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Tactical Radio Products

RF-5800H 20-WATT VEHICULAR SYSTEM

SYSTEM INSTALLATION/ MAINTENANCE MANUAL

next level solutions

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RF-5800H 20-WATT VEHICULAR SYSTEM

SYSTEM INSTALLATION/ MAINTENANCE MANUAL

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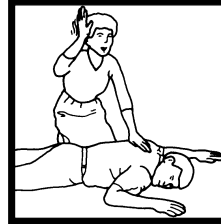
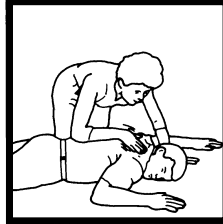
When an Adult Stops Breathing

WARNING

DO NOT attempt to perform the rescue breathing techniques provided on this page, unless certified. Performance of these techniques by uncertified personnel could result in further injury or death to the victim.

1 Does the Person Respond?

- Tap or gently shake victim.
- Shout, "Are you OK?"

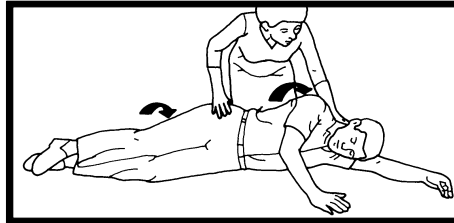


2 Shout, "Help!"

- Call people who can phone for help.

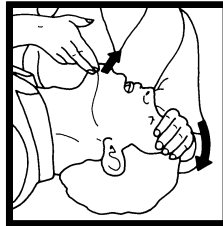
3 Roll Person Onto Back

- Roll victim toward you by pulling slowly.



4 Open Airway

- Tilt head back and lift chin.



5 Check for Breathing

- Look, listen, and feel for breathing for 3 to 5 seconds.

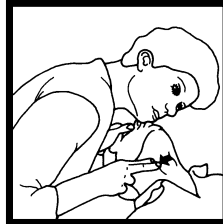
6 Give 2 Full Breaths

- Keep head tilted back.
- Pinch nose shut.
- Seal your lips tight around victim's mouth.
- Give 2 full breaths for 1 to 1-1/2 seconds each.



7 Check for Pulse at Side of Neck

- Feel for pulse for 5 to 10 seconds.

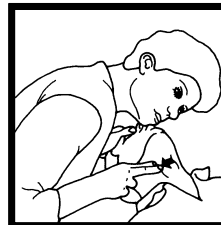
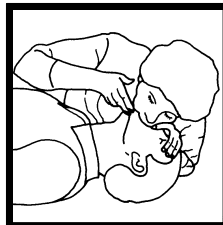


8 Phone for Help

- Send someone to call an ambulance.

9 Begin Rescue Breathing

- Keep head tilted back.
- Lift chin.
- Pinch nose shut.
- Give 1 full breath every 5 seconds.
- Look, listen, and feel for breathing between breaths.



10 Recheck Pulse Every Minute

- Keep head tilted back.
- Feel for pulse for 5 to 10 seconds.
- If victim has pulse but is not breathing, continue rescue breathing. If no pulse, begin CPR.

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SAFETY SUMMARY

1. INTRODUCTION

All operators and maintenance personnel must observe the following safety precautions during operation and maintenance of this equipment. Specific warnings and cautions are provided in the manual and at the end of this Safety Summary. Warnings, Cautions, and Notes appear before various steps in the manual and will be used as follows:

- **WARNING** – Used when injury or death to personnel and damage to equipment is possible
- **CAUTION** – Used when there is a possibility of damage to equipment
- **NOTE** – Used to alert personnel to a condition that requires emphasis

2. PERSONNEL AND EQUIPMENT SAFETY

Basic safety precautions consider factors involved in protecting personnel from injury or death. Electrical, mechanical, Thermal, electromagnetic radiation (EMR), material, or chemical hazards are the most common types of hazards found in electronic equipment. The following are types of hazards that may exist:

- ELECTRICAL** – Hazardous voltage and current levels may exist throughout the equipment. Contact with these hazards could cause electrocution, electrical shock, burns, or injury due to involuntary reflexes of the body.
- MECHANICAL** – Mechanical hazards are created when heavy assemblies and components must be removed and replaced. Moving parts (such as fan blades) and hot surfaces are potential mechanical hazards.
- THERMAL** – Burn hazards may exist in the equipment that could cause personal injuries and/or serious equipment damage. Internal surfaces of the equipment may be in excess of 65°C, the point at which personnel could be burned. Extreme caution should be used when working with any hot assemblies (for example, power supply or power amplifier assemblies). Physical injury or damage may result to personnel and/or equipment as a result of a reflex action to a burn.
- CHEMICAL** – Chemicals or materials used for servicing the equipment may present potential hazards. Many chemical agents, such as cleaners and solvents, may be toxic, volatile, or flammable. If used incorrectly, these agents can cause injury or death.
- EMR** – Overexposure to electromagnetic radiation results from amplified radio frequencies that may produce a health hazard.

3. OPERATIONAL AND MAINTENANCE SAFETY GUIDELINES

Good safety discipline is critical to prevent injury to personnel. All other safety measures are useless if personnel do not observe the safety precautions and do not follow safety disciplines. Once aware of a hazard, personnel should ensure that all other personnel are aware of the hazard. The following basic safety disciplines are stressed:

- a. Read a procedure entirely before performing it. Personnel must always perform each assigned task in a safe manner.
- b. Prior to applying equipment power after maintenance, personnel must ensure that all unsecured hand tools and test equipment are disconnected from the serviced/maintained equipment and properly stored.

- c. Power to the equipment must be removed before a piece of equipment is removed.
- d. Extreme care must be used when adjusting or working on operating equipment. Voltages in excess of 70 V or current sources in excess of 25 A are covered with barriers. Barriers include warning information about the hazard encountered upon barrier removal.
- e. Personnel must react when someone is being electrically shocked. Perform the following steps:
 - 1. Shut off power.
 - 2. Call for help.
 - 3. Administer first aid if qualified.

Under no circumstances should a person come directly in contact with the body unless the power has been removed. When immediate removal of the power is not possible, personnel must use a non-conductive material to try to jolt or pry the body away from the point of shock.

- f. Personnel should work with one hand whenever possible to prevent electrical current from passing through vital organs of the body. In addition, personnel must never work alone. Someone must be available in the immediate area to render emergency first aid, if necessary.
- g. Lifting can cause injury. Items weighing more than 37 pounds must be lifted by two or more people.
- h. Some electrolytic capacitors contain aluminum oxide or tantalum. If connected incorrectly, the capacitor will explode when power is applied. Extreme care must be used when replacing and connecting these capacitors. The capacitor terminals must always be connected using the correct polarity: positive to positive and negative to negative.

The next section contains general safety precautions not directly related to specific procedures or equipment. These precautions are oriented toward the maintenance technician. However, all personnel must understand and apply these precautions during the many phases of operation and maintenance of the equipment. The following precautions must be observed:

DO NOT SERVICE EQUIPMENT ALONE

Never work on electrical equipment unless another person familiar with the operation and hazards of the equipment is near. When the maintenance technician is aided by operators, ensure that operators are aware of the hazards.

GROUNDING

Always ensure that all equipment and assemblies are properly grounded when operating or servicing.

TURN OFF POWER AND GROUND CAPACITORS

Whenever possible, power to equipment should be turned off before beginning work on the equipment. Be sure to ground all capacitors that are potentially dangerous.

KEEP AWAY FROM LIVE CIRCUITS

Operators and maintainers must observe all safety regulations at all times. Do not change components or make adjustments inside equipment with a high voltage supply on unless required by the procedure. Under certain conditions, dangerous potentials may exist in circuits with power controls off, due to charges retained by capacitors.

DO NOT BYPASS INTERLOCKS

Do not bypass any interlocks unnecessarily. If it is necessary to employ an interlock bypass for equipment servicing, use extreme care not to come in contact with hazardous voltages.

USE CARE HANDLING HEAVY EQUIPMENT

Never attempt to lift large assemblies or equipment without knowing their weight. Use enough personnel or a mechanical lifting device to properly handle the item without causing personal injury.

HEED WARNINGS AND CAUTIONS

Specific warnings and cautions are provided to ensure the safety and protection of personnel and equipment. Be familiar with and strictly follow all warnings and cautions on the equipment and in technical manuals.

PROTECTIVE EYEWEAR

All personnel must wear protective eyewear when servicing or maintaining equipment. Protective eyewear must be worn at all times when using tools.

4. PROTECTION OF STATIC-SENSITIVE DEVICES

Diode input-protection is provided on all CMOS devices. This protection is designed to guard against adverse electrical conditions such as electrostatic discharge. Although most static-sensitive devices contain protective circuitry, several precautionary steps should be taken to avoid the application of potentially damaging voltages to the inputs of the device.

To protect static-sensitive devices from damage, the following precautions should be observed.

- a. Keep all static-sensitive devices in their protective packaging until needed. This packaging is conductive and should provide adequate protection for the device. Storing or transporting these devices in conventional plastic containers could be destructive to the device.
- b. Disconnect power prior to insertion or extraction of these devices. This also applies to PWBs containing such devices.
- c. Double check test equipment voltages and polarities prior to conducting any tests.
- d. Avoid contact with the leads of the device. The component should always be handled carefully by the ends or side opposite the leads.
- e. Avoid contact between PWB circuits or component leads and synthetic clothing.
- f. Use only soldering irons and tools that are properly grounded. Ungrounded soldering tips or tools can destroy these devices. **SOLDERING GUNS MUST NEVER BE USED.**

5. EXPLANATION OF HAZARD SYMBOLS



The symbol of drops of a liquid onto a hand shows that the material will cause burns or irritation of human skin or tissue.



The symbol of a person wearing goggles shows that the material will injure your eyes.



The symbol of a flame shows that a material can ignite and burn you.



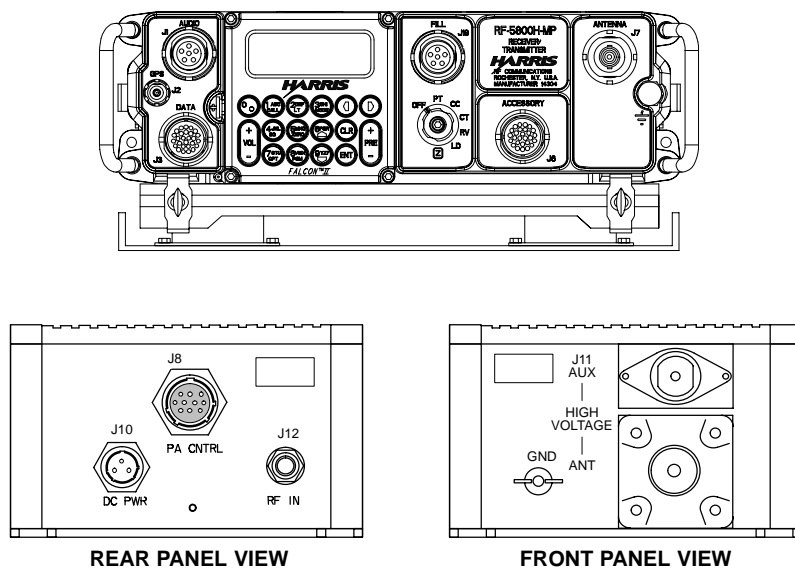
The symbol of a skull and crossbones shows that a material is poisonous or a danger to life.



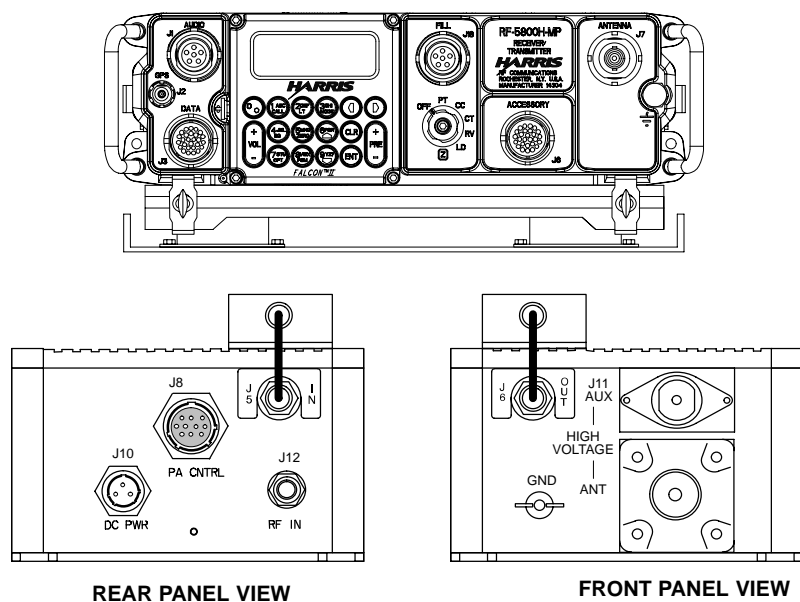
The symbol of a human figure in a cloud shows that vapors of a material present danger to your life or health.

RF-5800H 20-WATT VEHICULAR SYSTEM

SYSTEM INSTALLATION/
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TYPICAL RF-5800H 20 WATT VEHICULAR SYSTEM WITHOUT LOW PASS FILTER



TYPICAL RF-5800H 20 WATT VEHICULAR SYSTEM WITH LOW PASS FILTER

5800H-20W-VEH01D

Figure 1-1. Typical RF-5800H 20-Watt Vehicular Systems

CHAPTER 1

GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides the maintainer with all technical information required to support Level II maintenance as described in Paragraph 1.3.2.

The overall intent of this manual is to help the maintainer expedite repair of the unit in a reasonable amount of time, resulting in reduced downtime and increased system availability. Detailed information that will be useful to the maintainer is provided in the following areas:

- Installation
- Configuration
- Equipment specifications
- Fault isolation and repair techniques
- Required tools and test equipment
- Functional descriptions at the system level

1.2 SAFETY PRECAUTIONS

All safety precautions necessary for the protection of personnel and the equipment are cross-referenced here. The WARNING or CAUTION is referenced to the paragraph number where it is used in the manual, and a brief subject phrase indicating the content is provided. It is recommended that these items be read in their entirety before performing the referenced procedure. References are as follows:

- WARNING – Paragraph 2.2.1.1 – Inadequate or defective grounding presents a personnel hazard that could result in injury or death.
- CAUTION – Paragraph 2.2.1.1 – Inadequate or defective grounding could damage the equipment.

1.3 MAINTENANCE LEVELS

Harris/RF Communications designs its products and systems to be supported by up to four maintenance levels. See Figure 1-2. Each maintenance level relies on a defined set of support documentation and equipment in order to fulfill its maintenance tasks. The tasks performed at each level grow in complexity as fault isolation is narrowed to the component causing the fault. This concept assists the maintainer by supplying only the information and materials required for that maintenance level. These levels may be combined to sustain any particular user maintenance philosophy. The four maintenance levels are described in Paragraphs 1.3.1 through 1.3.4.

1.3.1 Level I

This level is restricted to fault recognition and detection. Fault isolation is not usually performed at this level. An operator who detects a faulty condition alerts Maintenance Level II for repair.

1.3.2 Level II

The maintenance technician repairs the radio system by utilizing a System (Level II) manual to fault isolate to the faulty unit (for example, receiver-transmitter, power amplifier, antenna coupler, etc.). The faulty LRU is replaced with a spare and sent to Maintenance Level III.

1.3.3 Level III

The faulty unit is serviced at a facility that has support equipment available, typically a hot test bed radio system. The suspected faulty unit is inserted into the hot test bed radio system to isolate the faulty assembly using a Maintenance (Level III) manual. The faulty SRU or module is replaced with a spare and passed to Maintenance Level IV.

1.3.4 Level IV

The faulty SRU or module is returned to Harris/RF Communications for repair. If Level IV maintenance capabilities are available on-site, the maintenance technician can identify the faulty component on the SRU using a Depot Maintenance (Level IV) manual that outlines the electronic maintenance techniques and test fixtures necessary to repair the SRU.

1.4 WARRANTY

Harris Corporation guarantees that if the equipment fails from normal use within one year from the date of shipment due to a defect in workmanship or materials, Harris will repair or replace the equipment at no charge. Repairs made by Harris to the equipment under this warranty are warranted to be free from defects in material and workmanship for 60 days from the date of repair.

For information on how to process a claim under this warranty, and on what is not covered by this warranty, refer to the warranty information printed on the inside front cover of this manual.

1.5 GENERAL SYSTEM DESCRIPTION

The following paragraphs describe the configuration of the RF-5800H 20-Watt Vehicular System.

1.5.1 RF-5800H 20-Watt Vehicular System

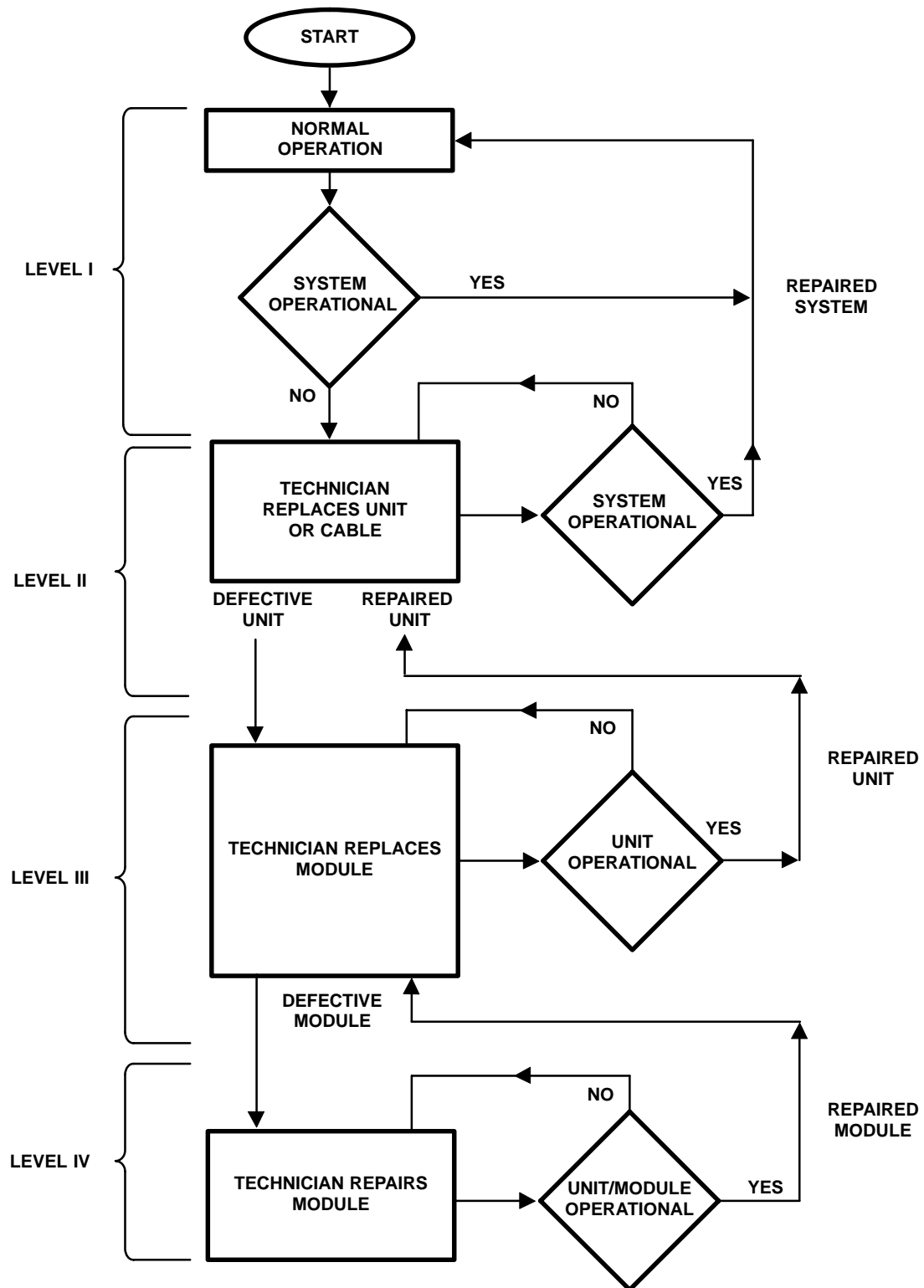
Figure 1-3 shows the relationship of the units contained in the RF-5800H 20-Watt Vehicular System and Figure 1-4 is the family tree. This system includes a RF-5830H-PA 20-Watt Power Amplifier/Coupler (herein after referred to as RF-5830H-PA/Coupler), interconnect cables, ground strap, and shock mount. The RF-5211VSM Vehicular Shock Mount (herein after referred to as RF-5211VSM) is used with the RF-5800H-MP Manpack Radio (herein after referred to as RF-5800H-MP).

