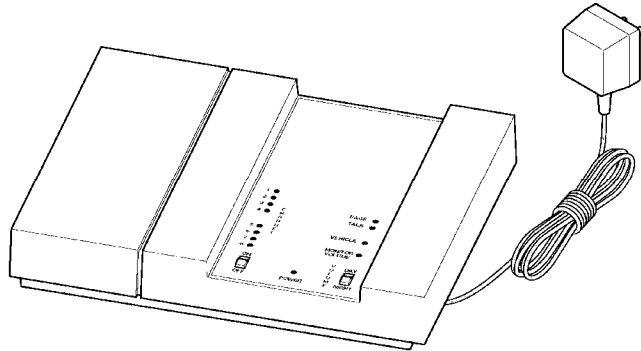


# 3M

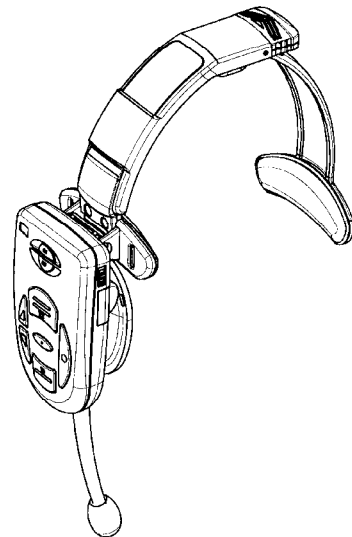
## Model C960

### Headset Intercom System

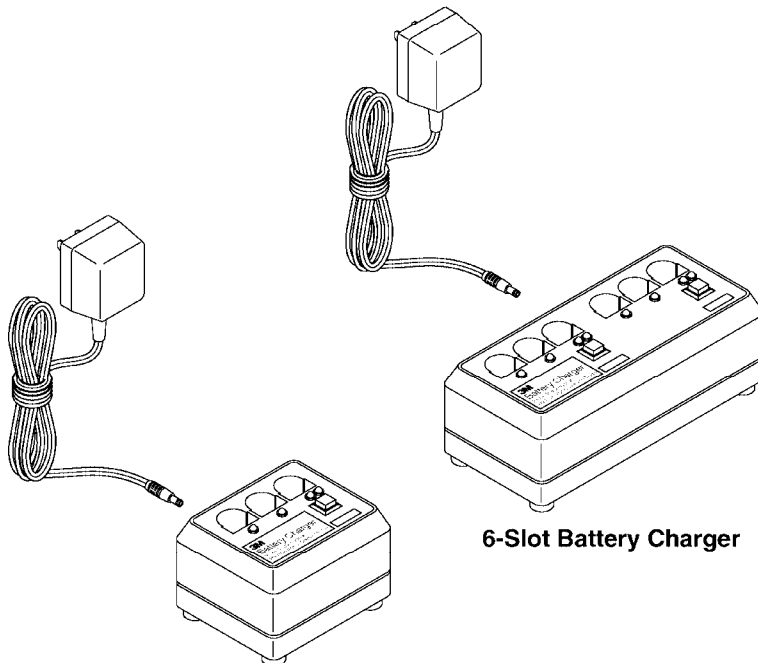
# Service Information



Base Station

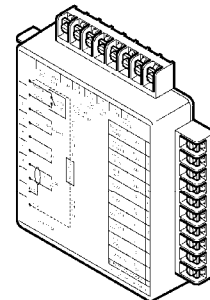


Headset



3-Slot Battery Charger

6-Slot Battery Charger



Interconnect Module

SP-290A

# 3M

Food Services Trade Department  
3M Center  
St. Paul, MN 55144-1000

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 Five-Inch Speaker and Mic Assembly (78-8050-8497-3) ..... 1996 April  
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## Introduction

The 3M Model C960 Headset Intercom System is a wireless intercom system designed for high reliability, compactness, and ease of service. It is designed to provide two-way, radio-frequency audio communication in quick service drive-through restaurants and convenience stores.

The system can be programmed to operate on any one of 16 different channels to provide high-quality audio performance and reduce the possibility of interference between neighboring wireless systems.

## System Components

The number of components in a system varies depending on the system configuration. However, the base station, headset, and battery charger are common to all system configurations.

### Base Station

The wall-mounted base station contains logic and analog circuits and related system controls, a receiver to receive signals transmitted *from* the headsets, and a transmitter to transmit signals *to* the headsets.

### Headset

The headset is a wireless, battery-powered, two-way radio used by the operator to communicate with menu sign customers and with other store personnel who are wearing headsets. The microphone and earpiece enable the operator to transmit and receive spoken communication and alert tones.

The headset can be programmed to operate on any one of 16 different channels to provide high-quality audio performance and reduce the possibility of interference between neighboring wireless systems.

The headset assembly has several field-replaceable components. These components are detailed in Section 3 of this manual (Replacement Parts and Service).

### Battery Charger

The battery charger charges headset batteries in approximately 1.5 to 2 hours. The charger is available in 3-slot and 6-slot versions.

Each battery charger has two field-replaceable components:

S Charger Assembly

S Transformer Assembly

## Speaker and Microphone Assemblies

### Standard Systems

The 5-Inch Speaker and Mic Assembly is recommended for use in standard communication systems. It consists of a 5-inch, water-resistant, eight-ohm cone speaker plus a special weather-resistant dynamic microphone. It also includes a mounting bracket for easy mounting in menu signs, speaker posts and other applications. Using this separate speaker and microphone ensures maximum sound quality.

### Duplex Systems

The 3.5-Inch Duplex Microphone and 5-Inch Duplex Speaker Assembly are recommended for use in duplex communication systems. The microphone is mounted on a foam housing, which can be cut to the required size. The speaker is mounted in a metal housing.

### Interconnect Module

This optional module provides a convenient connection point for equipment such as speakers, microphones, vehicle detectors, and auxiliary intercoms.

### Cross-Lane Module

This module is a required component for dual-lane duplex cross-lane communication systems. It enables a single headset to operate two base stations.

### Vehicle Alert System

The Model C960 is compatible with all 3M vehicle detectors and those of most other manufacturers. There are two types of vehicle detectors, classified as presence detectors or pulse detectors. Presence detectors (such as magnetic loops or SODAR) provide a signal for as long as a vehicle is present at the detector. Pulse detectors, such as air hoses, provide only a momentary signal—signalling vehicle arrival with no indication of whether or not the vehicle remains at the detector station.

## System Configurations

The system can be configured in one of five ways depending on the number of menu signs at the facility and the type of communication desired.



## Single-Lane Standard Communication System

This system provides standard communication (talk/listen) for facilities that have one menu sign. It consists of one base station and one or more headsets and battery chargers.

## Dual-Lane Standard Communication System

This system provides standard communication (talk/listen) for facilities that have two menu signs. It consists of two independent systems - one dedicated to menu sign 1 and the other dedicated to menu sign 2. The headsets are programmed to work with one system or the other and are labeled accordingly (1 or 2).

## Single-Lane Duplex Communication System

This system provides duplex communication (simultaneous talk/listen) for facilities that have one menu sign. It consists of one base station and one or more headsets and battery chargers.

## Dual-Lane Duplex Communication System

This system provides duplex communication (simultaneous talk/listen) for facilities that have two menu signs. It consists of two base stations and two or more headsets and battery chargers.

## Cross-Lane Communication System

This system provides duplex communication (simultaneous talk/listen) for facilities that have two menu signs. It consists of two duplex systems that are connected to a cross-lane module. The headsets are programmed for either lane 1 or lane 2.

During off-peak hours, the cross-lane module is turned on to link the two systems and enable one operator to talk to customers at menu sign 1 or menu sign 2 or with other headset operators.

During peak hours, the cross-lane module is turned off to separate the systems. With the cross-lane module off, one system is dedicated to menu sign 1 and the other to menu sign 2. Menu sign 1 operators can talk to customers at menu sign 1 or with other headset operators. Menu sign 2 operators can talk to customers at menu sign 2 or with other headset operators.

## Operating Theory

The 3M Model C960 Headset Intercom System has two basic functions. First, it processes vehicle alert signals that are supplied by a hard-wired vehicle detection system. Second, it transmits and receives radio signals to provide one or more of the following types of audio communication:

- S Talk/listen communication
- S Talk lock communication
- S Page communication
- S Page monitor communication
- S Cross-lane talk/listen communication

## Processing Vehicle Alert Signals

The Model C960 is compatible with all 3M vehicle detectors and those of most other manufacturers. The vehicle alert system provides a signal to the base station to indicate a customer is present at the menu sign.

There are two types of vehicle detectors. *Presence detectors* (such as magnetic loops or SODAR) provide a signal for as long as a vehicle is present at the detector. *Pulse detectors*, such as air hoses, provide only a momentary signal—signalling vehicle arrival with no indication of whether or not the vehicle remains at the detector station.

- S If a presence detector is used, menu sign audio is turned off automatically when the vehicle leaves.
- S If a pulse detector is used, menu sign audio is silenced by pressing and releasing a headset page switch.

When a vehicle detection signal is presented to the base station, the base station broadcasts a repeating alert tone to all headsets. The alert tone continues until the talk switch [on an active headset] is pressed.

## Transmitting and Receiving

The transmitting and receiving functions are accomplished by two separate sets of radio transmitters and receivers. One set is located in the headset and the other in the base station.

The headset receives microphone audio signals from the base station on *frequency B* and transmits both audio signals and control tones on *frequency A*. The control tones are above the audible range, and function to turn the base station receiver ON to enable reception of the audio signal from the headset microphone. Because the control tones are above the audible range, audible tones from devices such as telephones, pagers, and radios will not interfere.

The base station transmits on *frequency B* and receives on *frequency A*. The receiver in the base station operates above the audible frequency range. While it receives the high-frequency control tones from the headset, it is not affected by audible tones from devices such as telephones, pages, and radios.

The transmitter in the base station is always transmitting a “no signal” transmitter carrier, even when there is no microphone audio from the menu sign or headset operator being broadcast. This “no signal” carrier is continually broadcast to and received by all headset receivers. It serves to block out other radio-frequency signals or noises from headset receivers.

Similarly, the headset receiver is always ON to enable the listen mode. The headset transmitter turns ON only when a talk or page switch is pressed.

In standard communication systems, the output from the headset receiver is muted when the headset transmitter is ON. This provides standard communication (talk *or* listen).

In duplex communication systems, the output from the headset receiver is enabled (not muted) when the headset transmitter is ON. This provides duplex communication (*simultaneous* talk *and* listen).

The two sets of transmitters and receivers work together to provide audio communication between the customer at the menu sign and the headset operators inside the drive-through restaurant *or* between two or more headset operators.

All audio transmitted by a headset during talk operation is heard by:

- S Menu sign customers.
- S Personnel wearing active headsets.
- S People near the optional monitor speaker.

All audio from the menu sign is heard by:

- S Personnel wearing headsets that are operating in the talk/listen mode.
- S People near the optional monitor speaker.

## Talk/Listen Communication

### Headset to Menu Sign

After the vehicle detection signal is presented to the base station, the base station broadcasts a repeating alert tone to all active headsets.

The headset operator presses and holds the talk button to acknowledge the customer at the menu sign and cancel the alert tone. When the headset operator speaks into the microphone, the headset generates a talk control tone and adds it to the microphone audio. The microphone audio and talk control tone are then transmitted to the base station. The talk control tone turns the base station receiver ON, enabling it to receive the microphone audio.

---

#### Note

The talk control tone is above the audible frequency range, and is used to prevent the base station receiver from receiving signals from other devices (telephones, pagers, etc.) that might be on the same frequency.

---

When the base station receives the microphone audio signal, it re-transmits it to all headset receivers. The same microphone audio signal is also routed to the menu speaker amplifier and the monitor speaker amplifier.

The menu speaker amplifier routes the amplified microphone audio through wire to the menu speaker where it can be heard by the customer. The monitor speaker amplifier routes the amplified microphone audio through wire to an optional monitor speaker (typically located in the kitchen area) where it can be heard by anyone in close proximity to the speaker.

---

#### Note

The menu sign audio is not turned ON unless the base station receives a talk control tone from the headset. However, the the monitor amplifier is always turned ON.

---

## Menu Sign to Headset

When the customer at the menu sign speaks, audio is detected by a microphone and sent through wire to the transmitter and the monitor amplifier in the base station.

The transmitter transmits the microphone audio to all headset receivers. The monitor amplifier routes the same microphone audio through wire to the optional monitor speaker.

---

### ⌋ Note

Personnel wearing headsets that are set to monitor only page communications will not hear talk communications. If the headset is in the Page Monitor Mode, the “talk” audio output to the headset speaker is muted.

---

## Talk Lock Mode

The talk lock mode is used to operate “hands free.” In this mode, the headset automatically switches from standby to talk/listen when a customer is detected at the menu sign. The headset automatically switches back to standby when the customer leaves the menu sign. This mode is only available with duplex system configurations.

## Page Mode

When the headset page button is pressed, system operation is identical to *talk* operation except for two things:

- S The *talk control tone* is not broadcast, so the menu sign amplifier is not turned on, muting menu sign audio.
- S A *page control tone* is sent from the headset, turning on the base station transmitter. The transmitter rebroadcasts this tone to turn ON any headsets that are in the page monitor mode. Any audio detected by the headset microphone is transmitted to the base station where it is received, transmitted to other headsets and sent to the monitor speaker amplifier.

## Page Monitor Mode

The page monitor mode allows headset operators to hear only page communication. In the page monitor mode, talk audio output to the headset is muted. Only internal page communication is heard because the

headset transmitter is turned ON only when it receives a *page control tone*. Talk transmissions from other headsets or audio from the menu sign are not heard.

## Cross-Lane Talk/Listen Mode

The cross-lane talk/listen mode is available only in a dual-lane duplex cross-lane system. The cross-lane module in this system enables the menu sign operator to selectively communicate (talk and listen) to customers in *either* lane 1 *or* lane 2.

With the T1 (Talk Lane 1) switch pressed, the headset transmitter/receiver switches to the lane 1 channel frequencies, enabling the lane 1 base station and lane 1 communications.

With the T2 (Talk Lane 2) switch pressed, the headset transmitter/receiver switches to the lane 2 channel frequencies, enabling the lane 2 base station and lane 2 communications.

## Monitor Amplifier and Speaker

A one-watt, single-ended monitor amplifier in the base station powers [an optional] speaker which is capable of reproducing the following signals:

- S Talk audio (communications *to* the menu speaker)
- S Listen audio (communication *from* the menu speaker)
- S Page audio (internal store communications)
- S Vehicle alert tone

Separate volume controls adjust the level of each signal to achieve the desired signal balance. In addition, there is a master volume control which adjusts the overall volume of the monitor speaker.

## Headset Components

---

### ⌋ Note

The receiver/transmitter and logic circuitry contained in the C960 headset housing is both proprietary and non-field repairable.

---

The headset assembly has several field-replaceable components. These components are detailed in Section 3 of this manual (Replacement Parts and Service).

The major components are as follows:

- S Rechargeable Battery
- S Headband
- S Microphone Boom Assembly
- S Speaker Assembly

**Rechargeable Battery**

The nickel metal hydride battery provides DC power for the headset circuitry.

**Headband**

The headband consists of two interlocking assemblies that provide adjustments for headband width and headband size. Both assemblies are replaceable.

**Microphone Boom Assembly**

The boom/earpiece assembly includes an electret microphone and a speaker-driven earpiece. It is replaceable as a separate unit.

**Speaker Assembly**

The speaker assembly is housed between the inner and outer cases and is replaceable as a separate unit.

## Base Station

---

### Note

Receiver/transmitter and logic circuitry contained in the C960 headset intercom base station is both proprietary and non-field repairable. For this reason, the accompanying base station diagram provides no circuit component detail. Only those details that assist fault isolation (such as connections, configuration jumpers, audio control circuits, replaceable components and input/output functions) are shown.

---

## DC Power

DC power for the base station circuits and external components is provided as follows:

A self-contained DC power transformer, connected to 120VAC, provides unregulated +12VDC to the base station power input jack. The +12VDC is turned on or off by a slide switch located on the front of the base station. The unregulated +DC is routed through a protective polyswitch (circuit breaker) to circuit components and a voltage regulator (called power supply in the diagram). If an overcurrent condition causes the polyswitch to open, it automatically resets after power is removed.

The unregulated +12VDC is used by the vehicle detector to provide a +DC vehicle detect signal to the base station vehicle detect circuits. If an interconnect module is used in the system, unregulated +DC is provided to energize the interconnect module relays.

## Talk/Page Input

Talk and page voice communications transmitted from the headset are received along with their accompanying “talk” or “page” control tones. Received talk communications are routed by the RCVR & RCVR LOGIC as follows:

- S To the menu sign speaker amplifier via the DAY/NIGHT volume controls and DAY/NIGHT switch, through the amplifier to the menu sign
- S To the monitor speaker amplifier via the MON TALK volume control, through the amplifier and the Master Monitor Volume control to the monitor speaker

- S Through the transmit amplifier to the TXMT & TXMT LOGIC for transmission to all headset receivers and to output connector pin 9 for use in cross-lane applications

Received page communications are routed by the RCVR & RCVR LOGIC as follows:

- S To the monitor speaker amplifier via the MON PAGE volume control, through the amplifier and the Master Monitor Volume control to the monitor speaker
- S Through the transmit amplifier to the TXMT & TXMT LOGIC for transmission to all headset receivers, and to output connector pin 9 for use in cross-lane applications

## Vehicle Detector Input

Upon detection of a vehicle, the vehicle detector signal will be a steady DC or a short-duration DC pulse depending on whether the vehicle detector is a “presence” or “pulse” type detector. Upon receipt of the vehicle detect signal, the VEHICLE DETECT LOGIC circuit emits alert tones. These alert tones are routed as follows:

- S To the monitor speaker amplifier via the MON ALERT volume control, through the monitor speaker amplifier and the Master Monitor volume control to the monitor speaker
- S To the transmit amplifier via the Headset Alert Level control, through the amplifier to the TXMT & TXMT LOGIC for transmission to all headset receivers
- S To output connector pin 12 for use in cross-lane applications

---

**Note**

The vehicle detect PULSE/PRESENCE jumper J4 must be set appropriately and its setting programmed into the base station logic for correct vehicle detection and alert tones to occur. For further explanation of vehicle detect alert tones, refer to the Vehicle Alert System. The vehicle detect PULSE/PRESENCE jumper J4 must be set appropriately and its setting programmed into the base station logic for correct vehicle detection and alert tones to occur. For further explanation of vehicle detect alert tones, refer to the paragraphs titled *Vehicle Alert System* and *Vehicle Detector Input* in this section.

---

**Menu Mic Input**

Audio from the menu sign may come from one of two sources: a combination speaker/microphone (the MENU SIGN SPEAKER) or a separate dynamic microphone (the MENU MIC). The MIC/SPKR jumpers J1 and J2 must be set accordingly; both must be set to the MIC position if a separate outside mic is used, to the SPKR position if a combination outside speaker/mic (OSM) is used. Depending on jumper positions, mic input is routed to the mic amplifier, through the amplifier and its Menu Mic Sensitivity control and then:

- S To the monitor speaker amplifier via the MON IN volume control, through the monitor speaker amplifier and the Master Monitor volume control to the monitor speaker
- S Through the transmit amplifier to the TXMT & TXMT LOGIC for transmission to all headset receivers, and to output connector pin 9 for use in cross-lane applications

**Base Station Configuration Jumpers and Switches****Configuration Jumpers**

Jumpers J1 and J2 are used to configure the base station for use with either a separate outside microphone or a combination outside speaker/mic (OSM). Unlike jumpers J3, J4 and J5 which affect logic input levels, jumpers J1 and J2 simply switch the microphone amplifier inputs to either the

microphone or OSM. Set both jumpers to jumper pins 2 and 3 for use with a separate outside mic, or to jumper pins 1 and 2 for a combination speaker/mic (OSM).

Jumper J3 is used to configure the base station for use in a cross-lane, dual-lane communications system. In such a system, one base station must be set for lane 1 frequency communications, the other base station must be set for lane 2 frequency communications. Jumper J3 pins 1 and 2 (forcing the related logic input high) for lane 1 configuration. Jumper J3 pins 2 and 3 (forcing the related logic input low) for lane 2 configuration. Whenever jumper J3 is changed, you must press the base station RESET switch to program the new jumper setting into the base station microprocessor.

---

**Note**

It may also be necessary to re-program system headsets, depending on system configuration. Refer to the C960 Installation Instructions for more information.

---

Jumper J4 is used to configure the base station for use with either a presence type vehicle detector or a pulse type vehicle detector. Jumper J4 pins 1 and 2 (forcing the related logic input high) for a presence type detector. Jumper J4 pins 2 and 3 (forcing the related logic input low) for a pulse type detector. Whenever jumper J4 is changed, you must press the base station RESET switch to program the new jumper setting into the base station microprocessor.

Jumper J5 is used to configure the base station so that it can in turn, program the headsets for standard (talk, then listen, then talk etc.) communications or for duplex (simultaneous talk and listen) communications. During standard communications, headset receiver output is muted during talk transmissions. During duplex communications, headset receiver output is not muted during talk transmissions. The headset receiver mute/not mute (standard/duplex) command is sent to the headset logic during headset programming—determined by the jumper J5 setting. Whenever Jumper J5 is

changed, you must press the base station RESET switch to program the new jumper setting into the base station microprocessor.

---

### ⓘ Note

When jumper J5 is changed, you must also reprogram the system headsets. Refer to the C960 Installation Instructions for more information.

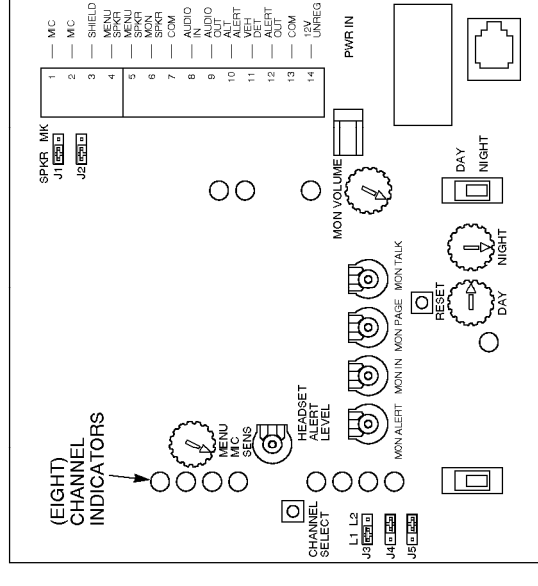
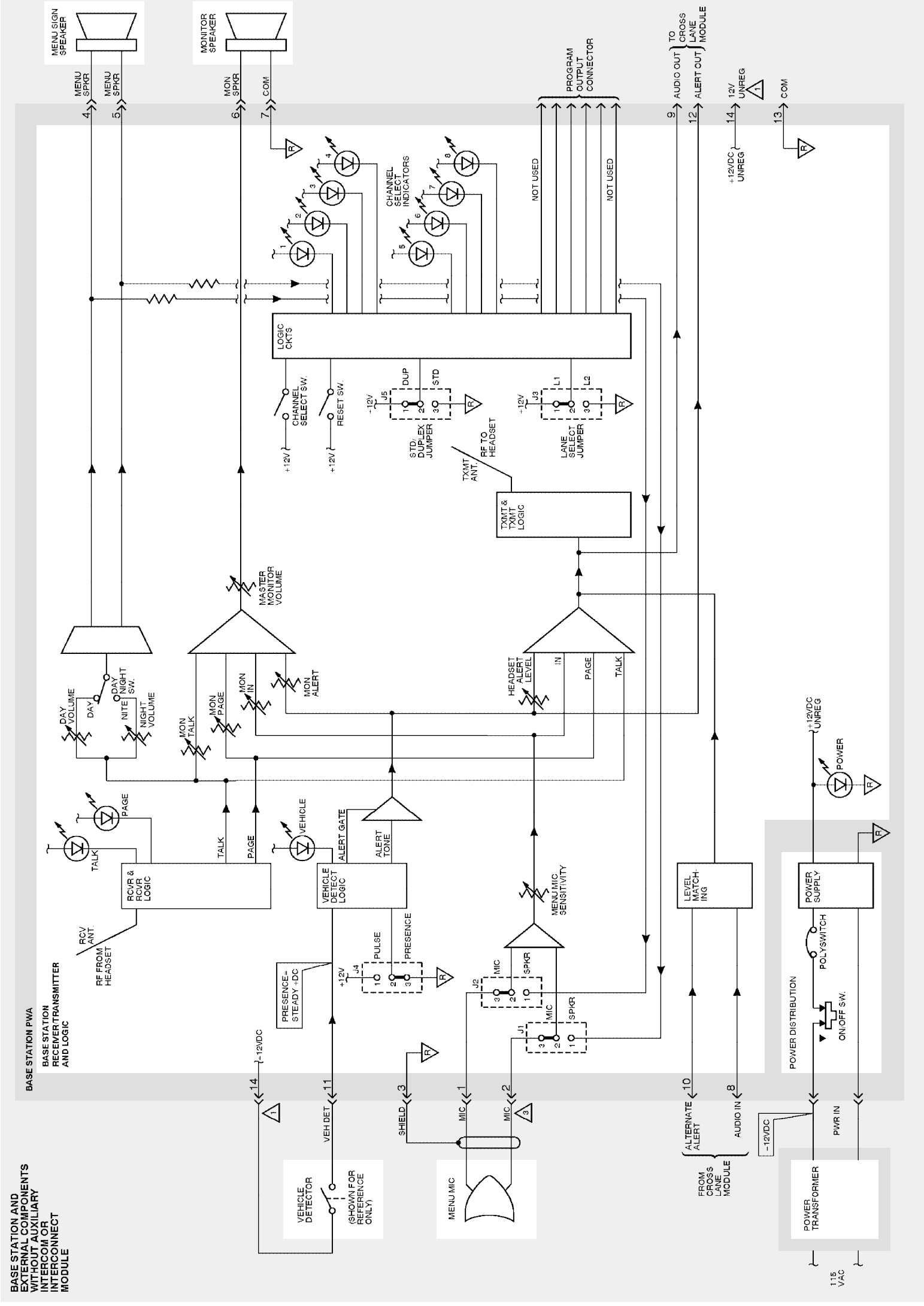
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### Configuration Switches

**RESET SWITCH:** Very briefly, actuation of the RESET SWITCH clears logic inputs of their established levels and latches the logic inputs at their new levels.

**CHANNEL SELECT SWITCH:** The C960 system is capable of operating on eight different channels for each of two lanes. This provides a total of 16 operating channels since each system may be designated as a lane 1 or lane 2 system. Each operating channel is comprised of a “set” of two frequencies, one for receiving, one for transmitting. The channel frequencies are preprogrammed in both the base station and headset microprocessors. Each actuation of the CHANNEL SELECT switch prompts the base station microprocessor to advance to the next available channel. After a new channel is selected, you must reprogram all system headsets to the new channel. (Headsets can operate only on lane 1 or lane 2 channels unless they are used with an accessory cross-lane module.) For more information on channel selection and reprogramming, refer to the C960 Installation Instructions.

Base Station and External Components Diagram



BASE STATION CIRCUIT BOARD

- NOTES:
- 1 CONNECTION SHOWN TWICE FOR CLARITY
  - 2 JUMPERS SHOWN IN MICROPHONE (J1/J2), PRESENCE (J4), DUPLEX (J5), LANE 1 (J3) SETTINGS
  - 3 ALL MICROPHONE WIRING SHOULD BE SHIELDED, TWISTED PAIR

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## Interconnect Module

An interconnect module is needed when a C960 Headset Intercom system includes an auxiliary intercom to provide continued communications when the primary intercom needs service.

The auxiliary intercom may be a conventional, hard-wired intercom or it may be a second C960 base station.

External system components (speakers, microphone, vehicle detector) connect to interconnect module connector J302. Base station inputs and outputs (power, common, menu mic, menu speaker, vehicle detector) connect to interconnect module connector J303. Auxiliary intercom (or second base station) inputs and outputs connect to interconnect module connector J301.

### On/Off DC

In the interconnect module schematic diagram, the interconnect module is shown in its “on” state, with relays energized.

On/Off control of the interconnect module is provided by (the presence or absence of) +12VDC from the (primary) base station. With base station +12VDC present (via J303 pins 1 and 2), relays K301, K302 and K303 energize to switch microphone, speaker and vehicle detect signals to/from the base station. If the base station-provided DC is not present (base station turned off), relays K301, K302 and K303 de-energize to the switch the same signals to/from the auxiliary intercom.

### Menu Microphone Signal Control

Relay contacts K301-A and K301-B control distribution of the menu mic signal(s). With relay K301 energized, the menu mic is connected to the base station inputs. With Relay K301 de-energized, the menu mic is connected to the auxiliary intercom.

### Menu Speaker Audio Control

Relay contacts K302-A and K302-B control distribution of the menu speaker audio. With relay K302 energized, the menu speaker is connected to the base station. With relay K302 de-energized, the menu speaker is connected to the auxiliary intercom.

### Monitor Speaker Audio Control

Relay contacts K303-B control distribution of monitor speaker audio. With relay K303 energized, the drive side of the monitor speaker is connected to the monitor speaker output of the base station. With relay K303 de-energized, the drive side of the monitor speaker is connected to the monitor speaker output of the auxiliary intercom. Monitor speaker common is not switched.

### Vehicle Detector Signal DC

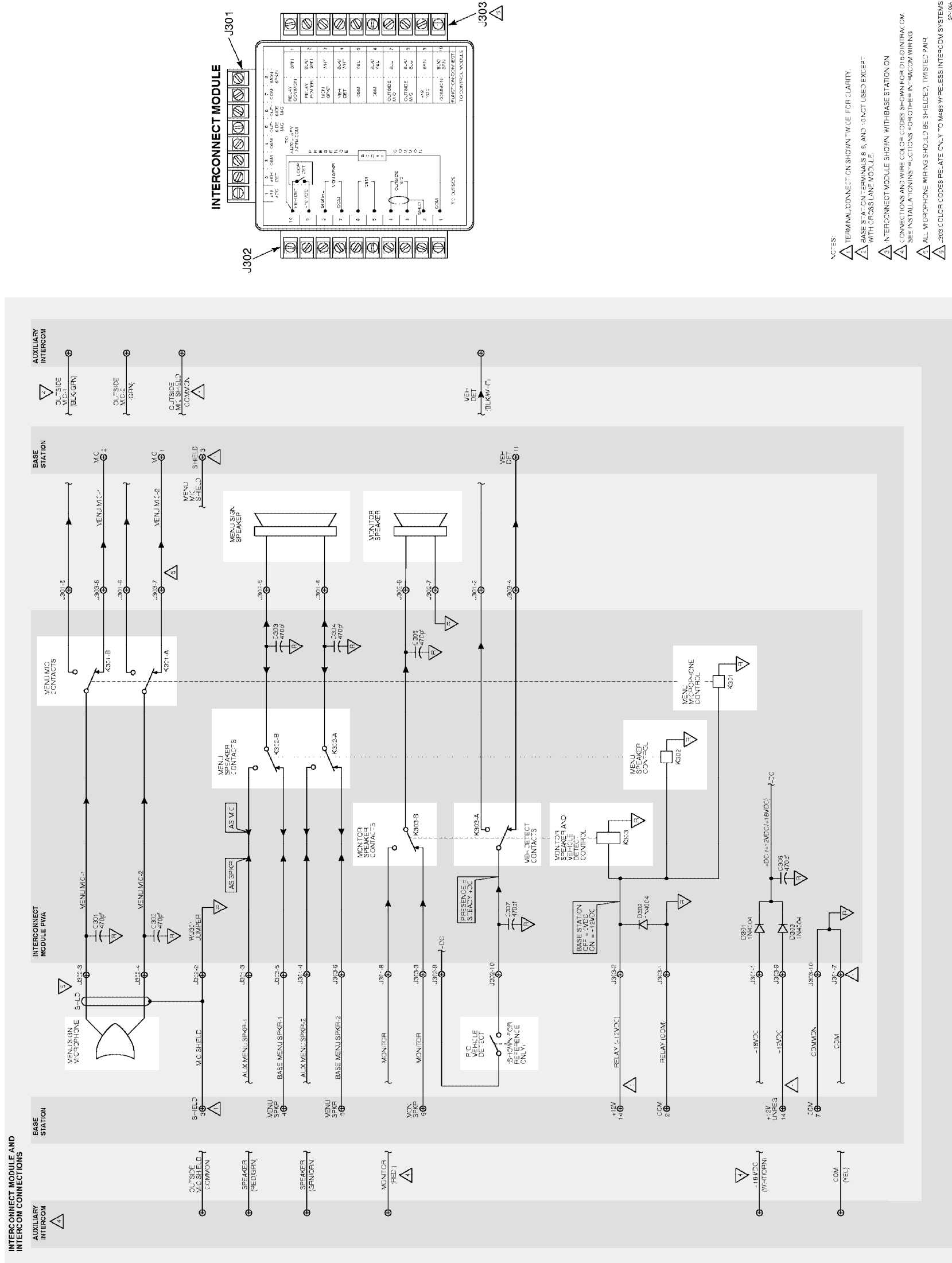
While the vehicle detector is powered separately (if it is a “presence” type detector), vehicle detector signal DC is always provided by both the base station and the auxiliary intercom. This vehicle detector signal DC is available at interconnect module connector J302-9.

A vehicle detector signal DC of +12VDC is provided by the base station at J303 pins 9 and 10. A vehicle detector signal DC of +18VDC is provided by the auxiliary intercom at J301 pins 1 and 7.

If both the auxiliary intercom and the base station are ON, the vehicle detector signal will always be +18VDC because the auxiliary intercom’s +18VDC will take precedence over the +12VDC supplied by the base station. (Isolation of the two DC sources is provided by interconnect module diodes D301 and D303.) If only the base station is ON, the vehicle detector signal DC will be +12VDC.

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Interconnect Module Diagram



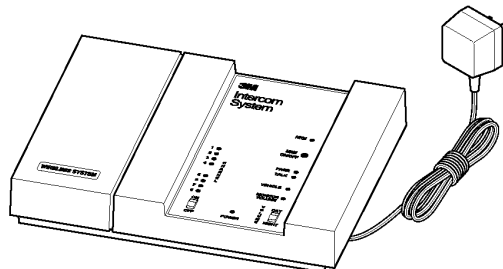
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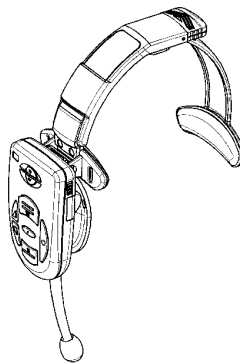
# Headset Intercom Systems

Model C960/C860

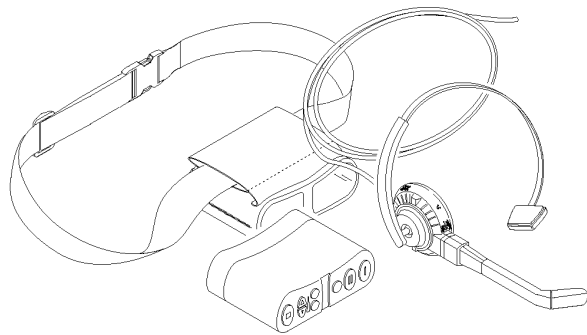
## Installation Instructions



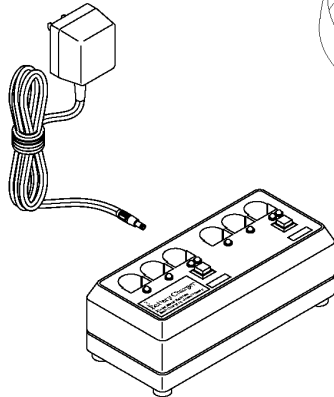
Base Station



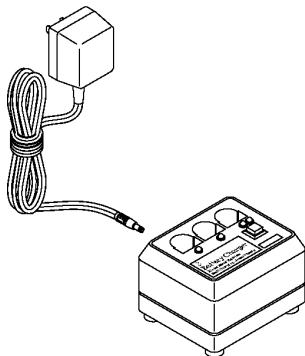
Headset



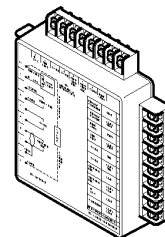
Headset & Belt Pack



6-Slot Battery Charger



3-Slot Battery Charger



Interconnect Module



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## Battery Charger

Install the battery charger and begin charging the batteries before you install any other components.

Install the battery charger in a clean, dry environment. An office location is best.

The battery charger may be placed on a flat surface such as a table, desk, etc., or it can be fastened to a wall using the optional wall-mount kit.

Plug the power supply transformer into a 120-Volt wall outlet and then plug the transformer cord into the connector in the end of the battery charger. The three green lights on the battery charger will turn on.

To charge a battery, plug it into the charger as shown in Figure 2. Observe the charging status indicator next to the battery:

- The indicator lights RED to indicate the battery is charging.
- The indicator lights GREEN to indicate the battery is fully charged.
- The indicator lights ORANGE to indicate the battery is defective.

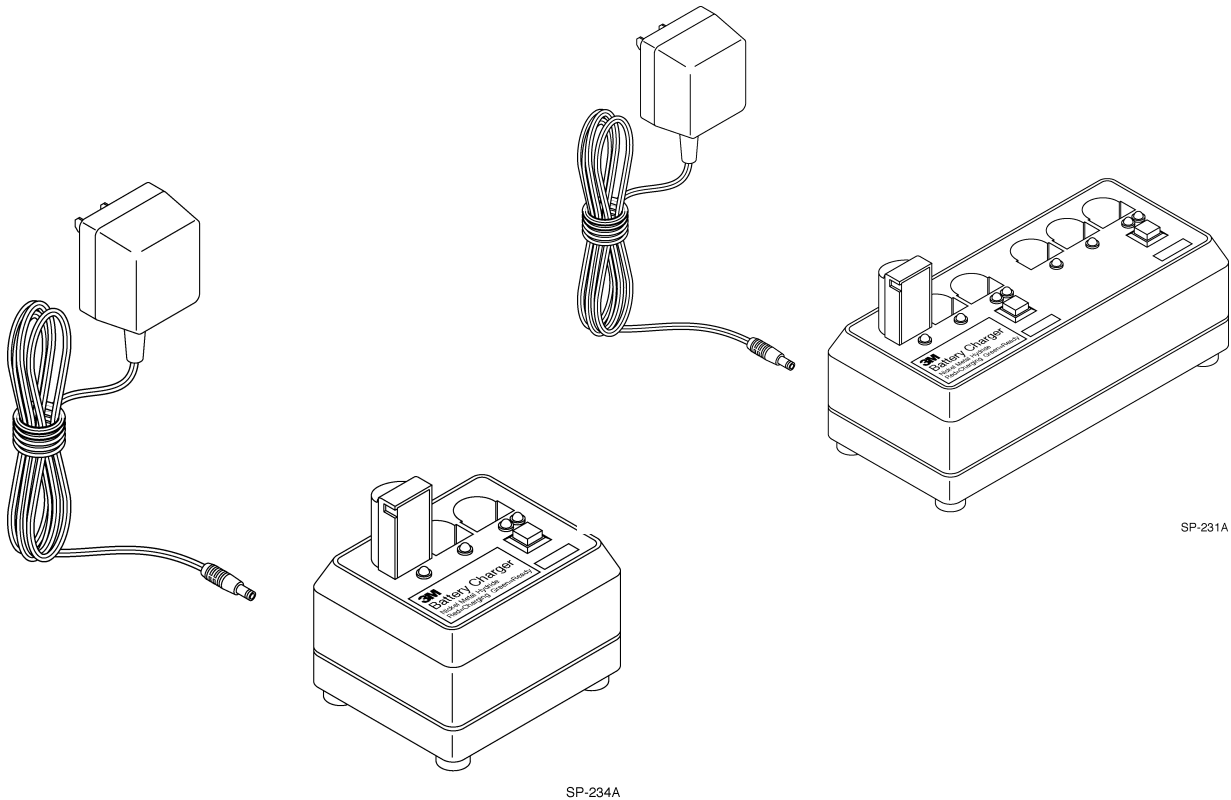
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✓ **Note**

Discharged batteries require 1–1/2 to 2 hours to charge.

---

When the battery voltage becomes too low, a short, low volume tone, occurring at seven-second intervals is heard in the headset. This repeating tone continues for two minutes. After the two-minute interval, the headset automatically turns off to prevent battery damage.



**Figure 2. Battery Chargers (3-Slot and 6-Slot Versions)**

# Speaker and Microphone Assemblies

## Standard Systems

For standard systems, install the Deluxe 5-Inch Speaker and Microphone Assembly, Part Number 78-6911-1545-1. Refer to the installation instructions packaged with the assembly.

## Duplex Systems

For duplex systems, install the 3.5-Inch Duplex Microphone (with foam housing), Part Number 78-6911-4476-6 **and** the 5-Inch Metal Speaker Assembly, Part Number 78-6911-4411-3. Refer to the installation instructions packaged with the assemblies.

## Face-to-Face Type Duplex Systems

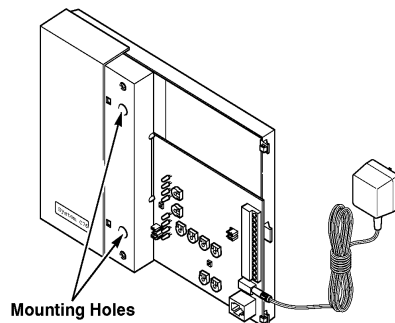
The 3M Communications Bar, Part Number 78-6911-4451-9 contains the Duplex Speaker and Microphone listed above. Refer to the installation instructions that are packaged with the assembly.

## Base Station

1. For proper system operation, locate the base station module:
  - 5 to 6 feet above the floor
  - at least 10 feet from the cashier/drive-thru window
  - At least 3 feet from large metal objects such as refrigerators, ranges, coolers, etc., and other metal or electrical devices.

<b>⚠ Important</b>
Do not mount base station under steel countertops, within 3 feet of coolers/refrigerators/ranges or in areas where it will be obscured by steel doors, walls, etc. as this will cause operational problems.

2. Mount the base station using the included screws and anchors. (See Figure 3.)



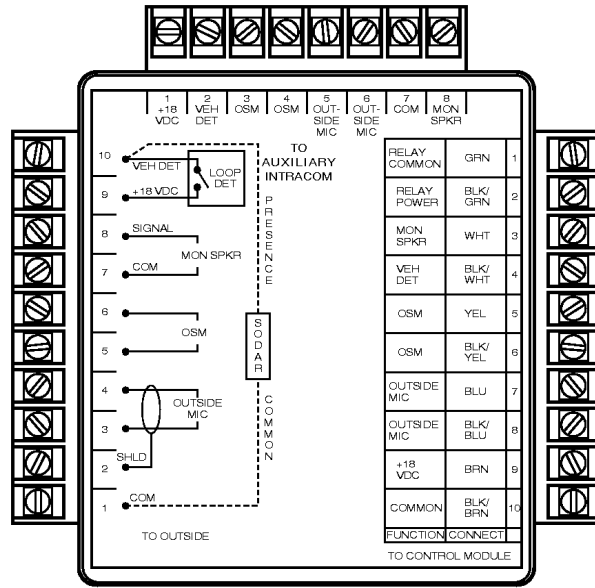
**Figure 3. Base Station Mounting Holes**

3. Install conduit and cable clamps as necessary.
4. Feed the cables for speaker, microphone, vehicle detect and monitor speaker (if used) through the conduit down to the interconnect module or base station. (See Figure 1.)
5. Feed the transformer cable from the outlet to the base station. (See Figure 1.)  
Keep the transformer cable at least 6 inches from the left half of the base station. This half contains sensitive radio components which will be affected if the cable is too close.

