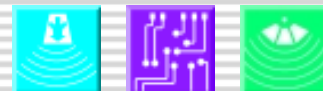




RENKUS-HEINZ

Reference Point Arrays

TriPolar RPA's



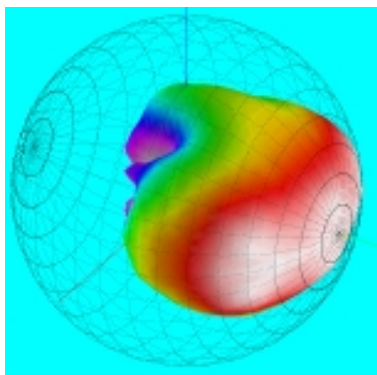
INTEGRATED SYSTEMS ENGINEERING

We engineer and manufacture everything from signal processors to amplifiers to waveguides, enclosures, transducers - even hardware. We've patented innovations in many of these areas. But reinforcement's next major step closer to reality will be the development of total systems, not just refined components.

Reference Point Arrays reflect this approach. From line level to listener, every element of these complex multi-element arrays has been engineered to work as an acoustical point source.

A Foundation in Physical Acoustics

Our unique set of acoustical solutions includes the TRue Array Principle that aligns acoustic centers within the array to virtually eliminate destructive interference.



TRAP horn/enclosure topology minimizes midrange and HF lobing.

CoEntrant topology allows us to use a single horn for both midrange and high frequencies, and fits larger horns in smaller enclosures - both advantages that maximize the capability of the wave-guide.

TOTAL PERFORMANCE ENGINEERING

Each RPA is designed, assembled, measured and installed as both a multi element system and an acoustical point source

POINT SOURCE SYSTEMS

Coherent topologies such as TRAP work with signal processing solutions like TriPolar to turn complex arrays into point sources

REFERENCE QUALITY OUTPUT

By engineering all system components to work together, RPAs bring reinforcement a quantum leap closer to reality

FASTER SPECIFICATION, ORDERING INSTALLATION

RPAs are modeled, ordered, assembled, tested, shipped and installed as complete acoustical units

FOCUS ON PERFORMANCE, NOT PROBLEMS

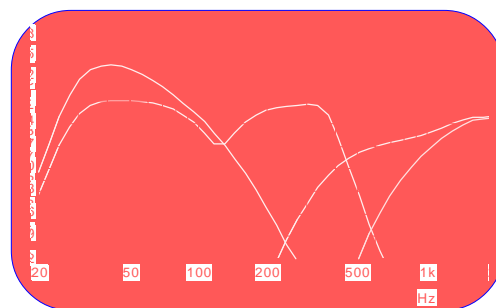
Commissioning an RPA-based system means optimizing the listening experience, not tracing down faults to deliver the basic functionality of sound reinforcement

ADVANCED ELECTRONICS

Acoustical topologies such as TRAP depend on horns. As wavelengths become longer, physical pattern control using horns becomes impractical. Renkus-Heinz engineers apply sophisticated signal processing to control low frequencies. Our unique TriPolar process delivers individually shaded signals to three woofers, using interference effects to provide vertical pattern control below 300 Hz and keep low frequencies from spilling onto the stage. We have developed similar techniques to minimize interference in the horizontal plane and extend the pattern bandwidth of tight-packed arrays.

