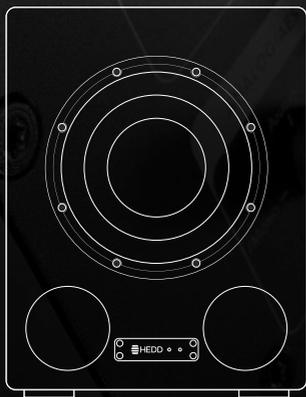




# OPERATION MANUAL

HEDD BASS 08

HEDD BASS 12



## Table of Contents

3	Introduction and Quickstart
4	Box Contents
5	Product Overview
7	Status LED
8	CoP: Closed or Ported
9	HEDD Lineariser®
11	Control Settings
15	Safety Instructions
17	Warranty
18	Troubleshooting
19	Technical Specifications
20	A Brief History of Time

# Introduction & Unpacking

Thanks a lot for choosing HEDD BASS subwoofer

All BASS subwoofer models have an identical backplate so this Manual works for all of them.

The BASS subwoofers monitors offer detailed and partly new kinds of controls, so we invite you to read through the following sections carefully.

Please unpack your new loudspeaker carefully. If you discover any damage to the packaging or the speaker itself, don't operate the speaker and contact your HEDD dealer for solving the problem.

We suggest that you allow the speaker to acclimate to the temperature of your room for about an hour before using it.

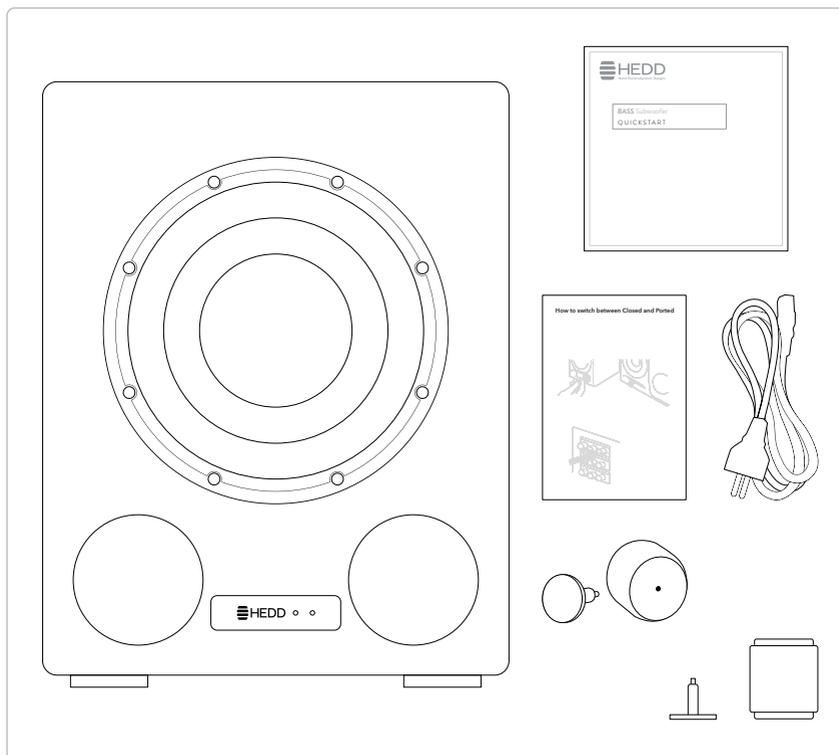
## Quick Start

- Make sure the main power switch is in the "0" position, then connect the power cord to the power-socket.
- Set the power switch to "1"
- Connect your audio source via the balanced XLR or the AES in socket, then select the desired input with the ANALOG / AES rotary switch.

As there are quite a number of control knobs on the backplate we recommend to start playing music with all markers in the "Up" position: ALL "0" and "↑" POSITION = FACTORY SETTING

Enjoy the music.

PS: Please save the original box as it provides the safest way for a future transportation of your speaker.



