

SA1232

■ The SA1232 is a high-efficiency, extreme-output, active 3-way, wide dispersion, sound reinforcement speaker system. The SA1232 benefits from the integration of 1300 watts of amplifier power, complete active control electronics, and precision components into a speaker system with 103 dB of sensitivity (1 watt/1 meter). The result is unprecedented output, resolution, and clarity as well as mid-range reproduction previously available only from high end, esoteric PA speaker systems.

■ The SA1232 features the same horn assembly as introduced in the Mackie SR1530 active 3-way speaker. The horn is a one-piece design with 90° x 40° dispersion that integrates both the mid-range and high-frequency sections. This allows for the horn loading of the mid-range transducer and seamless coupling between the MF and HF sections. The 6-inch mid-range's basket assembly is designed as part of the horn assembly and is also designed to function as an optimized compression chamber, dramatically simplifying the mid-range assembly. Also, in three-way designs the mid-frequency horn and the high-frequency horn are physically pointing to a different location in front of the box. The SA1232 features an "Optimized Wavefront" horn design. Unlike typical mid/high horns, the high-frequency section is positioned to fire down into the 6-inch mid-range's dispersion pattern. This creates a focused, single wave front with excellent phase and power response characteristics.

■ The SA1232 Mid/High Section is designed to deliver over 136 dB of acoustic output. This required designing high-efficiency, high-power components. The SA1232 incorporates several state of the art advancements in transducer technology. The compression driver uses a new 1.75-inch titanium diaphragm design featuring a 3-slot, optimized geometry phase plug. The magnetic structure incorporates pure, high-grade, Neodymium providing a higher gauss capability, significant weight reduction, and higher BL (force) in the magnetic gap. This results in higher control of the moving mass, and audio reproduction with lower distortion and distortion artifacts.

■ A new Neodymium magnetic structure was developed for the 6-inch mid-frequency driver that provides the control and efficiency required to keep up with the compression driver. By itself, the mid-range transducer has over 106 dB of sensitivity at

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Active 3-Way Sound Reinforcement Speaker System



Features

- **Active, High Output/Wide Dispersion**
- **136 dB of Peak SPL**
- **1300 watts of integrated power**
- **Wide dispersion, ultra-low distortion High-/Mid-Frequency Combination**
- **Complete electronic and component protection circuitry**
- **Two precision 12-inch high-efficiency, light mass woofers with high temperature inside/outside coil technology**
- **State-of-the-art Neodymium compression driver with titanium dome and 3-slot, low distortion, optimized geometry phase plug**
- **Electronic equalization, time correction, and phase alignment**
- **Low-frequency dynamic bass protection**
- **RMS Limiting, Power Supply and Amplifier Thermal Protection**
- **Professional trapezoidal enclosure design**
- **Correctly weight-balanced with two comfortable side handles for easy carrying and set up**
- **One top and one bottom handle for easy repositioning of speaker and built-in pole mount cup on bottom**

Applications

- Live Applications
- Playback Applications
- Portable PA Systems
- Corporate Events

SA1232 Technical Specifications

System Acoustic

-3 dB response	45 Hz—18 kHz
-10 dB response	38 Hz—20 kHz
Directivity Factor; Q(DI)	13.2 (11.2 averaged 2 to 10 kHz)
System Sensitivity ¹	103 dB, 1W @ 1m
Max SPL long-term	130 dB
Max SPL Peak	and 136 dB
Crossover Points	700 Hz, 3000 Hz, 24 dB/octave

¹ Measured on-axis in the far field, referenced back to 1 watt RMS from maximum power and to 1 meter distance using the inverse square law.

