

*Thank you for using our products.*

**INSTALLATION INSTRUCTIONS  
 HORN SPEAKER WITH AMPLIFIER**

*Use this product according to this instruction manual. Please keep this instruction manual for future reference.*

**MODEL NUMBERS:**

SA-H5-B 8" HORN SPEAKER W/5 WATT AMPLIFIER  
 SA-H15-B 8" HORN SPEAKER W/15 WATT AMPLIFIER

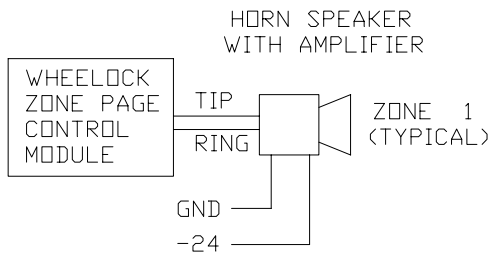
**GENERAL:**

Horn speakers with built-in amplifiers are used for one-way voice paging, background music, and tone alerting in large indoor and outdoor and/or noisy locations. Model SA-H5-B has a built-in 5 watt amplifier, and model SA-H15-B has a built-in 15 watt amplifier. Both models have a built-in volume control. The horn speakers with built-in amplifier are used in the following manner. Figure 1 shows a zone paging application used with Wheelock's Zone Page Control Module. The horn speaker can also be used to provide single-zone paging when connected directly to an unused Central Office (C.O.) line port, which can be programmed to function as a 600 Ohm Audio Page Port (i.e., does not require Talk Battery). See Figure 2.

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

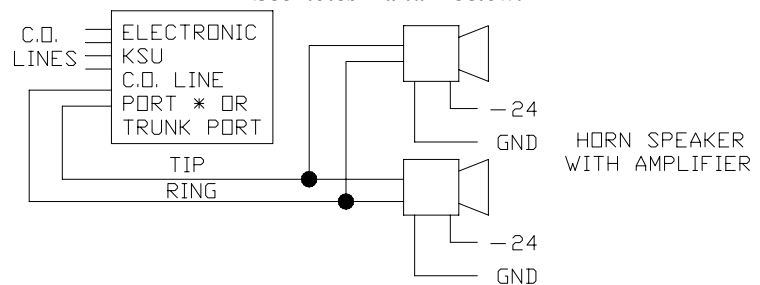
**⚠ WARNING: READ THESE INSTRUCTIONS CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

**Figure 1.**



**Figure 2.**

*See notes 1 and 2 below.*

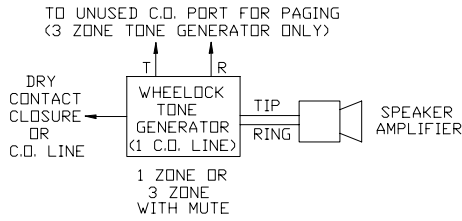


**\*NOTES:**

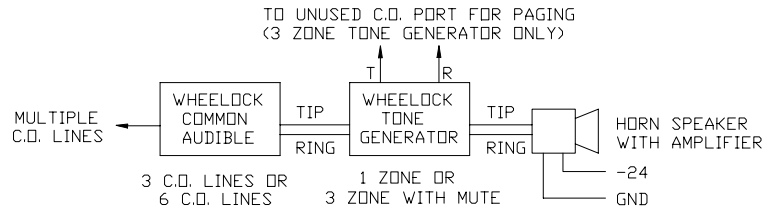
1. Some telephone systems require that the C.O. trunk port (loop start) or C.O. line port be equipped with a trunk card, page card or other equipment. Consult the telephone manufacturer's system manual for equipment or programming required.
2. If unused C.O. port requires talk battery to pass audio (most do) then a Wheelock Zone Control is required as an interface for zoned paging systems. For single-zone paging a Wheelock PRM-150 Preamplifier with an RPS-2406 power supply is required as an interface.