## Box Contents

The complete set includes:

- one active subwoofer HEDD BASS 08 or BASS 12
- one power cable compatible with the region from where it was sold
- quickstart guide
- «CoP» leaflet explaining the proper switch from Ported to Closed Mode
- «CoP» screw and plugs to seal the bass reflex ports

Please make sure your box contents match our listing.

# Product Overview

Congratulations on purchasing the HEDD BASS 08 or BASS 12. You have acquired very precise subwoofer with a rich feature set. The main features are exchangeable use as a *Closed* or *Ported* system, as well as the integration of the on-board *HEDD Lineariser®*. Please head to the specific section to find out more.

As active subwoofers, the BASS subwoofers have an integrated amplifier. You can connect them with a digital interface or analog pre-amplifier. Please refer to the section *Getting Started* or *Positioning* to find out more.

Due to their similar nature, this operation manual equally covers the HEDD BASS 08 and HEDD BASS 12 subwoofers. This manual uses illustrations of the different variants, which thus might not match your exact version in terms of appearance.

Front View



HEDD Honeycomb Woofer  
size 8" or 12" respectively

Front-facing Bass Reflex Port  
can be used ported or closed  
with included plugs

Status LED

please refer to section [Status LED](#) to correctly read the signal

Rear View



**Power Switch**

integrated universal mains, compatible with 85V - 264V at 50/60 Hz  
appropriate power cable supplied

**In- & Output Connections**

XLR analog & AES digital input

XLR analog output & AES passthrough

**BASS Control Board**

used for adjusting the various settings

please see section [Control Settings](#)

## Status LED

The front LED panel of the subwoofer will indicate its operational status as follows:



Green Light  
power on



Red Light  
overload: please decrease the input sensitivity



White Light  
stand-by

The monitors automatically jump into stand-by after 30 minutes. They wake back up when audio is played.

## Subwoofer placement

Only recommendations can be given here as the interaction between a subwoofer and the room modes (that are responsible for the standing waves that may occur) are complex and not predictable:

- Avoid placing subwoofers near walls.
- Definitively avoid subwoofers in corners.
- Try to watch a minimum distance of 50 cm between subwoofers and adjacent walls.

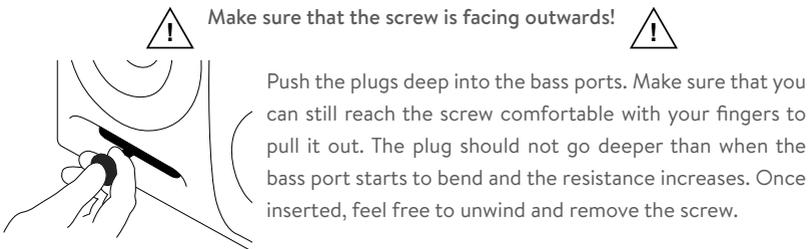
## «CoP» Closed or Ported

The HEDD Type 20 MK2 and Type 30 MK2 can be used in either closed or in ported mode. These are two fundamentally different systems that are available for the user to compare and choose. There is no definite *better* between the two systems. We recommend to compare carefully to find the optimal option for your environment and listening habits.

### Switching Between Closed and Ported

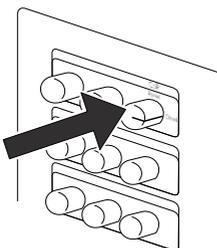
By default, the HEDD speakers are "ported." This means that the bass port is open. To switch to "closed" mode, please follow the steps below.

1. Insert the included HEDD plugs with help of the HEDD screw to close the ports.



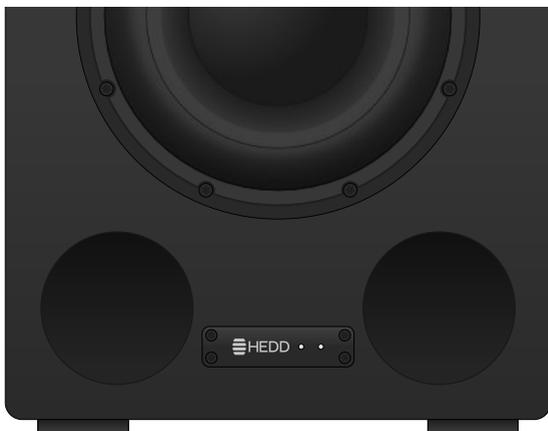
2. Switch the knob on the backpanel of your monitors to Closed mode.

