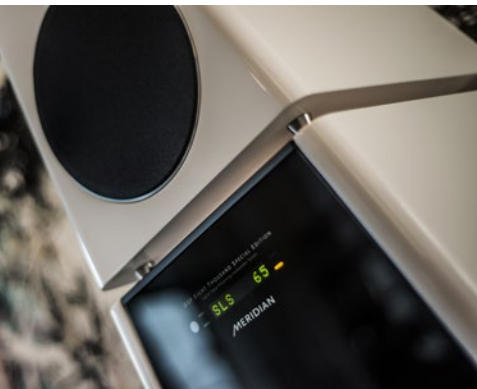




MERIDIAN SPECIAL EDITION DSP8000

Reviewer Jez Ford

DIGITAL ACTIVE LOUDSPEAKERS



△ WHEN YOU AUDITION A PIECE OF HIGH-END MERIDIAN AUDIO EQUIPMENT, IT'S A WHOLE LOT MORE THAN A COLLECTION OF HARDWARE. YOU'RE ALSO ACCESSING A WELL-DEVELOPED KNOWLEDGE OF DIGITAL AUDIO AND A PHILOSOPHY OF PSYCHO-ACOUSTICS EVOLVED ALONGSIDE CONSTANT INNOVATION.



The Special Edition DSP8000s contain not only eight drivers but also the entire system's amplification, plus DACs and DSP

It's hard to imagine a company more solidly founded on technology and design than the UK's Meridian. Even before it began, founders Bob Stuart and Alan Boothroyd had delivered a design legend in the unique and colourful Lecson knobless preamp and cylindrical amplifier, going on to set up Meridian Audio and enjoy 40 years of successful products underpinned as much by a stream of tech breakthroughs and patents in signal processing as in the hardware itself. Meridian Lossless Packing became the standard compression method on DVD-Audio content and within Dolby TrueHD, while the more recent MQA (Master Quality Authenticated) platform for "folding" high-res audio into smaller file sizes also originated with Meridian before being spun out to 'MQA Inc' for global licensing. Most recently of all, the company's 218 Zone Controller won the 2017 CEDIA EMEA 'Best New Hardware' Award for its delivery of high-resolution sound from local and distributed audio, including easy operation with the company's award-winning Sooloos music management platform.

So when you audition a piece of high-end Meridian Audio equipment, it's a whole lot more than a collection of hardware. You're also accessing a well-developed knowledge of digital audio and a philosophy of psychoacoustics evolved alongside constant innovation.

And at the tip-top of that philosophy and experience stands the company's statement product, the DSP8000, reviewed here in its even tip-topper Special Edition version.

A SYSTEM, NOT JUST A SPEAKER

Although listed by Meridian under 'loudspeakers', the stately 135cm-high dual enclosures of the Special Edition DSP8000s contain not only the eight-driver transducer complement but also the entire system's amplification, plus digital-to-analogue converters and the digital signal processing (DSP) which contributes to model name of this 'loudspeaker', which is actually a complete audio system lacking only the music signal at its inputs.

"Meridian breaks it down to selecting your source and connecting that with the speakers in the digital domain", as David Moseley of Meridian's Australian distributor Cogworks puts it. "The main influence after that is your room".

The advantages of active loudspeakers, especially when fed directly with a digital signal, are clear and well-established. You can enjoy bespoke matching of amplification with known speaker characteristics, and short internal cable runs compared with long runs from external amplification or digital crossovers.

And why does the DSP get top billing here? Because it allows Meridian to keep the signal digital until the last possible stage, undertaking all its processing in the digital domain — the crossover splitting, any equalisation or adjustment of treble or bass, and the volume control (to 48-bit precision), as well as digital protection of the loudspeakers against high-level low-frequency transients. In the last few years such digital-domain processing has become an increasingly used strategy at all levels of hi-fi. Meridian was several decades ahead of this trend, its first "digitally-driven" D600 loudspeaker appearing in 1989, and then the DSP6000 in 1991.

