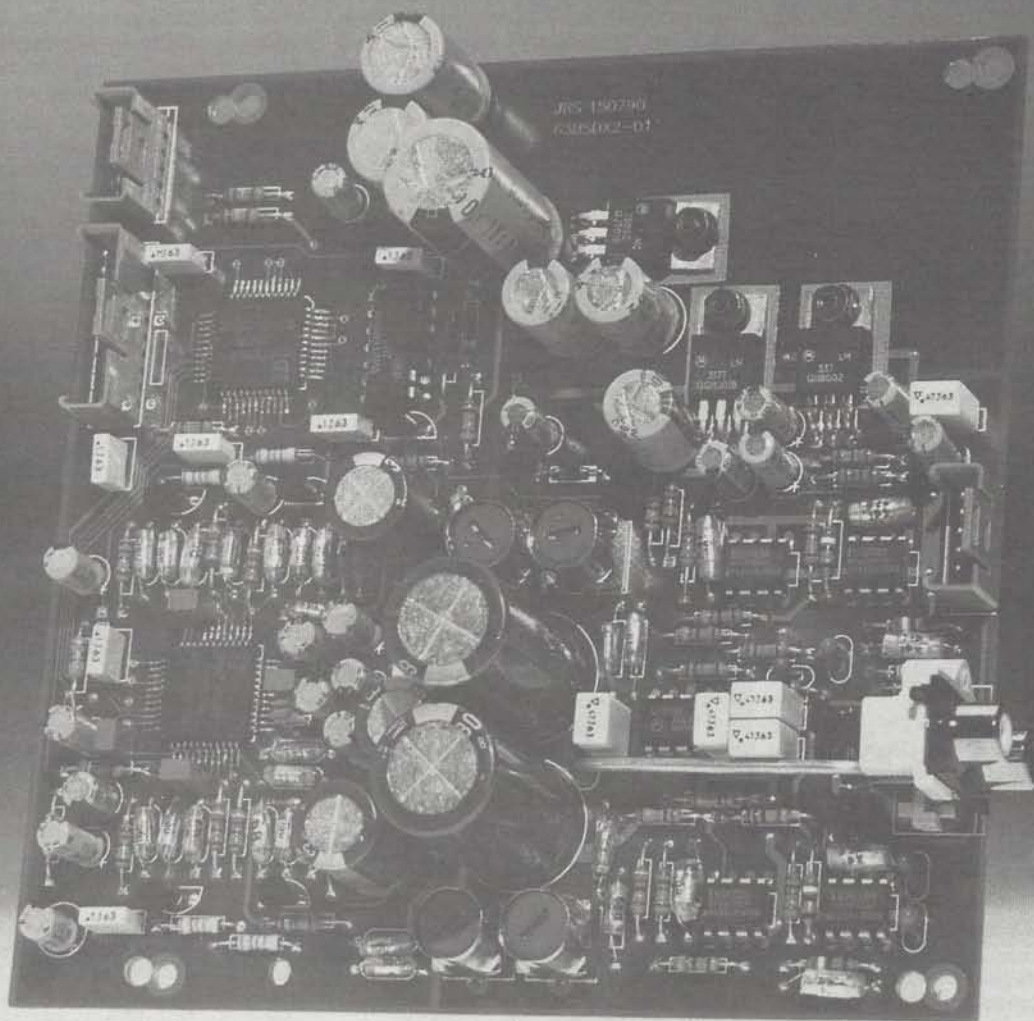




MERIDIAN'S HIGH NOON

Only a matter of months after the release of the mid-priced '203 decoder, a device which has put Meridian at the forefront of CD replay, and notwithstanding the acknowledged high performance of their 208 player, Meridian has now released an 'audiophile' two-box CD player in the shape of the new 602-603. These are the lead components in the new high end 600 series which is running at a price level higher than the established 'Series 200' lineup. First seen at the Chicago CES, and soon to be reviewed on these pages, the amazing D6000 'digital' loudspeaker is the flagship of the 600 range and, ideally, would be partnered by the advanced 602 CD transport assessed here. Following the company's nomenclature, with 602 specified

**Following the 208 and 203,
Meridian offers its high-end CD
statement, the 602/603
combination**

by Martin Colloms

as a high performance CD transport, we then have the matching 603, which rather confusingly (and in contrast to the 203), is more than just a D/A convertor. While the 203 was a straight decoder, the top-of-the-line 603 includes a gamut of analogue pre-amplifier functions.

