

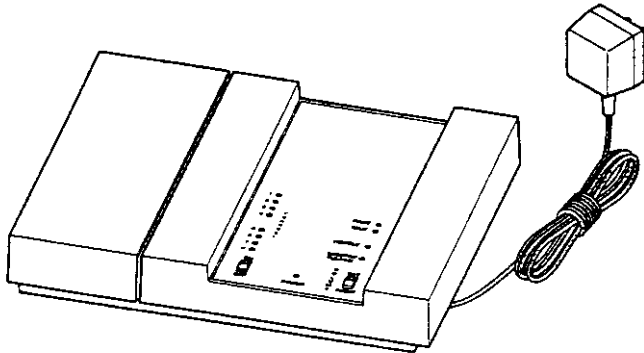
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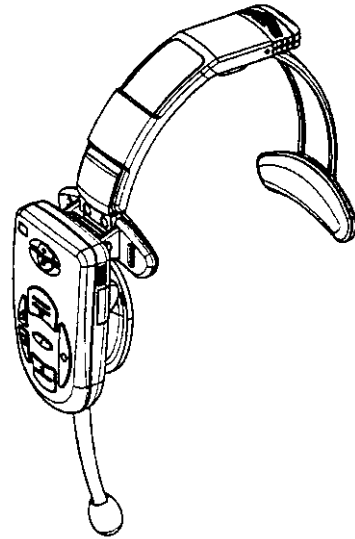
# Model C960AA

## Headset Intercom System

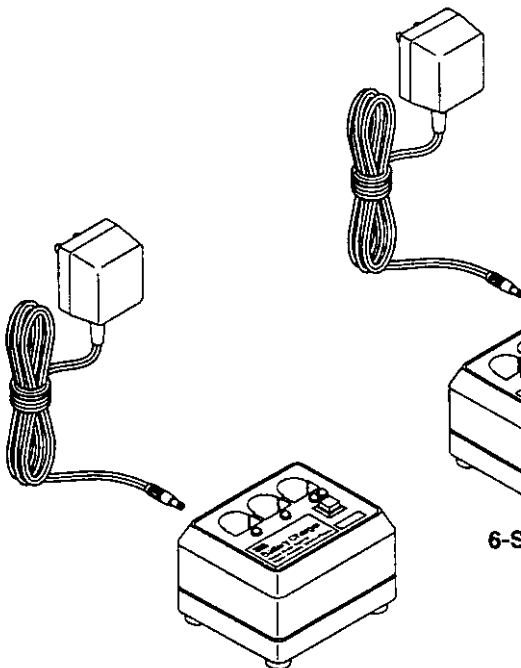
### Installation Instructions



Base Station

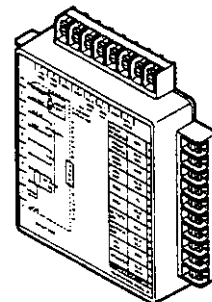


Headset



3-Slot Battery Charger

6-Slot Battery Charger



Interconnect Module

SP-290A

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## Typical Single Lane Installation

