

Design without Boundaries, Performance Without Limits

PN102 series line arrays use advanced technology and application-driven engineering to bring vertical arrays closer to the ultimate reference point (reality) in demanding environments. Fully integrated electro-acoustic systems with all elements optimized deliver superior fidelity and coverage. Wherever the venue is appropriate for a high-powered vertical array, a RHAON empowered PN102/LAR, self-powered PN102/LA or externally powered PNX102/LA line array is the logical choice for demanding designers, operators and audiences.

RHAON, the Renkus-Heinz Audio Operations Network, is the first technology to extend the power, adaptability and pristine audio performance of digital networks all the way to the loudspeaker -- and to the listener in front of that loudspeaker. RHAON places total control and supervision on your computer at your fingertips, no matter how far away you are from the loudspeaker.

Applications

- Virtually any application where outstanding sonic performance is required and sound level and coverage needs cannot be satisfied with a conventional horizontal loudspeaker array.
- Portable "touring" sound systems for both small and large concert venues, corporate AV events, etc.
- Sound reinforcement systems in large Houses of Worship, Performing Arts Centers, Sports Arenas, Theaters and other similar venues.



PN102/LA Line Array Modules

The self-powered PN102/LA, RHAON Empowered PN102/LAR and the non-powered PNX102/LA are the basic building blocks in the Renkus-Heinz PN Series of high power line arrays. Their unique design allows arrays of all sizes to be quickly and easily assembled and installed safely and securely.

PN-1 Series PowerNet Amplifiers

The **PN-1**, the heart of the PN102/LA performance and the muscle behind it, is a new kind of intelligent electronics system. It combines Class A/B amplification with comprehensive signal processing into a single lightweight unit. Protection, crossovers and parametric EQ are integrated into the signal path.



RHAON The RHAON Empowered **PN-1R** adds onboard DSP and CobraNet capabilities. It has dual analog inputs, dual CobraNet inputs and an AES3id serial input. The onboard DSP is easily configured using RHAON software; it includes eight bands of parametric EQ, high and low shelving filters, input level control and up to 20 msec of delay. Critical operating parameters such as signal clipping, amplifier output voltage and current, and temperature are continually monitored with automatic alert functions.

Line Array Systems

PNX102LA

Non-Powered

PN102LA

Powered

PN102LAR

RHAON Empowered

Line Array Systems

PASSIVE • POWERED • NETWORKED
MAXIMUM CONTROL • MAXIMUM CHOICE



• Heavy Duty Flying Hardware

Safely flies columns of up to 12 units, provides a wide range of aiming angles.

• Easy Rigging - Designed to Travel

Assemble easily, are light in weight (the self-powered PN102/LA and PN102/LAR weigh under 85 Lbs).

• Flexible Input Configurations

Choose passive inputs, or go self-powered with either the PN-1 or PN-1R RHAON Empowered amplifier.

• RHAON Renkus-Heinz Audio Operations Network

All self-powered PN102/LA R loudspeakers are provided with RHAON for flexible digital signal distribution, loudspeaker management and control.

• Exclusive Isophasic Plane Wave Generator

Provides constant beamwidth/directivity down to 300 Hz.

• Unique Acoustic Diffractor Baffle

Eliminates mid-frequency narrowing, provides consistent horizontal coverage

• Dual 1" Mylar HF Drivers and Dual 10" Woofers

Provide smooth, low distortion performance from 60 Hz to 18 kHz and beyond.

Advanced Audio Technology



“Line Arrays” (more properly called vertical arrays) have become popular because they can provide consistent SPL from the front to the rear of a deep rectangular area with a flat or gently sloping floor.

Arraying multiple loudspeakers vertically creates a line source with narrow vertical dispersion: The wavefront radiated by a properly designed line array behaves more like a plane wave (whose output diminishes 3 dB every time the distance doubles)

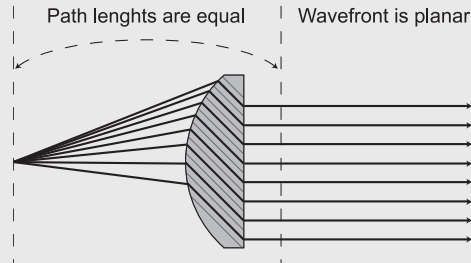
than a spherical wave (which loses 6 dB each time the distance doubles).

The lower frequency limit of this line source behavior (the flattened vertical beam and slower level decay) depends on the length of the array (the height of the array). The taller the array, the lower in frequency the array is effective.

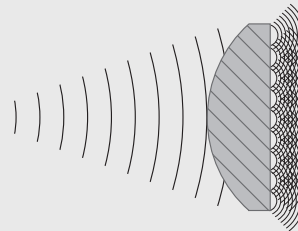


The Isophasic Plane Wave Generator

The Renkus-Heinz Isophasic Plane Wave Generator features path length equalization technology which has a significant advantage over other techniques (such as reflectors and obstacle arrays) that operate over a relatively narrow bandwidth. The path length refractor generates planar wavefronts over a wide operating band.