Input/Output

Input	Bal./unbal. Female XLR
Loop-through	Bal./unbal. Male XLR
Level Control	Rotating knob, center detent @ 0 dB (-15 to +5 dB)

Amplifiers

Total Amplifier Power	1300 Watts Continuous*
High Frequency	100 Watts*
Type	Class AB
Rated THD	.03%
Mid Frequency	100 Watts*
Type	Class AB
Rated THD	.03%
Low Frequency	1100 Watts*
Type	Class G Hybrid
Rated THD	.03%

*Rated power is continuous RMS wattage into transducer's rated impedance @ 1 kHz for the HF and MF amplifiers and @ 100 Hz for the LF amplifier

High/Mid Frequency Section

Compression Driver	
Diaphragm Size	1.75"
Horn Exit Diameter	1"
Phase Plug	3-Slot Optimized Geometry
Diaphragm Material	Damped titanium
Magnet Type	Neodymium

Mid Frequency Driver	
Diaphragm Size	6"
Voice Coil Diameter	1.75"
Phase Plug	Optimized Geometry
Diaphragm Material	Epoxy-reinforced Cellulose
Magnet Type	Neodymium

High/Mid Horn Design

Horizontal Coverage (-6 dB)	90° 1 kHz to 10 kHz avg.
Vertical Coverage (-6 dB)	40° 1 kHz to 10 kHz avg.
Type	Constant Directivity
Design Feature	Optimized Wavefront High/Mid Integration

Low Frequency Section

Number of Drivers	2
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Woofer Size 12"

Voice Coil Diameter 3" with Inside/Outside Winding

Diaphragm Material Epoxy-reinforced Cellulose

Magnet Type Ferrite

Construction Features

Basic Design Trapezoidal

Material 13-ply Baltic birch/resin end caps

Finish Wear-resistant PVC vinyl

Handles One on each side, one top, one bottom

Grille Perforated metal with weather-resistant coating

Line Input Power

Power consumption 450 W long term with IEC pink noise and limiter on

US Recommended amperage service 120 VAC, 60 Hz 20 Amps

Europe Recommended amperage service 230 VAC, 50 Hz 16 Amps

AC connector 3 pin IEC 250 VAC

Control System function

Electronic Crossover

Phase Alignment

Time Correction

Equalization

Parametric equalization

Safety Features

Protection Low Frequency Dynamic Bass Protection, RMS Limiting, Power Supply and Amplifier Thermal Protection

Display LEDs Power ON, Signal Present, Limit, and Thermal (Cool Down Auto Reset)

