

# SELF-AMPLIFIED (24V) SYSTEMS

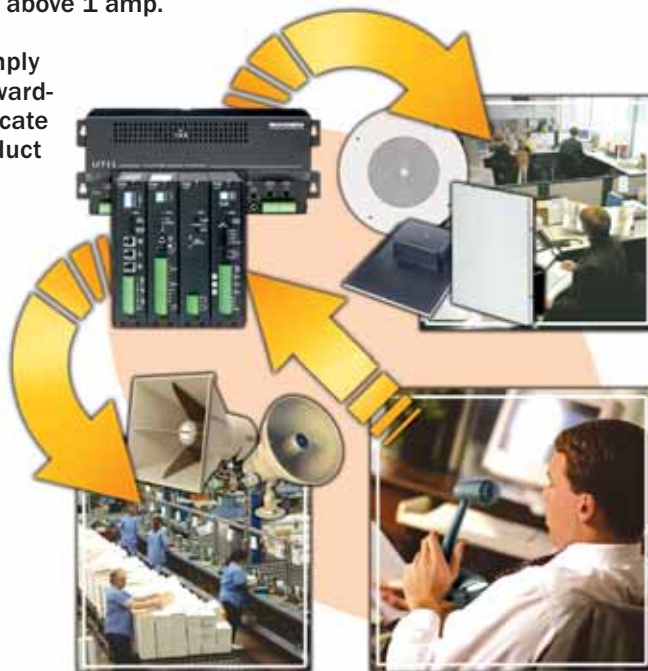
Bogen introduces the next generation in self-amplified (24V) paging equipment. Only Bogen offers high-efficiency horn speakers that use digital switching amplifiers and constant dispersion horn technology; single- and multi-zone telephone paging interfaces that provide a new level of features and flexibility with programmable AUX relay contacts and installer programmable dialing codes; and an extensive line of 24V switching power supplies with secure mounting holsters and pluggable screw terminal connectors on models above 1 amp.

To locate Bogen's Self-Amplified (24V) Paging Products, simply look for the upward-pointing **green** triangles and the downward-pointing **red** triangles. The numbers inside the triangles indicate "Current Units", which determine how much power that product provides to or consumes from the system.



Other products such as telephone interfaces, buffered level controls and 24V power supplies that are well suited for use in self-amplified paging systems carry these same icons for easy identification. Suitable products that neither provide nor consume power are shown with the neutral gray icon with a zero inside it.

For more information on understanding Current Units for your system, see pages 68-69.



## Getting Started

1. Select Self-Amplified Speaker Type  
(Use this chart)
2. Select a Telephone Interface  
(pages 29-31)
3. Select Power Supplies  
(page 28)

SPEAKER MODELS				
TYPICAL AMBIENT NOISE LEVEL	TYPICAL ENVIRONMENTS	ASWB1 ACD2X2 see pages 21 - 23	SAH5 AH5A see pages 24 & 26	SAH15, SAH30 AH15A see pages 24 & 26
<b>VERY HIGH NOISE</b> 85-95 dB Speech Almost Impossible To Hear	<ul style="list-style-type: none"> <li>Construction Site</li> <li>Loud Machine Shop</li> <li>Noisy Manufacturing</li> <li>Printing Shop</li> </ul>			
<b>HIGH NOISE</b> 75-85 dB Speech Is Difficult To Hear	<ul style="list-style-type: none"> <li>Assembly Line</li> <li>Crowded Transit Waiting Area</li> <li>Machine/Print Shop</li> <li>Shipping Warehouse</li> <li>Supermarket (Peak)</li> <li>Very Noisy Bar or Restaurant</li> </ul>			
<b>MEDIUM NOISE</b> 65-75 dB Must Raise Voice To Be Heard	<ul style="list-style-type: none"> <li>Bank/Public Area</li> <li>Transit Waiting Area</li> <li>Department Store</li> <li>Noisy Office Setting</li> <li>Supermarket (Normal)</li> <li>Bar or Restaurant</li> </ul>			
<b>LOW NOISE</b> 55-65 dB Speech Is Easy To Hear	<ul style="list-style-type: none"> <li>Conversational Speech</li> <li>Doctor's Office</li> <li>Hospital</li> <li>Hotel Lobby</li> <li>Quiet Office</li> <li>Quiet Bar or Restaurant</li> </ul>			

# SELF-AMPLIFIED CEILING SPEAKERS

## Drop-In Ceiling Speakers

**ACD2X2**



The ACD2X2 full-range speaker is quick and easy to install. Simply wire it and drop it into place. This saves installation time, effort, and cost.

