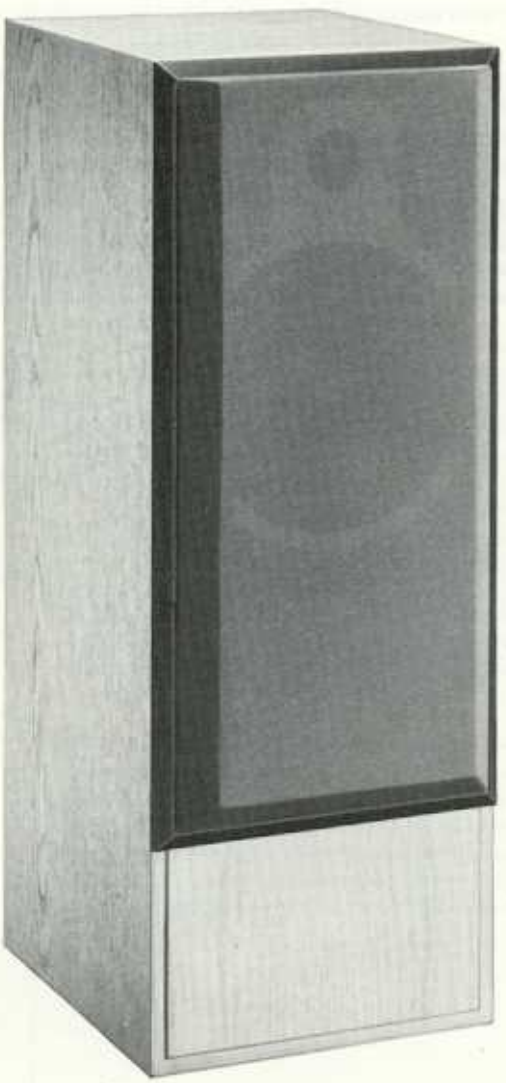
B&W LOUDSPEAKERS

Instruction Manual

# DM1600 & DM1800

MONITOR LOUDSPEAKER SYSTEMS


DM1600



DM1800

# 1

## Introducing B&W models DM1600/DM1800

The brief to our design team for the DM1600/DM1800 envisaged two loudspeaker systems of medium size, incorporating all the benefits of our new Matrix technology. There was an additional challenge: the two new systems must be even more cost-effective than the original Matrix monitors 1, 2 & 3.

High sensitivity (89–90dB for 1W input) was another prime requirement. Also, we called for enclosures of modest dimensions – and this was to be achieved while maintaining extended bass response.

To measure up successfully to such exacting requirements calls for high technology research programmes such as B&W are uniquely well manned and equipped to carry out. To quote two interesting examples: (1) finite element analysis of diaphragm behaviour was used in the design of transducers which behave as true piston radiators throughout their operating range and (2) modal analysis was the guide for optimum positioning of cabinet Matrix elements.

Complementary with this high-tech approach to component design was the decision – by consultant Dr Kenneth Grange of Pentagram – to mould the front baffle in lime-filled polypropylene, which makes its own contribution to acoustic superiority.

The enclosures of both models are finished in selected genuine wood veneers. Matching stands are available; but note that low frequency performance has been tailored to ensure that shelf-mounting is perfectly acceptable.

Because the systems are protected by the patented B&W audio-powered overload circuit (APOC), high listening levels do not entail the risk of damage to drive units.

### Getting the best from your system

The purpose of this manual is to enhance your enjoyment of the DM1600/DM1800 loudspeakers you have chosen. Systems of this high class are still dependent on the signals fed into them and are also influenced by the immediate environment in which they operate. Useful advice on these aspects will be found in the following pages.

An international network of carefully chosen distributors handles B&W products in more than forty countries worldwide. If at any time you have a problem that your Dealer cannot resolve, the B&W Distributor for your area will be more than willing to help.

Thank you for the confidence you have shown in purchasing your DM1600/DM1800 loudspeakers. Please be assured of our continuing interest in your long-term listening pleasure.

