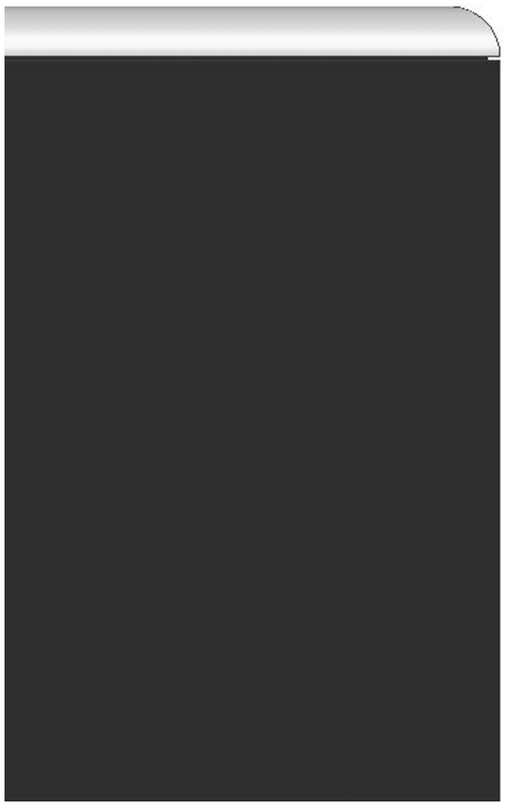
OWNER'S MANUAL

ACOUSTIC ENERGY

LINEAR
sub



Contents

Important Safety Instructions

Ensure that your Linear Sub is set to the appropriate mains input voltage before it is connected to a mains socket. The warranty does not cover damage caused by incorrect mains voltage.

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

16. The MAINS plug is used as the disconnect device, the disconnect device shall remain readily operable.

17. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

1. Introduction

Welcome to the Linear Sub. Perhaps more than any other hi-fi product, speakers are sensitive to installation so please take a little time to read this manual and to follow, as far as practical, the installation guidelines it contains. Careful installation will help ensure that your Linear Sub performs optimally. Should you have any questions not covered here we are happy to try and answer them either by telephone or email. Contact information can be found in Section 11.

Following this introduction, the Manual is divided into sections covering handling, installation, positioning, connecting, controls and system setup, specifications, matching products, warranty and contact information. We recommend that you read at least the first six of these sections carefully before installing and using your Linear Sub. We would also draw your attention to the **Important Safety Instructions** on this page.

Finally, please enjoy your Linear Sub, but remember it is capable of generating high volume levels of low frequency sound, so please also be considerate of your neighbours.

2. Handling

The Linear Sub is a relatively delicate precision engineered product that can be damaged by inappropriate handling. It is also large and heavy. Please take great care therefore when unpacking or moving it. Plan any handling in advance of carrying it out - ideally with a second person to help. Please take care when unpacking or moving the subwoofer not to touch any of the drivers. Damage to a driver will at best degrade the Linear Sub's performance and at worst result in its complete failure.

The enclosure surfaces should also be handled sympathetically. Any cleaning should only require a soft cloth, slightly dampened if necessary. Be wary of using any polishes or solvent based cleaning agents.

The packaging should be retained for future use.

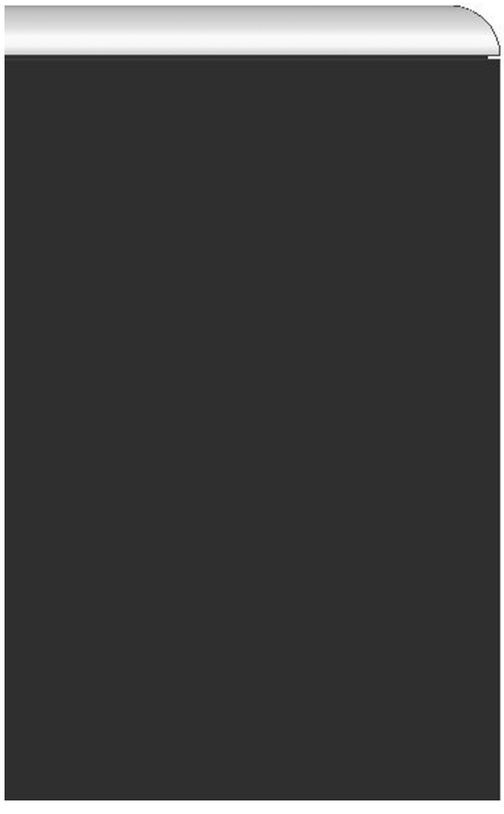
3. Installation

The Linear Sub is intended to be used in either stereo audio music systems or multi-channel audio-visual (home theatre) systems. Although it is intended primarily to partner other products in the Linear range it may also be used successfully with alternative loudspeakers.

