

B&W 800 SERIES

M A T R I X  
**803**



**B&W**  
LOUDSPEAKERS

U S E R



M A N U A L

M A T R I X  
**804**



QUALITY CONTROL	
Line Insp.	A. BOARD
Tester	G. CHOWE
Packer	<i>MS</i>
Random Insp.	

B&W LOUDSPEAKERS



It is more than ten years since the 800 Series of monitor loudspeakers was launched with the now legendary Model 801. The introduction of the Model 802, and more recently the inclusion of Matrix technology and sixth-order bass alignment, has ensured their continued lead in the professional and discerning audiophile fields. As a logical development of that success, the 800 Series has been extended to include Matrix 803 and 804, slimmer models designed for domestic environments.

Many of the lessons learned from the 800 Series have been incorporated into the 803 and 804 not least B&W's pioneering Matrix cabinet construction. Other major features include a Kevlar coned bass/midrange driver coupled with a Cobex-coned bass driver. Both incorporate 30mm (1 1/4in) high-temperature voice coils on Kapton formers and low hysteresis surrounds for optimum transient performance.

High frequencies are handled by a time-aligned metal-domed tweeter, adapted from the Matrix 801, which has been mounted on the top of the enclosure, to substantially increase the spaciousness of the sound image. This unit incorporates all the latest advances in materials technology to ensure good power handling and freedom from compression effects – essential for the faithful reproduction of the transient information present in modern digital recordings. Of course, high quality units in themselves are of no advantage if the crossover is not of similar quality. To this end, all the capacitors in the direct high frequency path are of the superior polypropylene type, and only heavy duty inductors are used for the low-frequency filter. As a final refinement, the high- and low-frequency sections of the crossover are physically separated to minimise component interactions.

The increase in detail resolution, which comes from the systematic removal of masking influences, enables greater appreciation of subjective improvements through the use of bi-wiring or bi-amplification. Accordingly, Matrix 803 and 804 are permanently bi-wired, although external links are supplied for use where a single speaker cable is unavoidable.

The aim of this manual is to increase your knowledge of the speakers and, in doing so, give you greater enjoyment from their use. But within the manual's limited scope it is possible to give only the briefest insight into the technology embodied in Matrix 803 and 804. However, B&W's research and development establishment, the source of this technology, is covered in detail in other B&W literature. Please ask your dealer.

B&W loudspeakers are distributed to more than 50 countries worldwide and we maintain an international network of carefully chosen distributors who aim to give you, the customer, the widest possible service. If at any time you should have any problem which your dealer cannot resolve, our distributors will be more than willing to assist you.

## UNPACKING, INSTALLATION, ELECTRICAL CONNECTIONS

### Unpacking

We suggest that, after unpacking your loudspeakers, you should retain the packing in case it is necessary to transport them at a later date.

#### Each carton contains:

- (a) One Matrix 803/804 loudspeaker and one grille.
- (b) One pair of terminal link wires.

#### And in one carton only:

- (c) One copy of this user manual.
- (d) Two calibration certificates.
- (e) Eight floor spikes.
- (f) One high-pass bass alignment filter.

### Installation

Your Matrix 803/804 loudspeaker system is designed to be floor standing, and as such does not require stands. However, floor spikes are supplied and should be screwed into the threaded holes in the base of the loudspeaker. Locknuts on the spikes allow for adjustment on uneven floors.

### Electrical connection

Your speakers are fitted with two pairs of input terminals, allowing the system to be bi-wired (separate cables from a common power amplifier to each pair of terminals) or bi-amplified (each speaker fed from a separate amplifier). (Figs. 1 and 2). The positive (red +) and negative (black -) terminals should be connected to the respective (+) and (-) amplifier outputs using a good quality cable of at least 1.5mm conductor area.

## AMPLIFIER, CONTROL UNIT AND SOURCE

### The power amplifier

The recommended limits of power output for the driving amplifier are given in the specification. However, in giving these limits it should also be stated that amplifier power output requirement is an almost impossible figure for the loudspeaker manufacturer to specify. It will depend entirely upon the type of music reproduced, size of listening room and sound level required. It is always better to have an amplifier with high power output, as this allows the proper reproduction of transients; whereas if the amplifier output is too low, clipping can occur during high peak level transients. Apart from causing audible distortion, clipping results in a relative increase in the power fed to the high-frequency unit, with the possibility of thermal damage.

### The control unit

The control unit – although it deals with small voltages rather than large currents as in the case of the power amplifier – is an equally critical part of your listening chain.

## LOUDSPEAKER ACCESSORIES

Here we comment briefly on three accessories associated with loudspeakers.

### Spikes

Sound reproduction can be assisted in two quite different ways by using the spikes supplied. 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.

If the spikes are to be used they should be firmly screwed into the base of the cabinet. Then, with assistance, the loudspeaker should be lowered into position so that all four spikes make contact simultaneously.