The DSP6000 is the clear antecedent of this DSP8000 and its SE variant, with similarly separated enclosures — a decoupled head unit for midrange and tweeter, and the same side-firing bass driver arrangement too.

This last feature takes you by surprise in a speaker the size of the DSP8000 — there are no forward-facing bass drivers lined up at you. Instead there is a smooth front panel of 6mm glass, with a window for the display and infrared sensor. It's an unusual styling developed to a mature perfection in the 8000 SEs with which we spent time, their white gloss wrapping seamlessly to the side interlaminated panels. All Meridian's DSP speakers use a cabinet construction of timber interlaminated with a layer of aluminium which keeps the entire speaker shielded from RF. In this lower cabinet sit the three pairs of 200mm bass drivers, directly opposed to help cancel cabinet vibration, of course, and in the SE version given additional clamp rings to improve isolation from the cabinet. The bass drivers are wired in pairs, each pair with their own amplifier, and with the first digital crossover point between them — the uppermost two pairs of bass drives receive the whole range of bass frequencies, while the lowest pair is fed only the very lowest bass frequencies.

Above and supported by the bass enclosure on three machined feet, the head assembly uses curved pressure-laminated panels with multiple layers of selected woods and metal to form a sealed and stiff enclosure, its tapered shape designed to optimise dispersion for the treble unit, a semi-horn-loaded beryllium dome with dual silver voice-coil, and the midrange unit, described as "a cone made from a uniquely light and stiff combination of polymers". The beryllium tweeter is part of the SE elevation, this element is half the density of diamond, seven times more rigid than aluminium and over twice as 'fast' — this, says Meridian, allows the SE to control transients across a wider frequency range.

The Special Edition DSP8000 also uses special solid metal rings that clamp the drivers more



△ THE COMPLETE CABINET STANDS ON TRIANGULATED ADJUSTABLE MACHINED FOOT ASSEMBLIES WITH PROVISION FOR FLOOR SPIKES OR SKIDS

firmly in their cabinet. It uses a similar treble unit but with a lighter, more rigid, beryllium dome. This combination allows the Special Edition loudspeakers to have a more controlled transient response across a wider frequency range.

The complete cabinet stands on triangulated adjustable machined foot assemblies with provision for floor spikes or skids. And you know how some high-end multiple-enclosure speakers have you getting out the spanners to ratchet up or down the precise angles for time alignment? Meridian does all that in its digital processing too, with what it calls Enhanced Bass Alignment (EBA). To overcome the progressive delay of lower frequencies, a combination of digital filters and time delays make the mid and high frequencies 'wait' for the low frequencies to catch up, "delivering perfectly-timed music playback, additional clarity and an open, transparent sound-stage", says Meridian. The speakers have the EBA enabled by default — but an internal switch can be de-activated during configuration, so you can assess the effect.

PLUGGING UP

Connections on the Special Edition DSP8000 are firmly digital, with one S/PDIF coaxial electrical digital input for a local source, plus an RJ45 (Ethernet) connector for Meridian's SpeakerLink connection. Each type offers both the input and also an output onto another speaker, and there are sockets also for Meridian's 'Comms' system control. If you're using the SpeakerLink connection the separate system control connections won't be required, since SpeakerLink carries both two balanced digital connections (in a Meridian system, digital audio is distributed in pairs of channels) and the Meridian Comms control in that single RJ45 connection.

Switching the configuration from SpeakerLink to the coaxial input requires restarting both speakers in a different mode, but we gather you can use both of the speaker's inputs at the same time and assign the inputs to source keys on a Meridian MSR remote, or configure a controller like the 818v3 to switch between them. And if you do end up using the local SPDIF input as well, the local source can be forwarded on to other speakers via SpeakerLink.

