

# Basscube

## Operating Instructions



### Contents:

1. Introduction
2. Precautionary Measures
3. Our Idea
4. Operating Elements
5. Summary of Operations
6. Technical Data



## 1. Introduction

Welcome to AER. Thank you for purchasing the BASSCUBE.

You have chosen a professional, compact and powerful amplifier that was specially developed to amplify acoustic and electric bass instruments.

The BASSCUBE unfolds particularly impressive qualities with the double-bass, whether plucked or bowed. Although the range of bass tones is huge and their tone variety is enormous, we think we have found more than just a "good compromise".

## 2. Precautionary Measures

*When you use your BASSCUBE, always take basic safety precautions to reduce to a minimum the risk of injury by fire or by electric shock.*

- Read all the directions in these operating instructions and make sure that you understand them.
- Pay attention to all warnings, instructions and supplementary text written on the BASSCUBE.
- Always use a grounded mains connection with the appropriate supply voltage. If you are uncertain whether the connection is grounded, have a qualified expert check it.
- Do not let your BASSCUBE come into contact with water and never touch the amplifier if you have wet hands.
- Always operate your BASSCUBE in a place where no one can trip over the cables causing injury to themselves or damage to the cables.
- Do not operate your BASSCUBE near devices with strong electromagnetic fields such as large mains transformers, generators, neon lights etc. Do not lay the signal cable parallel to power lines.
- Do insure that your BASSCUBE is switched off before plugging in the power cable to the mains.
- Before cleaning your BASSCUBE, unplug it from the mains supply. Use a damp cloth to clean it. Do not use cleaning agents, and be careful that no liquid finds its way into the amp.
- There are no parts within your BASSCUBE that can be serviced by the user. Refer all repairs and servicing to an agent authorised by AER. Any unauthorised repair or servicing will void the two-year warranty!
- Keep these operating instructions in a safe place.

### 3. Our Idea

The BASSCUBE is fundamentally different from other amplifiers on the market.

As in the case of our ACOUSTICUBE IIa we have tried to produce a professional amplifier with comprehensive facilities producing excellent tone qualities in a small transportable cabinet. It is well known how innovative and experimental contemporary bassists are and this has resulted in greatly increased demands on tone and technology, and thus greater challenges for the developer.

#### To say in concrete terms:

1) Distortion-free powerful low-bass reproduction in particular is constantly at odds with physics, human perception and what cost accounting admits as being marketable. The following points have to be kept in mind:

Much more energy is required to make really deep tones as audible as mid-range or treble tones. The goal is a balanced reproduction of the authentic tone of the instrument independantly of resonance and formants. This is where several problems can theoretically add up:

- Human hearing is much more sensitive to the mid-range than to the other ranges.
- The instrument does not display its individual spectrum at all uniformly. There are great differences in level, diffraction and vibration period. There are cancellations and intensifications
- Low-bass reproduction requires more energy and places considerably greater demands on both the material and the components, in particular when supplementary amplification is made by the means of the tone control (for example: + 15dB at 80 Hz corresponds to 5.6 times the voltage at that point).

2.) The "bass" is a very demanding instrument as far as its tone is concerned. Its soundproducing capacity ranges over the entire audio spectrum. However, the distribution with respect to the level is quite disproportional. Except in the case of the contra-bass, there is little natural bass to be found, but a considerable amount of "lower mid-range" and "mid-range", and little in the way of useful natural treble. Particularly when the sound is to be amplified, the spectrum of instruments played (double-bass, electric double-bass, passive electric bass-guitar, active electric bass-guitar, acoustic bass-guitar) require an acoustic processing of the bass signal in order to acquire a tone that will felt to be "beautiful". As a rule, the bass and especially the treble range are considerable amplified in order to acquire a more balanced signal to be processed further by means of lavish tone-controls. The chance coordination of tone pick-ups, pre-amplifiers and power amplifiers, each with control facilities of variable quality of its own, quickly leads to boundaries consisting in a mediocre signal-to-noise ratio of the system as a whole, as well to an impaired dynamic range since the power amplifier, the power source or the components too quickly reach the performance limit.