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## B&W DM1600/DM1800 – design background

### The enclosure

Drawing on our recent experience with the invention, development and outstanding success of the B&W Matrix series, we designed the DM1600/DM1800 enclosures with all the following proven advantages built-in.

(a) Significant reduction of those unwanted colourations so frequently associated with box-type loudspeakers. (Any radiation from an enclosure adds its own unwanted character to the desirable neutral, uncoloured sound produced by the drive units.)

(b) Reduction of the decay time of enclosure vibrations, with consequent improvement in transient response – a key factor in correct reproduction of compact discs.

(c) Improved detail and depth in the stereo image, due to reduction of image-confusing rear and sideways radiation. The sounds seem to be in the space around and between the speakers – not emanating from them.

### The drive units

The reduction of enclosure radiation to extremely low levels has the unfortunate side effect of exposing hitherto inaudible defects in driver performance. It was therefore necessary to carry out extensive development of drivers, refining their performance in order to take full advantage of the new Matrix technology.

The cone of the bass/midrange driver that resulted from this development programme is made from a specially formulated plastic compound. Critical parameters of the motor system and cone mass have been optimised for the chosen fourth-order vented alignment.

A similar design philosophy is behind the drive units of both systems, but in the case of DM1800 our computer-aided design programmes called for a motor system with considerably more power. This gives worthwhile bass extension, and the increased voice coil diameter results in enhanced power handling.

The high frequency transducer is of entirely new design, incorporating a metal-domed diaphragm. It exhibits perfect piston-like behaviour up to frequencies well beyond audibility. This unit is the result of advanced research using established B&W laser techniques – plus the new science of finite element analysis, which can predict driver performance, permitting many more options to be assessed than if each had to be built and tested.

### Filter networks and protection circuits

Just as the drivers required refinement to accord with improvements in enclosure design, so care was needed to ensure that the crossover filtering would maintain overall system performance. The quality and tolerance of components had to be controlled to fine limits in order to meet the high standards of distortion and linearity we set.

## 3

# Unpacking, installation and aftercare

### Unpacking

We suggest that after unpacking your loudspeakers you retain the packing against the possibility of wishing to transport them at a later date.

The loudspeaker cartons contain:

**DM1600** (one carton)

(a) A pair of DM1600 loudspeakers.
(b) One copy of this instruction manual.
(c) Two calibration certificates – one for each loudspeaker.

**DM1800** (two cartons)

In each carton :

(a) One DM1800 loudspeaker.
– and in one carton only:
(b) One copy of this instruction manual.
(c) Two calibration certificates – one for each loudspeaker.

### Installation

The rear of each DM1600/DM1800 enclosure is fitted with a pair of screw terminals marked red for positive and black for negative. These should be connected to your amplifier + and – outputs respectively, using a good quality cable. Since the currents involved when playing loud music can be large, it is recommended that the cable cross-sectional area should be not less than 1.5mm for runs up to 3 metres and correspondingly larger for longer runs.

Later sections deal with positioning your loudspeakers, use of stands, and ancillary equipment.

### Aftercare

The DM1600/DM1800 baffle is finished in 'Nextel'. Consequently the greatest care should be taken to ensure that any cleaning is done without the use of abrasive materials. A soft, damp cloth should be all that is necessary to clean the paintwork. Proprietary polishes, such as car polish, are not recommended.

The cabinet is finished in real wood veneer and should be treated in the same way as you would treat a normal piece of furniture. However, if you use an aerosol, please spray on to a piece of cloth first in order to avoid the application of polish to the grilles.

The grilles may be cleaned after first removing them by brushing with a soft, clean, clothes brush or something similar.

Please avoid touching the drive units, especially the dome tweeter, as damage could result.

## 4

# The listening room and positioning your loudspeakers

The degree of accuracy with which the original musical performance can be reproduced in your own home depends on a number of factors, including the quality of the original recording, the equipment used for reproduction, and the acoustic properties of your listening room.

