

# **B&W**

## **Instruction Manual**

### **DM7 Mk2**



## **B&W Loudspeakers**

## Introducing the DM7 Mk 2

DM7 Mk 2 is a development of the highly-praised DM7, benefiting from B&W's expanded research facilities and employing in-house computer facilities and advanced technology such as Laser Interferometry to improve the performance of the original DM7 in all respects.

DM7 Mk 2 is a precision, three unit loudspeaker system featuring entirely new purpose-designed drive units and compact (approx. 40-litre) enclosure. Our lengthy programme of design and development has been completed with excellence of performance rather than cost in mind. Used stereophonically or quadrophonically, your new speakers will achieve the very highest standards of fidelity in the reproduction of original sound.

The integral stand positions the loudspeaker at the optimal listening height for accurate amplitude and phase-coherent information within a listening 'window'. The following instructions and information will help to ensure that you derive the maximum listening pleasure from this exceptional loudspeaker system.

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## Specification

<b>Frequency response</b>	80Hz to 20kHz $\pm 2$ dB free-field at centre of the listening window at 2m.
<b>Low-frequency system</b>	Passive-radiator type, system parameters: (after R. H. Small) $f_s = 31$ Hz $Q_T = 0.22$ $\alpha = 1.75$ $h = 1.06$ $\delta = 7.50$
<b>Dispersion</b>	Vertical: $\pm 1$ dB over $10^\circ$ arc. Horizontal: $+0 -3$ dB over $60^\circ$ arc, 20Hz - 15kHz.
<b>Drive units</b>	Two vertical in-line and staggered for correct time alignment.
<b>Bass/mid-range driver</b> BM220	Diaphragm: 160mm dia. aromatic polyamide fibre matrix cone. Voice coil: 38mm dia. Vibration-isolated mountings reduce excitation of structural resonances of the enclosure.
<b>High-frequency driver</b> TS26	Diaphragm: 26mm dia. multi-filament weave dome. Voice coil: 26mm dia. To achieve a compact unit with excellent directional characteristics, a high-energy nickel cobalt centre pole is used in the magnet system.
<b>Distortion</b>	For a nominal s.p.l. of 95dB at 1m. 40Hz to 20kHz. Second harmonic less than 3%. Third harmonic less than 2%.
<b>Impedance</b>	8 ohms nominal. Minimum magnitude 6.5 ohms.
<b>Sensitivity</b>	1 watt into 8 ohms for a s.p.l. of 86dB at 1m, sine-wave input at 1kHz.
<b>Power handling</b>	Suitable for amplifiers having a power output of 40 watts or greater. No upper limit because of electronic overload protection device. Maximum s.p.l. at 1kHz 110dB, at 1m.
<b>Dimensions</b>	Height: 900mm (35 $\frac{1}{8}$ in) Width: 270mm (10 $\frac{1}{4}$ in) Depth: 382mm (15in)
<b>Weight</b>	29kg (64lb)
<b>Cabinet finish</b>	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.





## Unpacking and Assembly

It is important to follow these unpacking and assembly instructions carefully.

1. Having opened the carton, remove the wooden bass plate to reveal the accessory bag, the contents of which are illustrated in Fig 1. It is most important to leave the top polystyrene in position until assembly has been completed as this protects the tweeter assembly which is fragile.
2. Bend the opened flaps of the carton securely back and turn the carton upside-down. Slide it up and off the white polystyrene packing.
3. Remove the column from polystyrene pack as illustrated (Fig 2) and remove polystyrene end cap revealing the bottom of the cabinet. Attach metal base plate of stand with four socket button screws provided. Fig 3 Allen key for tightening these screws is provided in your accessory pack, Fig 4 and it is important that they are properly tightened.
4. The wooden base plate to complete the stand may now be fitted as shown in Fig 5. Place the loudspeaker on its stand and remove the top polystyrene end cap. The loudspeaker is now ready for operation.

The above procedure should be repeated for second loudspeaker.