Physical

Height 50.0 in/1270 mm

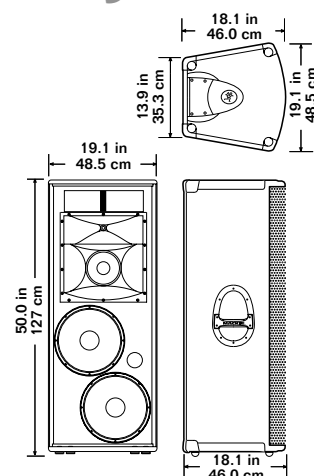
Width Front 19.1 in/485 mm

Width Back 13.9 in/353 mm

Depth 18.1 in/460 mm

Weight 132 lbs/60 kg

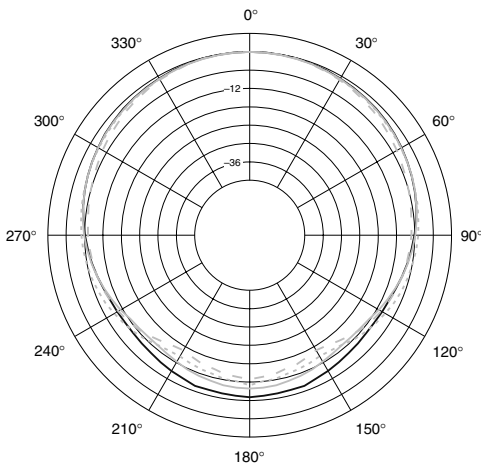
SA1232 Dimensions



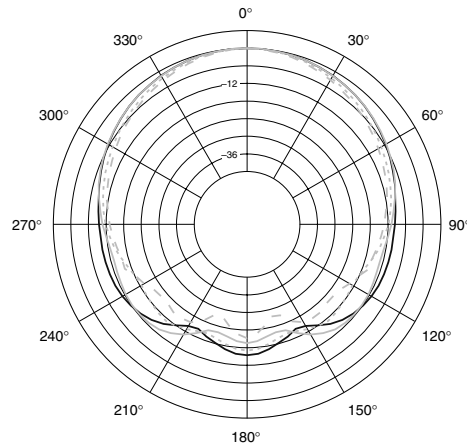
SA1232

Active 3-Way Sound Reinforcement Speaker System

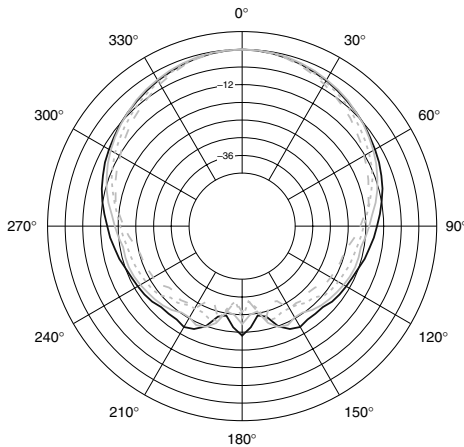
SA1232 Horizontal Polars



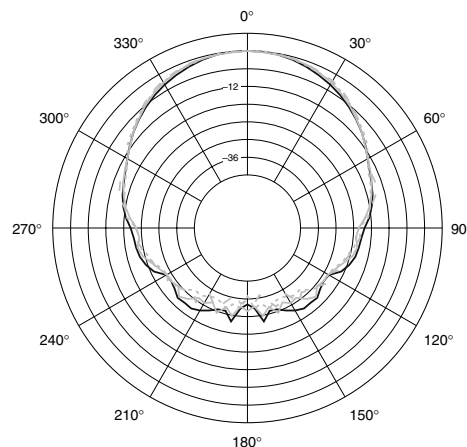
- 200Hz
- 250Hz
- - - 315Hz
- - - 400Hz