Please note that the headroom in Closed Mode is limited compared to Ported Mode. We highly recommend to lower the volume before switching.



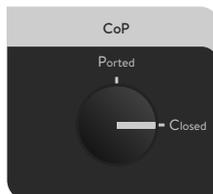
from Closed to Ported

To switch back to Ported Mode, stop the audio playback, wind the screw back into the plug, gently pull the plug back out again and change the rotary switch on the backpanel to Ported.



## Ported Mode

This is the default operating mode. The bass reflex ports are open and allow for a powerful low-end reproduction. This operation mode allows for a higher efficiency and while maintaining access to lower bass regions.



## Closed Mode

In closed mode the HEDD BASS subwoofer functions as an infinite baffle speaker. This results in a cleaner sound and increased resolution. However, a 6-10 dB reduction in maximum sound pressure level (depending on the audio material) for low frequencies is the consequence.

## HEDD Lineariser®

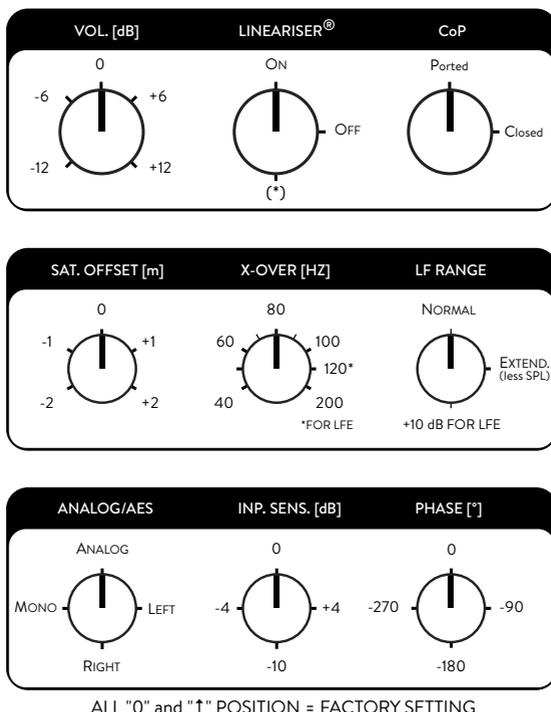
Due to the physically given relationship between time and frequency, expressed in the groundtaking harmonic analysis or Fourier transform, different tones have slightly different travelling times through loudspeakers. This is true for both active or passive speakers. Broadly speaking, lower frequencies need more time to pass through than midrange frequencies, and these are slower than the high tones.

Our HEDD Lineariser® offers a complex phase-correction of your HEDD sat-sub system. It solves one of the most challenging problems in loudspeaker designs, e.g. the natural occurrence of phase difference during multi-component sound reproduction. With the on-board Lineariser®, our monitors and subwoofers are always “right in time”.

The phase-linearisation will improve transients and imaging. To be noted: the correction necessarily will introduce a latency of around 30 ms. To avoid the delay that might affect live recordings or instrument playing the HEDD Lineariser® can be switched off.

# Control Settings

When viewing in PDF, please click the corresponding switch to jump to the appropriate section.



## Volume

The output volume rotary switch changes the reproduction level in a  $\pm 12$  dB range. We recommend to fine-tune the volume through the connected source like an interface, control board, mixing board or pre-amp.

The output volume allows to match the speakers to the audio chain, e.g. lowering SNR or THD. The default setting is 0 dB.

## HEDD Lineariser®

By default, the Lineariser rotary switch is turned on. This activates an on-board phase-correction of our HEDD BASS subwoofers.

For more information, please refer to the section [HEDD Lineariser®](#).

