



GE Mobile Communications

MVS

Installation Manual

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INTRODUCTION

This manual contains installation instructions for the MVS Mobile Radio and associated accessories. Included are mounting instructions, instructions for connecting the ignition cable assemblies and suggested cable routings. Interconnection and wiring diagrams are contained in the back of this manual.

UNPACKING AND CHECKING EQUIPMENT

Carefully unpack the Two-Way Radio. It is recommended that you identify the items ordered and check them off in the box below before discarding the packing material. If any damage has occurred to the equipment during shipment, file a claim with the carrier immediately.

STANDARD EQUIPMENT

Two-Way Radio
Microphone 19B801398P4
Microphone Hanger 19B801398P5
Battery Power Cable 19B801358P2
Mounting Hardware Kit 19A138051G11

OPTIONS

Control Panels

Option CP01 - 2 Channel 19B801450P1
Option CP02 - 2 Channel with Type 99 decode 19B801450P2
Option CP03 - 16 Channel with scan 19B801450P3
Option CP04 - 16 Channel with scan and Public Address 19B801450P4
Includes Public Address Relay 19C851585P6 (requires Option CC01 Option Cable)
Option CP05 - 128 Channel with scan 19B801450P5
Includes EEPROM Memory IC 19A705553P1

- Option CP06 - 2 Channel with Public Address 19B801450P6
Includes Public Address Relay 19C851585P6 (requires Option CC01 Option Cable)
Option CP07 - 16 Channel with scan and Type 99 decode 19B801450P7
- Other Available Options:
- Option PD01 - Noise Suppression Kit 19A148539G1
Option PS01 - AC Power Supply 121 V, 60 Hz, 13 Amp 19A704647P2
Option PS02 - AC Power Supply 121/242 V, 50/60 Hz, 13 Amp 19A704647P3
Option MC03 - Desk Microphone 19B851086P10
Option CC01 - Option Cable 19C851585P3
Option CC02 - Universal Tone Cable (requires Option CC01) 19C851585P5
Option CC03 - Power Cable (20 foot) 19B801358P4
Option LS01 - External Speaker (Dash Mount) 19C850550G10 (requires Option CC01))
Option LS02 - External Speaker (Window Mount) 19C850550G11 (requires Option CC01)
Option SU01 - External Alarm (Horn) Relay 19A705499P1 (requires Option CC01 and SU02)
Option SU02 - External Alarm ON/OFF Switch 19C851585P7 (requires Option SU01)
Option CB01 - Remote Mount Option

NOTE: ONLY ONE OPTION CABLE CC01 REQUIRED PER RADIO.

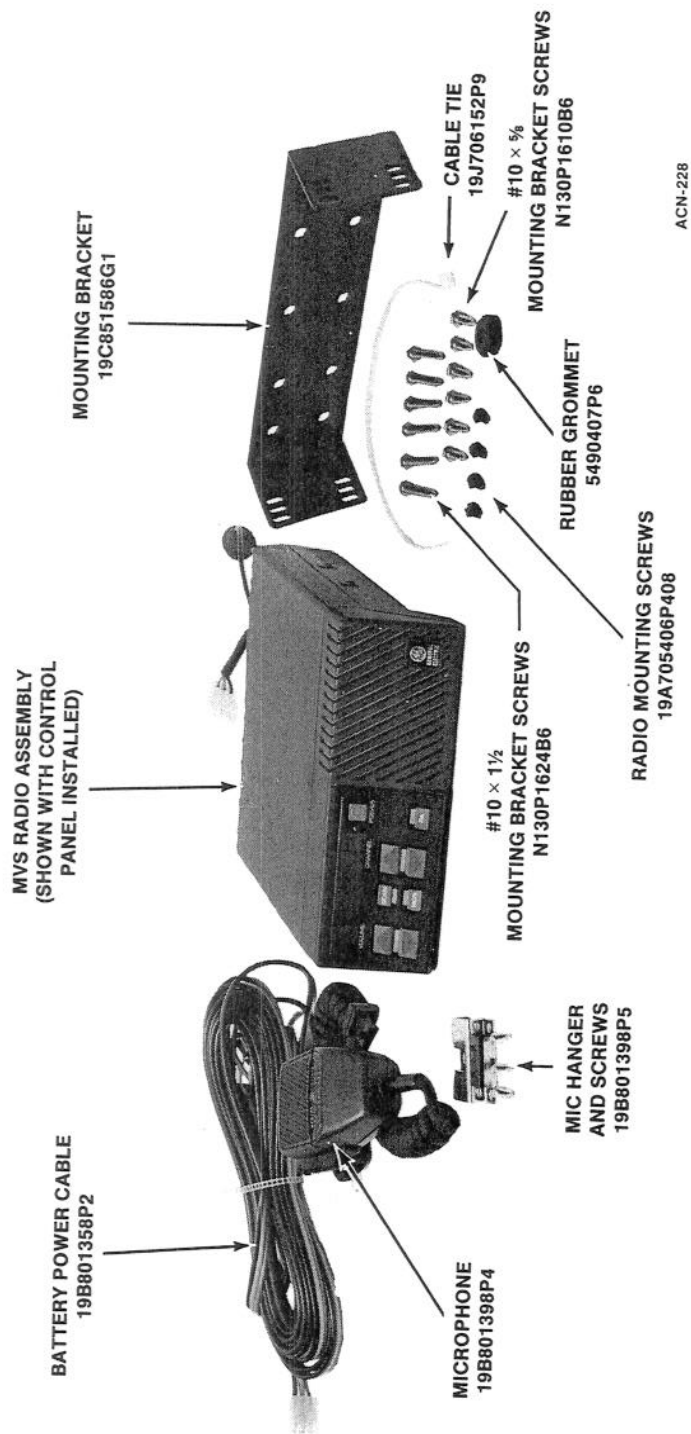


FIGURE 1 - MVS RADIO COMPONENTS AND MOUNTING HARDWARE

It is suggested that you take advantage of the experience of one of the many authorized General Electric Service Stations located throughout the United States by having them install the equipment.

WARNING

Interference with Vehicular Electronics - Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc., are typical of the types of electronic devices which may be prone to malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealer for the make of the vehicle and enlist his aid in determining if such electronic circuits will perform normally when the radio is transmitting.

The accompanying illustrations should help you in your installation.

PLANNING THE INSTALLATION

Before starting, plan your installation carefully so that it will be:

- Safe for the operator and passengers in the vehicle.
- Protected from damage from water.
- Easy for the serviceman to service.
- Neat.
- Out of the way of auto mechanics.

EQUIPMENT REQUIRED

The equipment required for installing the MVS Mobile Radio is:

- Electric Drill
- No. 31 (1/8-inch) drill for No. 8 screws
- No. 27 (9/64-inch) drill for No. 10 screws
- Phillips screwdriver

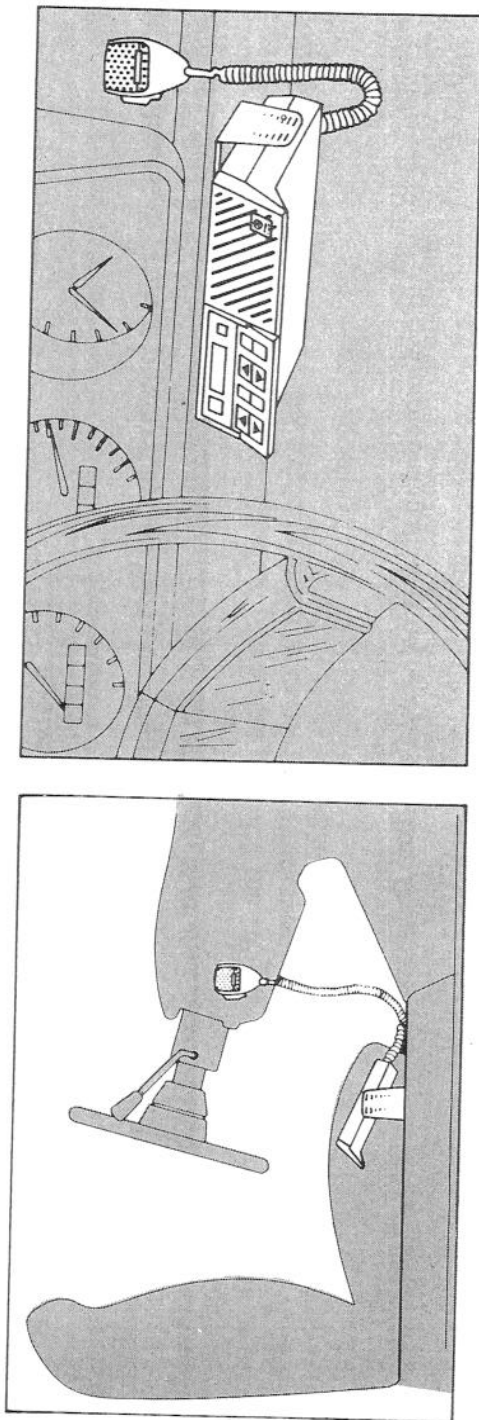


FIGURE 2 - TYPICAL HUMPH OR DASH MOUNT

- No. 15 TORX® driver (STO 606) for Control PANEL mounting
- No. 20 TORX® driver or 1/4-inch HEX driver for radio mounting
- 5/8-inch punch or hole saw for rubber grommet
- TORX® Trademark of CAMCAR Division, TEXTRON, Inc.

CAUTION

Be careful to avoid damaging some vital part (fuel tank, transmission housing, etc.) of the vehicle when drilling mounting holes. Always check to see how far the mounting screws will extend below the mounting surface before installing.

INSTALLATION IN VEHICLES POWERED BY LIQUIFIED (LP) GAS

WARNING

Radio installations in vehicles powered by liquefied petroleum gas must conform to the following requirements.

