



electromod
the sound connection

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TOPPING

Above Topping's top-tier D900 DAC/preamp

Meet the D900 – Topping's technical tour de force

Eschewing chip-based DAC design for proprietary, discrete 1-bit decoding technology, Topping's new reference-class DAC/preamp sets new sonic standards under £2000

Buckinghamshire, England -- DAC specialist Topping has earned a global reputation for exemplary design and class-leading performance at accessible prices. With a range of DACs (Digital-to-Analogue Converters) and amplifiers starting at £100 and stretching to over £1000, the company's products deliver exceptional value for money for both hi-fi systems and head-fi applications.

Hot on the heels of the recently launched DX5 II – a budget powerhouse at £299 – comes the finest DAC Topping has ever built: the new flagship D900. With an RRP of £1799, this innovative new DAC/preamp is now shipping to the UK via Electromod – Topping's official UK distributor.

The D900 is unlike any other DAC on the market at its price point. Most manufacturers build their DACs around specialised, bought-in chips using 'delta-sigma' processing. A smaller number, termed 'R2R' DACs, use a ladder-like network of resistors instead of chips to convert digital signals to analogue. A third approach is to use programmable chips (FPGAs) to allow the manufacturer to write its own audio processing firmware – dCS, Nagra, Chord Electronics and Schiit Audio are among the companies that take this route (with differing implementations).

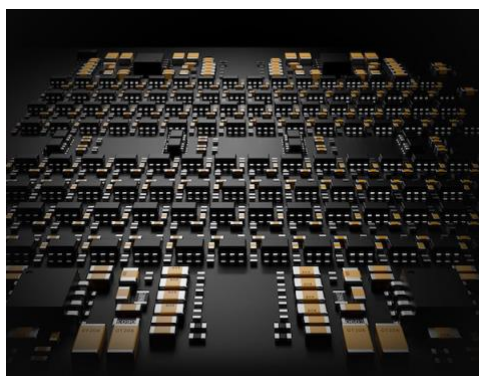
Topping's new flagship is distinct from all these other DAC designs, benefitting from innovative D-to-A conversion technology designed and built entirely in-house. Topping calls this 'PSRM' – a discrete 1-bit decoding architecture featuring an ultra-fast switching logic array and a precision voltage reference to

accurately convert digital audio signals into analogue voltage. By minimising power supply interference and using careful component selection, PSRM technology achieves high audio accuracy, low noise and excellent signal integrity.

PSRM – Topping’s technical tour de force

The D900 is not the first DAC to use Topping’s proprietary PSRM architecture – that was the D90 III Discrete, which launched in late 2024. But the company has further developed the technology for its new flagship DAC, perfecting its architecture until even the most ambitious design goals were achieved.

PSRM stands for Precision Stream Reconstruction Matrix and incorporates discrete 1-bit modules that convert digital audio streams into analogue voltage by turning each audio sample into a very fast train of 1-bit pulses. The density of this pulse train – the proportion of ‘ones’ versus ‘zeros’ – represents the instant waveform level; these pulses are then averaged/smoothed with an analogue reconstruction filter. In essence, this is a form of delta-sigma processing, but the implementation, algorithms and circuit choices are unique to Topping.



Left Instead of a chip-based DAC, the D900 incorporates discrete 1-bit ‘PSRM’ DAC circuitry developed by Topping

Compared to the D90 III Discrete, the D900’s sophisticated PSRM implementation doubles the number of elements in the PSRM module from 16 to 32. After rigorously evaluating dozens of component configurations, Topping selected a combination that delivers an extremely fast response whilst preserving the integrity of the original signal. The component selection also minimises interference with the power supply system, laying the foundation for exceptional performance.

An accurate reference

The design of the voltage-reference power supply is critical because it directly determines the accuracy of the PSRM modules’ analogue output. Topping’s digital switching logic operates at the nanosecond level; while current fluctuations are regulated by these ultra-fast switches, they can still affect the purity of the reference voltage – an element that has a direct impact on noise and distortion.

To address this, Topping has developed a sophisticated voltage-reference power supply – stable, noise-free and purely resistive. The resulting synergy between this and the switching logic enables the D900 to reproduce the original audio signal with astonishing fidelity, achieving harmonic distortion below -140dB and a signal-to-noise ratio of 131dB.

Jitter ye not

Jitter – a timing error in digital audio signals that causes audible distortion – is eradicated by a sophisticated clocking system using a CPLD (Complex Programmable Logic Device) to optimise the signal. A CPLD is a type of programmable chip that delivers more predictable timing (in a digital data sense) than an FPGA chip owing to the way it is constructed, making it ideal for timing-critical digital applications. As lab measurements clearly illustrate, the D900's jitter performance is exemplary.

Danger! High (quality) voltage!

I/V (Current-to-Voltage) conversion is a necessary part of any DAC. It converts the initial current output from the digital-to-analogue conversion process into the voltage signal required by an amplifier, so the amp in turn can drive a pair of headphones or speakers, and the quality of its implementation is critical to sound quality.