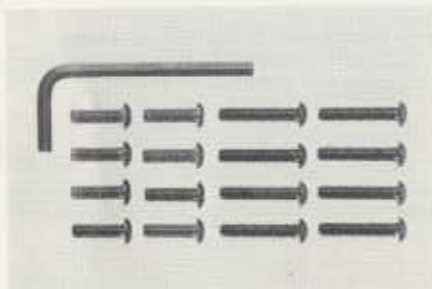


Fig 4

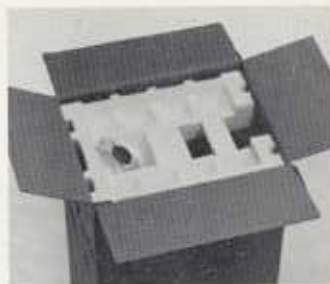


Fig 1

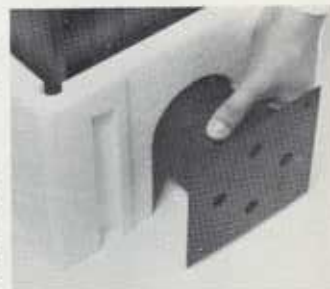


Fig 2



Fig 3



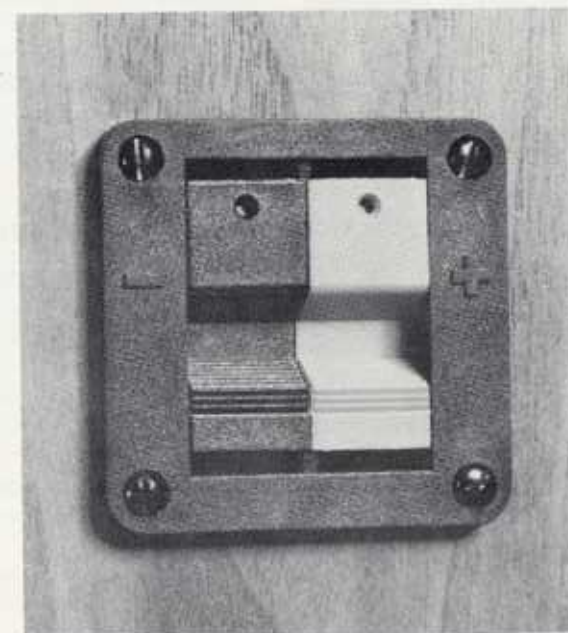
Fig 5

## Electrical Connection

Connect the output leads from your amplifier to the spring-loaded terminals provided on the back of your loudspeaker by sliding the red and black finger mouldings downward to reveal a 4mm hole into which the bared end of the cable is inserted. Immediately you release the finger moulding it will return to the upward position, this clamping the bared wire firmly in position.

It is important to ensure correct phasing that the red or positive wire from your amplifier is connected to the red socket on the loudspeaker.

Whilst we do not recommend the use of so-called "special" loudspeaker cables there is considerable advantage in keeping the DC resistance between amplifier output and the loudspeaker as low as possible. If the power amplifier is separate from the control unit it is well worth while locating this within say 4 metres (approx. 12 feet) or less from the loudspeakers. Where longer loudspeaker leads are necessary a heavy duty cable should be employed.



## The Listening Room and Loudspeaker Positioning

You may find the following simple guidelines helpful in selecting the most suitable room, and the best position for your loudspeakers to achieve optimal tonal balance, reproduction and accuracy in stereo listening.

### Sound dispersion

In the design of the DM7 Mk 2 we have paid special attention to the achievement of accurate amplitude and phase information within a listening window. In Fig 7 you will see that dispersion has been made greater horizontally than vertically, allowing greater group enjoyment of stereo location.

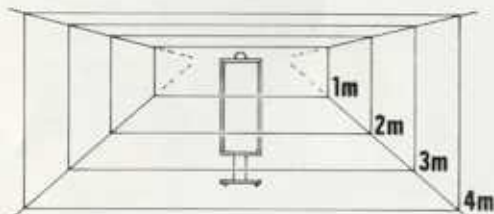


fig. 7

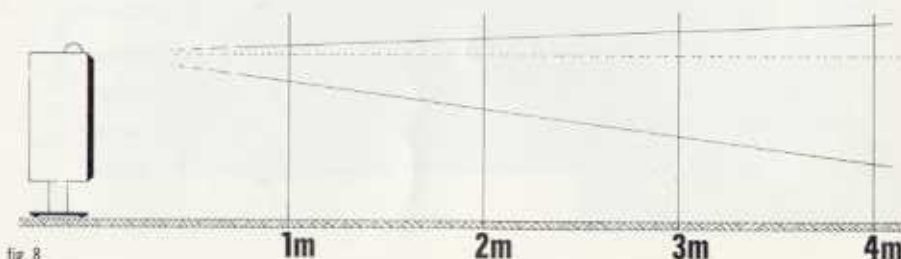


fig. 8

The height of the stand ensures that the centre of the vertical listening axis is approximately at ear height when the listener is seated. The greater the distance from the loudspeaker, the greater the tolerance or listening location (see Fig 8).