Regardless of other links in the chain, the listening room will to a greater or lesser degree imprint its character on the reproduced sound you hear. In simple proof of this statement, notice how the sound of the human voice changes according to environment.

### Choice of listening room

Few people are fortunate enough to have a choice of listening rooms, but for those to whom this is possible (or anyone planning a new home) the following may be helpful guidelines:

(a) Any room with different dimensions for ceiling height, length and width will sound more even in response than rooms where all three dimensions are similar.
(b) Solid walls are preferable and will show better reproduction of low frequency transients than some modern constructions where the inner walls are of plasterboard and therefore slightly flexible.
(c) Other than in houses with solid or concrete floor structures, a ground floor room is preferable to an upper floor.

### Changing listening room acoustics

Quite small changes in the furnishing of a room can affect its acoustic properties significantly. If you already have pictures on the wall, remove these experimentally and at once you will notice a considerable change in the sound from your loudspeakers! We are not suggesting that you should leave the room bare of pictures – quite the reverse, because pictures break up the otherwise plain wall surfaces and generally give fewer discrete high frequency resonances or flutter echoes.

Curtains are another element which can change the sound of your listening room in the mid/upper frequencies. Heavier curtains give more sound absorption of these frequencies and a softer, less reverberant quality to the upper octaves. Conversely if your room sounds too dead, thinner curtains will give more life or sparkle in these frequency regions. So far as sound in the low frequencies is concerned, this is largely controlled by the dimensions and construction of the room. However, large items of furniture do change room behaviour at low frequencies, so it may be worth experimenting with their placement.

### Placement of loudspeakers

There is some truth in the notion that cheap loudspeakers correctly placed may sound better than more expensive ones, poorly placed. While this is a somewhat simplistic idea, it is certainly true that the position of your loudspeakers within your environment will have a greater effect than any other variable under your control.

Models DM1600/DM1800 are designed to fit into as many different situations as possible and they will function successfully standing on shelves or furniture. However, we do recommend the use of our purpose-made stands, which place the drivers at the correct height in relation to most seating arrangements (see Section 7).

## 5

## Amplifier, control unit and source equipment

The recommended limits of RMS power output for the driving amplifier are 30W min. 200W max. (into 8Ω).

It should be stated that amplifier power output is impossible to quote precisely, as it depends to some extent on the type of music being reproduced. Similarly, the required amplifier power will depend on room volume and the sound level required by the listener.

It is generally true to say that too high a power output is better than too low, because it allows more headroom for transients and reduces the risk of clipping, with its attendant sharp rise in distortion.

B&W established their own electronics research department for the express purpose of in-depth research into active loudspeakers, protection, amplifiers, test equipment and other items of electronics. A range of electronics specifically designed to complement the performance of your loudspeakers will be on the market shortly. We suggest you ask your Dealer for a comparative demonstration of these products.

## 6

## The APOC protection circuit

The DM1600/DM1800 systems are fully protected against excessive signal levels. As soon as the safe limit of any given drive unit is approached, the protection circuit will disconnect the input until the fault/overload is removed.

## 7

## Loudspeaker accessories

Here we comment briefly on three accessories associated with loudspeakers: stands, spikes and cables.

A purpose-made stand is available which rigidly supports DM1600/DM1800 at optimum listening height; it was designed by Kenneth Grange to integrate perfectly with either enclosure. In use, the stands positively enhance the look of the speakers and blend pleasantly with furniture and furnishings.

The loudspeakers incorporate stand locating sockets and full fitting instructions are included with the optional stand kit.

Spikes (supplied with the stand) can assist sound reproduction in two quite different ways. Firstly, due to their extremely small area of contact relative to the stand base, their interface provides many thousands of times greater pressure at the point of contact. This increases the stability of the loudspeaker and helps withstand any movement of the enclosure due to sound excitation.