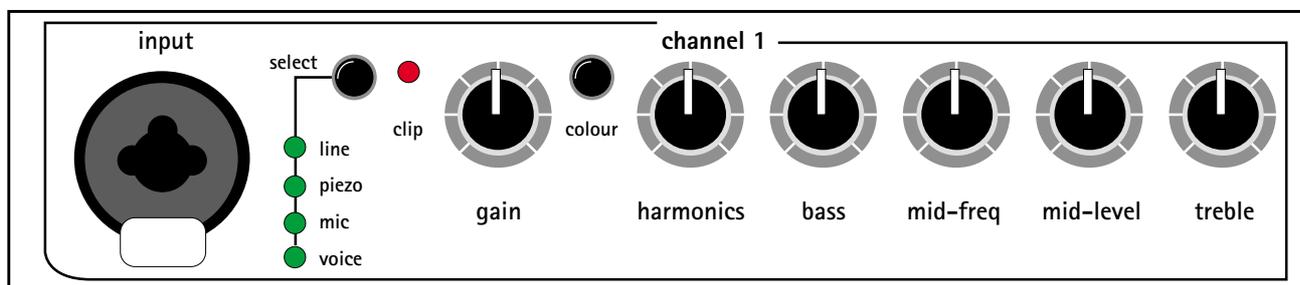
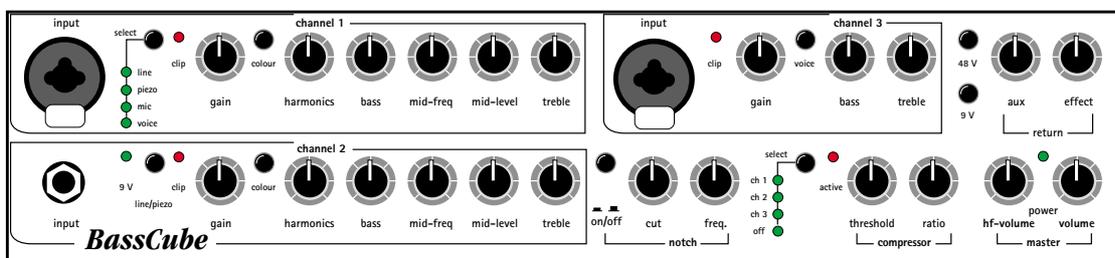
The double-bass presents even more problems. It can be bowed or plucked and it is supposed to be electrically amplified not only to sound "beautiful", but also so that it will sound "authentic", it has a sensitive resonance pattern and a larger sound range. At this point, that should be enough to make it clear

how varied the problem is and why we followed radically different paths when we set out to realise our tone ideas in order to make the bass sound the way it wants to sound.

- A controlled switched mode power supply clocked to 200 kHz supplies the 350 watts/8 Ohm bass power amplifier with adequate constant voltage, independent from the load current. Its efficiency is exceptionally high. Among other things, this makes it possible to provide this degree of performance in such a small cabinet without causing thermal problems.
- The analogous signal processor monitors the signal so that full power-amplifier performance can be called upon without the "headroom" that would normally be necessary. That saves space and weight, is gentle to the loudspeaker and provides for constant and definite conditions in the power amplifier. Since a "closed system" (power amplifier, processor and loudspeaker) is at issue, it is possible to match all components involved optimally, thus ensuring a maximum of effectiveness without overstraining the system. We approach the limits without exceeding them.
- We chose a 12" B&C die-cast long-stroke speaker. This 12" loudspeaker is particularly suitable for bass reproduction in small bass-reflex cabinets. Reproduction characteristics, capacity and efficiency are interrelated in such a manner that special bass speakers are always somewhat softer (by about 3 dB) than universal speakers. The speaker has been subjected to electrical and mechanical testing according to AES (Audio Engineering Society) standards.
- The cabinet must withstand enormous strains. It is made of 18 mm birch multiplex (13 ply) and is grooved and glued with waterproof glue. The loudspeaker is contained in a bass-reflex chamber separate from the electronic unit so that everything is mechanically decoupled.
- The BASSCUBE is "two-way-active", that is, there is an additional dome tweeter with active frequency crossover and its own power amplifier with 60 watts to 8 ohm. The tweeter is mounted on a multiplex traverse in the middle of the 12" bass loudspeaker (coaxial construction). The "combo-amplifier" is hence a full-range 2-way active speaker system with audio quality.
- Furthermore, the BASSCUBE is constructed with 3 channels (supplemented by Aux-in). This makes complicated set-ups using a piezoelectric pick-up, magnetic pick-up and microphone, all linked to one amplifier, through which you can also sing.
- Further features include:
  - 48 V phantom source for a microphone
  - 9 V phantom source for bass electronics (through a stereo cable)
  - FX-loop, mono, parallel
  - Notch filter with adjustable cut and frequency
  - switchable compressor
  - variable DI-out to XLR
  - line-out, tuner-out, headphones-out
  - footswitch (FX-loop on/off)
  - variable tape-in (RCA phono plug)
  - active subwoofer out
  - passive ext. speaker out
  - groundlift & voltage select