### Product Features:

- 2' x 2' design fits into 2' x 2' and 2' x 4' suspended ceiling tile spaces (support rail crossbar included for 2' x 4' ceilings)
- Finely perforated grille covers entire front of speaker panel
- Fully enclosed, industrial-grade steel construction
- Front-mounted, recessed volume control
- Self-contained 1-watt amplifier
- 8" main cone speaker, with secondary cone
- Non-reflective, off-white finish
- Complies with UL-2043

Dimensions:	23-7/8" W x 5" H x 23-7/8" D
Product Weight:	12 lb. each

See page 28 to select a Power Supply.

## Ceiling Speaker Assemblies

**ASWG1, ASWG1DK**

The ASWG1 and ASWG1DK traditional style, recessed ceiling speakers are available with a fixed or detachable volume control knob.



ASWG1

ASWG1DK

### Product Features:

- 8" cone speaker
- Front-mounted volume control with knob (knob is detachable on ASWG1DK)
- Off-white enamel over steel grille
- Self-contained 1-watt amplifier
- 90° dispersion pattern

See page 28 to select a Power Supply.

### Accessories



TB8  
Tile Bridge



RE84  
Ceiling Enclosure



MR8  
Mounting Ring

Dimensions:	12-7/8" dia. x 3-1/4" D
Product Weight:	4 lb. each

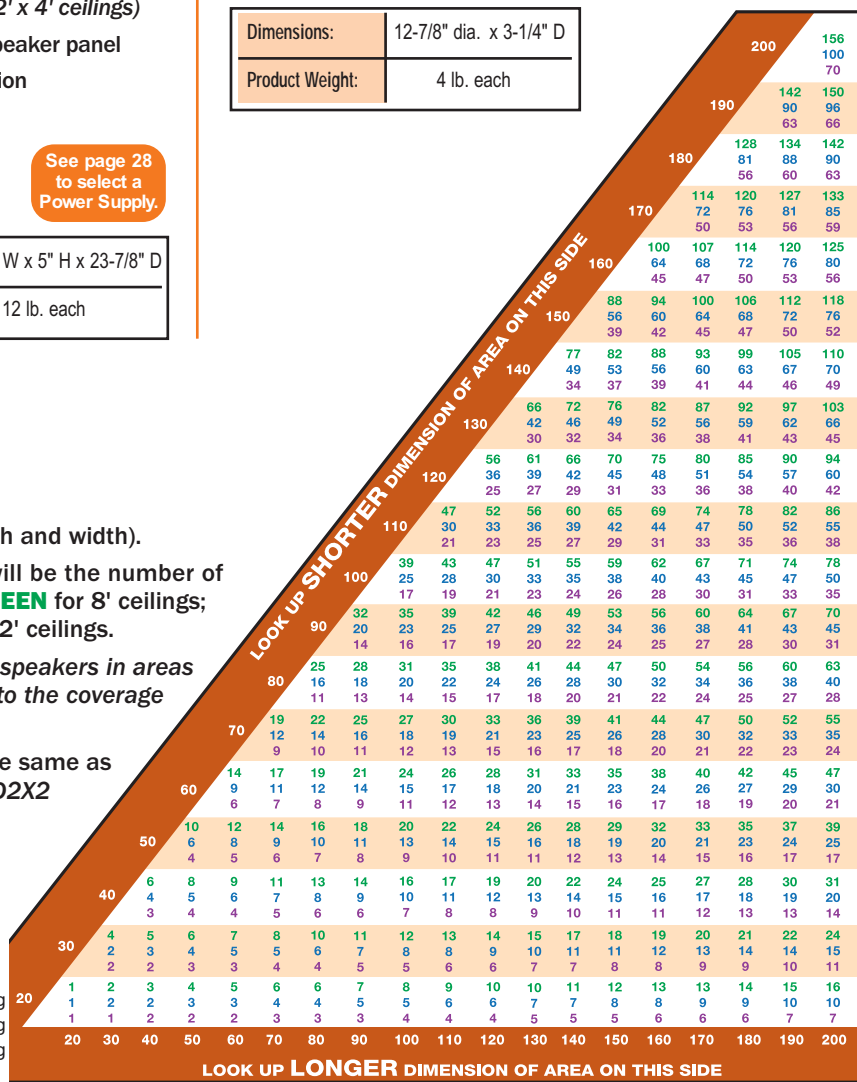
## Determine Speaker Quantity

### Using the chart:

1. Locate the dimensions of the room (length and width).
2. Where these two measurements meet will be the number of speakers required. Use the number in **GREEN** for 8' ceilings; **BLUE** for 10' ceilings; and **PURPLE** for 12' ceilings.  
(You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)
3. The number of Current Units needed is the same as the number of speakers (1W models, ACD2X2 ASWG1/DK, ASM1, AMBSL/SQ).

**Current Units (min.) =  
Number of Ceiling Speakers**

**GREEN** for 8 ft. Ceiling  
**BLUE** for 10 ft. Ceiling  
**PURPLE** for 12 ft. Ceiling



# SELF-AMPLIFIED SURFACE-MOUNT SPEAKERS

## Easy Install® Ceiling Speakers

### ASM1 CURRENT UNITS -1

Bogen's Self-Amplified Easy Install Speakers can be installed in a ceiling tile in less than a minute in any drop ceiling with standard ceiling tiles. Installation is a simple, three-step process that requires no tools. Simply pierce the ceiling tile with the specially-designed studs, use wing nuts to secure the speaker to the ceiling, and fasten wire nuts to make the 24V DC power and audio connections.

#### Product Features:

- Installs in less than a minute
- No-tool installation eliminates need to cut ceiling tiles
- Built-in 1W amplifier