Figure 3 shows a horn speaker w/amplifier connected to a tone generator for telephone alerting or night ringing, with paging.

**Figure 3.**



**Figure 4.**



**\*NOTE:**

1. If unused C.O. port requires talk battery to pass audio (most do) then a Wheelock Zone Control is required as an interface for zoned paging systems. For single-zone paging a Wheelock PRM-150 Preamplifier with an RPS-2406 power supply is required as an interface.

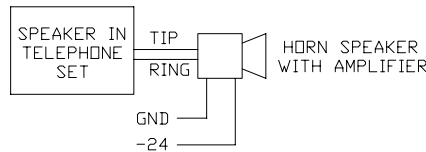
Figure 4 shows the same tone generator and horn speaker w/amplifier activated by a common audible.

**\*NOTE:**

1. If unused C.O. port requires talk battery to pass audio (most do) then a Wheelock Zone Control is required as an interface for zoned paging systems. For single-zone paging a Wheelock PRM-150 Preamplifier with an RPS-2406 power supply is required as an interface.
2. The horn speaker w/amplifier can be used to amplify the tone of a telephone as shown in Figure 5. It can also be used to expand the capability of 25 or 70 volt paging systems. Up to 125 horn speakers w/amplifiers may be connected to each transformer using the 1/4W tap.

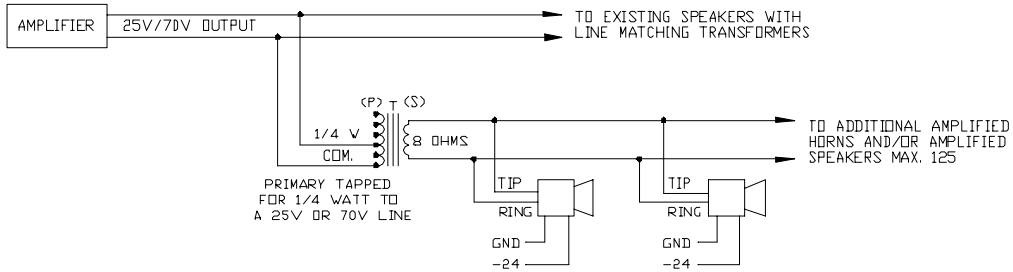
See Figures 6 and 6A.

**Figure 5.**



**Figure 6.**

CONNECTIONS FOR 25V OR 70V LINE MATCHING TRANSFORMER HAVING A TAPPED PRIMARY WINDING



**Figure 6A.**

CONNECTIONS FOR 25V OR 70V LINE MATCHING TRANSFORMER HAVING A TAPPED PRIMARY WINDING

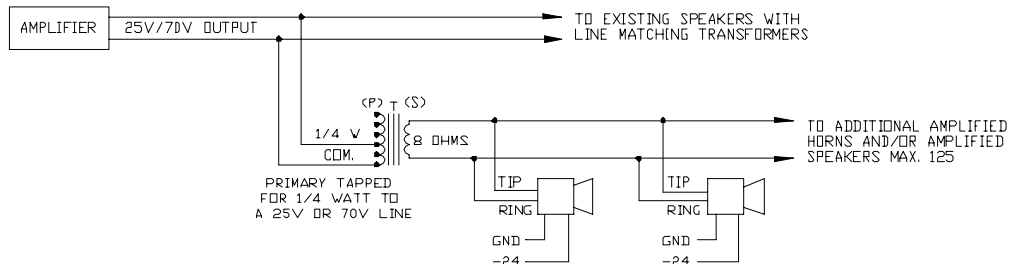
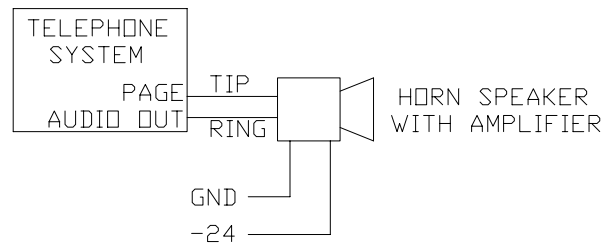


Figure 7 shows a horn speaker w/amplifier connected to a PABX or EKSU which provides one or more audio page ports.