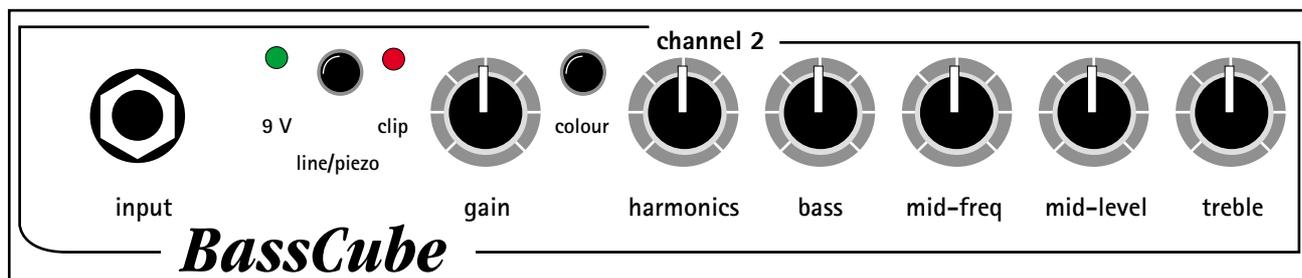
## 4. Operating Elements

Front (seen from above, from left to right):



Channel 1 (1st main channel):

<b>Input</b>	XLR combination socket with a socket for a 6.3 mm jack plug asymmetrical for "line" and "piezoelectric" and an XLR male socket symmetrical for "mic" and "voice"	<b>Voice</b>	symmetrical microphone input stage with a special filter to strengthen language reproduction
<b>Select</b>	<p>preselector switch for:</p> <p><b>Line</b> input stage (among others, for instruments with magnetic sound pickups or piezoelectric pick-ups with active preamplifiers)</p> <p><b>Piezo</b> input stage (passive piezoelectric pick-up without preamplifier, a special AER development)</p> <p><b>Mic</b> standard symmetrical microphone input stage and</p>	<b>Clip</b>	overload indicator
		<b>Gain</b>	input level control
		<b>Colour</b>	mid-range contour filter, switchable
		<b>Harmonics</b>	control for mixing in internally generated harmonics (tone-control with parametric mid-range)
		<b>Bass</b>	tone control for bass
		<b>Mid-Freq.</b>	mid-range frequency selection
		<b>Mid-Level</b>	level control for mid-range
		<b>Treble</b>	tone control for treble

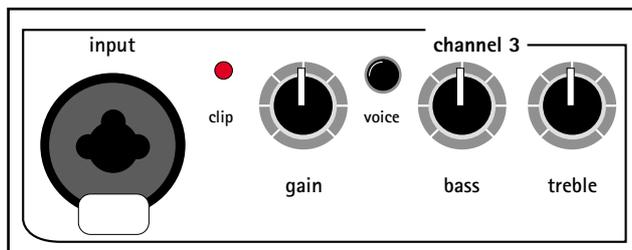


**Channel 2 (2nd main channel):**

- Input** socket for a 6.3 mm jack plug
- Select** switch for input stages:
  - Line input stage (among others, for instruments with magnetic sound pickups or piezoelectric pick-ups with active preamplifiers)
  - Insertable filter module (200 Hz + 3 dB, 800 Hz - 6 dB) to improve matching to various instruments
  - Piezo input stage (passive piezoelectric pick-up without preamplifier, a special AERdevelopment)
- 9 V** LED indicator: 9 V phantom source on – permits voltage supply to an electronic internal bass-unit from the BASSCUBE
- Clip** overload indicator
- Gain** input level control
- Colour** mid-range contour filter, switchable
- Harmonics** control for mixing in internally generated harmonics

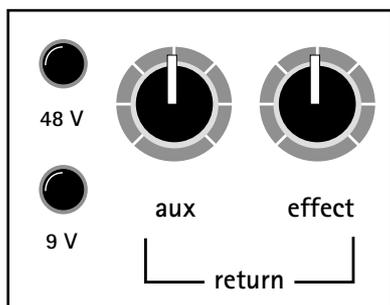
(tone-control with parametric mid-range)