## The listening room

Choice is normally restricted, but if you are able to choose, it may be helpful to bear in mind the following points:

- i All enclosed volumes exhibit resonances which, in the case of the listening room, will be essentially determined by the distance between parallel surfaces. The strongest resonances will lie between 30Hz and 180Hz in average domestic room sizes.
- ii The most unsuitable listening room would be one where all dimensions (wall spacing and ceiling height) are similar, since all resonances occur over a narrow band of frequencies. Rooms where all dimensions are different give the most even and natural bass response.
- iii Protuberances and larger items of furniture tend to break up

these resonances and, where practical, varying the position of such items can often favourably influence sound reproduction.

- iv Soft furnishings, wall coverings and even pictures influence middle- and high-frequencies. Ideally one should aim to avoid discrete resonances or 'ringing' and an easy test for this problem is a simple hand-clap. If resonances exist there will be a distinct 'overhang' or sustaining of the response which could last between 0.5 and 1 second.
- v A bookcase, placed on a wall opposite a reflective surface such as a window, will often help to alleviate the problem outlined above. Alternatively, a small panel of acoustic tiles – approximately 4ft x 3ft (120cm x 90cm) – placed on a wall can produce a remarkable improvement.

## Positioning your loudspeakers

A typical listening room with suggested positions of the loudspeakers for initial listening tests, is shown in Fig 9, with the preferred listening area shaded. On initial installation of the loudspeakers, it is advisable to allow long, flexible audio connections for free movement of the speakers during listening tests.

All listening rooms have complex resonances (eigentones) and the excitation of these will be considerably affected by the positioning of the loudspeakers. The following guidelines may be helpful:

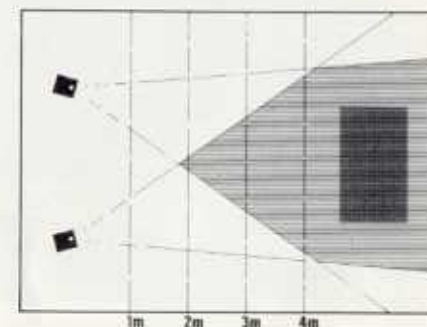


fig. 9



- i Placing the loudspeaker close to either wall will result in an apparent increase in bass response at a cost of some unevenness in low-frequency reproduction. This "tighter" coupling excites the room resonances more strongly.
- ii Placing the loudspeakers close to the corner of a room is usually not the most suitable position for low-frequency performance, although an increase in extreme bass will be apparent.
- iii The listening position will also influence apparent bass performance. The darker area marked in Fig 9 is normally preferable to the extreme boundaries of the listening area.
- iv The separation of the loudspeakers and their angle toward the listening area influence the accuracy of the stereo reception and the 'solidity' of the centre image. Generally a distance of 8-12ft (2.4-3.6m) between the speakers, and an angle of 15° toward the room centre is most effective.
- v The closer your own position to the loudspeakers, the nearer they should be to each other, or the greater should be the angle between them.
- vi Positioning the loudspeakers may be more critical in smaller, more regularly-contoured rooms than in those where boundary dimensions are more varied.

Figs 10, 11 and 12 illustrate the influence of positioning on low-frequency performance – see i and ii.



Fig 10 Optimum  $\frac{1}{3}$  octave response curve. Ref: Henning Möller paper of etc.



Fig 11 Idealised room loudspeaker position.



Fig 12 Effect of excessively close coupling to room, i.e. corner position.

## Overload Protection

B&W were the first major loudspeaker manufacturer in the world to introduce full electronic protection against damage and overload to their loudspeakers, this advanced circuitry was introduced in our professional monitor Model 801 and has been specially developed for DM7 Mk 2 as part of the design programme.

The overload protection circuits employed in your DM7 Mk 2 are audio powered and entirely automatic in operation. The principle on which APOC (Audio powered overload circuit) works is a dual sensing

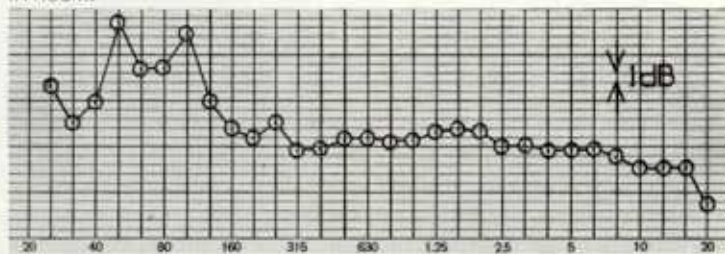
of the voltage applied to each drive unit. The applied voltage is measured both in terms of peak amplitude over a pre-determined time cycle thus measuring the temperature at the voice coil of each driver. Should the safe temperature of any drive unit in the system be exceeded APOC will automatically remove the audio supply and not restore it until the overload or fault condition has been removed. Immediately an overload or fault condition occurs the red LED located on the HF driver base will indicate this condition.



