

**User Manual: Centre Channel Speakers: C1 • C3 • C4 • C5 • C6 • C7**  
**Sub-woofers: C1 • C2 • C4 • C6 • C7**

# AV Products



MULTICHANNEL



ACOUSTIC ENGINEERS

1. Read instructions – all the safety and operating instructions should be read before the appliance is operated.
2. Retain these instructions – the safety and operating instructions should be retained for future reference.
3. Heed warnings – all warnings on the appliance and in the operating instructions should be adhered to.
4. Follow instructions – all operating and other instructions should be followed.
5. Water and moisture – the appliance should not be used near water, for example near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement or near a swimming pool etc..
6. Ventilation – the appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings. Similarly, the appliance should not be built into an installation, such as a bookcase or cabinet, that may impede the flow of air through the ventilation openings.
7. Heat – the appliance should be situated away from heat sources such as radiators, stoves or other appliances that produce heat.
8. Power sources – the appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
9. Power cord protection – power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles and the point where they exit the appliance.
10. Cleaning – the appliance should be cleaned only as recommended by the manufacturer.
11. Unattended periods – the power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
12. Object and liquid entry – care should be taken so that objects and liquids do not fall into the appliance.
13. Damage requiring service – the appliance should be serviced by qualified service personnel when:
  - i. the power supply cord or the plug has been damaged
  - ii. objects have fallen or liquid has been spilled into the appliance
  - iii. the appliance has been exposed to rain or other serious liquid exposure
  - iv. the appliance does not appear to operate normally or exhibits a marked change in performance
  - v. the appliance has been dropped or the cabinet damaged
14. Servicing – the user should not attempt to service the appliance beyond those measures described in the operating instructions. All other servicing should be referred to qualified service personnel.
15. Grounding or polarisation – precautions should be taken so that grounding or polarisation means for the appliance are not defeated.

## Introduction

Welcome. In selecting ATC you have chosen an example of the finest audio engineering available. ATC was founded on a principle of engineering excellence, and that principle still defines our products today. Given the right opportunities, ATC products will deliver exceptional audio performance, but the opportunities will only arise from careful and thoughtful installation and use. Please read the following manual fully. It will help you understand the product and to realise its full potential. We are happy to answer questions and offer advice on any issues that arise through installation or use of ATC products. Contact details can be found at the back of this manual.

ATC was founded in London in 1974 by Australian emigre Bill Woodman, who still heads the company today. An enthusiastic pianist and engineer he was naturally drawn to loudspeaker design and after a period working at Goodmans, where many of the names that went on to found British loudspeaker companies began their careers, he struck out on his own. The premise on which ATC began is a simple one, and one that in many respects is still true today: hi-fi loudspeakers tend to be detailed and accurate but of limited dynamic range, while professional monitor speakers tend to express the opposite character. ATC products were designed from the outset to offer the best of both. It's an easy concept to describe, but surprisingly difficult to engineer.

The difficulty inherent in designing such loudspeakers is one of scale. Hi-fi levels of accuracy and detail call for lightweight moving parts and delicate engineering. Professional monitor levels of performance however demand far more robust components engineered to survive the rigours of high level use for extended periods. The only way to combine the two is through precision engineering of a class and scale more often associated with aerospace or motorsport. But the results are worth the effort and the cost. ATC loudspeakers, with their unique in-house designed drivers, combine the best of hi-fi and professional to devastating effect.

ATC has become synonymous with active systems. Choosing to offer active loudspeakers (where the passive crossover network is replaced by active filters and multiple power amplifiers) is simply a result of the uncompromising attitude to loudspeaker design. While passive systems still have their place, and ATC engineering skills can still bring remarkable results from them, "active" is a fundamentally better solution to the problems posed by accurate, high level music reproduction. The ATC instinct is always for the better solution. Not cheaper, not quicker, but better.

It was the development of active loudspeakers that first brought ATC into electronics design and engineering. Active speakers demand multiple power amplifiers so ATC from the mid 1980s became not just a loudspeaker manufacturing company but an electronics manufacturer too. The further step from electronics for active speakers to a range of stand-alone amplifier products was natural and now means that ATC engineering is available from the recording desk or CD player output to the ears.

From modest beginnings ATC has grown to become one of the very few manufacturers successful across both domestic and professional audio. By selecting ATC you join a group of music lovers, professional audio engineers, studios and musicians across the World that understand and value the engineering that goes into an ATC product - and the sound that comes out.

## Contents

Page 2		Introduction
Page 3	<b>C4/C5/C6/C7 Active Centres</b>	
	Section 1.1	Centre Speaker Placement
	Section 1.2	Connection
Page 4	Section 1.3	Signal Cable Options
	Section 1.4	Operation
	Section 1.5	Listening
Page 5	Section 1.6	Care and Maintenance
	Section 1.7	Warranty and Contact Specifications
Page 6	<b>C1/C3 Passive Centres</b>	
	Section 2.1	Centre Speaker Placement
	Section 2.2	Amplification
	Section 2.3	Connection
	Section 2.4	Listening
Page 7	Section 2.5	Care and Maintenance
	Section 2.6	Warranty and Contact Specifications
Page 8	<b>C1 Active Sub-woofer</b>	
	Section 3.1	Sub-woofer Placement
	Section 3.2	Connection
Page 9	Section 3.3	Operation
	Section 3.4	Listening
Page 10	Section 3.5	Care and Maintenance
	Section 3.6	Warranty and Contact Specifications
Page 11	<b>C2, C4, C6, C7 Active Sub-woofers</b>	
	Section 4.1	Sub-woofer Placement
	Section 4.2	Connection
	Section 4.3	Signal Cable Options
Page 12	Section 4.4	Operation
	Section 4.4	Listening
Page 13	Section 4.6	Care and Maintenance
	Section 4.7	Warranty and Contact Specifications
Page 14	<b>System Installation Notes</b>	
	Section 5.1	Full Bandwidth Speaker Positioning
Page 15	Section 5.2	Bass Management in Domestic Systems
	Section 5.3	Bass Management Compromises
	Section 5.4	Bass Management Conclusions

## 1.1 Centre Speaker Placement

The positioning constraints on a centre channel loudspeaker are always influenced by the type and location and of the associated screen. However, the basic parameters that influence the subjective performance of any loudspeaker in a listening room - alignment to the listening position and proximity of room boundaries - also apply to a centre channel and should be taken into account.

ATC centre channel speakers are intended to be positioned relatively clear of room boundaries and centrally either just below or just above the screen. If the screen is either a plasma or projector type located close to the wall it may not be possible to position the centre channel speaker very far forward. In these cases, some adjustment of low frequency equalisation via the AV processor may be necessary to reduce excess bass. It is always preferable however to experiment with loudspeaker positioning before resorting to electronic equalisation.