## Closed or Ported

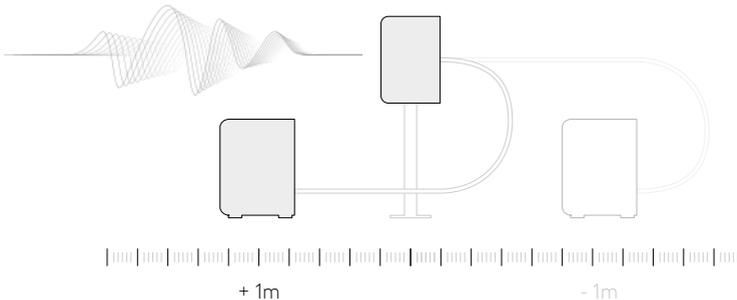
CoP switches the internal system layout according to the selected option. Please make sure that the plugs are correctly inserted for closed mode.

For more information, please refer to the section [Closed or Ported](#).

## Satellite Offset

With HEDD MK2 monitors and HEDD BASS subwoofers it is possible to build completely linear phase Satellite-Subwoofer set-ups. This works best when satellites and subs have the same distance with respect to the listener. For more details please read the “A Brief History of Time” section at the end of this manual.

In case the subwoofer has to be placed at a shorter or a longer distance the differences in travelling time of the sound can be compensated. Taking the sub position as given, with the Sat OFFSET control you can add or subtract  $\pm 2$  m in satellite distance with respect to the sub location. +1 m means the satellites are 1 m farther away than the subwoofer etc.



## Crossover (X-Over)

Different crossover frequencies are selectable by this control. In practice the 80 Hz position has established itself as a quasi-standard and we recommend it as well. Should you intend to set up a linear phase satellite-sub system you have to choose 80 Hz to make the phase linearization really working.

### LFE option

Sometimes multi-channel audio tracks have a separate audio channel, referred to as low-frequency effects (LFE).

For the use in LFE channel set-ups the BASS subwoofers can be set to LFE, the preferred format for film sound reproduction. The Format means a 120 Hz crossover point and an additional + 10 dB level.



These two settings are available at the controls:

- X-Over: 120 Hz for LFE
- LF Range: +10 dB for LFE

Should an AV receiver be responsible for the bass management, please set the X-Over control to “120 Hz for LFE” and the LF Range control to “normal”.

## Low Frequency Range

The default low frequency range may be adjusted according to specific needs. When set to extended, the low frequency response is extended by ~20 %. In the case of BASS 12 it goes from 20 Hz (-3 dB) down to 16 Hz (-3 dB).

Due to the now much bigger amplitudes the woofer has to manage the maximum sound pressure level SPL<sub>max</sub> is reduced by 6-12 dB depending on the kind of music.

## Analog/AES

This 4-position rotary switch functions as input selection. “Analog” takes an analog signal from a symmetrical source.

The other 3 positions refer to an incoming digital AES signal. Left, Right or Mono can be extracted from the data.

## Input Sensitivity

The “Input Sensitivity” rotary switch levels the voltage of the analog input. It can be used to optimize the signal to noise ratio for the A/D converter. In case of weak input signals the gain can be added for up to +4 dB. In case of very loud signals (>2 V) either -4 or -10 dB gain reduction can be applied to avoid an A/D converter overload.

The setting has no effect when the signal is received through the digital AES input.

## Phase

Due to different positions between Sub and Satellite it might be recommendable to switch the phase from 0 to 180 °, in some cases to 90° or 270° corresponding to timely optimisation in the crossover region, it is not clearly predictable due to the room - subwoofer coupling.

# Safety Instructions

Please read the following safety instructions carefully before setting up your system. Keep the instructions for subsequent reference. Please read the warnings and follow the instructions.

