

# High power speaker arrays



## Description

WAVES High Power Speaker Arrays (HPSA-7100-R Series) from Eaton's Cooper Notification business broadcast crisp, intelligible voice messages and tones, over large outdoor coverage areas where immediate notification is essential. Designed to meet Life Safety requirements, CE mark approval and TUV certification, this wide-area Mass Notification System (MNS) features industry-leading intelligibility using an advanced amplification system design. Deployed on a static pole, affixed to a building or mounted on a rooftop, the HPSAs have a variety of installation options. These Giant Voice speaker arrays ensure that you get the right message to the right person at the right time.

The HPSA-7100-R Series can be integrated and controlled by either voice-capable Fire Alarm Control Panels (FACP) or Eaton's SAFEPATH (SP40S) Voice Evacuation Systems or SAFEPATH Mass Notification Systems (SPMNS). The supervised NAC input of the HPSA is designed to activate and de-activate audio at the HPSA by applying 24 VDC in the appropriate polarity or contact closure. The NAC input does not accept audio directly. There is a separate input to bring audio into the HPSA that supports 100 V, 70 V, 25 V or 1 V audio.



HPSA-7106-R Omni-directional




HPSA-7104-R Directional

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## Features & benefits

- Highly intelligible live voice and tone announcements
- Energy- and cost- efficient advanced amplification system enables lower current draw and increased battery life, requiring fewer speakers and significantly less power for a substantially larger range (see specifications)
- Continuous emergency operation regardless of primary power outage
- Omni-directional and directional speaker coverage options
- Intelligent battery charger maintains batteries at optimal charge state and supervises the batteries for multiple fault conditions
- Six discrete (Form C) trouble signals: No AC, No Battery, Low Battery, Door Open (tamper), Amplifier Fault, Driver Fault
- Multiple HPSAs can be controlled by one source

**Note:** All CAUTIONS and WARNINGS are identified by the symbol . All warnings are printed in bold capital letters.

## WARNING

**PLEASE READ THESE SPECIFICATIONS AND ASSOCIATED INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS OR WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

## Approvals



## Applications

Multi-use applications- Integrated with a facility's audio source (panel agnostic), HPSA-7100-R Series can function as mass notification, emergency communications, personnel notification, and citizen warning system for natural or man-made disasters. It can also be used for training and exercises, general announcements, crowd control and special events.

## Components

- 2, 4, 6, or 8 horns, varies by model
- Assembly horn driver with cover (number varies by model number)
- Electronics cabinet includes audio and monitoring bridge and four 65AH batteries
- Battery cable

## Accessories

- Pedestal/stand kit: M37-00056
- Mounting options include HRNMT-100\* and HRNMT-250\*
- Optional microphone for set-up and testing- HPSA-MIC\*
- 500 ft speaker wire kit: CAB-SPKR-KIT
- HPSA-7100-V-KIT—required for all 100V and 70V applications

\*For additional information, see separate specification sheets.

## Installation and mounting dimensions

HPSA horns can be deployed on a static pole, affixed to a building or mounted on a roof. The diameter of the pole for the HPSA speaker horns must be 4.5" to 6". Pole and mounting accessories are not included with the HPSA.

