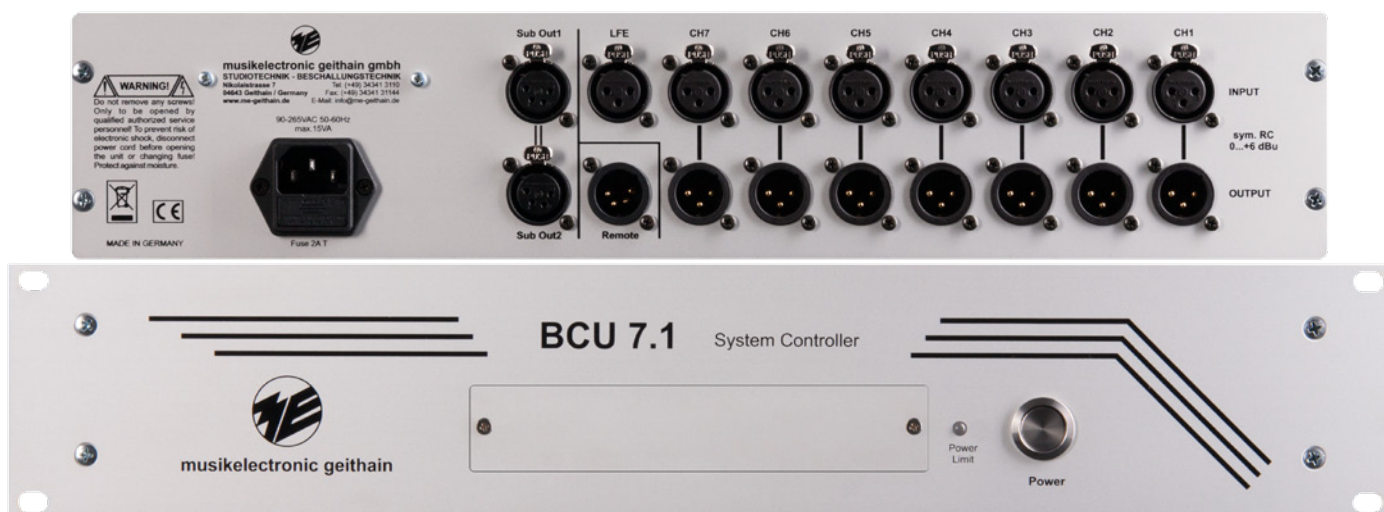




musikelectronic geithain

BCU 7.1



Instructions for installation and use

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1 Introduction

Dear customer,

Thank you for your trust you have put in us by buying this bass management system. You decided upon a quality product that in regard to technical characteristics complies to the utmost expectations.

Please read the technical description and manual to take advantage of the capabilities of this bass management system and ensure safe operation.

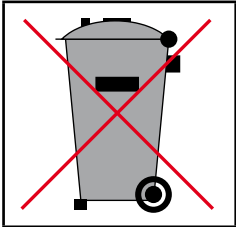
2 System description

The analogue bass management system BCU7.1 is used in addition to our BASIS models and is employed everywhere, where source systems don't provide a separate bass management system, e.g. in outside broadcasting vans or small post production studios. The BCU7.1 is geared for application with active subwoofers from the BASIS series and provides enough flexibility for optimal adjustment to the application site without being confronted with a complicated control concept. The bass management system applies all tasks of filtering, equalisation, level adjustment of the subwoofer as well as bass signal limiting. It is connected via a special XLR4 cable to the MPI (Multi-purpose input) of the actual BASIS model. The BCU 7.1 allows feeding up to two subwoofers. Because of a compact cabinet it is easily integrated into existing setups. In contrast to other alternatives, where the bass management system is integrated into the subwoofer, with BCU7.1 wiring effort is significantly reduced.

3 Basic information

3.1 Guidelines

This product complies to requirements of current European and national guidelines (Elektromagnetische Verträglichkeit EN55103-1 Class A und EN55103-2 Immunität).