**NOTE:** Allowing the loudspeaker to rest on one or two spikes at an angle will damage the threaded inserts.

### Cables

The subject of cables between the power amplifier and loudspeakers is dealt with under 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.

## AL CONNECTION AND AFTERCARE

For bi-amplification the amplifier gains on each system must be very closely matched in order to maintain the correct system balance.

Fig.1 803

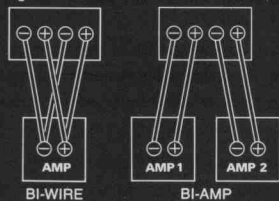


Fig.2 804

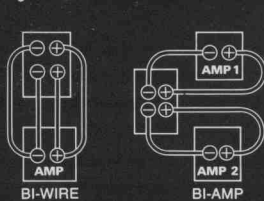
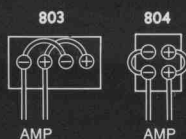


Fig.3 Single speaker lead



Bi-wiring is strongly recommended as a minimum requirement. However, if a single speaker lead only is possible, the two positive (+) and negative (-) input terminals must be joined using the links supplied (Fig.3).

### Aftercare

The cabinet should be treated as any normal piece of furniture. If you use an aerosol cleaner, spray onto a cloth and keep it away from the front of the loudspeaker, especially the grille cloth and drive units. For the paint finish use a soft damp cloth. If you need to clean the grille, first remove the frame by grasping the outer edges near the corners and gently pull away from the cabinet. The material may then be brushed with a normal clothes brush or similar. Please avoid touching the drive units, as damage could result.

## THE LISTENING ROOM AND POSITIONING YOUR LOUSPEAKERS

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 choosing a new home) the following may be helpful guidelines:

- Any room with different dimensions for ceiling height, length and width will sound more even in response than rooms where all the dimensions are similar.
- 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 slightly flexible.
- 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 change its acoustic properties quite 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, and their placement may be worth experimenting with.

### Placement of your loudspeakers

It was once said that correct placement of a cheap pair of loudspeakers could produce better sound than incorrect placement of a much more expensive product. Whilst this is somewhat of an exaggeration, it is still true that changing the position of your loudspeakers will have a greater influence on the sound than any other variable under your control.

The spacing between your loudspeakers will depend on the size of your listening room and the distance of your seating from the loudspeakers. As a general rule they should not be closer than 1.5m (5ft) and the space between them should not exceed the distance of your seating for listening. Placement of the two loudspeakers and the listener on the points of an equilateral triangle is not a bad rule to follow.

The position of the loudspeakers in relation to the walls of the listening room can have a noticeable effect on reproduction – especially at low frequencies. Generally, bass will increase relative to the middle and high frequencies as the loudspeakers are moved nearer the walls.

Placement hard against a wall, or worse still in the corner, may give rise to too much bass, with a boomy quality. In general, spacing from the walls of between 0.5m (2½ft) and 1.5m (5ft) is recommended, but it is well worth experimenting until you have the most acceptable sound. It is usually worth endeavouring to make the spacing between the two nearest walls uneven. As an example, the ratio of 0.5m (2½ft) to 1.5m (5ft) for the two walls can give excellent results.

We have been discussing the proximity of loudspeakers to the wall in the context of lower frequencies; but it is also worth mentioning that stereo information in a front-back plane will also improve if the rear wall is at least 0.5m (2½ft) from the back of the loudspeaker.

The choice as to which of the four walls to place your loudspeakers near will largely depend on your arrangement of furniture. But again, the option of the longer, as opposed to the shorter wall is well worth trying.

A final word about symmetry. For best balance of stereo information the boundary conditions relative to each of the two loudspeakers should be as acoustically similar as is possible.

## ICE EQUIPMENT

Choose with care, in the knowledge that the ultimate test for audio components is critical listening.

At B&W's research department there are many different combinations of control units, amplifiers and source components such as analogue/CD players, tuners, etc. It is our experience that each unit (to say nothing of the interconnecting cable) is a variable, and the final listening chain is a combination of variables which should be carefully listened to before making a final choice.

### CD player, analogue turntable and tuner

The comments in the previous paragraph apply equally to these items of equipment. CD players have now been on the market for some years and considerable advances have been made. In its present state of development the CD player, when coupled with the best recordings made on this medium, can provide the most exceptional source material, totally worthy of the finest equipment with which it is associated.

### High-pass bass alignment filter

This external filter gives the possibility of extending the response down to 26Hz (803) and 29Hz (804) (-3dB point) with a sixth-order Butterworth alignment, and also filtering out sub-sonic frequencies which may give rise to excessive cone excursion and intermodulation distortion.

The unit may be either connected permanently between the pre-amplifier and power amplifier, or to the tape input and output sockets of the pre-amplifier, enabling it to be switched in and out by means of the tape monitor switch (Fig.4).

It should be noted that the loudspeakers may be used perfectly satisfactorily without this additional filter, giving the system a fourth-order Bessel alignment. Indeed, many recordings have little information below 35Hz, so the effect of introducing the filter can be quite subtle.

