

B&W DM16

The Design Brief

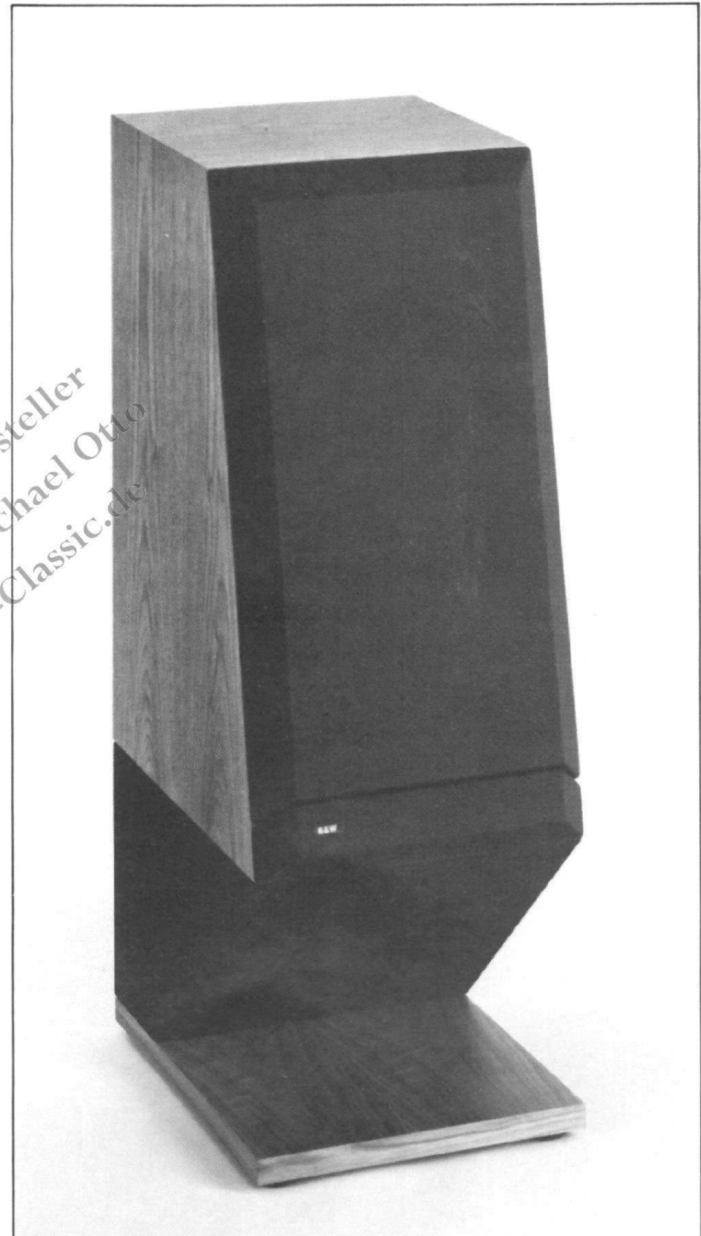
In 1975 B&W introduced Europe's first linear phase loudspeaker system. This loudspeaker system introduced new concepts of design philosophy where such factors as group time delay and transient behaviour formed an integral part of design optimization.

Additionally, new materials were developed for the design and construction of the driver units, probably the most important being B&W's polyamide cone assembly on which we have World-wide patents.

Many of these innovations have been carried forward to other models in the range; the most notable of course is B&W's 801 now accepted widely by Recording Companies such as EMI, Decca and Angel for their professional monitoring requirements.

The success of the DM16's predecessor, the DM6 may be judged not only by the fact that it has been in consistent full production for the last 5 years but that this design has been virtually copied by many other loudspeaker manufacturers.

The design brief for DM16 was that it should be a domestic monitor loudspeaker system of medium/high sensitivity, the top of B&W's DM range, and a worthy successor to DM6. The DM16 took full advantage of such advanced technology as computer optimization and laser interferometry which B&W have extensively developed over the past 5 years.



The Drivers

There is little doubt that the World-wide acclaim which B&W loudspeakers receive is due in no small measure to the fact that all drive units are purpose-designed for their particular system requirements. Moreover, they are manufactured within our own factory, being subject to rigid quality control at every stage.

Employing a critically braced, heavily damped and totally sealed enclosure of some 39 litres, the original DM6 bass driver had much to commend it. It did, however, suffer from lower than 8 ohms impedance (to DIN specification) and some cone flexure, which became apparent from our post-design laser interferometry investigation. This drive unit has been totally redesigned with a higher voice coil impedance, a bigger magnet structure, and a laser optimized cone profile. It is now capable of tremendous acoustical output and a system resonance of 42 Hz.