## Interconnect Module (Optional)

1. Install the interconnect module in an “out of the way” location, near the wiring for the auxiliary intercom, vehicle detector, etc. (Under a counter is desirable.)
2. To fasten the interconnect module in position:
  - a. Remove the backing from the adhesive hook and loop fastener material on the rear of the module.
  - b. Orient the module to provide the most convenient wire connection arrangement.
  - c. Press the adhesive surface of the hook and loop fastener material against a flat, smooth surface.

The module is now removable for wiring and if needed, future servicing.

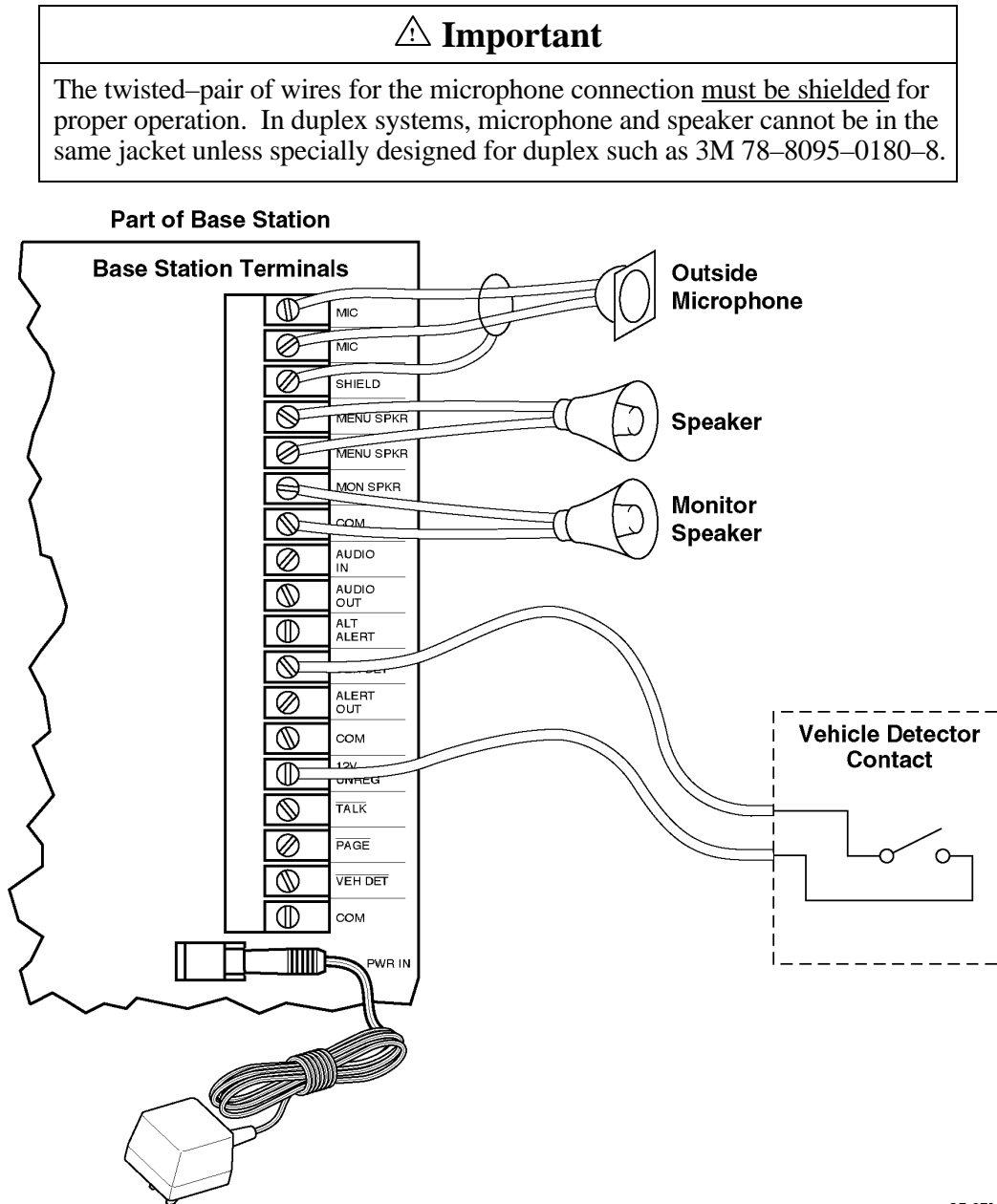


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**Figure 4. Interconnect Module**

## Connecting the Base Station Directly to Components

If an interconnect module is not used, connect the components (vehicle detector, speaker/microphone and optional monitor speaker) directly to the base station as shown in Figure 5. Use 18–20 gauge twisted pair audio wire for all connections except the microphone. Use an 18–20 gauge shielded twisted-pair of audio wire for the connection to the microphone.

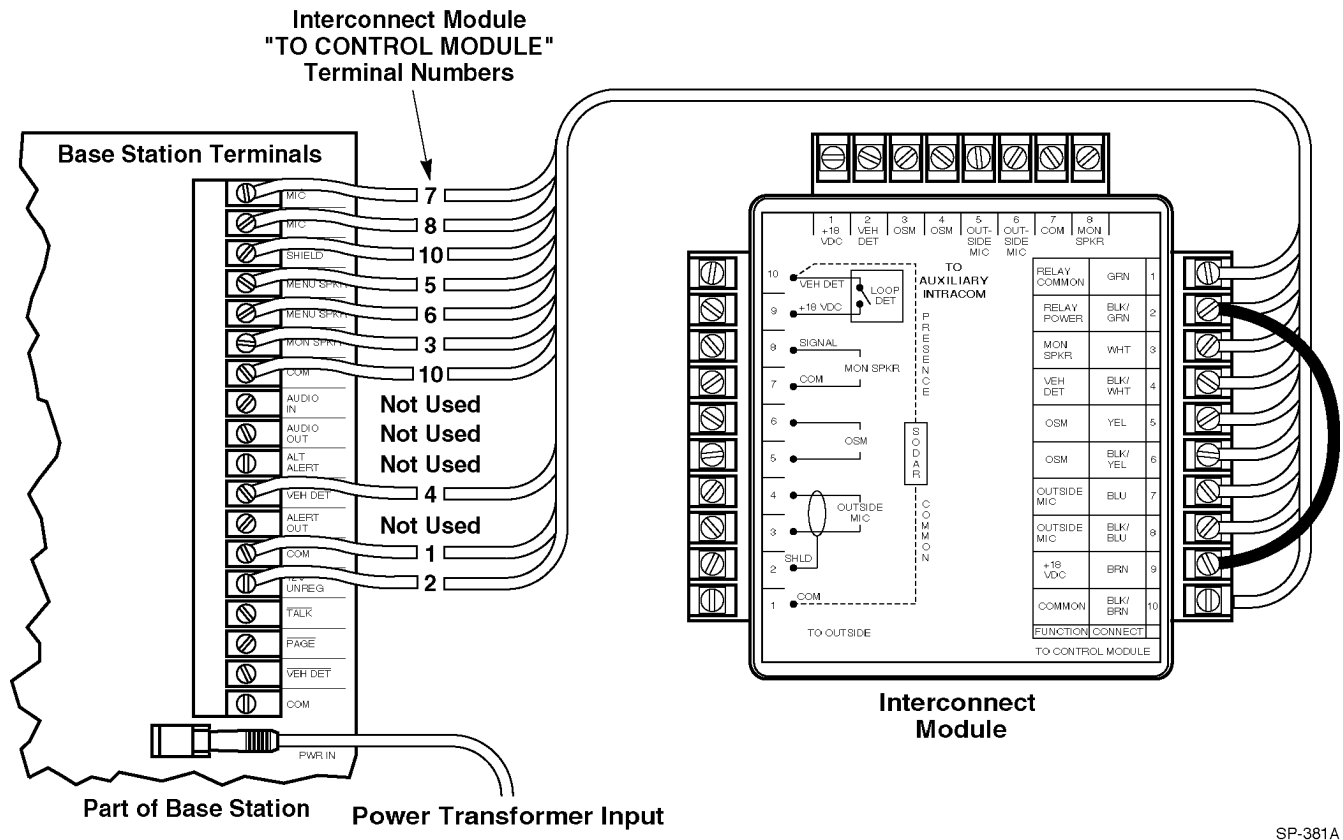


**Figure 5. Direct Base Station-to-Component Connections**

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# Connecting the Base Station to Components Using the Optional Interconnect Module

Connect the base station to the interconnect module as shown in Figure 6. Note that the connections are made to the “TO CONTROL MODULE” terminals on the interconnect module.



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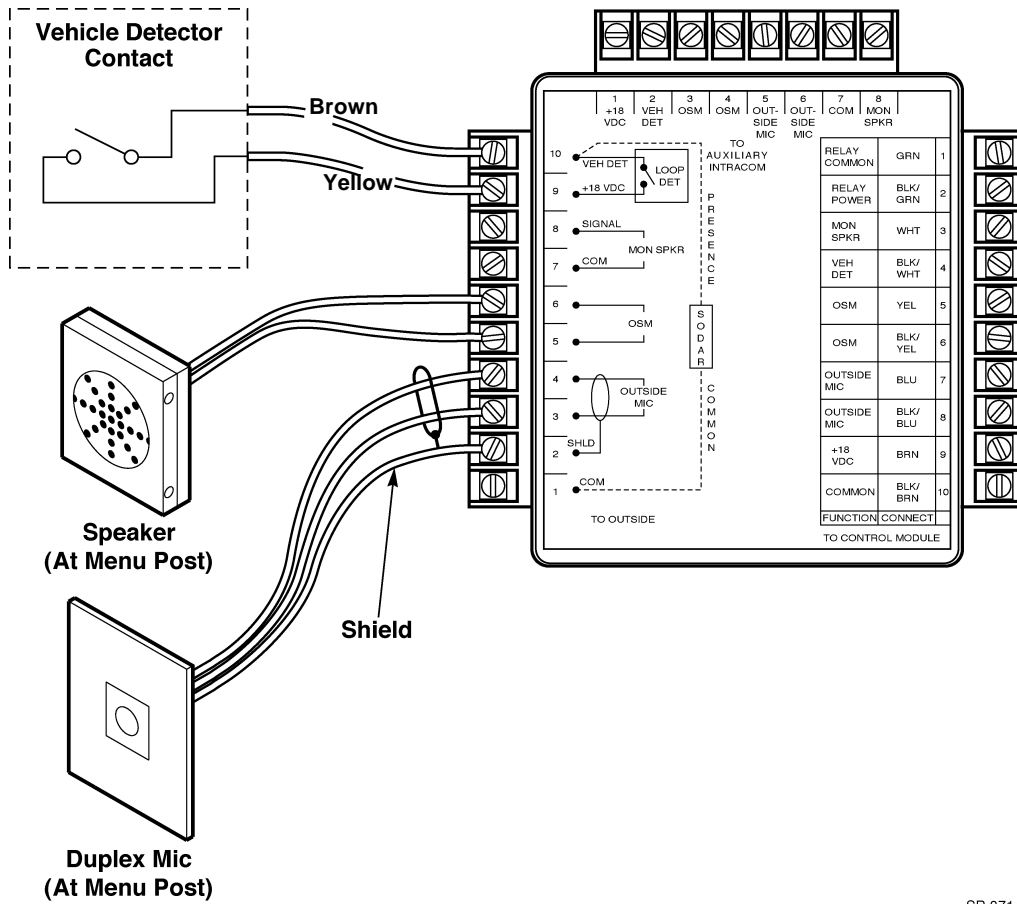
**Figure 6. Base Station – Interconnect Module Connections**

Connect the components (vehicle detector, speaker/microphone, and optional monitor speaker) to the interconnect module as shown in Figure 7. Note that the connections are made to the “TO OUTSIDE” terminals on the interconnect module.

**\*Note**

If an optional back-up (auxiliary) intercom is connected to the “TO AUXILIARY INTERCOM” on the interconnect module, the base station must be turned off to enable operation/usage of the back-up intercom.

Use 18–20 gauge twisted-pair audio wire for all connections except the microphone. Use an 18–20 gauge **shielded** twisted-pair audio wire for the connection to the microphone.



SP-371A

**Figure 7. Connecting Components to the Interconnect Module**



# Connecting the Auxiliary Intercom (Optional)

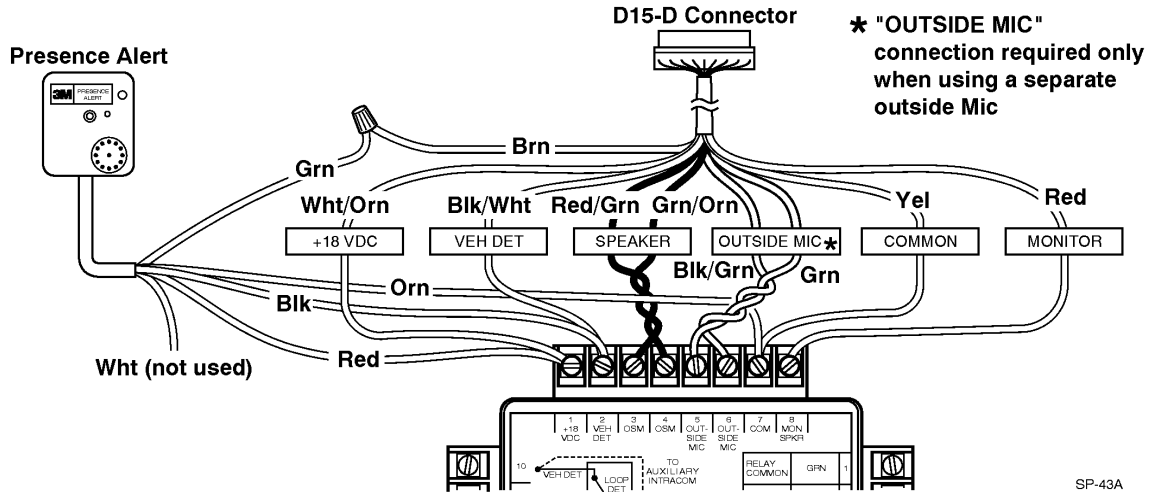
**\*Note**

The base station must be turned off to enable operation/use of the auxiliary intercom.

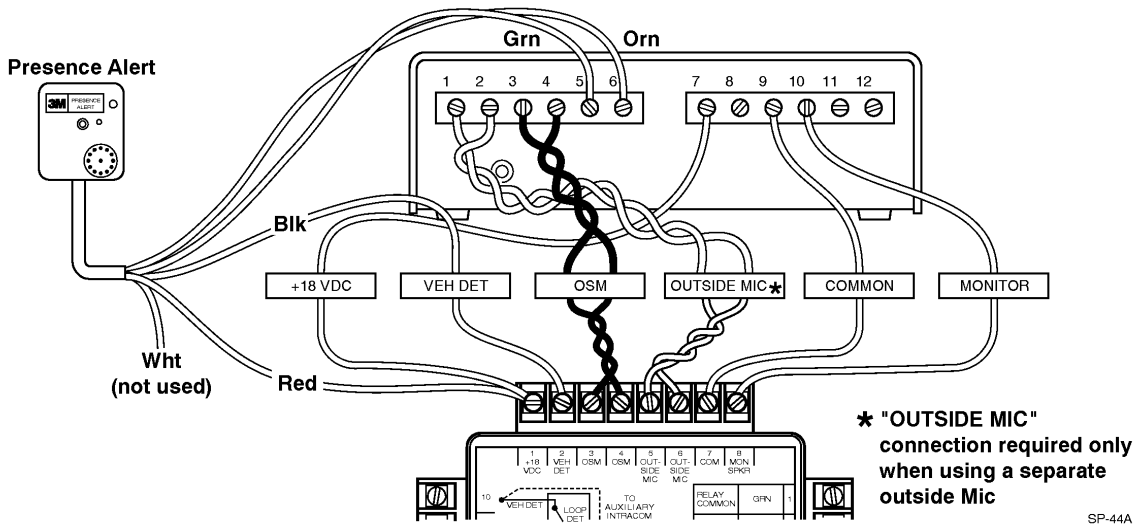
1. Connect the auxiliary intercom to the "TO AUXILIARY INTERCOM" terminals on the interconnect module as shown in Figure 8 through Figure 10 (depending on the model of intercom used).

The presence alert shown is wired to operate only when the Model C960/C860 is turned off.

If a separate outside microphone is used, the auxiliary intercom must be configured for OUTSIDE MIC. Refer to the Auxiliary Intercom Installation Instructions for information about moving any internal jumpers.



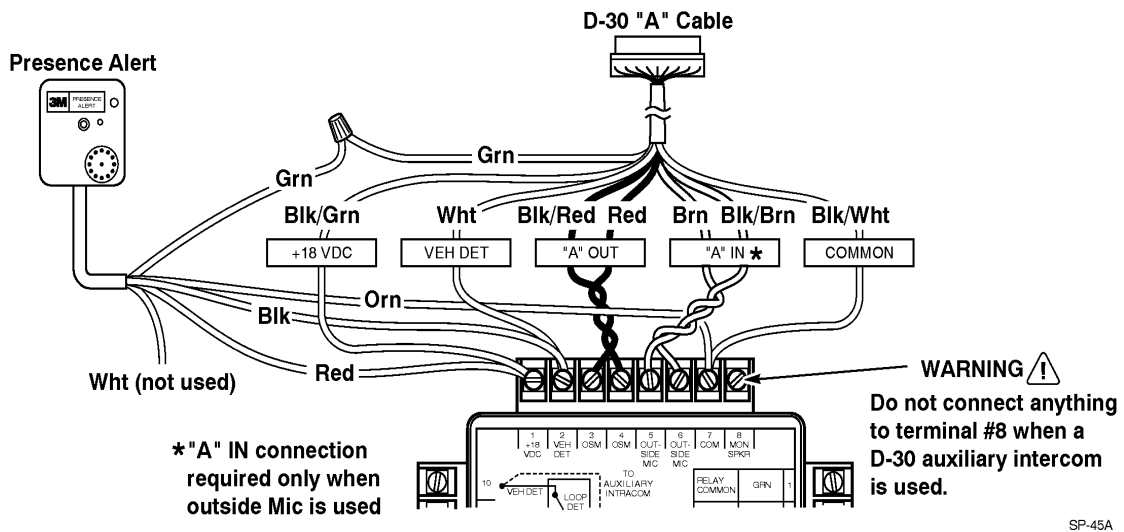
**Figure 8. D-15D (M478 DA) Connections**



**Figure 9. D-15B and D-15C (M478 BA and CA) Connections**

**⚠ Important**

If you use a D-30 as the auxiliary intercom, a separate monitor speaker must be provided for the Model C960/C860. (Both the Model C960/C860 and D-30 intercoms require separate monitor speakers.)



## Dual Lane System Installation

A dual lane system consists of two separate single lane systems that operate independently of each other. Each single lane system has its own dedicated base station and headset(s).

To install a dual lane system:

1. Install two single lane systems as outlined in these installation instructions, placing the base stations **at least 15 feet** apart from each other.

**⚠ Important**

If the base stations are not at least 15 feet apart, operational problems will occur.

2. With the base stations turned off, set jumper J3 on one of the base stations so that it jumpers pins 1 and 2. This designates the base station as a lane 1 system.
3. Set jumper J3 on the other base station so that it jumpers pins 2 and 3. This designates the base station as a lane 2 system.

**⚠ Important**

Do not set both base stations to the same lane number as this will cause operational problems.

4. Turn on both base stations and press the RESET SWITCH on each of the base station circuit boards to “read” the jumper setting into the microprocessor.
5. Select a channel for each of the base stations. (See page 14 for the channel selection procedure.) After you select the channel, press the RESET SWITCH on the base station circuit boards to “read” the selection into the microprocessor.
6. Re-program the headsets as instructed on page 15.
7. Check the operation of each of the systems. Note that the alert tone for the Lane 1 system headsets is a single repeating “beep” while the alert tone for the Lane 2 system headsets is a double repeating “beep.”

## **Cross-Lane System Installation**

The Cross-Lane system provides communication for facilities that have two menu signs. It consists of two base stations that are connected to a Cross-Lane Module. A Cross-Lane Module is a five-pole switch that allows the two systems to be separated during hours of peak activity. Refer to the installation instructions included with the Cross Lane Module (78-6911-4396-6). These instructions are also located in the C960 Service Manual.

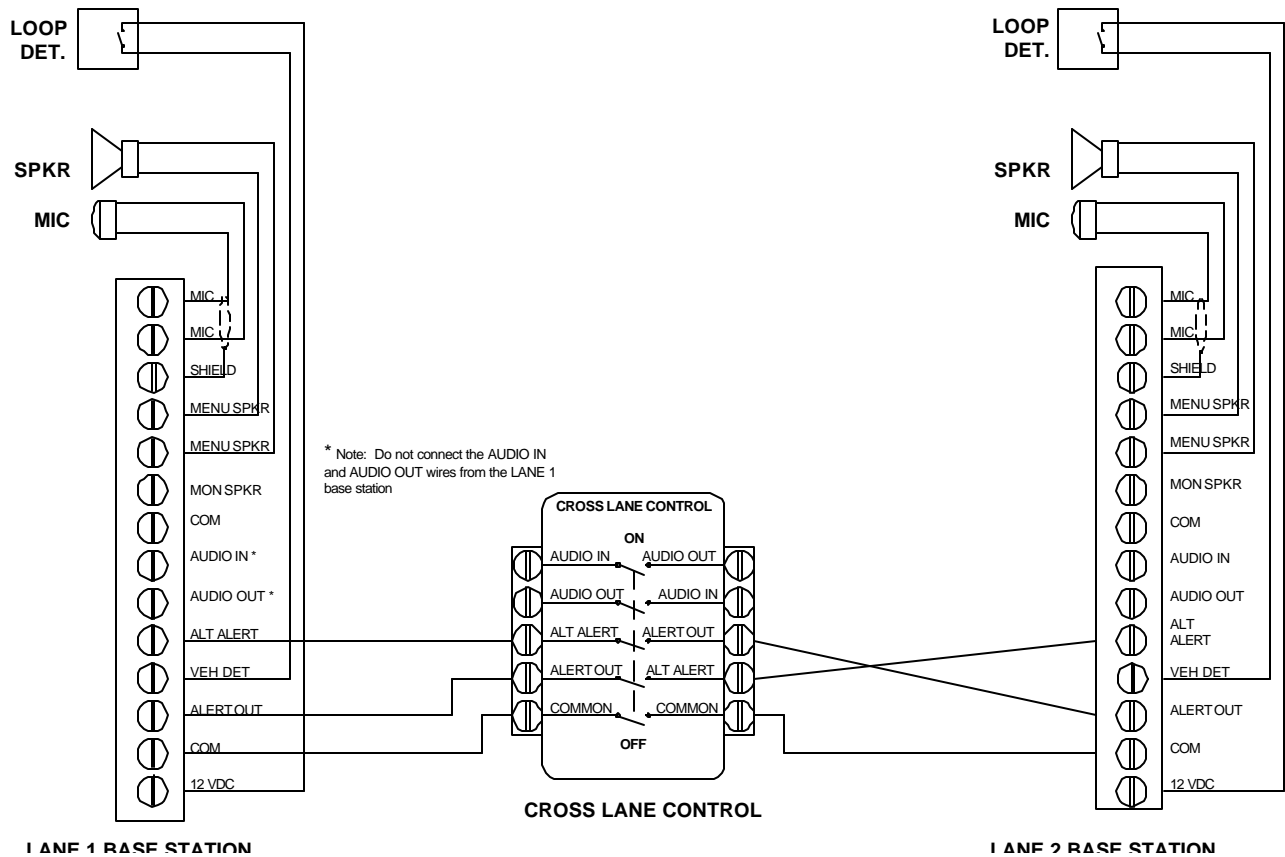
A Cross-Lane Module can be useful if the manager wishes to operate each lane with a separate crew during periods of peak activity. This is accomplished by turning the Cross-Lane switch OFF. By pressing the T1 button on any headset, the operator can communicate with a customer at menu sign 1. By pressing the T2 button on any headset, another operator can communicate with a customer at menu sign 2. When the Cross-Lane Module is OFF, the operator will only hear the vehicle detector alert from the menu sign with which he or she last talked.

During periods of lower activity, the Cross-Lane Module is turned ON, allowing one headset order-taker to operate both lanes. When the cross-lane module is turned ON, the operator will always hear vehicle detector alerts from both menu signs. A single alert indicates a vehicle is at menu sign 1 while a double alert indicates a vehicle is at menu sign 2.

## Installation

**Notes:** Both base stations must be set to the same channel number and different lane numbers.  
Both base stations must be at least 12 feet apart.

## Wiring the System



**Figure 11. Cross-Lane Wiring Diagram**

## Programming the Headsets for Cross-Lane Operation

Follow the steps below to program the C960 headsets for Cross-Lane operation, and disable the Talk-Lock function. It does not matter which base station is used to program the headsets. By pressing T1, the headset will always communicate with the lane 1 base station; by pressing T2, the headset will always communicate with the lane 2 base station.

### 1. Disable the Talk Lock function

Talk-Lock is a toggle function that must be checked first to see if it is enabled or disabled. If the Talk LED lights when the L button is pressed, Talk-Lock is enabled.

- To disable Talk-Lock, turn the headset OFF, press and hold the L button while pressing ON for 5 seconds. You will hear an acknowledging beep.
- Recheck the Talk-Lock function by pressing the L button. The Talk LED on the base station should not light.

## 2. Program the Headsets for Cross-Lane Operation

- With the headset OFF, press and hold T1 and T2 while pressing ON for 5 seconds. You will hear an acknowledging beep.
- Verify that the headsets are properly programmed for Cross-Lane operation:
  - Press T1 and verify that the Talk LED lights on the lane 1 base station and does not light on the lane 2 base station.
  - Press T2 and verify that the Talk LED lights on the lane 2 base station and does not light on the lane 1 base station.
- To remove the Cross-Lane function and return the headsets to the normal operating mode, first turn the headset OFF, and then hold down T1 while pressing ON for 5 seconds. You will hear an acknowledging beep.

## Operation

### Cross-Lane Module OFF

#### *Vehicle detector alerts*

The operator will only hear the vehicle detector alert from the menu sign with which he or she last talked. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

#### *Answering customers*

Pressing T1 will only allow communication with the lane 1 customer. Pressing T2 will only allow communication with the lane 2 customer.

#### *Paging function*

Pressing T1 will only allow communication with other headsets, which recently pressed T1. Pressing T2 will only allow communication with other headsets, which recently pressed T2.

### Cross-Lane Module ON

#### *Vehicle detector alerts*

The operator will always hear both vehicle detector alerts. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

#### *Answering customers*

Pressing T1 will only allow communication with the lane 1 customer. Pressing T2 will only allow communication with the lane 2 customer.

#### *Paging function*

Pressing T1 will only allow communication with other headsets, which recently pressed T1. Pressing T2 will only allow communication with other headsets, which recently pressed T2.

## NOTES:

### 1. Both vehicle alert tones will be heard at all times with the Cross-Lane Module ON

The order-taker may object to hearing the vehicle alert from the other lane while taking an order; if so, we suggest you decrease ALERT TONE LEVEL on each base station so it is audible in the headsets but not objectionable. The tone should be low enough so that the order-taker can ignore it, yet know that someone is waiting at the other lane.

## **2. Listening and Paging in a Cross Lane system**

With the AUDIO IN and AUDIO OUT wires disconnected, the T1 and T2 buttons control which menu sign to talk or listen to. They also control which headsets to PAGE to. Disconnecting the AUDIO IN and AUDIO OUT wires presents some issues if a cook or cashier needs to monitor both lanes:

- If the cook or cashier is using a headset to monitor lane 1, and the order-taker is taking an order from menu lane 2, or if the order-taker needs to PAGE the cashier, he/she must first press T1 momentarily, then press PAGE to communicate privately with the cashier on lane 1. Then the order-taker can press T2 to resume taking the order on lane 2.
- As an alternative, a monitor speaker from each base station may be installed in the kitchen. (Caution: Monitor speakers are generally not recommended for duplex systems using C921AA base stations. The speaker location and volume are usually too critical to avoid feedback. C921BA base stations can usually be configured successfully to allow operation of monitor speakers.)

## **3. The vehicle alerts may echo in the headsets**

With the Cross-Lane module turned ON, two rapid single tones may be heard from the lane 1 base station. To eliminate this problem, turn down the volume of the ALERT TONE LEVEL control, on one of the base stations.

# System Configurations and Function Jumper Settings

## ⚠ Important

Whenever a jumper setting is changed, the RESET SWITCH on the base station circuit board must be pressed to program the new jumper setting into the microprocessor. Also, each of the headsets in the system must be reprogrammed when a jumper setting is changed (see Channel Selection on page 14 for the headset programming procedure).

Determine the system type (standard operation – single lane, etc.) and identify the type of speaker (speaker only **or** speaker and microphone) and the type of vehicle detector (air switch **or** loop/SODAR detector).

Refer to the base station circuit board illustration (Figure 14) and the applicable system configuration below. Set the function jumpers as noted and per the type of speaker and vehicle detector in the system. (An illustration of the circuit board also appears on the decal inside of the base station half-cover.)

### Standard Operation – Single Lane System (One Base Station)

<b>Function</b>	<b>Jumper Settings</b>
Menu Sign with Speaker only (OSM)	Jumper pins 1 and 2 on jumpers J1 <u>and</u> J2.
<b>or</b>	<b>or</b>
Menu Sign with Separate Speaker and Microphone	Jumper pins 2 and 3 on jumpers J1 <u>and</u> J2.
Lane 1 System	Jumper pins 1 and 2 of jumper J3.
Air Switch (Pulse) Detector	Jumper pins 1 and 2 of jumper J4.
<b>or</b>	<b>or</b>
Loop/Sodar (Presence) Detector	Jumper pins 2 and 3 of jumper J4.
Standard Operation	Jumper pins 2 and 3 of jumper J5.
Menu Power Selection	Jumper <b>must</b> cover the top 2 pins of jumper J6.
Talk Monitor Level	Jumper left 2 pins of jumper J9.

### Standard Operation – Dual Lane System (Two Base Stations)

<b>Function</b>	<b>Jumper Settings</b>
Menu Sign with Speaker only (OSM)	Jumper pins 1 and 2 on jumpers J1 <u>and</u> J2.
<b>or</b>	<b>or</b>
Menu Sign with Separate Speaker and Microphone	Jumper pins 2 and 3 on jumpers J1 <u>and</u> J2.
Lane 1 System	Jumper pins 1 and 2 on base station 1, jumper J3.
Lane 2 System	Jumper pins 2 and 3 on base station 2, jumper J3.
Air Switch (Pulse) Detector	Jumper pins 1 and 2 of jumper J4.
<b>or</b>	<b>or</b>
Loop/Sodar (Presence) Detector	Jumper pins 2 and 3 of jumper J4.
Standard Operation	Jumper pins 2 and 3 of jumper J5.
Menu Power Selection	Jumper <b>must</b> cover the top 2 pins of jumper J6.
Talk Monitor Level	Jumper left 2 pins of jumper J9.

## Duplex Operation – Single Lane System (One Base Station)

### Function

Menu Sign with Separate Speaker and Microphone

Lane 1 System

Air Switch (Pulse) Detector

**or**

Loop/Sodar (Presence) Detector

Duplex Operation

Menu Power Selection

Talk Monitor Level

### Jumper Settings

Jumper pins 2 and 3 on jumpers J1 and J2.

Jumper pins 1 and 2 of jumper J3.

Jumper pins 1 and 2 of jumper J4.

**or**

Jumper pins 2 and 3 of jumper J4.

Jumper pins 1 and 2 of jumper J5.

Jumper bottom 2 pins of jumper J6.

Jumper left 2 pins of jumper J9.

**or**

If feedback occurs, jumper right 2 pins of jumper J9

## Duplex Operation – Dual Lane System (Two Base Stations)

### Function

Menu Sign with Separate Speaker and Microphone

Lane 1 System

Lane 2 System

Air Switch (Pulse) Detector

**or**

Loop/Sodar (Presence) Detector

Duplex Operation

Menu Power Selection

Talk Monitor Level

### Jumper Settings

Jumper pins 2 and 3 on jumpers J1 and J2.

Jumper pins 1 and 2 on base station 1, jumper J3.

Jumper pins 2 and 3 on base station 2, jumper J3.

Jumper pins 1 and 2 of jumper J4.

**or**

Jumper pins 2 and 3 of jumper J4.

Jumper pins 1 and 2 of jumper J5.

Jumper bottom 2 pins of jumper J6.

Jumper left 2 pins of jumper J9.

**or**

If feedback occurs, jumper right 2 pins of jumper P9.

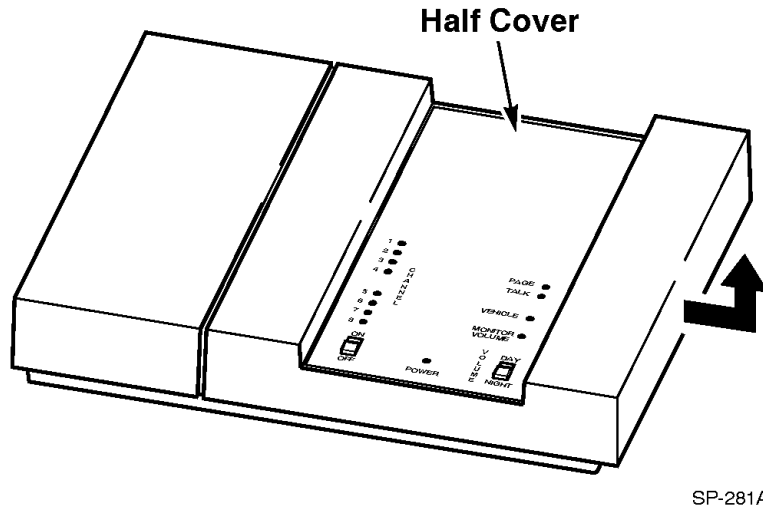


## Channel Selection

The Model C960/C860 Headset Intercom System can operate on any one of eight different channels.\*

Select a channel that neither receives or causes interference and then program the headsets to that channel using the following procedure:

1. Pull slightly outward on the lower right side of the base station half-cover and then lift and remove the cover as shown in Figure 12.



**Figure 12. Removing the Half-Cover from the Base Station**

2. With the base station turned on, press and release the CHANNEL SELECT switch once. (This advances the system to the next channel.) One of the red indicators (1–8) will light, indicating the newly selected channel.

### **⚠ Important**

After making any changes to the base station jumper settings, you must press the RESET SWITCH to “read” the new settings into the microprocessor.

### **⚠ Important**

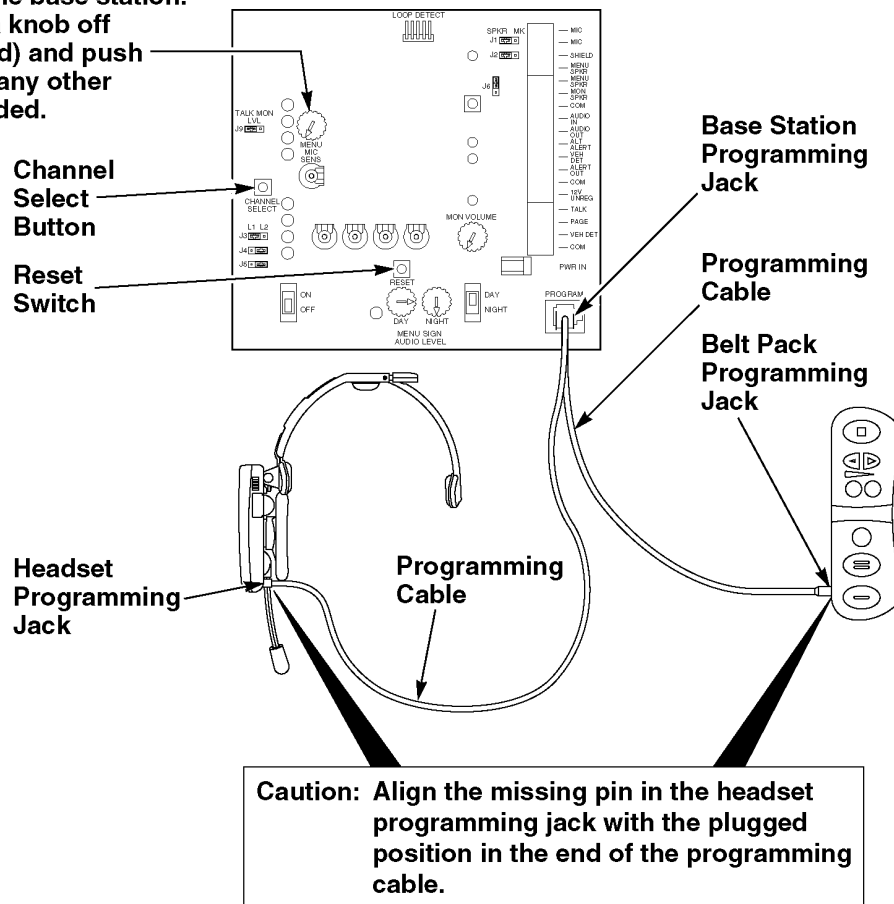
When two systems are used in a *dual lane application*, each base station **must** be set to the same channel, and one base station must be set to Lane 1 and the other to Lane 2.

### **\*Note**

If you are installing this as a single lane system, 8 channels on the LANE 2 setting are also available for use.

## Channel Selection (Cont.)

Only 2 rotary knobs are shipped with the base station. You may pull a knob off (by pulling hard) and push it gently on to any other control as needed.



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Figure 13. Base Station Circuit Board

3. With the headset/belt pack turned off, plug one end of the programming cable into the headset programming jack.
4. Plug the other end of the programming cable into the base station modular jack.
5. Turn on the headset/belt pack. (Audible tones will be heard in the headset earpiece indicating that programming is complete.)

The headset/belt pack is now programmed to the same channel as the base station.

Repeat the channel selection procedure if interference occurs. After seven channel changes, the original channel will again be encountered. If interference is still present and the system is a single lane system, try changing the J3 lane designation jumper from lane 1 to lane 2. If this fails and none of the channels are interference free, contact your 3M representative.

## Setting Audio Levels

To set the audio levels, refer to the related audio level procedure below and to the illustration of the base station circuit board (Figure 14). All the audio level adjustment controls are located on the base station circuit board. (An illustration of the circuit board also appears on the decal mounted to the base station.)

## Duplex Systems Only

The following procedure sets system audio levels for duplex systems so that headset/belt pack volume controls have enough “range” to allow operators to adjust headset volume to their preference.

### **\*Note**

The microphone at the menu sign must be located within four feet of the vehicle for duplex operation.

To set the audio levels:

1. Turn the base station MENU MIC SENS control to minimum (CCW).
2. Adjust the headset volume control to maximum.
3. Press the headset **Talk** switch, and set the base station outbound (DAY/NIGHT) audio levels to the desired level at the post/sign.
4. Press and hold the headset/belt pack **Talk** switch, and turn the base station MENU MIC SENS control up (CW) until feedback occurs. Then turn the MENU MIC SENS level control down (CCW) until the feedback stops.
5. Check each additional headset/belt pack (to be used in the system) at maximum volume. Verify that feedback does **not** occur. If feedback occurs, adjust the MENU MIC SENS level down until the feedback stops.
6. Lower the volume control on the headset/belt pack 2 levels from maximum, and check that the inbound audio level from the menu mic is usable. If everything is all right, the audio will be too loud.
7. Compare this inbound listen level in the headset to the page audio level from another headset.
8. Adjust the MENU MIC SENS level down (never up) to match the page audio level as required.
9. If the inbound listen level cannot be made to match the page audio level, then more acoustic isolation is needed for the menu mic and menu speaker.

This procedure ensures that feedback will not occur even if the headset/belt pack is run at its maximum setting. It is also a measure of how the menu sign/post components are placed in relation to one another.

## Duplex *and* Standard Systems

### **\*Note**

For Duplex systems, the microphone at the menu sign must be located within four feet of the vehicle for duplex operation.

For Standard (half-duplex) systems, jumper J6 **must** be placed in the STD position.

The following procedures apply to both duplex and standard systems.

### Alert Tone Level

The alert tone level is the volume of the alert tone heard in the headset.

To set the alert tone level:

1. Turn the headset off and then on. (This sets the volume control to midrange.)
2. Have someone drive a vehicle up to the menu sign. When the vehicle is detected, you will hear the vehicle alert tone in the headset.

3. Adjust the HEADSET ALERT LEVEL control to provide a comfortable alert tone level in the headset (clockwise to increase; counterclockwise to decrease).

### Monitor Speaker Volume Levels

The monitor speaker volume levels are the levels for the various functions heard through the optional monitor speaker. All adjustment controls are located on the base station circuit board. Turn the controls clockwise to increase the volume and counterclockwise to decrease volume.

To set the monitor speaker volume levels:

1. Set the master MON VOLUME control to the midrange position.
2. With a vehicle detected at the menu sign (alert tone sounding), adjust the MON ALERT control so that the alert signal coming through the monitor speaker is at a suitable level.
3. Press and hold the headset **T**alk switch and speak into the headset microphone. Adjust the MON TALK control so that the talk audio coming through the monitor speaker is at a suitable level.
4. Press the headset **P**age switch and speak into the headset microphone. Adjust the MON PAGE control so that the page audio coming through the monitor speaker is at a suitable level.
5. While you listen to audio coming from the menu sign, adjust the MON IN control so that the menu sign audio coming through the monitor speaker is at a suitable level.

#### **\*Note**

If any monitor functions are not desired by the customer, turn the related adjustment control fully counterclockwise to silence the function.

### Standard Systems Only

The following procedures apply only to standard systems.

#### **\*Note**

For Standard (half-duplex) systems jumper J6 **must** be placed in the STD position.

### Listen Level (Menu Sign Microphone Sensitivity)

The listen level is the volume of the menu sign audio heard in the headset.

To set the listen level:

1. Turn the headset/belt pack off and then on. (This sets the volume control to midrange.)
2. Have someone drive a vehicle up to the menu sign. When the vehicle is detected, you will hear the vehicle alert tone in the headset/belt pack.
3. Press and release the headset **T**alk switch to cancel the alert tone and allow you to listen to the audio from the menu sign.
4. Adjust the MENU MIC SENS level control for the desired volume (clockwise to increase volume; counterclockwise to decrease.)

The Listen Level should now be properly adjusted. Because the headset/belt pack volume control was set at midrange, there will now be enough range (up/down) in the headset/belt pack volume control to allow operators to set the headset volume to a preferred level.