Linear Sub must be fitted with either floor spikes or rubber feet. Floor spikes offer the highest potential performance and should be fitted if the subwoofer is to be placed on a carpeted floor. If spikes are inappropriate for your floor covering, metal protection pads, coins for example, maybe used between the spike and the floor.

Note: Damage to the drive unit may result if Linear Sub is placed upright on the floor without floor spikes or feet fitted.

The rubber feet or M8 floor spikes and lock-nuts should be fitted to the underside of the subwoofer once it has been moved near its final location. Carefully lay the subwoofer on its side to gain access to the tapped holes in the underside. If the rubber feet are to be used simply screw them into the tapped holes and return the subwoofer to upright. If floor spikes are to be used screw a spike and lock-nut into each hole leaving a length of spike extending beyond the lock-nut such that once the subwoofer is upright the lock-nuts will "float" just above the floor covering.



Tighten three of the lock-nuts with a 13mm spanner leaving one lock-nut finger-tight to aid adjustment once the subwoofer is upright in its final position. Once the final position has been established adjust the length of the loose spike such that the subwoofer is vertical and does not rock. If the floor is particularly uneven it may be necessary to loosen one of the tightened spikes to ensure that the subwoofer can be levelled.

Finally, tighten all loose lock-nuts. It may be necessary to re-adjust to minimise rock once the subwoofer has settled on the floor. Take care when installing floor spikes. They are sharp and can cause injury or pierce electrical cables.

Linear Sub is not magnetically shielded and may cause picture distortion if located too close to a CRT screen. Contact your dealer installer or Acoustic Energy for advice.

4. Positioning

The position of the speakers in a home theatre installation will have great influence over its performance. It is worth spending some time experimenting both with the finer points of speaker positioning, as well as the larger scale issues of room layout. **Diagram One** over the page illustrates an idealised general home theatre speaker layout.

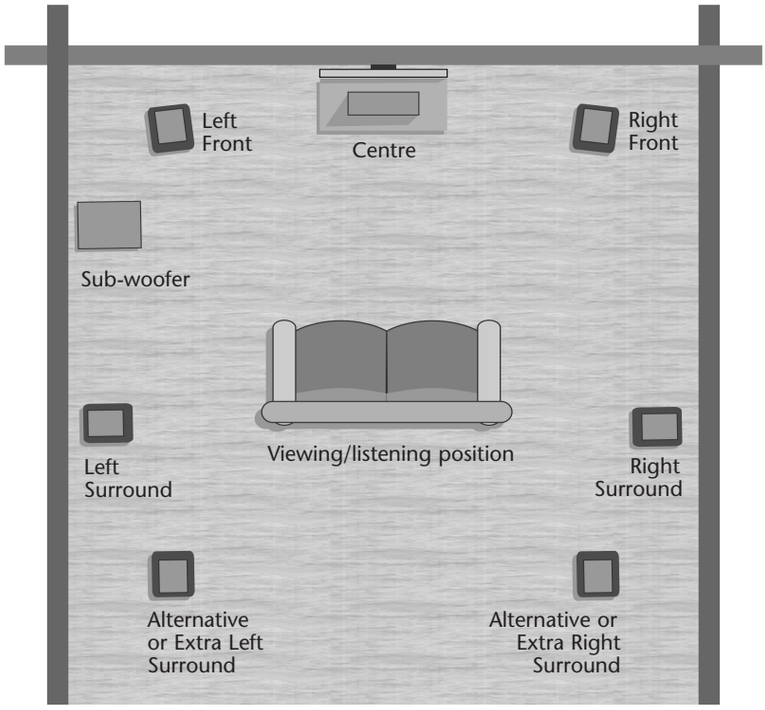
If you are already familiar with the characteristics of your room, and the way speakers perform in it, you may already have a good feel for where to position your Linear Sub. However, installing any new component provides a good opportunity to review an existing set-up and perhaps make improvements.