- To reduce the risk of an electric shock, do not open the loudspeaker yourself. Always refer to qualified service personnel.
- This is an active loudspeaker. It must be connected with an IEC 60320 AC mains power cord like the one supplied with the product.
- Please switch off your audio system before connecting or disconnecting any cables to the speaker – also if you intend to clean the surface or single components. Never use flammable or combustible chemicals for cleaning audio components.
- HEDD studio monitors are equipped with universal mains, meaning that the speakers work within a voltage range from 85–265V. This makes the usual voltage switches unnecessary.
- Do not place this unit on an unstable cart, stand or tripod, bracket or table. The unit may fall, causing serious injury and/or serious damage.
- This product should never be used outside. Avoid exposing it to rain or any sort of moisture.
- Power chords and audio cables connected to this product should never be stepped on.
- Please note that defective cables can harm your speakers and / or create humming, crackling, etc.
- Always keep electric equipment out of the reach of children.
- Always unplug sensitive electronic equipment during lightning storms.
- The monitor should be installed near the socket outlet and disconnection of the device should be easily accessible.
- To completely disconnect the speaker from the AC mains, physically disconnect the power chord.
- Please try to avoid touching the speaker diaphragms. Always keep the woofer's ventilation ports open.
- Don't use the speaker at very high or low temperatures. The speakers' back panel should not be exposed to direct sunlight. Never operate this product in an explosive atmosphere.
- High SPL's can irreparably damage your ears! Please take good care when working the speakers at high levels.
- Loudspeaker diaphragms are embedded in strong magnetic fields. Magnetic objects (toys etc.) should not be placed or played around with next to the speakers.
- Make sure that the air can circulate behind the speaker as it needs sufficient cooling.
- Only mount this product onto dry and non-conducting walls (wood, plaster). For other wall materials an additional isolation panel is required. To prevent injury, this loudspeaker must be securely attached to the wall in accordance with the installation instructions of your wall mount bracket.

## Maintenance and Care

- Your HEDD BASS subwoofer doesn't need any internal maintenance like lubricating, mechanical adjusting and so on, so there is no reason to open up the speaker cabinet. If servicing will be necessary, refer to qualified service personnel.
- For cleaning the surface of the cabinet, we recommend to use a microfiber cloth and simply warm water. Don't use any aggressive detergent, as it will damage the finish.
- For cleaning dust out of the loudspeaker diaphragms, use a very soft brush.
- Always switch the speaker off before cleaning!
- Make sure that no liquids get inside the cabinet.
- Don't use flammable or acidic chemicals for cleaning.

## Shipping and Packaging

If you need to send your speakers postal, use the original packaging. It's the safest way to get your speakers from A to B.

HEDD Audio GmbH cannot be held responsible for any damage due to improper packaging.

## Environmental Information

All our products comply with RoHS and WEEE.

If your speaker is seriously broken, please consult your local authorities for further information on proper disposal.

# Warranty

We promise that our products are free of defects in material and workmanship for the duration of twenty-four (24) months from the date of the original purchase. This warranty can be extended to thirty-six (36) months if the product is registered with us within the first 6 months after purchase: [hedd.link/registration](https://hedd.link/registration)

Accessories and any parts that are subject to wear and tear are covered for six (6) months.

The latest updates to our warranty will be accessible online at [hedd.audio/warranty/](https://hedd.audio/warranty/)

Please always contact your point of sale first: Please check our list of authorized resellers: <https://hedd.audio/store-locator/>

# Limitations

Please note that inappropriate use voids the warranty and any claims.

## Trouble Shooting

Problem	Solution
Green Power-LED is “on” but there is no audio output	<ol style="list-style-type: none"><li>1. Check the wiring and make sure that all cables are connected correctly.</li><li>2. Check if you have selected the correct input via the ANALOG/AES switch on the back panel of the speaker.</li><li>3. Check the signal path. Swap the cables of both loudspeakers. You might have one defective signal cable.</li><li>4. Connect an audio source directly to the speaker (pay attention to the volume!). If you now have audio output, the malfunction is in your signal path.</li><li>5. If the back panel of the speaker is very hot, it may be that the internal thermal protection of the amplifiers has shut down the audio output to prevent electrical damage. Turn the unit off, let it cool down and repower.</li></ol>
There is a hum or buzz noise in the output	<ol style="list-style-type: none"><li>1. Disconnect all signal cables. If the noise is gone, check your audio cables and the equipment of your signal path. If you are using the balanced XLR input, try to activate Ground Lift on your signal source.</li><li>2. If there is still noise, check if you have any other electrical devices that potentially produce high amounts of RFI (cellphones, switching power supplies, radio equipment) next to your speakers. If so, move them further away.</li><li>3. Try connecting the speakers to a different power socket.</li></ol>
Red Overload-LED lights up constantly	Reduce the input audio level either on the source or with the Inp. Sens. control and increase the Vol. instead.