1.5.2 Related Equipment Manuals

Table 1-1 identifies the manuals that may be necessary to configure and maintain the RF-5800H 20-Watt Vehicular System in its various configurations.

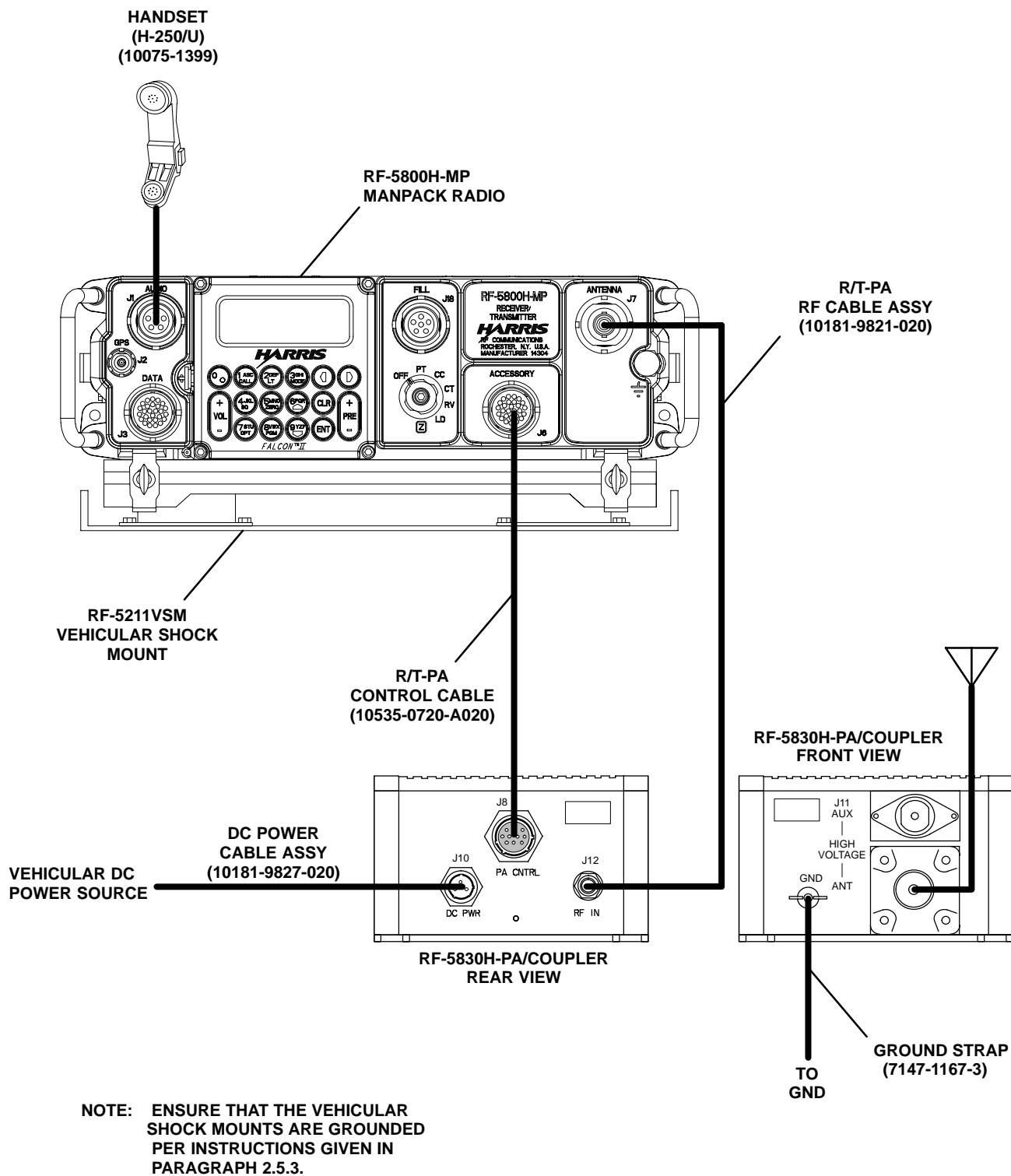
Table 1-1. Related Equipment Manuals

Part Number	Manual Description
10515-0117-4200	RF-5800H-MP Operation Manual
10515-0117-4300	RF-5800H-MP Intermediate Maintenance Manual
10515-0121-4300	RF-5830H-PA001 20-Watt PA/Coupler Intermediate Maintenance Manual
10515-0071-4100	RF-5056PS 12/24 V DC/DC Power Converter Supplement
10515-0183-4300	RF-5830H-PA002 PA/Coupler Intermediate Maintenance Manual



5800H-027A

Figure 1-2. Maintenance Flow Chart

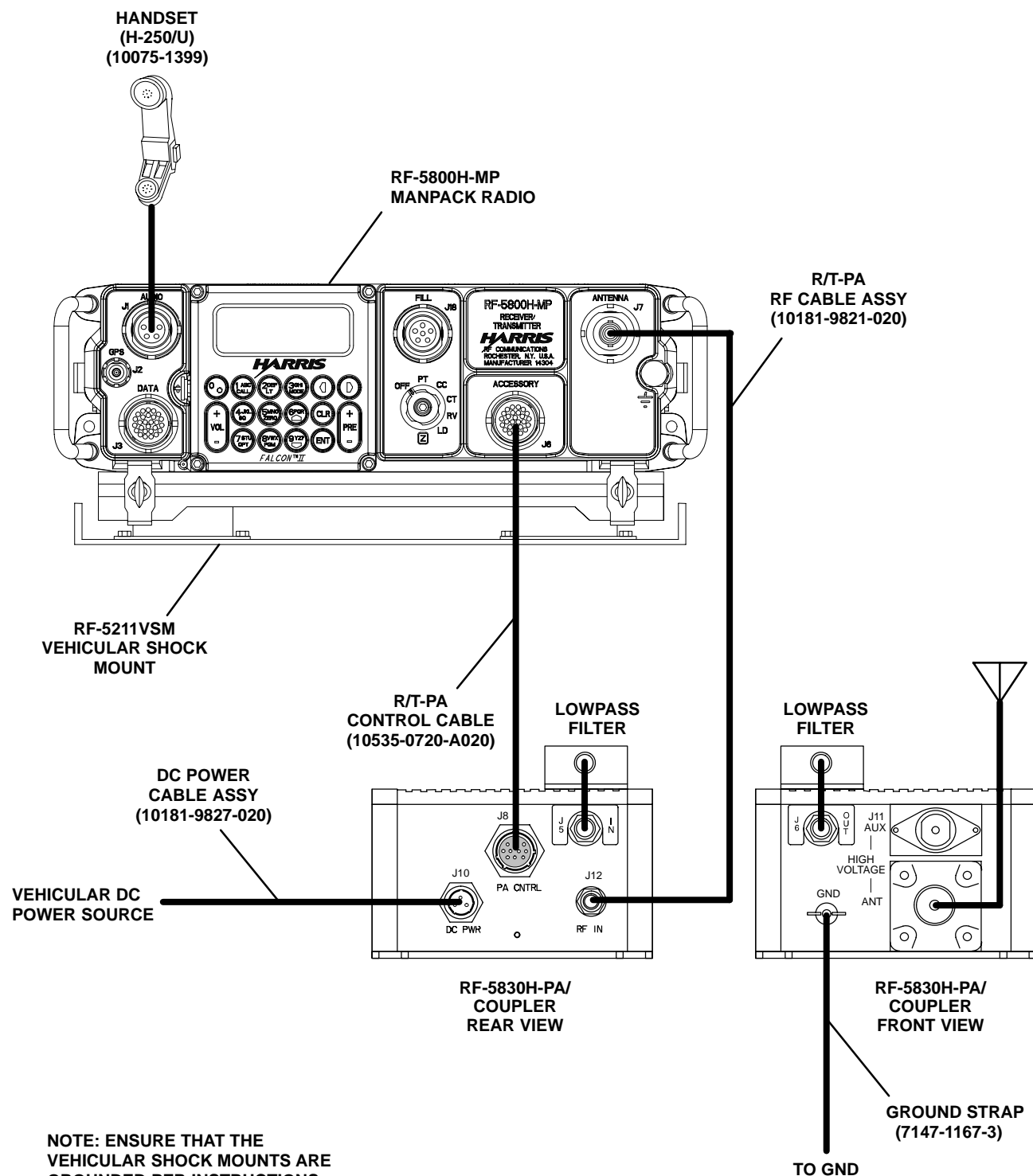


5800H-20W-VEH05B

Figure 1-3. Relationship of Units in RF-5800H 20-Watt Vehicular System



1-5



5800H-20W-VEH100B

Figure 1-5. Relationship of Units in RF-5800H 20-Watt Vehicular System with LPF

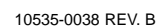


Figure 1-6. RF-5800H 20-Watt Vehicular System Family Tree

1.6 GENERAL EQUIPMENT DESCRIPTIONS

The following paragraphs describe the unit that makes up the RF-5800H 20-Watt Vehicular System.

1.6.1 RF-5830H-PA 20-Watt Power Amplifier/Coupler

The RF-5830H-PA/Coupler has the following features:

- Maximum frequency range of 1.6 MHz to 59.9999 MHz
- Power output of approximately 20 watts PEP/Average into 50 ohms, 1.6 MHz to 30 MHz;
10 watts average into 50 ohms, 30 MHz to 60 MHz
- Automatic antenna tuning
- Automatic control from the RF-5800H-MP
- Integral power supply, control circuits, and harmonic filters
- Power supply conditioning and fault protection for the RF-5800H-MP
- Operational status of power amplifier and antenna coupler monitored via control cable to RF-5800H-MP

1.6.2 Unit Identification

The unit is identified by tags with the model (part) number and serial number.

1.6.3 Specifications

Table 1-2 provides RF-5830H-PA/Coupler specifications. Table 1-3 provides specifications for the RF-5056 DC/DC Power Converter.

Table 1-2. RF-5830H-PA/Coupler Specifications

Function	Specification
GENERAL:	
Frequency Range	1.6 MHz to 59.9999 MHz maximum
RF Input/Output Impedance	50 ohm nominal, unbalanced
Modes of Operation	J3E (single sideband, upper or lower, suppressed carrier telephony) H3E (compatible AM single sideband plus full carrier telephony) J2A MCW (single sideband suppressed carrier keyed tone) F2B (FSK) F3E (FM) 39 Tone DQPSK
Power Input	+26.4 VDC (nominal operating voltage) @ 4.5 amps, maximum
Temperature Range	-40° C to +70° C
Shock/Vibration	MIL-STD-810E
Leakage	MIL-STD-810E (1 meter depth)
Humidity	MIL-STD-810E (0 TO 95%)
MTTR	Less than 15 minutes to the module level
Size	Without LPF: 5.75 W x 8.13 D x 3.45 H inches (14.6 W x 20.6 D x 8.8 H cm) With 20 W LPF: 5.75 W x 9.75 D x 4.75 H inches (14.6 W x 24.8 D x 12.1 H cm)

Table 1-2. RF-5830H-PA/Coupler Specifications – Continued

Function	Specification
Weight	5.5 lbs. (2.5 kg)
POWER AMPLIFIER:	
Power Output	20 watts PEP/Average into 50 ohms, 1.6 MHz to 30 MHz 10 watts average into 50 ohms, 30 MHz to 60 MHz.
RF Drive Requirements	Less than 100 mW (+20 dBm)
ANTENNA TUNER:	
Antenna Tuning Capability	Standard 8-, 10-, 16-, and 35-foot whips AS-2259/GR (RF-1936): 3.5 MHz to 10 MHz
Tuning Time	Learn Tune: < 2 seconds Memory Tune: <10 milliseconds

Table 1-3. RF-5056PS DC/DC Power Converter Specifications

Function	Specification
Input Voltage	12 to 28 VDC nominal
Output	26.4 VDC at 22 A
Efficiency	75% minimum at full load with an input voltage of 25 to 30 VDC
Load Regulation	300 mV
Line Regulation	50 mV
Output Current Duty Cycle	4:1 RX/TX
Size	7.5 W x 12.75 D x 3.3 H inches (19.1 W x 32.4 D x 8.38 H cm)
Weight	11 lbs. (5.0 kg)
Temperature Range	-55° C to +70° C (-67° F to +158° F)
Environmental	MIL-STD-810E

1.7 LIST OF ITEMS REQUIRED BUT NOT SUPPLIED

Table 1-4 lists the tools and materials required for installing, and removing and replacing the individual unit. Part number and CAGE Code information is also provided.

Table 1-4. Required Tools, Test Equipment, and Materials

Description	Part Number	CAGE Code
Wrench, Ratchet, 3/8-Inch Drive	S832	55719
Socket Set, 1/2-Inch Drive	319SY	55719
Screwdriver, Cross-Tip, #2, 4-Inch Blade	X102	55719
Screwdriver, Flat-Tip, 1/4-Inch, 6-Inch Blade	SDD460	55719
Multimeter, Digital	Fluke 87 or equivalent	89536

1.8 LIST OF MANUFACTURERS

Table 1-5 provides a list of manufacturers.

Table 1-5. List of Manufacturers

CAGE Code	Manufacturer Name and Address
14304	Harris Corporation RF Communications Division 1680 University Avenue Rochester, NY 14610-2842
55719	Snap-On Tools 2801 80th Street Kenosha, WI 53141-1410
89536	John Fluke Mfr Co, Inc 6920 Seaway Blvd. P.O. Box 9090 Everett, WA 98206-9090
96508	Cooper Industries, Incorporated Cooper Tools Division 3535 Glenwood Avenue P.O. Box 30100 Raleigh, NC 27612-4934

CHAPTER 2

INSTALLATION

2.1 INTRODUCTION

This chapter describes the following:

- Site information – Paragraph 2.2
- Tools and materials required – Paragraph 2.3
- Unpacking and repacking – Paragraph 2.4
- Equipment installation – Paragraph 2.5
- Installation checkout – Paragraph 2.6

2.2 SITE INFORMATION

The information contained here provides general guidelines for setting up the RF-5800H 20-Watt Vehicular System. In general, select a ventilated, well-lit location. Avoid placing the system in a congested area, or where there is excessive noise. The following are general site considerations:

- Availability of power source, earth ground, antenna, etc.
- Ease of operation, maintenance, or removal and replacement
- Ventilation
- Clearance of cable connections
- Stable surface to mount equipment

2.2.1 General Guidelines

The information contained in the following paragraphs provides general site guidelines. Before choosing a location, become familiar with the dimensions of the equipment and mounting brackets, and make sure there is plenty of room for maintenance when the radio system is installed.

2.2.1.1 Grounding

The following paragraphs suggest grounding guidelines that should be followed when performing vehicular installations.



Inadequate or defective grounding presents a personnel hazard that could result in injury or death.



Inadequate or defective grounding could damage the equipment.

2.2.1.2 Vehicular Configuration Grounding

The following are general guidelines for vehicular grounding:

- All ground straps should be as short as possible (ideally less than 12 inches [30 cm]).

NOTE

This system is grounded by connecting power ground return directly to the power source ground to maximize noise immunity.

- Paint, grease, rust, etc. must be removed so only bare metal is visible at grounding points. Use the vehicle chassis frame or a welded steel body panel for the grounding point.
- Never ground to trim or hinged panels (door, hood, etc.) or to surfaces which can be removed from the vehicle chassis (dashboard, seats, etc.).
- Ground cables should be fabricated from tinned, braided copper of the correct length. Ground is provided via vehicle shock mount ground strap.

2.2.1.3 Environmental

The RF-5830H-PA/Coupler will function normally in the environments listed in Paragraph 1.6.3 and Table 1-2.

2.3 TOOLS AND MATERIALS REQUIRED

A typical installation requires wrenches, hammer, punch, pliers, power drill, drill bits, in addition to the tools listed in Table 1-4.

2.4 UNPACKING AND REPACKING

Equipment is packed in corrugated boxes. A two-piece foam enclosure protects the equipment against corrosion and rough handling. The boxes and packing materials should be retained in case the equipment is shipped again.

The following paragraphs describe how to unpack and repack the radio system units.

2.4.1 Unpacking

Perform the following procedure to unpack the equipment:

- a. Inspect the exterior of the box for signs of damage during shipment. Note any problems and report them to the proper authority. An external sticker on the shipping box provides additional instructions concerning inspection of the package.
- b. Use normal care to move the boxed equipment into the general location where the installation is to be performed. Certain boxes, depending on system configuration, may be heavy. Exercise care when moving boxed assemblies to and from locations.
- c. After removing the equipment from the box, check the contents against the packing slip to see that the shipment is complete. Report discrepancies to Harris/RF Communications' customer service department (tel: 716-244-5830).

2.4.2 Repacking

Perform the following procedure to repack the equipment:

- a. Use the original box if it was retained. If not, use a box that allows three inches of clearance on all sides of the unit.
- b. Use the original packing material if it was retained. If not, use foam packing material to fill the space between the unit and the box. Surround the entire unit with three inches of foam packing material.
- c. Use a good quality packing tape (or straps) to seal the box after closing.

2.5 EQUIPMENT INSTALLATION

The following paragraphs describe the power requirements and ancillary items kit required to properly install the vehicular system. Cabling, switch settings, unit removal and installation procedures, clearance and ventilation requirements, and mounting information is also included. For installation information regarding the RF-5056PS 12/24 V DC/DC Power Converter, refer to the applicable manual listed in Table 1-1.

2.5.1 Power Requirements

The RF-5800H 20-Watt Vehicular System is designed to operate from a standard 28 VDC vehicular battery-alternator system, typical of military vehicles (per MIL-STD-1275).

