

## Review

# EXTENDING THE LINE

Meridian has taken BitStream into a new age. The 602/606 and 603 DAC preamp throw off criticisms levelled at other players of this persuasion. Alvin Gold opens the drawer



**I**f DCC is the digital 'wow' of 1991, then last year's barnstormer can only have been BitStream. It swept through the budget CD player arena, shedding the pounds as it went, until anyone still producing a multibit machine was in danger of being labelled 'quaint'. Separate BitStream DACs soon appeared, and while most of the public remains blissfully unaware of the many variants of bitstream with a little b, the cry of 'one-bit is better' has been firmly heeded by marketing men everywhere.

The problems of such fervour are discussed on page 22 in *'The Bitstream Bandwagon'*, but for now let's confine ourselves to the upper echelon of the digital fraternity. Here you find that BitStream has far less universal acclaim — the most expensive DACs from the likes of Wadia and TEAC

choose conventional multibit technology.

Meridian is a company that likes BitStream. It has found success with its mid-price 200 series, in which the curving aesthetics and matt minimalism of preceding Meridian wares finally found a successful alliance. It sounded pretty good too.

The new 600 series goes further, costs more, and should sound even better. It's an ambitious concept — a range of components that can be used in a number of distinct configurations. They can operate as stand-alone components in conventional high fidelity systems, or can combine as a true active system with 'digital' loudspeakers such as the D600 which has on-board D/A converters, power amps, electronic crossovers and so on. Finally, 600 series components can be used in multi-room installations. Meridian has been promoting itself for some time, at least by implication, as a kind of British equivalent to Bang & Olufsen, but with greater emphasis on the sonics. The 600 series represents the culmination of its efforts in this direction.

This review is of the 602/606 combination, which when used together makes a single, stand-alone CD player. We'll also examine the 603, a combined DAC and preamp. As an introduction to the range, this is limited to the extent that it illustrates just two facets of what the series is about.

The 602 is a CD transport; the 606 is a digital-to-analogue converter capable of accepting the 602's output, along with the digital feeds from other digital sources. Both units are constructed from two individually screened sections bolted together externally. On the left of the 602 transport is a drawer mechanism which includes almost the entire transport mechanism, plus power supply components. The logic and control circuitry is screened off in its own separate box on the right hand side. Similar demarcation is used in the 606 DAC where the analogue circuitry is kept well apart from the power supplies and digital areas.

Right from the first few button pushes it was easy to find fault with this player. I would suggest that its control system has not been clearly thought through. I was forever cursing the malevolent electronic brain inside that made it impossible, for example, to find the start of the current track in a single operation. Control response at times seemed tardy, though often this was an illusion caused by the display. This can only show one message at a time, and it queues them up for viewing with an appropriate delay to ensure readability. Even after a couple of months' use I still punch and repunch buttons, unsure if my instructions have been accepted.

This is exacerbated by the buttons themselves, which can mechanically click with-

*The pairing of  
602 transport  
with 606 DAC  
offers as near  
to definitive  
state-of-the-art  
as any at  
this price*

out necessarily reaching the switch operating point — although I was pressing a button enough to get a physical response, nothing would happen. (Engineers would call this a misleading tactile response.)

You wouldn't find such elementary mistakes on a £150 Sony, so it would be perverse to judge a £3000 player any more lightly, especially one where 'human engineering' is so clearly a prime objective.

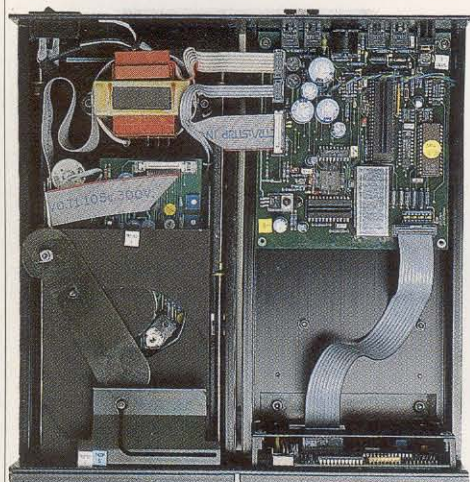
In fairness though, there are some good points. It is possible to programme a 'wait' time before a selected track is found. The time delay can be set from 0.1 to 9.9 seconds, which allows slightly slow DACs to lock onto the digital signal before the music starts, rather than after.