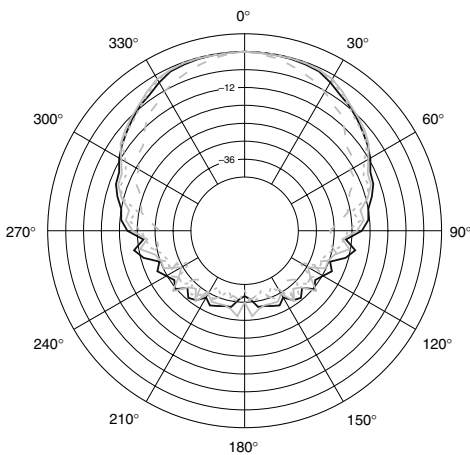
- 500Hz
- 630Hz
- - - 800Hz
- - - 1kHz



- 1.25kHz
- 1.6kHz
- - - 2kHz
- - - 2.5kHz

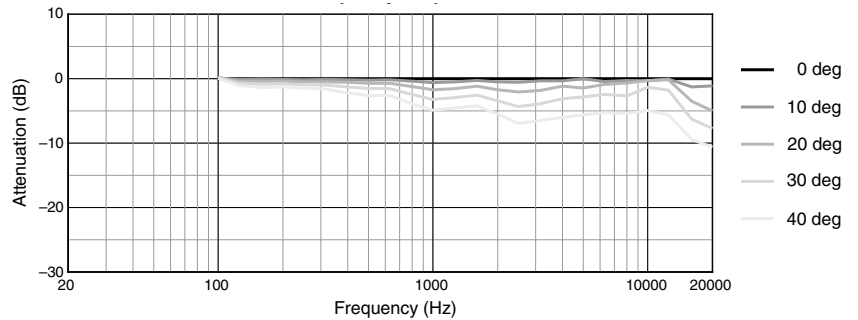


- 3.15kHz
- 4kHz
- - - 5kHz
- - - 6.3kHz



- 8kHz
- 10kHz
- - - 12.5kHz
- - - 16kHz

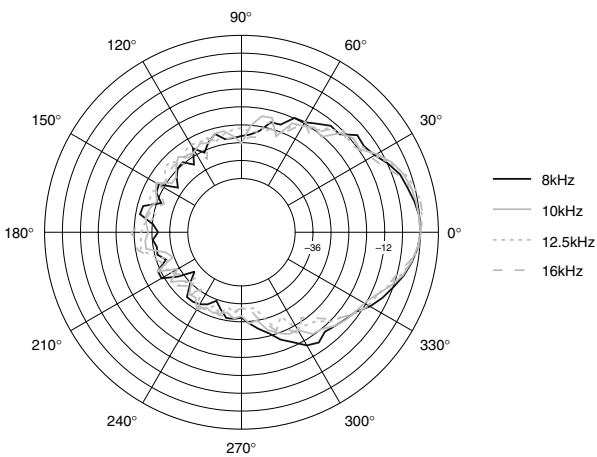
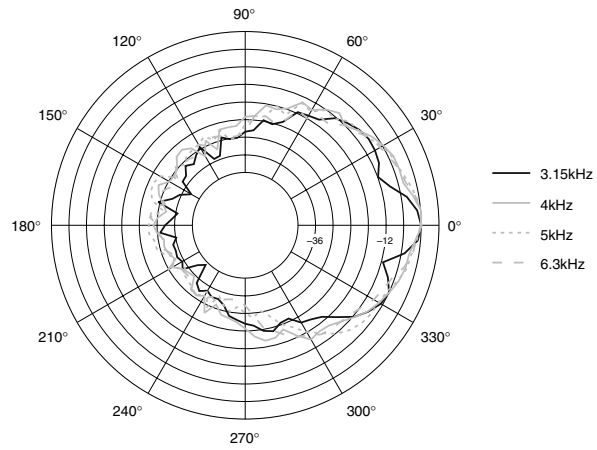
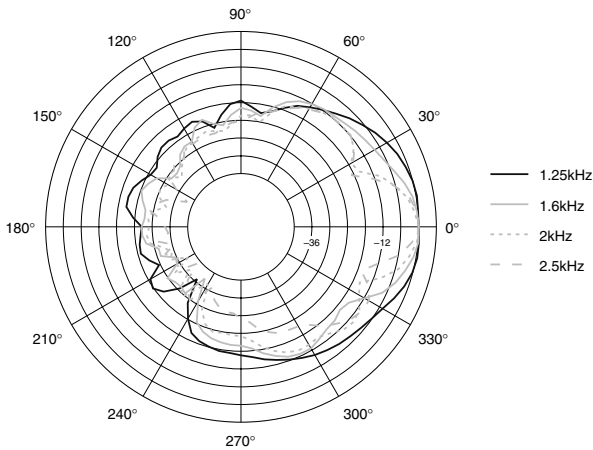
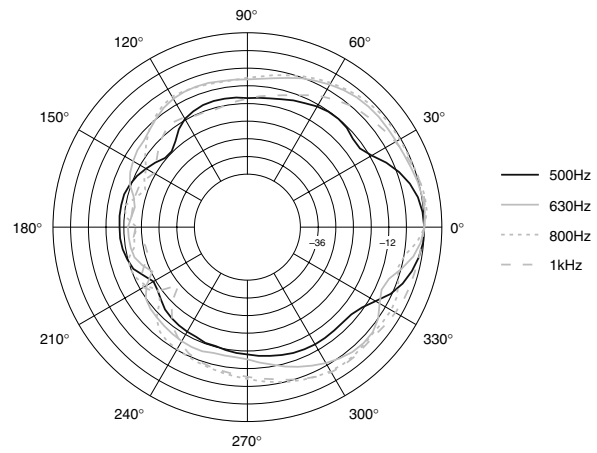
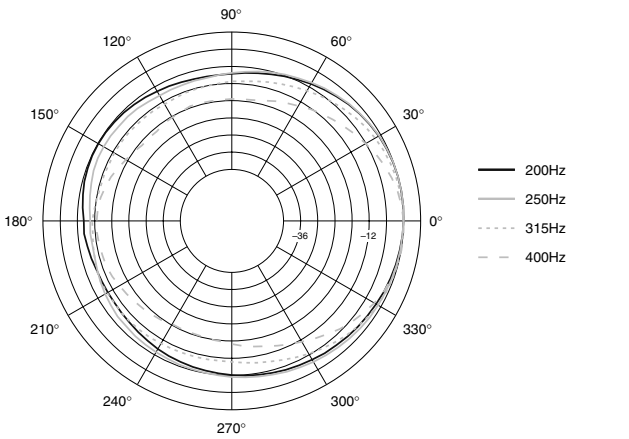
SA1232 Horizontal Off-Axis Frequency Response