Radio installations in vehicles powered by liquefied petroleum gas with the LP-gas container in the trunk or other sealed-off space within the interior of the vehicle must conform to the National Fire Protection Association Standard NFPA 58 which requires that:

- Space containing radio equipment shall be isolated by a seal from the space containing the LP-gas container and its fitting.
- Outside filling connections shall be used for the LP-gas container.
- The LP-gas container space shall be vented to the outside of the vehicle.

RUNNING CABLES

To assure feasibility of the cable routing you plan to use, it is suggested that you run the cables before mounting the equipment. Be sure to leave some slack in the cables going to the equipment so that the equipment may be pulled out for servicing with the power applied and antenna attached.

Try to route the cables away from locations where they will be exposed to heat (exhaust pipes, mufflers, tailpipes, etc.), battery acids, sharp edges or mechanical damage, or where they will be a nuisance to automobile mechanics, the driver or passengers. Keep wiring away from electronic computer modules, other electronic modules and ignition circuits to help prevent interference to these components and radio equipment.

In addition, try to utilize existing holes in the firewall and trunkwall and the channels above and beneath the doors. You may also use the channels through door and window columns, where they are convenient for running cables, unless you plan to install rigid or flexible conduit in which to run cables.

POWER AND IGNITION CABLES

The Power Cable consists of a red lead, an orange lead, a black lead, a 3 pin systems plug, and a set of fuses and fuse holders to be installed (See Figure 3).

To install the Power Cable, start with the plug end of the cable at the location of the radio and run the three leads to the firewall, drill a 5/8 inch hole and insert the rubber grommet provided.

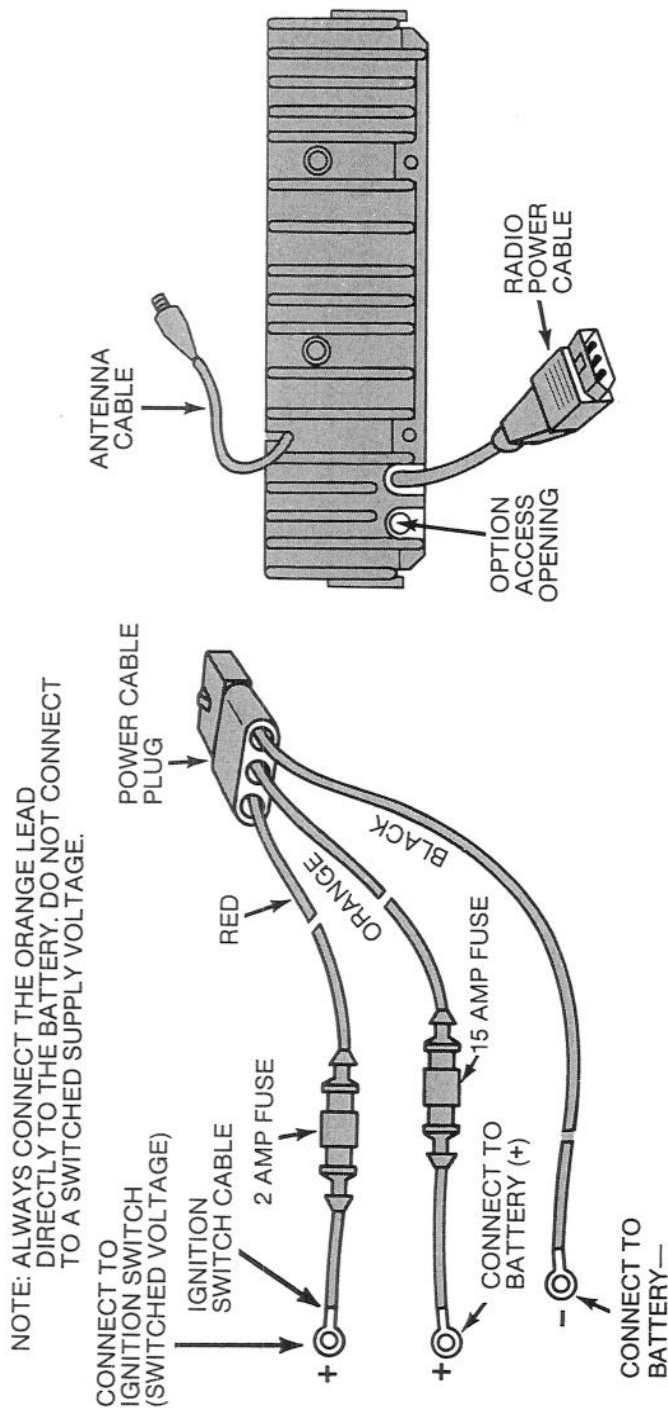
To install the fuses: 1) Cut off 12 to 18 inches from the red and orange wires; 2) Strip back the insulation approximately 3/8 of an inch on each end of the wires; 3) Insert the stripped end of each wire into the small opening at the end of each fuseholder section and crimp the wire to the fuseholder section; and 4) Place the fuse into the large section of the fuseholder and snap the large end of the fuseholder to the small end of the fuseholder.

Connect the orange fused lead to the positive (+) battery terminal, and the black to the negative (-) battery terminal. Always locate the fuse as close to the battery as possible.

Connect the red lead to the ignition "on" sense point (preferably an "Accessory" point on the fuse panel that is switched on when the ignition switch is in the accessory position and in the "run" position). Locate the fuse as close as possible to the accessory point.

NOTE

With some accessory points, the voltage only drops when the ignition switch is in the START position. A connection point should be used where the voltage is completely off when the ignition switch is in the START position.



MOBILE USE; HIGHLY RECOMMEND FUSE IN (-) LEAD ALSO

FIGURE 3 - POWER CABLE

CAUTION

Certain problems may be encountered when accessory equipment is connected to the ignition or accessory lines of the vehicle, where these lines may have large filter capacitors or a leakage path present.

If the radio does not turn off within a reasonable amount of time after the ignition is turned off, first try a different accessory or ignition sense pickup point in the vehicle. Many vehicles have more than one circuit that is switched by the ignition switch, and one may be available that does not have large filter capacitors or a leakage path present.

If a different pickup point cannot be found, then add a 470-ohm 1-watt resistor from the ignition sense pickup point to ground. This will discharge the capacitor(s) or reduce the leakage voltage to a low value. Current drain through this resistor will be minimal (less than 0.03A) when the ignition is switched on.

Coil up the surplus cables and secure them out of the way with the retaining strap provided. Be sure to leave some slack in the cables going to the radio so that it may be pulled out for servicing with the power applied.

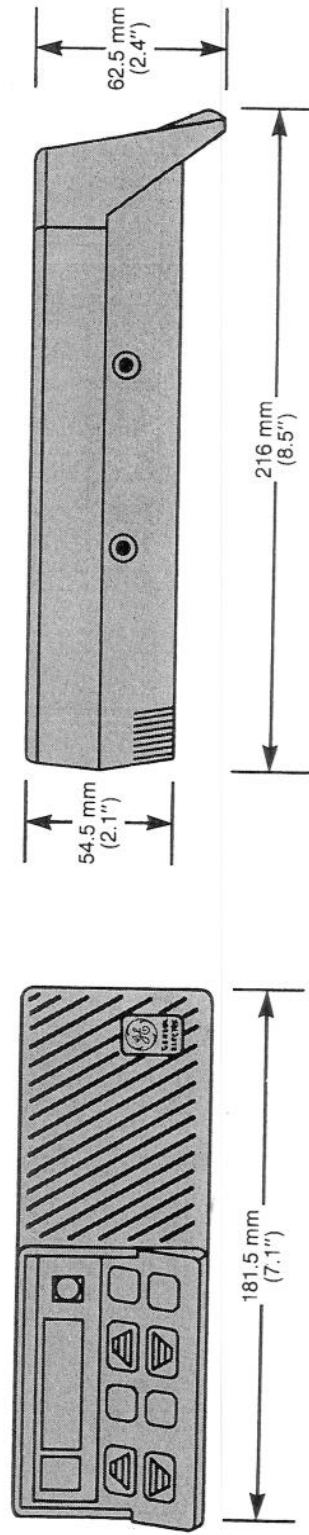


FIGURE 4 - MOUNTING DIMENSIONS

INSTALLING THE RADIO

Mount the radio so that the controls are within reach of the operator. Use the mounting bracket as a template to locate the holes, and mount the radio as shown in Figure 5. Be sure to leave enough room at the rear of the radio for cable connections.

