

**GAJA** Manual volume: E 0.1



**YOU ART. WE SOUND.**

# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

## Safety precautions



### Potential risk of personal injury

Never stand in the direct sound beam close to a loudspeakers driven at a high level. Professional loudspeaker systems can cause sound pressure levels that could harm human health. Noncritical sound levels at about 90 dB can cause hearing damage if people are exposed to it over a longer period.

In order to prevent accidents when deploying loudspeakers on the ground or when flown, please take note of the following:

- When setting up the loudspeakers or loudspeaker stands, make sure they are standing on a firm surface. If you place several systems on top of one another, use straps to secure them against movement.
- Only use accessories which have been tested and approved by Cadenbach Acoustics for assembly and mobile applications. Pay attention to the correct application and maximum load capacity of the accessories.
- Ensure that all additional hardware, fixings and fasteners used for installation or mobile use are of an appropriate size and load safety factor. Pay attention to the manufacturers instructions and to the relevant safety guidelines.
- Regularly check the loudspeaker housings and accessories for visible signs of wear and tear, and replace them when necessary.
- Regularly check all load bearing bolts in the mounting devices.

### Potential risk of material damage

Loudspeakers produce a static magnetic field even if they are not connected or not in use. Therefore make sure when erecting and transporting loudspeakers that they are not near equipment and objects which may be impaired or damaged by an external magnetic field.

#### **WARNINGS ON THE SPEAKERS BACK PLATE:**

**THIS EQUIPMENT CAN GENERATE EXTREME SOUND PRESSURE LEVELS THAT CAN LEAD TO PERMANENT HEARING DAMAGE.**

**THIS SURFACE MAY REACH HIGH TEMPERATURES WHILE IN USE.**

**TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**

**NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.**

**ONLY PERSONAL CERTIFIED TO BE TRAINED BY CADENBACH ACOUSTICS, HAVING PASSED S1 COURSE SHOULD SETUP THIS SYSTEM, OTHERWISE ANY WARRANTY IS VOID. SEE CORRESPONDING MANUAL.**

**MADE IN GERMANY / EU**

# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

## Product description



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### Overview

GAJA is a 3 way point source full horn loaded loudspeaker where two 12 inch speakers are working into the same horn as the coaxial mid high section build into an acoustical optimise trapezoid design with integrated absorber chamber. GAJA offers 6 aero mounting points for maximum mounting freedom. Even full active equipped GAJA is still light wight for it's size and offers in all version more than 143 dB SPL at 1 meter. This enables the system to be used as main Loudspeaker system either as single speaker or in multiple horizontal speaker array arrangement.

GAJA was designed for high efficiency high power sound reproduction keep high resolution at any time. The full horn loaded CD design of GAJA offers constant directivity and dispersion control with 65° horizontal and 40° vertical dispersion, where exceptional dispersion control is already reached at 250 Hz.

The total symmetric D'Appolito construction of the double 12 inch Low frequency neodymium cone with it's 3 inch voice coil and coaxial Mid To High 1.5 + 1.0 inch exit driver section is full horn loaded an both section are working into the same horn main horn. The coaxial 2 way ring radiator design of the Mid to High compression driver has got a 3.5 inch Mid frequency and a 1.75 inch High frequency voice coil delivering extra high excursion possibilities and radiates distortion free sound from 600 Hz up to 35 kHz.

HORUS is the dedicated low frequency extension with offers full ground stack support for GAJA, anyway all cadenbach acoustic sub woofers can be chosen to run with GAJA.

On order GAJA incorporates a very power full two channel frequency modulated floating modulator amplifier. Due to it's advanced high efficiency power technology it runs at any moment at very low temperature and needs no fan cooling at all.

### Operation

The frequency and phase response of GAJA is exceptional smooth at very low THD. GAJA can run full passive or 2 way active in linear phase mode by using Cadenbach Acoustics **FIR filter** of the HEIMDALL D1 digital controller. It's full horn loaded design offers CD dispersion control in normal horizontal point source mode.

### Applications

- Medium to bigger tents or concert halls, theatres and houses of worship.
- Medium to bigger main system sound reinforcement.
- Side or front fill system, distributed system, ground stack system.