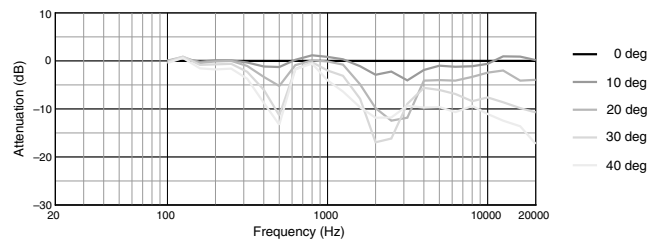
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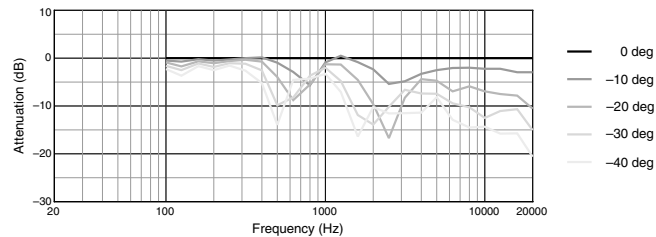
SA1232 Vertical Polars



SA1232 Vertical Off-Axis Frequency Response (UP)

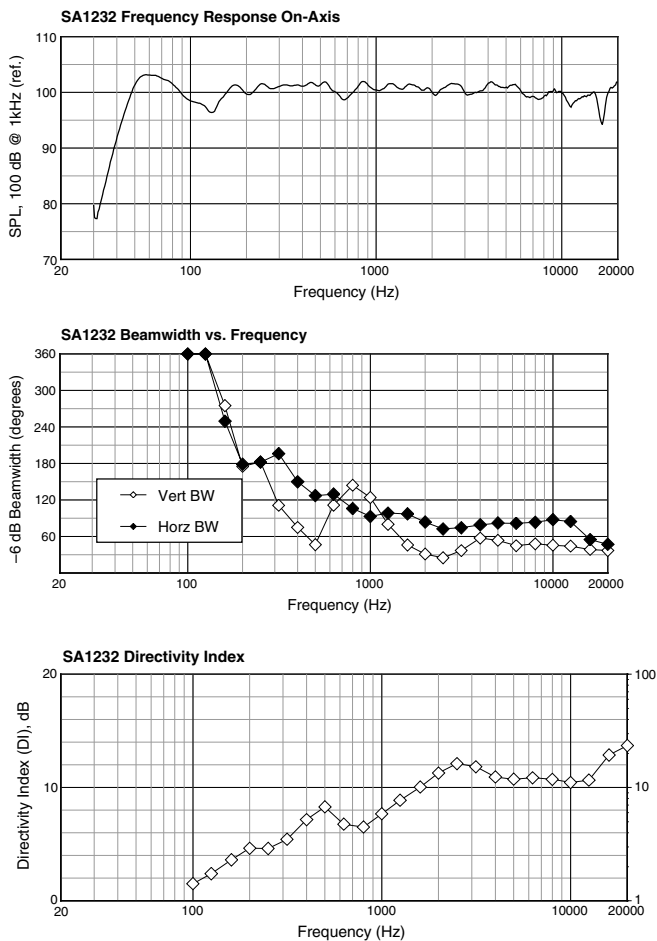


SA1232 Vertical Off-Axis Frequency Response (DOWN)



SA1232 Active 3-Way Sound Reinforcement Speaker System

SA1232 Frequency Response



(continued from page 3)

1 watt/1 meter, but more importantly, it also provides low distortion and excellent linearity characteristics. This is a fundamental reason why 3-way systems can reproduce mid-band audio signal with higher output, definition, and dynamics. The mid-range transducer operates between 700 Hz and 3,000 Hz, eliminating the placement of a crossover point in the middle of critical voice frequencies.

■ The amplifiers for the compression driver and mid-range incorporate a Class AB topology, renowned for its clarity, warmth, and high-voltage output required to generate extreme SPL levels. A Class G design is used for the low-frequency amplifier, which features two power supplies for improved efficiency and more output power per pound.

