

**INSTALLATION INSTRUCTIONS  
 TALKBACK HORN SYSTEM**

**MODEL NUMBER: TBH-104**

**APPLICATION INFORMATION:**

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The TBH-104 is a two component talkback system which consists of a control unit and an 8 ohm horn, both of which are designed for indoor or outdoor use. An optional S-H8 8 ohm horn may be added to the TBH-104 system when 2 horns are required. The control unit contains an omni-directional microphone and a preamplifier for talkback. It also contains a 4 watt amplifier to power the horn which is used for one-way voice paging, background music and tone alerting. The TBH-104 is compatible with most EKSU, KSU (1A2) and PABX systems. The TBH-104 may be used in single zone or multi-zone applications. For typical connection applications for the TBH-104, See Figure 2.

The 4 watt voice paging capability of the TBH-104 is ideal for use in noisy environments or for large areas. The talkback capability of the TBH-104 will effectively service up to 1000 square feet, depending upon the background noise level. See Figure 1 and Chart 1 for relation between noise and maximum reply distance. The direction of speech is controlled by the calling party (at the telephone), to prevent false switching of speech direction due to background noise.

<u>Location</u>	<u>dB</u>
Machine Shop	90
Manufacturing (Noisy)	80
Printing Shop	80
Assembly Line	75
Supermarket	75
Transportation - Waiting Room	75
Office (Noisy)	70
Shipping/Warehouse	70

Figure 1: Talkback Distance Vs. Ambient Noise

Chart 1: Typical Noise Levels

Figure 2: Talkback/Paging Connections & Applications

Figure 2A: Optional S-H8 Second Horn Connection

**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).

**NOTES:**

1. Wheelock's TBH-104 Talkback Horn may be connected to a 600 ohm low power audio page port, if the page port allows two-way audio. Check with telephone system manufacturer.
2. If unused CO port requires talk battery to pass audio (most do), then install using a Wheelock RPS-2406 power supply as shown in Figure 4A. For multi-zone applications, a Wheelock Zone Control is required as an interface.
3. "INH" is used only when TBH-104 is connected to a Wheelock Zone Control. The "INH" wire inhibits (disconnects) talkback when an all zone page is initiated. Use adjacent "GND" wire only when TBH-104 and Zone Control are using separate power supplies. When not connected to a Zone Control, install a jumper between adjacent "GND" and "INH" terminals.

**PRIVACY LED INDICATOR OPERATION:**

- A. When connected to a Wheelock Zone control Module:
  - The privacy LED illuminates only when the TBH-104 is in the talkback mode.
- B. When connected directly to an unused CO port:
  - The LED will be illuminated when the TBH-104 is in the idle state. Occasional flicker of the LED is normal (caused by sudden noise).
  - When in the two-way communication (hands free talkback) mode, the privacy LED will be illuminated only when in the talkback mode.

**SPECIFICATIONS:**

Parameter	Min.	Nom.	Max.	Units
Supply Voltage	-20	-24	-28	VDC
Operating Current	---	250	400	mA
Audio Input Level	-15	---	10	dBm
T & R Input Impedance	---	600	---	Ohms
Switching Speed	---	200	---	m Sec
Audio Output Level @ 1 Meter	---	115	---	dB
One 8 ohm horn	---	110 (Each)	---	dB
Two 8 ohm horns *	---	---	---	---
Output Power	---	4	---	Watts
One 8 ohm horn	---	1.5 (each)	---	Watts
Two 8 ohm horns *	---	---	---	---
Talkback Reply Distance @ 50dB Ambient	---	50	---	Ft.

\* When 2 horns are used, they must be connected in series as shown in Figure 2A.

**INSTALLATION INFORMATION:**

The TBH-104 has been designed as a two component system to allow each component to be located so the optimum effectiveness of each can be obtained. The system should not be located near noise producing equipment such as machinery, fans, air conditioners, etc. The TBH-104 Horn should be positioned in a location that will project the paging output toward the area to be covered. The horn should be mounted at least 15 feet above floor level. The TBH-104 Control Unit should be located in an area with the least amount of ambient noise and the most convenient place for people to reply to the page. Refer to Figure 1 and Chart 1 for suggested reply distances at a given ambient noise level. Ideal mounting height for the control unit is 6 to 12 feet above floor level.

When installing the TBH-104, be sure to use mounting hardware suitable for the surface to which the components are to be mounted. To install the Control Unit, simply mount one screw in desired location for top (key hole) tab of control unit. Place key-hole tab over the screw. Secure the control unit by mounting a second screw through the clearance hole of the bottom tab, spacing the 2 mounting screws vertically on 10.250" centers (See Figure 3). The horn may be surface mounted by simply using the holes in the swivel base to locate and drill mounting holes. The mounting base is also fully adjustable in both the vertical and horizontal planes.

To rotate horn into desired position; first loosen wing nuts located on the base of horn, position horn as desired, then re tighten wing nuts to maintain selected position. See Figure 4.