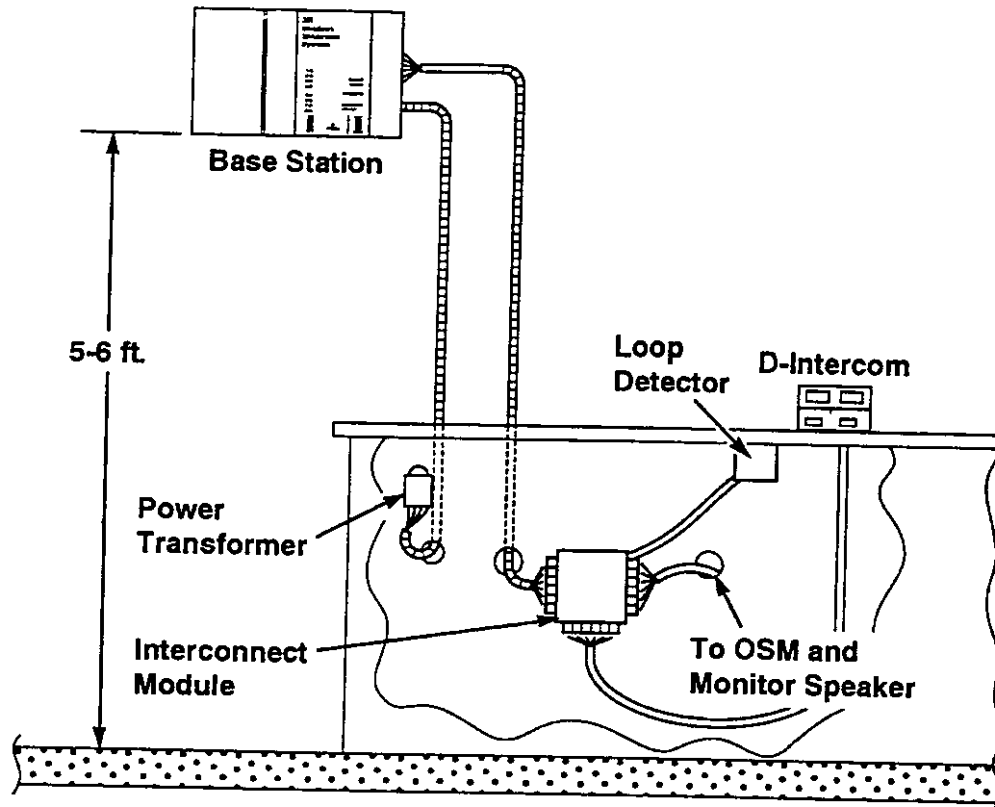


Figure 1. Typical Installation

### Material Required (not supplied)

- 3/4-inch conduit (metal or plastic) - 2 pieces 4-5 feet in length
- conduit clamps
- assortment of sheet metal screws
- two sets of 18-gauge, twisted-pair (two wires each set) audio cable, sufficient in length to connect the speaker and microphone assembly (in the menu sign) to the interconnect module or base station.

### ⚠ Important

The pair of wires for the microphone connection must be shielded for proper operation.

- In standard systems, the shielded microphone pair of wires can be in a cable which also contains other wire pairs.
- In duplex systems, the shielded microphone pair of wires must be alone in a separate cable for proper operation. If other pairs are in the cable with the microphone pair, problems will result.

- sufficient twisted pair sets of audio cable to connect other components such as monitor speaker, vehicle detection device, etc.

## Battery Charger

Install the battery charger and begin charging the headset 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.

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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.

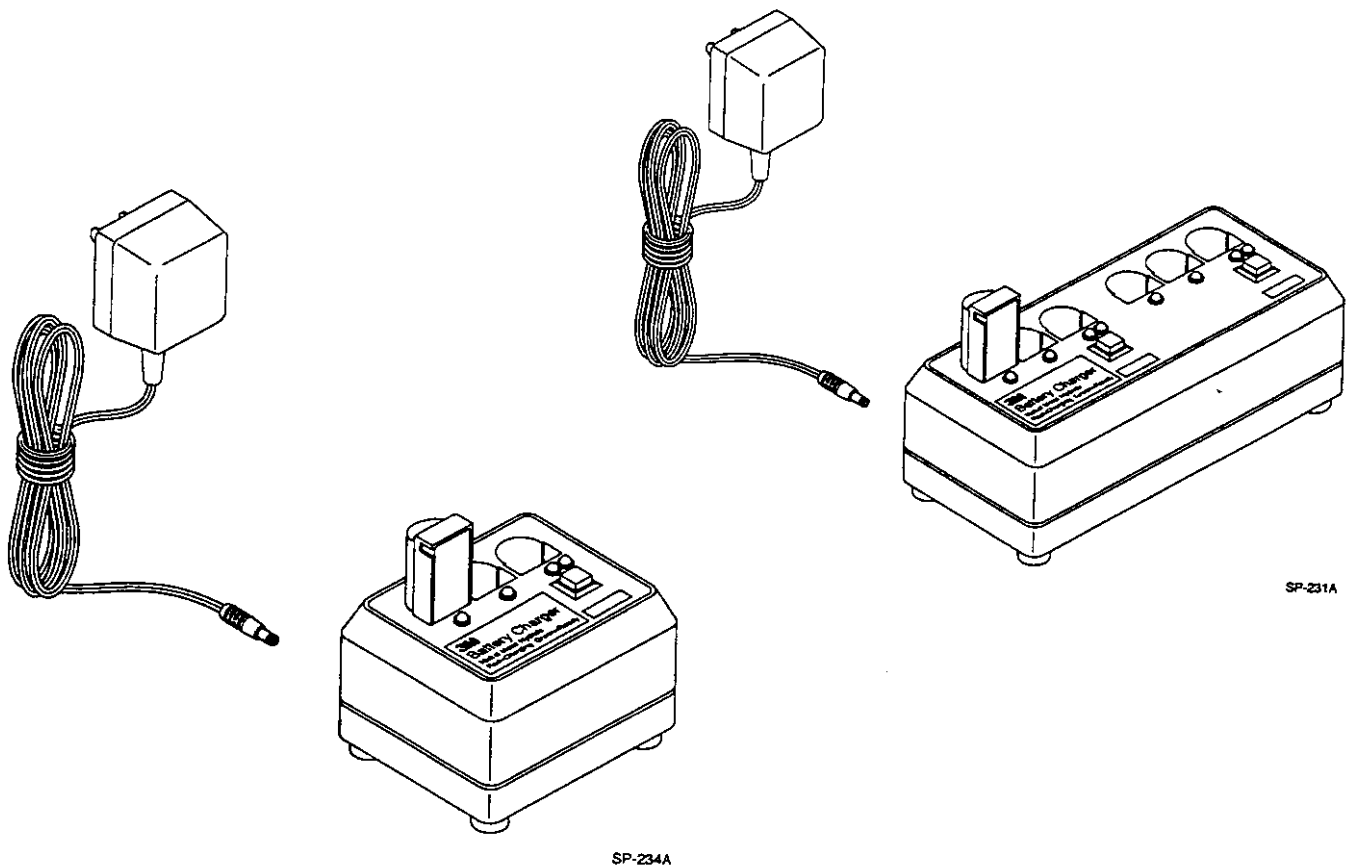


Figure 2. Battery Chargers (3-Slot and 6-Slot Versions)

## 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.

## 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.

### ! Important

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.)

