RENKUS-HEINZ

Reference Point Arrays

S8 & S9
Non-Powered

ST8R & ST9R
Self-Powered

4-WIDE HIGH POWER REFERENCE POINT ARRAYS

Quad 12” Lows
CoEntrant M/H Drivers
Complex Conic Loudspeakers

Uncompromised Performance - Unequalled Versatility

Four-wide ST and S Series Reference Point Arrays use advanced technology and application-driven engineering to bring live sound closer to the ultimate reference point: reality. The process produces fully integrated electro-acoustic systems with signal processing, amplification, flying hardware and cabling all optimized to deliver superior fidelity and coverage. Wherever the superior performance demanded by the audiences and operators cannot be met with a single loudspeaker, self-powered ST PowerNet and non-powered S series Reference Points Arrays are the choice for reference quality performance.

All ST PowerNet loudspeakers are RHAON empowered for flexible analog and digital signal distribution and loudspeaker management and control over a CAT 5 Ethernet network.

Applications

- Virtually any application where outstanding sonic performance is required and sound level and coverage needs cannot be satisfied with a single loudspeaker.
- Sound reinforcement systems in Houses of Worship, Performing Arts Centers, Sports Arenas, Theaters and other similiar venues.
- Large Audio Visual playback systems.

RHAON Empowered Amplifiers

Choose external amplification or go self-powered and networked, you can select the system configuration that meets your needs. Select the S series RPAs when the project dictates the use of external amplifiers and the self-powered ST/R RHAON Empowered RPAs for convenience and control in other applications.

The PM-3R shown here is the heart of the self-powered ST/R series loudspeakers. It is a new kind of intelligent electronic system. It combines Class D digital amplification with RHAON, the Renkus-Heinz Audio Operations Network for comprehensive DSP controlled signal processing and control.

RHAON EMPOWERED

RHAON empowers you with CobraNet digital audio distribution, user configurable DSP for maximum control, remote systems management from any Windows computer, life safety functions and more – all using standard Ethernet hardware and cable.

RHAON empowered amplifiers have 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, signal delay and input level control. Critical operating parameters such as signal clipping, amplifier output voltage and current, and temperature are continually monitored with automatic alert functions.

- **3-Way, Wide-Angle Reference Point Arrays**
  Factory assembled and tested PPA arrays provide “plug ‘n play” systems assuring consistent performance.
- **Flexible Input Configurations**
  Choose external amplification or go self-powered with RHAON empowered amplifiers for flexible analog and multi-channel digital signal distribution, computer control and supervision.
- **Seamless Wide-Angle Coverage**
  Four-wide 40° TRAP modules combine seamlessly to produce a 160° phase aligned wave front virtually free of lobing.
- **Quad-12 Doublet Low Frequency Design**
  Provides superior low frequency directionality in both horizontal and vertical planes.
- **Exclusive Complex Conic Design**
  Provides constant beamwidth/directivity without the problems of conventional rectangular horns.
- **Patented CoEntrant Topology**
  Integrates the acoustic output of a mid-range cone and HF driver into a wideband, high power true point source.

Renkus-Heinz Audio Operations Network

RHAON is the first practical system to combine digital audio distribution with individual control and supervision of self-powered loudspeaker systems. RHAON uses standard Ethernet hardware, advanced CobraNet technology and onboard DSP (Digital Signal Processing) to let you communicate with and control an array from a remotely located laptop or desktop PC.

RHAON integrates loudspeakers, amplifiers, signal-processors, audio distribution and remote supervision 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.

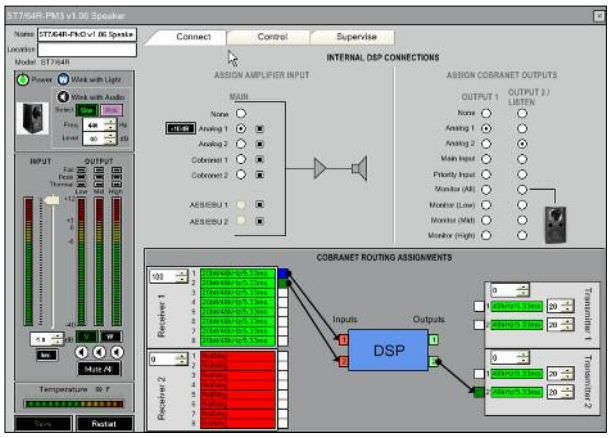
RHAON gives you Maximum Control of:

– Real time digital audio distribution over standard Ethernet networks using proven CobraNet technology to deliver multiple channels of high quality digital audio over a single CAT 5 cable.