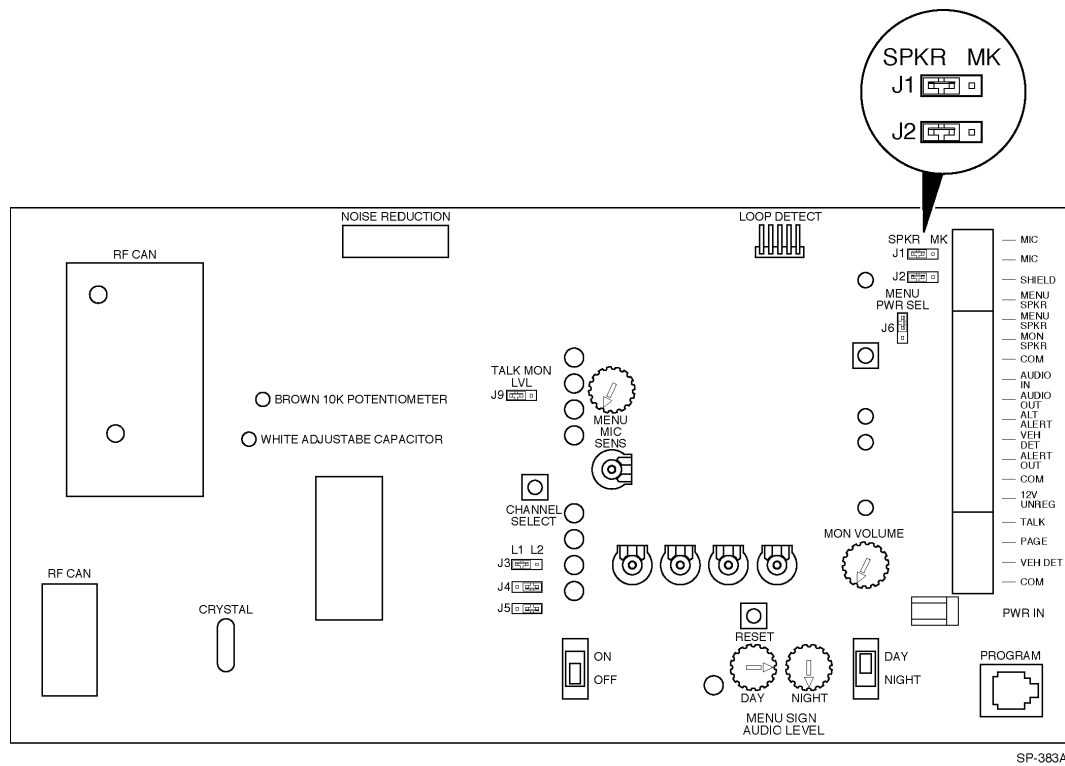
## Menu Sign Talk Volume Level

The menu sign talk volume level is the volume of the headset/belt pack audio heard at the menu sign.

To set the menu sign talk volume level:

1. Move the DAY/NIGHT switch on the base station to the DAY position.
2. Press and hold the headset/belt pack Talk switch and speak into the headset microphone.
3. Adjust the DAY menu sign audio level control for the desired audio level at the menu sign (clockwise to increase; counterclockwise to decrease.)
4. Move the DAY/NIGHT switch on the base station to the NIGHT position.
5. Press and hold the headset/belt pack Talk switch and speak into the headset microphone.
6. Adjust the NIGHT menu sign audio level control so that the audio level at the menu sign is slightly lower than the DAY audio level setting (clockwise to increase; counterclockwise to decrease.)

# Circuit Board Jumpers, Adjustment Controls, Indicators and Switches



**Figure 14. Base Station Circuit Board**

## Jumpers

- J1 and J2 Set for the type of menu sign in the system. Jumper pins 1 and 2 on both jumpers for menu signs having a speaker only. Jumper pins 2 and 3 on both jumpers for menu signs having a speaker and a microphone.
- J3 Set to designate the number of the lane in the system. Jumper pins 1 and 2 to select lane 1. Jumper pins 2 and 3 to select lane 2.
- J4 Set for the type of vehicle detector in the system. Jumper pins 1 and 2 for an air switch detector. Jumper pins 2 and 3 for a loop/sodar detector.
- J5 Set to designate the type of communication operation. Jumper pins 2 and 3 for standard operation. Jumper pins 1 and 2 for duplex operation.
- J6 MENU PWR SEL – STD or DPLX  
 STD – applies power to outbound speaker amplifiers only when the TALK switch is pressed. Note: for Standard (half-duplex) operation J6 MUST be placed in the STD position.  
 DPLX – applies power to outbound speaker amplifiers constantly. This will reduce the click that is sometimes heard in duplex mode when the TALK button is pressed.
- J9 TALK MON LVL  
 REDUCE – reduces the volume to the Monitor Speaker by 16dB while the TALK button is pressed. This decreases the chance of feedback when a headset is operating near the Monitor Speaker in duplex mode.  
 NONE – mutes the volume to the Monitor Speaker while the TALK button is pressed.

**⚠ Important**

After changing any jumper setting(s), be sure to press the RESET SWITCH on the base station circuit board to “read” the change into the microprocessor.

### Adjustment Controls

MENU MIC SENS	Controls the volume of the menu sign audio heard in the headset.
HEADSET ALERT LEVEL	Controls the volume of the alert tone heard in the headset.
DAY	Controls the volume heard at the menu sign with the Day/Night switch in the Day position.
NIGHT	Controls the volume heard at the menu sign with the Day/Night switch in the Night position.
MON VOLUME	Master volume control for the following functions heard through the optional monitor speaker:
MON ALERT	Controls the alert tone level.
MON IN	Controls the audio level coming from the menu sign.
MON PAGE	Controls the page audio level coming from the headset/belt pack microphone.
MON TALK	Controls the talk audio level coming from the headset/belt pack microphone.

**\*Note**

If any of the monitor functions are not desired by the customer, turn the appropriate adjustment control completely counterclockwise to silence that particular function.

### Indicators

POWER	Lights when power is applied to the base station.
CHANNEL 1–8	Lit LED indicates which channel is selected for base station operation.
VEHICLE	Lights when a vehicle is detected at the menu sign.
TALK	Lights during communication between headset/belt pack and menu sign.
PAGE	Lights during paging from headset/belt pack.

### Switches (etc.)

ON/OFF Switch	Controls power to the base station.
DAY/NIGHT VOLUME Switch	Selects volume for day or night operation.
CHANNEL SELECT Switch	Selects base station operating channel.
Programming Jack	For programming headsets/belt packs to the same channel as the base station.
RESET Switch	For programming new channel selection or jumper setting(s) into the microprocessor.
ON/OFF Switch	Switches the optional Noise Reduction Module ON or OFF.

### Connectors:

C5000 Terminal Strip	An extra 4 terminals at the bottom of the right-hand terminal block.
J7	Loop Detector Connector
J8	Noise Reduction Connector (under left half-cover)

## Finishing Up

1. Secure any loose wires.
  2. Replace the cover on the base station module.
  3. Check the operation of the system.
  4. Check the operation of the auxiliary intercom.
  5. Perform operator training, including the following functions:
    - Normal use and care of the system.
    - Use and care of the headset.
    - Battery replacement and recharging.
    - Operation of the base station module switches and controls.
    - Operation of optional Noise Reduction Module
    - Operation of Loop Detector
- Refer to the Model C960/C860 Headset Intercom System Operating Instructions.

## Troubleshooting Audio Feedback

If audio feedback occurs, check the following and correct as necessary:

- Is the microphone audio cable shielded twisted pair – grounded at the inside end?
- Is the microphone audio wiring separately contained in its own cable, with no other “active” wires in the same cable?
- Are the speaker and microphone **at least** 14 inches apart?
- Is the outbound audio level too high?
- Is speaker audio being reflected back to the microphone from nearby surfaces?

## Technical Assistance

For technical assistance, call **1-800-328-0033** or write to 3M Communication Products at the following address:

Food Services Trade Department  
3M Center, Building 551-1E-02  
St. Paul, MN 55144-1000





**Food Services Trade Department**  
3M Center  
St. Paul, MN 55144-1000



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**Ordering Replacement Parts**

The following pages show replacement parts for the Model C960AA Headset Intercom.

Order parts by the model number, part number, part name, and quantity required.

Replacement parts and their prices are available by calling:

1-800-328-0033.

For replacement parts correspondence, write to:

3M Food Services Trade Department  
3M Center  
St. Paul, MN 55144-1000

**Technical Service**

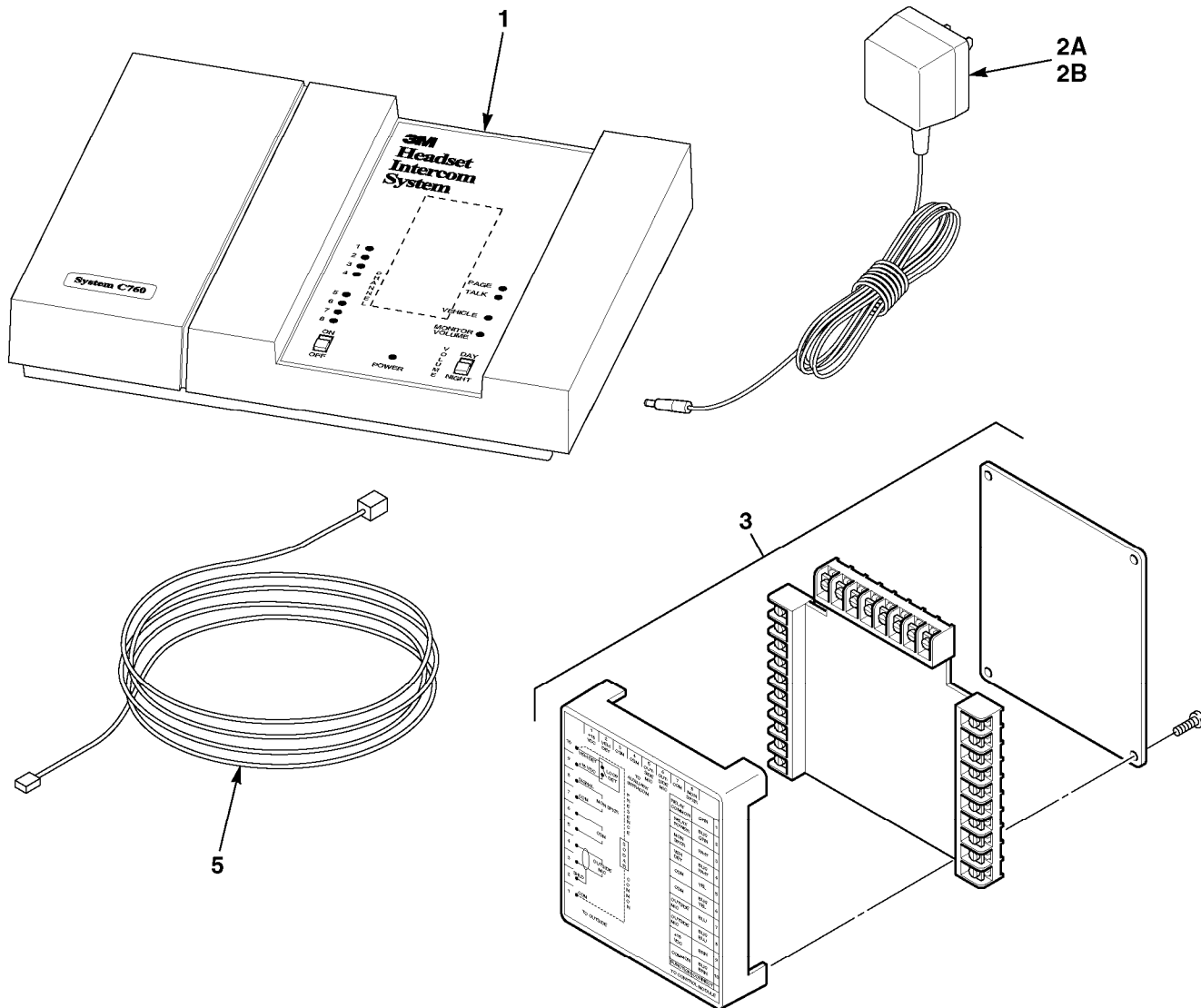
For technical assistance, call:

1-800-328-0033,

or write to:

3M Food Services Trade Department  
3M Center  
St. Paul, MN 55144-1000

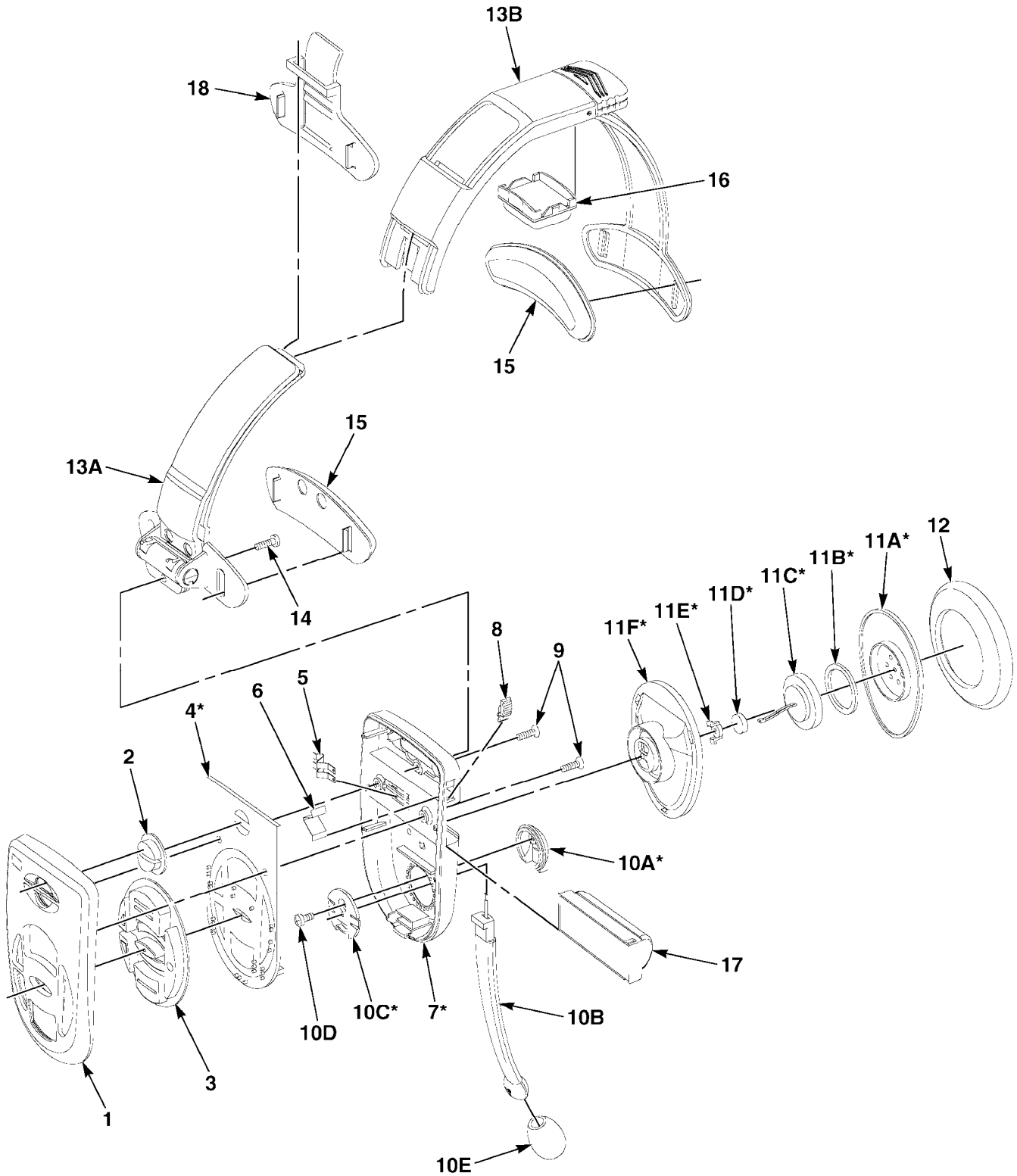
Section 1 - Base Station Assembly and Interconnect Module



SP-250A

Item No.	Part Number	Description	Qty.
0	78-9236-6330-2	BASE STATION ASSEMBLY, Model C921AA (w/o Power Supply)	1
1	78-8095-0500-7	CABINET, Base Station	1
1A	78-8095-0965-2	HINGE Assembly, (Replacement)	1
2A	78-6911-4377-6	POWER SUPPLY, 13.5 VDC, 20 VA	1
3B	78-6911-4430-3	POWER SUPPLY, Alternate, 13.5 VDC, 1.7 A	1
3	78-6911-3777-8	INTERCONNECT MODULE	1
5	78-8095-0505-6	CORD, Programming	1

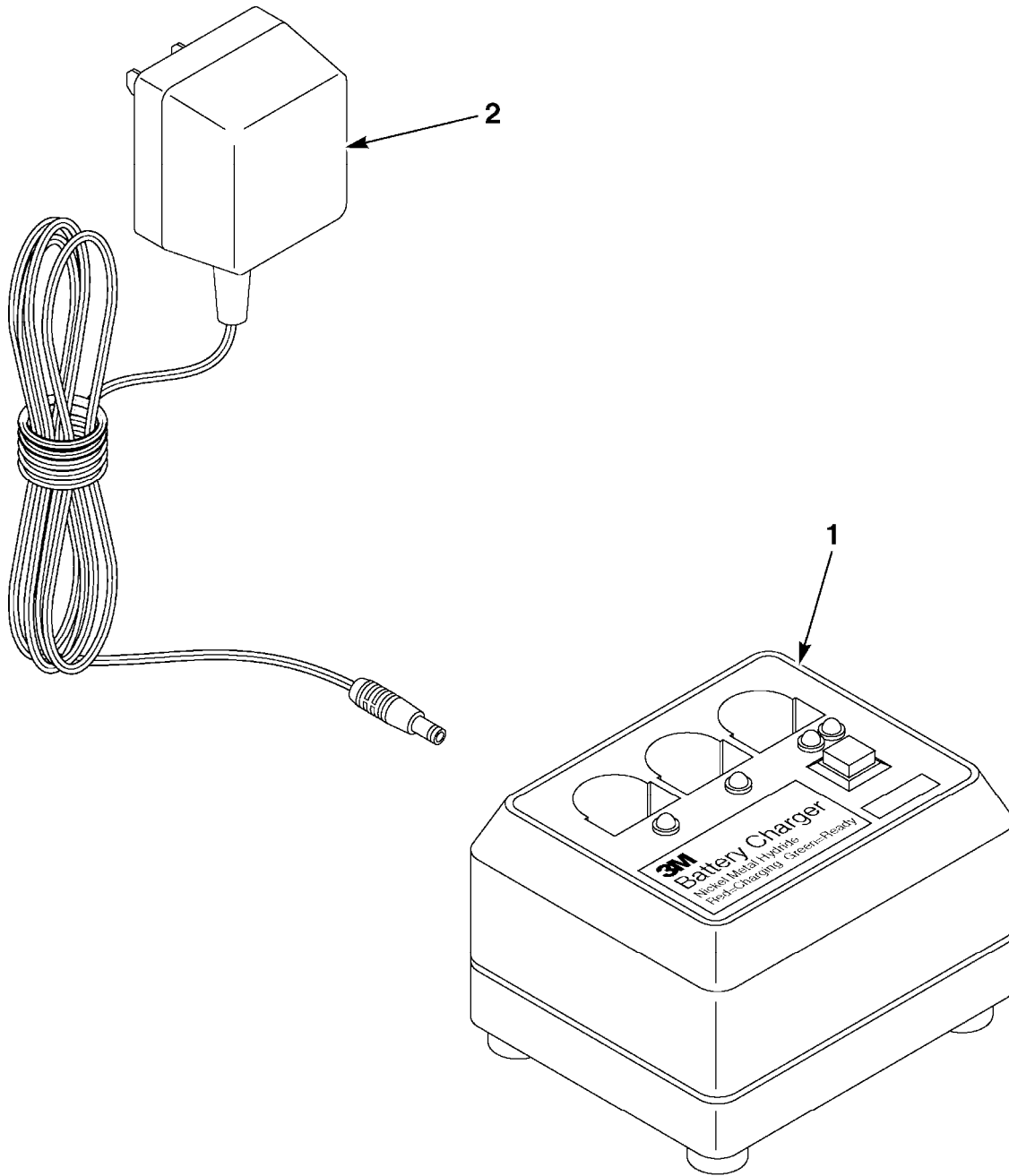
Section 2 - Headset Assembly



SP-258A

Item No.	Part Number	Description	Qty.
0	78-6911-4492-3	HEADSET ASSEMBLY, Model C920AC	1
1	78-8095-0525-4	OUTER CASE (with logo)	1
2	78-8095-0557-7	ON/OFF KEYPAD	1
3	78-8095-0574-2	KEYPAD	1
4*	Not Available	HEADSET PWA	1
5	78-6911-4630-8	BATTERY TERMINAL Kit (5 pairs)	2
6	78-8095-0556-9	SPRING, Battery Release Button	2
7	78-8095-0559-3	INNER CASE ASSEMBLY	1
8	78-8095-0551-0	BUTTON, Battery Release	1
9	26-1014-3441-8	SCREW, Flat Head, CS, Hi-Low, 4-40 x 1/4"	2
9A	26-1002-5298-5	SCREW, Flat Head, Mach, 4-40 x .375	2
10	78-8095-0523-9	MIC BOOM ASSEMBLY (Replacement)	1
10A	78-8095-0566-8	BASE, Mic Boom	1
10B*	Not Available	BOOM, Mic	1
10C	78-8095-0565-0	LOCK, Mic Boom	1
10D*	Not Available	SCREW, Pan Head, 4-40 x 1/4"	1
10E	78-6911-4506-0	MIC WINDSCREEN (Package of 10)	1
11	78-8095-0524-7	SPEAKER ASSEMBLY (Replacement)	1
11A*	Not Available	EAR CUP, Speaker Cover	1
11B*	Not Available	GASKET, Speaker	1
11C*	Not Available	SPEAKER ASSEMBLY	1
11D*	Not Available	FOAM, Speaker	1
11E	78-8095-0563-5	JOINT, Ear Cup	1
11F*	Not Available	EAR CUP	1
12	78-6911-4505-2	EAR PAD (Package of 10)	1
13A	78-8095-0583-3	HEADBAND ASSEMBLY, Adjustable	1
13B	78-8095-0582-5	HEADBAND ASSEMBLY, Main	1
13B-1	78-8095-0607-0	CAP, Headband Width Adjustment	1
14	26-1014-3439-2	SCREW, Pan Head, 6-32 x 7/16"	1
15	78-6911-4510-2	SIDE PAD ASSEMBLY (Package of 10)	2
16	78-6911-4507-8	TOP PAD ASSEMBLY (Package of 5)	1
17	78-6911-4491-5	BATTERY ASSEMBLY	1
18	78-8095-0591-6	CAP/VISOR CLIP (Package of 5)	1

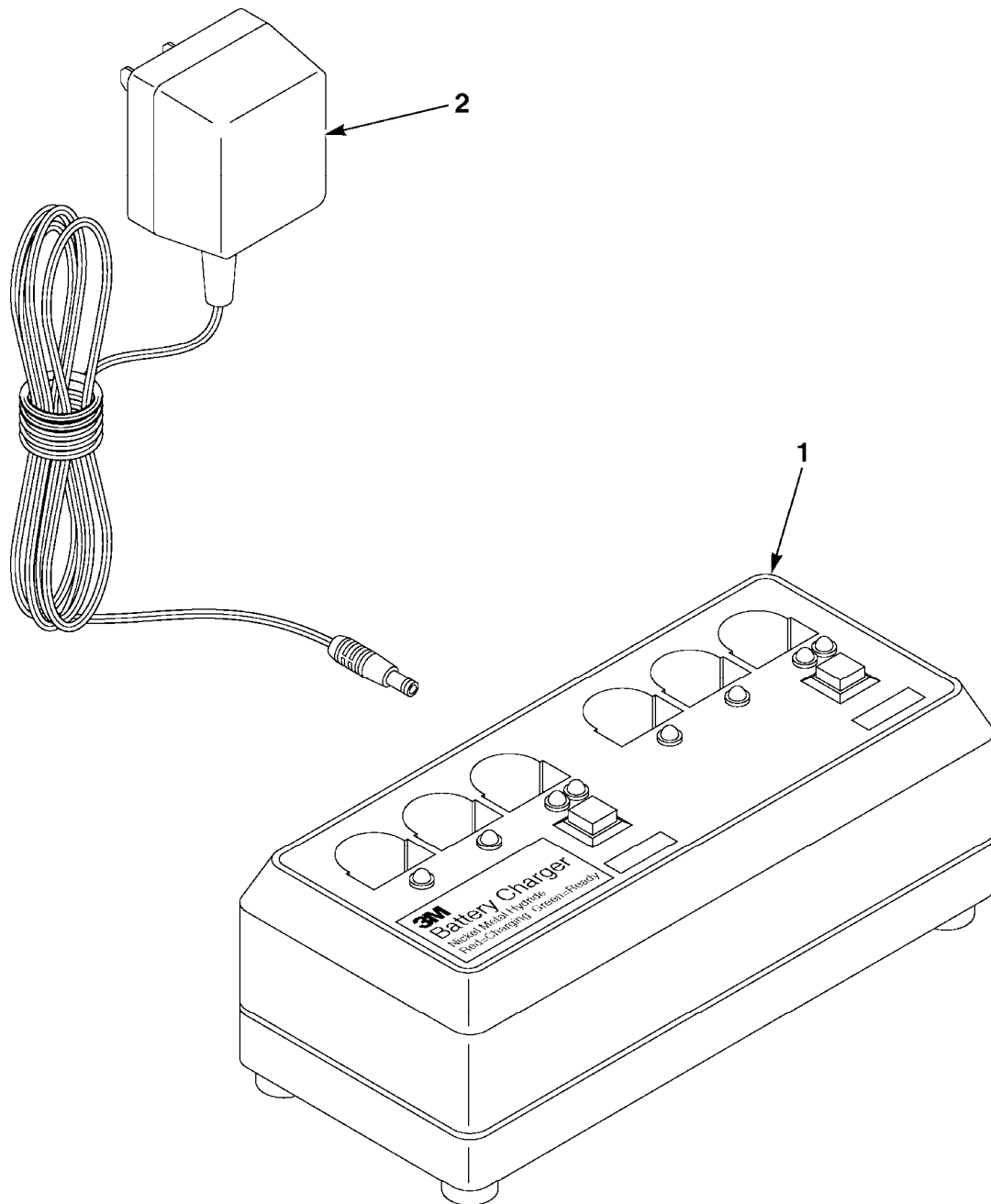
**Section 3 - 3-Slot Battery Charger Assembly**



SP-248A

<b>Item No.</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty.</b>
1	78-8095-0580-9	3-SLOT BATTERY CHARGER ASSEMBLY, Model C923AA	1
2	78-8028-9283-2	TRANSFORMER ASSEMBLY, 14 VAC, 20 VA	1

Section 4 - 6-Slot Battery Charger Assembly



SP-249A

Item No.	Part Number	Description	Qty.
1	78-8095-0581-7	6-SLOT BATTERY CHARGER ASSEMBLY, Model C926AA	1
2	78-8028-9283-2	TRANSFORMER ASSEMBLY, 14 VAC, 20 VA	1



## Replacing the Headset Speaker

### Tools Required:

- S Phillips screwdriver
- S Razor blade
- S Small, flat-blade screwdriver (jeweler's type)
- S Needlenose pliers

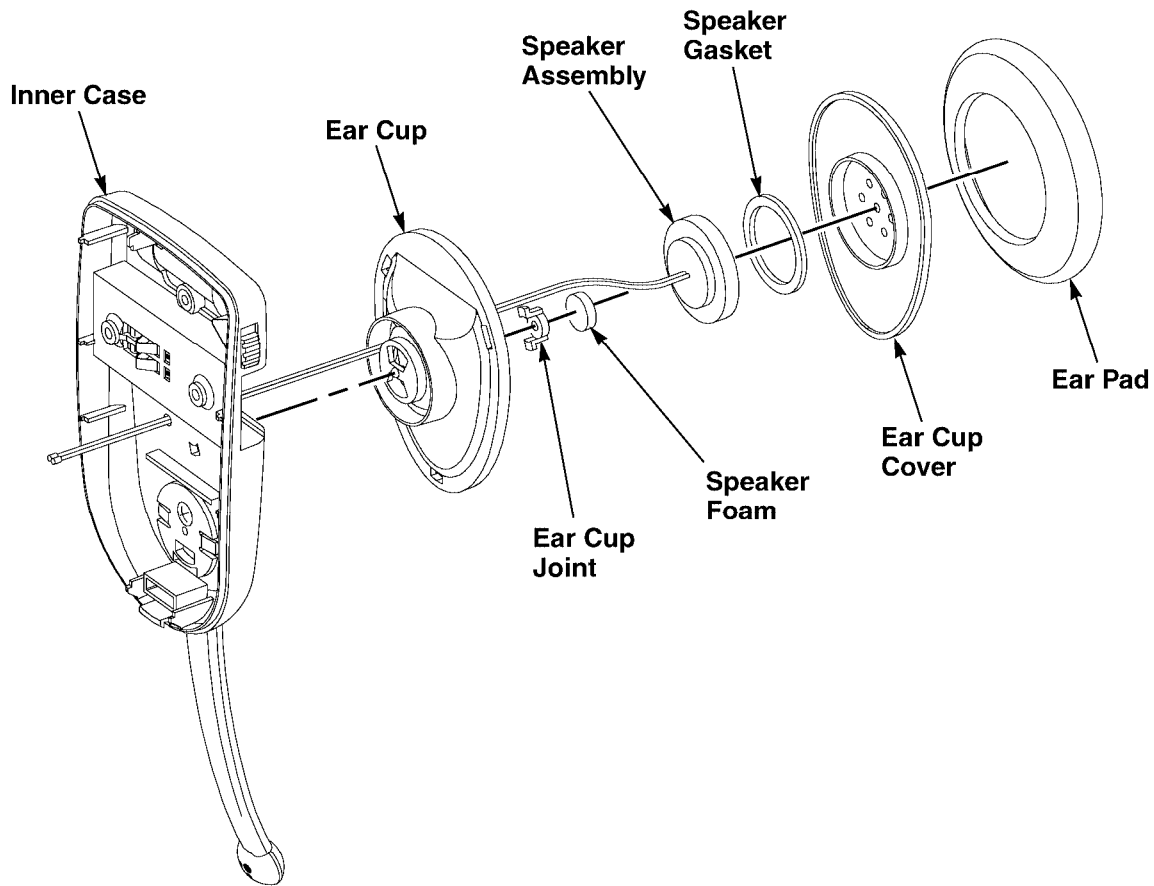
### Procedure:

1. Remove the ear pad as shown in Figure 3-1.

2. Remove the headband and the battery. See Figure 3-2.
3. Remove the outer case and the two keypads and set them aside. See Figure 3-2.

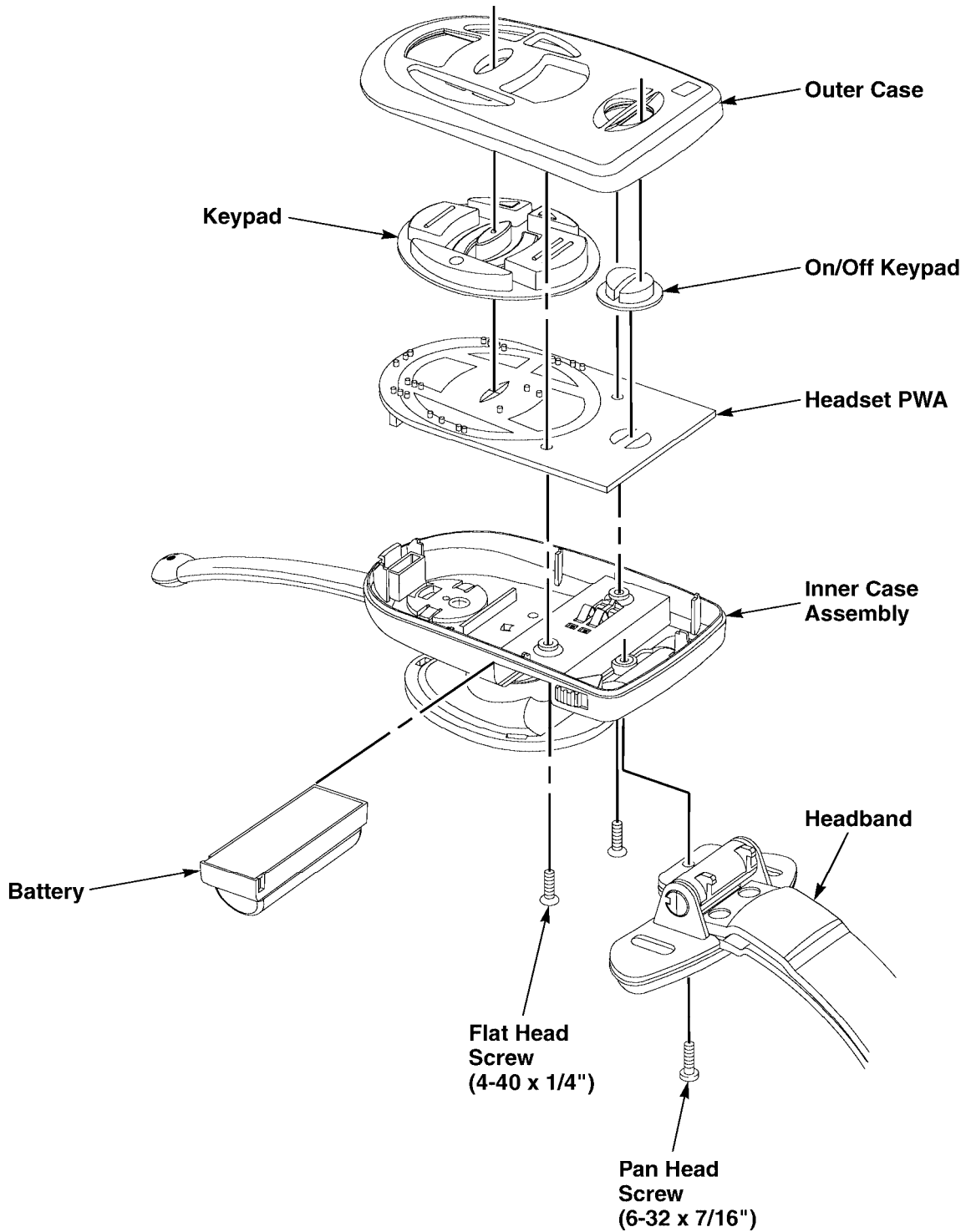
**⚠ Caution**

The headset PWA is **not** fastened to the inner case assembly. Be careful not to strain the speaker battery contact and microphone leads that are connected to the PWA.



SP-304A

**Figure 3-1.**



SP-303A

**Figure 3-2.**

4. Carefully unplug the microphone and speaker connectors from the headset PWA and set the PWA aside. See Figure 3-3.
5. Remove the connector terminals from the speaker connector housing as shown in Figure 3-4.

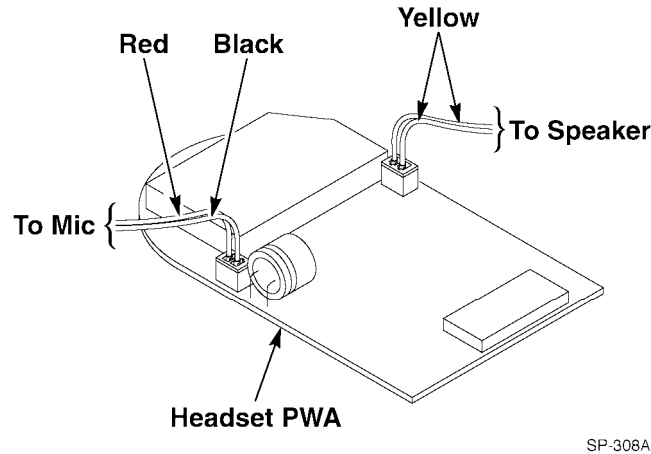


Figure 3-3.

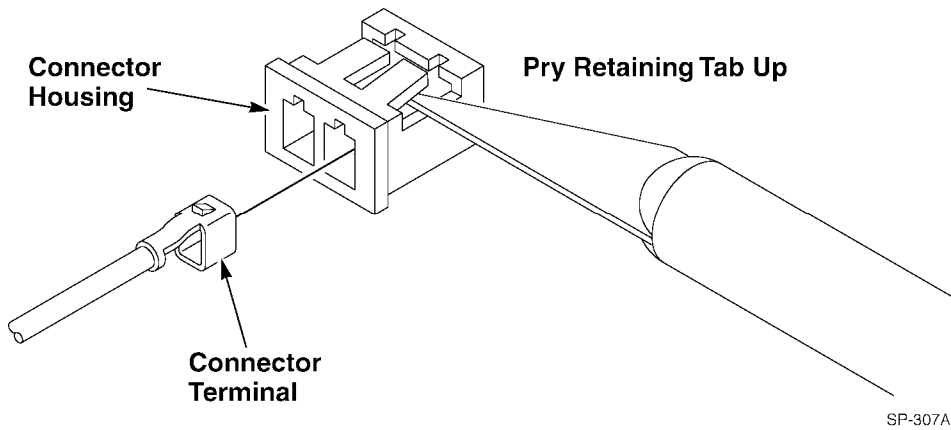
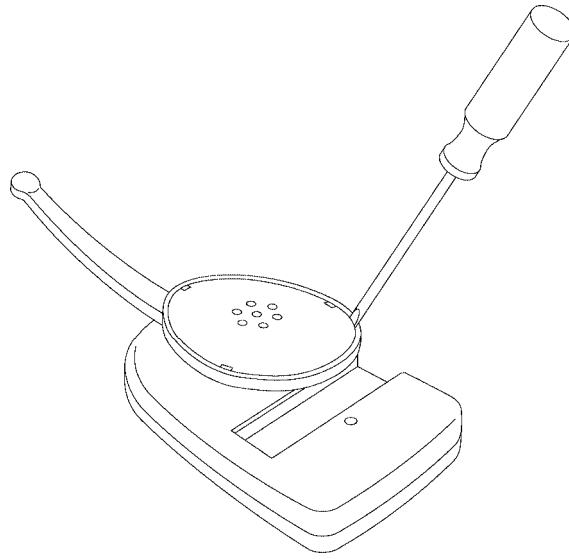


Figure 3-4.

6. Remove the ear cup cover from the ear cup:
  - a. If the cover is sealed to the cup, carefully cut through the epoxy seal using a sharp razor blade.
  - b. Carefully insert a small, flat-blade screwdriver between the cover and the ear cup at the point indicated in Figure 3-5 and pry the cover out of the ear cup.
7. Remove the ear cup joint. See Figure 3-1.
8. Carefully withdraw the speaker leads from the hole in the inner case.
9. Install the new headset speaker and reassemble the headset in the reverse order of disassembly.

**Note**

Be sure to correctly align the speaker foam and speaker gasket with the ear cup cover. Refer to Figure 3-1.



SP 308A

**Figure 3-5.**

## Replacing the Mic Boom Assembly

### Tools Required:

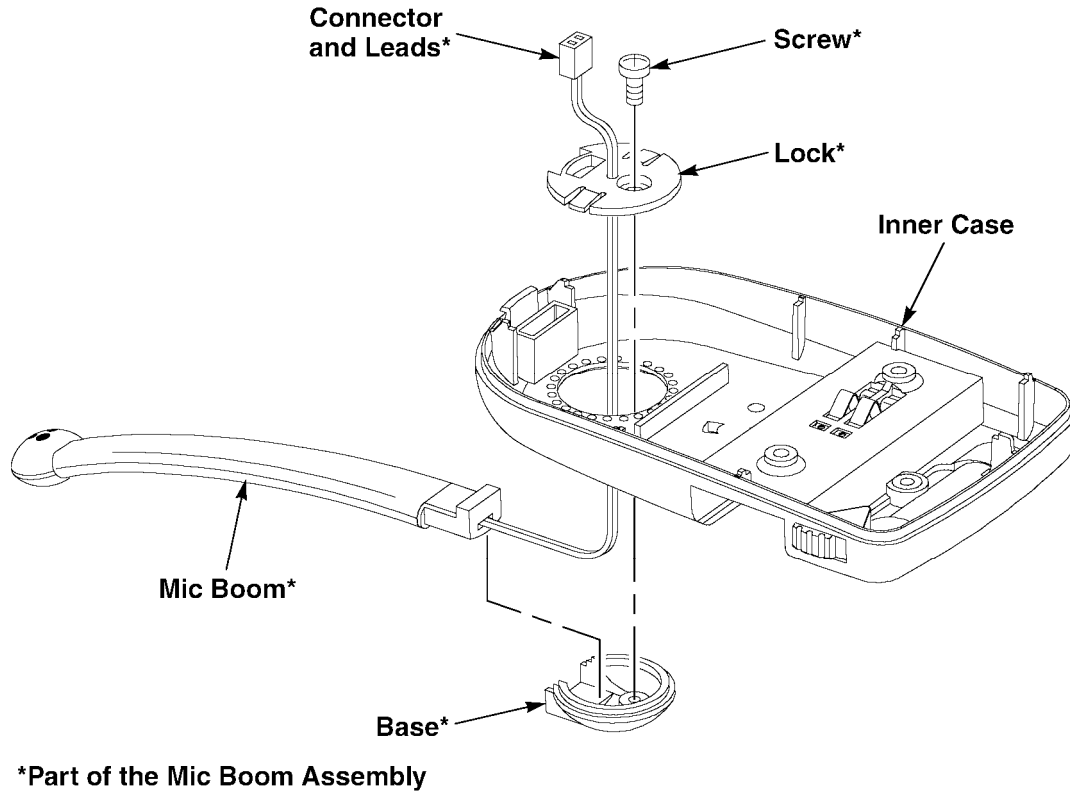
- S Phillips screwdriver
- S Razor blade
- S Small, flat-blade screwdriver (jeweler's type)
- S Needlenose pliers

### Procedure:

1. Remove the ear pad as shown in Figure 3-1.
2. Remove the headband and the battery. See Figure 3-2.
3. Remove the outer case and the two keypads and set them aside. See Figure 3-2.
4. Carefully unplug the microphone and speaker connectors from the headset PWA, and set the PWA aside. See Figure 3-3.
5. Remove the mic boom lock as shown in Figure 3-6.
6. Remove the mic boom base from the mic boom. See Figure 3-6.
7. Route the mic boom assembly through the hole in the inner case assembly. See Figure 3-6.
8. Install the new mic boom assembly and reassemble the headset in the reverse order of disassembly.

### Caution

The headset PWA is **not** fastened to the inner case assembly. Be careful not to strain the speaker battery contact and microphone leads that are connected to the PWA.



SP-305A

Figure 3-6.

### Replacing the Battery Release Button Spring

**Tools Required:**

- S Phillips screwdriver
- S Needlenose pliers

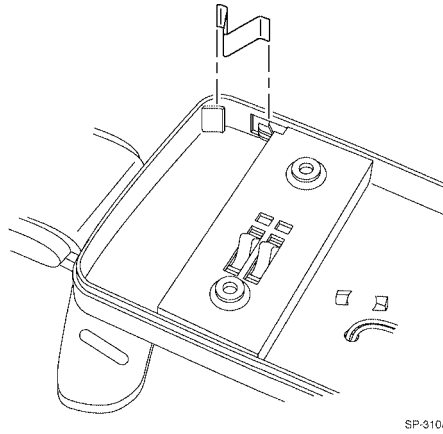
**Procedure:**

1. Remove the battery. See Figure 3-1.
2. Remove the outer case and the two keypads and set them aside. See Figure 3-2.

3. Carefully unplug the microphone and speaker connectors from the headset PWA, and set the PWA aside. See Figure 3-3.
4. Lift the battery release button spring out of the retainers in the housing. See Figure 3-7.
5. Install the new battery release button spring, and reassemble the headset in the reverse order of disassembly.

