

A SPECIAL TEST REPORT

MERIDIAN D600 DIGITAL ACTIVE SPEAKER

**Powered speakers
and full system control**



MANY audio products are advertised as "digital," often with little justification. For example, most "digital-ready" loudspeakers can claim little more than the ability to reproduce CD programs, something any speaker can do. Until now, CD players, digital audio tape (DAT) decks, and certain related components and processors have been the only consumer audio products to which the term "digital" could be justifiably applied. To this list we can now add the Meridian D600 Digital Active Loudspeaker from Boothroyd Stuart Ltd. of Huntington, England. This impressive and innovative product is all that its name implies, and much more, since it contains virtually every part of a top-quality analog or digital music system except the program source.

The loudspeaker itself has a relatively conventional "two-and-a-half-way" design that uses two 6½-inch polypropylene-cone woofers and a 1-inch aluminum-dome tweeter in a moderate-size vented columnar enclosure. Both woofers operate together below a few hundred hertz; above that the output of one woofer is rolled off, leaving the second, called a "mid/woofer," to radiate the midrange frequencies.

The "active" portion of the speaker's name derives from the fact that each driver

is powered by its own built-in 70-watt amplifier. The amplifiers use Meridian's Class AA nonswitching circuit, a sliding-bias system that lets the amplifier operate in Class A at low power levels, for minimum distortion, and change smoothly to Class AB when a higher power output is required. Each amplifier has its own active crossover network and is direct-coupled to its driver, eliminating any extraneous components or wiring between the amplifier output stages and the speakers' voice coils.

The D600 is designed to accept audio inputs in digital form through either coaxial or optical cables. Although the built-in amplifiers, like the speakers, are conventional analog components, the digital portion of the system contains quadruple-oversampling, true 16-bit digital-to-analog (D/A) converters that can operate at any of the standard sampling rates—32, 44, and 48 kHz—used by the current compact disc and digital audio tape formats.

System Control

In addition to its signal-conversion, amplification, and loudspeaker functions, the Meridian D600 serves as a full-fledged system control unit, providing most of the usual preamplifier functions. It has two

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pairs of analog inputs, each of which can be used in a fully balanced mode or in the more usual unbalanced configuration. The system is operated by the Meridian Model 609 Handset remote control, which is supplied with each pair of D600 speakers. The cable connecting a compatible Meridian source component, such as the Model 207 CD player, to the master speaker—which is joined by another cable to the “slave” speaker—also carries return control signals, received via the speaker, from the Handset.

Most of the functions of the CD player can be operated by pointing the controller toward the master speaker, which is normally used for the left channel. In operation, the display panel on the top front of the master speaker shows the full operating status of the system, including the input source, the settings of the volume, balance, and tone controls, and time and track information for a connected CD player. The display on the slave speaker shows only its level setting, which is normally the same as the master speaker's unless their balance has been changed. In the standby mode, the system's normal nonoperating condition, the

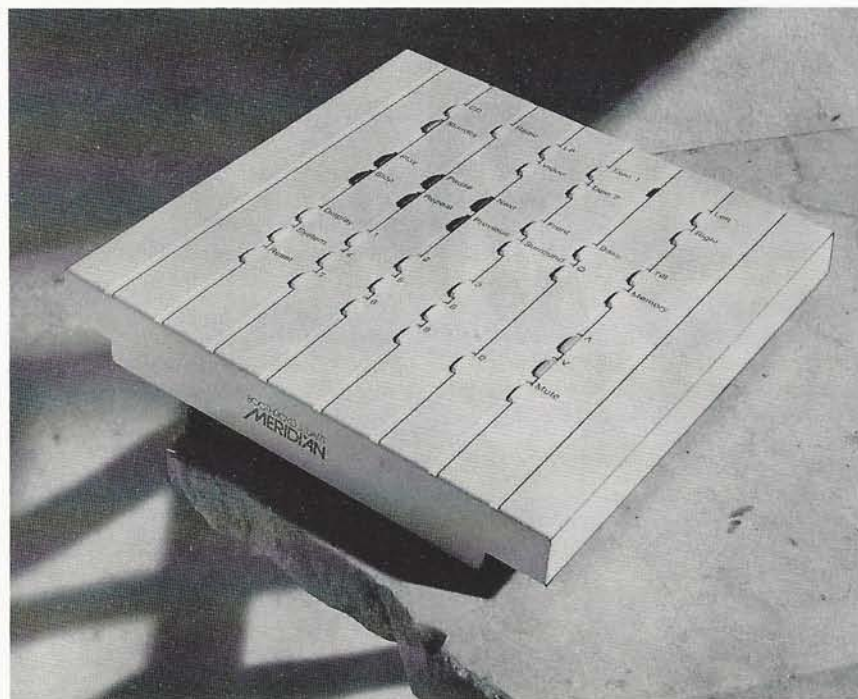
amplifiers are shut down, but certain control circuits remain active and a small green light in each speaker's display shows that it is energized. While the system is operating, the master display contains a clearly visible red light.

