

B&W
LOUDSPEAKERS
B&W



MATRIX 803 Series 2

MATRIX 804

MATRIX 805

USER MANUAL

INTRODUCTION

In 1979 with the launch of the first Matrix 801, B&W Loudspeakers established itself as the leading manufacturer of professional audio monitors in the UK and, arguably, the world. The decision to extend the pioneering technology found in the flagship model 801 to the other models in the 800 series was an important step in the move to introduce recording studio hi-fi performance into the living room.

The growth in popularity of the Matrix 800 range has been made possible only by a continuous reappraisal of both the aesthetics and the acoustics of every model in the series. Advances made at the top of the range filter through to the domestic models, as in the case of the revolutionary B&W invention – the Matrix cabinet construction – which helped drastically reduce internal sound resonance for a new generation of loudspeakers. The time-aligned metal-domed tweeter, a trademark of the 800 Series, was adapted from the Matrix 801 and is a major contributor towards the spacious sound image found in all models.

The acclaimed Kevlar cone bass/midrange driver also features in all 800 Series monitors and incorporates a 30mm high-temperature voice coil on a Kapton former and low hysteresis surround to deliver optimum transient performance.

The latest developments in materials technology are used to ensure good power handling and freedom from compression effects. Together with parallel improvements in crossover componentry, such as custom made capacitors, this ensures that the transient detail found in modern digital recordings are faithfully reproduced.

Whilst most of the technical enhancements tend to filter downwards, occasionally the reverse occurs. The new Matrix 803 Series 2 can boast of being the first loudspeaker to feature B&W's next generation Matrix² cabinet construction. A new closer spaced matrix is employed in the critical mid-range section, sitting at right-angles to the LF section standard matrix, producing a two-way honeycomb aligned with the driver axis to secure a generous reduction in internal standing waves and enclosure wall resonance. The use of three 160mm (6in) drivers instead of two 180mm (7in) units has increased the radiating area and boosted powerhandling, whilst the slimmer 803 Series 2 cabinet now delivers a LF extension of 23Hz as well as an enhanced midrange dispersion.

The achievement is to carry the majority of these innovations through the range from the powerful 803 Series 2 to the shelf-standing Matrix 805. In consequence, the compact Matrix 805 is just as likely to be seen in the confined space of a recording studio as any of the other models. Bi-wiring and bi-amplification is possible on all 3 models to capture the high detail resolution possible with modern recordings. However, 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 Series 2 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 connection and aftercare

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:

- One Matrix 803/804 loudspeaker and one grille. Two 805 loudspeakers and two grilles in a single carton.
- One copy of this user manual.
- Two calibration certificates.
- Eight floor spikes, the fitting of which is covered under the Accessories section. (Eight rubber feet in the case of the Matrix 805.)

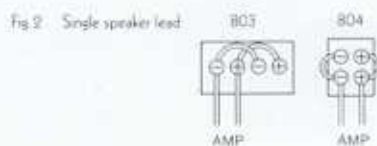
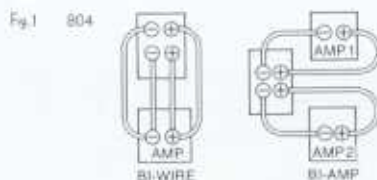
Installation (Matrix 803/804)

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.

Installation (Matrix 805)

Your Matrix 805 loudspeaker system is designed to be shelf or stand mounted.

For shelf monitoring, each system can be fitted with the self-adhesive rubber feet. Attach by removing the peel-off backing and applying to the underside corners of the cabinet approximately 1cm (3/8in) from each edge. Should you wish to stand the speakers on an uneven surface it is suggested that only three feet are fitted with two at the front corners and one centred at the rear.



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.

For bi-amplification the amplifier gains on each system must be very closely matched in order to maintain the correct system balance. 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. 2).

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.

Amplifier, control unit and source equipment

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.

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.

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.

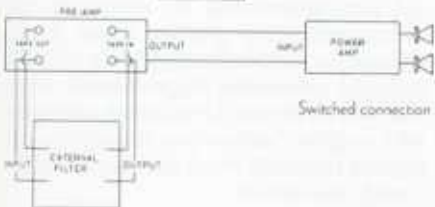
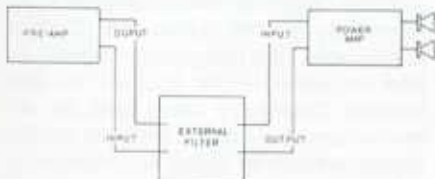
NOTE: Allowing the loudspeaker to rest on one or two spikes at an angle will damage the threaded inserts.

Cables

The subject of cables between the power amplifier and loudspeakers is dealt with under Installation. There remains the question of

Fig. 1

Permanent connection



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.

Optional high-pass bass alignment filter

The low frequency response of the 800 Series closely resembles that of the so-called fourth order Bessel alignment, which has the special property of being critically damped, i.e. having no overhang or ringing. It also complements the natural bass boost which most rooms introduce, to give an overall balanced result.

For larger than average rooms, or those in which the structure tends to absorb low frequencies, B&W have produced a bass alignment filter which converts the system to a sixth order, maximally flat alignment, and enables the correct balance to be maintained.

The accompanying diagrams (fig 3) illustrate how the filter may be connected either between pre and power amps, or in a tape loop where it can be switched in or out according to requirements.

The Listening room and positioning your speakers

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.

