TECHNICAL MANUAL
UNIT MAINTENANCE MANUAL

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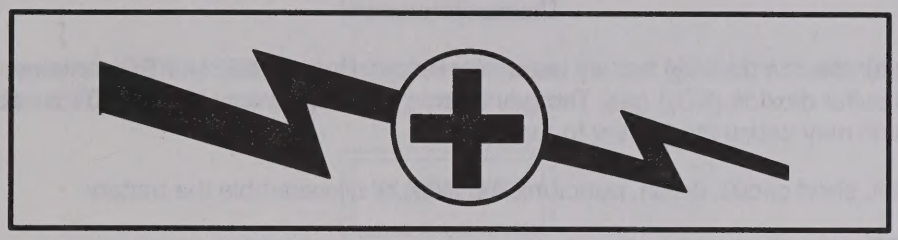
GROUND ICOM RADIO SETS

AN/PRC-119A	(NSN 5820-01-267-9482)	(EIC: L2Q)
AN/PRC-119D	(NSN 5820-01-421-0801)	(EIC: N/A)
AN/VRC-87A	(NSN 5820-01-267-9480)	(EIC: L22)
AN/VRC-87C	(NSN 5820-01-304-2045)	(EIC: GDC)
AN/VRC-87D	(NSN 5820-01-351-5259)	(EIC: GAR)
AN/VRC-88A	(NSN 5820-01-267-9481)	(EIC: L23)
AN/VRC-88D	(NSN 5820-01-352-1694)	(EIC: GAS),
AN/VRC-89A	(NSN 5820-01-267-9479)	(EIC: L24)
AN/VRC-89D	(NSN 5820-01-420-6619)	(EIC: N/A),
AN/VRC-90A	(NSN 5820-01-267-5105)	(EIC: L25)
AN/VRC-90D	(NSN 5820-01-420-6618)	(EIC: N/A),
AN/VRC-91A	(NSN 5820-01-267-9478)	(EIC: L26)
AN/VRC-91D	(NSN 5820-01-420-6621)	(EIC: N/A),
AN/VRC-92A	(NSN 5820-01-267-9477)	(EIC: L27)
AN/VRC-92D	(NSN 5820-01-421-2605)	(EIC: N/A)

(WITH CONTROL, RECEIVER-TRANSMITTER C-11561(C)/U (RCU))

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 MAY 1998



5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK.

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER.

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATION MATERIAL.

4 SEND FOR HELP AS SOON AS POSSIBLE.

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

WARNING

A lithium-sulfur dioxide (Li-SO_2) battery used with Battery Box, CY-8523A/PRC contains pressurized sulfur dioxide (SO_2) gas. The gas is toxic, and the battery **MUST NOT** be abused in any way which may cause the battery to rupture.

DO NOT heat, short circuit, crush, puncture, mutilate, or disassemble the battery.

DO NOT USE any battery which shows signs of damage, such as bulging, swelling, disfigurement, brown liquid in the plastic wrap, a swollen plastic wrap, etc.

DO NOT test Li-SO_2 batteries for capacity, except as authorized.

DO NOT recharge Li-SO_2 batteries.

DO NOT use water to extinguish Li-SO_2 battery fires).

If the battery compartment becomes hot to the touch, if you hear a hissing sound (i.e., battery venting), or if you smell irritating sulfur dioxide gas, **IMMEDIATELY TURN OFF** the equipment. Remove the equipment to a well ventilated area or leave the area.

DO NOT use a Halon type fire extinguisher on a lithium battery fire.

In the event of a fire near a lithium battery(ies), rapid cooling of the battery(ies) is important. Use a carbon dioxide (CO_2) extinguisher.

DO NOT store lithium batteries with other hazardous materials and keep them away from open flame or heat.

NOTE

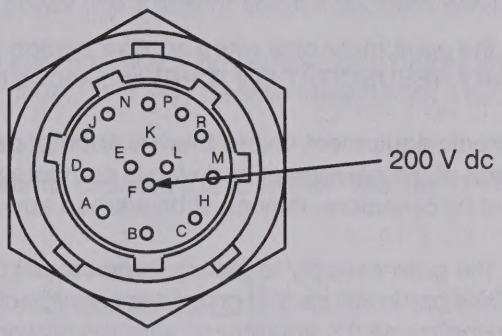
A BA-5372/U is used in the RT as a memory hold-up battery (HUB). It is a lithium battery. The HUB is used to hold memory in the RT when the main battery is removed (manpack radio). In vehicular radios the HUB will hold the memory if amplifier-adapter CB1 is set to OFF. The battery life depends on how long the RT is used each day. Replace the HUB before it fails or at 180 days, whichever comes first.

WARNING

RF energy is present near the antenna during transmission. Except Manpack, maintain at least **30 inches** from antenna and personnel during transmission.

WARNING

HIGH VOLTAGE

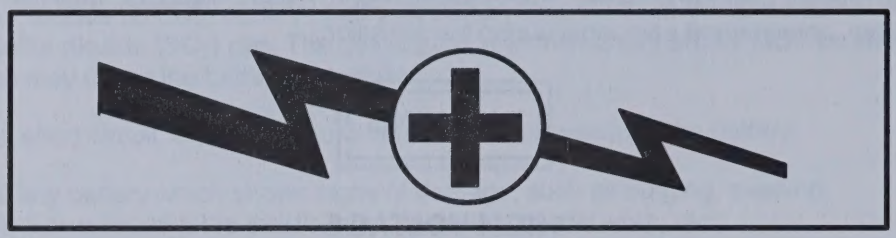


VAA J1, PA MOUNT J4

WARNING

DO NOT lift the amplifier-adapter with any component installed. Maximum weight for a one-person lift is 35 lbs.

WARNING



HIGH VOLTAGE is present during testing and troubleshooting of the radio sets. **DEATH ON CONTACT** can result, so observe the following safety precautions:

If possible, work on the equipment only when another person is nearby who is competent in **CARDIOPULMONARY RESUSCITATION (CPR)** and knows the five safety steps on page **a**.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technicians are aided by operators, they must be warned about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 V ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

DO NOT BE MISLED by the terms "low voltage" and "low potential." Voltages/potentials as low as 50 V can cause **DEATH** under certain conditions.

Remove or tape all personal metal objects (e.g., watches, rings, and medallions) before working on C-E equipment.

For Artificial Respiration, refer to FM 21-11.

HARDNESS CRITICAL PROCESS

The RT-1523 series of radio sets have been designed to survive the effects of a nuclear explosion. This includes over pressure and burst, thermal radiation, electromagnetic pulse (EMP), and transient radiation effects on electronics (TREE). Those maintenance procedures that are critical in maintaining the nuclear hardness of the radio are marked **HCP** .

WARNING

MOBILE OPERATION WITH WHIP ANTENNAS

DO NOT stop your vehicle under power lines.

Maintain mobile communications with your antenna tied down.

Ensure that the protective antenna tip cap is on the end of your antenna.

DO NOT touch or stand within 30 inches (0.75 meters) of a vehicular antenna if it is possible that the RT is keyed.

When operating cross-country, do not place arm, leg, or weapon over the sides of the vehicle. If your antenna accidentally touches a power line a fatal or serious accident can happen.

If you believe your vehicular antenna may not clear a power line, stop before you get near the power line. Carefully tie the antenna down. You may remove the antenna if necessary to ensure that it does not touch the power line.

Install a stay-down or snap-free antenna clip over the antenna. See TM 11-5820-890-10-1 for details.

WARNING

Death or serious injury can result:

- When antenna tip caps are not installed on antenna.
- When an antenna that is not tied-down hits a fixed object such as an overhead bridge, tree limb, etc., flying antenna parts might strike nearby personnel.

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Technical Manual
No. 11--5820-890-20-2

Headquarters
Department of the Army
Washington, D.C. 30 MAY 1998

Technical Manual
Unit Maintenance Manual
Ground ICOM Radio Sets:

AN/PRC-119A	(NSN 5820-01-267-9482)	(EIC: L2Q)
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AN/VRC-92A	(NSN 5820-01-267-9477)	(EIC: L27)
AN/VRC-92D	(NSN 5820-01-421-2605)	(EIC: N/A)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: U.S. Army CECOM, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, New Jersey 07703-5007. A reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

OBJECTIVE.

The goal of this technical manual is to provide unit maintenance procedures that are easy to understand and equally easy to follow when operating in the field.

MANUALS.

Three technical manuals support the unit maintainer:

TM 11-5820-890-20-1 (Short title: TM 20-1) focuses on SINCGARS radios, both manpack and vehicular configurations, and provides essential information regarding cables, component replacement and repair. By limiting TM 20-1 to this primary focus, the manual is small enough to be carried around by the maintainer during field operations if required.

TM 11-5820-890-20-2 (Short title: TM 20-2) supplements TM 20-1 with maintenance procedures regarding other system components. These include vehicular intercommunications system (VIC), frequency-hopping multiplexer (FHMUX), control-monitor (C-M), remote control unit (RCU), single radio mount (SRM), FH fill devices, and batteries. Additionally, TM 20-2 includes the maintenance allocation chart and power distribution diagrams. TM 20-2 is necessarily larger than TM 20-1, and it is designed primarily for use under shelter.

TM 11-5820-890-20-3, Unit Maintenance Handbook (Short title: TM 20-3) is the third manual. This is a logbook size manual designed to be routinely carried by each unit maintainer while checking out communications systems installed in vehicles and in field locations. The information contained in this handbook is extracted from TM 20-1 and TM 20-2, but the manual's useful size obviously limits the amount of information provided. The guidance found in the handbook is accurate. It is just not as detailed as that found in TM 20-1 and TM 20-2.

Unit maintenance personnel are encouraged to use all three manuals. The handbook is carried on their person for on-site, in the field, troubleshooting and faulty line replaceable unit (LRU) identification. TM 20-1 and TM 20-2 are then used to confirm handbook-based findings, or to extend troubleshooting procedures where the handbook fails to disclose which LRU is faulty.

PRINCIPLES OF OPERATION.

Where appropriate, TM 20-1 and TM 20-2 provide background information of general interest in understanding how the system or component works.

OPERATIONAL CHECKS.

Each chapter of TM 20-1 and TM 20-2, where applicable, contains Operational Checks. This is where the unit maintainer starts to identify the nature of the problem. As these manuals caution, it is important to perform Operational Checks exactly as presented, or false findings can result. The second important application of the Operational Check is its use after LRU replacement, or repair, to verify that the fault has been corrected. The Operational Check for manpack and vehicular radios found in TM 20-3, Unit Maintenance Handbook, are identical to those provided in TM 20-1. Operational checks for other items of equipment are shown in TM 20-2 only.

TROUBLESHOOTING FLOWCHARTS.

Each chapter of TM 20-1 and TM 20-2, where applicable, contains Troubleshooting Flowcharts. Which flowchart to use is determined by the Operational Check. Use of the troubleshooting flowchart then identifies the specific problem and tells the maintainer to replace, or repair, a specific LRU.

The Unit Maintenance Handbook, TM 20-3, contains abbreviated troubleshooting flowcharts called Troubleshooting Guides. Guides are shorter than flowcharts to permit their use in a logbook sized handbook. Experience has shown that by using these abbreviated troubleshooting guides, a unit maintainer is able to correctly identify system problems. When use of the troubleshooting guides fails to properly identify the problem, or there is a question about the accuracy of the problem identification, the unit maintainer should use TM 20-1 or TM 20-2 with their more extensive troubleshooting flowcharts. The purpose of the handbook is to help the unit maintainer when working inside vehicles in the field, but the procedures contained in the handbook may be supplemented with those in TM 20-1 and TM 20-2.

SYSTEM VERSUS COMPONENTS.

The Operational Checks and troubleshooting flowcharts/guides found in TM 20-1, TM 20-2, and TM 20-3 are based upon the requirement to check systems rather than components. For example, a problem with the radio in a vehicle must be checked in the vehicle, not by removing the RT and taking it elsewhere to be checked. Once the vehicular radio system has been checked and a specific LRU identified as faulty, that LRU can be taken elsewhere for further checking. When the radio system being checked includes an AN/VIC-1 (VIC), check first to determine if the fault is in the radio or the VIC. Then troubleshoot the faulty part of the system.

AVOIDING FALSE PULLS.

When properly used, these three TMs offer the unit maintainer the means for accurately identifying nearly all faulty LRUs. The number of problems which can occur in radio systems and the detailed procedures required for accurate identification dictate that manuals must be used even under the most adverse field conditions. Attempts to troubleshoot from memory have proven over and over to result in false pulls, reflecting adversely on the unit maintainer and helping no one. Four sure ways to keep false pulls to an absolute minimum are: (1) start by performing the prescribed Operational Check; (2) use these manuals when troubleshooting; (3) confirm your fault identification by again performing the Operational Check; and (4) use TM 20-1 and TM 20-2 troubleshooting flowcharts to double-check faulty LRUs before evacuating them to direct support (DS) maintenance.

CHAPTER 1

INTRODUCTION

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SECTION I

GENERAL INFORMATION

1.1. SCOPE.

a. Type of Manual. This is a unit maintenance manual. It contains the information required to maintain the SINCGARS radio ancillary equipment.

b. Model Numbers and Equipment Names.

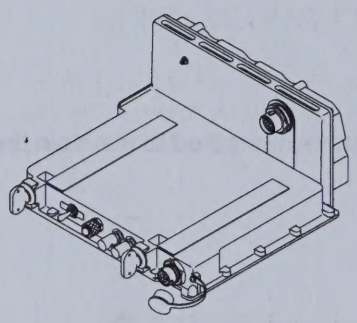
Model	Common Name
AN/VIC-1	VIC
AM-1780	Amplifier
C-2297	Driver's Control Box
C-2298	Commander/Crewmember Control Box
C-11291/VRC	Control-Monitor
C-11561/VRC	Remote Control Unit
MT-6576/VRC	Single Radio Mounting Base
MX-10862/VRC	Single Radio Power Supply Adapter
CY-8664	Battery Tray
MX-18290	FH Fill Device
AN/CYZ-10	Automated Net Control Device

Radio Sets Using RT-1523 Series	Common Name
AN/VRC-87C	Short range radio in single radio mount

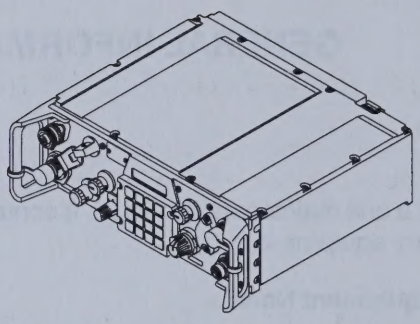
1.1. SCOPE. Continued

c. Components of Radio Sets and Ancillary Equipment.

AN/VRC-87C SHORT RANGE RADIO IN SINGLE RADIO MOUNT



ADAPTER, POWER SUPPLY (PSA)
MX-10862/VRC



RECEIVER-TRANSMITTER,
RADIO (RT)
RT-1523 SERIES



CABLE ASSEMBLY,
SPECIAL PURPOSE,
ELECTRICAL
CX-13314/VRC

1.1. SCOPE. Continued

d. **Purpose and Use of Equipment.** All types of SINCGARS ICOM radio sets use the RT-1523 series as the basic receiver-transmitter. They can operate in single channel (SC) mode or in the frequency hopping (FH) mode. In either mode the RT can receive and transmit, voice, and analog or digital data. The RT has a self-test function, retransmit capabilities, and can be remotely controlled. The RCU (remote control unit) can remotely control a RT up to 4 km away. The control-monitor provides for control of the installed RT, but with less capabilities than the RCU. Like the RT, the RCU and control-monitor have a self-test function. External COMSEC equipment is not required when using the RT-1523 series or RCU. Secure communications functions are built into the RT and RCU.

1.2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS.

Refer to the latest issues of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1.3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your series of radio sets needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the design. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: US Army, CECOM, ATTN: AMSEL-LC-ED-CFO, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

1.4. MAINTENANCE FORMS, RECORDS, AND REPORTS.

a. **Reports of Maintenance and Unsatisfactory Equipment**. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

b. **Reporting of Item and Packing Discrepancies.** Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVIST 4355.18/AFR 400-54/MCO 4430.3J.

c. **Transportation Discrepancy Report (TDR) (SF 361)**. Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1.5. DESTRUCTION OF ARMY ELECTRONICS MATERIEL.

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1.6. PREPARATION FOR STORAGE OR SHIPMENT.

Before placing equipment in administrative storage, operational checks will be performed and necessary repairs made. When removing equipment from administrative storage, an operational check will be performed to assure operational readiness. Always remove batteries prior to storage.

1.7. NOMENCLATURE CROSS REFERENCE LIST.

This list contains common names used in this manual in place of the official nomenclature.

COMMON NAME	NOMENCLATURE
Battery	Battery, Non-Rechargeable BA-5590/U, Battery, Rechargeable BB-390/U or BB-590/U
Battery box	Battery Box CY-8523A/PRC ,CY-8523B/PRC or CY-8523C/PRC
Battery tray	Tray, Battery CY-8664/VRC
Control-Monitor (CM)	Control-Monitor C-11291/VRC or C-11291A/VRC
Control Box	Control, Intercommunication Set C-2297/VRC, C-2298/VRC, and C-10456/VRC
Fill device	Automated Net Control Device, AN/CYZ-10
Handset	Handset H-250/U, Handheld Remote Control Radio Device (HRCRD)
Hold-up battery (HUB)	Battery, Non-Rechargeable BA-5372/U
Intercom cable	CX-13300/VRC
Loudspeaker	Loudspeaker-Control Unit LS-671/VRC RCU Loudspeaker, Crystal LS-685/U
Loudspeaker cable	CX-13292/VRC used with LS-671/VRC
Intercom (VIC)	Intercommunication Set, AN/VIC-1(V)
Mounting Base (MB)	Mounting Base, Electrical Equipment MT-6352/VRC, MT-6352A/VRC, or MT-6576/VRC
VIC interface cable	CX-13313/VRC
Power cable	Any power cable connected to mounting base connector J1 or J2.
Power Supply Adapter (PSA)	Adapter, Power Supply MX-10862/VRC
Radio	Radio Sets
RF cable	Cable Assembly, RF
Test set	Test Set, Radio AN/PRM-34
RT	Receiver-Transmitter, Radio RT-1523(C)/U, RT-1523A(C)/U, RT-1523B(C)/U, RT-1523C(C)/U, or RT-1523D(C)/U
Remote Control Unit (RCU)	Control, Receiver-Transmitter C-11561(C)/U
Servicable Low Profile Antenna(SLPA)	Antenna, Vehicular AS-3916/VRC
Single Radio Mount (SRM)	Radio system containing an Adapter, Power Supply MX-10862/VRC
Splitter cable	CX-13417/VRC
Vehicular Amplifier-Adapter (VAA)	Amplifier-Adapter, Vehicluar AM-7239/VRC, AM-7239A/VRC, AM-7239B/VRC, AM-7239C/VRC, or AM-7239D/VRC
Vehicular antenna	Antenna, Vehicular AS-3900/AS-3900A/VRC/AS-3916

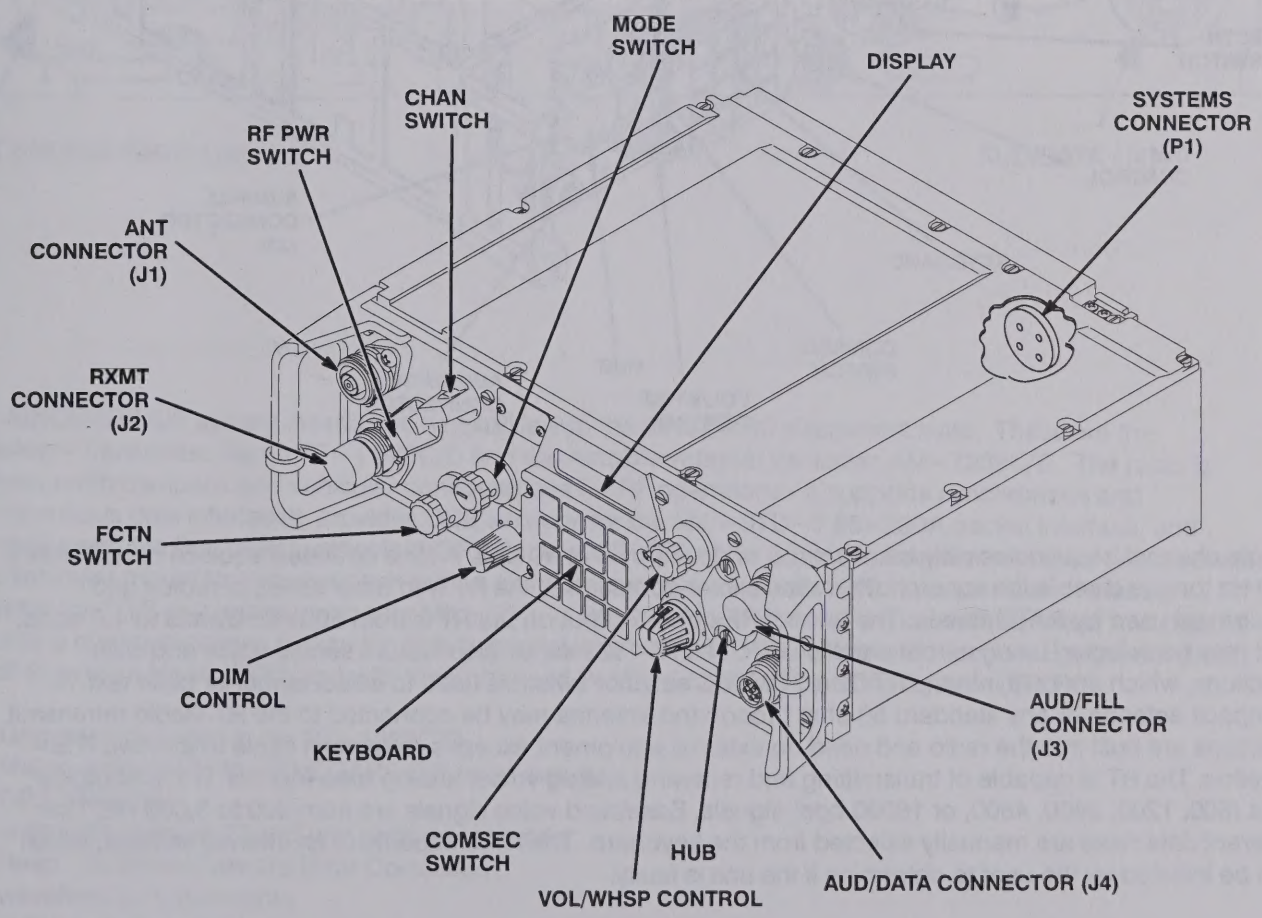
SECTION II

EQUIPMENT DESCRIPTION AND DATA

1.8. DESCRIPTION OF COMPONENTS.

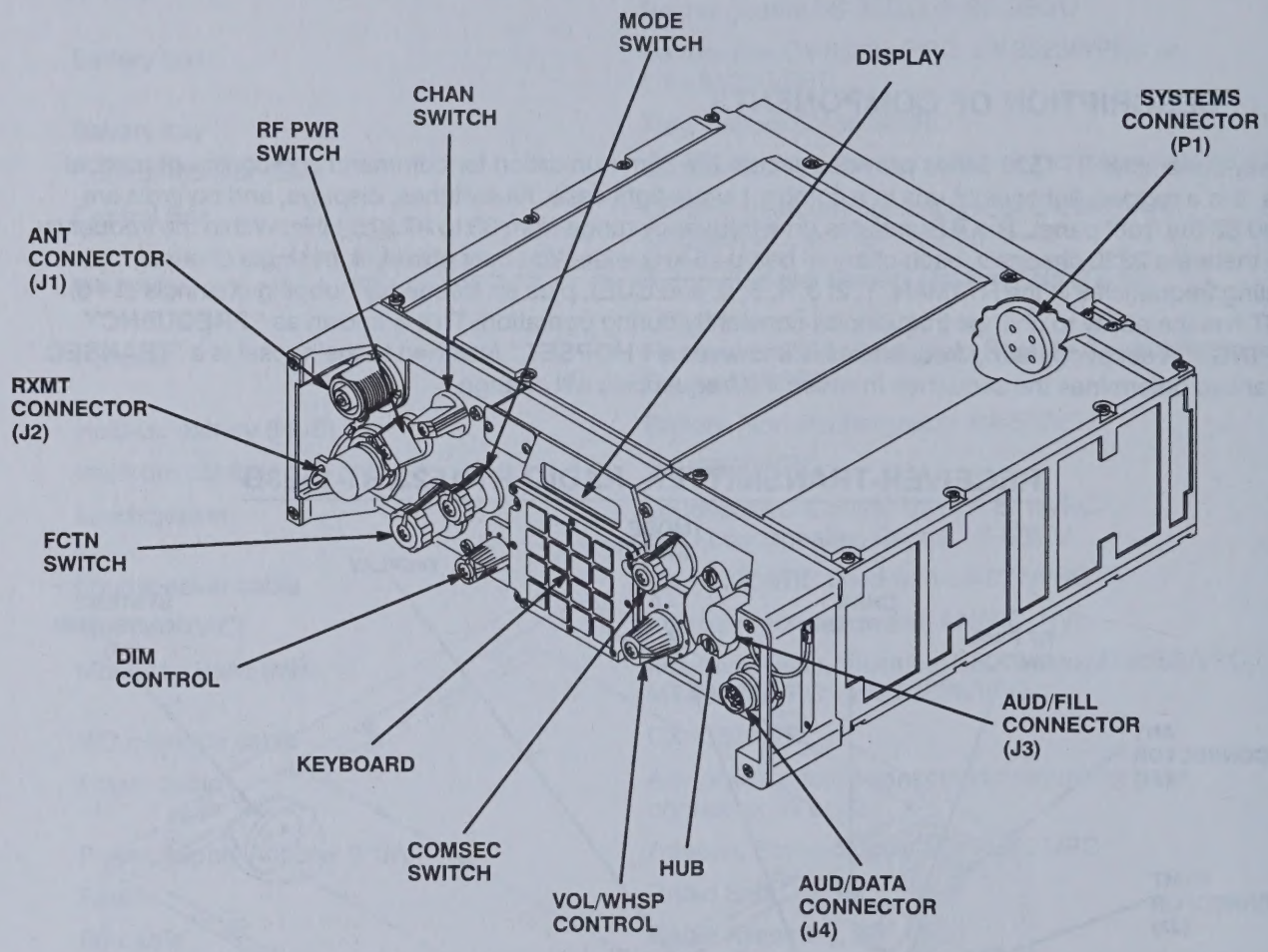
Receiver-transmitter RT-1523 series provides secure FM communication for command and control of combat forces. It is a rugged, lightweight unit in a compact water-tight case. All switches, displays, and controls are located on the front panel. The RT operates on a frequency range from 30 to 87.975 MHz. Within the frequency range there are 2320 channels, each channel being 25 kHz wide. You may preset eight single channel operating frequencies in the RT (MAN, 1, 2, 3, 4, 5, 6, and CUE), plus six frequency hopping channels (1-6). The RT has the ability to change frequencies constantly during operation. This is known as " **FREQUENCY HOPPING** ." A set of operating frequencies is known as a " **HOPSET**." Attached to the hopset is a "**TRANSEC**." The transec determines the sequence in which the frequencies will change.

RECEIVER-TRANSMITTER, RADIO RT-1523/RT-1523B



1.8. DESCRIPTION OF COMPONENTS. Continued

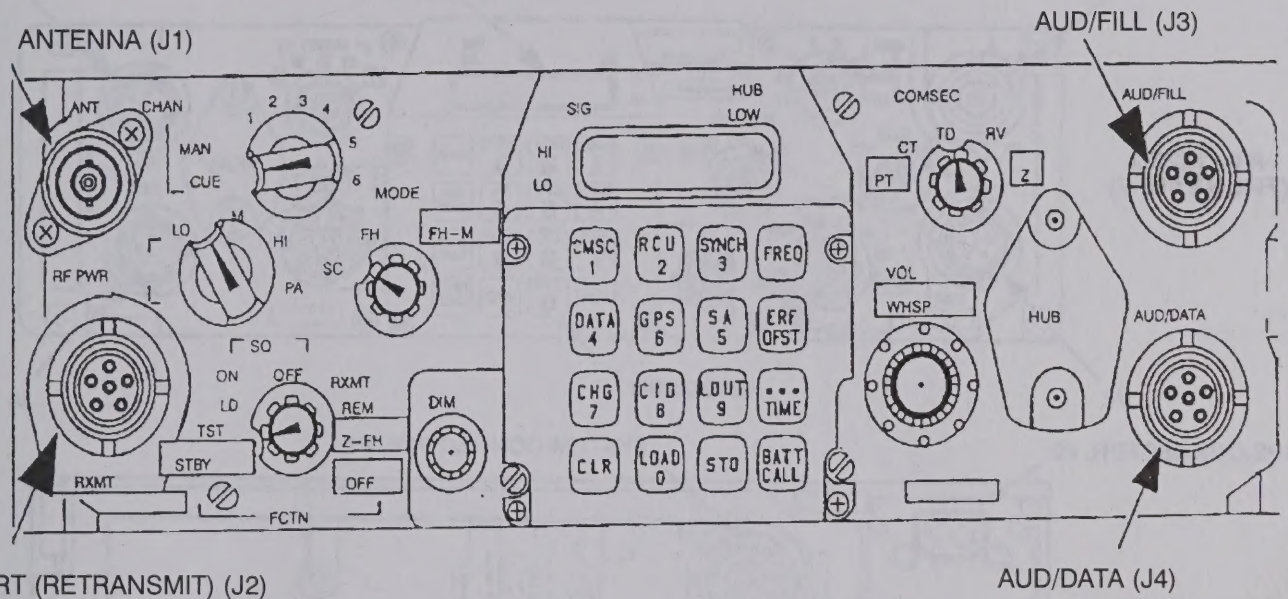
RECEIVER-TRANSMITTER, RADIO RT-1523A



Single channel frequencies may be offset (up or down) by 5 or 10 kHz. A tone operated squelch circuit uses a 150 Hz tone to disable the squelch. This allows inter-operation of the RT with older series of radios and equipment used by NATO forces. The level of RF power output on the RT is from 500 microwatts to 4.5 watts, and may be selected using a front panel switch. The RT-1523 series also feature secure voice and data functions, which are built into the RT. The COMSEC selector switch is used to select cipher or plain text. A manpack antenna or any standard 50 ohm broadband antenna may be connected to the RT. Radio retransmit functions are built into the radio and need no external equipment except a retransmit cable to join two RTs together. The RT is capable of transmitting and receiving analog voice, analog data (AD1 or TF), and digital data (600, 1200, 2400, 4800, or 16000 bps) signals. Baseband voice signals are from 300 to 3,000 Hz. The different data rates are manually selected from the keyboard. The RT is capable of an internal self-test, which can be initiated by the user to determine if the unit is faulty.

1.8. DESCRIPTION OF COMPONENTS.. . Continued

RECEIVER-TRANSMITTER, RADIO RT-1523C



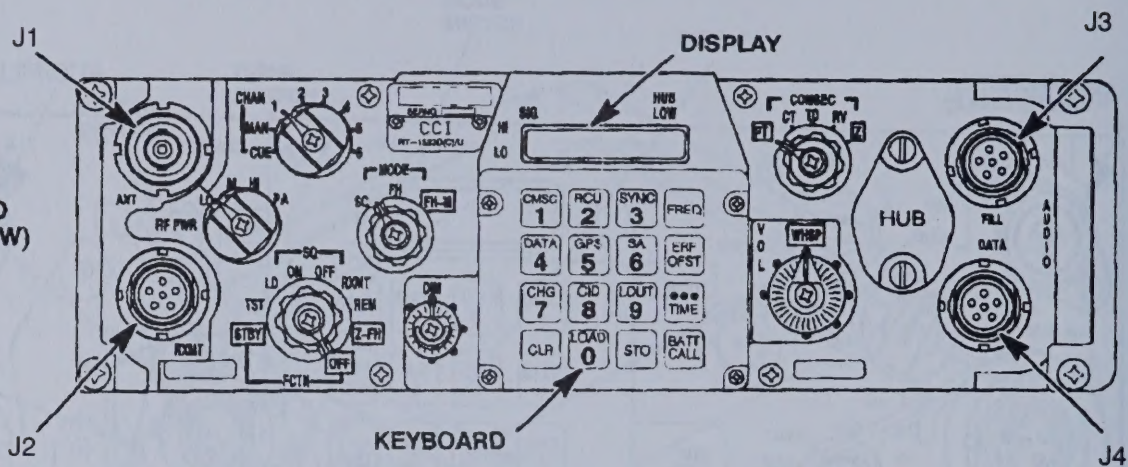
The SINCGARS SIP system inserts two new LRUs into the SINCGARS equipment suite. These are the Receiver-Transmitter, Radio RT-1 523C/D and the AmplifierAdapter,Vehicular, AM-7239C/D. The radio is common with manpack and vehicular configurations for RF operations. It supports synchronous and asynchronous data interfaces, provides DCE services for the MIL-STD-1 88-220A packet interface, and interfaces with the Precision Lightweight GPS Receiver (PLGR). The Vehicular Amplifier-Adapter (VAA) serves as a vehicular mount for two manpack radios, provides synchronous and asynchronous data interfaces, provides the DTE and router portion for MIL-STD-1 88-220A packet switched network services, and may be used as a communications device for data transmissions over wire with a Mobile Subscriber Equipment (MSE) Small Extension Node (SEN) and with the Enhanced PositionLocation Reporting System (EPLRS).

a. Upgrades included in the RT-1523C/D
   Major upgrades to the SINCGARS SIP radio include
   GPS interface
   automatic Combat ID and unit position reporting
   Reed-Solomon Forward Error Correction
   waveform enhancements
   data rate enhancements
   RS-232 asynchronous data interfaces
   DCE portion of packet networking and packet interface operations
   RS-232 control
   RCU mode

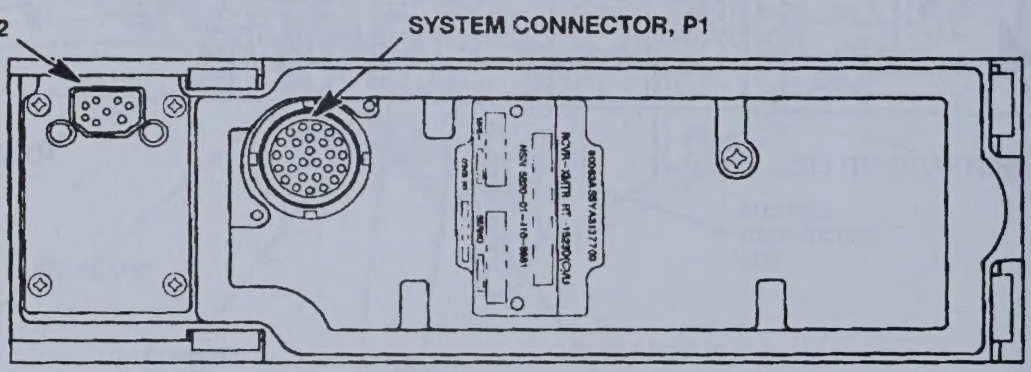
1.8. DESCRIPTION OF COMPONENTS.. . Continued

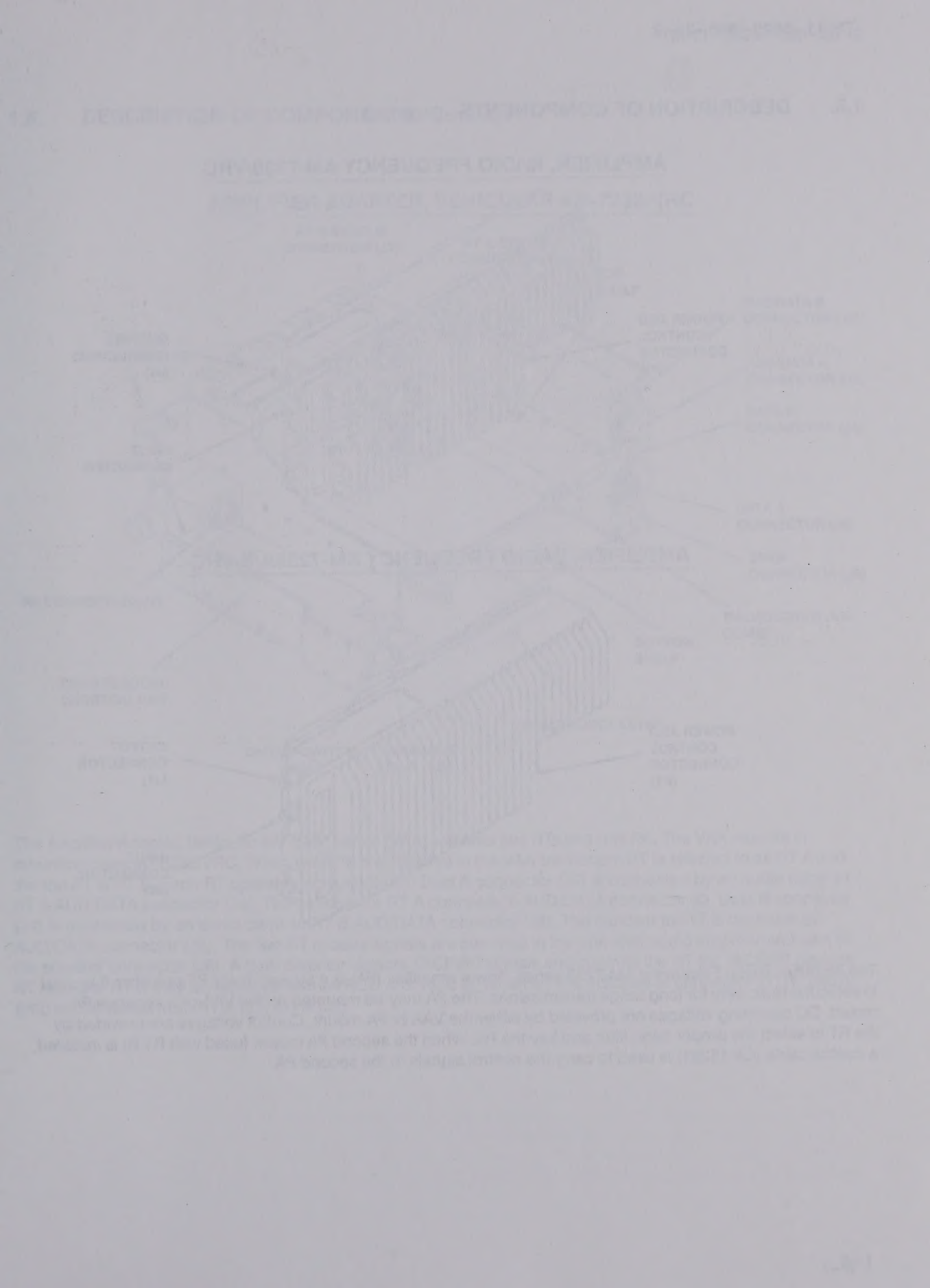
RECEIVER-TRANSMITTER, RADIO RT-1523D

RT-1523D (FRONT VIEW)



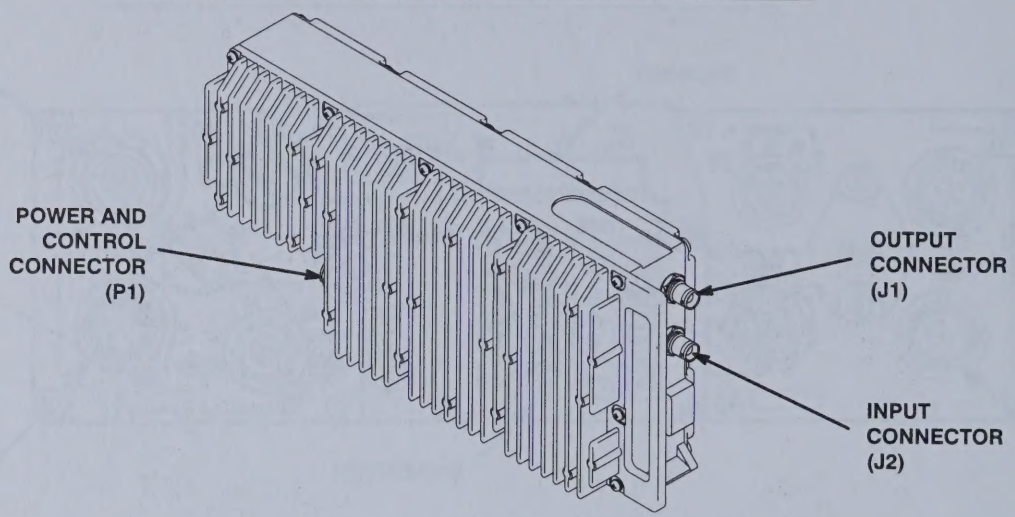
RT-1523D (REAR VIEW)



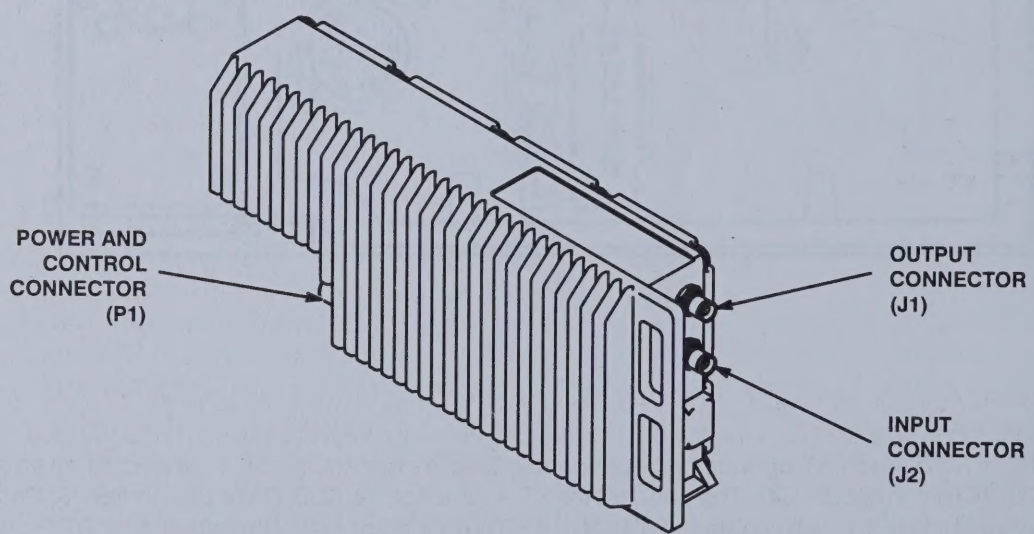


1.8. DESCRIPTION OF COMPONENTS. Continued

AMPLIFIER, RADIO FREQUENCY AM-7238/VRC



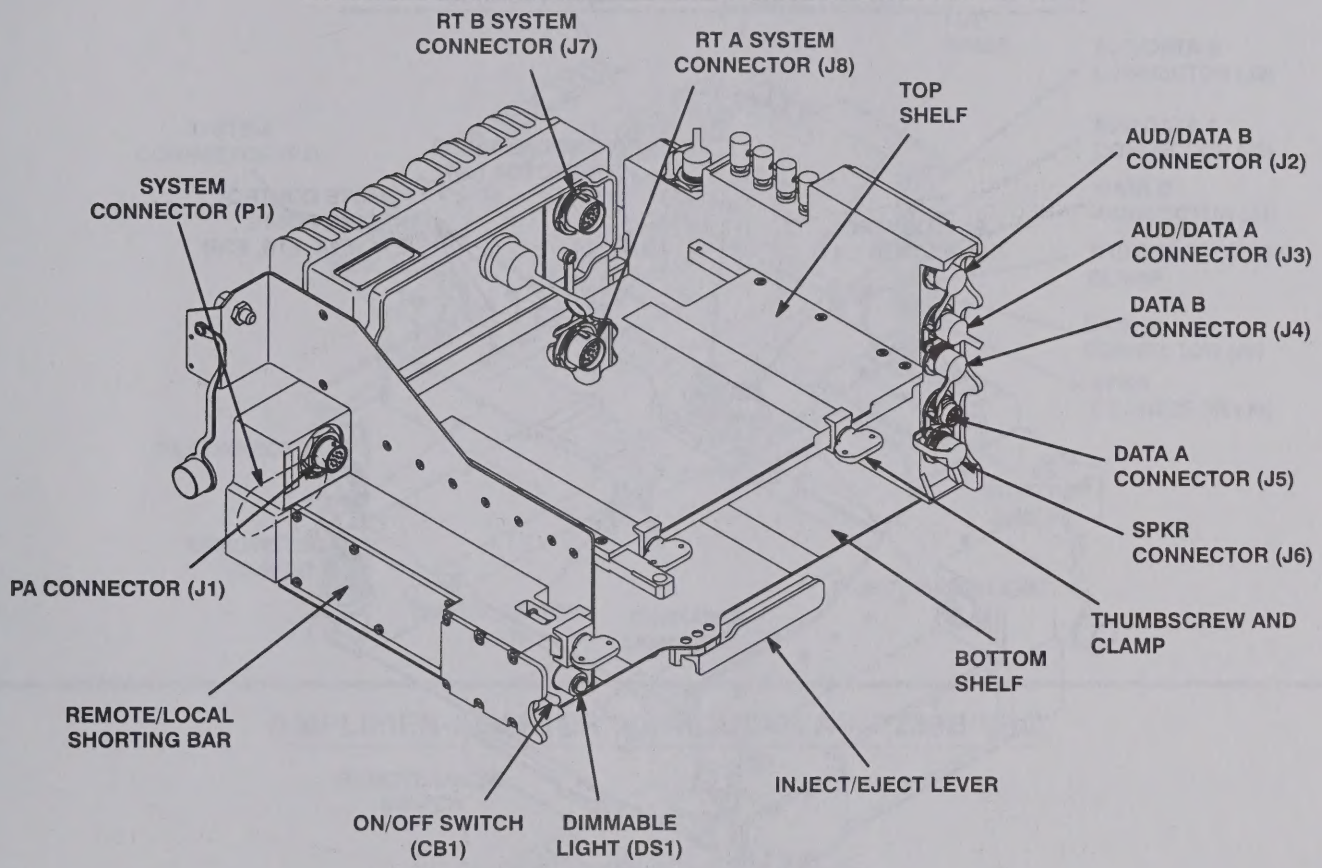
AMPLIFIER, RADIO FREQUENCY AM-7238A/B/VRC



The Amplifier, Radio Frequency AM-7238 series, power amplifier, (PA) is a 50 watt linear RF amplifier. It is used in vehicular radio sets for long range transmissions. The PA may be mounted on the VAA or a separate PA mount. DC operating voltages are provided by either the VAA or PA mount. Control voltages are provided by the RT to select the proper band filter and key the PA. When the second PA mount (used with RT B) is installed, a control cable (CX-13291) is used to carry the control signals to the second PA.

1.8. DESCRIPTION OF COMPONENTS. Continued

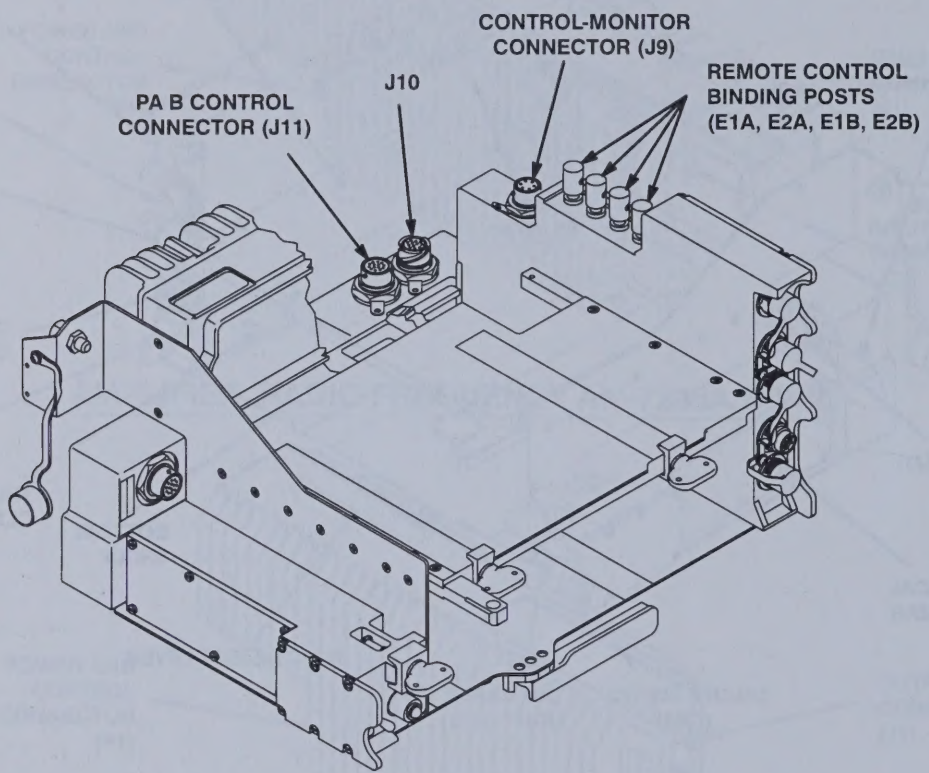
AMPLIFIER-ADAPTER, VEHICULAR AM-7239/VRC



The Amplifier-Adapter, Vehicular AM-7239 series (VAA) will hold two RTs and one PA. The VAA mounts in mounting base MT-6352/VRC. When two RTs are installed in the VAA the bottom RT is referred to as RT A and the top RT is RT B. Each RT operates independently. Data A connector (J5) is connected by an audio cable to RT A AUD/DATA connector (J4). The handset for RT A connects to AUD/DATA connector J3. Data B connector (J4) is connected by an audio cable to RT B AUD/DATA connector (J4). The handset for RT B connects to AUD/DATA connector (J2). The two RT receive signals are summed in the one-watt audio amplifier and sent to the speaker connector (J6). A tone detector detects TACFIRE signals and controls the RT for TACFIRE devices. RT A and/or RT B may be replaced with an RCU A or RCU B. When a PA is installed at connector J1, RF cable (W2) is connected from RT A (J1) to PA (J2).

1.8. DESCRIPTION OF COMPONENTS. Continued

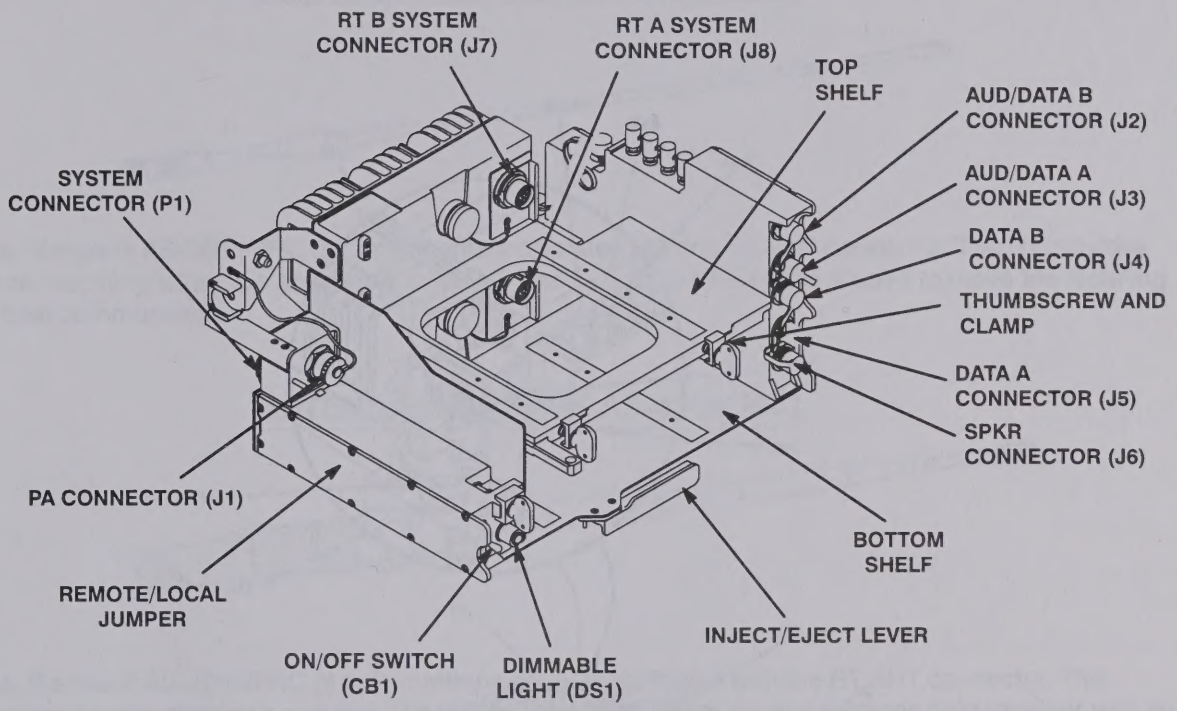
AMPLIFIER-ADAPTER, VEHICULAR AM-7239/VRC



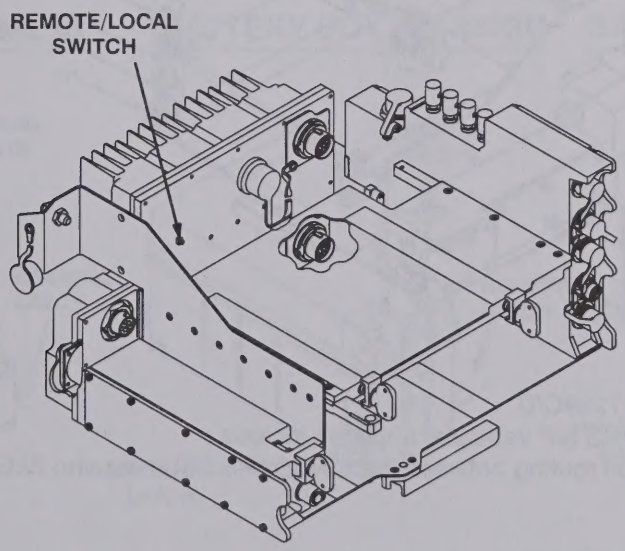
The control-monitor is connected to the VAA connector J9. The control-monitor cable must be disconnected from connector J9 if an RCU is to be installed. When a PA is installed to enhance RT B, then the PA mount control cable is connected to connector J11. J10 is an unused connector. Binding posts are provided for a remote control unit. These binding posts hold field wire which connects to another set of binding posts on an VAA or battery box. This allows the radio and RCU to communicate with each other. A retaining bar is issued with the VAA. It is used to prevent the loss of the RT, RCU, or PA.

1.8. DESCRIPTION OF COMPONENTS. Continued

AMPLIFIER-ADAPTER, VEHICULAR AM-7239A/VRC



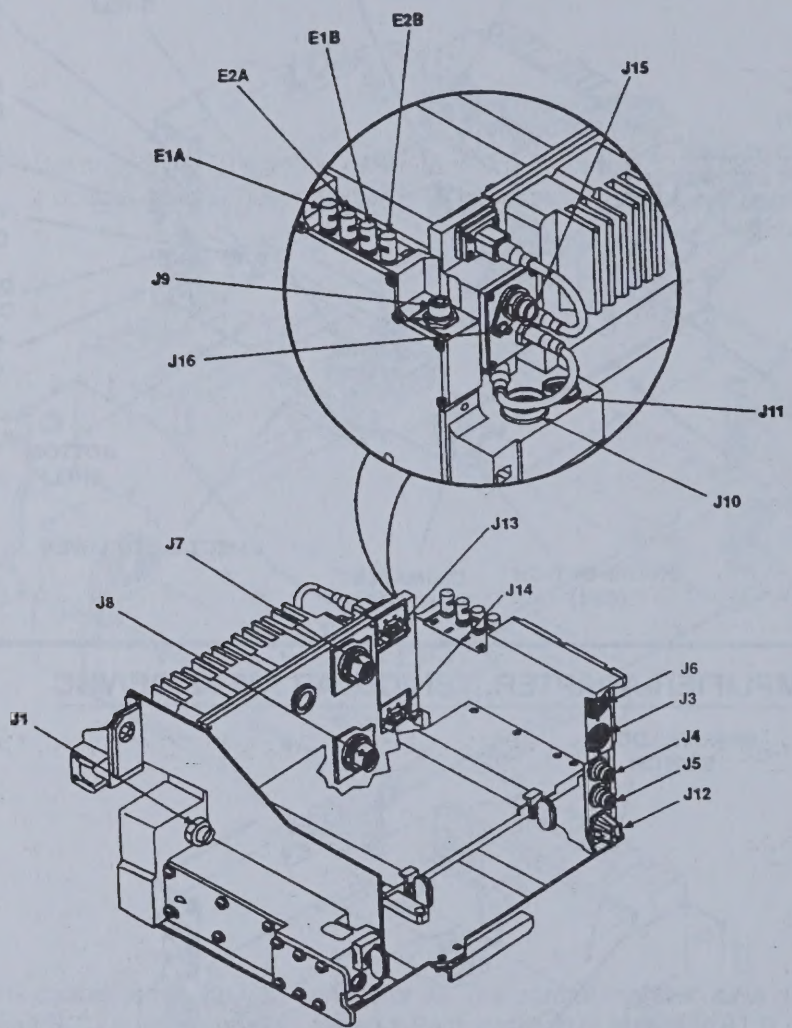
AMPLIFIER-ADAPTER, VEHICULAR AM-7239B/VRC



The Amplifier-Adapter, Vehicular AM-7239A/VRC and AM-7239B/VRC are form, fit, and function compatible with the AM-7239/VRC. The main difference is replacement of the shorting bar (for remote operation power control) with a Remote/Local jumper or Remote/Local switch. The AM-7239A/VRC Remote/Local jumper is located inside the power control section of the AM-7239A/VRC in the same relative position as the shorting bar in the AM-7239/VRC. The AM-7239B/VRC Remote/Local switch is a sealed externally selectable switch and is located to the left of the RT B system connector (J7).

1.8. DESCRIPTION OF COMPONENTS. Continued

AMPLIFIER-ADAPTER, VEHICULAR AM-7239C/D



Upgrades included in the AM-7239C/D
Major upgrades to the SINCGARS SIP vehicular applique include :

- GPS control and information routing between the SINCGARS SIP radio and PLGR
- MSE interface
- EPLRS interface
- RS-422 synchronous data interfaces
- RS-423 synchronous data interfaces
- RS-232 asynchronous data interfaces
- DTE portion of packet networking and packet interface

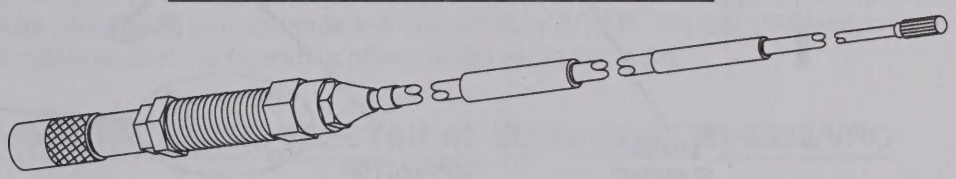
1.8. DESCRIPTION OF COMPONENTS. Continued

ANTENNA, MANPACK AS-3683/PRC



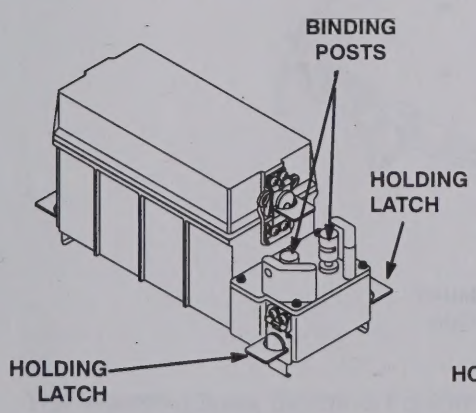
The Antenna, Manpack AS-3683/PRC (manpack antenna) mates with the RT ANT connector. The RT provides for impedance matching when this antenna is installed. The flexible antenna base is used to move the radiating element for best communication.

ANTENNA, MANPACK AS-4266/PRC

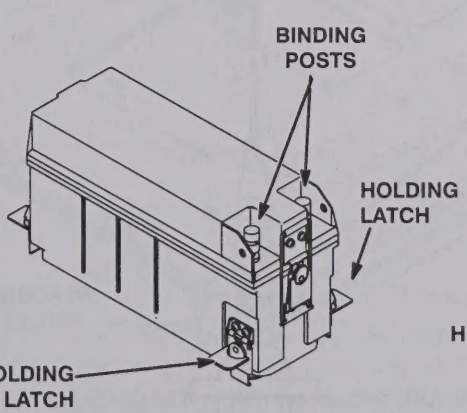


The Antenna, Manpack AS-4266/PRC (8 ft, 7 in manpack antenna) mates with the RT ANT connector. This antenna contains its own matching circuitry. The antenna is composed of several sections held together with an elastic cord running through the center and is stored in a folded position.

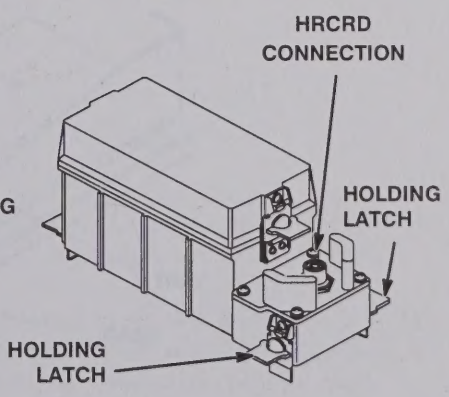
BATTERY BOX, CY-8523A



BATTERY BOX, CY-8523B



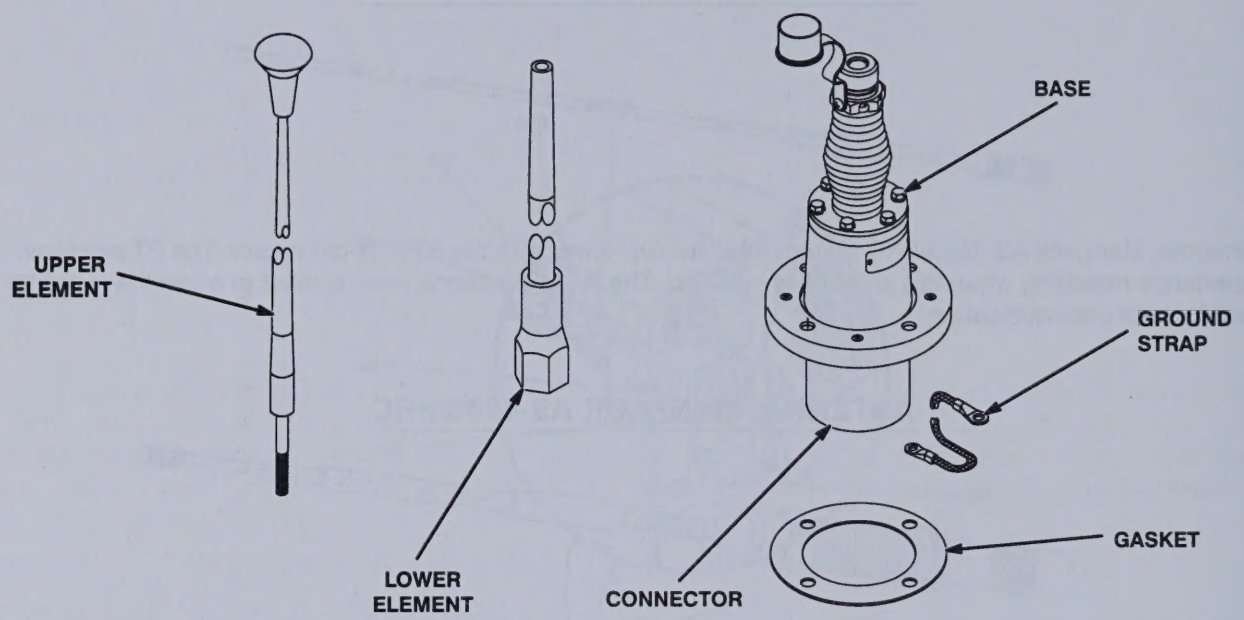
BATTERY BOX, CY-8523C



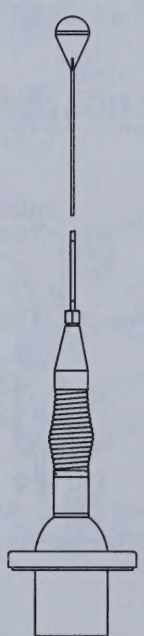
The Battery Box CY-8523 series (battery box) holds the battery to the back of the RT or RCU. The connector on the battery box mates with the system connector on the RT or RCU. Four latches hold the battery box in place. The CY-8523A and CY-8523B battery box has two binding posts that are used to connect the RCU to the RT. The CY-8523C binding post has been eliminated, CY-8523C has a special connector to allow connection of the Hand Held Remote Control Device (HRCD). For use of a SIP RT as an RCU or remote RT, CY-8523A and CY-8523B battery box is required.