So while you could use the Special Edition DSP8000s in stereo purely through their coaxial connections in a 'Master' and 'Slave' set-up, SpeakerLink is the optimal way to go, especially as it can scale up as easily for a full home cinema set-up as for stereo, using SpeakerLink cables either daisy-chained or star-connected from a central hub.

What central hub? Meridian calls them 'end points'. For home cinema you might be using Meridian's G68 Digital Surround Controller, or for stereo its 808 Reference CD player, or its UltraDAC (or both). Very convenient for additional zones may be the aforementioned 218 Zone Controller. Each of these provides physical inputs not only for your sources but also for Meridian's app-based "intuitive visual music management interface", Sooloos.

SWIMMING WITH SOOLOOS

We needed no introduction nor convincing when it came to using Sooloos in our time with the Special Edition DSP8000s. We were convinced by the concept when we first met it in standalone form, and it received an award from our sister magazine *Sound+Image* all the way back in 2010. So this is a mature platform for organising your streaming file-based music from a networked drive of music, and also for integrating Tidal's online music service. With Tidal being among the first to make MQA files available for streaming, it's no surprise to find that Sooloos and the Special Edition DSP8000s will be delighted to perform the full double-unfold required to re-weave these streams to as high as 24-bit/192kHz when available. We gather that the first unfold (decoded MQA Core) occurs in the end-point, then the secure MHR digital transport system (over SpeakerLink) transmits the MQA Core data digitally to the DSP speaker which then renders the signal, performing the second unfold and also optimising the data for the speaker's DACs.

But the joy of Sooloos is not so much in the technology behind it, but in the pleasure of using it. Sooloos very much travelled first where Roon has followed (Roon was set up by former Meridian staff), harvesting metadata about your music and enabling a seamless 'swim' through strands of connection — from a featured performer on one song to their full catalogue, to a producer's other work or to other versions of a song. Alternatively it can 'focus' intelligently on whatever you please to build a smart playlist — 'jazz / from the 1990s / in high-res', say, and all with touch-screen control and a lovely interface with powerful indexing renowned for handling the largest of music collections.

In the early days Sooloos ran on a dedicated touchscreen controller, but of course now you can have Sooloos on your phone, on your tablet, and/or using software on your PC or Mac computer. In our time with the Special Edition DSP8000s we made



all our music selection using the Sooloos app on an iPad. We were able to access files previously stored on a Meridian Media Core storage device, and also to access Tidal, streaming files at CD quality and, using MQA, unfolded to high-resolution streams.

BETWEEN INPUT AND DRIVERS

Behind those SpeakerLink connections each Special Edition DSP8000 uses two of NXP's Freescale CMOS 24-bit DSPs (56367) running at 150MHz, and on all incoming signals Meridian uses its proprietary jitter-reduction technique — a FIFO (first-in first-out) buffer reclocking using an independent output clock to reset any timing errors in the incoming signal. CD-quality and lower signals arriving via SpeakerLink are upsampled to 88.2kHz and 96kHz for the Digital Signal Processing within, with this upsampling also providing the opportunity to apply apodising correction, using a unique Meridian filter that avoids pre-ringing, so it can be steeper, potentially cleaning up the effects of less efficient filters used by the ADCs or other upstream processing.

The DSP also allows that digital user adjustment of volume, bass and treble, also an adjustment for speaker positioning, adjusting for potential room effects. And those without air-conditioning might like to note that there are also options for ambient temperature adjustment. "If the ambient temperature is greater than 24°C (75°F) you should adjust the ambient temperature setting" says the manual. Which probably doesn't happen much back in the UK, but hey Meridian, welcome to Australia!

Above CD quality the Sooloos system can handle FLAC, WAV, Ogg and AIFF up to 24-bit/192kHz, remembering that SpeakerLink itself is limited to 96kHz, so that higher sampling rates will be downsampled before transmission to the speakers — other than the final unfolding of high-res MQA files. A yellow light on the display is a 'High Speed' indicator showing a sampling rate of 88.2 kHz or higher.