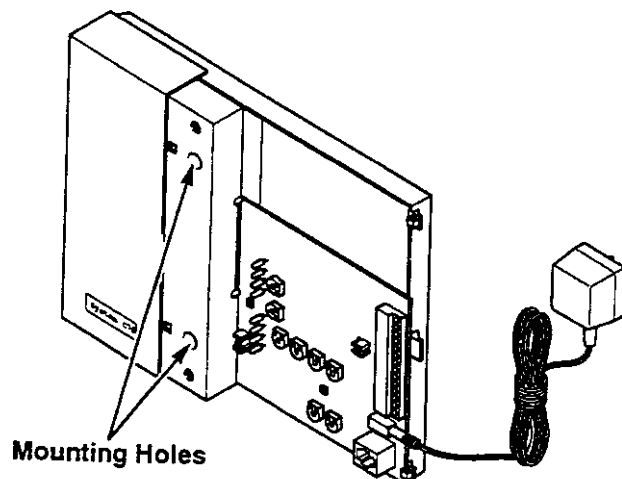


Figure 3. Base Station Mounting Holes

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.)

**⚠ Important**

The pair of wires for the microphone connection must be shielded for proper operation.

- In standard systems, the shielded microphone pair of wires can be in a cable which also contains other wire pairs.
- In duplex systems, the shielded microphone pair of wires must be alone in a separate cable for proper operation. If other pairs are in the cable with the microphone pair, problems will result.

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.

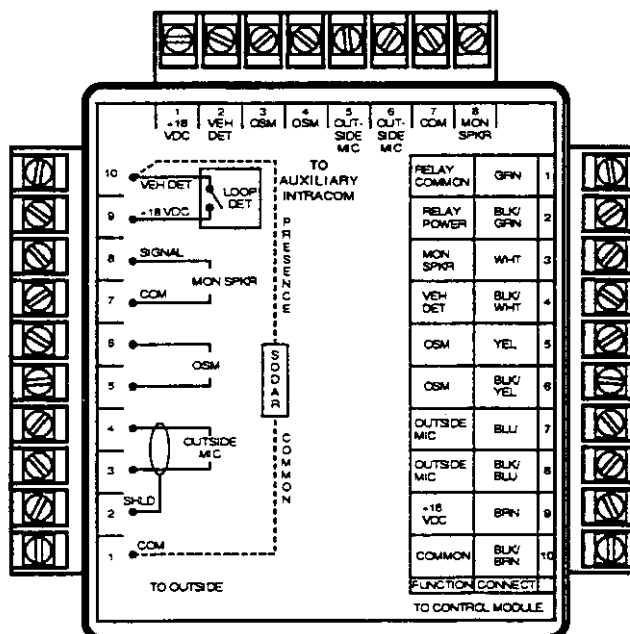


Figure 4. Interconnect Module

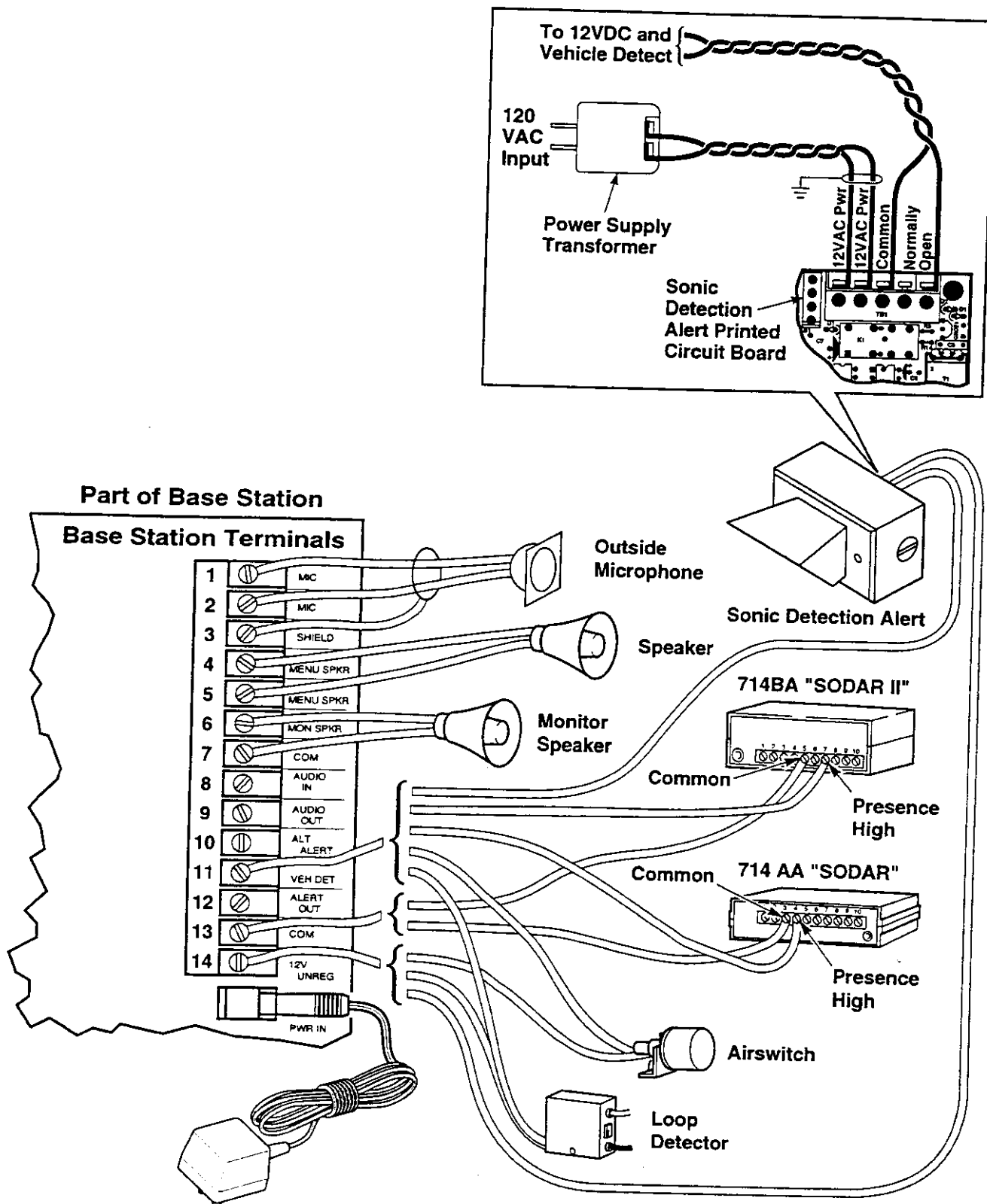
## Connecting the Base Station Directly to Components