Products built by us belong to B2C-class of the WEEE guidelines and must not be disposed with domestic waste.

3.2 Safety instructions

Like using any other electrical device you should observe the following operation guidelines, safety instructions and warning signs to ensure optimum functionality and safety of operation!

- ✦ Read these instructions carefully.
- ✦ Keep these instructions.
- ✦ Do not attempt to service this product yourself as opening or removing cover may expose you to dangerous voltage or other hazards.
- ✦ Electrical devices are not intended for use by kids.
- ✦ Operate this device only with the mains voltage stated on the backside.
- ✦ Do not install the device near any heat sources.
- ✦ Do not expose the device to direct sun radiation.
- ✦ Do not install the device in rooms with high humidity.
- ✦ The device shall not be exposed to dripping or splashing and no objects filled with liquids shall be placed on the device.
- ✦ There is risk of electric shock when the device is open.
- ✦ Refer all servicing to qualified service personnel.
- ✦ Clean only with dry or slightly moistened cloth.

Water, rain, humidity and dust

The device is not protected against water, rain or excessive humidity and mustn't be exposed to these environmental conditions or operated next to them (for example damp rooms or next to swimming pools).

Employ appropriate safety measures to prevent dust and dirt to get into the device. Dust and humidity are often the main reason for high voltage creepage paths and serious electrical dangers.

Maintenance

The device has to be disconnected from mains supply and contact the authorised retailer or authorised repair and maintenance shop or the manufacturer. Maintenance is only allowed by one of the stated groups, because opening or removing the cover could expose you to dangerous voltages or other dangers. Maintenance is required when

1. the mains cable or plug is damaged.
2. liquids were spilled over the device or objects have fallen into the device.
3. the device was exposed to rain or high humidity.
4. the device has fallen down or was damaged otherwise.
5. the device shows no correct functionality.

Repairs and replacement parts

All repairs have to be conducted by authorised retailers or an authorised repair and maintenance shop or the manufacturer. In case replacement parts are required, it has to be ensured, that only the parts specified by the manufacturer are used. Using unauthorised replacement parts may lead to injuries or damages by fire or electric shock or other electrical dangers.

Safety test

After completion of maintenance or repairs on the product the authorised retailer or the authorised repair and maintenance shop or the manufacturer should conduct safety tests to ensure the correct functionality of the device.

Transport damage

To ship this device, always use the original shipping carton and packaging materials. For best protection pack it the same way as the factory.

Environments

This product is only allowed to be operated in E1, E2, E3, or E4 environments corresponding to EN55103-2 "Electromagnetic compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use – Part 2: Immunity".

Cleaning

Disconnect the device from the mains supply before cleaning. Do not use liquid cleansers or spray.

Mains protection

Install mains cables so that nobody steps on them or they are impressed by objects placed above or next to them. Pay attention to cables, plugs, and sockets as well as the points, where they leave the device.

Thunderstorms

To additionally protect the product in thunderstorms or when it is unattended and not used for a longer time, disconnect the device from the mains supply. This prevents damages at the product by lightning or current pulses. Disconnecting the mains supply is only possible when the plug is pulled out of the mains socket.

Intrusion of external objects or liquids into the device

Do not put any objects into any openings of the device, because they could contact dangerous voltage points or shorten out parts leading to fire or electrical shock. The device mustn't get into contact with liquids.

Connection to other devices

When connecting the device to other equipment, ensure the devices are switched off and disconnected from mains supply. Otherwise there is risk of electrical shock and serious injuries. Consider the service manuals of the other devices carefully and follow the instructions before connecting the devices.

Connections

Independent wiring is only allowed by qualified personnel. To avoid electrical shock, do not operate the product when a conducting part of the speaker cable is exposed.