- Direct and reflected sound paths create wide dispersion angle
- Lightweight and durable, off-white plastic shell with paintable finish
- Contemporary, low-profile design
- O-ring seal prevents whistling and ensures smoother sound without peaks
- High-quality, wire-wound volume control on outside of speaker
- Complies with NFPA National Code 160b for installation in plenums and other air handling spaces
- Complies with UL-2043

Refer to Speaker Quantity Chart on page 21

Frequency Response	Maximum dBspl	Depth	Dimensions	Product Weight
125 Hz - 15 kHz	90	3" from tile surface	9-1/2" diameter	2 lb.



#### Accessories



SMTB  
Tile Bridge



AMBSQ1  
Shown with  
Volume Knob

AMBSL1  
Shown with Volume  
Knob detached

Detachable  
Volume Knob

## Metal Box Speakers

### AMBSQ1, CURRENT UNITS -1 AMBSL1

Bogen's Self-Amplified Metal Box Speakers are available in two models, AMBSQ1 and AMBSL1, and are suitable for both ceiling and wall mounting.

#### Product Features:

- Rugged all-steel, surface-mounted, off-white painted enclosure
- Speaker front is available flat (AMBSQ1) or angled downward by 12.5 degrees for wall mounting (AMBSL1)
- Full-range 8" cone loudspeaker for excellent intelligibility
- Built-in volume control with detachable knob
- Self-contained 1-watt amplifier
- Mounting hardware included

Refer to Speaker Quantity Chart on page 21 for ceiling mount or chart on page 23 for wall mount

Models	Front Panel Design	Frequency Response	Maximum dBspl	Dimensions	Product Weight
AMBSL1	Slant/Angle	110 Hz -15 kHz	92	11-5/8" W x 11-3/8" H x 5-3/8" D (Top Dimension) 11-5/8" W x 11-3/8" H x 3-1/8" D (Bottom Dimension)	9 lb.
AMBSQ1	Square/Flat	110 Hz -15 kHz	92	11-5/8" W x 11-5/8" H x 4-1/4" D	9 lb.

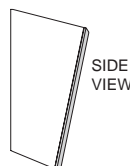


# SELF-AMPLIFIED WALL BAFFLE SPEAKERS

## Wall Baffle Speakers

### ASWB1

The ASWB1 Wall Baffle Speaker is an 8", cone-type loudspeaker, complete with a built-in amplifier and volume control, designed for telephone paging applications. It is engineered to provide excellent sound quality and trouble-free operation.



#### Product Features:

- Self-contained 1-watt amplifier
- Simulated walnut finish with black grille cloth on front
- Sloping front panel (13.5 degrees) provides enhanced downward dispersion
- Easy wall-mount installation (mounting hardware included)
- Built-in volume control
- 8" main cone speaker
- 90° dispersion pattern

Dimensions:	9-1/2" W x 9-1/2" H x 5-1/4" D
Product Weight:	4 lb.

