

# B&W DM23

## The Design Brief

The design brief for Model DM23 followed closely on the lines of the DM10 in that a compact loudspeaker was required having orthodox styling, low cost and good performance. In addition to these requirements, the DM23 was to be a three-driver system so that the important mid-frequency range could be covered by a single loudspeaker driver.

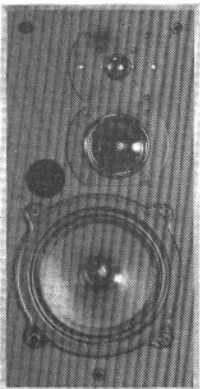
Within these guidelines it was felt essential to have a high-quality wood veneered enclosure which would look equally at home positioned upright or on its side.

The requirements of good performance and compact size led to the natural choice of a vented low-frequency system for the DM23. To keep the system cost effective, a higher than usual crossover frequency from the low-frequency system to the mid-frequency system was proposed. This yielded two benefits; firstly it enabled a reduction in the size and material content of the crossover network to be obtained, and secondly, it enabled the use of a smaller mid-frequency system to be used. To obtain maximum gain from the latter benefit, B&W designed a completely new mid-frequency driver and enclosure for Model DM23.

Following B&W's normal practice, Model DM23 was designed with careful regard to its measured acoustic performance. However, B&W view a system's subjective performance with equal importance. In listening tests on Model DM23 the system was compared with the reference standard acknowledged by many major recording companies – B&W's own Model 801. The overall tonal balance of the DM23 was tailored to mimic that of Model 801, resulting in a system which provides exceptionally accurate performance for a very modest cost.



*With Optional Stand*



*Without Front Grill*

### The Drivers

The driver configuration chosen for the DM23 is the well-known 3 in-line arrangement. In view of the compact dimensions and high sensitivity required of the DM23, a departure from B&W's recognised "sealed box" technique has been made in favour of the vented-box system. This offers higher sensitivity compared to a closed-box system of the same enclosure size and low-frequency cutoff for only a small degradation in transient performance. The DM23 bass driver is of 200mm nominal diameter and uses a rigid cast alloy chassis and a motor system optimised for the vented system.

The mid-frequency system of DM23 was designed specifically for this model to take advantage of the operating range chosen. The 80mm diameter mid-frequency driver uses a Bextrene cone coupled to a 26mm diameter high-temperature voice coil. The rigid cast alloy chassis of the driver is mounted into a tough plastic moulding which forms the mid-frequency enclosure. The shape of this moulding has been chosen so that structural resonances are minimised. The air space within the enclosure is filled with wool to provide acoustic damping. The complete mid-frequency system thus forms a neat single component which can be mounted directly into the low-frequency enclosure without the need for enclosure partitioning.

The high-frequency transducer used in the DM23 is the well proven TW26 design which is used in several of the current B&W loudspeaker designs. It employs a 26mm diameter polyester weave dome coupled to a high-temperature voice coil of the same diameter. The TW26 offers wide dispersion, high power handling capacity and an excellent transient response.

### The Crossover Network

Crossover frequencies of 900Hz (low/mid) and 4.5kHz (mid/high) were chosen for the DM23. The choice of 900Hz for the lower crossover point enabled the use of a simple 2nd-order network here to provide an attenuation rate of 12dB/octave in the stopbands. The attenuation rates in the mid/high crossover region were chosen to be 18dB/octave to satisfy the power handling requirement specified for the high-

frequency system. The values of the components in the DM23 crossover network were selected by a computer optimisation program pioneered by B&W Engineers and first used for the design of the crossover networks for the B&W Model 801. This sophisticated design technique ensures that the best possible performance is obtained with the minimum number of components.

All the capacitors used in the crossover are close tolerance reversible electrolytic types, while the inductors are ferrite cored where it is necessary to minimise series resistance.

### The Enclosure Design

As mentioned in the design brief, two important requirements of the DM23 were that it should have an orthodox styling so as to appeal to a wide market, and that it should be finished in a genuine wood veneer. A skilful application of modern mitrefolding techniques has allowed expensive genuine wood veneers to be combined with a very sturdy 18mm thick particle board enclosure.

By using isolated fixing screws for the low-frequency driver the excitation of structural resonances of the enclosure is minimised. The enclosure volume is partly filled with acoustic damping material to effectively eliminate the build-up of internal standing waves. The length and diameter of the vent were optimised to give the best possible extension of low-frequency response with negligible extraneous noise.

### The Accessories

The DM23 is a true bookshelf loudspeaker system which can be mounted upright or on its side. Where a free-standing system is preferred, B&W's STAV22 loudspeaker stand (illustrated overleaf) is highly suited.

### Conclusion

With the DM23 B&W have created a compact three-driver system of wide bandwidth, high sensitivity and high power output, but at a remarkably low cost. In many respects the DM23 is modelled on B&W's very successful DM4 system and thus it should appeal to a very wide audience.

#### SPECIFICATION

##### Frequency Response

75Hz to 20kHz  $\pm 3$ dB free-field on listening axis at 2m.

##### Low-Frequency System

Computer-optimised vented-box system, cutoff ( $-3$ dB) frequency is approximately 60Hz for half-space loading.

##### Dispersion

Vertical:  $\pm 2$ dB over  $10^\circ$  arc.  
Horizontal:  $\pm 2$ dB over  $40^\circ$  arc, 20Hz-20kHz.

##### Drive Units

Three, vertical in-line.

##### Bass Driver BM200/23

160mm diameter laminated fibre/polymer composition cone. 26mm diameter high-temperature voice coil phenolic resin impregnated on a foil-lined former. Vibration-isolation mountings reduce excitation of minor structural resonances.

##### Mid-Frequency Driver MR80/23

Newly developed 80mm diameter moving-coil driver employing a damped Bextrene cone and a 26mm diameter high-temperature voice coil. The enclosure for this driver is in the form of a tough plastic "pod" which is attached directly to the cast alloy driver chassis thus forming a perfectly sealed system. The enclosed volume is filled with wool to provide acoustic damping.

##### High-Frequency Driver TW26SL

26mm diameter polyester weave dome driven by a 26mm diameter high-temperature voice coil. A total moving mass of less than 0.3g ensures excellent transient response and extended frequency range above 20kHz.

##### Distortion

For a nominal s.p.l. of 95dB at 1m.

Second Harmonic: Less than 3% 20Hz to 500Hz  
Less than 1% 500Hz to 20kHz  
Third Harmonic: Less than 2% 20Hz to 500Hz  
Less than 0.5% 500Hz to 20kHz

##### Impedance

8 ohms nominal. Magnitude does not fall below 6.4 ohms throughout the frequency range 20Hz to 200kHz.

##### Sensitivity

1 watt into 8 ohms for a s.p.l. of 88dB at 1 metre, sinewave input at 1kHz.

##### Power handling

Suitable for amplifiers having power outputs between 10 and 100 watts.

##### Dimensions

Height: 495mm  
Width: 250mm  
Depth: 240mm

##### Weight

9.8kg

##### Cabinet Finishes

Genuine wood veneer of teak or walnut.  
Simulated wood veneer 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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