B&W LOUDSPEAKERS

Signature seven

User Manual

Introduction

The Signature 7 is a true audiophile speaker for installation in cavity walls and ceilings or custom wall furniture, which offers the highest sound quality and incorporates several features designed to make the system simple and flexible to install. The speaker incorporates many of the features found in the B&W 800 Series speakers and may successfully be used in conjunction with these cabinet systems, for example, in Home Theatre installations.

Please take time to read through this manual fully before installing the speakers. Time spent carefully planning the installation will pay dividends later and maximise your listening pleasure.

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

Unpacking

Check that, in addition to this user manual, the outer carton contains the following:

Carton A containing:

- 2x *Baffle with drive units, crossover and foam pad*
- 2x *Wall frame*
- 2x *Perforated metal grille with scrim backing*
- 1x *Alignment template*
- 1x *Accessory pack containing:*
- 20x *spring clips + self-tapping screws + washers*
- 8x *machine screws (fixing baffles to wall frames)*

Carton B containing:

- 2x *Pre-Mount box*
- 4x *Slotted steel straps*
- 1x *Alignment template*
- 1x *Accessory pack containing:*
- 8x *L-shaped pegs (securing pre-mount boxes to drywall - retrofit)*

Protection

Keep the baffles in their plastic bags (and preferably in the carton) away from the work area until you are ready to fit them. The thin alloy tweeter diaphragms are delicate and must be protected from damage. Do not attempt to straighten a dented diaphragm; even if it looks good the coating will be impaired, leading to distortion and eventual fatigue.

Positioning

In all cases, check that there is no conflict with other in-wall installations (pipework, air conditioning, power cabling etc.). In existing construction, use a stud-finding tool to map the wall construction accurately and a pipe detector to scan the proposed installation position. Avoid installing the speakers in the same cavity of the wall as flimsy ducting, which may be induced to rattle. The speakers are designed to operate satisfactorily in a wide range of cavity volumes, but volumes less than 30 liters (1cu ft) may give rise to a boomy bass. Before cutting into any of the wall panels, make sure that all the proposed sites are usable. If you need to alter one site then it is possible that you will need to move its pair.

The speakers are balanced for half-space mounting (ie flush in a wall or soffit). Placement near a wall / ceiling, wall / floor junction or in a corner is to be avoided as it may give rise to too much bass and a boomy quality to the sound. If possible keep the speakers more than 0.5m (20in) from the wall edges.

The speakers may be mounted in either portrait or landscape orientation. Wherever possible, however, portrait orientation, with the drive units mounted one above the other, is to be preferred as it gives better horizontal dispersion and a more stable stereo image. If landscape orientation is used, orient the baffle so that the tweeters are towards the center of the room. Do not mix portrait and landscape orientation at left and right as an imprecise stereo image will be created.

The following sections give guidance on optimum positioning, but this may be modified in line with domestic constraints.

Normal Stereo and Home Theatre Front Left and Right Applications

The speakers should be positioned with the tweeters at around ear height. If this is not possible, orient the baffle tweeter uppermost for below ear positioning and bass unit uppermost for above ear positioning. The spacing between them will depend on the size of the room and the distance to the listeners.

As a general rule they should not be closer to the listeners than 1.5m (5ft) and the distance between them should not exceed their distance from the listeners. Having the speakers and listeners approximately at the corners of an equilateral triangle is not a bad rule to follow. This arrangement generally provides the best stereo imaging. If the speakers are placed too far apart, a hole-in-the-middle effect may become apparent. Too close and the panoramic effect will be lost, accompanied by a reduction in depth information.

For Home Theatre installations, the speakers should not be closer together than the width of the screen and their height should be approximately at center screen height.

Home Theatre Center Channel Applications

Theoretically, the best position for a center channel speaker is behind the center of the screen, but this can only be realised when using an acoustically transparent projection screen. In most cases the speaker will be positioned in a laterally central position either directly above or directly below the screen. All other things being equal, choose the position that is nearest ear height. However, if this leads to a below screen position, you should be careful to ensure that the speaker is not too close to the floor (see above) and that the sound will not be muffled by the later placement of furniture. See also the comments on baffle orientation in the preceding section.

Home Theatre Surround Speaker Applications

The sound from surround speakers should be as diffuse as possible. This ensures that the frontal audio image is not distorted by changes of listener position or head movements. The speakers should generally be placed behind and 0.6m (2ft) or more above ear height. Ceiling mounting often gives good results in this application. The orientation is less important in this application than in other cases.