### Features

- Trapezoid design with very high output level, with optional integrated amplifier
- Optimal integration with HORUS sub woofer for various ground stack configurations.
- Full horn loaded CD design and Cadenbach Acoustics FIR filters.
- Six integrated aero flying points for various flown configurations

# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

## Data



## Technical Specifications

### Transducers

- Low frequency: **2 x 12 inches** (320 mm) Neodymium
- Mid frequency: **1.5 inches** (38 mm) Neodymium
- High frequency: **1 inches** (25.4 mm) Neodymium

### Voice coil size and impedance

- Low frequency: **2 x 3 inches** (101.6 mm) Al, 8 ohms
- Mid frequency: **3.5 inches** (90 mm) Cu, 16 ohms
- High frequency: **1.75 inches** (44.4 mm) Cu, 16 ohms

### Diaphragm size

- Mid frequency: **3.5 inches** (90 mm) Polyester
- High frequency: **1.75 inches** (44.4 mm) Polyester

### Exit size

- Mid + High frequency: **1.5 + 1 inches** (38 mm) port

### Nominal Impedance

- Low frequency: **2 x 8 ohms**
- Mid + High frequency: **16 ohms** passive
- Passive: **4 ohms** Z=6 ohms

### Output at 1m

- **145 dB SPL** ( 3 )  
driven with PAX P16 143 dB  
driven with internal amps 145 dB

### Sensitivity (SPL at 1m)

- Low frequency: **106 (300 Hz) dB / 135 dB** cont. at 800 watts
- Mid frequency: **118 (900 Hz) dB / 140 dB** cont. at 150 watts
- High frequency: **119.5 (9 kHz) dB / 138.5 dB** cont. at 80 watts

### Power Handling

- Low frequency: **3000 watts** peak  
800 watts AES  
1600 watts program  
rec. amp power on 4 ohms  
2800 watts
- Mid + High frequency: **1000 watts** peak  
150 watts AES  
400 watts program  
rec. amp power on 4 ohms  
2800 watts
- Passive: **3000 watts** peak  
800 watts AES  
1600 watts program  
rec. amp power on 4 ohms  
2800 watts

### Crossover type and frequency

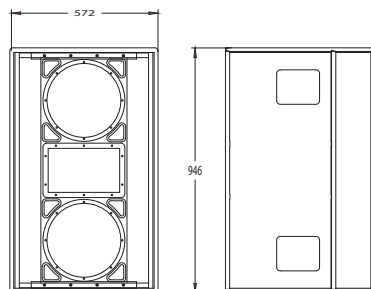
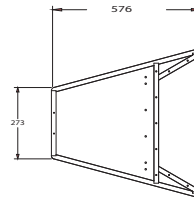
- Filter type active / passive: **FIR zero phase**  
Low to Mid: **650 - 850 / 700 Hz**
- Filter type passive: **None** / FIR zero phase  
Mid to High: **6 kHz**
- Sub to Low: **70 Hz - 130 Hz**

### Frequency and Phase response

- Usable frequency rang: **45 Hz - 23 kHz** ( 1 )
- Free field frequency response: 68 Hz - 21.5 kHz (-5 dB) linearity (+/- 0.5 dB)
- Phase response: **0° +/- 2°**  
from 280 Hz to 23 kHz

### Size and weight

- Height: **37.24 inches** (946 mm)
- Width: **22.52 inches** (572 mm)
- Depth: **22.68 inches** (576 mm)
- Weight:  
**110.23 lbs** (50 kg) passive model  
**114.64 lbs** (52 kg) active model



### Coverage

- Horizontal coverage: 65°
- Vertical coverage: 40°

### Speakers per PAX P16 channel

- For external powered model:  
**2 ( 2 )** parallel via link

### Connection

- For 2 way external powered model 212HA:  
**2 x NL4** (1+/1- Low, 2+/2- Mid + High)
- For passive model 212HP:  
**2 x NL4** (1+/1- Low, 2+/2- sense)

( 1 ) Full-range mode, providing 121 dB @ 45 Hz

( 2 ) possible only with short length cables.

( 3 ) SPL max peak, test signal: pink noise with crest factor 6 dB.

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## Data



## Technical Specifications

### Internal Amp module

- Type of output stage: free floating modulator FM out put power stage
- Total output Power and Volts: into 8 ohms  
Music: **2 x 2800 watts** at **150 V<sub>pk</sub>**  
RMS: **2 x 1400 watts** at **106 V**
- Low frequency:  
**3000 watts** peak / 1500 watts rms
- High frequency:  
**1400 watts** peak / 700 watts rms

### Audio specifications

- IM: **0,05%** (SMPTE)
- DIM: **0,005%** (DIM 100)
- THD: **0,02%** (+N 20 Hz - 20 kHz)

### Audio input Connection

- XLR 5 pin, (with internal Controller XLR 3 pin)  
female in and male link out  
5pin: 1g, 2 LF+, 3 LF-, 4 HF+, 5 HF-,  
3pin: 1g, 2 +, 3 -

### Audio input Impedance

- 20 kOhms symmetric (between + and -),
- 10 kOhms non symmetric (- grounded).