Employ appropriate safety measures when connecting the mains cable. When installing or connecting the product, disconnect it from mains supply. The product mustn't be connected to other alternating voltages and sockets than demanded on the back of the device.

NOTE: Only off-the-shelf cables are allowed to be used to connect the product to mains.

NOTE: To disconnect the product from mains, first disconnect the mains cable from the socket, then remove the cable from the product.

THE MAINS CONNECTION MUSTN'T BE DISCONNECT FROM PROTECTIVE EARTH. THAT'S ILLEGAL AND DANGEROUS.

3.3 Environmental conditions

Ensure the following environmental conditions when handling the BCU 7.1:

Operating temperature + 15 °C ... + 35 °C

Storage temperature range - 25 °C ... + 45 °C

Relative humidity 45 % ... 75 %

3.4 Unboxing

Unpack the device carefully and check for visible damages by inappropriate transport. In case of damages report them to your retailer. Keep the packaging, in case the speaker has to be transported in the future.

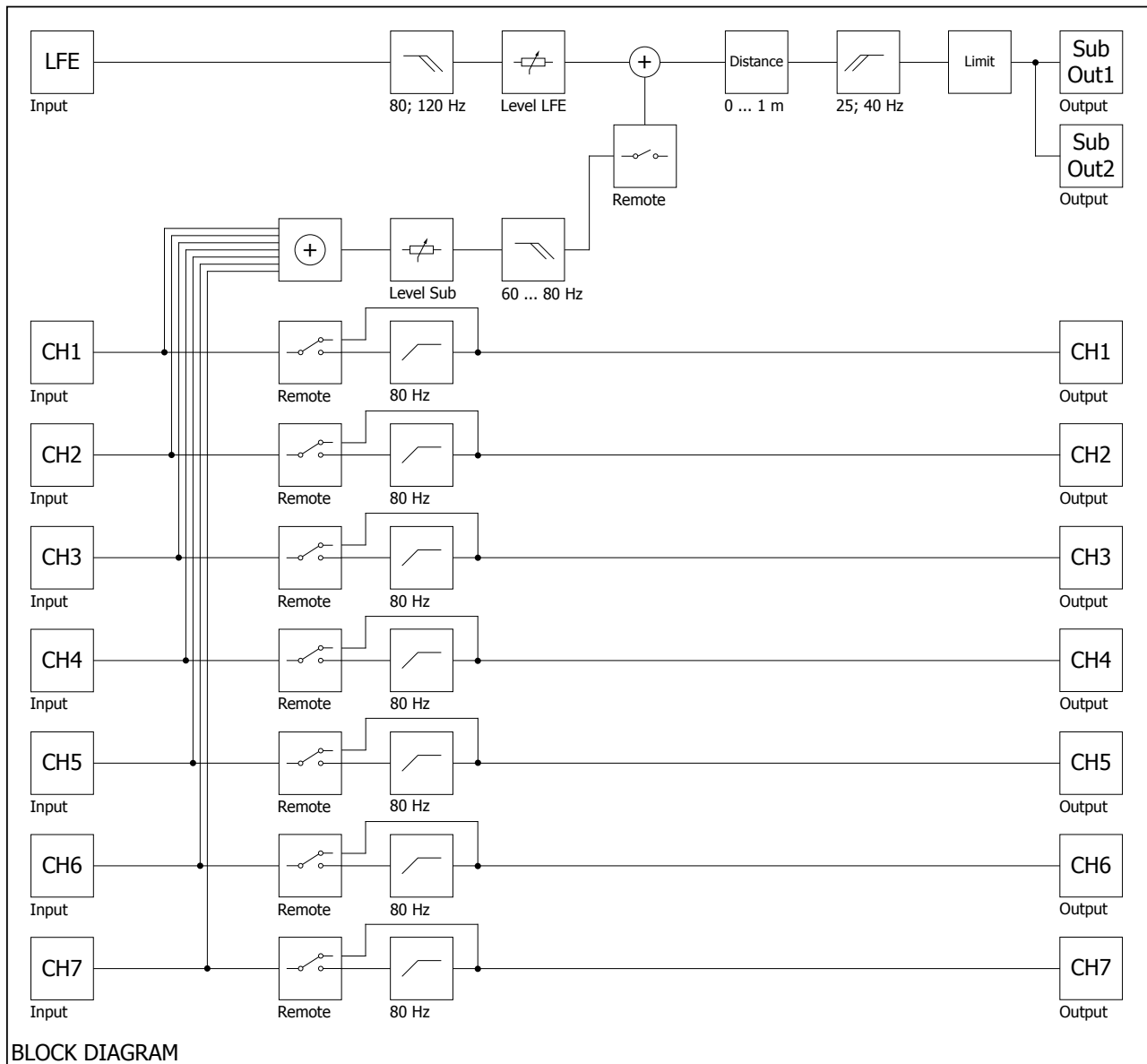
3.5 Delivery contents

- ✦ Bass management system BCU 7.1 (19 inch)
- ✦ Mains cable
- ✦ Connection cable between BCU 7.1 and BASIS subwoofer (standard length 5 m)
- ✦ System description and service manual

3.6 Guarantee acknowledgements

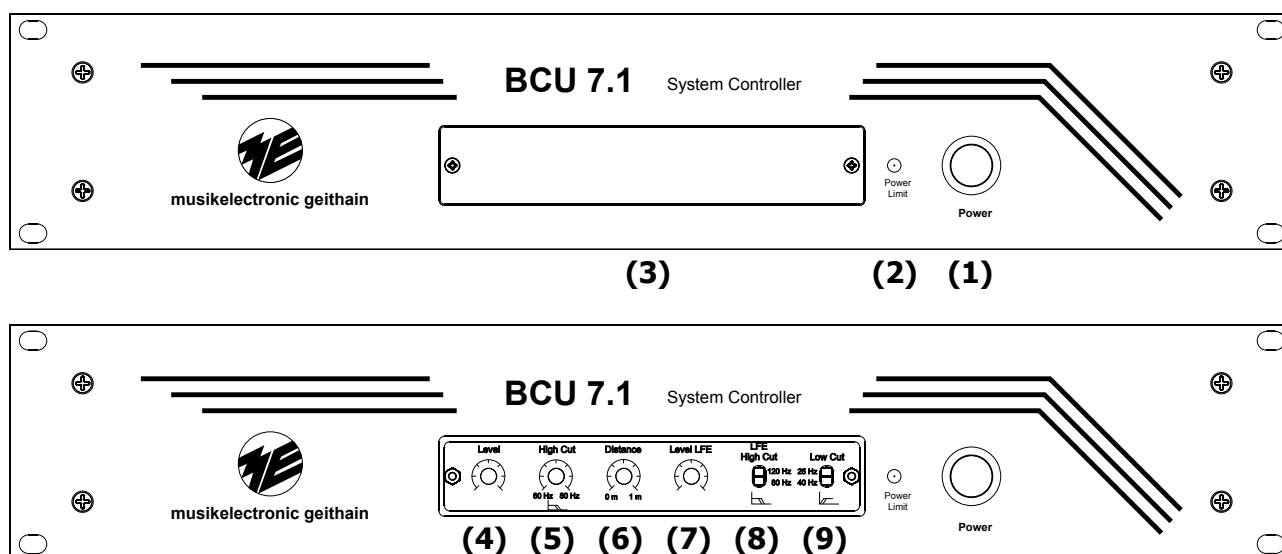
Opening the device by unauthorized personnel leads to all claims under guarantee expire. In case of destruction by overload, misuse or outside influences there are no claims under guarantee.