Cutting the Aperture (Retrofit only)

Use the template provided to mark out the correct size aperture, having regard to which fixing method is to be used and how the wall frame is to be lined up with any other features such as door frames, and cut out the aperture neatly.

Laying the Cable

Use twin cable that is coded for polarity and of a gauge heavy enough to keep the loop impedance below the maximum recommended in the specifications. Note that some very heavy gauge cables introduce inductance that may cause noticeable attenuation at high frequencies over a long run. With new construction, laying the cable is a fairly straightforward process. For existing construction you will need to run cable pathways through enclosed walls. It may be possible to gain access through ceiling cavities. Use a stiff but reasonably flexible wire to force a path and use it to drag the cable into place. It is common practice when laying power cable to leave plenty of excess. For speakers, because of the impedance effects mentioned above, excess cable should be kept to a minimum and should not be coiled up for neatness as this increases the inductance. To avoid rattles, tie down loose cable near the speaker with clips, mastic or tape. To reduce the risk of damage by short circuit, do not connect the cable to the amplifier until after connection has been made to the speaker.

Damping the Wall Cavity

The baffle is supplied with a foam damping pad behind the drive units. However, the long narrow shape of the wall cavity is particularly susceptible to resonances and further damping is required. The whole of the cavity should be filled (not tightly) with wadding. Fiberglas or mineral wool matting supplied for heat insulation or polyester fiber wadding are all suitable. For safety, you should ensure that the material, if basically combustible, is at least fire retarding. Closed cell foam or expanded polystyrene pieces are not usable as they simply reduce the effective volume of the cavity. Check that there is no debris that may fall into the speaker (especially in ceiling mount situations).

Fitting the Wall Frame
New Construction (See figure 1)

Slotted steel straps are provided to secure the pre-mount box to the wall studs before the drywall panels are fixed. Screw one strap horizontally across two studs just above the intended top edge of the pre-mount box. When deciding on the correct position, have regard to how you may wish to line up the wall frame (not the pre-mount box) to other features in the room such as door frames. Feed the upper tags of the

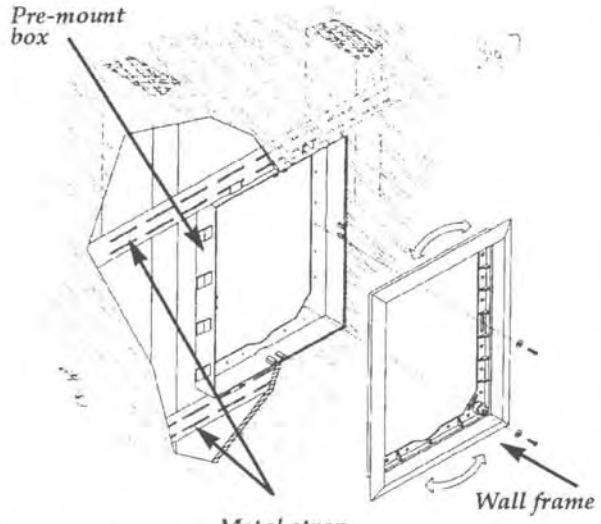

Figure 1

pre-mount box through the lower slots in the strap and allow it to hang. Position a second strap over the lower tags, swing into position over the studding and secure. It is not necessary to get the pre-mount box absolutely square as some azimuth adjustment of the wall frame is provided for.

If it is required to mount the pre-mount box hard up against one of the studs, cut away the tags from that side then drill and screw through the side of the pre-mount box into the stud. Similarly, if the pre-mount box is to be mounted hard against a horizontal bracing stud or header, remove the tabs from that end and screw into the header instead of using the steel strap. After the drywall panels have been fixed and the coating applied, fix the wall frame to the pre-mount box. Apply a strip of sealing compound or mastic to the back side of the frame lipping both to provide a seal and to prevent rattling. Screw, but do not tighten, 6 of the screws plus washers provided through the slots in the wall frame into the pilot holes in the pre-mount box. Use a spirit level to align the frame squarely and tighten down the screws. A certain amount of flexing of the wall frame is allowed to take up unevenness in the wall surface, but be careful not to over tighten the screws as excessive distortion of the frame may impede the fitting of the baffle.