### Ac Power connection

- Powercon 25 A blue in and white link (max 12,6 A link)

### Ac Power specifications

- 180 - 265 V AC 50 Hz / 2200 VA

### Mechanical specifications

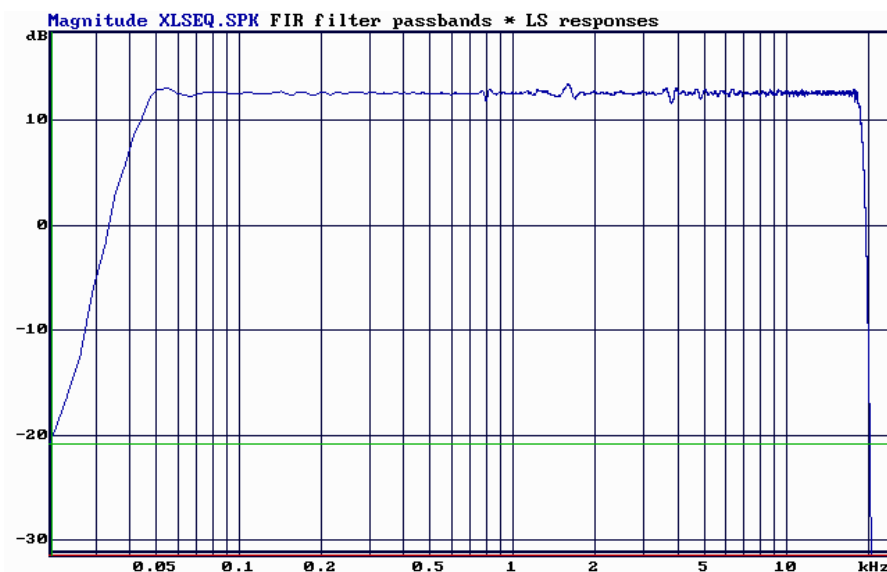
- Mounting: **6 Aluminum aero quip**
- Working load: 12 x Speaker-weight
- Construction: **15 - 27 mm Plywood**  
steel grill with foam, powder coated,  
inside acoustic carpet,  
foam and glue damping.  
Internal amp module mounted on 7 mm  
aluminum back plate with total passive fan  
free cooling.

# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

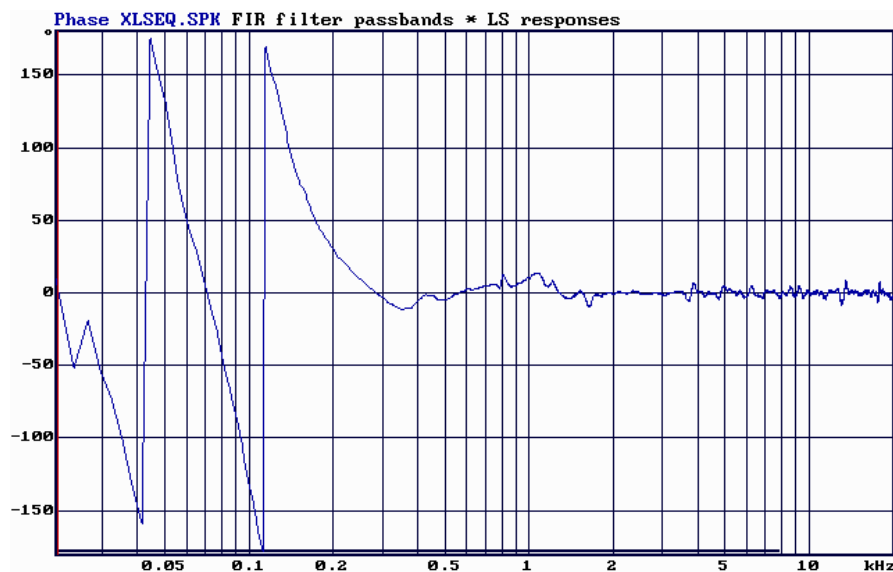
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## Measurements