If the screen is a CRT type and its stand is also to carry the centre channel speaker it is advisable to mount the speaker via some decoupling material so that vibration does not disturb the picture.

While every ATC centre channel speaker is effectively magnetically shielded, the extreme sensitivity of some CRT tubes to residual levels of magnetic flux may mean that, in rare cases, ATC centre channel speakers are not appropriate. Adjusting the relative front/back position of the center speaker and the CRT can reduce magnetic interference but should your screen suffer intractable picture distortion caused by the proximity of a centre speaker contact your dealer or installer for advice.

If the centre speaker is to be placed in any form of cabinet, adequate side and top clearance for cooling airflow must be provided.

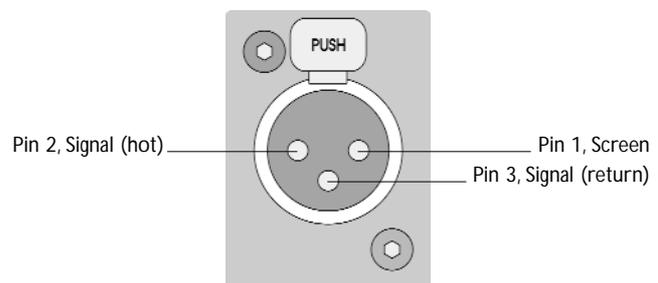
More information on loudspeaker positioning in multi-channel systems can be found later in this manual in Section 5.

## 1.2 Connection

Two cable connections are required for each monitor: one for mains power and one for the audio signal. The mains cable is specifically supplied to comply with local statutory safety approvals and alternatives should not be substituted. If you intend to use your monitors in an alternative territory please contact ATC for advice. The mains connection must always be earthed.

The signal cable and plug (not necessarily supplied) should be of a good quality and XLR terminated. Poor cable and plug quality will compromise the performance of your monitors. The signal input pin configuration is illustrated in Diagram 1.

Diagram 1 - input connection pins

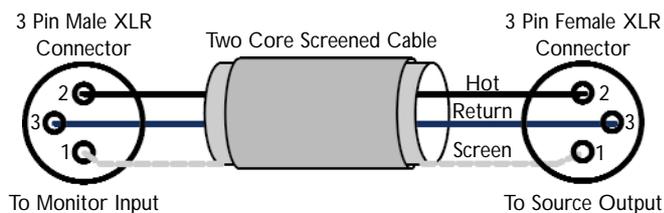


### 1.3 Signal Cable Options

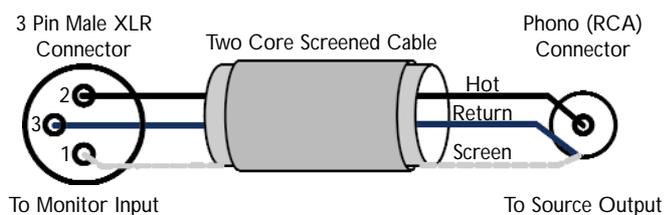
Balanced cable configuration is the preferred option, however unbalanced connection is possible. Diagrams 2 and 3 illustrate the signal cable connections required for each option. Balanced (XLR to XLR) connection offers lower noise and better immunity to “hum” pick-up. Unbalanced (XLR to Phono or Two Pole Jack) connection carries risk of hum caused by multiple signal earths.

Hum problems resulting from unbalanced connection may be reduced by making ONE of the following modifications to the signal cable connections: If the driving preamplifier (or desk) is “double insulated” (i.e. has no mains earth), disconnect the signal cable screen at the RCA Phono plug end. Alternatively, disconnect the signal cable screen at the XLR end. This second option will make the source the reference signal earth.

**Diagram 2 - balanced cable**



**Diagram 3 - unbalanced cable**



### 1.4 Operation

The C4, C5, C6 and C7 are connected to the mains and signal cables via sockets on the rear panel. The rear panel also carries the mains switch and fuse holder. Each feature is described below.

- **Mains Inlet:** The supplied mains power lead (appropriate to the local territory) should be connected here. Ensure that the mains voltage specified on the panel (above the input socket) corresponds with the local supply.
- **Power Switch:** Switches on the speaker. When switched on the indicator on the back of the monitor will illuminate (C6 & C7 only).
- **Fuseholder:** Should a speaker fail to switch on when the power switch is operated the fuse should be inspected. Lift out the fuseholder cover using a small flat-blade screwdriver, remove the fuse and inspect it for damage. If required, a spare fuse may be supplied in the body of the fuseholder cover. It should be stressed however that fuses most often fail only because of a serious electrical fault. If this is the case then simply replacing the fuse will only result in another fuse failure. The monitor should be returned to ATC for service if a second fuse fails.
- **Input Socket:** The audio signal cable should be connected here. Balanced or unbalanced cables may be used (See Section 1.3).

Due to the nature of the electronics in ATC active loudspeakers it is quite normal for a sound to be heard from the speaker when the power is applied or disconnected. The noise heard will not damage the speaker and is quite normal. Although ATC uses the highest-grade components, a different noise may be heard from each speaker due to slight tolerance variations in the amplifier components.

### 1.5 Listening

The ear and brain tend to interpret distorted sound as loudness and thus underestimate the actual level of undistorted sound. The C4, C5, C6 and C7, like all ATC monitors, demonstrate very much lower levels of distortion than conventional systems of a similar size and it is therefore advisable to begin listening at an artificially low level and carefully increase the volume. It is also possible for the C4, C5, C6 or C7 to produce sufficient sound pressure levels for your ears themselves to become a source of distortion and make the sound appear harsh. Any audible distortion indicates that either the system or your ears are being overloaded and that the volume level should be reduced.