So far the 602/606 would seem to be losing points for features and operational convenience. Musically, however I have no comparable qualms. An expensive player, it ought to sound better than those Meridian has produced in the past. It does.

This doesn't make the results particularly easy to describe. Musically I find the combination difficult to get to grips with using words, not least because so many of its virtues are best stated as negatives. Thus it sounds uncoloured and unprocessed, almost to the point of being self-effacing. The colourless quality of the Meridian is no bad thing. If the sound of a high fidelity component is too easy to describe, it implies a readily-identifiable personality, precisely what should be avoided.

This is a quality the Meridian shares with other BitStream implementations. However, the 602/603 breaks the mould by achieving this without the fatal loss of definition and the compression that characterises so many BitStream players. Nor does it exhibit the hard, unyielding quality that characterises others. Those players usually offer in recompense very fine resolution of low level signals, down to the threshold of hearing in many cases. I didn't hope to find much of an improvement here, but again the Meridian managed to exceed all expectations. Its

**A perfect pair: the 602 transport (£1500) and 606 DAC (£1100). Together they avoid the unmusical 'snapshot' sound of many BitStream players**



**Inside the 602: mechanism to the left; logic and control to the right**

resolution of fine detail proved to be among the best I have ever heard.

I've been using the combinations on a (almost) daily basis for well in excess of two months, and have used the player with a wide and catholic selection of equipment. I was using the 602/606 just before the Martin Logan Sequel II speakers (reviewed in January) went back home. I also used it extensively with my own DNM/Musical Fidelity amplification and with an Audio Research pre/power amp, the LS-1 and Classic 60. More recently I have had a Krell pairing I shall be reporting on shortly. These amplifiers were used to drive such excellent loudspeakers as the Monitor Audio Studio 15s. Best of all are the vivid recollections I have of the Ongaku valve amp, one of the most remarkable products I have ever had the pleasure of using.

With each of these products and more besides, the Meridian pairing has proved its mettle by producing music of the utmost sophistication and clarity. There was a sharp sense of focus and dynamic range even when used at very low replay levels, which is a vastly more searching test than turning the volume on full blast. I confess the bass doesn't have quite the declamatory quality of the best multibit players (namely the best of the Wadia range), but for the first time in such a comparison none of the underlying information content of the music was missing via the BitStream player. It was simply presented in a different manner to the Wadia multibit — the choice more than ever becoming a matter of personal taste.

There were other impressive qualities too, not least the way the Meridian completely eluded stereo imaging traps.

We're on difficult ground talking about these things, not least because of the way such subtle matters are modified by other parts of the system, especially the loudspeaker and the way it interacts with room acoustics. Nevertheless, in systems with which I was already familiar, I could appreciate the way the Meridian almost

imperceptibly painted the furthest reaches of the soundstage, and the scale and solidity of images painted in space — always assuming this kind of information content was present on the original recording of course.

Most of these observations are general to the extent that they can be identified from any recording with a sufficiently wide spectral, tonal and dynamic content. Nevertheless there were pieces of music I found particularly illuminating and illustrative of the Meridian's qualities. The unusual quality and presence of the Meridian's soundstaging are wonderfully demonstrated by the Denon (CD only) recording of Mahler's 4th (Inbal/Frankfurt RSO) which is as near to a purist one-mic jobbie as any full orchestral recording that comes to mind. I was particularly struck by the layering on depth of the string parts, and the almost tangible sense of hush around the soprano's entry in the finale.

Almost inevitably the other recording to which I refer is the superb Cowboy Junkies magnum opus *Trinity Sessions*, in particular the final track *Walking after Midnight*. This has one of the liveliest and most realistic acoustics I have ever experienced on disc, or record for that matter.

In ways with which those who know these discs will already be familiar, these two recordings also have an abundance of low level detail. Though it can't necessarily be heard directly (and is all too frequently weeded out by players), it immeasurably enriches the experience of listening.