Frequency response with FIR Filter of GAJA with HORUS



Phase response FIR linear phase Filter of GAJA with HORUS

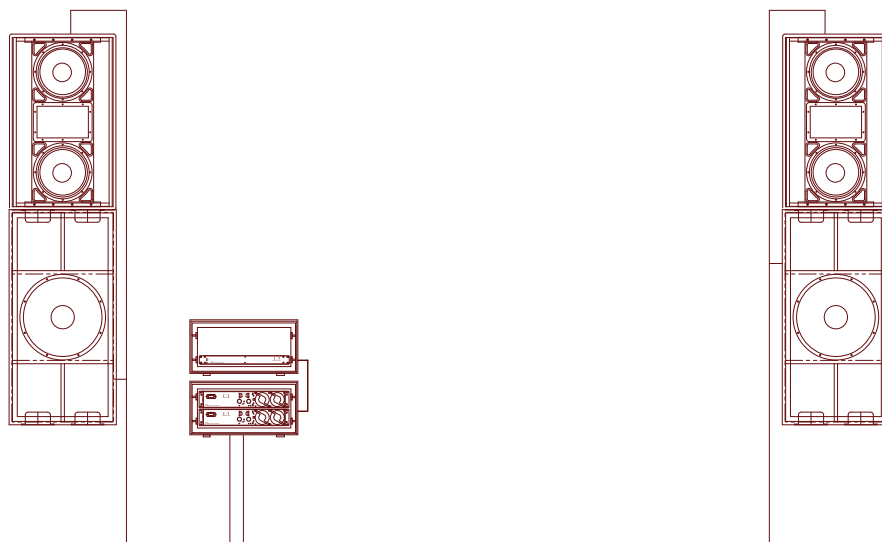
# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

## Systems



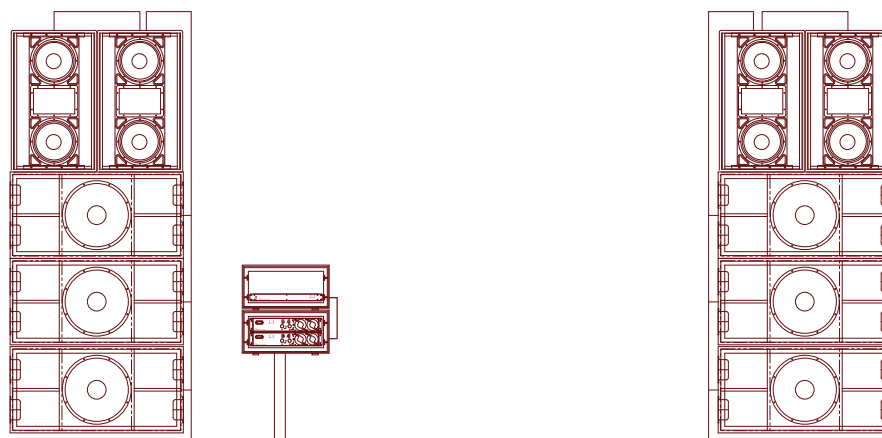
### System setups: GAJA-S1

System for Main or side, drum, stage fill system use, with 2 x GAJA-212HP passive with 2 x HORUS subwoofer external powered, 2 x PAX-P16, 1 x HEIMDALL D05 FIR Controller.



### System setups: IRIS-S2

Typical high efficient ground stack main system for tents and halls using 4 x GAJA-212HP passive with 6 x HORUS sub external powered on the ground with 2 x PAX-P16 Amp + 1 x HEIMDALL D05 FIR Controller.



# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

Save operating

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## Protecting your speaker

GAJA speakers may be used in combination with Cadenbach Acoustics PAX Amplifiers and Cadenbach Acoustics HEIMDALL controller.

In general, audio signals must not be over driven. This may be caused by mixing consoles, equalizers, effect equipment, etc. and should be indicated on this equipment. When a power amplifier is over-loaded at the output (clipping), then the amplifier activates a clipping warning signal. In any case, the signal must be reduced as soon as it sounds unnaturally distorted.

Damage caused by overloading the speakers or using the speakers without Cadenbach Acoustics PAX and HEIMDALL we do not assume warranty and excludes liability for possible consequential damage.

Permanent high-level signals with high frequency and continuous noise from feedback or permanently distorted high-level signals or noises, which occur when the amplifier is on while equipment is being connected, disconnected or switched on could damage the loudspeakers.

Do not install loudspeakers at places where they are permanently exposed to direct sunlight, high moisture, direct rain or strong vibrations and dust.



# GAJA 2x 12 inch 3 way FIR point source horn loudspeaker

Manufacturer's Declarations



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## EU conformity of loudspeakers (CE symbol)

### This declaration applies to:

Cadenbach Acoustics loudspeaker, GAJA-212HP  
Cadenbach Acoustics loudspeaker, GAJA-212HA  
Cadenbach Acoustics loudspeaker, GAJA-212H

All production versions of these types are included, provided they correspond to the original technical version and have not been subject to any later design or electro-mechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective EC directives including all applicable amendments.

A detailed declaration is available on request and can be ordered from Cadenbach Acoustics.

## WEEE Declaration (Disposal)

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, please contact Cadenbach Acoustics.

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