4 Block diagram



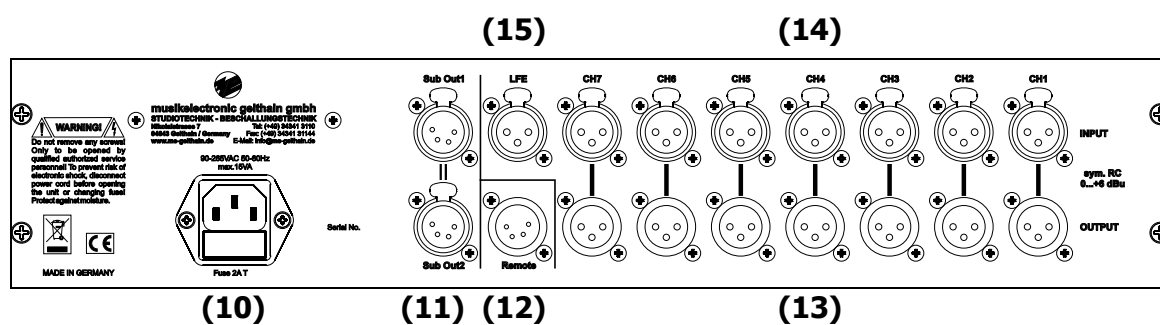
5 Controls and connections

5.1 Front side



- ✦ Power button **(1)**
- ✦ Status indicator **(2)**
- ✦ Unscrewable faceplate **(3)**
- ✦ Continuously adjustable rotary controls for level, high cut, distance and level **(4) - (7)**
- ✦ Switch for LFE high cut and low cut **(8) - (9)**

5.2 Back side



- ✦ Mains connection **(10)**
- ✦ Output connectors Sub out 1 and Sub out 2 **(11)**
- ✦ Remote control **(12)**
- ✦ Output jacks CH1 and CH7 **(13)**
- ✦ Input jacks CH1 bis CH7 **(14)**
- ✦ LFE input **(15)**

5.3 Operation

On the back of the BCU 7.1 is a mains connector to power up the device (10), seven XLR3 input and output jacks (13) - (14) and one LFE XLR3 input jack (15). Two XLR4F jacks (11) provide a connection to up to two subwoofers. Below the LFE input is a XLR4M to connect a remote control.

The front houses a power switch (1) and status indicator LED (2). Below an unscrewable faceplate (3) are four continuously adjustable rotary controls (4) - (7) and two switches (8) (9) to adjust the subwoofer to the satellites and acoustical conditions in the listening room.

The controls affect the overall level of the mixed signal derived from the input channels (4), it's upper cut off frequency (5), the phase degree (distance) (6), and the LFE level (7). Through two switches the roll off frequency of the LFE high cut is switchable from 80 to 120 Hz (8) and the lower roll off frequency of the subwoofer from 25 to 40 Hz (9).

5.4 Wiring

Ensure that the mains switch is in position "OFF" (1). Only when The BCU 7.1 is completely connected you can take the device into operation by use of the mains switch.

Mains connection

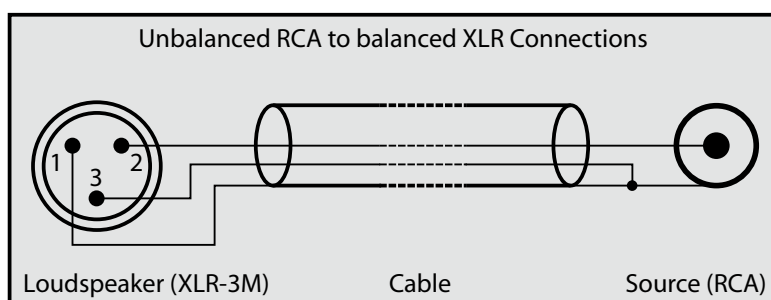
Connect the mains connector of the BCU 7.1 to a mains socket with the included mains cable.