Total Performance Design

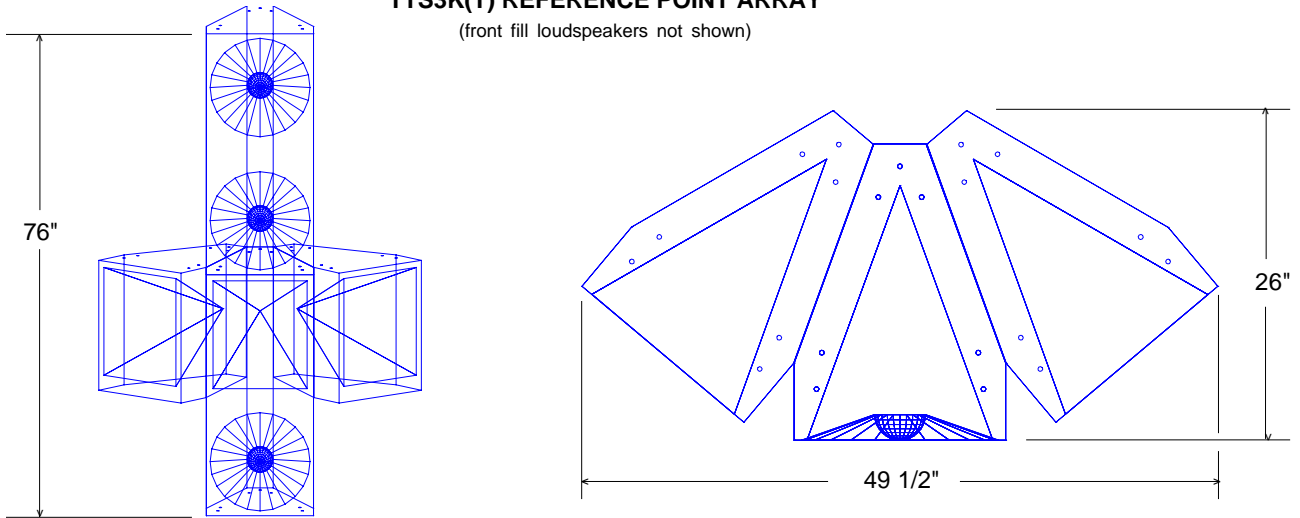
To reach new reference points in array performance, Renkus-Heinz engineers design each RPA as a total system. Loudspeaker Specific Processor modules that monitor output are integrated into each System Specific Power Amplifier, so each channel can have a unique transfer function. The signal path is defined by a pre-engineered wiring harness, and source locations are fixed by purpose-designed R-Hang hardware. The entire system is designed, built, ordered and installed as one unit. Remote Signal Processing is provided by our D26 DSP unit, which allows integration of delays and downfills. R-Control Remote Supervision network hardware and software is available to simplify operation.



Frequency shading eliminates LF lobing

TTS3K(T) REFERENCE POINT ARRAY

(front fill loudspeakers not shown)



A complete "pre-engineered" TTS3(K) TRAP40 Array consists of:

- 1 TRAP40/6K (TRAP40/7K) full-range loudspeakers
- 2 TRAP40M/6K (TRAP40M/7K) mid/high modules
- 1 TRAP-SVBK Dual 15" LF cabinet
- 2 TRC81/9KH 2-way loudspeakers (for front fill)
- 3 P3500 Amplifiers
- 1 PK-167-A P3500 Controller module
- 1 PK-168-A P3500 Controller module
- 1 PK-169-A P3500 Controller module
- 1 TTS3-RHANG Hanging hardware

Interconnecting cables, system preparation & testing

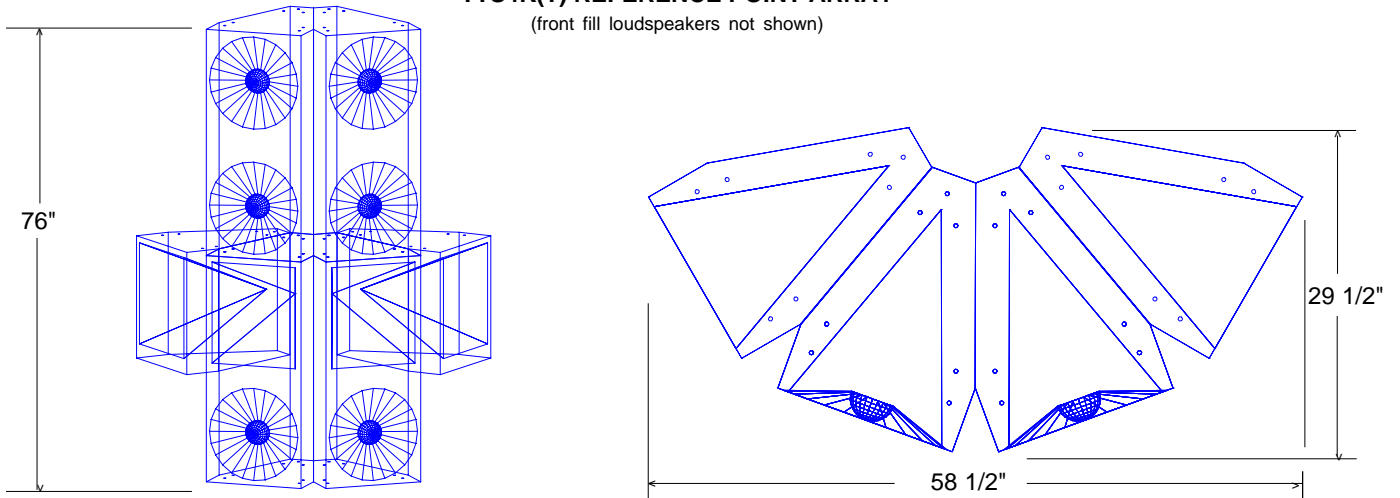
Horizontal Dispersion: 120°
Vertical Dispersion: 60°