This is the second machine based on the 7350 BitStream chip that I have had the opportunity to use at length. The first was the Deltec PDM One Series II, and from what I can tell at this distance (I had the same Philips CD850 and Wadia for comparison), the difference is as near to chalk and cheese as these things ever get. Of course the price difference implies that it would be remarkable if they sounded that close. But it underlines the points made by Bob Stuart in the accompanying interview that the common perception of chip-type determining sound quality is wrong.

The 7350 BitStream chip is often hailed as an advance in the state of the art, but this is the first machine I have heard that does such claims justice. The 602/606 are important and successful products not because they use the latest and most advanced technology, but because unlike at least some of the opposition, Meridian understands the issues involved. No unnecessary and inappropriate compromises have been made, and the products appear to have been extremely well informed by audio designers who knew what they wanted and how to get it. The resulting presence and low-level clarity render the Meridian capable of causing that shiver down the spine, and a flush to the cheeks. The 602/606 is as near to a definitive state of the art as any at this price, and is only broadly equalled by a tiny group of players at even less palatable prices.

## Starting a new series

Some of the changes from the previous 200 series Meridian products are trivial, though this doesn't mean they're uninteresting. The revised styling is based on the familiar-looking black aluminium fluted extrusions. The fascia area is mainly glass-fronted, with a minimum of attractive, low-key screen printing where necessary. Styling of the switches and display has been changed. The controls are now long, thin, gold-coloured layers, hinged at the bottom (which means you have to be a little careful where you press them).

The control legends are illuminated LEDs and take alphabetic form. Thus the familiar transport mnemonics have been replaced by words like 'Next' and so on. This may sound very user-friendly, but actually requires more brain processing than the usual symbols. The status readout follows the minimalist lines of the 200 series except that alphabetic labels for player status — 'play', 'pause', 'select' and so on — are shown at appropriate times. This has meant dropping the standard numeric display in favour of a dot matrix panel of acceptable readability.

The 602/606 comes with a system remote control rather than one dedicated to the player itself. Random track access, index search and programming are available from the remote control, with basic functions available on the player too. The handset also enables the display to cycle through various modes, namely: track/index number (this is the default), disc elapsed time, track elapsed time and disc remaining, in each case with the current track number. Curiously, there is no audible cueing mode (though non-audible cueing is available), no headphone socket, and none of the secondary features such as those found on many players to help when recording tapes from CD.

The 606 D/A converter has two electrical and two optical inputs using standard connectors. The use of optical connectors is recommended on the grounds of reduced generation of (and susceptibility to) radio frequency interference. It can look onto digital signals with sampling frequencies of 32, 44.1 and 48kHz.

Visually the Meridian components are real crackers; refined, elegant, and subtle. Meridian perceives the 600 series as a very high quality range. The 200 series was based on stove enamel extrusions; the 600 series is anodised. One decision made was to reduce the number of controls to a basic minimum, to the extent of omitting audible cueing, which Bob Stuart explained as sounding 'a bit squalid'. Meridian has also included a digital communications bus to completely unify all remote control facilities using optical fibre distribution between components, which means it can be achieved without audible losses. At the moment this facility is only available with the D6000 and the matching 603 preamp (see opposite).

## Adding control — the Meridian 603

**T**he Meridian 603 is a complex product — essentially a 606 DAC with preamp built into a single chassis. Suffice it to say that this combination gives the product considerable flexibility. The 603 can be used at the heart of a system with, say, Meridian's M60 active loudspeakers, which it feeds from an analogue output. So this is not strictly top echelon stuff. The combination of D6000 active digital loudspeaker and D607 analogue to digital converter (to be reviewed in *Audiophile* shortly) fulfils that role. But it comes pretty damn close.

The mug shot below shows that the 603 conforms to the build, styling conventions and control layout of the other Meridian components. It is designed to be operated by the same model 209 remote control described in the 602/606 review or via its front panel controls, which include source and tape source switching (see later), a display off key, a mute switch/panic button and volume switching which is performed by a high-quality, glitchless 64-step discrete FET switch network.

Some explanation of the way the 603 interfaces with the outside world is necessary. In addition to the fixed output DAC — essentially the same as the one in Meridian's 606 — two line inputs, a phono input, a tape circuit, plus digital CD and DAT inputs via coaxial sockets. Selection is via a front panel key which cycles through each input in turn, or remotely from the 209. The names of the inputs are spelt out on the fluorescent dot matrix display.