**Figure 7.**



- (A) 8 Ohm, Amplified (1-3 Watts) page port: Maximum capacity is 125 horn speakers w/amplifiers.
- (B) 600 Ohm, low power page port: Maximum capacity is 10 horn speakers w/amplifiers (See System Capacity below). If a PRM-150 preamplifier is used, then maximum capacity is 150 horn speakers w/amplifiers.

**SYSTEM CAPACITY:**

For applications with a typical 600 Ohm source impedance such as a telephone system audio page port, a maximum of 10 Horn Speakers may be used. Additional Horn Speakers (up to 150 maximum) will require the PRM-150 Preamplifier for correct level and impedance matching.

**SPECIFICATIONS:**

Horn Speaker

Dimensions:	8-15/16" Dia. X 10" D
Voice Coil Impedance:	8 Ohms
Sound Dispersion:	110 Degrees
Frequency Response (@ Full Rated Output)	
(-30dB) Ref. 1.1kHz:	375 - 14,000Hz
Typical Sound Pressure Level (SPL-On Axis,	
@ 1 Meter, @ 1.1KHz, @ Full Rated Output):	SA-H5-B - 114dB
	SA-H15-B - 117dB

Amplifier

Rated Output Power:	SA-H5-B - 5 Watts
	SA-H15-B - 15 Watts
Audio Input Impedance:	600 Ohms
Nominal Sensitivity for Full Rated Output:	SA-H5-B - 35mV (± 20mV)
	SA-H15-B - 55mV (± 20mV)
Power Input Voltage:	Maximum - 26.4VDC
	Nominal - 24VDC
	Minimum - 21.6VDC
Maximum Input Current (@ Idle):	SA-H5-B - 100mA (@ 24VDC)
	SA-H15-B - 100mA (@ 24VDC)
Maximum Input Current (@ Full Rated Output):	SA-H5-B - 450mA (@ 24VDC)
	SA-H15-B - 1.4A (@ 24VDC)

**INSTALLATION INFORMATION:**

Horn speakers should be used in large and/or noisy locations. They are weatherproof and may be used indoors or outdoors. The horn speaker has a built-in amplifier. It's volume controls should be set to provide horn sound pressure level (SPL) of at least 6 to 10dB for paging, and 3 to 6dB for background music. However, the horn speaker's volume should not be set so high as to cause discomfort to those closest to the horn. These devices should not be operated at volume levels loud enough to cause audible distortion. Operation in this manner may result in damage to the unit. In some cases, use of multiple horns set at lower volume provide better sound coverage, than one horn set at full volume. Horns should be mounted at least 15 feet above the floor, and angled downward.

See Tables 1 & 2 and Figures 8 & 9 as a guide to determine horn spacing, area coverage, and sound pressure level.

Although designed for continuous operation, the use of continuous tone signals at high volume is not recommended. While short tone bursts should cause no problem, sustained operation in this mode may result in failure of the unit.

<i>Table 1.</i>				
Ambient Noise Level (dBA)	Area Coverage Per Horn (Sq. Ft.)	Effective Forward Projection (Ft.)	Spacing	
			Side to Side	Front to Rear
Quiet To Moderate 50-74	5,000	128	40 Ft.	120 Ft.
Noisy 75-85	2,500	64	40 Ft.	60 Ft.
Very Noisy* 85-90 (SA-H5-B)	1,250	32	40 Ft.	30 Ft.
85-96 (SA-H15-B)	1,250	32	40 Ft.	30 Ft.