- Bass** tone control for bass
- Mid-Freq.** mid-range frequency selection
- Mid-Level** level control for mid-range
- Treble** tone control for treble

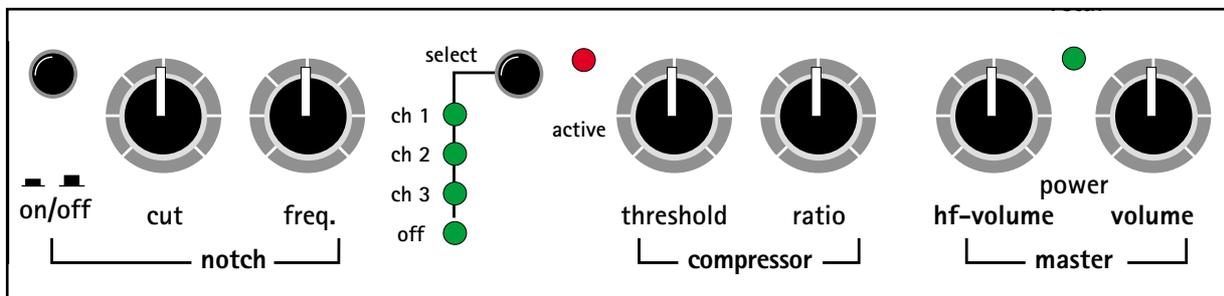


**Channel 3 (supplementary channel):**

- Input** XLR combination socket with a socket for a 6.3 mm jack plug asymmetrical for line input (magnetic pick-up or piezoelectric with preamplifier) and an XLR male socket symmetrical for mic (voice-filter can be switched)
- Clip** overload indicator
- Gain** input level control
- Bass** tone control for bass
- Treble** tone control for treble



**Phantom** (supplementary source voltage):  
**48 V** 48 V on or off (for all microphone inputs)  
**9 V** 9 V on or off (only channel 2 to supply an active electronic unit)  
**Return:**  
**Aux** level-control for the auxiliary input (tape-in, RCA phono-plug)  
**Effect** level-control for the internal effect-loop



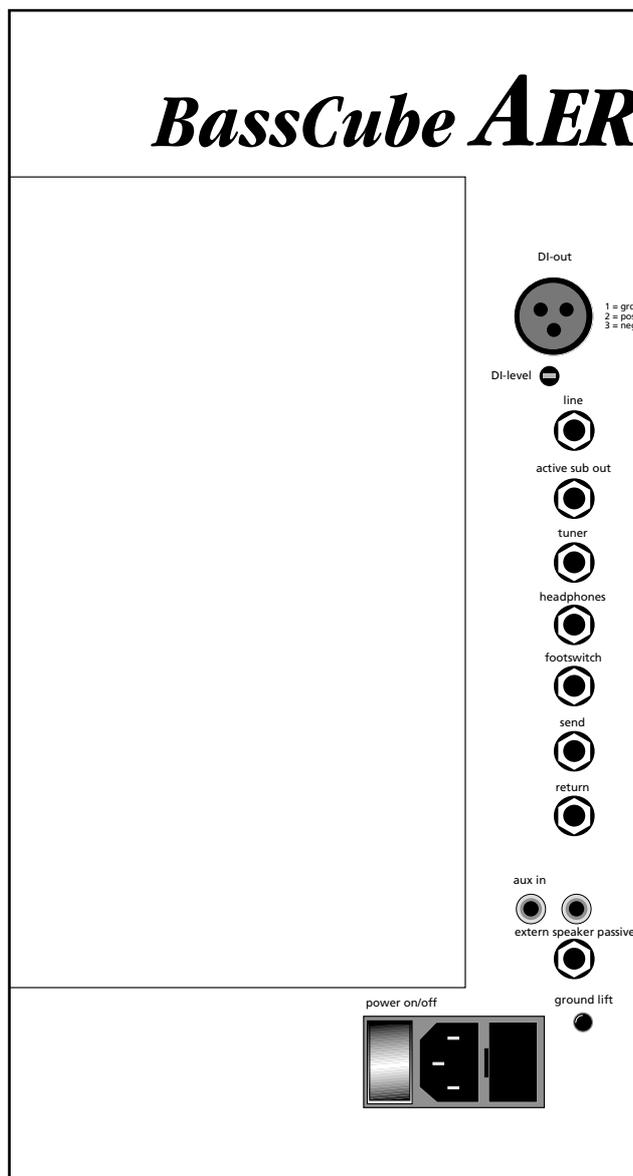
**Notch** (notch filter):  
**on/off** filter on or off  
**Cut** level-control for the narrow-band reduction  
**Freq** level-control for the frequency selection