The 96kHz limit of SpeakerLink seemed surprising, so we took the opportunity to ask Meridian Audio's Matt Holland about it.

"On paper it may seem like a limitation," he told us, "but I often use the analogy of the importance of camera lens versus the pixel count on the sensor on the final image quality. Our digital transport design allows us to achieve amazing resolution at the analogue output stage. We measure resolution in terms of noise, jitter, time smear, not just bit-depth and high frequency extension. We also do not believe there is any technical argument to support operating at bit-depths higher than 24-bit, as a correctly dithered 24-bit signal, when correctly converted to analogue, has no quantisation noise and more dynamic range than any recording microphone or studio preamp can capture. Bob

[Stuart] has written and published some excellent technical papers on the subject over the years.

"Our ambition in the future is to increase the maximum sampling rate of our SpeakerLink transport. The current Meridian state-of-the-art is 24/96 for DACs. Our front-end processors, like 818v3 and UltraDAC, can handle much higher sampling rates at their inputs, so in terms of file compatibility we handle practically everything available."

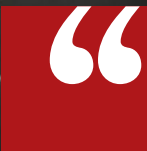
With the processing and crossovers undertaken in DSP, twin 24-bit multi-bit delta-sigma DACs with 128x oversampling are deployed to deliver the inputs to five independent high-power low-feedback power amplifiers — one amplifier each for treble and midrange drivers, one for each pair of bass drivers. These are described as extended-bandwidth analogue electronics, optimised to deliver high-resolution recordings, but there seems little published information on the specifics of these amplifiers, although Meridian did send (in response to our queries) a 1981 white paper by Malcolm Hawksford describing an approach to power amplifier design where nonlinear distortion generated by the output transistors is compensated for by simple fast-acting local circuitry — essentially a design with low feedback at high bandwidth at the output stage only, to result in a high degree of linearity.

There's certainly heat produced — the Special Edition DSP8000s were producing a healthy amount, dissipated via the multi-finned extruded heatsink which forms much of the back of the speakers, while the whole electronic assembly is supplied from two substantial toroidal transformers feeding high-quality audiophile-grade capacitors.

One interesting note is that you should not use mains protection with the Special Edition DSP8000 (or any Meridian DSP speaker), as they rely on a brief high current burst to blow their fuses. That, of course, would only be *in extremis* — there is thermal protection for the midrange and tweeter, with the DSP reining them in above a certain operating temperature and a green LED coming on to warn you so (though your first warning may be their change in response). Beyond that comes 'Pro95' protection, dropping the level to 95 until sufficiently cooled to continue. The fuse blowing is, then, a final additional protection.

LISTENING

No protection was required during our listening session before an imposing white gloss pair of Special Edition DSP8000s — the 'standard' finishes are white or black gloss but the Special Edition range is also available in any of 270 'Meridian Select' colours from the RAL colour chart, almost certain to satisfy anyone keen either to décor match or



Digital active
loudspeakers deliver
clear advantages
in signal paths
and processing
that allow digital
signals to pass with
purity to the last
possible stage prior
to still-analogue
amplification

to achieve some requisite spousal acceptance. The ‘speakers’ were positioned a metre and a half from the rear wall and a metre or so out from the side walls as well — those side firing woofers need space. The room was one of Wavetrain Cinemas’ demonstration suites, so impeccably sound treated, far from dead (more diffusers than merely absorbers), delivering a natural low reverb and an ideal situation to appreciate the Special Edition DSP8000’s talents to their best advantage.

A Meridian remote was to hand — the classic wide tablet-shape that the company has favoured as a system remote for decades — but most of our musical selection was made on an iPad using the Sooloos software pulling tunes from both Tidal and from files on a remote Meridian Core.