1.8. DESCRIPTION OF COMPONENTS. Continued

ANTENNA, VEHICULAR AS-3900/VRC



ANTENNA, VEHICULAR AS-3916/VRC (SLPA)

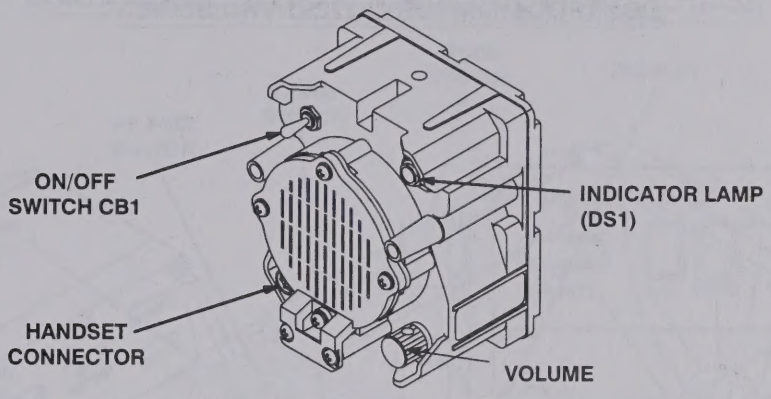


AS-3916 DOES NOT DISASSEMBLE

The Antenna, Vehicular AS-3900/VRC or AS-3916/VRC (SLPA) (vehicular antenna) is used on vehicles. It receives and transmits FM signals. It is a broadband antenna that contains impedance matching circuitry. The base spring allows the antenna to bend when it strikes an obstruction.

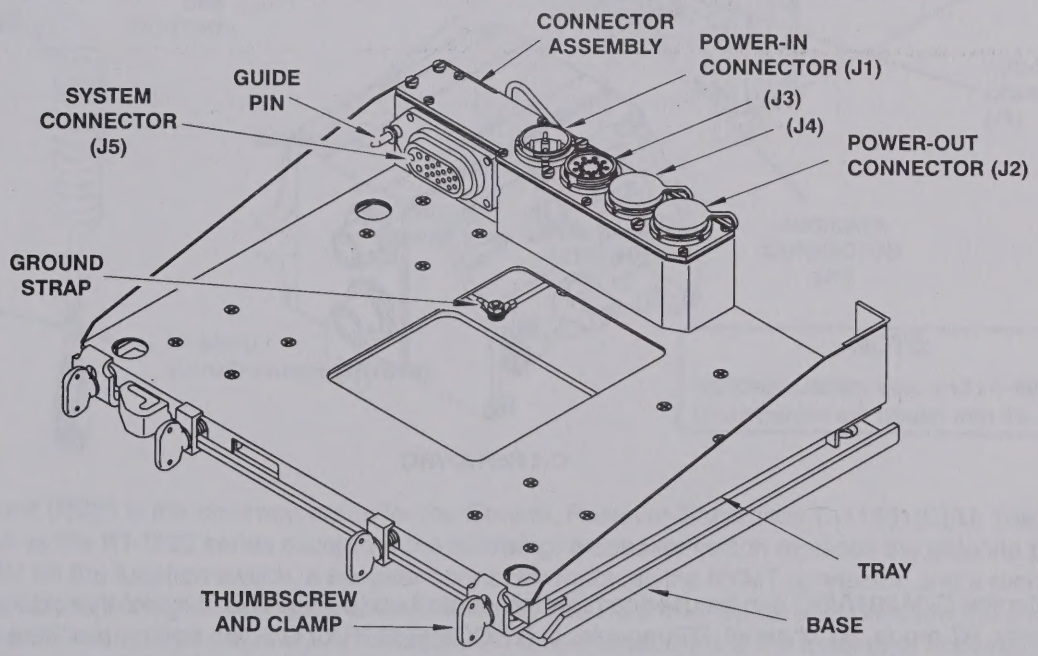
1.8. DESCRIPTION OF COMPONENTS. Continued

LOUDSPEAKER-CONTROL UNIT LS-671/VRC



The Loudspeaker-Control Unit LS-671/VRC is designed for vehicular installations and connects to the RT or RCU through MB connectors J3 or J4. Connector J3 provides monitoring and transmission for RT A or RCU A. Connector J4 provides monitoring and transmission from RT B or RCU B. The ON/OFF switch on the loudspeaker can remotely control the operating power to the vehicular radio.

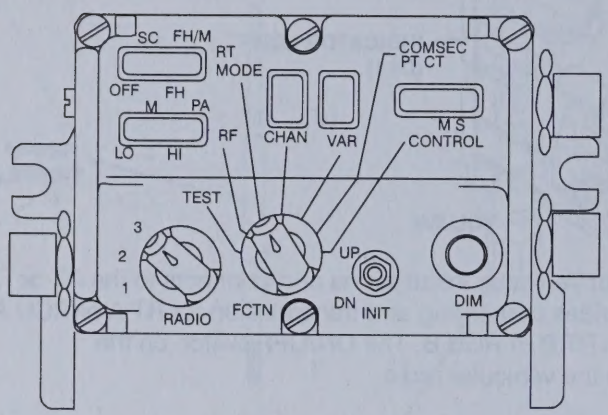
MOUNTING BASE, ELECTRICAL EQUIPMENT MT-6352/VRC



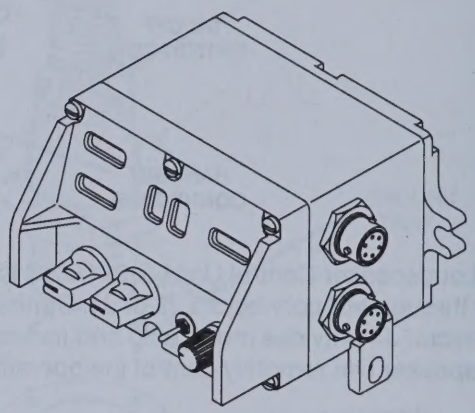
The Mounting Base, Electrical Equipment MT-6352/VRC (MB) holds the VAA. It also provides the electrical interface to the vehicle power. The tray and base are connected by four shock mounts. Six internal ground straps are used for grounding. The base is bolted to the shelf of the vehicle. The base has four thumbscrews and clamps; two hold the VAA in place; two hold the lower RT or RCU in place. The guide pin and system connector help aline the VAA or PSA. There are five connectors on the connector assembly in the back of the MB. The system connector mates with the system connector on the VAA. The operating voltage (22 to 32 V dc) from the vehicle's electrical system is connected to the power-in connector, J1. A second MB or PA mount is connected to the power-out connector J2. The vehicle intercom or LS-671/VRC loudspeaker, for RT A or RCU A, is connected to J3. The vehicle intercom or LS-671/VRC loudspeaker, for RT B or RCU B, is connected to J4.

1.8. DESCRIPTION OF COMPONENTS. Continued

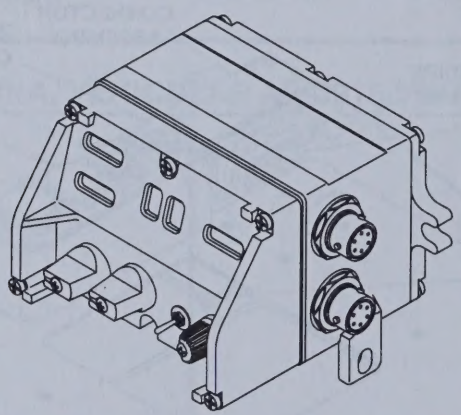
CONTROL-MONITOR C-11291/VRC SERIES



FRONT PANEL



C-11291/VRC

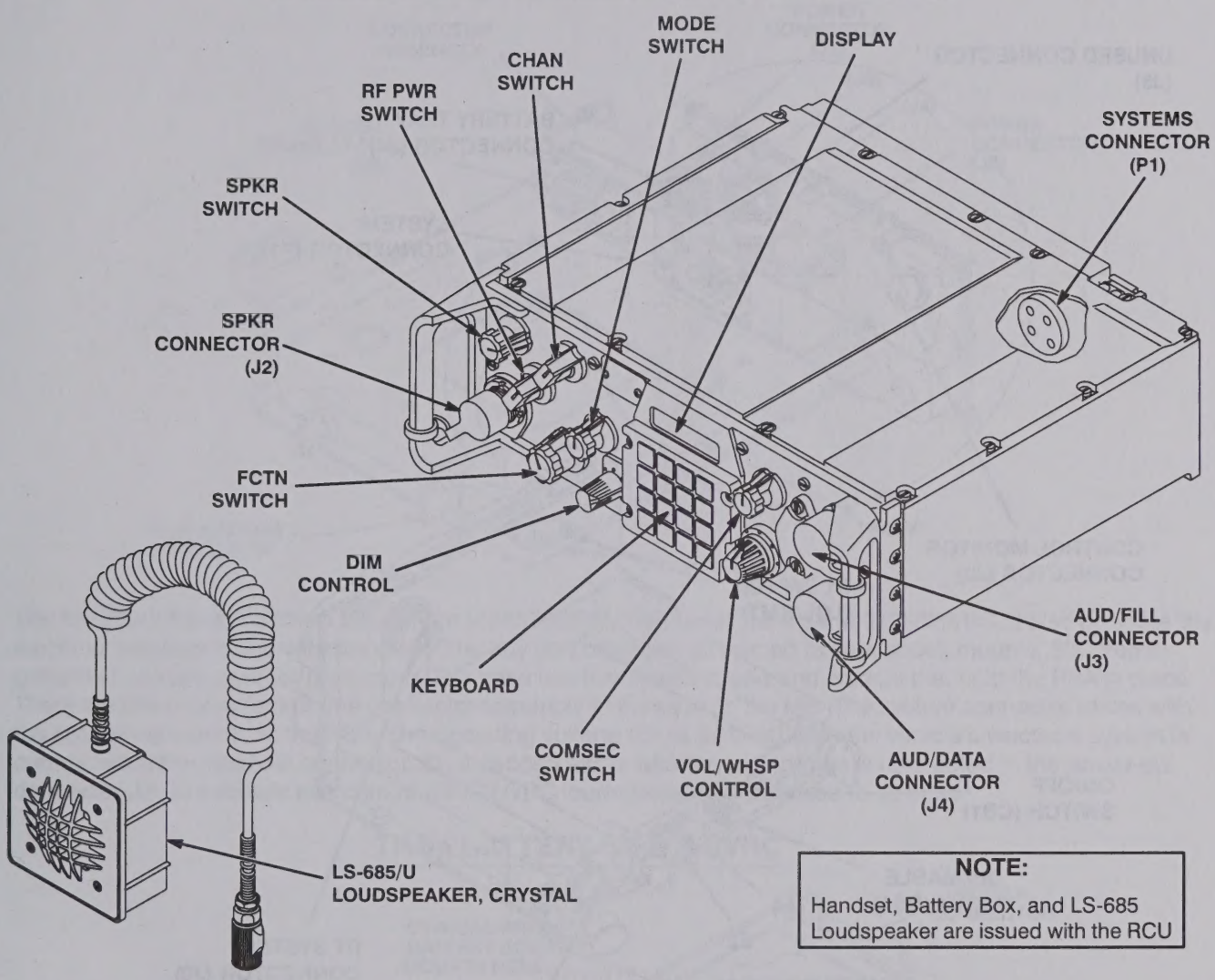


C-11291A/VRC

Control-Monitor C-11291/VRC can be used to remotely control up to three RTs. It remotely selects: RT ON/OFF, RT RF power, RT mode, RT channel, RT variable, or RT COMSEC PT or CT. Two control-monitors can be used to control the same RTs. Cable CX-13290/VRC is used to connect the VAA or PSA to the control-monitor. The same type cable is used to interconnect two control-monitors. The RADIO switch selects the RT to be controlled. Position 1 selects RT A in the primary radio or the single radio mount RT. Position 2 selects RT B. Position 3 selects RT A in the second radio. The FCTN (function) and INIT (initiate) switches are used to select the RT operating functions. The control-monitor receives electrical power from the first radio. A self-test is provided for diagnostic use. The control-monitor must be removed from the VAA if an RCU is to be used.

1.8. DESCRIPTION OF COMPONENTS. Continued

CONTROL, RECEIVER-TRANSMITTER C-11561(C)/U (RCU)



NOTE:

Handset, Battery Box, and LS-685 Loudspeaker are issued with the RCU

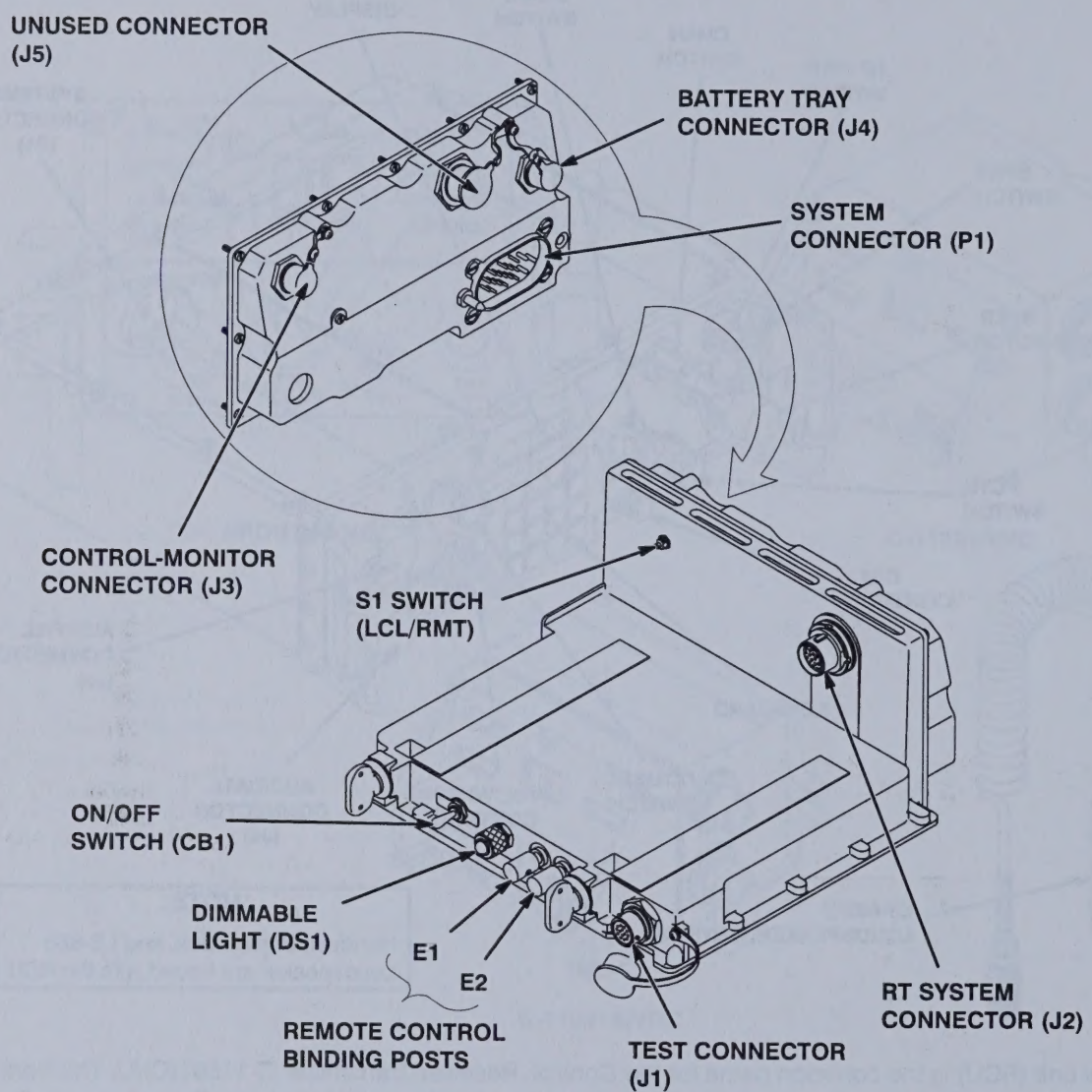
Remote control unit (RCU) is the common name for the Control, Receiver-Transmitter C-11561(C)/U. The front panel is the same as the RT-1523 series except for the following: a speaker switch replaces the antenna port, ICM replaces REM on the function switch, a speaker connector replaces the RXMT connector, and a receive signal indicator replaces the signal strength/transmit indicator. The RCU front panel controls allow the user to perform all RT capabilities up to 4 km away. An exception to these capabilities is the loading of hopset/transec variables. The RCU contains no frequency hopping circuitry, therefore the RT's circuitry is used for this mode of operation. The RT must be loaded with the necessary hopset/transec at the RT front panel. The RCU is capable of an internal self-test and of initiating an RT self-test, to determine if one of the units is faulty.

The RCU and RT are connected with field wire via the binding posts on the VAA or battery box. The RCU display will read OPEN if the RT function switch is not placed in REM, the field wire is disconnected or open, or one of the system units has an open in the two-wire path.

The LS-685/U loudspeaker is installed on the RCU front panel speaker connector J2 for dismounted applications.

1.8. DESCRIPTION OF COMPONENTS. Continued

ADAPTER, POWER SUPPLY MX-10862/VRC (PSA)

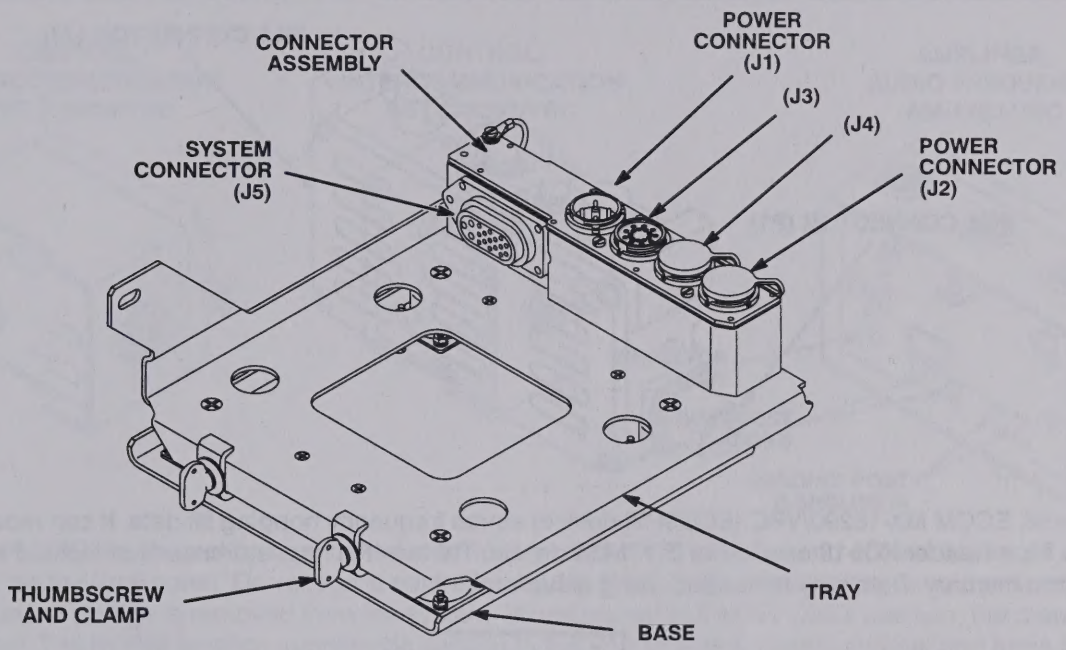


The Adapter, Power Supply MX-10862/VRC (PSA) will hold one RT and is used where space is such that the VAA will not fit. The PSA mounts in the MB MT-6576/VRC. Switch S1 can be set to either LCL (LOCAL) or RMT (REMOTE). The LCL setting turns system power on from the PSA CB1. The RMT setting allows the system to be remotely powered from a LS-671/VRC or vehicular intercom. A CX-13314/VRC cable is needed to mate connector J1 and the RT AUD/DATA connector for remote keying. Connector J1 also serves as a test connector to aid in fault isolation.

The control-monitor is connected to PSA connector J3. A battery tray, which provides RT back up power during a system power failure, is connected to J4. Binding posts (E1 and E2) are present for the use of a remote control unit.

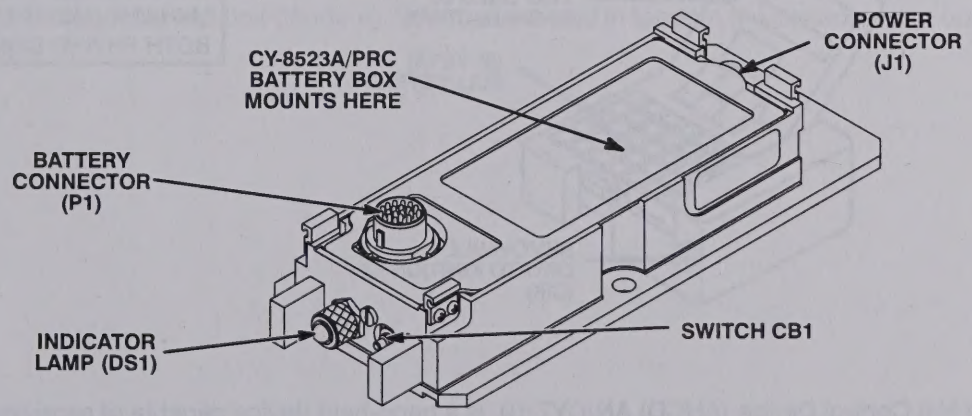
1.8. DESCRIPTION OF COMPONENTS. Continued

MOUNTING BASE, ELECTRICAL MT-6576/VRC



The Mounting Base, Electrical Equipment MT-6576/VRC (MB) holds the PSA MX-10862/VRC. It also provides the electrical interface to the vehicle power. The tray and base are connected by four shock mounts. Six internal ground straps are used for grounding. The base has two thumbscrews and clamps that hold the PSA in place. There are five connectors on the connector assembly in the back of the MB. The system connector mates with the system connector on the PSA. The operating voltage (22 to 32 V dc) from the vehicle's electrical system is connected to the power-in connector, J1. A second MB or ancillary equipment is connected to the power-out connector J2. The vehicle intercom or LS-671/VRC loudspeaker is connected to J3 or J4.

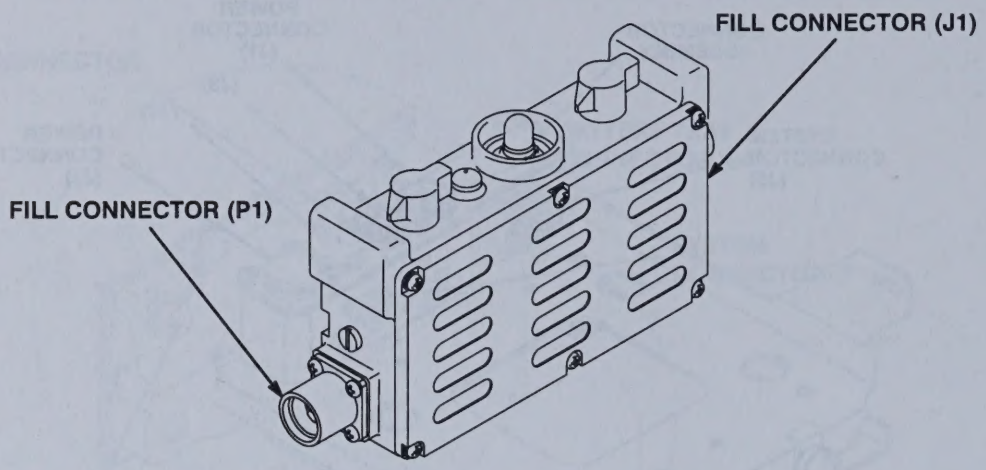
TRAY, BATTERY CY-8664/VRC



The Tray, Battery CY-8664/VRC is designed for use in conjunction with the single radio mount (SRM) in vehicular installations that require an additional power source for the RT during certain vehicular operations (ie. turret rotation, etc.).

1.8. DESCRIPTION OF COMPONENTS. Continued

FILL DEVICE, ELECTRONIC COUNTER-COUNTERMEASURES MX-18290/VRC

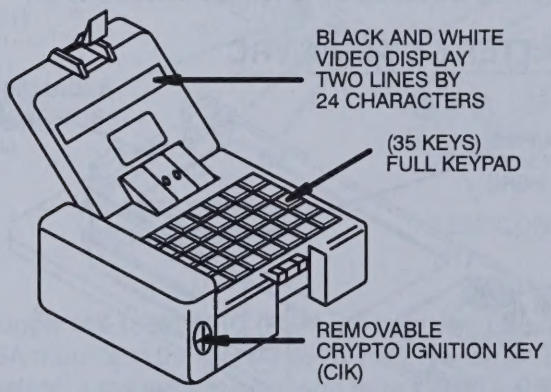


The Fill Device, ECCM MX-18290/VRC (ECCM fill device) stores frequency hopping fill data. It can receive fill data from a Tape Reader KOI-18 or another ECCM fill device. Thirteen FH hopset/transecs or lockout sets may be loaded into memory. Data may be loaded using either end.

CAUTION

Do not connect fill device to RT without using the fill cable.

AUTOMATED NET CONTROL DEVICE (ANCD) AN/CYZ-10



NOTE:

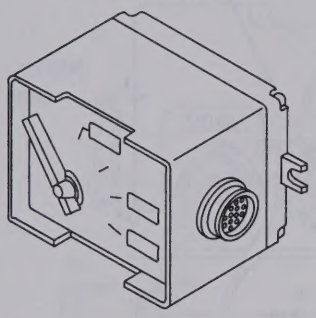
THE ANCD REPLACES THE MX-18290 AND IS USED TO LOAD BOTH FH AND COMSEC DATA.

The Automated Net Control Device (ANCD) AN/CYZ-10, is a hand-held device capable of receiving, storing, and transferring data between ANCDs, to an LRU, or to a SINCGARS radio. Primary application is the transfer of COMSEC keys and FH data, plus replacement of the paper SOI. The ANCD replaces the KYK-13, KYX-15, and KOI-18 COMSEC fill devices, and the MX-18290 ECCM fill device.

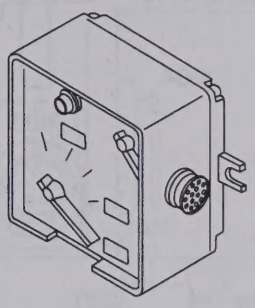
1.8. DESCRIPTION OF COMPONENTS. Continued

INTERCOMMUNICATION SET AN/VIC-1(V) (INTERCOM) COMPONENTS

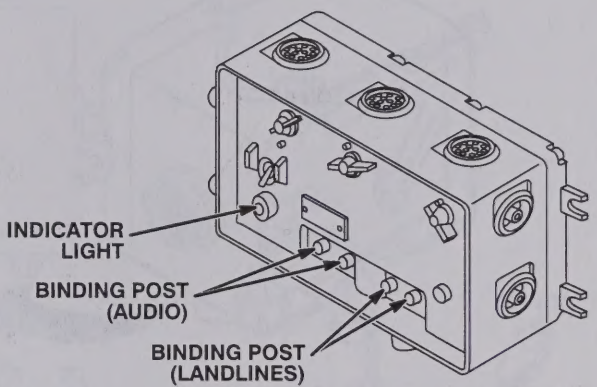
CONTROL, INTERCOMMUNICATION SET C-2298/VRC



CONTROL, INTERCOMMUNICATION SET C-2297/VRC



AMPLIFIER, AUDIO FREQUENCY AM-1780/VRC

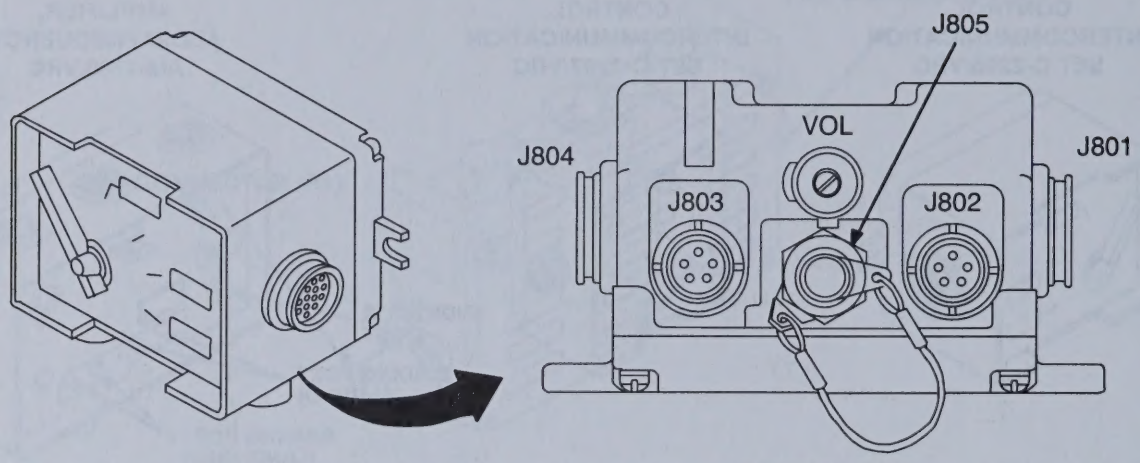


The AM-1780/VRC (main junction box) controls dc voltage and audio to radios and control boxes. All controls are located on the front panel. Dc voltage is controlled by the MAIN PWR switch. It has three positions. In the OFF position, all voltage is removed from the system. When placed in the INT ONLY position, the crew can talk to each other. The NORM position supplies dc voltage to the VAA or power supply adapter and turns the radios on. The power CKT BKR controls the voltage to the control boxes. A power indicator light shows when the CKT BKR is set to on. The INT ACCENT switch is used to reduce the RT audio and prevent confusion as to the source of the voice in the handset or helmet. In the ON position, the INT ACCENT switch reduces the receive audio. Intercom audio remains the same. The AM-1780/VRC may also be used to control dc voltage and audio to RCUs.

Control Box C-2298/VRC is used by the commander and the crew to talk to each other. The crew use radios to talk to other tank crews or commanders. There are four connectors on this box. Two are for audio accessories. Connector J803 is used for intercom. J802 is used to operate the radio. J801 and J804 provide all power and control signals. They are wired in parallel, so that, one jack can be connected to the AM-1780 and the other jack connected to another control box (tandem). When connected in tandem the control boxes operate independently.

1.8. DESCRIPTION OF COMPONENTS. Continued

CONTROL BOX C-10456/VRC



BOTTOM VIEW

The C-10456/VRC is a modified C-2298/VRC. It is used in the M1, M2, and M3 tracked vehicles to provide remote keying of the AM-1780/VRC main junction box. The C-10456/VRC has an additional connector, J805 located behind the volume control. Special cables are connected between tracked vehicle control sticks and connector J805. A dummy plug is provided for normal operation. The plug is connected to J805 to allow keying from J805.

VIC CONTROL BOX FUNCTIONS BY SWITCH POSITION:

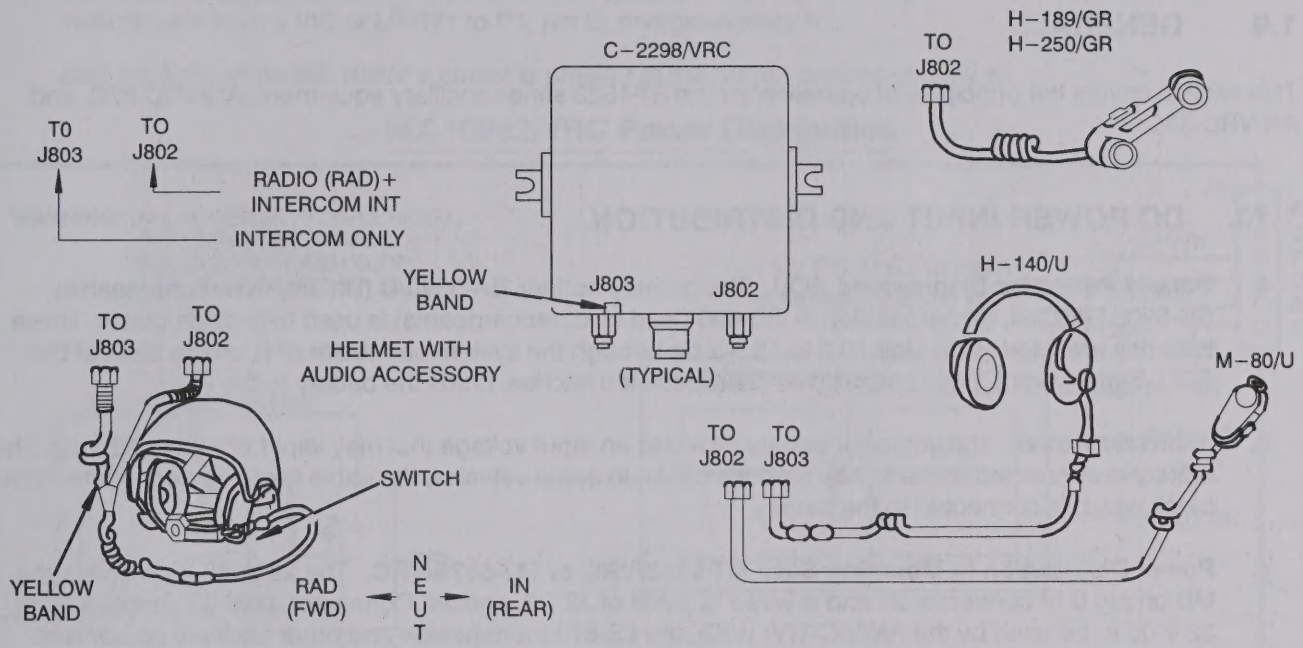
FUNCTION	POSITIONS*	CDRS	CREW
RADIO "A" (TALK & LISTEN)	ALL, A	YES	YES
RADIO "B" (LISTEN)	ALL, C	YES	YES
INTERCOM (TALK & LISTEN)	ALL	YES	YES
	INT ONLY	YES	YES
	A	YES	YES
	C	YES	NO

*** Position B is not used with SINCGARS.**

1.8. DESCRIPTION OF COMPONENTS. Continued

AUDIO ACCESSORIES

These standard audio accessories may be used with any radio system.



SECTION III

PRINCIPLES OF OPERATION

1.9. GENERAL.

This section covers the principles of operation for the RT-1523 series ancillary equipment, AN/VRC-87C, and AN/VRC-88C.

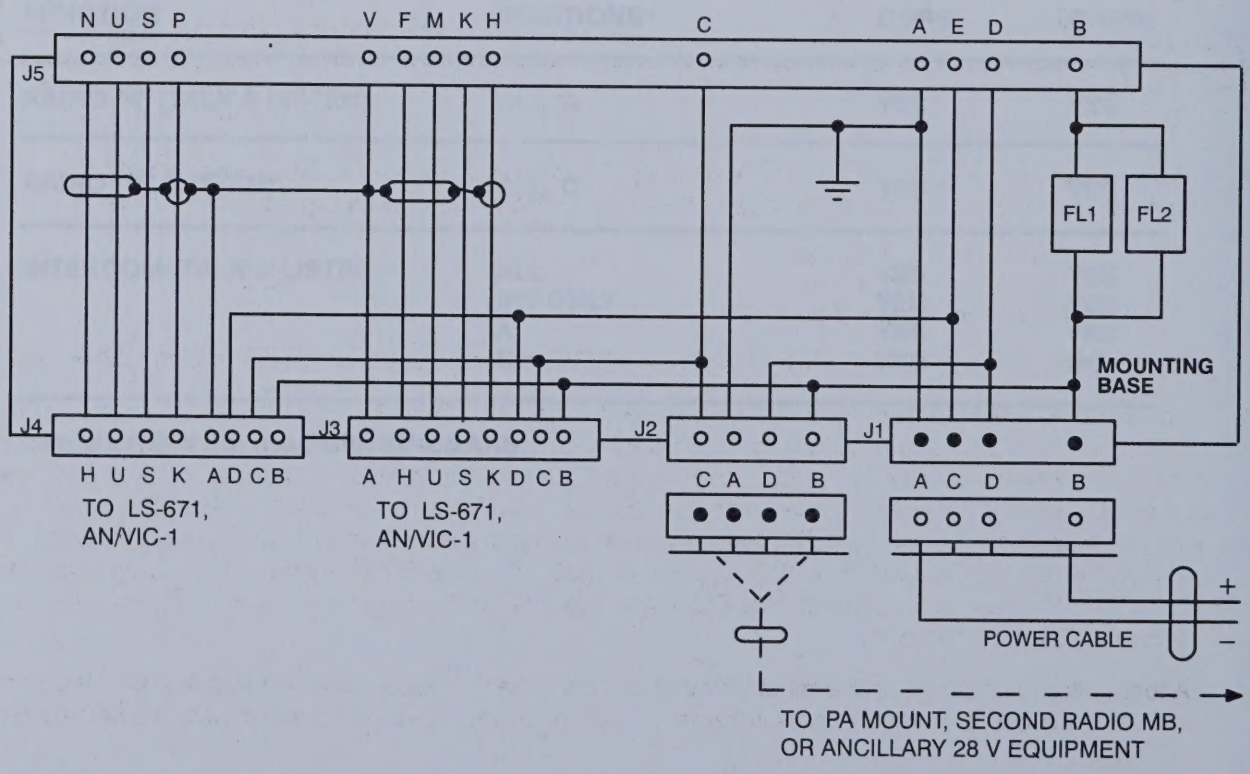
1.10. DC POWER INPUT AND DISTRIBUTION.

a. **Battery Power for Dismounted RCU.** The primary battery, BA-5590/U (lithium, non-rechargeable), BB-590/U (NiCad, rechargeable), or BB-490 (lead acid, rechargeable) is used to provide power. These batteries are used to provide 10.5 to 15.5 V dc through the system connector (P1) on the back of the RCU. Battery box CY-8523 series, with its associated latches, holds the battery to the RCU.

b. **Vehicular Power.** The vehicular battery provides an input voltage that may vary from 22 to 32 V dc. The battery is connected to the MB by a power cable. In some vehicles, the cable is connected to a terminal block which is connected to the battery.

c. **Power Distribution in Mounting Base MT-6352/VRC or MT-6576/VRC.** The 22 to 32 V dc enters the MB on pin B of connector J1 and is wired to pin B of J2, J3, and J4. Connector J3 or J4 supplies 22 to 32 V dc to be used by the AN/VIC-1(V) (VIC), the LS-671 loudspeaker and other ancillary equipment.

Mounting Base Power Distribution

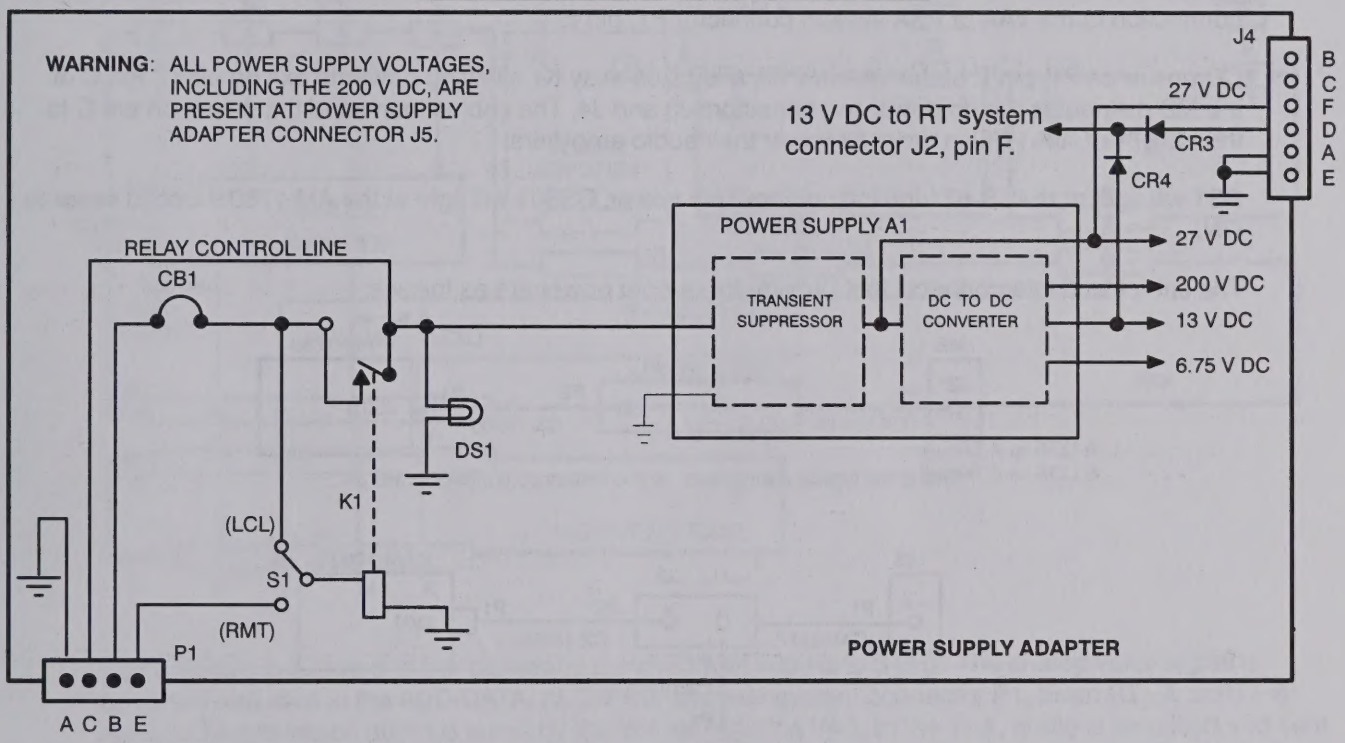


1.10. DC POWER INPUT AND DISTRIBUTION. Continued

d. Power Distribution in Power Supply Adapter (PSA), MX-10862. The 22 to 32 V dc from J5, pin B, of the MB enters the PSA through P1, pin B. P1, pin B is connected to CB1, which provides over-current protection for the power supply. In the MX-10862, a switch is used for local or remote mode. In local mode the voltage present at P1, pin B either bypasses or energizes relay K1. In remote mode, the voltage sent from a VIC or LS-671 to P1, pin E, energizes relay K1.

DS1 will light at the MX-10862 if power is present at the output contact of relay K1.

MX-10862/VRC Power Distribution



e. Power Supply Module. The 22 to 32 V dc is applied to power supply A1. This power supply is a dc-to-dc converter which takes the 22 to 32 V dc and produces the following voltages:

6.5	to	7.25 V dc
12.6	to	13.4 V dc
180.0	to	220.0 V dc

These voltages are used by RT-A, RT-B, RCU-A, RCU-B, control-monitor, and PA installed on the VAA.

f. Power Distribution in Battery Tray CY-8664/VRC. The CX-13290/VRC cable is used to connect PSA connector J4 to battery tray connector J1. The 22 to 32 V dc present at PSA connector J4, pin F, is sent through the cable to battery tray connector J1, pin F. This voltage energizes battery tray relay K1 to the closed position. K1 will remain energized from 2 to 32 V dc. If the 13 V dc line from from the power supply drops low, the MX-10862/VRC diodes allow the battery in the battery box connected to battery tray connector P1 to provide the 13 V dc to the RT. The 13 V dc exits battery tray J1, pin E through the cable to PSA connector J4, pin D. Pins E and A are ground at PSA connector J4. Pins D and A are ground at battery tray connector J1.

A test switch is provided on the battery tray to test the battery voltage. If the test switch is pressed and the battery is good, then DS1 lights. If the test switch is pressed and the battery is bad, the DS1 does not light.

1.10. DC POWER INPUT AND DISTRIBUTION. Continued

g. Remote Control.

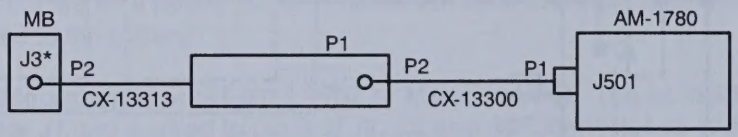
An LS-671 or AM-1780 can remotely power up the vehicular amplifier adapter (VAA) or power supply adapter (PSA) if they are set to the remote mode.

Primary power enters the MB at connector J1, pin B. From here it is distributed to MB J3 and J4. Cables carry the dc on pin B to an LS-671 or AM-1780. If the LS-671 ON/OFF switch is set to ON or the AM-1780 MAIN PWR switch is set to NORM, the dc on pin B is returned on pin D and sent back through the cables to MB J3 or J4. MB J3 or J4 connect pin D to the system connector J5, pin E. This is a direct connection to the VAA or PSA system connector P1, pin E.

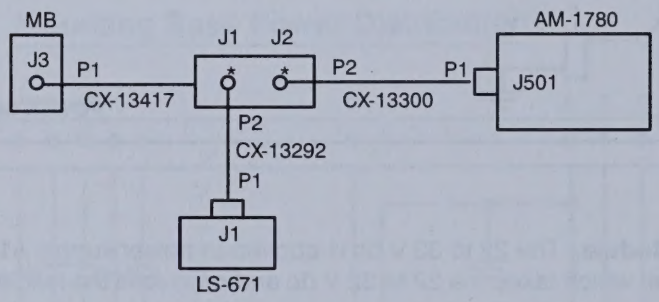
DC power on P1, pin E of the VAA or PSA energizes relay K1 allowing power to exit on pin C. Pin C of the MB distributes the dc power to connectors J3 and J4. The cables then send the power on pin C to the LS-671 or AM-1780 in order to power their audio amplifiers.

DS1 will light at the LS-671 indicating complete power. DS501 will light at the AM-1780 if CB501 is set to ON.

The cables and interconnects that provide for remote power are as follows:



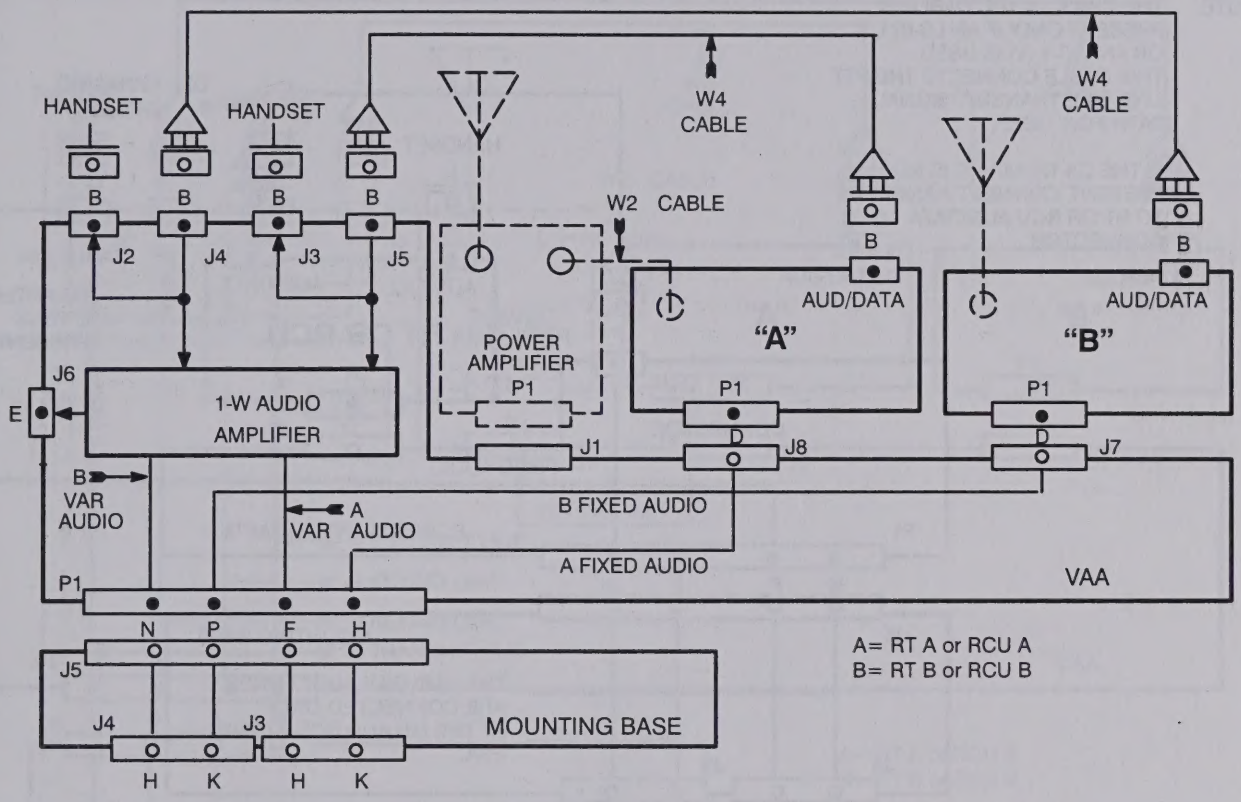
* This is the typical connection. Some instances connect to MB J4.



* CX-13292 and CX-13300 may be connected to J1 or J2 of CX-13417.

1.11. RADIO ANALOG RECEIVE PATH.

a. SINCGARS Radios Using the AM-7239 Series.



Voice signals are limited to the baseband bandwidth of 300 Hz to 3 kHz. The analog voice signal is amplified and sent to the AUD/DATA, AUD/FILL, and rear system connector P1. From RT-A or RT-B AUD/DATA connector, audio is taken by the W4 cable to the VAA. In the VAA, audio is amplified and sent to speaker (SPKR) connector J6 and VAA system connector P1 as variable audio. From RT-A or RT-B rear system connector P1, audio is sent directly to the VAA system connector P1 as fixed audio.

The audio of RT-A and RT-B are summed in the amplifier for the speaker connector J6. A mute circuit is provided to mute the speaker during transmission. A muting line is provided at MB connector J2 for external muting of RT-A or RT-B audio.

"A" and "B" variable audio lines are used by the VIC

"A" and "B" fixed audio lines are used both by the VIC and the LS-671.

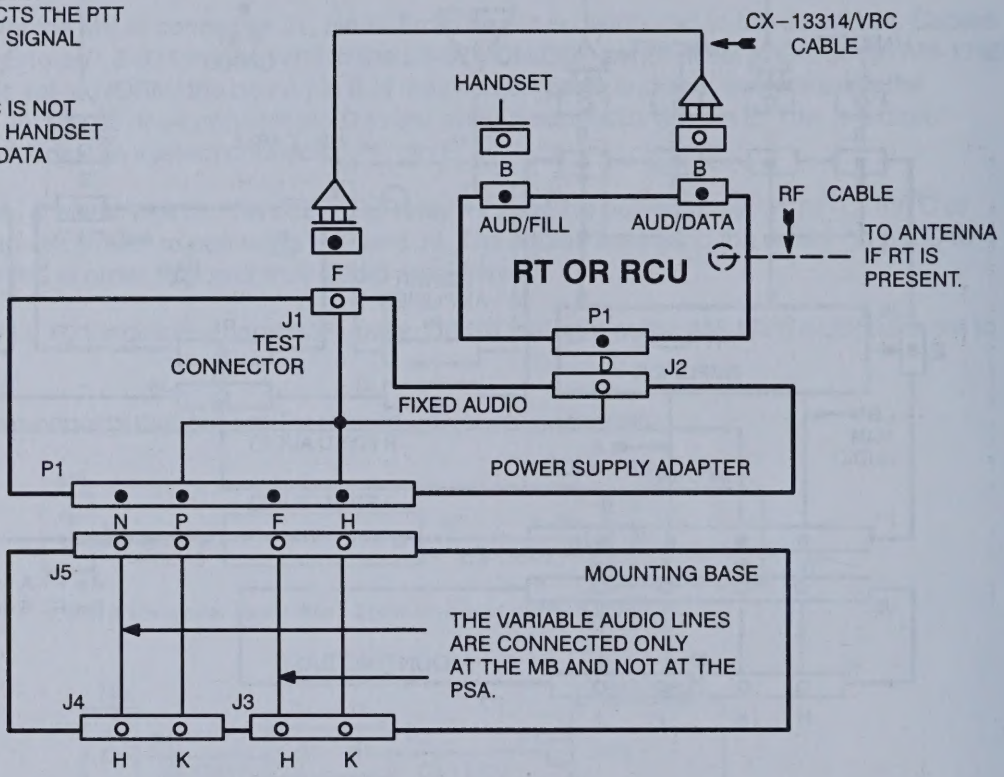
"C" and "D" models of AM-7239 do not have a connection for speaker LS-454. Only fixed audio is sent from the RT to the VAA. Variable audio is not sent to the VIC via the W4 cable. Audio from either radio will be the same and cannot be adjusted to differing levels to differentiate which radio is receiving.

1.11 RADIO ANALOG RECEIVE PATH. Continued

b. SINCGARS Radios Using the MX-10862/VRC.

NOTE: THE CX-13314/VRC CABLE IS PRESENT ONLY IF AN LS-671 OR AN/VIC-1 (V) IS USED. THIS CABLE CONNECTS THE PTT LINE. SEE TRANSMIT SIGNAL PATH FOR USE.

IF THE CX-13314/VRC IS NOT PRESENT, CONNECT HANDSET TO RT OR RCU AUD/DATA CONNECTOR.



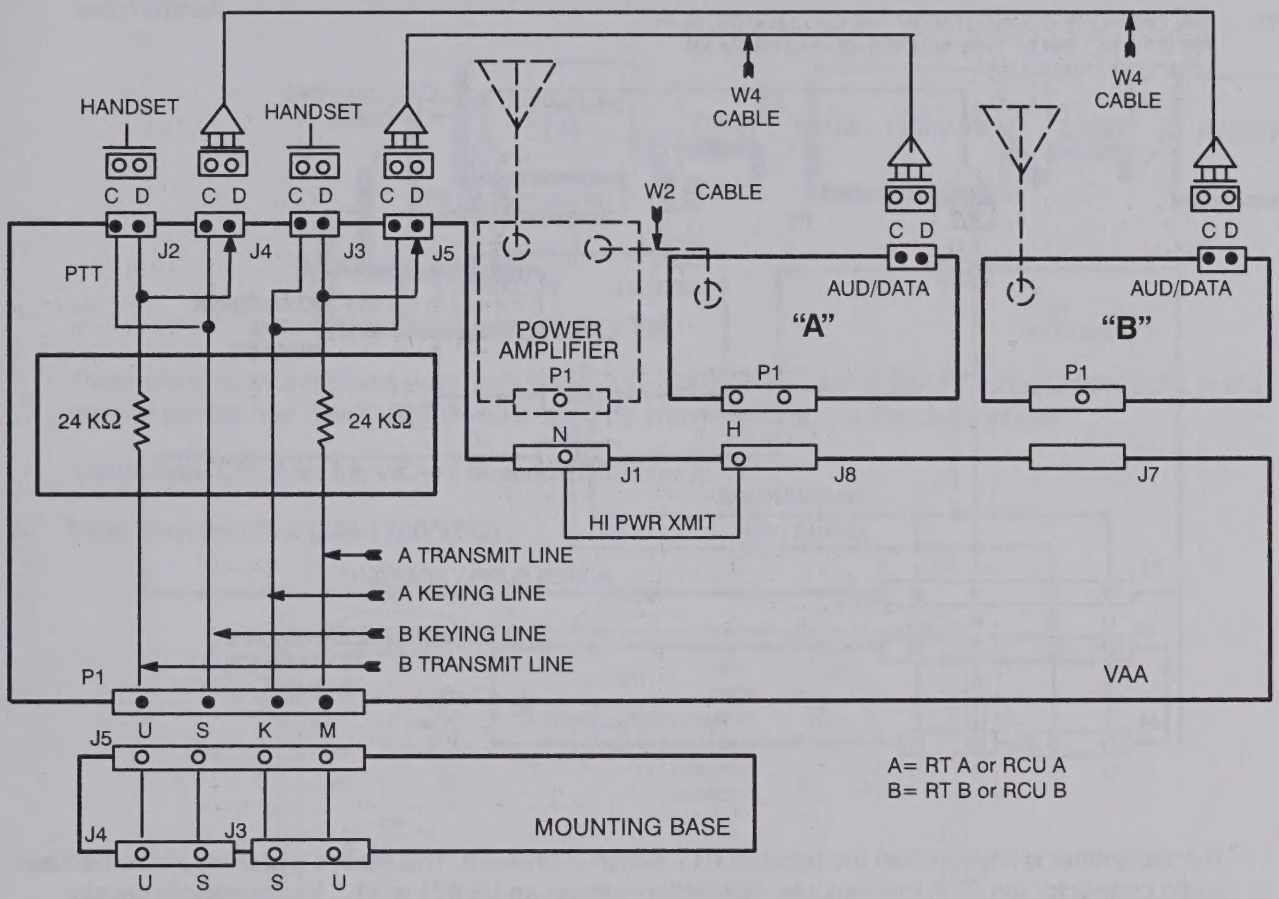
Voice signals are limited to the baseband bandwidth of 300 Hz to 3 kHz. The analog voice signal is amplified and sent to the RT or RCU, AUD/DATA, AUD/FILL, and rear system connector P1. From the RT or RCU rear system connector P1, the audio is sent directly to the PSA system connector P1 as fixed audio. The fixed audio is also sent to PSA test connector J1 to aid in fault isolation during troubleshooting.

The RT or RCU fixed audio lines are used both by the VIC and the LS-671.

The RT or RCU variable audio is used only if a handset is connected directly to the AUD/FILL or AUD/DATA connector.

1.12. RADIO ANALOG TRANSMIT PATH.

a. SINCGARS Radios Using the AM-7239 Series (VAA).



The transmitter is "keyed" when the handset PTT switch is pressed. When the radio is mounted in a vehicle, the handset is connected to the VAA.

A PTT command can also be generated by the LS-671 or VIC. MB connector J3 controls RT-A. MB connector J4 controls RT-B.

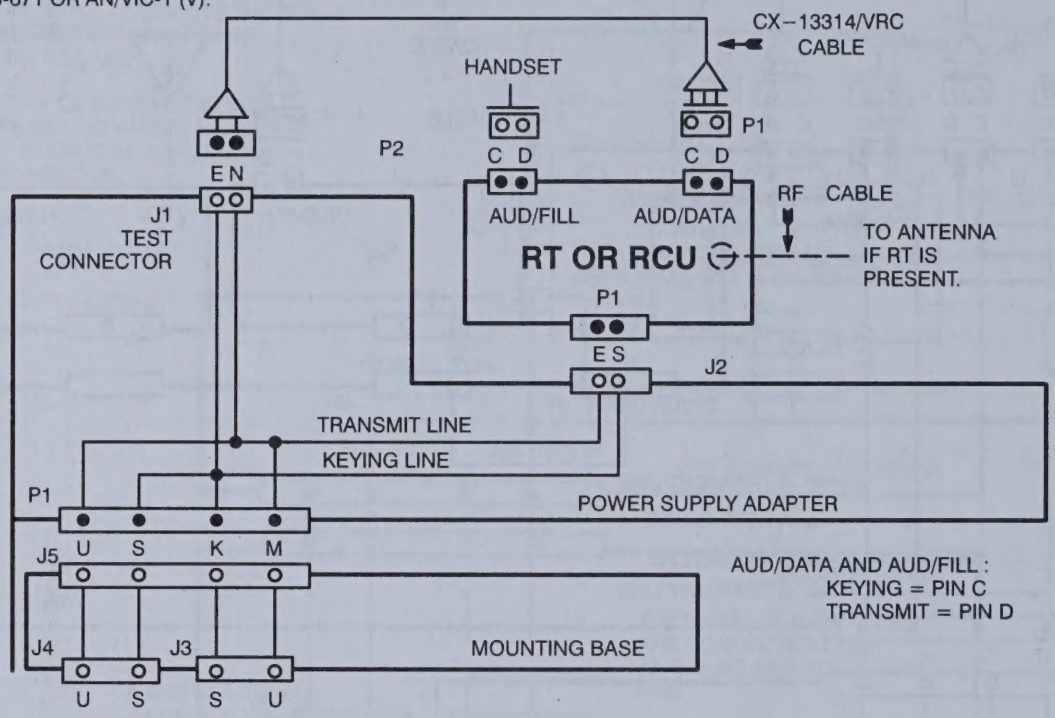
Audio signals are generated in the handset when the PTT switch is pressed. These signals are passed directly to the VAA connector J2 or J3. These connectors are wired in parallel to connectors J4 and J5, and connector the the W4 cable. The audio is then passed on pin D to RT-A or RT-B.

Audio signals are generated at the loudspeaker-control unit LS-671 or VIC. Cables pass these signals to MB connector J3 or J4.

1.12 RADIO ANALOG TRANSMIT PATH. Continued

b. SINCGARS Radios Using the MX-10862/VRC (PSA).

NOTE: THE ONLY LINE CONNECTED IN THE CX-13314/VRC IS P1, PIN C TO P2, PIN E. THIS ALLOWS KEYING FROM AN LS-671 OR AN/VIC-1 (V).



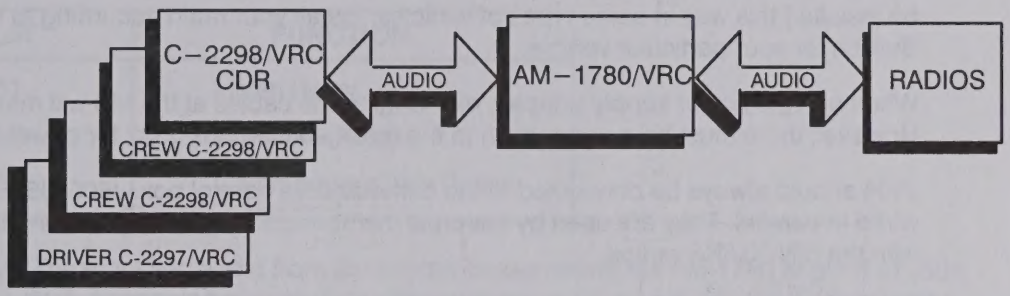
The transmitter is keyed when the handset PTT switch is pressed. This places a ground on the handset audio connector pin C. In the vehicular installation without an LS-671 or VIC, the handset is usually connected to RT or RCU AUD/DATA connector. However, the handset may be connected to the AUD/FILL connector if needed.

A PTT command can also be generated by the LS-671 or VIC.

Audio signals are also generated at the VIC or LS-671. Cables pass these signals to MB connector J3 or J4, pin U. The audio also exits test connector J1, pin N, to aid in fault isolation.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V).

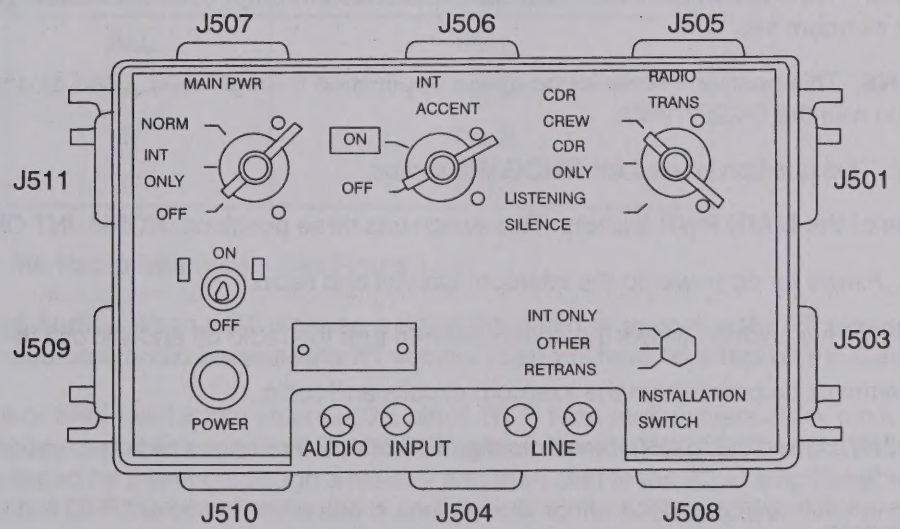
a. General. The AM-1780/VRC audio frequency amplifier is used in track vehicles. They provide control of the dc power to crew member control boxes and the radios. The amplifiers also amplify and control the audio signals.



There are two control boxes used with the VIC: C-2297/VRC and C-2298/VRC. The C-2297/VRC is the driver's control box. The C-2298/VRC is used by crewmembers and the commander.