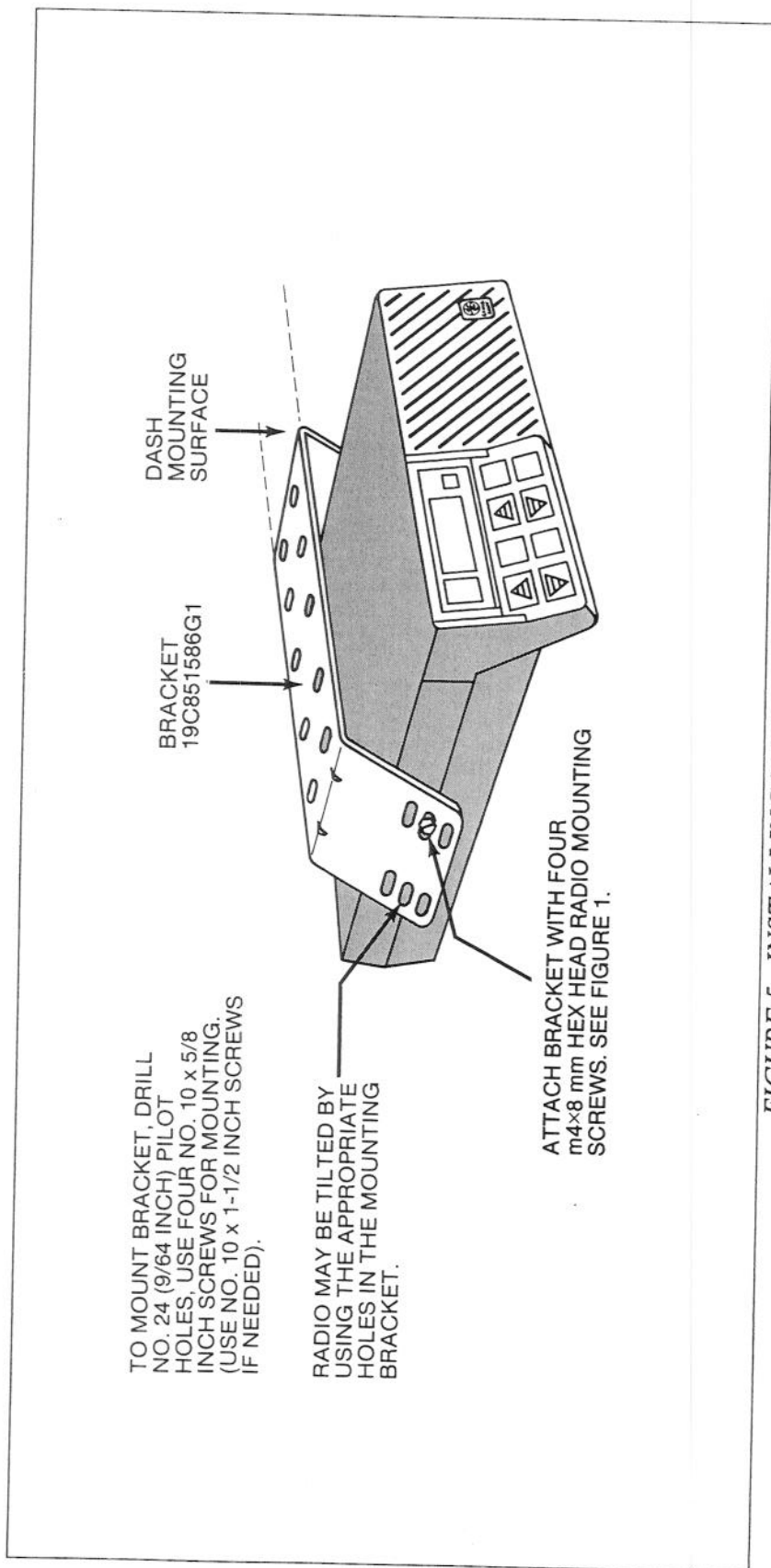


FIGURE 5 - INSTALLING MOUNTING BRACKET

MICROPHONE CONNECTIONS

Normally, the microphone is shipped connected to the radio. The connection is made at the bottom of the radio. A cable clamp is used for strain relief and is attached to the bottom of the radio using a M4-0.7x8 Hex Head screw.

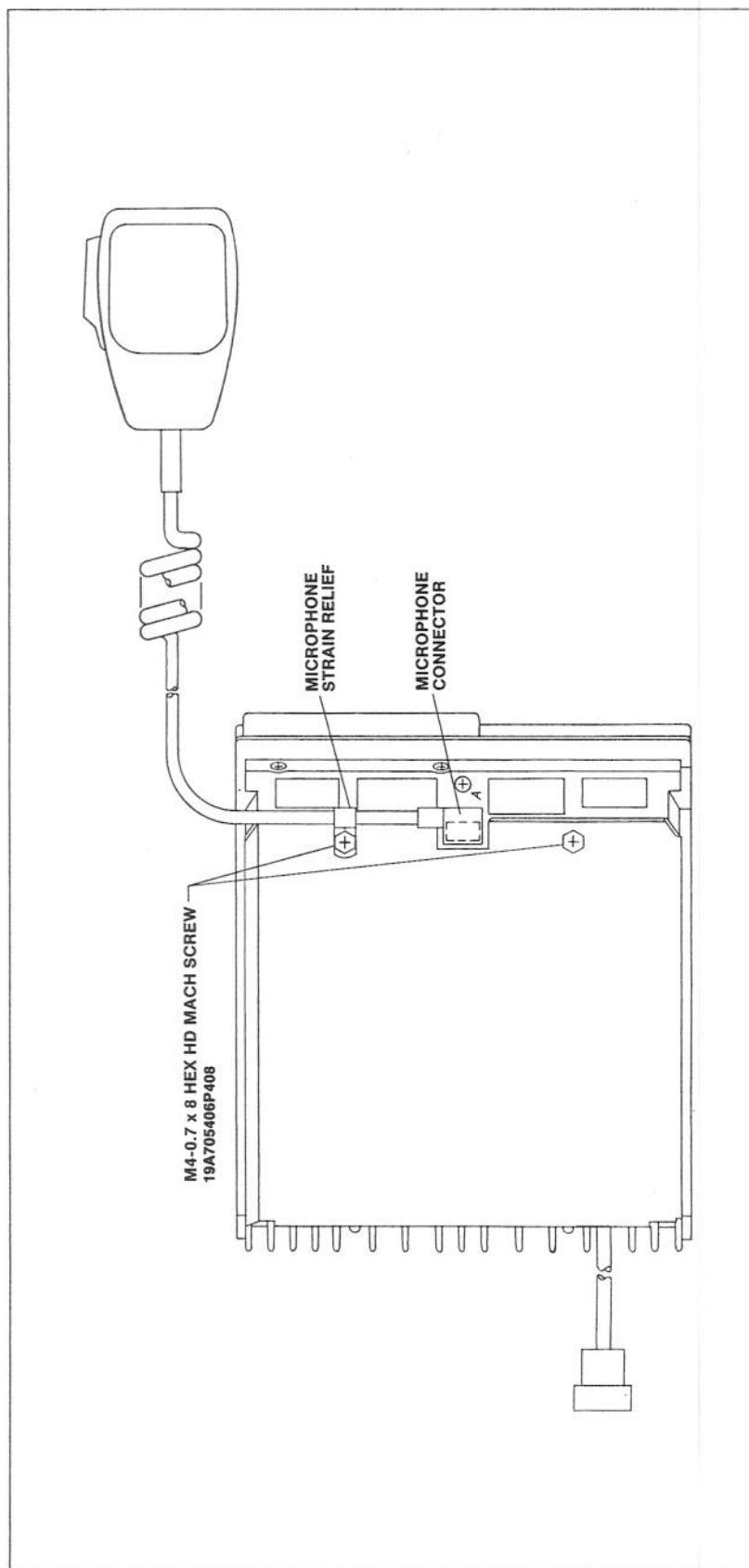


FIGURE 6 - MICROPHONE CONNECTION AND STRAIN RELIEF

MICROPHONE BRACKET

Mount the magnetic microphone bracket where it will be within easy reach of the operator, but will not interfere with safe operation of the vehicle. Refer to Figure 7 for bracket dimensions. The microphone must be placed in the hanger so that the cord end of the mike housing is over the magnet assembly. To mount the bracket, drill three No. 32 (1/8-inch) pilot holes, and use the No. 8 x 5/8 screws supplied with the bracket.

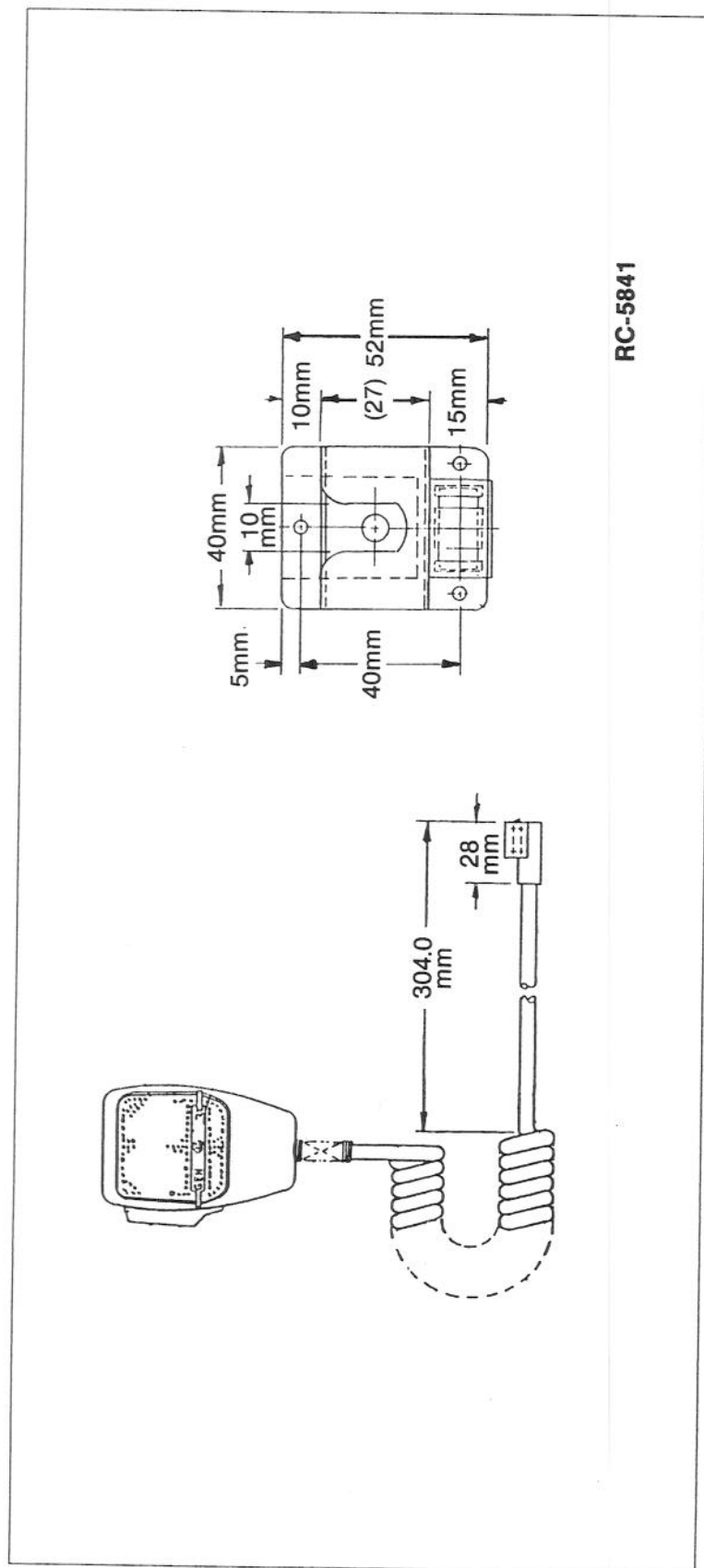


FIGURE 7 - MICROPHONE BRACKET MOUNTING

DISABLING THE MICROPHONE HOOKSWITCH

Placing the microphone off-hook disables Channel Guard. In scan radios, an off-hook microphone also stops scan completely (with the SCN indicator flashing) and the radio reverts to the SELECTED channel. If this feature is not desired, the hookswitch must be disabled to an on-hook condition at all times. This will allow scanning while the mic is out of the mic hanger between transmissions. The microphone has an internal magnetic reed switch which senses the magnet on the microphone hanger. The microphone must be opened, and either wire to the reed switch must be cut to disable the switch. See Figure 8.