SPECIFICATIONS

MATRIX 803 Series 2

MATRIX 804

MATRIX 805

FREQUENCY RANGE	(-6dB points) 28Hz to 22kHz* (-6dB points) 28Hz to 22kHz**	(-6dB points) 26Hz to 22kHz* (-6dB points) 31Hz to 22kHz**	(-6dB points) 31Hz to 22kHz* (-6dB points) 42Hz to 22kHz**
BASS LOADING	Sixth order Butterworth with 25Hz cut-off with optional alignment filter* Overdamped fourth order -6dB at 28Hz without filter**	Sixth order Butterworth with 28Hz cut-off with optional alignment filter* Overdamped fourth order -6dB at 31Hz without filter**	Sixth order Butterworth with 35Hz cut-off with optional alignment filter* Overdamped fourth order -6dB at 42Hz without filter**
FREE-FIELD RESPONSE	Listening axis ± 2 dB: 26Hz to 20kHz*, 42Hz to 20kHz** $\pm 30^\circ$ horizontal ± 2 dB to 10kHz $\pm 5^\circ$ vertical ± 2 dB to 20kHz	Listening axis ± 2 dB: 29Hz to 20kHz*, 45Hz to 20kHz** $\pm 30^\circ$ horizontal ± 2 dB to 10kHz $\pm 5^\circ$ vertical ± 2 dB to 20kHz	Listening axis ± 2 dB: 36Hz to 20kHz*, 60Hz to 20kHz** $\pm 30^\circ$ horizontal ± 2 dB to 10kHz $\pm 5^\circ$ vertical ± 2 dB to 20kHz
SENSITIVITY	90dB spl (2.83V at 1m)	89dB spl (2.83V at 1m)	87dB spl (2.83V at 1m)
DRIVE UNITS	Two 165mm (6 1/2in) Cobex cone bass One 165mm (6 1/2in) Kevlar cone bass/mid All with 30mm high temperature coils. One 26mm (1in) HF metal dome with magnetic fluid 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	One 165mm (6 1/2in) bass/midrange with Kevlar cone. One 26mm (1in) high-frequency with metal-dome, high-temperature voice coil and ferrofluid cooling.
DISTORTION	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)	For 90dB at 1m Second harmonic: < 2.0% (20Hz to 150Hz) < 1.0% (150Hz to 20kHz) Third harmonic: < 1.5% (20Hz to 150Hz) < 1.0% (150Hz to 20kHz)
IMPEDANCE	Nominal 8 Ω (not below 3.7 Ω)	Nominal 8 Ω (not falling below 4 Ω)	Nominal 8 Ω (not falling below 4 Ω)
POWER HANDLING	Suitable for amplifiers with 50 to 250W output into 4 Ω	Suitable for amplifiers with 50 to 200W output into 4 Ω	Suitable for amplifiers with 50 to 120W output into 4 Ω
DIMENSIONS	Height: 1017mm (40in) Width: 258mm (10 1/4in) Depth: 334mm (13 1/4in)	Height: 920mm (36 1/4in) Width: 258mm (10 1/4in) Depth: 258mm (10 1/4in)	805H Height: 333mm (13 1/4in) Width: 334mm (13 1/4in) Depth: 210mm (8 3/4in) 805V 407mm (16in) 260mm (10 1/4in) 210mm (8 3/4in)
WEIGHT	27kg (59 1/2lb)	19.4kg (42 7/8lb)	8.5kg (18.7lb)

*With Bass Alignment filter
**Without Bass Alignment filter

B&W Loudspeakers Ltd reserve the right to amend details of their specifications in line with technical developments.
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Listening and record 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 special compact disc recordings that will enable you to enjoy a full appreciation of your new system. They are available from your dealer.

Luister - en muzieksuggesties

Uw B&W 800 Series luidspreker zijn een gigantische stap voorwaarts op het gebied van luisteren naar muziek in plaats van naar luidsprekers. U hoort veel meer gewenste diepte en details bij goede opnames. Fouten van slechte opnames worden echter ook duidelijk hoorbaar.

Audiciones sugeridos

Su sistema de la Serie 800 de B&W le hará dar un gran paso hacia la audición de la música, y no de los altavoces. Usted podrá oír mucho mejor el ambiente deseable y los detalles de las buenas grabaciones; desafortunadamente, los fallos de las grabaciones pobres también serán notables.

B&W ha producido estas grabaciones especiales en compact disc, que le permitirán disfrutar con total apreciación de su nuevo sistema.

Schallplattenempfehlungen

Ihre B&W Matrix-Lautsprecher aus der Serie 800 bringen Sie wieder ein großes Stück weiter auf dem Weg zur perfekten Reproduktion von Musik. Sie werden bei wirklich guten Aufnahmen z.B. hinsichtlich der räumlichen Darstellung wie auch der instrumentalen Staffeln sehr viel mehr Details wahrnehmen als bisher, bei schlechten Aufnahmen allerdings auch die Aufnahmefehler deutlich heraushören.

B&W hat deshalb vier spezielle CDs produziert, die Musikbeispiele enthält, die sowohl klanglich und aufnahmetechnisch wie auch in der Interpretation als hervorragend gelten. Diese CDs sind bei Ihrem B&W-Händler erhältlich.

Suggestions musicales

Vos enceintes de la Série 800 vous emmeneront plus près de la Musique. D'excellents enregistrements de "live" vous donneront tous les détails que malheureusement de pauvres disques ne pourront vous révéler. B&W a produit ces disques pour vous procurer un maximum de plaisir avec votre nouveau système. Demandez les à votre revendeur.

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