The required voltage for RF-5800H 20-Watt Vehicular System is +22.5 VDC to +30.0 VDC (negative ground). Maximum power consumption is 4.5 amperes at +28.0 VDC (per MIL-STD-1275). Nominal operating voltage is 26.4 VDC. Refer to Chapter 7 for pinouts of power cables.

NOTE

Use of power cables less than 18 AWG or that are greater than 20 feet long will result in significant voltage drops.

2.5.2 Access Clearance and Ventilation Requirements

See Figures 2-1 and 2-2 for RF-5800H 20-Watt Vehicular System installation and maintenance clearances. Consider the following access clearance and ventilation requirements when possible:

- Ventilation clearance of at least 1.5 inches (3.81 cm) behind the system.
- Clearance in front of the system for maintenance personnel of at least 41 inches (104 cm).
- Ventilation clearance of at least 3.0 inches (7.62 cm) above the system.

When adequate space is provided as described above, special ventilation requirements are not necessary.

2.5.3 Vehicular Shock Mount

See Figure 2-3 for the vehicular shock mount dimensions. Refer to Table 7-3 for a list of attaching hardware included in the RF-5211VSM ancillary kit.

For the four hole locations on the RF-5211VSM, attach to the vehicle in the following arrangement:

- Hex Bolt
- Shock mount bottom plate
- Vehicle body
- Flat washer
- Lock washer
- Hex Nut

Install the ground strap at one of the four locations between the flat washer and the shock mount bottom plate or at the ground stud located near the rear of the shock mount bottom plate. Refer to the RF-5211VSM outline and installation drawing (10372-0876), included with the shock mount for additional information.

2.5.4 Jumper/DIP Switch Settings

The following are jumper settings in the RF-5830H-PA/Coupler:

- HF only: JMP1, 1 and 2
- HF/VHF: JMP1, 2 and 3

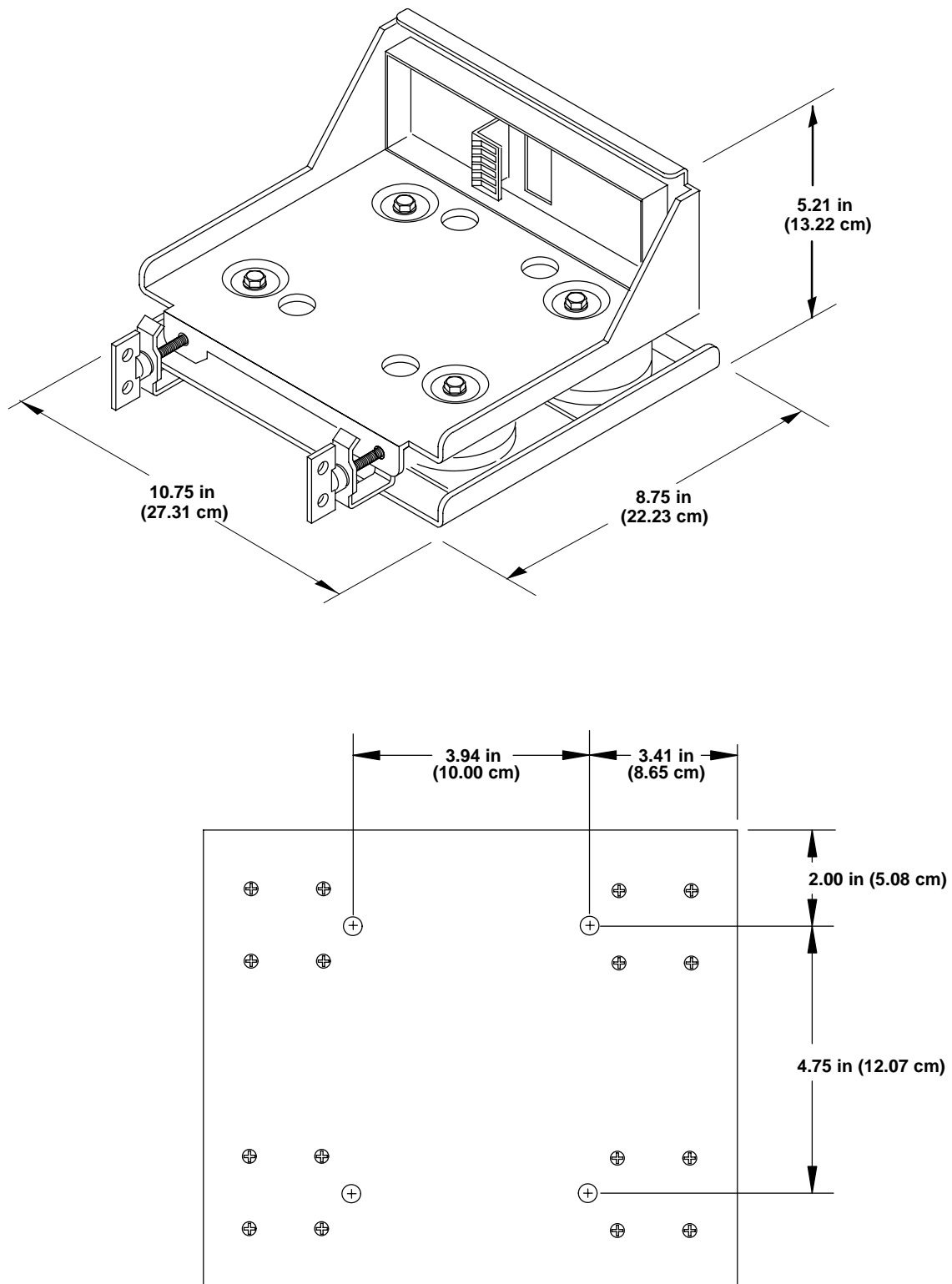
Refer to RF-5830H-PA 20-Watt PA/Coupler Intermediate Maintenance Manual, Chapter 6 for jumper locations.

2.5.5 Unit Removal and Installation Procedures

See Figure 2-4 for the mounting template of the RF-5830H PA/Coupler.

2.5.6 System Cabling Interconnect Information

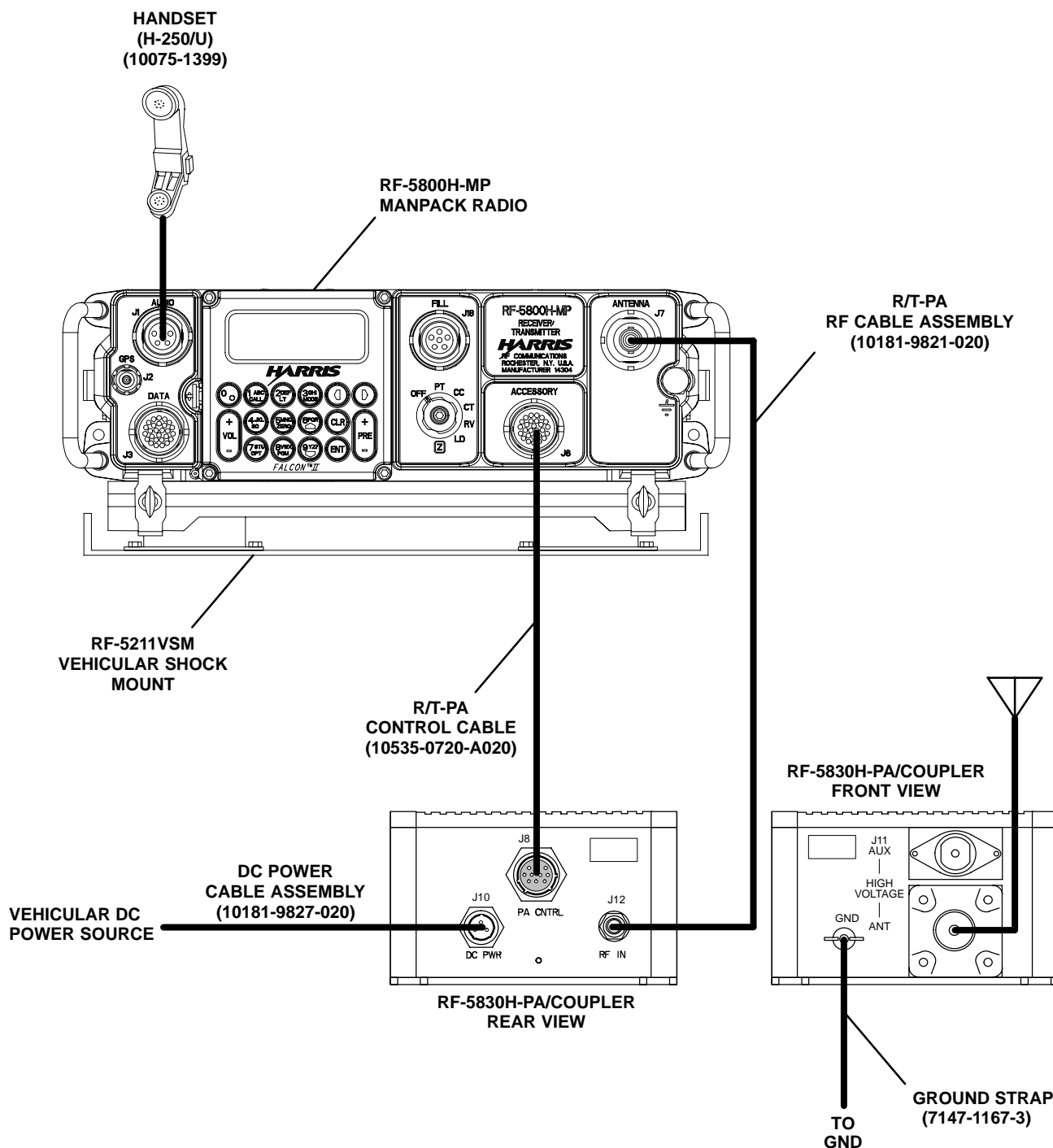
See Figures 2-5 and 2-6 for the cabling interconnect diagram of the RF-5800H 20-Watt Vehicular System.



5800H-20W-VEH04B

Figure 2-3. RF-5211VSM Shock Mount Dimensions

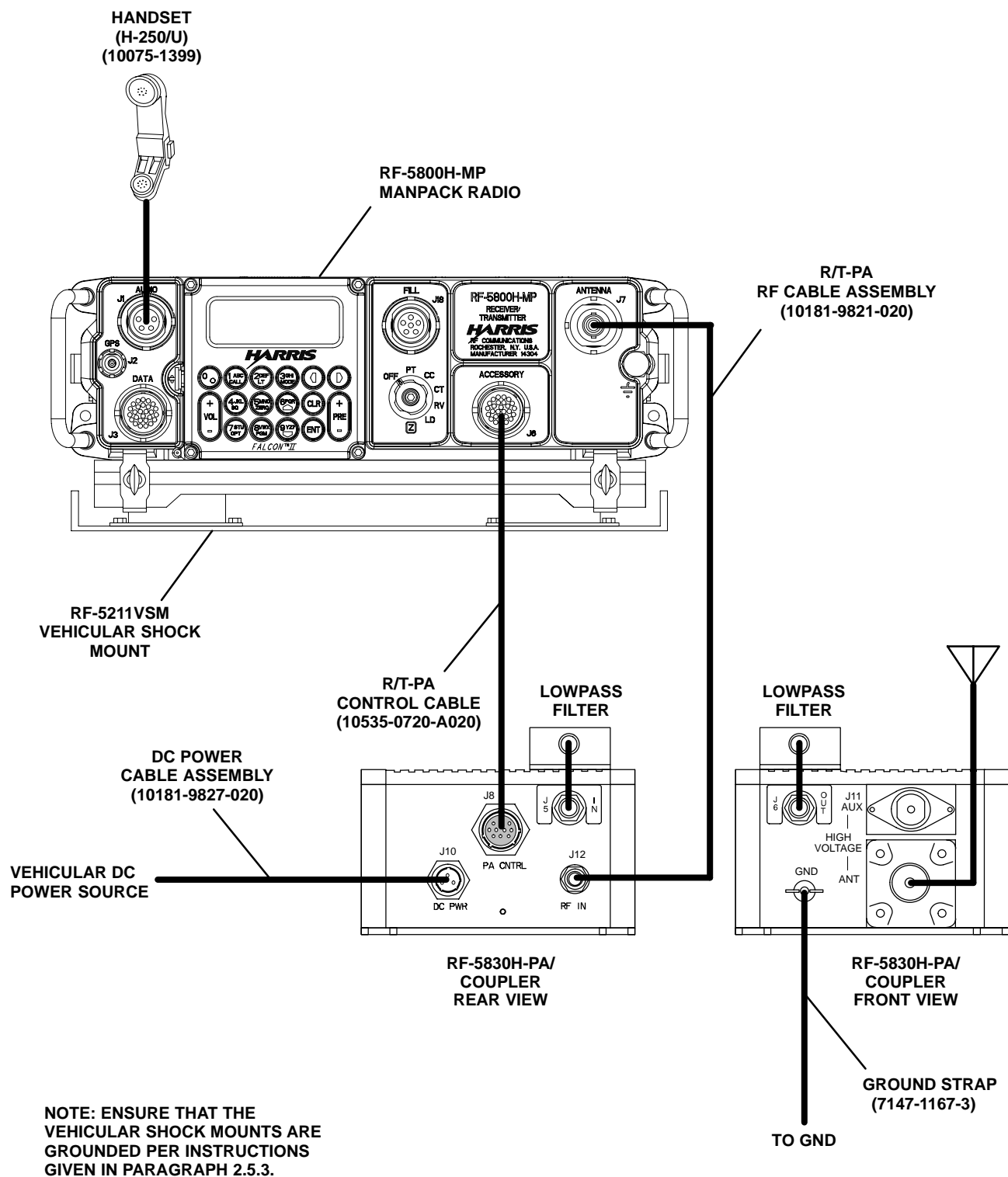
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**NOTE: ENSURE THAT THE
VEHICULAR SHOCK MOUNTS ARE
GROUNDED PER INSTRUCTIONS
GIVEN IN PARAGRAPH 2.5.3.**

5800H-20W-VEH05B

Figure 2-5. RF-5800H 20-Watt Vehicular System Cable Interconnects



5800H-20W-VEH100B

Figure 2-6. RF-5800H 20-Watt Vehicular System with LPF Cable Interconnects

2.5.7 Antenna Considerations

A number of factors should be considered before erecting an antenna. Radio signals are absorbed and reflected by nearby obstructions such as hills, trees, buildings, and power lines. Avoid these if possible, especially when they are in a direct line with the RF signal path. Signal strength is usually greatest from the top of a hill, over level terrain, or over water. Mountainous or hilly terrain may present unpredictable transmission or reception problems. Some antennas are more directional than others, and must be correctly oriented for maximum signal gain. A good earth ground connection and radial grounding system improves antenna performance and protects the equipment and personnel from lightning and electrical shock.

2.6 INSTALLATION CHECKOUT

Installation checkout has three phases. Paragraph 2.6.1 is an installation and pre-power up check to make sure the system is installed correctly, and that all support items are available. Paragraph 2.6.2 covers the radio system's initial settings, power up, and preliminary tests.

2.6.1 Inspection and Pre-Power Up Procedures

When the RF-5800H 20-Watt Vehicular System is installed and all connector cables are attached, verify that the following items are completed:

- All connectors are attached and associated hardware is secure.
- System units are connected to ground, preferably at a single point.
- Ground wires are connected between the radio system units and a known good ground.
- Ensure all hardware is tightened.
- Area cooling is adequate for removing heat that may develop during equipment operation.
- Power source is of adequate capability and adequately protected for the radio system's load, and that installation of the power cable is correct.
- Antenna is in place, correctly connected, and protected against accidental contact.

2.6.2 Initial Settings and Power Up

Perform the following procedure to power up the RF-5800H-MP and RF-5830H-PA/Coupler and execute BIT:

- a. On the RF-5800H-MP, set the function switch to the **PT** position.
- b. On the RF-5800H-MP, press the **OPT** pushbutton.
- c. If necessary, press the left/right arrow pushbuttons to select the **TEST** field.

NOTE

While in TEST mode, the RF-5800H-MP cannot receive or transmit.

- d. Press the **ENT** pushbutton.
- e. If necessary, press the left/right arrow pushbuttons to select the **ALL** field.
- f. Press the **ENT** pushbutton. This will initiate the BIT test.

- g. If the unit passes BIT, place in service. If a BIT code is displayed refer to the following paragraphs.

If the RF-5800H-MP displays a fault code on the LCD after completing the BIT test, record the fault code and proceed to Paragraph 6.2.4, BIT troubleshooting.

If the RF-5800H-MP displays no error messages, try to operate the RF-5800H 20-Watt Vehicular System in an attempt to generate a run-time fault. If a run-time fault is generated, refer to the non-BIT troubleshooting procedures in Paragraph 6.2.3.

If a run-time fault cannot be generated and the RF-5800H 20-Watt Vehicular System is still not operating properly, refer to the non-BIT troubleshooting procedures in Paragraph 6.2.3.

CHAPTER 3

OPERATION

There are no special operating procedures at Level II maintenance. Refer to Paragraph 6.2.2 for a Level II operational check. For normal operation, refer to the RF-5800H-MP Operation Manual listed in Table 1-1.

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CHAPTER 4

FUNCTIONAL DESCRIPTION

4.1 INTRODUCTION

This chapter covers the functional description of the RF-5800H 20-Watt Vehicular System. Refer to Chapter 6 for BIT and system troubleshooting information. The major function level description is divided into the following three signal paths:

- RF/Audio Signal Path
- Control Path
- Power Distribution Path

The description of each signal type is further divided as each LRU relates to the signal path. Each signal type is not present on every LRU.

NOTE

For more detailed information, refer to the Level III
RF-5800H-MP and RF-5830H-PA/Coupler Intermediate
Maintenance Manuals.

4.2 SIGNAL PATHS

4.2.1 RF/Audio Signal Path

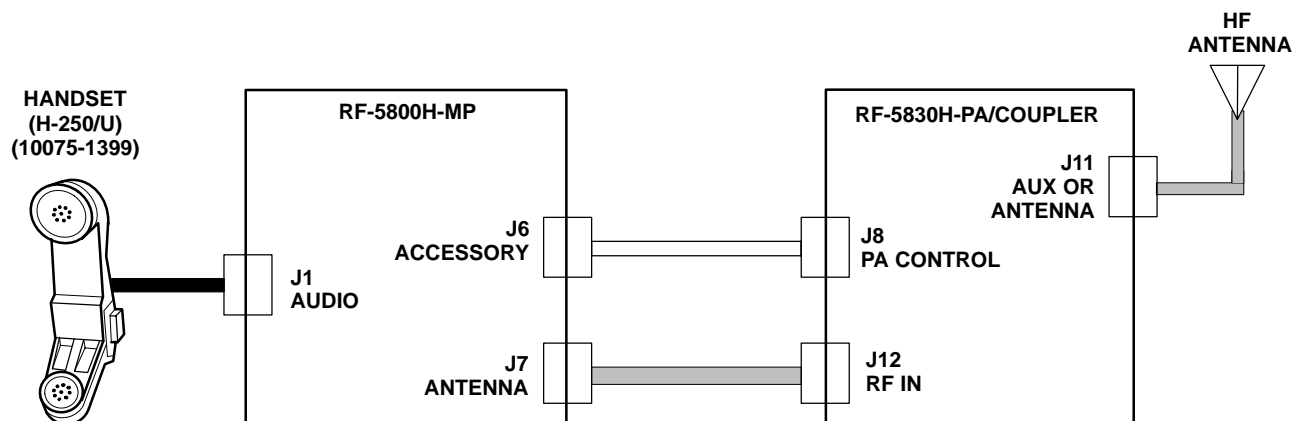
See Figures 4-1. The RF/Audio transmit signal path begins at the handset connected to J1 on RF-5800H-MP. The RF-5800H-MP converts the analog audio signal input from J1 into RF. The RF output from RF-5800H-MP is routed via J7 and the R/T-PA Coaxial Cable Assembly to J12 of the RF-5830H-PA/Coupler. The RF signal is amplified to 20 watts by RF-5830H-PA/Coupler. For systems with the external Low Pass Filter (LPF), the RF signal is sent out J6 to the LPF and then back into J5. The signal is then output at J11 or at the insulated antenna port. The receive path is identical, except in the reverse direction.