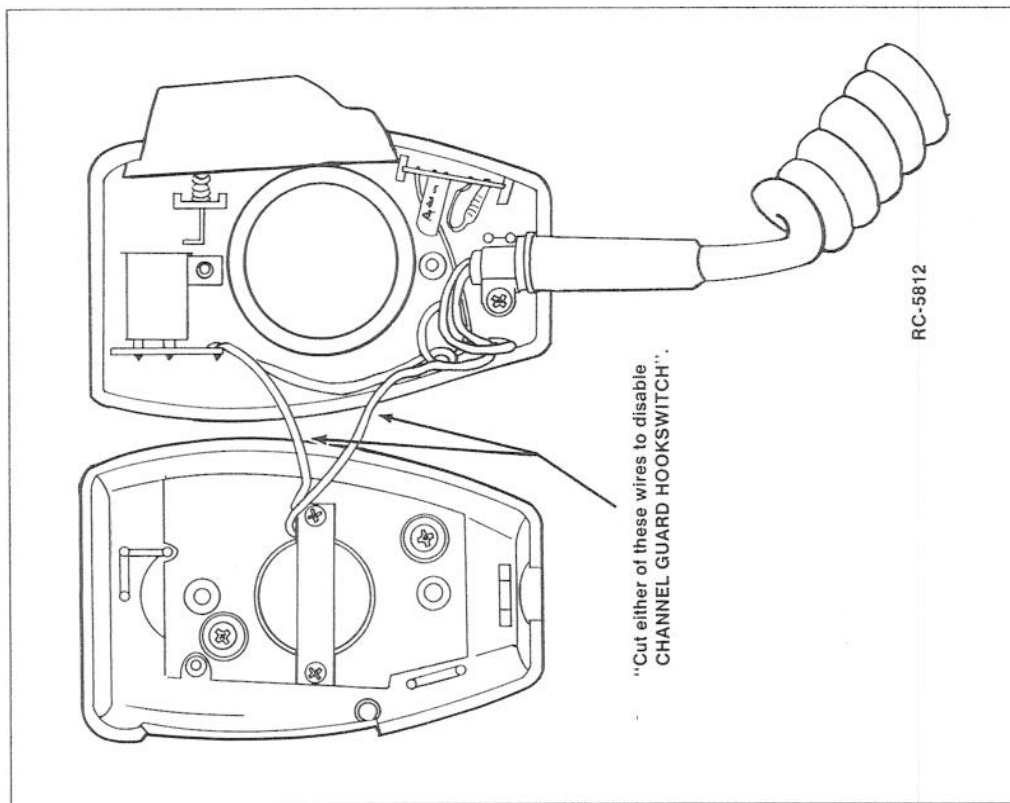


FIGURE 8 - DISABLING CHANNEL GUARD HOOKSWITCH

ANTENNA

Installation instructions for the antenna are packaged with the antenna. The antenna must be installed in accordance with good engineering practice for optimum results.

A permanent mount type of antenna should be located in the center of the roof or center of rear deck. Glass mounted antennas should be kept as high as possible in the center of the rear window. Some states have laws restricting vision obstructing items from the window. Be familiar with local laws before installing glass mount antennas.

Try to route the cable away from locations where it will be exposed to heat, sharp edges or mechanical damage, and where it will be out of the way of the driver, passengers or vehicles mechanics. Wherever possible, existing holes in the trunk wall, and the channels above or beneath doors and window columns should be utilized.

Avoid routing the antenna cable near any electronic modules or along side any vehicle wiring.

Connect the antenna cable to the TNC connector on the radio.

CAUTION

In station applications, the radio may not operate properly with the antenna mounted near the radio. Always mount the antenna at least 5 feet from the radio.

OPTIONAL ACCESSORIES

CONTROL PANELS OPTIONS CP01, CP02, CP03, AND CP07

NOTE

When the channel capacity of the radio is changed, Error 3 (E3) will be displayed until the radio is reprogrammed with new personality information. Refer to the programming software package.

To remove the Control Panel:

1. Remove the two control panel retaining screws (#15 TORX) from the bottom of the Front Cap Assembly. Refer to Figure 8.
2. Carefully pry the bottom of the control panel from the Front Cap Assembly exposing the ribbon cable on the rear.
3. Disconnect the ribbon cable from the backside of the control panel.

To install the new panel:

1. Connect the ribbon cable to the back of the panel.
2. Insert the panel into the Front Cap Assembly, and install the two M3.5-0.6x8 screws supplied. See Figure 1.
3. Remove the protective plastic from the LCD display.

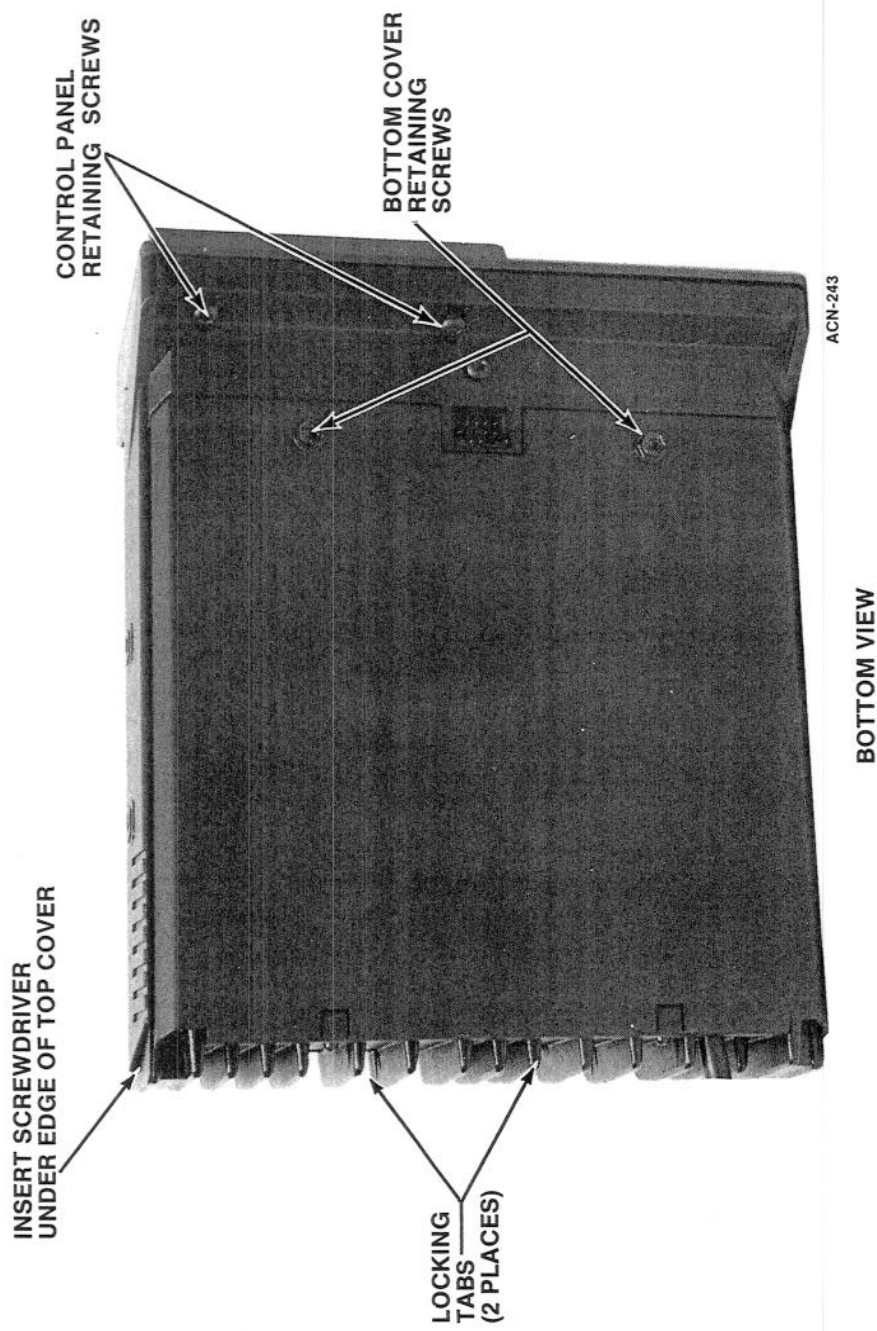


FIGURE 9 - BOTTOM VIEW

CONTROL PANEL OPTIONS CP04 AND CP06

Control Panels with Public Address are supplied with a Public Address Relay (19C851585P6). The relay requires Option Cable (Option CC01) and an external speaker. Mount the external speaker ON/OFF switch and the relay in a location where the operator will have easy access to the switch.

1. Remove the bottom cover of the radio by removing the two bottom cover retaining screws. Refer to Figure 9.
2. Cut the PC run between holes 6 and 7 on the System Board which will allow switching of the internal speaker. Refer to Figure 11.
3. Install the Option Cable (if not already present) by plugging the option cable to J905 on the system board. Replace the bottom cover.
4. Refer to Figure 10 and insert the pins on the relay wires into the empty connector housing supplied with the Option Cable. Plug the connector into P2 of the Option Cable.
5. Plug an external speaker (not supplied) into the two conductor connector on the relay.
6. Install the Control Panel as described previously for Option CP01.