In principle there is great freedom of position of a sub-woofer in a listening room. In practice, however, the performance will be fundamentally influenced by the room and position. Small changes of location, or of the acoustic character of items in the immediate vicinity of the subwoofer, can significantly influence its performance.

Initially choose a site for the Linear Sub along one of the walls of the listening room well away, but not equi-distant, from the corners. It is not necessary that the Linear Sub be positioned along the same wall as the main loudspeakers. Chose a solid wall (rather than a partition) and keep the subwoofer clear of any large resonant objects - furniture panels, heating radiators, etc.

Don't worry if, thanks to the architecture or layout of your room, it is not practical to follow these guidelines exactly. The most important thing is to experiment with the different options that are practical and find the best one.

Once your Linear Sub is connected and working, and you begin to become familiar with its performance, it is likely to be worthwhile experimenting a little more with its positioning. For example, moving the Linear Sub towards a room corner will increase the level of low bass. This gain may however be at the expense of bass definition and consistency over the listening area.



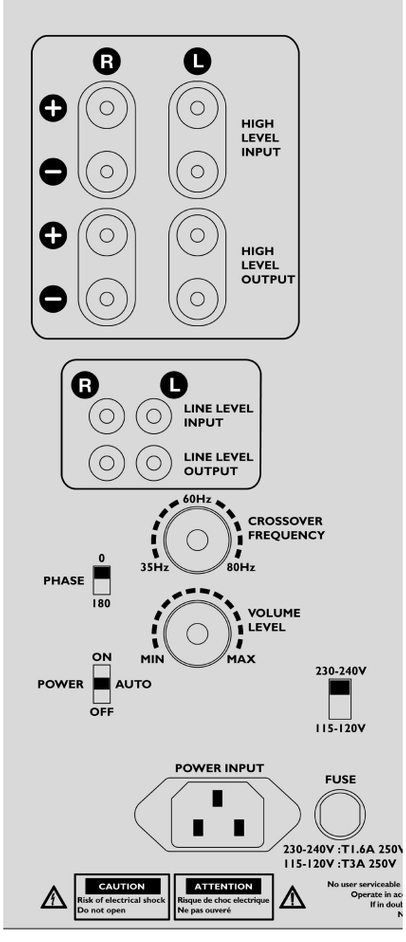
5. Connecting

The Linear Sub requires connection both to mains power and an appropriate audio signal. The connection sockets are located on the back panel illustrated opposite. Leave the subwoofer switched-off at the mains until all connections are made and ensure that the subwoofer level control, also located on the back panel is turned fully anti-clockwise. Connecting your Linear Sub to an audio signal is a simple process, however, there are some choices to be made concerning connection mode.

Signal Input Connections

Linear Sub is fitted with both **line-level** and **high level** inputs.

The RCA Phono socket **line level** inputs are intended to accept signals from either audio-visual processors or stereo preamplifiers (or integrated amplifiers incorporating preamplifier outputs). Connect to these input sockets using an appropriate RCA Phono connection cable. Ensure that the cable is of good quality. If connecting from a stereo amplifier, connect the left output to the left input and the right output to the right input. If connecting from an audio visual processor the single subwoofer output may be connected to either left or right input.



The binding-post **high level** inputs are intended to be used in conventional stereo systems where the Linear Sub is to augment the low frequency performance of a pair full range speakers, and where no appropriate line-level signal is available. Connect using simple twin core cable from either the amplifier's speaker terminals or from the full-range speaker terminals themselves. Take care not to reverse the polarity of any connections (connect positive to positive and negative to negative) or any left/right orientation (connect left to left and right to right). The binding posts will accept either "4mm" plugs or stripped wires. Take care if using stripped wires not to "short" the amplifier by unintentionally connecting stray wires.