The higher frequencies pass through the device as “rays”.



At lower frequencies the refractor lens represent a closely spaced array of diffraction slots.

Slots are $< 1/2 \lambda$ apart: wavefront is planar



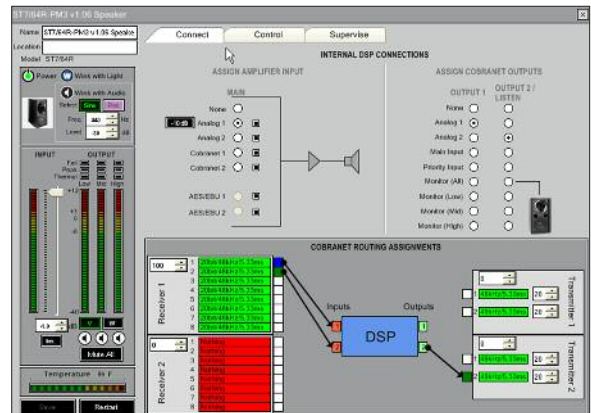
RENKUS-HEINZ AUDIO OPERATIONS NETWORK

RHAON is the first practical system to combine digital audio distribution with individual loudspeaker control and supervision of self-powered loudspeaker systems. RHAON uses standard Ethernet hardware, advanced CobraNet technology and onboard DSP (Digital Signal Processing) to turn self-powered Renkus-Heinz loudspeakers from “black boxes” into “smart boxes” that can easily be controlled from a remotely located laptop or desktop PC.

RHAON integrates loudspeakers, amplifiers, signal-processors, audio distribution and control networks into a single easy-to-manage network that sets new performance standards in every area of audio operations. Signal connections are faster, with fewer errors. Signal processing is specific to every loudspeaker. System setup is flexible yet powerful with user-configurable GUI software.

RHAON puts you in total control of:

- Real time digital audio distribution over standard Ethernet networks using proven CobraNet technology to deliver multiple channels of high quality digital audio over a CAT 5 cable.
- A powerful DSP inside each loudspeaker on the Ethernet network that includes eight bands of parametric EQ, high and low frequency shelving filters, input level control, muting and up to 18 ms of delay.
- Monitoring of each loudspeakers critical operating parameters such as signal clipping, amplifier output voltage and current and temperature with automatic alert functions.
- A user friendly Windows GUI that simplifies loudspeaker management and control.

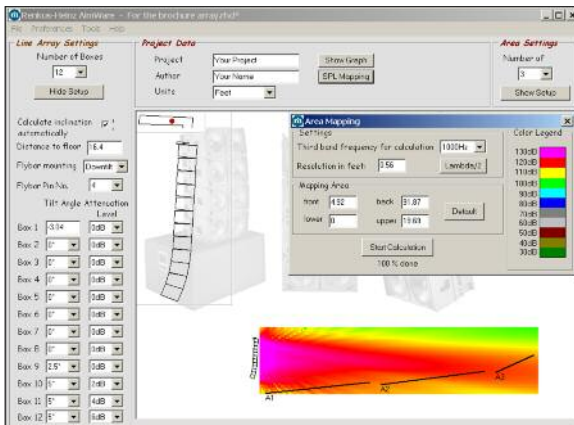
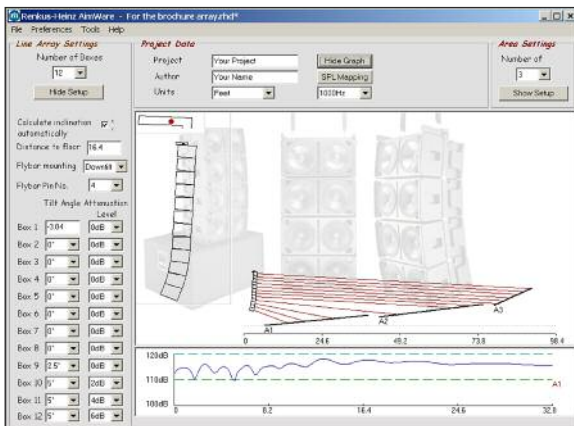


AIMWARE - Array Aiming Software

Effective sound system design with line arrays is not a simple 'point and shoot' process and many of the design tactics learned over the years with horizontal arrays do not work. You can't just aim a straight line array at the center of the audience and expect it to work. The typical result would be a few very loud rows in the center of the audience area with insufficient level at the front and rear. The height, tilt angle and curvature of the array all interact to produce the desired result (consistent sound levels from the front to the rear).

The possibilities are almost endless. How many cabinets will be needed to obtain the desired coverage and SPL levels? Which array configuration will provide the best coverage and performance, a straight line array, a curved array or a "J" array? What suspension (aiming) angle will work best?

Renkus-Heinz **AimWare** answers these questions and takes all the guesswork out of Line Array design and installation. With **AimWare**, you can quickly and easily decide how many Line Array modules will be needed to achieve the desired coverage and SPL levels, and whether they should be configured as a straight line array, a curved array or as a "J" array. **AimWare** also enables you to determine the ideal mounting height and the correct hanging points for the array.