Topping has created a new, proprietary I/V conversion circuit to unlock the full potential of the D900's PSRM DAC architecture, composed of low distortion integrated op-amps and ultra-low-noise discrete components carefully selected after repeated testing. This ensures that the voltage signal output remains pristine, delivering excellent dynamic range and an immersive sonic experience.



Left Sophisticated on the inside and understated on the outside, the D900 is a first-rate example of advanced digital audio engineering

Pre-eminent preamplification

The D900 is a 'pure DAC' to use with digital sources in any high-performance audio system. It does not include an onboard headphone amp, although it can of course be paired with one, such as Topping's matching A900. Keeping the headphone amp and DAC in separate chassis ensures both elements can be fully optimised to a level beyond any integrated solution.

In a high-end hi-fi system, the D900 is capable of competing with DACs costing several times its price. It can be connected to an integrated amp, or a pre/power amp system, via its line-level output; it also has a variable output, enabling direct connection to a power amp or a pair of active speakers, with no need for a separate preamp in-between.

The D900 is far from unusual in this regard. But not all DACs that claim to offer built-in 'preamp' functionality are equal – most simply apply a passive volume control or a digital attenuator, which is less sophisticated than a dedicated active preamp. The D900, however, includes a 'proper' analogue preamp stage with an independent, discrete circuit design that is a match for high-performance dedicated preamps, rendering a separate preamplifier unnecessary when used in a system with all-digital sources.

The D900's volume control is a true high-end design, using 18 analogue relays (9 per channel) to deliver adjustment in 0.5dB steps – smooth, clear, refined and precise. Whether the volume control is applied or the output fixed at line level, the Topping's superb analogue stage – fully balanced from input to output – coupled to its unique PSRM D-to-A architecture delivers a high-end performance of remarkable quality at a relatively accessible price.

Well connected

The D900 provides an unusually wide array of digital inputs. There are eight cable inputs in total, including two USB (USB-C and USB-B) plus four S/PDIF (two optical and two coaxial). These are joined by an AES/EBU input and an IIS-LVDS (I²S) input, using XLR and HDMI connectors respectively – both are high-quality, low-interference digital audio connections that can provide superior performance in comparison to USB and S/PDIF, especially over longer cable runs.

The two USB ports and the IIS-LVDS input support PCM audio to 32-bit/768kHz, and DSD to DSD512 (native) and DSD256 (DoP). The other cable inputs handle PCM to 24-bit/192kHz and DSD64 (DoP only). In other words, the D900 processes all relevant digital file formats including the very highest of hi-res audio, now and in the future, without any sonic restriction.



Left The D900 provides an array of hi-res digital inputs and balanced analogue outputs to make the most of its top-class DAC and preamp circuitry

Topping has included the convenience of device-to-device streaming via Bluetooth too. A comprehensive suite of high-definition codecs is supported including LDAC and aptX Adaptive up to their 24-bit/96kHz specifications, as well as aptX HD (24-bit/48kHz).

Other Bluetooth formats include aptX Low Latency, 'regular' aptX, AAC and SBC, ensuring that whatever type of device you're streaming from – Android, iOS, Windows PC or Mac – you're assured the best possible sound quality. The range and reliability of wireless reception is optimised by compliance with the Bluetooth 5.1 standard.

Analogue outputs are provided in balanced XLR form for maximum sound quality, via high-grade Neutrik connectors. (Cables converting XLR to single-ended RCA can be used if connecting to an amp without balanced inputs.) There are two pairs of XLR outs – one delivering a fixed line-level signal, the other utilising the D900's preamp circuitry.

Sophisticated sonic tuning

The D900 supports Topping's new PEQ (Parametric Equaliser) system, allowing precise control of frequency, gain and Q (bandwidth) across ten customisable bands. By using the free 'Topping Tune'

software for Windows and Mac OS, in combination with an FPGA chip in the D900, users can create and save multiple profiles and upload them to the DAC; these can then be selected via the D900's menu system without the software running in the background.

Far more sophisticated than simple tone controls, Topping Tune allows the user to create multiple sonic profiles and even import target curves. This enables the sound to be precisely tuned to suit the connected hi-fi or head-fi system, and the differing characteristics of digital sources and acoustic environments, in line with one's personal sonic taste. (Utilising this facility is entirely optional, of course.)



Left Users can create parametric EQ profiles and upload them to the D900 to precisely tailor the sound to suit different headphones and speakers

Built to be a flagship

With dimensions of 33x5.7x21cm (WxHxD), the D900's top-notch build quality stands comparison with much more expensive high-end hi-fi components. Its crisp, elegant lines are fashioned from sturdy aluminium – 3mm thick for the main casework and 8mm for the front panel and heatsinks on both sides. Impeccably finished for a classy, understated look, the beauty of its external design is more than skin deep; its solid chassis and aluminium feet with vibration-absorbing pads are built to nullify all forms of interference, from RFI/EMI to external resonance.