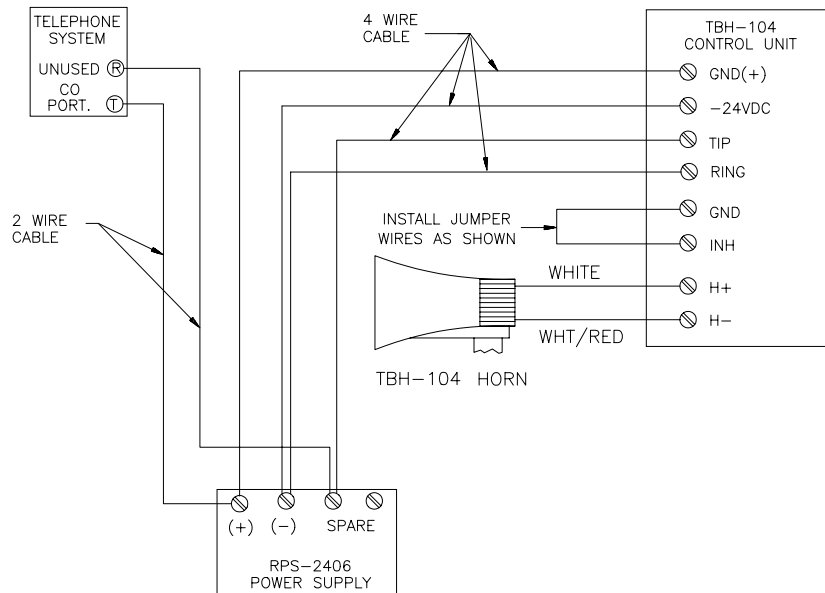
Figure 3: Control Unit Mounting

Figure 4: Horn Mounting

**CAUTION:** Must be mounted as shown with keyhole tab at top.

**CONNECTION DIRECTLY TO AN UNUSED CO PORT:**

When connecting a TBH-104 directly to an unused CO port requiring talk battery to pass audio (most do), install with a Wheelock RPS-2406 power supply as shown in Figure 4A.



NOTE

USE THIS INSTALLATION FOR NO MORE THAN ONE TBH-104.

Figure 4A: Unused Co Port Installation

**WIRING INFORMATION:**

The TBH-104 control unit is provided with 4 knockouts to accommodate 1/2 inch conduit for installation purposes. When mounting the TBH-104 outdoors, a 1/2 inch conduit with rain tight fittings must be used to prevent damage to the unit due to water.

Follow the procedure below, and refer to Figure 5, when wiring to the TBH-104:

- Make sure the 24VDC Power Supply is disconnected from 115VAC Power Source.
- Remove cover of control unit by removing the 2 holddown screws; 4 more holddown screws are contained in a plastic bag within the enclosure.
- Connect 24VDC power supply "+" and "-" to Control Unit "GND" and "-24" terminals, respectively.
- Connect audio (Tip and Ring) from telephone system, or Wheelock Zone Control Modules to Control Units "TIP" and "RNG" terminals, respectively
- For connection to an unused CO port requiring talk battery, install as shown in Figure 4A.
- When used with Wheelock's Zone Control Modules:
  - (A) Connect the Control Units terminal labeled "INH" to the Zone Control Modules "INH" terminal.
  - (B) If Control Unit and Zone Control Module use separate power supplies, then also connect the adjacent terminal labeled "GND" to the Zone Controls "GND" terminal.
- When not used with Wheelock Zone Control, install jumper between adjacent terminals "INH" and "GND".
- Connect the white wire from the horn to the terminal "H+".
- Connect the white/red wire from the horn to the terminal "H-".
- (For optional second horn, refer to Figure 2A for wiring connections to horns.)
- Make sure wires do not rest against black heat sink on circuit board.
- Recheck all wiring.
- Connect the power supply to 115VAC power source.

**OPERATING INSTRUCTIONS:**

- Pick up telephone hand set and press the CO line button, or dial the number assigned to paging. When used with Wheelock Zone Control, next touch/dial single digit number assigned to zone in which TBH-104 has been connected, and listen for page alert tone.
- Paging and talkback is now possible. The calling party has control of the conversation (direction of speech).
- Talkback is possible only while LED is illuminated and calling party is silent.
- Talkback (respond hands free) at a voice level normally used (in that location) to respond to another person at the same distance.
- Adjust the "HORN VOL" (PAGE) control and "MIC VOL" (TALKBACK) control located on the printed circuit board to desired levels See Figure 5.
- Replace cover on control unit and tighten sufficiently to ensure a watertight seal with the gasket.

Figure 5: Simplified Schematic & Wiring Diagram

**NOTE:** If Zone Control is not used, then install jumper between adjacent terminals "INH" and "GND".

**TROUBLING SHOOTING:**

**CONDITION**

1. No sound in page mode.
2. Low volume in page mode.
3. Listening volume at phone is too high or too low in talkback mode.

**CHECK**

- 1) Check that horn volume control is turned up (clockwise).
- 2) Check presence and polarity of -24VDC and GND.
- 3) Check audio presence and level on TIP and RING at TBH-104 Control Unit , and if necessary also at the audio source. (-15dBm is minimum audio level required)
- 1) Check that "HORN VOL" (PAGE) control in Control Unit is turned up (clockwise).
- 2) Check audio presence and level on TIP and RING at Control Unit, and if necessary also at the audio source. (-15dBm is minimum audio level required).
- 1) Set the "MIC VOL" (TALKBACK) control to the suitable listening level.

**NOTE:** Some telephone systems require that CO trunk port (loop start) or CO line port be equipped with a trunk card, page card or other equipment. Consult the telephone manufactures system manual for equipment or programming required.

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