4.2.2 Control Path




See Figures 4-1 and 4-2. Control signals from RF-5800H-MP are routed from J6 via the R/T-PA Control Cable Assembly to J8 on RF-5830H-PA/Coupler.

4.2.3 Power Distribution Path

See Figure 4-3. Power distribution for the RF-5800H 20-Watt Vehicular System consists of distributing +28 VDC nominal voltage from the vehicle alternator/battery system to the various units in the system. External power enters the RF-5830H-PA/Coupler at J10. Power is supplied from J8 on RF-5830H-PA/Coupler to on the RF-5800H-MP radio via the R/T-PA Control Cable.

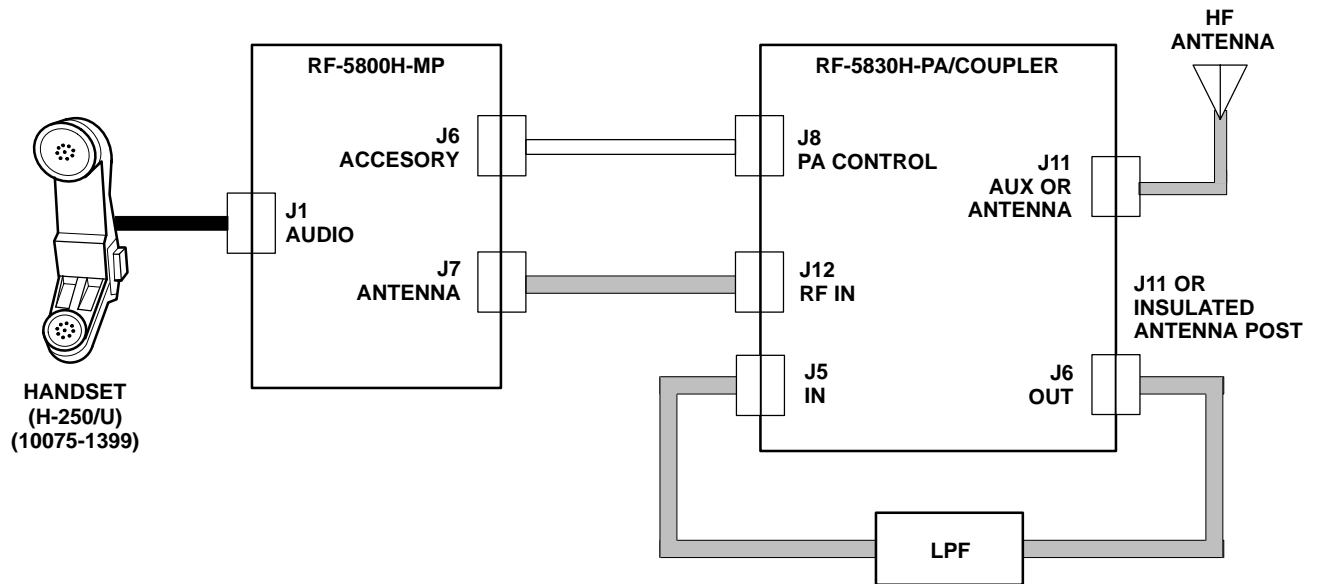


NOTE:
A BROADBAND 50 Ω HF ANTENNA
CAN BE CONNECTED DIRECTLY
TO J11.

KEY	
	RF SIGNALS
	AUDIO SIGNALS
	CONTROL SIGNALS

5800H-20W-VEH03B

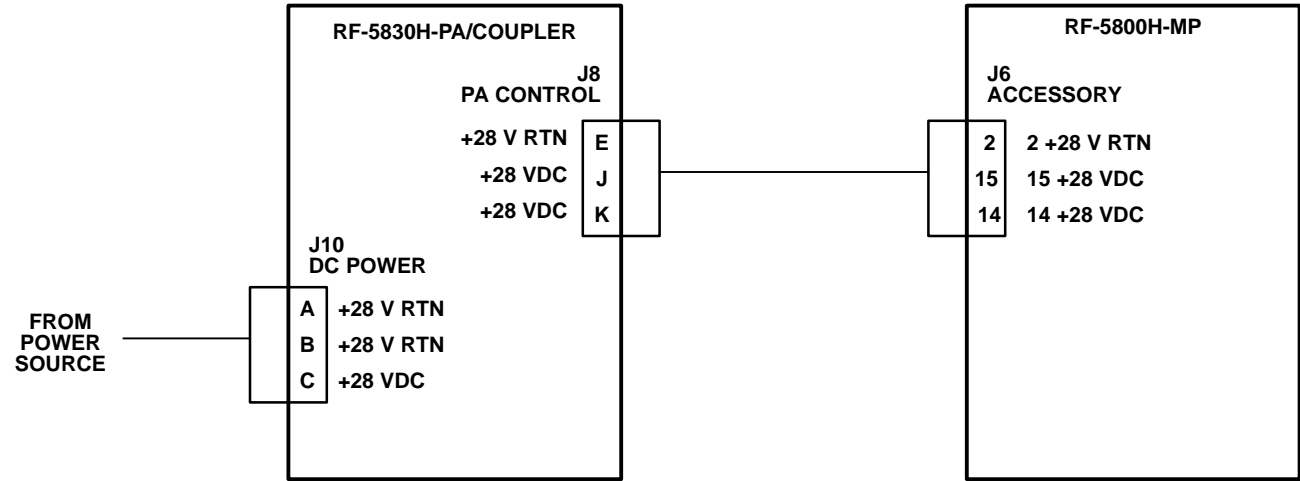
Figure 4-1. RF-5800H 20-Watt Vehicular System RF/Audio and Control Paths



NOTE:
A BROADBAND 50Ω HF ANTENNA
CAN BE CONNECTED DIRECTLY
TO J11.

5800H-20W-VEH03C

Figure 4-2. RF-5800H 20-Watt Vehicular System RF/Audio and Control Paths with LPF



5800H-20W-VEH04B

Figure 4-3. Power Distribution Diagram

CHAPTER 5**SCHEDULED MAINTENANCE****5.1 PREVENTIVE MAINTENANCE**

Preventive maintenance is the systematic, daily care and inspection of equipment to prevent equipment failure and reduce downtime.

Table 5-1 contains the checks and services that should either be performed on a daily basis when the equipment is in use or on a weekly basis when the equipment is in a standby condition. Table 5-2 contains the checks and services that should be performed on a weekly basis.

Table 5-1. Daily Preventive Maintenance Checks and Services for Normal Operating Conditions or Weekly Preventive Maintenance Checks and Services for Standby Conditions

Check No.	Item to be Inspected	Procedure
1	Completeness	Check to see that the equipment is complete.
2	Exterior Surfaces	Remove dust, dirt, and moisture from all surfaces and clean front panel display window with a soft cloth.
3	Controls	Check all controls for looseness or damage; check mechanical action of each control for smooth operation.
4	Operation	Perform self-test. Reference Paragraph 2.6.2.

Table 5-2. Weekly Preventive Maintenance Checks and Services for Normal or Standby Conditions

Check No.	Item to be Inspected	Procedure
1	Connectors	Check all connectors for debris, damage, or corrosion. Contact a qualified Level III or Level IV maintainer if further repair is required.
2	Antenna	Check for breaks or strains; repair or replace as required.

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CHAPTER 6

TROUBLESHOOTING

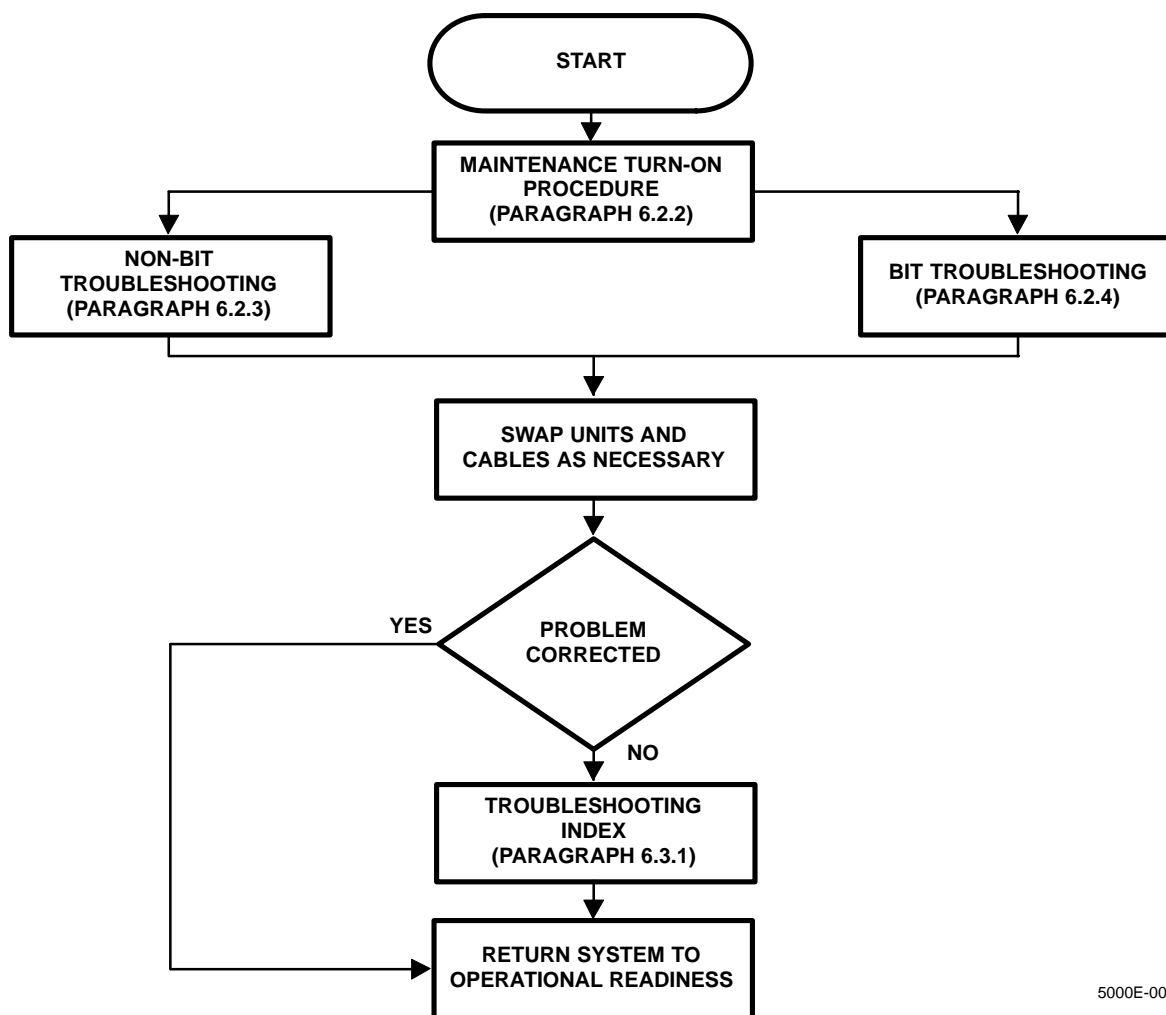
6.1 INTRODUCTION

6.1.1 General

This chapter provides troubleshooting data necessary for fault isolation to the LRU level.

6.1.2 Scope of this Chapter

See Figure 6-1. The procedures presented in this chapter assume that a Level I fault has led the maintainer to suspect a fault with the RF-5800H 20-Watt Vehicular System. The maintainer begins the troubleshooting process by using the maintenance turn-on procedure to find a fault indication that identifies the faulty LRU. If there is a non-BIT fault, the maintainer will use the non-BIT troubleshooting procedures. If there is a BIT fault, the maintainer will use the BIT troubleshooting procedures. TAPs are provided to help the maintainer isolate faults using procedures other than simple unit swapping. When the problem is found and corrected, the radio system is returned to operational readiness.



5000E-004A

Figure 6-1. Troubleshooting Process Used in this Chapter

6.2 TROUBLESHOOTING PROCEDURES

6.2.1 General

Troubleshooting begins with performing the maintenance turn-on procedure. The maintenance turn-on procedure references the non-BIT and BIT troubleshooting procedures.

6.2.2 Maintenance Turn-On Procedure

The Level II maintenance turn-on procedure is used to guide the maintainer through the proper RF-5800H-MP front panel settings to power up the RF-5800H 20-Watt Vehicular System from a de-energized state to a fully operational state. In each step, the maintainer is to observe the RF-5800H 20-Watt Vehicular System for normal operating conditions. Faults may be determined by using BIT or visual observation. BIT faults for all units are displayed on the RF-5800H-MP KDU.

Perform the following procedure to power up the RF-5800H-MP and execute BIT:

- a. Rotate the FUNCTION switch to the **PT** position. If the RF-5800H-MP does not power-up, verify that the power source is on. If necessary proceed to Paragraph 6.2.3, Non-BIT Fault Troubleshooting.
- b. Press the **OPT** button.
- c. If necessary, press the left/right arrow buttons to select the **TEST** field.

NOTE

While in TEST mode, the radio cannot receive or transmit.

- d. Press the **ENT** button.
- e. If necessary, press the left/right arrow buttons to select the **ALL** field.
- f. Press the **ENT** button. This will initiate BIT.

If the RF-5800H-MP displays a fault code on the LCD after completing the BIT test, record the fault code and proceed to Paragraph 6.2.4, BIT Troubleshooting.

If the RF-5800H-MP displays no error messages, try to operate the RF-5800H 20-Watt Vehicular System in an attempt to generate a run-time fault. If a run-time fault is generated, refer to the non-BIT troubleshooting procedures in Paragraph 6.2.3.

If a run-time fault cannot be generated and the RF-5800H 20-Watt Vehicular System is still not operating properly, refer to the non-BIT troubleshooting procedures in Paragraph 6.2.3.

6.2.3 Non-BIT Troubleshooting

Table 6-1 is a list of the non-BIT fault symptoms and references to the recommended actions that should be taken. Perform the recommended actions one at a time in the order listed, testing the system after each action is performed. Paragraph 2.5 provides the LRU removal and installation procedures. When the action column refers to a TAP, proceed to the specified TAP in Paragraph 6.2.5.

If the actions do not correct the problem, proceed to the troubleshooting index in Paragraph 6.3.1.

Table 6-1. Non-BIT Fault Symptoms/Run Time Fault Codes

Symptom Observed	Action
System does not power up. COUPLER FAULT displayed on RF-5800H-MP KDU. HIGH VSWR displayed on RF-5800H-MP KDU. PA BAD FILTER displayed on RF-5800H-MP KDU. PA COMM FAULT displayed on RF-5800H-MP KDU. PA HIGH DC INPUT displayed on RF-5800H-MP KDU.	Refer to TAP-1. Perform the following: <ul style="list-style-type: none"> ● Replace RF-5830H-PA/Coupler. Perform the following: <ul style="list-style-type: none"> ● Check RF cables and antenna, replace as necessary. ● Replace RF-5830H-PA/Coupler. Perform the following: <ul style="list-style-type: none"> ● Check RF cables, replace as necessary. ● Replace RF-5830H-PA/Coupler. Perform the following: <ul style="list-style-type: none"> ● Replace PA-R/T Control Cable. ● Replace RF-5830H-PA/Coupler. Perform the following: <ul style="list-style-type: none"> ● Check level of DC input voltage is within specification. ● Replace RF-5830H-PA/Coupler.

Table 6-1. Non-BIT Fault Symptoms/Run Time Fault Codes – Continued

Symptom Observed	Action
PA LOW DC INPUT displayed on RF-5800H-MP KDU.	Perform the following: <ul style="list-style-type: none"> • Check that DC input voltage is within specification. Perform check under a loaded and unloaded condition. • Replace PA-R/T Control Cable. • Replace RF-5830H-PA/Coupler.
PA OVERCURRENT displayed on RF-5800H-MP KDU.	Perform the following: <ul style="list-style-type: none"> • Replace RF-5830H-PA/Coupler.
PA OVERTEMP displayed on RF-5800H-MP KDU.	Perform the following: <ul style="list-style-type: none"> • Unkey RF-5800H-MP and allow RF-5830H-PA/Coupler to cool. Confirm RF-5830H-PA/Coupler is well ventilated and not in direct sunlight. If problem persists, remove and replace RF-5830H-PA/Coupler.
PA WARNING displayed on RF-5800H-MP KDU.	Perform the following: <ul style="list-style-type: none"> • Retune RF-5800H-MP and rekey. If fault clears, continue operating. • Replace RF-5830H-PA/Coupler.
THERMAL WARNING displayed on RF-5800H-MP KDU.	Perform the following: <ul style="list-style-type: none"> • Unkey RF-5800H-MP and allow RF-5830H-PA/Coupler to cool. Confirm RF-5830H-PA/Coupler is well ventilated and not in direct sunlight. If problem persists, remove and replace RF-5830H-PA/Coupler.
Low or no transmit power on some (but not all) HF or VHF frequencies.*	Perform the following: <ul style="list-style-type: none"> • Replace RF-5830H-PA/Coupler.
Low or no transmit power on all HF or all VHF frequencies.*	Perform the following: <ul style="list-style-type: none"> • Check RF cables and antenna and replace as necessary. • Replace RF-5830H-PA/Coupler.

*If the LPF is connected, frequencies above 25 MHz will be filtered out.

Table 6-1. Non-BIT Fault Symptoms/Run Time Fault Codes – Continued

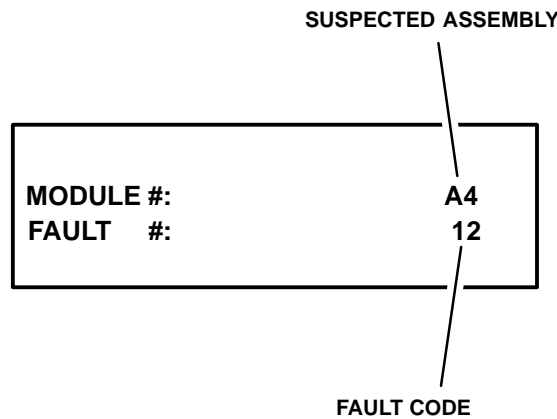
Symptom Observed	Action
Variable or no audio signals.	Perform the following: <ul style="list-style-type: none"> • Check volume setting. • Replace PA-R/T Control Cable. • Replace RF-5800H-MP. • Replace RF-5830H-PA/Coupler.
Suspected power output problem.	Perform the following: <ul style="list-style-type: none"> • If possible, perform scheduled maintenance tests. Refer to RF-5800H-MP and RF-5830H-PA/Coupler Intermediate Maintenance Manuals. • Check RF cables and replace as necessary. • Check ground straps. • Check that DC input voltage is within specification. Perform check under a loaded and unloaded condition. • Replace RF-5830H-PA/Coupler. • Replace RF-5800H-MP.
Suspected receive sensitivity problem.	Perform the following: <ul style="list-style-type: none"> • If possible, perform scheduled maintenance tests. Refer to RF-5800H-MP and RF-5830H-PA/Coupler Intermediate Maintenance Manuals. • Check RF cables and replace as necessary. • Check ground straps. • Replace RF-5800H-MP. • Replace RF-5830H-PA/Coupler.
RF-5800H-MP does not reach normal operational display.	Perform the following: <ul style="list-style-type: none"> • Replace RF-5800H-MP.

