 2 device, and requires a computer with a USB 2 (or 3) port. In Class 1 mode the m900 supports driverless operation on Mac OS and Windows up to 96kHz. In Class 2 mode, the m900 supports driverless Mac Core Audio operation up to 384kHz; for Windows, Class 2 operation requires installation of the Grace Design 'XMOS Stereo USB Driver' which can be downloaded from the support area of their web site.

The extremely sleek little black box has 3 input choices on the back: a mini USB 2, S/PDIF and TOSLINK. Two gold plated RCA/Phono sockets provide the unbalanced line out, and there's an extra mini USB socket for an additional 5V power input from a (supplied) 2A wall-wart, although the unit may also be self-powered via the input USB. "High power" mode seems to have a little bit better bass control plus treble extension, and seems more effortless reproducing layered music with a lot of hard transients. It's possible to connect an iPhone or iPad using the Apple Lightning to USB Camera Adapter, for Android devices you will need an "On The Go" USB cable. I connected my iPhone successfully — the iPhone can't supply sufficient power — but I did manage to power the m900 from a typical phone charging pocket-brick, so mobile operation is entirely possible! I also successfully tested the optical and S/PDIF inputs, which can be selected by entering the setup menu mode with a 2 second push-and-hold of the encoder. The last-adjusted menu parameter will be displayed, and can be toggled by a quick press of the dial.

Apart from source select, when in menu mode several other options can be adjusted: Crossfeed on/off for headphone outs, dimming of the front panel display, power-up default gain level, USB mode 1 or 2, incoming sample rate display and 4 different DAC filter settings.

The DAC filters are basic roll offs, with associated analogue-like minimum phase effects, or digital-domain linear phase equalisation. The choices are: F1-sharp roll off linear phase; F2-slow roll off, linear phase; F3-sharp roll off, minimum phase; F4-slow roll off, minimum phase. Grace provide a useful explanation in the manual of which DAC Filter setting might be appropriate for which type of music. The effect is pretty subtle, I found myself preferring F3, which Grace describe as: "Not linear phase in the pass band. Fast roll off protects against aliasing distortion from high amplitude high frequency content. Best for recordings that are loud, compressed and with lots of treble." My kind of music, I guess.

There are two 1/4" headphone output jacks on the front, which are wired in parallel. The jack on the right is a switched type. Connecting headphones to this jack automatically mutes the line outputs. The switched (via menu) crossfeed for headphones is pretty discrete, it won't transform your cans into a pair of loudspeakers, but for those who like this sort of thing, it seems a low-THD implementation of the effect. Easy to drive headphones (as often found in studios) can actually be more challenging to power for high fidelity. Lower impedance, easy to drive, headphones require a lot of current, rather than a lot of pure power. You also need a low output impedance for damping. Ultra-low impedance outputs means the m900 can drive a lot of current, especially since it can deliver 1030mW at 32 ohms, and 57mW into 600 ohms. If you can't get enough power for your headphones from the m900 you're either deaf, or you've blown the cans. With its linear response and lack of IMD, the m900 is bound to become a favourite with the "headfi" hi-fi fraternity. It certainly knocked the spots of a weighty copper-bottomed piece of hi-fi extravagance in my collection. If you're a Grado PS500, Sennheiser HD 800 or Beyer Tesla listener you will not be disappointed. The DSD capability will also tap into a particular audiophile clique.

So what does the m900 sound like? A DAC is the single most important benchmark tool for an audio pro: we assess everything we produce via our digital converters. We EQ instruments and blend our mixes according to what we hear through our DACs. Like many outstanding reference devices, the m900 (depending on one's regular DAC) can seem slightly unimpressive on very first listen. We get used to the subtle sonic signatures of our regular kit — we miss the colouration — and the m900 has ... none. Resolving, transparent and fast would be descriptive terms that come to mind; in my case, I noticed how separated the notes of instruments were, and how unblended the lower frequencies of a mix were. Compared to my regular laptop interface, I missed the warm smeary glow at the low end, and realised I had probably over-EQd or over-transient-shaped tracks at the high end. You won't hear the m900 — you hear through it. Production pros will recognise the other hallmark of a good DAC: I suddenly found myself impelled to turn the monitor level down, feeling I could happily hear enough to work at lower levels ... much lower!

In fact, the continuous volume control is one of the killer features of the m900. Each click up or down is equivalent to 0.5dB, with the right-hand decimal point illuminating to indicate a step: "48." indicates a value of 48.5dB. A volume level of 90 is "unity gain" and the m900 will then produce a 2V output signal for a 0dBFS input signal. A press down on the top of the controller mutes the output, dimming the display. Just like an analogue control room pot, the level can be precisely adjusted whilst in mute mode, and then switched back on with a single push. L-R Channel balance at very low gain settings — an annoyance for many mixers — is impressively consistent.

You'll have to pay around three times the price of the m900 to match it's playback performance with other pro-audio hardware. The m900 is the perfect piece of kit for the mixer working in-the-box, or for playback in editing rooms. With most modern DAWS now capable of selecting different USB interfaces on input/output sides, I found myself listening back through the m900 all the time. I guarantee even hard-working audio pros will be tempted to start listening to music for pleasure with the m900, it's performance at super-low monitoring levels is really outstanding. Overall, a superb DAC to rival the very best, providing a generous range of sample rate and input choices, with the unusual digital filter options and an admirable headphone drive capability. If you don't need analogue input in the same box, and you want a great monitor controller and headphone amp, the m900 is about as good as it gets.

PROS	Benchmark performance, generous range of sample rates, a good match for even the most esoteric headphones.
CONS	None at this price ($499), although a balanced line out would complete the pro package.
EXTRAS	Comes with PSU, 2 good quality USB cables & printed manual.

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