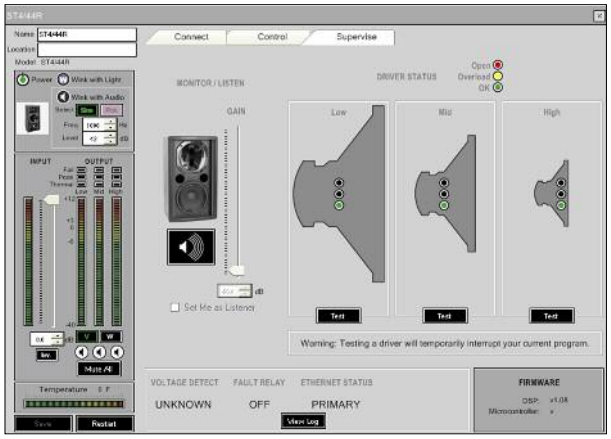
– A powerful DSP inside each loudspeaker on the Ethernet network that includes eight bands of parametric EQ, high and low frequency shelving filters, input level control, muting and delay.

– Monitoring of each loudspeaker's 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 network setup, system configuration, loudspeaker management and control.



RHAON Software - Connect Screen



RHAON Software - Supervise Screen

True Array Principle (TRAP) Design

No matter how good a single conventional loudspeaker sounds, once it is used in a cluster or array, interaction with its neighboring loudspeakers produces undesirable lobing or comb filtering - which creates a profusion of "hot spots" and "dead spots" in the overlap areas, along with disturbing variations in frequency response from one location to another.

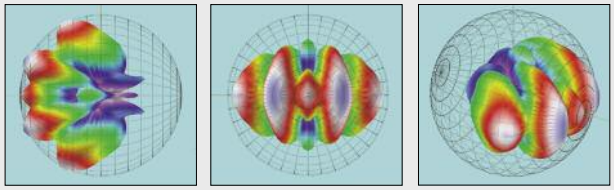
Electronics can improve the performance of any array. But only TRAP loudspeakers are engineered from the inside out to produce a single source of sound even in large arrays. The reason ordinary loudspeakers can't help interfering with each other in clusters is that their acoustic centers are widely spaced.

That's why we designed TRAP horns and enclosures to align the acoustic centers. The horn angles are matched to the trapezoidal enclosures, which are designed to place the drivers as close together as physically possible. All sound originates from the same spot, so interference between adjacent horns is practically eliminated.

Arrays of TRAP loudspeakers produce a phase aligned wavefront with uniform frequency response across the coverage area. Below the horn's cutoff frequency, RPA signal processing eliminates low frequency interference and can improve pattern control. The result is great sound at every seat -- no more "hot spots" and "dead spots" in the overlap areas and disturbing variations in frequency response from one location to another.

Conventional Cluster Performance

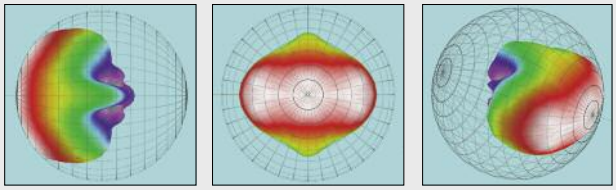
Overhead View | Front (on axis) View | 3-D View



In clusters, conventional loudspeakers can't help interfering with each other.

TRAP (True Array Principle) Cluster Performance

Overhead View | Front (on axis) View | 3-D View



TRAP loudspeakers work together to produce a coherent wavefront.

Reference Point Arrays

Cut the complexity of working with multi-speaker clusters until they're as easy to work with as a single loudspeaker. That's the concept driving Renkus-Heinz engineering as we develop each new Reference Point Array (RPA).

When the entire system comes from one source, it can function as a single acoustic source. RPA integrated systems engineering expands on our proprietary TRue Array Principle (TRAP) that practically eliminates interference between adjacent horns. Complex Conic horns provide constant beamwidth/ directivity without the problems of conventional horns.