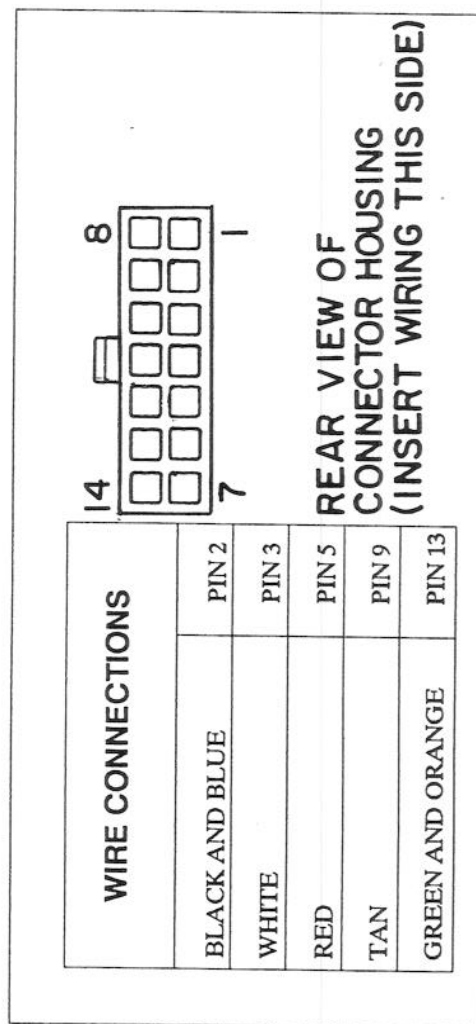


FIGURE 10 - WIRE LOCATIONS

BOTTOM VIEW

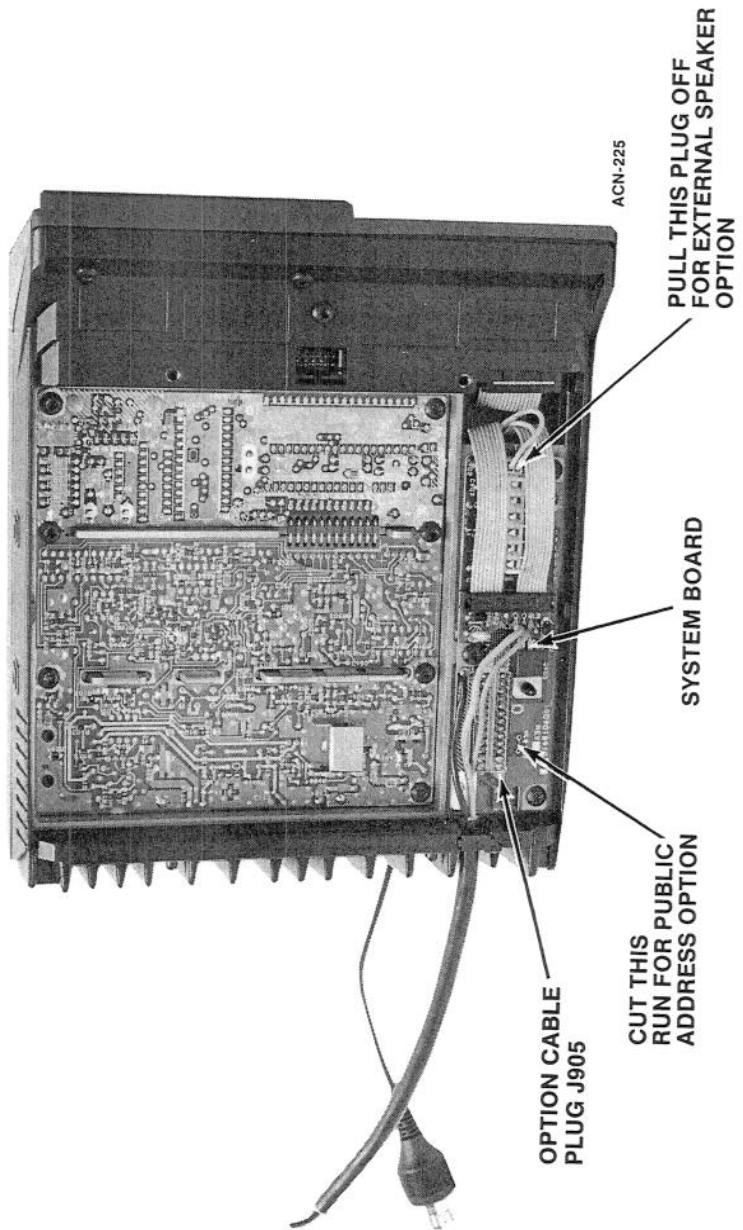


FIGURE 11 - BOTTOM VIEW (COVER REMOVED)

CONTROL PANEL OPTION CP05

A 128 Channel Control Panel is supplied with a larger EEPROM memory IC which must be installed on the Logic Board in the radio.

1. Remove the top cover by inserting a small standard screwdriver under one side of the top (at the rear of the radio) and gently pry the side of the cover away from the frame releasing the locking tab. Using the screwdriver, press in on the two locking tabs at the rear of the radio and release the two tabs. Move the screwdriver to the other side of the radio and release the other locking tab to release the top cover from the radio frame.
2. The EEPROM is on the Logic Board which is under the Audio Board. Remove the Audio Board by first pulling out the black clip shown in Figure 11. Remove the four #15 TORX screws securing the Audio Board to the radio. Pry out the board by inserting a screwdriver in the hole that was occupied by the clip.
3. Unplug and replace U704 with the new EEPROM.
4. Replace the Audio Board, the black clip, and the top cover.
5. Install the Control Panel as described previously for Option CP01.
6. Reprogram the radio. Error 3 (E3) will be displayed until the radio is reprogrammed.

TOP VIEW

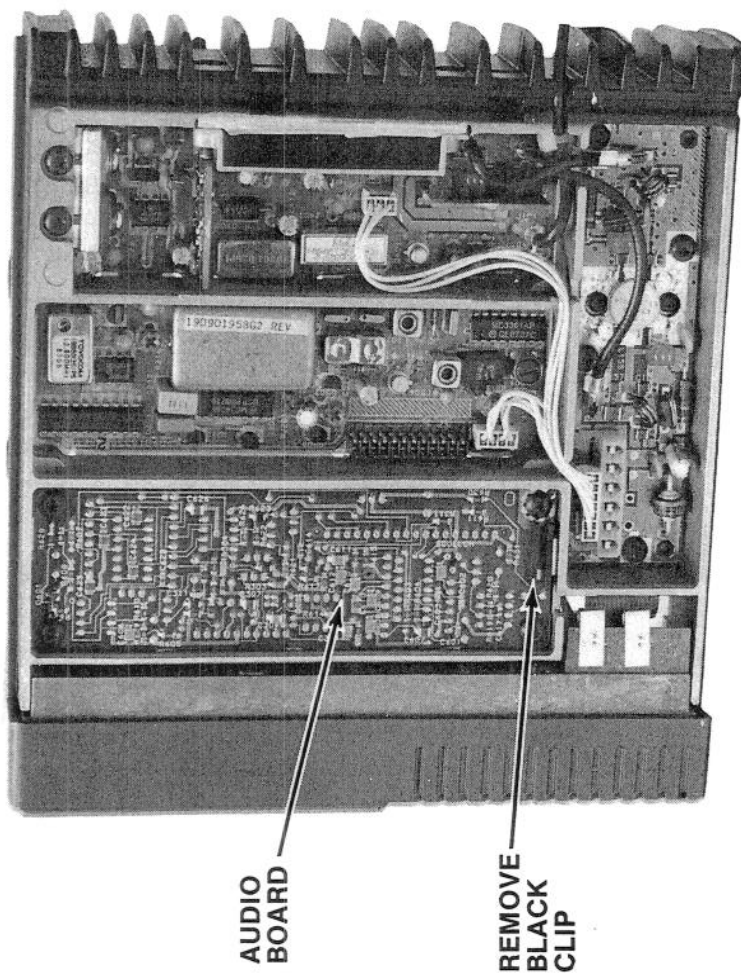


FIGURE 12 - TOP VIEW (COVER REMOVED)

AC POWER SUPPLY (12 VOLTS AT 13 AMPS)
OPTION PS01 (19A704647P2) 121 V, 60 Hz
OPTION PS02 (19A704647P3) 121/242 V, 50/60 Hz

1. An empty connector housing and terminals are provided with the power supply. Crimp three terminals on the end of the 9 foot power cable provided with the radio. An optional 20 foot cable is available.
2. Insert the orange and red leads into Pins 3, 6, or 9 of the connector housing. Insert the black lead into Pins 1, 4, or 7. Figure 12 provides an illustration of the empty connector housing which plugs into J1 of the power supply.