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 pair of audio wire for the connection to the microphone.

### Important

The pair of wires for the microphone connection must be shielded for proper operation.

- In standard systems, the shielded microphone pair of wires can be in a cable which also contains other wire pairs.
- In duplex systems, the shielded microphone pair of wires must be alone in a separate cable for proper operation. If other pairs are in the cable with the microphone pair, problems will result.

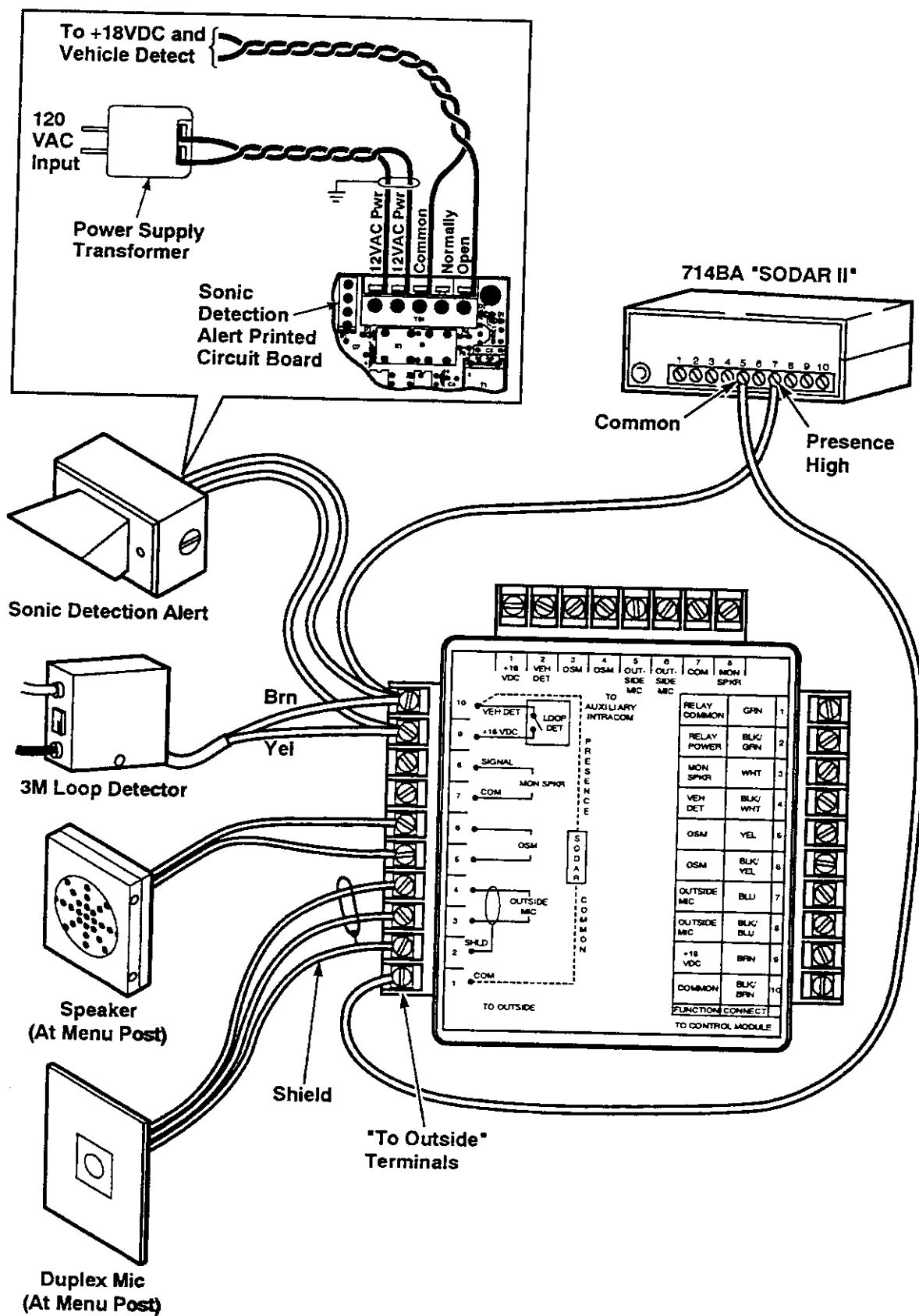


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Figure 5. Direct Base Station-to-Component Connections



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SP-282A

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 is turned off.