See page 28 to select a Power Supply.

#### Determine Speaker Quantity

##### Using the chart:

1. Locate the dimensions of the room (length and width).
2. Where these two measurements meet will be the number of speakers required.  
(You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)
3. The number of Current Units needed is the same as the number of speakers

**Current Units (min.) =  
Number of Wall Mount Speakers**



## PAGING INTERFACE

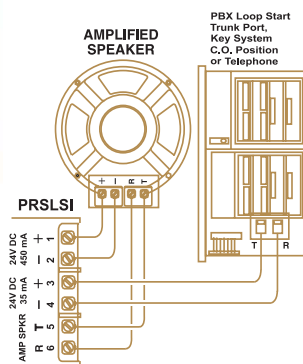
### Loop Start Interface/Power Supply

#### PRSLSI

The PRSLSI functions as both a 24V DC power supply and a loop start interface for small paging systems.

#### Product Features:

- 24V Talk battery supply for loop start ports
- Buffered audio output for up to 25 self-amplified speakers
- 450 mA, 24V DC power supply for external equipment
- Integral flanges and rubber feet for wall or shelf mounting
- 6-terminal barrier strip
- C-UL, listed for US and Canada



#### Loop Start Interface

Both the audio and power connections from self-amplified speakers can be connected to the PRSLSI. Connect the Tip and Ring terminals of the PRSLSI to a loop start trunk to provide paging access. The PRSLSI provides 9 CU (450 mA) of regulated 24V DC power for self-amplified speakers and enough audio capacity to drive 25 self-amplified speaker inputs.

Dimensions:	2-3/4" W x 4-1/2" H x 2-1/2" D
Product Weight:	3 lb.

# SELF-AMPLIFIED HORN SPEAKERS

High-Efficiency, Digital Switching,  
Horn Loudspeakers

**SAH5** (5W) <sup>CURRENT UNITS</sup> **-4**, **SAH15** (15W) <sup>CURRENT UNITS</sup> **-9**, **SAH30** (30W) <sup>CURRENT UNITS</sup> **-17**

Using digital switching amplifier technology, these **Self-Amplified Horn Loudspeakers** provide unprecedented low DC current draw and heat dissipation, allowing them to use fewer power supplies, run on longer cable runs, and work at higher ambient temperatures than conventional analog self-amplified horn speakers. The shape of the horn's flare provides a controlled dispersion of sound for better intelligibility. The horn can be rotated on its axis, offering wide dispersion patterns, vertically or horizontally, depending on its position. In addition, these weatherproof, plastic horns are extremely durable and rugged. They can be used in any environment, indoors or outdoors, without affecting sound quality.

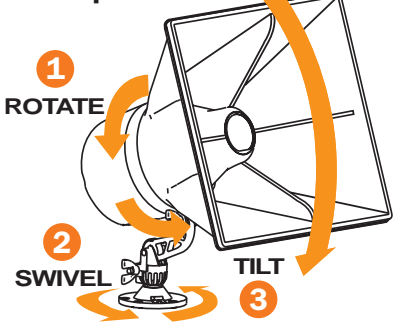


## Product Features:

- 5-, 15-, and 30-Watt models with built-in amplifiers
- All models operate from 24V DC power source
- Digital switching amplifier technology greatly reduces current consumption when compared to conventional analog self-amplified horn loudspeakers
- Low heat dissipation of the digital switching amplifier allows units to operate with continuous background music and in higher ambient temperatures than conventional analog amplifiers
- Excellent extended frequency response from 1.6" diameter voice coil and 90 mm, 12-ounce magnet structure (SAH5/15), or 100mm, 16-ounce magnet structure (SAH30)
- Rotatable horn allows for the use of a wider (120°) vertical or horizontal dispersion pattern
- Predictable dispersion pattern over the full frequency range ensures excellent intelligibility and ease of layout
- Removable access cover protects terminals and volume control
- Weatherproof, UV-protected plastic housing
- Simple and secure, cast aluminum swivel mount
- Screw terminal strip for easy wire connections
- Complies with FCC Part 15 requirements



## 3 Ways To Position SAH Speakers



See page 28  
to select a  
Power Supply.