	C4 Active Centre	C5 Active Centre	C6 Active Centre	C7 Active Centre
<b>Drivers:</b>				
<b>HF</b>	25mm (1")	25mm (1")	25mm (1")	25mm (1")
<b>MF</b>			75mm (3")	75mm (3")
<b>LF</b>	2 x 125mm (5")	2 x 150mm (6")	2 x 234mm (9")	2 x 234mm (9")
<b>Amplitude Linearity ±2dB</b>	75Hz – 20kHz	75Hz – 12kHz	50Hz – 12kHz	50Hz – 12kHz
<b>Cut-off Frequencies (-6dB free standing)</b>	57Hz & 20kHz	48Hz & 20kHz	32Hz & 20kHz	32Hz & 20kHz
<b>Matched Response</b>	±0.5dB	±0.5dB	±0.5dB	±0.5dB
<b>Dispersion:</b>				
<b>Horizontal</b>	±10° Coherent	±10° Coherent	±60° Coherent	±60° Coherent
<b>Vertical</b>	±80° Coherent	±80° Coherent	±10° Coherent	±10° Coherent
<b>Max Continuous SPL</b>	108dB SPL @ 1 metre	112dB SPL @ 1 metre	115dB SPL @ 1 metre	115dB SPL @ 1 metre
<b>Crossover Frequency</b>	2.5kHz	2.5kHz	380Hz and 3.5kHz	380Hz and 3.5kHz
<b>Input Connector</b>	Male XLR	Male XLR	Male XLR	Male XLR
<b>Input Sensitivity</b>	1.0V Balanced	1.0V Balanced	1.0V Balanced	1.0V Balanced
<b>Input Impedance</b>	>10k Ohms	>10k Ohms	>10k Ohms	>10k Ohms
<b>Amplifier Output:</b>				
<b>LF</b>	200 Watts RMS	200 Watts RMS	200 Watts RMS	200 Watts RMS
<b>MF</b>			100 Watts RMS	100 Watts RMS
<b>HF</b>	50 Watts RMS	50 Watts RMS	50 Watts RMS	50 Watts RMS
<b>Overload Protection</b>	All products: Active Momentary Gain Reduction on all amplifiers plus Tweeter LDR protection.			
<b>Cabinet Dimensions (HxWxD)</b>	190 x 550 x 380mm	245 x 650 x 571mm	388 x 1200 x 511	550 x 1200 x 480mm
<b>Overall Weight</b>	48.9kg (107.5lb)	45kg (99lbs)	83.6kg (184.3lb)	101kg (222.7lb)
<b>Power Requirements:</b>				
<b>Voltage</b>	100, 115, 230V	100, 115, 230V	100, 115, 230V	100, 115, 230V
<b>Frequency</b>	50/60Hz	50/60Hz	50/60Hz	50/60Hz
<b>Cabinet Finishes</b>	Black/Silver	Black/Silver	Cherry, Walnut, Rosewood veneers standard. Others to special order.	Black/Silver Others to special order

Specifications comply with the following standards: Australian Standard Specification No 1127 "Sound System Loudspeakers" Part 5, IEFEE Specification Standard No 219-1975

ATC reserves the right to vary products and specifications without prior notice. Acoustic Transducer Co. is a trading name and ATC is the registered trade mark of Loudspeaker Technology Ltd.

## 1.6 Care and Maintenance

High technology material finishes are used in these products. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster will be all that is required to keep the finishes clean. Heavy soiling can be cleaned using a cloth slightly moistened with a non-abrasive household cleaner.

There are no components within the speakers that can be considered expendable, or that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance. Should a speaker fail to switch on when the power switch is operated the fuse should be inspected. Lift out the fuseholder cover using a small flat-blade screwdriver, remove the fuse and inspect it for damage. If required, a spare fuse may be supplied in the body of the fuseholder cover. Fuses most often fail only because of a serious electrical fault. If this is the case then simply replacing the fuse will only result in another fuse failure. The speaker should be returned to ATC for service if a second fuse fails.

There are no user replaceable parts within the speakers and in the unfortunate event of any malfunction, repair should be referred to either the supplying dealer or consultant, the relevant importer, or ATC.

## 1.7 Warranty and Contact

All ATC products are guaranteed against any defect in materials or workmanship for a period of two years from the date of purchase. Within this period we will supply replacement parts free of charge provided that the failure was not caused by misuse, accident or negligence.

**Purchasers who complete and return the Warranty Card will have their warranty period extended up to a period of six years from the date of purchase. This guarantee does not limit statutory rights.**

ATC can be contacted at:

Loudspeaker Technology Ltd, Gypsy Lane, Aston Down, Stroud, Gloucestershire GL6 8HR, UK.

Telephone: 01285 760561

Fax: 01285 760683

Email: info@atc.gb.net

Website: www.atc.gb.net

**Installation****2.1 Centre Speaker Placement**

The positioning constraints on a centre channel loudspeaker are always influenced by the type and location and of the associated screen. However, the basic parameters that influence the subjective performance of any loudspeaker in a listening room - alignment to the listening position and proximity of room boundaries - also apply to a centre channel and should be taken into account.

The C1 and C3 are intended to be positioned relatively clear of room boundaries and centrally either just below or just above the screen. If the screen is either a plasma or projector type located close to the wall it may not be possible to position the C1 or C3 very far forward. In these cases, some adjustment of low frequency equalisation via the AV processor may be necessary to reduce excess bass. It is always preferable however to experiment with loudspeaker positioning before resorting to electronic equalisation.

If the screen is a CRT type and its stand is also to carry the C1 or C3 it is advisable to mount the speaker via some decoupling material so that vibration does not disturb the picture.

While every ATC centre channel speaker is effectively magnetically shielded, the extreme sensitivity of some CRT tubes to residual levels of magnetic flux may mean that, in rare cases, ATC centre channel speakers are not appropriate. Adjusting the relative front/back position of the center speaker and the CRT can reduce magnetic interference but should your screen suffer intractable picture distortion caused by the proximity of a centre speaker contact your dealer or installer for advice.

More information on loudspeaker positioning in multi-channel systems can be found later in this manual in Section 5.

**2.2 Amplification**

The choice of partnering amplifier for the C1 and C3 will have significant influence on the performance of the system. Consider the following when selecting the amplifier:

- With any passive loudspeaker there is a trade-off between low frequency extension and sensitivity. The C1 and C3's extended low frequency response means that their sensitivity is relatively low. It is advisable therefore to select an amplifier of relatively high power capabilities. Use of an under specified amplifier will result in distortion at high levels and may risk damage. Valve or solid state amplifiers with high output impedance should be auditioned carefully to establish that their characteristic reduced damping at low frequencies is acceptable.
- Thanks in part to their underhung voice coil construction, the C1 and C3 not only demonstrate extremely low distortion at all levels but also a greatly enhanced effective dynamic range. This exceptional distortion performance, also combined with very wide dispersion, will ruthlessly reveal deficiencies in ancillary equipment. It is advisable therefore to audition the C1 or C3 with your proposed amplifier and ancillary system.

**2.3 Connection**

The C1 and C3 are equipped with a "bi-wire" connection panel that enables separate amplification of the bass drivers and tweeter. Remove the linking bars between the two pairs of terminals if you wish to take advantage of the bi-wire facility.

The terminals can accommodate either stripped cable ends or 4mm plugs. Always use good quality speaker cable with a 2.5mm<sup>2</sup> minimum cross sectional area per conductor (79 strand). Cable of a smaller cross sectional area or fewer strands is unsuitable. For cable runs longer than 10m use a significantly heavier gauge cable. Consult your dealer or consultant for specific cable recommendations.

Ensure that the positive and negative terminals on each connection panel are connected back to the corresponding positive and negative terminals on the amplifier.

**2.4 Listening**

The ear and brain tend to interpret distorted sound as loudness and thus underestimate the actual level of undistorted sound. The C1 and C3, like all ATC monitors, demonstrates very much lower levels of distortion than conventional systems of a similar size and it is therefore advisable to begin listening at an artificially low level and carefully increase the volume. It is also possible for the C1 and C3 to produce sufficient sound pressure levels for your ears themselves to become a source of distortion and make the sound appear harsh. Any audible distortion indicates that either the system or your ears are being overloaded and that the volume level should be reduced.