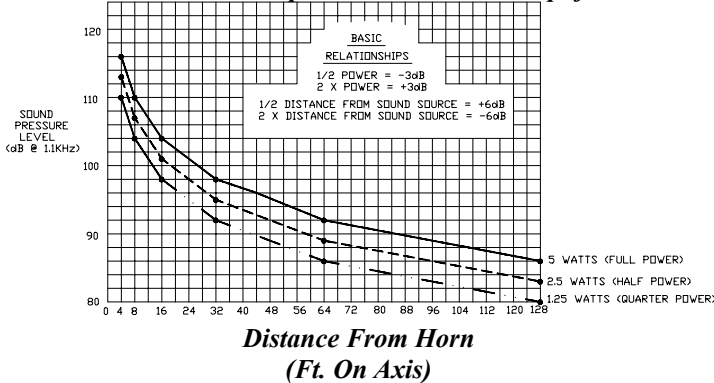
\* For very noisy locations (above 96dB), consult Wheelock for applications assistance.

**NOTES:**

1. Mounting Height is 15-20 Feet.
2. Typical Mounting Angle (to Vertical) is 60 degrees.

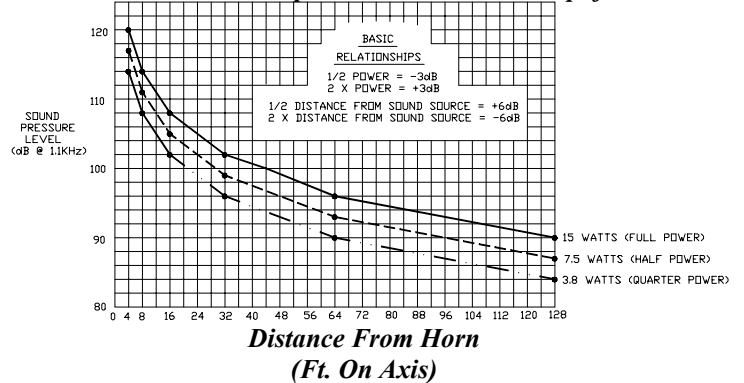
**Figure 8.**

**SA-H5-B Horn Speaker With 5 Watt Amplifier**



**Figure 9.**

**SA-H15-B Horn Speaker With 15 Watt Amplifier**



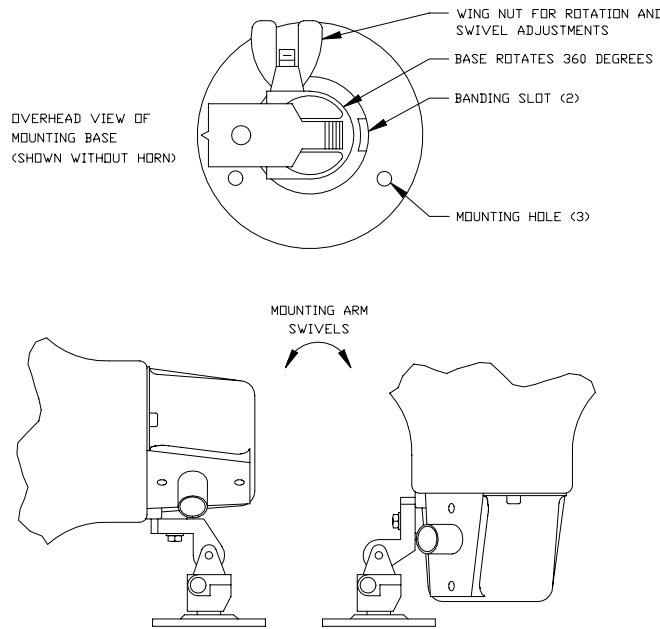
**CAUTION:** The total system wattage requirement should not exceed 85% of the system amplifiers rated output. The total system wattage requirement is the summation of the wattage tap selections of all system speakers and horns.

