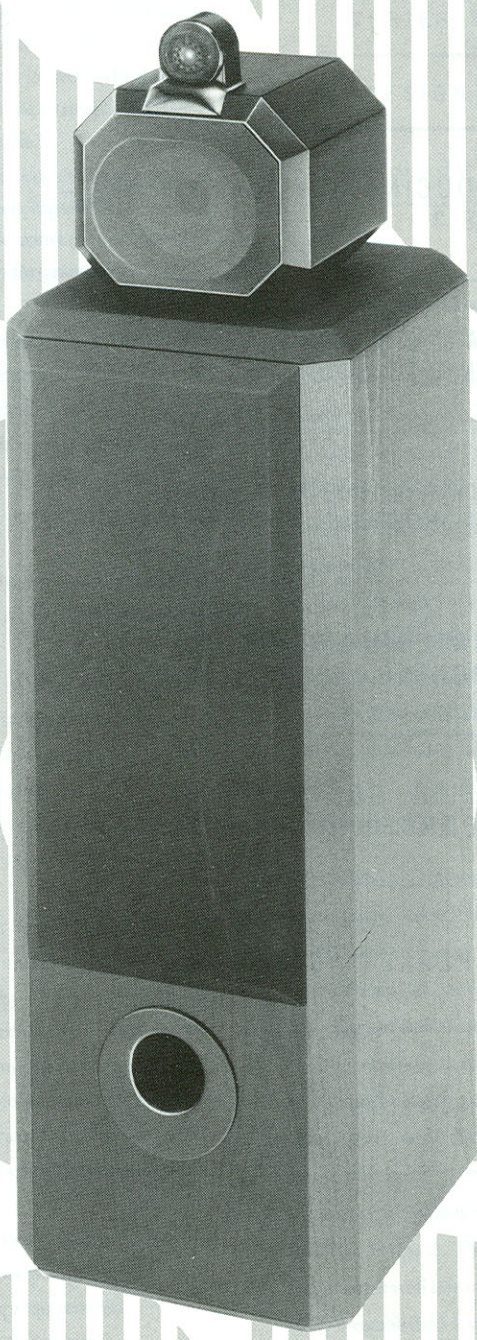
B&W LOUDSPEAKERS



user manual

MATRIX 802 SERIES 3

contents

1

INTRODUCING

B&W MATRIX 802

SERIES 3

Striving for continually higher standards in sound reproduction is a hallmark of B&W Loudspeakers.

It would have been forgiveable, if somewhat out of character for us to rest on our laurels and say that to improve on the Matrix 802 Series 2 was impossible.

However, our dedicated team of sound scientists believe in delivering the best of their capabilities — even if this exceeds the specifications associated with more conventional monitors.

Exceptional performance has become the taken-for-granted dividend of being a B&W owner.

As before, the 802 Series 3 incorporates all the high standards of design technology, fine engineering and production methods found in the professional Matrix 801 Series 3. The more compact dimensions of the 802 enable it to find a permanent home in your domestic environment. The new Series 3 refinements, also found in the 802's professional counterpart, ensure that this superb system remains at the leading edge of audio technology.

It can claim a crossover design completely revised in line with current thinking to reduce the component count. The bass and mid/HF boards have been isolated to combat crosstalk.

There is still more to savour. The bass inductors now use a new iron dust core that produces lower distortion than larger laminated types and far lower DC resistance than air-cored equivalents. Delivering in the process new standards of bass control and dynamic performance.

To maintain the highest integrity signal path the rotating head assembly is now permanently connected to eliminate contact resistance in the connector.

The significant advance represented by high power magnetic fluid cooling of the tweeter has made APOC protection unnecessary — and these circuits have been removed to avoid the possibility of sonic degredation. Extensive tests have indicated that the standard fourth order Bessel alignment at bass frequencies complements most listening rooms extremely well.

If the acoustic landscape of your room is unable to satisfactorily absorb low frequencies and produce an acceptable balance, then the use of the B&W Bass Alignment Filter accessory will extend the bass response down to 17.5Hz without increasing distortion.

The result of this painstaking process of continual improvement is a loudspeaker that has to meet our stringent requirements first.

Only then do we allow it to serve your listening requirements.

Please enjoy the singular experience of owning this system.