Cable schematics for the VIC are located in chapter 2.

b. Main Junction Box (AM-1780/VRC)



(1) Circuit Description

The main junction box has ten cable connectors used to connect to control boxes and RTs. It has four selector switches, one circuit breaker, one power indicator, two sets of binding posts, and an audio amplifier.

RT-A, the bottom RT in a VAA, is typically connected to main junction box connector J501 and is controlled by setting the control box MONITOR switch to "A". RT-B, the top RT in a VAA, is typically connected to main junction box connector J503 and is controlled by setting the control box MONITOR switch to "C". The single radio mount uses a power supply adapter which allows only one RT to be installed. The RT is connected to main junction box connector J501 and is controlled by setting the control box MONITOR switch to "ALL".

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

NOTE

When using a VAA, exchanging the cables also exchanges the keying and audio lines. This reverses the operation of the radios. Controls for RT-A operate RT-B and vice versa. Radios may be installed this way in some types of vehicles. Install your radio according to the Technical Bulletin for your particular vehicle.

When using a power supply adapter, exchanging the cables at the MB will make no difference. However, there must be a connection to the main junction box J501 for power.

J504 should always be connected to the commanders control box. J505, J506, and J507 are wired in parallel. They are used by the crew members. J508, J509, J510, and J511 are not used with the SINCGARS radios.

Two pairs of binding posts are provided. One set, labeled AUDIO, allows for connection of an additional receiver. The other is labeled either LINE or TEL/REMOTE and allows for connection of a field telephone or switchboard.

(2) **Functions of the Installation Switch.** The switch has three positions: INT ONLY, OTHER, and RETRANS.

(a) **INT ONLY.** This position allows for dc power application through J508 when radios are not used with the intercom set.

(b) **RETRANS.** This position allows for dc power application through J508. Used as a radio relay operation with the C-2297/VRC.

(c) **OTHER.** This position is used for SINCGARS radios.

(3) **Functions of the MAIN PWR Switch.** This switch has three positions: NORM, INT ONLY, and OFF.

(a) **NORM.** Allows for dc power to the intercom circuits and radio.

(b) **INT ONLY.** This position allows the commander to turn the radio off and still use the intercom.

(c) **OFF.** Removes dc power from the intercom circuits and radio.

(4) **INT ACCENT.** When set to ON, the audio signals from the radios are reduced, making the intercom sound louder.

(5) **RADIO TRANS.**

(a) **LISTENING SILENCE.** No one can key (transmit on) radios through the intercom set.

(b) **CDR ONLY.** Only the commander can key the radios.

(c) **CDR+CREW.** All crew members can key the radios connected to the intercom set.

(6) **AM-1780 Power, Intercom Keying, and Voice Path.** Refer to Figure 1-1.

(a) **INT ONLY Power.** Power is applied from pin B of MB J3 to the AM-1780 connector J501. When CKT BKR CB501 is set to "ON", the power lamp DS501 lights and power is distributed to pin C of J504, J505, J506, and J507.

(b) **NORM Power.** The radio is powered as in section 1.10 g. Remote Control. When CKT BKR CB501 is set to "ON" the power present at J501, pin C is then distributed to DS501 and pin C of J504, J505, J506, and J507.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

(c) **Intercom Keying.** When a handset PTT generates a ground on pin H of J504, J505, J506, or J507 the AM-1780 energizes relays K501, K502, and K503 for the intercom mode. Due to the presence of CR521, only the commander can key relay K503.

RELAY	FUNCTION
K501	Listen Relay
K502	Crew Talk Relay
K503	Commander's Talk Relay

(d) **Intercom Voice.** The amplified audio from the control boxes enters the AM-1780 at pin K of J504, J505, J506, and J507. After being summed with the radio signals they are amplified again by the A250 amplifier and exit through the energized K501 relay. The commander is the only one who can talk on control box MONITOR position C. In position C his voice will enter at J504, pin V and then follow the above path.

LISTEN PATH	
SETTING	**CONNECTORS J504-J507**
ALL	Pin L
A	Pin M
B	Pin B
C	Pin J

(7) **AM-1780 Radio Interface.** See Figure 1-2.

(a) **Fixed Audio.** When a RT receives a signal the audio is present at the RT system connector P1. It is called fixed audio because the RT volume knob will have no effect on the audio level.

RT A or SRM fixed audio enters J501, pin K. RT B fixed audio enters J503, pin K. The combined audio is passed through the INT ACCENT switch. If the INT ACCENT switch is ON the audio level is reduced by passing through a resistor and then sent to the A250 amplifier. If the INT ACCENT switch is OFF the combined audio is sent directly to the A250 amplifier. After amplification and summing with intercom audio the fixed audio exits at J504 through J507, pin L. The control boxes must be set to ALL in order to hear this audio.

(b) **Variable Audio.** Variable audio exits the RT AUD/DATA connector and the level can be controlled from the RT volume knob.

RT A variable audio enters J501, pin H and exits at J504 through J507, pin M. The control boxes must be set to A in order to hear this audio.

RT B variable audio enters J503, pin H and exits at J504 through J507, pin J. The control boxes must be set to C in order to hear this audio.

(c) **RT Keying.** When a handset PTT generates a ground on J504, J505, J506, or J507, pin D it will key RT A or SRM. This ground passes from pin D through the RADIO TRANS and INSTALLATION switches and exits on J501, pin S. The control box settings are set to ALL or A for RT A, or A for the SRM.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

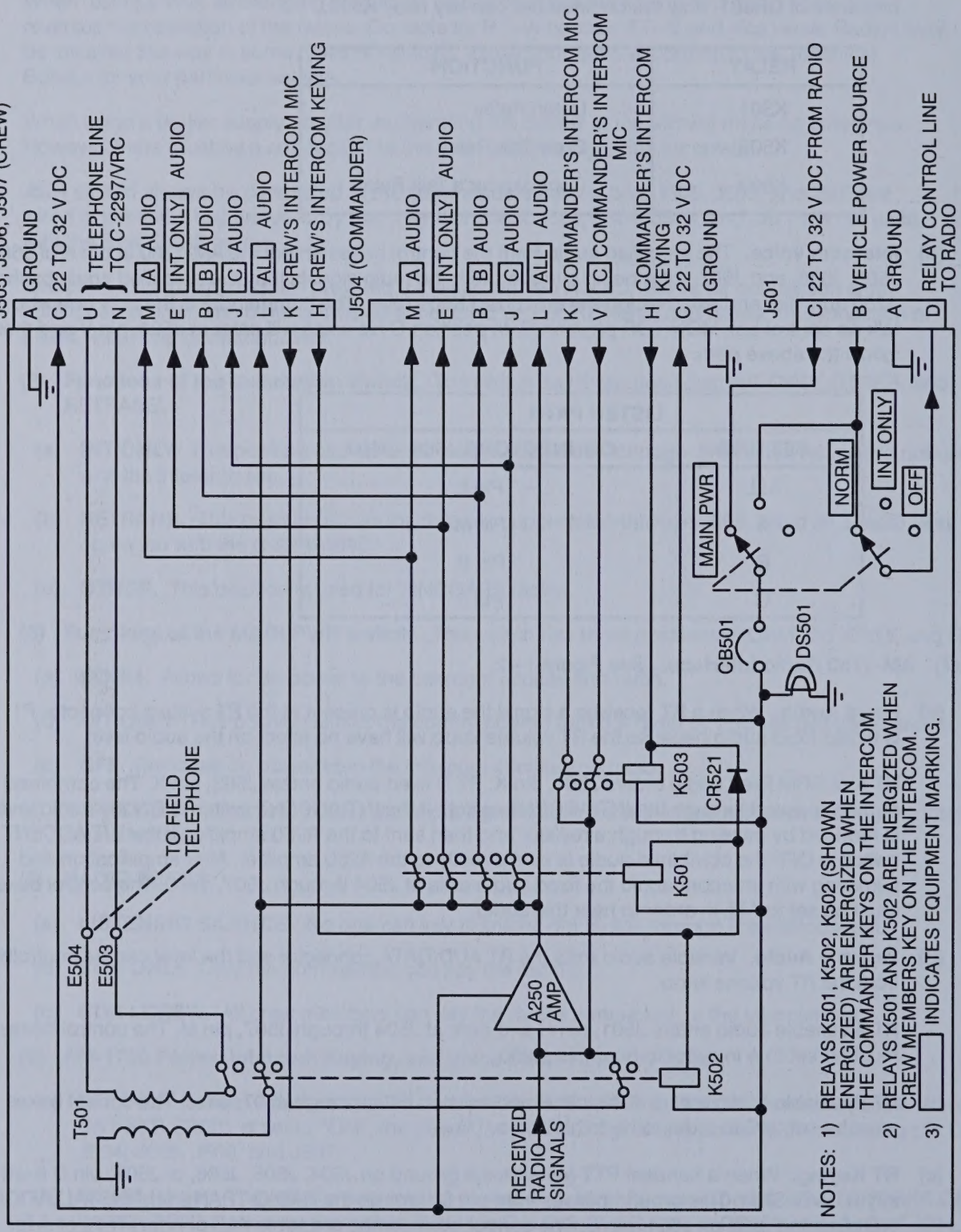


Figure 1-1. AM-1780/VRC DC Power and Intercom Paths

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

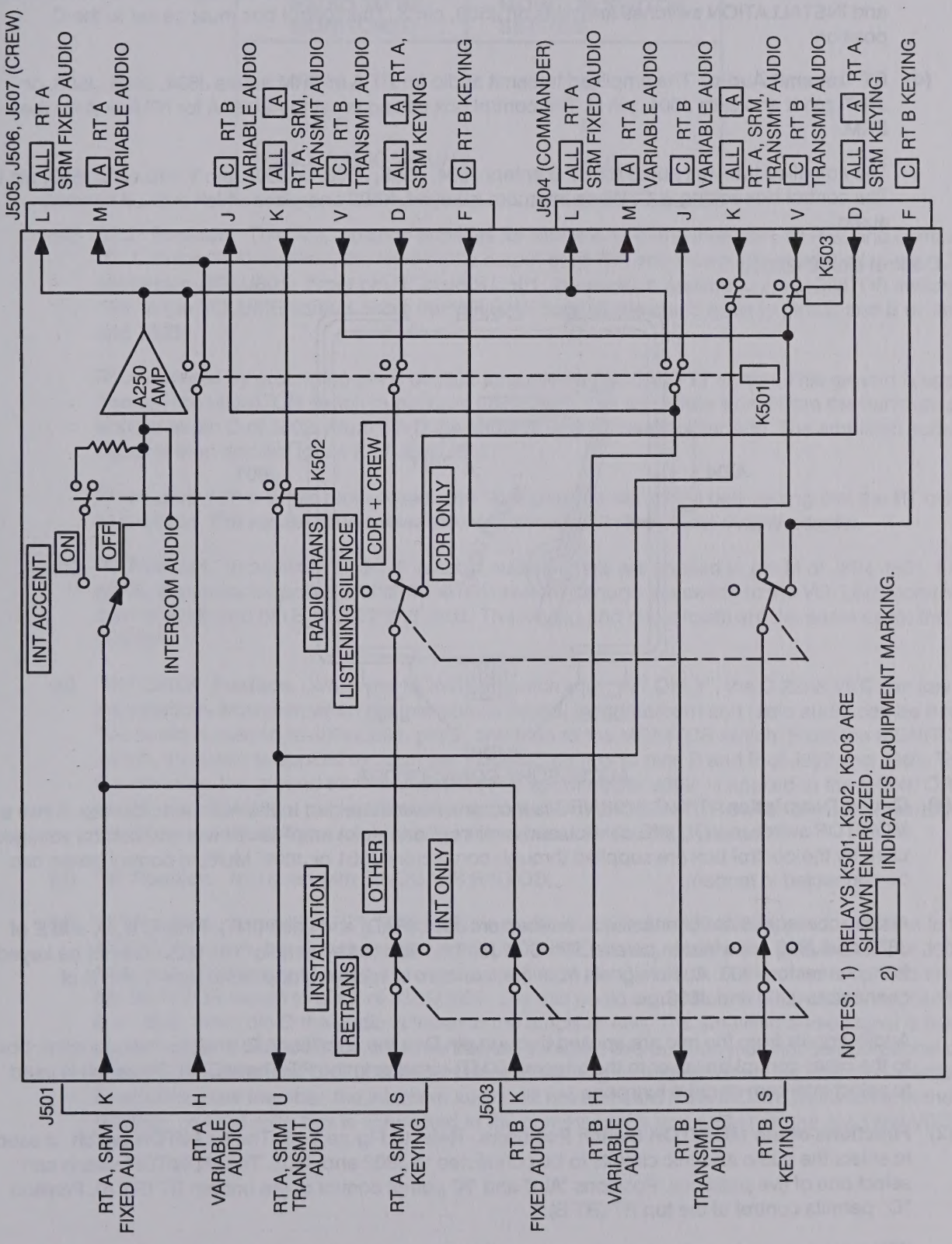


Figure 1-2. AM-1780/VRC SINCGARS Radio Interface Path

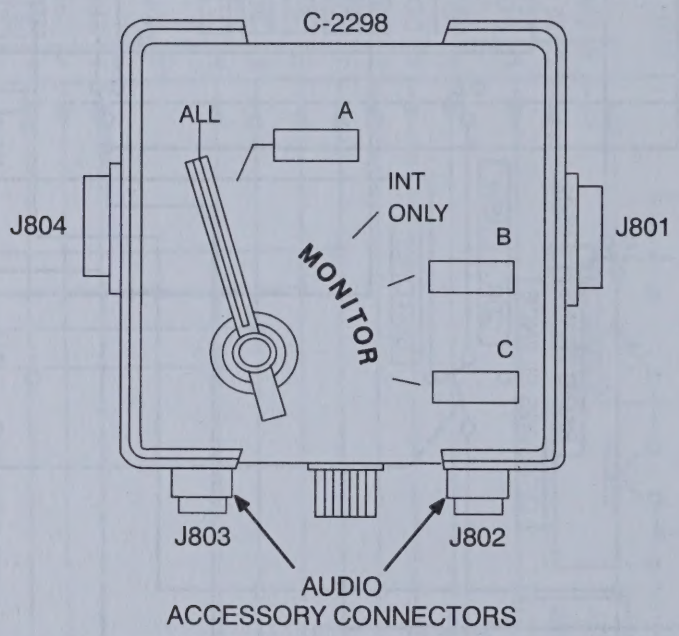
1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

J504, J505, J506, or J507, pin F keys RT B. This PTT ground passes through the RADIO TRANS and INSTALLATION switches and exits on J503, pin S. The control box must be set to the C position.

(d) RT Transmit Audio. The amplified transmit audio for RT A or SRM enters J504, J505, J506, or J507, pin K and exits J501, pin U. The control box setting is set to ALL or A for RT A or A for the SRM.

The amplified transmit audio for RT B enters J504, J505, J506, or J507, pin V and exits J503, pin U. The control box setting is C. When intercom is keyed, K502 energizes which cuts off transmit audio.

c. Control Box C-2298.



(1) Circuit Description. The C-2298/VRC is a control box connected to the main junction box. It has a MONITOR switch, a VOLUME control, and a microphone (mic) amplifier. Power and control voltages used by the control box are supplied through connectors J801 or J804. Multiple control boxes can be connected in tandem.

Audio accessories are connected to connectors J802 (RAD) and J803 (INT). Pins A, B, D, and E of J802 and J803 are wired in parallel. Pin C of J802 is used to key a radio. The radio cannot be keyed from connector J803. Audio signals from the intercom or radio are applied to pins B and E of connectors J802 and J803.

Audio signals from the mic are applied through pin D to the amplifier A80 and the main junction box to the other control boxes or to the transmit (XMT) circuitry in the RT. The MONITOR switch is used to select intercom or radio functions.

(2) Functions of the MONITOR Switch Positions. Refer to Figure 1-3. The MONITOR switch is used to select the audio and mic circuits to be connected to J802 and J803. The MONITOR switch can select one of five positions. Positions "ALL" and "A" permit control of the bottom RT (RT A). Position "C" permits control of the top RT (RT B).

When using a single radio mount the only position that can be used is the "ALL" position.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

RADIO TO BE MONITORED	MONITOR SWITCH SETTING
RT A	A
RT B	C
SINGLE RADIO MOUNT	ALL

(a) "ALL" Position. The "ALL" position provides for monitoring of the intercom, all RTs, and control of RT A. In the "ALL" position, the fixed audio output of all RTs and intercom are applied to pin "L" of connector J804/J801. From pin "L" of J804/J801, the audio is applied to the MONITOR switch and then to the VOLUME control. From the VOLUME control, the audio goes to pins B and E of J802 and J803.

RT A is keyed by grounding pin C of J802 through the handset PTT switch. This ground is applied through the MONITOR switch to pin D on J804/J801. The mic audio signal from the handset is applied to pin D of J802. From pin D the audio is sent to the amplifier A80. The amplified audio signal is then applied to pin K of J804/J801.

When used with a single radio mount, the "ALL" position will be the only setting that the RT can be heard from. The variable audio lines are not connected in the power supply adapter.

(b) "A" Position. In position "A", RT A variable audio signals are applied to pin M of J804/J801. From pin M, the audio is applied to the MONITOR switch, through the switch to the VOLUME control and then to pin B and pin E of J802 and J803. The keying and mic circuits are the same as for the "ALL" position.

(c) "INT ONLY" Position. When the MONITOR switch is in "INT ONLY", the C-2298/VRC can key only the intercom. However, when the intercom is keyed, both intercom and radio audio can be heard. The audio is applied to J804/J801, pin E, and then to the MONITOR switch. From the MONITOR switch, the audio is applied through the VOLUME control to pins B and E of J802 and J803. To key the intercom, the ground from the handset PTT at connector J802 is applied to the MONITOR switch and J804/J801, pin H. Other keying contacts of the MONITOR switch are open, therefore the RT is not keyed. The mic circuits are the same as for the "ALL" position.

(d) "B" Position. Not used with SINCGARS RADIOS.

(e) "C" Position. In position "C", RT B variable audio is applied to J804/J801, pin J, and then to the MONITOR switch, through the switch, to the VOLUME control, and then to pins B and E of J802 and J803. RT B is keyed when a ground is applied to pin C of J802. The ground is applied through the MONITOR switch to pin F of J801/J804. The mic audio signal from the handset is applied to pin D of J802. From pin D the audio is taken to the amplifier A80. The amplified audio signal is then applied to pin V of J804/J801. In some tracked vehicles, this position may not be operational due to limited circuits in the CX-7060/VRC cable and slip ring assembly. When the intercom is activated by another crew member, the intercom audio will not be heard if the MONITOR switch is in the "C" position, or if the crew box is connected to the commander's port (J504) on the AM-1780/VRC.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

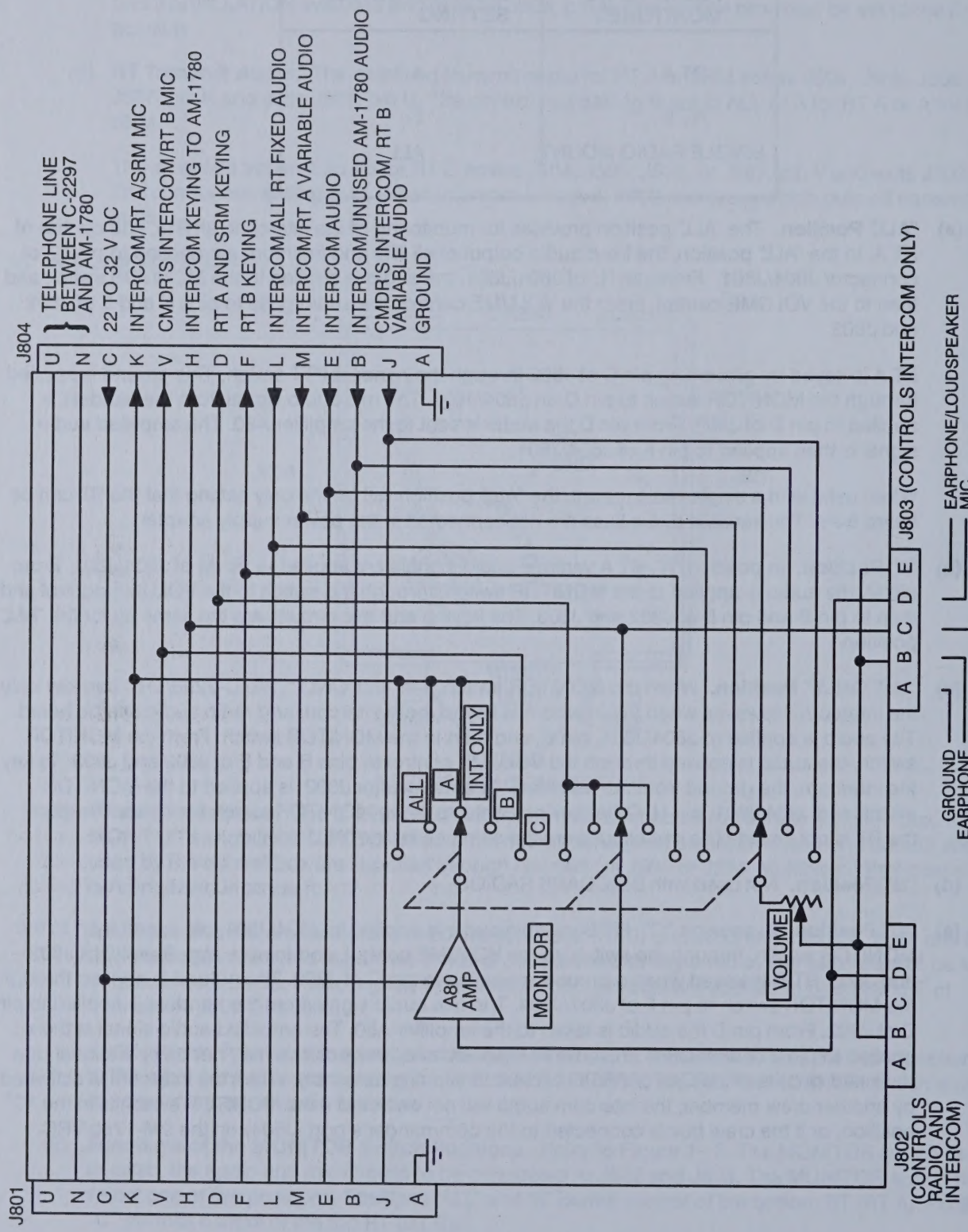
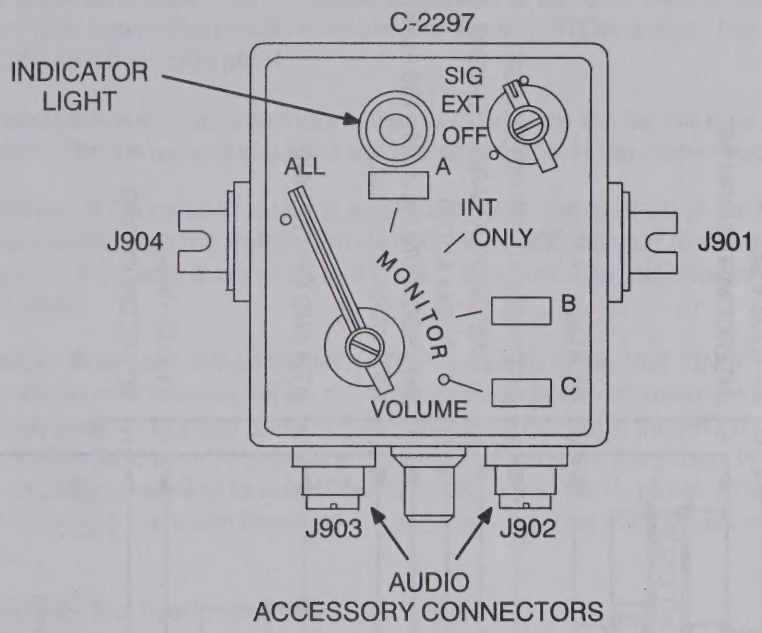


Figure 1-3. C-2298/VRC Circuit Paths

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

d. Control Box C-2297.



(1) Circuit Description. The C-2297 is the driver's control box that is connected to the main junction box. This control box has a MONITOR switch, VOLUME control, SIG-EXT-OFF switch, an indicator lamp, and a microphone amplifier.

Power and control voltages used by the control box are applied to connector J904. Unlike the C-2298 control box, the C-2297 cannot be connected in tandem.

Audio accessories are connected to J902 (RAD) or J903 (INT). Connector J902 is used to key a radio. The radio cannot be keyed from connector J903. Pins A,B,D,and E of J902 and J903 are wired in parallel. Audio signals for the intercom are applied to pins B and E of connectors J902 and J903. EXT mic audio is applied unamplified to MONITOR switch.

(2) Functions of the MONITOR Switch Positions. Refer to Figure 1-4. The MONITOR switch is used to select the audio and mic circuits to be connected to J902 and J903. The MONITOR switch can select one of five positions. Positions "ALL" and "A" permit control of the bottom RT (RT A). Position "C" permits control of the top RT (RT B).

When using a single radio mount the only position that can be used is the "ALL" position. The RT can be keyed from the "A" and "B" positions, but not monitored.

(a) "ALL" Position. The "ALL" position provides for monitoring of the intercom, all RTs, and control of the bottom RT (RT A). In the "ALL" position, the fixed audio output of all RTs and intercom are applied to pin "L" of connector J904. From pin "L" of J904, the audio is applied to the MONITOR switch. The audio leaves the MONITOR switch and is then applied to SIG-EXT-OFF switch and VOLUME control. From the VOLUME control, the audio goes to pins B and E of J902 and J903. Audio applied to the SIG-EXT-OFF switch is stopped when the switch is in the "OFF" position.

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

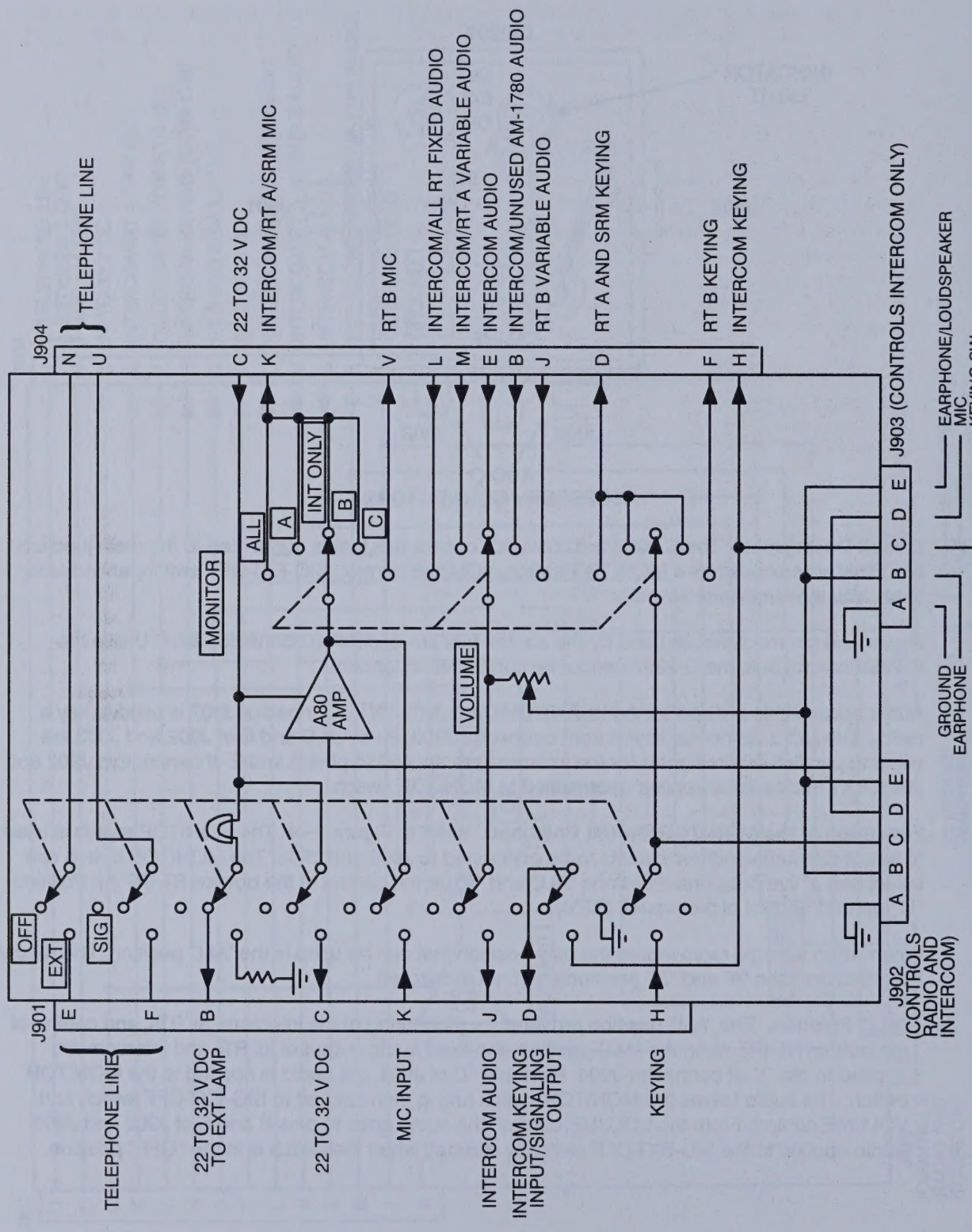


Figure 1-4. C-2297/VRC Circuit Paths

1.13. INTERCOMMUNICATION SET, AN/VIC-1(V). Continued

RT A is keyed when a ground is applied at pin C of J902 by the handset or helmet. The ground is passed to pin D of J904. The mic audio is applied to pin D of J902 or J903 and then to the A80 amplifier. The unamplified audio is applied to the MONITOR switch. The audio passes through the MONITOR switch to J904 pin K.

When used with a single radio mount, the "ALL" position will be the only setting that the RT can be heard from. The variable audio lines are not connected in the power supply adapter.

(b) "A" Position. RT A variable audio is applied to J904, pin M, then to the MONITOR switch. The audio passes through the switch, through the VOLUME control, to connectors J902 and J903. RT A is keyed in the same manner as in the "ALL" position. The mic circuits are the same as for the "ALL" position.

(c) "INT ONLY" Position. When the MONITOR switch is in the "INT ONLY" position, the driver can key only the intercom. However, when the intercom is keyed both intercom and radio audio can be heard. The audio is applied to J904, pin E, and then through the MONITOR switch to J902 and J903 as in the "ALL" and "A" positions. To key the intercom, the ground from the handset PTT at connector J902 is applied to the MONITOR switch and J904, pin H. Other keying contacts of the MONITOR switch are open therefore RT is not keyed. The mic circuits are the same as for the "ALL" position.

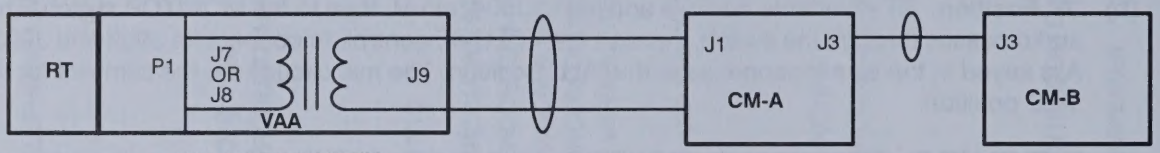
(d) "B" Position. Not used with SINCGARS RADIOS.

(e) "C" Position. RT B variable audio is applied to J904, pin J, and then through the MONITOR switch to connectors J902 and J903. RT B is keyed when a ground is applied to pin C of J902. From pin C, the ground is applied through the MONITOR switch to J904 pin F. The mic audio signal is applied to the amplifier A80 and then through the MONITOR switch to J904, pin V. In some tracked vehicles, this position is NOT operational due to limited circuits in the cable CX-7060 and the slip ring assembly. When the intercom is activated by another crew member, the intercom audio will not be heard if the MONITOR switch is in the "C" position, or if the crew box is connected to the commander's port (J504) on the AM-1780.

(3) Functions of the SIG-EXT-OFF Switch. In the "OFF" position, the MONITOR switch acts as described above. Dc voltage is furnished by the main junction box and applied to J904 pin C. From pin C, the dc is applied to the audio amplifier. "EXT" Position is not used. "SIG" Position is not used.

1.14. CONTROL-MONITOR, C-11291 SERIES.

The control-monitor is used to monitor and control a radio. When the RT FCTN switch is placed in REM, the control-monitor controls the RT. A total of three RT's can be monitored and controlled by a single control-monitor. The third RT is cabled to the first control-monitor (CM-A) at connector J2. A second control-monitor (CM-B) can be used by installing a CX-13290/VRC cable between the J3 connectors of both CM-A and CM-B. Only one control-monitor can control the radio at any given time and control must be passed back and forth. The control-monitor controls the selected RT using frequency shift keying (FSK). The control-monitor is under microprocessor control at all times.



VAA AM-7239 SERIES

CX-13290/VRC CABLE

CX-13290/VRC CABLE

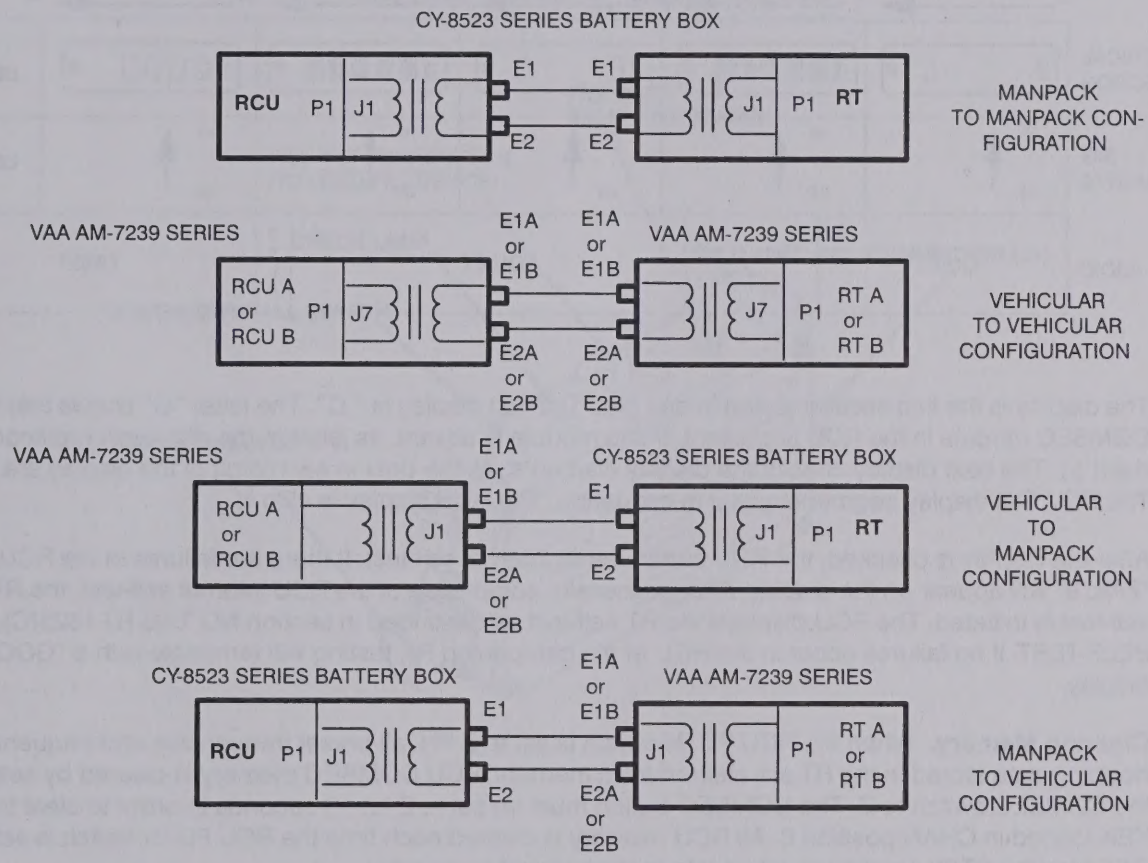
The microprocessor monitors the front panel for any change in switch settings. The FCTN switch, in conjuction with the INIT switch, starts all control signals to the RT. The control-monitor will control the function, mode, RF power output, channel selection, and cipher or plain text. There are no provisions in the control-monitor for controlling individual frequencies or frequency offsets. This may be done only at the RT keyboard.

The control-monitor can test its operation similar to the RT by setting the FCTN switch to the TEST position. In TEST, the control-monitor checks the internal programming and circuitry. "Gd" is displayed if the control-monitor is good. If the control-monitor is bad, an "F1" or "F2" will be displayed. Testing continues and displays are repeated until the FCTN switch is moved from the TEST position. Self-test is run automatically when power is first applied to the control-monitor. Other displays seen during operation indicate failures. "F7" is displayed on the control-monitor if an incorrect response is received from the RT. This may occur if the RT FCTN switch is moved out of REM, or if there is a failure in the communication link. "Fr" (failed response) is displayed if two control-monitors are installed, and an incorrect response is received. Either of the control-monitors or the interconnect cable can be faulty. "Er" typically indicates that the operator made an error in operation. The CHAN display may blink when all other displays are normal. This occurs if the user has not loaded the selected channel with an SC frequency or FH hopset. If a frequency or hopset is loaded and the CHAN display blinks, the RT is bad.

1.15. REMOTE CONTROL UNIT (RCU), C-11561(C)/U.

a. Characteristics and Configurations.

The function of the RCU is to remotely control the RT manpack and vehicular configurations with integrated COMSEC capability in the unit itself. This addition provides secure communications to the ICOM RT. There are four configurations that use an RT, RCU, and a vehicular mount. These include: Manpack to Manpack, Vehicular to Vehicular, Manpack to Vehicular, and Vehicular to Manpack.



Information is sent between the RT and the RCU by means of a two-wire link (WD-1 or WD-14). The two-wire link allows the units to be connected up to 4 kilometers away from each other. Connection is made to the binding posts on the CY-8523 series battery box or the VAA. Two types of information can be sent on the two-wire link: control information for the RT, and baseband communication for messages.

b. Main Panel Displays.

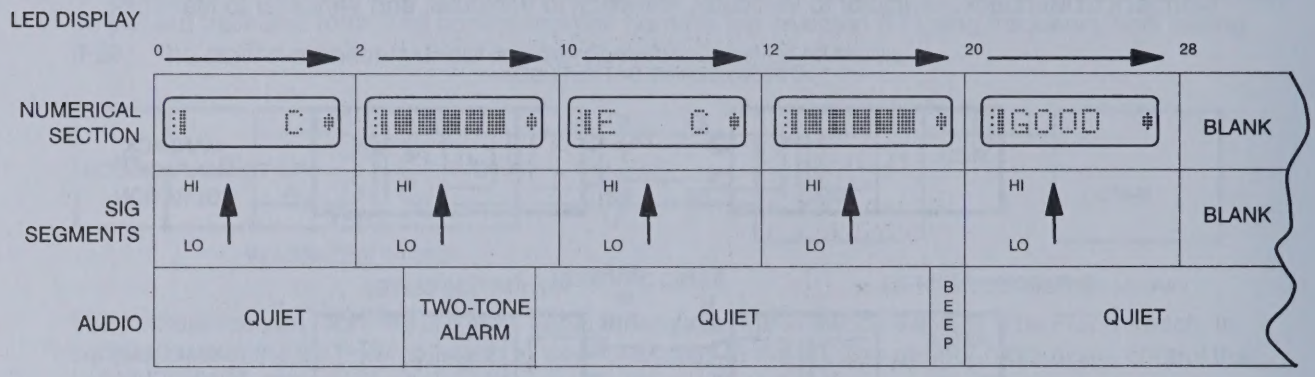
When used with a companion RT, the main panel displays on the C-11561(C)/U give the operator the required information for remote operation.

Like the RT-1523 series, the hold up battery (HUB) for the C-11561(C)/U is a lithium-sulfur dioxide battery used to retain internal memory when the unit is in standby operation. The HUB display informs the operator when the battery is low. The HUB display will flash on and off when the battery voltage drops. During self-test the HUB display LED's are lit. The LED's remain lit until the entire RT display goes blank or shows "GOOD" at the end of the test.

The receive signal display will light when the companion RT has received a signal.

1.15. REMOTE CONTROL UNIT (RCU), C-11561(C)/U. Continued

c. **Self Test.** The C-11561(C)/U (RCU) self-test is selected by setting the FCTN switch to the TST position. The COMSEC switch must be set to CT before the self-test can be run, if not the RCU will display **FAIL 9** or **GO PT**. The displays and audio should be as shown below.



The display is the first section tested in self-test. The first display is " C". The letter "C" shows that the COMSEC module in the RCU is present. If this module is absent, its letter in the display is replaced by a dash (-). The next display checks the display elements. All the dots in each digit of the display are lit. The RCV SIG display segments are lit in sequence. The HUB display is also lit.

After the display is checked, the RCU continues its internal self-test. If there are failures in the RCU, a "FAIL 9" will appear on the display. After successful completion of the RCU internal self-test, the RT self-test is initiated. The RCU displays the RT self-test as described in section NO TAG RT-1523(C)/U SELF-TEST. If no failures occur in the RCU or it's companion RT, testing will terminate with a "GOOD" display.

d. **Clearing Memory.** When the RCU FCTN switch is set to Z-FH, all preset frequencies and frequency hopping data stored in the RT are cleared from memory. RCU COMSEC memory is cleared by setting the COMSEC switch to Z. The COMSEC switch must be set to Z for 10 seconds in order to clear the KEK loaded in CHAN position 6. All RCU memory is cleared each time the RCU FCTN switch is set to OFF. Use the STBY position to retain information stored in memory.

e. **Additional Tests.**

The RCU display will read "OPEN" if the RT FCTN switch is not placed in REM, field wire is disconnected or open, or one of the system units has an open in the two-wire path.

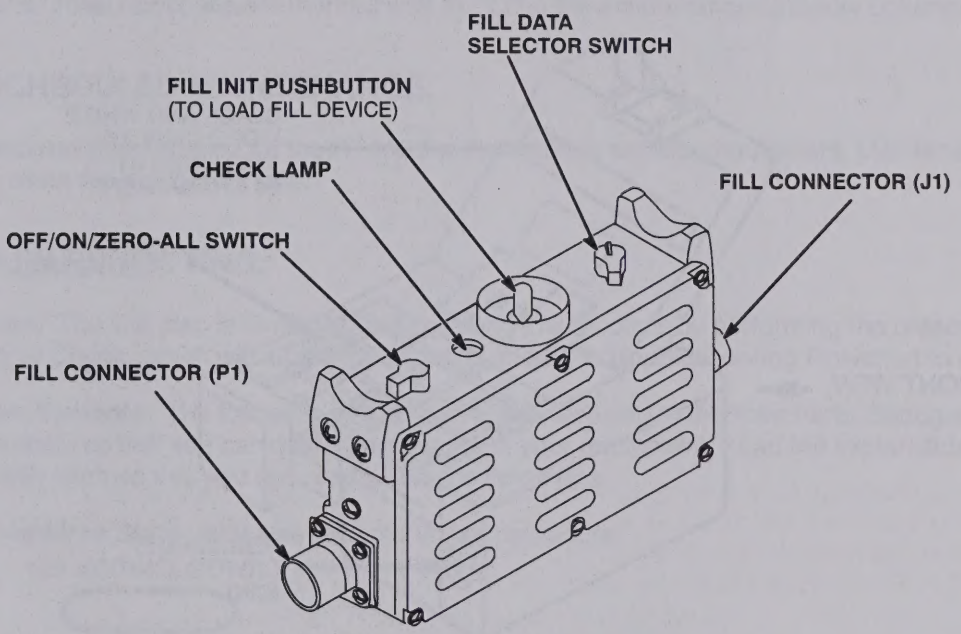
RF energy reflected back into the RT is measured by a VSWR detector and compared to the forward power. When the VSWR goes above the 5 to 1 ratio, the sidetone is turned off at the RT. If this situation arises the RT sends a control word to disable sidetone at the RCU.

1.16. FH FILL DEVICE, MX-18290/VRC

The MX-18290/VRC fill device is commonly called the FH fill device. The FH fill device can be loaded from another MX-18290 fill device or an ANCD.

The FH fill device provides an OFF/ON/Zero-All switch, a (fill Init) pushbutton switch, a check lamp, and a fill data selector switch. The FH fill device contains an internal battery for fill data storage memory.

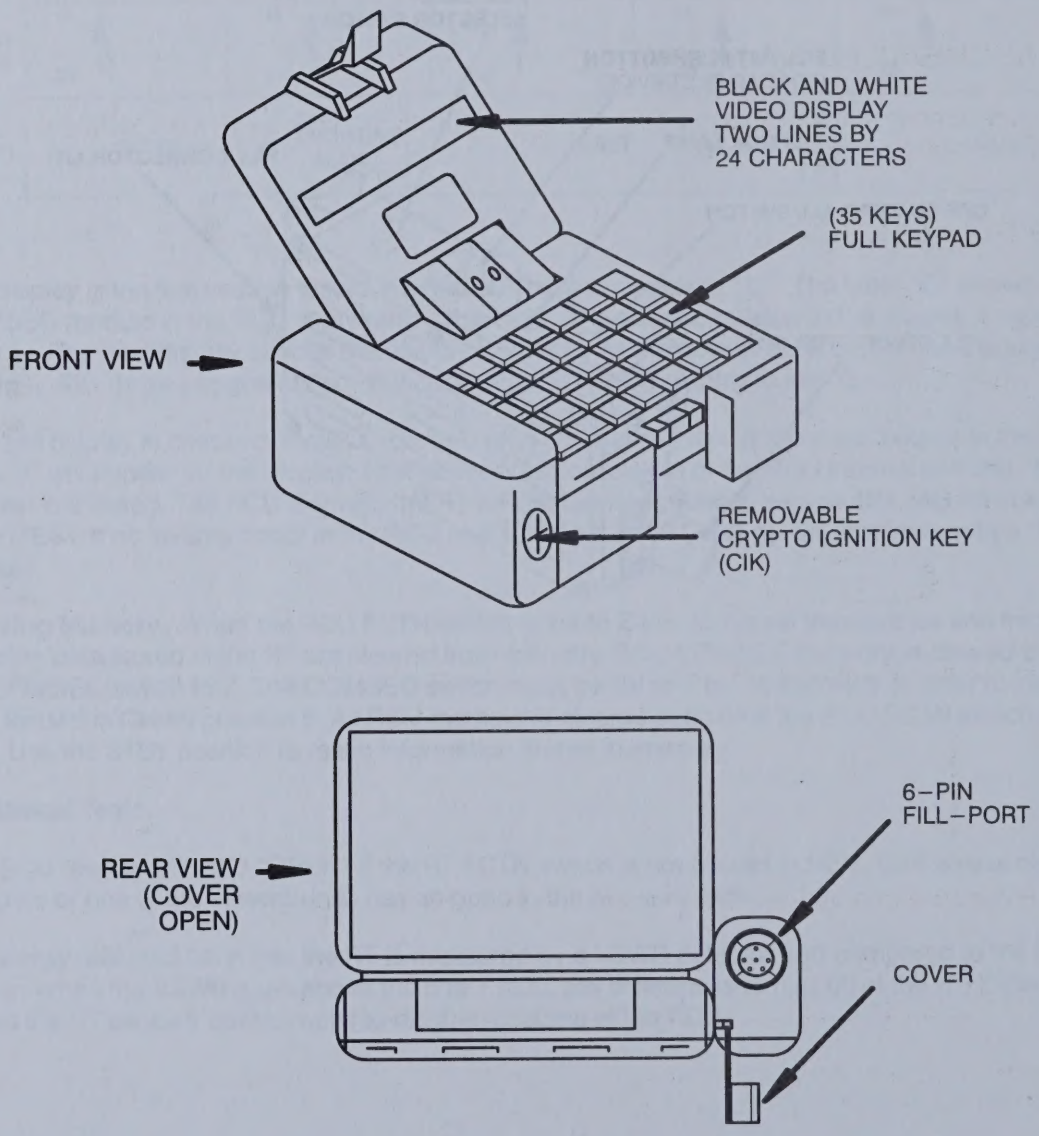
FH FILL DEVICE, MX-18290/VRC



1.17. AUTOMATED NET CONTROL DEVICE (ANCD), AN/CYZ-10

The ANCD is a hand-held electronic device capable of receiving, storing, transfering data between ANCDs and compatible devices, and to SINCGARS radios. The ANCD is a component of the Automated COMSEC Management Engineering System (ACMES). It replaces the KYK-13, KYX-15, KOI-18 (COMSEC devices), and the MX-18290 (ECCM fill device). It eliminates the requirement for paper SOIs.

AUTOMATED NET CONTROL DEVICE (ANCD), AN/CYZ-10



SECTION IV

PRINCIPLES OF MAINTENANCE OPERATION

1.18. USE OF MAINTENANCE ALLOCATION CHART (MAC).

The MAC gives you the authority and responsibility for doing maintenance tasks on the RT-1523 series radio and ancillary equipment. There are 12 maintenance functions: inspect, test, service, adjust, aline, calibrate, remove, install, replace, repair, overhaul, and rebuild. You will only do these six: inspect, test, service, remove, install and replace. These functions are marked with an "O" in the maintenance category column.

1.19. UNSCHEDULED MAINTENANCE.

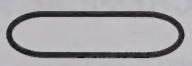
There is no scheduled maintenance for the RT-1523 series radio or ancillary equipment. Maintenance will be performed only when the equipment fails.

1.20. TROUBLESHOOTING.

a. **Procedure.** The first step is to identify the problem. That is done by performing the prescribed Operational Check, which will locate the fault and specify a Troubleshooting Flowchart to use.

b. **Flowchart Symbols.** The following standard symbols are used in the flowcharts. Become familiar with these symbols so that you can quickly troubleshoot your equipment. Read the explanation and be familiar with each so that you can readily use the flowcharts.

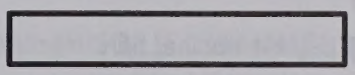
Test Procedures Start. Indicates start of the test procedure.



Test Procedure Flow Line. Indicates direction of the procedure flow.



Test Procedure Instruction. Gives instructions for doing a specific test.

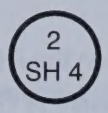


Decision. Indicates that a decision must be made (YES or NO) to answer a question about the previous test. Path taken depends on the answer (YES or NO).



1.20. TROUBLESHOOTING. Continued

Connector. Directs user to an entry point on another sheet in the same chart. Contains an entry number and sheet number that are the same as the entry number and sheet number found on another sheet in the same chart.



Notes Column. Presents critical information. States cautions and warnings that must be observed when doing a test. Has additional data as to what to do or where to go after that step in the testing. Provides references to appropriate circuit diagrams.

Connector Illustrations. Front views of connectors are placed accordingly to give the maintainer a visual reference when measuring resistances between pins.

Helpful Hints. When taking measurements, remember that a connector's pin numbers are mirror images of those on the connector from which it was removed. Whenever possible, use a chassis ground instead of a pin ground. This will allow you greater flexibility when taking measurements and can prevent shorting the equipment.

1.21. POST-REPAIR USE OF OPERATIONAL CHECK.

When the faulty LRU has been found, inspected, and replaced, repeat the operational check to ensure that the system is in fact operational.

1.22. OPERATION IN THE NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) ENVIRONMENT.

The RT-1523 series is designed to be used in NBC warfare. This radio has been nuclear hardened and is protected against electromagnetic pulses (EMP) and electromagnetic interference (EMI). The radio has such features as transient suppressors to protect against transient radiation effects on electronics (TREE) and nuclear hardened cables to protect against EMP. This requires special attention to maintenance procedures. All hardness critical processes are marked with the symbol [HCP] . Each maintenance procedure so marked is a critical maintenance procedure that shall be performed exactly as written. Failure to do each step as it is written jeopardizes the nuclear survivability of the equipment.

CAUTION

[HCP] Use only the cables issued with the Installation Kit. They are nuclear hardened. Using any other type cable will reduce the radio's ability to survive in a nuclear environment.

1.22. OPERATION IN THE NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) ENVIRONMENT. Continued

a. **Effects.** The nuclear effects of neutron and gamma radiation, EMP, and thermal and air blasts will not prevent the radio from working as it should. Chemical and biological agents cannot penetrate the paint. However, the presence of these agents will create a surface hazard to unprotected personnel. How well this NBC protection functions depends on you and how well you take care of the equipment.

b. **Nuclear Maintenance.** Gamma and neutron radiation may upset some of the circuits in the radio. This condition is known as "latch-up." Latch-up may cause any function to fail, and the user may repair the RT that doesn't work. Latch-up is not a serious condition. In most cases, setting the RT-1523 series to STBY and removing the battery power will clear latch-up.

c. **Electromagnetic Interference (EMI), Electromagnetic Pulse (EMP), and Transient Protection.** The antenna and field wire inputs to the RT and VAA are protected from high voltage and current transients. Special spark gaps are used. Do not by-pass these protective devices. The following information will help you keep your radio operating before, during, and after an NBC attack:

- Do not replace any parts with other than authorized parts. Substituted parts may jeopardize the nuclear hardness of the radio.
- Do not assemble the radio in any configuration except as shown in the manual. For instance, if long cables are used between the RT and antenna, high EMP may be picked up. High EMP may damage the input or output circuits in the RT.
- Do not use substitute antennas, such as field wire, or other unauthorized type antennas.
- Check the keyboard and displays for damage when cleaning the radio.
- Check the display glass for cracks. If it is cracked or broken, have it replaced by DS (Direct Support) maintenance.
- Use care in removing panels and covers. Do not damage gaskets.

d. **Chemical Maintenance.** The radio components have been painted with a special coating. This paint is a Chemical Agent Resistant Coating (CARC). It will resist water, acid, polish, solvent, lime, slurry, and DS2. Decontaminating agents will not harm the radio. In the event of a chemical attack, follow your unit SOP. Decontaminate the radio as practical. Do not allow bare skin to come in contact with contaminated equipment. If equipment requires painting, send to DS level maintenance.

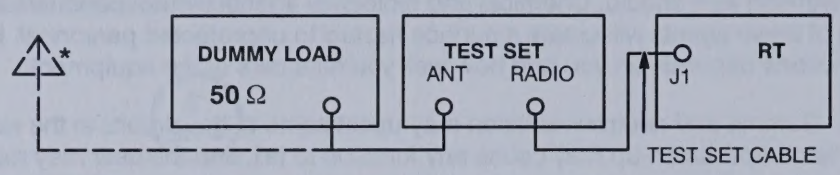
e. **Biological Maintenance.** Use only germicidal baths to decontaminate biological agents. Temperatures higher than +160° F (+71° C) must not be used. Do not decontaminate with boiling water. See your Unit SOP for proper biological decontamination procedures.

1.23. TYPICAL SINGLE CHANNEL (SC) TEST SETUP.

Forward and reverse power measurements vary with the transmit frequency, where the antenna is mounted, the length of coax cable, and many other factors. A standard test set-up will help you to make correct power measurements and get consistent results. This reduces the likelihood of turning in good antenna bases. Testing RF systems with high RF power is dangerous. RF energy can cause burns if you touch the antenna when it is transmitting with high RF power (50 watts).

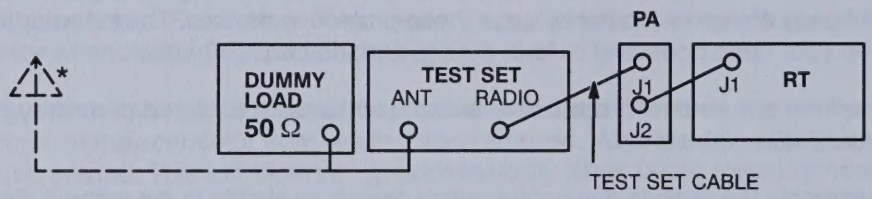
1.23. TYPICAL SC TEST SETUP. Continued

For testing RF in SC mode, use the following test setup for short range radios:



* INDICATES ANTENNA DISCONNECTED

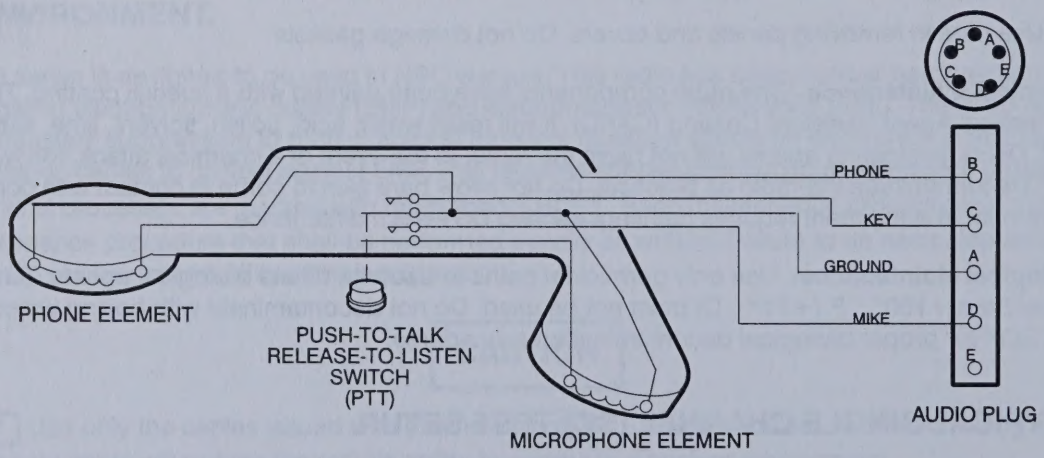
For testing RF in SC mode, use the following test setup for long range radios:



* INDICATES ANTENNA DISCONNECTED

1.24. HANDSET, H-250.

Troubleshooting requires that you have a known good handset. This may be hard to determine, if the radio you are working on is not operational. If you have doubt about your handset check it with your test set.



- Audio Check — Circuit disturb between pin A and B of the handset's audio connector. A clicking sound should be heard in the phone element.
- Keying Check — Connect meter leads between pin A and pin C of handset's audio connector. Press handset PTT switch. Meter should read zero (0) ohms. Release handset PTT switch. Meter should read infinity ohms.
- Microphone Element — Connect meter leads between pin A and pin D of handset's audio connector. Press and release handset PTT switch. Resistance reading should change from 1 (infinity) to between 50 and 150 ohms.

SECTION V

REPAIR PARTS, SPECIAL TOOLS: TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

1.25. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1.26. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

a. **Special Tools.** No special tools are required.

b. **TMDE and Support Equipment.** For TMDE and support equipment required for Unit Maintenance, refer to the Maintenance Allocation Chart, Appendix B.

1.27. REPAIR PARTS.

Repair parts lists are found in TM 11-5820-890-20P-1.

SECTION VI

PREPARATION FOR STORAGE OR SHIPMENT

1.28. GENERAL.

This section provides steps for packing the RT-1523 series radio. The radio will be properly packed before placing in storage. All PMCS will be done prior to storage.

CAUTION

Remove all batteries from equipment before storage or shipment. Ruptured cells will spill corrosive chemicals into electronic circuits.

1.29. SPECIAL PROCEDURES.

The RT-1523 series and C-11561(C)/U are controlled cryptographic items (CCI). Remove the HUB battery. Refer to TB 380-40-22 for procedures to prepare for shipment.

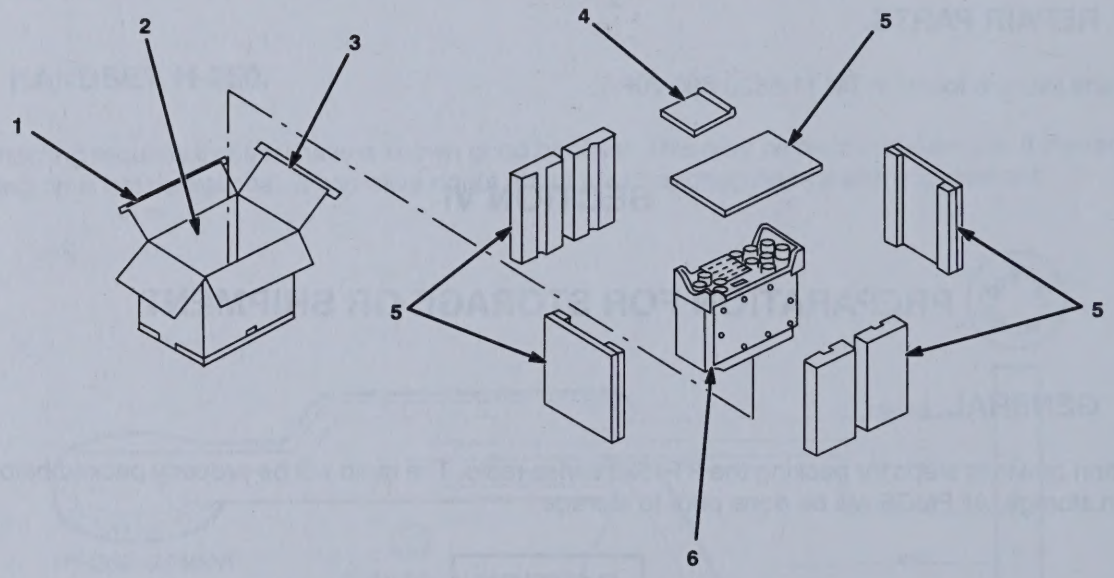
There is no need for special preservation, packaging, packing, or marking. Under extreme climatic conditions, corrosion-preventive compounds, moisture barriers, and/or desiccant material may be required.

1.30. ADMINISTRATIVE STORAGE.

a. General. Administrative storage is the placement of organic equipment in a limited care and preservation status for short periods of time, reviewed every 6 months to revalidate the requirement.

b. Procedures. Equipment placed in storage must be capable of being restored to a working state within 24 hours. Before storing equipment, apply all mandatory MWOs. Ensure that only equipment rated OPERATIONALLY READY is placed in storage. Refer to AR-750-1.

(1)	Tools and Materials:	Tool Kit, Electronic Equipment TK-101/G Equipment carton and packing material Tape
(2)	Packing:	Secure dust covers on component (6) connectors. Place component (6) in carton (2). Install packing (5). Replace manuals (4). Close flaps (1, 3) and seal carton with tape.
(3)	Marking:	Mark carton with nomenclature, model identification, and serial number of radio component.
(4)	Disposition:	Place carton in secure storage area.

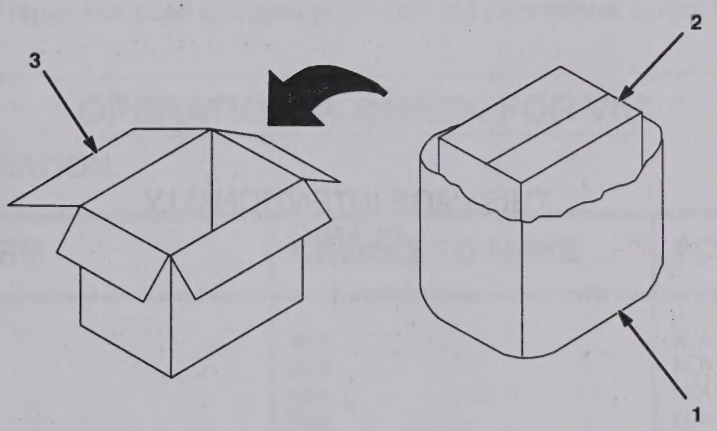


1.31. INTERMEDIATE STORAGE.

a. General. Intermediate storage is the placement of organic equipment in storage for less than 180 days.

b. Procedures. Pack equipment for administrative storage.

(1)	Tools and materials:	Tool Kit, Electronic Equipment TK-101/G Shipping cartons Waterproof barrier wrap
(2)	Packing:	Place waterproof barrier wrap (1) around equipment carton (2) and seal. Place equipment carton in outer carton (3). Close flaps and seal.
(3)	Marking:	Mark carton with nomenclature, model identification, and serial number of radio component.
(4)	Disposition:	Place carton in secure storage area.



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CHAPTER 2

VEHICULAR INTERCOM AN/VIC-1(V) (VIC)

Subject	Para	Page
Operational Check	2.1	2-1
Troubleshooting Flowcharts	2.2	2-9
Cable Schematics	2.3	2-164

2.1. OPERATIONAL CHECK.

General guidelines for checking problems in the Vehicular Intercom AN/VIC-1(V), commonly referred to as the VIC, are as follows. In that the VIC is used in conjunction with the SINCGARS radio, an important first step is to isolate the problem between the VIC and the radio as early as possible. If a vehicular radio is used with the VIC being checked, it may be necessary to troubleshoot the vehicular radio VAA or PSA, as covered in other chapters of this manual or TM 20-1. Once the problem is isolated, make use of the appropriate radio operational check or the VIC operational check which follows. As in troubleshooting a radio, the VIC Operational Check is the start point. It will identify the faulty component or specify a Troubleshooting Chart to use. Once replacement or repair has been completed, perform the Operational Check to ensure full operability.