The polyamide coned mid-range driver, which contributed greatly to the enormous success of Model 801 and more recently Model 802, has been described as one of the most advanced mid-range transducers in the World. It was decided to use this component as the heart of the DM16 system, covering frequencies from 400 Hz to 3kHz (crossover points) in a separately sealed mid-range enclosure within the structure of the main cabinet. The motor system of the TS26cm (the tweeter common to both 801 and 802) has been used to evolve a flat plate high frequency driver (TW26cm) capable of excellent performance from 3kHz to above audibility.

The DM16's three drivers are mounted vertically with the mid and high frequency units off-set to improve stereo imagery. Thus, DM16 systems are supplied in mirror image pairs.

The Enclosure

It is now well known that the larger and heavier the moving mass of a transducer the greater is the time delay. In order to correct for this and produce a coherent wave front free from time delay distortion, the low and mid-frequency transducers must physically be mounted ahead of the high frequency transducer by discretely differing distances. The designer is faced with two options. The option chosen in DM6 and DM7 uses a stepped baffle configuration; the solution chosen for Model DM16 employs a sloping baffle. This latter solution while satisfying the required time delay correction, offered

considerable stylistic opportunities.

Thus, Pentagram Design Partnership, B&W's designers, were able to style DM16 in such a manner that it formed a distinctive, yet homogeneous leader of the B&W family. The whole of the DM16 enclosure design has been subjected to the most detailed investigation to ensure maximum freedom from colouration and to minimize cabinet "read out" problems. Coupled with the floating driver isolation originally developed for Model 801, DM16 achieves a new high standard of neutrality. The DM16 is certainly a most attractive piece of furniture, floor standing with its in-built plinth; but through its tooled front grille assemblies and other technology developed for the Series 80 range, it offers this attractive visual appearance with minimal loss of acoustic perfection.

The Crossover Network

The identical fourth order Butterworth Squared crossover networks developed for Model 801 are also employed in the DM16—using no fewer than 46 components (including overload circuit). The detailed advantage of this highly complex configuration is discussed in the paper "Computer-Aided Design of Loudspeaker Crossover Networks" by Dr. G. J. Adams and S. P. B. Roe.

The Overload Protection

B&W pioneered electronic overload protection for Model 801 and Model 802 and a similar device (with the exception that it is audio, rather than battery, powered) is employed in Model DM16. This Audio Powered Overload Circuit (APOC) renders Model DM16 completely safe against all forms of AC or DC overload conditions.

Quality Control

Model DM16 will be subjected to the same uniquely rigid quality control procedures as Model 801 and Model 802—so all drivers will be computer-matched and paired, typically bettering $\pm 0.25\text{dB}$ between matching samples.

Conclusion

We confidently offer DM16 not only as a worthy successor to DM6, but as a leader of the DM range where such models as DM12, the miniature of the Series, are already being widely used for monitoring purposes by professional Recording Studios throughout the World.

SPECIFICATION

Frequency response

65 Hz to 20kHz $\pm 2\text{dB}$ free-field on listening axis at 2 metres.

Low frequency system

Acoustic suspension with third order high pass characteristic, -3dB at approx. 60 Hz (half-space loading)

Dispersion

Vertical: $\pm 2\text{dB}$ over 10° arc free-field response.
Horizontal: $+0, -4\text{dB}$ over 60° arc, 20 Hz-10kHz axial free-field.

Impedance

8 ohms nominal.

Distortion

For a nominal s.p.l. of 95dB at 1 metre.
Second Harmonic: Less than 2%, 20 Hz to 20kHz
Third Harmonic: Less than 1%, 20 Hz to 20kHz

Sensitivity

1 watt into 8 ohms for an s.p.l. of 87dB at 1 metre, sinewave input at 300 Hz.

Power handling

Suitable for amplifiers having a power output of 15 watts or greater.
No upper limit (APOC) Maximum s.p.l. 99dB at 10kHz
at 1 metre 108dB at 1kHz
105dB at 100 Hz

High frequency driver TW26

26mm dia. polyester weave dome 26mm dia. high-temperature voice coil

Total moving mass not more than 0.3g ensuring excellent transient response and extended frequency range above 20kHz.

Mid-range driver

Diaphragm: 100mm dia. aromatic polyamide fibre matrix cone, critically formed and PVA impregnated following a laser interferometry computer-linked pattern.

Bass driver

Diaphragm: 220mm diameter thermo-plastic cone with PVA compound coating

Ultra long-throw suspension

Voice Coil: 50mm High Temperature Nomex

Magnet System: High Performance Ceramic.

Dimensions

Height: 950mm (37.5in)

Width: 335mm (13.2in)

Depth: MAX 415mm (16.3in)

MIN 310mm (12.2in)

Weight

35kg (77lb)

Cabinet finish

Standard: selected veneers of teak or walnut.

Special: selected veneers of rosewood or black ash.

B&W Loudspeakers Ltd. reserve the right to amend details of their specifications in line with technical developments.



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