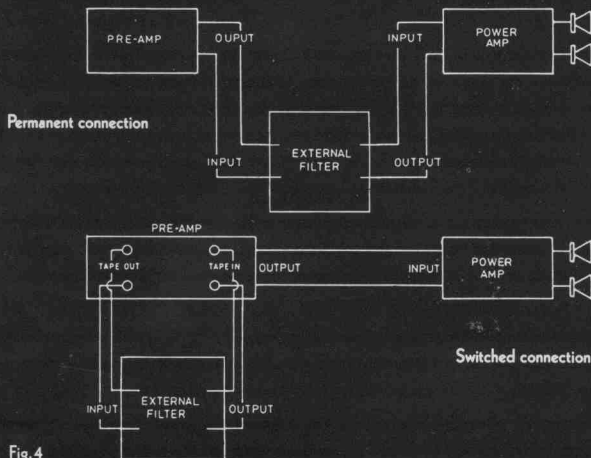
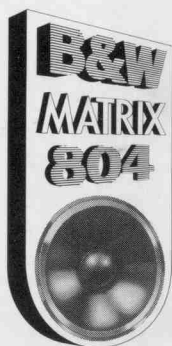


Fig.4

# S P E C I F I C A T I O N S



**MATRIX 803**



**MATRIX 804**

<b>FREQUENCY RANGE</b>	(-6dB points) 23Hz to 22kHz	(-6dB points) 26Hz to 22kHz
<b>BASS LOADING</b>	Sixth-order Butterworth alignment 26Hz cut-off	Sixth-order Butterworth alignment 29Hz cut-off
<b>FREE-FIELD RESPONSE</b>	Listening axis $\pm 2$ dB, 28Hz to 20kHz $\pm 30^\circ$ horizontal $\pm 2$ dB to 10kHz $\pm 5^\circ$ vertical $\pm 2$ dB to 20kHz	Listening axis $\pm 2$ dB, 31Hz to 20kHz $\pm 30^\circ$ horizontal $\pm 2$ dB to 10kHz $\pm 5^\circ$ vertical $\pm 2$ dB to 20kHz
<b>SENSITIVITY</b>	90dB spl (2.83V at 1m)	89dB spl (2.83V at 1m)
<b>DRIVE UNITS</b>	One 180mm (7in) bass with Cobex cone One 180mm (7in) bass/midrange with Kevlar cone - both have 30mm (1 1/4in) high-temperature voice coils on Kapton formers. One 26mm (1in) high-frequency with metal dome, high-temperature voice coil and ferrofluid cooling	One 165mm (6 1/2in) bass with Cobex cone One 165mm (6 1/2in) bass/midrange with Kevlar cone - both have 30mm (1 1/4in) high-temperature voice coils on Kapton formers. One 26mm (1in) high-frequency with metal dome, high-temperature voice coil and ferrofluid cooling
<b>DISTORTION</b>	For 95dB spl at 1m Second harmonic: < 2.0% (20Hz to 100Hz) < 0.5% (100Hz to 20kHz) Third harmonic: < 2.0% (20Hz to 100Hz) < 0.5% (100Hz to 20kHz)	For 95dB spl at 1m Second harmonic: < 2.0% (20Hz to 100Hz) < 0.5% (100Hz to 20kHz) Third harmonic: < 2.0% (20Hz to 100Hz) < 0.5% (100Hz to 20kHz)
<b>IMPEDANCE</b>	Nominal 8 $\Omega$ (not falling below 4 $\Omega$ )	Nominal 8 $\Omega$ (not falling below 4 $\Omega$ )
<b>POWER HANDLING</b>	Suitable for amplifiers with 50 to 200W output into 4 $\Omega$	Suitable for amplifiers with 50 to 200W output into 4 $\Omega$
<b>DIMENSIONS</b>	Height: 1017mm (40in) Width: 285mm (11 1/4in) Depth: 334mm (13 1/8in)	Height: 920mm (36 1/4in) Width: 258mm (10 1/8in) Depth: 258mm (10 1/8in)
<b>WEIGHT</b>	26.3kg (58lb)	19.4kg (42 1/2lb)

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## LISTENING SUGGESTIONS

Your B&W 800 Series system will take you a giant step nearer to listening to the music rather than to the loudspeakers. You will hear much more of the desirable ambience and detail in good recordings; unfortunately the faults in poor recordings will also be revealed. B&W have produced four special compact disc recordings that will enable you to enjoy a full appreciation of your new system. They are available from your dealer.



**BW001**  
The Academy of Ancient Music:  
Christopher Hogwood.



**BW002**  
Live at the Montreux Jazz Festival.



**BW003**  
The EMI Abbey Road Classical Collection.



**BW004**  
Live at the B&W Montreux Music Festival 1989 Vol.1.

# B&W

LOUDSPEAKERS

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