But even this isn't quite the whole story. The 603 can be customised to provide fewer inputs — as few as one if required — or alternatively more inputs — as many as eight — the extras being two optical digital

inputs. The alphanumeric display that announces which input has been selected can also be changed using a menu stored in ROM. The setup routine is readily achieved if you have the informative and terse instruction booklet to hand, and the default can be reinstated at will.

And still we haven't exhausted the range of possibilities. The series feedback phono input board can be switched between mm and mc settings, though getting inside to make the change is not to be undertaken lightly. Socketry is provided for headphones and for communications with the 602 CD transport, providing remote on/off switching, triggered optically to prevent interactions. A comms link is also fitted for other 600 and 200 Series components to relay full system remote control commands. Fixed and variable analogue outputs are provided. To round off this part of the story, any source can be assigned to the tape output or deselected using a front panel switch independent of the source currently being fed to the loudspeakers.

The 603's digital converter is effectively identical to the 606 with one exception. The inputs are not crystal-locked, but use a phase locked loop, which gives a little leeway for digital sources whose clocks are a little out of kilter — apparently often the case with portable DAT in particular. The digital inputs will also strip the subcode data from the incoming signal so that it can display various time modes on the display.

The preamplifier side of the 603 holds few surprises, except for the sheer number of inputs (four digital and six analogue is good going by any standards) and that the analogue output can be configured as a balanced source.

It's own-up time: the 603 arrived very late in the day, leaving less than 24 hours to form a broad assessment, and six days to get to grips with any subtleties not apparent

*The 603 is essentially a 606 DAC with preamp. It is what many CD products patently are not: genuinely listenable*

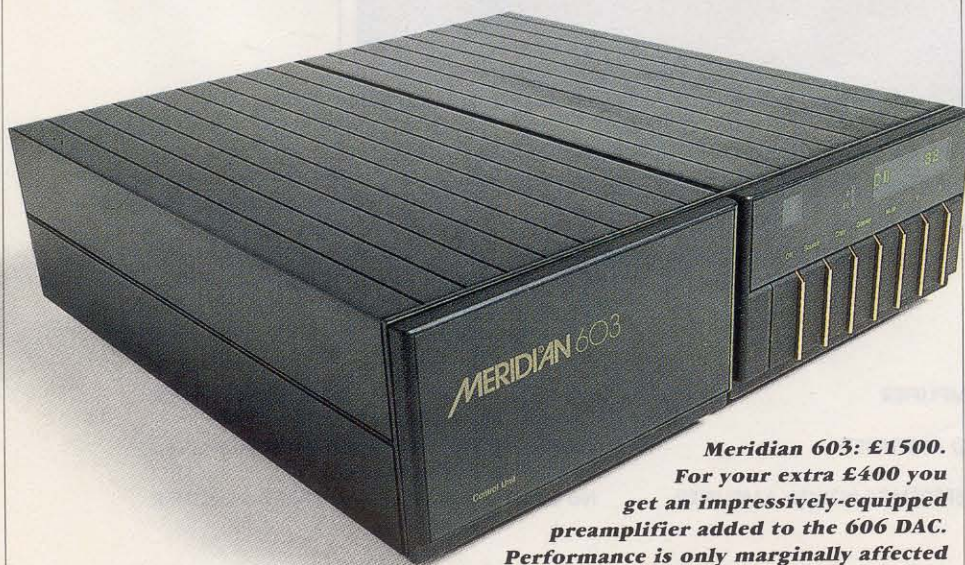
during the first round of listening. The time I had available wasn't even enough to get the 603 fully up to temperature, but I had a certain amount of help from the fact that the 606 I had been using was also run up from cold at the same time, for comparison.

With these qualifications duly noted, I was still able to get a pretty firm picture of the 603's capabilities, though it took some time (and several changes of music) to pin down the differences between the 603 and the 606 in a consistent way. In the end, I felt that the 606 had a slightly more concisely articulated sound. Piano transients through the 603 were a tad softer and the unusual harmonic vitality of one of the choral sessions (*Liber scriptus*) from Verdi's *Requiem* (Telarc) was slightly less coherent.