	CI Passive Centre	C3 Passive Centre
<b>Drivers:</b>		
<b>HF</b>	25mm (1")	25mm (1")
<b>LF</b>	2 x 125mm (5")	2 x 150mm (6")
<b>Amplitude Linearity ±2dB</b>	75Hz – 12kHz	60Hz – 12kHz
<b>Cut-off Frequencies (-6dB free standing)</b>	57Hz & 20kHz	48Hz & 20kHz
<b>Matched Response</b>	±0.5dB	±0.5dB
<b>Dispersion:</b>		
<b>Horizontal</b>	±10° Coherent	±10° Coherent
<b>Vertical</b>	±80° Coherent	±80° Coherent
<b>Max Continuous SPL</b>	108dB SPL @ 1 metre	112dB SPL @ 1 metre
<b>Crossover Frequency</b>	2.5kHz	2.5kHz
<b>Input Connector</b>	Binding Posts/4mm Sockets (Bi-Wire capable)	
<b>Sensitivity</b>	84dB for 1 Watt @ 1 metre	86dB for 1 Watt @ 1 metre
<b>Nominal Impedance</b>	8 Ohms	8 Ohms
<b>Recommended Power Amplifier:</b>		
<b>Cabinet Dimensions (HxWxD)</b>	160 x 450 x 268mm	212 x 600 x 300mm
<b>Overall Weight</b>	11kg (24.2lb)	30kg (66.0lb)
<b>Cabinet Finishes</b>	Cherry, Rosewood veneers standard. Other veneers can be supplied to special order.	

Specifications comply with the following standards: Australian Standard Specification No 1127 "Sound System Loudspeakers" Part 5, IEF Specification Standard

No 219-1975

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## 2.5 Care and Maintenance

High technology material finishes are used in this product. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster will be all that is required to keep the finishes clean.

Heavy soiling can be cleaned using a cloth slightly moistened with a non-abrasive household cleaner.

There are no components within the speaker that can be considered expendable, or that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance.

There are no user replaceable parts within the speaker and in the unfortunate event of any malfunction, repair should be referred to either the supplying dealer or consultant, the relevant importer, or ATC. ATC has every confidence in the quality of each product that it manufactures.

## 2.6 Warranty and Contact

All ATC products are guaranteed against any defect in materials or workmanship for a period of two years from the date of purchase. Within this period we will supply replacement parts free of charge provided that the failure was not caused by misuse, accident or negligence.

**Purchasers who complete and return the Warranty Card will have their warranty period extended up to a period of six years from the date of purchase. This guarantee does not limit statutory rights.**

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### 3.1 Sub-woofer Placement

The subjective performance of any sub-woofer will be fundamentally influenced by the acoustic character of the room in which it is used, and its position within the room. Speaker and sub-woofer systems are most often installed in rooms which are comfortable to sit and talk in, and the typical mixture of carpets, curtains and soft furnishings help ensure that middle and high frequencies are reasonably well controlled. There may however be low frequency problems; either too much or too little bass.

To minimise these problems the sub-woofer should be kept away from corners or walls. Start with it positioned around 1 metre from the side walls and 2 metres from the back. If the balance is bass-light, the sub-woofer can be moved towards the corner. Use the sub-woofer controls (see Section 4.5) to optimise satellite integration and for fine tuning rather than to compensate for inappropriate positioning. All rooms vary and it is a good idea to experiment with both listening and speaker positions until a good compromise is reached.

If the sub-woofer is to be placed in any form of enclosure, adequate side and top clearance for cooling airflow must be provided. For professional installations the requirements are often very specific. Please consult with an experienced professional acoustician if necessary.

More information on sub-woofer installation and use can be found later in Section 5.

### 3.2 Connection

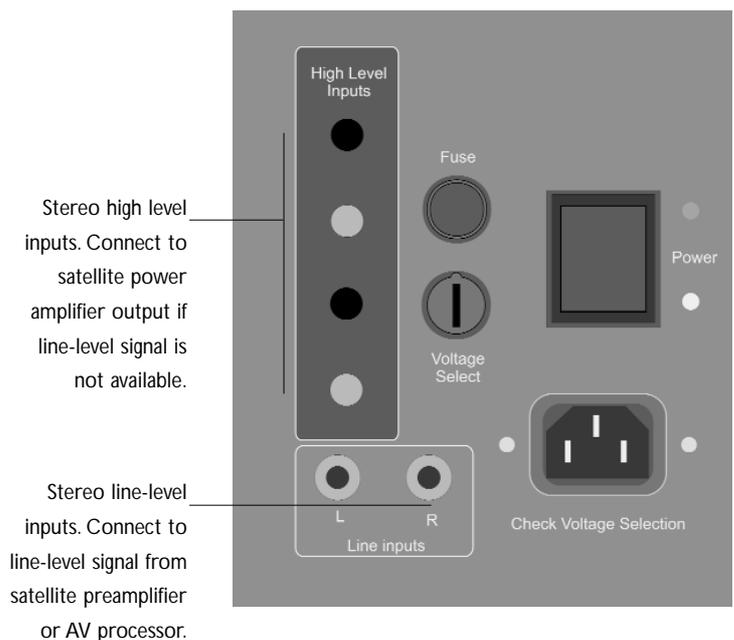
Mains power and signal connections are required for the C1 Sub-woofer. The mains cable is specifically supplied to comply with local statutory safety approvals and alternatives should not be substituted. If you intend to use your sub-woofer in an alternative territory please contact ATC for advice. The mains connection must always be earthed. Ensure that the local mains voltage matches that specified on the connection panel voltage selector.

The audio signal can be connected to the C1 either through the stereo pair of line-level RCA Phono inputs, or through a stereo set of 4mm binding post connectors. The binding post connectors are designed to accept high level signals from power amplifiers but should be used only if an appropriate line level signal is not available. High level signals from power amplifiers rated at up to 300 Watts into 8 Ohms are compatible. Take care to ensure that correct, positive to positive and negative to negative, polarity of high-level connections is retained. Diagram 1 illustrates these signal connection options.

If two signal connections are made to the sub-woofer (i.e. a stereo pair) the left and right signals will be summed to mono internally by the amplifier. The mono sub-woofer signal from an audio-visual processor may be connected to either left or right line-level Phono input.

The signal cable(s) and plug(s) should be of a good quality. Poor cable and plug quality will compromise the performance of your sub-woofer.

Diagram 1 - CI signal connections



**3.3 Operation**

The C1 sub-woofer control and connection panel provides a range of adjustment facilities to assist its integration with the satellite speakers. These facilities are explained below and illustrated in Diagrams 2, 3 and 4.