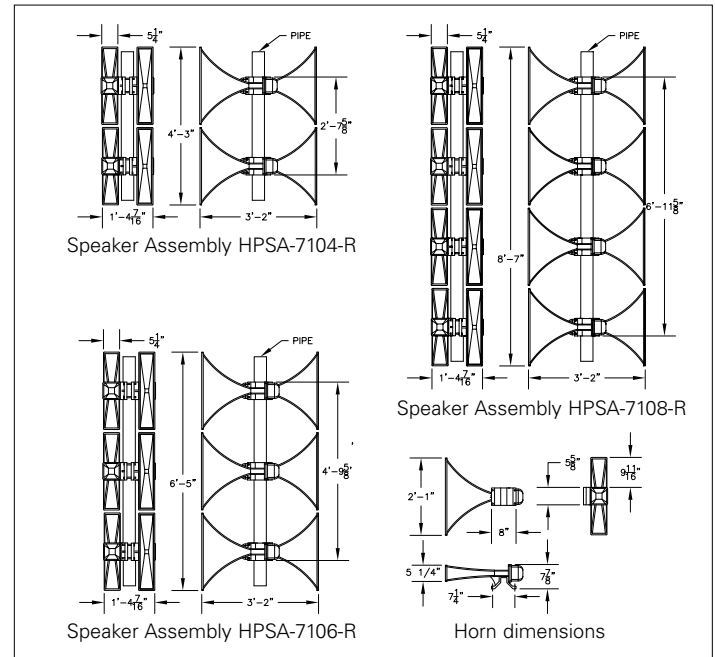


Figure 1. Wall speaker strobe

## HPSA electronics cabinet

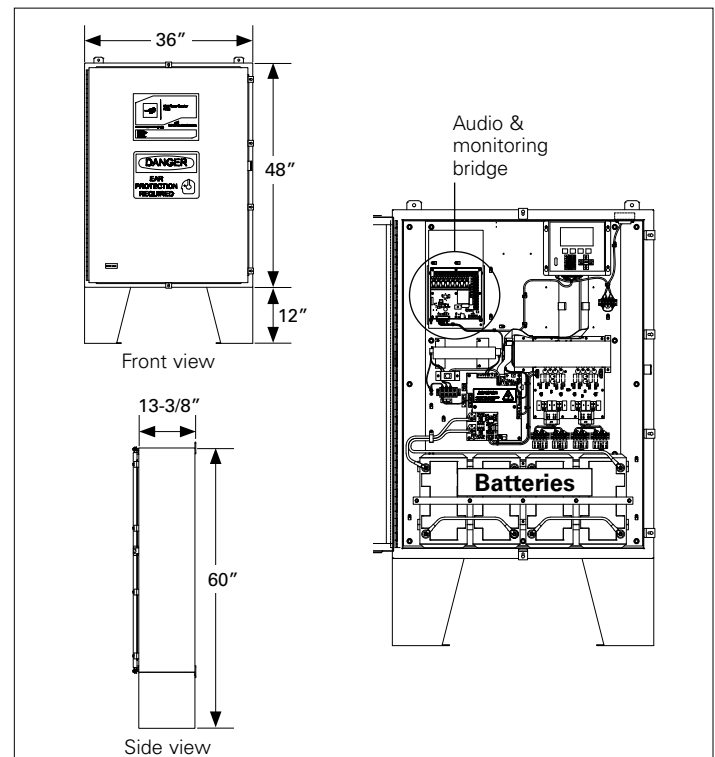


Figure 2. Electronics cabinet dimensions

**Table 1. Specifications**

Model Number	Number of Horns	Watts	dB (C) @ 100' (30 m) <sup>①</sup>	Effective Range <sup>①</sup> : 180° Radius @ 70dB (C)	dB (C) @ 100' (30 m) <sup>①</sup>	Effective Range <sup>①</sup> : 360° Radius @ 70dB (C)	Height	Horn & Driver Kit Weight
HPSA-7102-R	2	200	110	1600' (480 m)	105	1200' (366 m)	25" (63.5 cm)	52 lbs (23.6 kg)
HPSA-7104-R	4	400	115	2400' (732 m)	110	1600' (480 m)	51" (129.5 cm)	104 lbs (47.2 kg)
HPSA-7106-R	6	600	119	3040' (927 m)	114	2240' (683 m)	77" (195.6 cm)	156 lbs (70.8 kg)
HPSA-7108-R	8	800	123	4160' (1268 m)	118	2880' (878 m)	103" (261.6 cm)	208 lbs (94.4 kg)

**Table 2. Product features**

<b>External Interface</b>	
NAC input	PTT Activation. 9–40 VDC, 17 mA Max.
Dry contact input	PTT Activation (alternative to NAC Input). 250ms < 1 K Ohms.
Audio input	100 $V_{RMS}$ , 70.7 $V_{RMS}$ , 25 $V_{RMS}$ or 1 $V_{RMS}$ selectable (100 $V_{RMS}$ and 70.7 $V_{RMS}$ require model HPSA-7100-V-KIT, which is sold separately)
Trouble outputs	Form C, dry contact. 2 Amps., 30VDC (resistive). Max. Trouble Signals (6) provided: AC, No Battery, Low Battery, Tamper, Amplifier Fault and Driver Fault.
<b>General Specifications</b>	
Electronic cabinet dimensions	36" W x 48" H (60" with pedestals) x 12" D / 91.4 x 121.9 (152.4 with pedestals) x 30.5 cm
Electronic cabinet weight	110 lbs (not including batteries) / 49.9 kg; Total weight with batteries: 322 lbs / 146 kg
Horn dimensions	3' 2" W x 2' 1" H x 1' 4 7/16" D / 96.52 cm x 63.5 cm x 41.91 cm (2 horns with drivers, omni-directional)
Horn weight	52 lbs for each horn and driver kit (pair) / 23.6 kg
Horn material	Special aluminum alloy horn construction provides long service life without material fatigue
Battery weight	53 lbs each / 24 kg
Speaker mounting/pipe pole <sup>②</sup>	Minimum 4.5" (11 cm) outside diameter (OD); Maximum 6" OD (15.25 cm)
Ground mount pedestal kit <sup>②</sup>	Model M37-00056 raises the cabinet 12" (30.5 cm) from the ground
Speaker cable kit <sup>②</sup>	Model CAB-SPKR-KIT, 500 ft (152 m) long; 16 AWG stranded, non-shielded, marine-rated
Speaker wire <sup>②</sup>	12–16 AWG stranded two-conductor jacketed cable. Non-shielded either twisted or non-twisted. UL/CSA/EU: approved for outdoor use. The distance of the cable length between the HPSA and each driver is limited to a maximum of 100 feet.
Wire size ratings	Speaker Lines: 12–16 AWG (limited to 14 AWG for connectors) AMB Lines: 12–22 AWG AC Mains: 10–16 AWG
<b>Power (Including Standby)</b>	
Input voltage	120 to 240 VAC; 50 to 60 Hz Single-phase (Universal AC/Auto-switching)
Input current	3 Amps
Battery input voltage	40.8 - 55.4 VDC 48 Volts (nominal)
Operating voltage	~48 VDC
Standby time	72 hrs followed by 60 min continuous voice
Continuous signaling time	60 minutes (voice)
Battery charger	Universal AC Supply, 4 Amp maximum
Batteries	Four (4) deep cycle discharge AGM, SLA batteries. 65 AH each, connected in series
<b>Amplifiers</b>	
Amplifier	Class D
Frequency response	300 Hz to 7.2 kHz (Driver, typical); 20 Hz to 20 kHz (Amp, typical)
Total harmonic distortion	0.1% THD+N Capable; 10% THD+N Max to achieve specified SPL levels
Efficiency	Greater than 90% at full load
Thermal protection	Yes
Short circuit protection	Yes, Auto Recovery
Driver impedance	11 Ohm (Typical)
<b>Environment</b>	
Operating temperature	-40° F to 140° F (-40° C to +60° C)
Electronic cabinet rating	NEMA 4X, IP66, UL508 cabinet
Transient protection	Built-in lightning protection on mains, external interfaces, and speaker lines