OPERATIONAL CHECK FOR VIC

STEP 1. PREPARATION:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.1 Set RT:		
FCTN to OFF	N/A	N/A
CHAN to 1	N/A	N/A
MODE to SC	N/A	N/A
RF PWR to HI	N/A	N/A
VOL to Mid-Range	N/A	N/A
DIM to Full CW	N/A	N/A
COMSEC to Z	N/A	N/A
1.2 Set Vehicular Amplifier-Adapters (VAA):	Ensure VAA set to REMOTE	Set VAA to REMOTE
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
1.3 Set PA Mount MT-6353:		
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
1.4 Set AM-1780:		
CB501 to OFF	N/A	N/A
MAIN PWR to OFF	N/A	N/A
INSTALLATION to OTHER	N/A	N/A
RADIO TRANS to LISTENING SILENCE	N/A	N/A
INT ACCENT to OFF	N/A	N/A
DS501 to Full CCW	N/A	N/A
1.5 Set all loudspeakers (LS-671):		
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
VOL to OUT & Midrange	N/A	N/A

2.1. OPERATIONAL CHECK. Continued

STEP 1. PREPARATION: Continued

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.6 Set Power Supply Adapter (PSA) (If present): CB1 to OFF DS1 to Full CCW S1 to RMT	 N/A N/A N/A	 N/A N/A N/A
1.7 Set Vehicle Master Power Switches: In accordance with vehicle instructions, turn off power to VIC/Comm equipment.	 N/A	 N/A
1.8 Set C-2297: SIG-EXT-OFF to OFF VOLUME to Full CW Connect HS to J903*	 N/A N/A Ensure HS is operational	 N/A N/A Install known good HS
1.9 Set all C-2298 VOLUME to Full CW Connect HS to J803	N/A Ensure HS is operational	N/A Install known good HS

STEP 2. MAIN POWER CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.1 Set Vehicle Master Power Switches: In accordance with vehicle instructions, turn on power to VIC/Comm equipment.	Master Power Circuit Breaker trips?	NO: Continue ↓ YES: Go to TS Chart 1
	VIC/Comm power lamp (if applicable) lights?	YES: Go to Step 2.2 NO: Vehicular wiring is bad
2.2 Set AM-1780 MAIN PWR to INT ONLY	AM-1780 DS501 lights?	NO: Go to Step 2.3 YES: Replace AM-1780
2.3 Set AM-1780 CB501 to ON	AM-1780 CB501 trips?	NO: Continue ↓ YES: Go to TS Chart 2
	AM-1780 DS501 Lights?	YES: Go to Step 2.4 NO: Go to TS Chart 3
2.4 Set C-2297 SIG-EXT-OFF to OFF	N/A	Go to STEP 3

* Disconnect all other CVC and handset from system.

2.1. OPERATIONAL CHECK. Continued

STEP 3. INTERCOM CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
3.1 At each control box, in turn MONITOR to ALL MONITOR to A MONITOR to INT ONLY MONITOR to C	 N/A N/A N/A N/A	 N/A N/A N/A N/A
3.2 Press HS PTT and count into HS at each MONITOR switch setting	AM-1780 relays click and sidetone heard?	YES: Go to Step 3.3 NO: Continue ↓
	At any position: AM-1780 relays do not click and sidetone not heard?	NO: Continue ↓ YES: Go to TS Chart 5
	At any position: AM-1780 relays do not click and sidetone is heard?	NO: Continue ↓ YES: Go to TS Chart 6
	At every position: AM-1780 relays click and sidetone not heard?	NO: Continue ↓ YES: Go to TS Chart 7
	At a particular position: AM-1780 relays click and sidetone not heard?	NO: Go to Step 3.3 YES: Go to TS Chart 8
3.3 Set commander's C-2298 MONITOR to C. Connect HS to J803 Press HS PTT and count into HS	N/A N/A Sidetone heard?	N/A N/A YES: Go to Step 3.4 NO: Go to TS Chart 9
3.4 Set all C-2298 MONITOR to INT ONLY. Move HS to J802	N/A N/A	N/A Go to Step 3.5
3.5 Set C-2297 MONITOR to INT ONLY. Move HS to J902	N/A N/A	N/A Go to Step 3.6
3.6 At each control box, press PTT and count into HS	Sidetone heard?	YES: Go to STEP 4 NO: Replace Control Box

2.1. OPERATIONAL CHECK. Continued

STEP 4. VAA REMOTE DC POWER CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
4.1 Check configuration	■ SRM configuration?*	YES: Go to STEP 5 NO: Go to Step 4.2
4.2 Set VAA CB1 to ON	Is VAA an AM-7239A, B, C, or D?	YES: Go to Step 4.3 NO: Continue ↓
	AM-7239 VAA DS1 lit?	YES: Go to Step 4.3 NO: Go to TS Chart 10
4.3 Set RT-A FCTN to SQ ON	RT-A display lights?	NO: Go to Step 4.4 YES: Go to TS Chart 11
4.4 Set AM-1780 MAIN PWR to NORM	VAA CB1 trips?	NO: Go to Step 4.5 YES: Go to TS Chart 12
4.5 Set RT-A FCTN to LD and back to SQ ON	RT-A display lights?	YES: Continue ↓ NO: Go to TS Chart 13
	AM-7239A, B, C or D VAA DS1 lit and steady?	YES: Continue ↓ NO: Replace DS1
	AM-1780 DS501 lit?	YES: Continue ↓ NO: Go to TS Chart 14
	CX-13417 present?	YES: Continue ↓ NO: Go to STEP 6
	Two CX-13417 present?	NO: Go to Step 4.6 YES: Go to Step 4.11
4.6 Set AM-1780 MAIN PWR to INT ONLY	N/A	Go to Step 4.7
4.7 Set RT-A LS-671 CB1 to ON	RT-A LS-671 CB1 trips?	NO: Go to Step 4.8 YES: Replace LS-671
4.8 Set RT-A FCTN to LD and back to SQ ON	RT-A display lights?	YES: Continue ↓ NO: Go to TS Chart 15
	RT-A LS-671 DS1 lit?	YES: Continue ↓ NO: Go to TS Chart 16
	RT-B LS-671 present?	YES: Go to Step 4.9 NO: Go to STEP 6
4.9 Set RT-A LS-671 CB1 to OFF. Set RT-B LS-671 CB1 to ON.	N/A RT-B LS-671 CB1 trips?	N/A NO: Go to Step 4.10 YES: Replace LS-671
4.10 Set RT-A FCTN to LD and back to SQ ON	RT-A display lights?	YES: Continue ↓ NO: Go to TS Chart 17
	RT-B LS-671 DS1 lit?	YES: Go to STEP 6 NO: Go to TS Chart 18

■ * SRM means Single Radio Mount

2.1. OPERATIONAL CHECK. Continued

STEP 4. VAA REMOTE DC POWER CHECK: Continued

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
4.11 Set AM-1780 MAIN PWR to INT ONLY	N/A	Go to Step 4.12
4.12 Set RT-A LS-671 CB1 to ON	RT-A LS-671 CB1 trips?	NO: Go to Step 4.13 YES: Replace LS-671
4.13 Set RT-A FCTN to LD and back to SQ ON	RT-A display lights?	YES: Continue ↓ NO: Go to TS Chart 15
	RT-A LS-671 DS1 lit?	YES: Go to Step 4.14 NO: Go to TS Chart 16
4.14 Set RT-A LS-671 CB1 to OFF. Set RT-B LS-671 CB1 to ON.	RT-B LS-671 CB1 trips?	NO: Go to Step 4.15 YES: Replace LS-671
4.15 Set RT-A FCTN to LD and back to SQ ON	RT-A display lights?	YES: Continue ↓ NO: Go to TS Chart 19
	RT-B LS-671 DS1 lit?	YES: Go to STEP 6 NO: Go to TS Chart 16

STEP 5. SRM REMOTE DC POWER CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
5.1 Set PSA CB1 to ON	PSA DS1 lights?	NO: Go to Step 5.2 YES: Go to TS Chart 20
5.2 Set AM-1780 MAIN PWR to NORM	PSA CB1 trips?	NO: Continue ↓ YES: Go to TS Chart 21
	PSA DS1 lights?	YES: Continue ↓ NO: Go to TS Chart 22
	AM-1780 DS501 lights?	YES: Go to STEP 7 NO: Go to TS Chart 23

2.1. OPERATIONAL CHECK. Continued

STEP 6. VAA RADIO AND INTERCOM INTERFACE TEST:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
6.1 Set AM-1780 MAIN PWR to NORM. Set RT-A LS-671 CB1 to ON. Connect HS to VAA J3 (RT-A) or VAA J2 (RT-B)*	N/A N/A Ensure that HS is operational	N/A N/A Go to Step 6.2
6.2 Perform Operational Check on radio(s) (Refer to TM 11-5820-890-20-1)	Ensure radio(s) pass Operational Check?	Go to Step 6.3
6.3 Connect HS to VAA J3/J2 Set RT FCTN to SQ ON Press Push-To-Test *	N/A N/A Test tone heard in HS	N/A N/A Go to Step 6.4
6.4 Set all RT(s): FCTN to SQ ON MODE to SC Connect HS to C-2298 J802 and to C-2297 J902	 N/A N/A N/A	 N/A N/A Go to Step 6.5
6.5 Set a crewmember C-2298 MONITOR to A Press HS PTT	N/A RT-A keys?	N/A NO: Go to Step 6.6 YES: Replace AM-1780
6.6 Set a crewmember C-2298 MONITOR to C Press HS PTT	N/A RT-B keys?	N/A NO: Go to Step 6.7 YES: Replace AM-1780
6.7 Set commander's C-2298 MONITOR to A Press HS PTT	N/A RT-A keys?	N/A NO: Go to Step 6.8 YES: Replace AM-1780
6.8 Set commander's C-2298 MONITOR to C Press HS PTT	N/A RT-B keys?	N/A NO: Go to Step 6.9 YES: Replace AM-1780
6.9 Set AM-1780 RAD TRANS to CDR ONLY	Either RT keys?	NO: Go to Step 6.10 YES: Go to TS Chart 24
6.10 Set commander's C-2298 MONITOR to ALL Set RT-A FCTN to SQ OFF Set RT-A VOL to Full CW	N/A N/A N/A	N/A N/A Go to Step 6.11
6.11 Listen at commander's HS	Rushing noise heard?	YES: Go to Step 6.12 NO: Go to TS Chart 25
6.12 Press HS PTT	RT-A keys?	YES: Go to Step 6.13 NO: Go to TS Chart 26
6.13 Press HS PTT, count into HS	Sidetone heard?	YES: Go to Step 6.14 NO: Go to TS Chart 27
6.14 Set commander's C-2298 MONITOR to A Listen at commander's HS	N/A Rushing noise heard?	N/A YES: Go to Step 6.15 NO: Go to TS Chart 28
6.15 Press HS PTT, count into HS	RT-A keys and sidetone heard?	YES: Go to Step 6.16 NO: Replace commander's C-2298

* If VAA is an A ,C or D model disconnect W-4 cable from VAA and RT. Connect H -250 to RT AUD/DATA.

2.1. OPERATIONAL CHECK. Continued

STEP 6. VAA RADIO AND INTERCOM INTERFACE TEST: Continued

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
6.16 Set commander's C-2298 MONITOR to ALL Set RT-A FCTN to SQ ON Set RT-B FCTN to SQ OFF Set RT-B VOL to Full CW Listen at commander's HS	N/A N/A N/A N/A Rushing noise heard?	N/A N/A N/A N/A YES: Go to Step 6.17 NO: Go to TS Chart 29
6.17 Set commander's C-2298 MONITOR to C Listen at commander's HS	N/A Rushing noise heard?	N/A YES: Go to Step 6.18 NO: Go to TS Chart 30
6.18 Press HS PTT	RT-B keys?	YES: Go to Step 6.19 NO: Go to TS Chart 31
6.19 Press HS PTT, count into HS	Sidetone heard?	YES: Go to Step 6.20 NO: Go to TS Chart 32
6.20 Set AM-1780 RAD TRANS to CRD + CREW	Either RT keys?	NO: Go to Step 6.21 YES: Go to TS Chart 33
6.21 Set each crewmember C-2298 MONITOR to A Set RT-B FCTN to SQ ON Set RT-A FCTN to SQ OFF Listen at each crewmember HS	N/A N/A N/A Rushing noise heard?	N/A N/A N/A YES: Go to Step 6.22 NO: Go to TS Chart 34
6.22 Press HS PTT, at each crewmember C-2298	RT-A keys?	YES: Go to Step 6.23 NO: Go to TS Chart 35
6.23 Press HS PTT, count into each crewmember HS	Sidetone heard?	YES: Go to Step 6.24 NO: Go to TS Chart 36
6.24 Set each crewmember C-2298 MONITOR to ALL Listen at each crewmember HS	N/A Rushing noise heard?	N/A YES: Go to Step 6.25 NO: Go to TS Chart 37
6.25 Press HS PTT at each crewmember C-2298	RT-A keys?	YES: Go to Step 6.26 NO: Replace defective C-2298
6.26 Press HS PTT, count into each crewmember C-2298	Sidetone heard?	YES: Go to Step 6.27 NO: Replace defective C-2298
6.27 Set each crewmember C-2298 MONITOR to C Set RT-A FCTN to SQ ON Set RT-B FCTN to SQ OFF Listen at each crewmember HS	N/A Rushing noise heard?	N/A YES: Go to Step 6.28 NO: Go to TS Chart 38
6.28 Press HS PTT at each crewmember C-2298	RT-B keys?	YES: Go to Step 6.29 NO: Go to TS Chart 39
6.29 Press HS PTT, count into each crewmember C-2298	Sidetone heard?	YES: Go to Step 6.30 NO: Go to TS Chart 40

2.1. OPERATIONAL CHECK. Continued

STEP 6. VAA RADIO AND INTERCOM INTERFACE TEST: Continued

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
6.30 Set AM-1780 INT ACCENT to ON Set any control box MONITOR to INT ONLY Press HS PTT Listen at different control box	N/A N/A N/A Rushing sound reduced?	N/A N/A N/A YES: END OF TEST NO: Replace AM-1780

STEP 7. SRM RADIO AND INTERCOM INTERFACE TEST:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
7.1 Perform Operational Check on SRM radio	Ensure SRM radio passes Operational Check?	Go to 7.2
7.2 Set RT FCTN to SQ ON Connect CX-13314 from RT to PSA J1 Connect HS to all C-2298 J802 Connect HS to C-2297 J902 Set a crewmember C-2298 MONITOR to ALL Press PTT	N/A N/A N/A N/A N/A RT keys?	N/A N/A N/A N/A N/A NO: Go to Step 7.3 YES: Replace AM-1780
7.3 Set commander's C-2298 MONITOR to ALL Press HS PTT	N/A RT keys?	N/A NO: Go to Step 7.4 YES: Replace AM-1780
7.4 Set AM-1780 RAD TRANS to CDR ONLY	RT keys?	NO: Go to Step 7.5 YES: Go to TS Chart 24
7.5 Set RT FCTN to SQ OFF Set RT VOL to Full CW Listen at commander's HS	N/A N/A Rushing noise heard?	N/A N/A YES: Go to Step 7.6 NO: Go to TS Chart 41
7.6 Press HS PTT	RT keys?	YES: Go to Step 7.7 NO: Go to TS Chart 42
7.7 Press HS PTT, count into HS	Sidetone heard?	YES: Go to Step 7.8 NO: Go to TS Chart 43
7.8 Set commander's C-2298 MONITOR to A Press HS PTT	N/A RT keys?	N/A YES: Go to Step 7.9 NO: Replace commander's C-2298
7.9 Set AM-1780 RAD TRANS to CRD + CREW	RT keys?	NO: Go to Step 7.10 YES: Go to TS Chart 33

2.1. OPERATIONAL CHECK. Continued

STEP 7. SRM RADIO AND INTERCOM INTERFACE TEST: Continued

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
7.10 Set each crewmember C-2298 MONITOR to ALL Listen at each crewmember HS	N/A Rushing noise heard?	N/A YES: Go to Step 7.11 NO: Go to TS Chart 37
7.11 Press HS PTT at each crewmember C-2298	RT keys?	YES: Go to Step 7.12 NO: Go to TS Chart 35
7.12 Press HS PTT, count into HS of each crewmember C-2298	Sidetone heard?	YES: Go to Step 7.13 NO: Go to TS Chart 36
7.13 Set each crewmember C-2298 MONITOR to A Press HS PTT at each crewmember C-2298	N/A RT keys?	N/A YES: Go to Step 7.14 NO: Replace defective C-2298
7.14 Set AM-1780 INT ACCENT to ON Set any control box MONITOR to INT ONLY Press HS PTT Listen at a different control box	N/A N/A N/A Rushing sound reduced?	N/A N/A N/A YES: END OF TEST NO: Replace AM-1780

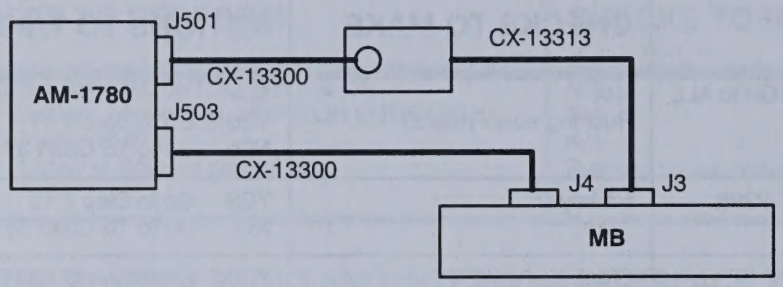
2.2. TROUBLESHOOTING FLOWCHARTS.

This paragraph provides the unit maintainer with three general use schematics (SINCGARS Using a VAA and AM-1780 Interface, SINCGARS Using a PSA and AM-1780 Interface, and AM-1780 and Control Box Interface) plus 43 Troubleshooting Charts. The unit maintainer is directed to one or more specific Troubleshooting Charts from the Operational Check. Use of Troubleshooting Charts prior to application of the Operational Check, represents poor use of unit maintainer time, can result in false pulls, and is strongly discouraged.

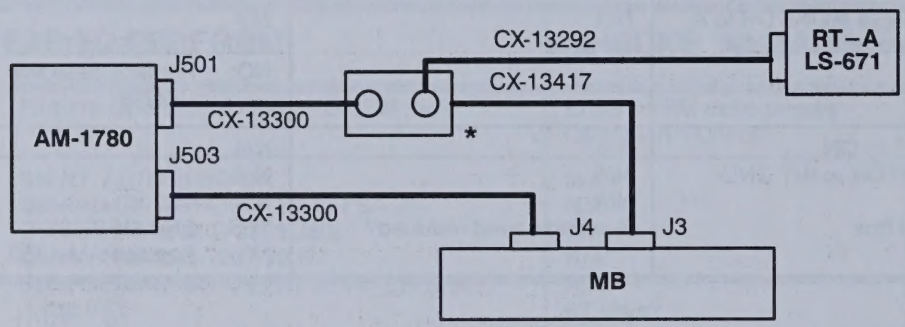
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

SINCGARS USING A VAA AND AM-1780 INTERFACE

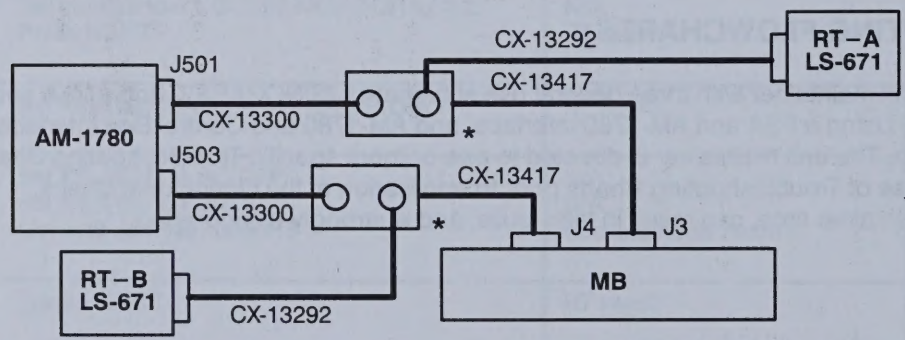
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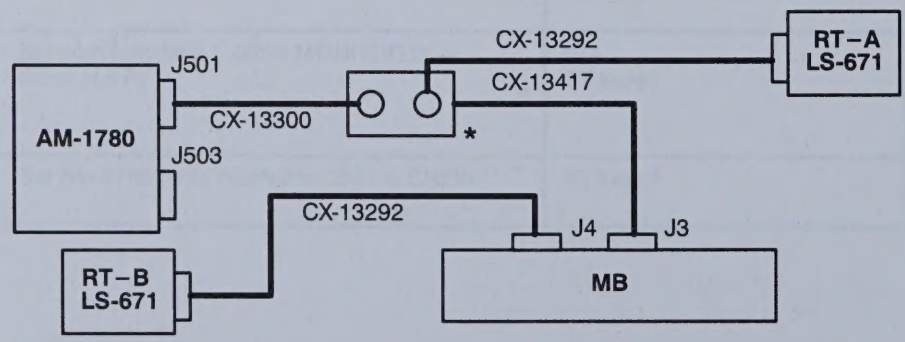
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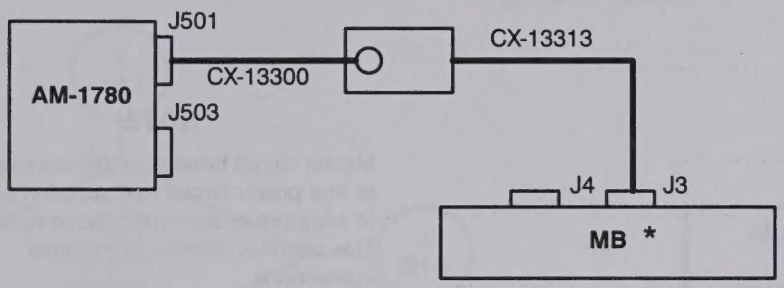
4)



* CX-13300 and CX-13292 may be connected to either J1 or J2 of CX-13417

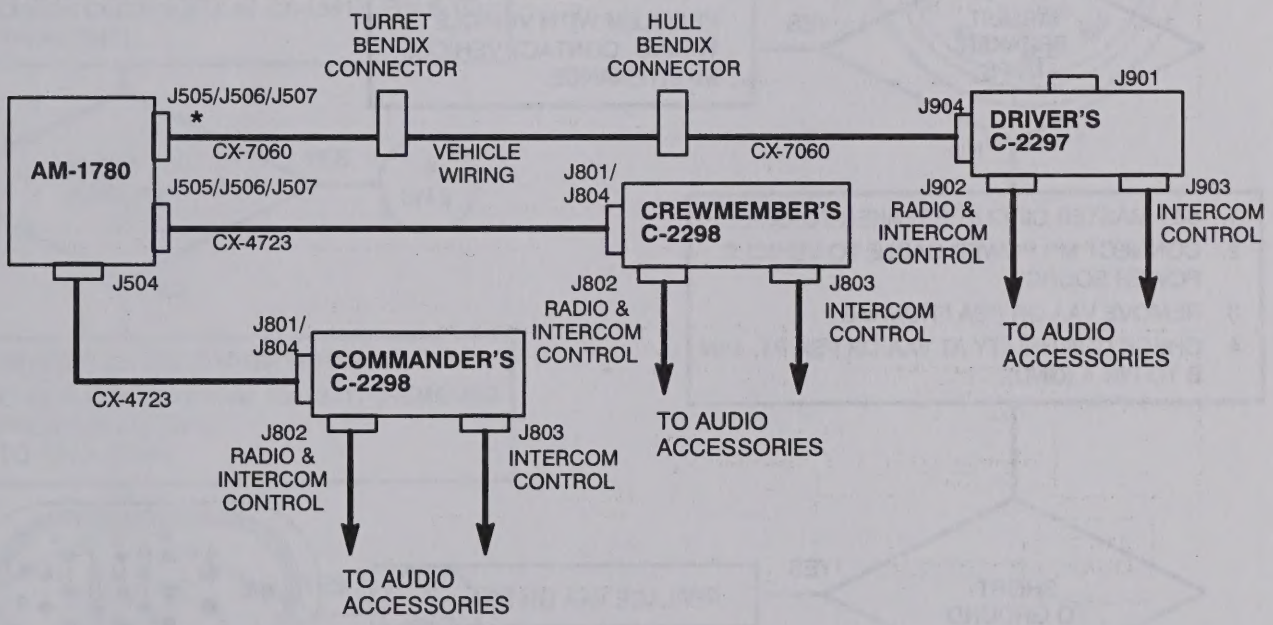
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

SINCGARS USING A PSA AND AM-1780 INTERFACE



* CX-13313 may be connected to either J3 or J4 of MB

AM-1780 AND CONTROL BOX INTERFACE



* If C-2297 is not installed, then crewmember C-2298s may be connected to AM-1780 J505, J506, or J507.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 1 of 12)

START

1. DISCONNECT MB POWER CABLE FROM VEHICLE POWER SOURCE.
2. SET MASTER CIRCUIT BREAKER TO ON.

CIRCUIT BREAKER TRIPS ?

YES → PROBLEM WITH VEHICLE WIRING, CONTACT VEHICLE MAINTENANCE.

NO

1. SET MASTER CIRCUIT BREAKER TO OFF.
2. CONNECT MB POWER CABLE TO VEHICLE POWER SOURCE.
3. REMOVE VAA OR PSA FROM MB.
4. CHECK CONTINUITY AT VAA OR PSA P1, PIN B TO PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE VAA OR PSA.

NO

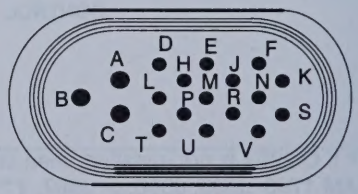
CX-13417 PRESENT ?

YES → 1 SH 2

NO → 2 SH 8

NOTE:

Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.



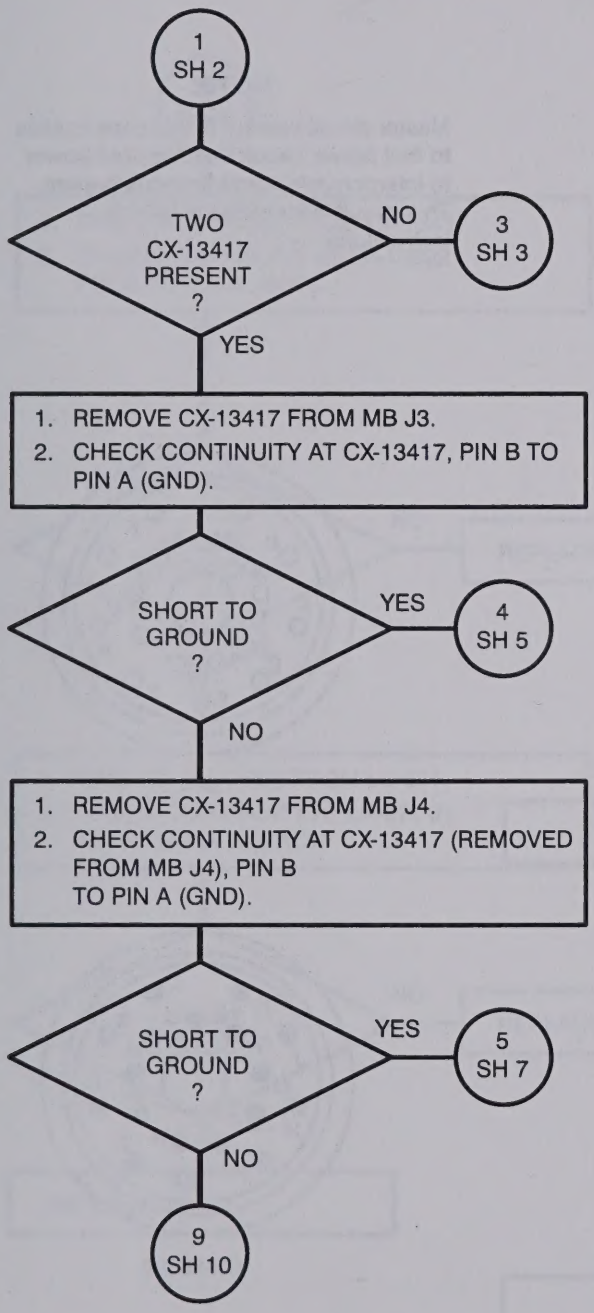
VAA/PSA P1

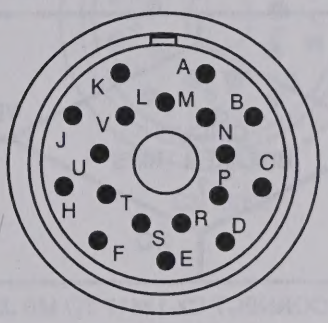
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 2 of 12)





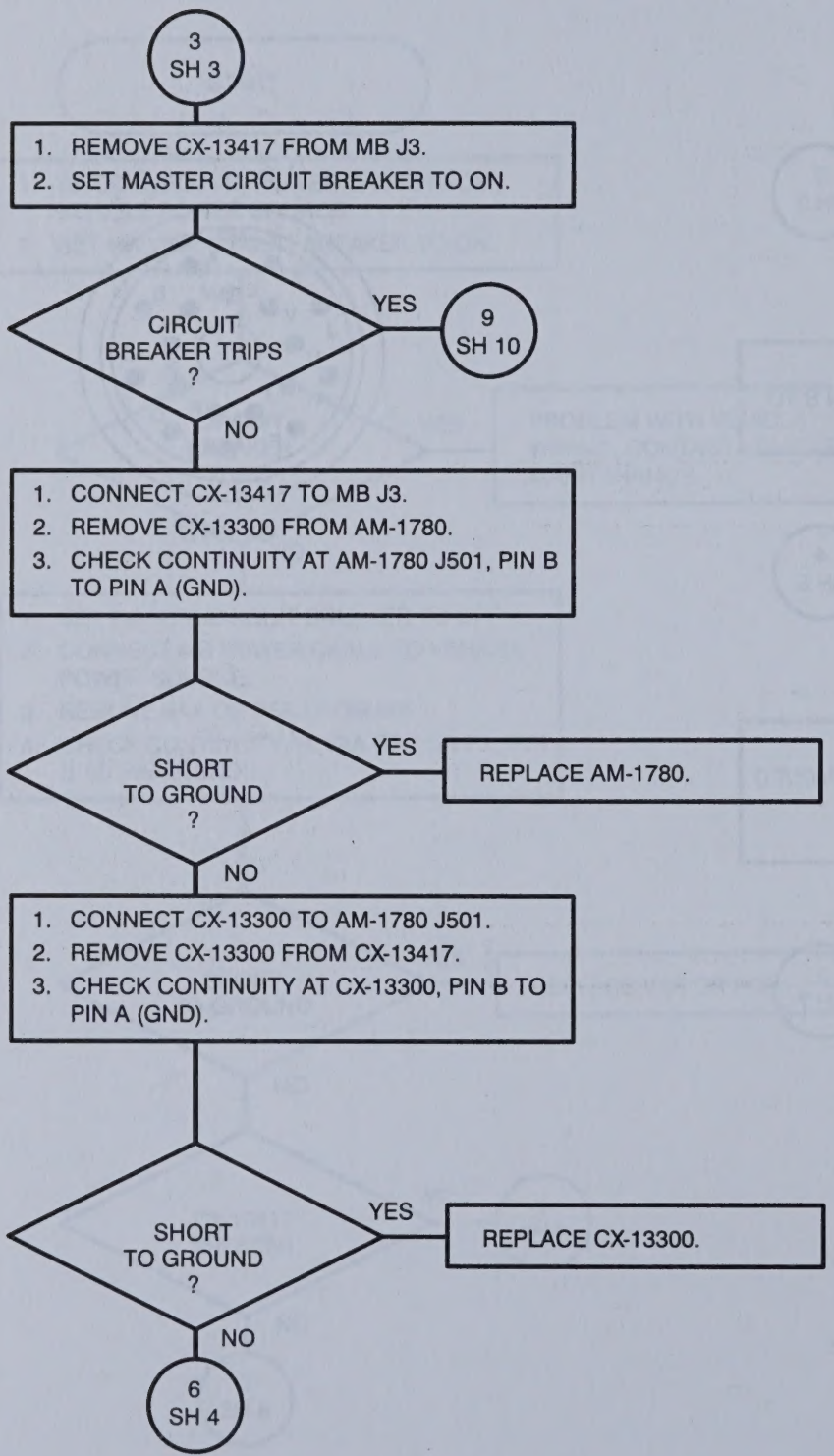
CX-13417

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

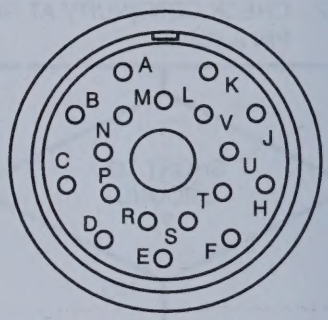
VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 3 of 12)

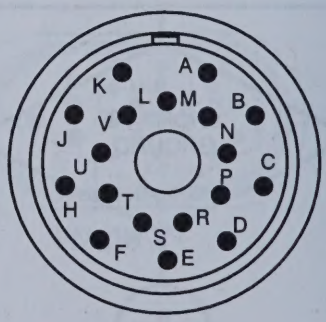


NOTE:

Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.



J501



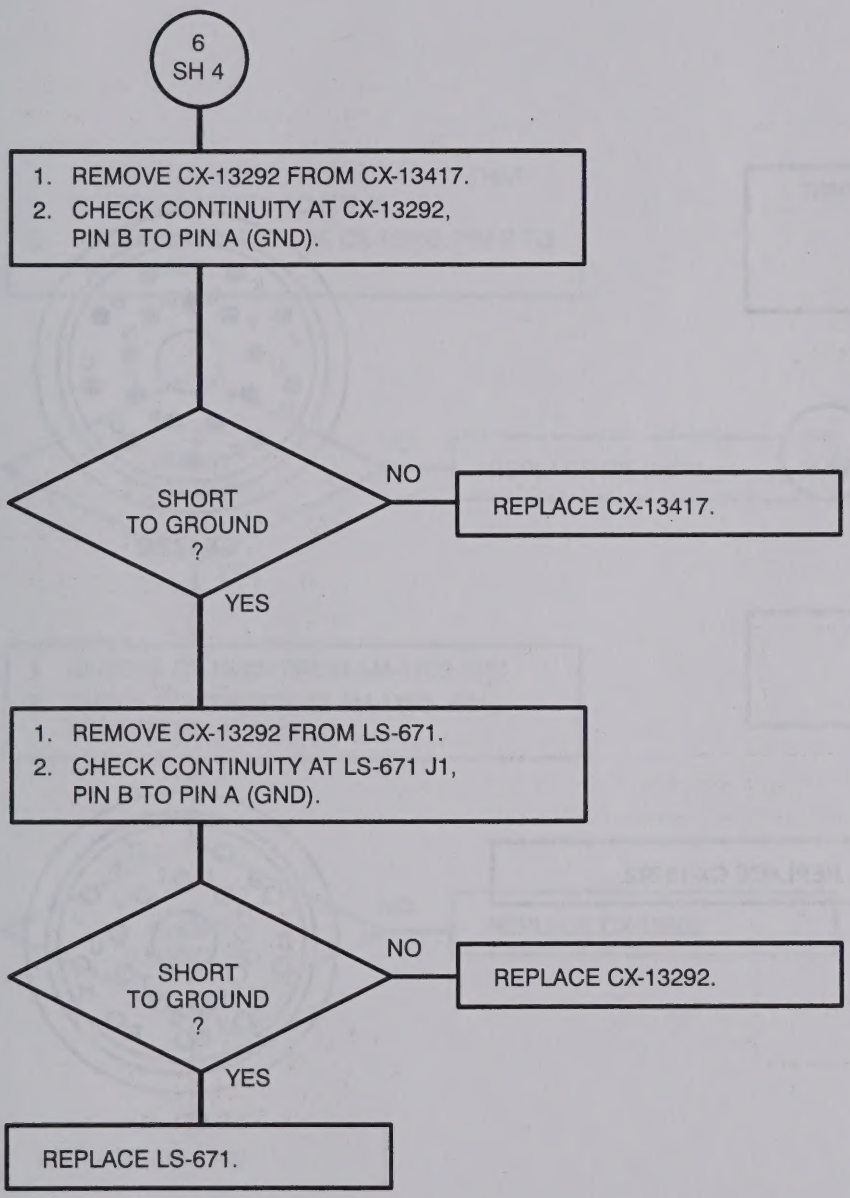
CX-13300

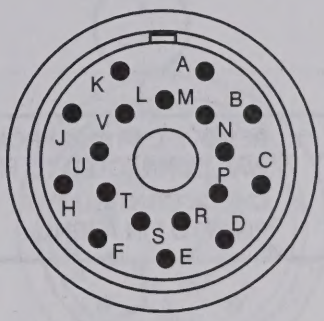
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

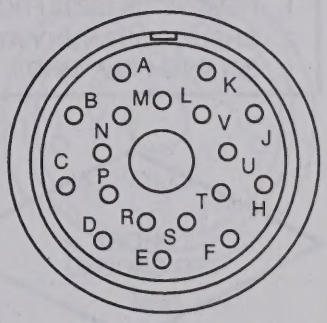
VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 4 of 12)





CX-13292



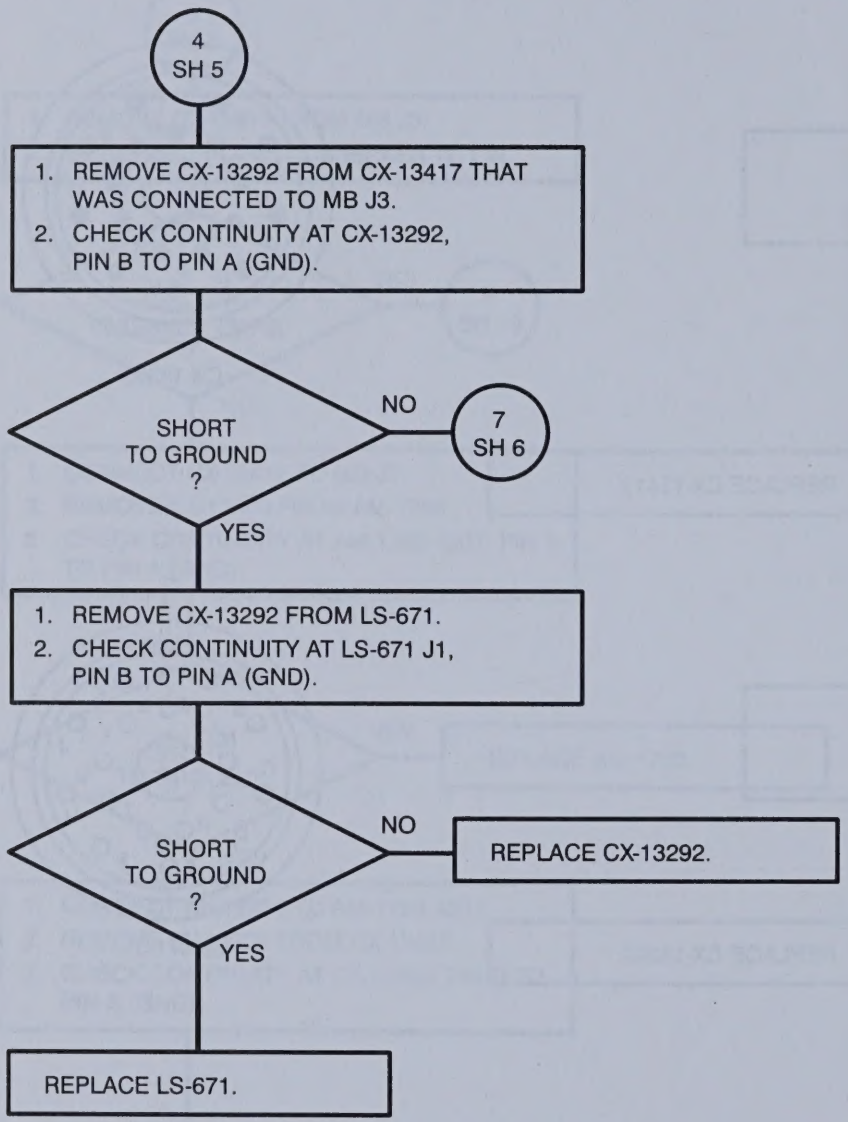
LS-671 J1

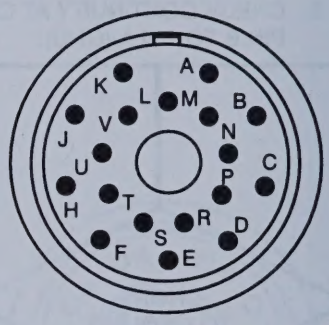
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

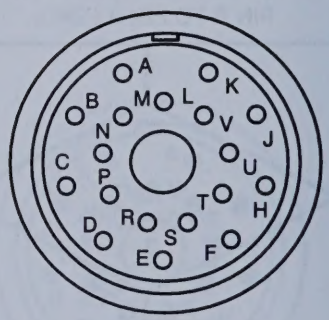
VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 5 of 12)





CX-13292



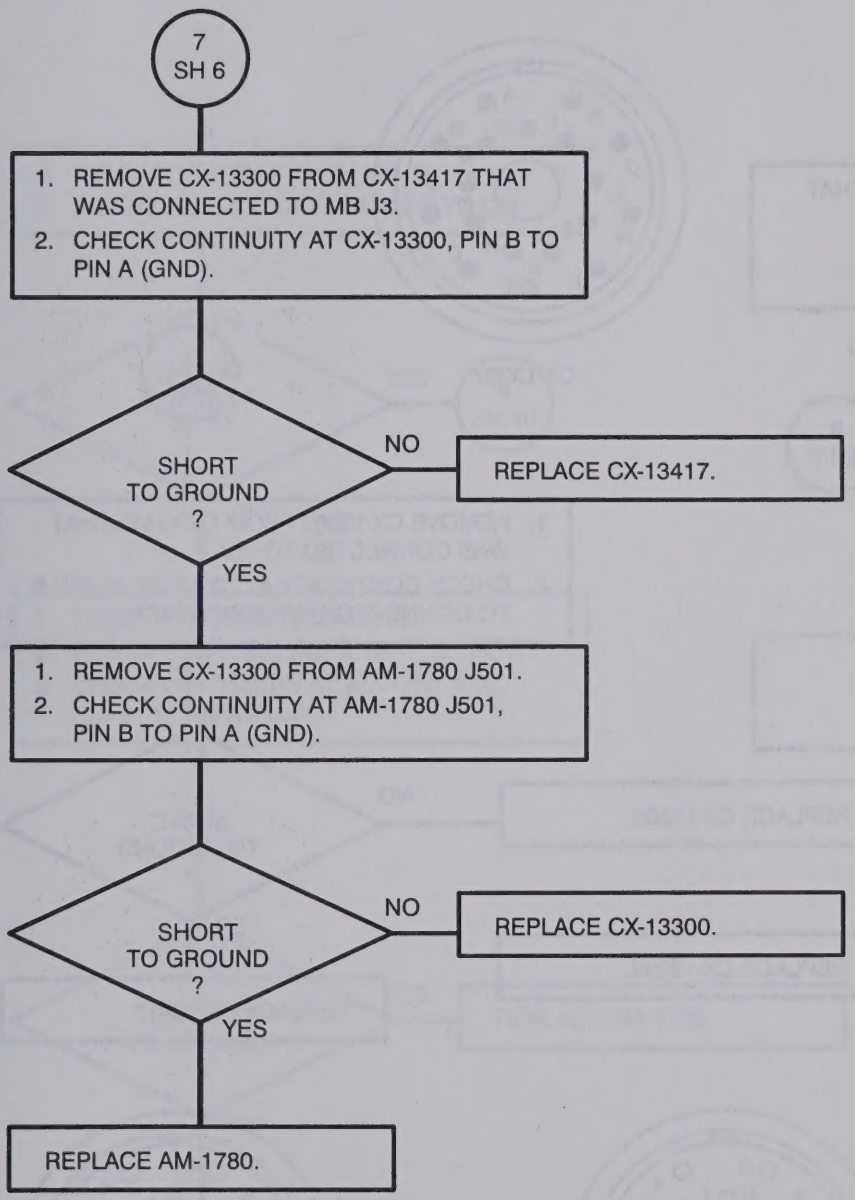
LS-671 J1

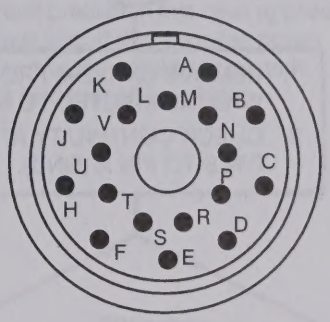
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

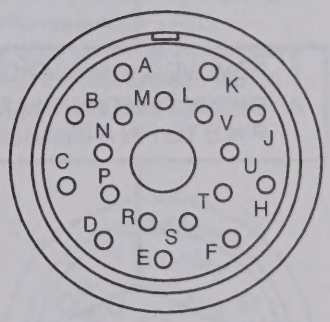
VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 6 of 12)





CX-13300



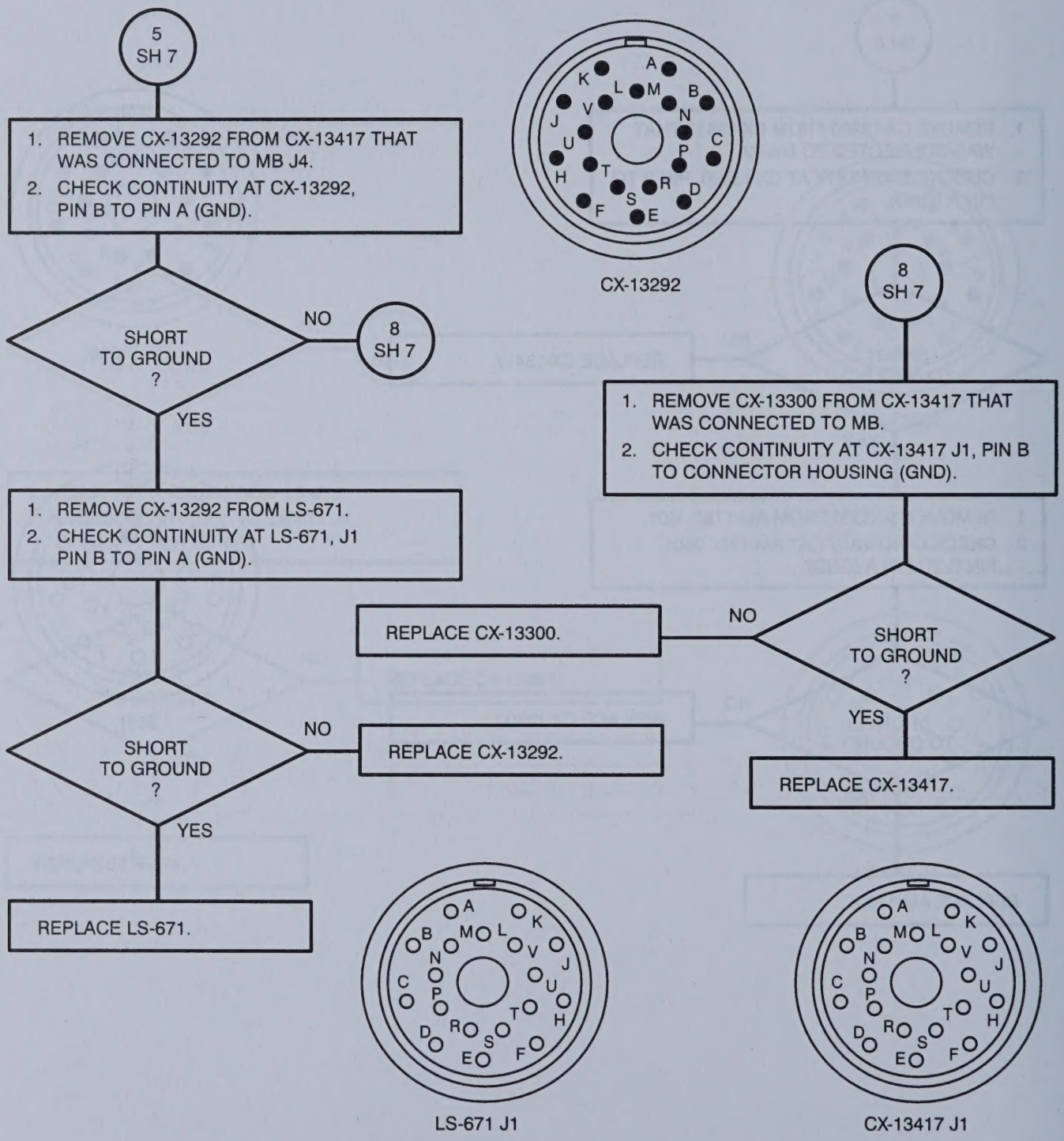
J501

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 7 of 12)

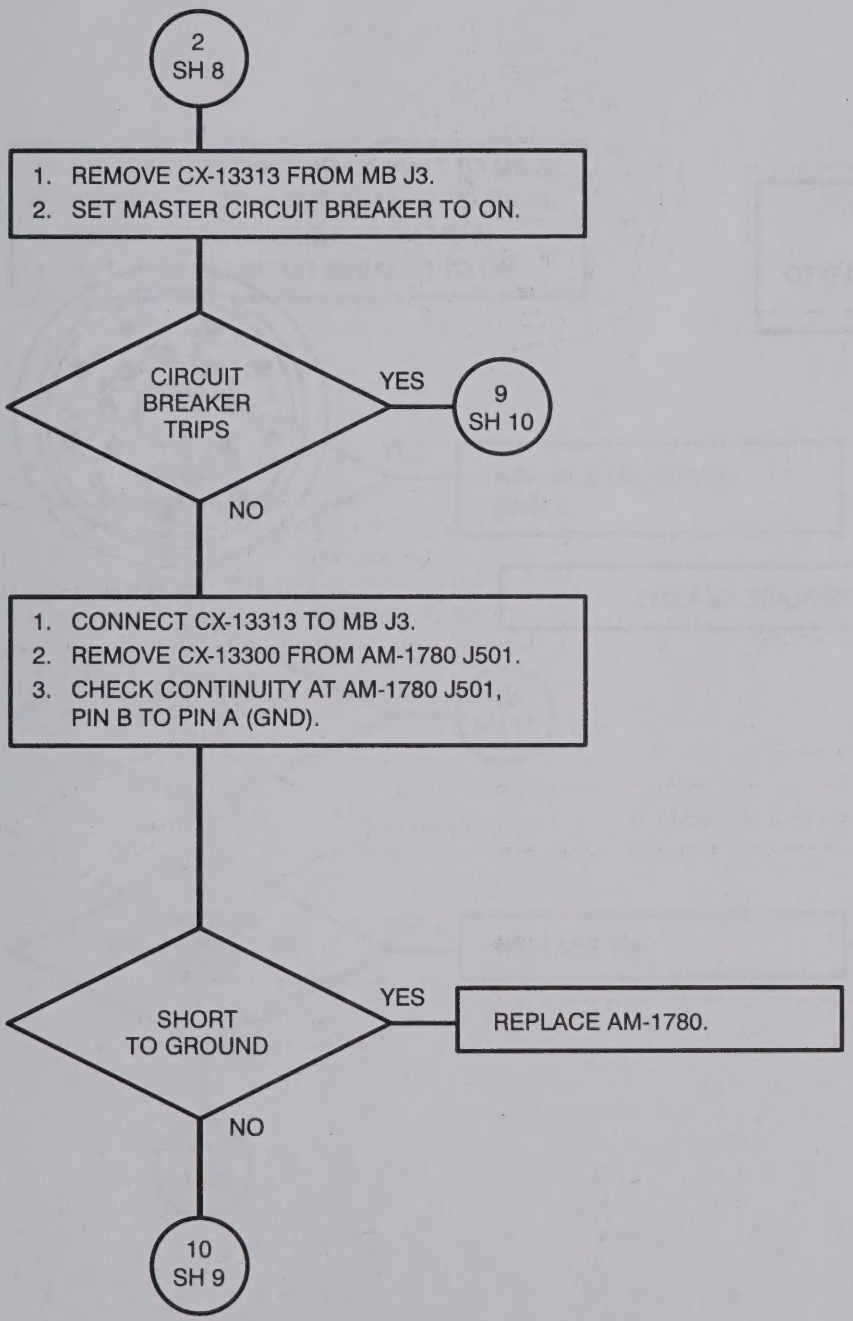


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 8 of 12)

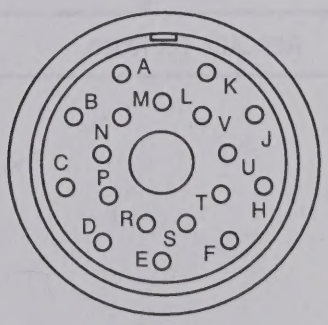


NOTE:

Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.

NOTE:

The normal installation connects the CX-13313 and CX-13300 from MB J3 to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system. MB J4 could be a possible connection for some systems.



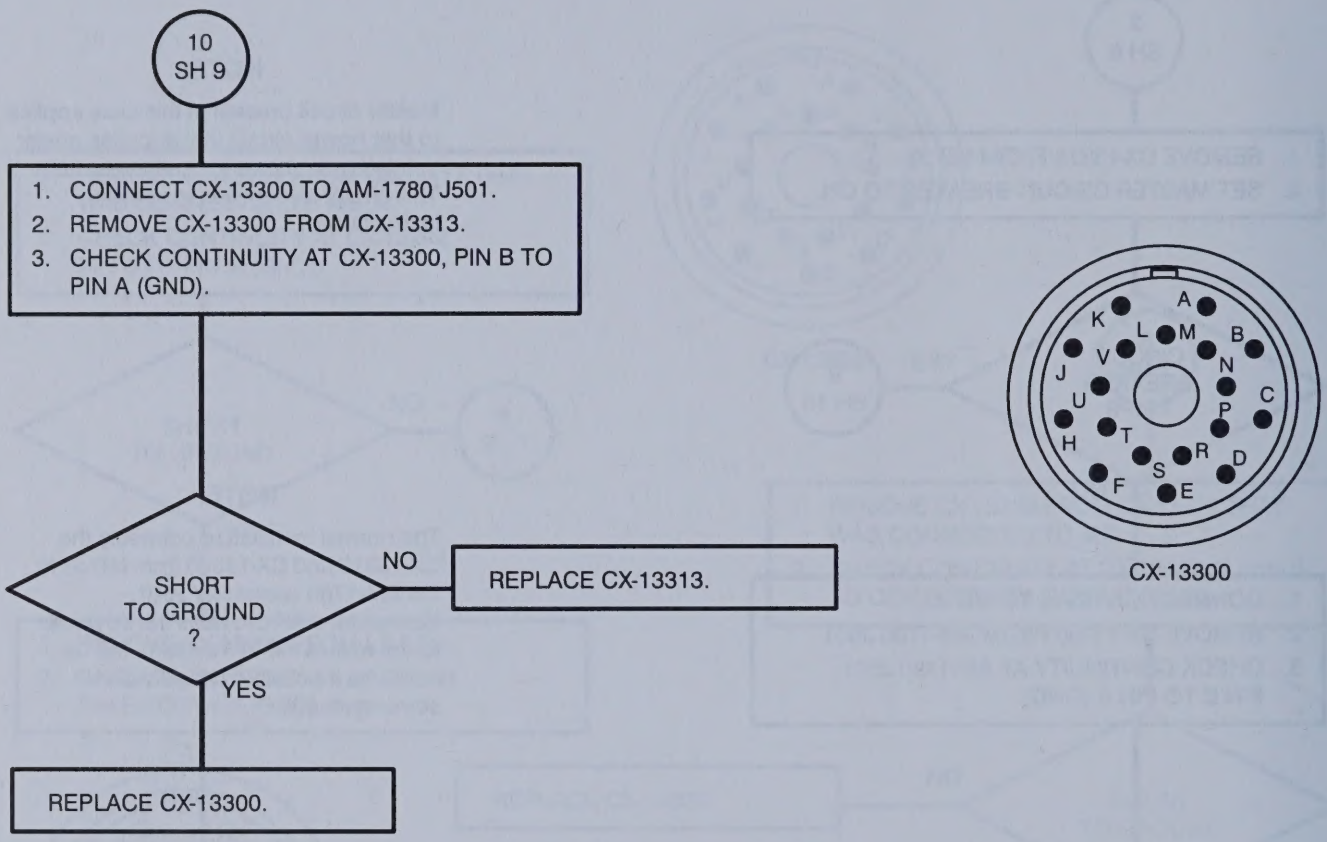
AM-1780 J501

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 9 of 12)

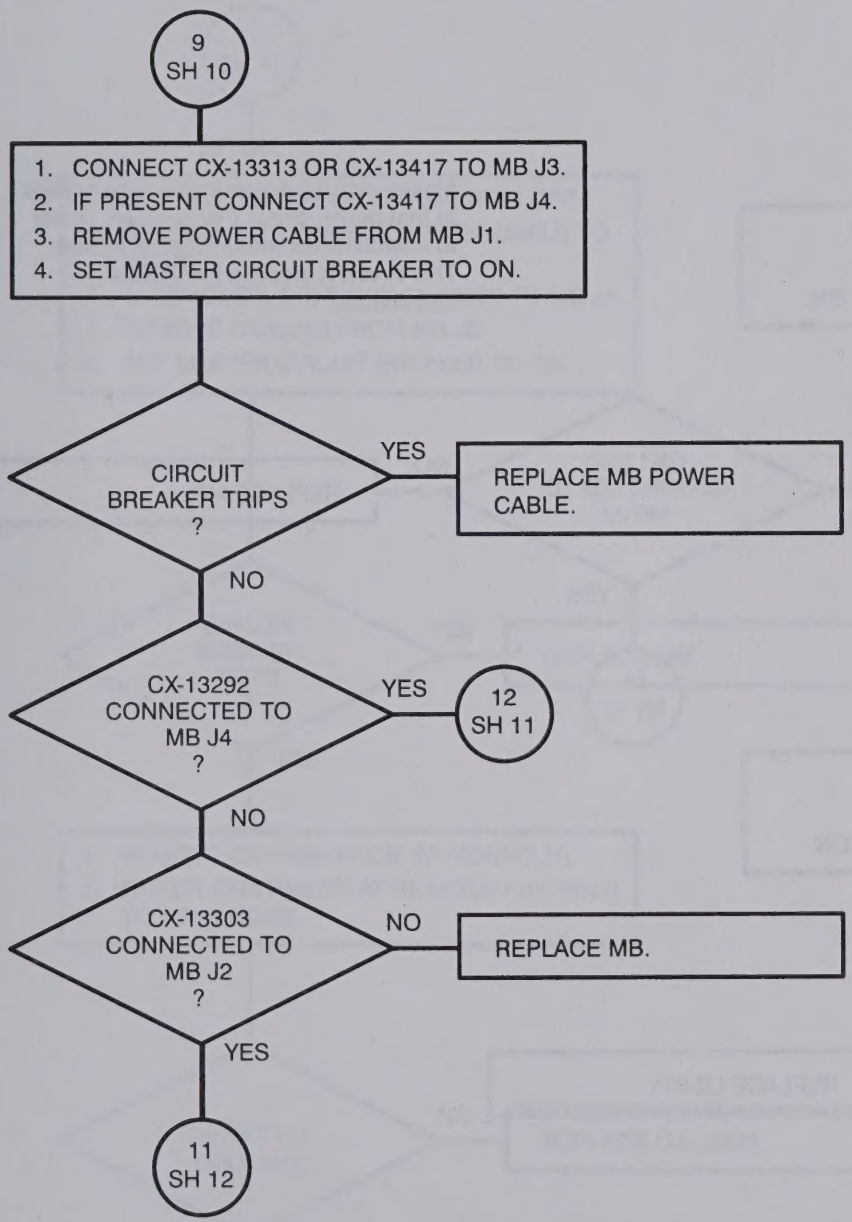


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 10 of 12)



NOTE:

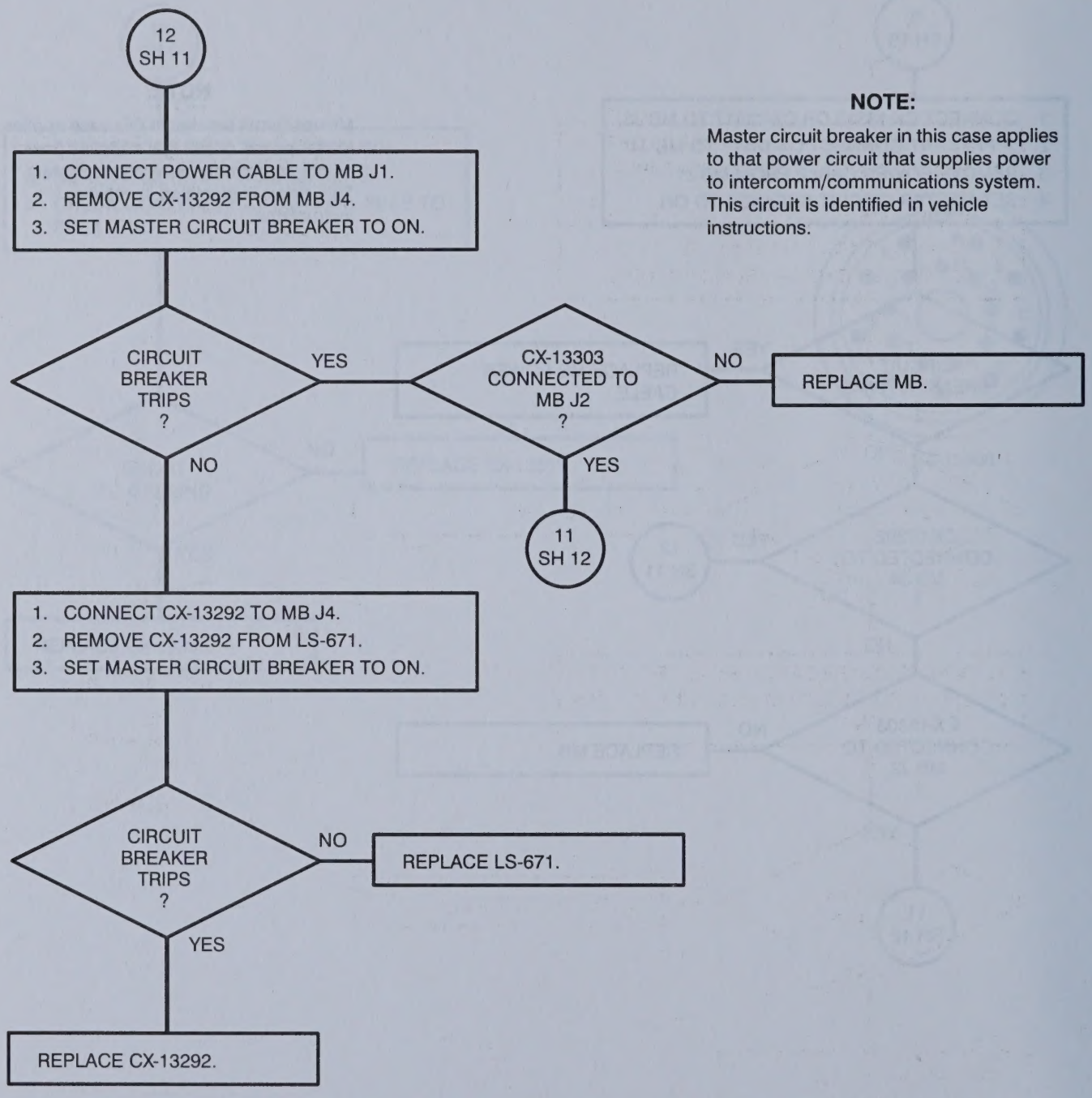
Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 11 of 12)



NOTE:

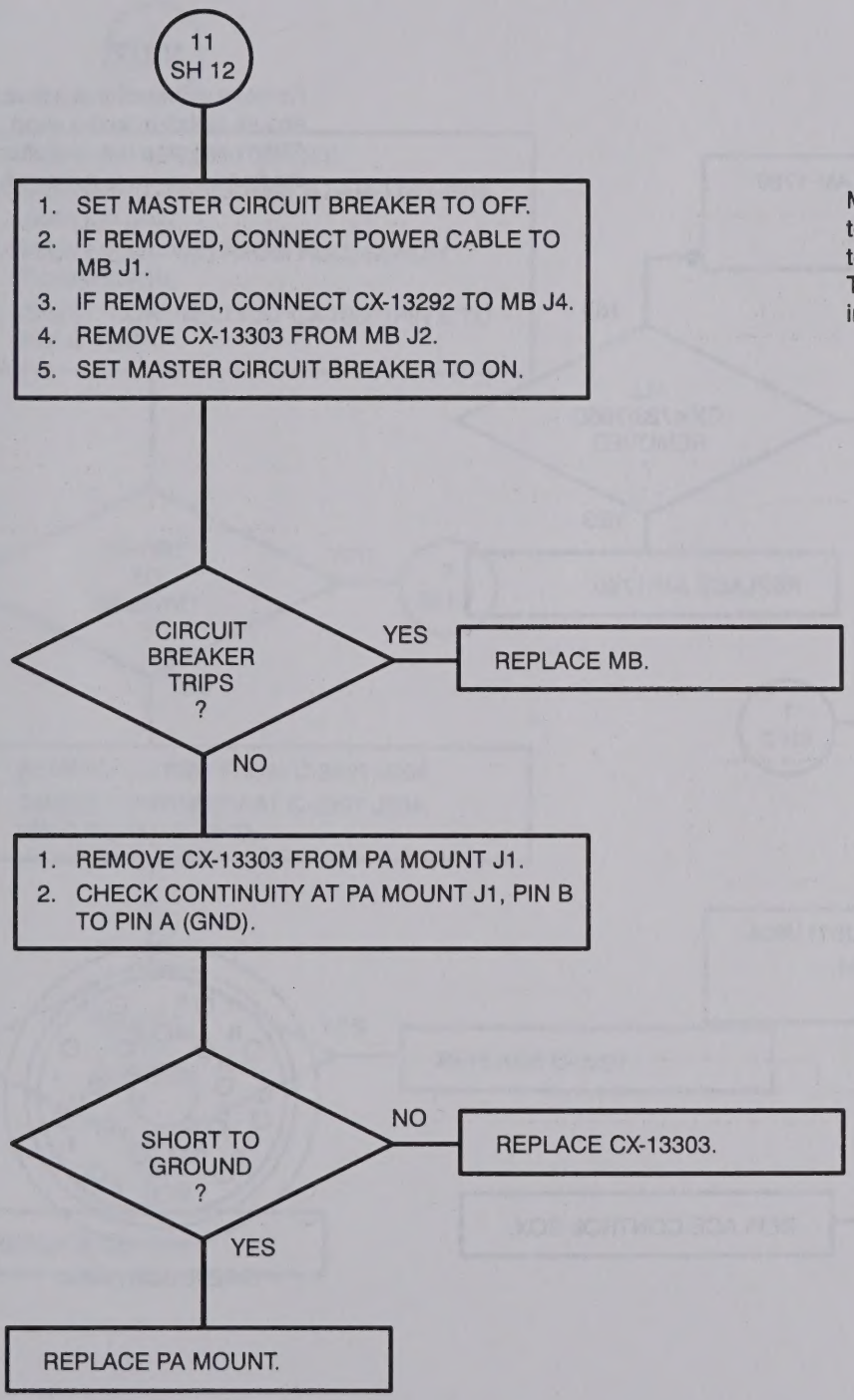
Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

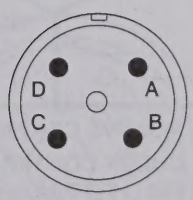
VEHICLE MASTER CIRCUIT BREAKER TRIPS WHEN SET TO ON.