Maximum SPL:
Program: 132 dB
Peak: 135 dB

Weight:
Without hardware: 319 Lbs.
With hardware: 469 Lbs.

TTS4K(T) REFERENCE POINT ARRAY

(front fill loudspeakers not shown)



A complete "pre-engineered" TTS4K(T) TRAP40 Array consists of:

- 2 TRAP40/6K (TRAP40/7K) full-range loudspeakers
- 2 TRAP40M/6K (TRAP40M/7K) mid/high modules
- 2 TRAP-SVBK Dual 15" LF cabinet
- 2 TRC81/9KH 2-way loudspeakers (for front fill)
- 3 P3500 Amplifiers
- 1 PK-167-A P3500 Controller module
- 1 PK-170-A P3500 Controller module
- 1 PK-171-A P3500 Controller module
- 1 TTS4-RHANG Hanging hardware

Interconnecting cables, system preparation & testing

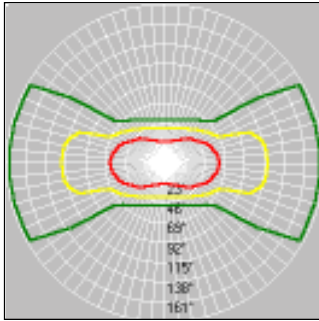
Horizontal Dispersion: 160°
Vertical Dispersion: 60°

Maximum SPL:
Program: 135 dB
Peak: 138 dB

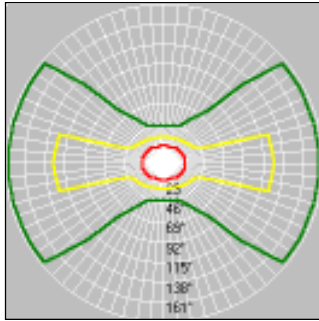
Weight:
Without hardware: 514 Lbs.
With hardware: 714 Lbs.

TTS3K(T) TriPolar Array Polar Coverage
 (front fill loudspeakers not included)