If none of these advices solves the problem, the speaker might be faulty. If you need further assistance, please contact us directly: [info@hedd.audio](mailto:info@hedd.audio)

# Technical Specifications

HEDD Subwoofers	BASS 08	BASS 12
Woofers (honeycomb diaphragm)	8" (2" voice coil)	12" (2.5" voice coil)
Frequency response (-3 dB)	24 - 80 Hz	20 - 80 Hz
Upper frequency limit (var.)	40 - 120 Hz	40 - 120 Hz
LF range (-3 dB): normal / extended	24 / 20 Hz	20 / 16 Hz
LFE function (LowPass filter +10 dB gain)	LP 200 Hz / +10 dB	LP 200 Hz / +10 dB
Input 1: analog stereo (2ch) / impedance	2x XLR / 22 kΩ	2x XLR / 22 kΩ
Input 2: AES "in"	1x XLR	1x XLR
Output: AES "through"	1x XLR	1x XLR
Output to satellites (2ch) highpass @	80 Hz L/R 4th order	80 Hz L/R 4th order
Satellite offset @ANALOG OUT	± 2m in .5m steps	± 2m in .5m steps
Sensitivity (Inp. Sens.: 0 dB, Vol.: +12 dB)	90 dB SPL 1W/m	96 dB SPL 1W/m
Input gain	± 12dB	± 12dB
Input sensitivity	-10 / 4 / 0 / +4 dB	-10 / 4 / 0 / +4 dB
HEDD Lineariser®, disengageable, delay	30 ms	30 ms
Phase switch	0 / 90 / 180 / 270°	0 / 90 / 180 / 270°
Maximum SPL at 1 m (half space)	105 dB	115 dB
Power amplifier / universal mains 110 - 240 V	300 W ICEpower	700W ICEpower
AD/DA Conversion	96 kHz / 32 Bit	96 kHz / 32 Bit
Cabinet with satin lacquer finish	black	black
Dimensions (H x W x D)	392 x 290 x 400 mm	595 x 380 x 610 mm
Weight	17 kg	32.1 kg
Warranty	2 years	2 years

## A Brief History of Time (within subwoofers, this time)

by *Klaus Heinz*

Subwoofers are in use since many decades, their integration into the reproduction chain allows to add fundamental frequencies where small speakers meet their limits. However, the use of separate bass units often shows two typical unwanted side effects: the woofer section appears to be separated or not really integrated into the overall sound image, and the low frequencies themselves tend to sound somewhat boomy or weakened. Before we started to build subwoofers we took a closer look at the reasons for these widely experienced problems. The answer we found is: time.

Already in single loudspeakers one can observe that lower frequencies need more time to travel through the speaker than higher frequencies. In Satellite-Sub systems additional time shifts occur at the crossover points and the involved high- and lowpass filters both in satellites and subwoofers. All in all some timely confusion is added in the reproduction chain by loudspeakers, let us see why.

As we deal with sound a principal physical remark has to be made: soundwaves are completely characterized by time and frequency. Between these two there is a fundamental physical relationship called the Harmonic Analysis. It states that each change in the frequency response of a loudspeaker inevitably causes a corresponding change in the Phase Response.

But what is a “Phase Response”?

A phase describes the timely distance between two events, nothing more. So if a tone starts at exactly 12 pm and another one at 12:01 pm the phase delay is 1 minute. As a consequence of the Harmonic Analysis phase delays in loudspeakers necessarily occur due to the nonlinearities in their frequency response. These delays range from <1 ms (Millisecond) to appr. 50 ms, depending on the transmitted bandwidth and some DSP internal settings.