**MOUNTING INFORMATION:**

The SA-H5-B and SA-H15-B may be wall mounted by simply using the holes in the swivel base to locate and drill mounting holes. For ease of mounting, the swivel base may be removed from the horn body. Then mount the base to the surface with appropriate hardware. Slots are also provided in the base for banding straps, to allow mounting to beams, poles, and girders. The mounting base is also fully adjustable in both the vertical and horizontal planes. See Figure 10.

**⚠ CAUTION:** These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

**Mounting Base**  
**Figure 10.**

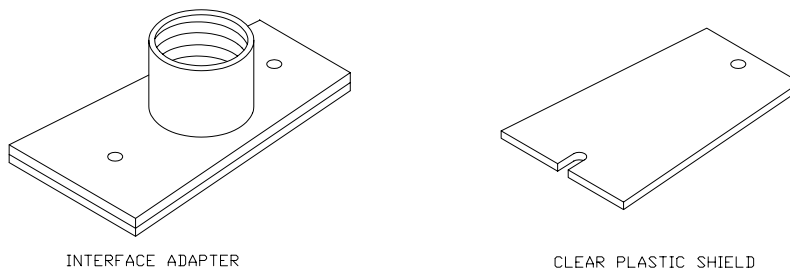


**NOTE:** Loosening the wing nut will allow for both pitch and rotation of the unit.

**⚠ CAUTION:** When adjusting horn position, be careful not to lose adjusting hardware.

An interface adapter (mounted to the horn) permits weatherproof connection. The interface adapter is threaded for standard 1/2" pipe, and will accommodate BX cable, flexible or rigid conduit and matching connectors. If the interface adapter is not suitable for your installation, then replace it with the clear plastic shield and 2 short mounting screws packed separately.

**Figure 11.**



**WIRING INSTRUCTIONS:**

Use "D" type station wire (24 Awg) or other suitable wire, as noted in Tables 2, 3, 4, 5 & 6. Table 2 is a guide to determine the number of horn speakers per audio pair run.

<b>Table 2: Number of Horn Speakers per Audio Pair*</b>		
Wire Run (Feet)	Number of Horn Speakers *	
	22 AWG	24 AWG
100	150	120
200	150	120
400	100	60
800	50	30
1600	25	15
* Based upon using Wheelock's PRM-150 Preampifier		

Table 3 is a guide to determine the type of power supply required, and how many amplified horns (@ full power) can be powered by each type. Use Tables 4, 5 and 6 to determine actual wire gage (Awg).

<b>Table 3.</b>		
Power Supply	Horn - Full Power	
	SA-H5-B(5W)	SA-H15-B (15W)
RPS-2406 (600 mA)	1 (See Table 5)	N/A
RPS-2440 (2 Amp Output)	4 (See Table 6)	1 (See Table 7)
RPS-2440 (4 Amp Output)	8 (See Table 6)	3 (See Table 7)

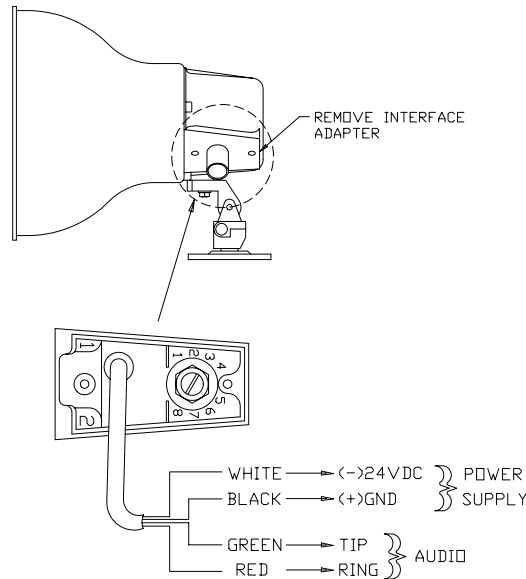
<b>Table 4.</b>						
Quantity Of SA-H5-B @ Full Power, With RPS-2406 Power Supply						
Wire Run (Feet)	Wire (Awg)					
	24	22	18	16	14	12
Up to 100	1	1	1	1	1	1
Up to 200	N/A	N/A	1	1	1	1
Up to 400	N/A	N/A	1	1	1	1
Up to 800	N/A	N/A	N/A	N/A	1	1
Up to 1600	N/A	N/A	N/A	N/A	N/A	1