**Compressor** (e.g. to compensate differences in the dynamic range of the sources):  
**Select** switch to select channel 1, channel 2, channel 3 or non-operational  
**Active** compressor operational  
**Threshold** control for the operational level  
**Ratio** control for the compression ratio

**Master** (adjustment of the overall volume):  
**HF-Volume** level-control for the high-frequency power amplifier  
**Volume** level-control for the overall-volume

Rear (from left to right):

- DI-out** XLR direct output before the master-control
- DI-level** DI level-control, trim potentiometer
- Line** preamplifier output before master-control
  - Insert stereo jack to switch off the vent!
- Active sub out** output to drive an accessory active bass loudspeaker-unit
- Tuner** output for a tuning-device before master-control
- Headphones** headphone output, stereo plug
- Footswitch** connection for a footswitch to switch effects on and off
- Send** output for an external effect-device
- Return** input for an external effect-device
- Aux-in** auxiliary input, e.g. for tape recordings, drum machine
- Extern passive speaker** output for an additional passive loudspeaker (minimum impedance 8 ohm)
- Groundlift** disconnects the protective conductor from the signal ground to prevent hum pick-up in case of multiple grounding
- Power on/off** combined power supply with line-socket, fuse-holder (6.13 A slowblow) and voltage selection switch 115/230 V



## 5. Summary of Operations

### • Connecting and starting-up:

Check to ensure that the mains voltage (110 V in the USA and Japan, 230 V in Europe) at your location corresponds to what is permitted for operating your BASSCUBE. You will find the necessary information on the rear under "Dest." (country of destination) and "AC-voltage". The voltage is factory set appropriately for the country to which the set is delivered. However, you can switch the voltage between 110 and 230 volts if you wish to operate the BASSCUBE in another part of the world. For this purpose, remove the voltage switch element from the Power on/off module and rotate the inset until the desired voltage shows in the inspection window. Then return the element (115 volts on the indicator correspond to 110 volts).

Before switching the amp on, the "Master" and "Return" controls should be in the zero position (as far left as they will go) and all other controls in middle position. Then make all necessary cable connections (mains, instrument and/or microphone). Now you can switch on your BASSCUBE with the "Power"-switch on the rear of the amp. The green power indicator shows that the amp is operational.

### • Level control:

You can use the "Gain"-control to match the various pick-up systems and signal sources to the BASSCUBE. The "Clip"-indicator shows when the input-signal is too high. You should then reduce the gain-control or the volume-control in your guitar or other source to ensure distortion-free reproduction. Then set the desired overall-volume with the "Master"-control; "HF-Vol." is the control for the share for the high-frequency power amplifier.

### • Tone control:

The three-band tone control of your BASSCUBE is technically of a completely parametric design; however, only the mid-band can be user-adjusted in frequency and level. We hope that we have chosen the filters so that you will be provided with a versatile and universal amplifier too that can come to terms with the variety of basses and voices. Please tell us if we are right. However, we are of the opinion that more is needed in order to make an instrument sound balanced. For one part, the "Colour"-switches on channels 1 and 2 make it possible to turn the tone-brighter and more transparent. On the other hand, the "Harmonics"-control makes it possible to mix generated overtones into the bass signal. We are confident that harmonics, colour and variation of the ratio of treble to bass will enable you to establish a basic sound that you can then adjust with the tone-controls as needed. You should remember here, too, that more can be less. Extreme treble-accentuation (unbalanced reproduction characteristics particularly in combination with active bass-electronics) will also amplify hiss from stage to stage.

### • Three channels – why?

Channel 1 and 2 are intended to be the main instrumental channels. Several input stages, colour, harmonics and three-band tone-control are equally available for two instruments or two signal-sources on one instrument. Channel 3 is intended to be the address or vocals channel. Each channel has special attributes, but the following features are also doubly available: "Line", "Piezo", "Mic", "Voice", "Colour", "Harmonics" and "Three-band tone-control".

- **Notch filter**

A notch filter subjects frequencies of a certain frequency-band (in this case between 30 and 400 Hz) to severe reduction (- 14 dB) in a very narrow band (quality 2). This helps to reduce feedback and other annoying resonances. The special properties of the notch filter can also be used to modify the sound.