We control the location and orientation of each array element with purpose-designed, precision R-Hang hardware. At our automated test and measurement facility, we dial in the parameters for Array-Specific Processing, optimizing low frequency directionality, wavefront coherency and cluster integration.

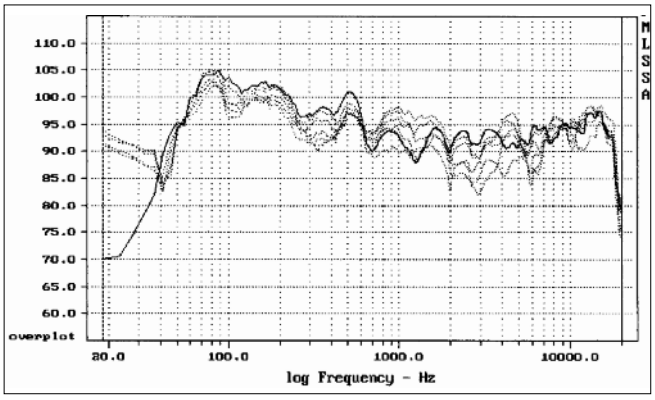
We make sure that each carefully processed signal is delivered to the right set of transducers with internal intelligent amplification or rack mount amplifier/controllers with pre-configured wiring.

Before we ship any RPA, the entire array is assembled and its performance verified. When your RPA arrives at the job site, all you do is re-assemble the speakers and hardware. Then plug it in, turn it on and walk the room. Like hundreds of designers, operators, owners and audiences around the world, you'll be delighted with the results.

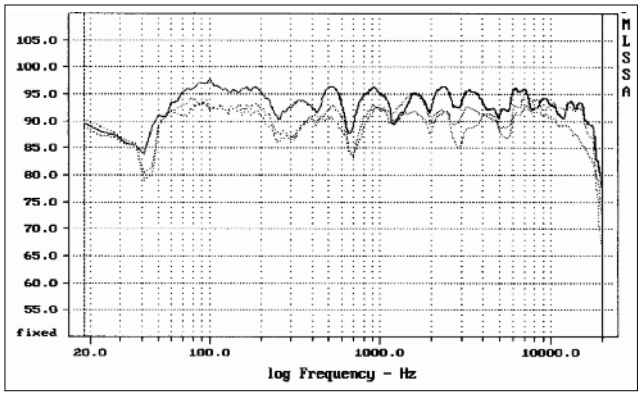
RPA's are the best example of how advanced technologies, real world experience and intelligent system design can provide both uncompromising audio fidelity and unsurpassed practicality - starting with EASE, which includes single-source data for RPA's. You'll save hours of installation and troubleshooting time, while delivering results that are superior to "handmade" arrays using conventional components

4-wide ST8/ST9 Array with PN121-9R downfill loudspeakers

4-wide S8/S9 Array with STX2M/DF downfill loudspeakers



3-wide RPA Array measured without RPA processing.



3-wide RPA Array measured with RPA processing.

TECHNICAL SPECIFICATIONS

4-Wide Reference Point Arrays

Model	*Dispersion (degrees)*	*Frequency Response*	*SPL Rating (prog/peak)*	*Width x Height x Depth (inches / centimeters)*	*Weight (with hardware)*
S8/4-4(T)	160º H by 40º V	40 Hz to 18 kHz	132 / 135 dB	85 5/8" x 60" x 42 1/8" (217.6 cm x 152.4 cm x 106.8 cm)	657 Lbs / 298 kg
S9/4-3(T)	120º H by 40º V (asym)	40 Hz to 18 kHz	138 / 141 dB	85 5/8" x 60" x 42 1/8" (217.6 cm x 152.4 cm x 106.8 cm)	855 Lbs / 387.8 kg

Externally powered S8/4-4(T) and S9/4-4(T) RPAs require four dual-channel amplifiers having the same voltage gain; minimum recommended RMS power ratings are: One amplifier with 800 W/ch @ 8 ohms, 1000 W/ch @ 4 Ohms, 1600 W/ch @ 2 Ohms; Two amplifiers with 500 W/ch @ 8 ohms, 750 W/ch @ 4 Ohms, 900 W/ch @ 2 Ohms; One amplifier with 350 W/ch @ 8 ohms, 500 W/ch @ 4 Ohms.