Cable connection

The inputs and outputs of the BCU 7.1 are electrically balanced. When your signal source also utilises balanced connectors, please use a cable wired as stated in the table:

	Balanced connector (amplifier) XLR	Balanced connector (signal source) XLR	Unbalanced connector (signal source) RCA
Earth	Pin 1	Pin 1	Ring
Signal +	Pin 2	Pin 2	Tip
Signal -	Pin 3	Pin 3	Ring

When using a signal source with unbalanced outputs (RCA) you need to balance the connecting cables. This avoids hum and other noise interferences. The table and the following figure show the wiring.



LFE connection

Through the LFE connection you can use a BASIS 11K, BASIS 13K or BASIS 14K to play back the LFE signal or as a subwoofer. Connect the LFE output of your signal source to the LFE input of the BCU 7.1 (15).

Subwoofer connection

The subwoofers are connected through the included cable. For reasons of safety, this cable has XLR4M plugs on each end. In case you need another cable length, it can be manufactured on request. The cable is wired as shown in the following table:

	Balanced connector (BCU7.1)	Balanced connector (BASIS)
	XLR4M	XLR4M
Earth	Pin 1	Pin 1
Signal +	Pin 3	Pin 3
Signal -	Pin 4	Pin 4

Integration in stereo and surround speaker systems

In stereo or multi-channel operation the channels connected to the BCU 7.1 are passed through the active crossover of the BCU 7.1. The lower frequencies of the signals are filtered and played back by the bass system. The main and surround speakers are relieved in the lower frequency range.

Connect the speakers with the output jacks CH1 to CH7 (13). Pay attention to the input and output jacks CH1 to CH7 while connecting so they aren't interchanged. The following table shows an example for stereo operation:

	Input (from signal source)	Output (to speakers)
CH1	Front left	Front left
CH2	Front right	Front right

The connection scheme for a 5.1 configuration could be as follows:

	Input (from signal source)	Output (to speakers)
CH1	Center	Center
CH2	Front left	Front left
CH3	Front right	Front right
CH4	Surround left	Surround left
CH5	Surround right	Surround right

For 7.1 operation consider the following example:

	Input (from signal source)	Output (to speakers)
CH1	Center	Center
CH2	Front left	Front left
CH3	Front right	Front right
CH4	Surround left	Surround left
CH5	Surround right	Surround right
CH7	Surround back left	Surround back left
CH7	Surround back right	Surround back right

5.5 Status indication

The two-coloured LED at the front of the BCU 7.1 is used as status indicator of the device.

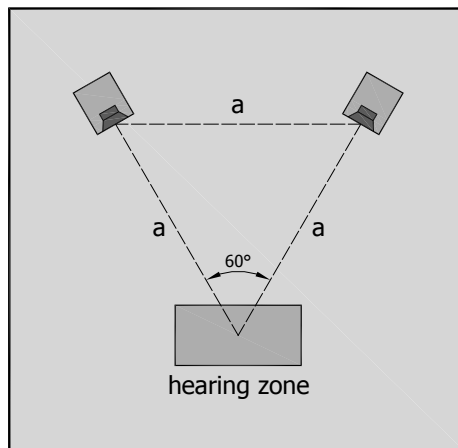
- ◀ LED green: indicates normal operation of the device
- ◀ LED red: indicates the operation of the overload protection circuit;
Output voltage limitation to protect the BASIS from overloading

NOTE: As the BCU 7.1 takes over the overload protection, the clipping LED at the BASIS is permanently green and therefore does not serve as overload indicator.