The second way in which spikes can assist is by reducing the area of contact between floor and loudspeaker enclosure. This is especially valuable in the case of a resonant floor, which may be regarded as a giant sounding board coupled to the cabinet.

Two areas of improvement in sound reproduction will be noticed when spikes are fitted. Bass transients will be tighter and stereo images will be slightly more precise, due to the increased stability of the system.

The subject of cables between the power amplifier and loudspeakers is dealt with under Section 3 (Installation).

There remains the question of interconnecting cables between the various pieces of equipment and the power amplifier. A number of excellent cables are available on the market and audible differences certainly exist between them. We suggest, therefore, that you choose one of the better cables for this purpose, after consideration of the published reports.

## 8

## A record suggestion

With your DM1600/DM1800 system, you will find that you are noticeably nearer to listening to the music rather than to the loudspeakers. You will hear desirable ambience and detail in good recordings; unfortunately, the faults in poor recordings will also be revealed.

We have produced a special compact disc recording that will enable you to enjoy a full appreciation of your new system. It is available from your Dealer:

B&W label No. BW001, 'B&W Present':

The Academy of Ancient Music: Christopher Hogwood.

# 9

## Specifications

### DM1600

| | |
|---|---|
| **Frequency range** | (−6dB points) 50Hz–30kHz |
| **Bass loading** | Fourth-order vented alignment<br>3dB down at 65Hz |
| **Frequency response** | 70Hz–20kHz ±2dB free-field |
| **Dispersion** | Horizontal: 40° arc +0 −2dB<br>Vertical: 10° arc ±1.5dB |
| **Sensitivity** | 89dB at 1m for 1W into 8Ω |
| **Distortion** | For 95dB at 1m<br>Second harmonic: <3% 20Hz–200Hz<br><1% 200Hz–20kHz<br>Third harmonic: <3% 20Hz–200Hz<br><1% 200Hz–20kHz |
| **Crossover network** | Fourth-order Butterworth squared acoustic response crossing over at 3kHz |
| **Impedance** | Nominal 8Ω (not falling below 6Ω) |
| **Drive units** | One 200mm polymer cone bass/midrange<br>One 26mm metal dome high frequency with true piston action up to 20kHz |
| **Power handling** | Suitable for amplifiers of 30–200W<br>Automatic overload protection (APOC) |
| **Dimensions** | Height: 490mm (19¼in)<br>Width: 236mm (9¼in)<br>Depth: 300mm (11¾in) inc. grille |
| **Cabinet finish** | Real wood veneers of black ash or walnut |

### DM1800

| | |
|---|---|
| **Frequency range** | (−6dB points) 43Hz–30kHz |
| **Bass loading** | Fourth-order vented alignment<br>3dB down at 50Hz |
| **Frequency response** | 65Hz–20kHz ±2dB free-field |
| **Dispersion** | Horizontal: 40° arc +0 −2dB<br>Vertical: 10° arc ±1.5dB |
| **Sensitivity** | 90dB at 1m for 1W into 8Ω |
| **Distortion** | For 95dB at 1m<br>Second harmonic: <3% 20Hz–200Hz<br><1% 200Hz–20kHz<br>Third harmonic: <3% 20Hz–200Hz<br><1% 200Hz–20kHz |
| **Crossover network** | Fourth-order Butterworth squared acoustic response crossing over at 3kHz |
| **Impedance** | Nominal 8Ω (not falling below 6Ω) |
| **Drive units** | One 200mm polymer cone bass/midrange<br>One 26mm metal dome high frequency with true piston action up to 20kHz |
| **Power handling** | Suitable for amplifiers of 30–200W<br>Automatic overload protection (APOC) |
| **Dimensions** | Height: 634mm (25in)<br>Width: 236mm (9¼in)<br>Depth: 300mm (11¾in) inc. grille |
| **Cabinet finish** | Real wood veneers of black ash or walnut |

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