(Sheet 12 of 12)



NOTE:

Master circuit breaker in this case applies to that power circuit that supplies power to intercomm/communications system. This circuit is identified in vehicle instructions.



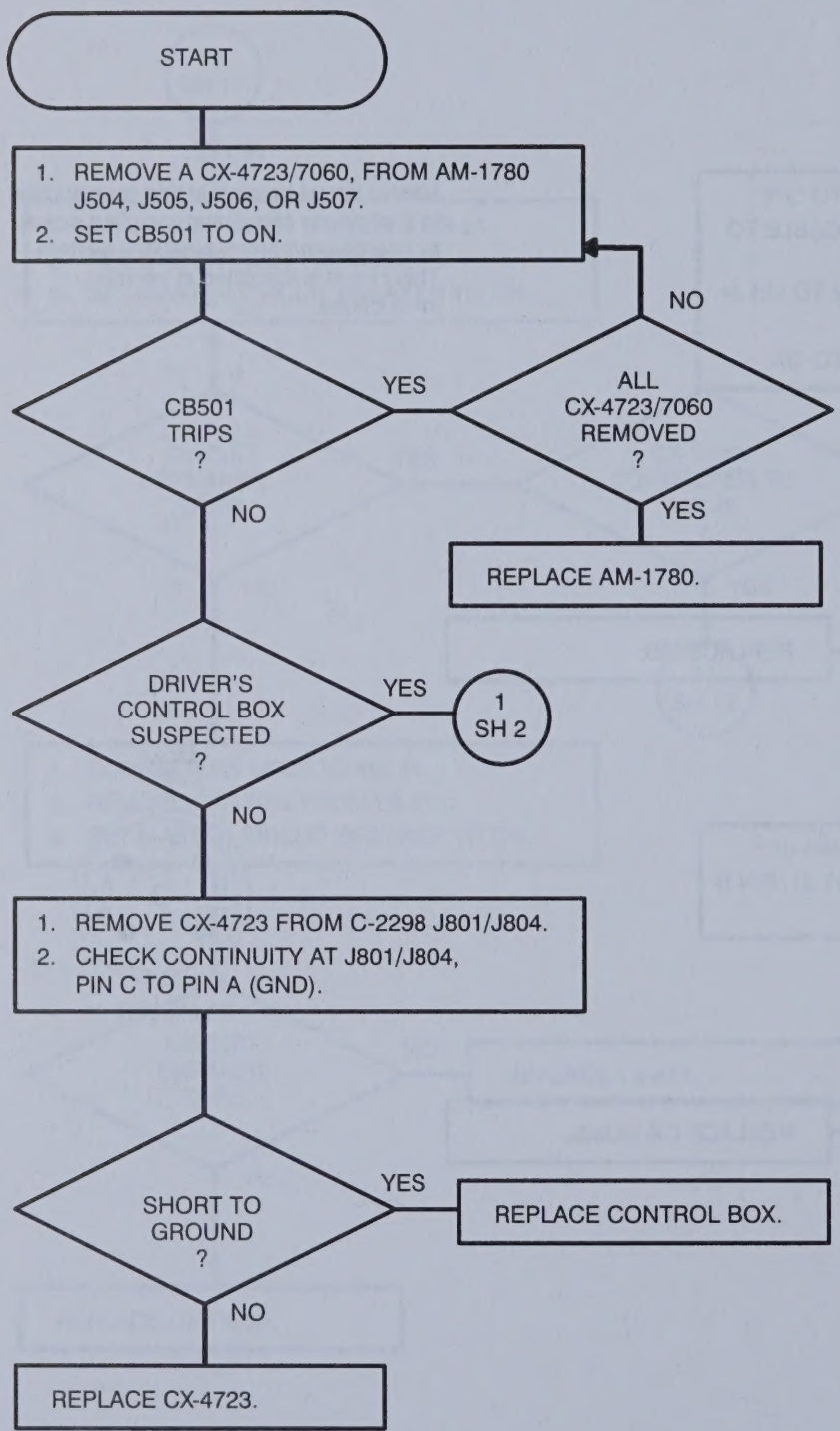
PA MOUNT J1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 2

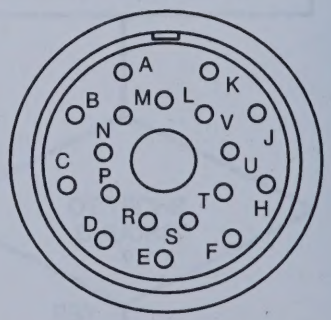
AM-1780 CB501 TRIPS WHEN SET TO ON.

(Sheet 1 of 3)



NOTE:

Remove cables one at a time to ensure isolation to the short. CB501 will stop tripping after the faulted cable is removed.



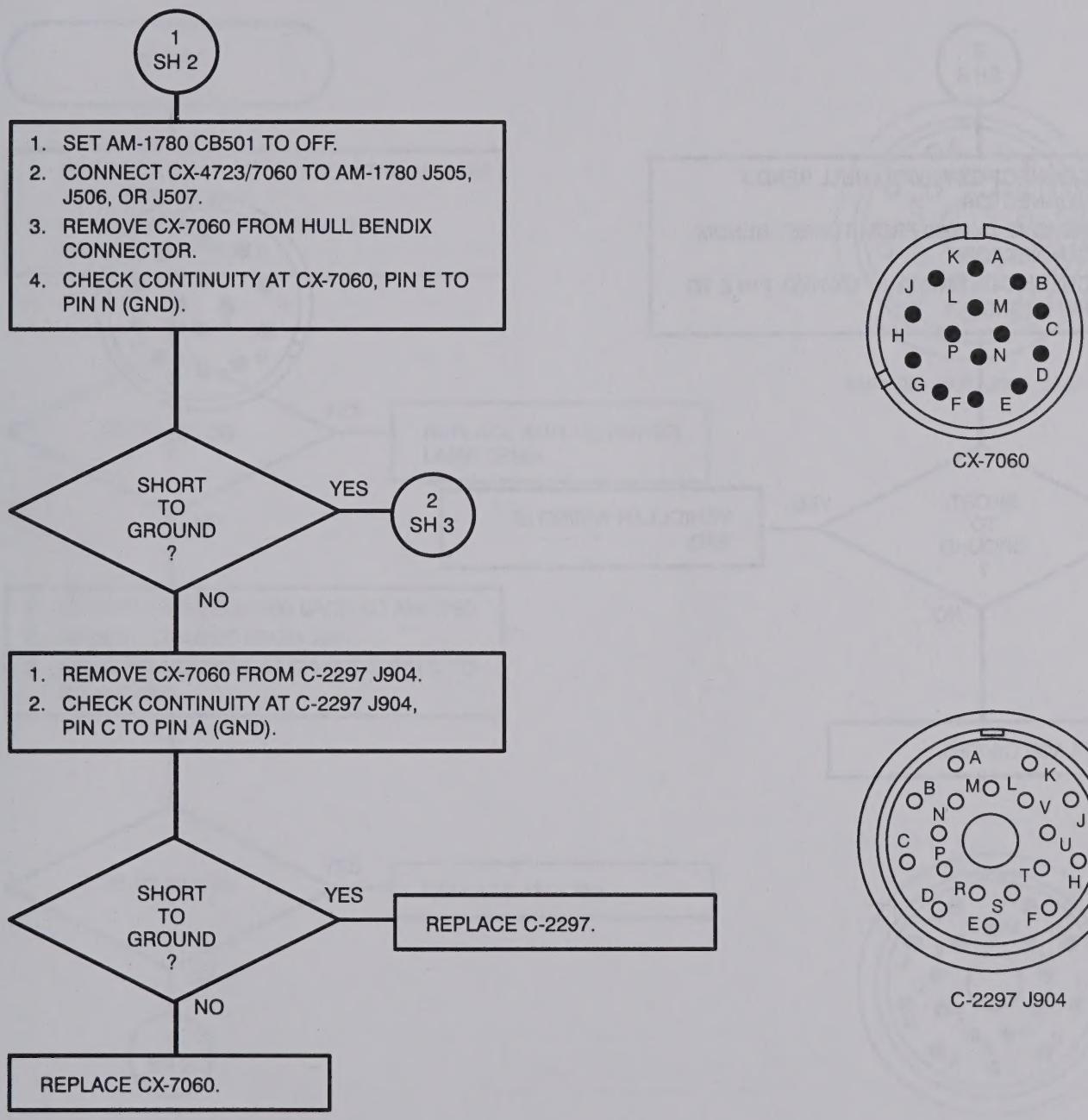
C-2298 J801, J804

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 2

AM-1780 CB501 TRIPS WHEN SET TO ON.

(Sheet 2 of 3)

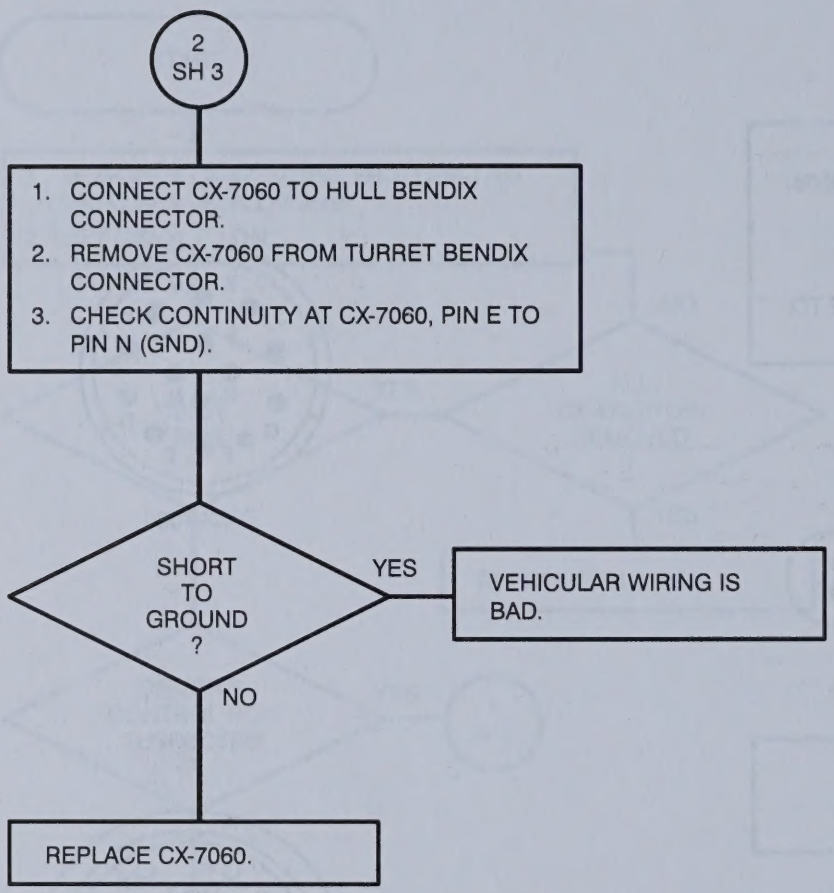


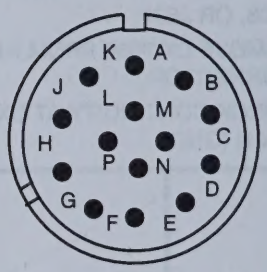
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 2

AM-1780 CB501 TRIPS WHEN SET TO ON.

(Sheet 3 of 3)





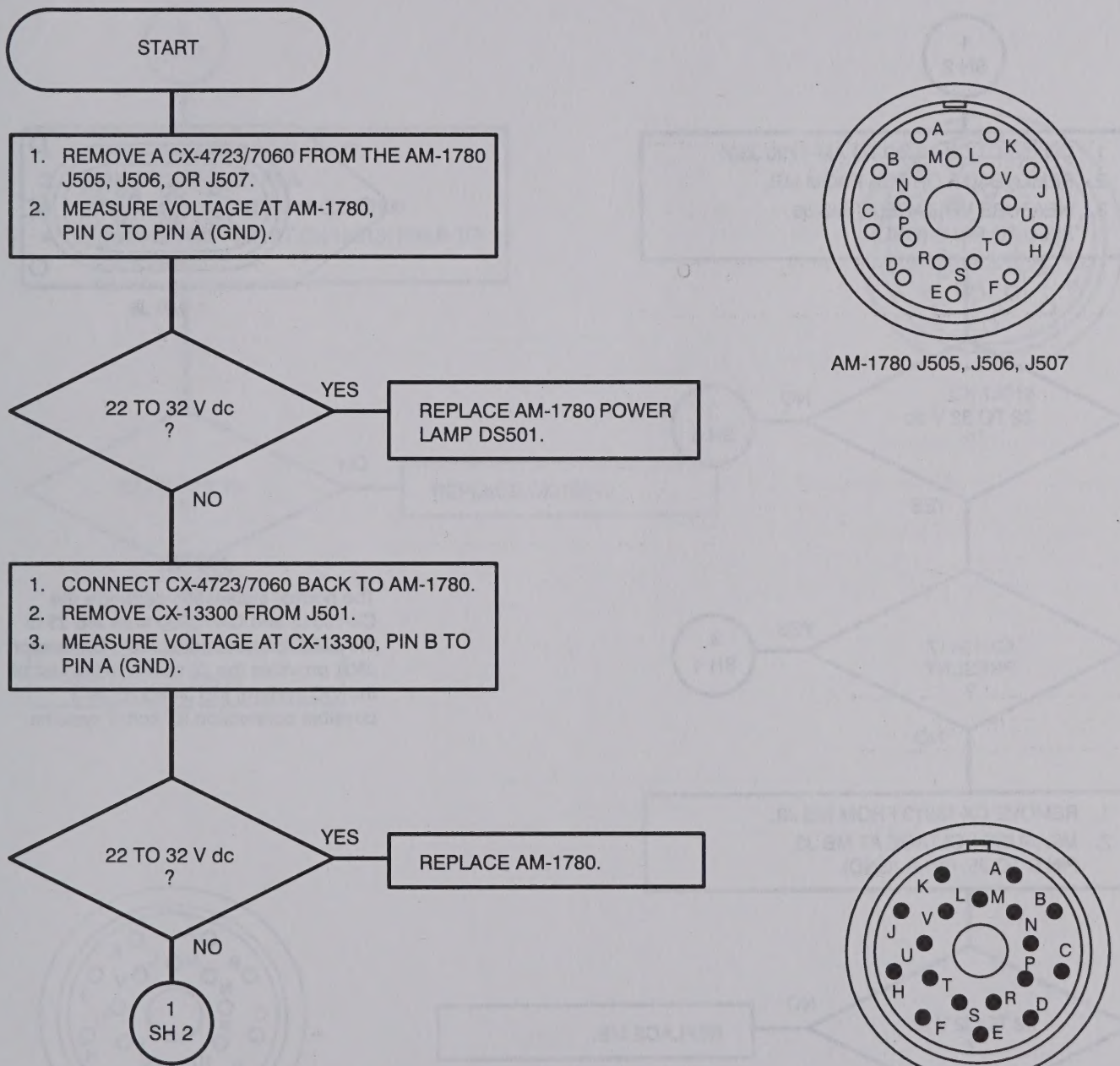
CX-7060

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

AM-1780 POWER LAMP DS501 DOES NOT LIGHT.

(Sheet 1 of 5)

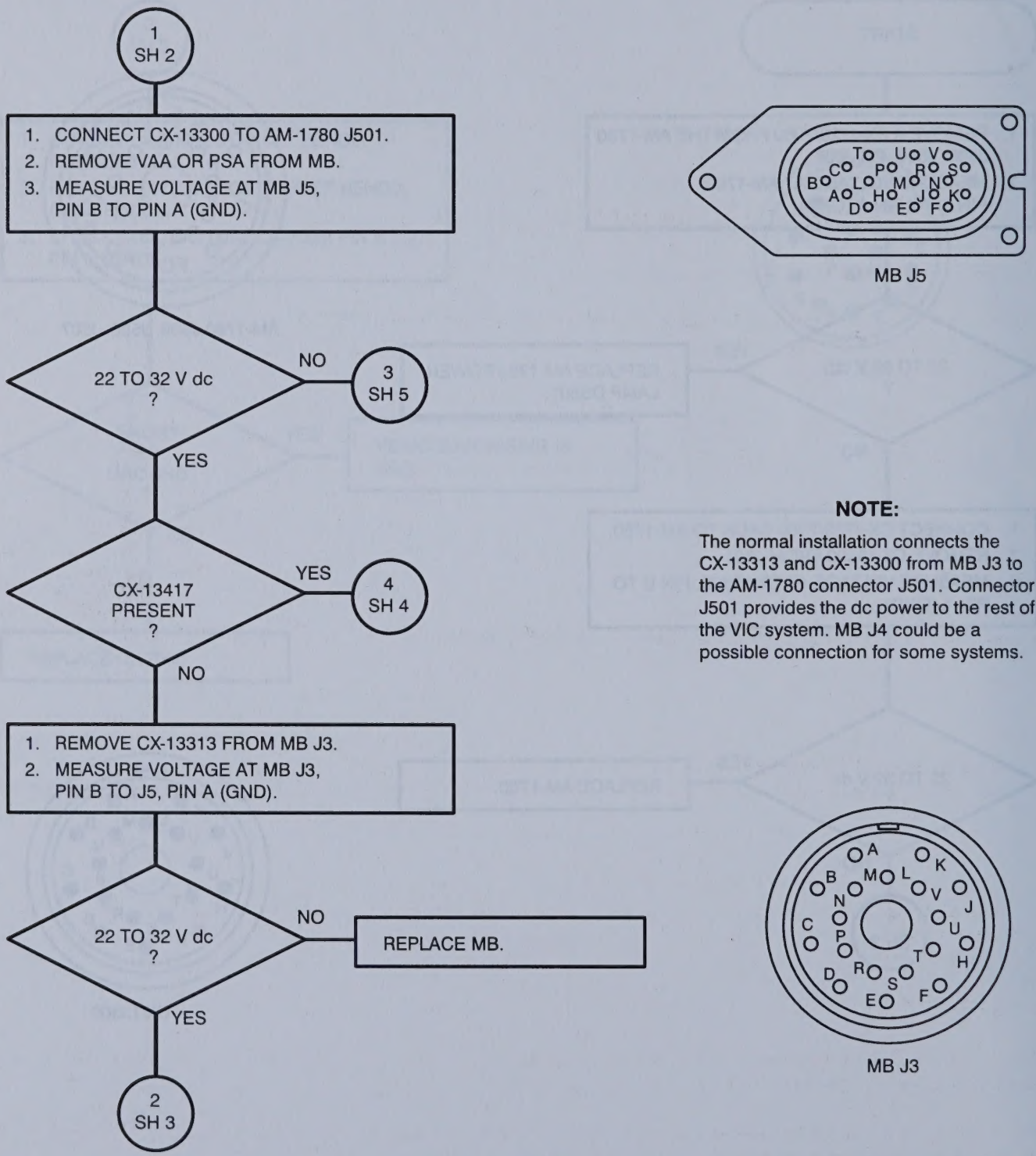


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

AM-1780 POWER LAMP DS501 DOES NOT LIGHT.

(Sheet 2 of 5)



MB J5

NOTE:

The normal installation connects the CX-13313 and CX-13300 from MB J3 to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system. MB J4 could be a possible connection for some systems.

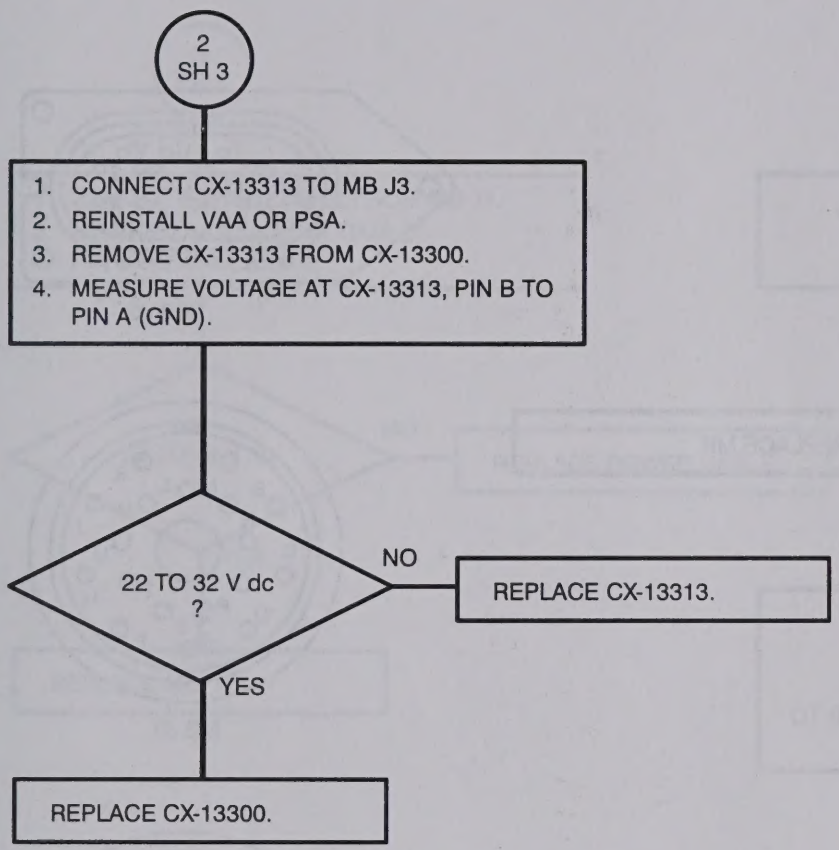
MB J3

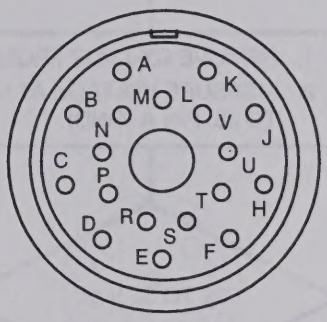
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

AM-1780 POWER LAMP DS501 DOES NOT LIGHT.

(Sheet 3 of 5)





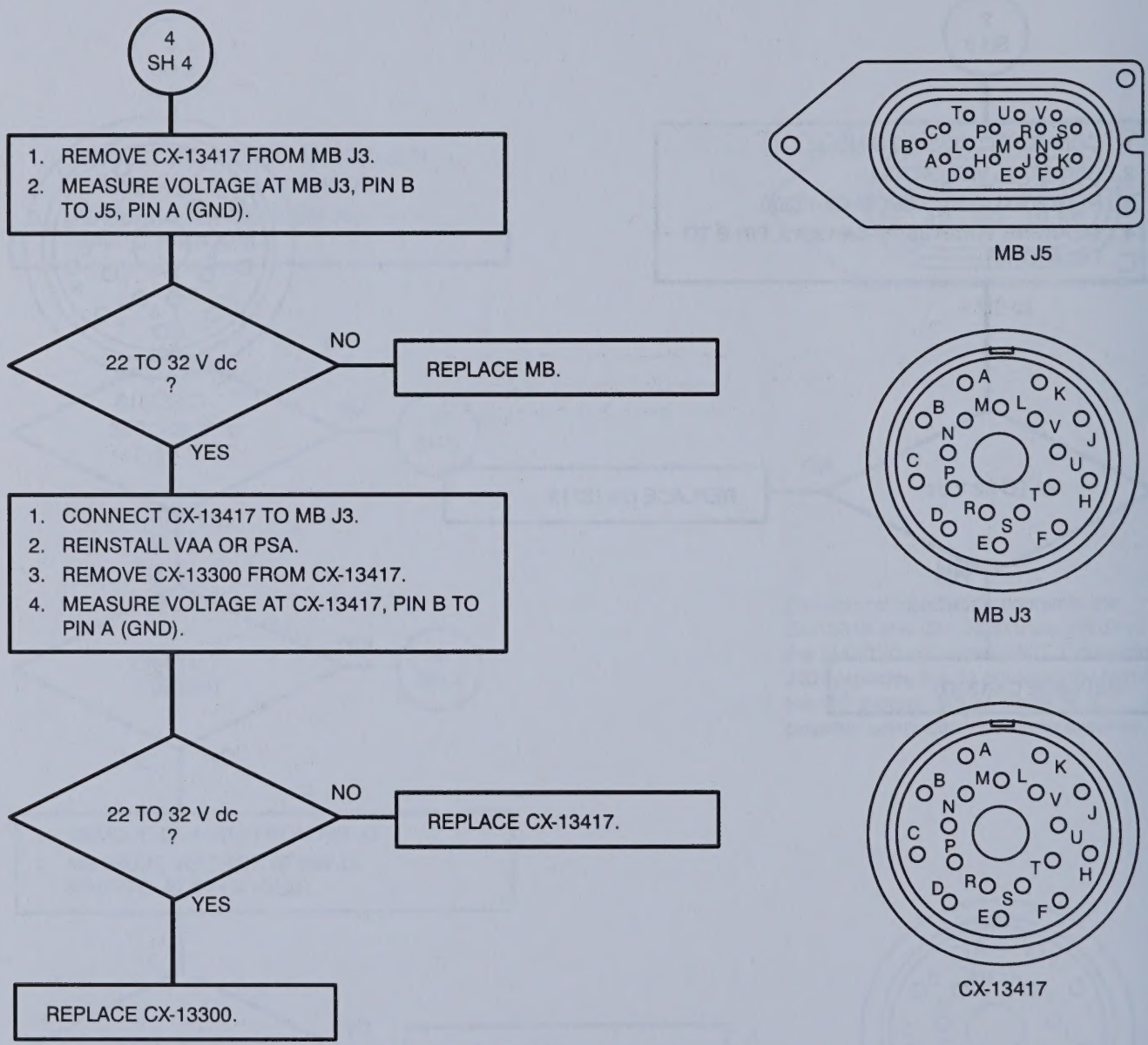
CX-13313

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

AM-1780 POWER LAMP DS501 DOES NOT LIGHT.

(Sheet 4 of 5)

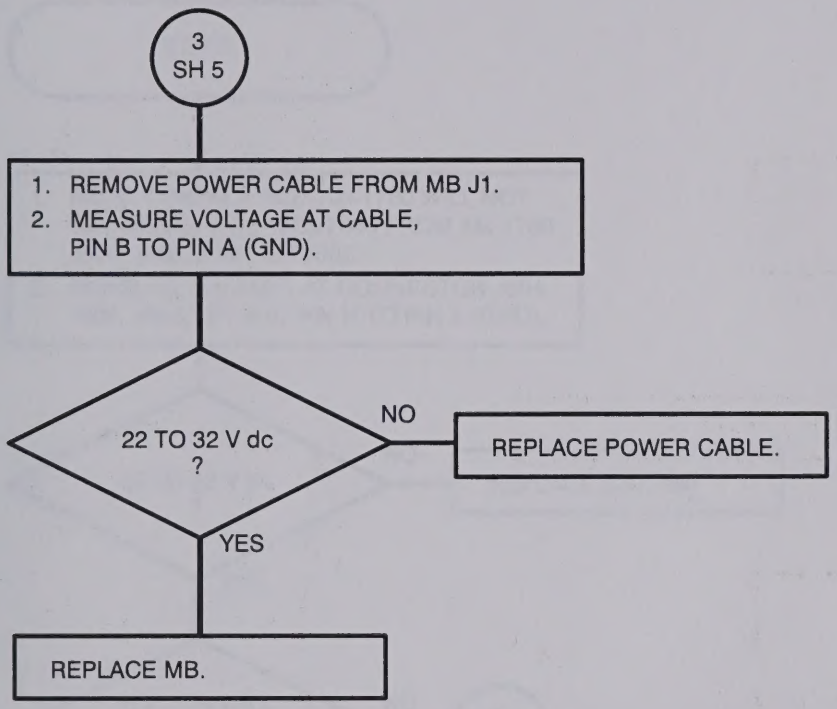


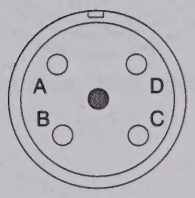
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

AM-1780 POWER LAMP DS501 DOES NOT LIGHT.

(Sheet 5 of 5)





POWER CABLE

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

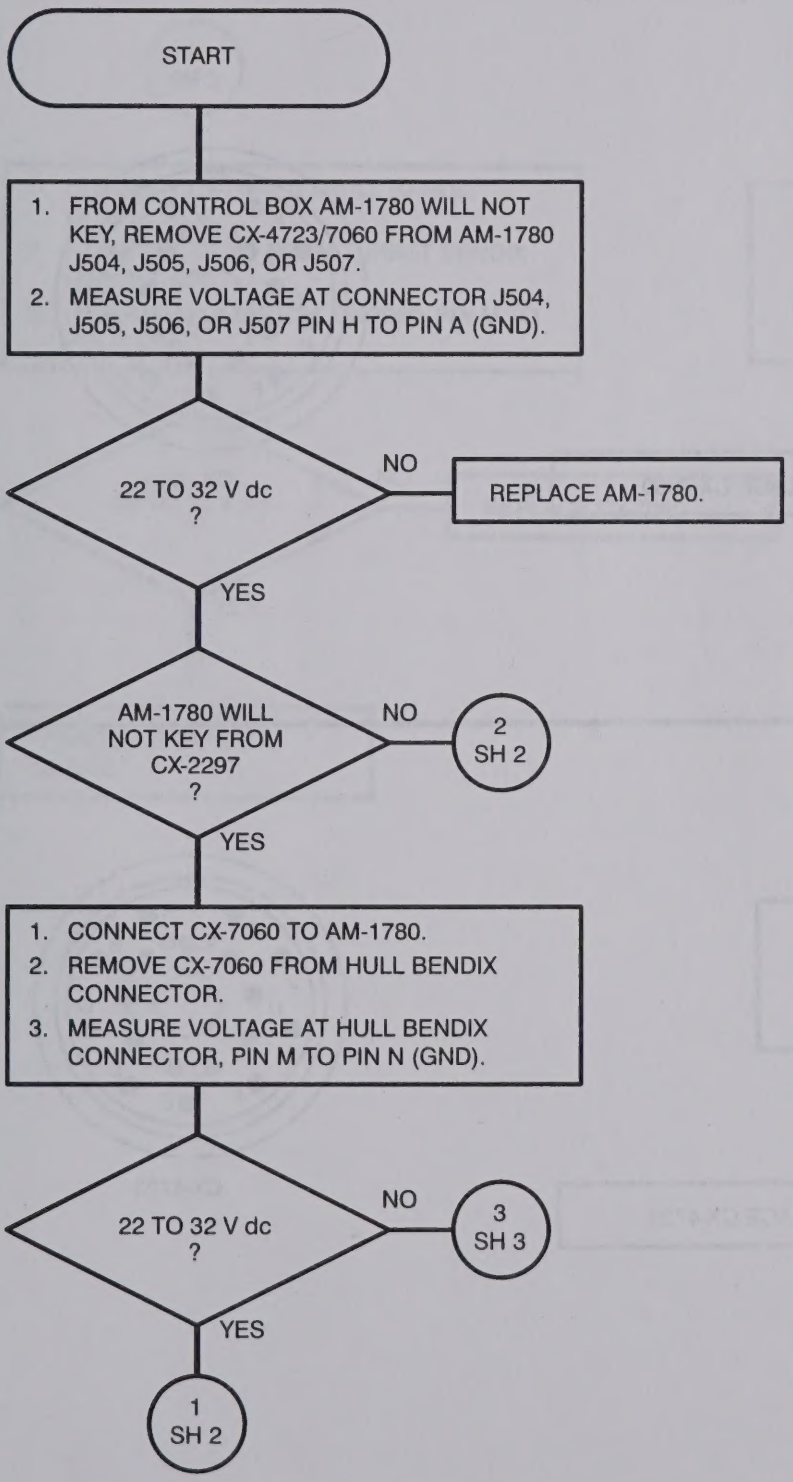
Chart 4
N/A (TBD)

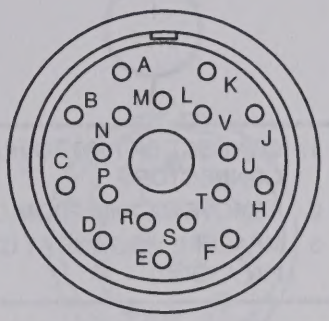
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 5

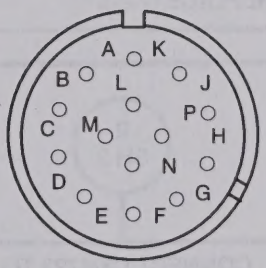
AM-1780 RELAYS DO NOT CLICK AND SIDETONE NOT HEARD. AM-1780 WILL NOT KEY FROM A SPECIFIED CONTROL BOX.

(Sheet 1 of 3)





AM-1780 J504, J505, J506, J507



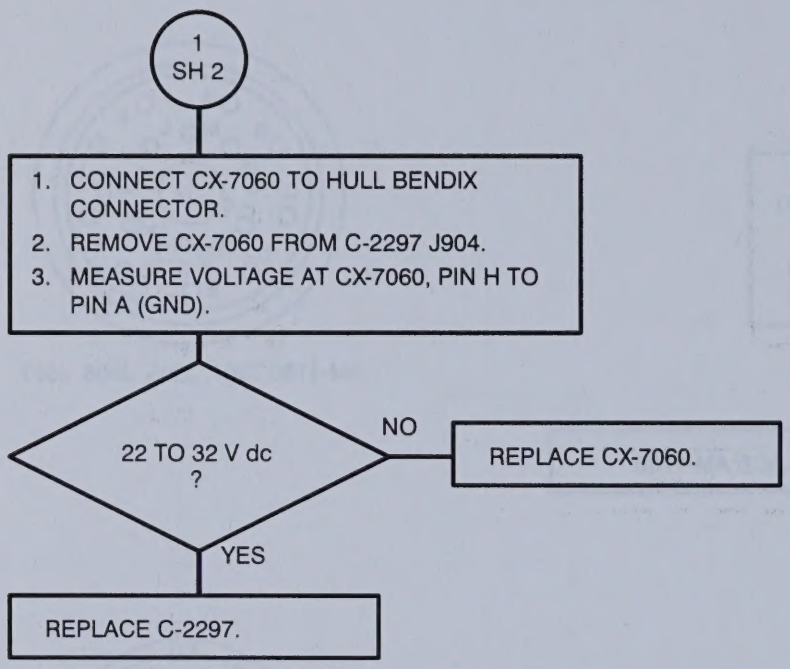
HULL BENDIX CONNECTOR

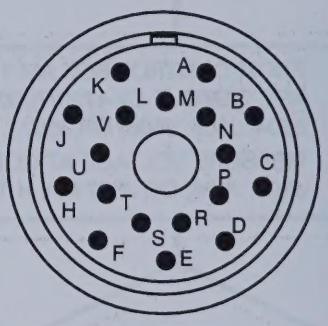
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 5

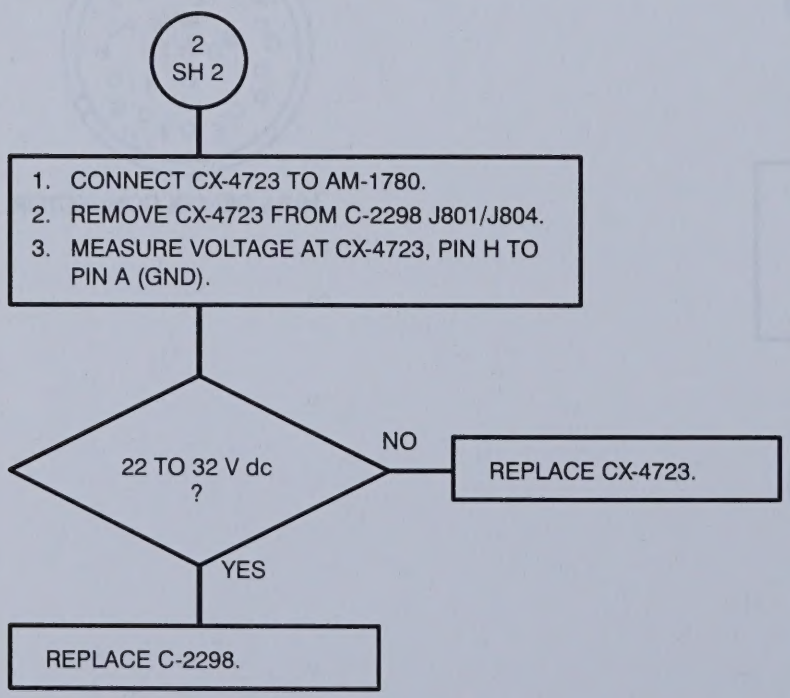
AM-1780 RELAYS DO NOT CLICK AND SIDETONE NOT HEARD. AM-1780 WILL NOT KEY FROM A SPECIFIED CONTROL BOX.

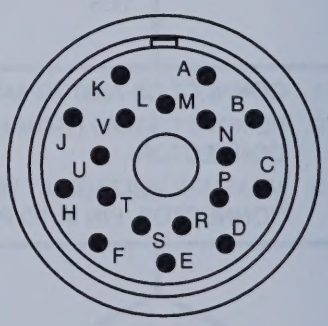
(Sheet 2 of 3)





CX-7060





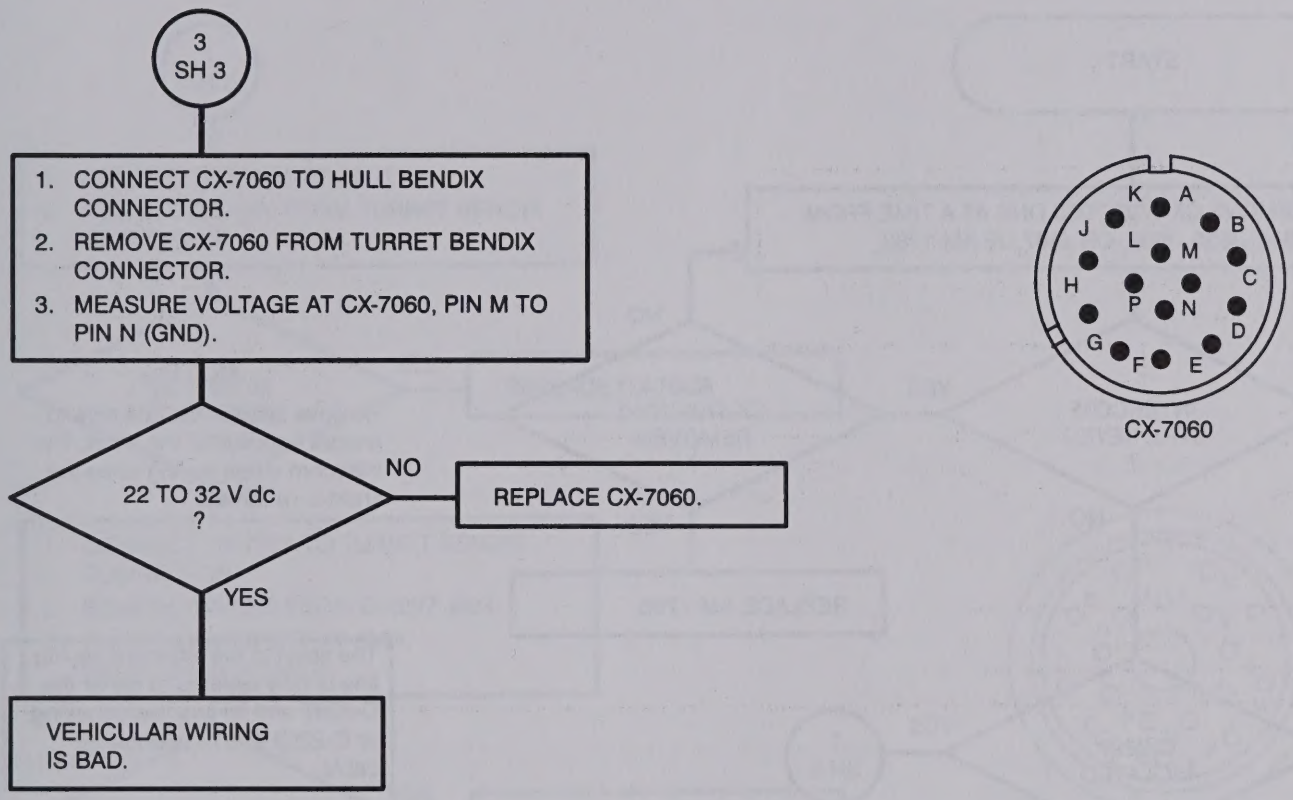
CX-4723

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 5

AM-1780 RELAYS DO NOT CLICK AND SIDETONE NOT HEARD. AM-1780 WILL NOT KEY FROM A SPECIFIED CONTROL BOX.

(Sheet 3 of 3)

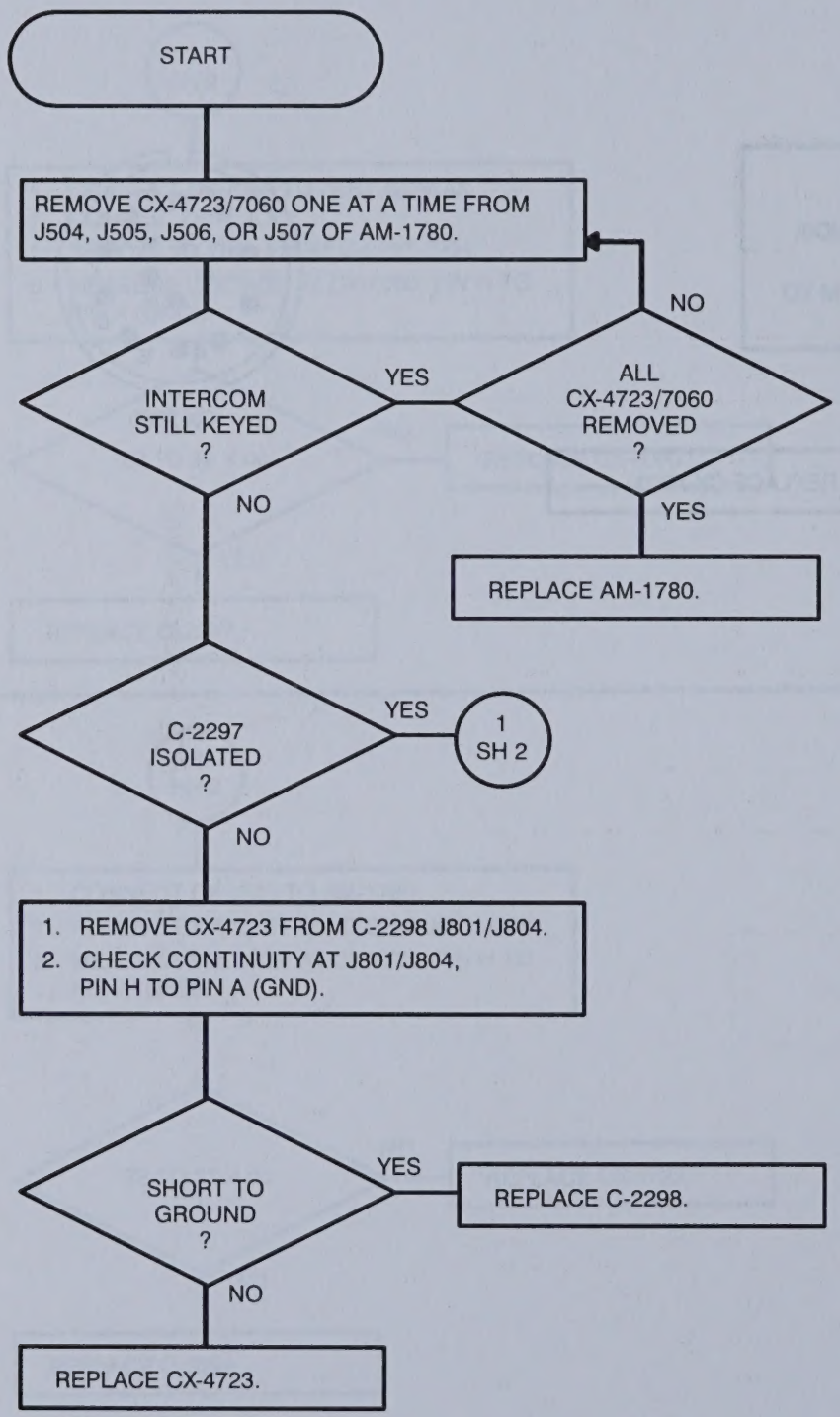


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 6

AM-1780 RELAYS DO NOT CLICK AND SIDETONE IS HEARD. INTERCOM CONTINUOUSLY KEYED WHILE CHECKING A C-2298 OR C-2297.

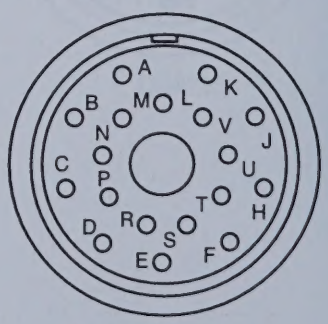
(Sheet 1 of 2)



NOTE:

Remove cables one at a time to ensure isolation of the short. The intercom stops keying once the short is removed.

The short In the intercom keying line is now isolated to either the C-2297 and its associated wiring, or C-2298 and its associated cable.



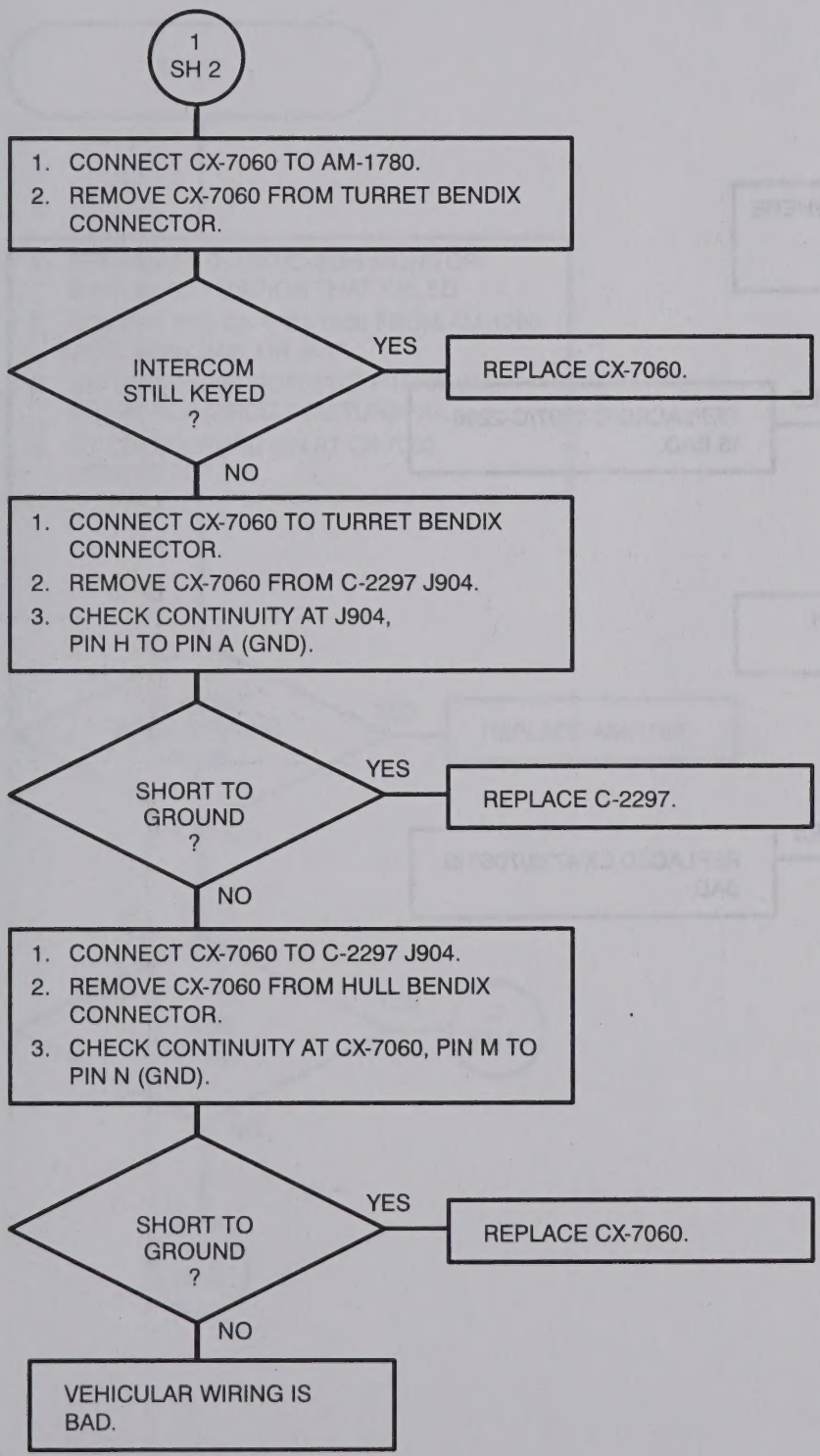
C-2298 J801, J804

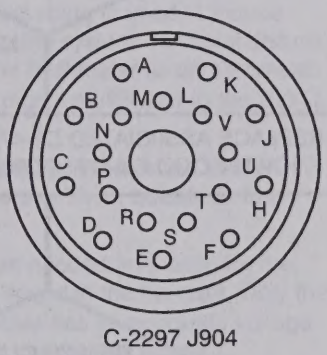
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 6

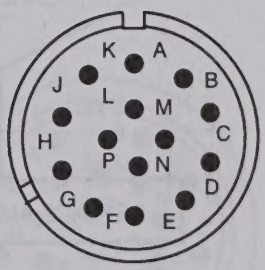
AM-1780 RELAYS DO NOT CLICK AND SIDETONE IS HEARD. INTERCOM CONTINUOUSLY KEYED WHILE CHECKING A C-2298 OR C-2297.

(Sheet 2 of 2)





C-2297 J904



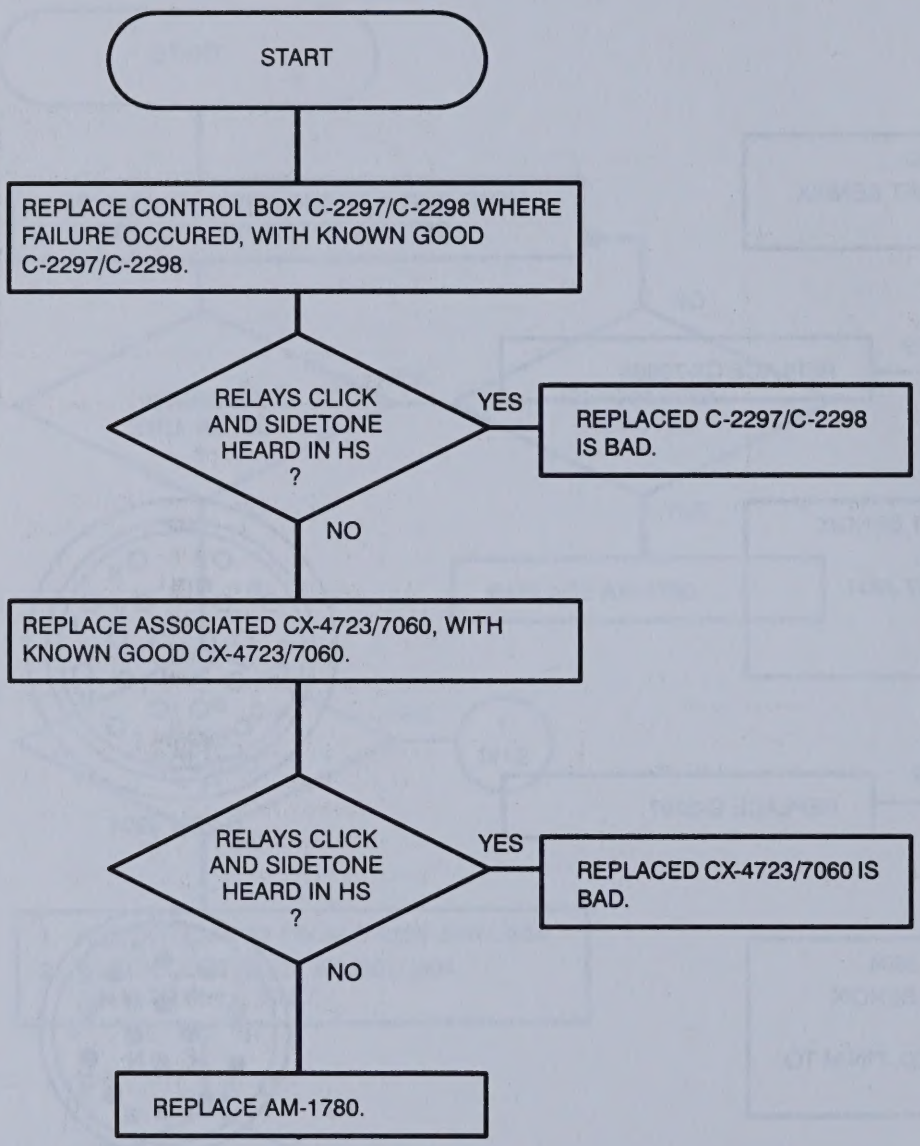
CX-7060

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 7

AM-1780 RELAYS CLICK AND NO SIDETONE HEARD AT EVERY TESTED POSITION OF MONITOR SWITCH.

(Sheet 1 of 1)

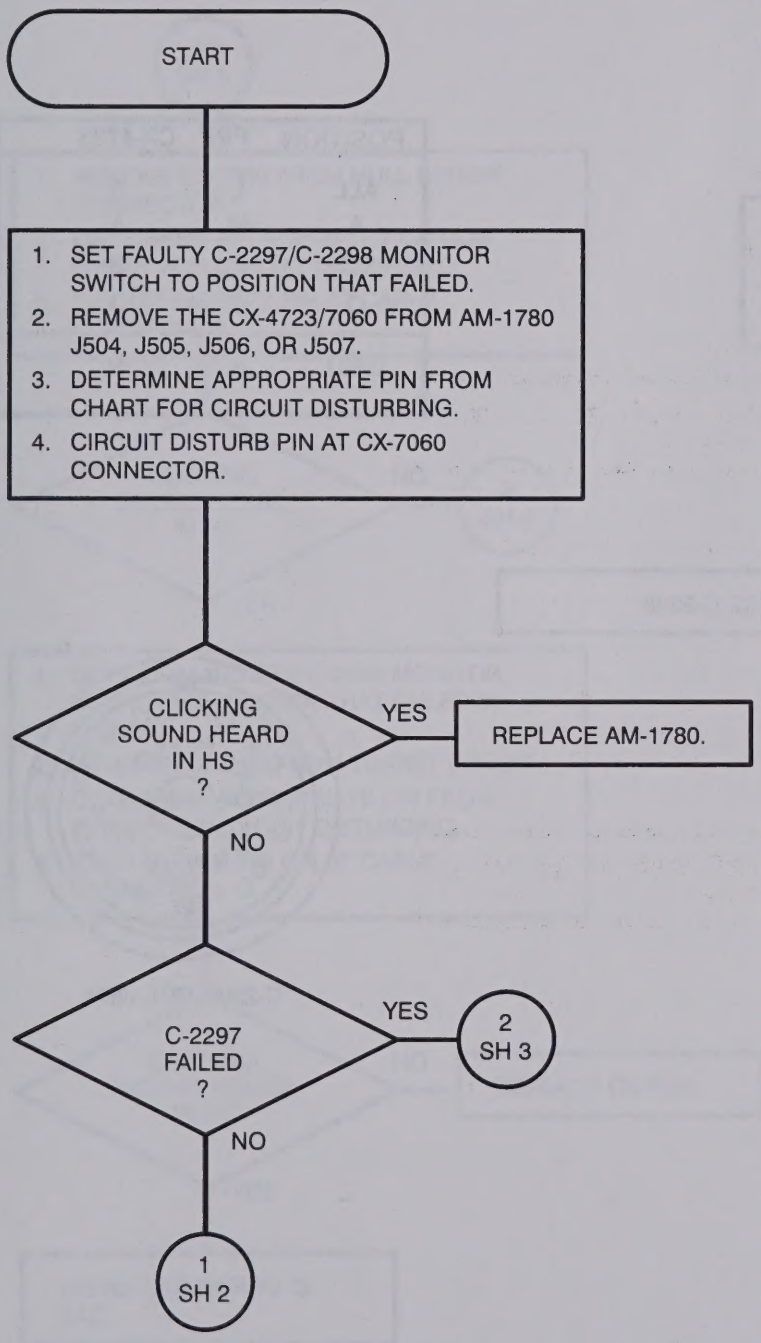


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8

AM-1780 RELAYS CLICK AND NO SIDETONE HEARD AT A PARTICULAR POSITION OF MONITOR SWITCH.

(Sheet 1 of 4)



POSITION	PIN	CX-4723/7060
ALL	L	B
A	M	A
INT	E	G
C	B	J
GND	A	N

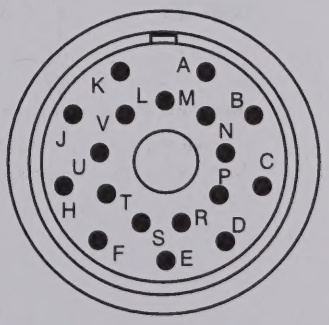
NOTE:

Circuit disturbing is used to induce noise into the system. To circuit disturb, set up the multimeter as an ohmmeter. Use the digital multimeter in the 200 Ω range.

Connect the ground probe to the indicated pin. Then, quickly lift the probe.

Repeat as needed and listen for the clicking sound in the handset. Only the 200 Ω scale has an adequate voltage to cause the clicking sound.

This chart checks for opens on the listen lines.



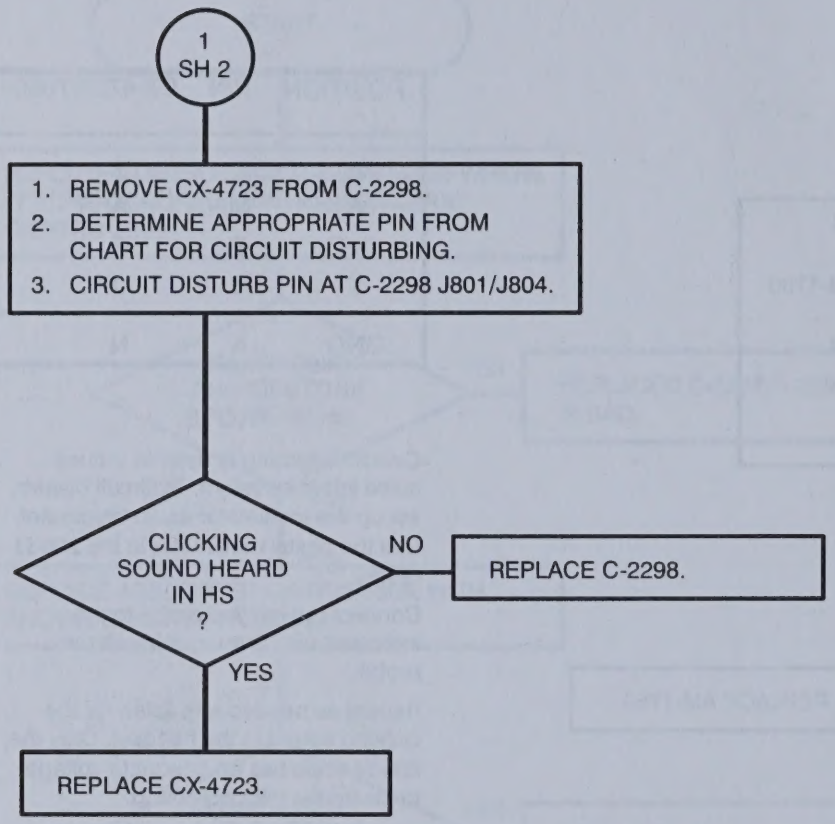
CX-4723/7060

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

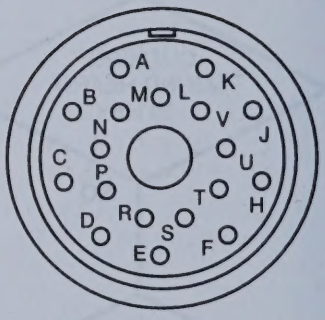
CHART 8

AM-1780 RELAYS CLICK AND NO SIDETONE HEARD AT A PARTICULAR POSITION OF MONITOR SWITCH.

(Sheet 2 of 4)



POSITION	PIN	CX-4723
ALL	L	B
A	M	A
INT	E	G
C	B	J
GND	A	N



C-2298 J801, J804

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8

AM-1780 RELAYS CLICK AND NO SIDETONE HEARD AT A PARTICULAR POSITION OF MONITOR SWITCH.