While the 203 comprised a single Meridian 'module' (and a pair makes a midi-sized unit such as the 208) each section of

the new two-box player is 'two-unit' sized, the resulting pair too wide for a standard equipment allocation; thus the 602 and 603 might be stacked. Recognisably Meridian, the styling of the 600 series nonetheless shows some subtle changes; for example, the control bars have been lengthened vertically and are in gold plated metal, replacing the plastic formerly employed. The effect is discreet and certainly looks the part. Priced at approximately £3000 the pair, the units may be purchased separately since, unlike the 208, they are interconnected via the industry-standard SPDIF digital audio interface. I can envisage a proportion of customers opting for the 602 transport alone, judging by the reputation of the 208 player used as a transport, and it is the

intended partner for the digital speakers, the D6000 and the established D600.

The 602 can accept basic commands from virtually any Philips-type RC5 remote handset. The full set of transport commands is to be found on the 209 system remote handset. This used to be a heavy affair with a matt finish, but has now been remodelled: still cast in metal, it is now a lighter device, finished in a high gloss black. The 600 series casework is also finished in a shiny satin black.

The 602 transport panel commands comprise open (close), play, stop, pause, next and previous (track). Display flags indicate concealed errors and track the presence of pre-emphasis, while the expanded display can simultaneously show track numbers and timings. Not only are the buttons provided with illuminated legends but the operating modes are also spelt out on the versatile display, *eg* select, cancel, play etc.

On the rear panel, together with the mains socket and associated power switch, is a series of optical and wired digital outputs. As a member of the Meridian remotely controlled family, a communications interface is provided to distribute relevant information amongst the connected components. As established, 'Comms', as Meridian call it, has been distributed *via* a wired cable with multi-pin DIN type terminations. The possible limiting effects of this type of wired interconnector were exposed in my D600 speaker review (*HFN/RR*, June '89), where the optimum sonic results were obtained with pure optical connection to the speakers, albeit by forgoing the full system control afforded by 'Comms'.

The 602 decisively addresses this point by providing Comms on both the standard wired connection and on a unique newly designed Meridian optical interfacing, the optical fibre and terminations borrowed from the cost-effective TOS-link technology. Transmitter and receiver terminations are provided by chaining the Comms link forward. Thus complete electrical isolation may be achieved, avoiding ground loops and related potential forms of interference to the digital and resulting audio data.

Two digital audio outputs are available in optical mode, enabling direct connection to left- and right-channel speakers, while the wired phono socket connection may be easily paralleled if required via a suitable cable. A special function concerns programmable Wait time at the start of each track. As a user function this may be desirable to avoid the disconcerting instant start present on some recordings. The other side of the coin concerns the provision of a little extra time at track start to allow the locking system of some accessory D/A converters (and digital speakers) to lock in properly.

The 602 'wait' may be set anywhere from 0.1 to 9.9 seconds. The chosen value is then retained for future use.

The handsome 603 decoder may be used with any digital transport but is ideally driven by a 208, at the least, and a

602 at best. It comprises the following: an audiophile quality, new-design Bitstream decoder with fixed level CD audio output, plus an eight-input pre-amplifier including facilities for moving-coil and moving-magnet cartridges for analogue disc use. Full handset and system remote control is available.

With its highly readable alpha-numeric display the 603 may be programmed so that each input can be properly labelled electronically, including notification of the assigned input terminal. A default setting is 'none' for spare inputs, ensuring that they cannot be selected and cause confusion. Input assignments include Digital, *ie*, D1 or D2, optical O1 or O2, and Analogue, *eg*, A-LP or A-TP for tape. Input labels include a CD, Radio, LP, Video, DAT, etc. Such setup possibilities can greatly help non-technical persons to use the system. Independent tape monitor 'copy' allows one input to be dubbed over while another is selected for listening. If the analogue disc input is not required, it may be removed by a dealer and a link board substituted, so providing another line input.

Technology

The two box construction for the 602-603 allows for their power supplies to be split and enlarged relative to those in the 208. Extensive regulation is employed, the power supply performance augmented in system terms by a practice unique to British audio, namely the use of four-layer printed circuit boards. This secures strong power supply and ground planes for the active sections.