Note: An alternative high level input connections scheme is to connect from the stereo amplifier to the subwoofer high level inputs and then from the subwoofer high level outputs (see the following paragraph) to the full-range speakers. This scheme however both demands longer lengths of high quality speaker cable and introduces unnecessary connections between the amplifier and full-range speakers.

Signal Output Connections

Line level and high level signal output connections are also fitted to the Linear Sub rear panel. Both carry an output signal identical to the input signal and may be used for example to transfer the signal back to a power amplifier or to multiple subwoofers.

Mains Connection

After checking that the mains voltage specified on the subwoofer rear panel is set correctly, connect the subwoofer via its IEC mains input to a mains wall socket. Use only the mains cable supplied with the subwoofer.

6. Controls & System Setup

Subwoofer Controls

Accompanying the mains and signal input sockets on the subwoofer connection panel are a level control, a crossover frequency control, an auto power switch and a phase reversal switch. Their function and use is described in the following paragraphs.

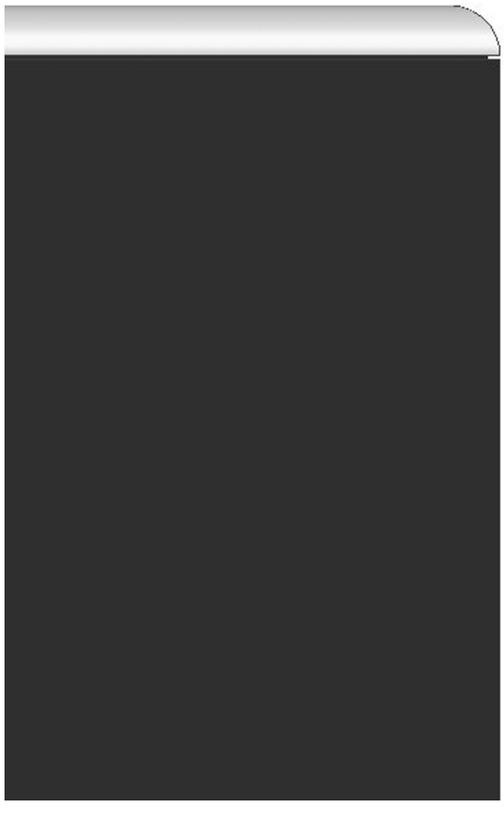
Subwoofer Level

The level control adjusts the volume of the subwoofer relative to the satellites. Begin with the level control set to around 50%. Detailed subwoofer adjustment guidelines can be found in the following paragraphs.

Subwoofer Crossover Frequency

The crossover frequency control adjusts the upper frequency at which the subwoofer output is filtered for the full-range speakers to take over. If the Linear Sub is to be used exclusively in an audio-visual system the crossover frequency should be set at 80Hz.

If the Linear Sub is to augment the low frequency performance of a pair full range speakers, the crossover frequency should be set to match their low frequency roll-off frequency. The larger the speaker, the lower its low frequency roll-off will be. Finding the optimal crossover frequency setting will require experiment and adjustment, but reasonable initial values for different speaker types are as follows:



Large floor stand speaker (Linear 3): 35Hz
Medium stand mount loudspeakers: 50Hz
Small stand mount speakers (Linear 1): 70Hz

Subwoofer Phase

The phase switch reverses the subwoofer acoustic polarity. With the switch set to 0° the subwoofer output is in phase with the full range speakers. With the switch set to 180° the subwoofer output is out of phase. Reversing the subwoofer phase can help optimise the sound of subwoofer systems. Further subwoofer phase advice can be found below.

Subwoofer Auto Power

The subwoofer mains power switch incorporates an automatic switch-on/off function. With the switch set to “Auto” the subwoofer will switch on automatically when an audio signal is present. It will switch off again when no signal has been present for around 10 minutes. With “on” selected the subwoofer remains switched-on permanently.

Note: There is necessarily a short delay between auto switch-on and audible sound from the subwoofer.

System Setup

Before listening to your system make one final check of the cables and connections. If all appears well begin listening at a relatively low volume to confirm that the system is operating as expected. Only increase the volume if you are happy that the sound at low volume is fundamentally as expected. If you are unhappy, turn the system off and re-check all the cables and connections.

The Linear Sub may take a little time to reach normal operating temperatures and to “run-in”. Your ears too will take some time to adjust to the new sound, so it is unwise therefore to make rapid judgements about the performance of the system.