The purpose of this manual is to enhance your enjoyment of the Matrix 802 Series 3 loudspeakers you have chosen. A system of this high class is still dependent on the signals fed into it and is also influenced by the immediate environment in which it operates. 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 fifty 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 Matrix 802 Series 3 loudspeakers. Please be assured of our continuing interest in your long-term listening pleasure.

2

B&W MATRIX 802

SERIES 3

DESIGN

BACKGROUND

the enclosure

Following the original development and success of the Matrix Series, B&W engineers have gone further in incorporating the following advantages into Matrix 802 Series 3:

(a) Reduction of the colourations so frequently associated with box-type loudspeakers. (Any radiation from the enclosure will add its own character to the relatively neutral and uncoloured sound of the drive units.)

(b) Reduction of the decay time of enclosure vibrations, with a resultant improvement in transient response — so important for the correct reproduction of modern compact discs.

(c) Improved detail and depth in the stereo image due to the reduced amount of rear and sideways radiation, which, when reflected back to the listener confuses the image. The sounds appear to be in the space around and between the speakers and not emanating from them.

The bass alignment for Matrix 802 Series 3 is a sixth-order Butterworth, using a vented cabinet construction and an optional external electronic filter to give bass extension to 25Hz (3dB frequency). The system has been designed to be used without this filter, to give a fourth-order Bessel response 9dB down at 25Hz — suitable for most listening environments.

the drive units

The reduction of enclosure radiation to extremely low levels has the unfortunate effect of exposing hitherto inaudible defects in driver performance. As a result it was necessary to carry out extensive development of drivers, refining their performance in order to take advantage of B&W's pioneering Matrix technology.

The resulting bass driver has a cone of specially formulated plastic compound, heavily damped to remove unwanted colourations, and fitted with a massive 13,000 Gauss magnet, to give the required sensitivity and bass control.

The high frequency transducer is the proven metal dome design used in 801/802 Series 2. This unit exhibits perfect piston-like behaviour to frequencies well beyond audibility. It is the result of advanced research using B&W's established laser techniques and the new science of finite element analysis, which can predict the performance of drivers — thus enabling the engineer to assess many more options than if each had first to be built and tested. The tweeter now also has the sonic benefit of being magnetic fluid cooled.

filter networks

As the drivers required refinement due to improvements in enclosure design, so care was also needed to ensure that the crossover filtering maintains the overall system performance. The quality and tolerance of components must be controlled to fine limits if high standards of distortion and linearity are to be met.

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.

Each Matrix 802 Series 3 loudspeaker carton contains:

(a) One Matrix 802 Series 3 loudspeaker system.
— and in one carton only:
(b) One instruction manual.
(c) One cleaning brush.
(d) Two calibration certificates — one for each loudspeaker.
(e) One accessory bag containing eight spikes (fitting covered under Section 6).

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

(a) Having opened the top of the carton and read these instructions, the other end of the carton should be opened, the box returned to its original position (lettering right way up) and the outer cardboard case removed to reveal the inner polystyrene pack.
(b) Remove the top section of the pack to reveal the head assembly and the accessory pack.
(c) Repeat the above procedure for the other loudspeaker.

installation

The Matrix 802 Series 3 is provided with two sets of input terminals. This enables the low frequency unit and the midrange and high frequency unit to be wired with separate cables, thus removing the possibility of intermodulation of low and high frequencies in the cables.

The two pairs of screw terminals on the back of the cabinet are marked red for positive and black for negative. These should be connected to your amplifier + and – outputs respectively, using high quality cable (see Fig.1).

Since the currents involved when playing loud music can be large, and high cable resistance can alter the response of the loudspeaker, 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.

If you decide not to use the Bi-wiring option it will be necessary to link the two red terminals together and also the two black terminals using short wire links on the back of the speaker (see Fig.2).

The Matrix 802 Series 3 system is floor standing and as such places the drivers at the correct height in relation to most seating arrangements.

aftercare

The Matrix 802 Series 3 head assembly is finished in a semi-gloss paint. 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 bass 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 by first removing them and brushing with the brush provided.