If a separate outside microphone is used, the auxiliary intercom must be configured for OUTSIDE MIC.

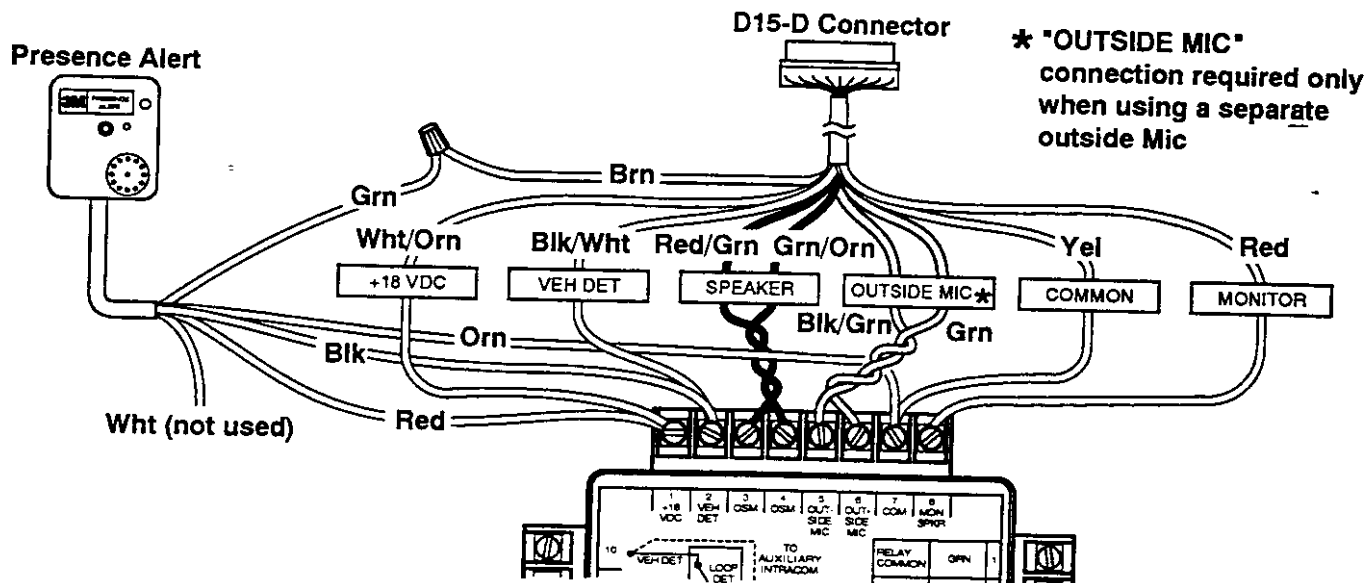


Figure 8. D-15D (M478 DA) Connections

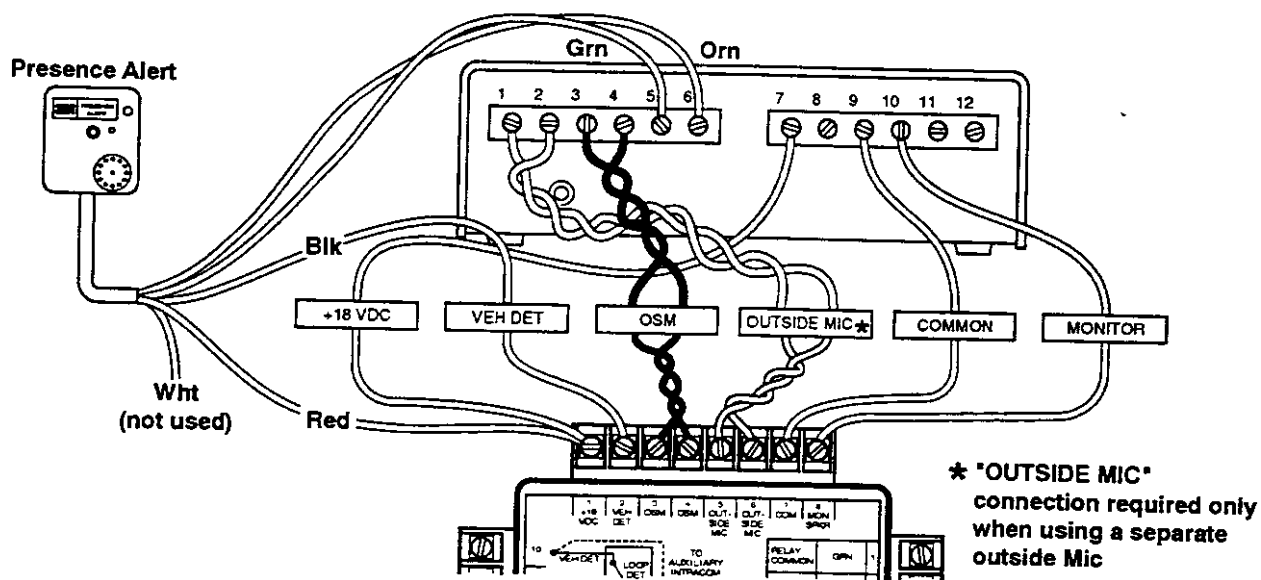


Figure 9. D-15B and D-15C (M478 BA and CA) Connections

### ⚠ Important

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

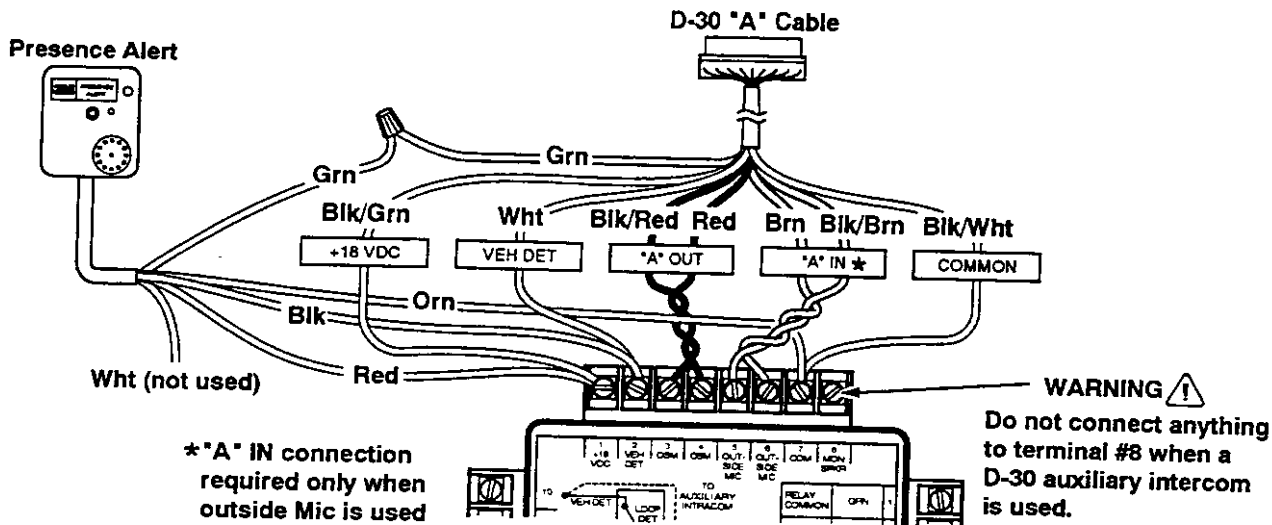


Figure 10. D-30 Connections

## 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 13 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.

**Note**

Preferably, each base station should be set to a different channel. However, if necessary (due to interference, etc.), both base stations may be set to the same channel.

6. Re-program the headsets as instructed on page 14.
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."

## 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 13 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 13) 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)

| Function                                       | Jumper Settings                                  |
|------------------------------------------------|--------------------------------------------------|
| Menu Sign with Speaker only (OSM)              | Jumper pins 1 and 2 on jumpers J1 <u>and</u> J2. |
| or                                             | or                                               |
| 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.                |
| or                                             | or                                               |
| Loop/Sodar (Presence) Detector                 | Jumper pins 2 and 3 of jumper J4.                |
| Standard Operation                             | Jumper pins 2 and 3 of jumper J5.                |

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

| Function                                                                                  | Jumper Settings                                                                                            |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Menu Sign with Speaker only (OSM)<br>or<br>Menu Sign with Separate Speaker and Microphone | Jumper pins 1 and 2 on jumpers J1 <u>and</u> J2.<br>or<br>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<br>or<br>Loop/Sodar (Presence) Detector                       | Jumper pins 1 and 2 of jumper J4.<br>or<br>Jumper pins 2 and 3 of jumper J4.                               |
| Standard Operation                                                                        | Jumper pins 2 and 3 of jumper J5.                                                                          |

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

| Function                                                            | Jumper Settings                                                              |
|---------------------------------------------------------------------|------------------------------------------------------------------------------|
| 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 J1.                                            |
| Air Switch (Pulse) Detector<br>or<br>Loop/Sodar (Presence) Detector | Jumper pins 1 and 2 of jumper J4.<br>or<br>Jumper pins 2 and 3 of jumper J4. |
| Duplex Operation                                                    | Jumper pins 1 and 2 of jumper J5.                                            |