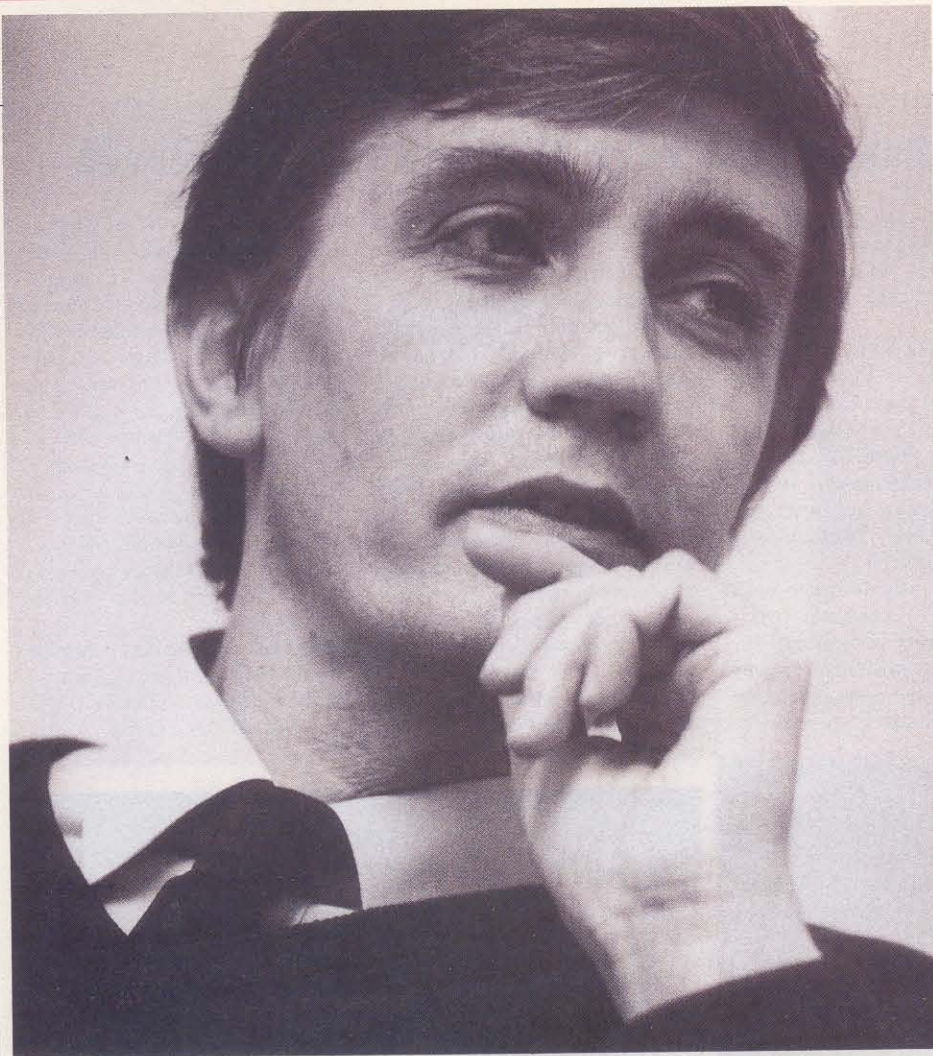
We're not talking big numbers here: without the benefit of a side-by-side comparison I think the differences could melt away, and I was impressed by the 603's obvious musical integrity and utter lack of superficiality, false emphasis or grain. The 603 is what many CD products are not: genuinely listenable. This is one of the few cases where I would agree with the assertion that BitStream makes CD listenable. But perhaps the real truth is the Meridian has made BitStream listenable.

Are there any obvious improvements that could be suggested? Only minor ones. The switches have shortcomings similar to those of the other Meridian components which I have already identified, and to facilitate service the box ought to be easier to break into. These minor details aside, the 603 is an eminently refined and enjoyable product which treads hard on the heels of the state of the art without quite rivalling the 606 or the best component preamps. This said, it was rather better as a preamp than I had anticipated, even using the mc input (driven by a Roksan/Artemiz/Shiraz) which was in great danger of outperforming CD. Now that *would* have been an own goal!