**Caution**

The headset PWA is **not** fastened to the inner case assembly. Be careful not to strain the speaker battery terminals and microphone leads that are connected to the PWA.



**Figure 3-7.**

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# Troubleshooting Guide

## 3M<sup>†</sup> Headset Intercom System, Model C960

### System Troubleshooting

To use this troubleshooting guide, locate the problem in the left column and look for the problem's possible causes and corrections in the middle and right columns. Possible causes are listed in the order in which they are most likely to happen. Check for possible causes in the given sequence to help isolate the problem.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
1. No communications. All headsets hear static.	<ol style="list-style-type: none"><li>1. The base station is not ON.</li><li>2. Base station and headsets are not programmed to same channel.</li><li>3. The Base Station is defective.</li></ol>	<ol style="list-style-type: none"><li>1. Turn the base station ON. Make sure the power transformer is plugged into the wall outlet <u>and</u> into the base station power receptacle. If the red power light does not come on, check for power at the wall outlet.</li><li>2. Reprogram the headsets with the programming cable.</li><li>3. Call for authorized service.</li></ol>
2. A single headset hears static.	<ol style="list-style-type: none"><li>1. Headset is not programmed to same channel as base station.</li></ol>	<ol style="list-style-type: none"><li>1. Reprogram the headset with the programming cable.</li></ol>
3. A single headset hears static. Programming cable has no effect.	<ol style="list-style-type: none"><li>1. Defective programming cable.</li><li>2. Defective headset.</li></ol>	<ol style="list-style-type: none"><li>1. Try to program other headsets with the same cable. If they won't program, replace the cable.</li><li>2. If the other headsets program OK, the single headset needs repair.</li></ol>
4. A single headset is dead. No static is heard.	<ol style="list-style-type: none"><li>1. The headset is not turned on.</li><li>2. The battery is discharged.</li><li>3. The headset is defective.</li></ol>	<ol style="list-style-type: none"><li>1. Press the ON button.</li><li>2. Replace the battery with a fully charged one.</li><li>3. Call for authorized service.</li></ol>
5. No vehicle alert tone in headset.	<ol style="list-style-type: none"><li>1. No power to the vehicle detector.</li></ol>	<ol style="list-style-type: none"><li>1. Plug the vehicle detector into power outlet or replace the detector fuse.</li></ol>



<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
	2. Vehicle detector is “locked up.” 3. The base station alert tone volume is set too low.	2. Remove power to vehicle detector for a few seconds to reset the detector. 3. Adjust alert tone volume.
6. All headsets will not go into Standby (silence) when the vehicle leaves the menu sign.	1. This is normal when a pulse (air switch) type of vehicle detector is used. 2. There is a large metal object near the loop in the driveway (if a loop is used). 3. The Loop detector is “locked up.” 4. Defective vehicle detector.	1. Press the Page switch to silence the menu microphone. 2. Remove the object. 3. Unplug the loop detector from the AC outlet and plug it back in to reset the detector. 4. Call for authorized service.
7. Audio on all headsets cuts out or is interrupted.	1. The cause could be radio interference. These are symptoms of interference: <ul style="list-style-type: none"> <li>S The operating range between the base station and the headsets gets very short, sometimes 25 feet or less. Normally you will hear nothing to indicate interference.</li> <li>S The Talk or Page light flickers briefly causing the system to leave standby mode, and go into listen mode with no vehicle alert heard.</li> <li>S The system may drop out of Talk Lock by itself.</li> <li>S When pressing the Channel Select button on the Base Station, the channel lights move sluggishly or not at all.</li> </ul> 2. Loose or frayed wiring. 3. Poor location of Base Station (behind large metal objects, too far from work area, etc.).	1. Change the channel on the base station to one at least three channels away. <ul style="list-style-type: none"> <li>S If using a single base station, move jumper J3 to the lane 2 position. This provides 8 additional channels from which to choose.</li> <li>S Locate and shut off other 900 MHz devices in the building, such as cordless phones, video and speaker systems, and video monitors.</li> </ul> 2. Call for authorized service. 3. Relocate the Base Station, or add an additional Base Station to extend the range of the system.

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
8. No Talk or listen from the menu sign when using the backup wired intercom. The C960 system works OK.	<ol style="list-style-type: none"> <li>1. The base station is turned on.</li> <li>2. No power to the backup intercom.</li> <li>3. The volume controls are set too low on the backup intercom.</li> <li>4. Defective backup intercom or wiring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the base station OFF.</li> <li>2. Turn the backup intercom on or plug in its power transformer.</li> <li>3. Turn the volume controls up.</li> <li>4. Call for authorized service.</li> </ol>
9. No Talk or Page to other headsets from a single headset, or Talk or Page buttons require excessive pressure to operate.	<ol style="list-style-type: none"> <li>1. Dirt or grease under Talk or Page Switch.</li> <li>2. Worn or defective Talk or Page switch.</li> <li>3. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> <li>2. Call for authorized service.</li> <li>3. Call for authorized service.</li> </ol>
10. Low Talk volume on a single headset.	<ol style="list-style-type: none"> <li>1. The holes in front of the microphone are plugged with dirt or grease.</li> <li>2. Operator is not positioning the microphone correctly.</li> <li>3. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> <li>2. Refer to Operating Guide.</li> <li>3. Call for authorized service.</li> </ol>
11. Louder Talk volume or feedback from a single headset.	<ol style="list-style-type: none"> <li>1. The holes in back of the microphone are plugged with dirt or grease.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> </ol>
12. Constant programming tones heard on a single headset. Programming cable has no effect.	<ol style="list-style-type: none"> <li>1. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> </ol>
13. The "hands free" function does not work.	<ol style="list-style-type: none"> <li>1. The Talk Lock button is not enabled on the headset.</li> <li>2. The system is operating in Standard mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to the Operating Instructions to enable Talk Lock.</li> <li>2. Talk Lock is disabled in Standard mode.</li> </ol>

## Battery and Battery Charger Troubleshooting

Problem	Possible Cause	Solution
1. No lights come on when a battery is inserted into charger.	1. Dirty contacts on battery or charger. 2. No power to charger. 3. Defective battery. 4. Defective charger.	1. Clean contacts on battery and charger with an alcohol moistened swab. 2. Make sure power transformer is plugged into charger and a "live" outlet. 3. Try a known good battery. 4. Call for authorized service.
2. Short battery life.	1. Worn out batteries. 2. The battery needs to be conditioned because it was repeatedly removed from the headset before the low battery alert sounded. 3. Wrong type of power transformer used for charger.	1. Replace battery. 2. Condition the battery. 3. Make sure power transformer is marked "Secondary Voltage 14 VAC."
3. The orange light comes on when a battery is inserted into the charger.	1. Defective battery.	1. Replace the battery.
4. The green light on the charger never comes on.	1. Defective battery.	1. Replace the battery.



**Food Services Trade Department**

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St. Paul, MN 55144-1000



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## Analyzing Batteries

The battery analyzer is used in conjunction with the battery charger to test the condition of headset batteries. The analyzer performs five tests:

- S Discharge
- S Cycle 1
- S Cycle 2
- S Cycle 3
- S Cycle 4

### DISCHARGE Test

The DISCHARGE test discharges the battery to a level of 1.0 volt. As the battery is discharged, the LCD continually displays the milliamper value in direct proportion to the amount of energy being removed from the test battery. The value displayed at the start of the test is the battery capacity from the previous charge. Because this test leaves the battery fully discharged, it is useful in testing other battery chargers.

### CYCLE 1 Test

The CYCLE 1 test is a 3-phase test that charges, discharges, and then recharges the battery.

During the first phase, the battery is charged.

During the second phase, the battery is discharged to a level of 1.0 volt. As the battery is discharged, the LCD continually displays the milliamper value in direct proportion to the amount of energy being removed from the test battery.

During the third phase, the battery is fully charged. After the battery is charged, the LCD displays the actual capacity of the battery in milliamper hours (mA hr). If the measured capacity is less than 80% of the rated capacity of 1200 mA hr, another cycle should be initiated. Another CYCLE 1 test can be initiated without removing the battery.

---

### Note

When CYCLE 1 test is selected again for the same battery, the test skips the first phase.

---

### CYCLE 2, CYCLE 3, and CYCLE 4 Tests

These tests are variations of the CYCLE 1 test, and are used to exercise a battery to bring back lost capacity.

- S The CYCLE 2 test performs two cycles of charge, discharge, and recharge.
- S The CYCLE 3 test performs three cycles of charge, discharge, and recharge.
- S The CYCLE 4 test performs four cycles of charge, discharge, and recharge.

Following the discharge phase of the each cycle, the LCD displays the number of cycles that remain.

The LCD messages are as follows for the a typical CYCLE 4 test:

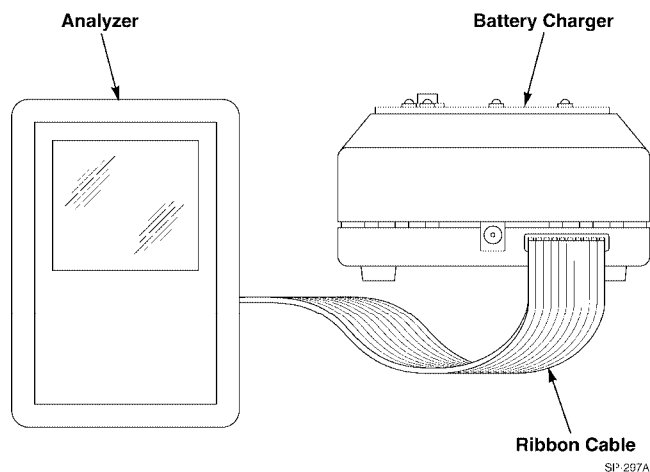
```

READY
CYCLE 4
(test initiated)
(Charge, discharge, recharge)
CYCLE 3
(Charge, discharge, recharge)
CYCLE 2
(Charge, discharge, recharge)
CYCLE 1
(Charge, discharge, recharge)
READY
CYCLE 4
(test complete)

```

## Setup Procedures

1. Connect the analyzer to the battery charger. See Figure 4-1.



**Figure 4-1.**

2. Turn the battery charger ON. The analyzer will run a short self-diagnostic test, displaying each segment on the analyzer LCD.

When the diagnostic test is complete, the word **READY** is displayed on the LCD. This indicates the analyzer and charger are ready to perform tests.

## Initiating a Test

To initiate a test:

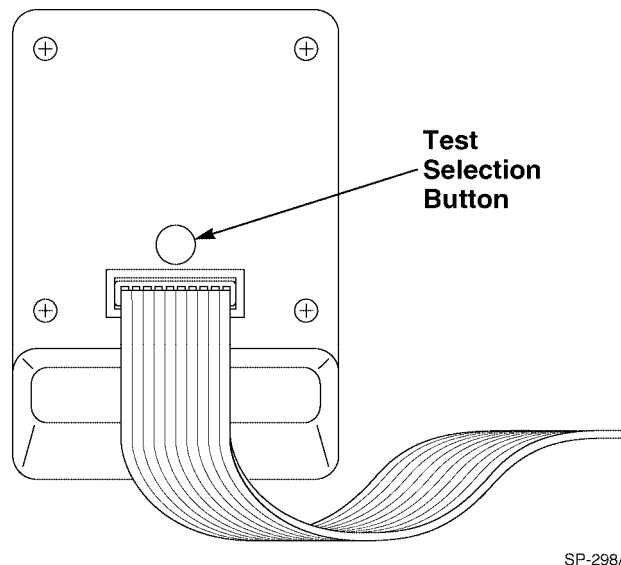
1. Insert the battery to be tested into the left-hand slot on the battery charger. The word **READY** will flash on the LCD. The analyzer remains in this state until the test selection button is pressed.
2. Press and release the test selection button to display the first test menu. See Figure 4-2. The next test menu is displayed each time the test selection button is pressed.

---

### **n Note**

Tests are initiated automatically approximately 10 seconds after they are displayed. Once a test is initiated, the test selection button is disabled and the test cannot be interrupted.

---



**Figure 4-2.**

3. When the test is complete, the word **READY** will flash on the LCD.

## Interpreting Test Readings

If the *measured* capacity of a battery is less than 80% of the *rated* capacity, the battery should be re-tested until the measured capacity is above 80% OR until it ceases to increase from one test to the next.

If the measured capacity of a battery is less than 80% after three or four test cycles, it should be removed from service and disposed of in accordance with local requirements.

## Error Codes

There are two error codes that are displayed to indicate that an error has occurred.

The code **ER-1** is displayed if the battery under test loses contact during the test. If this code is displayed, the test should be repeated.

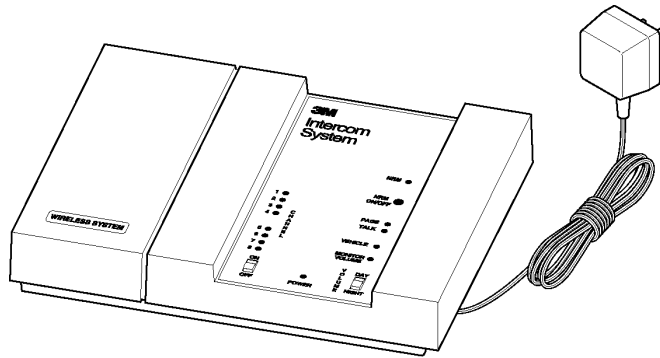
The code **ER-2** is displayed if the battery under test is out of the acceptable voltage range for charging. If this code displays repeatedly, the battery may have a bad cell. It should be removed from service and disposed of in accordance with local requirements.

# 3M

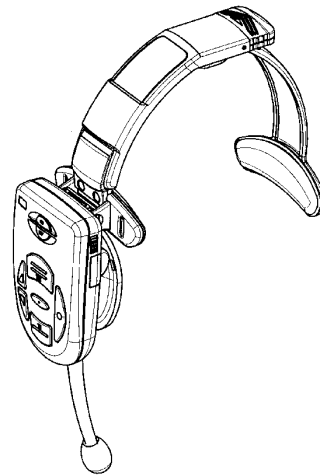
# Headset Intercom System

## Model C960

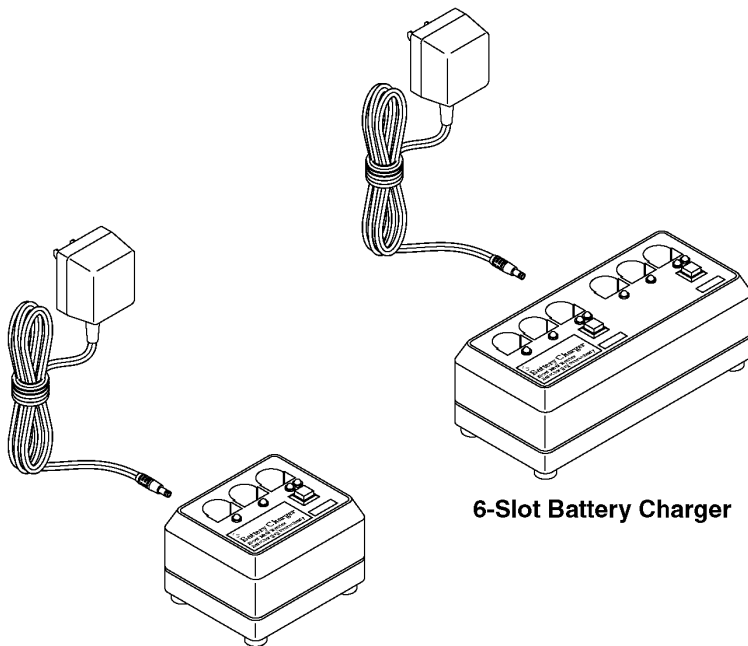
# Operating Instructions



**Base Station**

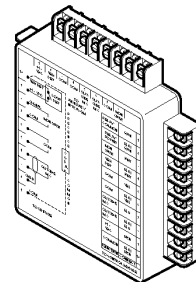


**Headset**



**6-Slot Battery Charger**

**3-Slot Battery Charger**



**Interconnect Module**

SP-385A



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**Intended Use**

The 3M Headset Intercom System, Model C960, is designed to provide 2-way radio-frequency audio communication in quick service drive-through restaurants and convenience stores.

Misuse of the Model C960 could result in poor performance and/or undesired operation.

**FCC Information**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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**Introduction**

The 3M Model C960 Headset Intercom System is a wireless intercom system designed for high reliability, compactness, and ease of service.

The system can be programmed to operate on any one of 16 different channels to provide high-quality audio performance and reduce the possibility of interference between neighboring wireless systems.

**Systems Configuration**

The system can be configured in one of five ways depending on the number of menu signs (lanes) at the facility and the type of communication desired.

**Single-Lane Standard Communication System**

The *single-lane standard communication system* provides standard communication (talk *or* listen) for facilities that have one menu sign.

The system consists of one base station and one or more headsets and battery chargers.

**Single-Lane Duplex Communication System**

The *single-lane duplex communication system* provides duplex communication (simultaneous talk and listen) for facilities that have one menu sign.

The system consists of one base station and one or more headsets and battery chargers.

**Dual-Lane Standard Communication System**

The *dual-lane standard communication system* provides standard communication (talk *or* listen) for facilities that have two menu signs.

The system consists of two independent systems - one dedicated to menu sign 1 and the other dedicated to menu sign 2. The headsets are programmed to work with one system or the other and are labeled accordingly (1 or 2).

**Dual-Lane Duplex Communication System**

The *dual-lane duplex communication system* provides duplex communication (simultaneous talk *and* listen) for facilities that have two menu signs.

The system consists of two independent systems - one dedicated to menu sign 1 and the other dedicated to menu sign 2. The headsets are programmed to work with one system or the other and are labeled accordingly (1 or 2).

**Cross-Lane Communication System**

The *cross-lane communication system* provides duplex communication (simultaneous talk *and* listen) for facilities that have two menu signs.

The system consists of two duplex systems that are connected to a cross-lane module. The headsets are programmed for either lane 1 or lane 2.

During *off-peak* hours, the cross-lane module can be turned ON to link the two systems and enable one operator to simultaneously talk *and* listen to customers at menu sign 1 or menu sign 2 or with other headset operators.

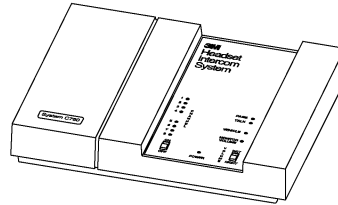
During *peak* hours, the cross-lane module can be turned OFF to separate the systems and enable menu sign 1 operators to talk to customers at menu sign 1, and menu sign 2 operators to talk to customers at menu sign 2.

**Systems Components**

The number of system components and the procedures necessary to operate them vary depending on the system configuration. However, three components are common to all system configurations.

**Base Station**

The base station is the interface between the customer at the menu sign and the headset worn by the operator. See Figure 1.

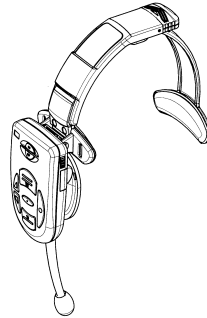


**Figure 1. Base Station**

**Headset**

The headset is a wireless, battery-powered, two-way radio used by the operator to communicate with menu sign customers and with other store personnel who are wearing headsets.

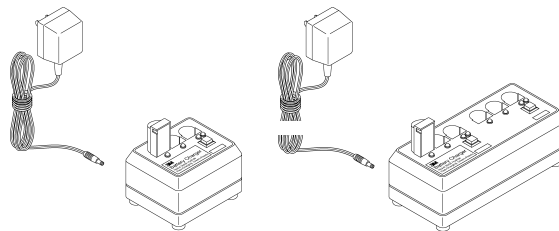
Headsets feature a light-weight design to provide for comfort. The headset pads can be easily removed and reinstalled, so operators can have their own set of pads for improved hygienic conditions. See Figure 2.



**Figure 2. Headset**

**Battery Charger**

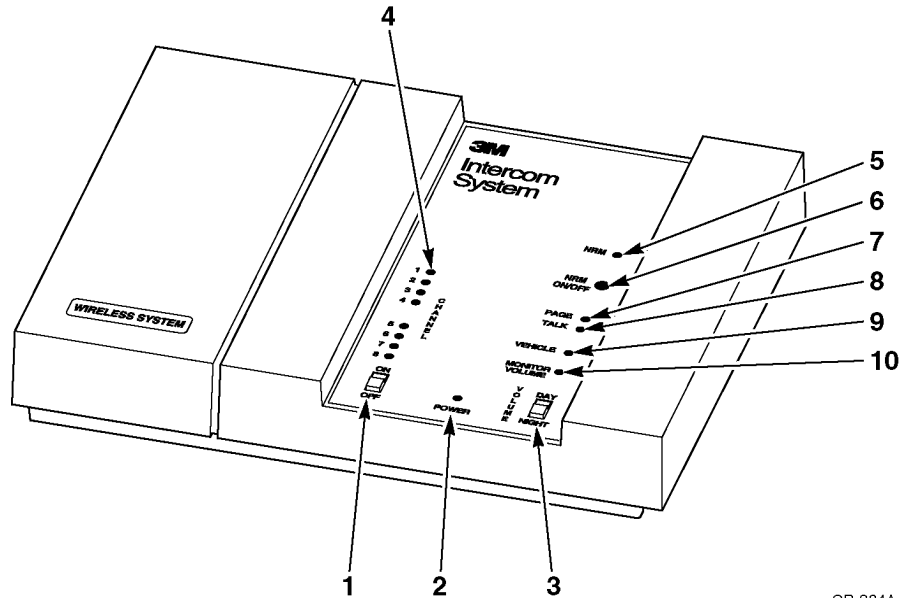
The battery charger charges headset batteries in approximately 1.5 to 2 hours. The charger is available in 3-slot and 6-slot versions. See Figure 3.



**Figure 3. 3-Slot and 6-Slot Battery Chargers**

**Base Station**

The base station controls and indicators are shown below.



SP-384A

**Figure 4. Base Station Controls and Indicators**

**1 ON/OFF Switch**

The ON/OFF switch controls power to the base station.

**2 POWER Indicator**

This indicator lights when the ON/OFF switch is in the ON position.

**✓ Note**

If for some reason the C960 headset system does not operate and the system includes an optional wired backup system, turn off the C960 Base Station to enable the backup system.

**3 VOLUME DAY/NIGHT Switch**

With the switch in the DAY position, the volume of the menu sign speaker is increased for daytime operation. With the switch in the NIGHT position, the volume of the menu sign speaker is decreased for nighttime operation. (Sound travels further and more efficiently at night.)

**4 Channel Indicators**

These indicators light to show which of the 8 channels is selected.

**5 NRM Indicator**

This indicator blinks when the Noise Reduction Module is switched on.

**6 NRM On/Off Button**

This button turns the optional Noise Reduction Module on or off.

**7 Page Indicator**

This indicator lights when headset Page communications occur.

**8 Talk Indicator**

This indicator lights when headset-to-menu sign “Talk” communications occur.

**9 Vehicle Indicator**

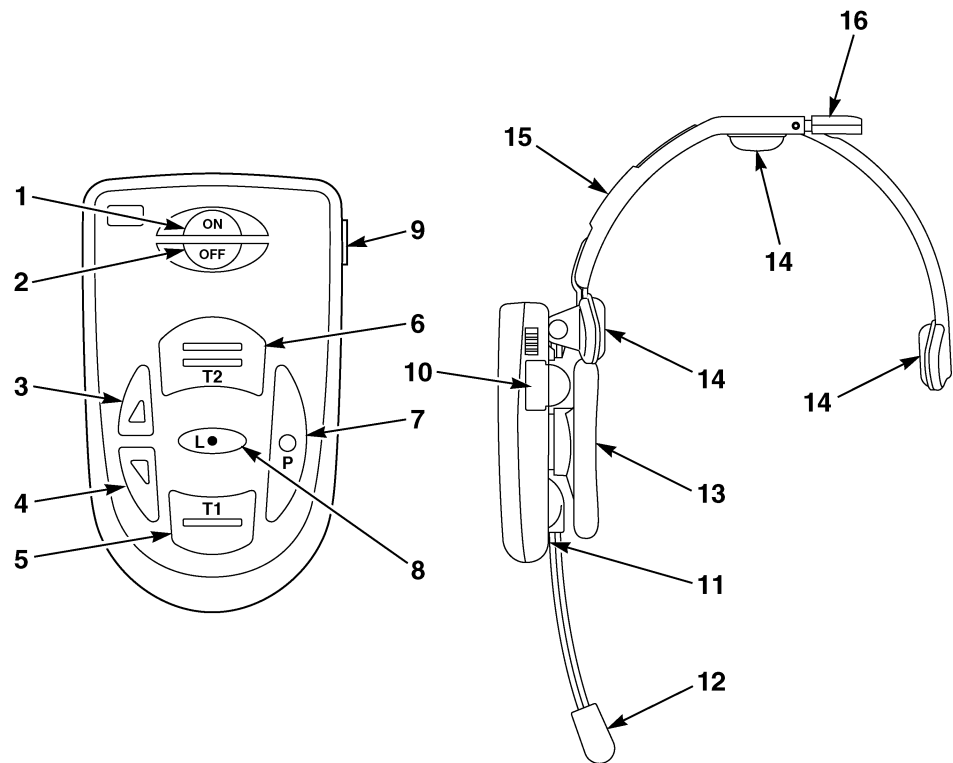
This indicator lights when a vehicle is detected at the menu sign.

**10 Monitor Volume Access**

This access hole allows for adjusting the volume of the optional monitor speaker.

**Headset**

The headset controls are shown below.



**Figure 5. Headset Controls**

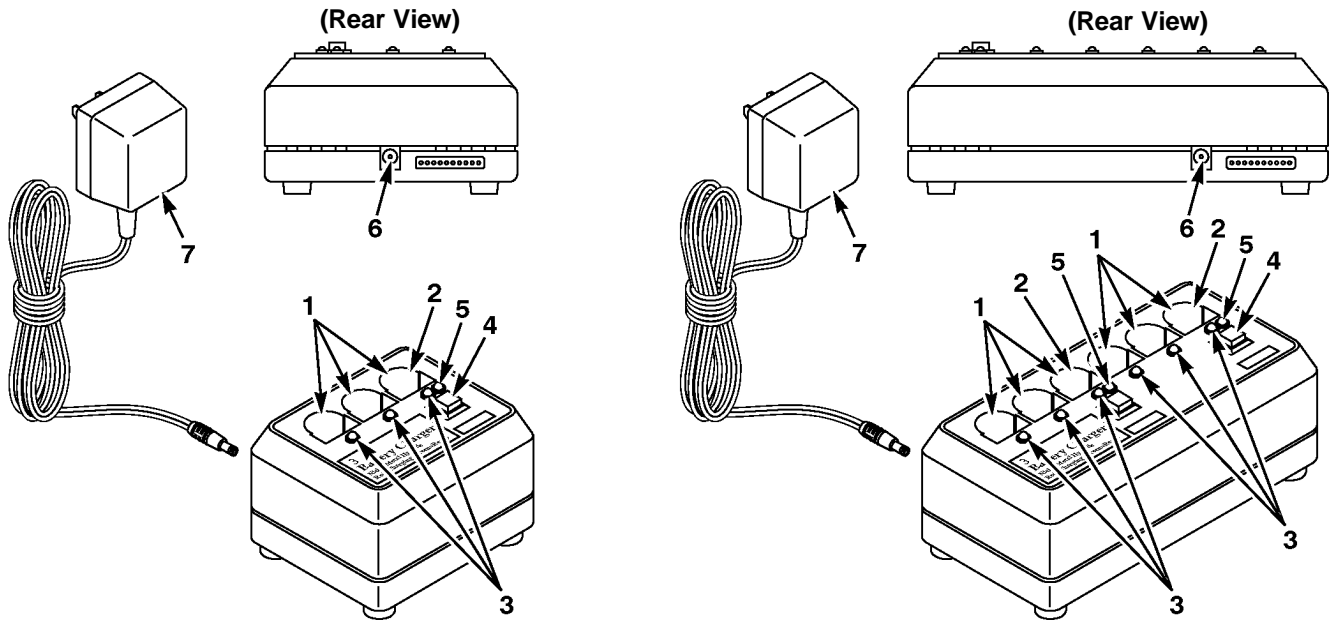
- 1 ON Switch** Press the ON switch to turn on the headset.
- 2 OFF Switch** Press the OFF switch to turn off the headset.
- 3 Volume UP ▲ Control** Press the volume up▲ control to increase the volume in the headset earpiece.
- 4 Volume DOWN ▼ Control** Press the volume down▼ control to decrease the volume.  
 When either volume control is pressed, the headset emits a short tone to indicate the new volume level. There are 15 different volume levels from minimum to maximum.  
 If the headset volume is at its maximum level, a low, continuous tone sounds when the volume up▲ control is pressed. A low, continuous tone also occurs when the volume reaches minimum level and the volume down▼ control is pressed.  
 When the headset is turned on, headset volume automatically returns to the previously-set level. Note that even when set to its lowest level, headset volume is not turned completely off.
- 5 T1 (Talk Lane 1) Switch** Press and hold the **T1 (Talk Lane 1)** switch to talk to the customer at the menu sign in lane 1. Release the switch to listen.

- 6 T2 (Talk Lane 2) Switch** For dual-lane systems, press and hold the **T2 (Talk Lane 2)** switch to talk to the customer at the menu sign in lane 2. Release the switch to listen.
- For single-lane systems, T2 can also be used to talk to lane 1.
- 7 Page Switch** Press and hold the **Page** switch to talk to internal personnel without being heard by the customer at the menu sign. Release the switch to listen. (With the switch released, you can hear both menu sign customers and internal paging.)
- 8 Talk Lock Switch** For duplex systems, press the talk lock switch once to talk and listen to the customer. This enables hands-free operation.
- 9 Battery Release** Push the battery release up and hold it there while sliding the battery out of the headset housing.
- 10 Battery** This rechargeable battery provides power to the headset.
- 11 Headset Programming Jack** This jack accepts the programming cable from the base station to allow the headset to be programmed to the same channel as the base station.
- 12 Microphone/Filter** The microphone sends the headset operator's voice to the menu sign or other headset operators. The filter is a protective cover for the microphone.
- 13 Earphone/Earpad** The *earphone* is a speaker that broadcasts the voice from the customer at the menu sign or from other headset operators. The replaceable *earpad* covers the earphone and cushions the operator's ear to provide comfort.
- 14 Headband Pads** The headband pads cushion the operator's head to provide comfort.
- 15 Headband Adjustment Slide** The headband adjustment slide is used to increase or decrease the size of the headband.
- 16 Headband Width Adjustment Tab** The headband width adjustment tab is used to increase or decrease the headband pad pressure.



**Battery Chargers**

The 3-slot and 6-slot battery charger controls are shown below.



**1 Charging Slots**

The charging slots hold batteries during the recharging cycle.

**2 Conditioning and/or Charging Slot**

This dual-function slot holds a battery during conditioning and recharging cycles. This slot functions as a conditioning slot when the conditioning button is pressed.

**3 Charging Status Indicators**

The charging status indicators light RED, GREEN, or ORANGE to indicate charging status:

RED indicates the battery is being charged.

GREEN to indicate the battery is fully charged.

ORANGE to indicate the battery is defective.

**4 Conditioning Button**

Press the conditioning button to condition a battery that is inserted in the conditioning/charging slot.

**5 Conditioning**

The conditioning status indicator lights YELLOW to indicate the battery in the conditioning slot is being conditioned.

**6 Power Supply Jack**

This jack accepts the plug from the power supply cord.

**7 Power Supply**

The power supply provides power to the battery charger.

## Introduction

To prepare the headset for use, you will need to check the headset for proper fit and install the cap clip (if desired).

## Checking the Headset for Proper Fit

To ensure effective operation and comfort:

- Adjust the headband width.
- Adjust the headband size.
- Position the ear pad and microphone.

## Adjusting Headband Width

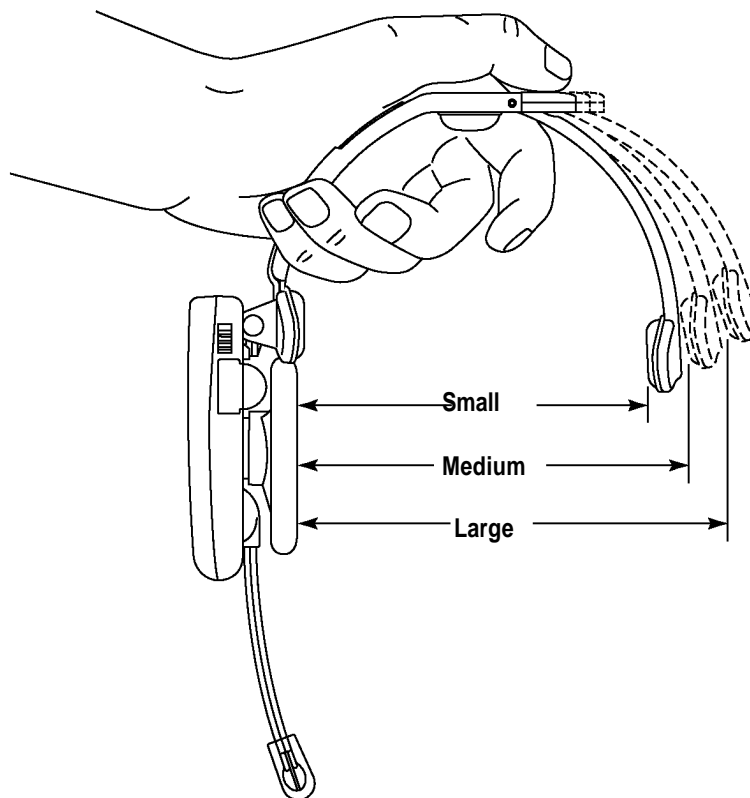
Adjust the headband width until the headband pads hold the headset firmly in place without causing discomfort. The headset can be worn with the ear pad against either ear. The three width settings are shown in Figure 6.

*If the headset is too **tight**:*

1. Fold the headband in toward the ear pad.
2. Push the width adjustment tab away from the center headband pad.
3. Fold the headband out against the adjustment tab.

*If the headset is too **loose**:*

1. Fold the headband in toward the ear pad.
2. Push the width adjustment tab toward the center headband pad.
3. Fold the headband out against the adjustment tab.

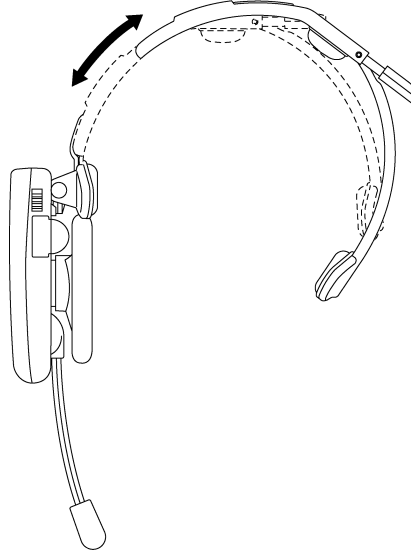


**Figure 6. Headband Width**

**Adjusting Headband Size**

Adjust the size of the 2-piece headband until the ear pad rests against one ear and the headband pads rest just above each ear.

- Slide the headband *apart* to make it *larger*.
- Push the headband *together* to make it *smaller*.



**Figure 7. Headband Size**

**Positioning the Ear Pad and Microphone**

Rotate the microphone boom up or down so that its tip is in line with the corner of your mouth. Do not bend the rubber microphone boom. See Figure 8.



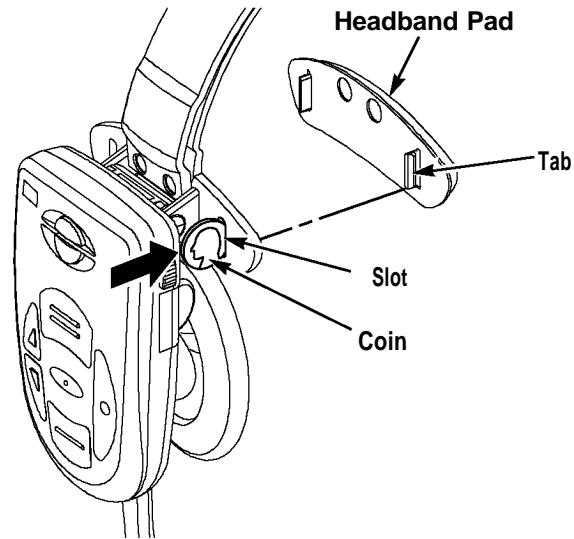
SP-237A

**Figure 8.**

**Installing the Cap Clip**

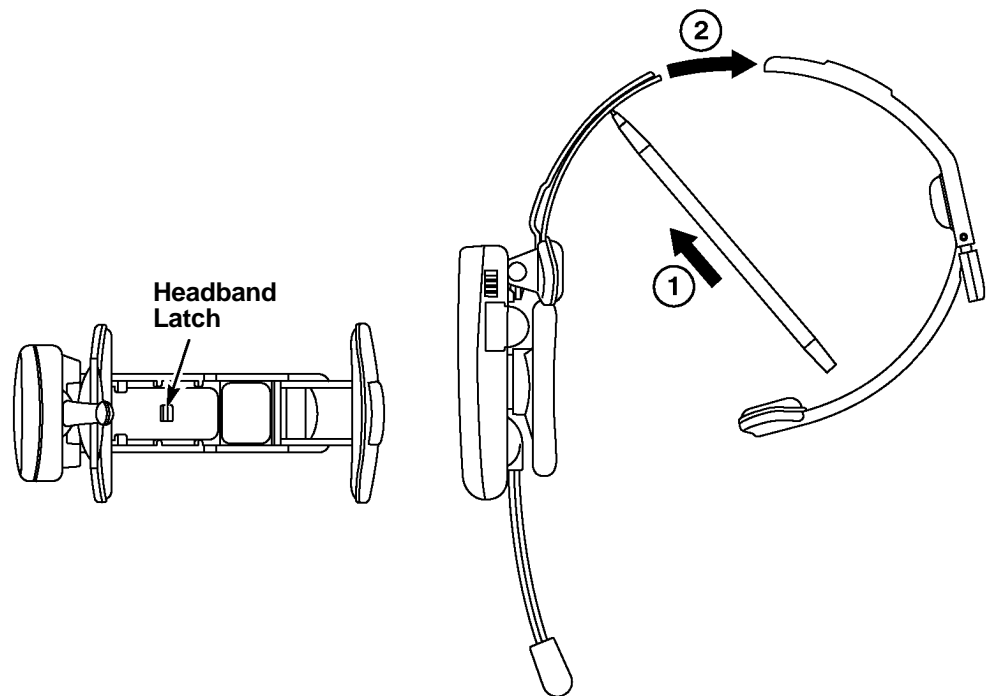
To install the cap clip:

1. Remove the side headband pad (from above the ear pad). Insert a dime in the slot on the headband pad housing and twist the dime to release the tab. See Figure 9.



**Figure 9.**

2. Extend the headband to maximum size.
3. Using a ball point pen, release the headband latch and slide the 2-piece headband apart. See Figure 10.



**Figure 10.**

- Slide the cap clip onto the cap band just above the ear.

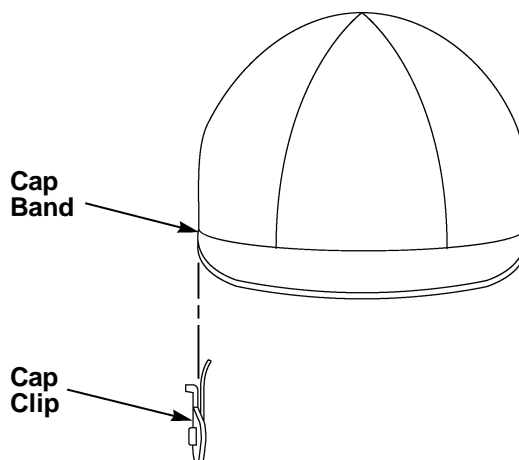


Figure 11.

- Slide the cap clip over the inside half of the adjustable headband until it snaps into position over the headband pad mount. See Figure 12.

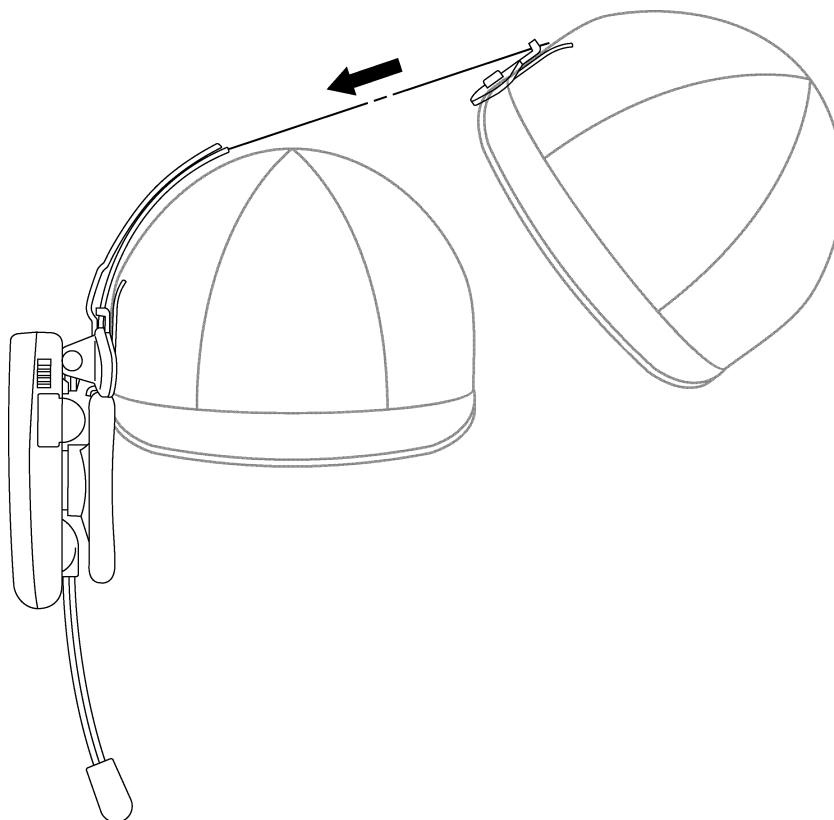


Figure 12.

**System Startup**

System startup includes turning on the base station and each headset that will be used.

**Turning On the Base Station**

To turn on the base station:

1. Slide the power ON/OFF switch to the ON position. Check to see that the POWER indicator lights.
2. Slide the VOLUME switch to the desired position (DAY or NIGHT).

**Turning On the Headset**

To turn on the headset, press the ON switch located on the transceiver housing. A single tone will sound in the earphone to indicate the headset has been turned on.

**Operating Modes**

The system has several operating modes. The number of available operating modes depends on the system configuration (*single-lane vs dual-lane, standard communication vs duplex communication, etc.*).

**Standby Mode**

In the standby mode, the headset is on and waiting to receive communication from the menu sign or other headset operators. This mode is available with all system configurations.

**Talk/Listen Mode**

Use the talk/listen mode to talk to the customer at the menu sign. This mode is available with all system configurations.

**Single-Lane Standard or Duplex Communication Systems**

1. A *single beep* alert tone sounds in the headset at 2-second intervals when the system detects a customer (vehicle) at the menu sign.
2. When you hear the alert tone, press and hold T1 or T2 to talk to the customer at the menu sign. Release T1 or T2 to listen.