① Field testing was performed in accordance with ANSI/ASA S12.14-1992, reaffirmed September 11, 2007. Actual SPL performance will depend on parameters such as site design, topography, climate and foliage.

② Not included with the HPSA-7100-R series.

## HPSA battery charger

### Output for 4 series connected sealed lead-acid (SLA) batteries:

- Maximum of 56VDC (14 V/battery, 2.33 V/cell)
- Operates in a constant current mode limited to a total of four amperes.
- Intelligent battery charger maintains batteries at optimal charge state and supervises the batteries for multiple fault conditions.

## Recommended maintenance

**Batteries:** Check all HPSA batteries once a month for optimal power; twice a month if the batteries are used excessively. If the power consistently drops below the working level, as specified in the operator manuals, the batteries may need to be replaced. Note: batteries are not covered under the Cooper Notification limited warranty.

**Speaker wire:** Visually check once a week all wiring for frays, cuts, and kinking.

Also recommended is to refer to the MNS maintenance schedule as specified by the Unified Facilities Criteria (UFC) code section 4-021-01. Test schedules are to be followed to standard operating systems (SOP) set forth by the UFC and/or WAVES Administrators of the site.

## Architects and engineers specifications

The High Power Speaker Array shall be a model HPSA-71\_\_\_-R, providing alarm tones and recorded or live voice announcements at \_\_\_ dB (A) at 30 meters (100 feet) from the source, omnidirectional, consisting of: The Siren Head shall be: [2- 8] high efficiency aluminum horns [select model] and 2, 4, 6 or 8 high power drivers with connectors [select model] with one (1) set, mounting materials (screws, nuts, washers).

The Siren Electronics shall be: One (1) outdoor cabinet, with terminations and all components fully assembled and tested; Universal AC/ Auto-switching (120 to 240 VAC; 50 to 60 Hz Single-phase) power supply, fused lightning protection. The siren electronics shall include a DSP-based processor board with power distribution board, amplifier and the appropriate set of horn drivers (2, 4, 6 or 8 for the 7102, 7104, 7106 and 7108 models respectively).

Features available from the front-panel (not the interface) shall include status display, horn driver test (silent test), and master volume adjustment.

The NAC input shall be designed to activate and de-activate audio at the siren by applying 24 VDC in the appropriate polarity. The NAC input shall not accept audio directly. A separate input, supporting 100V, 70 V, 25 V or 1 V audio (300 mV minimum), shall bring audio into the siren.

The HPSA control panel display shall be easy to navigate and operate and be capable of providing public address, test and configuration setup.

Approvals shall include CE Mark and TUV certification.

## Training

Free installation training is available at Eaton Cooper Notification Training Center at [www.cooperindustries.com/content/public/en/safety/notification/resources/education/e-learning.html](http://www.cooperindustries.com/content/public/en/safety/notification/resources/education/e-learning.html)

**Note:** Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Eaton's Cooper Notification business standard terms and conditions.

WE ENCOURAGE AND SUPPORT NICET CERTIFICATION  
18 MONTH WARRANTY

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