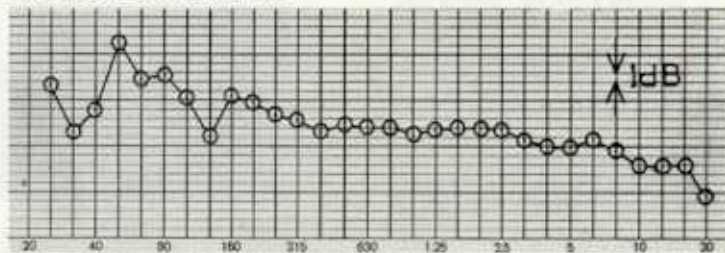
# Section 4

## Loudspeaker positioning

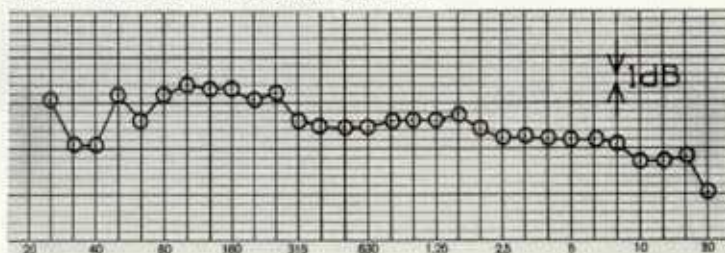
1/3RD OCTAVE ENVIRONMENTAL PLOTS  
SHOWING EFFECT OF LOUDSPEAKER POSITION  
IN ROOM.



LOUDSPEAKERS IN CORNERS.



LOUDSPEAKERS 0.4 METRES FROM CORNERS.



LOUDSPEAKERS 1.0 METRES FROM CORNERS.

The controls on your loudspeaker do a great deal to compensate for the position of your loudspeakers, which is often dictated by the layout of furniture and living arrangements; however, where it is convenient, varying the siting of your loudspeakers, following the guidelines below, can further improve overall performance.

- A. The loudspeaker should be positioned so as to give a good stereo effect.

In practice this means that the listening situation should be as symmetrical as possible, where possible the loudspeakers should be arranged symmetrically on one wall of the room. The stereo image may be blurred or sharpened depending on whether they are parallel to a wall, or angled towards the listening area. Optimum results depend upon the listening distance and the loudspeaker separation. In general the angle by which the loudspeakers are turned in should be increased the further they are apart and the closer the listening position.

- B. In order to obtain the most even frequency response at the lower frequencies, the position of the loudspeakers relative to the nearest surfaces is important. We have selected a stand height of 180 mm (7 ins) as being aestically suitable and acoustically acceptable. The distance of the loudspeakers from rear and side walls may be varied to suit particular situations. In general an apparent lack of low frequency output may be compensated for by coupling the loudspeaker closely to one wall or two walls (i.e. into a corner); the result will be increased bass response but at the cost of some low frequency unevenness. The response of the DM6 has been tailored to suit most rooms when situated some way from the corner of the rooms, thereby giving an even low frequency response. Examples of the effect of room positioning are shown.



## Ancillary Equipment

As a discriminating listener, you will not have chosen your DM7 Mk 2 loudspeakers without thorough preliminary listening tests. As you will have discovered, far from being the weakest link in the chain – as loudspeakers are so often described – the performance of the DM7 Mk 2 warrants the best ancillary equipment available in order to realise its full potential.

While we cannot, of course, recommend specific equipment manufacturers, there is a wide range of top-quality components available. Since you have already invested in one of the world's finest speakers, you should therefore pay equal attention to your choice of pick-up arm, cartridge, amplifiers, tuner and tape recorder. Differences between them

may be subtle but they do exist, and your own listening experience is an invaluable guide.

Reliable advice is always available from a reputable hi-fi specialist, and our own specially-appointed B&W dealer will be pleased to give you expert assistance. Naturally, if it is possible to carry out a listening test in your home, using familiar recordings, this is the best way to ensure lasting satisfaction.

One of the continuing rewards of owning exceptional, high-fidelity equipment is the huge variety of performances from the world's finest artistes that you can enjoy in your own home, both from VHF stereophonic radio transmissions and disc recordings.

## Service

Throughout the world B&W loudspeakers have appointed distributors and a list is printed opposite. Should any service problems occur, these distributors will always be pleased to direct you to your nearest B&W Appointed Dealer. In the United Kingdom some 180 dealers have been appointed and a list may be obtained from the factory.