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

FIG. 1

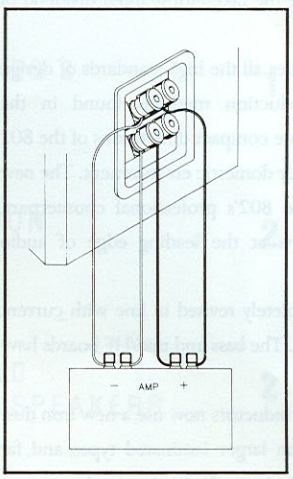
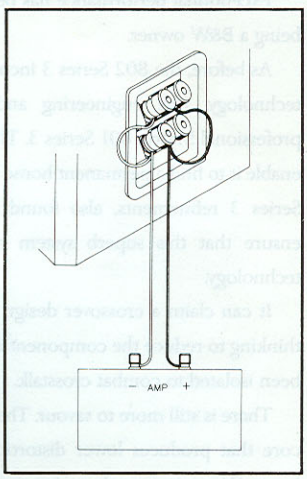


FIG. 2



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 the 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 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 the available environment will have a greater effect than any other variable under your control.

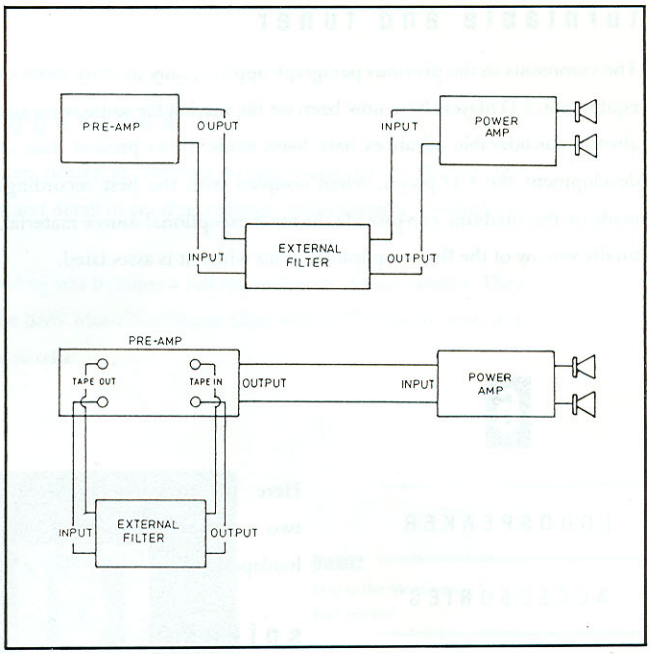
external high-pass bass alignment filter (optional)

This external filter gives the possibility of extending the response down to 25Hz (–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 (see Fig.3).

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. 3



5

AMPLIFIER, CONTROL UNIT AND SOURCE EQUIPMENT

The recommended limits of RMS power output for the driving amplifier are 50W min. 600W max. (into 8Ω).

It should be stated that it is impossible to quote amplifier power output 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.

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. 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 already 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.

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LOUDSPEAKER ACCESSORIES

Here we comment briefly on two 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 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.

7

SPECIFICATION

frequency range*	22Hz to 25kHz (−6dB points)
frequency response*	27Hz to 20kHz ± 2dB (free-field)
bass loading*	Sixth-order Butterworth alignment, 25Hz cut-off
dispersion	20Hz to 15kHz Vertical: ± 1dB over 10° arc Horizontal: +0 − 3dB over 60° arc
sensitivity	90dB (2.83V, 1m)
distortion	For 95dB at 1m Second harmonic: < 1.0% (20Hz to 20kHz) Third harmonic: < 1.0% (20Hz to 20kHz)
impedance	Nominal 4Ω
power handling	Suitable for amplifiers of 50W to 600W
crossover network	Fourth-order Butterworth acoustic response crossover frequencies 400Hz and 3kHz
drive units	Two 180mm high-power polymer cone bass, one 126mm Kevlar cone midrange, one 26mm metal dome high frequency
dimensions	Height: 1040mm (41in) Width: 300mm (11¾in) Depth: 370mm (14½in)
weight	32kg (70lb)

** These response and loading characteristics apply with the use of the high-pass bass alignment filter. Without this the bass loading is fourth-order and the frequency response −9dB at 25Hz. The latter response may well be suitable for average domestic requirements.*

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

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