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

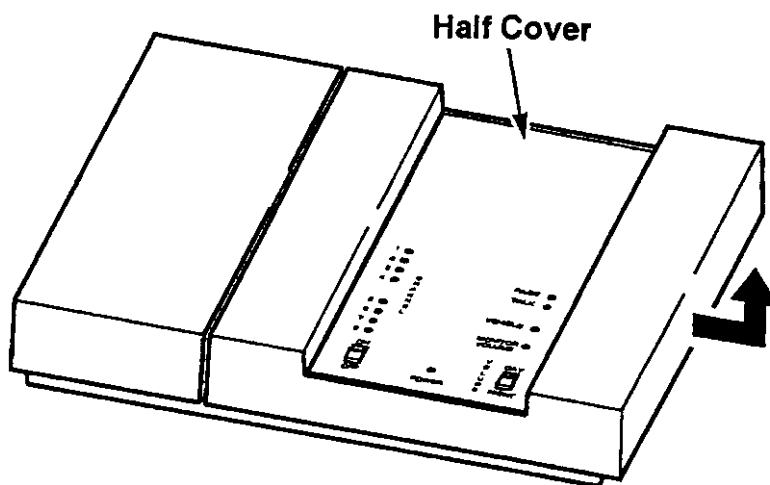
| Function                                                            | Jumper Settings                                                              |
|---------------------------------------------------------------------|------------------------------------------------------------------------------|
| 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<br>or<br>Loop/Sodar (Presence) Detector | Jumper pins 1 and 2 of jumper J4.<br>or<br>Jumper pins 2 and 3 of jumper J4. |
| Duplex Operation                                                    | Jumper pins 1 and 2 of jumper J5.                                            |

## Channel Selection

The Model C960 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 11.



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**Figure 11. 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.

After selecting a channel, press the RESET SWITCH on the base station circuit board to "read" the channel setting into the microprocessor. (see Figure 12.)

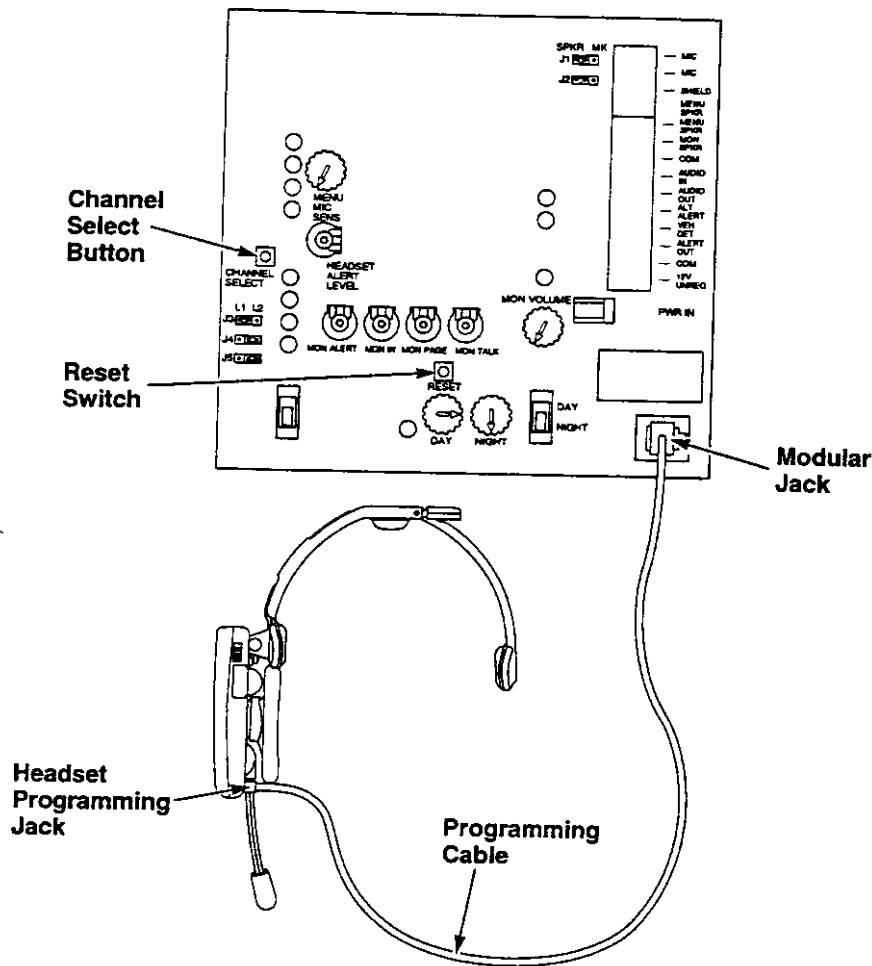
### **⚠ Important**

After making any changes to the base station programming (channel selection, jumper settings, etc.), 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 may be set to the same channel, but one base station must be designated as Lane 1 and the other base station as Lane 2.

## Channel Selection (Cont.)



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**Figure 12. Base Station Circuit Board**

3. With the headset 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. (Audible tones will be heard in the headset earpiece indicating that programming is complete.)

The headset 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 13). 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 volume controls have enough "range" to allow operators to adjust headset volume to their preference.

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 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 (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 headset volume control on the headset 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 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

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, and press the headset volume ▲ (up) switch seven times. (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 Talk 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 Page 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.