(Sheet 3 of 4)

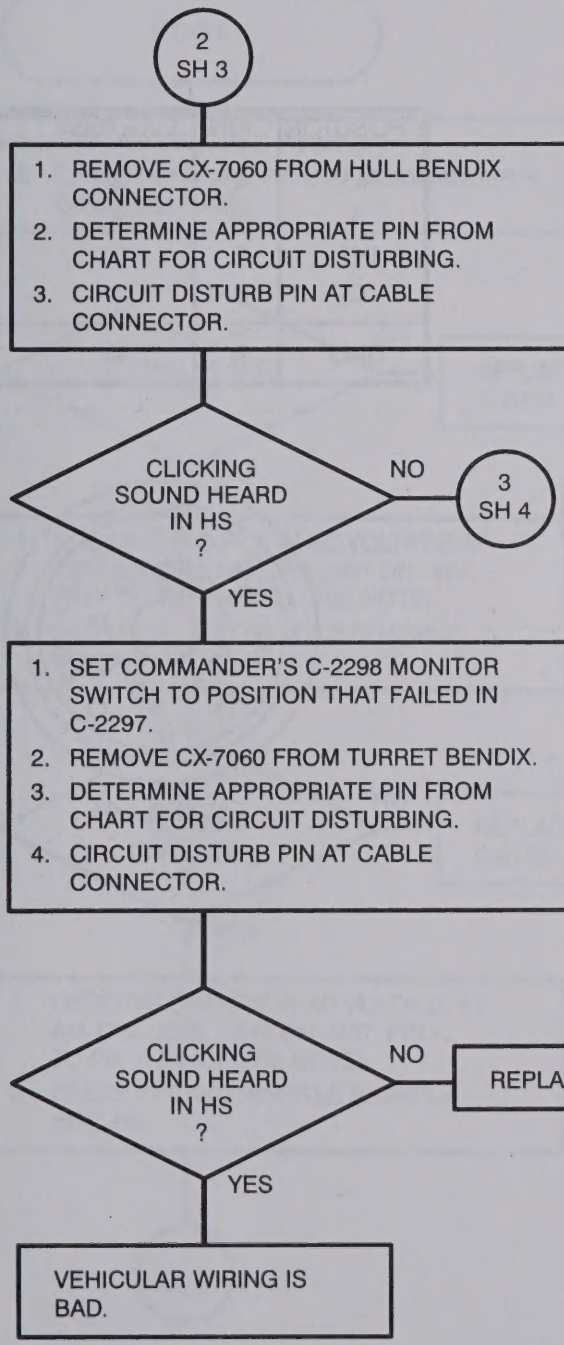
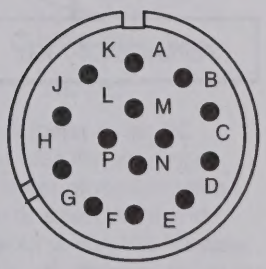


CHART:

POSITION	PIN	CX-7060
ALL	L	B
A	M	A
INT	E	G
C	B	J
GND	A	N



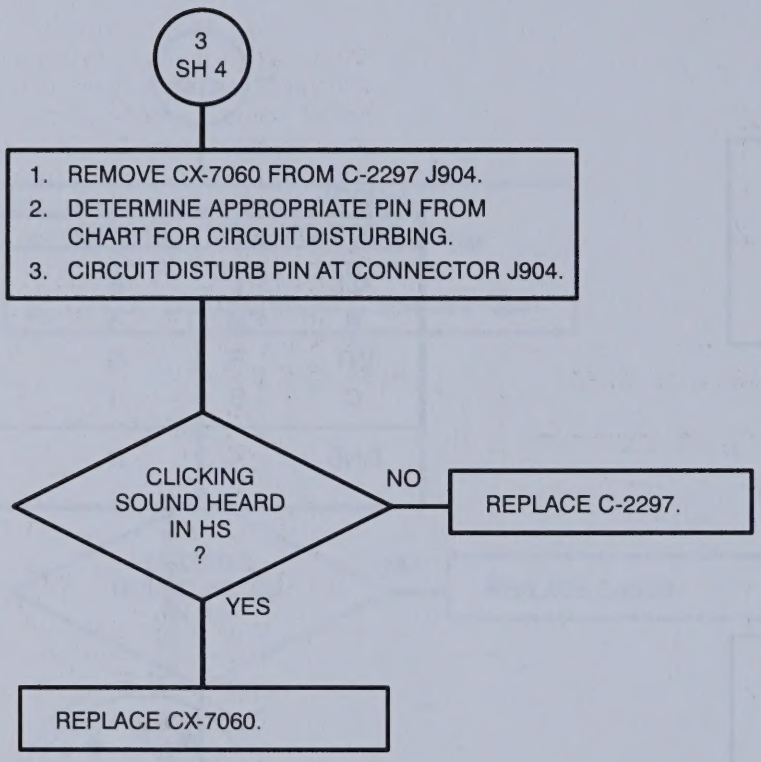
CX-7060

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

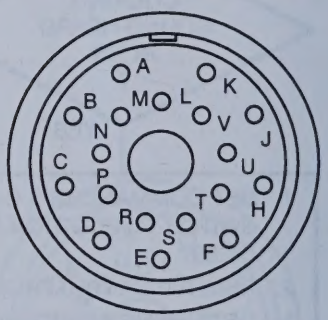
CHART 8

AM-1780 RELAYS CLICK AND NO SIDETONE HEARD AT A PARTICULAR POSITION OF MONITOR SWITCH.

(Sheet 4 of 4)



POSITION	PIN	CX-7060
ALL	L	B
A	M	A
INT	E	G
C	B	J
GND	A	N



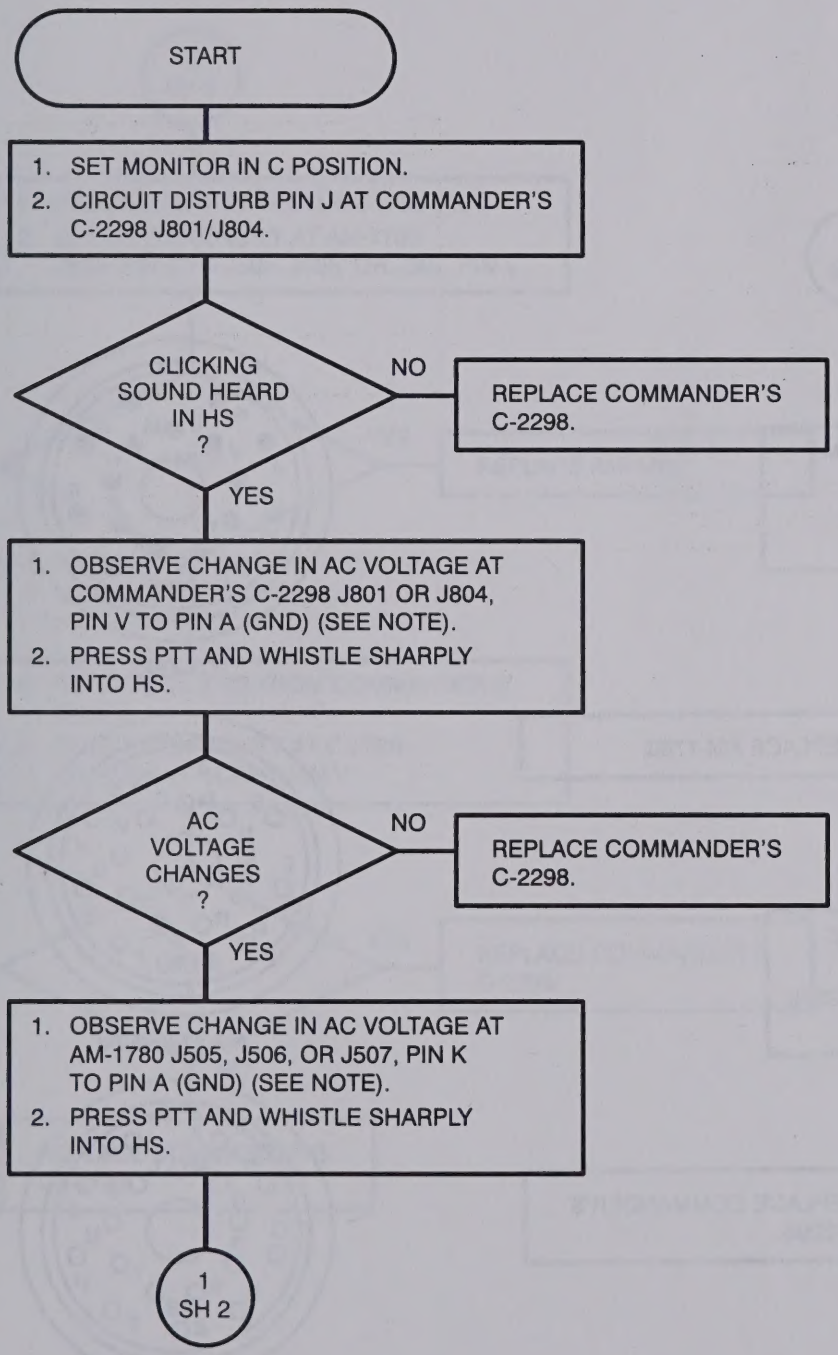
C-2297 J904

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

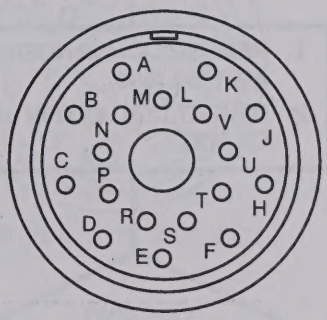
NO SIDETONE HEARD AT COMMANDER'S C-2298 WITH MONITOR SWITCH IN THE C POSITION.

(Sheet 1 of 3)



NOTE:

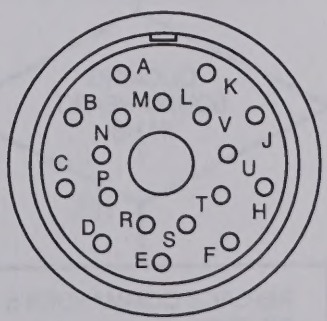
Circuit disturbing is used to induce noise into the system. To circuit disturb, set up the multimeter as an ohmmeter. Use the 200 Ω range. Connect the ground probe to pin A and touch the other probe to the indicated pin. Then, quickly lift the probe. Repeat as needed and listen for the clicking sound in the handset. Only the 200 Ω range has an adequate voltage to cause the clicking sound.



C-2298 J801, J804

NOTE:

Set up multimeter as an AC multimeter. Use lowest range. Connect meter probe between signal line or a test point and chassis ground. Key the handset and whistle into the mic look at the meter and note any change in the AC voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt.



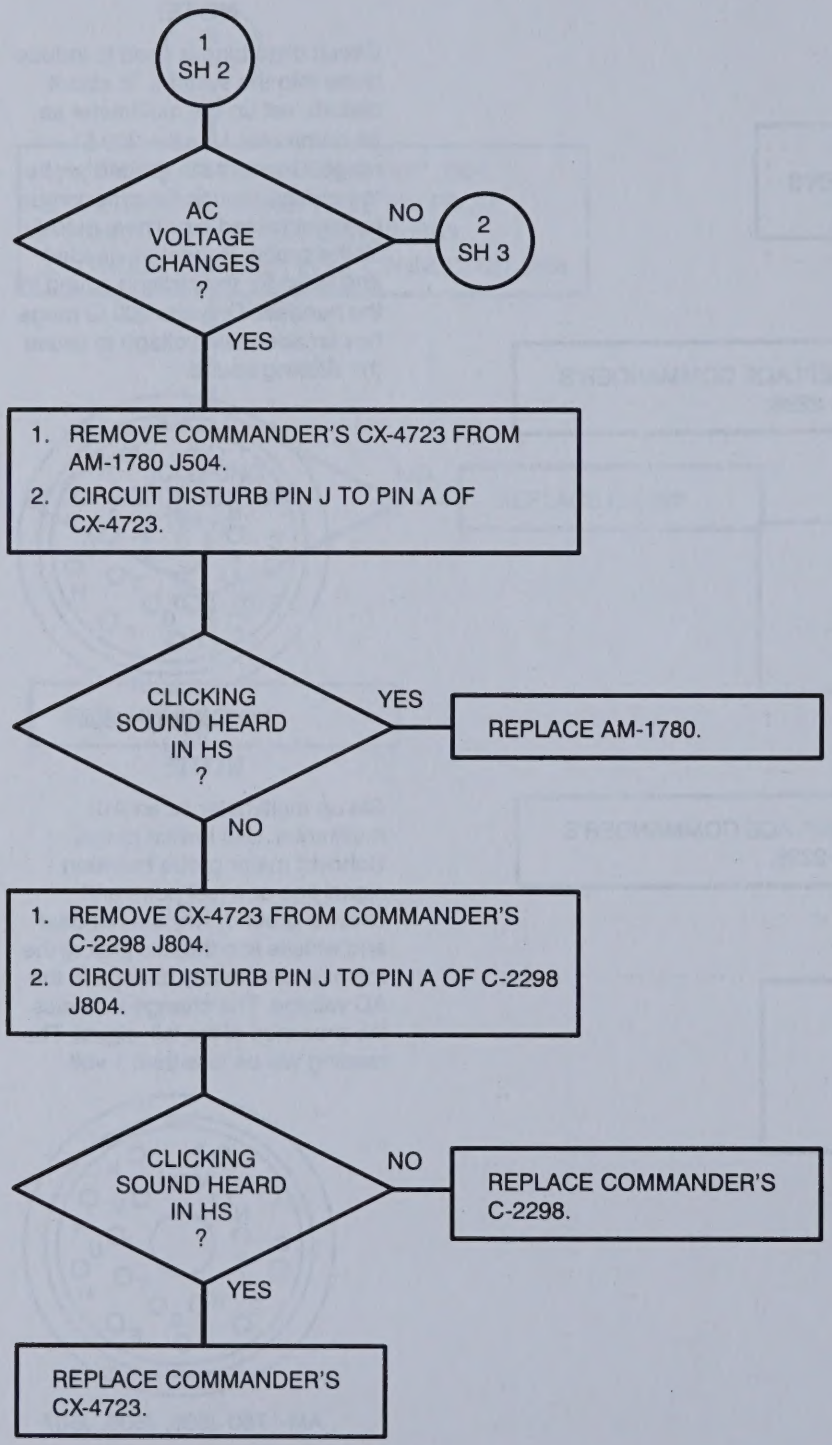
AM-1780 J505, J506, J507

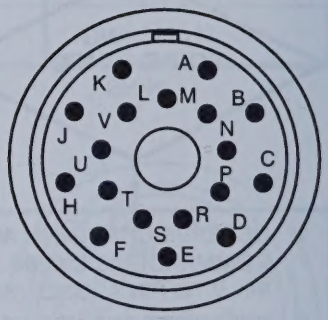
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

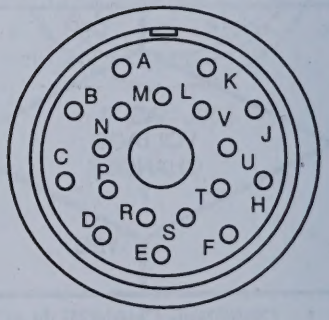
NO SIDETONE HEARD AT COMMANDER'S C-2298 WITH MONITOR SWITCH IN THE C POSITION.

(Sheet 2 of 3)

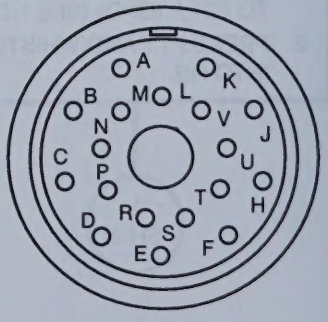




CX-4723



AM-1780 J504



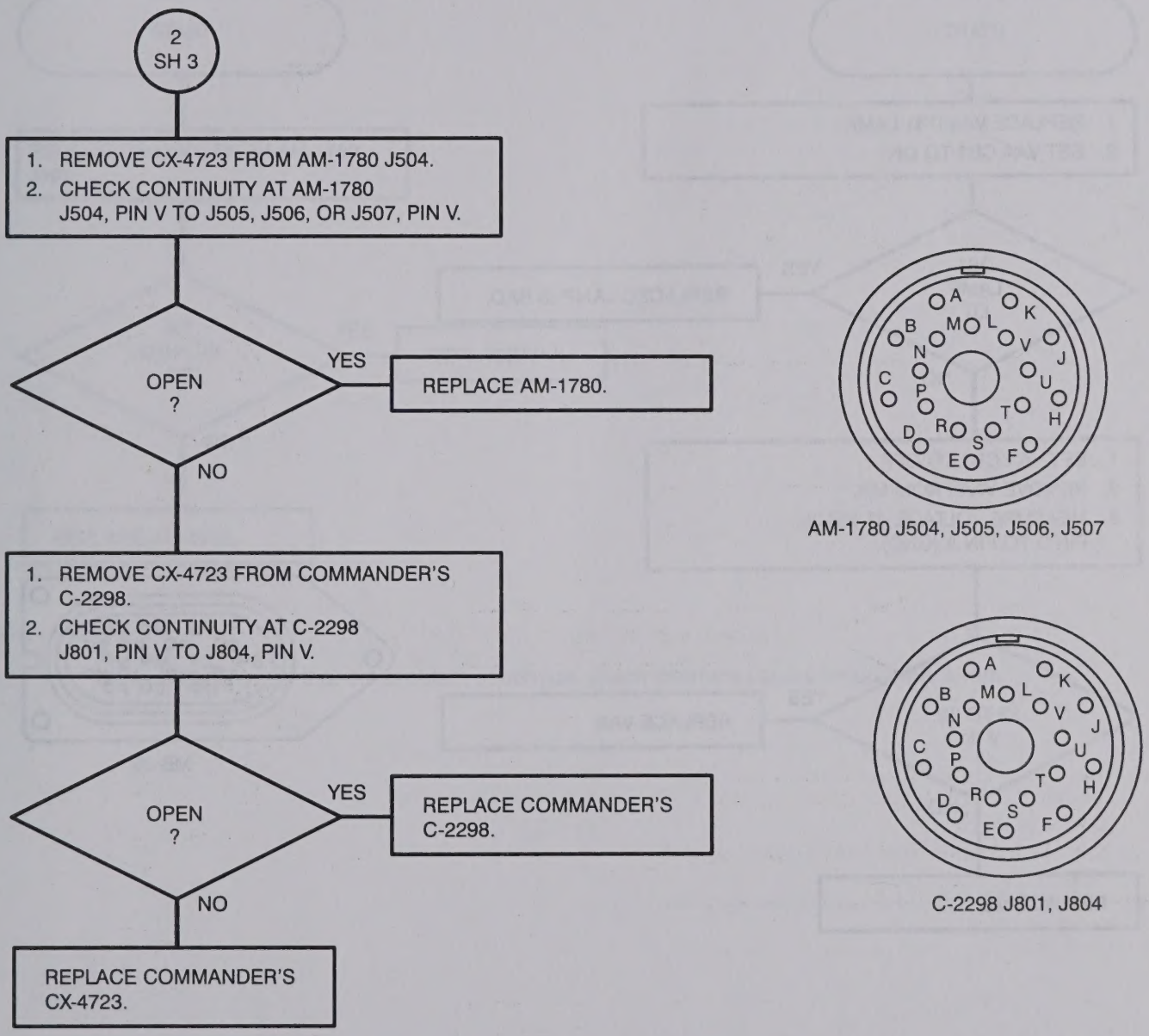
C-2298 J804

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

NO SIDETONE HEARD AT COMMANDER'S CONTROL BOX WITH MONITOR SWITCH IN THE C POSITION.

(Sheet 3 of 3)



AM-1780 J504, J505, J506, J507

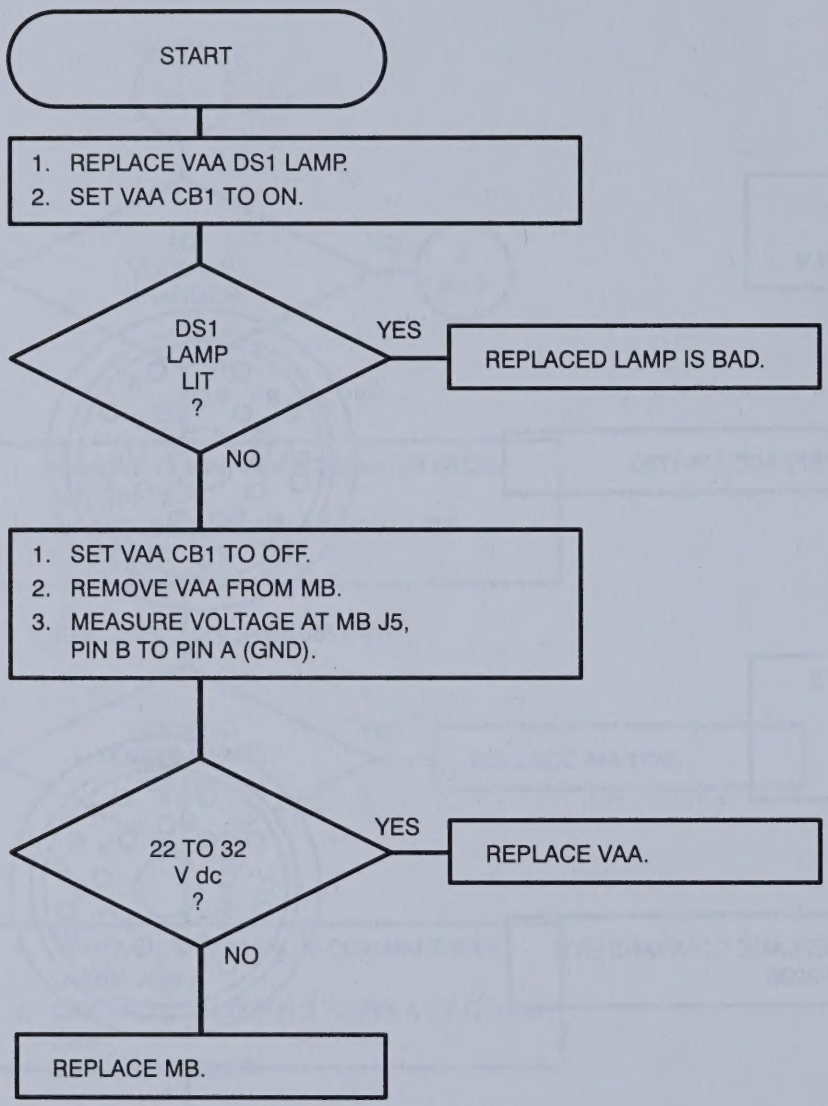
C-2298 J801, J804

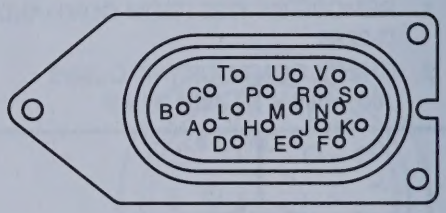
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 10

AM-7239 DS1 IS NOT LIT.

(Sheet 1 of 1)





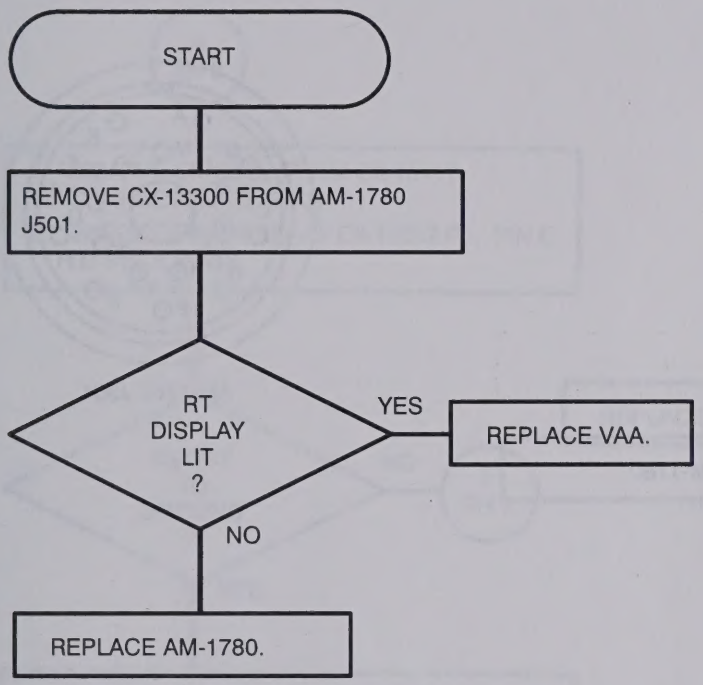
MB J5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 11

RT DISPLAY LIT WITH AM-1780 MAIN PWR SWITCH IN INT ONLY.

(Sheet 1 of 1)



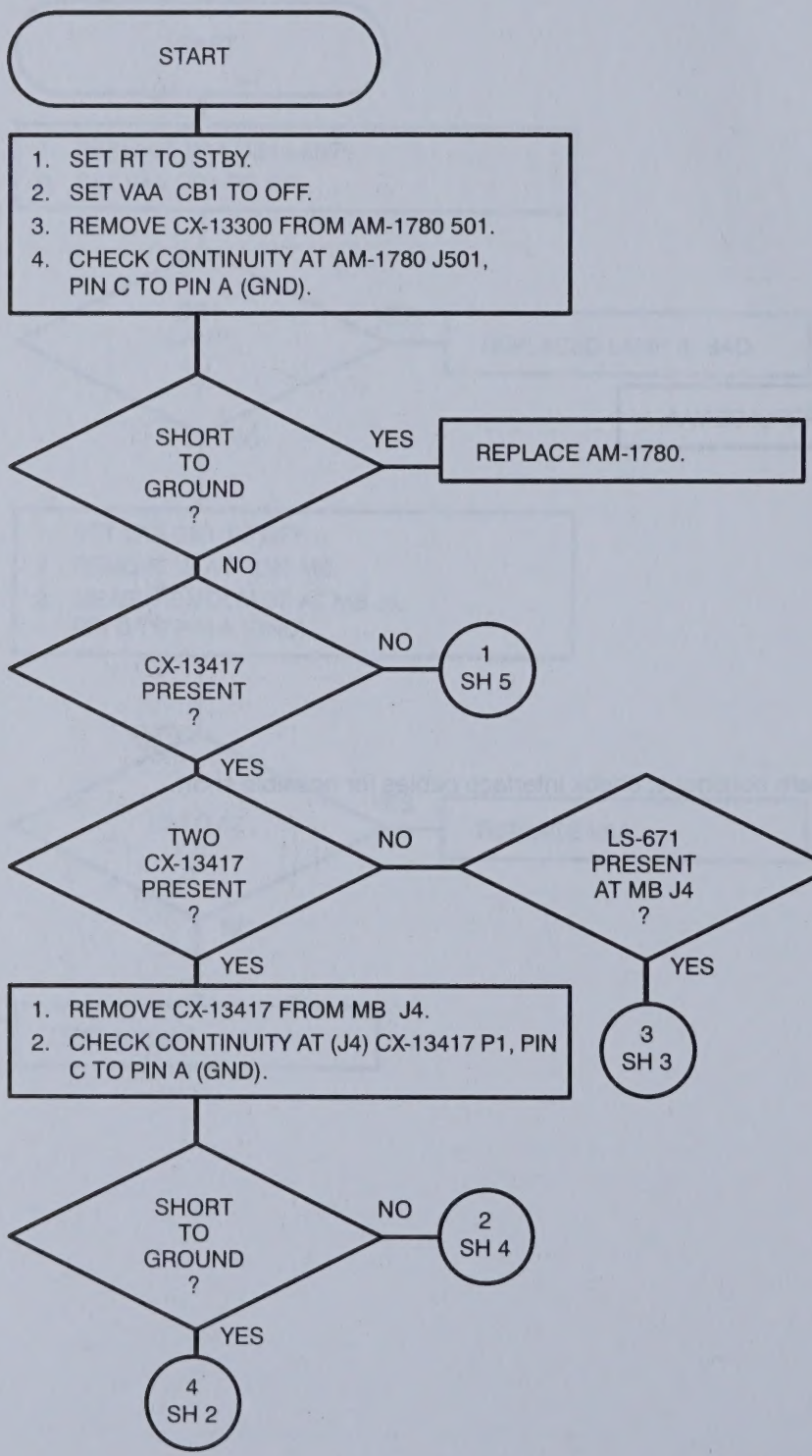
* In the unlikely event that the problem continous, check interface cables for possible short.

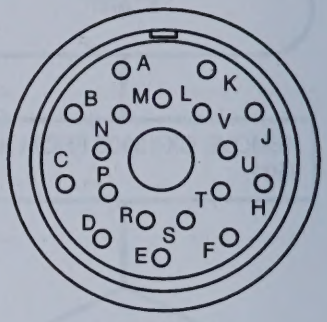
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 12

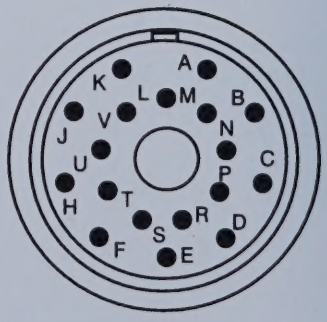
VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 1 of 5)





AM-1780 J501



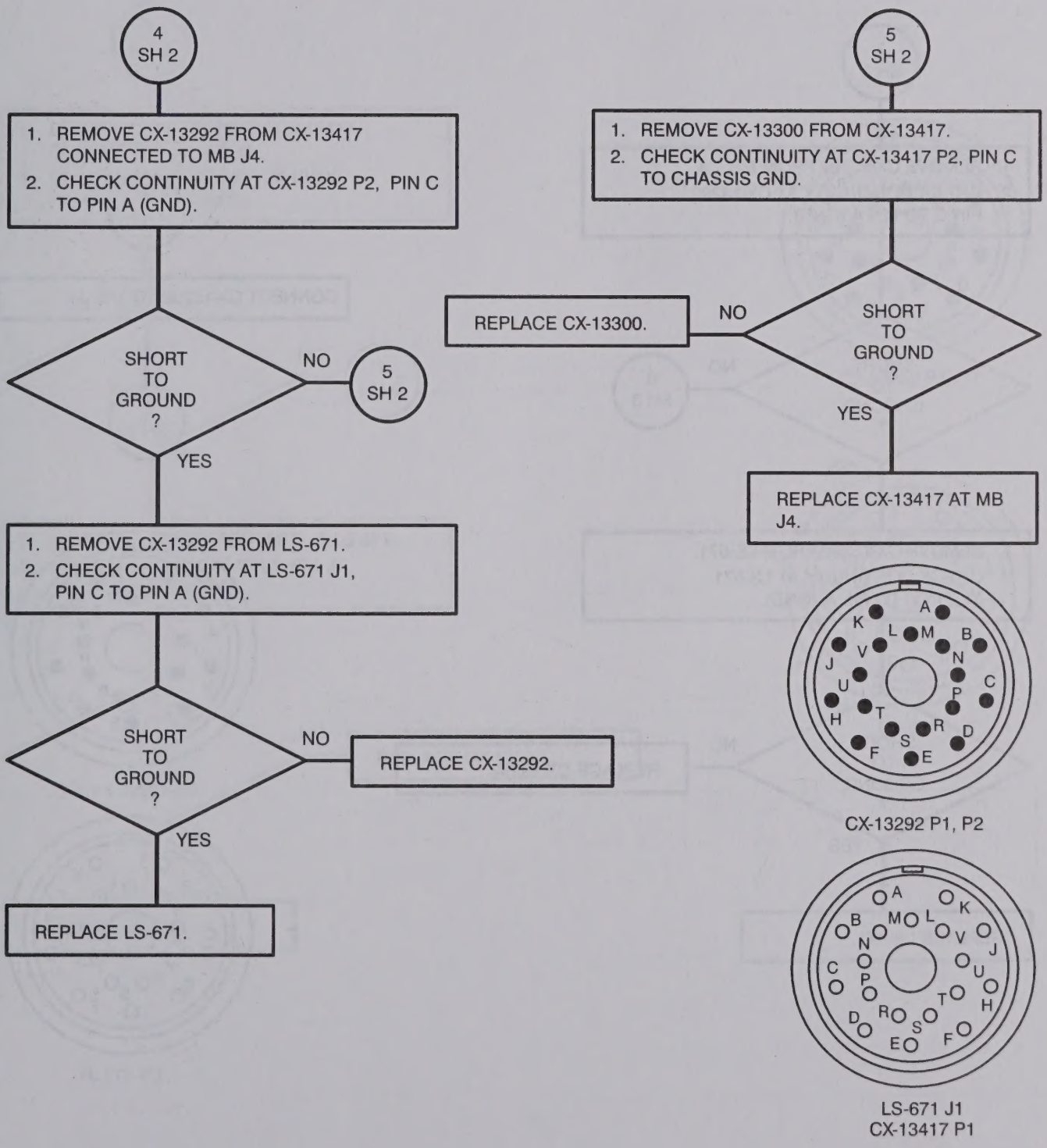
CX-13417 P1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 12

VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 2 of 5)

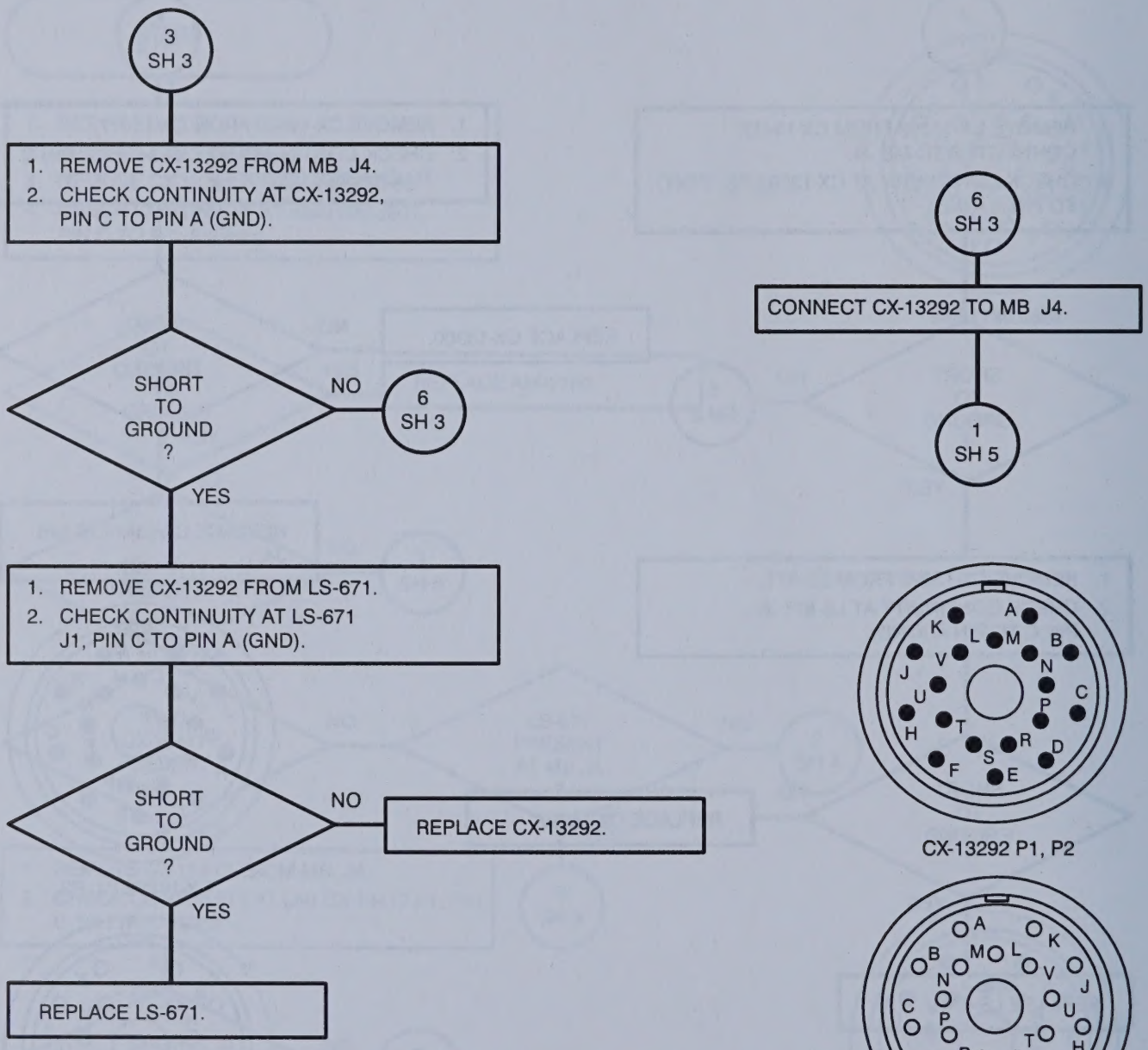


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 12

VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 3 of 5)



CX-13292 P1, P2

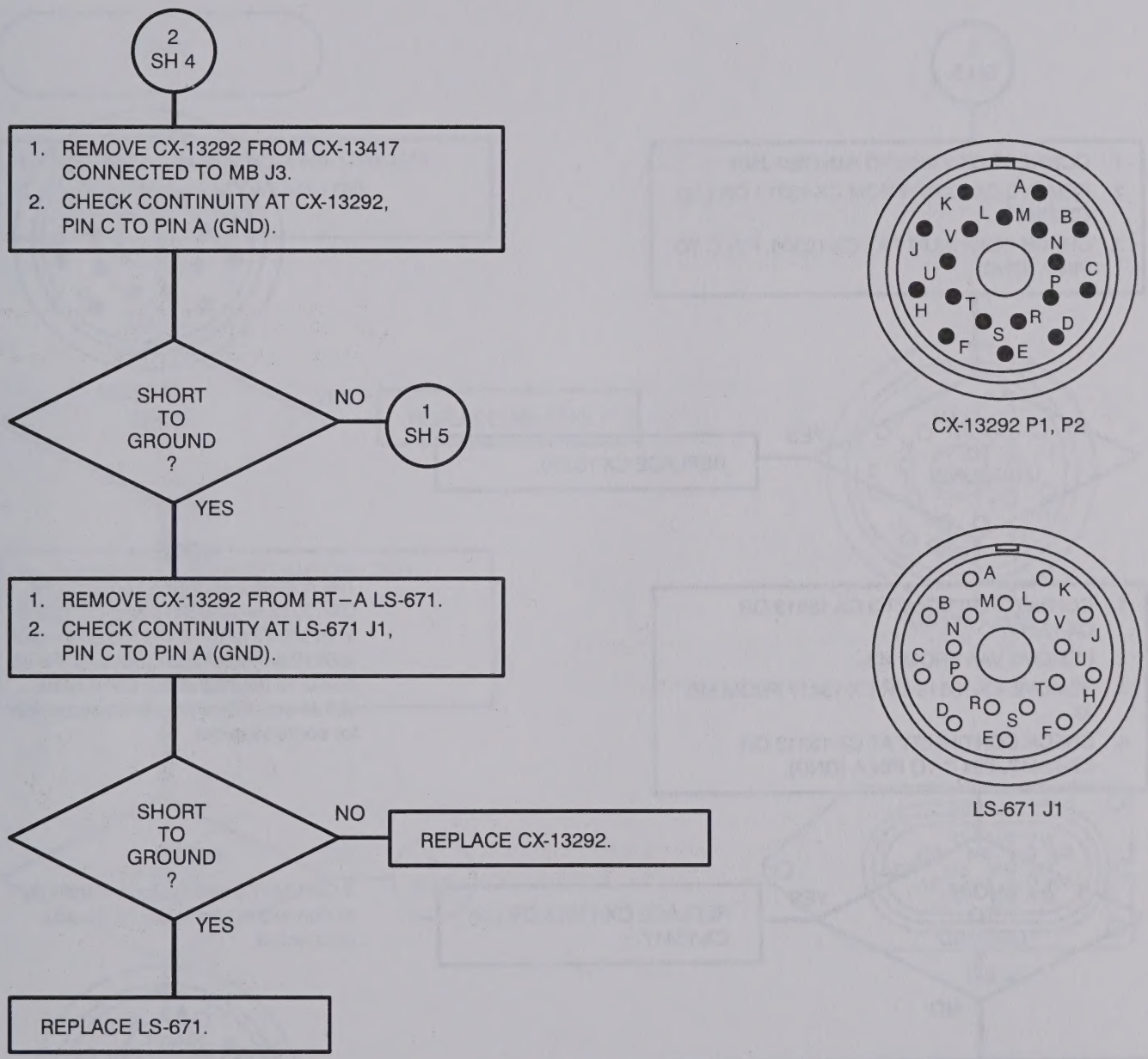
LS-671 J1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 12

VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 4 of 5)

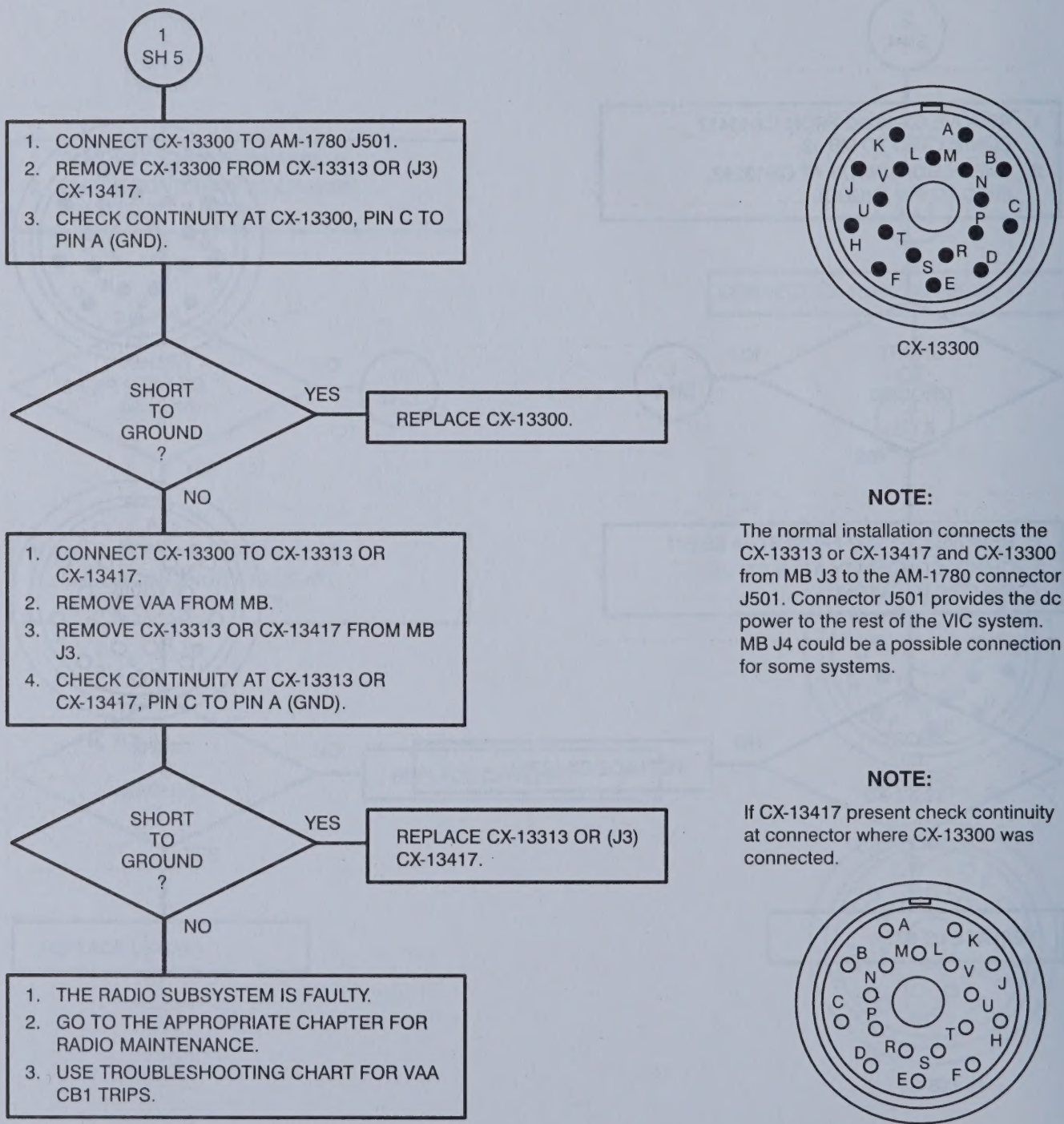


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 12

VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 5 of 5)



CX-13300

NOTE:

The normal installation connects the CX-13313 or CX-13417 and CX-13300 from MB J3 to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system. MB J4 could be a possible connection for some systems.

NOTE:

If CX-13417 present check continuity at connector where CX-13300 was connected.

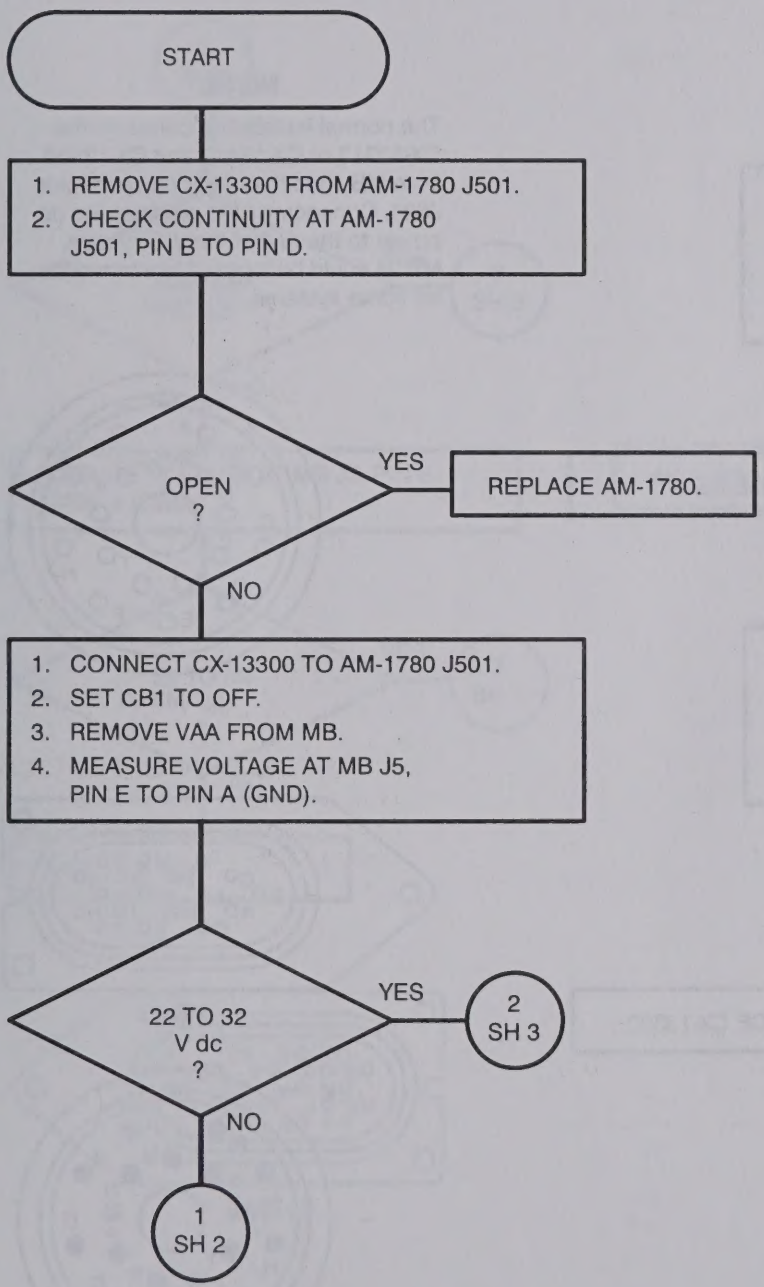
CX-13313 P1
CX-13417 J1, J2

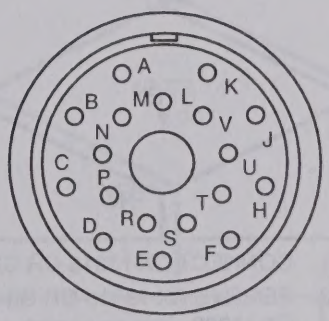
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 13

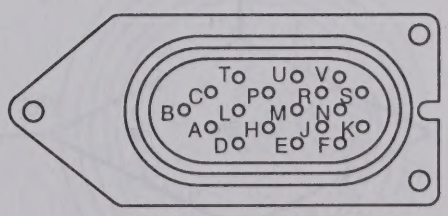
RT DISPLAY DOES NOT LIGHT WITH AM-1780 MAIN PWR SWITCH SET TO NORM.

(Sheet 1 of 3)





AM-1780 J501



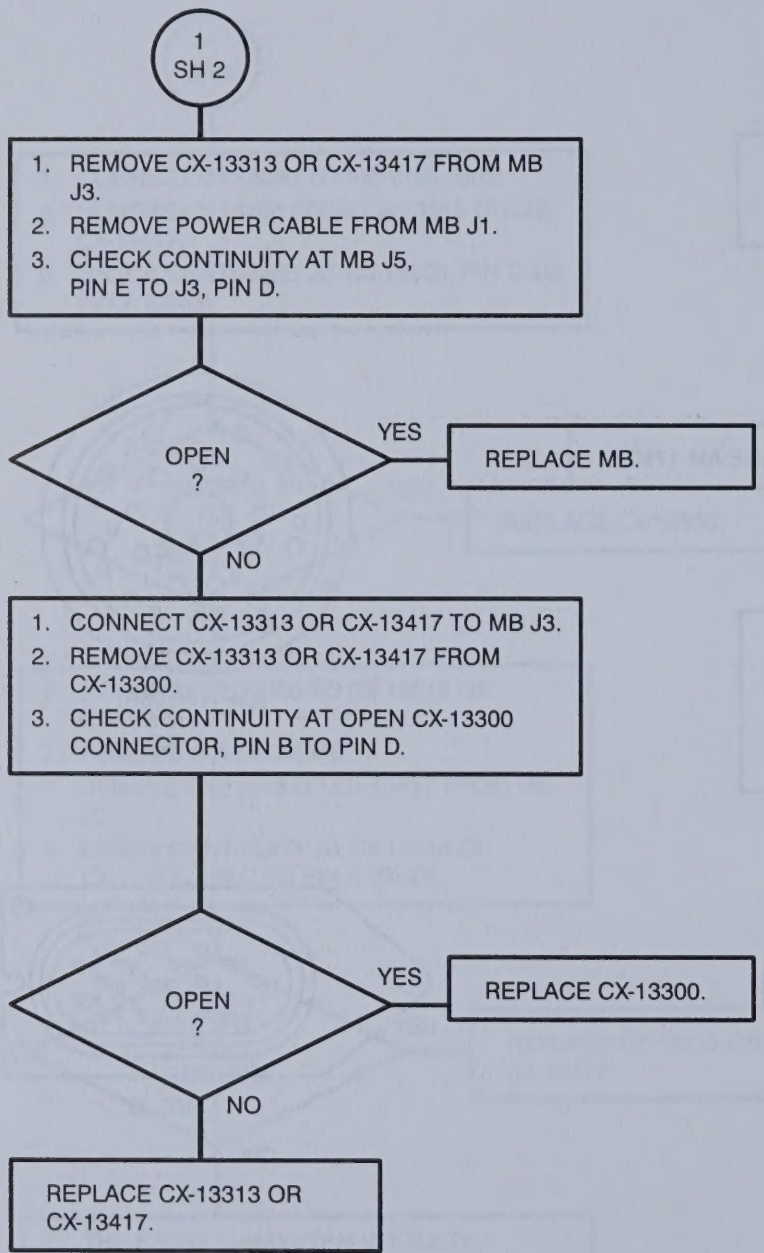
MB J5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 13

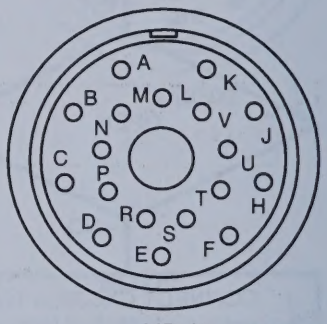
RT DISPLAY DOES NOT LIGHT WITH AM-1780 MAIN PWR SWITCH SET TO NORM.

(Sheet 2 of 3)

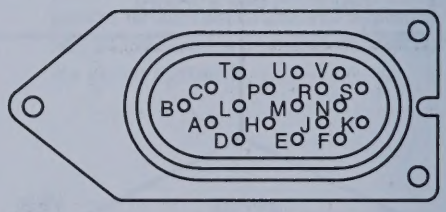


NOTE:

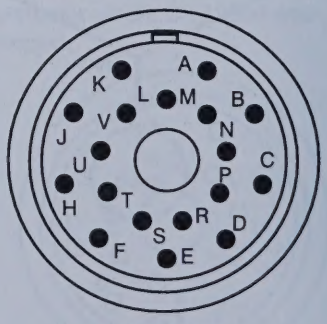
The normal installation connects the CX-13313 or CX-13417 and CX-13300 from MB J3 to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system. MB J4 could be a possible connection for some systems.



MB J3



MB J5



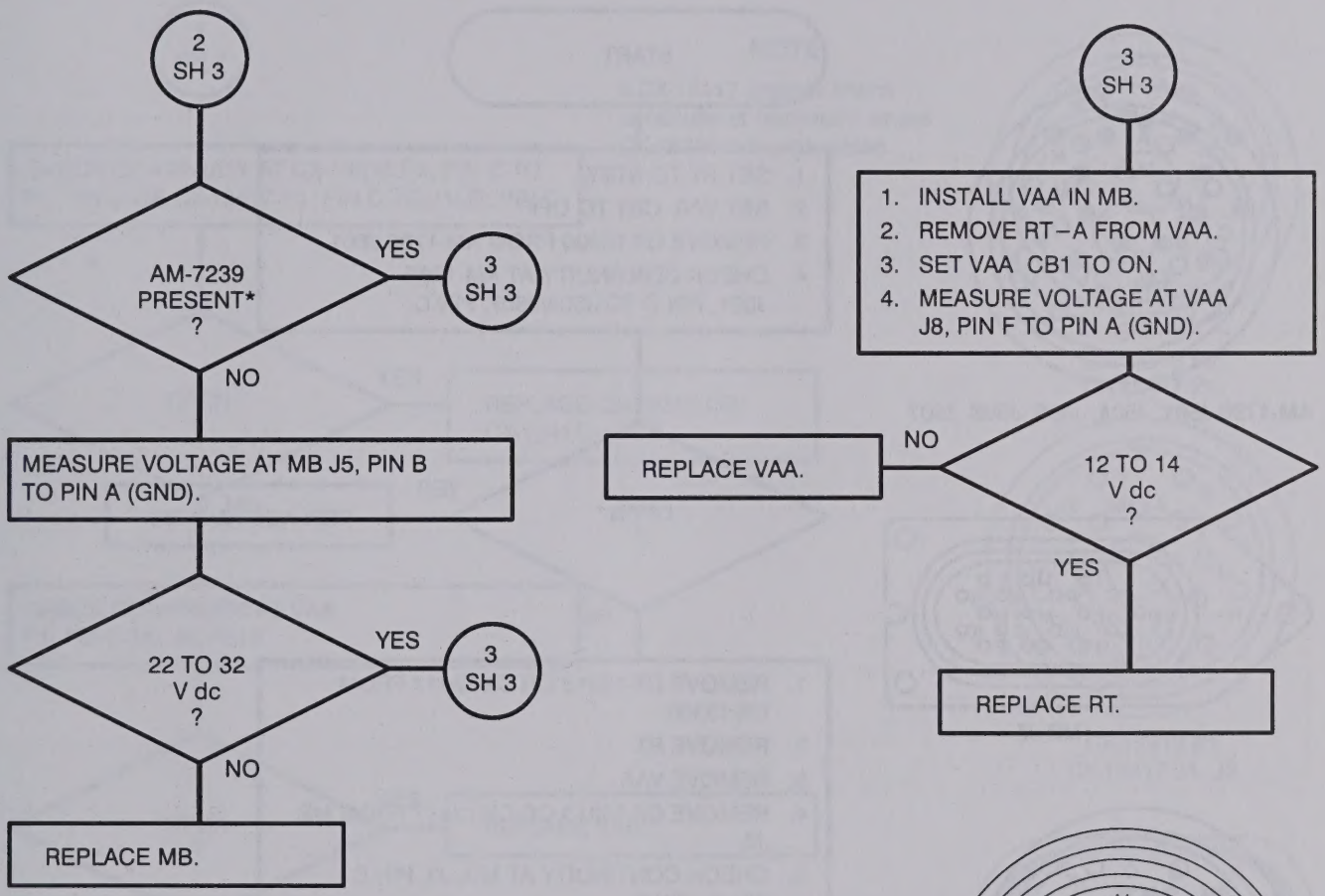
CX-13300

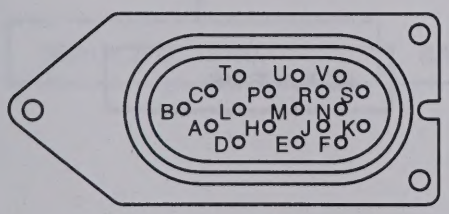
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 13

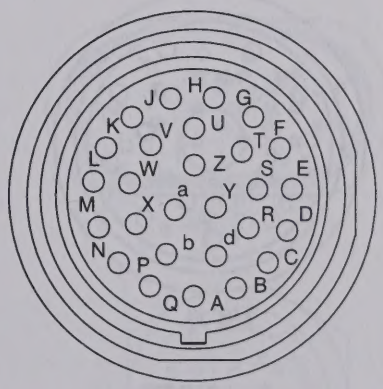
RT DISPLAY DOES NOT LIGHT WITH AM-1780 MAIN PWR SWITCH SET TO NORM.

(Sheet 3 of 3)





MB J5



VAA J8

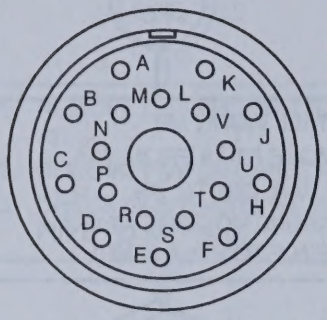
* NOT AM-7239A OR AM-7239B.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

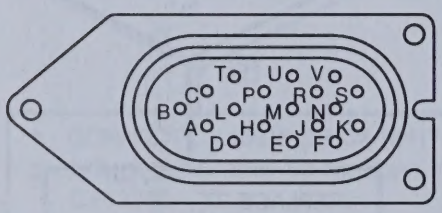
Chart 14

AM-1780 LAMP IS NOT LIT WITH VAA DS1 LIT.

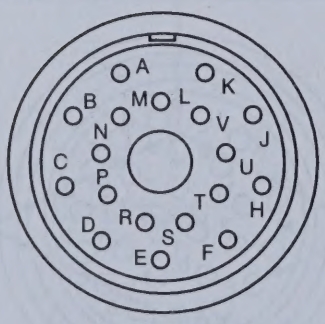
(Sheet 1 of 2)



AM-1780 J501, J504, J505, J506, J507



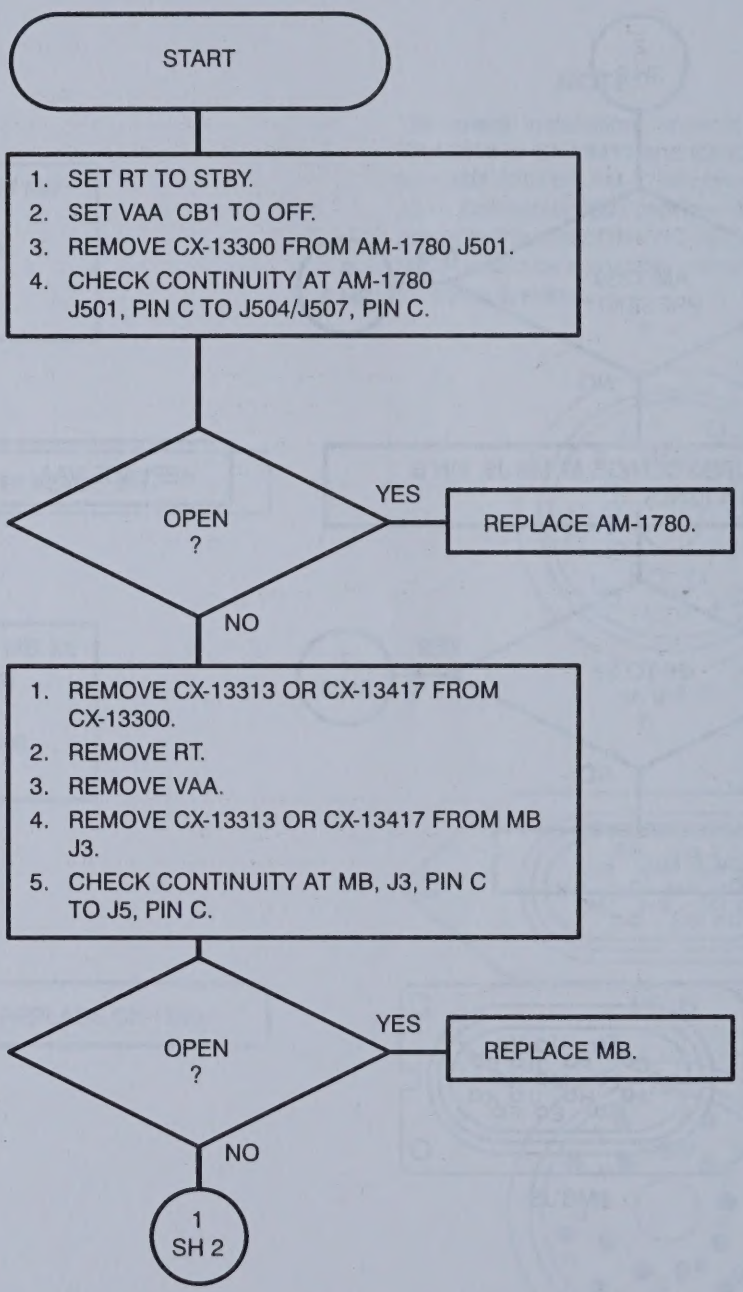
MB J5



MB J3

NOTE:

The normal installation connects the CX-13313 or CX-13417 and CX-13300 from MB J3 to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system. MB J4 could be a possible connection for some systems.

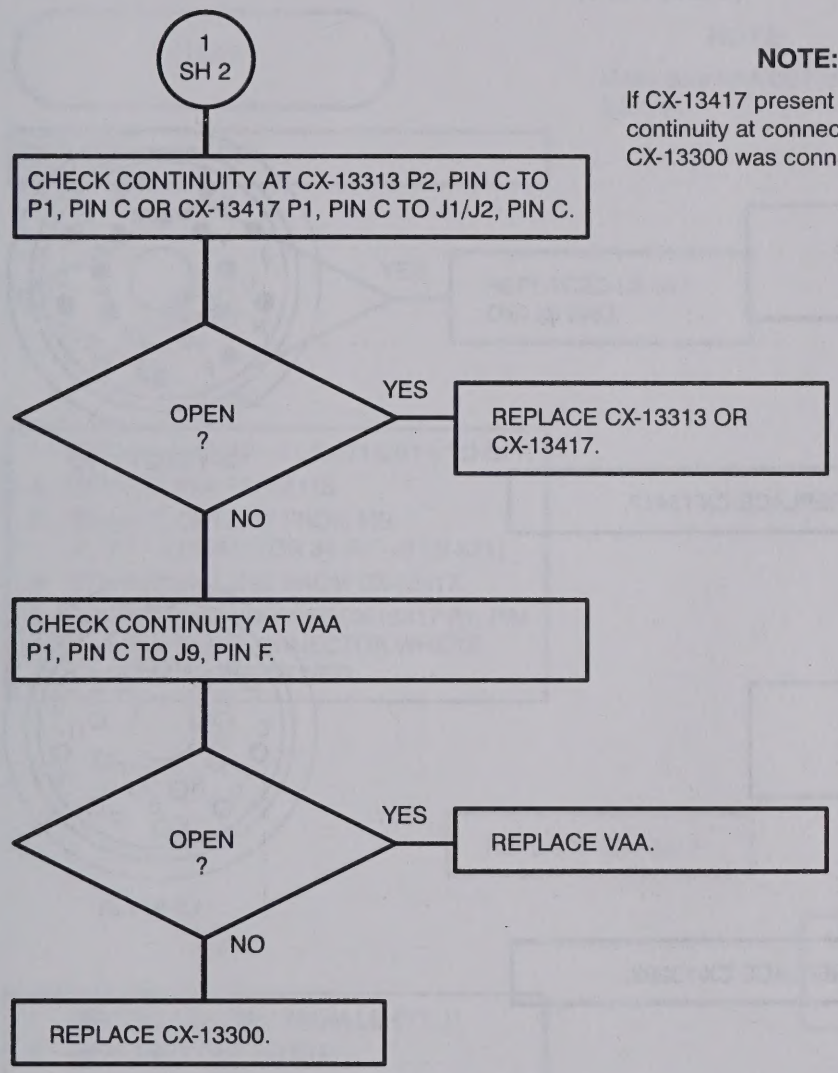


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 14

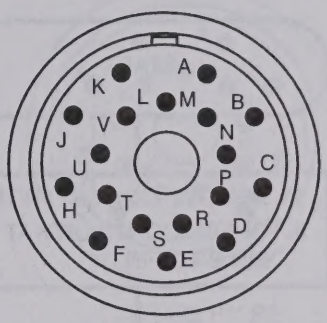
AM-1780 LAMP IS NOT LIT WITH VAA DS1 LIT.