The most important aspect of Linear Sub setup is its integration with the full-range speakers. Assuming the locations chosen for these are satisfactory, adjusting the subwoofer’s **location** in the room, its **volume level** and **phase**, and, if it is used in a conventional stereo system, its the **crossover frequency,** should enable a good end result to be achieved.

Select a few short examples of familiar programme material - both movie and music - to use while adjusting the setup. Listen also from a variety of different positions in the room. Check for balance and consistency of sound - neither too much nor too little bass across the range of programme material and listening positions. Experimentation and careful listening is the key to finding a good subwoofer setup.

Subwoofer Crossover Frequency

As you adjust other parameters you may find that moving the crossover frequency a little from the suggested starting value is beneficial. Adjust other aspects of the setup, particularly subwoofer location and phase, before adjusting the crossover frequency significantly.

Sub-woofer Volume

Setting the subwoofer volume is important in terms of both overall system balance and the demands of different types of programme material. You may find that material with an emphasis on music works better with a lower subwoofer volume than movie material with an emphasis on “effects”. Finding a compromise between the two is a matter of subwoofer volume adjustment in parallel with adjusting its position in the room.

Sub-woofer Location

Broadly speaking, the closer a subwoofer is to the corner of the room (assuming the walls are solid) the more bass it will generate in the room (and the lower its volume need be set). Moving the subwoofer closer to a corner however will also tend to reduce the consistency subwoofer volume over the listening room (a corner location being the worst in this respect). Positions closer to the corner will also tend to change the character of the bass produced by the subwoofer - it will emphasise the very lowest signals more. This change in bass character with location is the variable that enables a good compromise position for the subwoofer to be found.

Sub-woofer Phase

Switching the subwoofer phase should be left to last. If a good subwoofer position is proving difficult to find, try again with the phase reversed.

7. Specification

Type: Closed box, active subwoofer.

Drivers: Downward facing 220mm pulp cone with 48mm thermally bonded voice coil. High-power long-throw magnet system.

Low Frequency Cut-off: - 6dB @ 30Hz

Amplifier: 200 Watts into 8 Ohms

Low Pass Filter: 2nd order, 35Hz to 80Hz

Input Sensitivity: 300mv for rated output

Dimensions (H x W x D): 497 x 430 x 390mm

Weight: 26.0kg (single, unpacked)

Acoustic Energy reserves the right to modify product specifications.

8. The Linear Range

The **Linear Sub** is part of a range that includes the **Linear One** stand-mount speaker, the **Linear Three** floor-stand speaker and the **Linear Centre** centre channel speaker. **Linear One**, **Linear Three** and **Linear Centre** incorporate time-aligned drivers to improve image quality, depth and focus.

Linear One
Linear One is a compact two-way stand-mount speaker that adds high resolution accuracy to the imaging benefits of time alignment.

Linear Three
Linear Three is a true three-way floor stand speaker that builds on the performance of the Linear One with wider bandwidth, higher power handling and enhanced detail resolution.

Linear Centre
Linear Centre is a centre channel speaker designed to combine with the Linear One or Three for perfectly matched audio-visual systems.

9. Warranty

Your Acoustic Energy speakers are guaranteed against original defects in materials, manufacture and workmanship for 3 years from the date of purchase.

Under this warranty Acoustic Energy agrees to repair any defect or, at the company's discretion, replace the faulty component(s) without charge for parts or labour. This warranty does not imply any acceptance by Acoustic Energy or its agents for consequential loss or damage and specifically excludes fair wear and tear, accident, misuse or unauthorised modification.

This warranty is applicable in the United Kingdom only and does not in any way limit the customer's legal rights. Claims and enquiries under the warranty for Acoustic Energy products purchased outside the UK should be addressed to the local importers or distributors. If you have reason to claim under the warranty please contact your dealer in the first instance.

Please retain all original packaging materials for possible future use. We suggest that you complete details of purchase now and keep this information in a safe place for future reference.

Name: _____

Address: _____

_____

Dealer: _____

Purchase Date: _____

Serial Numbers: _____

10. Contact

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Gloucestershire GL7 1NJ
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