6.2.4 BIT Troubleshooting

BIT is executed from the KDU of the RF-5800H-MP connected to the RF-5800H 20-Watt Vehicular System, or from an optional terminal connected to the RF-5800H-MP. The self-test function of the RF-5800H-MP automatically tests the system. If a problem is located, a fault code will be displayed on the KDU.

See Figure 6-2 for a sample fault code display on the KDU. Table 6-2 is a list of the BIT fault codes. Next to each fault code is a recommendation of action to be taken to correct the fault. Remove and replace the recommended LRUs one at a time in the order listed, executing BIT after replacing each LRU. Paragraph 2.5 includes the LRU removal and installation procedures. If the unit passes BIT, the faulty LRU has been isolated.

If replacing the suspected LRU does not correct the problem, refer to Paragraph 6.3.1, the troubleshooting index, for additional troubleshooting recommendations.



5800H-010A

Figure 6-2. Sample Fault Code Display

Table 6-2. BIT Faults and Recommended Actions (RF-5800H-MP)

BIT Fault Observed	Action
A4 01	Remove and replace the following assemblies: <ul style="list-style-type: none"> • A3 Controller Assembly • A5 Interconnect PWB Assembly • A4 Interface PWB Assembly
A4 02	Remove and replace A3 Controller Assembly.
A4 03	Remove and replace A3 Controller Assembly.
A4 04	Remove and replace A3 Controller Assembly.
A4 05	Remove and replace the following assemblies: <ul style="list-style-type: none"> • A4 Interface PWB Assembly • A5 Interconnect PWB Assembly
A4 06	Remove and replace A3 Controller Assembly.

Table 6-2. BIT Faults and Recommended Actions (RF-5800H-MP) – Continued

BIT Fault Observed	Action
A4 07	Remove and replace A1 20 W Power Amplifier/Harmonic Filter Assembly.
A4 08	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 09	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 10	Remove and replace A1 20 W Power Amplifier/Harmonic Filter Assembly.
A4 11	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 12	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 13	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 14	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly
	<ul style="list-style-type: none"> • A3 Controller Assembly
A4 15	Remove and replace A1 20 W Power Amplifier/Harmonic Filter Assembly.
A4 16	Remove and replace the following assemblies:
	<ul style="list-style-type: none"> • Inspect J12 RF IN connector for visible damage. If damaged, replace W1 RF Input Coax Assembly.
	<ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly

Table 6-2. BIT Faults and Recommended Actions (RF-5800H-MP) – Continued

BIT Fault Observed	Action
A4 17	Remove and replace the following assemblies: <ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly • A3 Controller Assembly
A4 23	Remove and replace the following assemblies: <ul style="list-style-type: none"> • A1 20 W Power Amplifier/Harmonic Filter Assembly • A3 Controller Assembly
A4 50	Remove and replace A3 Controller Assembly.
A4 53	Remove and replace A2 Antenna Coupler Assembly.
A4 54	Remove and replace A3 Controller Assembly.
A4 55	Remove and replace A3 Controller Assembly.
A4 56	Remove and replace A3 Controller Assembly.
A4 57	Remove and replace A3 Controller Assembly.

6.2.5 TAPs

TAPs are provided to help the maintainer isolate faults using procedures other than simple unit swapping. The TAP begins with a simple description of the fault or symptom. Refer to Table 6-3 for a list of TAPs.

When applicable, begin by performing the listed initial checks. These are checks that can be performed without the use of tools or test equipment. If the initial checks do not solve the problem, continue by performing the procedure itself. If the problem still exists after completing the TAP, proceed to the Troubleshooting Index. Refer to Paragraph 6.3.1.

Table 6-3. Troubleshooting Analysis Procedures

Tap	Symptom Observed
TAP-1	No power up

TAP-1: NO POWER UP

RF-5800H 20-Watt Vehicular System does not power up.

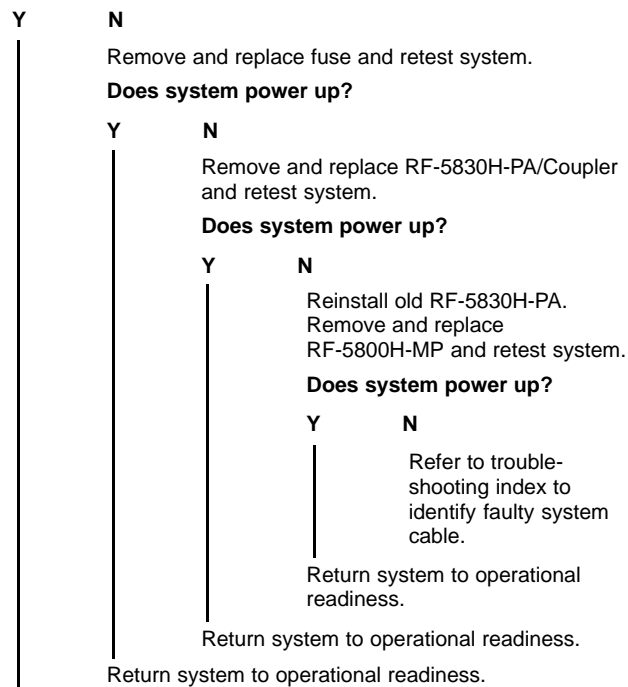
INITIAL CHECKS

- Make sure all cables are connected.
- Make sure all units are properly seated.
- Make sure all connections are tight and there are no broken connections.

PROCEDURE

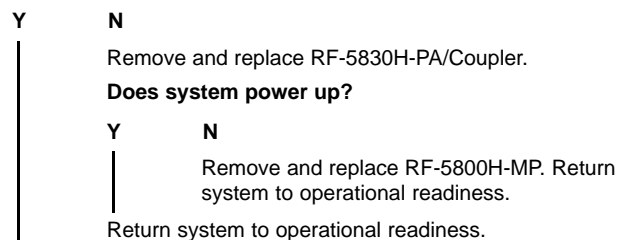
Check fuse in vehicle circuit supplying radio system.

Is fuse good?



Remove and replace DC power cable.

Does system power up?



Return system to operational readiness.

6.3 TROUBLESHOOTING SUPPORT DATA

6.3.1 Troubleshooting Index

Table 6-4 is the troubleshooting index for the RF-5800H 20-Watt Vehicular System. Use the troubleshooting index if the actions in the non-BIT troubleshooting (Paragraph 6.2.3) or the BIT troubleshooting (Paragraph 6.2.4) procedures do not correct the problem. The first column of Table 6-4 references the functional areas. The second column references the figure for each functional area. The third column references the text description for each functional area. Analyze the information for each functional area, and determine which units and cables affect each functional area in an attempt to isolate the problem to an LRU.

The information contained in this manual complies with the requirements specified for Level II maintenance.

Table 6-4. Troubleshooting Index

Functional Area	Signal Path Diagram	Functional Description Paragraph
RF/Audio Signal Path	4-2	4.2.1
Control Path	4-2	4.2.2
Power Distribution	4-3	4.2.3

6.4 INTERCONNECT INFORMATION

6.4.1 General

For RF-5800H 20-Watt Vehicular System interconnect information, refer to Chapter 2, Paragraph 2.5.6. For connector pinouts, refer to the Level III maintenance manual.

CHAPTER 7

PARTS LIST

7.1 INTRODUCTION

This chapter contains radio system parts list information for the RF-5800H 20-Watt Vehicular System. This information can be used to identify units within each radio system configuration, and to place orders for those units. This chapter is organized as follows:

- Paragraph 7.2 – LRUs
- Paragraph 7.3 – LRU Diagrams

7.2 LINE REPLACEABLE UNITS (LRUs)

Tables 7-1 through 7-3 list the LRUs that comprise the RF-5800H 20-Watt Vehicular System. Table 7-4 lists the optional cables available. Quantity, part number, and figure number references are provided.

Table 7-1. RF-5800H 20-Watt Vehicular System LRUs

Ref. Des.	Item Name	Part Number	Quantity	Figure Number
–	RF-5830H-PA 20-Watt Power Amplifier/Coupler	RF-5830H-PAxxx*	1	7-1, 7-2
–	Vehicular Shock Mount	RF-5211VSM	1	7-3
–	Coaxial Cable Assembly, R/T-PA (RF)	10181-9821-020	1	7-4
–	Cable Assembly, R/T-PA (Control)	10535-0720-A020	1	7-6
–	Ground Strap, Braided	7147-1167-3	1	–

*xxx represents a three-digit suffix that varies with the specific model of RF-5830H-PA purchased.

Table 7-2. RF-5211VSM Vehicular Shock Mount Assembly Parts List

Ref. Des.	Item Name	Part Number	Quantity	Figure Number
–	RF-5211VSM Shock Mount Assembly	10372-0870-01	1	7-3
–	RF-5211VSM Ancillary Kit	10372-0875-01	1	–

Table 7-3. RF-5211VSM Ancillary Kit Parts List (10372-0875-01)

Ref. Des.	Item Name	Part Number	Quantity	Figure Number
–	FW SS .281X.625	MS15795-810	3	–
–	FW SS .344X.688	MS15795-812	4	–
–	Bolt Hex HD 1/4-20X1	MS35307-308	1	–
–	Bolt Hex HD 5/16-18X7/8	MS35307-333	4	–
–	LW SPLT SS, 1/4	MS35338-139	2	–
–	LW SPLT SS, 5/16	MS35338-140	4	–
–	Washer Lock .250	MS45904-68	1	–
–	Nut Hex 1/4-20	MS51971-1	2	–
–	Nut No. 5/16-18	MS51971-2	4	–

Table 7-3. RF-5211VSM Ancillary Kit Parts List (10372-0875-01) – Continued

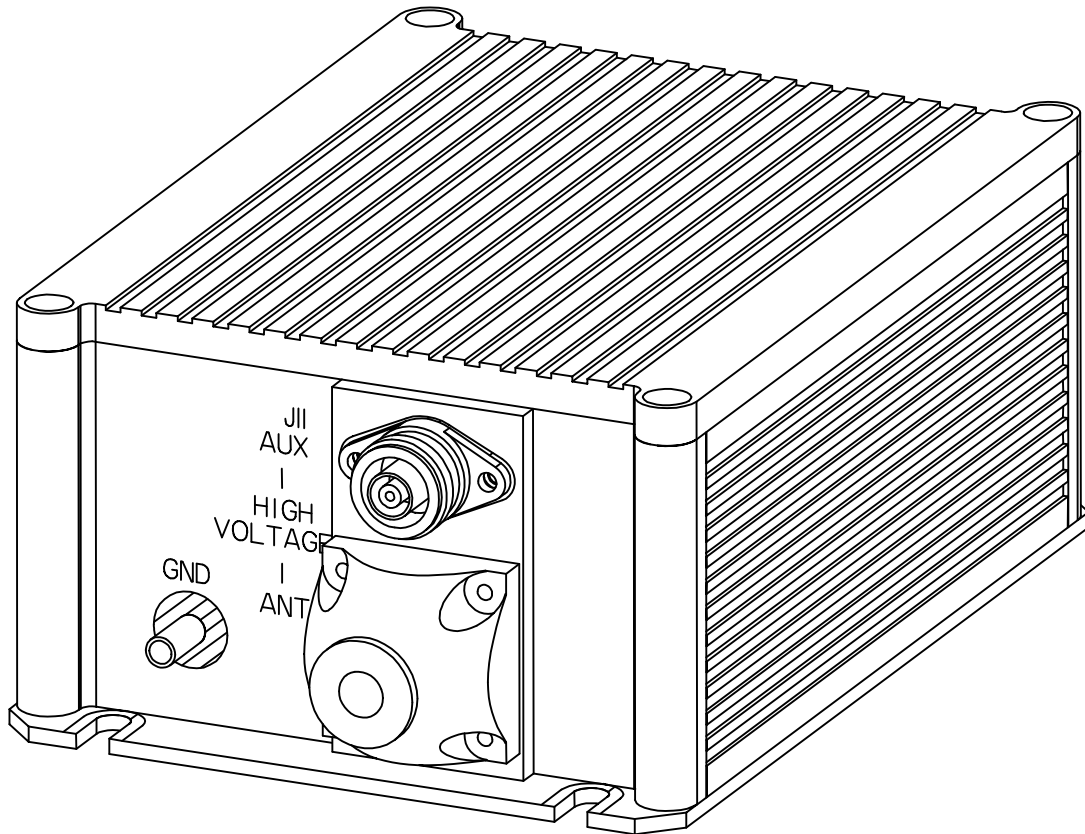
Ref. Des.	Item Name	Part Number	Quantity	Figure Number
–	Ground Strap	7147-1167-3	1	–

Table 7-4. Available Optional Cables (Purchased Separately)

Ref. Des.	Item Name	Part Number	Quantity	Figure Number
–	Cable Assembly, KY-99A Audio/Black Data	10535-0701-A004	– –	7-7
–	Cable Assembly, RS-232 Black Data to Encryption Device	10535-0702-A1	– –	7-8
–	Y-Cable Assembly, ASCII Remote and PA control	10535-0730	– –	7-9
–	Cable Assembly, KG-84C Black Data	10535-0750	– –	7-10
–	Cable Assembly, ASCII Remote Control Rear D-Connector	10535-0760	– –	7-11
–	Cable Assembly, Sync/Async RS-232 DTE Data	10535-0770	– –	7-12
–	Cable Assembly, Synchronous RS-232 DTE Data (DB-25)	10535-0780	– –	7-13

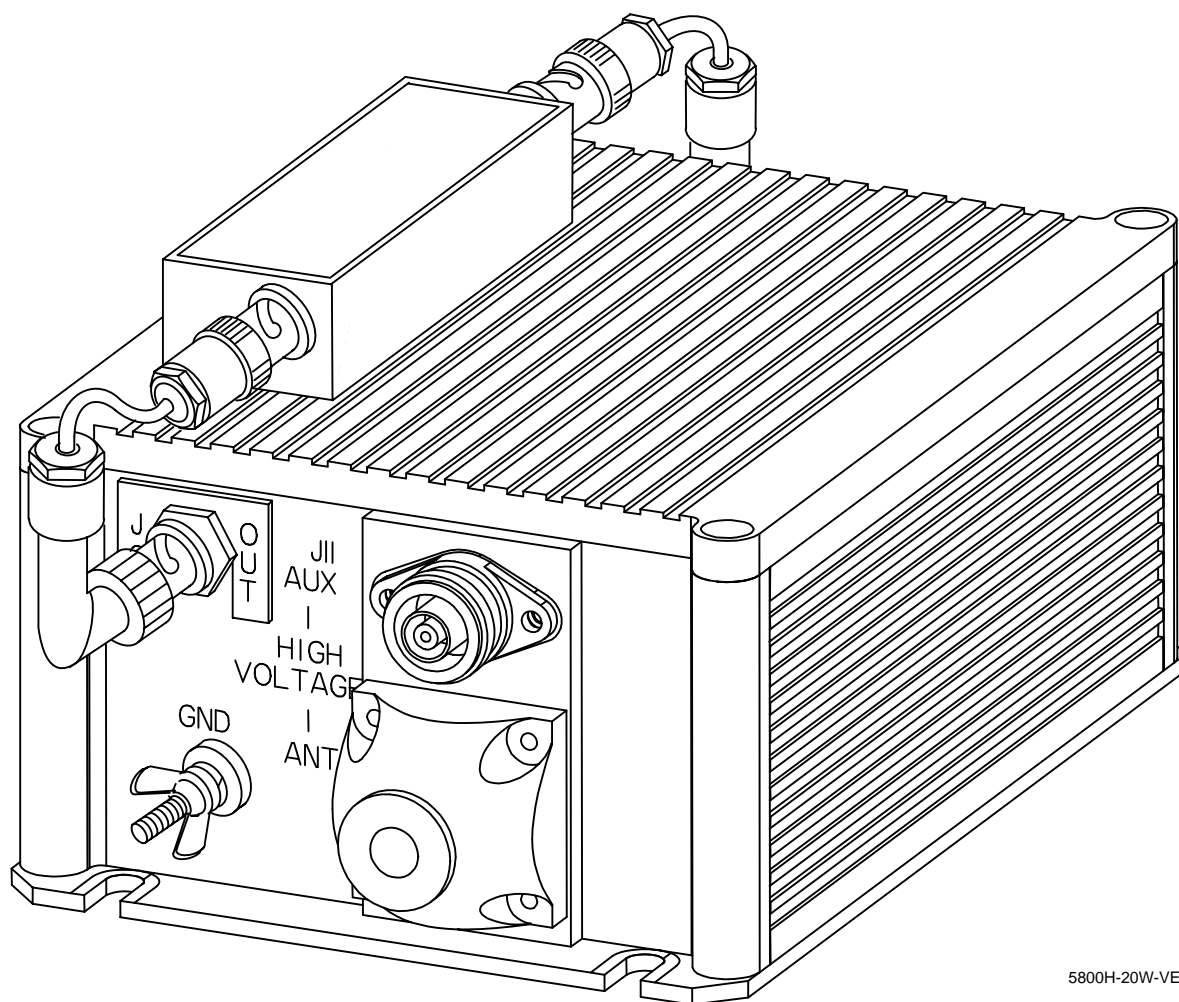
7.3 LRU DIAGRAMS

Figures 7-1 through 7-6 show the assemblies identified in Tables 7-1 through 7-3. Optional cables for the system are listed in Table 7-4 and shown in Figures 7-7 through 7-13.