In order to take full advantage of the system-control and digital-input capabilities of the D600, it should be used with the Meridian Model 207 CD player. More than merely a CD player, the Model 207 has inputs for phono and line sources and tape input and output jacks as well as its own fixed- and variable-level analog outputs, optical and coaxial digital outputs, and a headphone jack. Its built-in phono preamplifier can be switched between moving-coil (MC) or moving-magnet (MM) modes by an internal control. Buttons on the Model 207's panel select the program source and route it to the amplifier; when it is used with the D600 system, this selection can also be made from the speakers' remote control. The normal connection to the D600 system is through one of the digital outputs. The program signal is converted to analog form in the speakers just before the amplifier stages.

Each speaker contains digitally controlled analog circuits, which follow the D/A converters when a digital source is used, for adjustment of volume and frequency response. The volume can be varied in sixty-four steps of 1.25 dB each, with the number of the current setting appearing in the display window. The TILT control offers up to ± 2 dB of shelved high-frequency boost or cut, in five steps each, beginning at about 1,500 Hz and reaching its full effect above 5,000 Hz. A similar adjustment is provided for the low frequencies by the bass control, which introduces a single-step 2-dB boost or cut below 100 Hz. In addition, the Q control rolls off the low bass at an unspecified rate to -3 dB at 50 Hz. All these adjustments are made with push-buttons on the speaker's Handset controller.

Other Handset functions include input source selection (which also turns on the speakers), independent adjustment of left and right speaker levels, most basic CD player functions for the Model 207, volume control, and muting. A memory button stores the settings of the various level and equalization controls,

Multiroom Remote Control



One of the more advanced features of the Meridian D600 system is its ability to act as the controller for a multiroom installation. The Meridian remote system enables users in two locations to listen to different programs from the same set of central components. It also includes a “lock-out” feature that prevents users in either location from affecting the other location's system status or configuration. The Model 609 Handset (left) supplied with the D600 speaker system interfaces with all other Meridian Series 200 components, including the Model 204 tuner/timer and the Model 207 CD player.

The D600 itself includes a digital preamplifier that can select and control up to three digital sources directly and provide fixed- and variable-level digital outputs to another component. It has its own digital filter, error-correction circuitry, and quadruple-oversampling, 16-bit digital-to-analog converter. The D600 can also control two balanced or unbalanced analog inputs. The Handset can remotely control volume, balance, tone, muting, and even a surround-sound setup.

and a reset button restores their neutral settings. A display button cycles the displayed information through the volume setting, the CD track number, the elapsed time in that track, and the elapsed time on the disc.

Designed for Flexibility

A GROUP of four or six D600 speakers can be set up in a multichannel system for surround sound. In this mode, a single master speaker controls the entire system, including the volume and left/right balance for all the speakers. The Handset controls the front/rear balance. The D600 system can also be used in multiroom installations in combination with other Meridian Series 200 components, including the Model 201 remote-controlled preamplifier and the Model 204 stereo FM tuner in addition to the Model 207 compact disc player.

Each D600 speaker measures 35½ inches high, 8¼ inches wide, and 11⅞ inches deep and weighs 71 pounds. The rear panel is a metal plate that carries the digital and analog circuits and crossover components, DIN and phono-jack signal inputs and outputs, and a standard optical connector. The rear plate also serves as a heat sink for the electronic components.

The speakers are fitted with adjustable spiked feet, which can be capped if desired to protect finished floors. The rigidly braced cabinets are available in a choice of black ash, American walnut, or rosewood veneers. Except for the narrow display windows at the top, the front of each speaker is covered by a removable black grille.

The Handset does not resemble a typical hi-fi remote control. Finished in white, it is built on a metal base and weighs 18 ounces. It is square, 6⅜ inches on a side, and just under an inch thick (the "Handset" name seems inappropriate, since it is more easily used on a firm surface). Its thirty-seven buttons are slender and well spaced, with exceptionally clear black markings. Most of the buttons are white, but they are nonetheless very easily distinguished from the white surface of the Handset. The volume buttons

are red, and the standby button is green.