**Dual-Lane Standard or Duplex Communication Systems**

In dual-lane systems, some headsets are programmed to communicate with Lane 1 and others are programmed to communicate with Lane 2. The headsets are labeled accordingly.

1. An alert tone sounds in the headset when the system detects a customer (vehicle) at the menu sign:
  - The alert tone for Lane 1 is a single beep that repeats at 2-second intervals.
  - The alert tone for Lane 2 is a double beep that repeats at 2-second intervals.
2. When you hear the *single beep* alert tone, press and hold T1 and talk to the customer at menu sign 1. Release T1 to listen.

When you hear the *double beep* alert tone, press and hold T2 to talk to the customer at the menu sign 2. Release T2 to listen.

**Cross-Lane Communication Systems*****Communication During Peak Hours***

During peak hours, the cross-lane module is turned *off* and the system functions like a dual-lane duplex system. Some headsets are programmed to communicate with Lane 1 and others are programmed to communicate with Lane 2. The headsets are labeled accordingly.

**Communication During Off-Peak Hours**

During off-peak hours, the cross-lane module is turned *on* to enable a single operator to communicate with customers in either lane (1 or 2).

1. An alert tone sounds in the headset when the system detects a customer (vehicle) at the menu sign:
  - The alert tone for Lane 1 is a single beep that repeats at 2-second intervals.
  - The alert tone for Lane 2 is a double beep that repeats at 2-second intervals.
2. When you hear the *single beep* alert tone, press and hold T1 and talk to the customer at menu sign 1. Release T1 to listen.

When you hear the *double beep* alert tone, press and hold T2 to talk to the customer at the menu sign 2. Release T2 to listen.

**Talk Lock Mode**

Use this mode to operate “hands free.” The talk lock mode is only available with duplex system configurations.

In this mode, the headset automatically switches from standby to talk/listen when a customer is detected at the menu sign. The headset automatically switches back to standby when the customer leaves the menu sign.

---

**✓ Notes**

“Hands free” operation (talk lock mode) prevents all other headset operators from communicating.

“Hands Free” operation will not work in cross lane mode.

---

To use the talk lock mode, press the talk lock switch on the transceiver housing. To return to normal headset operation, press T1 or P.

**Page Mode**

Use this mode to talk to other operators who are wearing headsets without being heard by the customer at the menu sign. This mode is available with all system configurations.

To page another operator, press and hold the page switch. Release the page switch to listen.

---

**✓ Note**

If you are **not** a menu sign operator, do not use the page mode while the menu sign operator is communicating. Doing so may interrupt or prevent communication between the menu sign operator and the customer.

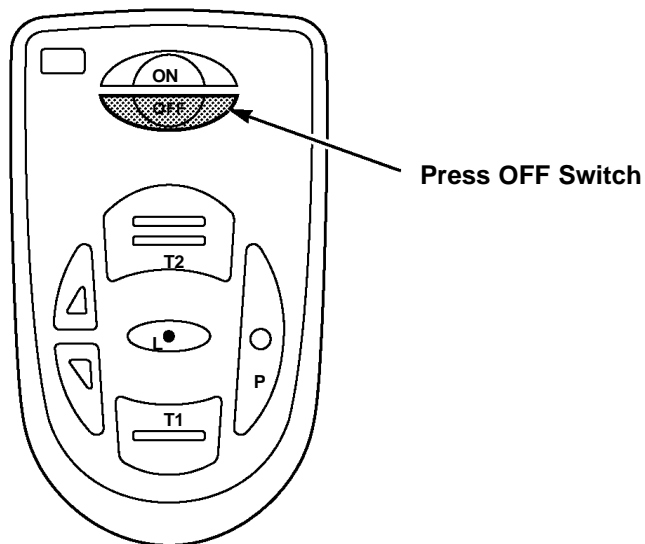
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**Page Monitor Mode**

Use this mode to listen for pages from other operators (without hearing the communication to and from the menu sign). This feature is convenient for managers and supervisors who only want to hear page communication. This mode is available with all system configurations.

**To use the page monitor mode:**

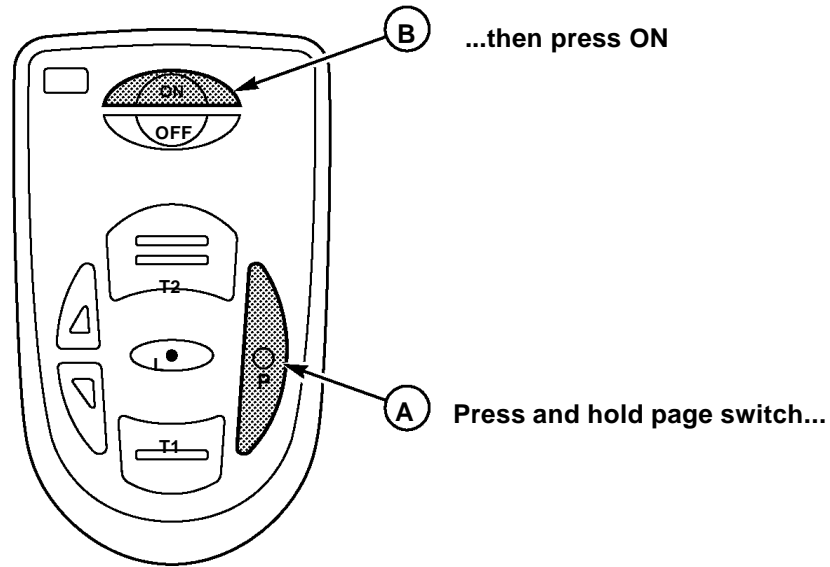
1. Turn the headset OFF. See Figure 13.



**Figure 13. OFF Switch**

2. While pressing and holding the page switch, turn the headset ON. This locks the headset in the page monitor mode. See Figure 14.





**Figure 14. Page Switch and OFF Switch**

To respond to a page, press P (page switch).

**To return to normal headset operation:**

1. Turn the headset OFF.
2. Turn the headset ON.

**Special Considerations**

When using the talk/listen mode or the page mode, keep the following things in mind:

- Communication between the menu sign operator and the customer may be heard by several people.
- Only one headset operator can talk at a time.
- In the talk/listen mode, communication **from the headset** is heard by menu sign customers and other operators who are wearing headsets.
- In the talk/listen **and** page modes, communication **from the menu sign** is heard by other operators who are wearing headsets.

## Headset

### Replacing the Battery

When the battery voltage is too low, the headset sounds a short, low-volume tone at seven-second intervals to alert the operator to install a fully charged battery. The “battery voltage low tone” continues for two minutes after which the headset turns off automatically to prevent damage to the batteries.

---

#### ✓ Note

When installing a battery, make sure it is fully charged. It is important to remember that an *unused* C960 battery loses five percent of its charge per week. If a batteries has not been used for several weeks, make sure to charge prior to use.

---

#### To replace the battery:

1. Push and hold the battery release. See Figure 15.
2. Push the discharged battery out of the transceiver housing.
3. Insert a **fully charged battery** in the housing with the notch facing the battery release. Make sure the battery is fully inserted (battery release clicks). See Figure 15.

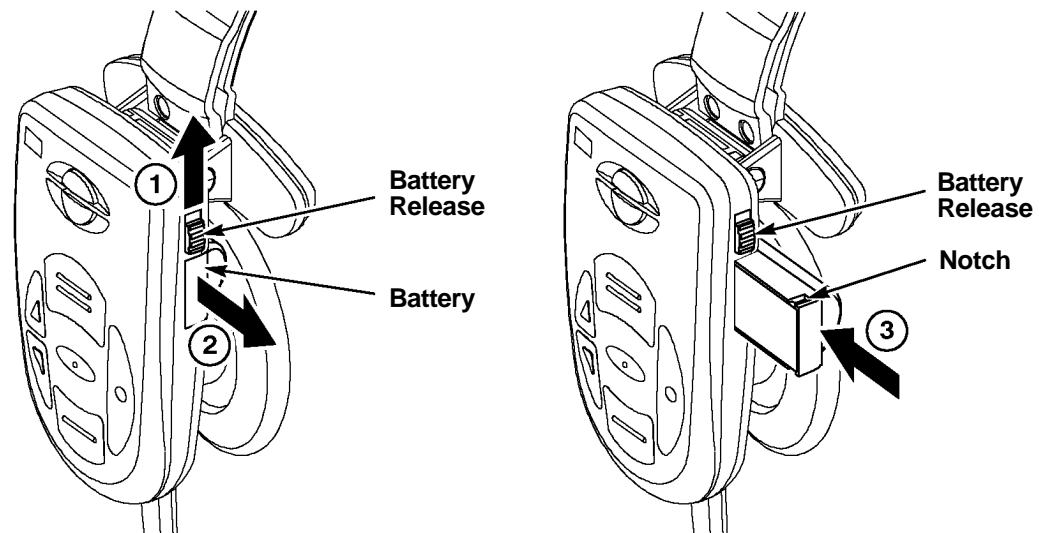
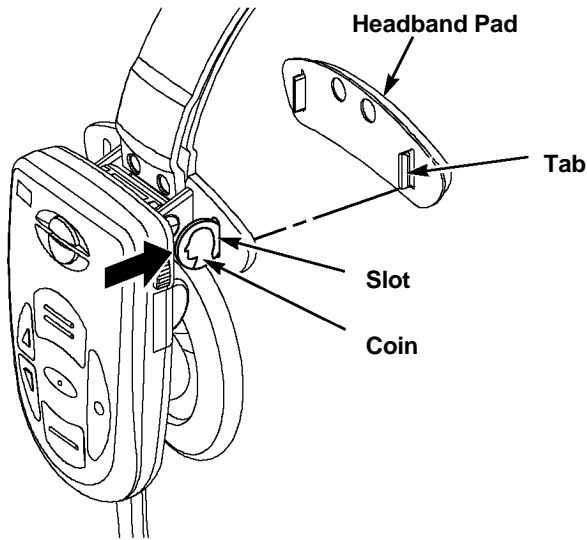


Figure 15.

**Replacing the Side Headband Pads**

To replace the side headband pads:

1. Insert the edge of a dime into the slot on the headband pad housing. See Figure 16.
2. Twist the dime to release the tab.

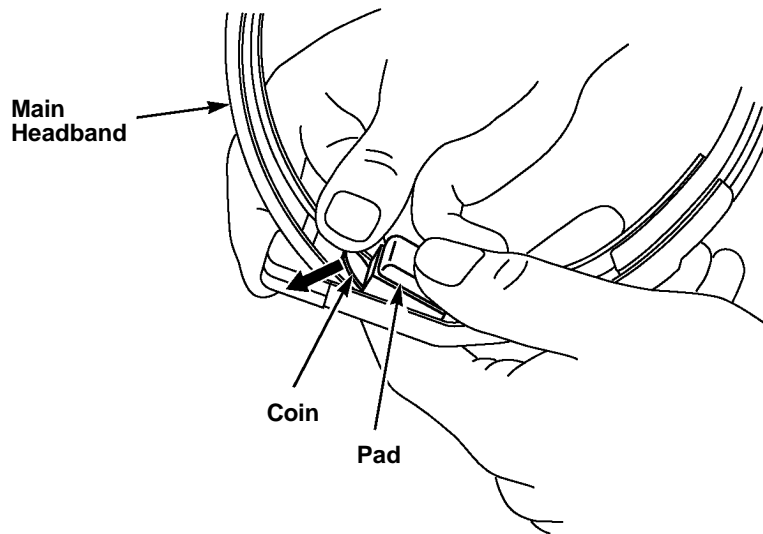


**Figure 16.**

**Replacing the Center Headband Pad**

To replace the center headband pad:

1. Insert the edge of a dime between the main headband and the top headband pad and pry up to remove the pad. See Figure 17.
2. Snap the new pad into place.



**Figure 17.**

**Replacing the Ear Pad**

To replace the ear pad, remove the worn/damaged ear pad from the ear cup and replace it with a new pad.

**Battery Charger****Location**

The battery charger should be placed on a flat surface such as a desktop or table in a clean, dry environment.

**Cleaning the Contacts**

If the indicators fail to light during charger operation, clean the contacts using an alcohol-moistened cotton swab.

**Batteries****Care, Handling and Storage**

Avoid dropping batteries.

Do not carry batteries in your pockets or leave them in hot, damp or dirty places.

Clean the battery contacts periodically using an alcohol-moistened swab.

Be careful not to short the battery contacts together.

Do not set the batteries contact-side down on a bare metal countertop-especially if it is damp.

**Battery Voltage Low Tone**

When the battery voltage becomes too low, a short, low-volume tone sounds in the headset at seven-second intervals to alert the operator to replace with a fully charged battery.

The “battery voltage low tone” continues for two minutes after which the headset turns off automatically to prevent damage to the batteries.

**Charging Batteries**

To charge a battery, insert the battery in one of the charging slots as shown in Figure 18.

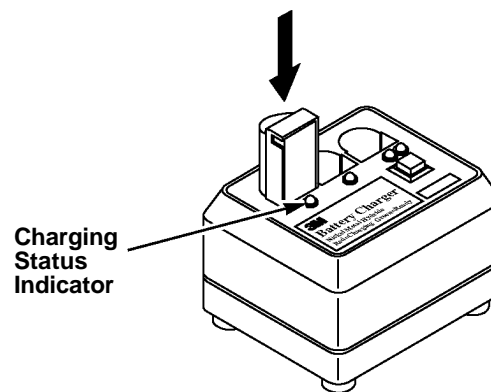
- The indicator lights RED to indicate the battery is charging.
- The indicator lights GREEN to indicate the battery is fully charged.
- The indicator lights ORANGE to indicate the battery is defective.

---

**✓ Note**

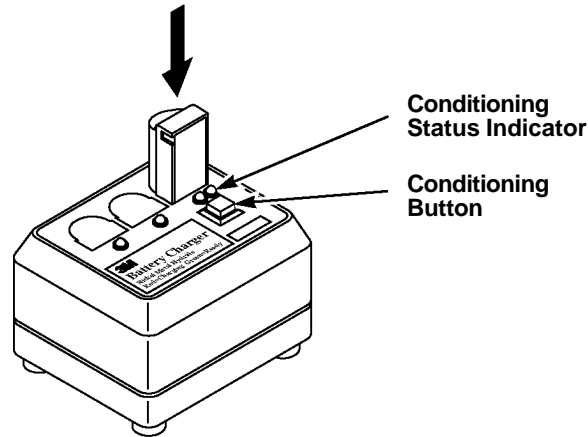
Discharged batteries require 1-1/2 to 2 hours to charge.

---

**Figure 18.**

**To condition a battery:**

1. Insert the battery in the charging/conditioning slot as shown in Figure 19.
2. Press the conditioning button within 2 seconds after inserting the battery. The indicator lights YELLOW to indicate the battery is being conditioned.

**Figure 19.****Disposing of Batteries**

To help protect the environment, C960 rechargeable batteries which have reached the end of their useful life should be disposed of in accordance with local requirements.

**Making Sure Batteries are Ready for Use**

Follow these tips to make sure batteries are always ready for use:

- Have an extra battery for each headset. This helps ensure that a fully charged battery is always available.
- Recharge a low battery as soon as it is removed from the headset. When a battery is low, repeat tones are heard in the headset.
- Keep the battery contacts clean: both those on the battery and those in the headset battery holder. To clean the contacts, use an alcohol-moistened cotton swab.
- Remember that a battery recharge takes approximately 1-1/2 to 2 hours.
- Avoid removing and reinserting batteries while they are charging (charging status indicator is RED).
- Remember that batteries discharge fastest during Talk and Page operation. Avoid unnecessary communications.

**Important Information about C960 Rechargeable Batteries**

Keep the following information in mind as you operate the system and as you establish operating procedures:

- Each 3M battery contains an internal protective device to prevent unsafe discharge rates. But, as with any battery, avoid shorting across the battery contacts with metal items. Never carry a battery in a pocket or place it in a drawer where it can accidentally be shorted by keys, coins etc.
- Have adequate charging capacity for the number of headsets in your system. One 3-slot battery charger will handle up to three headsets. Use of more than three headsets requires a 6-slot battery charger.

- Batteries perform best at moderate temperatures. Extremes of heat and cold reduce their performance.
- An unused C960 battery loses five percent of its charge per week. Batteries that have not been used for several weeks should be recharged before use.

### Programming the Headset for Cross-Lane Operation

The headsets are factory programmed for single-lane operation to enable the operator to press either T1 or T2 to communicate with lane 1.

For cross-lane systems, the headsets must also be programmed to enable communication with either lane 1 *or* lane 2. With the cross-lane module turned ON, the lane 1 **or** lane 2 operators can press T1 to talk to lane 1 customers **or** T2 to talk to lane 2 customers.

To program the headset for cross-lane operation:

- While pressing and holding *both* the T1 and T2 switches on the headset, turn the headset ON. Hold all three switches for at least 5 seconds. See Figure 20.
- Audible tones will be heard in the headset earpiece, indicating that the headset is programmed for cross-lane operation.

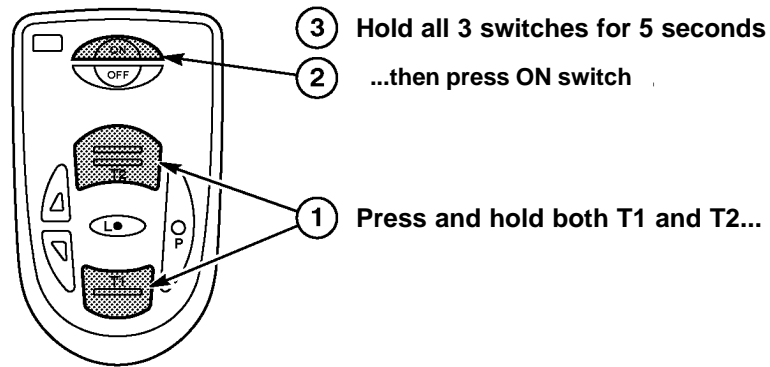


Figure 20.

### Reprogramming

To remove this function and lock T1 and T2 back together, first turn the headset OFF, then hold down either T1 or T2 while pressing ON for 5 seconds. You will hear an acknowledging beep. (Holding down T1 configures the headset to be a lane 1 headset; holding down T2 configures it for lane 2.)

## Enabling/Disabling the Talk Lock Feature

The talk lock feature provides hands free operation in duplex communication systems. With the talk lock feature enabled, the headset automatically switches from standby to talk/listen when a customer is detected at the menu sign. The headset automatically switches back to standby when the customer leaves the menu sign.

To enable or disable the talk lock feature:

1. Turn the headset OFF.
2. Press and hold the L button while pressing and holding the ON button until audible tones are heard. This indicates that the feature has been enabled or disabled.
3. Check headset operation to determine if the talk lock feature has been *disabled* or *enabled*. With the talk lock feature **enabled**:
  - The headset automatically switches from standby to talk/listen when a customer is detected at the menu sign.
  - The headset automatically switches back to standby when the customer leaves the menu sign.

---

### ✓ Note

The headsets are shipped with the talk lock feature enabled.

---

## Changing Channels if Interference is Encountered

### Symptoms of Interference:

- The operating range between the base station and the headsets gets very short, sometimes 25 feet or less.
- Normally, you will hear nothing to indicate interference. Occasionally, you might hear a whistle or a chirp in the background, but seldom, if ever, will you hear talking.
- The Talk or Page LED flickers briefly causing one of the following:
  - a. The system may leave the STANDBY mode, and go into the LISTEN mode with no vehicle alert heard.
  - b. The system may drop out of TALK LOCK by itself.

### Solutions:

- Change the base station to another channel, at least three channels away. A better solution is to change jumper J3 to Lane 2 if possible.
- Locate and shut off other 900 MHz devices in the building, such as cordless phones, video systems, and speaker systems.
- In cases where a cellular phone tower is nearby, certain combinations of cell frequencies may cause interference. In some cases, changing channels may have no effect. Please call your local 3M Dealer, or 3M F.S.T. Communications Products Technical Service (800-328-0033) in these cases.



The C960 system is capable of operating on any one of eight different channels. You can correct these types of interference by changing the base station operating channel. To do this:

1. Pull outward on the right side of the base station half-cover and then lift and remove the cover. See Figure 21.

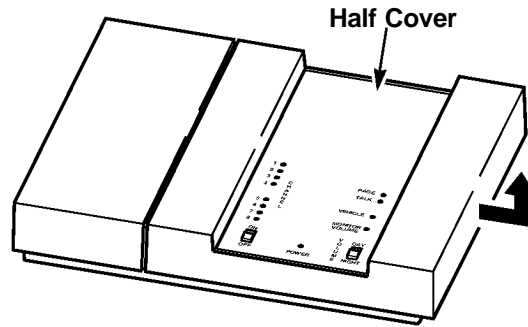


Figure 21.

2. With the base station turned on, press and release the Channel Select switch once. (This advances the system to the next channel.) One of the red indicators (1–8) will light, indicating the newly selected channel.

Only 2 rotary knobs are shipped with the base station. You may pull a knob off (by pulling hard) and push it gently on to any other control as needed.

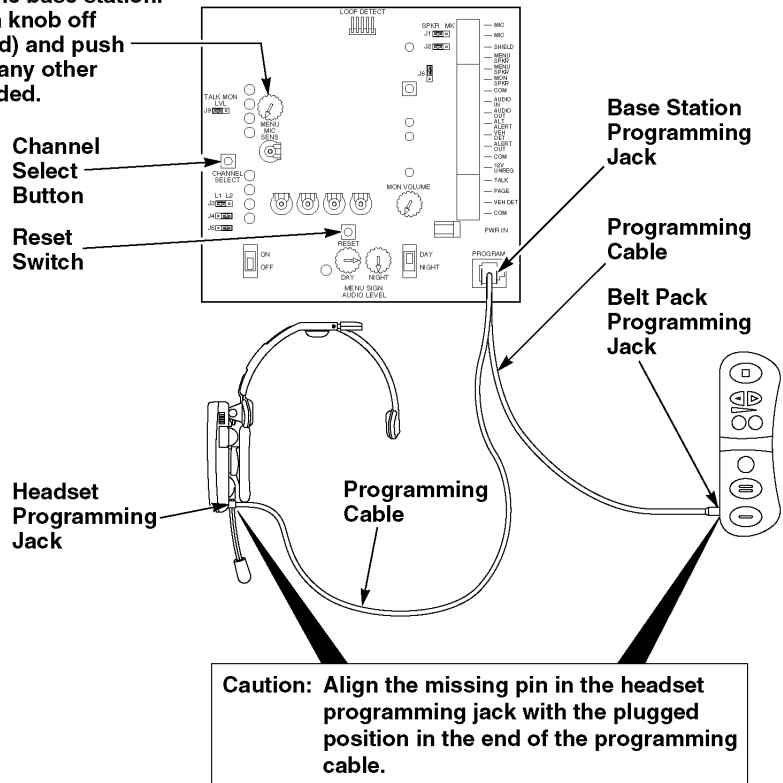


Figure 22.

3. Press the RESET switch to “read” the new channel selection into the microprocessor.

✓ **Note**

When two systems are used in a cross-lane application, both base stations **must** be set to the same channel.

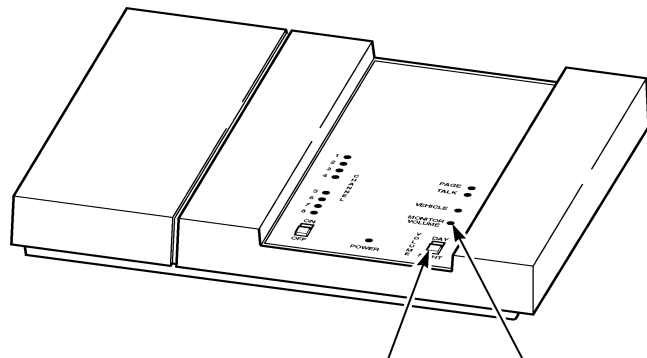
4. With the headset turned OFF, plug one end of the programming cable into the headset programming jack. See Figure 22.
5. Plug the other end of the programming cable into the base station programming jack. See Figure 22.
6. Turn the headset ON. Audible tones will be heard in the headset earpiece, indicating that programming is complete.
7. Repeat Steps 1 through 6 to program the rest of the headsets.

The headset is now programmed to the same channel as the base station. If interference continues to occur, repeat the channel programming procedure. After seven channel changes, the original channel will again be encountered. If none of the 8 channels are interference-free, try 8 additional channels on lane 2 by following the steps below: **Note: These steps may be used for single-lane systems only.**

1. On the base station, move jumper J3 to LANE 2.
2. Press the RESET button, or turn the base station OFF, then back ON.
3. Program all headsets with the programming cable by repeating the steps listed previously in “Changing Channels if Interference is Encountered.”

### Changing the Day/Night Switch Setting

Outdoors, sound travels best at night when air temperatures are cooler and background noise is reduced. To allow you to reduce the volume of the menu sign speaker to a lower, pre-set nighttime level, the base station has a VOLUME DAY/NIGHT switch. See Figure 23.



**Day/Night Switch**      **Monitor Volume Access**      SF

**Figure 23.**

Normally, the VOLUME DAY/NIGHT switch is always left in the DAY position.

**Adjusting the  
Monitor Speaker  
Volume**

However, if local ordinances require quieter nighttime operation of the menu sign, move the VOLUME DAY/NIGHT switch to the NIGHT position.

If the system has an optional monitor speaker, adjust its volume using the following procedure:

1. With the base station turned ON, insert a small straight-blade screwdriver into the MONITOR VOLUME access hole. See Figure 23.
2. Turn the volume control clockwise to increase the volume or counterclockwise to decrease it.

**Introduction**

To use the following troubleshooting guide, locate the problem in the left column and look for the problem's possible causes and corrections in the middle and right columns. Possible causes are listed in the order in which they are most likely to happen. Check for possible causes in the given sequence to help isolate the problem.

**System Troubleshooting**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
1. No communications. All headsets hear static.	1. The base station is not ON.  2. Base station and headsets are not programmed to same channel.  3. The Base Station is defective.	1. Turn the base station ON. Make sure the power transformer is plugged into the wall outlet <u>and</u> into the base station power receptacle. If the red power light does not come on, check for power at the wall outlet.  2. Reprogram the headsets with the programming cable.  3. Call for authorized service.
2. A single headset hears static.	1. Headset is not programmed to same channel as base station.	1. Reprogram the headset with the programming cable.
3. A single headset hears static. Programming cable has no effect.	1. Defective programming cable.  2. Defective headset.	1. Try to program other headsets with the same cable. If they won't program, replace the cable.  2. If the other headsets program OK, the single headset needs repair.
4. A single headset is dead. No static is heard.	1. The headset is not turned on.  2. The battery is discharged.  3. The headset is defective.	1. Press the ON button.  2. Replace the battery with a fully charged one.  3. Call for authorized service.
5. No vehicle alert tone in headset.	1. No power to the vehicle detector.  2. Vehicle detector is "locked up."  3. The base station alert tone volume is set too low.	1. Plug the vehicle detector into power outlet or replace the detector fuse.  2. Remove power to vehicle detector for a few seconds to reset the detector.  3. Adjust alert tone volume.

<p>6. All headsets will not go into Standby (silence) when the vehicle leaves the menu sign.</p>	<ol style="list-style-type: none"> <li>1. This is normal when a pulse (air switch) type of vehicle detector is used.</li> <li>2. There is a large metal object near the loop in the driveway (if a loop is used).</li> <li>3. The Loop detector is “locked up.”</li> <li>4. Defective vehicle detector.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press the Page switch to silence the menu microphone.</li> <li>2. Remove the object.</li> <li>3. Unplug the loop detector from the AC outlet and plug it back in to reset the detector.</li> <li>4. Call for authorized service.</li> </ol>
<p>7. Audio on all headsets cuts out or is interrupted.</p>	<ol style="list-style-type: none"> <li>1. The cause could be radio interference. These are symptoms of interference:                     <ul style="list-style-type: none"> <li>• The operating range between the base station and the headsets gets very short, sometimes 25 feet or less. Normally you will hear nothing to indicate interference.</li> </ul> <p>The Talk or Page light flickers briefly causing the system to leave standby mode, and go into listen mode with no vehicle alert heard.</p> <p>The system may drop out of Talk Lock by itself.</p> <ul style="list-style-type: none"> <li>• When pressing the Channel Select button on the Base Station, the channel lights move sluggishly or not at all.</li> </ul> </li> <li>2. Loose or frayed wiring.</li> <li>3. Poor location of Base Station (behind large metal objects, too far from work area, etc.).</li> </ol>	<ol style="list-style-type: none"> <li>1. Change the channel on the base station to one at least three channels away.                     <p>If using a single base station, move jumper J3 to the lane 2 position. This provides 8 additional channels from which to choose.</p> <p>Locate and shut off other 900 MHz devices in the building, such as cordless phones, video and speaker systems, and video monitors.</p> </li> <li>2. Call for authorized service.</li> <li>3. Relocate the Base Station, or add an additional Base Station to extend the range of the system.</li> </ol>

<p>8. No Talk or listen from the menu sign when using the backup wired intercom. The C960 system works OK.</p>	<ol style="list-style-type: none"> <li>1. The base station is turned on.</li> <li>2. No power to the backup intercom.</li> <li>3. The volume controls are set too low on the backup intercom.</li> <li>4. Defective backup intercom or wiring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the base station OFF.</li> <li>2. Turn the backup intercom on or plug in its power transformer.</li> <li>3. Turn the volume controls up.</li> <li>4. Call for authorized service.</li> </ol>
<p>9. No Talk or Page to other headsets from a single headset, or Talk or Page buttons require excessive pressure to operate.</p>	<ol style="list-style-type: none"> <li>1. Dirt or grease under Talk or Page Switch.</li> <li>2. Worn or defective Talk or Page switch.</li> <li>3. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> <li>2. Call for authorized service.</li> <li>3. Call for authorized service.</li> </ol>
<p>10. Low Talk volume on a single headset.</p>	<ol style="list-style-type: none"> <li>1. The holes in front of the microphone are plugged with dirt or grease.</li> <li>2. Operator is not positioning the microphone correctly.</li> <li>3. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> <li>2. Refer to Operating Guide.</li> <li>3. Call for authorized service.</li> </ol>
<p>11. Louder Talk volume or feedback from a single headset.</p>	<ol style="list-style-type: none"> <li>1. The holes in back of the microphone are plugged with dirt or grease.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> </ol>
<p>12. Constant programming tones heard on a single headset. Programming cable has no effect.</p>	<ol style="list-style-type: none"> <li>1. Defective headset.</li> </ol>	<ol style="list-style-type: none"> <li>1. Call for authorized service.</li> </ol>
<p>13. The “hands free” function does not work.</p>	<ol style="list-style-type: none"> <li>1. The Talk Lock button is not enabled on the headset.</li> <li>2. The system is operating in Standard mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to the Operating Instructions to enable Talk Lock.</li> <li>2. Talk Lock is disabled in Standard mode.</li> </ol>

**Battery and Battery Charger Troubleshooting**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
1. No lights come on when a battery is inserted into charger.	1. Dirty contacts on battery or charger. 2. No power to charger. 3. Defective battery. 4. Defective charger.	1. Clean contacts on battery and charger with an alcohol moistened swab. 2. Make sure power transformer is plugged into charger and a “live” outlet. 3. Try a known good battery. 4. Call for authorized service.
2. Short battery life.	1. Worn out batteries. 2. The battery needs to be conditioned because it was repeatedly removed from the headset before the low battery alert sounded. 3. Wrong type of power transformer used for charger.	1. Replace battery. 2. Condition the battery. 3. Make sure power transformer is marked “Secondary Voltage 14 VAC.”
3. The orange light comes on when a battery is inserted into the charger.	1. Defective battery.	1. Replace the battery.
4. The green light on the charger never comes on.	1. Defective battery.	1. Replace the battery.

**Service**

Most, if not all, C960 system service needs can be fulfilled by your local 3M dealer. If special service assistance is needed, however, or for information on how to properly dispose of your non-functional C960 rechargeable batteries, please call **1-800-328-0033**.





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# Installation Instructions

## Noise Reduction Module

### Model A121

#### Description

The 3M Noise Reduction Module (3M part number 78-9236-6403-7) improves the inbound intelligibility of an intercom system by reducing environmental background noise from vehicles, airplanes, noisy intersections, etc.

#### Additional Material Required

- 18 - 22 AWG twisted - shielded pair audio wire
- 2 mounting screws and appropriate wall anchors

 <b>Important</b>
-----------------------------------------------------------------------------------------------------

The 3M Noise Reduction Module should be mounted no more than 3 feet from the intercom or base station.
--------------------------------------------------------------------------------------------------------

#### System Requirements

The 3M Noise Reduction Module requires a system with a separate outside microphone and speaker. *The A121 will not function with an intercom system configured to use a single speaker as both the microphone and speaker.* The A121 will work in conjunction with most dynamic microphones and speaker/microphone assemblies.

#### System Configuration

The 3M Noise Reduction Module configuration is controlled by two jumper switch (JMP1 and JMP2) settings.

JMP1 is used to set the appropriate gain for the MENU MICROPHONE or SPEAKER/MICROPHONE (speaker used as both a speaker and a microphone).

JMP2 is used to match the A121 output level to the input of the intercom system.

Jumper Position	Position A	Position B
JMP1	* Separate microphone & speaker at menu sign/post	OSM (speaker used as both a speaker and a microphone at the menu sign/post)
JMP2	* C960 Intercom	C5000 Intercom

**Note:** \* Indicates factory default settings

**Table 1. 3M Noise Reduction Module Jumper Settings**

## Mode Configuration

The 3M Noise Reduction Board can be configured in several different modes by setting DIP switch, SW2. Following is a brief description of each mode and a DIP switch setting table.

**Noise Reduction:** With SW2 number 1 ON, the inbound microphone voice signal is digitized. The noise is digitally removed from the voice and converted back to an analog voice signal. The analog voice signal is then sent to the microphone input of the intercom.

**Echo Reduction:** With SW2 number 2 ON, echo is reduced for full-duplex intercom systems. Set SW2 number 2 OFF for half-duplex systems.

**Restaurant/Truck Stop Noise Reduction Level:** With SW2 number 3 OFF, the A121 is set for restaurant noise reduction level. With SW2 number 3 ON, the A121 is used for truck stop noise reduction level, which provides more noise reduction with slightly more voice degradation.

**Hi Frequency Equalization:** With SW2 number 4 ON, the higher-end frequencies are increased by 3 dB. This should be set to the customer's preference.

SW2 Number	ON Position	OFF Position
1	*Noise Reduction ON (Normal Mode)	Test Mode (Factory use only; do not change.)
2	* <sup>1</sup> Echo Reduction ON	Echo Reduction OFF
3	<sup>2</sup> Truck Stop Noise Reduction Level	* <sup>2</sup> Restaurant Noise Reduction Level
4	<sup>2</sup> Hi Frequency Equalization ON	* <sup>2</sup> Hi Frequency Equalization OFF
5	Not Used	Not Used

**Notes:** \* Indicates factory settings.

<sup>1</sup> Must be ON for 3M, HME, and Panasonic Full Duplex Systems

<sup>2</sup> Set to customer preference.

**Table 2. 3M Noise Reduction Module SW2 Settings**

## Status Indication Table

The condition of the red LED on the 3m Noise Reduction Module indicates the current status of the unit. The LED can be off, blink at defined intervals, or be constantly lit. Table 3 illustrates the status indicated by the LED.

Status	LED
Power OFF	LED off.
Normal Mode	LED blinks once per second.
Test Mode	LED blinks three times per second.
Fault Condition	LED is solid red (constantly illuminated).

**Table 3. 3M Noise Reduction Module Status Indication**

## Final Checkout Procedure

1. Turn the ON/OFF switch of the A121 ON. The red LED should blink slowly. Listen for a reduction in the background noise.
2. If the A121 is in a half-duplex system, set SW2 number 2 OFF and proceed to step 3. If the A121 is in a full-duplex system set SW2 number 2 OFF. Speak into the headset mic or intercom mic. The echo should increase. Turn SW2 number 2 back ON. The echo should decrease.
3. Set SW2 number 3 for appropriate level of noise reduction. Set SW2 number 3 OFF for restaurant mode. Set SW2 number 3 ON for truck stop mode.
4. Set SW2 number 4 (Hi Frequency Equalization) to customer's preference.

## Troubleshooting

Problem	Possible Cause	Correction
1. Status fault indicated.	Inbound audio exceeded maximum level.	Switch A121 off for one second.
2. No inbound audio.	Mode setting is incorrect. Wiring is incorrect.	Check mode configuration. Check wiring.
3. No outbound audio.	Wiring is incorrect.	Check wiring.
4. Loud audio in 3M headset when headset user talks.	Inbound audio on 3M base station too low.	Increase MENU MIC SENS potentiometer. Headset user should then reduce the headset audio volume.
5. Excessive echo	Excessive feedback from menu speaker to menu mic.	Add extra acoustic insulation to menu mic chamber.

Table 4. A121 Noise Reduction Module Troubleshooting

## Wiring Diagrams

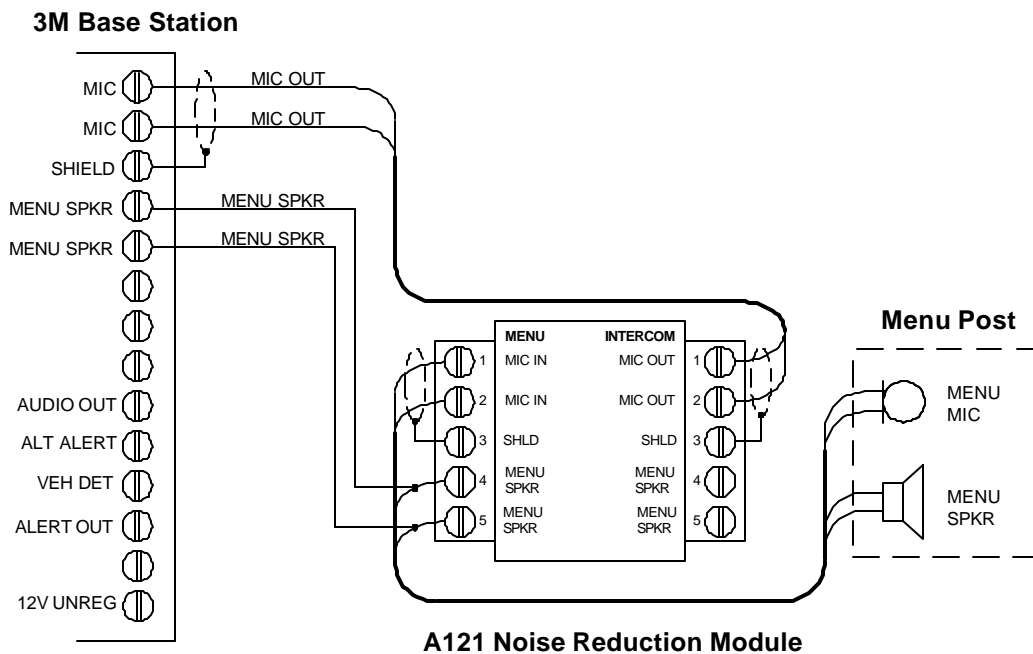
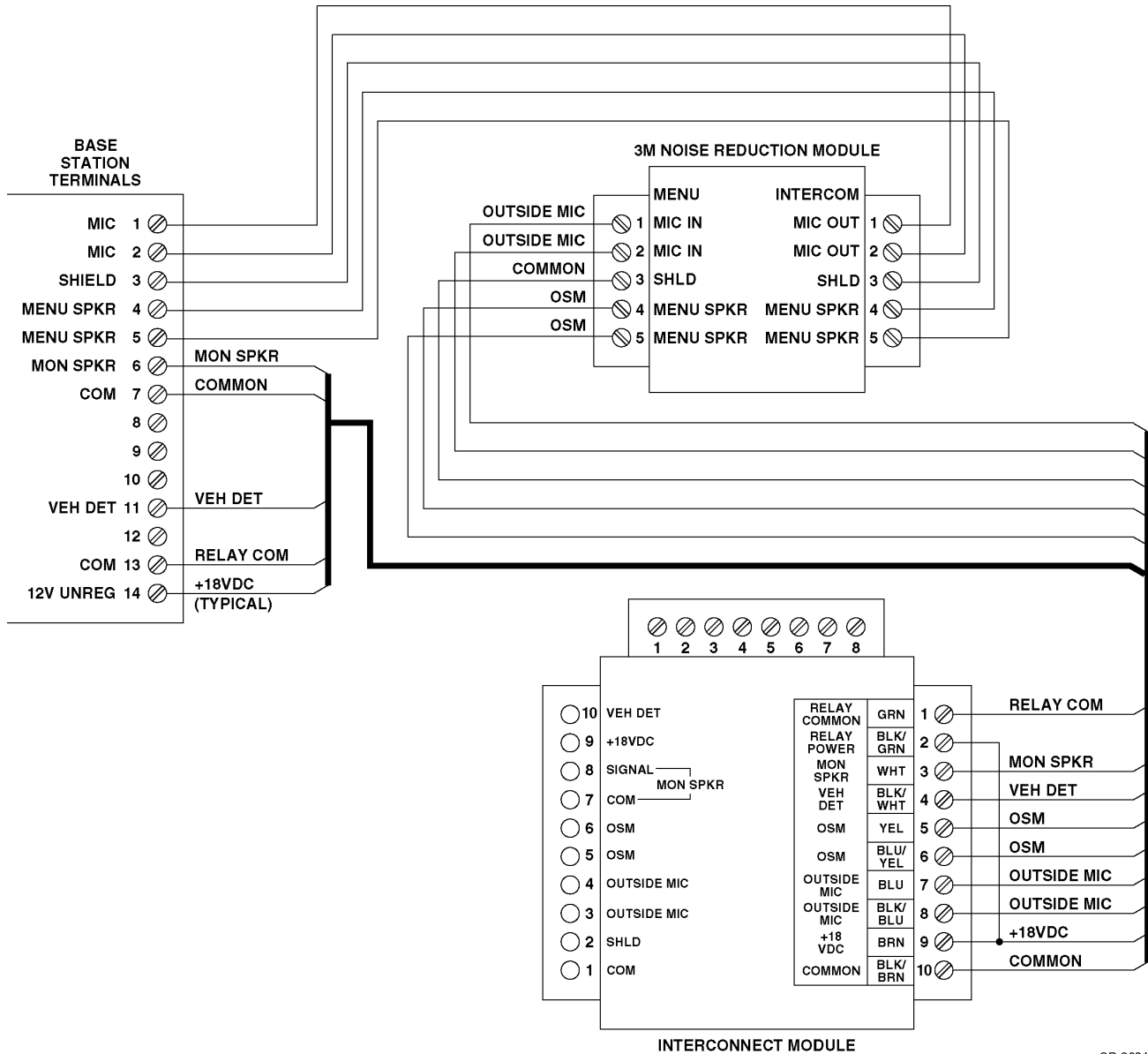
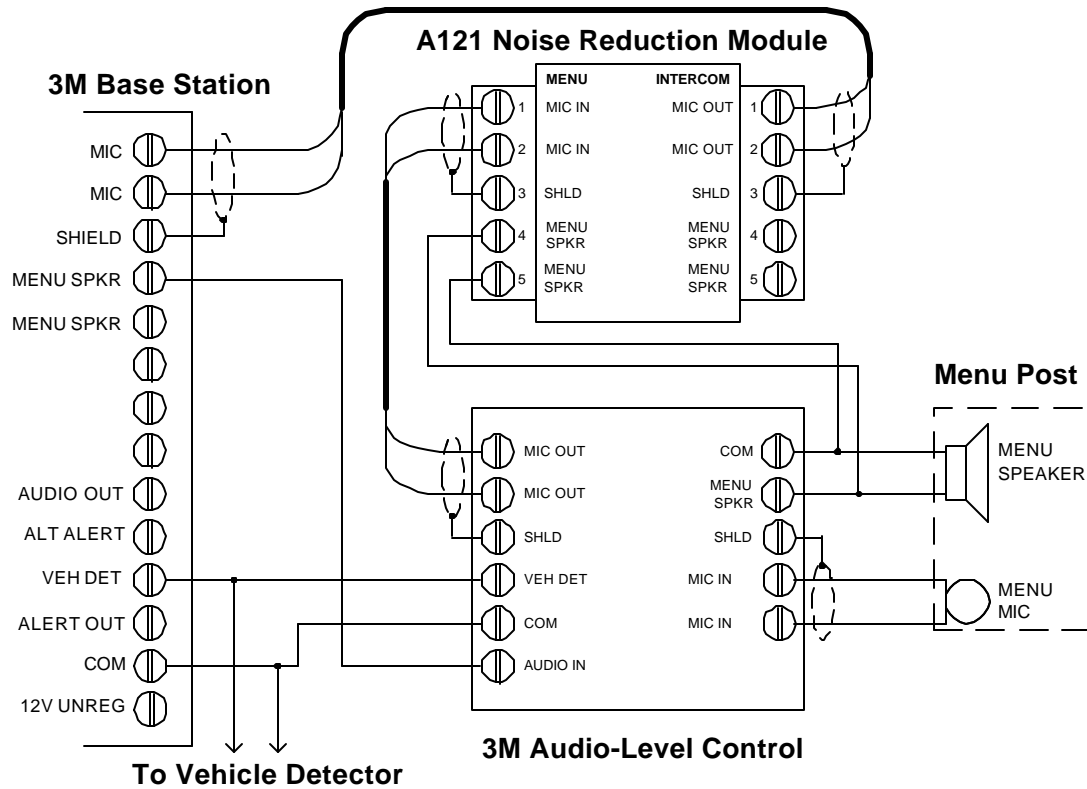