After allowing our ears to settle into the room for 20 minutes we began critical listening with Joan Armatrading’s *Show Some Emotion* album, the Meridians delightfully portraying her vocal on the title track, while also revealing the subtle variations in strength and attack on the opening bass line, all under some scintillating ride and hi-hat in the upper frequencies. The stereo-panned guitar runs following the break of the first verse

sounded studio-real and reference scale, while we could hear the extended reverb around her vocal spread and decay so slowly it was still subsiding when the following vocal line began.

Such a delight was this that we let the album run on, re-acquainting ourselves with old favourite *Willow*, delivered by the Meridians just pure and lovely, Joan in the centre with the panned acoustic/electric chops far more dynamic than we’ve ever heard them, the bass without a trace of bloat and hair-raising vocal overdubs entering for the choruses. This was heart-melting musical magic.

Paul McCartney and Wings’ *Band on the Run* album has benefited from an unlimited as well as standard remaster in 2010; though we’re not entirely sure which version was available on Wavetrain’s Sooloos collection, we jumped past the obvious to *Bluebird*, and enjoyed a presentation that can’t be far from how it must have sounded in the studio on the day of playback, percussion zinging to the sides — such detail to the scraper in the right channel, Linda’s slightly off-key harmonies with Paul central in in a tangible front-to-back soundstage; utterly real.

It’s a rare day when a recording of utter familiarity is revealed anew, and that’s what happened with *One of My Turns* from Pink Floyd ‘The Wall’ — not only the music, but the ‘Oh my God what a fabulous room’ recording of the young visitor to Pink’s trailer. The DSP8000 window on reality gave the slam of the trailer door a wonderful clunking weight and opened wide the extended bathroom acoustic. ... while the richness of Rick Wright’s synthesisers was skin-tinglingly scaled. And we’d never noticed Roger’s vocal moving from stage-left to centre between lines one and two, clear and obvious as it now seemed. Equally thrilling was the sheer depth of the organ tones through *Don’t Leave Me Now*, which rolled forth with room-activating resonance. Only when bass lines got bigger and faster did we need more tightness to lock things into place — with the slightly over-intense acoustic bass on Plant/Krauss’s *Killing the Blues*, say, the many woofers of the DSP8000SE seemed to spread the edges with bloom. This could affect other deep elements, so that Leonard Cohen’s wideband vocal on his O2 performance of *Tower of Song* was as crisp as we’ve ever heard it in the upper register, but again a bit of bloom below.

This is easily forgotten under the main flow of magic. One of our favourite testers for handling of layered complexity is kd lang’s version of *The Air That I Breathe*, with its delicate verses rising to a dynamic and layered chorus — the Meridians not only aced this, they again revealed new nuances in the subtle brush work and even in the structure of the layered harmonies of the choruses, while the bass descended to a level which had the very floor humming. A joy.

CONCLUSION

Meridian can seem such a technology-focused company that at times it’s easy to be distracted from the whole point of their innovations — the delivery of music (and movie soundtracks) at the highest levels of reproduction. Their ‘digital’ active loudspeakers deliver clear advantages in signal paths and processing that allow digital signals to pass with purity to the last possible stage prior to still-analogue amplification and on to the drivers of, in this case, an established high-end performer which thrilled us from top to bottom with its music delivery. 

SPECIFICATIONS

MERIDIAN SPECIAL EDITION DSP8000

INPUTS: Meridian Speakerlink (RJ45), coaxial digital, Meridian Comms

OUTPUTS: Meridian Speakerlink (RJ45), coaxial digital, Meridian Comms

AMPLIFIERS: 5 × 150W (each)

DRIVERS: 1 × 25mm short-horn beryllium dome with silver voice-coil, 1 × 160mm midrange, 6 × 200mm woofers

DSP: 2 × Freescale 56367 running at 150MHz

DACS: 2 × 24-bit multi-bit delta-sigma DACs with 128× oversampling xover: 2.6kHz

DIMENSIONS (HWD):

1350 × 158 × 210mm

WEIGHT: 105kg

WARRANTY: Five years

PRICE: \$90,000

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