**Level:** Sets the overall sensitivity of the sub-woofer. Initially the level control should be set towards the centre of its range and only adjusted once the Filter Frequency and Mode controls have been set.

**Filter Frequency:** Varies the upper crossover frequency as indicated on the control panel and Diagram 3. Filter frequency is the fundamental parameter that defines the integration of the sub-woofer with the satellites. The Filter Frequency control should be set at or slightly above the specified low frequency cut-off of the satellite speakers.

If the Filter Frequency control is set fully anti-clockwise, a supplementary control providing alternative fine adjustment of filter frequency between 40 and 100Hz becomes operational.

**Mode:** With the Mode control set to the **Music+** position the sub-woofer pass-band frequency response is fundamentally flat and in phase with the satellite speakers. With the Mode control to the **Music-** position the frequency response remains flat but the phase is reversed. Depending on the relative position of the sub-woofer and satellite speakers within the listening environment, phase reversal can result in more consistent integration. The Music position is recommended for music programme material. The response curves for each Low Pass filter position with **Music+** selected is shown on the control panel and in Diagram 3.

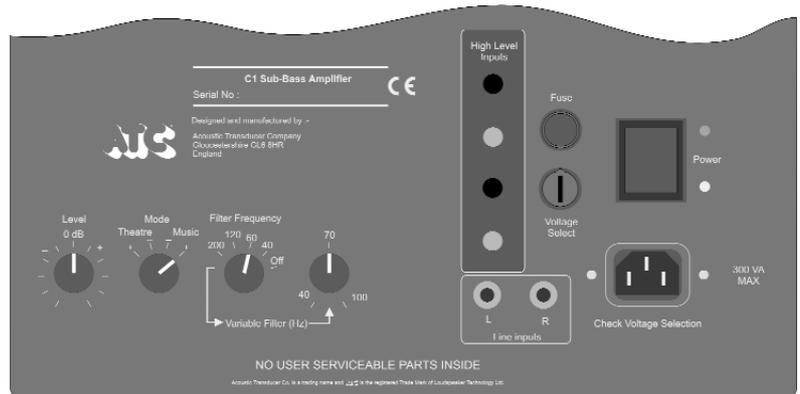
With the Mode control in the **Theatre+** position the frequency response is lifted in the 40 - 60Hz region. This boosted setting is designed to provide a more demonstrative sub-woofer performance appropriate for audio/visual programme material. The response curves for each Low Pass filter position with **Theatre+** selected is shown on the control panel and in Diagram 4. The **Theatre-** position retains the frequency response but reverses the phase.

Due to the nature of the electronics in ATC active loudspeakers it is quite normal for a sound to be heard from the speaker when the power is applied or disconnected. The noise heard will not damage the speaker and is quite normal. Although ATC uses the highest-grade components, a different noise may be heard from each speaker due to slight tolerance variations in the amplifier components.

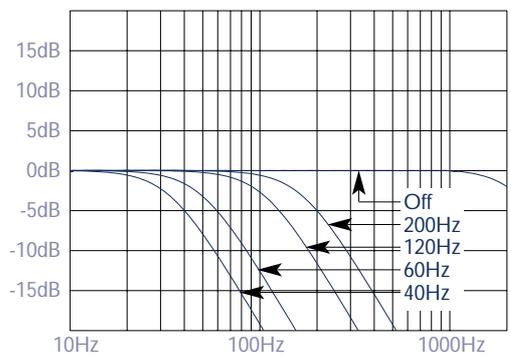
**3.4 Listening**

The ear and brain tend to interpret distorted sound as loudness and thus underestimate the actual level of undistorted sound. ATC sub-woofers, like all ATC products, demonstrate very much lower levels of distortion than conventional systems of a similar size and it is therefore advisable to begin listening at an artificially low level and carefully increase the volume. It is also possible for the ATC systems to produce

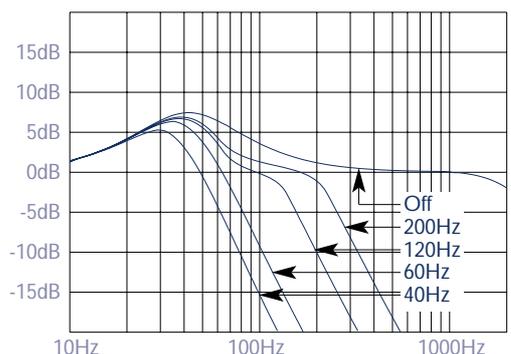
**Diagram 2 - connection and control panel**



**Diagram 3 - low pass options, music mode**



**Diagram 4 - low pass options, theatre mode**



## CI Active Sub-woofer

### 3.4 Listening cont'd

sufficient sound pressure levels for your ears themselves to become a source of distortion and make the sound appear harsh. Any audible distortion indicates that either the system or your ears are being overloaded and that the volume level should be reduced.

### 3.5 Care and Maintenance

High technology material finishes are used in this product. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster will be all that is required to keep the finishes clean. Heavy soiling can be cleaned using a cloth slightly moistened with a non-abrasive household cleaner.

There are no components within the speaker that can be considered expendable, or that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance. Should a speaker fail to switch on when the power switch is operated the fuse should be inspected. Lift out the fuseholder cover using a small flat-blade screwdriver, remove the fuse and inspect it for damage. If required, a spare fuse may be supplied in the body of the fuseholder cover. Fuses most often fail only because of a serious electrical fault. If this is the case then simply replacing the fuse will only result in another fuse failure. The speaker should be returned to ATC for service if a second fuse fails.

There are no user replaceable parts within the speaker and in the unfortunate event of any malfunction, repair should be referred to either the supplying dealer or consultant, the relevant importer, or ATC.

<b>Driver:</b>	234mm (9")
<b>Cut-off Frequencies (-3dB free standing)</b>	20Hz & 2kHz
<b>Max Continuous SPL</b>	112dB SPL @ 1 metre
<b>Input Connectors</b>	RCA Phono or Stripped cable
<b>Input Sensitivity</b>	1V Un-balanced (Phono input)
<b>Input Impedance</b>	>10k Ohms
<b>Amplifier Output Continuous</b>	250 Watts RMS
<b>Gain Control Range</b>	±6dB
<b>Theatre Equaliser</b>	6dB lift @ 40 - 60Hz
<b>Filter Characteristics</b>	Preset or variable, 40 - 200Hz
<b>Power Requirements:</b>	100, 115, 230V, 50/60Hz
<b>Cabinet Dimensions (HxWxD)</b>	434 x 350 x 350mm
<b>Overall Weight</b>	20kg (44lb)
<b>Cabinet Finish</b>	Cherry, Rosewood

The above specifications comply with the following standards: Australian Standard Specification No 1127 "Sound System Loudspeakers" Part 5, IEEF Specification Standard No 219-1975  
 ATC reserves the right to vary products and specifications without prior notice. Acoustic Transducer Co. is a trading name and ATC is the registered trade mark of Loudspeaker Technology Ltd.