## Accessories



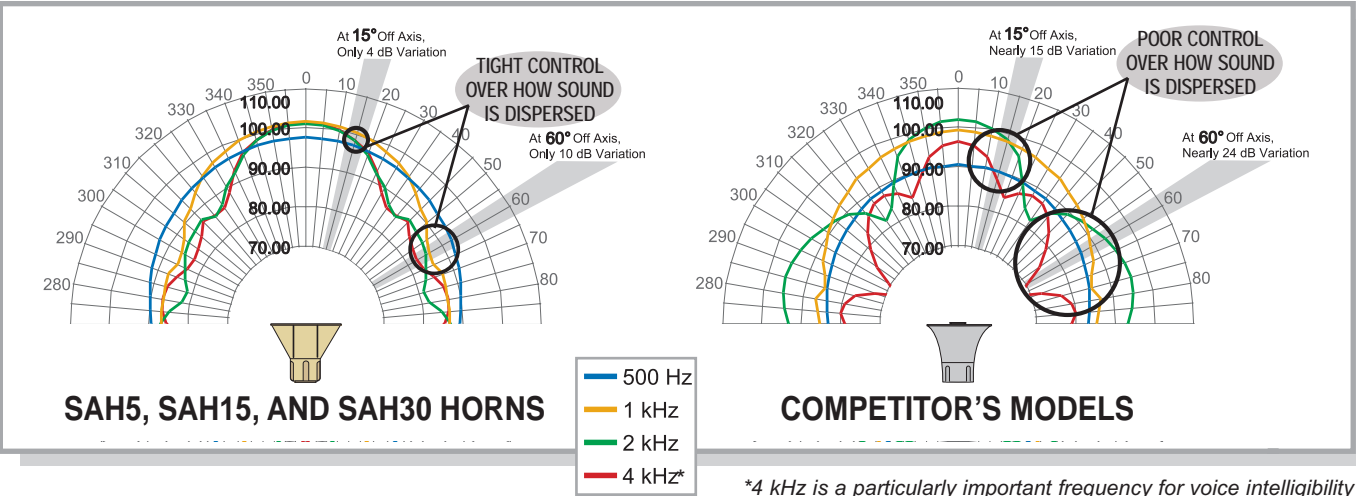
**BC1**  
Beam Clamp

Models	Maximum Power Level	Frequency Response	Maximum dBspl	Dimensions	Product Weight
SAH5	5 watts	275 Hz -14 kHz	119	10-5/8" W x 12" H x 11-1/2" D	6 lb.
SAH15	15 watts		124		
SAH30	30 watts		127		

## Controlled Dispersion

Many horns in the market disperse sound frequencies in a wild and uncontrolled manner. This reduces intelligibility and causes inconsistent sound quality over the horn's coverage angle. Bogen's SAH horns benefit from Bogen's long history as a commercial and

pro audio company. Bogen's SAH horns disperse the various frequencies that make up the sound of a page in a very carefully controlled manner. This means that the listener hears clean, crisp intelligible pages over the full coverage area of the horn.




\*4 kHz is a particularly important frequency for voice intelligibility

## Determine Speaker Quantity


Use the chart for the speaker you will use (SAH5, SAH15 or SAH30):

1. Choose the level of ambient noise in the area to be covered.
2. Locate the area's square footage.
3. Where these two measurements meet are two numbers. The number in **GREEN** is the number of speakers required. The number in **RED** is the number of Current Units (CU) needed for that many speakers. (You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)


**Current Units (min.) = Number in RED**

SAH5		HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																	
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
			100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
		55-65 dB Low Noise – speech is easy	HORNS	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9
		CU	4	4	8	8	12	12	16	16	20	20	24	24	28	28	32	32	36	36
		65-75 dB Medium Noise – must raise voice to be heard	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15
		CU	4	8	12	16	20	20	24	28	32	36	40	40	44	48	52	56	60	60