6 Speaker positioning

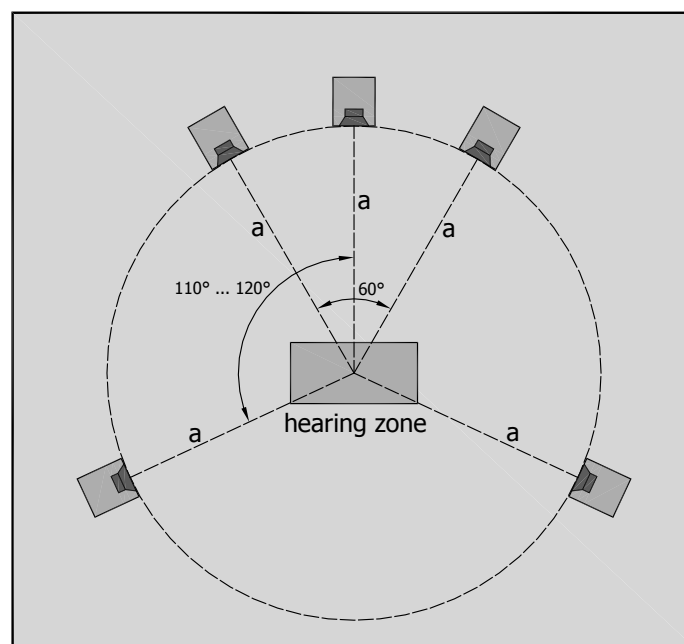
6.1 Stereo operation

The optimum position of the speakers in your listening environment is the so-called stereo triangle (see figure). The base distance between the speakers and the distance to the hearing zone form an equilateral triangle (stereo triangle). A distance less than 2 m (6 ft) or more than 4 m (13 ft) should be avoided. For precise, spacial reproduction turn the speakers inside, directed to the hearing zone.

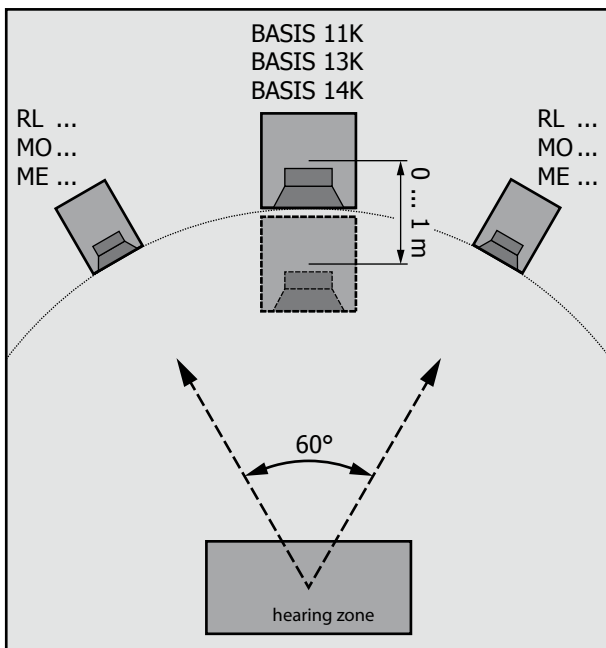


6.2 Surround operation

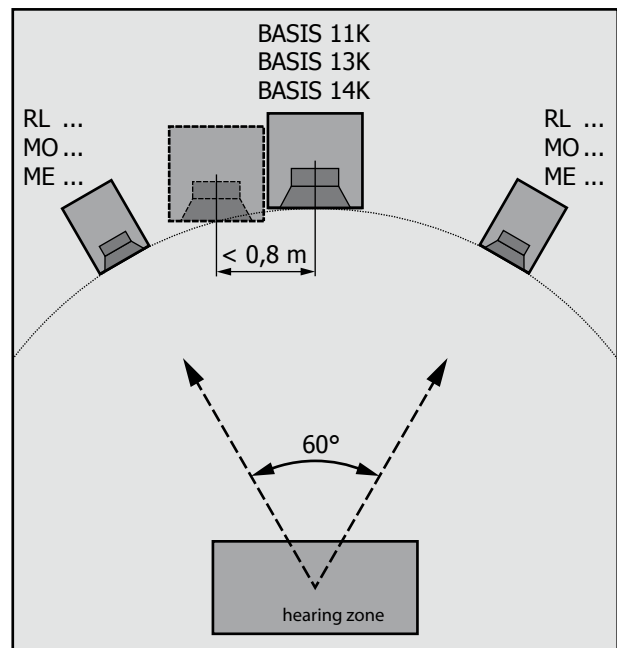
In surround operation the stereo triangle (see Stereo operation) is extended to a circle. The hearing zone is the center of this circle. Position all speakers in the same distance to the hearing zone. The center speaker is positioned in the middle between both front speakers. Pay attention to positioning the front and surround speakers horizontally along one plane. The angle between center and surround speakers should be about 110° - 120°.