■ The SA1232 produces deep bass through a duo of 12-inch high-efficiency woofers. The magnetic structure designed for the woofer motor is responsible for the system's resulting low-frequency section sensitivity of 101 dB at 1 watt/1 meter. High-efficiency motors provide an extraordinary amount of force compared to the overall cone area along with complete control of the cone mass. Two 12-inch woofers provide greater air movement than a single 18-inch woofer but with greater speed, control, and better attack. This type of control allows the woofers to deliver extended bass response and to efficiently reach the mid-frequency crossover point. The SA1232 frequency response is linear between 45 Hz and 18 KHz (± 3 dB).

■ A signal panel and a power panel are located on the amplifier assembly at the back of the cabinet, separated by a large aluminum heat sink. The signal input panel contains XLR connectors for line-level input and loop-through connections, a level control, and four status LEDs for Power ON, Signal Present, Limit, and Thermal functions. The power switch and IEC AC connector are located on the power panel.

■ The internal processor provides complete system management of all electronic and acoustic functions including electronic active crossover, electronic phase alignment, electronic time correction, electronic equalization, and complete amplifier and component protection.

■ To ensure long-term reliability and performance, the amplifiers are mounted on a massive heat sink, which is convection cooled and dramatically extends the life expectancy of the heat-producing components.

■ The SA1232 cabinet is constructed using both multi-layered plywood and pressure injected structural resin. The combination provides a robust enclosure system with useful ergonomic features. There are three-part cast aluminum handles on each side of the enclosure placed at the speaker's center of gravity for easy carrying and setup. Handles are also located on the top and bottom of the cabinet for easy movement and relocation. A full-size, oval punched, weather-resistant steel grille protects the front of the cabinet.

SA1232 Active 3-Way Sound Reinforcement Speaker System

SA1232 Architects' and Engineers' Specifications

The active three-way, full-range loudspeaker system shall incorporate two 12-inch low-frequency (LF) transducers, a 6-inch horn loaded mid-frequency (MF) transducer, and a 1-inch exit, 1.75-inch titanium dome compression driver high-frequency (HF) transducer. The LF drivers shall be mounted in a vented enclosure tuned for optimum low-frequency response. The MF and HF transducers shall be loaded on a symmetrical constant-directivity horn assembly designed for wide dispersion.

The system shall have a nominal coverage pattern of 90° (horizontal) x 40° (vertical). System frequency response shall vary no more than ±3 dB from 45 Hz to 18 kHz measured on axis. The loudspeaker shall incorporate a Class G low-frequency amplifier capable of delivering 1100 watts RMS over a frequency range of 20 Hz – 700 Hz. The system shall incorporate two Class AB 100 watt RMS amplifiers specifically designed to power the MF and HF drivers over the range of 700 Hz – 3000 Hz and 3000 Hz – 20 kHz respectively. The amplifiers shall be mounted on an aluminum heat sink, which shall be mounted on the rear of the speaker system, and shall be convection cooled.

The rear mounted amplifier assembly shall comprise separate signal and AC power panels separated by a large aluminum heat sink. The signal input panel shall contain an input and loop-through XLR, a volume level control, and four status LEDs

for Power ON, Signal Present, Limit, and Thermal functions. The system shall accept a standard line-level signal via the XLR input connector. The power switch and IEC AC connector are located on the power panel.

Thermal protection shall be provided by a thermal sensor mounted on the heat sink, which monitors the heat sink temperature and triggers the thermal protection circuit should the temperature exceed 158° F (70° C). The Thermal LED shall light and the input signal shall be muted until the heat sink cools to a safe operating level, at which point the thermal protection circuit auto-resets and normal operation resumes.

Overload protection shall be provided by a limiter circuit, which monitors the low-frequency amplifier output and reduces the input level to the amplifier should the amplifier output begin to clip.

The loudspeaker enclosure shall have a trapezoidal shape and shall incorporate two side handles, one on each side, and a top and bottom relocation handle. The enclosure shall be constructed of a combination multi-ply wood and high-pressure injected structural resin, with a black PVC vinyl finish. The front of the loudspeaker shall be covered with a powder coated, weather-resistant perforated steel grille.

The active three-way full-range loudspeaker system shall be a Mackie SA1232.

Electronic files for this product available at:
www.mackie.com

This Specification Sheet	SA1232_SS.PDF
Architects' and Engineers' Specifications	SA1232_AE.TXT
Instruction Manual	SA1232_IM.PDF

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