<b>Table 5.</b>								
Quantity Of SA-H5-B @ Full Power, With RPS-2440 Power Supply								
Wire Run (Ft.)	Wire (Awg) for 2 AMP Output				Wire (Awg) for 4 Amp Output			
	18	16	14	12	18	16	14	12
Up to 100	4	4	4	4	4	6	8	8
Up to 200	2	3	4	4	2	3	5	8
Up to 400	1	1	2	4	1	1	2	4
Up to 800	N/A	N/A	1	2	N/A	N/A	1	2
Up to 1600	N/A	N/A	N/A	1	N/A	N/A	N/A	1

<b>Table 6.</b>								
Quantity Of SA-H15-B @ Full Power, With RPS-2440 Power Supply								
Wire Run (Ft.)	Wire (Awg) for 2 Amp Output				Wire (Awg) for 4 Amp Output			
	18	16	14	12	18	16	14	12
Up to 100	1	1	1	1	1	2	3	3
Up to 200	N/A	1	1	1	N/A	1	1	3
Up to 400	N/A	N/A	N/A	1	N/A	N/A	N/A	1

Connect the audio lines to the wires designated as tip (green) and ring (red). Connect the 24VDC power supply to the wires designated as (+) GND (black) and (-) 24VDC (white), as shown in Figure 12. Remove interface adapter, or clear plastic shield, and adjust volume as required. Mount interface adapter or clear plastic shield back on horn.

**Figure 12.**



**TROUBLESHOOTING CHART:**

<i>Table 7.</i>	
Problem	Possible Cause And Correction
No Sound	<ol style="list-style-type: none"> <li>1) Is the volume control turned up (clockwise).</li> <li>2) Check presence and polarity of -24VDC and GND at the speaker.</li> <li>3) Check audio level on T &amp; R at speaker, and if necessary also at the audio source.</li> </ol>
Low Volume	<ol style="list-style-type: none"> <li>1) Check that volume control is turned up.</li> <li>2) Check for the sufficient audio level on T &amp; R at the speaker.</li> <li>3) Be sure at least 21.6VDC is present at the speaker during operation.</li> </ol>
Loud Squeal (Feed Back)	<ol style="list-style-type: none"> <li>1) Lower volume setting of speaker.</li> <li>2) Move the phone farther from the speaker.</li> <li>3) Install confidencer in phone if necessary.</li> </ol>

**⚠ CAUTION:** Excessive bass energy can damage horn voice coils, especially at high power levels. To avoid possible damage, an amplifier with a bass roll-off filter (horn protect circuit) should be used.

**⚠ CAUTION:** Always operate audio amplifiers and speakers within their specified ratings. Excessive input may distort sound quality and may damage audio equipment. Do not exceed +130% of speaker input voltage. Improper input voltage can damage speaker. If distortion is heard, check for clipping of the audio appliance with an oscilloscope and reduce the amplifier input level or gain level to eliminate any clipping.

**⚠ CAUTION:** Check the installation instructions of the manufacturers of other equipment used in the system for any guidelines or restrictions on wiring and/or locating Notification Appliance Circuits (NAC) and notification appliances. Some system communication circuits and/or audio circuits, for example, may require special precautions to assure electrical noise immunity (e.g. audio crosstalk).

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**IMPORTANT: READ SEPARATE "GENERAL INFORMATION" SHEET FOR INFORMATION ON THE PLACEMENT, LIMITATIONS, INSTALLATION, FINAL CHECKOUT, AND PERIODIC TESTING OF NOTIFICATION APPLIANCES.**

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