ST8/4-4R(T)	160º H by 40º V	40 Hz to 18 kHz	132 / 135 dB	85 5/8" x 60" x 42 1/8" (217.6 cm x 152.4 cm x 106.8 cm)	775 Lbs / 351.5 kg
ST9/4-4R(T)	160º H by 40º V (asym)	40 Hz to 18 kHz	138 / 141 dB	85 5/8" x 60" x 42 1/8" (217.6 cm x 152.4 cm x 106.8 cm)	1044 Lbs / 473.6 kg

Self-powered ST8/4-4R(T) and ST9/4-4R(T) RPAs operate from 120 or 240 V AC, 50-60 Hz; require 27.6 Amps at 120 V and 13.8 Amps at 240 V.

ST9/44ASR & STX9/44AS LOUDSPEAKERS

Sensitivity– ST9R: 1.4 V for rated power output
STX9 (1W/1m): LF – 101 dB, MF – 101 dB, HF – 109 dB
MaxSPL (Pgm/Peak): ST9R: 131/132 dB STX9: 132/135 dB
Dispersion: 40° H by 40° V (asym)
Freq. Response: 40 Hz to 18 kHz
Mid/High Drivers: CDT-2A; SSD3302-8A 2" HF (75W RMS) & SSL10-5 10" MF (150W RMS)
LF Drivers: Four 12" model SSL12-10 woofers; 3" VC ; 400W RMS (1600W RMS total)

Crossover Points: 350 & 1500 Hz
Power – STX9: Lows – 1600 Watts RMS at 4 Ohms; Mid/Highs – 300 Watts RMS at 8 Ohms
Enclosure: Multi-ply hardwood, perforated metal grille
Connectors –STX9: Neutrik 4-pin connectors or screw terminals
Finish Options: Black, white or custom paint , TuffTex, Natural (unfinished), Weather resistant

Refer to individual loudspeaker data sheets for additional details.

PM-3R AMPLIFIER

Pwr Rating(Watts):
Lows: 850 RMS, 950 Pgm,1200 Peak(20 ms)
Mids: 425 RMS, 475 Pgm, 600 Peak(20 ms)
Highs: 175 RMS, 200 Pgm, 250 Peak(20 ms)

Freq. Response: +0.0, -.5 dB, 20 Hz to 20 kHz
THD Distortion: < 0.01 % typical

CMR: > 90 dB, 30 Hz to 2 kHz
Hum & Noise: <100 dB, 20 Hz to 20 kHz)
Input Sensitivity: 1.4 V for RPO

Damping Factor: 135 (100 Hz to 400 Hz); 100 (400 Hz and above))
Power Connector: PowerCon locking connector

Pwr Requirements: 90/136 V AC or 180/260 VAC, 50/60 Hz; 9.6 Amps @ 120 V, 4.8 Amps @ 240 V
Idle Current: 380 mA @ 120 V, 190 mA @ 240 V
Max Inrush Current (soft start): 14.5 Amps @ 120 V, 7.3 A @ 240 V

Inputs:
Analog: Dual inputs; looping XLR (female in & Male out) & Looping Phoenix connectors
CobraNet: Dual RJ 45 connectors (for redundancy)
AESid Format: AESid Format Serial Audio (AES/EBU input); Phoenix connector

Controls: LF, MF, HF Mute buttons; Up & Down Output Level push buttons; 10 dB Input pad (on Analog 1 input); Power On/Off, Push-To-Reset circuit breaker

Computer Controls: Gain, Mute, On/Standby, Input Selection; Compression, 9-Band Parametric EQ, Shelving & Rolloff Filters, Delay
Status Indicators: Power, Signal, Overdrive, Thermal, Mute, Input Pad
Protection: Soft & Peak Limiting, Excursion Control & Thermal Regulation
Digital Format: 16, 20 or 24 bit PCM; 48 or 96 kHz sample rate; Selectable Network Latency

For additional details on the RHAON Audio Operations Network, refer to Renkus-Heinz brochure # RH 606

Note: All analog inputs and outputs comply with AES Standard 45-2005 on interconnecting, grounding and shielding.

RENKUS-HEINZ

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