(Sheet 2 of 2)

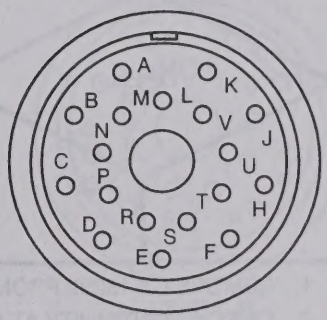


NOTE:

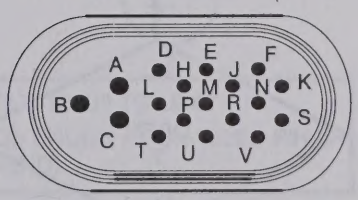
If CX-13417 present check continuity at connector where CX-13300 was connected.



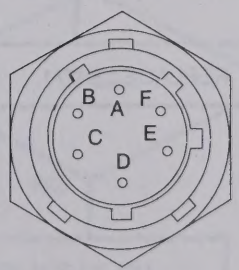
CX-13313 P2
CX-13417 P1



CX-13313 P1
CX-13417 J1, J2



VAA P1



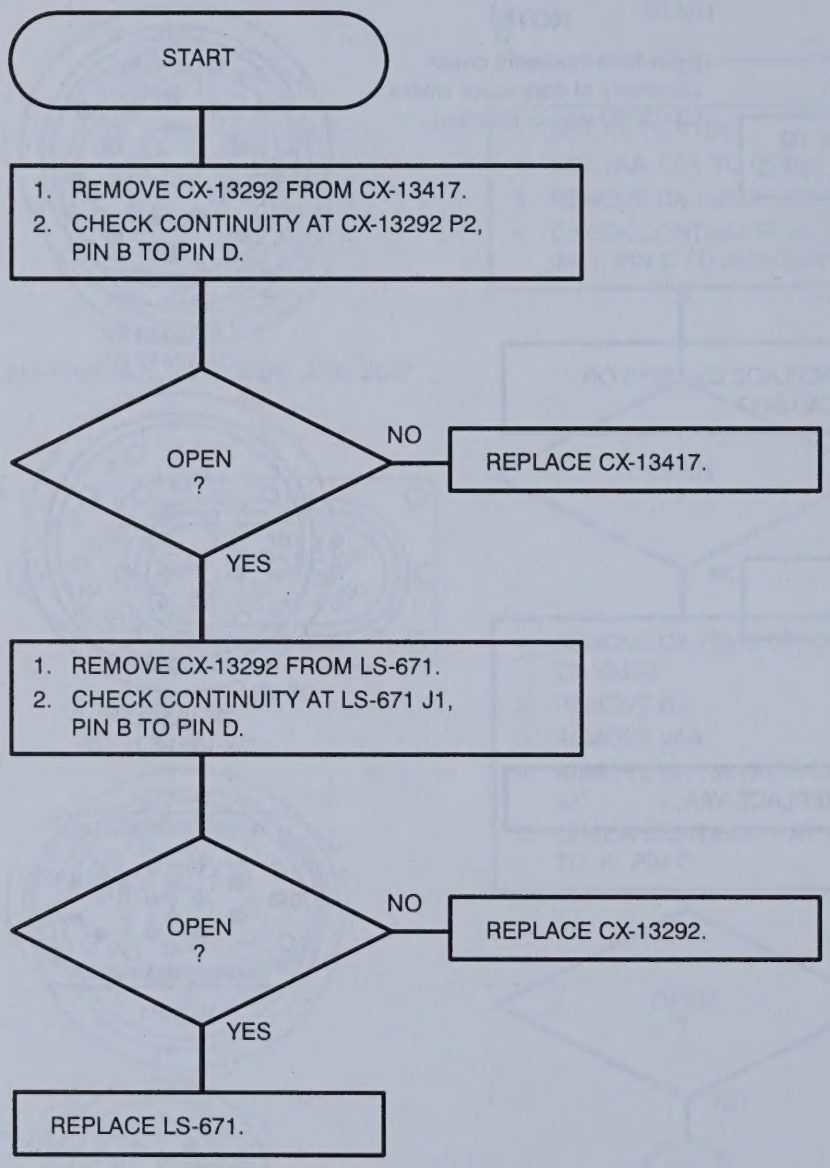
VAA J9

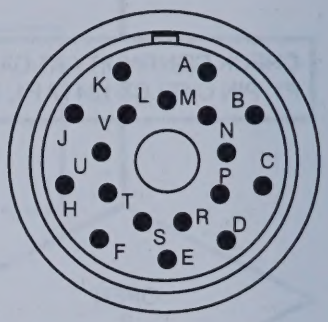
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 15

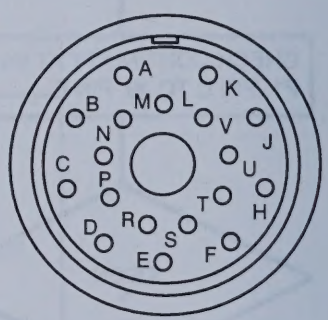
RT DISPLAY DOES NOT LIGHT WITH RT-A LS-671 CB1 SET TO ON, 1 OR 2 SPLITTER CABLES PRESENT.

(Sheet 1 of 1)





CX-13292 P1, P2



LS-671 J1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 16

RT-A OR RT-B LS-671 DS1 DOES NOT LIGHT (SPLITTER CABLE PRESENT).

(Sheet 1 of 1)

START

REPLACE LS-671 DS1.

LS-671 DS1 LIT ?

YES → REPLACED LS-671 DS1 IS BAD.

NO

1. SET VAA AND RT-A LS-671 CB1's TO OFF.
2. REMOVE VAA FROM MB.
3. REMOVE CX-13417 FROM MB J3 (RT-A LS-671) OR J4 (RT-B LS-671)
4. REMOVE CX-13292 FROM CX-13417.
5. CHECK CONTINUITY AT CX-13417 P1, PIN C TO PIN C OF CONNECTOR WHERE CX-13292 WAS REMOVED.

OPEN ?

YES → REPLACE CX-13417.

NO

1. REMOVE CX-13292 FROM LS-671 J1.
2. SET LS-671 CB1 TO ON.
3. MEASURE RESISTANCE AT LS-671 J1, PIN C TO PIN A (GND).

GREATER THAN 20 K OHMS BUT NOT OPEN ?

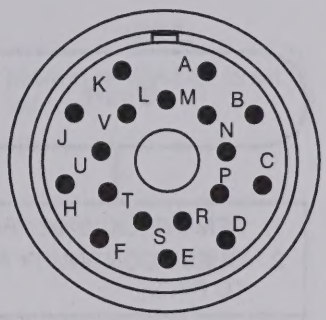
NO → REPLACE LS-671.

YES

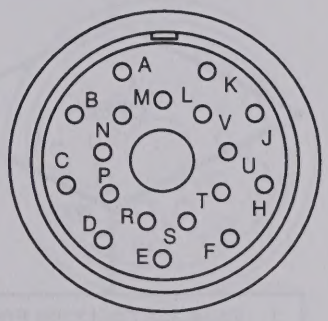
1 SH 1

NOTE:

Make sure VAA DS1 is set full ccw.



CX-13292 P1, P2
CX-13417 P1



LS-671 J1
CX-13417 J1, J2

1 SH 1

1. CONNECT CX-13292 TO LS-671 J1.
2. CHECK CONTINUITY AT CX-13292, PIN C TO PIN A (GND).

OPEN ?

YES → REPLACE CX-13292.

NO

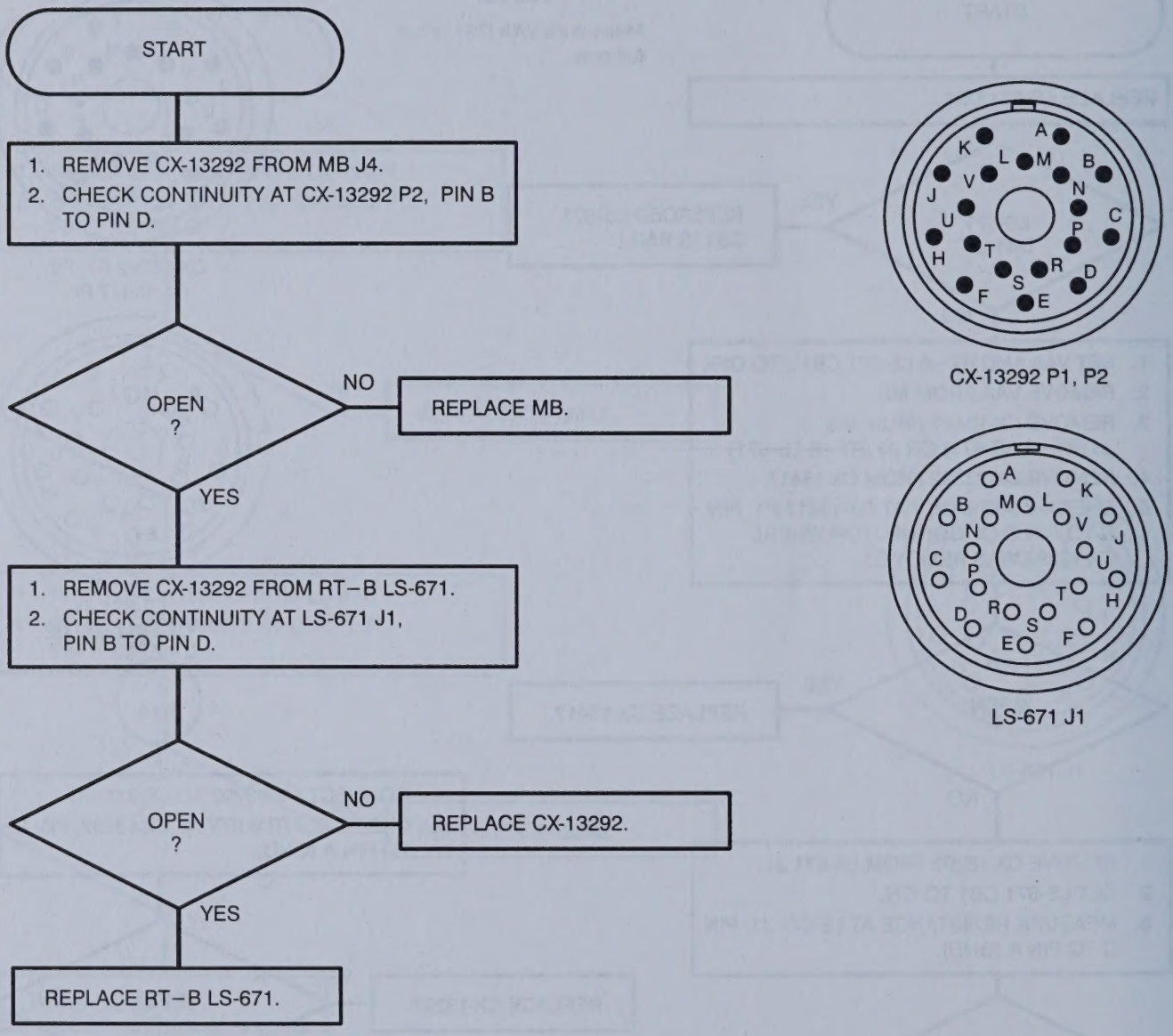
REPLACE LS-671.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 17

RT DISPLAY DOES NOT LIGHT WITH RT-B LS-671 CB1 SET TO ON. RT-B LS-671 PRESENT, BUT NO SPLITTER CABLE AT MB J4.

(Sheet 1 of 1)

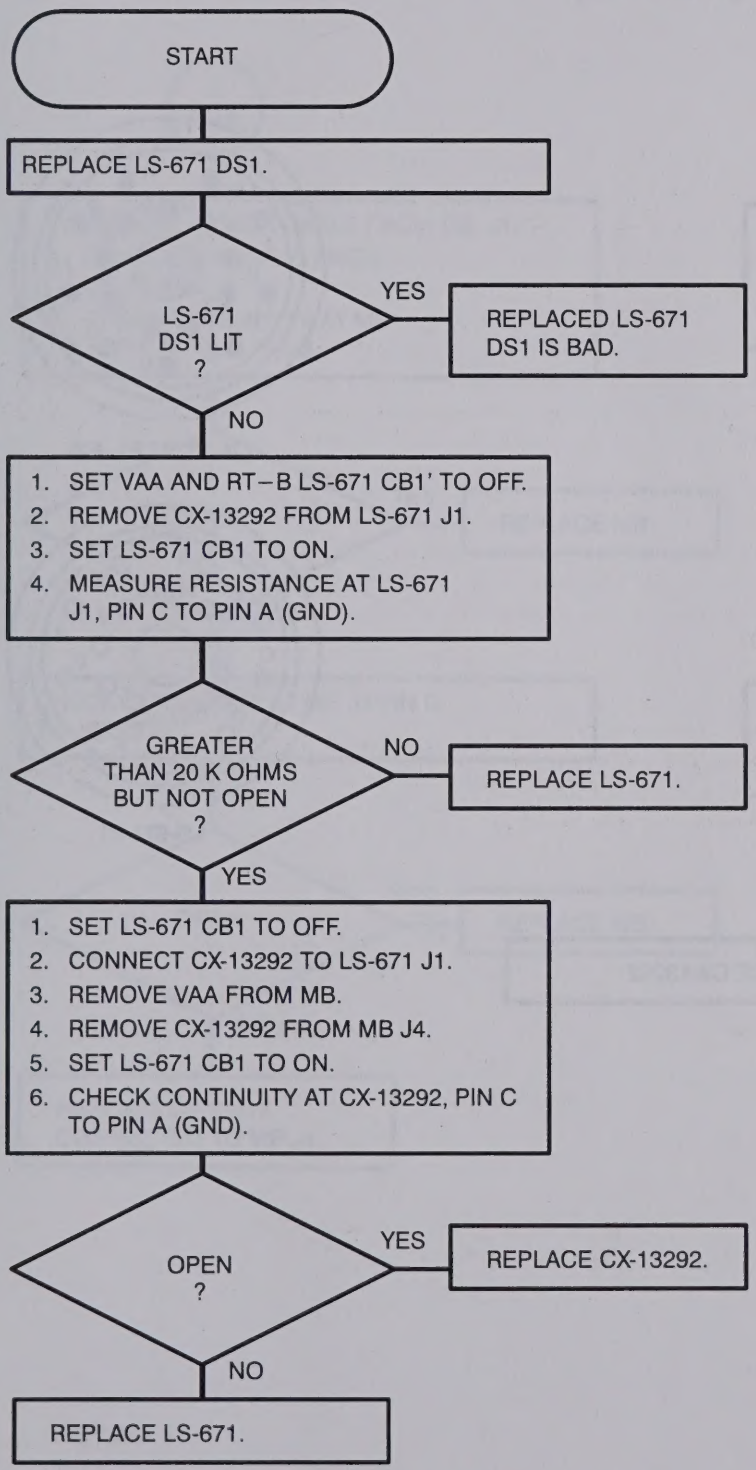


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 18

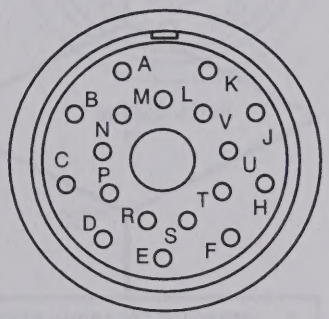
RT-B LS-671 DS1 DOES NOT LIGHT (NO SPLITTER CABLE PRESENT).

(Sheet 1 of 1)

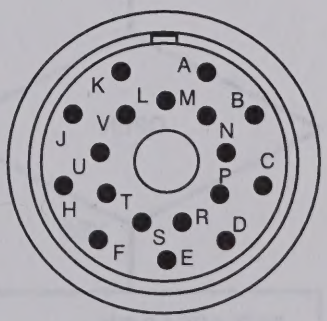


NOTE:

Make sure VAA DS1 is set full ccw.



LS-671 J1



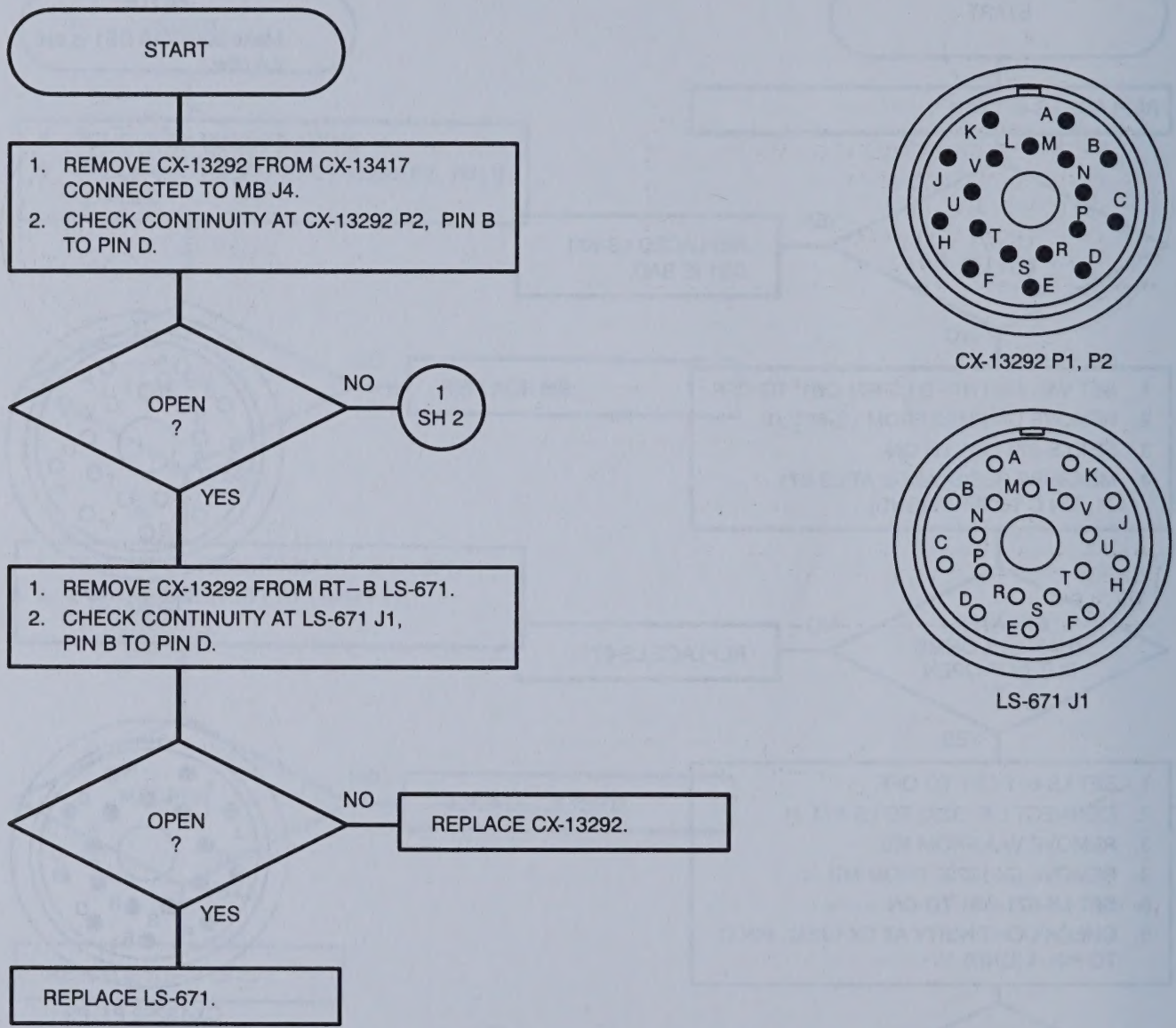
CX-13292 P1, P2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 19

RT DISPLAY DOES NOT LIGHT WITH RT-B LS-671 CB1 SET TO ON, 2 SPLITTER CABLES PRESENT.

(Sheet 1 of 2)



CX-13292 P1, P2

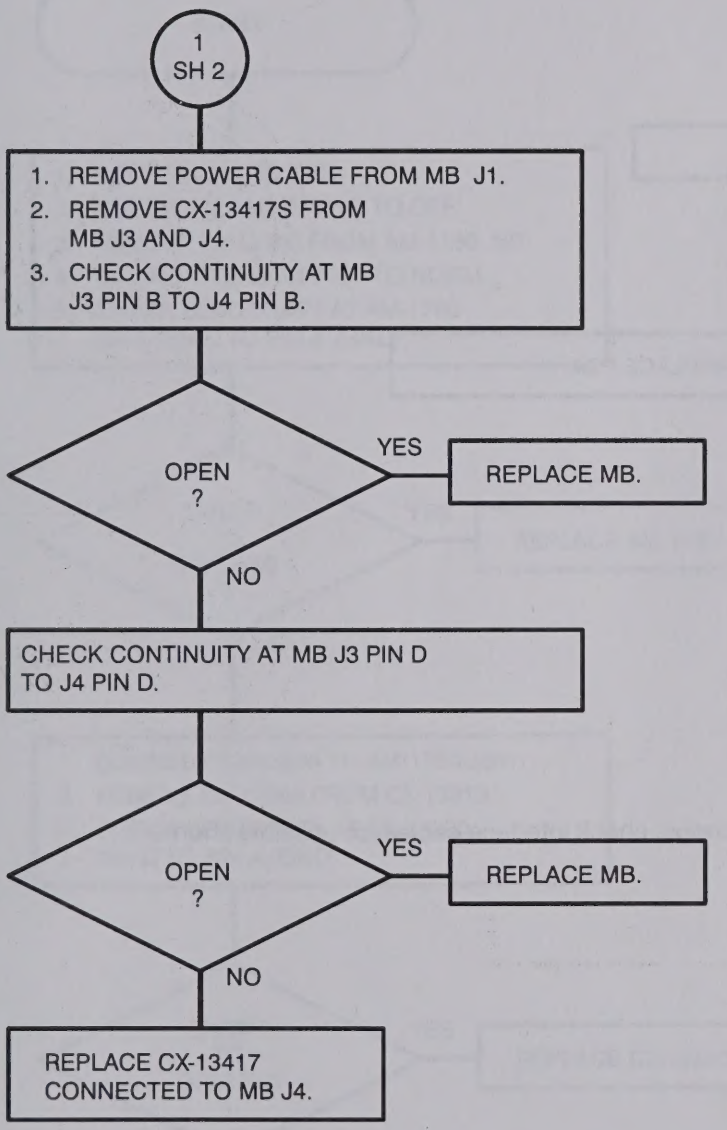
LS-671 J1

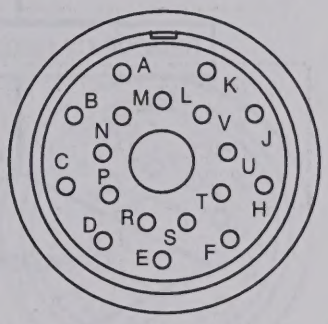
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 19

RT DISPLAY DOES NOT LIGHT WITH RT-B LS-671 CB1 SET TO ON, 2 SPLITTER CABLES PRESENT.

(Sheet 2 of 2)





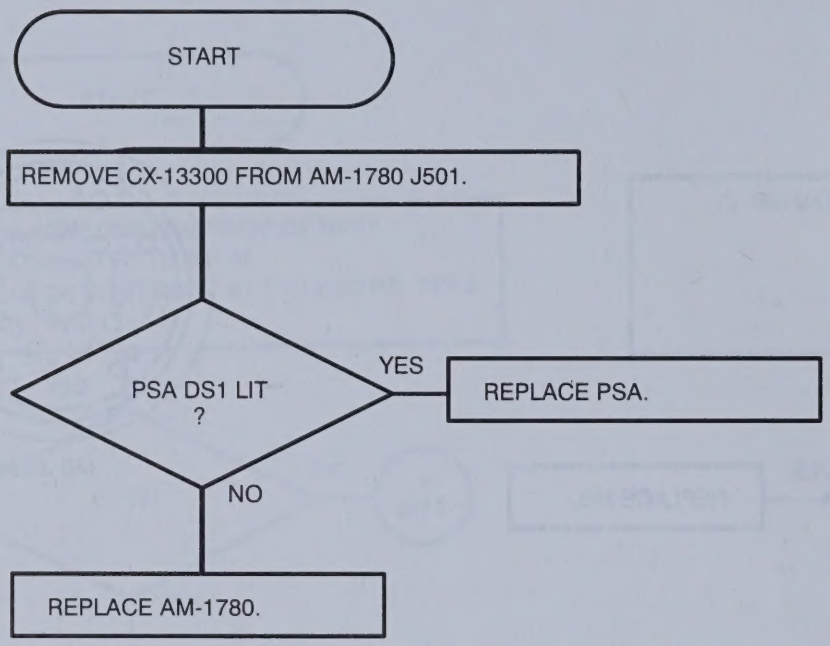
MB J3/J4

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 20

PSA DS1 IS LIT WITH AM-1780 MAIN PWR SET TO INT ONLY.

(Sheet 1 of 1)



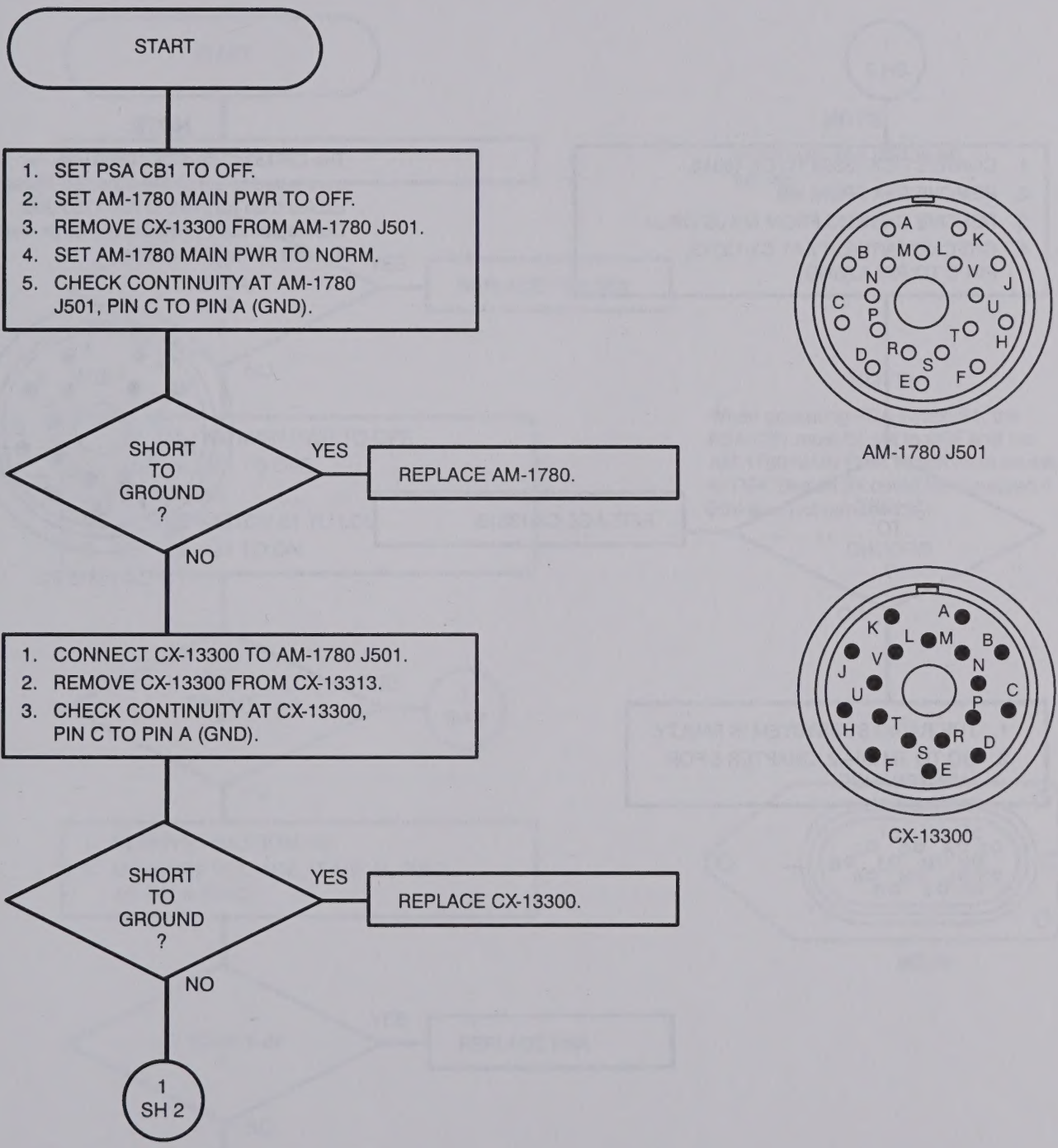
* In the unlikely event that the problem continous, check interface cables for possible short.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 21

PSA CB1 TRIPS WHEN AM-1780 SET TO NORM.

(Sheet 1 of 2)

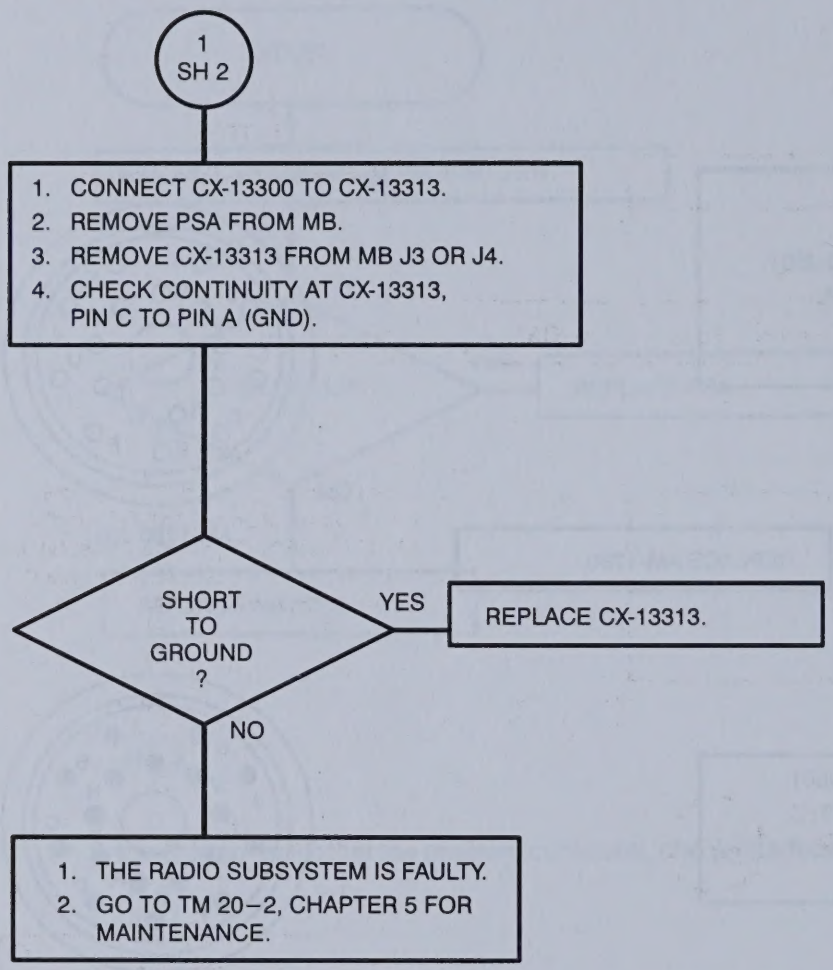


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 21

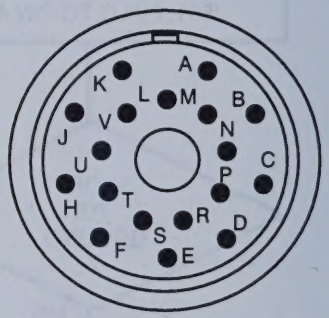
PSA CB1 TRIPS WHEN SET TO ON.

(Sheet 2 of 2)



NOTE:

The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to AM-1780 J501. Connector J501 provides the dc power to the rest of the VIC system.



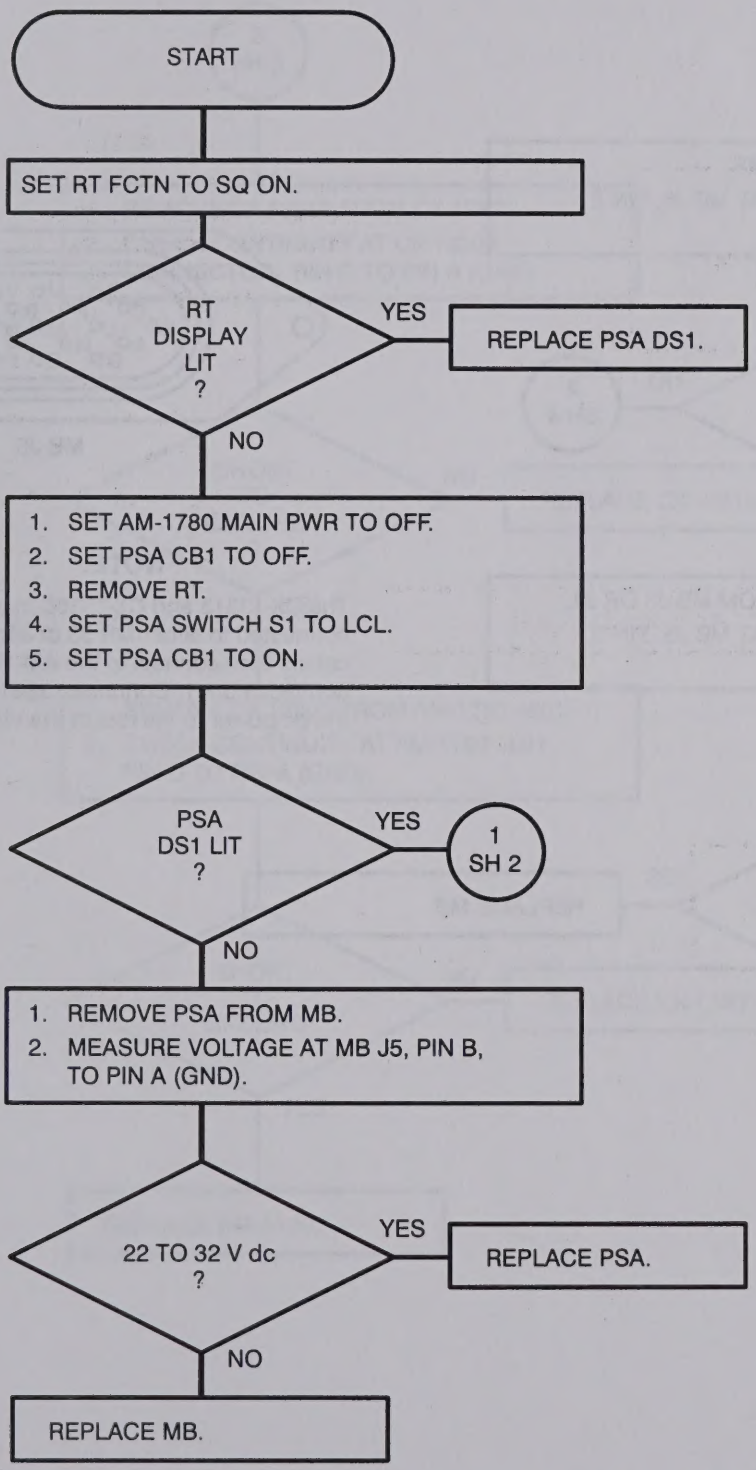
CX-13313 P2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 22

PSA DS1 IS NOT LIT WITH AM-1780 MAIN PWR SET TO NORM.

(Sheet 1 of 5)

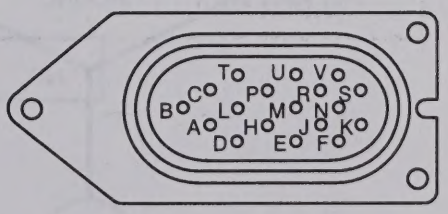


NOTE:

Make sure VAA DS1 is set full ccw.

NOTE:

When operating PSA switch S1, the PSA CB1 must be set to OFF and the AM-1780 MAIN PWR switch must be set to OFF. Switch S1 could be damaged if power is not removed.



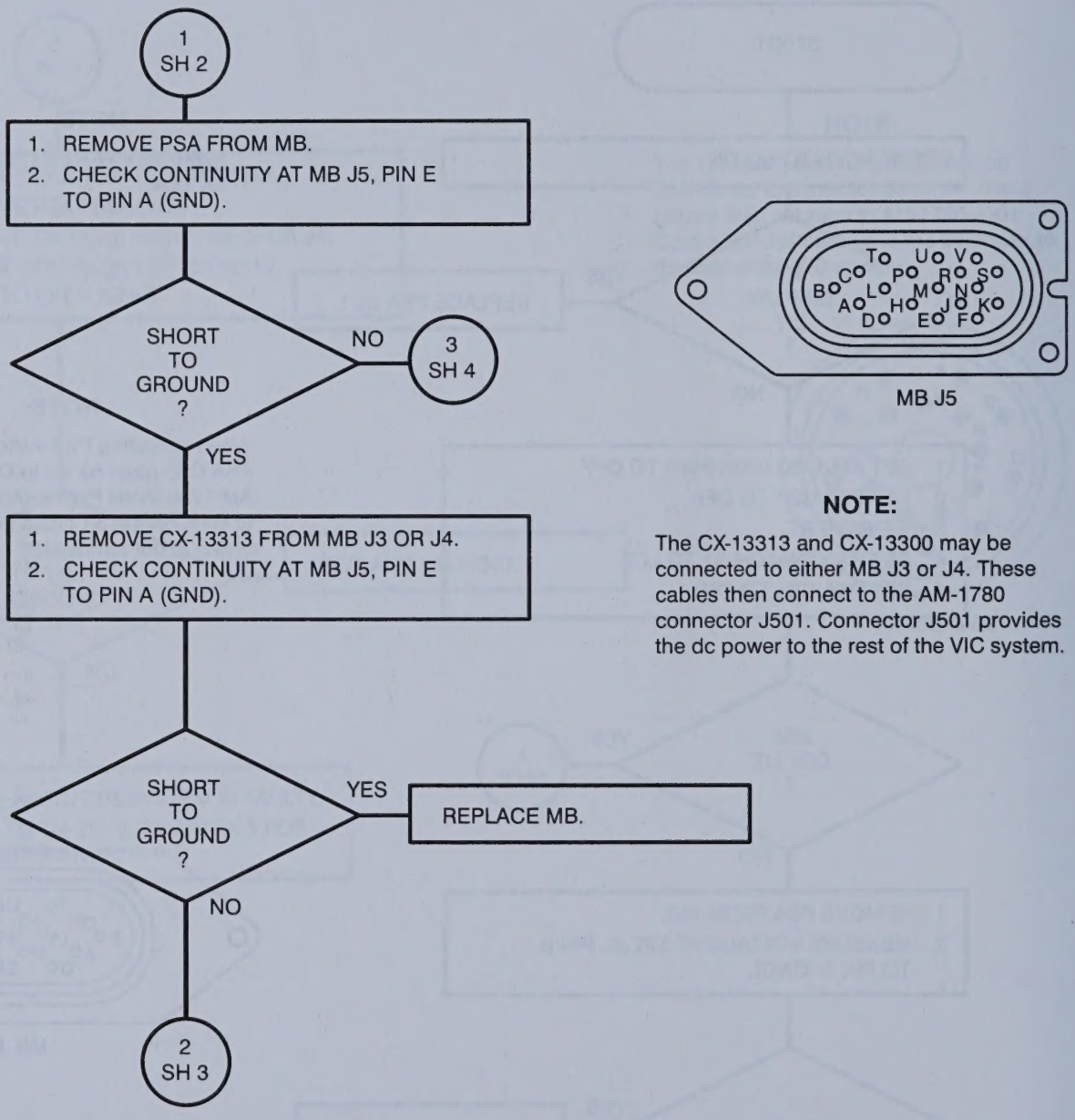
MB J5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 22

PSA DS1 IS NOT LIT WITH AM-1780 MAIN PWR SET TO NORM.

(Sheet 2 of 5)



MB J5

NOTE:

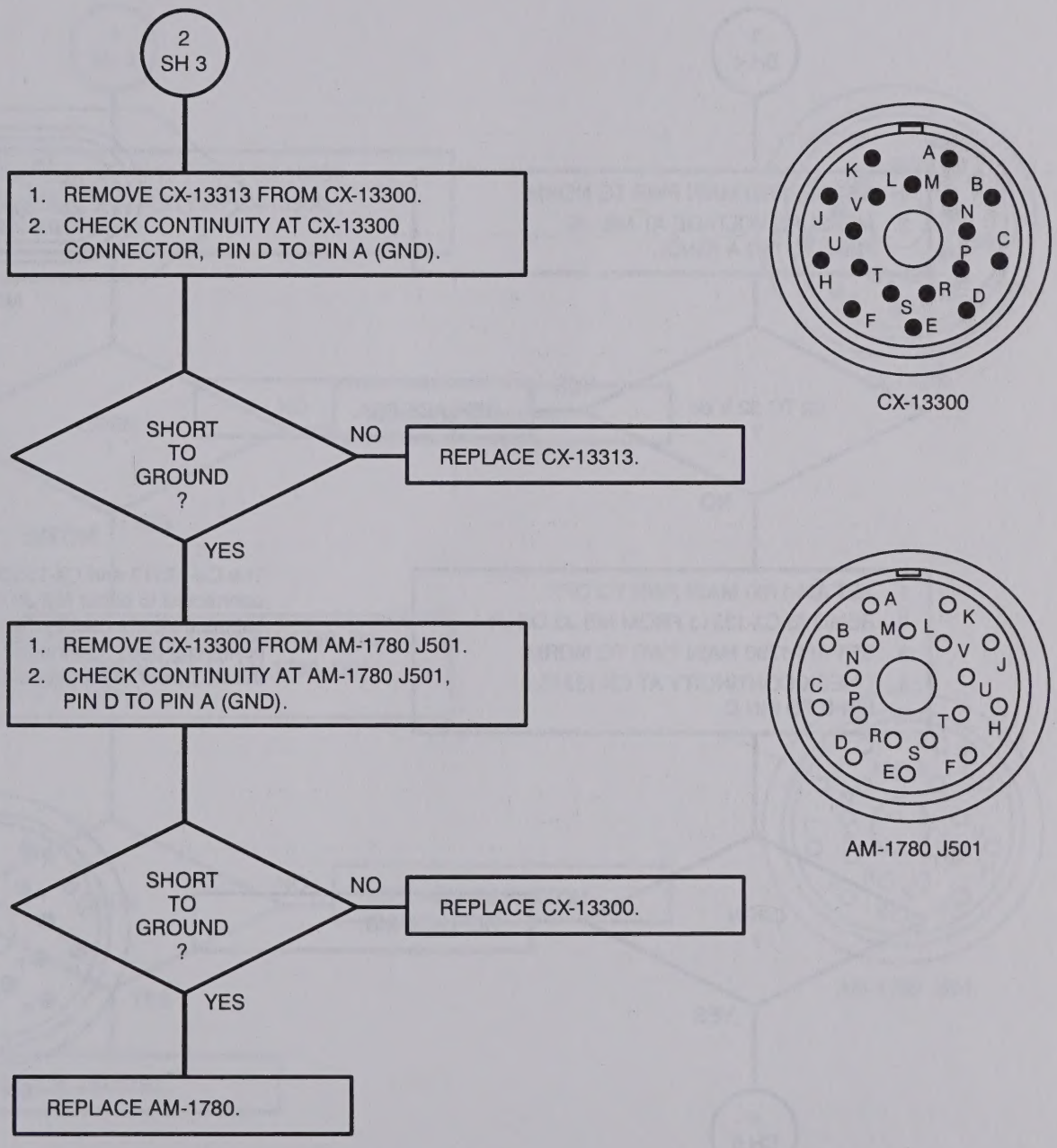
The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 22

PSA DS1 IS NOT LIT WITH AM-1780 MAIN PWR SET TO NORM.

(Sheet 3 of 5)

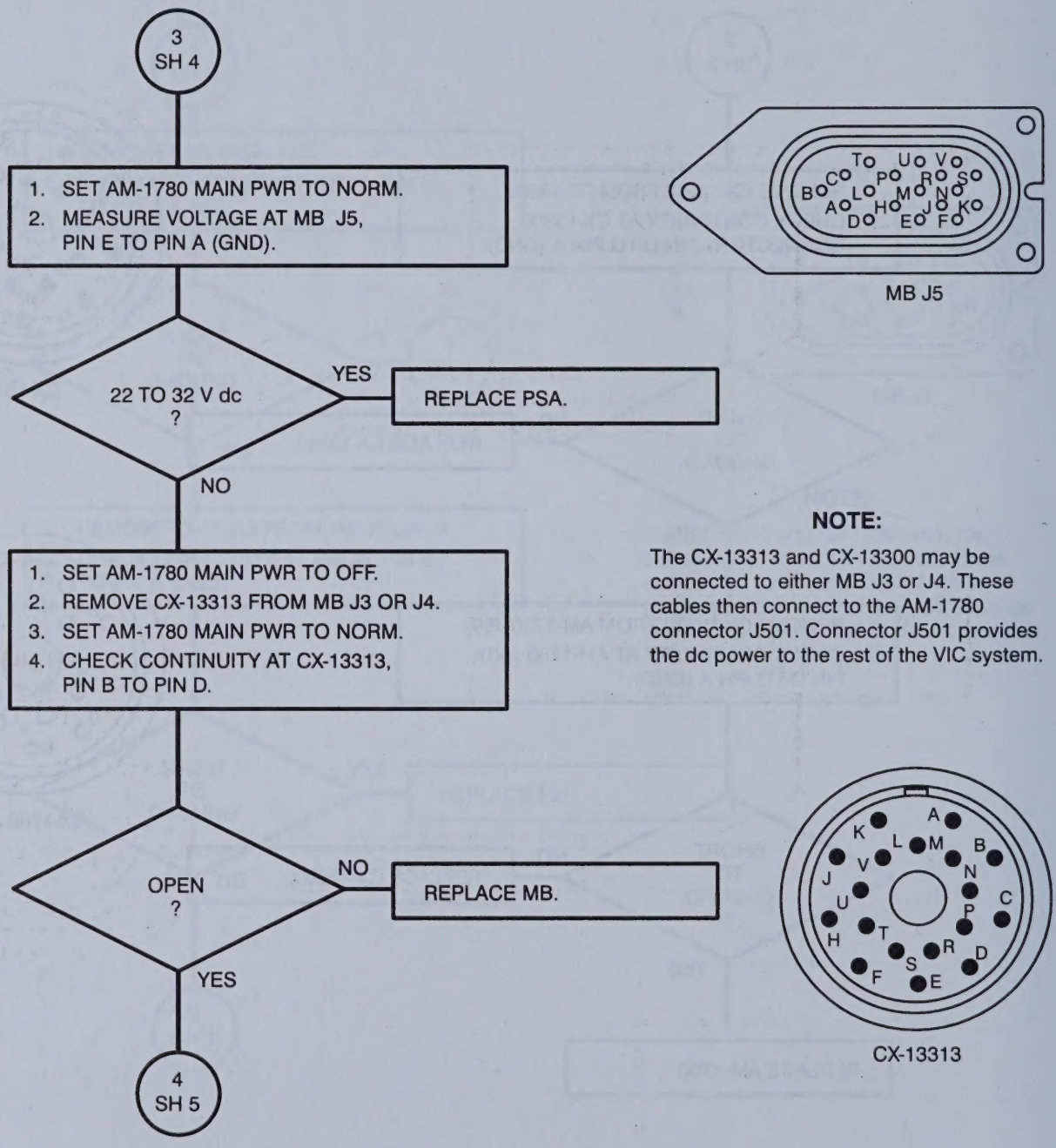


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 22

PSA DS1 IS NOT LIT WITH AM-1780 MAIN PWR SET TO NORM.

(Sheet 4 of 5)



NOTE:

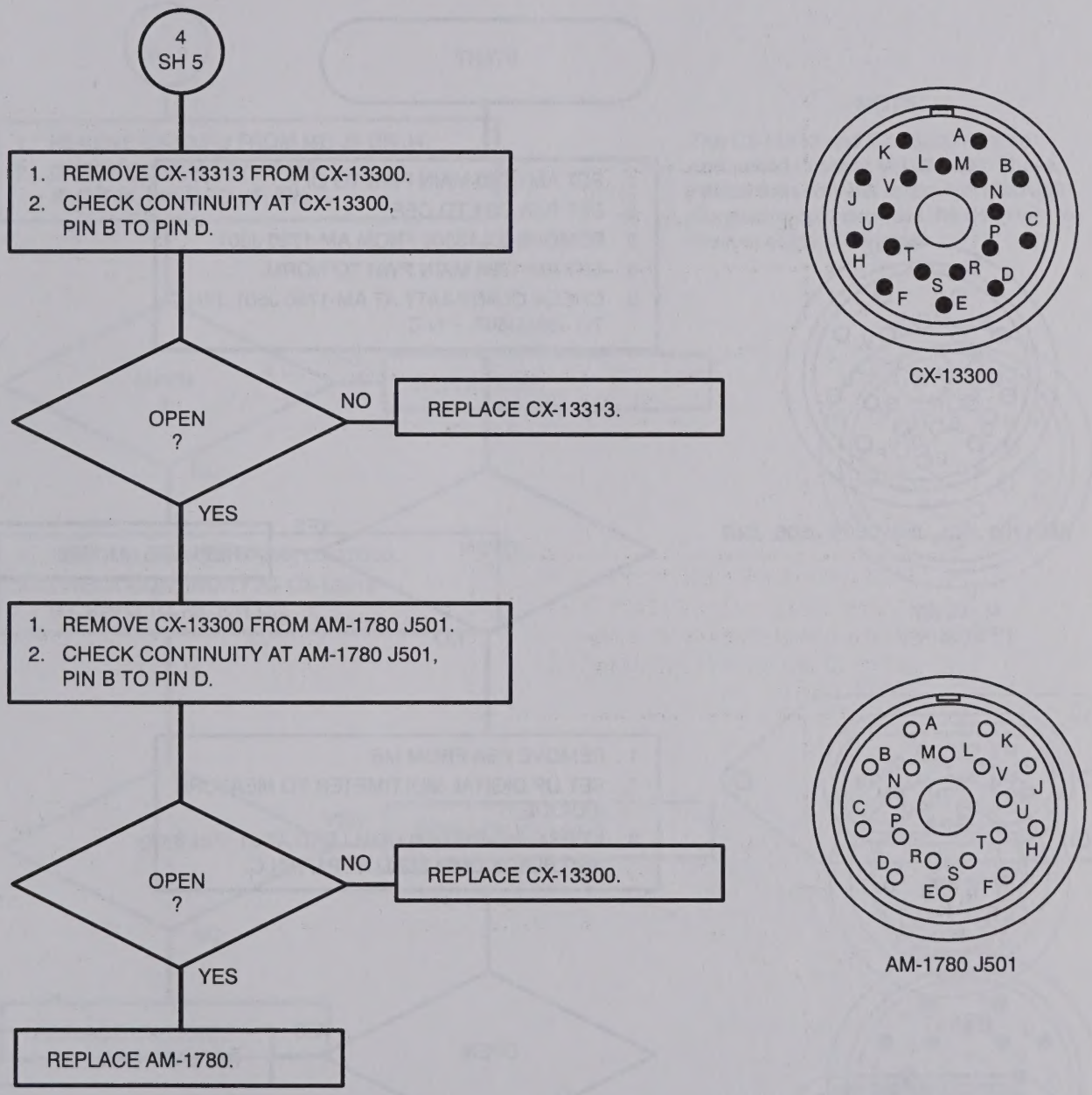
The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 22

PSA DS1 IS NOT LIT WITH AM-1780 MAIN PWR SET TO NORM.

(Sheet 5 of 5)

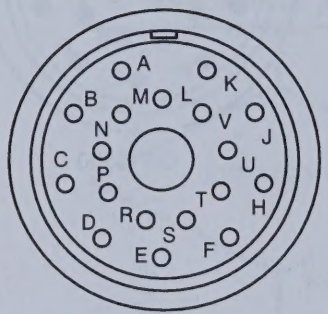


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

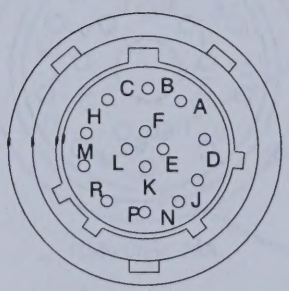
Chart 23

AM-1780 LAMP IS NOT LIT WITH PSA DS1 LIT.

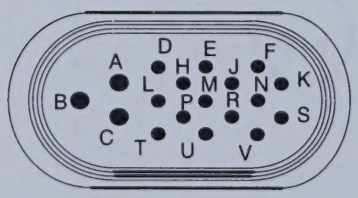
(Sheet 1 of 2)



AM-1780 J501, J504,J505, J506, J507



PSA J1



PSA P1

START

1. SET AM-1780 MAIN PWR TO OFF.
2. SET PSA CB1 TO OFF.
3. REMOVE CX-13300 FROM AM-1780 J501.
4. SET AM-1780 MAIN PWR TO NORM.
5. CHECK CONTINUITY AT AM-1780 J501, PIN C TO J504/J507, PIN C.

OPEN ?

YES → REPLACE AM-1780.

NO

1. REMOVE PSA FROM MB.
2. SET UP DIGITAL MULTIMETER TO MEASURE A DIODE.
3. AT PSA, PLACE RED DMM LEAD AT J1, PIN B, AND BLACK DMM LEAD AT P1, PIN C.

OPEN ?

YES → REPLACE PSA.

NO

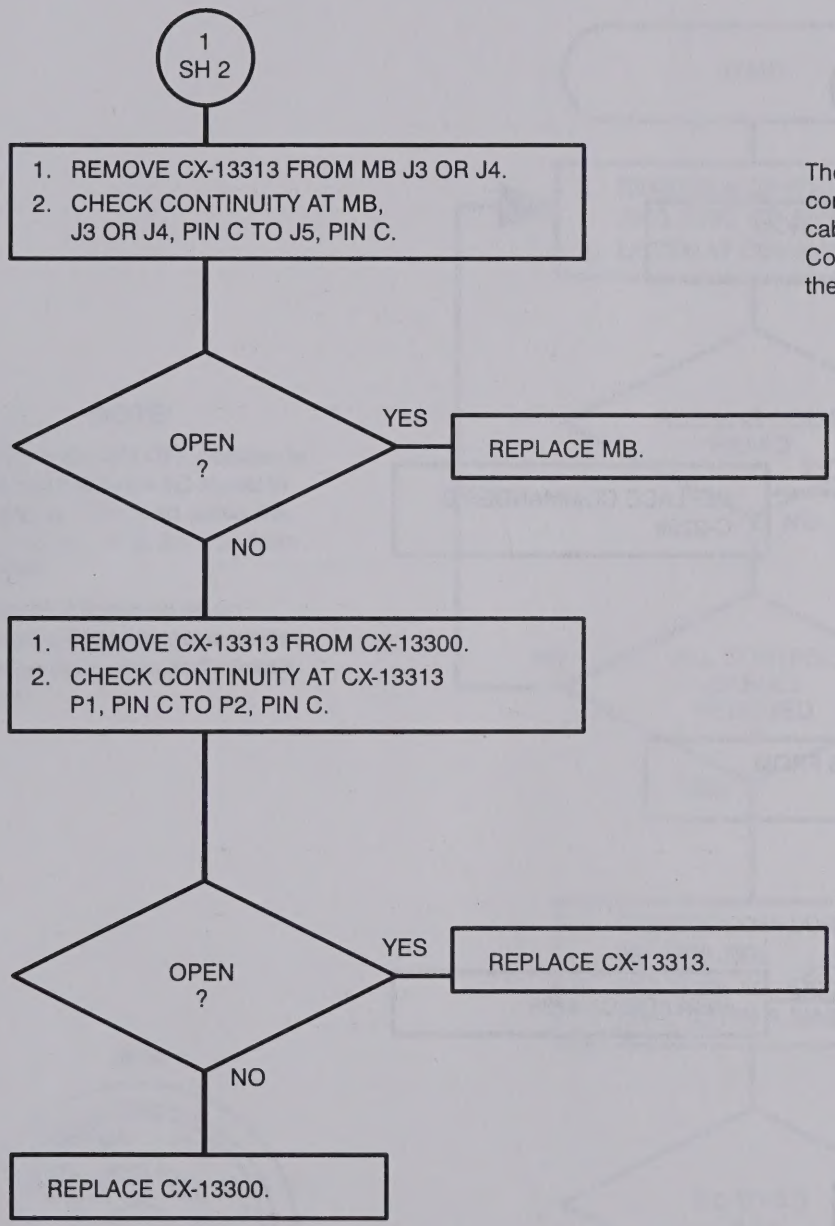
1 SH 2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 23

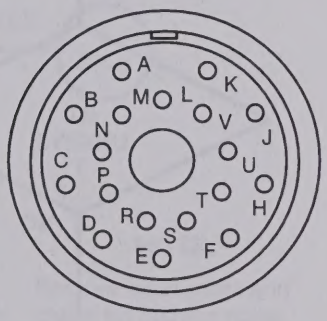
AM-1780 LAMP IS NOT LIT WITH PSA DS1 LIT.

(Sheet 2 of 2)

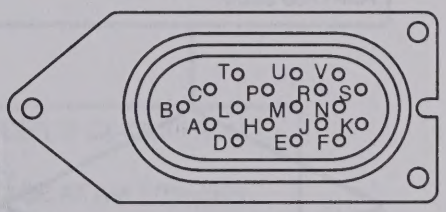


NOTE:

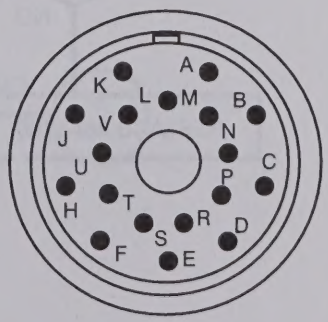
The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 J501. Connector J501 provides the dc power to the rest of the VIC system.



MB J3, J4
CX-13313 P1



MB J5



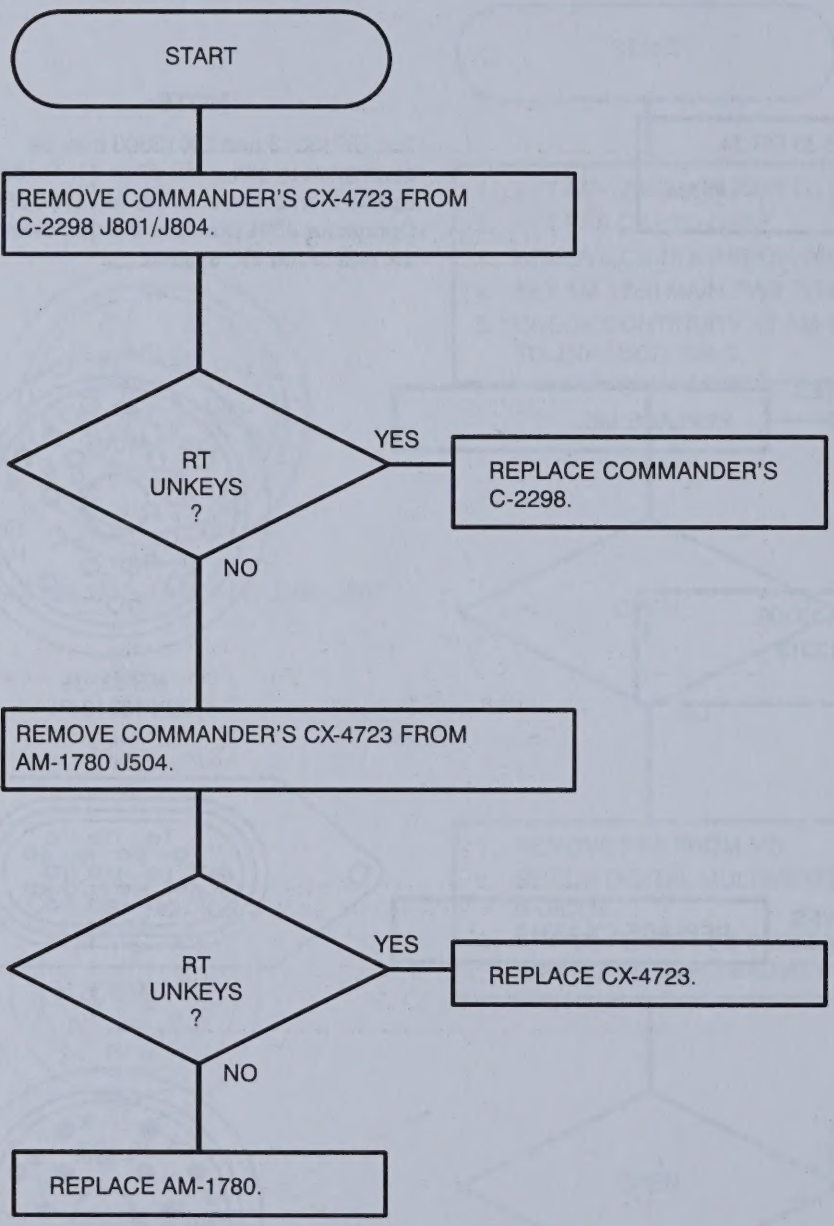
CX-13313 P2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 24

RT KEYS WHEN AM-1780 RADIO TRANS SWITCH IS SET TO CDR ONLY.

(Sheet 1 of 1)



2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 25

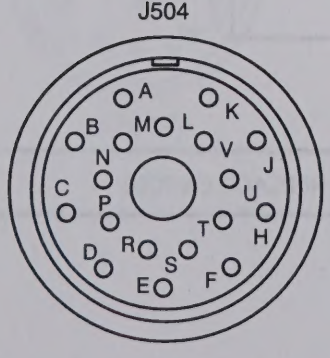
NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

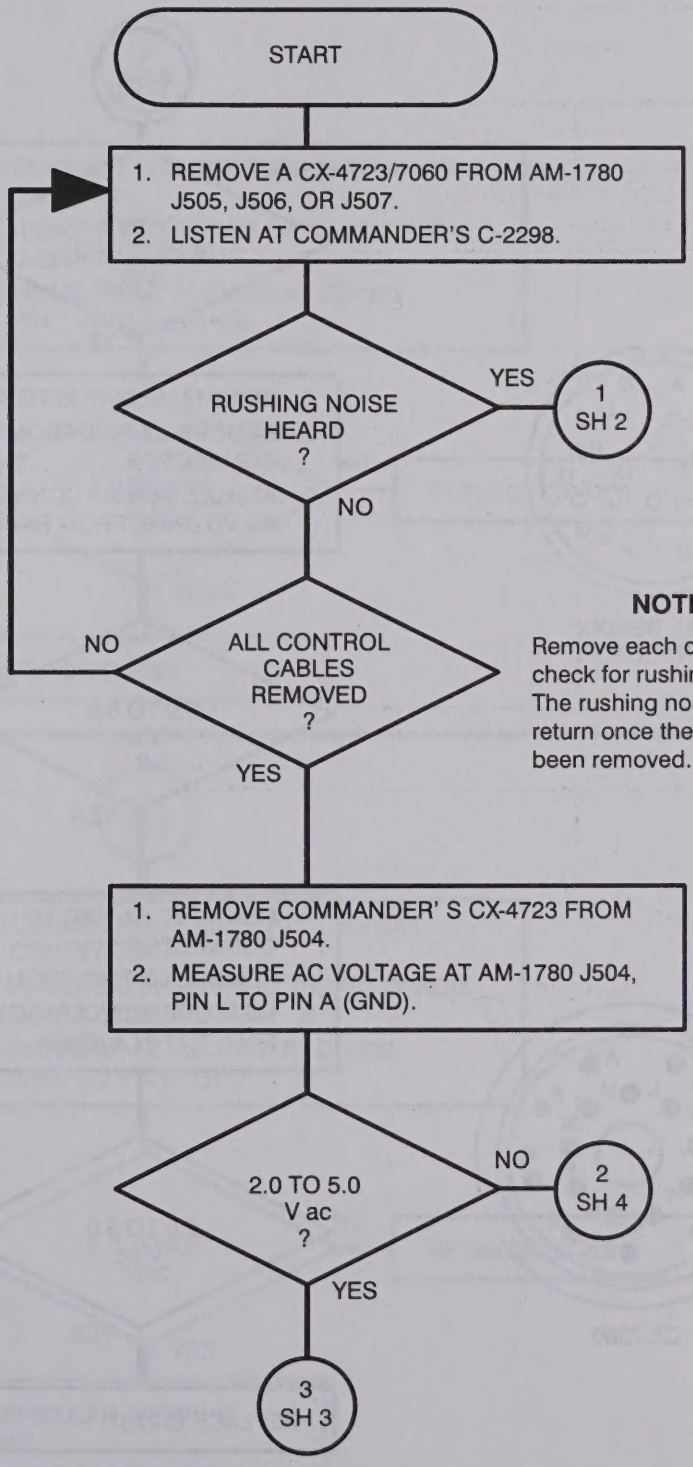
(Sheet 1 of 7)

NOTE:

The RT in the SQ OFF position is used to provide an AC signal in the system. The fixed audio line will produce 1.5 to 3.5 V ac from the radio.