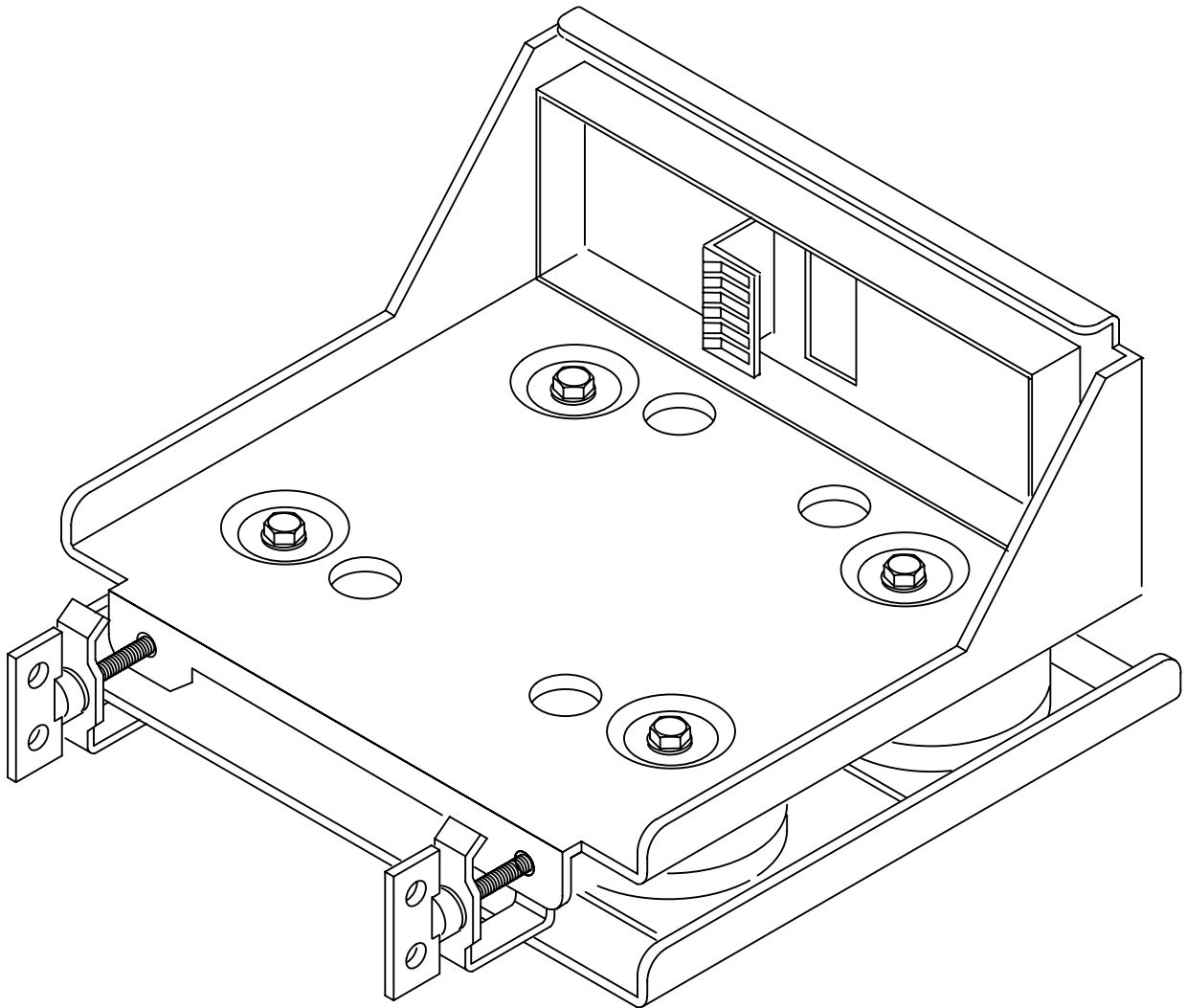
5800H-20W-VEH05A

Figure 7-1. RF-5830H-PA001 20-Watt Power Amplifier/Coupler



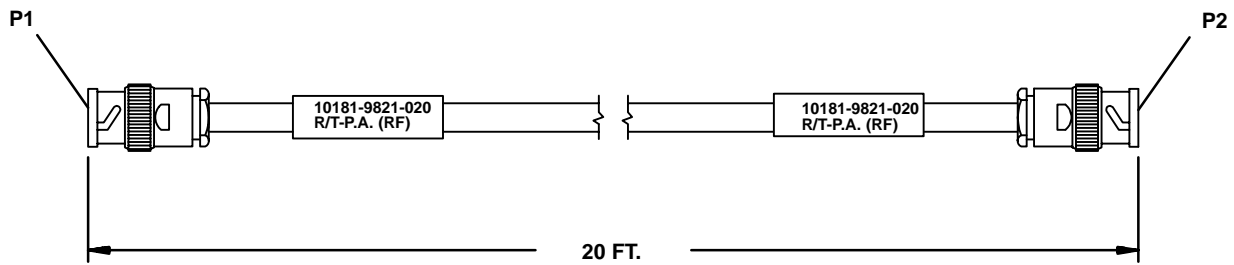
5800H-20W-VEH300

Figure 7-2. RF-5830H-PA002 20-Watt Power Amplifier/Coupler with LPF



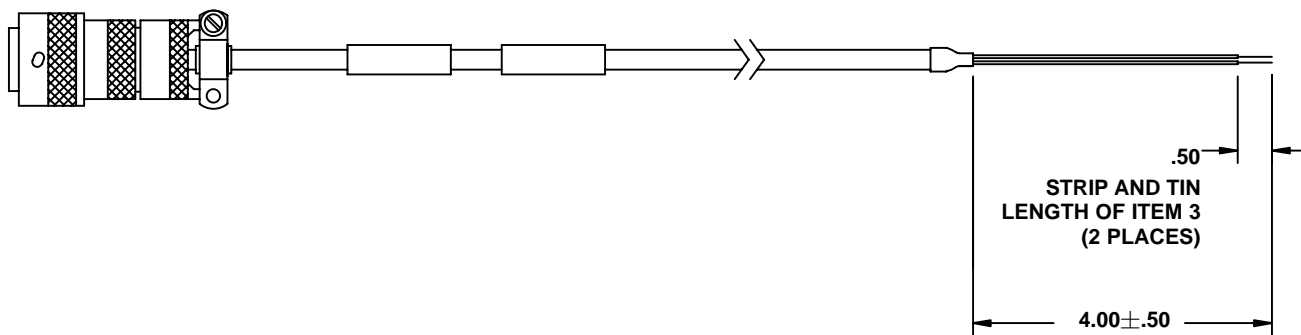
5800H-20W-VEH06B

Figure 7-3. RF-5211VSM Vehicular Shock Mount Assembly



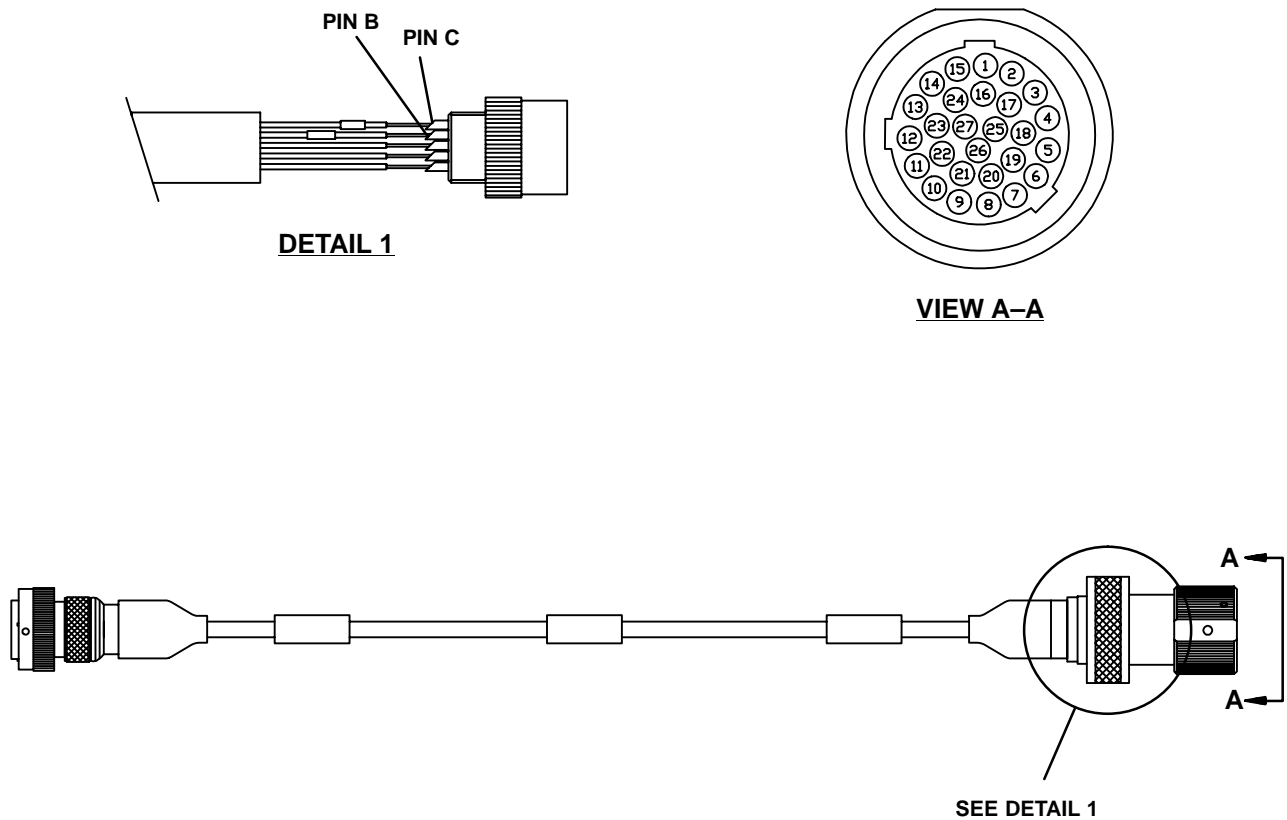
5800H-20W-VEH07B

Figure 7-4. R/T-PA Coaxial Cable Assembly (10181-9821 Rev. C)



10181-9827 F

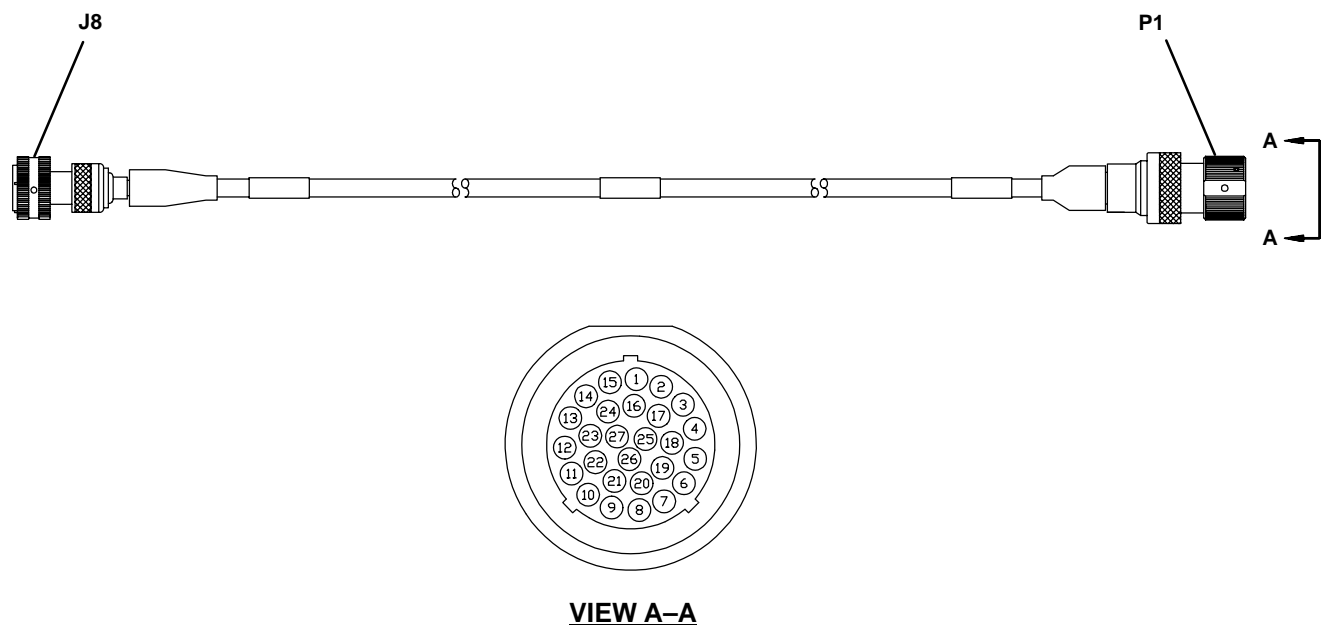
Figure 7-5. DC Power Cable Assembly (10181-9827 Rev. F)



WIRE RUN LIST

FROM P1 (RADIO J6)	TO P2 (PA J8)	FUNCTION
PIN 2	PIN E	EXT-DC PWR RTN
PIN 3	PIN B	DATA +
PIN 4	PIN C	DATA -
PIN 9	PIN D	ON/OFF
PIN 14	PIN K	EXT +DC PWR IN
PIN 15	PIN J	EXT +DC PWR IN
PIN 17	PIN F	EXT -DC PWR RTN
PIN 19	PIN H	FEEDBACK +
PIN 20	PIN G	FEEDBACK -
PINS 1,5,6-8,10- 13,16,18,21-27	NC	N/A
BRAID OF ITEM 6	CONNECTOR BODY OF P2 & P1	SHIELD GND & CONNECTOR BODY GND

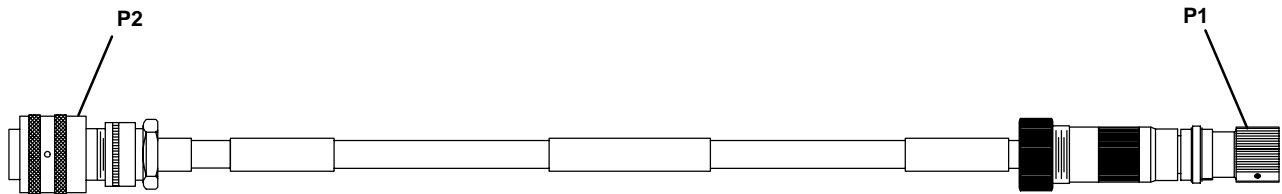
Figure 7-6. PA-R/T Cable Assembly (10535-0720 Rev. B)



WIRE RUN LIST

FROM		TO	
PIN	WIRE	PIN	FUNCTION
P2-1	ITEM-1 BLK	P1-13	GND
P2-2	ITEM-1 BRN	P1-11	FIXED LEVEL AUD OUT
P2-3	ITEM-1 RED	P1-15	RED PTT
P2-4	ITEM-1 ORN	P1-13	GROUND
P2-5	ITEM-1 YEL	P1-12	FIXED LEVEL AUD IN
P2-6	ITEM-1 GRN	P1-5	GND
P2 BACKSHELL	ITEM-1 BRAID	P1 BACKSHELL	FRAME GROUND

Figure 7-7. KY-99A Audio/Black Data Cable Assembly (10535-0701 Rev. A)



PIN	FUNCTION
P2-1	N/C
P2-2	N/C
P2-3	BPTT
P2-4	N/C
P2-5	N/C
P2-6	GND
P2-7	RX_D
P2-8	EXT_TX/RX_CLK
P2-9	TX_DATA
P2-10	INT_TX_CLK
P2-11	CTS
P2-12	LOSSEL
P2-13	N/C

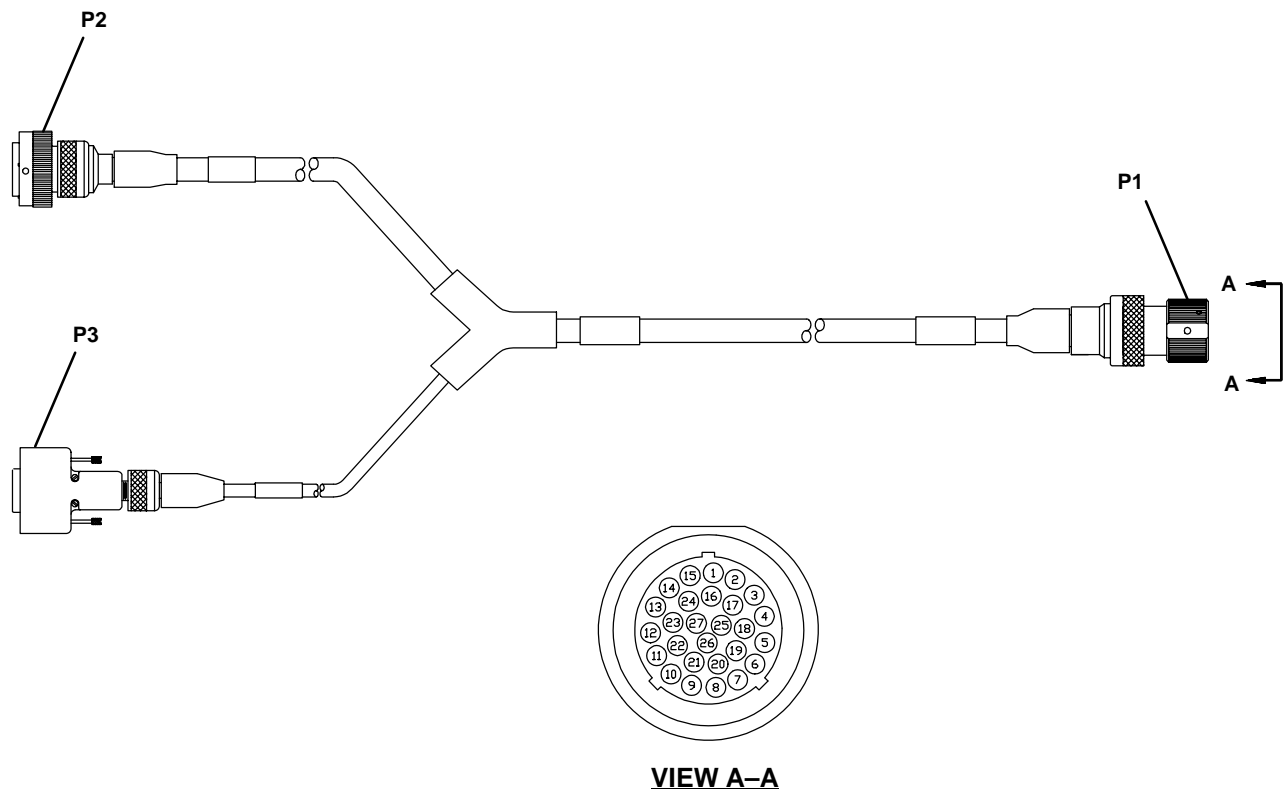
PIN	FUNCTION
P1-6	R_DCE_RXDATA
P1-3	R_DCE_RXCLK
P1-19	R_DCE_TXDATA
P1-18	R_DCE_TXCLK
P1-1	R_DCE_CTS
P1-9	RAD_PRESENCE
P1-26	R_DCE_RTS
P1-5	GND
P1-13	GND
P1-16	R_DCE_DTR
P1-4	N/C
P1-7,8	N/C
P1-(10-12)	N/C
P1-(14,15,17)	N/C
P1-(20-25)	N/C
P1-27	N/C

CONTINUITY TEST		
P2-7	TO	P1-6
P2-8	TO	P1-3
P2-9	TO	P1-19
P2-10	TO	P1-18
P2-12	TO	P1-13

NO SHORTS TEST		
P2-7	TO ALL PINS EXCEPT	P1-6
P2-8	TO ALL PINS EXCEPT	P1-3
P2-9	TO ALL PINS EXCEPT	P1-19
P2-10	TO ALL PINS EXCEPT	P1-18
P2-11	TO ALL PINS EXCEPT	P1-1

FUNCTIONAL TEST (FOR KY-99 CABLE CIRCUITRY) $\pm 10\%$	
1. USING AN OHMMETER, CONNECT POS LEAD TO P1-9 AND NEG LEAD TO P1-26. VERIFY THAT THE METER MEASURES 10K OHMS.	
2. GROUND P1-5.	
3. APPLY +9VDC TO P1-1. VERIFY THAT P2-11 DOES NOT EXCEED 5VDC.	
4. APPLY -9VDC TO P1-1. VERIFY THAT P2-11 DOES NOT DROP BELOW -1VDC.	
5. APPLY +9VDC TO P1-9.	
6. MEASURE +9VDC AT P1-16.	
7. CONNECT GROUND TO P2-3. VERIFY THAT THE VOLTAGE AT P1-26 IS 1.5VDC MINIMUM.	
8. REMOVE GROUND TO P2-3. VERIFY THAT THE VOLTAGE AT P1-26 DOES NOT EXCEED 200MV.	