Figure 1. Wiring for 3M C760/C960 Base Station

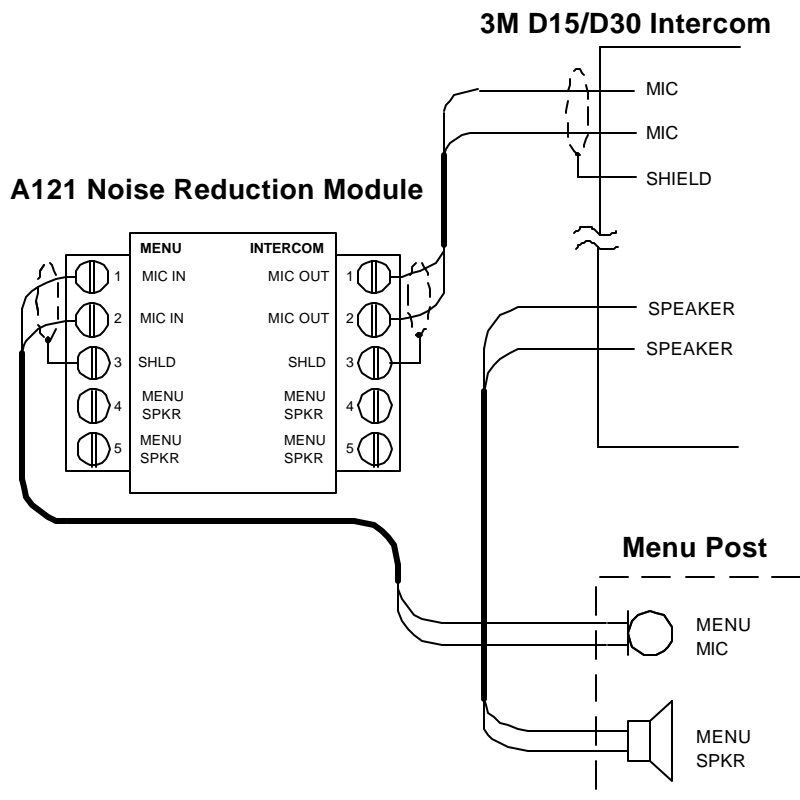


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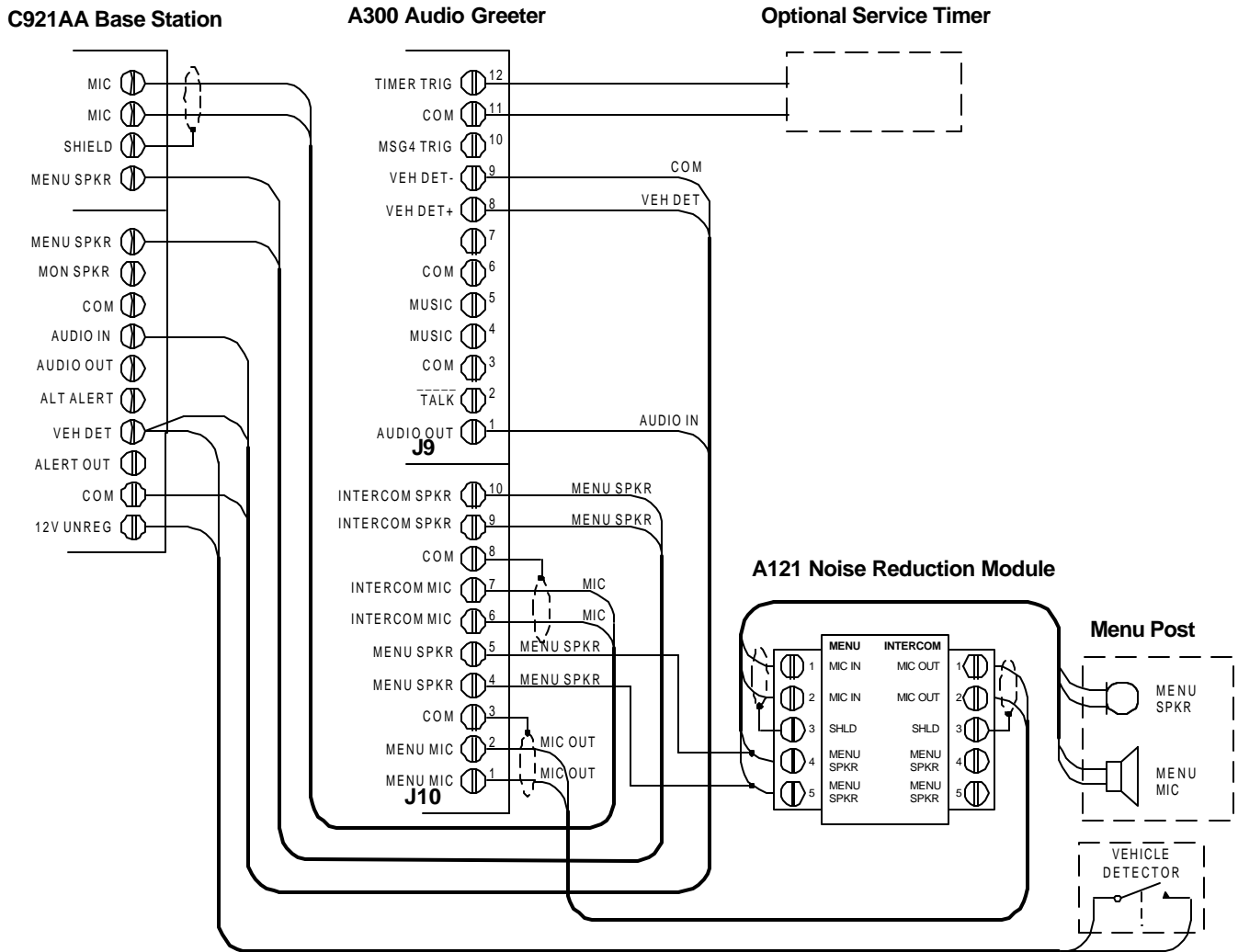
**Figure 2. Wiring for 3M C760/C960 Base Station with Interconnect Module**



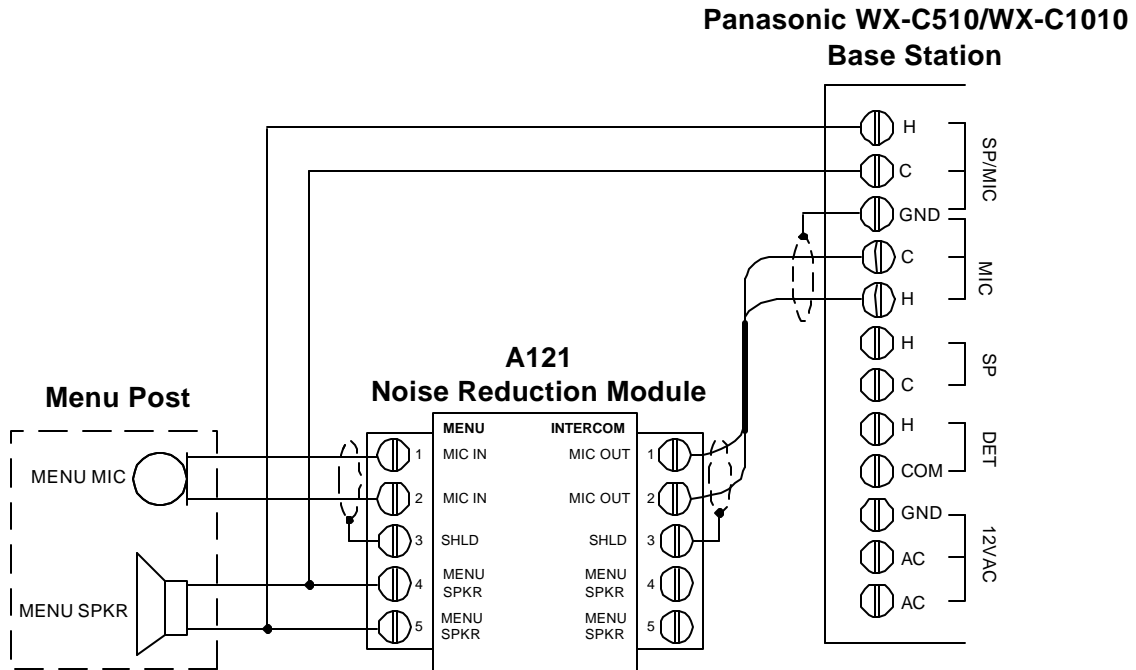
**Figure 3. Wiring for 3M C760/C960 Base Station with 3M Audio-Level Control Module**



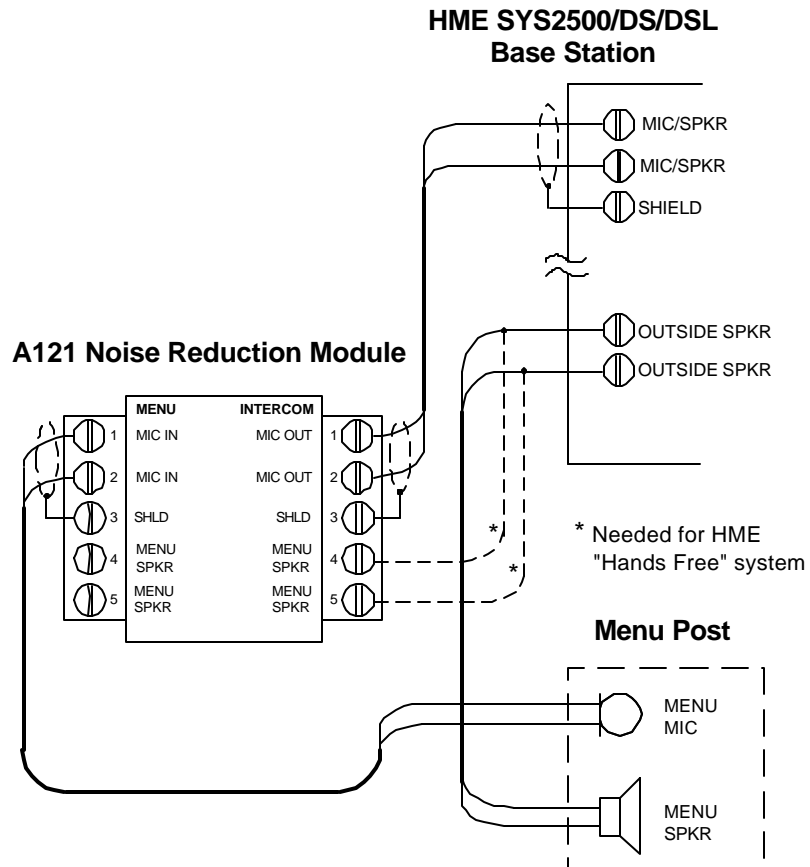
**Figure 4. Wiring for 3M D15/D30 Intercom**



**Figure 5. Wiring for 3M C760/C960 Base Station with A300 Audio Greeter**



**Figure 6. Wiring for Panasonic WX-C510/WX-C1010 Base Station**



**Figure 7. Wiring for HME SYS2500/DS/DSL Base Station**



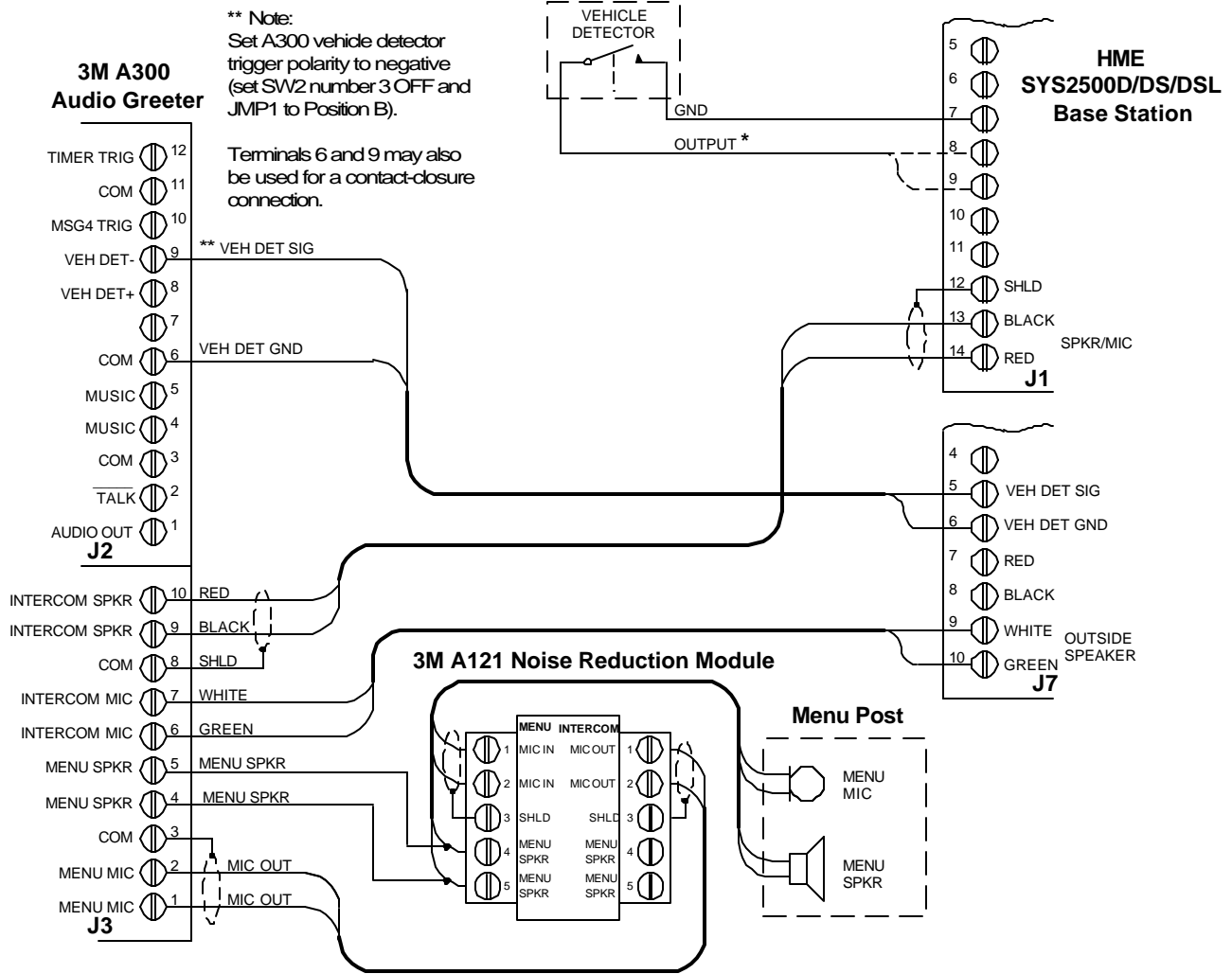
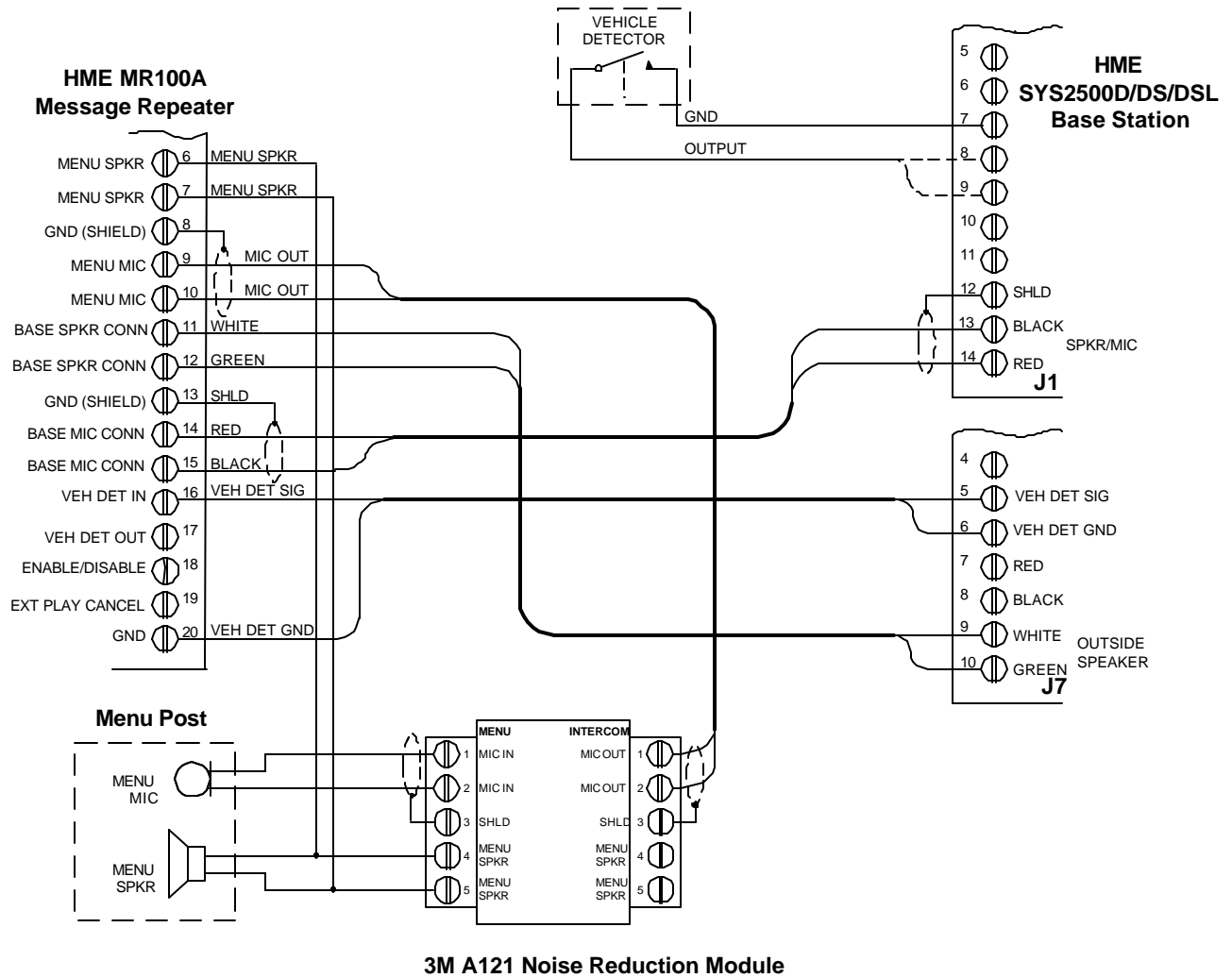


Figure 8. Wiring for HME SYS2500D/DS/DSL Base Station with 3M A300 Audio Greeter



**Figure 9. Wiring for HME SYS2500D/DS/DSL Base Station with HME MR100A Message Repeater**



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# Installation Instructions

## Noise Reduction Module

### Model A125

#### Description

The 3M A125 Noise Reduction board (3M part number 78-9236-6453-2) improves the inbound intelligibility of an intercom system by reducing environmental background noise from vehicles, airplanes, noisy intersections, wind, etc.

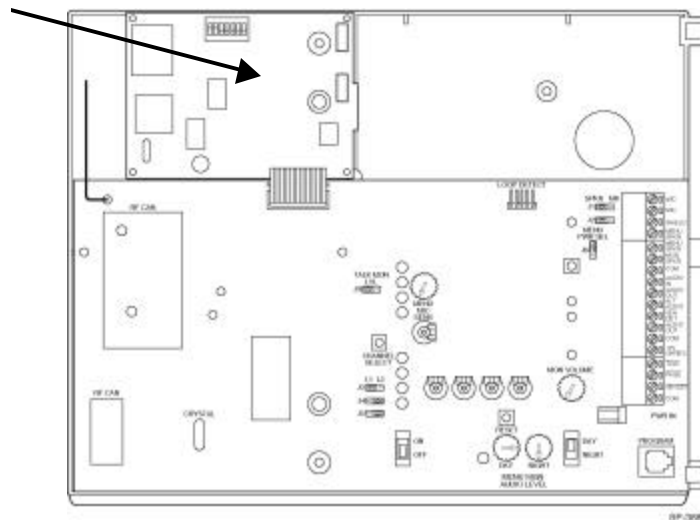
#### System Requirements

The 3M A125 Noise Reduction Module requires a C921BA Base Station.

#### *Installing the Noise Reduction board into the C921BA Base Station*

1. Remove the right-hand and left-hand top covers from the C921BA base station. Be careful that the C921BA circuit board does not fall out of the plastic base.
2. Plug the A125 ribbon cable onto connector J8, located at the top of the left side of the circuit board. Be careful to support the rear side of the base station circuit board when plugging in the A125 ribbon cable.
3. Position the holes near the edge of the A125 circuit board over the plastic standoffs on the base station.
4. Attach the left-hand base station cover after configuring the A125 board, and performing the Final Checkout Procedure.

Install the A125 board here



**Figure 1. Mounting the A125 to the C921BA Base Station**

## System Configuration

The A125 Noise Reduction board is configured by two jumper switches, (JMP1 and JMP2), shown in Table 1.

Jumper Position	Position A	Position B
<b>JMP1</b>	* Separate microphone & speaker at menu sign/post	OSM (speaker used as both a speaker and a microphone at the menu sign/post)
<b>JMP2</b>	* C960 Intercom	C5000 Intercom

**Note:** \* Indicates factory default settings

**Table 1. A125 Jumper Settings**

## Mode Configuration

The A125 Noise Reduction board can be configured in several different modes by using DIP switch, SW1. Following is a brief description of each mode and a DIP switch setting table.

**Noise Reduction:** When DIP Switch number 1 ON the inbound microphone voice signal is digitized. On digitized, the noise is digitally removed from the voice by the digital signal processor and converted back to an analog voice signal. The analog voice signal is then sent to the microphone input of the intercom. When DIP Switch number 1 is OFF the inbound microphone voice signal is digitized and converted back to an analog voice signal without removing any noise. The analog voice signal is then sent to the microphone input of the intercom.

**Echo Reduction:** Used to reduce echo for full-duplex intercom configurations. Turn Echo Reduction OFF for half-duplex intercom configuration.

**Restaurant / Truck Stop Noise Reduction Level:** When DIP Switch number 3 is OFF, the board is set for restaurant noise reduction level. When DIP Switch number 3 is ON, the board is set for truck stop noise reduction level. This provides approximately 6dB more noise reduction with slightly more voice degradation.

**Hi Frequency Equalization:** When DIP Switch number 4 is ON, the higher end frequencies are increased by 3dB. This should be set to the customer's preference.

DIP Switch Number	ON Position	OFF Position
1	* Noise Reduction ON	Noise Reduction OFF
2	* Echo Reduction ON	Echo Reduction OFF
3	Truck Stop Noise Reduction Level	* Restaurant Noise Reduction Level
4	Hi Frequency Equalization ON	* High Frequency Equalization OFF
5	Spare	Spare
6	Test Mode ( <b>FACTORY USE ONLY; DO NOT CHANGE</b> )	* Normal Operating Mode

**Note:** \* Indicates Factory Default Settings

**Table 2. A125 DIP Switch Settings**

## Status Indication

The condition of the red LED on the 3M C960 base station indicates the current status of the unit. The LED can be off, blink at defined intervals, or be constantly lit. Table 3 illustrates the status indicated by the LEDs.

Status	LED
Power OFF	LED Off
Normal Mode	LED blinks once per every two seconds
Test Mode	LED blinks three times per second
Fault Condition	LED is solid red (constantly lit)

**Table 3. A125 Status Indication**

## Final Checkout Procedure

1. On the C921BA Base Station, turn the NRM ON/OFF switch ON. The red LED should blink slowly. Listen for a reduction in the background noise.
2. If the A125 is in a half-duplex system, set SW2 number 2 OFF and proceed to step 3. If the A125 is in a full-duplex system set SW2 number 2 OFF. Speak into the headset microphone. The echo should increase. Turn SW2 number 2 back ON. The echo should decrease.
3. Set SW2 number 3 for appropriate level of noise reduction. Set SW2 number 3 OFF for restaurant mode. Set SW2 number 3 ON for truck stop mode.
4. Set SW2 number 4 (Hi Frequency Equalization) to customer's preference.
5. Check the inbound audio level of headset if TALK LOCK feature is used. Attempt to adjust the inbound level when background noise in restaurant is at a high level.

## Troubleshooting

Problem	Possible Cause	Correction
1. Status fault indicated.	Inbound audio exceeded maximum level.	Switch A125 OFF for one second.
2. No inbound audio.	Mode setting is incorrect.	Check mode configuration. Check wiring from post to base station. Reinstall A125 module.
3. Loud audio in 3M headset when headset user talks.	Inbound audio on 3M base station too low.	Increase MENU MIC SENS potentiometer. Headset user should then reduce the headset audio volume.
4. Excessive echo	Excessive feedback from menu speaker to menu mic.	Add extra acoustic insulation to menu mic chamber.
5. Low inbound audio when using C960/C860 TALK LOCK feature.	Background noise inside restaurant may cause inbound audio to be reduced.	Increase MENU MIC SENS potentiometer.

**Table 4. A125 Noise Reduction Module Troubleshooting**



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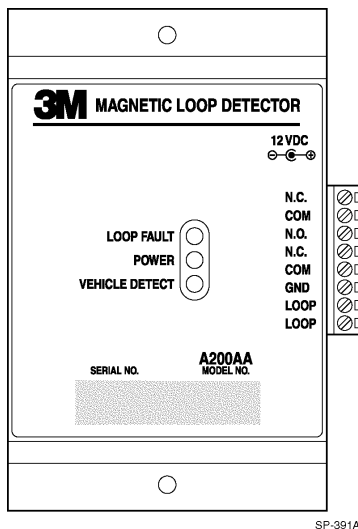
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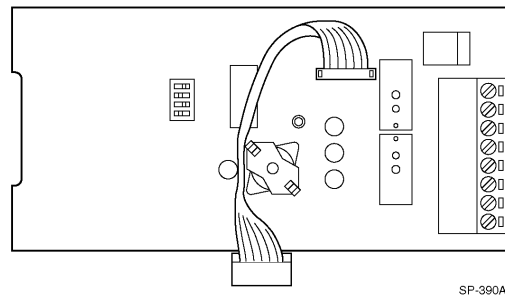
# Installation Instructions

## Loop Detector

### Models A200 and A201



**Figure 1. A200 3M stock number  
78-9236-6456-5**



**Figure 2. A201 3M stock number  
78-9236-6498-7**

### Introduction

These instructions explain how to install and configure the 3M Models A200 and A201 Loop Detectors as part of a Drive-thru Vehicle Detection System. With the exception of mounting, both circuit boards are the same.

The Model A200 Loop Detector comes with a 12VDC plug-in power supply and is designed as a stand-alone loop detector. Use this detector if a backup wired intercom is used to support the primary intercom.

The Model A201 Loop Detector comes with a special ribbon cable and is designed specifically as an optional accessory for the 3M C921BA or later Base Station. Power and switch closure signals are supplied through a ribbon cable.

Use these detectors with either the 3M Prefab Loop Kit (3M stock number 78-8016-9901-4) for new driveway construction, or with the 3M Saw-In Loop Kit (3M stock number 78-8016-9813-1) for existing driveways. Install the appropriate magnetic loop kit first, following instructions enclosed with that kit. Then install a 3M Combination Duplex Cable (3M stock number 78-8095-0180-8) or other 18-gauge, shielded, twisted-pair, jacketed cable between the menu sign and the drive-thru intercom location inside the building.

**WARNING:** Do not route Speaker/Mic or Loop cables through the same conduit with 115 VAC electrical wiring. This violates the National Electrical Code and presents a safety hazard.



# Installation

## Mounting Hardware for A200 (not supplied)

- 2 each, #6 or #8 screws
- 2 each, wall anchors

## Mounting the A200

To avoid possible damage caused by moisture, mount the A200 inside the building, not in the menu sign. Choose a location near the intercom base unit and within 5 feet of a 120 VAC, 60 Hz electrical outlet. It is best to firmly attach the detector to a wall or other surface to prevent movement, which could damage the connections. Mount the detector as follows:

1. Use the A200 bottom plastic case as a template to mark two holes on a wall or other surface.
2. Using appropriate mounting hardware (not supplied), attach the A200 to the wall or mounting surface.

## Mounting the A201

---

✓ **Note**

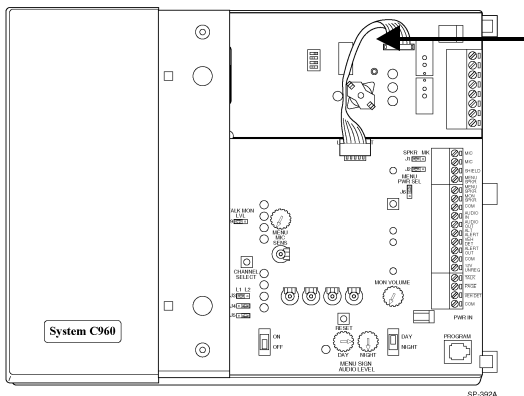
The Model A201 Loop Detector is designed specifically as an optional accessory for the 3M C921BA or later Base Station only.

---

1. Remove the right-hand and loosen the left-hand top covers from the C921BA base station. Be careful that the C921BA circuit board does not fall out of the plastic base.
2. Remove and discard the white nylon programming cord holder from the base station.
3. Plug the ribbon cable onto connector J7 on the base station so the center five holes are engaged. The colored wire should be on the left side of both connectors.
4. Position the hole near the center of the A201 circuit board over the plastic peg on the base station. Route the ribbon cable to the left of transformer T1 as shown in Figure 3.
5. Attach the left-hand base station cover.

✓ **Note**

Route the ribbon cable to the left of transformer T1. Make sure the colored wire remains on the left side of both connectors.



**Figure 3. Mounting the A201**

### ***Sensitivity and Operating Modes***

The sensitivity and operating modes are set with DIP switch S1 located on the circuit board. Four levels of sensitivity can be set with S1-1 and S1-2. The delay time is set with S1-3. The operating mode is set with S1-4. Presence mode is when the relay contacts are held closed while the vehicle is over the loop. Pulse mode is when the relay contacts close as the vehicle enters the loop and then open. Asterisks on Table 1 indicate the default factory settings. To gain access to the A200 circuit board and DIP switch S1, squeeze the corner tabs on the plastic cover and remove it from the base.

<b>SENS</b>	<b>MAX</b>	<b>*2</b>	<b>3</b>	<b>MIN</b>
<b>S1-1</b>	OFF	ON	OFF	ON
<b>S1-2</b>	OFF	OFF	ON	ON
<b>S1-3</b>	OFF = NO DELAY * ON = 2 SEC DELAY			
<b>S1-4</b>	* OFF = PRESENCE ON = PULSE			

\* Default Factory Settings

**Table 1. Configuration Settings for DIP switch S1**

### ***LED Indicators***

Red = Fault condition:

Open loop = Red LED blinks (1 long and 3 short) and relays are energized.

Shorted loop = Red LED blinks (1 long and 2 short) and relays are energized.

Green = Power applied

Yellow = Vehicle is detected

# Installation Diagram

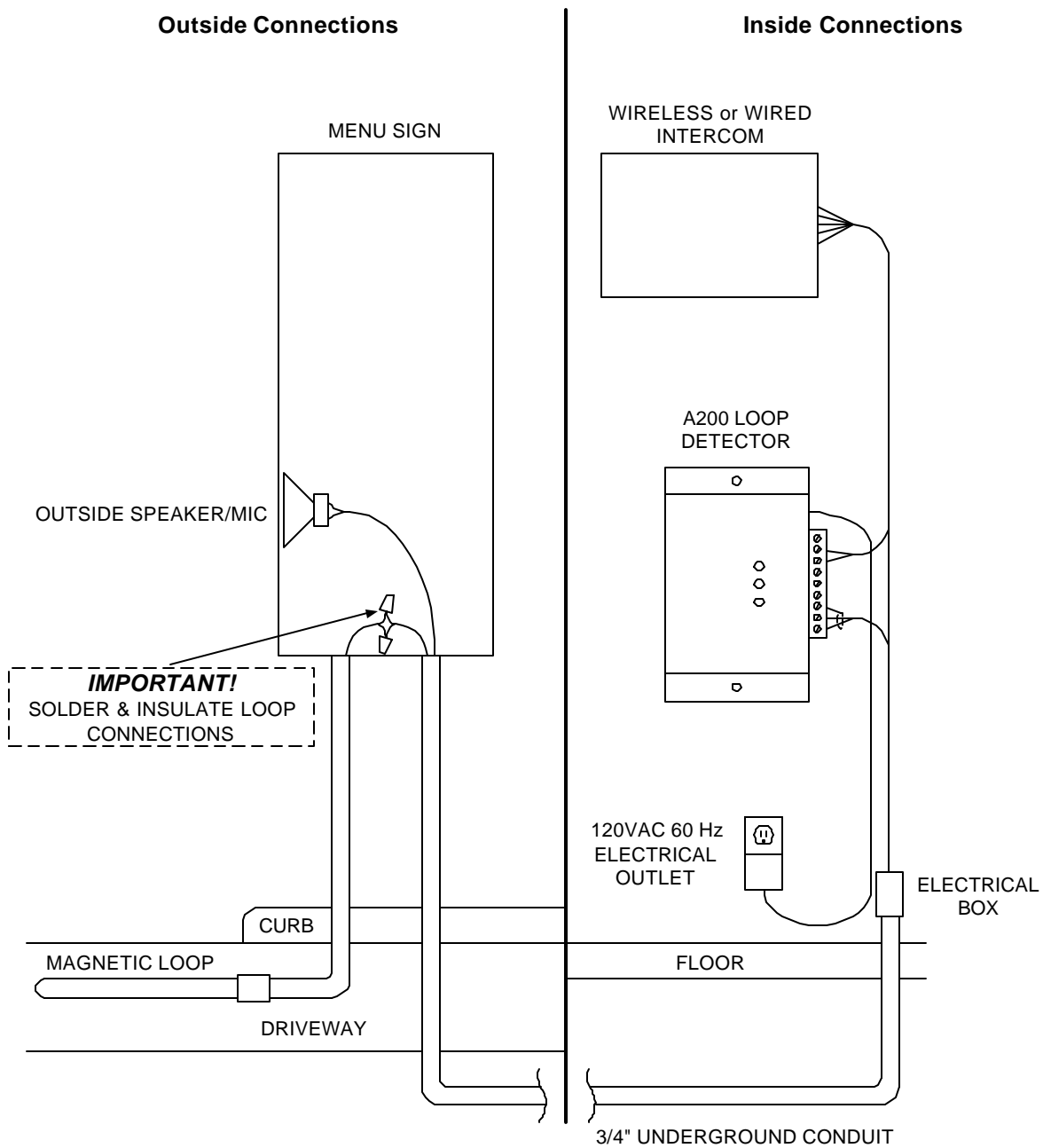


Figure 4. Typical A200 Installation

# Wiring Diagram

## Wiring the A200

Connect the loop wires to terminals 1 and 2 and the shield to 3. Terminals 4 through 9 are available to trigger external devices. Connect the included 12VDC power supply from the 12VDC jack to a 120 VAC electrical outlet.

## Wiring the A201

Connect the loop wires to terminals 1 and 2 and the shield to 3. 12 VDC power and terminals 7, 8, and 9 are connected to the C921BA Base Station through the ribbon cable. Terminals 4, 5, and 6 are available to trigger external devices.

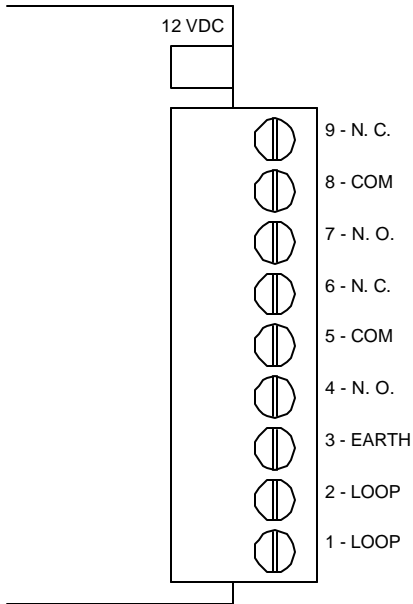


Figure 5. A200/A201 Terminals



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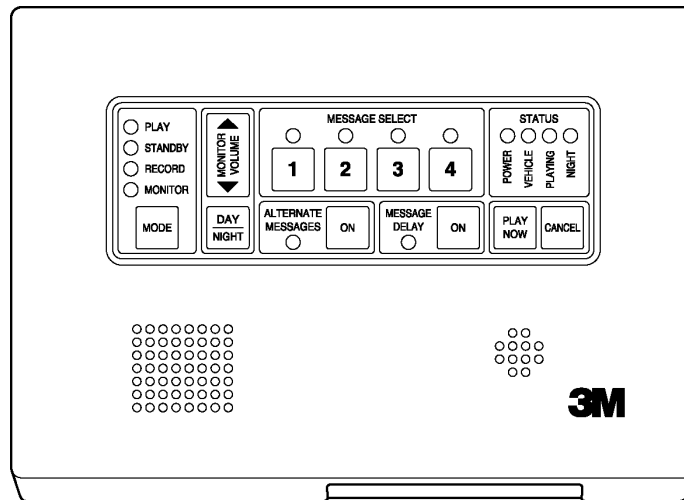
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# Installation Instructions

## Audio Greeter

### Model A300



SP-386A

## Package Contents

Quantity	Description
1	Model A300 Audio Greeter, Part No. 78-9236-6457-3
1	Power Supply; +12 VDC @ 800 mA, Plug-in, Part No. 78-8095-0976-9
1	Microphone; High Sensitivity Electret Condenser, 3.5 mm Stereo Plug, Part No. 78-8095-0928-7
1	Wire Cover
1	Installation Instructions, Part No. 78-6912-0717-5
1	Operating Instructions, Part No. 78-6912-0714-2
1	Operating Instructions Placard; Wall Mount, Part No. 78-6912-0721-7
1	Warranty Card
1	Receiving Report Card

Please check for shipping damage. Notify the shipping company immediately if any damage is found. Retain all packaging and components for inspection by the shipping company.

## Introduction

The 3M™ Audio Greeter, Model A300, is designed for use with intercom systems. A typical application is use in a quick service drive-thru restaurant to play digitally stored messages through a menu speaker.

# Installation

## *Determining the Best Location for the A300 Audio Greeter*

The A300 should be mounted on a vertical wall about 60 inches high. If the user must bend over a countertop to reach the A300, then lower it to 50 inches so the user can speak directly into the on-board microphone.

A quiet location is recommended if frequent voice recording is anticipated. A nearby manager's office or other enclosed room would be ideal. Cable runs over 35 feet should be avoided to reduce signal degradation.

## *Mounting Hardware (not supplied)*

- 4 each, #8 screws
- 4 each, wall anchors

## *Mounting the A300 Audio Greeter*

Before mounting the A300 to the wall, we recommend that you attach all the cables to the A300 while it rests on a countertop or a chair near its mounting surface. This allows easy access to all jumpers and controls with the cover open.

1. Remove the A300 cover and unplug the switch panel ribbon cable from the main circuit board.
2. Place the A300 at the desired location 50" to 60" high. Mark the locations of the four holes in the base onto the mounting surface.
3. Using appropriate mounting hardware (not supplied), attach the A300 base to the mounting surface.
4. Plug the ribbon cable into the main circuit board and attach the cover.
5. Clean the left-hand side of the cover with denatured alcohol and attach the external microphone holder using the double-stick tape provided.
6. Attach the wire cover to the right side of the A300 using the screws provided.

 <b>Important</b>
----------------------------------------------------------------------------------------------------

If it is necessary to operate the A300 with the cover removed while it is mounted on a vertical wall, do not allow the cover to hang from the switch panel ribbon cable. The cover may rest on the top edge of the base plate, but make sure it doesn't fall off.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## *Installation Diagrams*

- Figure 1. "Installing the A300 Audio Greeter with the 3M D-15 Intercom"
- Figure 2. "Installing the A300 Audio Greeter with the 3M Interconnect Module"
- Figure 3. "Installing the A300 Audio Greeter with the 3M C762AA/BA/C921AA Base Station"
- Figure 4. "Installing the A300 Audio Greeter with the 3M C921BA Base Station"
- Figure 5. "Installing the A300 Audio Greeter with the HME SYS2500D/DS/DSL Base Station"
- Figure 6. "Installing the A300 Audio Greeter with the Panasonic WX-C510/WX-C1010 Base Station"
- Figure 7. "Optional Installation with the HME or Panasonic Base Station"
- Figure 8. "Installing the A300 Audio Greeter with an Intercom Using an Outside Speaker/Microphone"
- Figure 9. "Installing the A300 Audio Greeter with the 3M Sodar Vehicle Detector"

## Configuration

The Operating Modes and Message Delay Times of the A300 are set with jumper JMP1 and DIP switches SW2 and SW3 located on the circuit board. Tables 1 and 2 list the switch settings.

### *Vehicle Detect Configuration*

#### **JMP1**

*Position A* - Position A is the default selection for most installations.