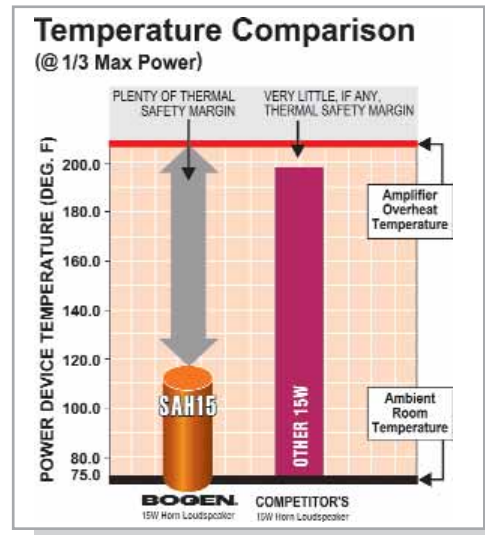
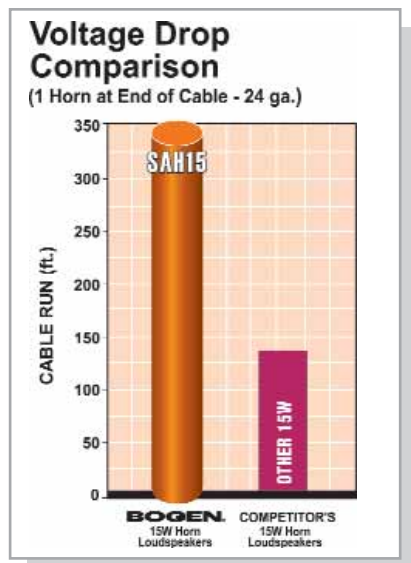
SAH15		HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																	
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
			100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
		75-85 dB High Noise – speech is difficult	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15
		CU	9	18	27	36	45	45	54	63	72	81	90	90	99	108	117	126	135	135
		85-95 dB Very High Noise – speech almost impossible	HORNS	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
		CU	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324

SAH30		HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE	SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																	
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
			100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185
		85-95 dB Very High Noise – speech almost impossible	HORNS	1	2	3	4	6	7	8	9	10	11	12	13	14	16	17	18	19
		CU	17	34	51	68	102	119	136	153	170	187	204	221	238	272	289	306	323	340

## Lower Currents = Lower Voltage Drops

Bogen's SAH self-amplified horn speakers consume significantly less current than equivalently sized conventional analog self-amplified horns. Lower current draw means less voltage drop, and longer cable runs than those allowed by conventional analog self-amplified horns. This allows more flexibility as to where you mount your power supplies and how many individual power supplies need to be installed.



## Thermally Rugged

The SAH self-amplified horn speaker's amplifier, by virtue of its high-efficiency digital switching technology, produces very little wasted heat. Lower amplifier operating temperatures mean these horns can work harder in higher temperature environments than conventional analog self-amplified horns. Lower operating temperatures also mean less stress on critical internal components and better reliability. Continuous background music is no sweat for these cool running horns.

# SELF-AMPLIFIED METAL HORN SPEAKERS

## Traditional Metal Horn Speakers

**AH5A** (5W)  **AH15A** (15W) 

The AH5A and AH15A Metal Horn Speakers are rugged, self-contained amplified paging horn assemblies that can be used for high noise paging areas indoors as well as for outdoor use. Their sturdy, weatherproof, all-metal construction allows them to withstand any environment while continuing to provide excellent audio intelligibility for paging and background music.



### Product Features:

- 5- and 15-watt models with built-in amplifiers
- Screwdriver-adjustable volume controls
- Universal tilt-and-swivel mount
- Banding slots easily secure horns to beams and pillars
- 4-conductor, color-coded cable for quick connections to audio and power sources
- Plastic cover protects volume control and provides cable strain relief
- Weatherproof, all-aluminum housing
- Self-aligning, field-replaceable diaphragm
- Speaker and brackets have textured mocha enamel finish
- 110° dispersion pattern

See page 28 to select a Power Supply.

Dimensions:	9" dia. x 9-1/4" D
Product Weight:	4 lb. each

### Accessories

BC1  
Beam Clamp



## Determine Speaker Quantity

Use the chart for the speaker you will use (AH5A or AH15A):

1. Choose the level of ambient noise in the area to be covered.
2. Locate the area's square footage.
3. Where these two measurements meet are two numbers. The number in **GREEN** is the number of speakers required. The number in **RED** is the number of Current Units (CU) needed for that many speakers. (You may need to increase the number of speakers in areas where large objects or shelving project into the coverage area, blocking sound.)