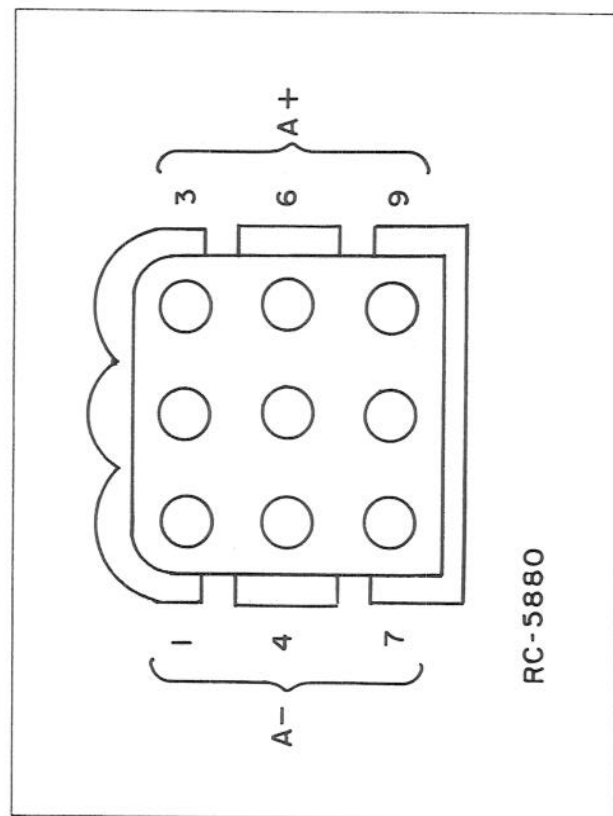


FIGURE 13 - REAR VIEW OF EMPTY CONNECTOR HOUSING

DESK MICROPHONE OPTION MC03 (19B851086P10)

1. The desk microphone plugs into the microphone jack on the bottom of the radio. Remove the standard microphone and reuse the same cable clamp for strain relief.
2. If needed, adjust the microphone gain depending on the normal talking distance from the microphone. Access the gain control through the small hole on the bottom of the microphone base.
3. The microphone audio is normally switched off when the PTT button is released. If the microphone audio needs to be active at all times, a jumper must be placed across the switch inside the microphone.

OPTION CABLE OPTION CC01 (19C851585P3)

The Option Cable brings all option connections from the System Board through the back of the radio to the outside. This cable is required with all external options (except the Remote Mount Option). Supplied with the Option Cable is the empty connector housing which plugs into P2 of the Option Cable. Pins supplied on the ends of the wires of each option (Molex #39-00-0060) are inserted into this connector housing. Refer to the Interconnection Diagram in the back of this manual. See Figure 14 for pin locations.

1. Remove the bottom cover of the radio as described previously for Options CP04 and CP06.
2. Remove the rubber plug from the slotted opening in the rear of the radio adjacent to the power cable.
3. Plug the Option Cable into J905A on the System Board and push the strain relief on the cable into the slotted opening. Refer to Figure 11.
4. Before replacing the bottom cover, check to see if the particular option being added requires unplugging the internal speaker or changing a jumper (Refer to the section describing the option).

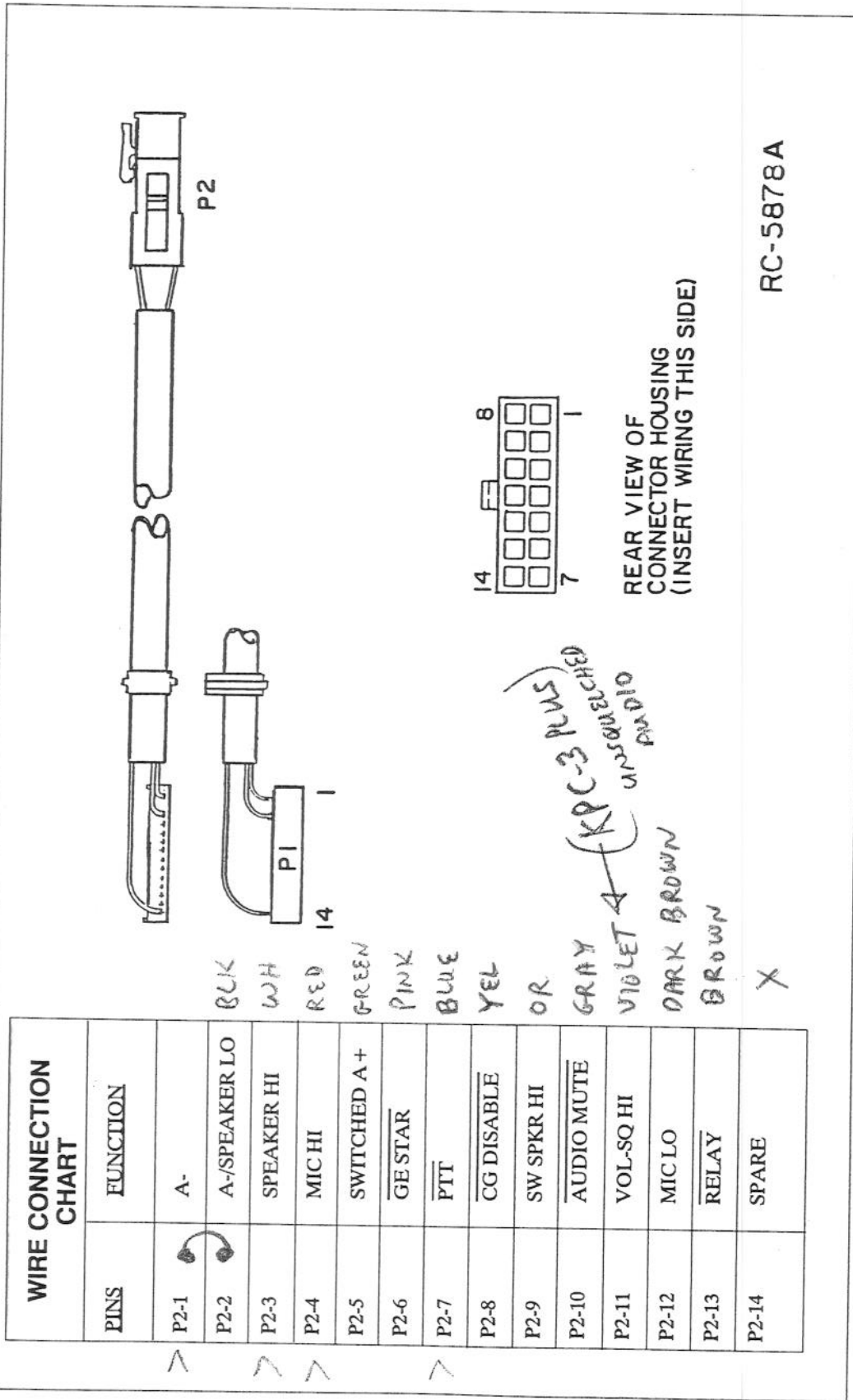


FIGURE 14 - OPTION CABLE PIN LOCATIONS

UNIVERSAL TONE CABLE OPTION CC02 (19C851585P5)

The Universal Tone Cable requires the Option Cable (Option CC01). P1 of the Universal Tone Cable plugs into P2 of the Option Cable. The Universal Tone Cable Option provides all option connections on P2 and a 9-pin Winchester connector for connecting to external tone encoders or decoders. See Figure 15.

If the tone decoder requires switching the internal speaker, remove the radio bottom cover and cut the PC run between holes 6 and 7 on the System Board. Refer to Figure 11 for the PC run identification.

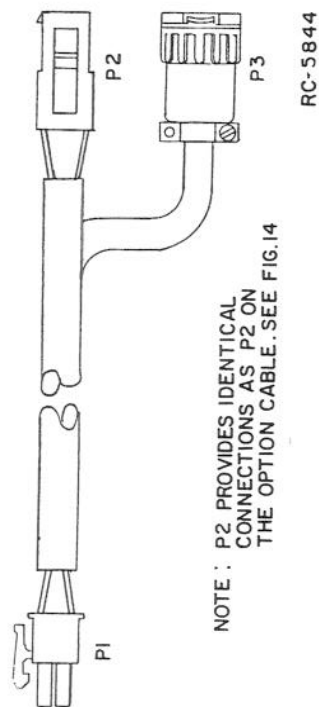


FIGURE 15 - TONE CABLE PIN LOCATION

EXTERNAL SPEAKER OPTION LS01 (19C850550)

1. Mount the External Speaker where the sound will be directed to the operator but not interfere with his vision or provide a hazard to passengers in case of an accident. The speaker may be mounted on the lower edge of the instrument panel, the firewall, or above the windshield in some trucks. Use the mounting bracket as a template for locating the mounting holes, and mount the speaker as shown in Figure 16.
2. Install the Option Cable (Option CC01) if not already present.
3. Before replacing the bottom cover of the radio, unplug the internal speaker from A5 J904 on the System Board. Refer to Figure 9.
4. Pins are supplied on the ends of the speaker leads. Push these pins into pins 2 and 9 of the connector housing supplied with the Option Cable. Refer to Figure 14.
5. Plug the connector into P2 of the Option Cable.

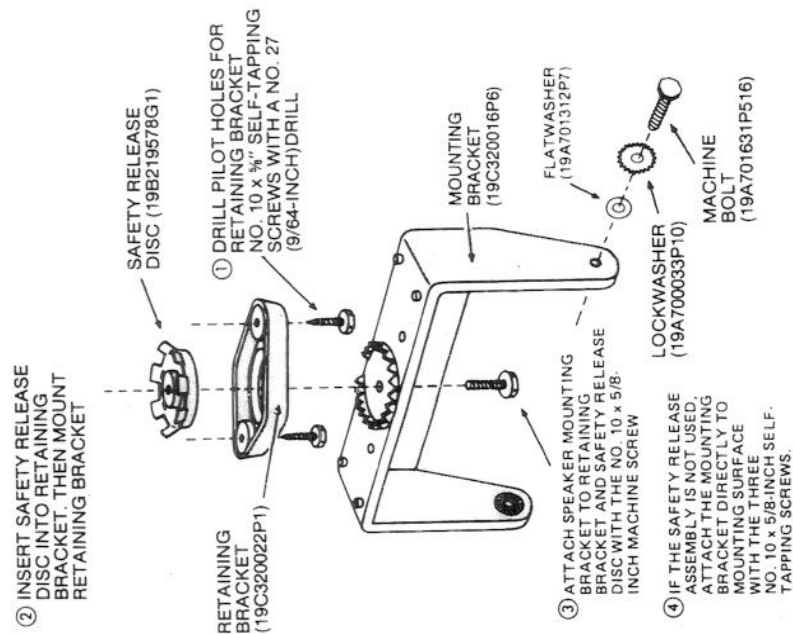


FIGURE 16 - MOUNTING THE SPEAKER

EXTERNAL ALARM (HORN) RELAY OPTION SU01 (19A705499P1)

The Alarm Relay Option requires the Option Cable (Option CC01). External Alarm ON/OFF Switch (Option SU02) is required to allow the horn relay to be disabled when desired. The Option consists of the following items:

- (1) Relay (19A149299P1)
- (1) Fuseholder
- (1) Fuse, 1 Amp, 250 volt
- 4 feet Red wire, AWG #18 with Ring Tongue Terminal for 3/8 stud
- 6 feet Black wire, AWG #18 with Molex #39-00-0060 terminal
- (5) Insulated 1/4 inch spade tab receptacles
- (1) Ring Tongue Terminal for 3/8 stud
- (1) #8 x 3/4 long Type A sheet metal screw
- (1) Nut Plate for #8 screw

1. Install the Option Cable (Option CC01) in the radio.
2. Fasten the relay in the desired location, close to the voltage source, using one #8 x 3/4 inch self-tapping screw.
3. Crimp an insulated 1/4 inch spade tab receptacle to one end of the #18 red wire. Connect the receptacle to relay lug #86. Cut the red lead so the fuse assembly is close to the voltage source. Install the fuseholder. Attach the other end of the fuse lead to the voltage source with appropriate hardware. See Figure 16.
4. Insert the black wire with the Molex terminal into Pin 13 of the option connector housing supplied with the option cable. Plug the connector into the option cable.

