

MERIDIAN

CONTROL

The Meridian 518 Digital Audio

*Controller may point the way towards
the future of digital mastering*

by MARTIN COLLOMS

I spent considerable time exploring the signal processing abilities of the Meridian 618 digital mastering processor [HFN/RR, Jan '95], marvelling at the changes in sound quality as the 618 moved down from 20 plus bit recordings to the common industry spec of 16-bit truncated. With its digital volume function allowing for an audio chain free from an analogue pre-amp, I pleaded for remote control of volume. The 618 is now supplanted by the new 518 and my wish has been granted. This unit is fully remotely controllable on all significant functions. In fact the 518 comes with a Meridian system remote, a small table-top controller called, logically enough, the MSR.

Not to be underestimated, the 518 is an assemblage of a number of functions provided by the powerful digital signal processor unit which lies at its heart [see box].

The 518's versatility may be extended via the 562 which allows for up to seven digital inputs, and seven analogue inputs, the latter converted to the digital domain using an accredited 16-bit A/D (derivative of the renowned 607). An LP equalised

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input is included on the 562.

In a digital system with final gain control, such as a Meridian digital loudspeaker, the volume facility on the 518 is disabled and it may be further optimised for signal enhancement by pre-setting optimal gain and modes for different sources.

Finally, it offers the versatility of the 618 for digital mastering where the many facilities described in the exhaustive but rather dense manual may be pre-programmed and stored on EPROM. The 518 costs £895 while the matching 562 input extender A/D is £695. Meridian's matching, stand-alone 20 bit DAC is the 566 at £995.

TECHNOLOGY

At the heart of the 518 is a powerful Motorola DSP 56002 computing engine. It allows two-channel volume and other calculations to be operated at an internal 72-bit level, rounded, noise shaped and dithered to the optimum word length for a given DAC or subsequent digitally interfaced component. Signal enhancement for this design doesn't come about because of some designer's particular preference for a function shape for data interpolation, but because of the high quality of signal handling *per se*, taken in conjunction with its operational features.

While the 518 is strongly based on the preceding 618, design and build improvements required for CE acceptance have yielded shorter, faster interfacing on the SPDIF I/O, improving transparency. A small gain in phase lock performance has also been achieved. Data interpolation uses the classic $\sin x/x$ function. Better sound is the result of several design features — the jitter busting double PLL front-end as well as the ability to apply pre-emphasis to appropriate DACs (those with

analogue domain de-emphasis), the addition of linearising properly shaped and distributed dither to the output data and the ability to scale the input data, to maximise the performance of a given DAC.

As a mastering processor much of the story was given in the 618 review. Suffice it to say here that the 518 has the ability to take high resolution digital audio and format it for the highest replay resolution, including the 16-bit CD standard. Note that the 518 cannot convert sample rates; the input sample appears at the output albeit de-jittered. Also don't forget that part of the 518 jitter reduction strategy is the stripping out of time codes from the output data. This generally improves the jitter level at the subsequent DAC.

SOUND QUALITY

It was impossible to cover all the options, but I hope to investigate some of these with the Meridian 20-bit DAC which takes 20-bit inputs and has the optimal de-emphasis. For this review I had the Orelle DA188, Krell KPS20i/1 and Audio Synthesis DAX-2 DACs, plus Meridian, Krell and Micromega transports, with Mark Levinson No333, Krell KSA200-S and Conrad-Johnson MV55 power amps driving Mordaunt Short 880 and Wilson Audio WITT loudspeakers. Control was by a Audio Synthesis Passion, the fine Conrad-Johnson PF-R and PV12, and we also made use of the variable output on the Krell CDP.

Referring back to a 618, I judged the 518 to be a still more transparent digital link operating on the SPDIF. With no processing at all, the jitter reduction was audibly more powerful, especially with poorer transports. While I would probably not buy it on the basis of its jitter

MULTI TALENTED

Wearing its hi fi hat, the 518 can operate as a digital line pre-amp or controller including a high-performance digital volume control. A host of named digital inputs may be assigned from the selection of AES EBU, three coaxials and a Toslink, with outputs in both coaxial and AES EBU balanced. It may also be controlled via an RS232 interface and it is CE compliant.

As a pre-amp the 518 provides signal enhancement via de-jittering of the inputs, plus optimisation of word lengths, dither type, noise shaping and de-emphasis. With appropriate DACs, 18 bit plus replay performance may be realised from the 16-bit CD data channel.

Additional controls for Meridian electronics, including the company's CD players, are provided on the MSR handset.

DIGITAL PROCESSORS

reduction alone, it was certainly a welcome advance.

As usual, you can hear changes as sections of the 518 math functions were brought into play, for example, coming out of Bypass, selecting a noise shaping function, and moving the volume control off its 0dB 'do nothing' setting. While these differences are audible, inherent even in the best processing, I'll quickly put them into perspective.

A top flight DAC, 18 or 20-bit in/out, may be used with the 518 operating as a correctly dithered volume control, allowing the DAC to be direct coupled to the power amplifier. This digital control mode may then be compared with one obvious alternative: no 518, and a superb passive control used with minimal lengths of the best quality audio cable. In this context the passive controller scores in the upper 30s (on my usual subjective listening scale) for sound quality; the average 'active' pre-amp comes in at 20 or below.

The Meridian control version, the 518, scores a whopping 45 on direct comparison including all interface losses. And this was without exploring all of the 518 enhancement facilities such as de-emphasised decoding, nor proper scaling of the DAC output to the power amplifier. For this comparison test I used

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the 'Flat' and 'High Pass' noise shaper options. As yet unconfirmed, I suspect that if fully optimised, a few more marks would be possible for the Meridian 518 used in this listening test context.

So the 518 offers another route to the current reference quality CD replay incorporating remote control of volume, namely the Krell KSP200i1 (at over £11,000). Compared with the usual analogue pre-amplifier routes to volume control with digital sources, the 518 delivered a cleaner and more immediate sound. There were global gains in definition and precision, heard over the entire frequency range. A small part of this may be attributed to the superior loading also achieved in the analogue domain by direct coupling the DAC to a good power amplifier; (even the '15K' Passion had a detectable loading effect).

Moreover the 518 delivered purer tonality, a more consistent sound over a wider volume range plus superior stereo depth and transparency. Subtleties of timing and rhythm associated with fine detail and superior low level ambience did make up for a slight softening of absolute dynamics and power rhythm, detectable when used purely as a digital interface.

However, taken overall the 518 result was unmistakably of front rank

audiophile quality, moving the domestic replay of digital recordings a large step nearer the original sound

CONCLUSION

The original work on the 618, and a couple of back-up checks on this 518 confirmed that the digital processor was working to the claimed performance limits. Actual results were more dependent on the sources and the DAC used rather than the 518.

As remote controlled pre-amplifiers go, the 518 is averagely priced. Placed in a high quality digital audio chain its performance was excellent, and it proved capable of bringing improvements in sound to a wide range of systems. In this context it offers unrivalled value and quality.

Where the use of the digital volume control is inappropriate the digital signal enhancement capabilities may be used to the full to maximise the performance of a given source/DAC combination. In a costly system the 518 again offers a substantial benefit in this mode and comes recommended.

Finally, its use as digital mastering processor is already something of a legend (this including the 618) and I have no doubts concerning its ability here, helping to produce the best sounding CD issues from superior quality masters. For all-digital replay the Meridian 518 is the sound of the future. +



MERIDIAN 518