Hardware Options

PNPX102/LA Series Line Arrays were designed to be easy to use; they install quickly in fixed installations and are easy to set up and tear down in portable applications.

Straight, curved and "J" arrays of up to 12 cabinets are easy to assemble and fly. Four-cabinet ground stacks are a snap; just roll them off the truck on their dolly, position them and turn them on.

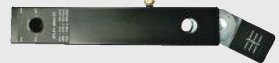
Rigging parameters (pick-up point locations and coverage angle settings) are provided in advance by Renkus-Heinz AIMWARE software program, taking the guesswork out of setup.

5/8 inch thick metal tie-bars and quick-disconnect pins are supplied with each module. They provide easy assembly along with metal-to-metal reliability and a choice of splay angles.

The associated heavy-duty fly bar attaches easily to the array with the quick-disconnect pins while providing a wide range of pick points and aiming angles; safely supports up to 12 cabinets.

An optional dolly handles stacks of up to four line array modules to be easily transported and moved about. Setup couldn't be easier; just roll them off the truck on the dolly, position them, plug them in and turn them on.

Optional IB0002 cabinet hardware allows the splay angles to be adjusted while the cabinets are sitting on the dolly; also meets all the stringent requirements of the German BGV flying standard including the 10 to 1 safety ratio.



Finish Options

The standard finish for PNPX102/LA Series Line Array modules is Black. Optional finishes include white and scuff resistant black TuffTex. Custom colors are also available.

Weather Resistant Options

PNPX102/LA Series Line Array modules are also available with weatherized woofer cones and connectors, in weather resistant fiberglass or TuffTex Elastomer finishes that are practically impervious to the elements.

TECHNICAL INFORMATION

Sensitivity:
PN102LA & PN102LAR: 1.4 V for rated power output
PNX102LA: 100 dB (1W/1m)

Max SPL:
PN102LA & PN102LAR: H; 132 dB pgm, 135 dB peak
 L; 129 dB pgm, 132 dB peak

PNX102LA: H; 133 dB pgm, 136 dB peak
 L; 130 dB pgm, 136 dB peak

Dispersion: 150° Horiz.; Vertical disp. determined by array design
Freq. Response: 60 Hz to 18 kHz

MID/HF Drivers: Two 1" SSD1803-8 compression drivers;
 8 Ohms, 50 W RMS, 100 W Pgm each

LF Drivers: Two 10" model SSL10-7 woofers;
 8 Ohms, 200 W RMS; 400 W Pgm each

Crossover: 1.0 kHz

Power: 115 V AC or 230 V AC, 50/60 Hz
PN102LA & PN102LAR: Lows – 800 Watts Pgm at 16 Ohms
PNX102LA: Highs – 200 Watts Pgm @ 16 Ohms

Enclosure: Multi-ply hardwood, perforated metal grille

Connectors: **PNX102LA:** Neutrik 4-pin, screw terminals

Finish: Black, white or custom paint
 Natural (unfinished)
 Weather resistant

Hardware Options: RHANG102LA Flybar
 102DOLLY Dolly
 COVER102 Padded cover (4 units)
 PN Weather Resistant Kit
Dimensions: 12" H x 23 3/4" W x 16" D
 (30.5 cm x 60.3 cm x 40.6 cm)

Weight:

PN102LA & PN102LAR: 82 Lbs. (37.2 Kg) net

PNX102LA: 72 Lbs (32.7 Kg) net

PN-1 AMPLIFIER

Power Rating: 300 W RMS @ 8 Ohms
Freq. Response: +0.0, -5 dB, 20 Hz to 20 kHz

THD Distortion: < 0.02% typical

Hum & Noise: <100 dB (A weighted)

Damping: >100

Input: 10K Ohm balanced differential

Sensitivity: 1.0 V for RPO

CMR: 74 dB

Controls: Gain (screwdriver adjustable)

Connectors

Input: Looping XLR; female in, male out (pin 1 chassis, pin 2 +, pin 3 -)

Power: EC Power connector

Power: 90-136 VAC or 180-260 VAC 50/60Hz.
 4 A @ 120 V, 2 A @ 240 V
 Idle current: 300 mA @ 120 V;
 150 mA @ 240 V
 Max inrush current: 10 A

PN-1R RHAON EMPOWERED AMPLIFIER

The PN-1R amplifier is identical to the PN-1 except for the addition of the RHAON Network Interface; additional capabilities include:

Inputs: CobraNet; dual RJ45 connectors; accept
 CAT 5 copper cable
 AES/EBU Phoenix connectors;
 Analog Phoenix connectors

Digital Format: 16, 20 or 24 bit PCM; 48 or 96 kHz sample rate; selectable Network Latency.

Protection: Soft & Peak Limiting, Excursion Control & Thermal Regulation

Note: All analog inputs and outputs comply with AES Standard 48-2005 on interconnecting, grounding and shielding.

DIMENSIONAL INFORMATION