The Model 207 CD player consists of two separate components, identical-size transport and electronic units measuring about 4 inches high, 6¼ inches wide, and 12¾ inches deep. They can be installed side by side or one above the other. The front-panel control buttons are similar to those of the D600's Handset, although each can serve at least two functions, and in most respects the operation of the player is unlike that of any other CD player we have used. While we did not make any measurements on the Model 207, it performed well with the D600 speakers. Prices: Meridian D600 speaker system, consisting of two speakers, Model 609 Handset, and all necessary cables, \$5,490; Model 207 CD player, \$2,250. Meridian America, Dept. SR, 14120-K Sullyfield Circle, Chantilly, VA 22021.

Lab Tests

WE measured the performance of the Meridian D600 using essentially the same procedures we would follow for any loudspeaker, except that we applied line-level input signals directly to its analog inputs instead of through an external power amplifier. Many of the manufacturer's performance ratings apply only to the electronic portions of the system, but we did not attempt to open the speaker for access to the amplifiers or the driver voice coils.

The composite frequency response, including the averaged room response from the left and right speakers and a close-miked woofer response, was one of the smoothest we have yet measured. With the system's frequency-trim controls set to their midpoints, the response was flat within +2, -0 dB from about 38 to 1,000 Hz. Above 1,000 Hz, there was a very gentle downward slope to about -2 dB at 3,000 Hz and a slightly steeper slope above 3,000 Hz.

The overall composite response was within ±4.5 dB from 28 to 20,000 Hz, with much of the variation occurring in the uppermost octave, where the output increased

somewhat. When we used the low-bass cut of the Q control and the highest setting of the treble TILT, the composite response became an even more outstanding +3, -2 dB from 30 to 20,000 Hz. Close-miked woofer measurements indicated that the crossover to the tweeter was at about 2,500 Hz and that the responses of the two woofers began to diverge above 200 Hz, although they did not differ materially below about 500 Hz. The effective crossover between the cone and port radiation was at 65 Hz.

Our FFT response measurements showed the exceptionally good dispersion of the tweeter up to 10,000 Hz. It also confirmed an effect that we had detected in some of our swept-sine-wave measurements: a large (about 18 dB) and undamped tweeter resonance at about 26,000 Hz. Although this effect was not audible (not to us, at least), it was apparently responsible for the speaker's rising output between 15,000 and 20,000 Hz in several of our measurements.

The system's group-delay variation was less than 0.1 millisecond overall from 5,000 to 20,000 Hz, and its phase linearity at lower frequencies was equally impressive, with a maximum change of only +0.4 ms in the 500- to 2,500-Hz range.

The woofer's distortion with a constant drive corresponding to 90 dB sound-pressure level (SPL) in the middle of its range was not particularly low, rising from about 1 percent between 100 and 300 Hz to 5 percent at 70 Hz and 10 percent at 50 Hz.

Listening Tests

FROM our first hearing of the Meridian D600 system, it was obvious that this was no ordinary speaker. Its smoothness and the breadth of its stereo stage were outstanding, and so was its balance throughout the audible range. We found its default equalization settings to be quite satisfactory. The audible effects of even the extreme settings were generally negligible, although perhaps a very critical listener might find reason to prefer a particular response characteristic. Incidentally, we kept

the mounting spikes capped, since it was necessary to reposition the speakers several times during our testing.

We listened exclusively to CD's played on the Meridian Model 207, which was connected to the speakers with coaxial digital coupling. One of our earliest impressions was of the seemingly limitless dynamic range of the system. No matter how loudly we played the music, the sound was never strained or compressed. We would not have dared play music that loud with any conventional speaker/amplifier combination (especially one based on 6½-inch woofers!) for fear of blowing a driver or two, if not the amplifier. Measurements with a sound-level meter at the listening position (about 15 feet from the speakers) showed sustained levels as high as 107 dB with some program material. The speakers did not sound particularly strained, nor did they suffer any damage from this treatment, but we found such listening levels uncomfortable and backed down. Meridian claims that the D600's maximum SPL is 110 dB and its maximum frequency range 36 to 20,000 Hz; both ratings were amply confirmed by our experience with the system.

We were concerned about damaging the speakers by such high-level operation, but according to Meridian the amplifiers are protected against overheating and will shut down if abused, and apparently the speaker drivers are able to absorb the full output of their amplifiers without damage. At no time in our tests or use of the speakers did their back panels get more than mildly warm; presumably it would take a sustained diet of very loud music at full power to do that.