NOTE

If External Alarm ON/OFF Switch (Option SU02) is used in conjunction with this option, refer to the next section describing Option SU02.

5. Crimp insulated 1/4 inch spade tab receptacle to the other end of the black wire. Connect the receptacle to relay lug #85.
6. Connect the horn or light circuit to lugs #30 and #87 (not 87a) using the insulated 1/4 inch spade tab receptacles.

NOTE

The relay contact make/break current and voltage rating is 30 amps at 16 volts.

EXTERNAL ALARM ON/OFF SWITCH OPTION SU02 (19C851585P7)

The External Alarm Switch, when used with the External Alarm Relay (Option SU01), allows the alarm relay to be disabled when desired. Connect the switch in series with the black wire from the relay. Insert the wire with the Molex terminal into Pin 13 of the option cable connector housing. Splice the other switch lead to the black wire from the relay. See Figure 17.

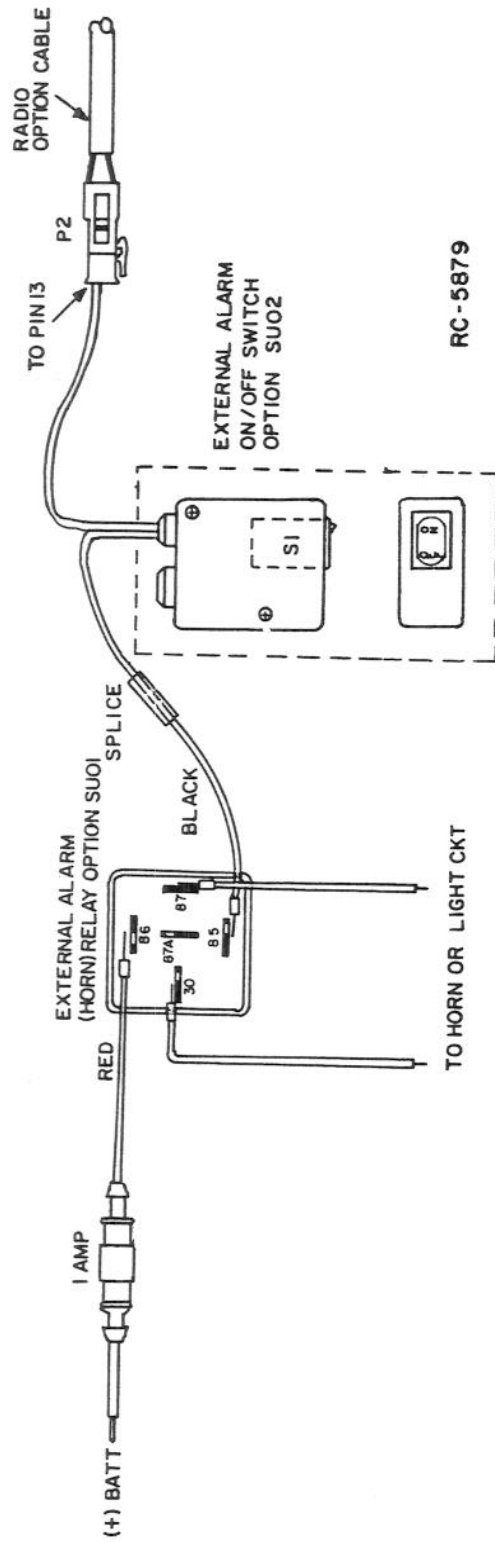


FIGURE 17 - EXTERNAL ALARM RELAY AND ON/OFF SWITCH

REMOTE MOUNT OPTION CB01

Contains:

Remote Mount Kit (19A705306G1)

- (1) Blank remote mount front cap assembly (19B801515G1)
- (1) Rear Housing for remote control unit (19B801516G1)
- (1) System Cable (19C851639P1)
- (1) Power Cable (20 feet) (19B801358P4)
- (1) Jumper Plug (19A149448P1)
- (1) Cable Clamp (19A701863P17)
- (2) M3.5-0.6x8 Flat Head Machine screws (19A702362P408)
- (2) M3.5-0.6x8 Pan Head Machine screws (19A702364P408)
- (2) M4-0.7x13 Hex Head Machine screws (19A705406P413)
- (2) M4-0.7x8 Hex Head Machine screws (19A705406P408)

Mounting Bracket Kit (19A705306G2) for remote control unit:

- (2) Mounting support brackets (19C851635P1)
- (6) Lock washers (19A700033P7)
- (6) Flat washers (19A701312P6)
- (6) M4-0.7x13 Hex Head Machine screws (19A705406P413)
- (4) Sheet Metal Screw (N193P1412J2)
- (4) Nut Plates (4029387P6)

This section contains modification instructions for changing the MVS front mount radio to a remote mount radio. Refer to the Assembly Drawing provided in Figure 18.

1. Unplug the microphone cable from the radio.

2. Remove the two TORX head screws which hold the bottom cover to the radio. Remove the bottom cover and unplug the speaker cable from the System Board. Install jumper plug at J905 on the System Board. Replace the bottom cover and reinstall the two torx head screws without the mic cable clamp.
3. Remove the top cover.
4. Remove the five screws that hold the front cap to the radio.
5. Unplug the Control/System ribbon cable at the front cap and install the cable on similar pins of the blank remote mount front cap. Mount the blank remote mount front cap to the radio housing using two flathead and one pan head screw.
6. Plug speaker cable to J801 on control board which is part of front cap. Mount front cap to remote mount rear housing using two M3.5-0.6X8 flathead machine head screws and three M3.5-0.6X8 pan head machine screws.
7. Plug system cable to radio and control unit. Secure cable using two M4-0.7X13 hex head machine screws supplied.
8. Plug the microphone cable to control unit. Secure cable using M4-0.7x8 HEX HEAD machine screw and cable clamp supplied.