The D900's remote control is similarly well built – encased in aluminium machined from a single block, it feels every inch a premium-quality device. It is a pleasure to use in combination with the D900's two-inch colour screen and intuitive on-unit controls, which include touch-sensitive buttons and a multifunctional rotary control; the latter is programmable for easy access to the functions its owner uses most often.

The display is highly configurable thanks to Topping's new Aurora UI, with nine different colour schemes, adjustable brightness and more. Users can choose to show data such as incoming file format, sample rate and volume level, or select a 'spectrum analyser' (FFT) display to represent the audio signal's frequency components in real time. A third option is a classic VU-style meter, showing signal levels as the music plays and adding vintage appeal to this most modern of devices.

Unique technology delivers sonic excellence

The D900 is an exceptionally well put together audio device, but its sound quality is what makes it truly special at its 'affordable high end' price point. Proprietary single-bit DAC technology of the level it

contains is simply not available from other manufacturers at anywhere close to the D900's sub-£2000 price point, and Topping's unique design delivers remarkable sonic results.

The line between analytical resolution and warm musicality is notoriously difficult for DACs to tread without leaning one way or the other, but the D900 achieves this balance with consummate skill. It combines lightning-fast transients with seamless musical flow; crystalline clarity with rich refinement; engaging punch and slam with a broad yet even-handed frequency response. It avoids the hard-edged 'digitality' exhibited by many chip-based DACs (often considered a benefit of R2R DACs) whilst delivering exceptional speed and agility (R2R DACs' common Achilles heel) – the balance it strikes is truly impressive.

The D900 is the consummate sonic all-rounder, the best of all worlds, made possible by proprietary reference-level technology at an accessible price. With production and international shipments ramping up, discerning music lovers in the UK can now enjoy its talents. And, as with all Topping products, customers who purchase the DAC from an official UK stockist benefit from UK-based tech and service support through distributor Electromod. The D900 is available at an RRP of £1799.



Left Crisply designed and impeccably finished, the D900 is complimented by an aluminium-encased remote control with a distinctly premium feel

Topping A900 A reference-class headphone amp to match the D900

Head-fi aficionados should note that the A900 – Topping's new flagship headphone amp – is now also shipping to the UK. It combines reference-class analogue headphone amp and preamp functionality and is the perfect headphone partner for the D900 (or any other high-performance head-fi configuration).

Under the hood, the A900 features Topping's new 'T'ang-ku-la' architecture with a patented three-stage feedback circuit. This eradicates circuit noise and high-frequency distortion, thus further enhancing dynamic range to an exceptional 151dB and reducing full-band total harmonic distortion to 0.00003% (90kBW) – the very definition of 'vanishingly low'. This new technology also reduces circuit heat generation, improving reliability and extending service life whilst minimising thermal noise.

The three T'ang-ku-la modules form a six-channel, fully differential architecture from input to output, thus achieving 'full-link' differential balanced amplification. Many amps claim to benefit from 'balanced' circuit design, but the term is often liberally applied; the A900 is truly *fully balanced*.

The headphone amp delivers prodigious power of up to 22,000mW (@16 ohms). No headphone on the planet is beyond the capabilities of the A900; it drives even the toughest loads with consummate ease, whilst maintaining the purest noise-free sound quality of any comparable amp. It sports a remarkable range of inputs and outputs too; its headphone ports allow the simultaneous connection of up to six pairs of headphones or IEMs, encompassing balanced 4.4mm, 4-pin XLR, 3-pin XLR and 6.3mm using premium Neutrik and Pentaconn connectors.

The A900 benefits from the same flagship level of specification as the D900, sharing the same build quality, machined aluminium remote control, relay-based volume control, PEQ functionality, colour display and Aurora UI interface. Stock is now arriving in the UK, available at an RRP of £1199.



Left Technically and sonically, Topping's D900 and A900 form a remarkable reference-class partnership for headphone lovers

TOPPING

Formed in 2008, Topping has forged a formidable reputation for first-rate audio design and engineering that puts its competitors in the shade. The company's range includes class-leading DACs of various 'flavours', some using ESS Technology or AKM chips, others incorporating R2R or proprietary discrete 1-bit DAC technologies, to cater for a wide variety of tastes and preferences. Amplifiers are another speciality, from analogue headphone amps to match the various DACs, to stereo and mono amps for loudspeakers. All punch well above their price points.

toppingaudio.com



Founded by Mark Dolbear, Electromod is a leading UK distributor specialising in head-fi gear, from DACs to amps to headphones and associated accessories. The company focuses on product excellence and a personal style of customer support, operating as official distributor for class-leading brands such as Dan Clark Audio, Dekoni Audio, Schiit Audio, Topping and Violectric. Mark has an engineering background and has worked in the audio industry since 1995, servicing products from the likes of Mark Levinson, Goldmund, Ayre Acoustic and Stax before forming Electromod.

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