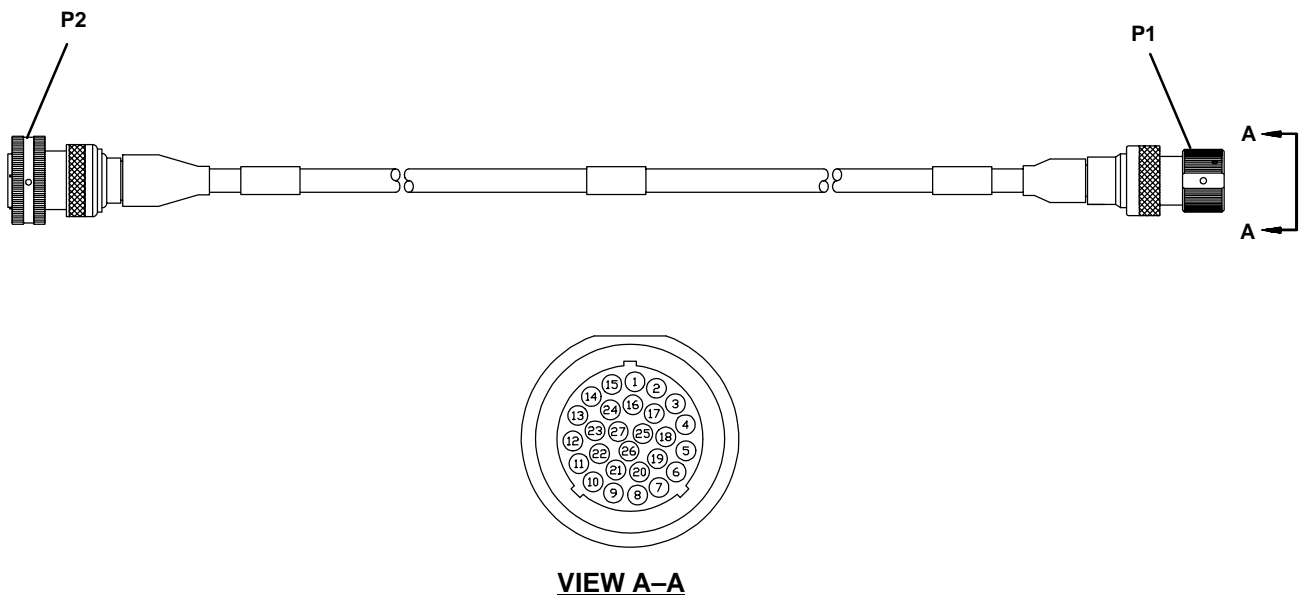
Figure 7-8. RS-232 Black Data to Encryption Device Cable Assembly (10535-0702 Rev. B)



WIRE RUN LIST

FROM		TO				FUNCTION	RF5800 SIGNAL NAME(REF)	NOTES
P1 PIN	ITEM 6 WIRE	ITEM 14 WIRE	P2 PIN	WIRE	P3 PIN			
2	BLK	BLK	E			EXT DC PWR RTN	FRNT_EXT_PWR_RTN	
3	BRN	BRN	B			DATA +	AIC_PA_CT-	SEE NOTE 5
4	RED	RED	C			DATA -	AIC_PA_CT+	SEE NOTE 5
9	ORN	ORN	D			ON/OFF	/AIC_PA_ON	
14	YEL	YEL	K			EXT +DC PWR IN	FRNT_EXT_PWR_IN1	
15	GRN	GRN	J			EXT +DC PWR IN	FRNT_EXT_PWR_IN2	
17	BLU	BLU	F			EXT -DC PWR RTN	FRNT_EXT_PWR_RTN	
19	VIO	VIO	H			FEEDBACK+	AIC_PA_FB+	
20	GRY	GRY	G			FEEDBACK-	AIC_PA_FB-	
25	WHT			ITEM 11 (RED)	2	RX DATA	AIC_RMT_RXD-	
26	WHT/BLK			ITEM 12 (ORN)	3	TX DATA	AIC_RMT_TXD-	
5	WHT/BRN			ITEM 13 (GRN)	5	GROUND	COMGND	
BACKSHELL	SHIELD	SHIELD	BACKSHELL	ITEM 8	BACKSHELL	OVERALL CABLE SHIELD		

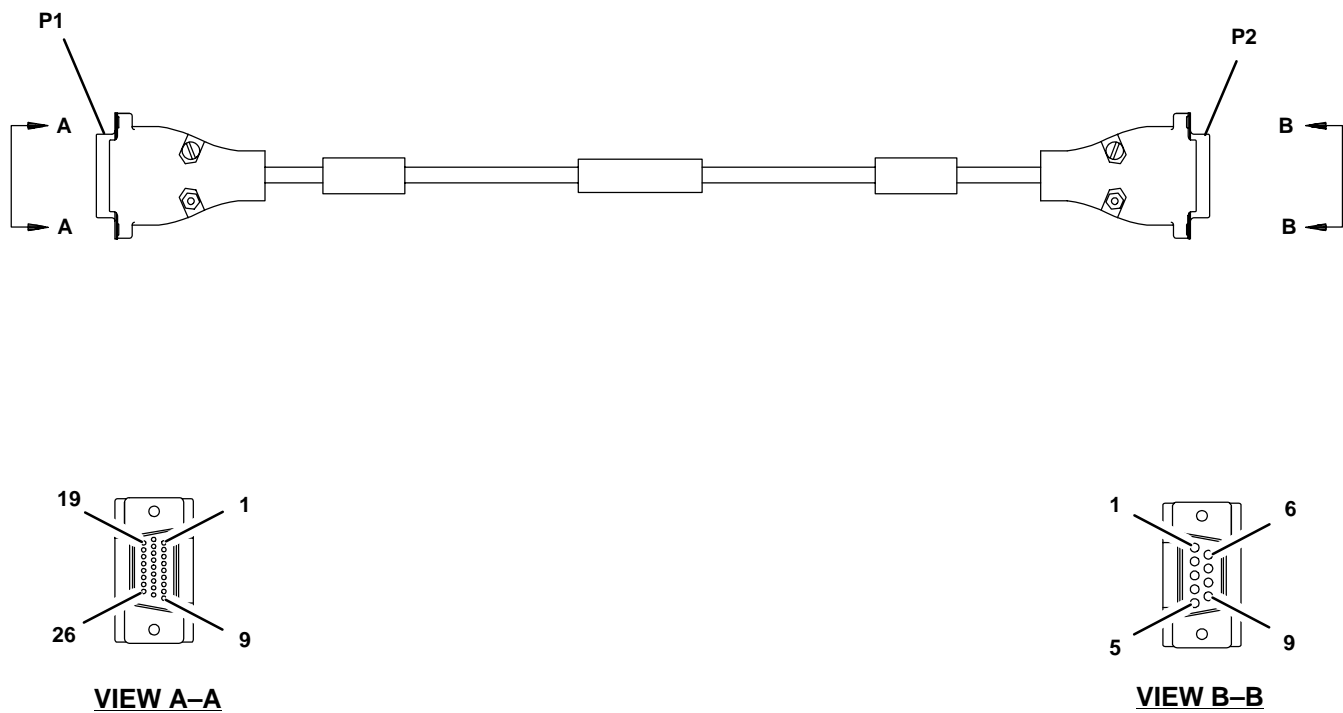
Figure 7-9. ASCII Remote and PS Control Cable Assembly, Y (10535-0730 Rev. B)



WIRE RUN LIST

FROM		WIRE	TO	
KG-84C FUNCTION	PIN		PIN	RF-5800H FUNCTION
DCD	P2-34	ITEM-3 BLK	P1-2	DCD
RX DATA	P2-13	ITEM-3 BRN	P1-6	RX DATA
TX DATA	P2-14	ITEM-3 RED	P1-19	TX DATA
SIG GND	P2-1	ITEM-3 ORN	P1-5	SIG GND
RTS	P2-47	ITEM-3 YEL	P1-26	RTS
CTS	P2-27	ITEM-3 GRN	P1-1	CTS
RX CLOCK	P2-19	ITEM-3 BLU	P1-18	TX CLOCK
TX CLOCK	P2-32	ITEM-3 VIO	P1-3	RX CLOCK
SHIELD	P2-2	ITEM-3 BRAID	P1 BACKSHELL	FRAME GROUND
SHIELD	P2 BACKSHELL	ITEM-3 BRAID	P1 BACKSHELL	FRAME GROUND
P2 JUMPERS				
	P2-19	ITEM-6 WHT	P2-21	
	P2-51	ITEM-6 WHT	P2-52	
	P2-49	ITEM-6 WHT	P2-52	
	P2-6	ITEM-6 WHT	P2-25	
	P2-10	ITEM-6 WHT	P2-28	
	P2-18	ITEM-6 WHT	P2-30	
	P2-1	ITEM-6 WHT	P2-12	
	P2-20	ITEM-6 WHT	P2-22	
	P2-12	ITEM-6 WHT	P2-20	

Figure 7-10. KG-84C Black Data Cable Assembly, Y (10535-0750 Rev. B)



WIRE RUN LIST			
FROM	COLOR	TO	FUNCTION
P1-7	RED	P2-3	TX DATA
P1-17	BROWN	P2-2	RX DATA
P1-12	BLACK	P2-5	GND
P1-1 - P1-6			N/C
P1-8 - P1-16			N/C
P1-18 - P1-24			N/C
P2-1, 3, 4			N/C
P2-6 - P2-9			N/C

Figure 7-11. ASCII Remote Control Rear D-Connector Cable Assembly (10535-0760 Rev. -)

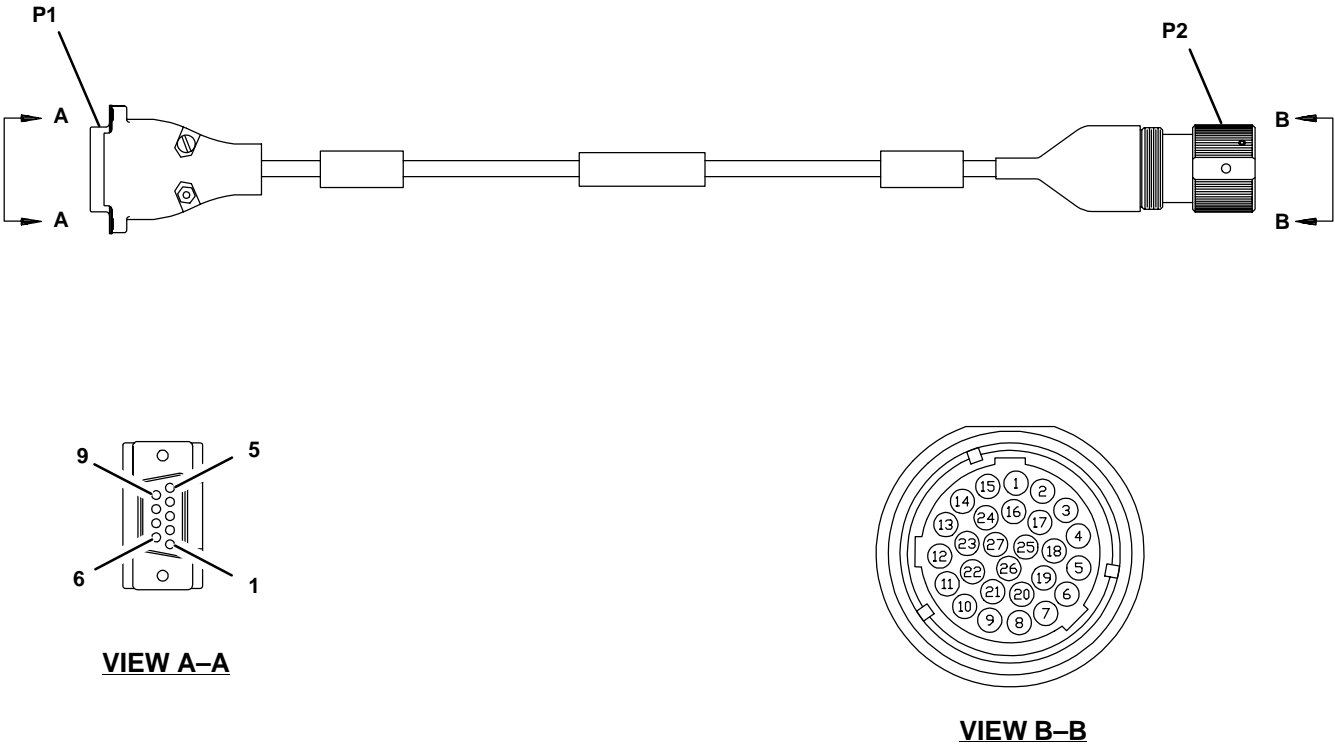


TABLE B

CONTINUITY TEST		
P1-2	TO	P2-6
P1-3	TO	P2-19
P1-5	TO	P2-5

TABLE C

NO SHORTS TEST		
P1-2	TO ALL PINS EXCEPT	P2-6
P1-3	TO ALL PINS EXCEPT	P2-19
P1-5	TO ALL PINS EXCEPT	P2-5

WIRE RUN LIST

FROM	COLOR	TO	FUNCTION
P1-SHELL	SHIELD	P2-SHIELD	SHIELD
P1-1	BROWN	N/C	
P1-2	RED	P2-6	RX DATA
P1-3	ORANGE	P2-19	TX DATA
P1-4	YELLOW	N/C	
P1-5	GREEN	P2-5	GND_CHAS
P1-6	BLUE	N/C	
P1-7	VIOLET	N/C	
P1-8		N/C	
P1-9		N/C	
N/C		P2-1 THRU 4,7 THRU 18,20 THRU 27	

Figure 7-12. Sync/Async RS-232 DTE Data Cable Assembly (10535-0770 Rev. -)

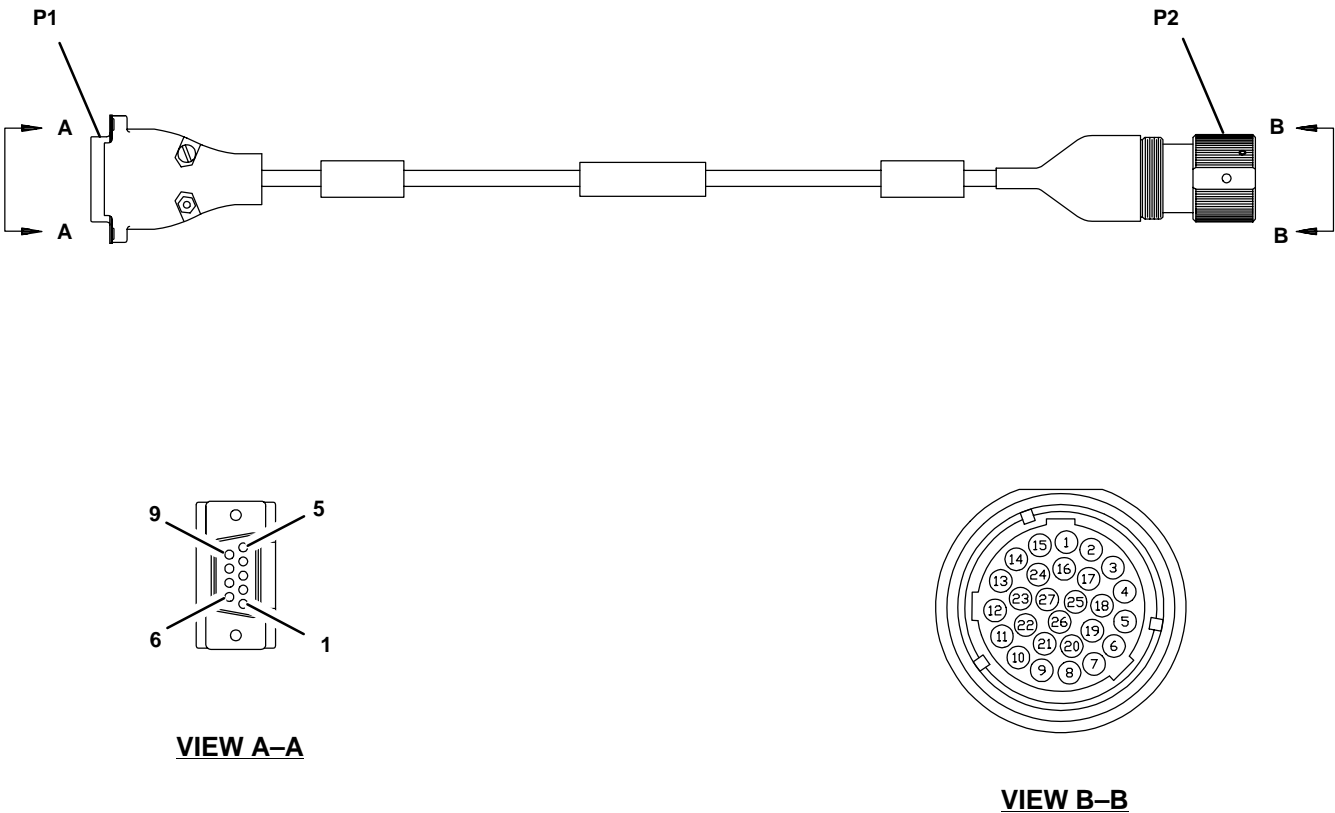


TABLE B

CONTINUITY TEST		
P1-2	TO	P2-6
P1-3	TO	P2-19
P1-5	TO	P2-5

TABLE C

NO SHORTS TEST		
P1-2	TO ALL PINS EXCEPT	P2-6
P1-3	TO ALL PINS EXCEPT	P2-19
P1-5	TO ALL PINS EXCEPT	P2-5

WIRE RUN LIST

FROM	COLOR	TO	FUNCTION
P1-SHELL	SHIELD	P2-SHELL	SHIELD
P1-1	BROWN	N/C	
P1-2	RED	P2-6	RX DATA
P1-3	ORANGE	P2-19	TX DATA
P1-4	YELLOW	N/C	
P1-5	GREEN	P2-5	GND_CHAS
P1-6	BLUE	N/C	
P1-7	VIOLET	N/C	
P1-8		N/C	
P1-9		N/C	
N/C		P2-1 THRU 4,7 THRU 18,20 THRU 27	

Figure 7-13. Synchronous RS-232 DTE Data Cable Assembly (10535-0780 Rev. A)

GLOSSARY**-A-**

A, AMP	Ampere(s)
ac, AC	Alternating Current
A/D	Analog-to-Digital Converter
ADC	Analog-to-Digital Converter
ADDR	Address
AM	Amplitude Modulation
AWG	American Wire Gauge

-B-

BIT	Built-In Test
BITE	Built-In Test Equipment
BNC	British Naval Connector
bps	Bits Per Second
BTU	British Thermal Unit
BW	Bandwidth

-C-

C	Capacitive
cm	Centimeter
CTRL	Control
CW	Continuous Wave, Clockwise

-D-

D/A	Digital-to-Analog
DAC	Digital-to-Analog Converter
dB	Decibel(s)
dBc	Decibel(s) with Carrier Reference

GLOSSARY – Continued

-D- – Continued

dBm	Decibels referenced to 1 milliwatt
dc, DC	Direct Current
DPRAM	Dual-Port RAM
DSP	Digital Signal Processor
DQPSK	Differential Quaternary Phase Shift Keying

-E-

EMI	Electromagnetic Interference
EMR	Electromagnetic Radiation
EPROM	Erasable Programmable Read-Only Memory

-F-

FET	Field-Effective Transistor
FM	Frequency Modulation
FSK	Frequency Shift Keying

-G-

Gnd, GND	Ground
-----------------	--------

-H-

HF	High Frequency
HPF	High Pass Filter
HV	High Voltage
Hz	Abbreviation for hertz, or cycles per second.