The 602 incorporates third-generation servo technology with Meridian's own added CPU (central microprocessor unit). Extra care has been taken over the master oscillator, which has a low jitter thanks to special circuitry helped by external screening. The transport unit is a fast focusing version of the Philips CDM4, bonded to a magnesium sub-chassis, the whole isolated on energy-absorbing Sorbothane mounts. Improved error interpolation and error flagging in the digital section allows later sections to handle the

digital data more effectively. A Hall-effect motor provides high torque with low noise and vibration. Improvements have also been made to the optical data outputs whose 15MHz bandwidth is virtually double that of the usual Toshiba devices.

In the 603 decoder, we see the first implementation of the new 7350 Bitstream converter, the 'BS DAC'. This Philips device, intended for audiophile applications, is a purpose-built chip with four 1 bit, 256-times oversampled DACs, working in stereo differential mode. The noise shaper is now third-order with reduced idle pattern effects and a digital shift register is incorporated to correctly code the various signals, phases and delays. Several choices of digital filter can be used and Meridian have chosen that available in the 7321 bitstream chip for this purpose, the design characterized by a dithered translation to the 16-bit filtered output CD code.

Internal op-amps provide for I/V conversion while selected external ICs carry out the differential summation. Selected quality components are used, including Cerafine electrolytics and polystyrene filter capacitors. The audio outputs are of the DC coupled servo controlled type. For the pre-amplifier the technology is similar to the 208 with some detail improvements; for example, to the discrete, electronically controlled FET attenuator unit. The analogue disc section is straightforward, using series feedback equalisation and the latest LT1028 low noise IC for m-c and m-m connection. Eight regulated supplies are used overall, with great attention paid to the stability of the screened phase lock oscillator used to acquire the digital input lock signal.

Sound quality

The units were allowed a day or two to warm up and condition fully, and then the fun commenced. Initial trials revolved around the 602 transport and the quality of its digital output in both link modes. First impressions were of an improvement in definition and focus, and of better bass control. Then, rightly or wrongly, my first interest was to explore the sound quality



of the fixed 'master' CD output of the 603 preamp-decoder under optimised conditions.

602-603 fixed CD output. Initial listening commenced using the selected optical link for the 602-603 connection, while the twin core Comms link between the two was left permanently in the optical mode for best electrical isolation. First sonic impressions were of a remarkable clarity, the unit showing an ability to dig deep into a recording and extract more information from it. Image depth, low level detail, stage width and focus were all advanced compared with extant references. Moreover it performed well in many other areas, the most noteworthy being an improvement in the observed tendency to mild dynamic compression noted in many bitstream products. Complex high level material was reproduced with little change in character or quality, this revealing a positive aspect in the performance of the new 'BS DAC'.

The optical mode did show a hint of thin glare in the upper mid-range, which also left a slightly 'forward' effect to the stereo image. Based on careful comparison tests it could also be shown that 'rhythm and timing' was ranked in the 'good' class, a notch or two below the reference standard. Balancing these properties a score of 96% on my scale was denoted, significantly lower than for a 208-203 combination under optimal conditions.

602-603, wired digital link (twisted pair ptf). As I was left feeling a little disappointed considering the described improvements to the optical link technology, I retested the unit using the wired digital audio connection. Now the full performance of this combination began to show itself. Introduced in the Wadia 2000 review this time last year, the 1989/90 CD reference score has now been obsoleted by the new Meridian. I had deliberately chosen a high aiming point for the reference figure to allow space for scaled improvements in CD replay. However the rapid pace of development has now caught up with that standard. The existing reference level will have to be revised very soon, while for the time being, and in the interests of consistency, the achievement of the 602/603 will be scaled as a percentage of the present standard. That figure is 113%, ie, a 13% advance over the very best existing, tested models.

Compared with the optical connection, the wired mode gave a worthwhile improvement in upper mid sweetness with the overall tonal balance now rated as essentially neutral. Significant gains were also made in stereo perspective, pace, rhythm, bass speed and precision. Additional benefits were apparent in both clarity and definition, the overall scale of improvement almost 20% over the optical mode by my reckoning.

Exploring the optimum connection in more depth, the 602-603 managed to convey an impression of lowered back-

ground noise even on programme with a just audible hiss level. Silences seemed darker, enhancing the contrast between the musical information and the background. I do not include ambience with the latter since if anything, its portrayal was superior, with the 'back wall' present in many recordings: more clearly read and better separated from the main structure of the recording.