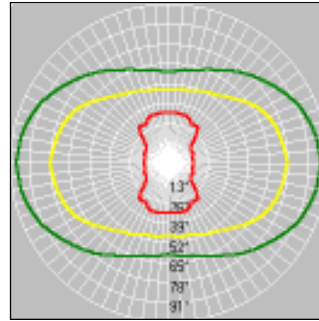
125 Hz



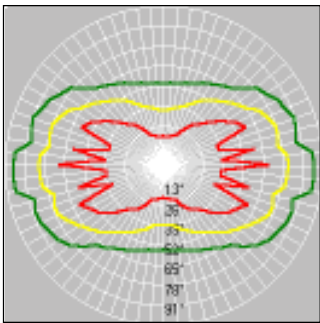
250 Hz



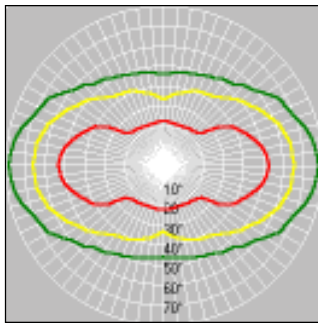
500 Hz



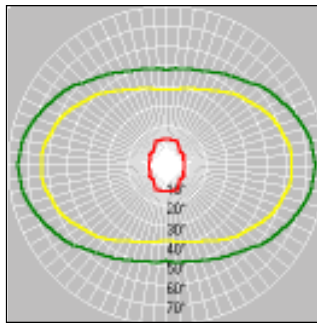
1000 Hz



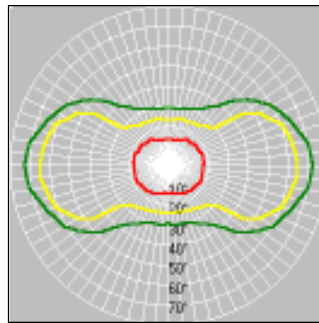
2000 Hz



4000 Hz

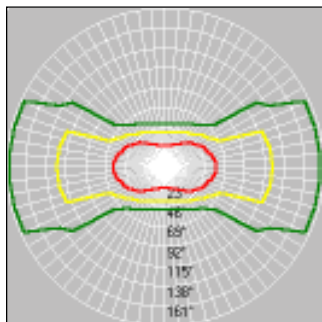


8000 Hz

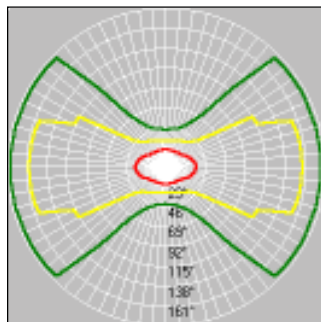


TTS4K(T) TriPolar Array Polar Coverage
 (front fill loudspeakers not included)

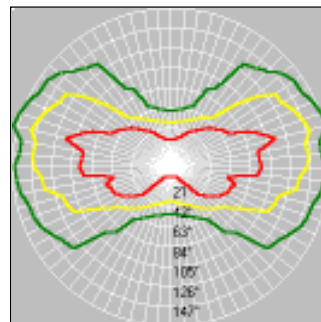
125 Hz



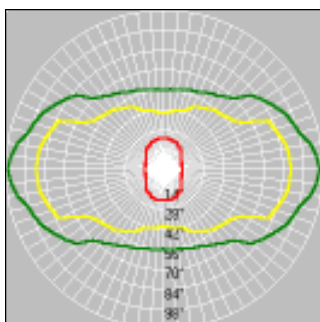
250 Hz



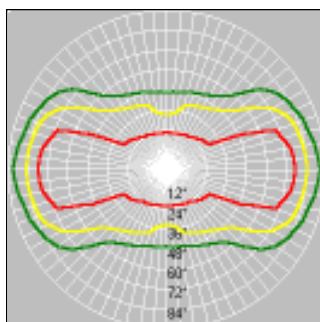
500 Hz



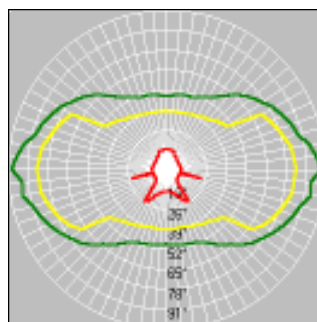
1000 Hz



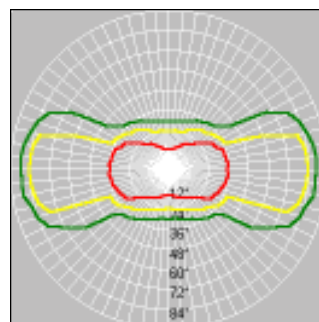
2000 Hz



4000 Hz



8000 Hz



TECHNICAL SPECIFICATIONS
All specifications are with loudspeaker specific processing

TTS3K(T) & TTS4K(T) CLUSTERS

SENSITIVITY: 98 dB (1W/1m) @ 300 Hz
 106 dB (1W/1m) @ 500 Hz
 109 dB (1W/1m) @ 2500 Hz

MAXIMUM PROGRAM SPL:

TTS-3: 132 dB pgm, 135 dB peak
TTS-4: 135 dB pgm, 138 dB peak

DISPERSION:

TTS-3: 120° H by 60° V
TTS-4: 160° H by 60° V

FREQUENCY RESPONSE: 40 Hz to 17,000 Hz

ENCLOSURE: 13 ply hardwood, heavily braced with perforated metal grille and moisture resistant foam insert

CONNECTORS: Neutrik 4-pin

FINISH OPTIONS: Black, white or custom color paint, natural, weather resistant

CLUSTER DIMENSIONS:

TTS3: 76" H x 49 1/2" W x 26" D
 (193 cm x 125.7 cm x 66 cm)

TTS4: 76" H x 58 1/2" W x 29 1/2" D
 (193 cm x 148.6 cm x 74.9 cm)

CLUSTER NET WEIGHT:

TTS3: 319 Lbs. (144.7 Kg)
TTS4: 514 Lbs. (233.2 Kg)

P 3500 AMPLIFIER

OUTPUT RATINGS: 500 w/ch at 8 Ohms
 (20 Hz to 20 kHz) 750 w/ch at 4 Ohms
 < 0.25% THD) 900 w/ch at 2 Ohms
 1500 Watts, 4 Ohms bridged

FREQUENCY RESPONSE: +0.0, -5 dB, 20 Hz to 20 kHz @ RPO

THD (at 1kHz) DISTORTION: < 0.1% at RPO (4 Ohms)

SMPTE IMD: < 0.2 %, 500 w at 8 Ohms

HUM & NOISE: -100 dB (referred to RPO @ 8 Ohms,

CROSSTALK: > 60 dB @ 400 Hz

INPUT SENSITIVITY: 1.5 V for RPO (at 8 Ohms)

INPUT IMPEDANCE: 20 K Ohms, balanced

VOLTAGE GAIN: 42

SLEW RATE: > 35 v/usec

DAMPING FACTOR: >100 for loads of 2 Ohms or greater, 20 Hz to 20 kHz

MAX. VOLTAGE SWING: +/-105 V Peak @ 8 Ohms RPO

POWER REQUIREMENTS: 100/120 VAC, 50/60 Hz (Dom.)
 200/230 VAC, 50/60 Hz (Export)
 (1440 VA)

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker cluster shall be a Renkus-Heinz Model {TTS3K(T) {TTS4K(T)} or approved equal pre-engineered TriPolar reference point array providing true point source performance.

The loudspeaker cluster shall include (1)(2) Renkus-Heinz TRAP40/6K loudspeakers, 2 TRAP40M/6K mid/high modules, (1)(2) TRAP-SVBK low frequency enclosures and all necessary hanging hardware. (optional - - Two Renkus-Heinz TRC81/9KH front fill loudspeakers shall also be provided.)

Sensitivity shall be no less than 98 dB @ 1w,1m @ 300 Hz with a maximum SPL of at least () dB and a frequency response of 40 Hz to 17 kHz.

The cluster shall be no larger than 76" high and (49.5") (58.5") wide, be no deeper than (26") (29.5"), and weigh no more than (469) (714) Lbs. The individual enclosures shall be trapezoidal in shape and constructed from 13 ply hardwood, heavily braced and lined with fiberglass to suppress resonances. Matching perforated metal grilles backed with protective foam shall be included.

The finish shall be (black carpet) (black paint) (white paint) (natural) (weather resistant). Connectors shall be 4-pin Neutrik.

The loudspeaker array shall be equipped with factory pre-engineered flying hardware, Renkus-Heinz model (TTS3-HANG) (TTS4-HANG).

Power for the array shall be provided by 3 Renkus-Heinz P3500 amplifiers equipped with appropriate PK-A loudspeaker controller modules.

The power amplifier shall have an FTC output power rating of at least 750 Watts per channel into 4 Ohm loads (900 Watts into 2 Ohms) at less than 0.25% THD from 20 Hz to 20 kHz.

Overall frequency response shall be within + 0.0 dB, - 0.5 dB over the same frequency range at all power levels up to rated power output. Hum and noise level shall be at least -100 dB referred to RPO @ 8 Ohms.

Binding posts and a 4-pin Neutrik connector shall be provided for output connections. Input connectors shall be 3-pin XLR type. Front panel controls shall include two input level attenuators and a power on/off switch.

The plug-in controller modules shall be calibrated to match the equalization, protection and delay requirements of the associated loudspeaker array. They shall provide separate fourth-order, 24 dB per octave crossovers, low frequency signal delay circuitry and protective circuitry for the associated loudspeakers.

The protective circuits shall be designed to prevent damage to the loudspeakers from overheating (thermal overload), from over-excursion and from high-level transients.