Existing Construction (Retrofit)
Method 1 (see figure 2)

This method uses the pre-mount box, but requires that the aperture has been cut fairly accurately. Feed the pre-mount box through the aperture and pull it forward so that the tabs pull on the back of the wall panel. If the tabs on any one side foul a stud, cut them off and drill and screw through the pre-mount box into the stud. Push fit 4 of the barbed L-shaped metal pegs into the slots at the center of each side so that the wall panel is nipped and the pre-mount box is held in place. Apply a strip of sealing compound or mastic to the back side of the wall frame lipping, both to provide a seal and to prevent rattling. Screw, but do not tighten,

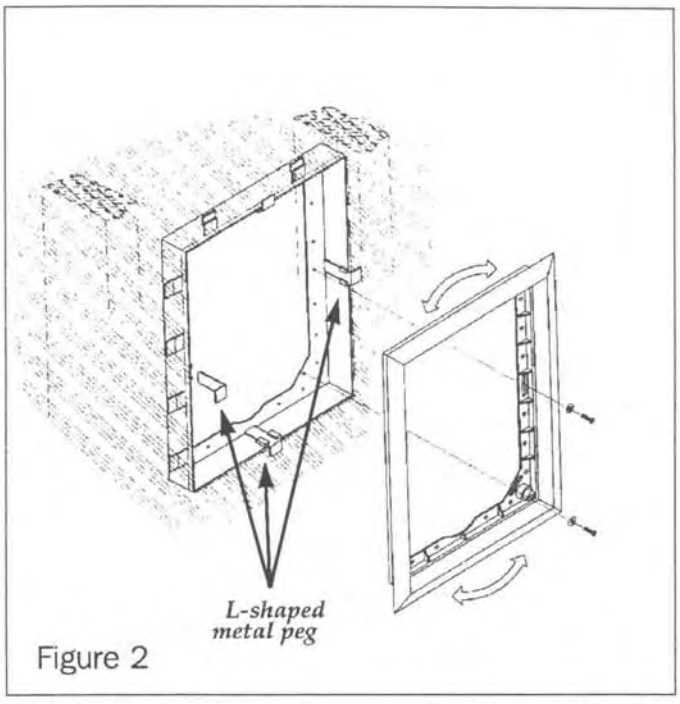

Figure 2

6 of the screws plus washers provided through the slots in the wall frame into the pilot holes in the pre-mount box. Use a spirit level to align the frame squarely and tighten down the screws. A certain amount of flexing of the wall frame is allowed to take up unevenness in the wall surface, but be careful not to over tighten the screws as excessive distortion of the frame may impede the fitting of the baffle.

Method 2 (see figure 3)

Ten spring clips are supplied for each wall frame. Screw sufficient of them via the holes in the rear surface of the wall frame to ensure that it sits properly on the wall surface. Extra clips may be concentrated around areas of particular unevenness. Apply sealing compound and level up as above before tightening down the screws.

Custom Wall Furniture

The speakers are ideal for fitting in large area custom furniture of substantial construction where an enclosed volume of approximately 30 liters (1cu ft) or more is

available. The walls of the enclosure should be constructed of high density chipboard, medium density fiberboard (MDF), plywood or solid wood at least 18mm (¾ in) thick. To reduce coloration from panel resonances, the sides of the enclosure should be cross-braced and the application of bituminous damping pads is recommended. These are often sold for damping motor vehicle panels, but for use on wood build up a