The precision of stereo staging directly rivalled that of the Krell 64X – a similar holographic effect where sound sources are placed and dimensioned with palpable accuracy, both in terms of depth and placement right across the broad soundstage. Even more remarkable, this performance was consistent over the entire frequency range. Depth was excellent; the sound transparent and pure.

Detail was also excellent and the many elements of complex overdub mixes were resolved cleanly with rather less muddle and confusion than is usually encountered. The 603 sound was highly consistent, and inspired aural confidence in a true audiophile component fashion.

Turning now to rhythm and timing, there was no doubt concerning the improvement here matching the best 203 standards at 'good plus'. Yes, there was a reservation here. The rhythm and timing aspects of CD in general, and Bitstream in particular, do not in my view attain the best available standards. So great was the broad excellence of the 602-603 it was fascinating to have to report that for those listeners who are committed in this subjective domain, the rhythmic performance of the 603 did lag somewhat behind its other achievements. Here a personal audition should settle the matter; while I am keenly aware that if this area were to be accorded diminished importance in my overall rating then the 602-603 score would rise significantly. In this area, judgments do vary.

Once a small accommodation had been consciously made, it was easy to relax and then enjoy the finely textured, stable, high resolution performance of the 602-603 which undoubtedly does genuinely attain the leading reference position.

603 preamplifier section. Taking the disc input first, set to moving-coil, the performance could only be regarded as satisfactory in the context of that achieved in the context of the fixed CD output. Clearly, the disc input facility has not been designed for an analogue disc enthusiast and is of middle-rank quality only. A pre-amp score of 50% was set for disc, improving somewhat to 58% via the line input.

Compared with reference pre-amps of approximately similar price, the 603 disc input showed a very noticeable loss in drive and involvement. Rhythmic performance was just average, while a significant loss in ambience and depth was also evident. Stage width was quite good, but the stereo image as a whole was let down by some loss of articulation on solo voices and a flattening of perspectives. The treble

range was a touch bright and exposed with a trace of glaze present on massed orchestral strings. The line stage was judged to be quite similar to the disc input though with some improvement in clarity, focus and dynamics. It did not compare very well with the high level reference consisting of a good quality potentiometer in passive mode.

As was noted in the 208 review, the sound quality on internal CD was better than expected *via* the variable pre-amp output, due to the direct signal routing accomplished within. Consequently, the variable output rated as a CD player scored 75%, a high rating in CD rankings and possibly the best 'remote variable' CD performance, yet one which was invariably overshadowed by the near perfection of the fixed CD output when used with a superior line stage preamplifier. Via the variable terminal the 603 CD signal seemed a paler, greyer copy of the original, with the sound quality taken substantially below the 208 fixed output standards for example.

Lab report

CD replay via fixed outputs. Covering the output characteristics first: the level was set virtually to standard at 2.06V, absolute phase correct, and of linear phase impulse characteristic (phase inversion is possible via the remote). The source impedance was commendably low at 12ohms, while the channel balance was better than 0.1dB and high levels of channel separation were achieved over the whole frequency range; eg an average of 105dB even at 20kHz. No interchannel phase difference was present. Notwithstanding the usual mild ripple present in the 7321 digital filter section, the frequency response was very flat, meeting +0.04, -0.11dB limits over the working range (Fig 1).

Despite this application of the 7350BS DAC in its very first available production form (which explains the limited availability of this new chip and of products which use it) the test results were most respectable. For example, the precision narrowband measurement of the absolute replay level showed that the -90dB recorded signal was accurate to -0.5dB for both channels, while the broader bandwidth linearity error graph (Fig 2) showed an excellent result right down to -110dB, with system noise clearly limiting the measurement at -120dB, still with a moderate error shown. Both channels were well matched.

Some de-emphasis error was apparent, an average of -0.3dB in the treble, an audible if mild change in tonal balance, and more than might be anticipated for a decoder in this class. At full level, mild peak clipping was present on the white noise peak signal. Also at full level fine results were obtained for the high frequency two-tone intermodulation, at a true measurement of -98dB of 1kHz tone (Fig 3). On this 100kHz span the ultrasonic responses above 20kHz were seen to be well controlled. At -20dB modulation

this two tone test also showed a good result, averaging -93.5dB for the two channels.