-I-

IC	Integrated Circuit
ID	Identification
in.	Inch

GLOSSARY – Continued**-J-****-K-**

k	Thousand
kbyte	Kilobyte
KDU	Keypad Display Unit
kHz	Abbreviation for kilohertz, or thousands of cycles per second.
kW	Kilowatt(s)

-L-

L	Inductance
LPF	Low Pass Filter
LRU	Line Replaceable Unit (Units in this manual.)
LSB	Lower Sideband

-M-

M	Meter, Mega (one million)
m	Milli, one-one thousandth
mA	Milliampere(s)
Mybyte	Megabyte
MCW	Modulated Continuous Wave
MHz	Megahertz
MIL-STD	Military Standard
MP	Manpack
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
ms, msec	Millisecond
MTTR	Mean Time To Repair
mVac	Millivolts Alternating Current
mVdc	Millivolts Direct Current

GLOSSARY – Continued

-N-

-O-

Ω	Ohms, a unit of resistance measurement
OEM	Original Equipment Manufacturer

-P-

PA	Power Amplifier
PEP	Peak Envelope Power
PK	Peak
PROM	Programmable Read-Only Memory
PWB	Printed Wiring Board

-Q-

-R-

RAM	Random Access Memory
RF	Radio Frequency
RFI	Radio Frequency Interference
ROM	Read-Only Memory
RTN	Return
R/T	Receiver-Transmitter
RX	Receive

-S-

SINAD	A ratio of (signal + noise + distortion) to (noise + distortion) used to measure the signal quality of a communication channel. SINAD is commonly used to evaluate the ability of a channel to pass voice traffic.
-------	--

GLOSSARY – Continued**-S- – Continued**

SNR	Signal-to-Noise Ratio
SRAM	Static Random Access Memory
SRU	Signal-to-Noise Ratio
SSB	Single Sideband

-T-

TR	Transmit/Receive
TLC	Transmit Level Control
TX	Transmit

-U-

USB	Upper Sideband
------------	----------------

-V-

V	Volt
VA	Volt-Ampere
VAC, vac	Volts, Alternating Current
VCA	Voltage Controlled Attenuator
VCO	Voltage Controlled Oscillator
VDC, Vdc	Volts, Direct Current
VHF	Very High Frequency
VSWR	Voltage Standing Wave Ratio

-W-

W	Watt(s)
----------	---------

-X-

XMT	Transmit
------------	----------

-Y-**-Z-**

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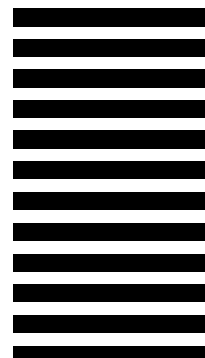
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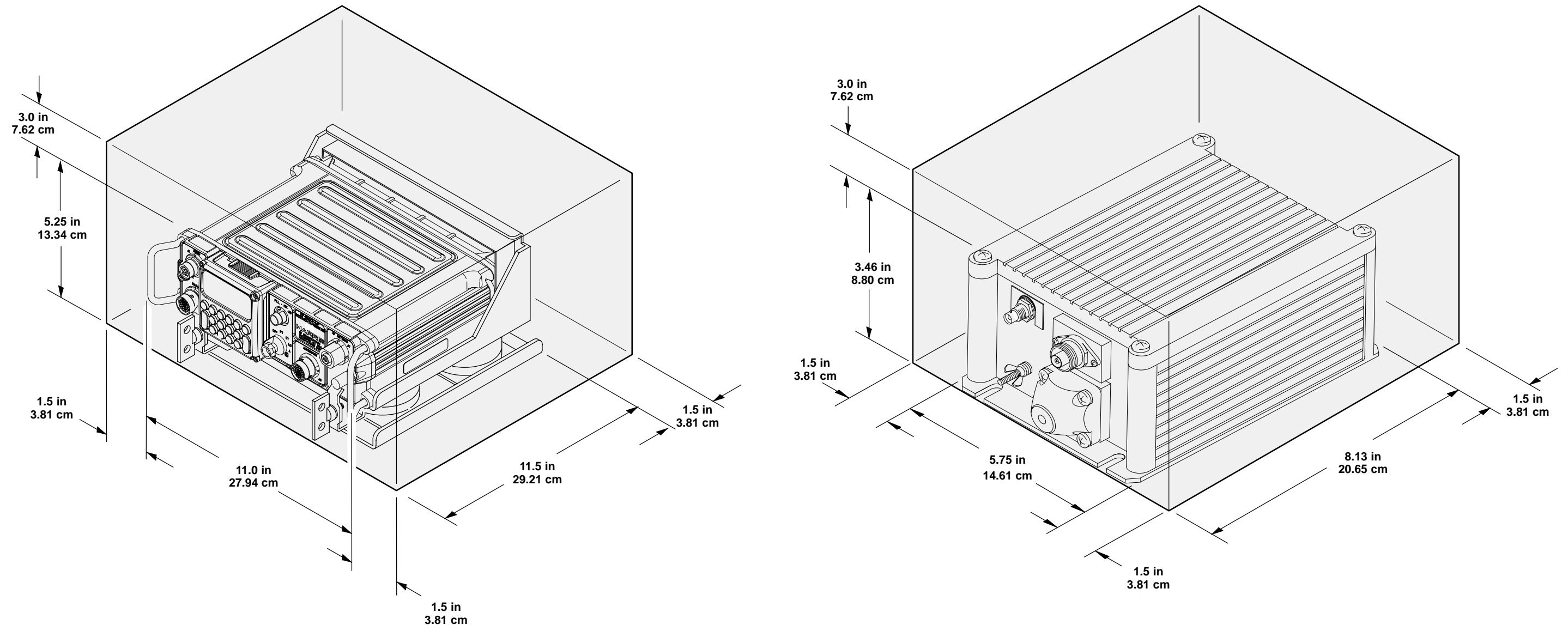
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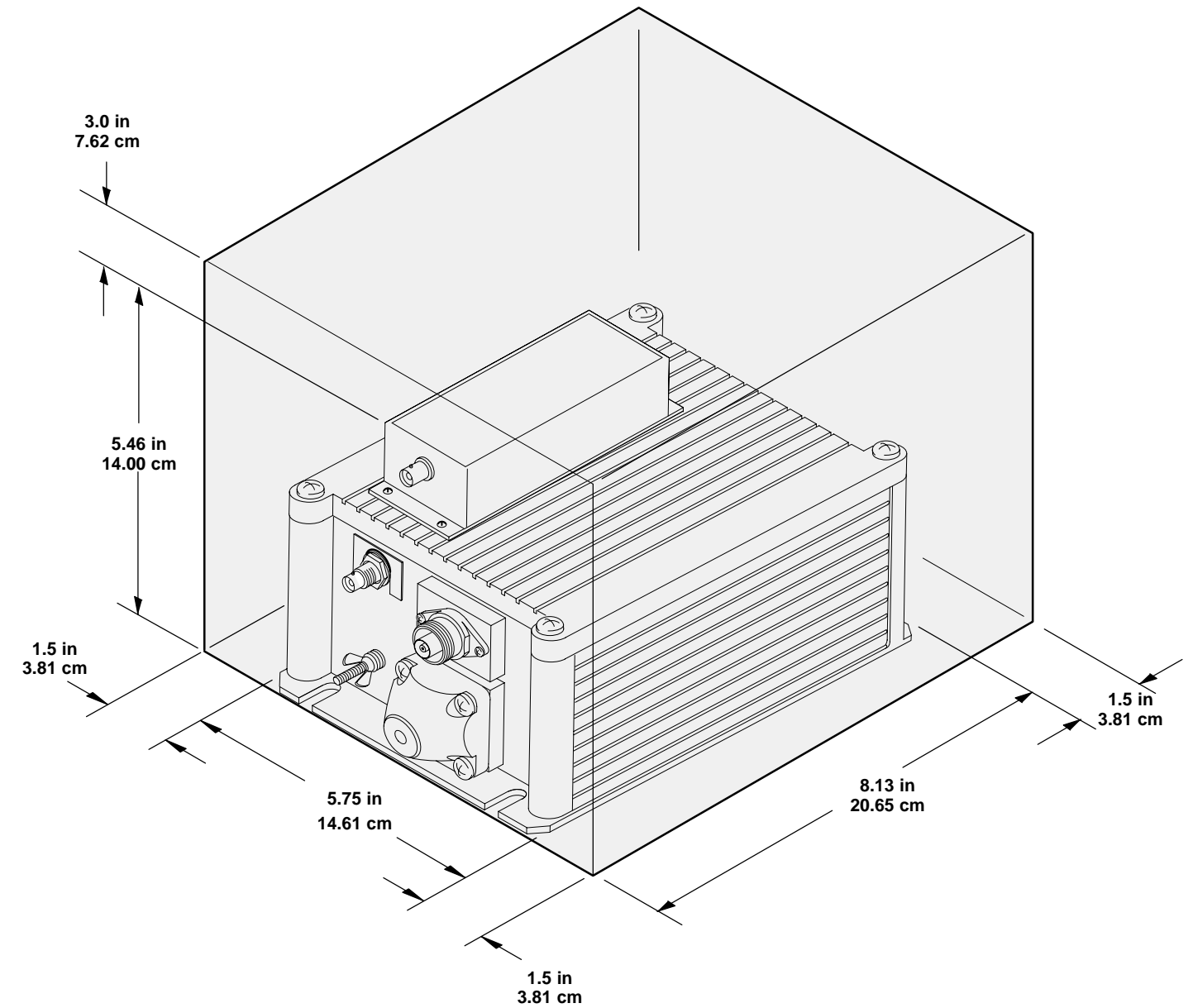
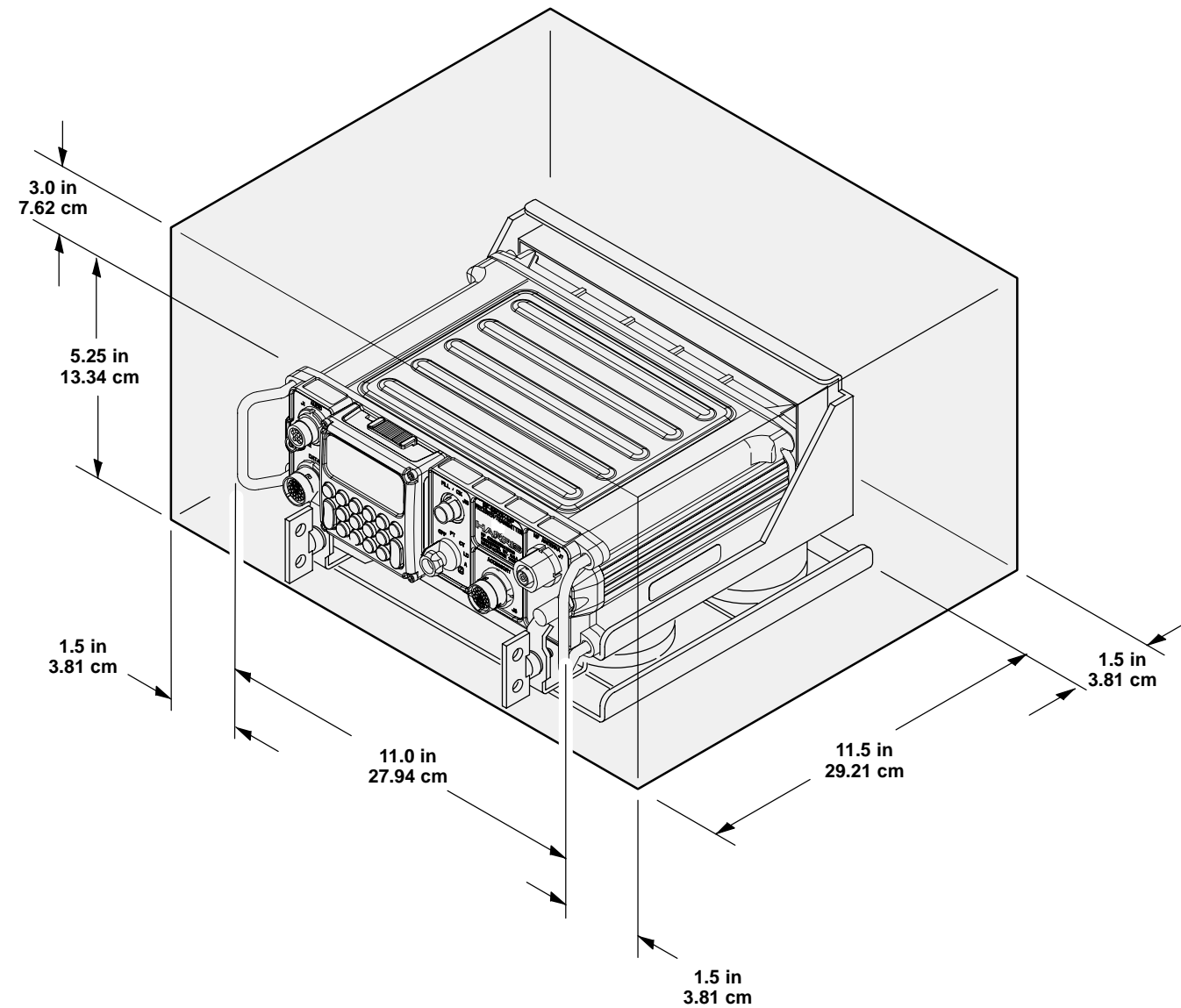
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5800H-20W-VEH03A

Figure 2-1. RF-5800H 20-Watt Vehicular System Installation and Maintenance Clearances

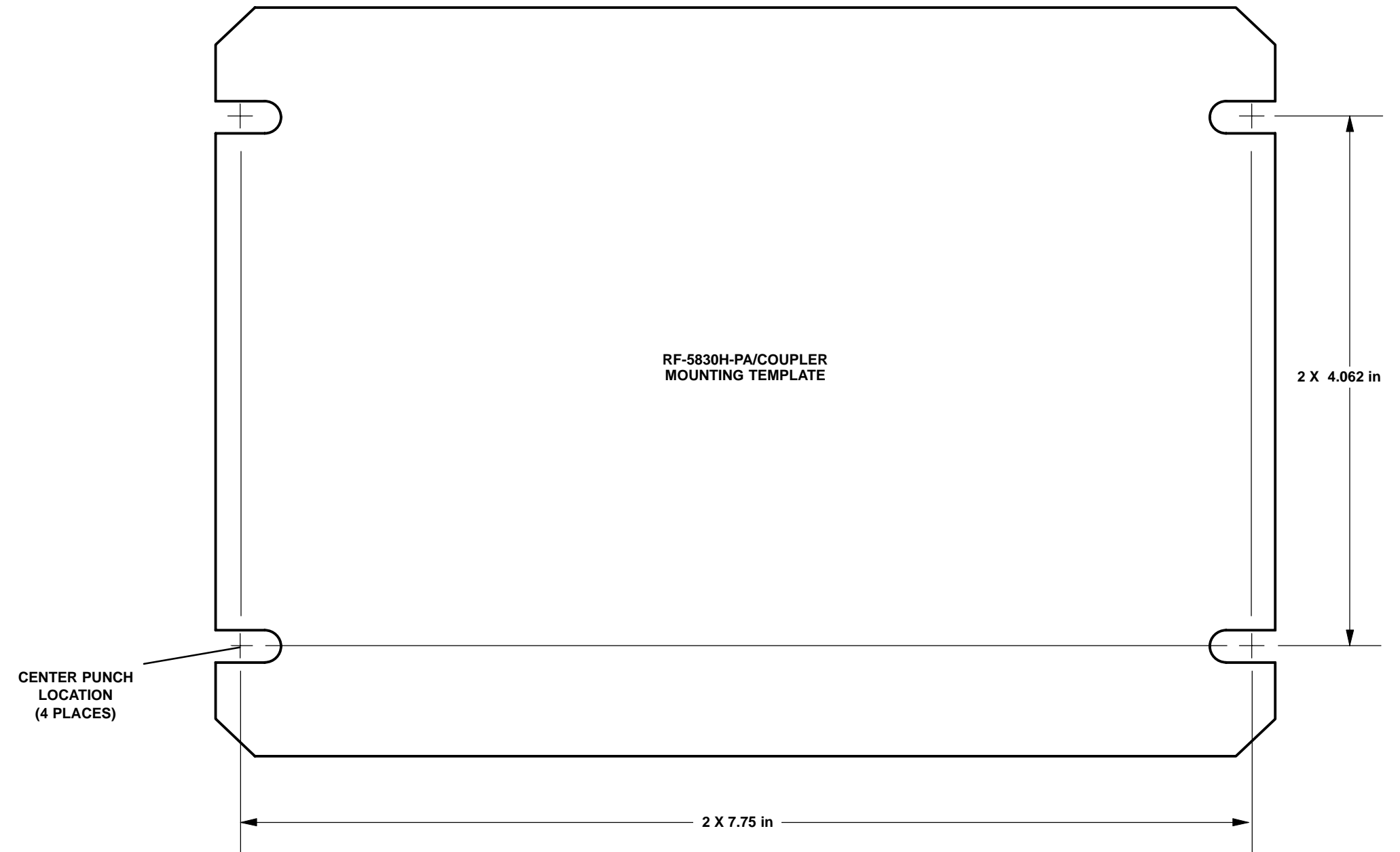


5800H-20W-VEH03C

Figure 2-2. RF-5800H 20-Watt Vehicular System with LPF Installation and Maintenance Clearances

INSTALLATION INSTRUCTIONS

1. PLACE TEMPLATE AT DESIRED LOCATION.
2. CENTER PUNCH THE TEMPLATE AT THE LOCATIONS SHOWN. MAKE CERTAIN THAT THE BASE MATERIAL HAS BEEN MARKED.
3. DRILL 4 HOLES USING A 17/64" OR 6.70 mm TWIST DRILL.



5030(21)-004A

Figure 2-4. Mounting Template for the RF-5830H-PA/Coupler



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RF-5800H 20-WATT VEHICULAR SYSTEM

SYSTEM INSTALLATION/ MAINTENANCE MANUAL

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