Within a subwoofer all frequencies between 20 Hz and typically 80 Hz should be reproduced at the same point in time of course, but as mentioned due to internal filters and driver properties delays of different durations are added at different frequencies:

### **Lower frequencies travel longer through speakers than higher ones.**

In other words: the phase response of a subwoofer falls from higher travelling times - like 50 ms at ~20 Hz – down to 10 ms at ~80 Hz, which has become the standard crossover frequency between subs and satellites. With respect to frequency these different delays vary in a characteristic way for each subwoofer, they are represented in a curve called phase response. In analog times there was no way to avoid these phase errors.

With today's powerful DSP's it is possible to apply FIR (for Finite Impulse Response) filters that are able to correct these deviations, but they only can achieve it on cost of an overall delay for the *through passing* signal. To do the job the filters need to “know” what's wrong in the time and frequency domain of the speaker, technically speaking they need the measured Impulse Response (IR) of the subwoofer under consideration. The IR's of BASS 08 and BASS 12 have been measured in the big anechoic chamber of the Technical University Berlin and implemented in the DSP boards to deliver that information. It contains all their frequency and phase nonlinearities and can be used to correct the speaker in real time. The HEDD Lineariser®, an adapted FIR (Finite Impulse Response) filter is the mathematical tool of choice that reinstalls the original timely relationships of the incoming musical signal. The audibly improved transient response and a better focused stereo localization are evident benefits.

Having done this the phase response in the subwoofers now is linear, but as mentioned this has to be “paid” by an overall delay of ~40 ms for a down to 20 Hz (- 3 dB) frequency response. The DSP has to wait these 40 ms before the sound can be put through to the power amplifier and out of the box. As a consequence all frequencies between 20 and 80 Hz are delayed by 40 ms, it is called a group delay of 40 ms. It means the sub starts the low frequencies 40 ms later compared to the sound of the satellites. Wait – the HEDD MK2 satellite themselves have a Lineariser® too, in their case - because their response is set to > 80 Hz - their group delay is 10 ms only.

To solve the timing problems completely we implemented two more DSP channels that add a 30 ms group delay to the analog “Outputs to Satellites” XLR sockets at the backplates of the BASS

08 and BASS 12 subwoofers.

The Satellites now “wait” these 30 ms until the subwoofer emits its low frequency signals, then - if the satellite Lineariser is “ON” - add their own group delay of 10 ms - and well there we are: 40ms later, all 3 loudspeakers start reproduction at the very same millisecond, and they do it for each and every frequency in the complete audio band.

One more thing: in practice it often is difficult to set up satellites and subwoofers at the same listening distance. As only with equal distances the above considerations really work we have added a distance control called “SAT. OFFSET [m]” at the back panels of the subs. It allows to compensate the potential difference in travelling time between satellites and subwoofers if necessary, it actually would mean a new additional phase error. You may adapt to a  $\pm 2$ m runtime difference between satellites and subwoofers in a .5 m resolution, that should cover the problem in most of the cases.

All components of HEDDs Linear Phase Satellite-Sub systems start the sound reproduction at the same point in time, and do so with the timely correct relationships within the audible band as to be found in the incoming music signal.

With the combination of HEDDs Linear Phase satellites, BASS Linear Phase subwoofers and an appropriate compensation for the longer group delay of the subwoofers, we actually have wiped out the standard problems that have been inherent in the use of subwoofers right from the beginning - until now.

We think we have found and eliminated the main reasons for inhomogeneous and boomy sound in Satellite-Sub systems. We at HEDD would be happy if you take the time for an audition, the proof as we do know is in the listening.

**HEDD Subs and Satellites are “Right in Time”**



HEDD | Heinz ElectroDynamic Designs is a high-end audio manufacturer founded by Klaus Heinz and Dr. Frederik Knop. Drawing on a rich history in audio creation and reproduction, the German company builds handcrafted professional studio monitors, subwoofers, and headphones in Berlin since 2016. HEDD's advantage is the in-house developed signature Air Motion Transformer driver.

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	LinkedIn:	HEDD   Heinz Electrodynamic Designs
	Twitter:	@HEDDAudio

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