#### **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 off and then on, and press the headset volume ▲ (up) switch seven times. (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. Press and release the headset Talk 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 volume control was set at midrange, there will now be enough range (up/down) in the headset 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 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 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 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

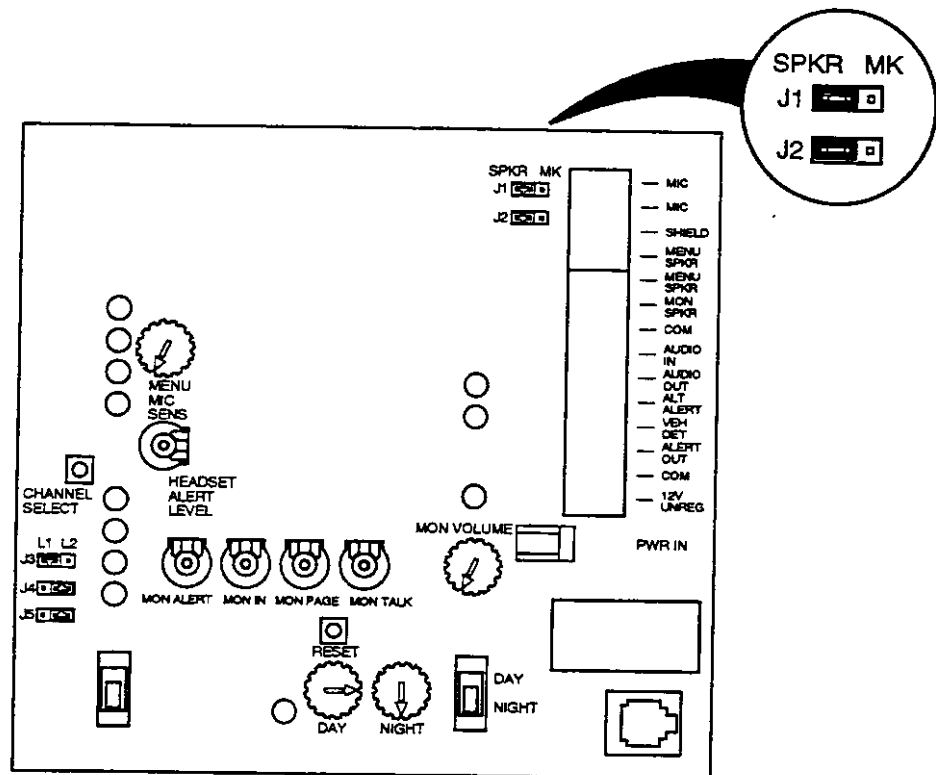


Figure 13. Base Station Circuit Board

### 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 2. Jumper pins 2 and 3 to select lane 1.
- 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.

### ⚠ 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

HEADSET ALERT LEVEL

DAY

NIGHT

MON VOLUME

MON ALERT

MON IN

MON PAGE

MON TALK

Controls the volume of the menu sign audio heard in the headset.

Controls the volume of the alert tone heard in the headset.

Controls the volume heard at the menu sign with the Day/Night switch in the Day position.

Controls the volume heard at the menu sign with the Day/Night switch in the Night position.

Master volume control for the following functions heard through the optional monitor speaker:

Controls the alert tone level.

Controls the audio level coming from the menu sign.

Controls the page audio level coming from the headset microphone.

Controls the talk audio level coming from the headset 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

CHANNEL 1-8

VEHICLE

TALK

PAGE

Lights when power is applied to the base station.

Lit LED indicates which channel is selected for base station operation.

Lights when a vehicle is detected at the menu sign.

Lights during communication between headset and menu sign.

Lights during paging from headset.

## Switches (etc.)

ON/OFF Switch

DAY/NIGHT VOLUME Switch

CHANNEL SELECT Switch

Programming Jack

RESET Switch

Controls power to the base station.

Selects volume for day or night operation.

Selects base station operating channel.

For programming headsets to the same channel as the base station.

For programming new channel selection or jumper setting(s) into the microprocessor.

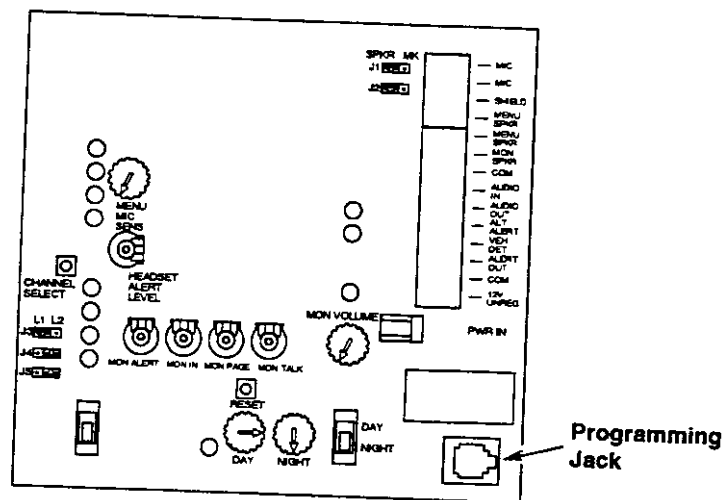


Figure 14. Base Station Circuit Board Controls

## **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.

Refer to the Model C960AA 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** 24 inches apart with their sound axes at 90 degrees to each other?
- 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 Media InTouch at the following address:

3M Media InTouch  
3M Center, Building 551-1E-02  
St. Paul, MN 55144-1000