Current Units (min.) = Number in **RED**



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE		SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
55-65 dB Low Noise – speech is easy	HORNS	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
	CU	6	6	12	12	18	18	24	24	30	30	36	36	42	42	48	48	54	54	60	60
65-75 dB Medium Noise – must raise voice to be heard	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	CU	6	12	18	24	30	30	36	42	48	54	60	60	66	72	78	84	90	90	96	102



HORN QTY. & MIN. CURRENT UNITS (CU) BASED ON AMBIENT NOISE		SIZE OF AREA TO BE COVERED (THOUSANDS OF SQUARE FEET)																			
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
75-85 dB High Noise – speech is difficult	HORNS	1	2	3	4	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16	17
	CU	18	36	54	72	90	90	108	126	144	162	180	180	198	216	234	252	270	270	288	306
85-95 dB Very High Noise – speech almost impossible	HORNS	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	CU	36	72	108	144	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720



# LEVEL CONTROLS

## Buffer/Expander/Volume Control

### BUFEX CURRENT UNITS -1

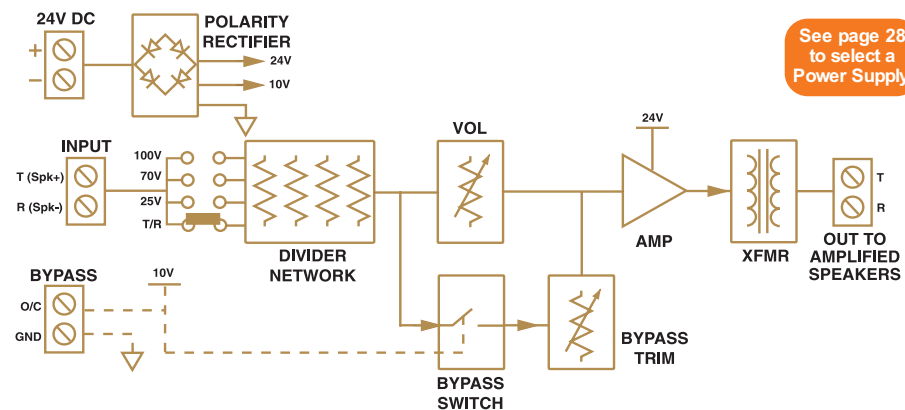
The **BUFEX** is a multi-purpose device that can work as a volume control for a network of speakers, and as a buffer that can drive up to 150 speakers. It also functions as a system expander when connecting to 100V, 70V, and 25V speaker systems.

To address the needs of emergency announcements, the BUFEX has a Bypass feature that allows emergency announcements to be heard at high levels regardless of the volume setting on the BUFEX. The BUFEX contains a Bypass Trim feature that allows some adjustment to the Bypass level.



#### Product Features:

- Local volume control for a group of speakers
- Provides buffering for up to 150 self-amplified speakers
- Allows self-amplified speakers to work with 100V/70V/25V systems, expanding existing systems
- Continuously variable attenuator
- Rugged and attractive stainless steel wall plate with engraved lettering
- Mounts in single gang wall box
- Easy and secure terminal strip connections
- Jumper selectable 100V, 70V, or 25V speaker selections as well as T/R
- Bypass feature overrides local volume setting for high importance messages
- Bypass trim allows a maximum 12 dB attenuation over bypass announcements



See page 28 to select a Power Supply.

Dimensions	Product Weight
2-7/8" W x 4-5/8" H x 2-1/2" D	Less Than 1 lb.

### Bypass

Local volume controls allow people working in an area to control the level of paging and background music for their needs. However, in paging systems where alert announcements are made as well as general announcements, local volume controls can be a problem. When users set volume controls for very low levels or off, the alert announcements may not be heard.

When the BUFEX's Bypass feature is activated (by an external contact closure), it overrides the local level setting of the BUFEX and allows important messages to be heard.

In certain circumstances, full level audio messages may be overpowering. The BUFEX includes a Bypass Trim that allows a maximum 12 dB of attenuation to the alert message when the local level is set to 0. As the local level is increased, the Bypass Trim will track this and increase the alert message level proportionally.

## Signal Level Control

### SLC CURRENT UNITS 0

The **SLC** provides a simple and cost effective way to remotely control the volume level of a network of up to 150 speakers. Simply wire in series with the audio feed to the desired group of amplified speakers.

#### Product Features:

- Continuously variable attenuator
- Rugged and attractive stainless steel wall plate with engraved lettering
- Mounts in single gang wall box
- Easy and secure terminal strip connections
- Passive (requires no DC power)



Dimensions	Product Weight
2-7/8" W x 4-5/8" H x 2" D	Less Than 1 lb.