*Position B* - Position B is used when an optional relay must be added to trigger the A300. An optional relay may be required in cases where the HME or Panasonic intercom triggers an external service timer. (See Figure 7)

Note: *When JMP1 is in position B, a +5Volt pull-up voltage is applied to VEH DET + (J9 terminal 8). Then, a contact closure between VEH DET - (J9 terminal 9) and COM (J9 terminal 3, 6 or 11) will initiate a vehicle detect trigger.*

### *Mode Configuration*

#### **SW2**

A description of each mode follows. Table 1 lists the DIP switch settings.

#### **Message 4 External Trigger**

When SW2 number 1 is ON, the fourth message can only be played to the outside menu speaker when triggered from MSG4TRG, connector J9-10. The trigger signal should be a contact closure from MSG4TRG to COM (i.e. fire alarm, etc.).

#### **Automatic message Repeat**

When SW2 number 2 is ON, the selected message(s) will continuously repeat when triggered by a vehicle detect signal. The message(s) will stop when the vehicle detect signal is disengaged.

Note: *The Automatic Message Repeat will only work with a presence-type vehicle detector (i.e. Loop detector, Sonic detector).*

#### **Vehicle Detect Trigger Polarity**

When SW2 number 3 is OFF, the A300 will be triggered by a positive going (low to high) vehicle detect signal. When SW2 number 3 is ON, the A300 will be triggered by a negative going (high to low) vehicle detect signal.

#### **Pulse/Presence Vehicle Detector**

When SW2 number 4 is OFF, the A300 requires a presence-type vehicle detect signal (i.e. Loop detector). When SW2 number 4 is ON, the A300 requires a pulse-type vehicle detect signal (i.e. air switch).

#### **Timer Trigger Polarity**

When SW2 number 5 is OFF the TTL output at TIMER TRG, connector J9-12 will be a positive going (0.8V to 5.0V) signal when triggered by a vehicle detect signal. When SW2 number 5 is ON the TTL output at TIMER TRG will be negative going (5.0V to 0.8V) when triggered by a vehicle detect signal.

#### **Music Mode**

When SW2 number 6 is ON, the A300 will play music at the menu speaker when a message is not playing. The input music source must have its own balanced output power amplifier and volume control capable of driving the 4 – 8 ohm balanced menu speaker. When SW2 number 6 is ON, the A300 will pass audio from the music source to the menu speaker. When a vehicle triggers the A300, the music will be interrupted while the greeter plays its message(s). The music will resume playing at the menu speaker 2 minutes after the vehicle detect signal is disengaged. Note: *Use this feature only with the 3M C921BA Base Station.*

### **Menu Microphone Mute**

When SW2 number 8 is ON, the inbound audio from the Menu Microphone will be muted while the A300 plays message(s) to the Menu Speaker. *The message(s) can only be heard if the A300 AUDIO OUT line is connected to the C760/C960 AUDIO IN line (use AUDIO OUT potentiometer on A300 to adjust message volume).* When SW2 number 8 is OFF, the A300 message will be heard through the menu microphone while the message is being played through the menu speaker.

<b>Switch Number</b>	<b>ON Position</b>	<b>OFF Position</b>
1	Message 4 External Trigger Activated	* Message 4 External Trigger Deactivated
2	Automatic Message Repeat ON	* Automatic Message Repeat OFF
3	Vehicle Detect Trigger Polarity Negative	* Vehicle Detect Trigger Polarity Positive
4	Pulse Detector	* Presence Detector
5	Timer Trigger Polarity - Negative	* Timer Trigger Polarity - Positive
6	Music Mode ON	* Music Mode Off
7	Not Used	Not Used
8	Menu Microphone Mute ON	* Menu Microphone Mute OFF

\* Default Factory Settings

**Table 1. 3M Audio Greeter SW2 Mode Configuration**

### **Message Delay Timer Configuration**

The message delay timer is set with SW3. Table 2 lists the switch setting for each message delay time.

<b>Position Number 1</b>	<b>Position Number 2</b>	<b>Position Number 3</b>	<b>Position Number 4</b>	<b>Message Delay (Seconds)</b>
OFF	OFF	OFF	OFF	0
OFF	OFF	OFF	ON	1
OFF	OFF	ON	OFF	2
* OFF	* OFF	* ON	* ON	* 3
OFF	ON	OFF	OFF	4
OFF	ON	OFF	ON	5
OFF	ON	ON	OFF	6
OFF	ON	ON	ON	7
ON	OFF	OFF	OFF	8
ON	OFF	OFF	ON	9
ON	OFF	ON	OFF	10
ON	OFF	ON	ON	11
ON	ON	OFF	OFF	12
ON	ON	OFF	ON	13
ON	ON	ON	OFF	14
ON	ON	ON	ON	15

\* Default Factory Settings

**Table 2. 3M Audio Greeter SW3 Message Delay Timer Configuration**



## ***Additional Features***

**TALK** - This terminal is an active low input, used to cancel the current playing message. When connected to the **TALK** output terminal on the C921BA base station, it allows the operator to remotely cancel the playing message by pressing and holding the headset or intercom TALK button for at least one second.

### **\*Note**

When using a C960/C860 headset, the message will not play when operating in Talk-Lock mode.

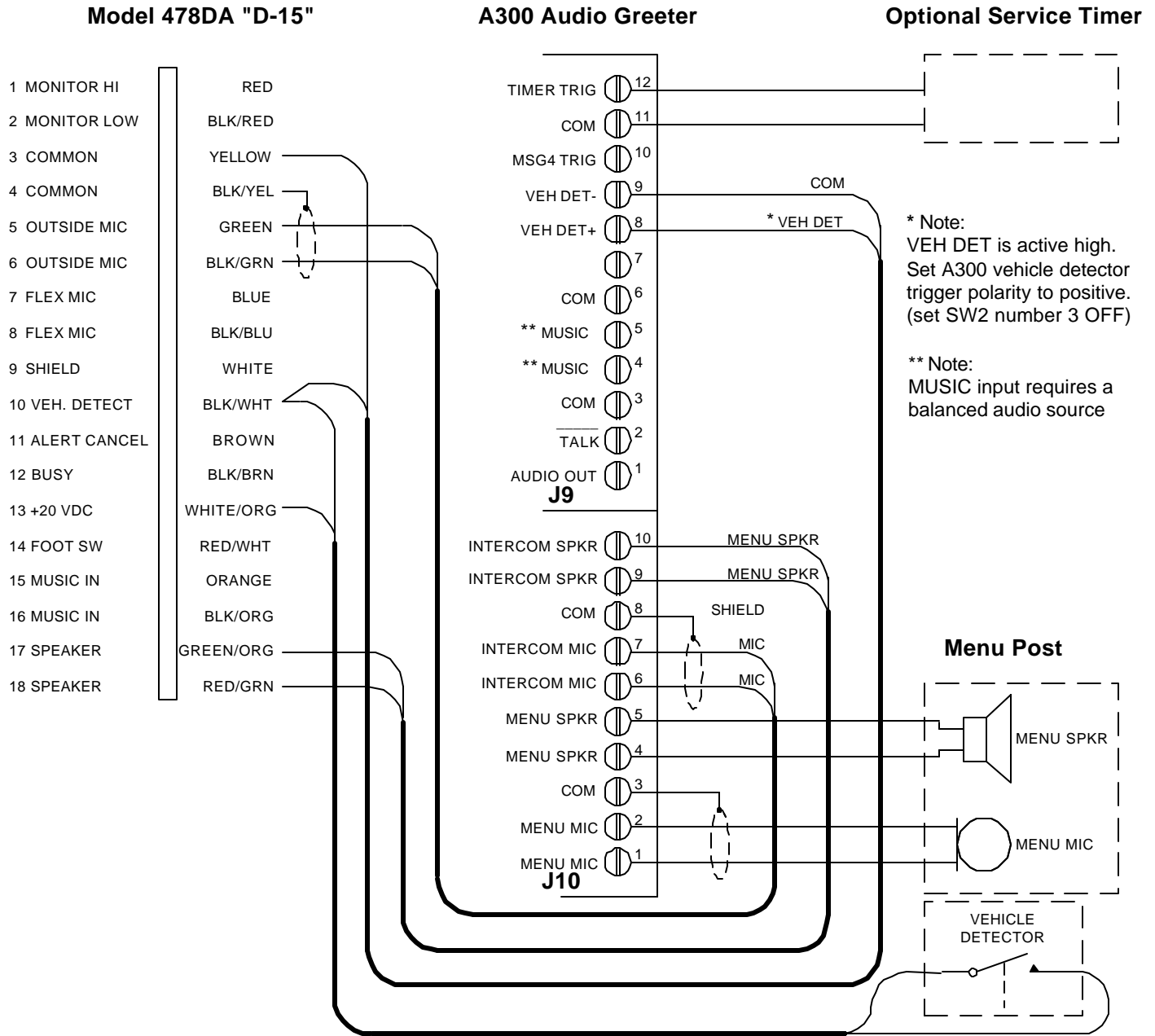
**AUDIO\_OUT** – This terminal is used in conjunction with the microphone mute feature, SW2 number 8. The AUDIO\_OUT terminal on the A300 sends the currently playing audio message to the AUDIO\_IN terminal of the intercom so that the message from the A300 is heard in the headset or intercom if the microphone mute feature is ON.

## **System Checkout and Balancing**

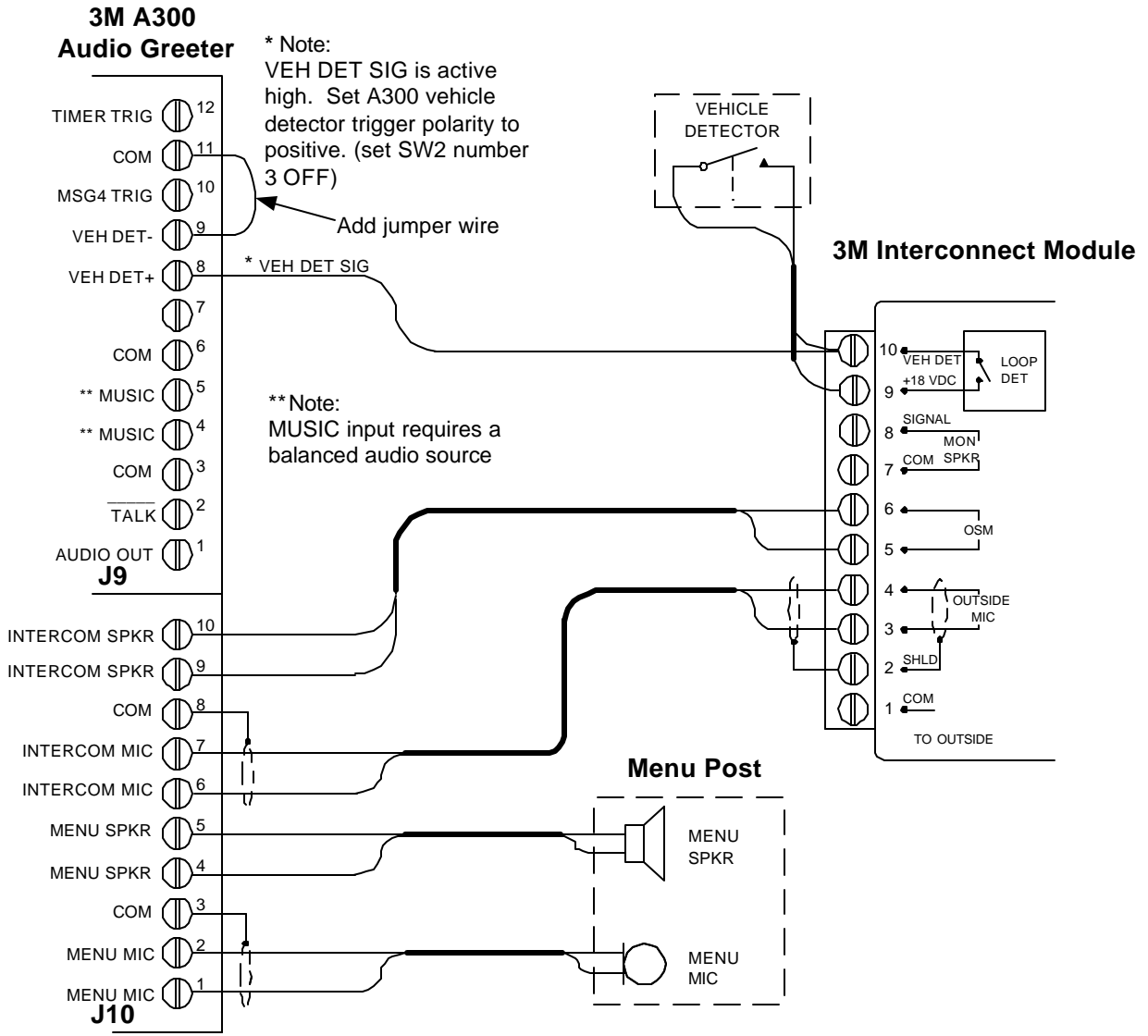
The system checkout of the A300 Audio Greeter can be completed by following the steps below:

1. Plug the +12VDC power supply into an electrical outlet and connect power plug into J5.
2. Turn the power switch on. Make sure the A300 completes its boot-up cycle. (Each LED will flash once, then the unit will beep 3 times).
3. Press the MODE button until the RECORD light comes on. Record a message in all four message locations.
4. Press the MODE button until the MONITOR light comes on. Play each message by pressing the MESSAGE SELECT number button and pressing PLAY NOW button. Also press the MONITOR VOLUME arrow buttons to change the volume of the messages.
5. Select all the messages by pressing all the MESSAGE SELECT number buttons. Test the ALTERNATE MESSAGES function by pressing the ALTERNATE MESSAGES ON button and the PLAY NOW button several times. Verify that each time the PLAY NOW button is pressed that the next message is played until the first message is played again. While a message is playing press the CANCEL button to verify that the message stops.
6. Verify that the vehicle detector is operating properly by having a vehicle drive into the vehicle detection area. The VEHICLE LED should illuminate when the vehicle is detected, and go off when the vehicle leaves.
7. Press the MODE button until the PLAY light comes on to test messages at the menu sign. Select all the messages by pressing all the MESSAGE SELECT number buttons.
8. Stand near the outside menu sign speaker and have a vehicle drive into the vehicle detection area to verify that all the messages play at the speaker. Also have someone inside the building press the PLAY NOW and CANCEL buttons to verify their operation.
9. Have the person inside press the MESSAGE DELAY ON button. Drive the vehicle through the vehicle detection area and verify that the message is delayed by the correct preset delay time.
10. Adjust potentiometer MENU SPKR VOL, located on the left side of the A300, to control the menu sign message volume. Also press the DAY/NIGHT button while playing a message to verify the night-time menu sign message volume.
11. For 3M C760/C960 Systems only. Adjust potentiometer AUDIO OUT to set the message volume in the headset/intercom.  
*Note: Potentiometer AUDIO OUT is only used to set the message volume for the convenience of the headset/intercom operator. Therefore, to reduce operator fatigue, adjust AUDIO OUT to set the message volume so it is barely audible in the headset/intercom.*
12. Attach the Wire Cover plate using the hardware supplied.
13. Attach the Operating Instructions Placard to a nearby wall, if possible, using an appropriate mounting method.

# Installation Diagrams



**Figure 1. Installing the A300 Audio Greeter with the 3M D-15 Intercom**

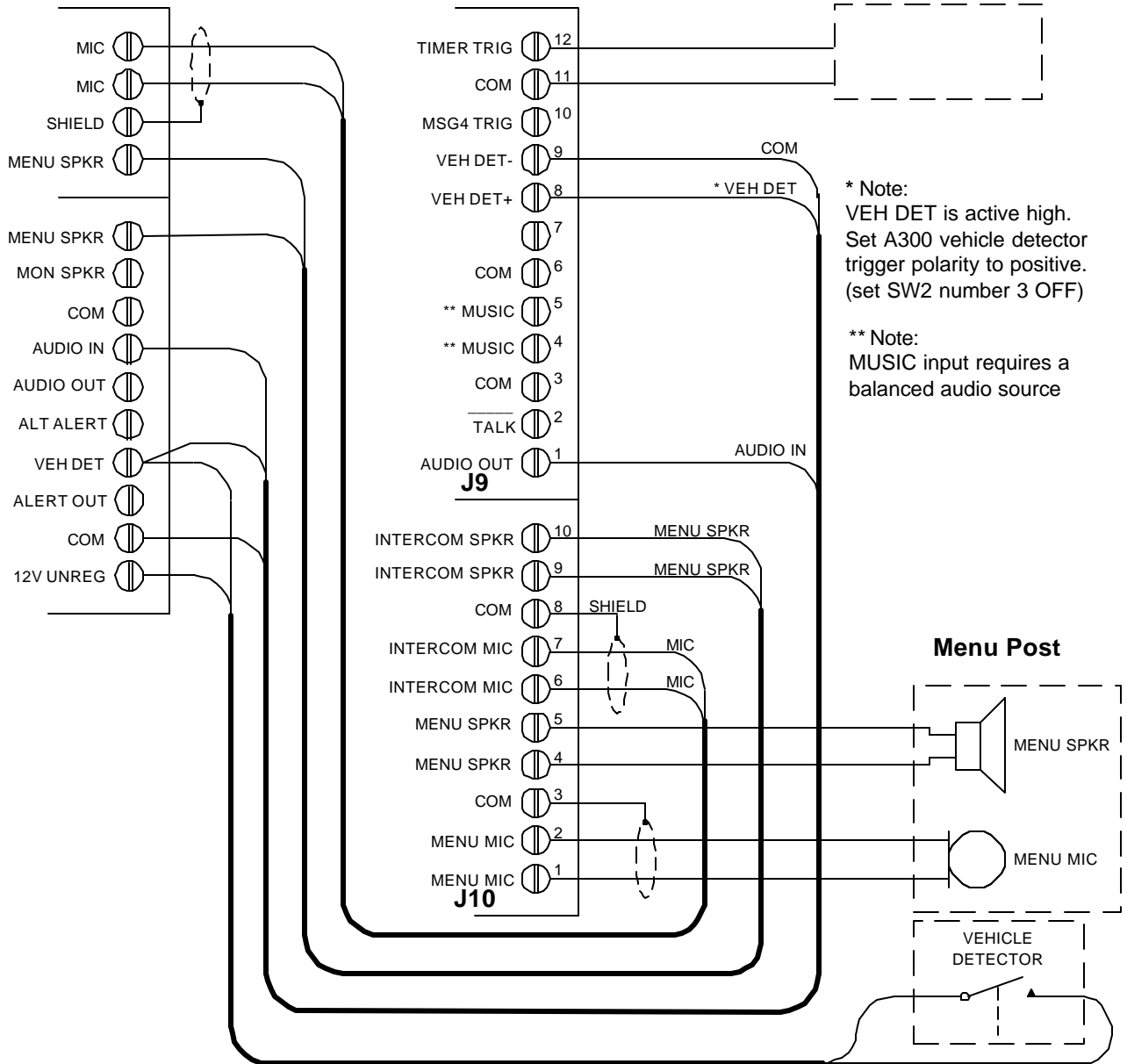


**Figure 2. Installing the A300 Audio Greeter with the 3M Interconnect Module**

**C762AA/BA/C921AA Base Station**

**A300 Audio Greeter**

**Optional Service Timer**

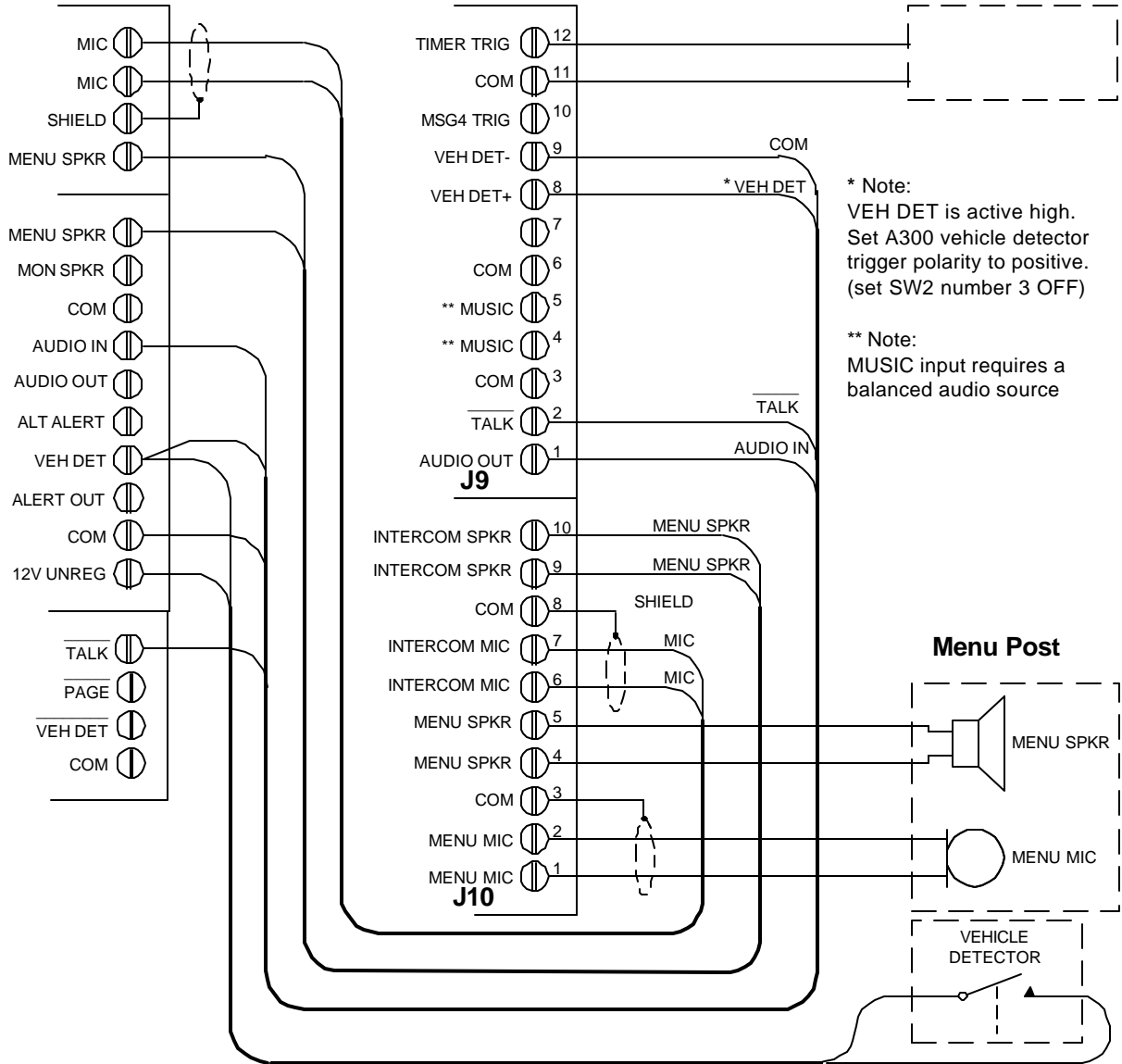


**Figure 3. Installing the A300 Audio Greeter with the 3M C762AA/BA/C921AA Base Station**

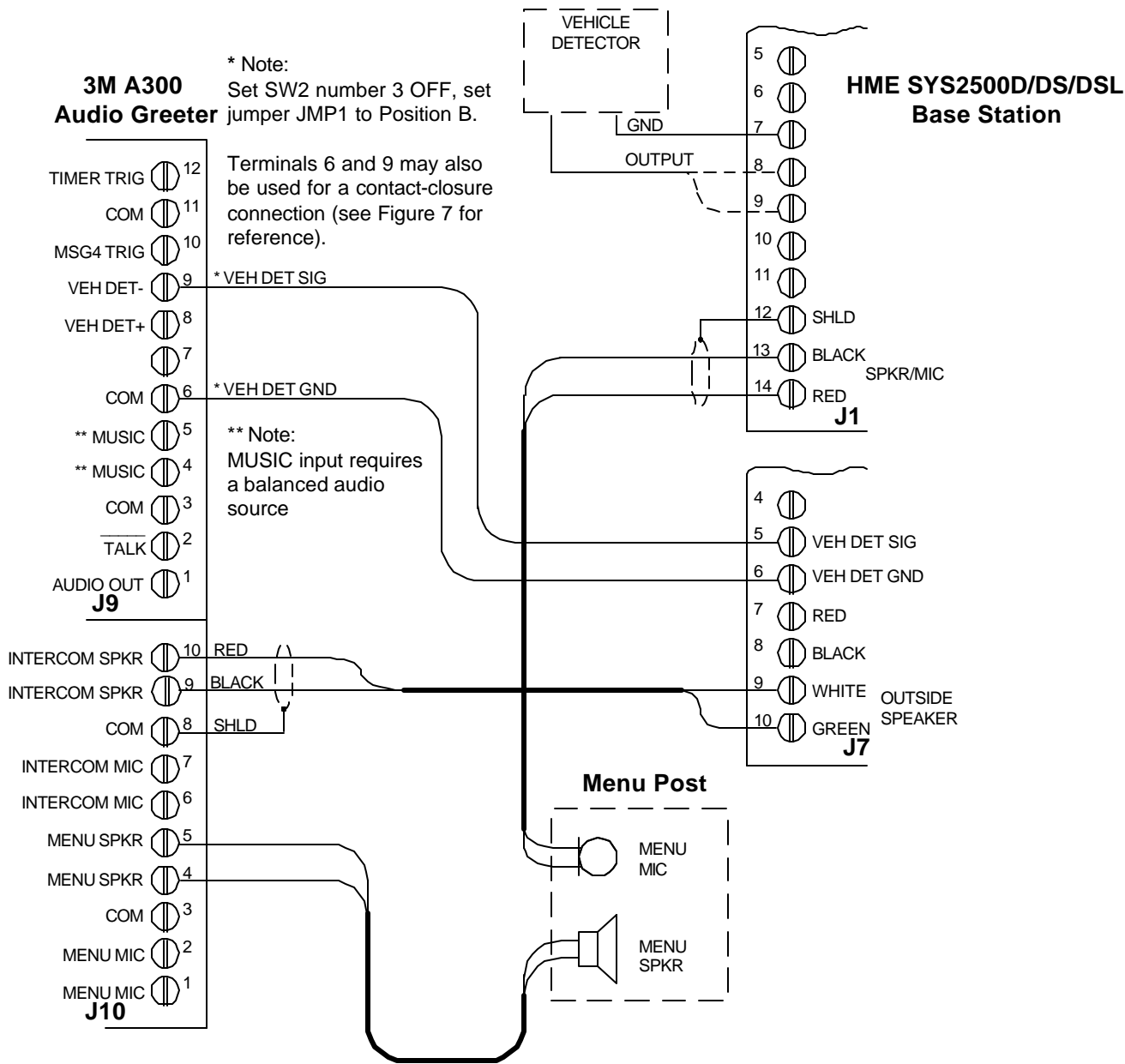
**C921BA Base Station**

**A300 Audio Greeter**

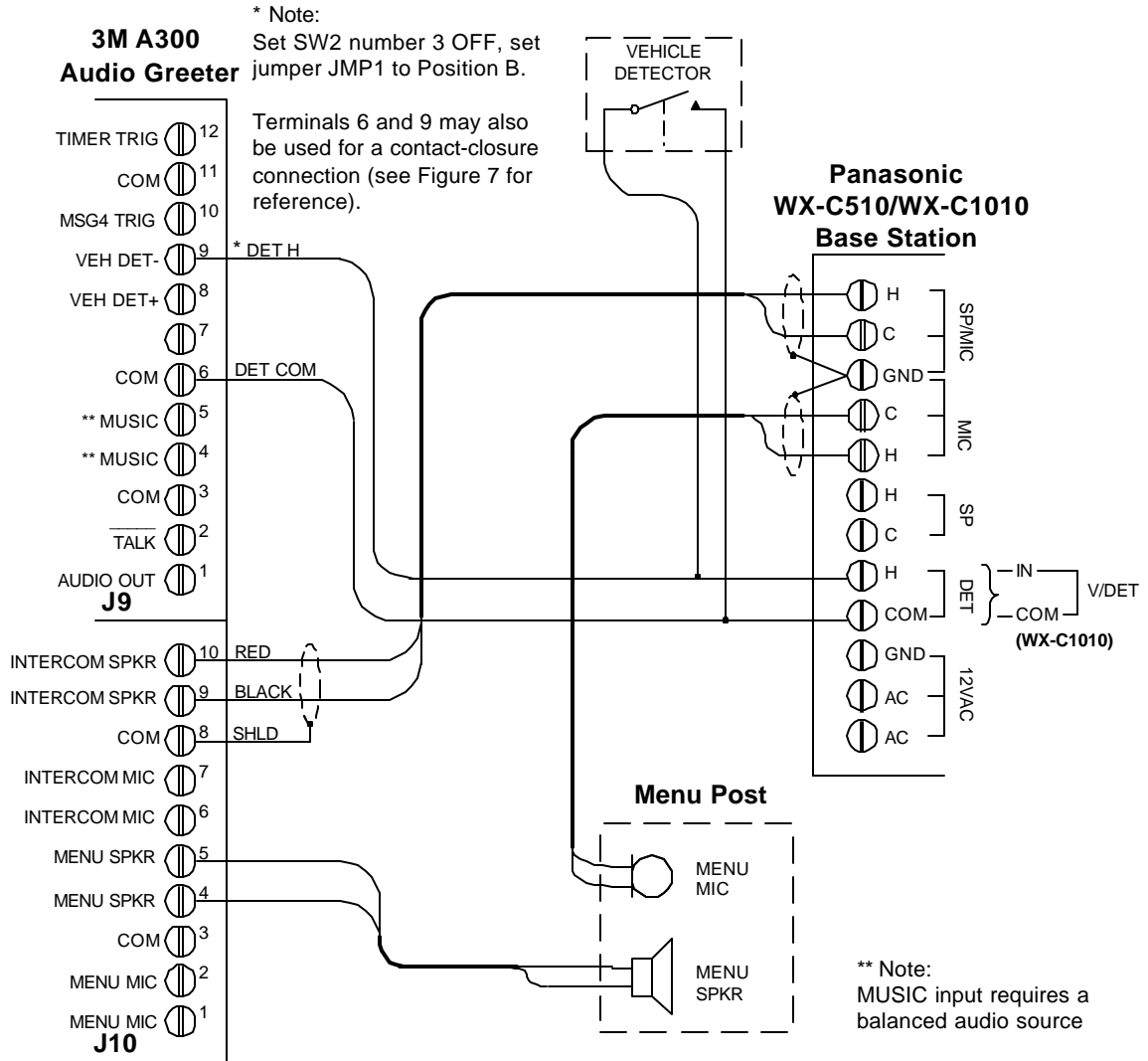
**Optional Service Timer**



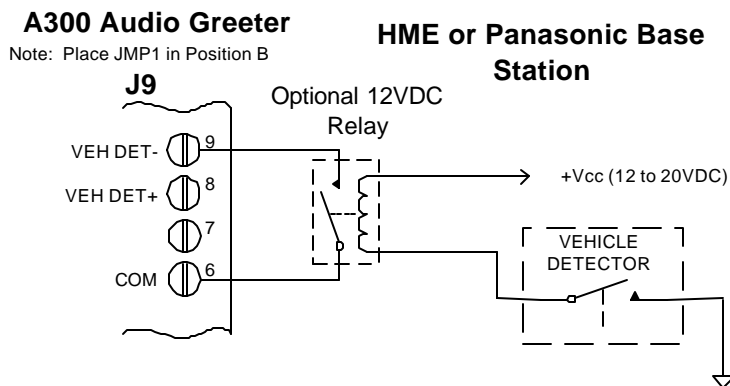
**Figure 4. Installing the A300 Audio Greeter with the 3M C921BA Base Station**



**Figure 5. Installing the A300 Audio Greeter with the HME SYS2500D/DS/DSL Base Station**

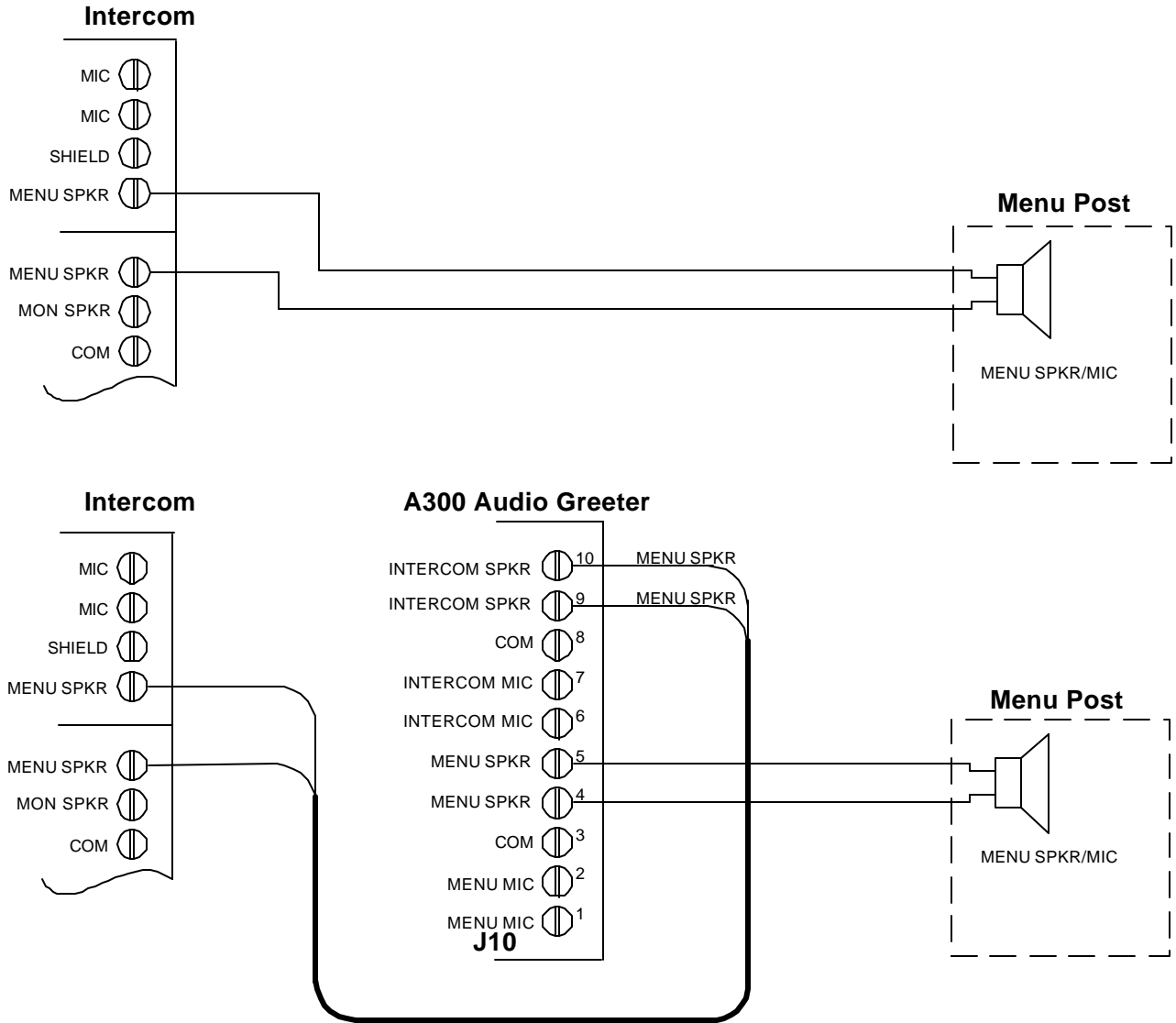


**Figure 6. Installing the A300 Audio Greeter with the Panasonic WX-C510/WX-C1010 Base Station**



**Figure 7. Optional Installation with the HME or Panasonic Base Station**

Below is an example of the A300 connected to a typical intercom using an Outside Speaker/Microphone (OSM): Use the appropriate vehicle detector connections to complete the installation.



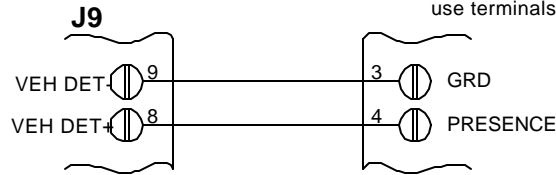
**Figure 8. Installing the A300 Audio Greeter with an Intercom Using an Outside Speaker/Microphone**



**A300 Audio Greeter**

**714AA SODAR**

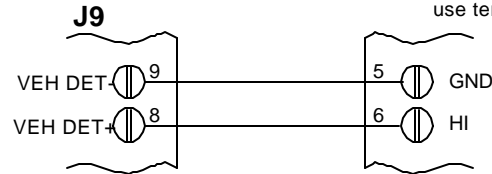
Note: If 714AA contains optional relay, use terminals 8 and 9.



**A300 Audio Greeter**

**714BA SODAR**

Note: If 714BA contains optional relay, use terminals 9 and 10.



**Figure 9. Installing the A300 Audio Greeter with the 3M Sodar Vehicle Detector**

**A300 Audio Greeter Troubleshooting Guide**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
1. Low outbound volume to the menu sign speaker.	<ol style="list-style-type: none"> <li>1. The NIGHT STATUS light on.</li> <li>2. The MENU SPKR VOL potentiometer is set too low.</li> <li>3. Defective menu speaker or A300.</li> </ol>	<ol style="list-style-type: none"> <li>1. Press the DAY/NIGHT button until the NIGHT STATUS goes off.</li> <li>2. Increase the setting of the MENU SPKR VOL potentiometer, located on the left side of the A300.</li> <li>3. Measure resistance of speaker and verify that it works properly. If not call for authorized service.</li> </ol>
2. Cannot record message.	<ol style="list-style-type: none"> <li>1. External microphone not connected.</li> <li>2. External microphone defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Verify that external microphone plug is fully inserted into microphone jack J6.</li> <li>2. Use internal microphone (internal microphone is automatically selected when external microphone is unplugged).</li> </ol>



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# Installation Instructions

## Cross-Lane Module

**78-6911-4396-6**

**Description:** The Cross-Lane Module allows two base stations in a dual-lane configuration to be operated by a single headset, using the dual-lane remote switch. A headset with a Dual-Lane Remote Switch can communicate with either base station in a cross-lane installation via the lane select switch. The Cross-Lane Module allows the headset to receive the vehicle alert tone and audio from a base station that the lane select switch is not set to.

### Additional Material Required:

- D A sufficient length of six-conductor 20 AWG twisted pair audio cable (not supplied) for connecting the Cross-Lane Module to the two base stations.
- D Applicable screws/fasteners (not supplied) for mounting the Cross-Lane Module.

### Installation:

1. Use the applicable screws/fasteners and mount the Cross-Lane Module to the wall in a convenient location next to one of the base stations.

**Note**

To ensure access to the switch on the Cross-Lane Module, locate the module near one of the base stations.

2. Run the proper length of six-conductor 20 AWG twisted pair audio cable between the Cross-Lane Module and the nearest base station.
3. Run the proper length of six-conductor 20 AWG twisted pair audio cable between the Cross-Lane Module and the other base station.

<b>Important!</b>
-------------------

<b>For proper operation, the base stations must be <u>at least</u> 15 feet apart.</b>
---------------------------------------------------------------------------------------

4. Remove the half-cover from each base station by slightly pulling out on the lower right side of the cover and then lifting it off.

5. Connect the cables from the module to the base stations as shown in Figure 1.

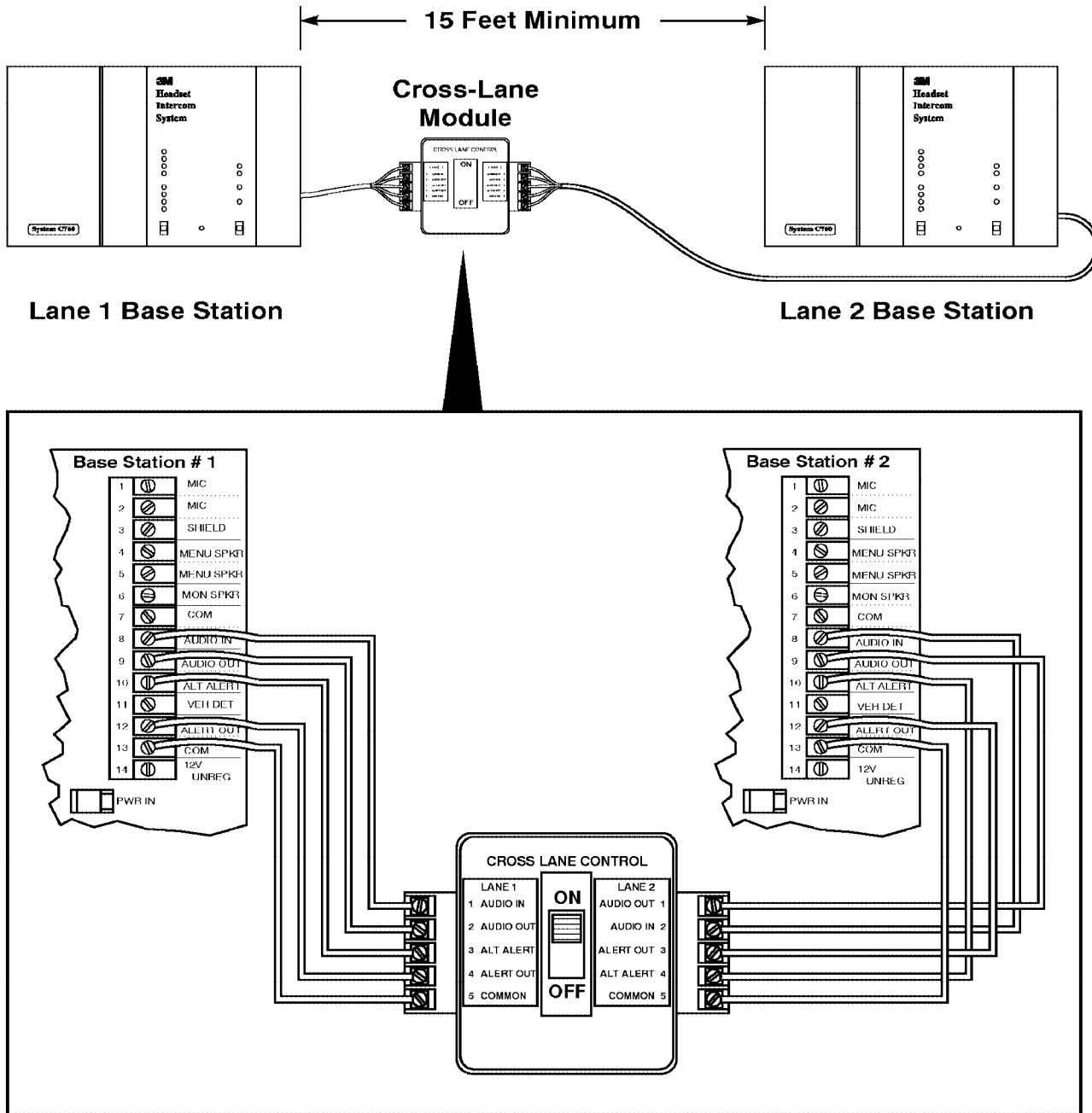
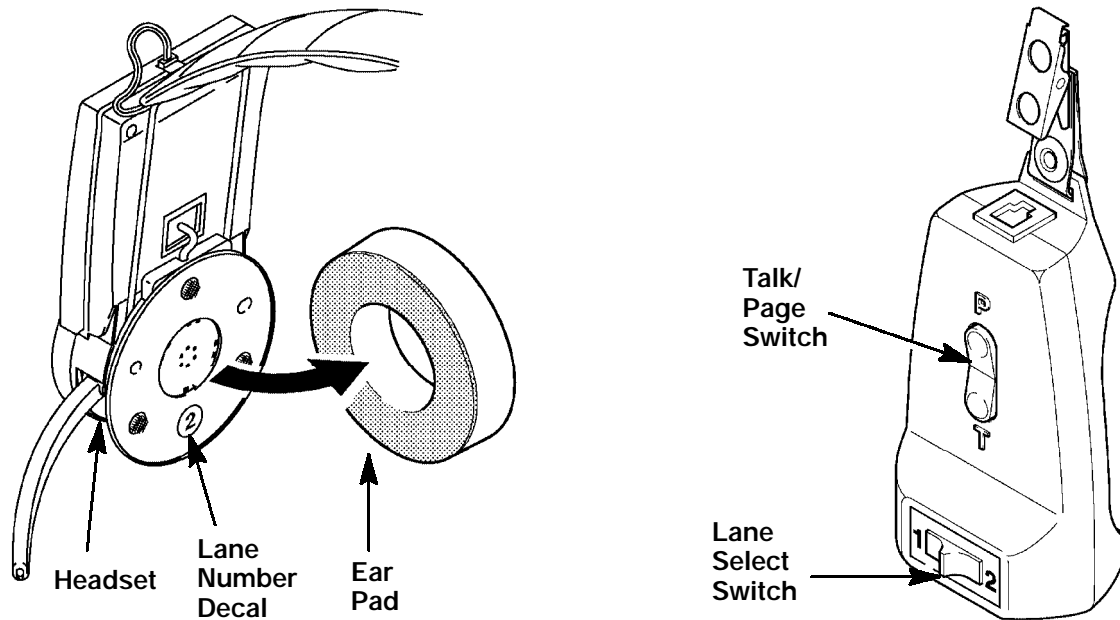


Figure 1



- a. Turn on the headset. (Audible tones will be heard in the headset indicating that the programming is complete.)
- b. To identify which lane a headset is assigned to, attach the applicable lane number decal (included with each headset) as shown in Figure 3.