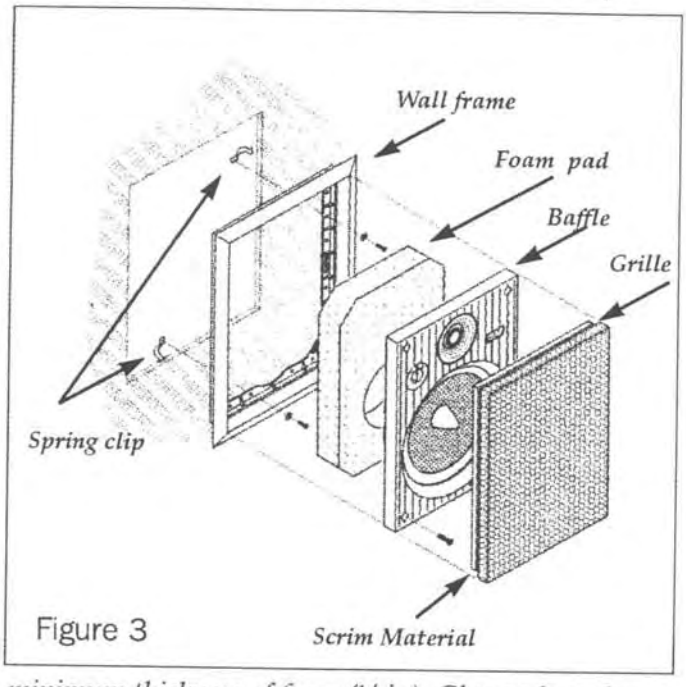

Figure 3

minimum thickness of 6mm (¼in). Glue and staple these in position. Allow the adhesive to cure fully and any fumes to disperse before installing the speakers.
The volume inside the enclosure should be damped by lining the inside surface of the walls with 50mm (2in) thick medium pore open cell foam or lightly filling the volume with any of the fibrous materials described in the section on damping wall cavities.
If the baffle board is made detachable for ease of access, it would be beneficial to increase the thickness to 25mm (1in). It should be firmly screwed to battens and the joint sealed with mastic or sealing foam. An aperture should be cut and the wall frame mounted as described in the section on retrofit wall mounting. Make sure that any cable access holes are also thoroughly sealed to prevent chuffing noises.

Decorating

Decorating should take place before the baffle is fitted. There will therefore be no necessity to mask off any areas. The wall frame and perforated grille are pre-finished in semi-matt white and will accept any water or oil based paint. For best results, the grille should be spray painted. Temporarily remove the scrim material from the rear of the grille before painting to avoid clogging the pores. The grille may be covered with a suitable acoustically transparent cloth if desired. If the cloth is sufficiently obscure visually, discard the scrim material to avoid excessive attenuation at high frequencies.
When redecorating after installation, remove the grille and baffle from the wall frame before commencing work.

Fitting the Baffle and Grille

The baffle is secured to the wall frame by 4 machine screws in the corners. A pre-fitted gasket seals the joint. The speakers are supplied with gold plated terminals that will accept most wire gauges. When connecting the speakers, be sure to observe the correct polarity. The positive (+ / red) and negative (- / black) terminals should be connected to the appropriate amplifier terminals. Failure to observe correct polarity will result in a loss of bass and vague imaging in a multi-speaker installation.
The grille is a simple friction push fit in the slot formed between the baffle and the wall frame. For installation in custom wall furniture, a separate cloth covered grille frame may already be fitted, in which case the metal grille should be discarded.

Tweeter Level Adjustment

A three position switch on the baffle adjusts the tweeter level relative to the bass / midrange unit. The center position, with the knob pointing vertically, gives a flat on-axis anechoic response. In situations where the lack of soft furnishings in the room gives too bright a sound, turn the knob anti-clockwise to reduce the tweeter output. Conversely, if the sound is too dim (for example if the normal listening position is well off-axis), turn the knob clockwise.

Specifications

Description	*2-way 2nd-order in-wall system featuring rigid glass-reinforced thermoset polymer baffle*
Drive Units	*One 180mm (7in) dia bass / midrange with rigid die-cast basket, Kevlar® diaphragm and 31mm (1 1/4in) dia high-temperature voice coil on Kapton® former* *One 26mm (1in) dia high-frequency with alloy dome, high-temperature voice coil and magnetic fluid cooling*
Frequency Range	*-6dB at 30Hz and 30kHz*
Frequency Response	*40Hz - 20kHz ±2dB on reference axis*
Dispersion	*Within ±2dB of response on reference axis* *Horizontal: over 40° arc* *Vertical: over 10° arc*
Sensitivity	*88dB spl (2.83V 1m)*
Nominal Impedance	*8Ω (min 4Ω)*
Crossover Frequency	*3kHz*
Power Handling	*Suitable for amplifiers with 10W-150W output continuous into 8Ω on undistorted speech and music program.* *Automatic system protection by APOC circuit.*
Maximum Recommended Cable Impedance	*0.3Ω*
Dimensions	*Height: 373mm (14.7in)* *Width: 285mm (11.2in)* *Depth: 103mm (4.1in) (from wall face)*
Finish	*Semi-matt white*

Kevlar and Kapton are registered trade marks of Dupont.
B&W Loudspeakers Ltd reserves the right to amend details of the specifications in line with technical developments.

B&W LOUDSPEAKERS

LISTEN AND YOU'LL SEE

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