### 3.6 Warranty and Contact

All ATC products are guaranteed against any defect in materials or workmanship for a period of two years from the date of purchase. Within this period we will supply replacement parts free of charge provided that the failure was not caused by misuse, accident or negligence.

**Purchasers who complete and return the Warranty Card will have their warranty period extended up to a period of six years from the date of purchase. This guarantee does not limit statutory rights.**

ATC can be contacted at:

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Fax: 01285 760683

Email: info@atc.gb.net

Website: www.atc.gb.net

**4.1 Sub-woofer Placement**

The subjective performance of any sub-woofer will be fundamentally influenced by the acoustic character of the room in which it is used, and its position within the room. Monitor and sub-woofer systems are most often installed in rooms which are comfortable to sit and talk in, and the typical mixture of carpets, curtains and soft furnishings help ensure that middle and high frequencies are reasonably well controlled. There may however be low frequency problems; either too much or too little bass. To minimise these problems the sub-woofer should be kept away from corners or walls. Start with it positioned around 1 metre from the side walls and 2 metres from the back. If the balance is bass-light, the sub-woofer can be moved towards the corner. Use the sub-woofer controls to optimise satellite integration and for fine tuning rather than to compensate for inappropriate positioning. All rooms vary and it is a good idea to experiment with both listening and speaker positions until a good compromise is reached. If the sub-woofer is to be placed in any form of enclosure, adequate side and top clearance for cooling airflow must be provided. For professional installations the requirements are often very specific. Please consult with an experienced professional acoustician if necessary.

More information on sub-woofer installation and use can be found later in Section 5.

**4.2 Connection**

Either two or three cable connections are required for each sub-woofer: one for mains power and one or two for the audio signal. The mains cable is specifically supplied to comply with local statutory safety approvals and alternatives should not be substituted. If you intend to use your sub-woofer in an alternative territory please contact ATC for advice. The mains connection must always be earthed.

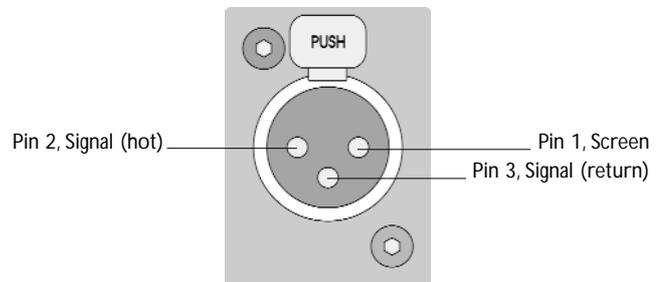
The signal cable(s) and plug(s) should be of a good quality and XLR terminated. Poor cable and plug quality will compromise the performance of your sub-woofer. The signal input pin configuration is illustrated in Diagram 1. If two signal connections are made to the sub-woofer (i.e. a stereo pair) the left and right signals will be summed by the amplifier so increasing the effective sensitivity by 6dB. The mono sub-woofer signal from an audio-visual processor may be connected to either left or right line-level XLR input.

**4.3 Signal Cable Options**

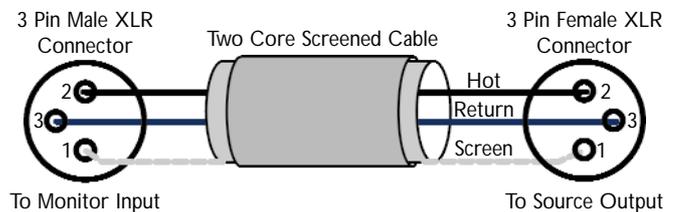
Balanced cable configuration is the preferred option, however unbalanced connection is possible. Diagrams 2 and 3 illustrate the signal cable connections required for each option. Balanced (XLR to XLR) connection offers lower noise and better immunity to “hum” pick-up. Unbalanced (XLR to Phono or Two Pole Jack) connection carries risk of hum caused by multiple signal earths.

Hum problems resulting from unbalanced connection may be reduced by making ONE of the following modifications to the signal cable connections: If the driving preamplifier (or desk) is “double insulated” (i.e. has no mains earth), disconnect the signal cable screen at the RCA Phono plug end. Alternatively, disconnect the signal cable screen at the XLR end. This second option will make the source the reference signal earth.

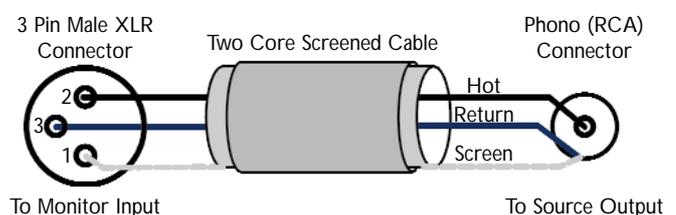
**Diagram 1 - input connection pins**



**Diagram 2 - balanced cable**



**Diagram 3 - unbalanced cable**



**4.4 Operation**

The sub-woofer amplifier control and connection panel provides a range of adjustment facilities to assist its integration with the satellite speakers. These facilities are explained below and illustrated in Diagrams 4, 5 and 6.

**Level:** Sets the overall sensitivity of the sub-woofer. Initially the level control should be set towards the centre of its range and only adjusted once the Low Pass and Contour controls have been set.

**Low Pass:** Varies the upper crossover frequency as indicated on the control panel and Diagram 5. This is the fundamental parameter that defines the integration of the sub-woofer with the satellites. The Low Pass control should be set at or slightly above the specified low frequency cut-off of the satellite speakers.

**Contour:** With the Contour control set to the Flat+ position the sub-woofer pass-band frequency response is fundamentally flat and in phase with the satellite speakers. With the Contour control to the Flat- position the frequency response remains flat but the phase is reversed. Depending on the relative position of the sub-woofer and satellite speakers within the listening environment, phase reversal can result in more consistent integration.

The Flat position is recommended for music programme material. The response curves for each Low Pass filter position with Flat+ selected is shown in Diagram 5.

With the Contour control in the Lift+ position the frequency response is lifted in the 40 - 60Hz region. This boosted setting is designed to provide a more demonstrative sub-woofer performance appropriate for audio/visual programme material. The response curves for each Low Pass filter position with Lift+ selected is shown in Diagram 6. The Lift- position retains the frequency response but reverses the phase.