Signal/noise ratio was fine at 96dB, while noise distribution was such that unusually the CCIR weighted reading was no different. On the standard test, ultrasonic products were rated just average at 62dB down, this breakthrough of 88kHz products (Fig 4) in the presence of a 14Hz tone at -70dB.

Full level distortion was better than average and was well maintained over the frequency range 20Hz to 20kHz. By -70dB (dithered) the distortion was pretty good at -39dB (Fig 5), this result dominated by a third harmonic component (3kHz). A clean noise floor at -50dB was otherwise shown. This minor kink was overcome by -90dB (dithered) where no distortion whatsoever was evident at the -115dB measurement noise floor (Fig 6). As you might expect, the accompanying sinewave was really wholesome, seen with a moderate noise component. The low level performance was in no doubt, with the machine offering 15.9 bit resolution, and a dynamic range exceeding 100dB.

Pre-Amplifier. Full tests were carried out with generally good results. Distortion was quite negligible under all conditions, typically better than 90dB down even with difficult signals. Noise levels were very good; the m-c disc input could accommodate quite low output cartridges. DC offsets were satisfactorily low, while input overload margins were generous, eg: more than 5V rms for the line inputs. Disc input overload margins were ample. Channel separation was better than usual via the disc input at typically 64dB rising to 95dB via the line connection. Line frequency response was very flat at around -1dB by 40kHz and with an extended low frequency response.

Despite the hint of brightness heard via the disc, the relevant frequency response showed evidence of mild rolloff and tapering in the treble, almost 1dB shy relative to the low mid region, an audible trend in an otherwise neutral world. The IEC rolloff is followed at low frequencies, -3dB at 20Hz and with mild bass energy rolloff below 45Hz.

The main output was powerful, with a maximum of 9.7V sourced from a low 10ohms impedance. Input sensitivities were fine while the line input impedance was rather low at 10K-ohms (as it was for the 208). Some CD sources do not sound as good when not offered loadings of 20K-ohms or more, though this is probably academic in view of the 603 and its own CD decoder. Any known power amplifier may be driven by a 603.

Conclusion

In a sense we have four products here, comprising: firstly, the 602 high end transport; then the 603 viewed as a universal audiophile CD decoder; then that other identity of the 603, namely a highly intelligent communication-linked

remotely controlled pre-amp unit, with eight input-handling in both optical and wired digital, plus analogue modes. The tape dubbing facilities are excellent, and the input selection ergonomics have been well thought out. The fourth product is the 602-603 two-box CD player viewed as a complete entity.

Taking them in stages, the 602 is the best digital transport I have reviewed. It is superior to the 208 transport section though the improvement has been won at the expense of rather a higher price.

The 603 preamp decoder can be used with a variety of digital sources; none seem to work as well as a 208 or 602 thus

far. Viewed as a fixed output universal digital decoder, it is the best yet.

However, the analogue preamp section of the 603 is really not up to the standard of the rest, and context would probably only be used as an auxiliary source system or as a remote multi-room driver.

Finally, viewing the 602-603 simply as a two-box CD player, the combination is undoubtedly of reference quality - Meridian's best yet - the best I have yet reviewed and representing fine value in the audiophile context. The build and finish were excellent and if you can make use of the 'auxiliary facilities' that would be an added bonus. ∇

MERIDIAN 602 / 603

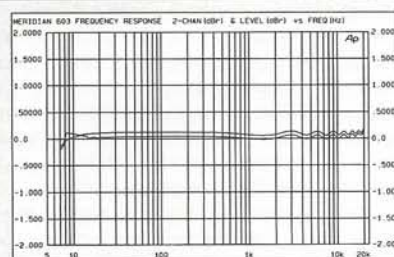


Fig 1. Meridian 603: frequency response.

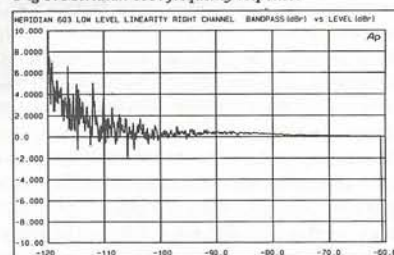


Fig 2. Meridian 603: low-level linearity at below -60dB.