- **Compressor**

All our amplifiers are dynamically controlled. The supplementary compressor can only be switched off completely or switched to one channel. In addition to its function as a dedicated bass effect-device, it can be used to compensate differences in dynamic range between various signal-sources or to give dynamic support to the voice.

**Further outputs:**

**DI-out** The composite signal after tone control but without effect and before master control lies on the XLR socket. (Appropriate for a direct connection of the BASSCUBE to a sound system.)

**Line** The composite signal after tone control, with effect and before master control lies here. (This output can be used for tape recordings).

**Active sub out** The composite signal after tone control, with effect and after master control is connected here. (This output can be used for active sub-woofers).

**Tuner** A tuning-device can be connected to this output, and need not be switched between instrument and amplifier, as is often the case. This precludes any effect on the sound.

**Headphones** Output for stereo headphones, the power amplifiers are then muted.

**Footswitch** The socket for the footswitch turns the effect on or off.

**Send** Sends the effect, delivers the drive-signal for the effect.

**Return** Effect return, returns the effect-signal to the BASSCUBE.

**Aux In** Auxiliary input for tape, CD or drum machine.

Extern passive A passive supplementary loedspeaker can be connected here speaker (minimum impedance 8 Ohm).

O.K.? We hope you enjoy your BASSCUBE!

## 5. Technical Data

### Inputs:

Ch1: XLR-Combi  
 line: unbalanced, 1 MEG, stereo,  
 (ring: 9V/15V phantom power)  
 piezo: unbalanced, >10 MEG, Bultra  
 high impedance inputstage  
 mic: balanced, 1 k, 48V phantom  
 power

Ch2: line: unbalanced, 1 MEG  
 piezo: unbalanced, >10 MEG, Bultra  
 high impedance inputstage

Ch3: XLR-Combi  
 line: unbalanced, 1 MEG, stereo  
 mic: balanced, 1 k, 48V phantom  
 power

Return: effect-return, mono 0dBV/22k  
 Aux-In: cinch, stereo 0dBV/22k

### Outputs:

DI: balanced, adjustable -20dBV to -  
 10dBV (1=gnd, 2=pos, 3=neg)

Line: unbalanced, 0dBV, pre master

Active Sub out:  
 unbalanced, 0dBV, post master

Tuner: unbalanced, -10dBV

Headphones: 2 x mono, 2 x 320 mW at min. 4 ohms

Footswitch: mono

Send: effect-send 0dbV

ext. speaker passive:  
 min 8 ohms

### eq:

ch1/2: bass: ±10 dB/ 80 Hz  
 middle: ±10 dB/ 200 Hz - 1 kHz  
 treble: ±10 dB/ 10 kHz  
 colour: -3 dBV/ 700 Hz and +  
 10 dBV/ 10 kHz

ch3: bass: ±06 dB/ 100 Hz  
 treble: ±10 dB/ 10 kHz

**Notch:** cut: -14 dBV/ 30-400 Hz

### Compressor:

threshold: -40 dBV - 0 dBV  
 ratio: 1:1 to 20:1

### Analog Signal

**Processor:** limiter, displacement filter

### Power Amp:

Powerconsumption:

220-240 V / 50-60Hz /  
 400 VA (110V / 50-60Hz)

rating: bass 340 watts / 8 ohms rms  
 tweeter 360 watts / 8 ohms rms

freq.resp: 20 Hz - 30kHz

fuse: 6.13 A slow

### Speaker:

bass: 12" B&C longcoil di-cast chassis  
 (96 dB 1w/1m, freq.range 38 Hz-  
 2 kHz)

tweeter: B&C cone tweeter (103 dB 1w/1m,  
 freq.range 5 -16.5 kHz)

**X-over:** active two-way, 4 kHz / 24 dB/  
 oct., LR-filter

**Cabinet:** 10.71" 3(18 mm) birch plywood

**Dimension:** 15.75" (400 mm) wide

15.75" (400 mm) high

14.33" (364 mm) deep

**Finish:** waterbased acrylic, black spatter finish

**Weight:** 53.3 lbs. (25 kg)

0dBV ~ 1V

Specifications and appearance subject to change without notice


**AER**<sup>®</sup>  
 Audio Electric Research

**Audio Electric Research GmbH&Co. KG**

Christine-Englerth-Straße 30

D - 45665 Recklinghausen

Telefon: +49 (0)2361 - 891789 / -90

Telefax: +49 (0)2361 - 891798 / -99