Remarkable as this system was, it *could* be driven beyond its limits. At high volume, the cannons on the Telarc CD of the *1812 Overture* were more than it (like most other speakers and amplifiers) could handle, and attempts to play this disc loud enough to *feel* the bass resulted in harsh clipping, either of a woofer or its amplifier. Devotees of ultra-deep bass will want to combine the D600 with a powered subwoofer. But for my taste, these handsome and terrific-sounding speakers did very well by themselves.

Happily, the Meridian D600 sounded as sweet and musical at the level of a whisper as it did at full-orchestral volume. In fact, if I had to pick a single adjective to describe it, it would be "effortless." "Awe-

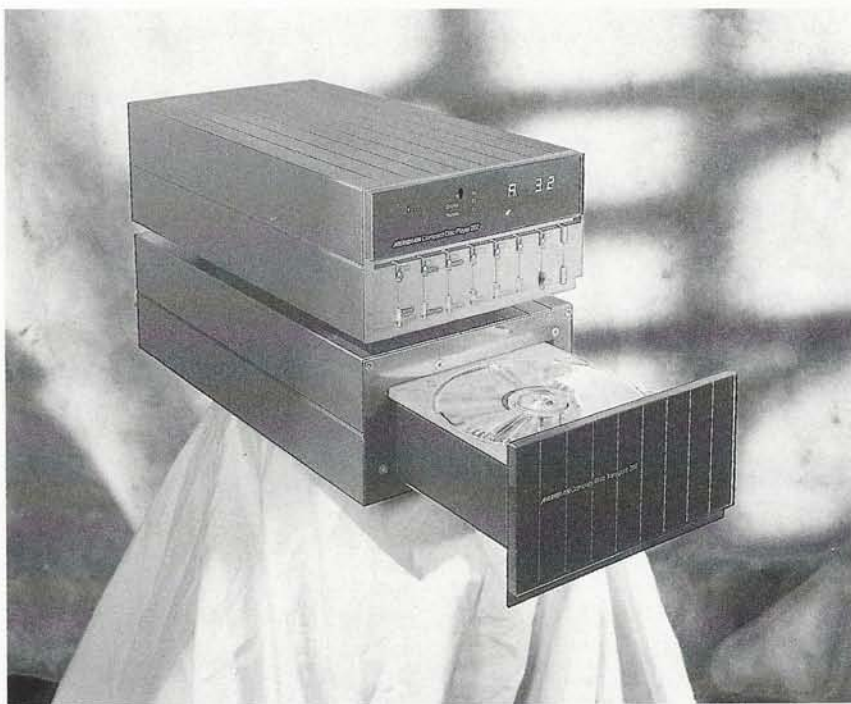
some" is another likely choice. Meridian's considerable claims for this system were amply justified by any standard we could apply.

Adding It All Up

GOOD as the D600 is—and it is hard to imagine anyone considering it less than *very* good, whatever personal preferences might be—it does appear at first glance to be a very pricy item. Spending \$5,490 just for a pair of speakers? Well, for that money you not only get two excellent speaker systems, which are attractively styled to be at home in almost any environment. You also get six high-quality 70-watt amplifiers and two sets of three-way electronic crossovers. You get a pair of excellent preamplifiers, with remote digital operation of their controls and rather subtle but sophisticated "tone controls" that are just made to order for people who hate ordinary tone controls. You get a pair of really good 16-bit, four-times-over-sampling D/A converters. You get a variety of connection options that enable these speakers to interface with many different source components. And you get a versatile and attractive system remote control. When you look at it in that light, the price seems a bit more reasonable, doesn't it?

The sheer versatility of the D600 system makes it difficult to comprehend its operation fully without a careful study of its two spiral-bound manuals. Everything is done differently from the way it is done in ordinary hi-fi systems, and much of what the system does is not at all obvious to anyone familiar with conventional audio products.

We were told by Meridian America that the complexity of this system requires a close relationship between customer and dealer. As with certain other high-end components, it is advisable that the dealer install and set up the components to insure their satisfactory operation. And even after the system is installed, my advice to a user is to read the manual carefully and practice using the system's many features. It would be a shame to own a magnificent system like this one and not know how to use it effectively. □



Meridian's Model 207-Pro CD player is housed in two separate enclosures in order to isolate the transport from the electronic components. It can also serve as the preamp for an entire system.