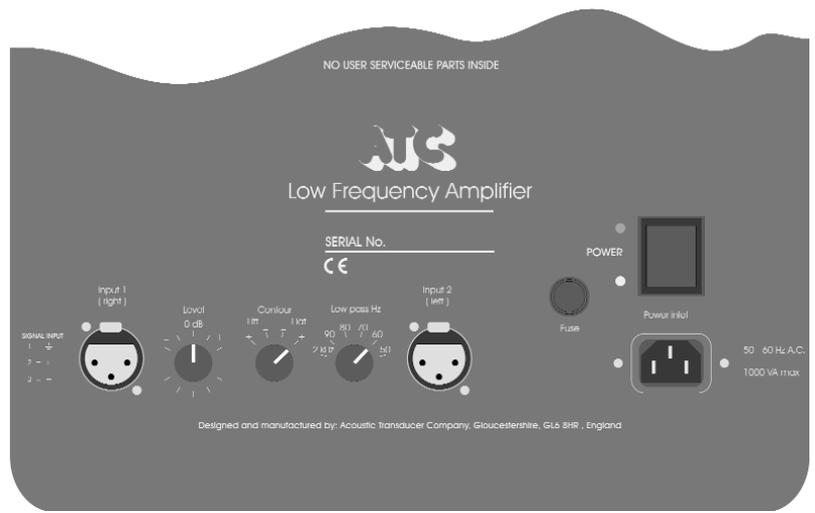
**Badge Indicator (C6 Only):** The badge located on the lower front of the C6 cabinet incorporates an amplifier status indicator. GREEN indication shows that the amplifier is operating normally. RED indication shows that the amplifier is operating at the full available output. Any more than brief RED indication means that the amplifier is being over-driven and that its protection circuits are operating. Protection will limit and distort the acoustic output of the sub-woofer so the operating volume should be reduced.

Due to the nature of the electronics in ATC active loudspeakers it is quite normal for a sound to be heard from the speaker when the power is applied or disconnected. The noise heard will not damage the speaker and is quite normal. Although ATC uses the highest-grade components, a different noise may be heard from each speaker due to slight tolerance variations in the amplifier components.

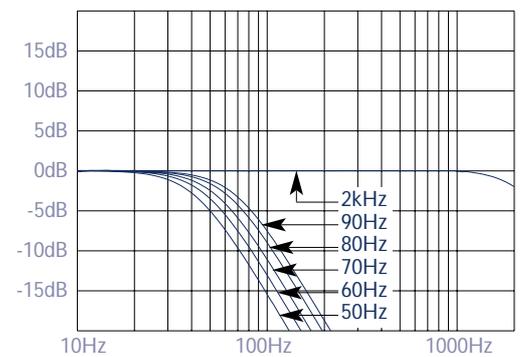
**4.5 Listening**

The ear and brain tend to interpret distorted sound as loudness and thus underestimate the actual level of undistorted sound. ATC sub-woofers, like all ATC products, demonstrate very much lower levels of distortion than conventional systems

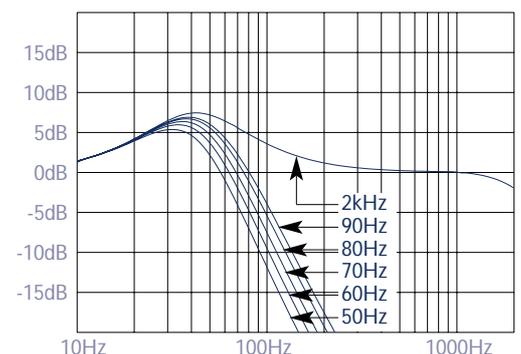
**Diagram 4 - connection and control panel**



**Diagram 5 - low pass options, contour flat**



**Diagram 6 - low pass options, contour lift**



	C2 Active Sub-woofer	C4 Active Sub-woofer	C6 Active Sub-woofer	C7 Active Sub-woofer
<b>Driver:</b>	234mm (9")	314mm (12")	375mm (15")	375mm (15")
<b>Cut-off Frequencies: (-3dB free standing)</b>	18Hz & 250Hz	18Hz & 250Hz	18Hz & 250Hz	18Hz & 250Hz
<b>Max Continuous SPL:</b>	108dB SPL @ 1 metre	112dB SPL @ 1 metre	115dB SPL @ 1 metre	115dB SPL @ 1 metre
<b>Input Connector:</b>	2 x Male XLR			
<b>Input Sensitivity:</b>	1.0V Balanced			
<b>Input Impedance:</b>	>10k Ohms			
<b>Amplifier Output:</b>	250 Watts	650 Watts	650 Watts	650 Watts
<b>Gain Control Range:</b>	±6dB			
<b>Contour Equaliser:</b>	+6dB @ 40 - 60Hz			
<b>Filter Characteristics:</b>	50Hz, 60Hz, 70Hz, 80Hz, 90Hz low pass second order critically damped			
<b>Power Requirements:</b>	100, 115, 230V 50/60Hz			
<b>Cabinet Dimensions (HxWxD)</b>	470 x 400 x 400mm	582 x 500 x 500mm	635 x 550 x 550mm	672 x 600 x 575mm
<b>Overall Weight</b>	46kg (101.4lb)	52g (114.6lb)	63.6kg (140.2lb)	70kg (154.3lb)
<b>Cabinet Finishes</b>	Black, Silver	Black, Silver	Cherry, Walnut, Rosewood	Silver (others to special order)

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## 4.5 Listening cont'd

of a similar size and it is therefore advisable to begin listening at an artificially low level and carefully increase the volume. It is also possible for the ATC systems to produce sufficient sound pressure levels for your ears themselves to become a source of distortion and make the sound appear harsh. Any distortion indicates that either the system or your ears are being overloaded and that the volume should be reduced.

## 4.6 Care and Maintenance

High technology material finishes are used in these products. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster will be all that is required to keep the finishes clean. Heavy soiling can be cleaned using a cloth slightly moistened with a non-abrasive household cleaner.

There are no components within the speakers that can be considered expendable, or that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance. Should a speaker fail to switch on when the power switch is operated the fuse should be inspected. Lift out the fuseholder cover using a small flat-blade screwdriver, remove the fuse and inspect it for damage. If required, a spare fuse is supplied in the body of the fuseholder cover. Fuses most often fail only because of a serious electrical fault. If this is the case then simply replacing the fuse will only result in another fuse failure. The speaker should be returned to ATC for service if a second fuse fails.