6.3 Subwoofer positioning



The distance between the subwoofer and the main speakers plane should not be more than one meter in direction of the listening spot (like shown in the figure). It is possible to correct the phase caused by the placement within this limits with the rotary controller "Distance" (6) on the BC U7.1 device.



There is no need to place the BASIS exactly in the middle of the stereo speakers, because sound sources below 100 Hz could not be localised accurate. But you ought to place the subwoofer somewhere between the main speakers and in the same distance to the listening spot. If you place the BASIS-sub outside the stereo triangle it could cause in a miss localisation.

7 Adjustments for stereo and surround operation

After all speakers and subwoofers are properly positioned and connected, the level (4) of the subwoofer and the main speakers needs adjustment. Afterwards the level of the additional LFE channel could be adjusted (7). We advice to adjust the level in steps. Adjusting the level in stereo operation is advantageous. Usually you will have the most listening experience with this case, so you are more sensitive to faults in the sound.

In case the subwoofer could not be placed in the same plane as the stereo speakers, use the "distance" controller (6) on the BCU 7.1 to correct the phase (see chapter „6.3 Subwoofer positioning" auf Seite 15).

With the control (5) the cut of frequency is adjustable between 60 and 80 Hz. This adjustment is possible when the subwoofer is used as a central bass system. By default a cut off frequency of 80 Hz is advisable. An optimised adjustment should be done by acoustical measurements. The upper roll of frequency of the LFE channel is switchable and lies at 80 or 120 Hz (8).

In delivery condition the switch "LFE Low Cut" is at 25 Hz. In case you need a higher overall level, a lower roll off frequency of 40 Hz is useful (9). This adjustment is suggested when a subwoofer is used as a central bass system in stereo or surround operation and in LFE operation.

In studio applications with reference status a professional measurement in the control room is appropriate.

8 Technical data

Input connectors	
Satellites	7x XLR 3F
LFE	1x XLR 3F
Remote	1x XLR 4M
Nominal input level	- 4 dBu ... + 6 dBu adjustable
Input impedance	> 10 kOhm RC balanced
Output connectors	
Satellites	7x XLR 3M
Subwoofer	2x XLR 4F
Output level	
Satellites	+ 6 dBu at 2 kOhm
Subwoofer	adjustable
Output impedance	50 Ohm balanced
Filter characteristics	
TP	24 dB / oct.
HP	12 dB / oct. 80 Hz
Crossover frequencies	
Satellites	HP 80 Hz
Subwoofer	TP 60 ... 80 Hz continuously adjustable
LFE	TP 80 / 120 Hz switchable
Bandwidth	
In connection with BASIS11K/13K/14K	25 / 40 Hz switchable 60 ... 80 Hz continuously adjustable
LFE channel	25 / 40 Hz switchable 80 / 120 Hz switchable
Inherent noise sound level	
In connection with BASIS11K/13K/14K	GK0 / DIN 15996 r = 1 m
Dimensions	2 U in 19-inch rack
Weight	3.3 kg (7.26 lbs)
Temperature requirements	
for use	+ 15°C ... + 35°C
for storage	- 25°C ... + 45°C
Humidity	45 % ... 75 %
Connection between BCU7.1 and BASIS	Standard length 5 m; other lengths optional available

9 Notes



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