**Be sure to reprogram all the headsets in the system to their respective channel and lane numbers.**



**Figure 3. Headset Lane Identification and Cross-Lane Remote Switch**

2. Using a remote switch cord, connect a Cross-Lane Remote Switch to one of the headsets in the system. The Dual-Lane remote has a Lane Select switch which allows the operator to selectively communicate with either lane 1 or lane 2.

### **Important!**

**Only one of the system headsets should be used at any time for cross-lane operation. This headset must have a Dual-Lane Remote (with a Lane Select switch) for cross-lane operation.**

3. Turn on both base stations and slide the switch on the Cross-Lane Module to the ON position.
4. Check for proper cross-lane operation as follows:
  - D Set the Lane Select Switch on the remote to the lane 1 position; you should be able to listen/talk to lane 1.
  - D Set the Lane Select Switch on the remote to the lane 2 position; you should be able to listen/talk to lane 2.
  - D Set the Lane Select Switch to lane 2 and then activate the lane 1 vehicle alert. You should hear one repeating “beep” in the headset. Set the lane select switch to lane 1 and then activate the lane 2 vehicle alert. You should hear two repeating “beeps” in the headset. (These steps verify that the Cross-Lane Module allows the vehicle alerts to “cross over” from one base station to the other.)



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# Installation Instructions

## Headset Storage Rack Kit

78-6911-4409-7

### Introduction:

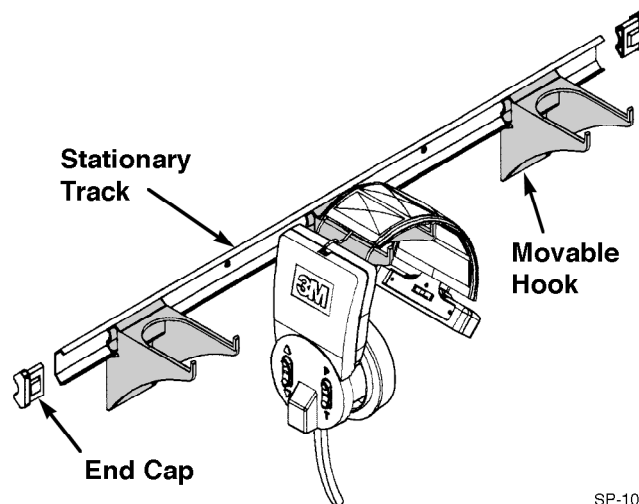
The headset storage rack provides safe, convenient storage of headsets that are not in use. Install sufficient three-hook headset storage racks to ensure that all headsets are protected from inadvertent damage.

### Kit Contents:

- Stationary track
- Movable hooks (3)
- End caps (2)
- Installation Instructions

### Procedure:

1. Using screws and anchors appropriate for the surface the storage rack is to be attached to, mount the track in an area that is away from heat, grease and moisture; preferably in a manager's office.
2. Slide the movable hooks into the track and then snap the end caps in place.
3. Space the hooks as shown below, and hang the headsets on the hooks as shown - *without the battery packs*.



SP-105



# Installation Instructions

## Duplex Menu Cable

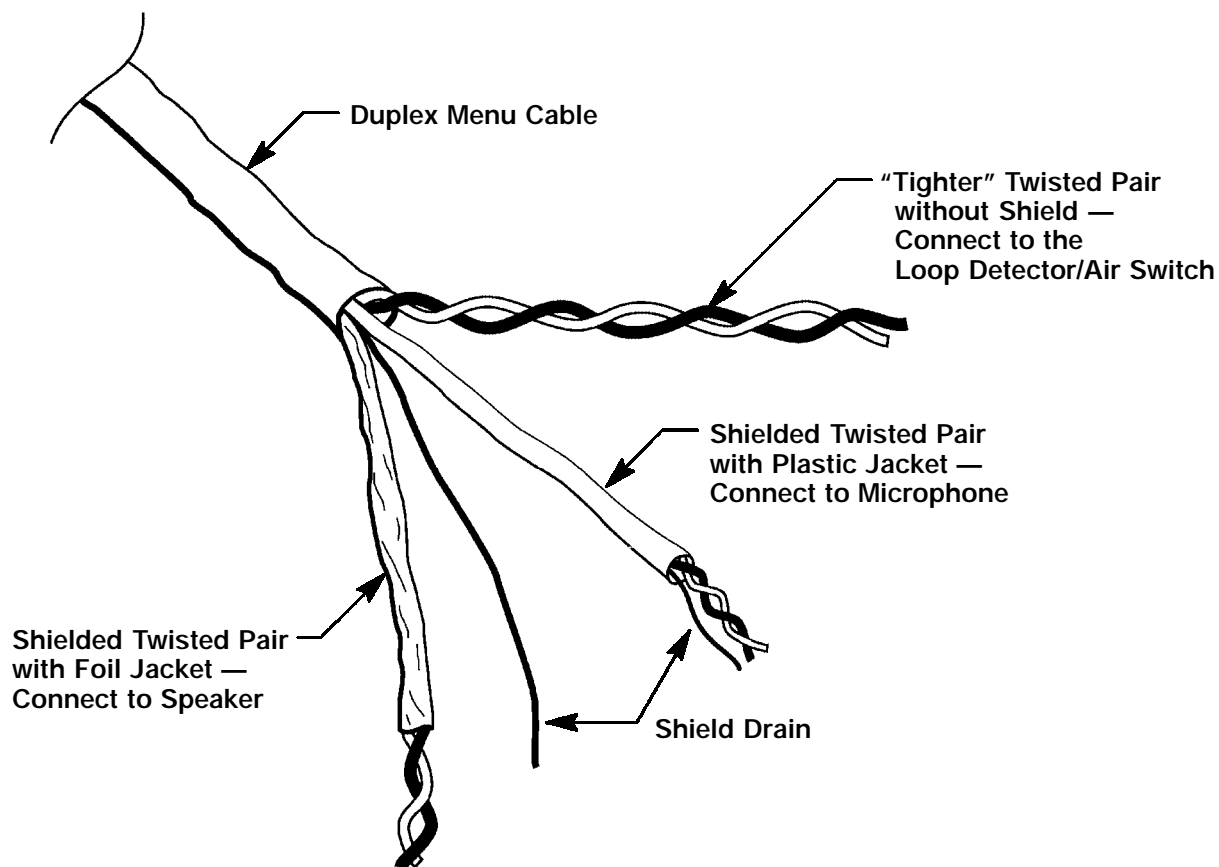
78-8095-0180-8

### Introduction:

The Duplex Menu Cable can be used for connections between menu signs/posts and intercom systems. The cable contains 3 separate twisted-wire pairs.

### Wiring Connections:

Connect the wire pairs to the appropriate components as shown below.



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# Installation Instructions

## 3M Communications Bar

78-6911-4451-9

### Purpose

The 3M Communications Bar provides audio communication between the customer and store personnel in standard intercom applications and in wireless intercom face-to-face installations.

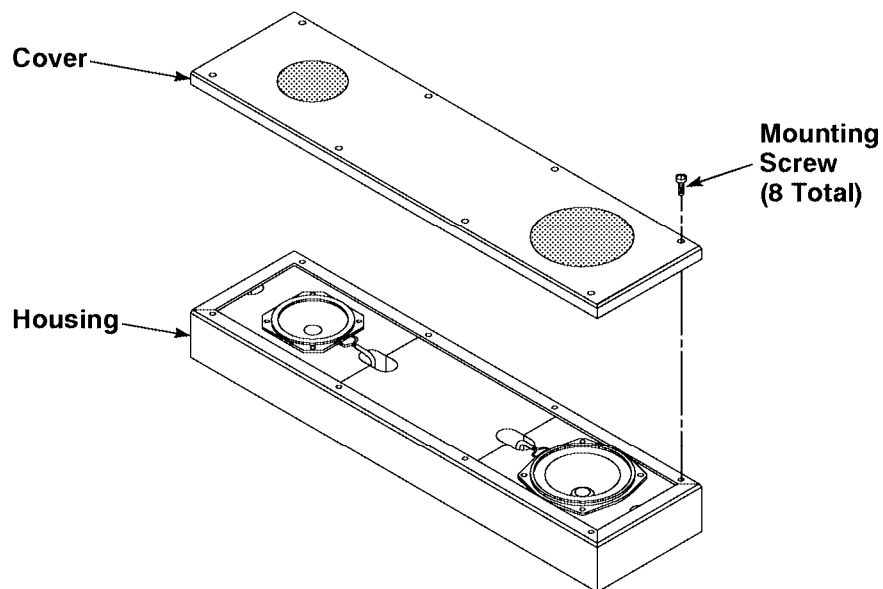
The communication bar can be mounted in one of two locations:

- D On the outside wall of the building next to the face-to-face window.
- D On the speaker post

### Procedure

#### Mounting the Communications Bar:

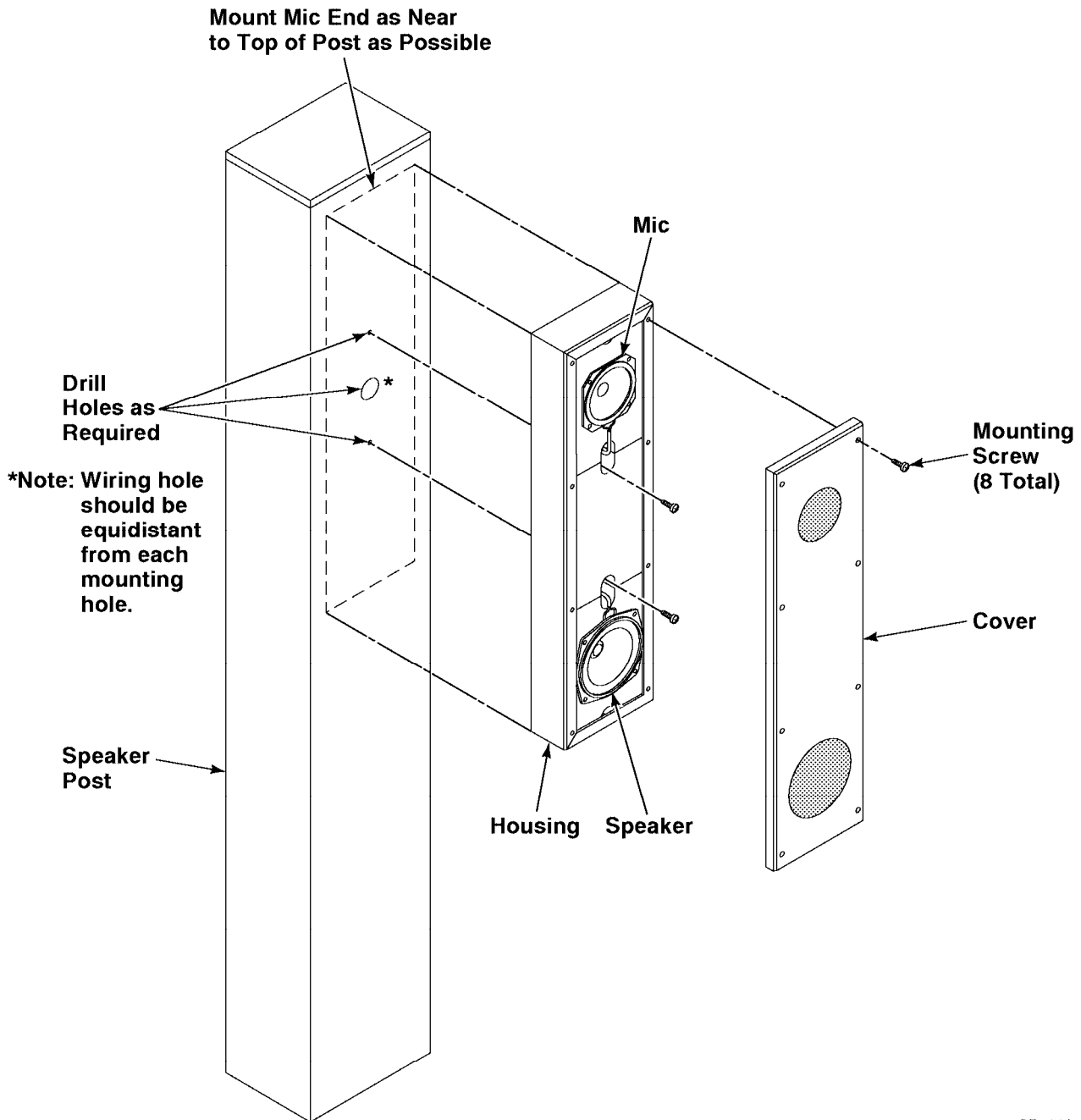
1. To gain access to the mounting holes, remove the cover mounting screws and the cover. See Figure 1.



SP-158A

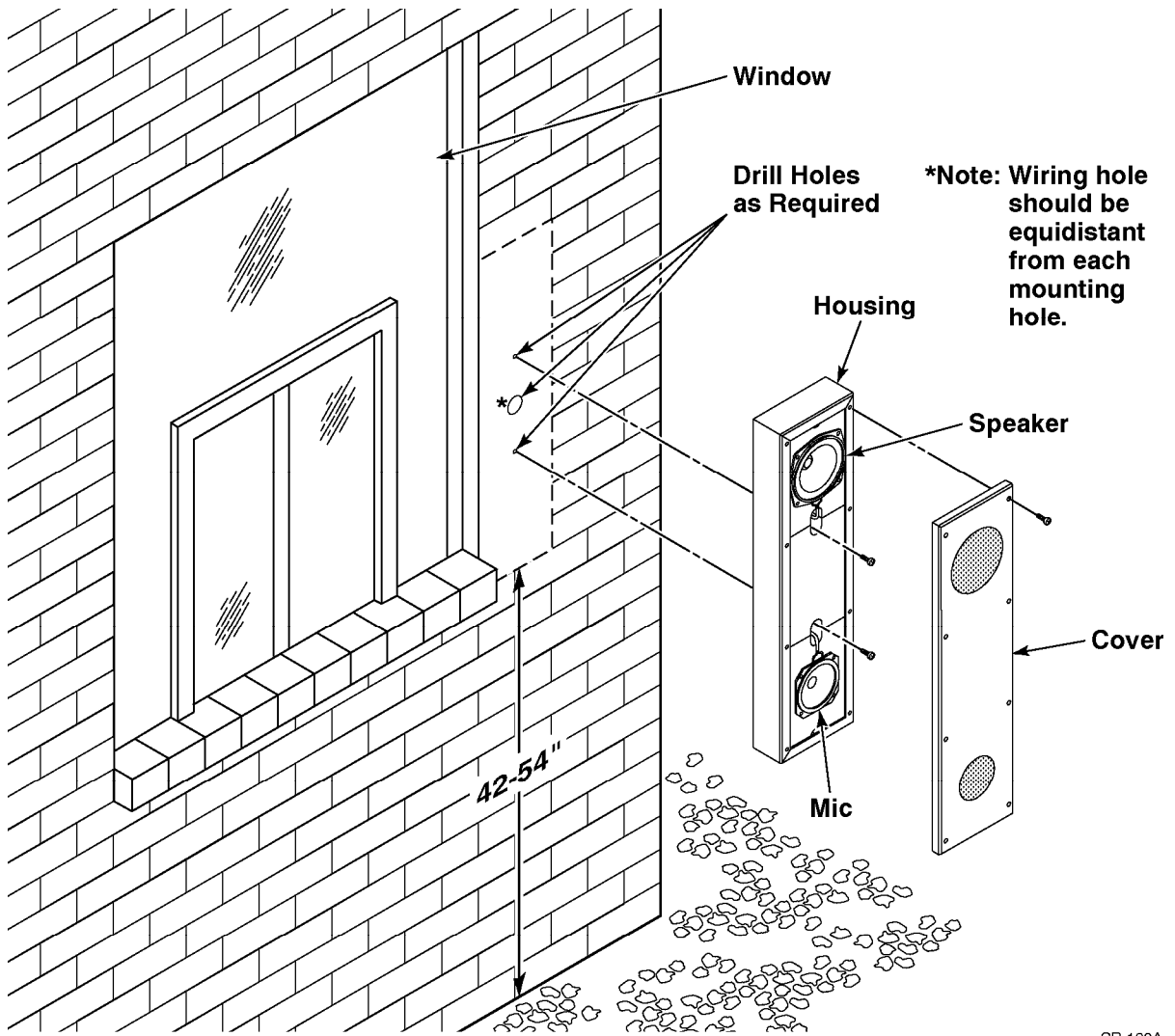
**Figure 1. Cover and Mounting Screws**

2. Determine the mounting location (speaker post or face-to-face window).
3. Position the housing, and mark the mounting holes:
  - D For speaker post mounting, position the housing with the microphone as near to the top of the post as possible. See Figure 2.
  - D For face-to-face window mounting, position the housing with the microphone at the bottom. Make sure the bottom of the housing is 42 to 54 inches above the driveway. See Figure 3.



SP-159A

**Figure 2. Speaker Post**



SP-160A

**Figure 3. Face-to-Face Window**

4. Mark the wiring hole equidistant from each mounting hole.
5. Drill the wiring and mounting holes.
6. Install the appropriate mounting anchors.
7. Route the speaker and mic cables through the wiring hole.

**Note**

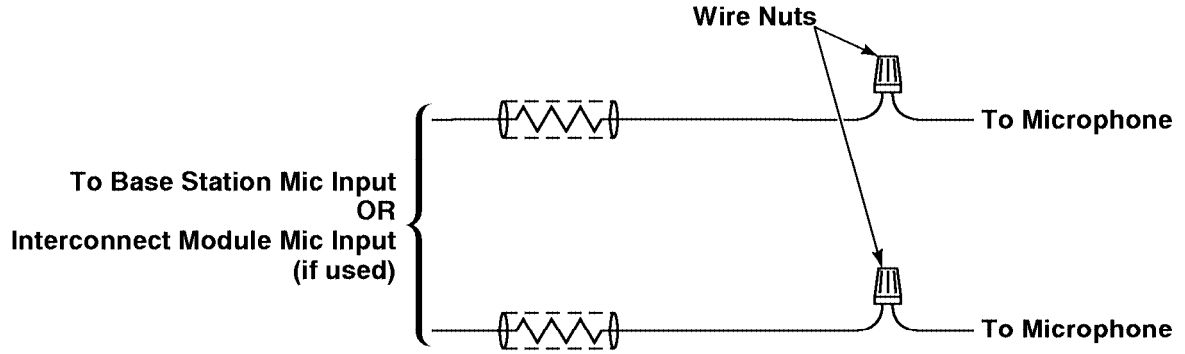
The wire exit hole in the housing is sized to accept a 1-inch conduit fitting.

8. Secure the housing to the speaker post or wall using the appropriate mounting screws.
9. Reinstall the cover. Tighten the screws evenly, starting with the four center screws. See Figure 2 or 3.

**Important**

The cover screws must be tightened securely and evenly to attain sufficient isolation between the speaker and microphone for duplex operation.

10. Using wire nuts, connect the attenuators to the microphone line **at the base station end** of the mic cable. See Figure 4.



**Attenuator is a 2-foot section of shielded microphone cable containing 2–1500 ohm resistors used for matching the audio output level of the new microphone to the base station electronics.**

SP-170A

**Figure 4. Connecting the Attenuators**

**Checkout:**

Determine the type of intercom system, and adjust the speaker and microphone according to the related installation instructions.



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# Installation Instructions

## Five-inch Speaker and Mic Assembly

78-6911-1545-1

### Introduction

The Speaker and Mic Assembly consists of a five-inch, water-resistant, eight-ohm cone speaker, a special weather-resistant dynamic microphone and a mounting bracket for easy mounting in menu signs, speaker posts and other applications. Use this product where a separate microphone may provide better voice quality than that of a combined speaker/mic.

### Specifications

**Dimensions** ..... See Figure 1 on reverse.

**Cable Connections** ..... Stripped and tinned wires

#### Microphone

Sensitivity ..... -71dB ± 3db at 1kHz (0dB = 1V/mBar)

Impedance ..... 500 ohms ± 20% at 1kHz

Operating Temp. .... -20 to +60°C (-4 to +40\_F)

#### Speaker

Size ..... 5 inches square

Impedance ..... 8 Ohms

Power Capacity ..... 6 watts maximum

Frequency Range ..... 110 Hz to 9 kHz (voice communication)

Sensitivity ..... 91 dB SPL for 1 watt @ 1 meter on axis

### Recommended Speaker and Mic Cable

Speaker ..... Use 18-gauge twisted-pair plus shield or unshielded cable.

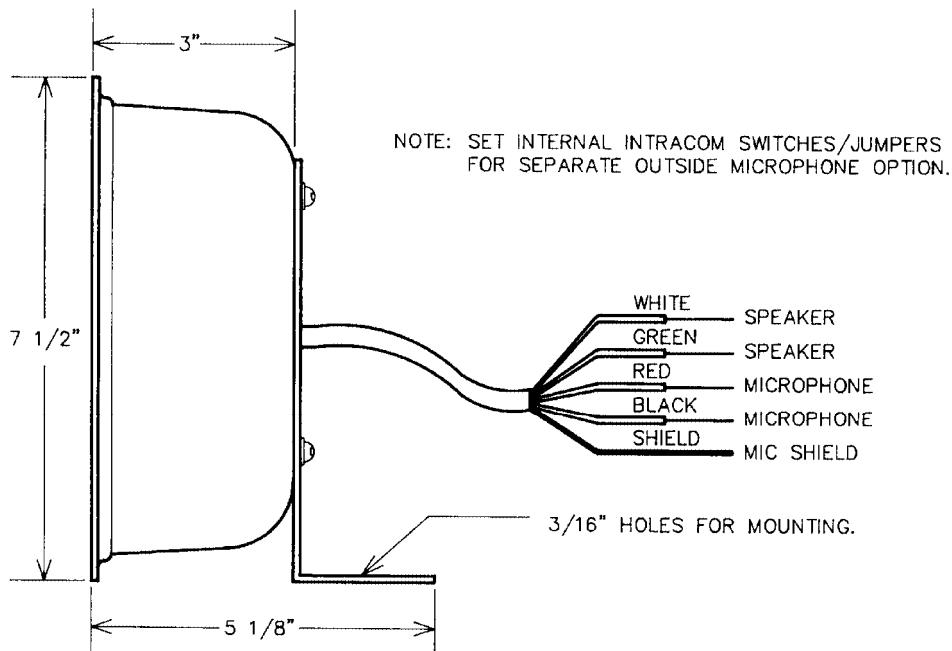
Microphone ..... Use 18-gauge twisted-pair plus shield cable. Connect the shield to COMMON at the Intracom end only.

### WARNING

Do not route speaker or microphone cables through the same conduit with 115 VAC electrical wiring. This violates the National Electrical Code, presents a safety hazard and may cause hum pickup.

## Mounting Procedure

1. Mount the speaker and microphone assembly inside the menu sign, communication post, or other cavity so that the speaker and microphone are facing the customer position. When used for automobile communications, the ideal mounting height is 54 inches above the pavement.
2. Use bolts or sheet metal screws to securely fasten the speaker "L" bracket so that the assembly does not move and cause loss of communications.
3. Connect the speaker and microphone wires to the intracom. Solder and insulate all splices. Insulate the shield at the microphone end.
4. Refer to the individual Intracom installation instructions and *make the necessary connections and changes to internal jumpers/switches for the "separate outside microphone" option.*



**Figure 1. Speaker and Mic Connections and Mounting**

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# Installation Instructions

Model C760AA/C960AA  
Headset Intercom System  
3.5-Inch Duplex Microphone  
(78-6911-4476-6)

## Microphone Installation Instructions

<p><b>1. Determine the type of speaker post and cut the microphone shield to the required size.</b></p> <p>Determine the microphone shield dimensions for the type of speaker post present at the installation location. A typical installation in a speaker post is shown in Figure 1.</p> <p>Mark the dimensions on the microphone shield.</p> <p>Using a razor blade or scissors, cut the shield to the required size.</p>	<p><b>2. Clean the inside of the microphone grill.</b></p> <p>Remove any existing foam from the inside of the grill.</p> <p>Clean the grill to ensure good tape adhesion. Use alcohol to remove dirt and oil.</p>
<p><b>3. Attach the microphone behind the grill.</b></p> <p>Remove the backing from the foam tape and press the microphone and shield in place behind the grill. Be sure that the tape adheres well to provide a good acoustic seal. (The entire grill area must be blocked by the microphone shield.)</p> <p>On posts with two cavities, mount the microphone in the upper cavity and the speaker in the lower cavity.</p> <p>Strip the microphone leads and connect them to the microphone cable from the building. Solder and tape is recommended. Do not ground the microphone ground lead to the post.</p>	<p><b>4. Fill the hollow area behind the microphone.</b></p> <p>Fill the hollow area behind the microphone with fiberglass insulation to decrease any echo effect. Allow at least four inches of clearance around the light bulb. Use only unfaced (without paper backing) insulation.</p> <p>Do not pack the insulation into the cavity. Two to three feet of insulation - cut to the width of the cavity - is sufficient.</p>

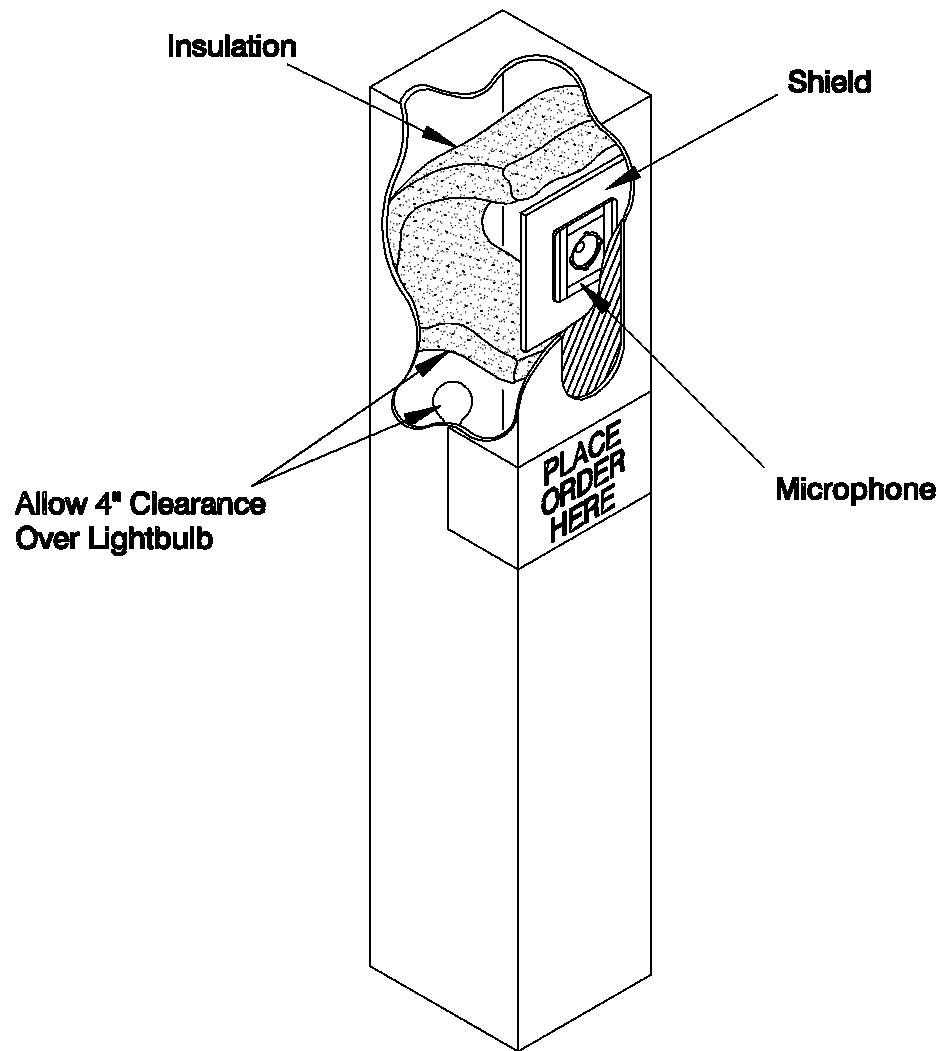
(continued)

**5. Connect the attenuators to the microphone line.**

Using wire nuts, connect the attenuators to the microphone line at the base station end of the mic cable. See Figure 2.

**6. Check the system for correct operation.**

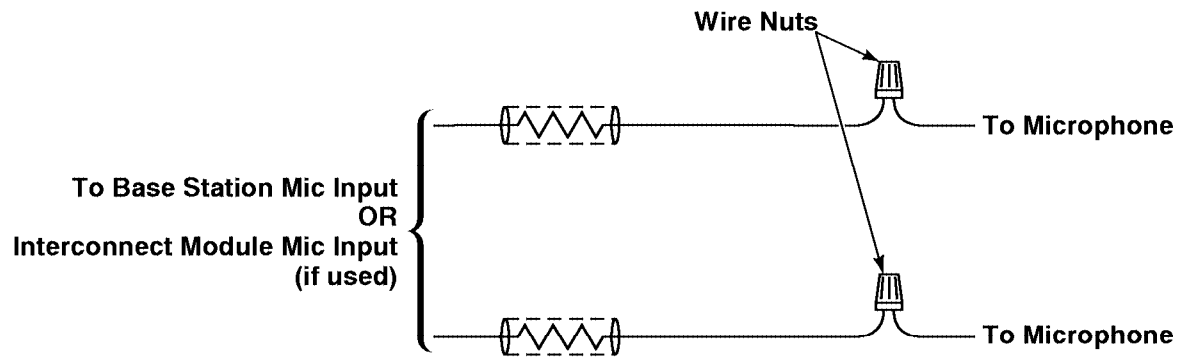
Determine the type of intercom system, and adjust the speaker and microphone according to the related installation instructions.



SP-171C

**Figure 1. Typical Installation in a Speaker Post**





**Attenuator is a 2-foot section of shielded microphone cable containing 2–1500 ohm resistors used for matching the audio output level of the new microphone to the base station electronics.**

SP-170A

**Figure 2. Attenuator Connections**



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# Installation Instructions

## 5-Inch Duplex Speaker Assembly

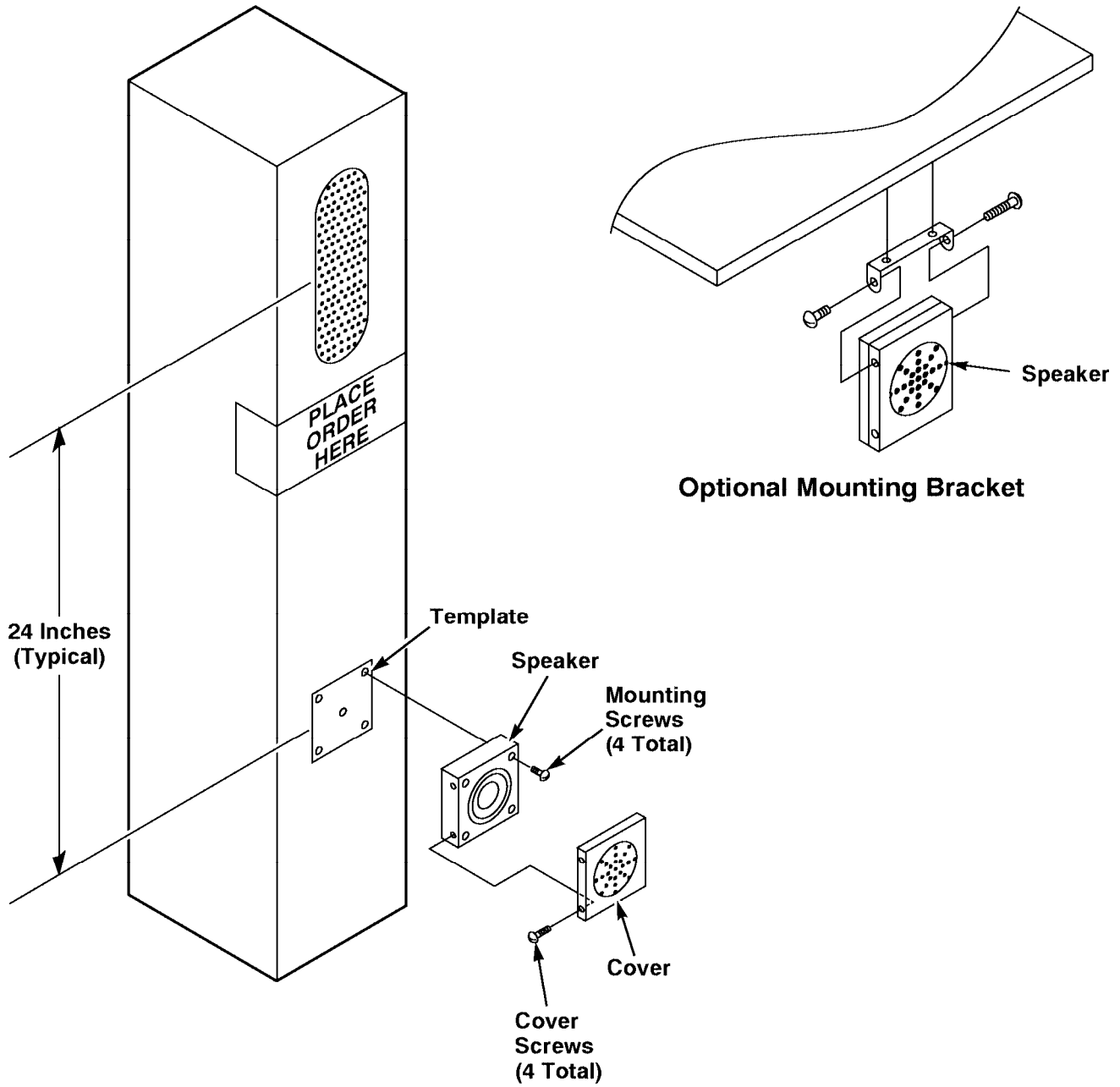
78-6911-4411-3

### **Introduction:**

These instructions describe the installation of a 5-inch duplex speaker assembly in an existing menu sign or speaker post. Please review these instructions before you begin the installation. The instructions provided are general in nature, describing complete installation in a “typical” menu sign or speaker post. If the menu sign or speaker post you are working with is different than those shown in these instructions, you may need to modify the procedure.

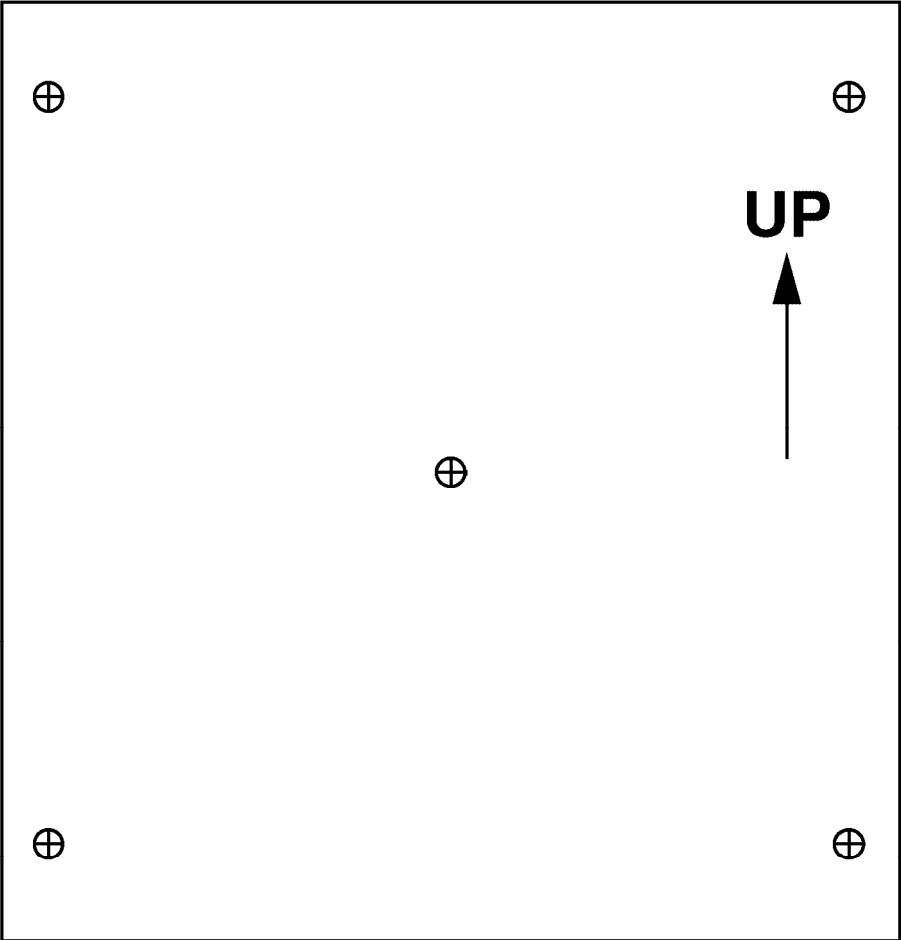
### **Procedure:**

1. Determine the type of mounting that is required. A typical installation on a speaker post is shown in Figure 1. A typical installation on a menu sign is shown in NO TAG. The optional mounting bracket shown in Figure 1 is provided for situations where the speaker cannot be mounted on a vertical surface. For information about types of mounting that are not shown, contact Food Service Business Technical Service at 1-800-328-0033.
2. Measure to mark the mounting location for the speaker. Use the template to mark the location of the mounting holes and cable entry hole. Refer to Figure 2.
3. Mark and punch four mounting holes and one cable entry hole.
4. Drill four 11/64-inch mounting holes and one 1/4-inch cable entry hole.
5. Install four #8 mounting screws of the appropriate type and size (not provided).
6. Insert cable in entry hole and hang speaker on mounting screw heads.
7. Remove speaker cover and tighten the mounting screws. Then reinstall the speaker cover.
8. Connect the leads from the speaker to the cable from the building. Solder and tape is recommended.

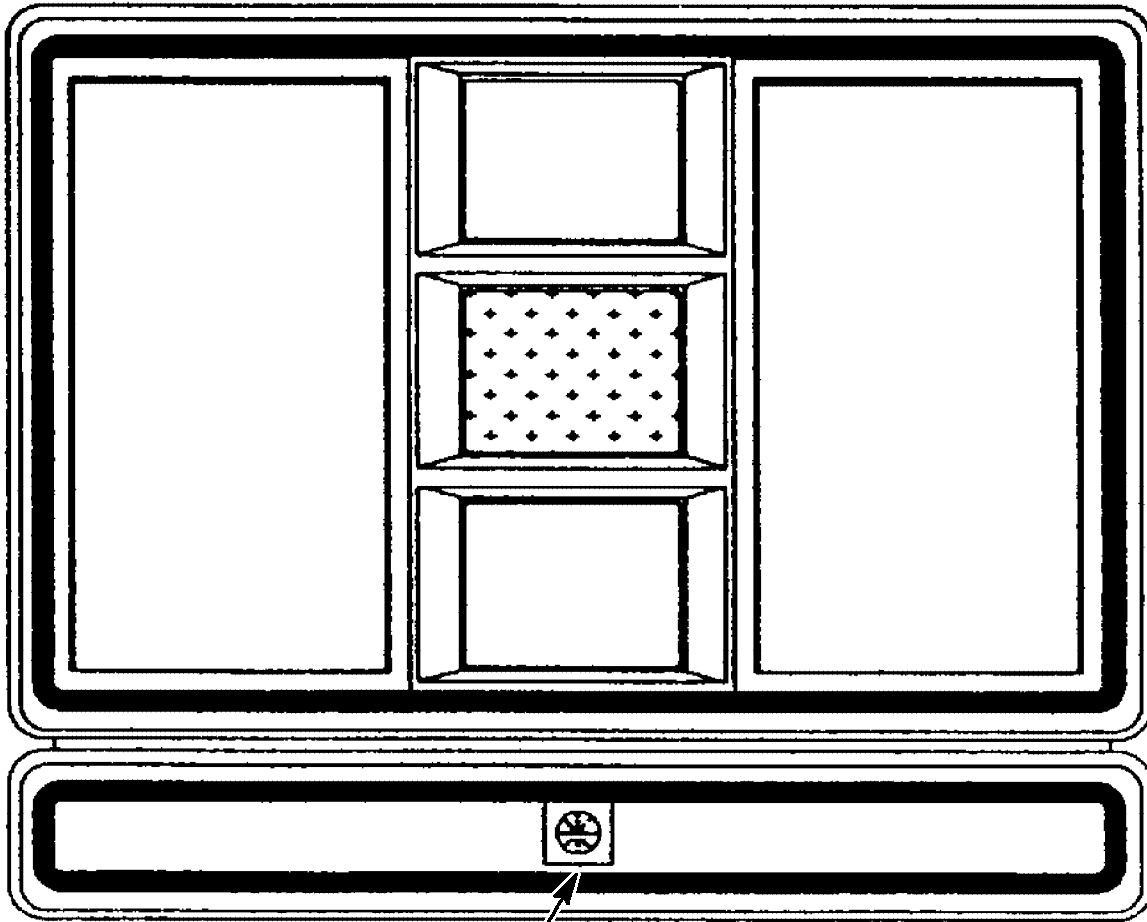


**Figure 1. Typical Installation on a Speaker Post**

SP-162A



**Figure 2. Speaker Mounting Template**



Align Speaker to Top Edge of  
Bevel Centered Under Microphone Grille

**Figure 3. Typical Installation on a Menu Sign**

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