■ **Right of Reply:** see page 81



**Meridian 603: £1500.**  
For your extra £400 you  
get an impressively-equipped  
preamplifier added to the 606 DAC.  
Performance is only marginally affected



How does the 600 series get the best from BitStream technology? Meridian's Bob Stuart talks to Alvin Gold

**B**ob Stuart, Technical Director at Meridian, realised that BitStream would be a step forward as soon as he heard about it. But he's keen to stress that it's not just the chips that count.

'The press and public seem to feel improvements in Compact Disc technology are due to advances in the chips. They aren't; it's how you use the chips that's important.

'For example, many people use one particular brand of input circuit and the digital filter that it's made to work with. This combination is easy to use, but turns out to be very jitter-prone, and is incorrectly dithered\*. In effect it dissipates all the advantages available from BitStream processing. Unfortunately, the good input chips tend to be pigs to use. You need to know what you're doing.

'The 606 converter is built around the Philips 7350 BS (BitStream) DAC working from the output of a digital filter. This filter

is from the first generation of Philips chips, as used for example in our 203. From this we extract the digital data, and ignore the analogue. It is the one and only commercially-made filter that is correctly dithered. Whenever you perform any DSP (digital signal processing), you need to redither the signal *every* time it is requantised or truncated. Most digital filters don't redither at all, or only do so at the output. We consider this to be very important in giving the 606 the combined benefits from the best of the first generation BitStream machines, plus such benefits as are available from the 7350 chip, which provides higher (third) order noise shaping, and reduced distortion. It also has a built-in differential mode, which previously had to be performed externally using two DACs in a back-to-back configuration.

'That third-order noise shaping is extremely important. Not only does it result in lower noise in the audio band (noise is neatly distributed with the bulk at much higher inaudible frequencies), but more crucial here is the reduction in modulation noise — noise modulated by the music signal. The previous generation of BitStream players had up to twice that achieved with the 606 — now around only

*'The press and public think CD improvements are due to advances in chips. But it's how you use the chips that counts'*

2.5dB. Most multibit systems have least eight times that amount of noise modulation, especially if incorrectly dithered, but the noise spectrum is different, and tends to result in an apparently more emphatic, delineated bass. With BitStream, modulation noise has a different spectrum, more dominated by low frequencies. That tends to soften our perception of low frequency information and reduce qualities like "slam". This we feel is the reason why many BitStream players come in for criticism.

'The 602 is based on the mechanical concept of the 208. One of its most important features, though it's rarely mentioned, is top loading. The disc goes into a completely-sealed environment which offers something like 35dB of physical attenuation and which largely inhibits disc vibration. The disc spins very close to the metalwork at the top of the box, which provides some additional acoustic damping, along with relief from static, though it doesn't actually disperse static. We think this layout avoids the usual compromises.'

'There are some fine components in the 602, including a master oscillator, and a number of separate regulated power supplies. We use high power amps to drive the electrical digital output, to ensure a good waveform at the far end of the digital cable link, even when quite long. This helps to reduce jitter: a digital decision is made at every such interface, which is why the drive system is so important. The optical link is not affected in the same way.

'One problem we have noted with digital interfaces is that audiophile cables tend to be detrimental to performance. We supply a broadcast standard cable, but we have seen some very poor examples, including twisted pair cables with impedances way off our specification. Cables of this type degrade the waveform and result in measurable error rate increases and increased susceptibility to electrical interference. By proper specifications and careful internal design, we hope to give our customers a good shot at driving any converter they may wish to use.'

\* Digital waveforms move in steps. Adding a very small random signal (called dither) helps smooth such sudden transitions

# Right of Reply

## **Meridian 602/ 603/606**

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**I** am delighted that Alvin has found the 602, 603 and 606 to be satisfactory. I was particularly pleased that he understood so well what we tried to do with the 603.

I would take issue on his criticisms of the user interface. The control system has been thought through for the end-user. In the 600-Series we anticipate an owner who is a music-lover and who will generally not use the extensive search/programming/index facilities relegated to the handset. The display gives the true state of the machine, not — as in most players — a pacifier that anticipates the hardware. Our difficulty is that a reviewer needs features — track replay, fast access to index points, audible cueing — that we do not see as primary. It is true that the Multiroom and inter-product communication facilities can slow down the response, but the upside is extensive and unique.

**Bob Stuart**

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