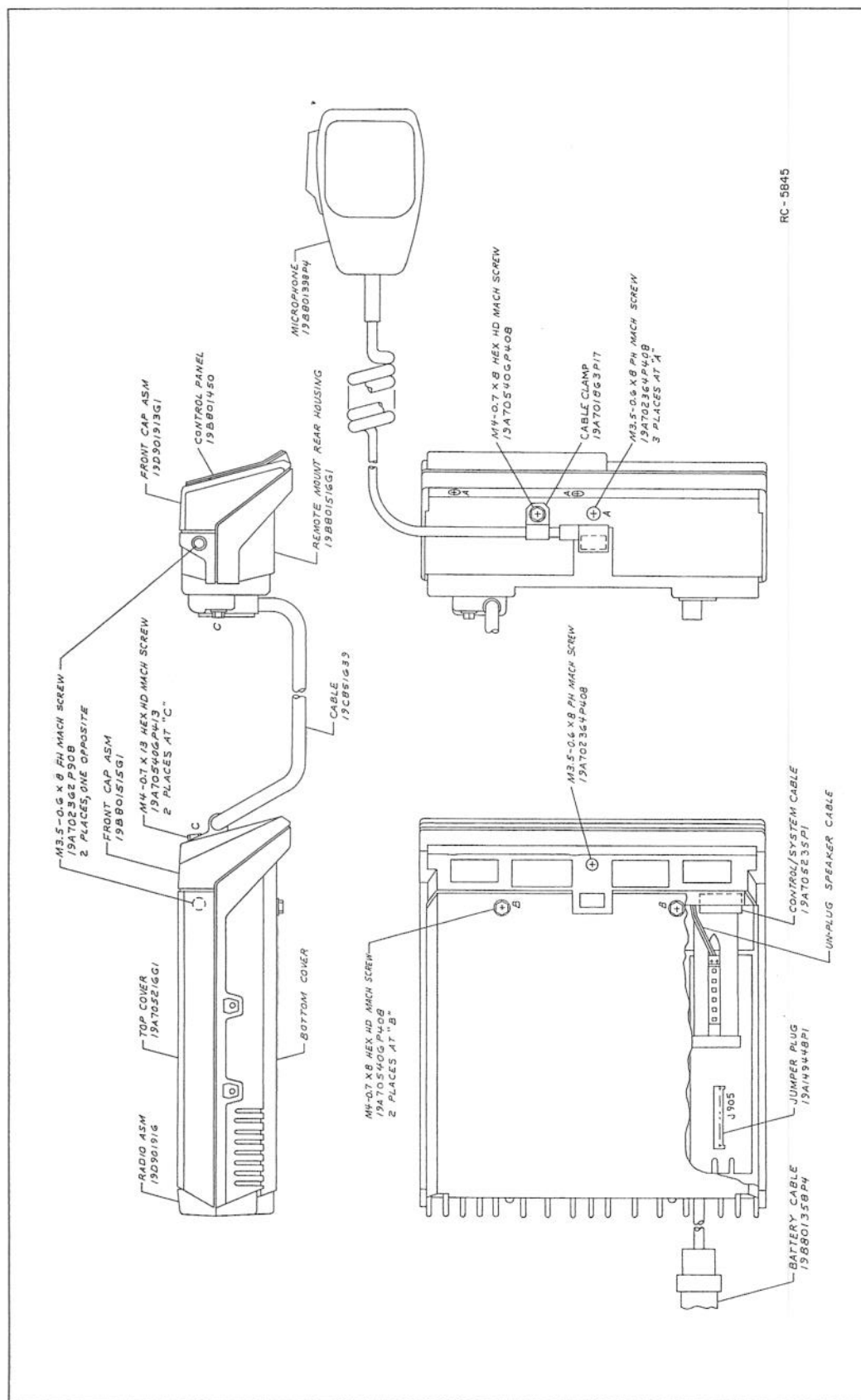


FIGURE 18 - REMOTE MOUNT INSTALLATION

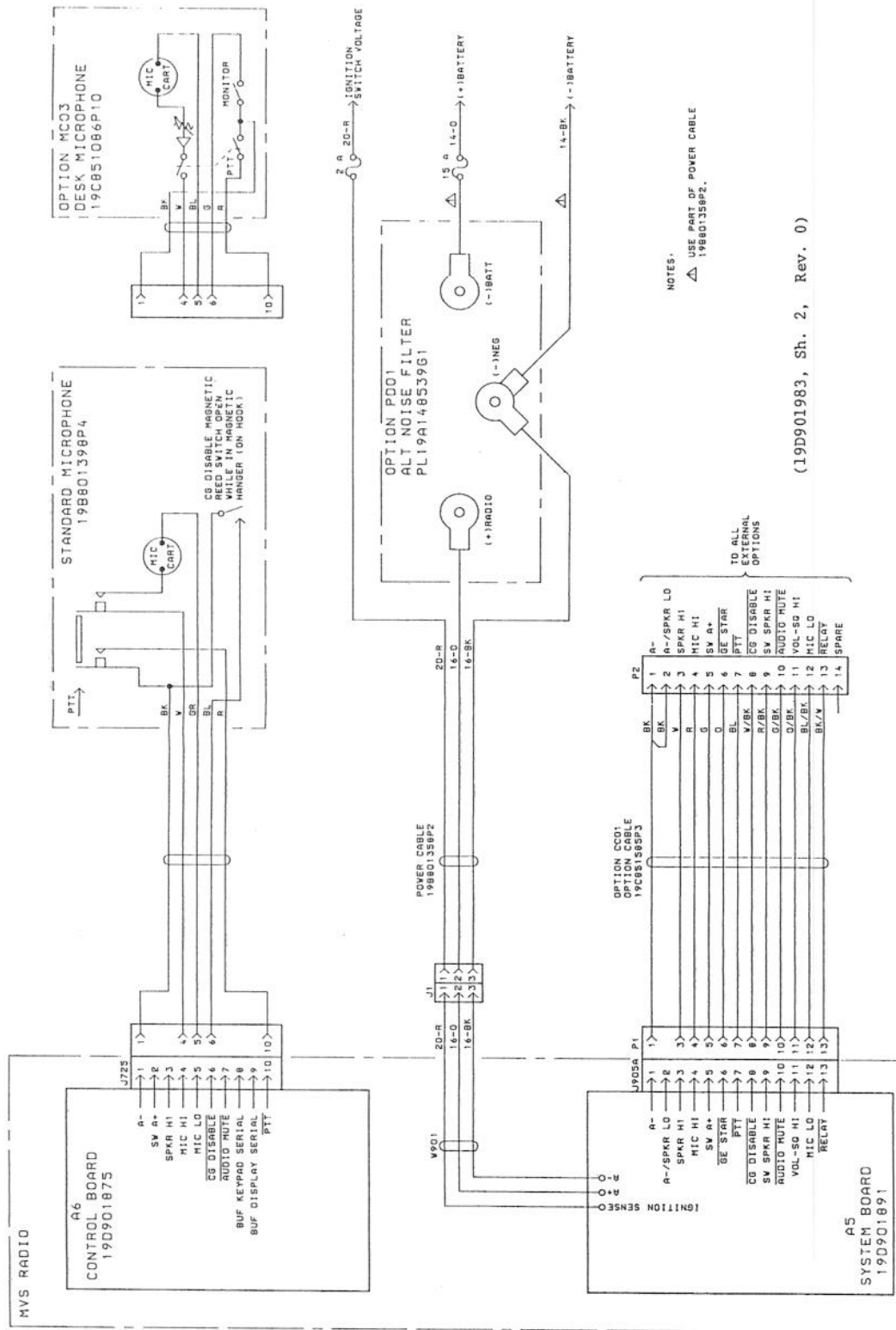
REMOTE MOUNT INSTALLATION

1. Mount the Front Cap Assembly so that the controls are within reach of the operator. Use the mounting bracket and hardware supplied with the Remote Mount Option. Use the bracket as a template to locate the holes. Be sure to leave enough room for clearance for the system cable.
2. Mount the Radio Assembly using the mounting bracket and hardware supplied with the radio.
3. Route the power/ignition cable and the system cable.

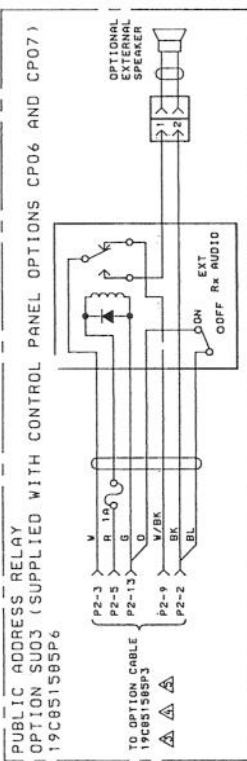
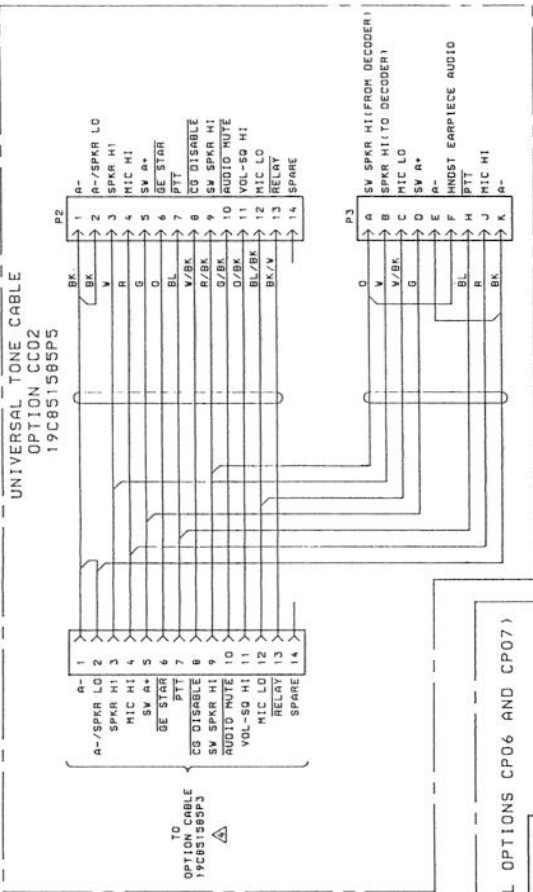
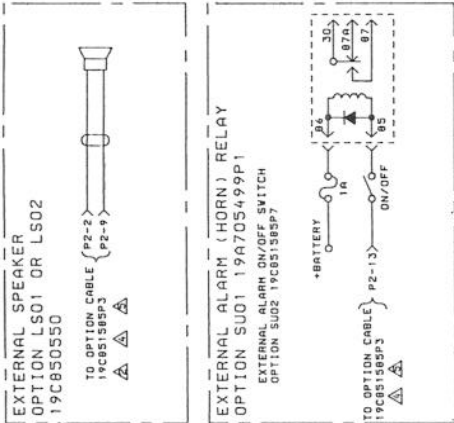
INSTALLING EXTERNAL OPTIONS WITH THE REMOTE MOUNT OPTION

Follow the same installation procedures given earlier for each option with the following exceptions:

1. The Option Cable (Option CC01) is not required with external options. The Front Cap Interface Board (A10) in the remoted Front Cap already contains the 14-pin option connector (J1102). Insert the wires from each option into the same pin locations of the empty connector housing supplied with the Remote Mount Option.
2. If an option requires unplugging the internal speaker, unplug the speaker from J801 on the Control Board (A6) in the remoted Front Cap.
3. If an option requires switching of the internal speaker, instead of cutting the PC run on the System Board, cut the PC run between holes 7 and 8 on the Front Cap Interface Board (A10).



INTERCONNECTION DIAGRAM



- NOTES:
- UNPLUS INTERNAL SPEAKER FROM AS J904 ON SYSTEM BOARD 19D901871. FOR REMOTE MOUNT APPLICATION, UNPLUS SPEAKER FROM AS J801 ON CONTROL BOARD 19D901875.
 - TO ALLOW SWITCHING OF THE INTERNAL SPEAKER, CUT PC RUN BETWEEN HOLES 6 AND 7 ON AS SYSTEM BOARD 19D901916. FOR REMOTE MOUNT APPLICATION, CUT RUN BETWEEN HOLES 7 AND 8 ON A10 FRONT CAP INTERFACE BOARD 19D902025.
 - FOR REMOTE MOUNT APPLICATION, CONNECT TO THE SAME PINS OF A10 J1102 OPTION CONNECTOR.
 - WHEN USING THE UNIVERSAL TONE CABLE, CONNECT TO P2 OF THE UNIVERSAL TONE CABLE OPTION 19C851585P5.

(19D901983, Sh. 3, Rev. 0)

OPTION INTERCONNECTION DIAGRAM



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Lynchburg, Virginia 24502

Printed in U.S.A.