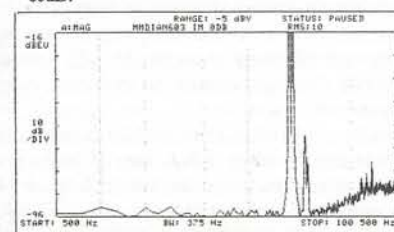


Fig 3. Meridian 603: intermodulation at 0dB.



Fig 4. Meridian 603: ultrasonic spurs associated with -70dB 1kHz tone, to 100kHz.

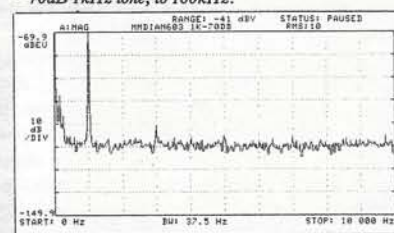


Fig 5. Meridian 603: spurs associated with -70dB 1kHz tone, to 10kHz.

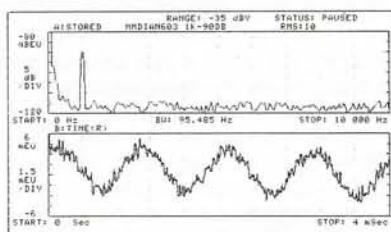


Fig 6. Meridian 603: sinewave at -90dB, spectrum (top) and waveform (below).

Test results

	20Hz	1kHz	20kHz
CD PLAYER SECTION			
Channel balance	0.08dB	0.08dB	0.06dB
Stereo separation	123/108dB	111/114dB	113/96dB
Channel phase difference	0°	0°	0°
THD 0dB	87dB	87dB	90dB
THD -10dB	—	-79dB	—
THD -70dB	—	-39dB	—
Intermod 19kHz/20kHz, 0dB	—	-91dB	—
Intermod 19kHz/20kHz, -10dB	—	-91dB	—
Frequency response, left	+0.02dB	—	-0.11dB
Frequency response, right	+0.04dB	—	-0.10dB
S/N 20Hz-20kHz unweighted	—	96dB	—
S/N CCIR/ARM, 1kHz ref	—	96dB	—
Output level, 0dB	—	2.06V	—
Output impedance	—	12ohms	—
De-emphasis (error in dB)	0.04	0.25	0.34
Track access time (Tr 15)	—	3secs	—
Error correction capability	—	gap > 2mm	—
Mechanical noise	—	low	—
Spurious up to 100kHz	—	62dB	—
Resolution at -90dB, left/right	—	89.8dB/89.9dB	—
PRE-AMPLIFIER SECTION			
Distortion	20Hz	1kHz	20kHz
Total harmonic distortion, at 0.5V output, aux input	95dB	96dB	84dB
Intermodulation, 19/20kHz, 0.5V output	—	—	—
Aux input	—	—	102dB
Disc (m-m)	—	—	77dB
Disc (m-c)	—	—	77dB*
Noise			
Disc (m-m) input (IHF, CCIR weighted)	—	—	—
Disc (m-c) input (IHF, CCIR weighted)	—	—	66dB
Aux/CD input (IHF, CCIR weighted)	—	—	92dB
Residual, unweighted (volume control at min)	—	—	104dB
DC output offset	—	left 3mV, right 2mV	—
DC output (tape)	—	left 2mV, right 2mV	—
Input overload			
Disc (m-m) input (IHF)	20Hz	1kHz	20kHz
Disc (m-c) input (IHF)	—	—	—
Aux/CD input (IHF)	35dB	31.9dB	33.1dB
Stereo separation	—	—	—
Disc input	66dB	66dB	63dB
Aux input	107dB	96dB	86dB
Channel balance, disc at 1kHz	—	—	0.15dB
Volume/balance tracking	—	—	—
Aux input	0.09 0dB	0.09 -20dB	0.05 -60dB
Output	Level 9.7V	Impedance 10ohms	—
Input data	Socket type	Sensitivity	Loading
Disc (m-m)	—	—	—
Disc (m-c)	phono	0.16mV	220ohms -pf
Aux	phono	54mV	10kohms 15pf
Frequency response			
Disc input (RIAA ref 1kHz, 100Hz to 15kHz)	—	—	+0.23/-0.6dB
Line	—0.5dB, -Hz to 40kHz;	—3dB -Hz and 100kHz	—
Dimensions (wdh)	—	—	32x10x34cm

*Into noise.

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