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## 4.7 Warranty and Contact

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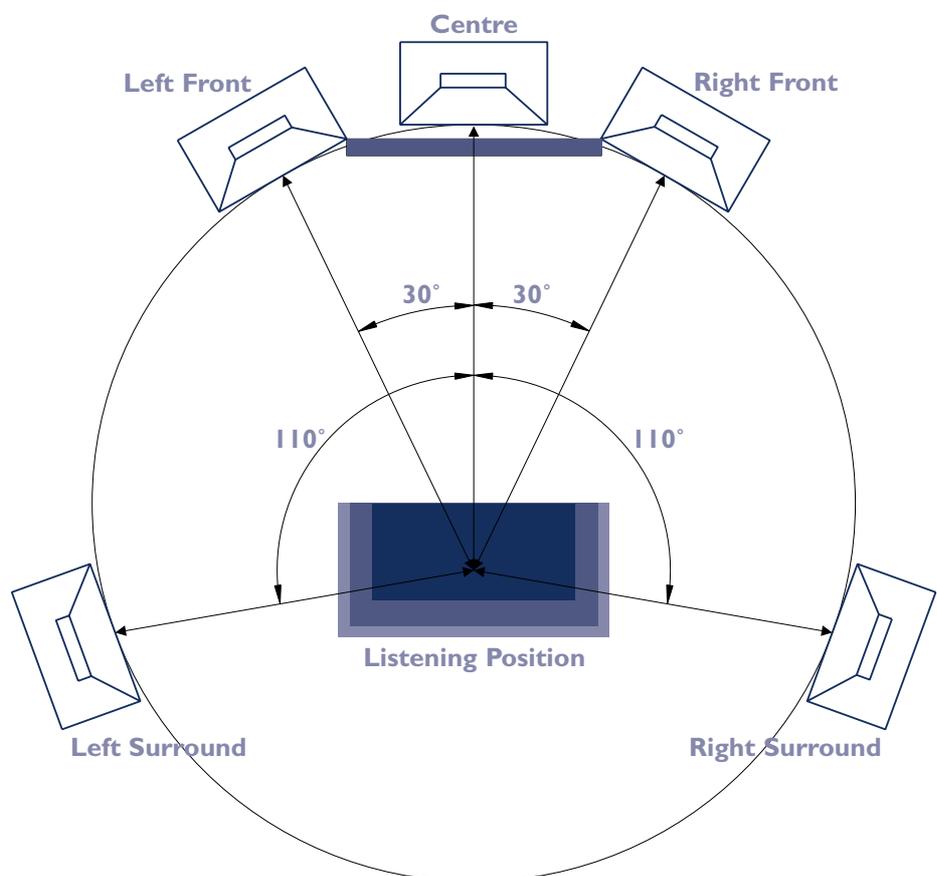
### 5.1 Full Bandwidth Speaker Positioning

While each loudspeaker in an AV system should be located appropriately in its immediate acoustic environment (see the positioning section in each loudspeaker User Guide), if an AV system is to reach its full potential the relative position of each loudspeaker element must be considered.

In professional environments the relative position is important because it will fundamentally influence multichannel mix decisions, while in domestic systems correct positioning will offer the best chance of programme material being heard as intended.

The basic guidelines for positioning the five full bandwidth speakers of a 5.1 system are illustrated in Diagram 1. The elements of an AV system should follow this positioning guide as closely as possible. There is some latitude for compromise in the speaker to listener distance of a domestic installation as AV decoders/processors provide facilities to adjust the delay time of all or some speaker channels. Professional installations however should adhere strictly to the recommendations of Diagram 1 and not use delay adjustment to compensate for alternative speaker to listener distances.

Diagram 1 - full bandwidth speaker positioning



## 5.2 Bass Management in Domestic Systems

This section aims to clarify some of the issues surrounding the use of Bass Management (or bass redirection as it sometimes known) in ATC multichannel systems. Topics discussed apply to the whole range of ATC systems and can be used for guidance when making installation decisions.

Differences in professional and domestic requirements dictate slightly different approaches to Bass Management. In the recording studio, the primary aim is to achieve a result which will transport well to a range of domestic equipment and listening environments, whilst retaining the artistic intentions. These notes however focus on the needs of the domestic user which are rather more particular. The primary function of Bass Management in domestic applications (home theatre or multichannel audio only reproduction) is to increase the dynamic range, or the total sound pressure that can be delivered by the speaker system. However, depending on the performance of the loudspeakers in use, this priority may not be appropriate in some situations - this is commonly the case when using ATC loudspeakers. Switching off bass management in the majority of AV processors is simply a case of ensuring that the Sub-woofer output is turned "ON" and that all satellite speaker size options are set to "LARGE".

The advent of multichannel reproduction technology in the home has led to the desire for inexpensive and robust speaker systems which can reproduce high sound pressure levels. Unfortunately the latter two requirements are in direct conflict with the former. Obviously, the simplest way of reducing the retail price of a product such as a loudspeaker is to cut back on the quality of the components used. However, when designed properly, there is a direct relationship between the cost of a moving coil loudspeaker and its potential dynamic range. This can be attributed to a number of factors. For example, a drive-unit's metal parts act as a sink for the heat generated by its voice coil, so as the mass of steel used is reduced for cost purposes, so the speaker's ability to handle power is degraded. Magnet size and diaphragm area also tend to be reduced in an attempt to cut costs. Again, the trade-off is efficiency and dynamic range, both of which suffer as the compromises are made.

A convenient way of helping a low power system to deliver more sound pressure is to divert the potentially more damaging low frequencies away from the vulnerable speakers and into a sub-woofer. Bass management was devised to perform this task in the digital domain. It is a system of software filters and gain controls commonly fitted to AV processors/decoders that can redirect low frequencies away from the satellite speakers (left, centre, right, surround left and surround right in a 5.1 configuration) and route it to the dedicated low frequency channel. Because the processing is done in software it is virtually free of cost and thus attractive to those who wish to maximise the dynamic range of a modest speaker system.

## 5.3 Bass Management Compromises

As described above, Bass Management was devised for domestic use as a means of extracting more performance from cost-sensitive systems. However in high quality audio systems it should be avoided. The improvement in dynamic range that may be achieved with Bass Management is not without side effects and in high quality systems these side effects are significant. The reasons for avoiding its use in high quality systems, such as ATC systems, are these:

- High quality systems have enough dynamic range and bass extension without the use of Bass Management. Less software processing of the source material implies less potential for undesirable artefacts.
- High quality active speakers often have built-in protection against the extreme low frequencies responsible for the majority of undesirable bass-related effects so undermining the value of Bass Management. This is the case for ATC active speakers.
- Without accurate knowledge of the acoustic character of satellite and sub-woofer it is impossible for Bass management to achieve a flat overall frequency response. Similarly the phase response will be unpredictable.
- Bass Management encourages the crossover frequency between sub-woofer and satellites to be above the onset of directionality in the sub-woofer output. The resulting ability to hear the location of the sub-woofer is clearly to be avoided.
- When a significant proportion of the frequency range is separated from the satellites and passed to the sub-woofer, any difference in the dynamic behaviour between the two types of loudspeaker will cause the system frequency response to change with output level.
- The addition of filter slopes to the existing roll-off shapes of the loudspeakers may incur time-domain ringing and audible colouration.

## 5.4 Conclusion

There is good argument for the use of Bass Management in modest, cost sensitive systems with restricted dynamic range. However, when applied to high quality systems the side effects are likely to be intrusive. We strongly recommend that Bass Management should not be used with ATC loudspeakers in domestic applications.



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