Set up multimeter as an ac voltmeter. Connect meter probes between test points and chassis ground.





NOTE:

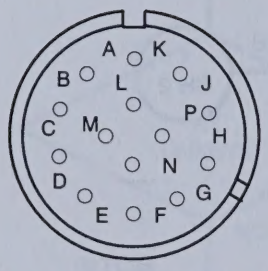
Remove each cable and check for rushing noise. The rushing noise will return once the short has been removed.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

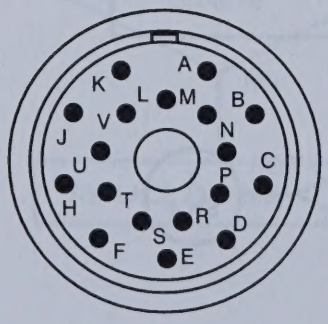
Chart 25

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 2 of 7)



HULL BENDIX CONNECTOR



CX-7060

1 SH 2

C-2297 SUSPECTED BAD ?

NO → 3 SH 3

YES

1. REINSTALL CX-7060 TO AM-1780.
2. REMOVE CX-7060 FROM HULL BENDIX CONNECTOR.
3. AT HULL BENDIX CONNECTOR, MEASURE AC VOLTAGE FROM PIN B TO PIN N (GND).

2.0 TO 5.0 V ac ?

NO → 4 SH 3

YES

1. CONNECT CX-7060 TO HULL BENDIX CONNECTOR.
2. REMOVE CX-7060 FROM C-2297 J904.
3. MEASURE AC VOLTAGE AT CX-7060, PIN L TO PIN A (GND).

2.0 TO 5.0 V ac ?

NO → REPLACE CX-7060.

YES

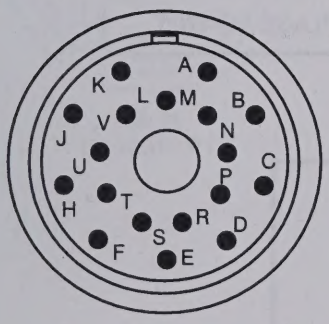
REPLACE C-2297.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 25

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 3 of 7)



CX-4723

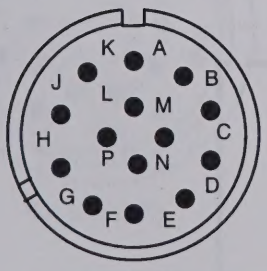
3
SH 3

1. CONNECT SUSPECT CX-4723 TO AM-1780 J505-J507.
2. REMOVE OTHER SIDE OF CX-4723 FROM C-2298 AT J801/J804.
3. MEASURE AC VOLTAGE AT CX-4723, PIN L TO PIN A (GND).

2.0 TO 5.0 V ac ?

NO → REPLACE CX-4723.

YES → REPLACE C-2298.



CX-7060

4
SH 3

1. CONNECT CX-7060 TO HULL BENDIX CONNECTOR.
2. REMOVE CX-7060 FROM TURRET BENDIX CONNECTOR.
3. MEASURE AC VOLTAGE AT C-7060, PIN B TO PIN N (GND).

2.0 TO 5.0 V ac ?

NO → REPLACE CX-7060.

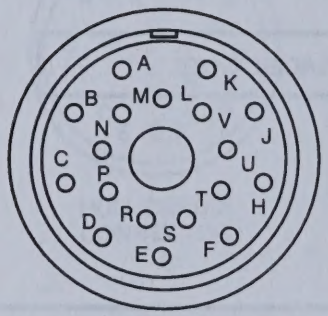
YES → VEHICULAR WIRING IS BAD.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

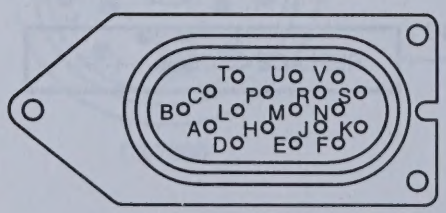
Chart 25

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 4 of 7)



MB J3,
AM-1780 J501, J511



MB J5

2
SH 4

MEASURE AC VOLTAGE AT AM-1780 J511, PIN K TO PIN A (GND).

85 TO 196 mV ac ?

YES → REPLACE AM-1780.

NO

1. SET RTs TO STBY.
2. SET THE VAA CB1 TO OFF.
3. REMOVE CX-13300 FROM AM-1780 J501.
4. CHECK CONTINUITY AT AM-1780 J501, PIN K, TO PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE AM-1780.

NO

1. RECONNECT CX-13300 TO J501.
2. REMOVE RTs FROM VAA.
3. REMOVE VAA FROM MB.
4. REMOVE CX-13313 FROM MB J3.
5. CHECK CONTINUITY AT MB J3, PIN K TO J5, PIN H.

OPEN ?

NO → REPLACE MB.

YES

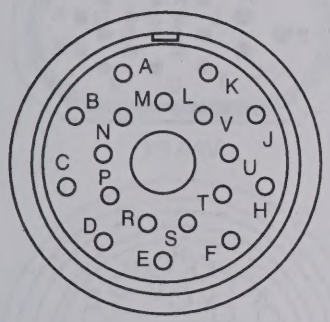
5
SH 5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

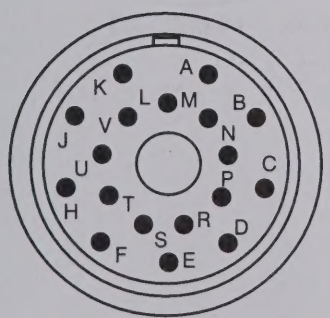
Chart 25

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

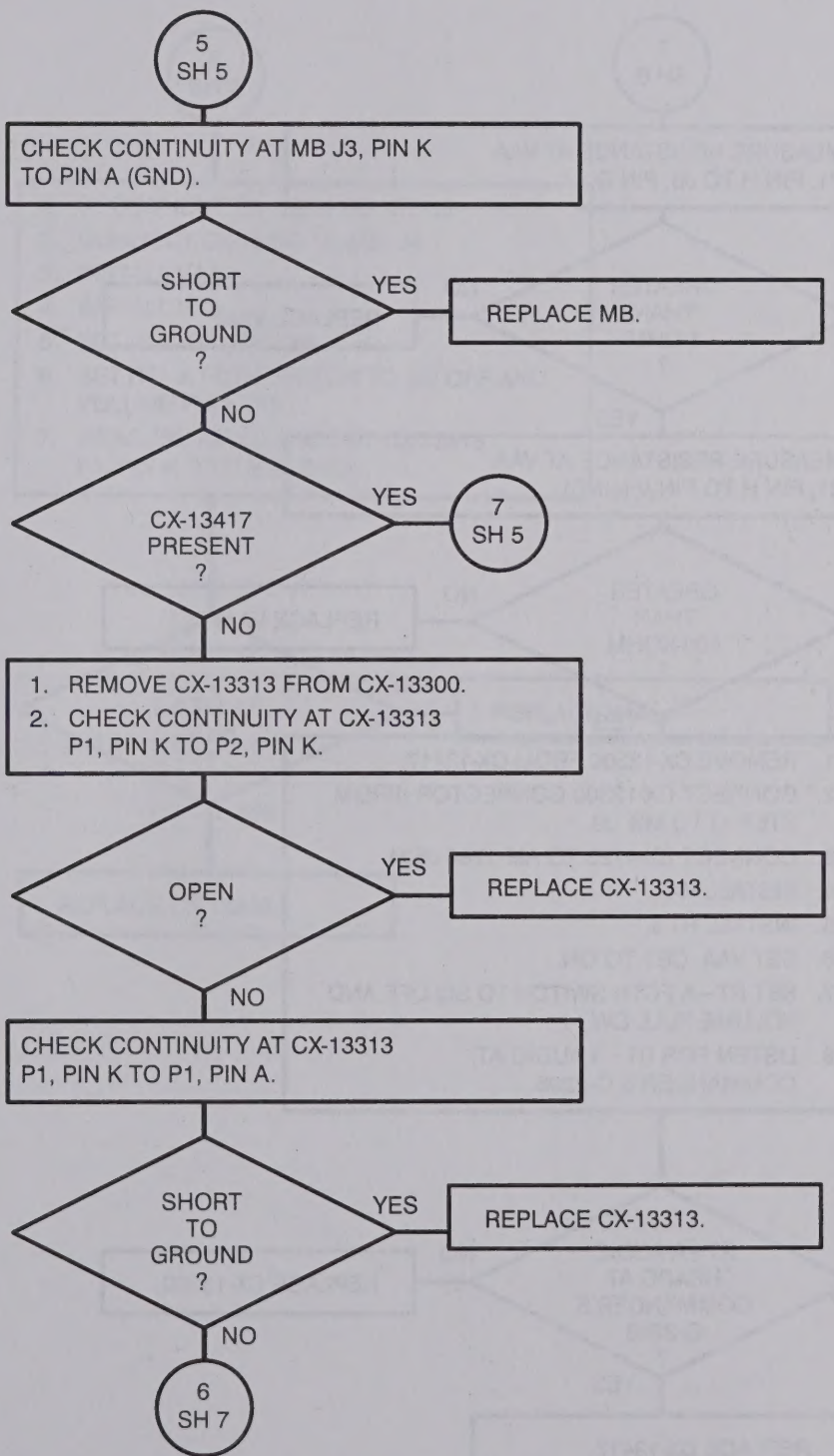
(Sheet 5 of 7)



MB J3
CX-13313 P1



CX-13313 P2

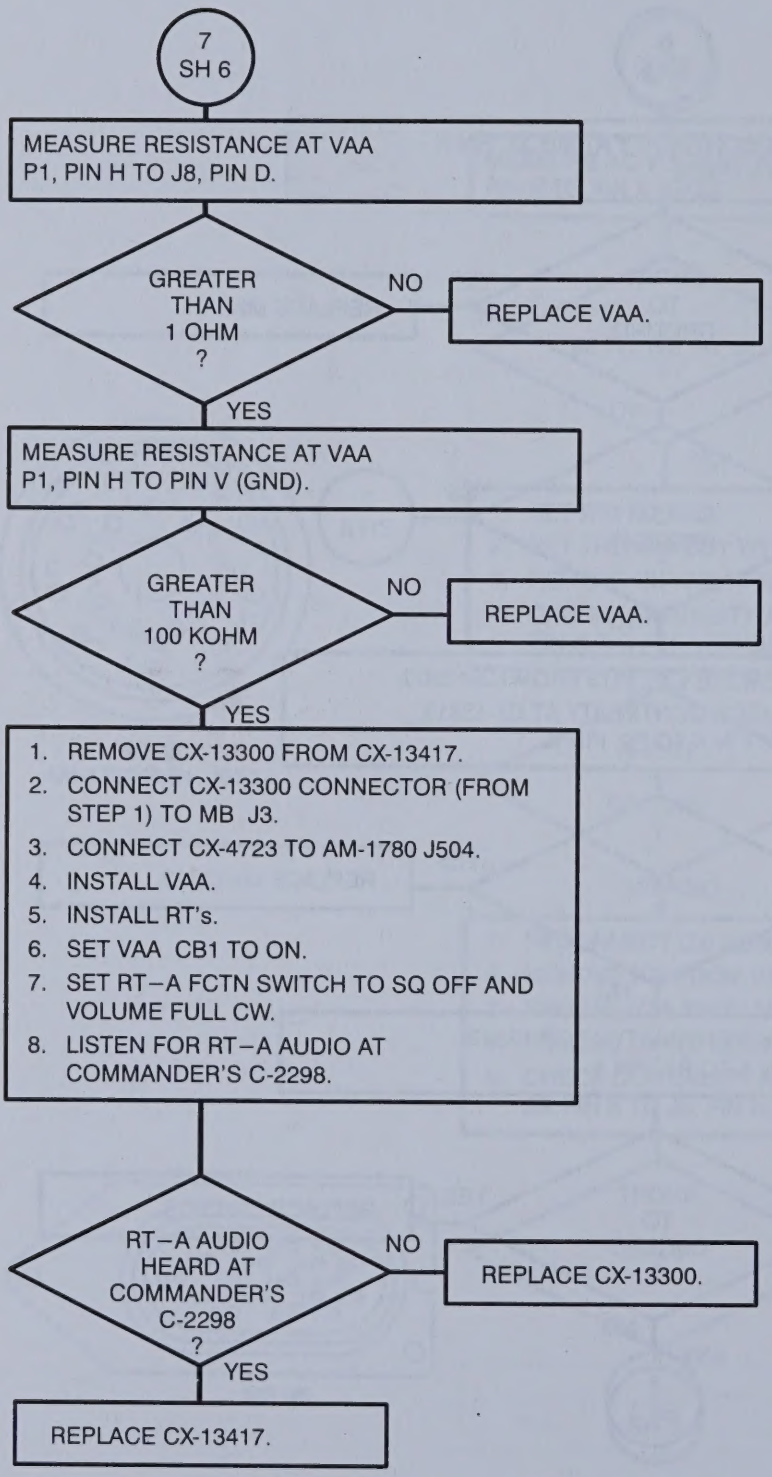


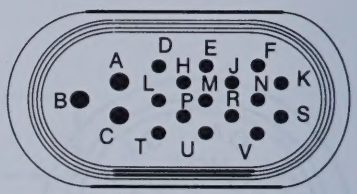
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 25

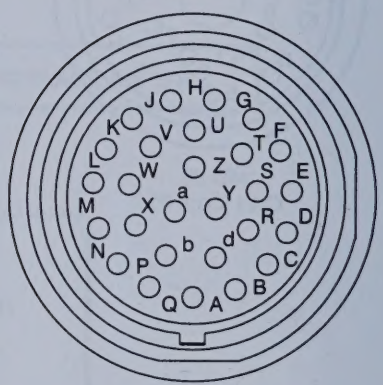
NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 6 of 7)





VAA P1



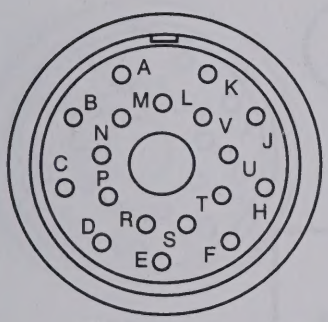
VAA J8

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

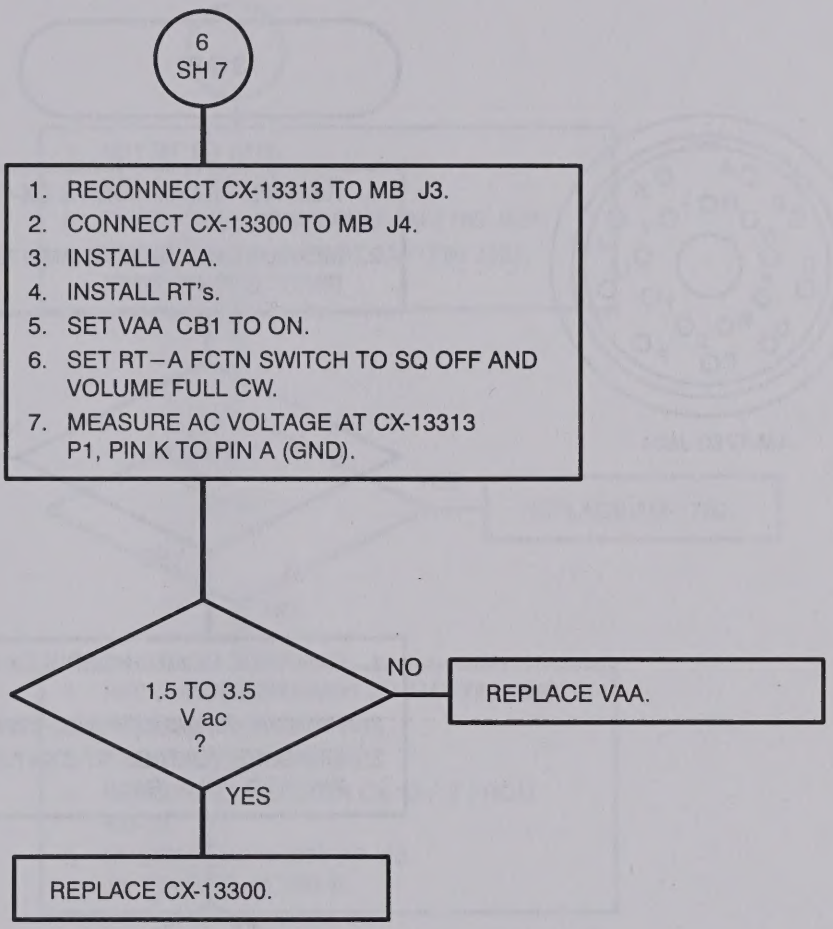
Chart 25

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 7 of 7)



CX-13313 P1

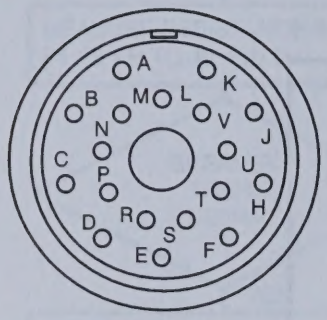


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 26

RT-A WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 1 of 3)



AM-1780 J504

START

1. REMOVE COMMANDER'S CX-4723 FROM AM-1780 J504.
2. MEASURE VOLTAGE AT AM-1780 J504, PIN D TO PIN A (GND).

1.0 to 2.5 V dc ?

NO → 1 SH 2

YES

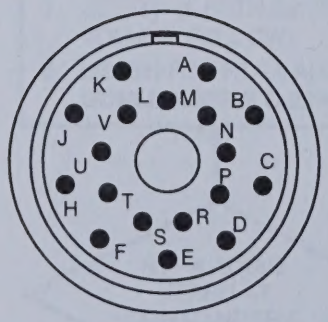
1. CONNECT COMMANDER'S CX-4723 TO AM-1780 J504.
2. REMOVE CX-4723 FROM C-2298 J801/J804.
3. MEASURE VOLTAGE AT CX-4723, PIN D TO PIN A (GND).

1.0 to 2.5 V dc ?

NO → REPLACE CX-4723.

YES

REPLACE COMMANDER'S C-2298.



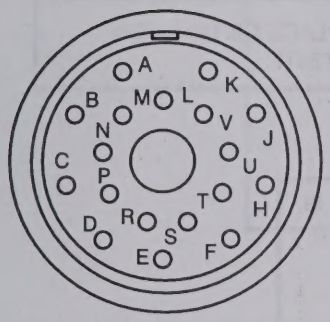
CX-4723

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

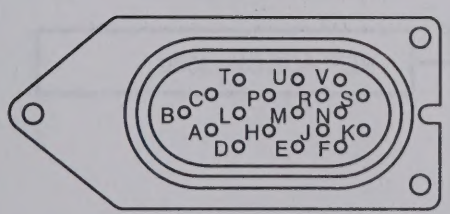
Chart 26

RT-A WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 2 of 3)



MB J3,
AM-1780 J501, J504



MB J5

1
SH 2

1. SET RT TO STBY.
2. SET VAA CB1 TO OFF.
3. REMOVE CX-13300 FROM AM-1780 J501.
4. CHECK CONTINUITY AT AM-1780 J501, PIN S TO J504, PIN D.

OPEN ?

YES → REPLACE AM-1780.

NO

1. RECONNECT CX-13300 TO AM-1780 J501.
2. REMOVE RTs FROM VAA.
3. REMOVE VAA FROM MB.
4. REMOVE CX-13313 OR CX-13417 FROM MB J3.
5. CHECK CONTINUITY AT MB J3, PIN S TO J5, PIN K.

OPEN ?

YES → REPLACE MB.

NO

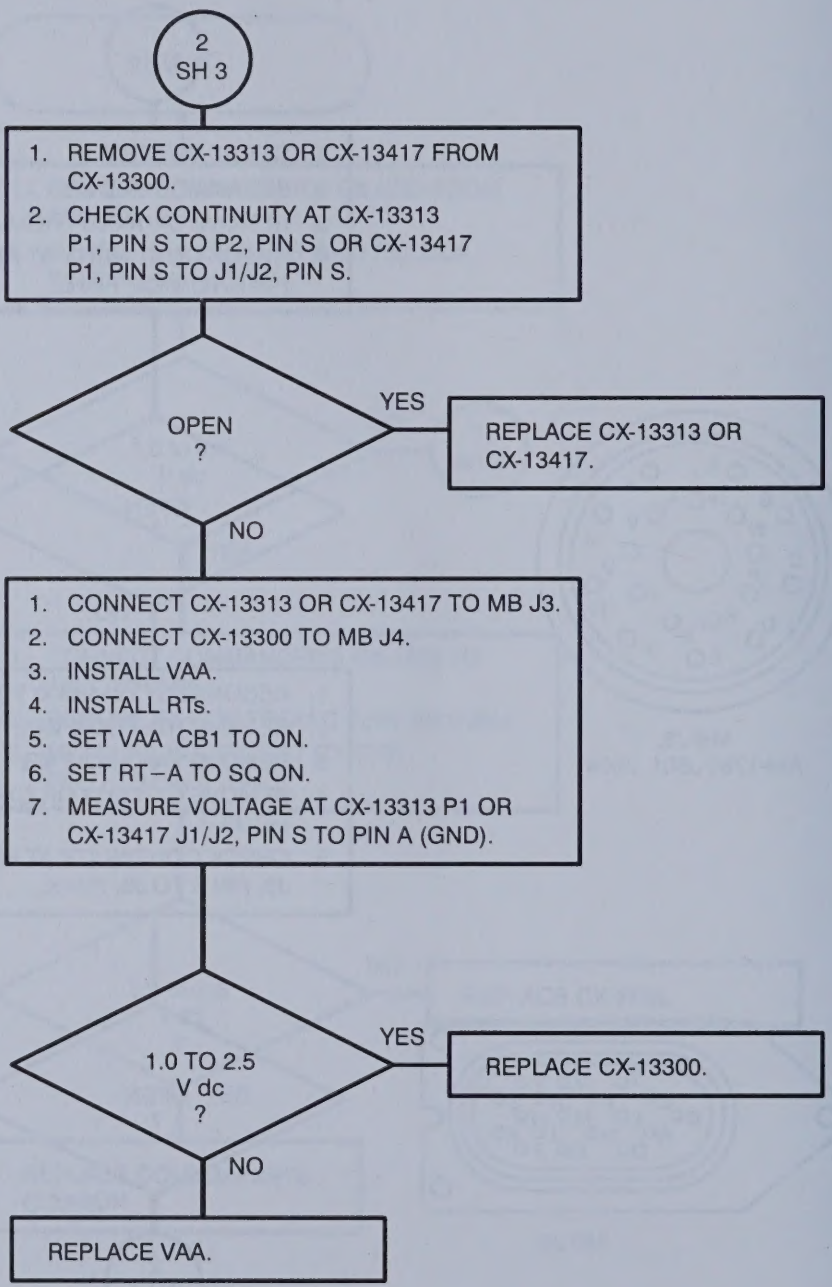
2
SH 3

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 26

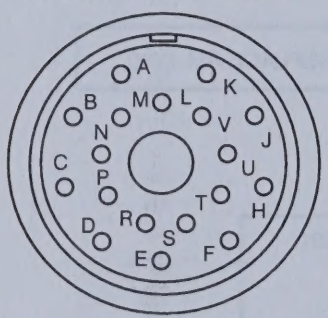
RT-A WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 3 of 3)

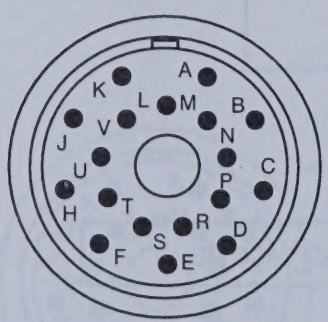


NOTE:

If CX-13417 present, check continuity at connector where CX-13300 was connected.



CX-13313 P1
CX-13417 J1, J2



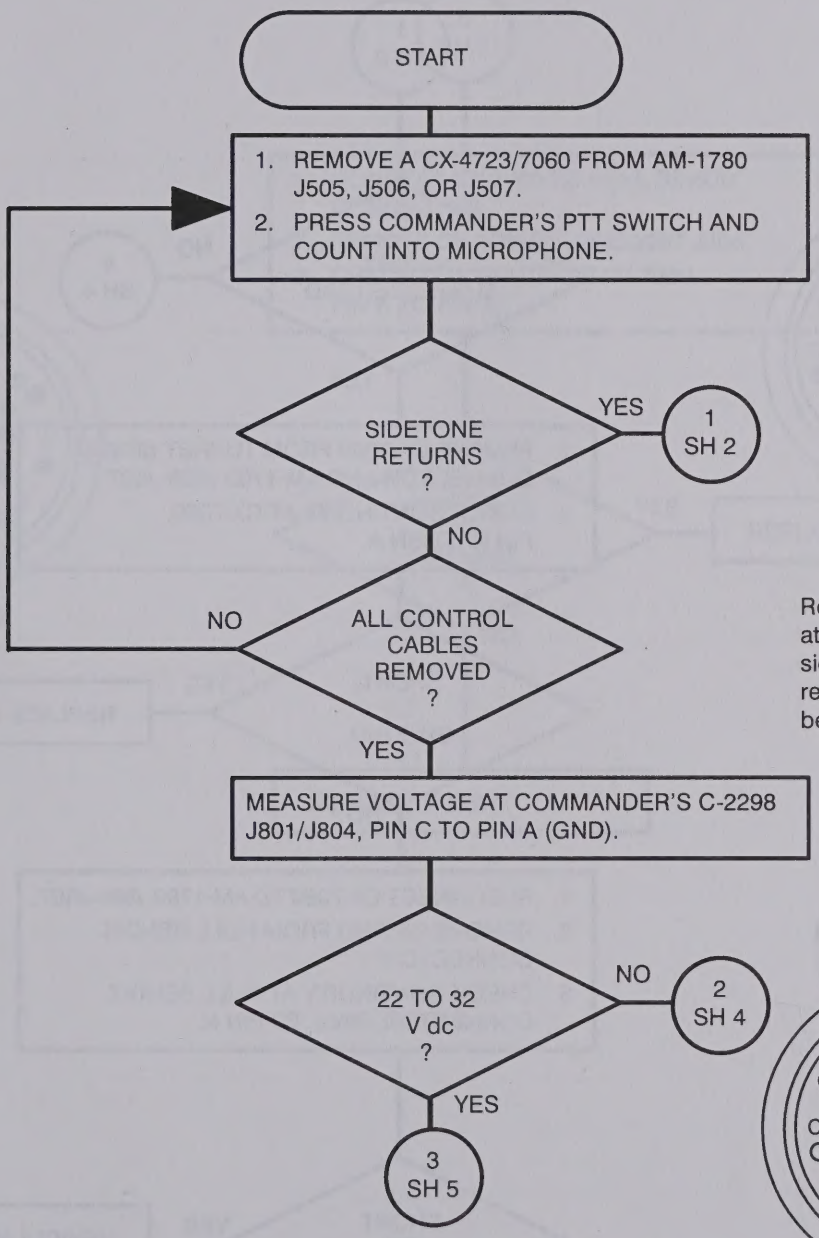
CX-13313 P2
CX-13417 P1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

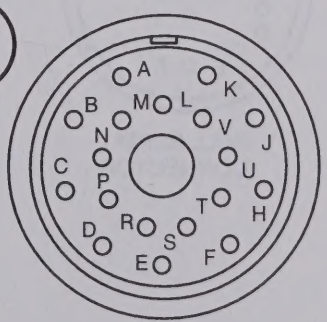
NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 1 of 14)



NOTE:

Remove each cable one at a time and check for sidetone. The sidetone will return after the short has been removed.



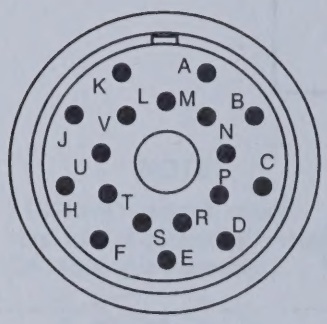
C-2298 J801, J804

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

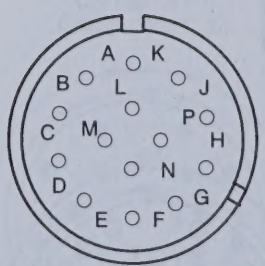
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

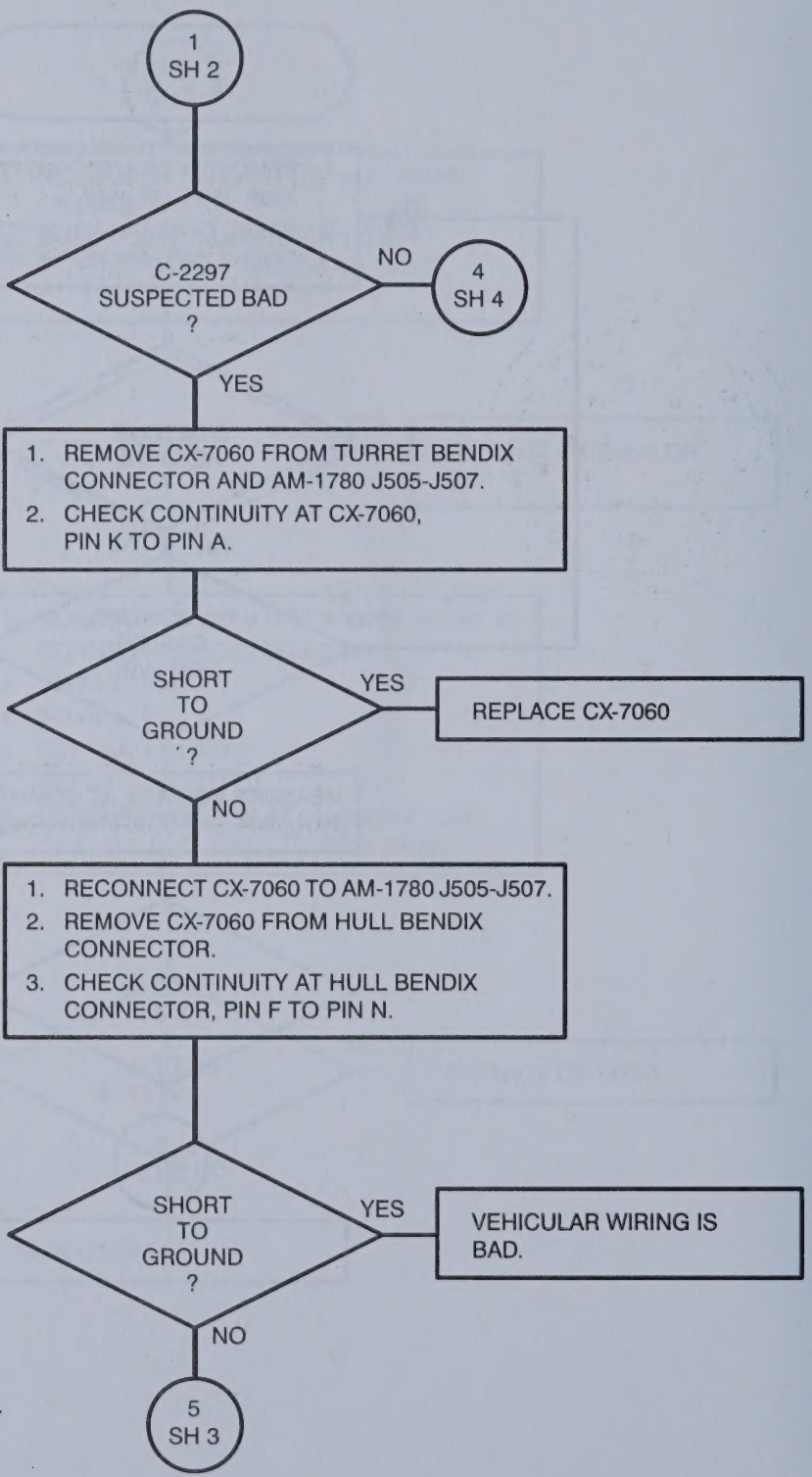
(Sheet 2 of 14)



CX-7060



HULL BENDIX CONNECTOR

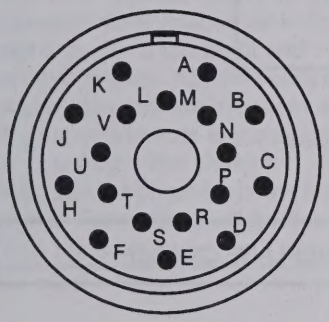


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

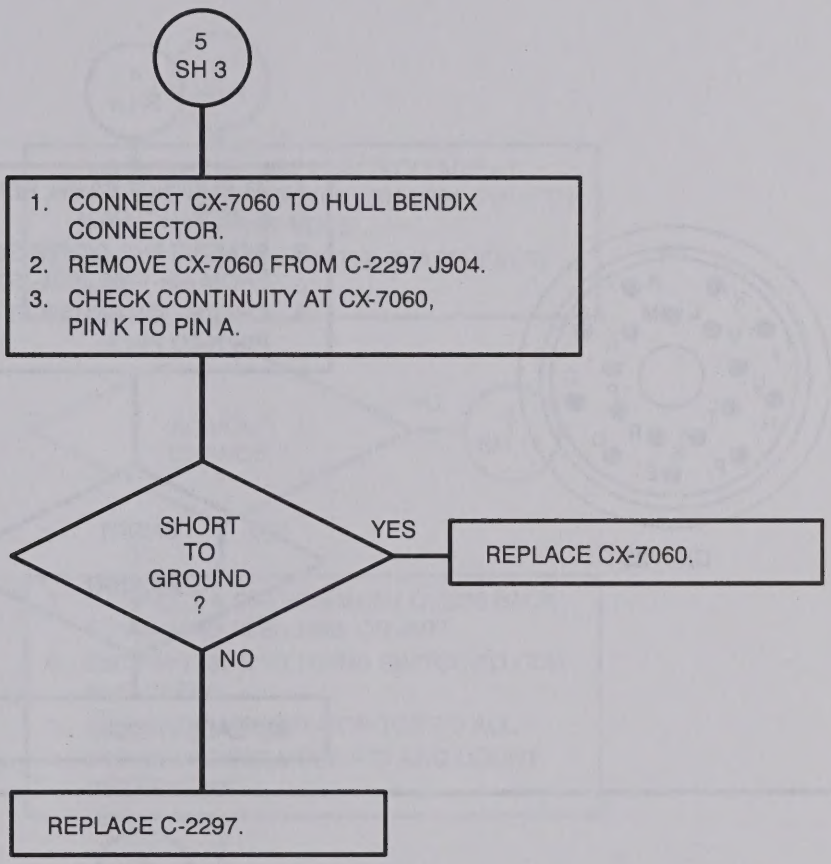
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 3 of 14)



CX-7060

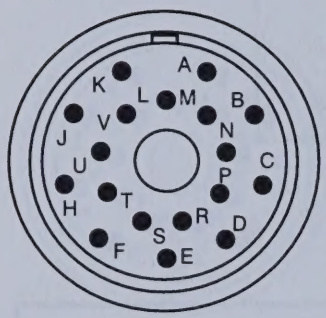


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 4 of 14)



CX-4723

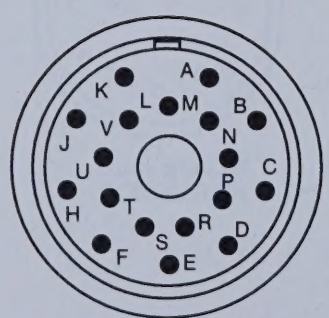
4
SH 4

1. AT SUSPECT C2298, REMOVE CX-4723 FROM C-2298 J801/J804.
2. REMOVE THE OTHER SIDE OF THE CX-4723 FROM AM-1780 J504-J507.
3. CHECK CONTINUITY AT CX-4723, PIN K TO PIN A.

SHORT TO GROUND ?

YES → REPLACE CX-4723.

NO → REPLACE C-2298.



CX-4723

2
SH 4

1. REMOVE COMMANDER'S CX-4723 FROM C-2298 J801/J804.
2. MEASURE VOLTAGE AT CX-4723, PIN C TO PIN A (GND).

22 TO 32 V dc ?

YES → REPLACE COMMANDER'S C-2298.

NO → REPLACE CX-4723.

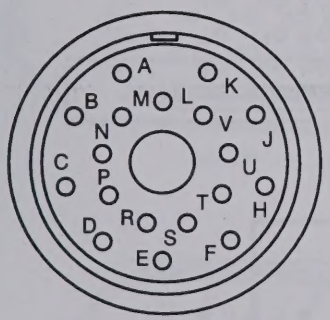
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

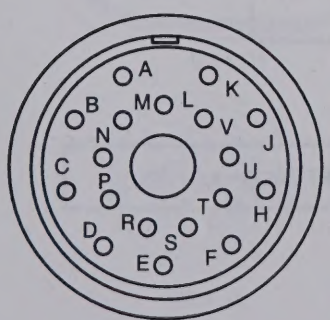
NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 5 of 14)

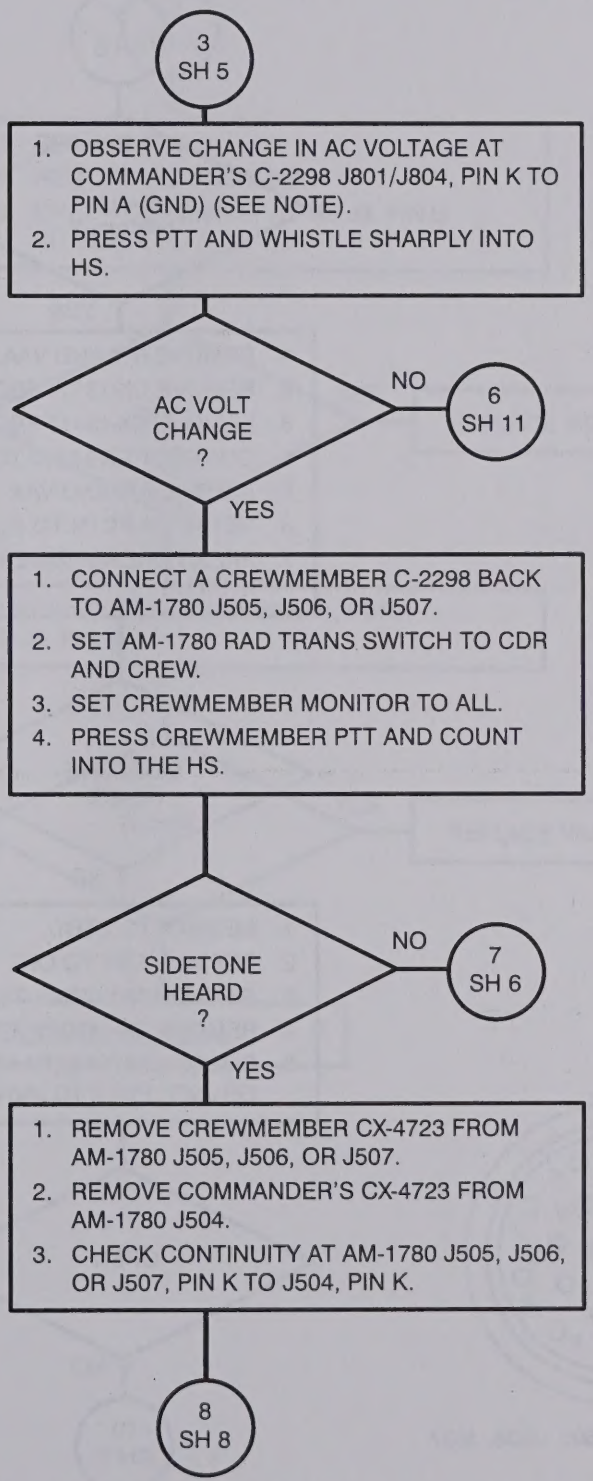
Set up multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or a test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt ac.



C-2298 J801, J804



AM-1780 J504, J505, J506, J507

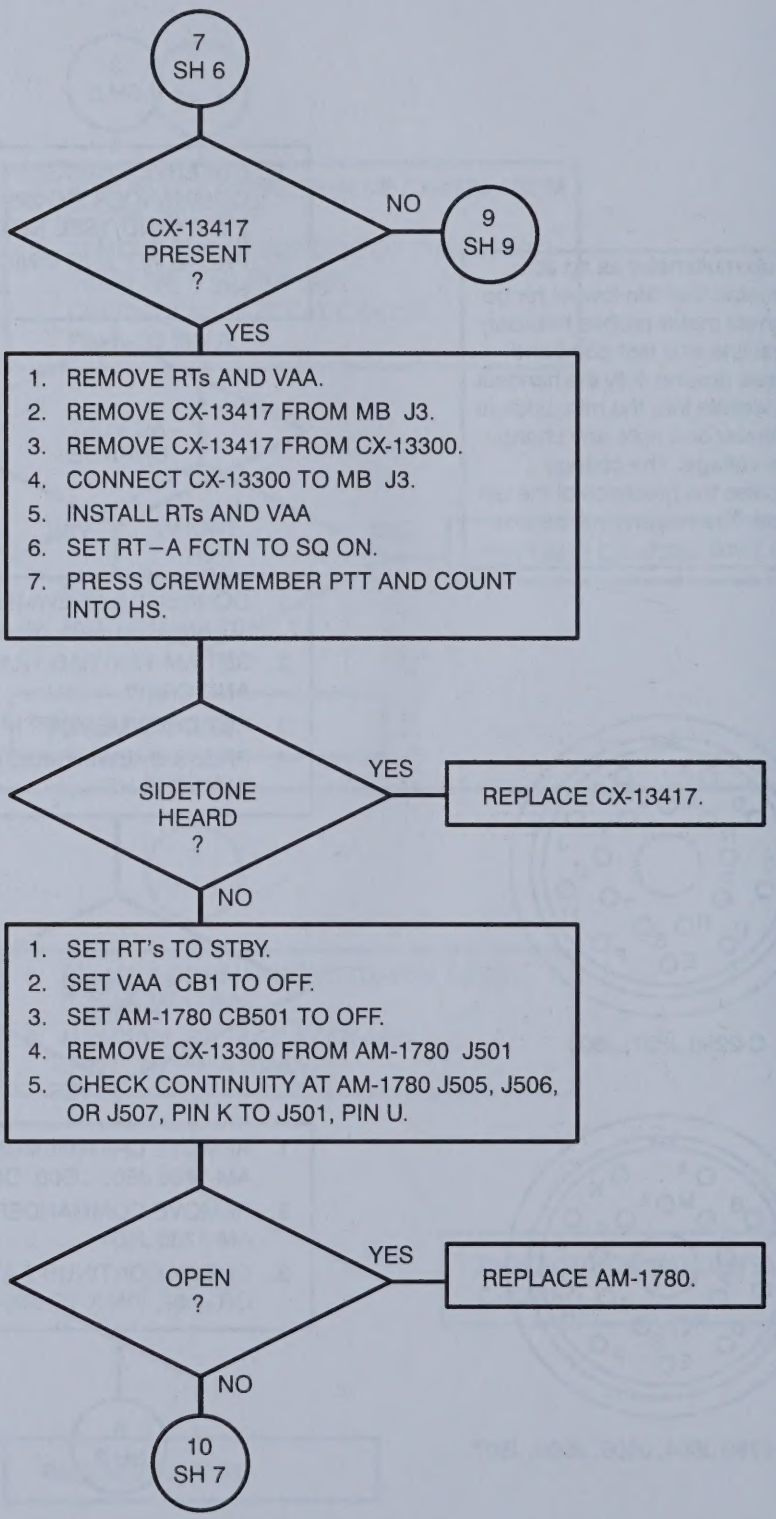


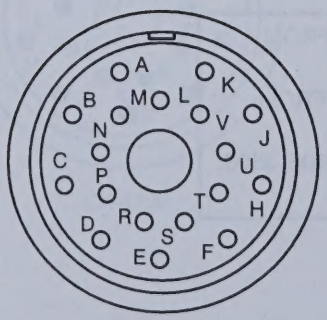
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 6 of 14)





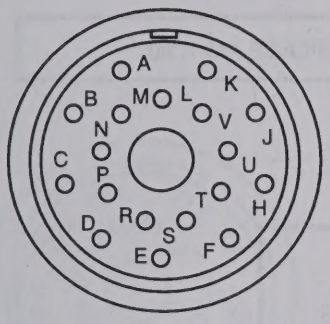
AM-1780 J501, J505, J506, J507

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

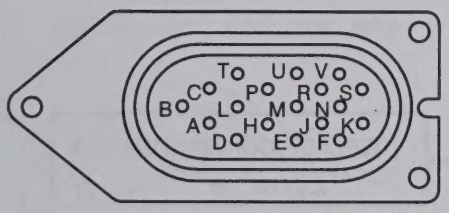
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

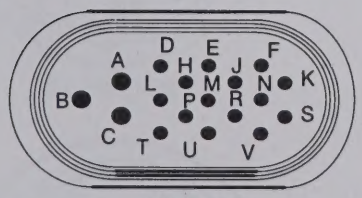
(Sheet 7 of 14)



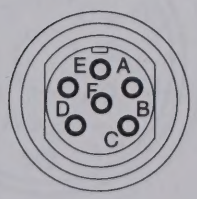
MB J3



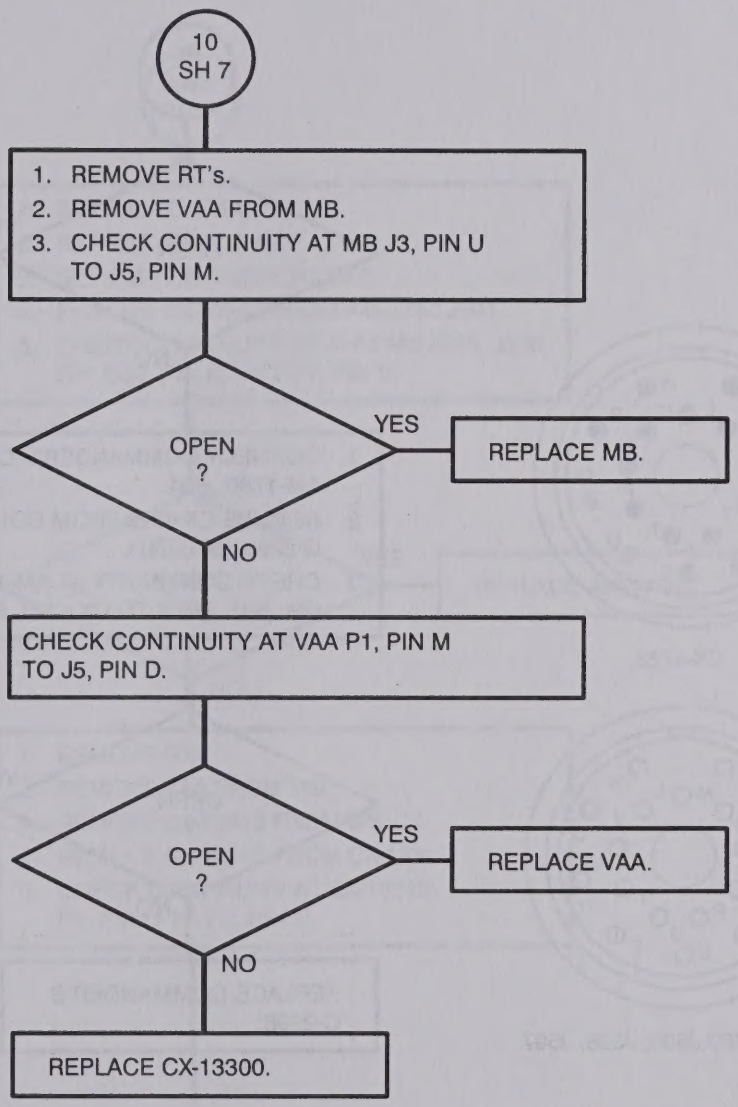
MB J5



VAA P1



VAA J5

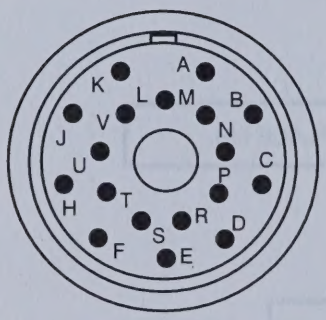


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

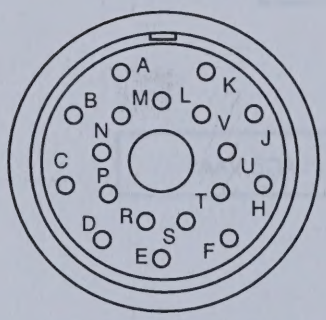
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 8 of 14)



CX-4723



AM-1780 J505, J506, J507

8
SH 8

OPEN
?

YES

REPLACE AM-1780.

NO

1. CONNECT COMMANDER'S CX-4723 TO AM-1780 J504.
2. REMOVE CX-4723 FROM COMMANDER'S C-2298 J801/J804.
3. CHECK CONTINUITY AT AM-1780 J505, J506, OR J507, PIN K TO CX-4723, PIN K.

OPEN
?

YES

REPLACE COMMANDER'S CX-4723.

NO

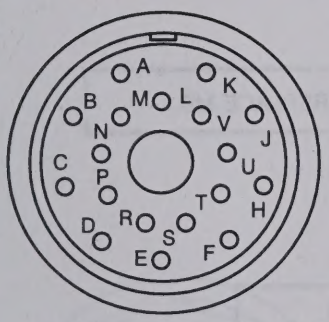
REPLACE COMMANDER'S C-2298.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

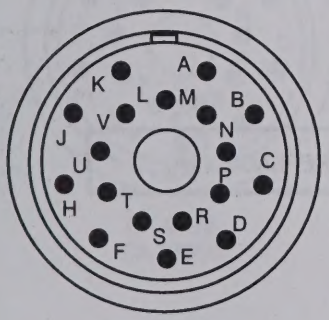
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

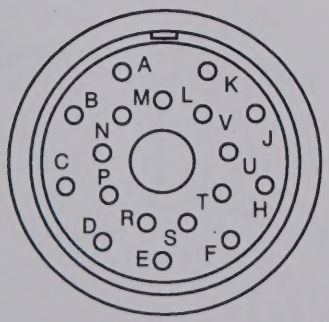
(Sheet 9 of 14)



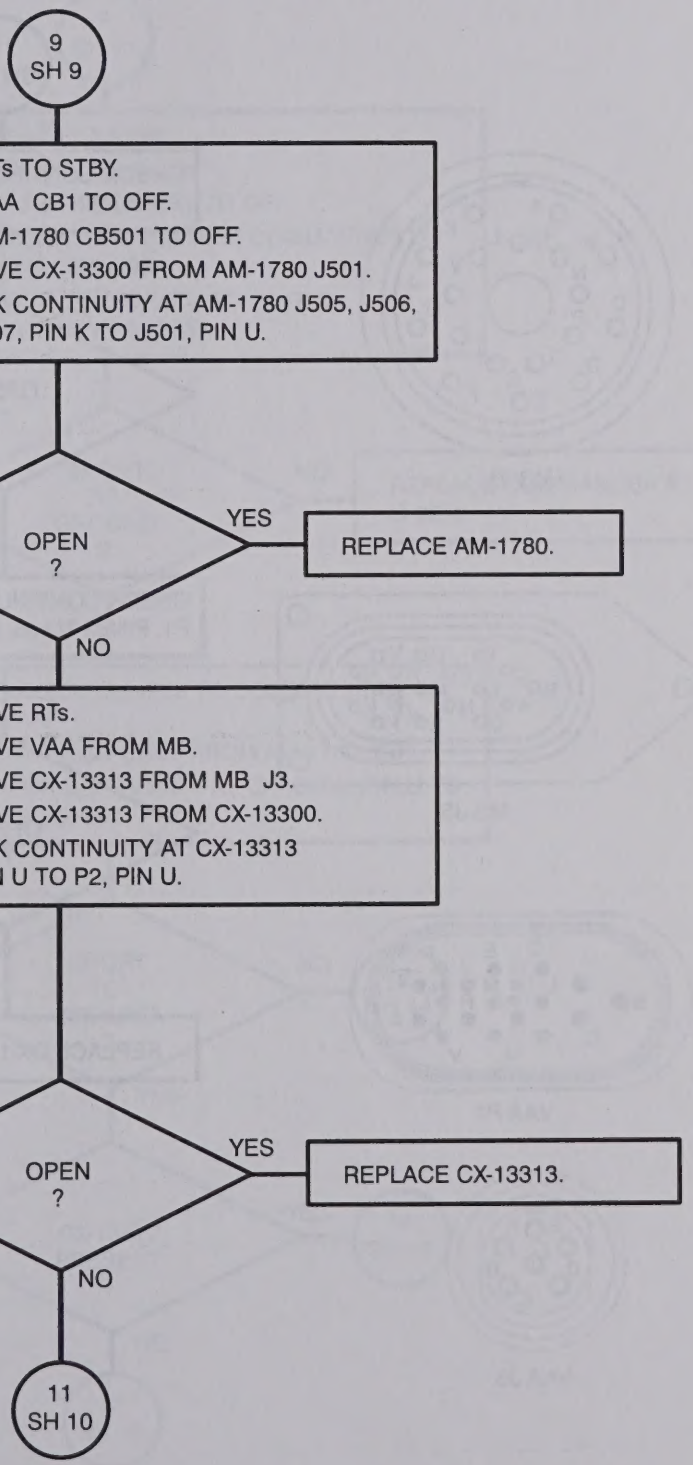
AM-1780 J501, J505, J506, J507



CX-13313 P2



MB J3
CX-13313 P1

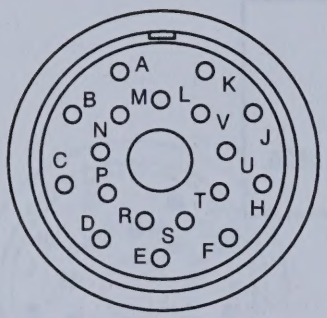


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

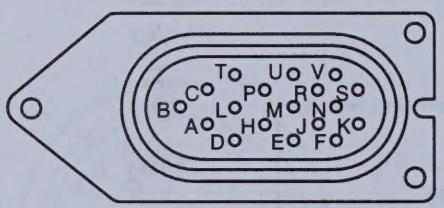
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

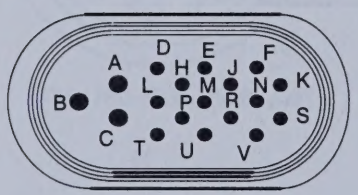
(Sheet 10 of 14)



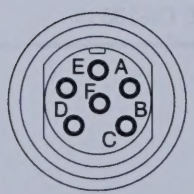
MB J3



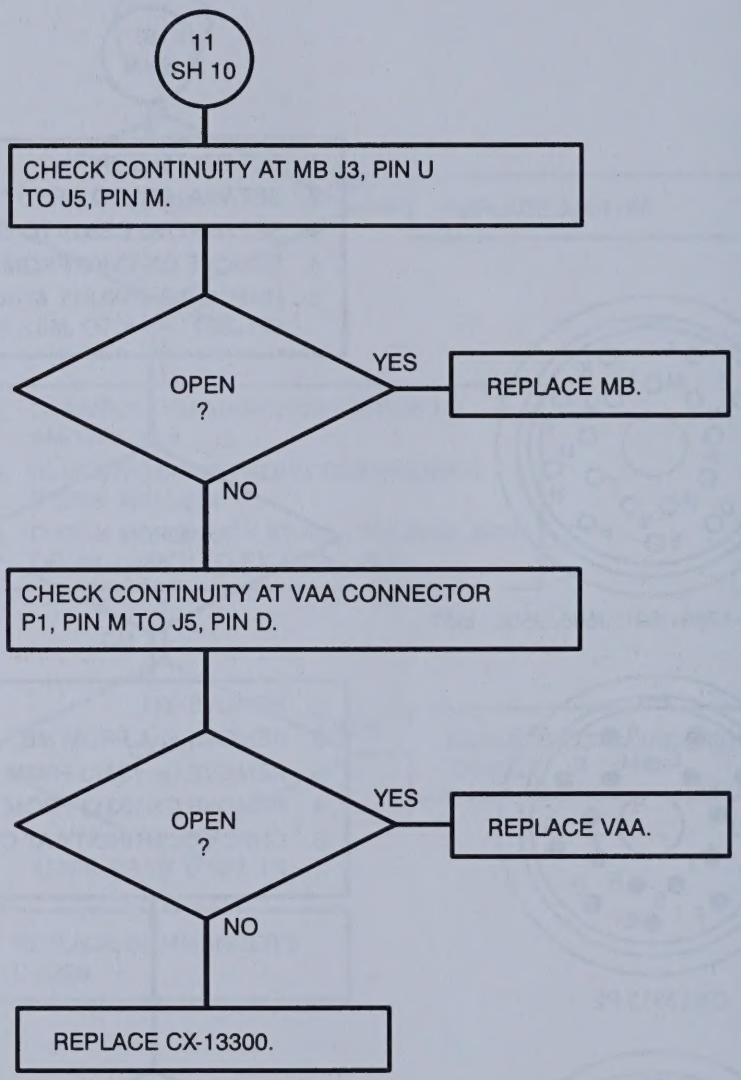
MB J5



VAA P1



VAA J5

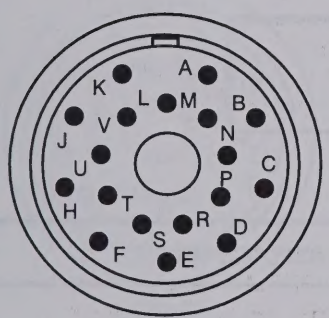


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 11 of 14)



CX-4723
CX-13300

6
SH 11

1. SET RTs TO STBY.
2. SET VAA CB1 TO OFF.
3. SET AM-1780 CB501 TO OFF.
4. REMOVE CX-4723 FROM COMMANDER'S C-2298 J801/J804.
5. CHECK CONTINUITY AT CX-4723, PIN K TO PIN A (GND).

SHORT TO GROUND ?

NO → REPLACE COMMANDER'S C-2298.

YES

1. CONNECT CX-4723 TO COMMANDER'S C-2298.
2. REMOVE CX-13300 FROM AM-1780 J501.
3. CHECK CONTINUITY AT CX-13300, PIN U TO PIN A (GND).

SHORT TO GROUND ?

NO → 12
SH 14

YES

CX-13417 PRESENT ?

YES → 14
SH 12

NO

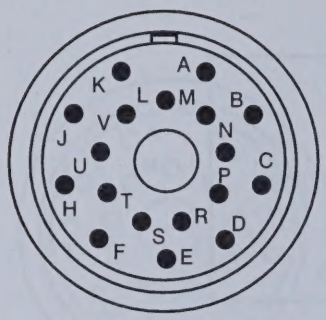
13
SH 13

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

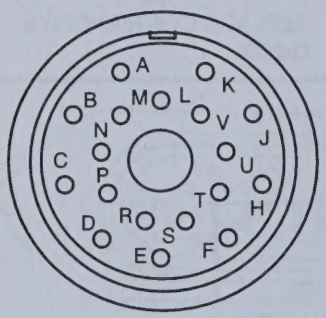
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

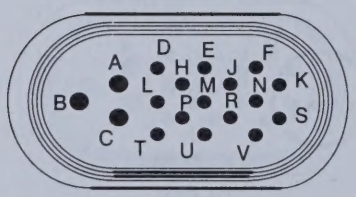
(Sheet 12 of 14)



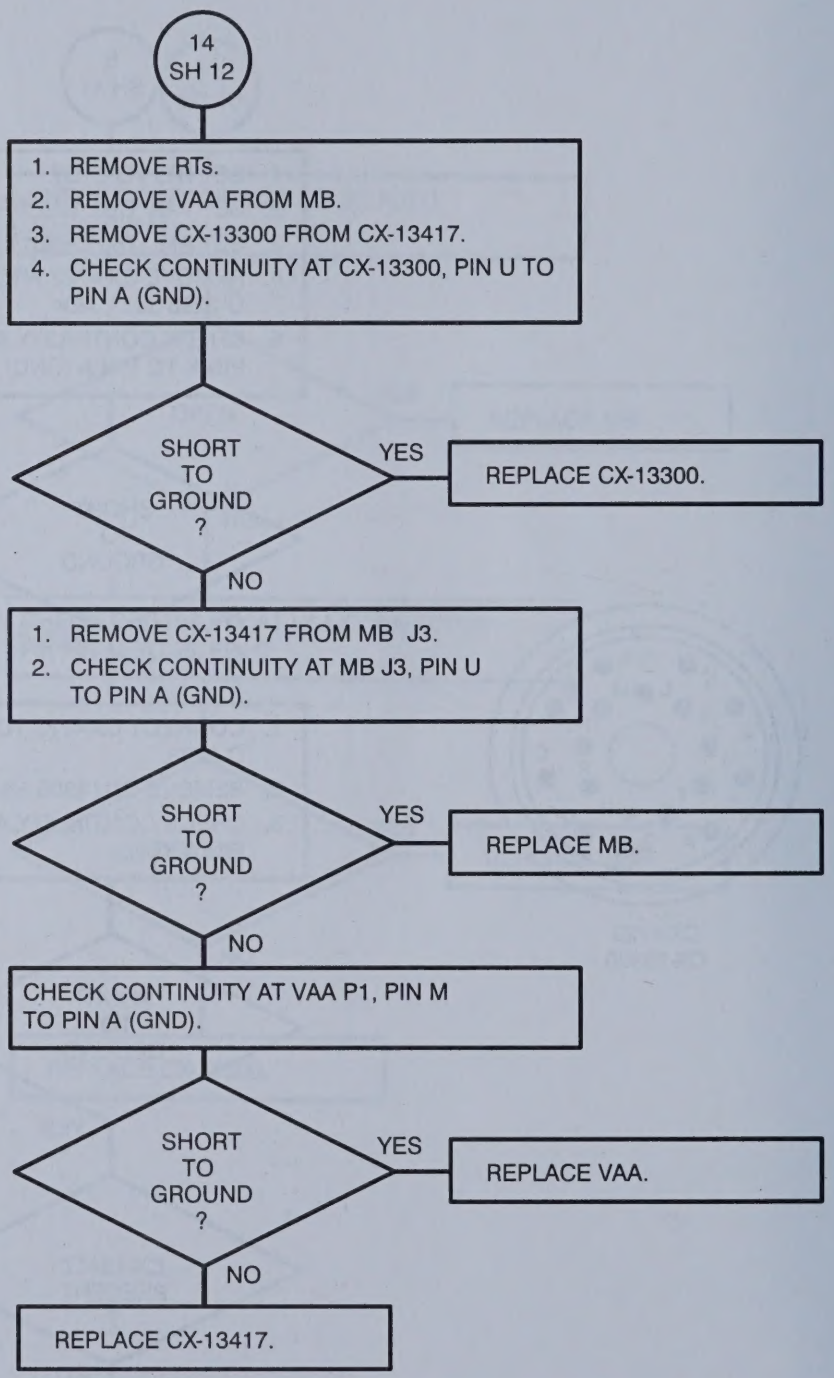
CX-13300



MB J3



VAA P1

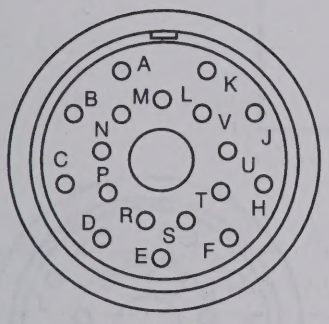


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

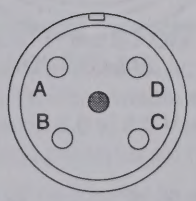
Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

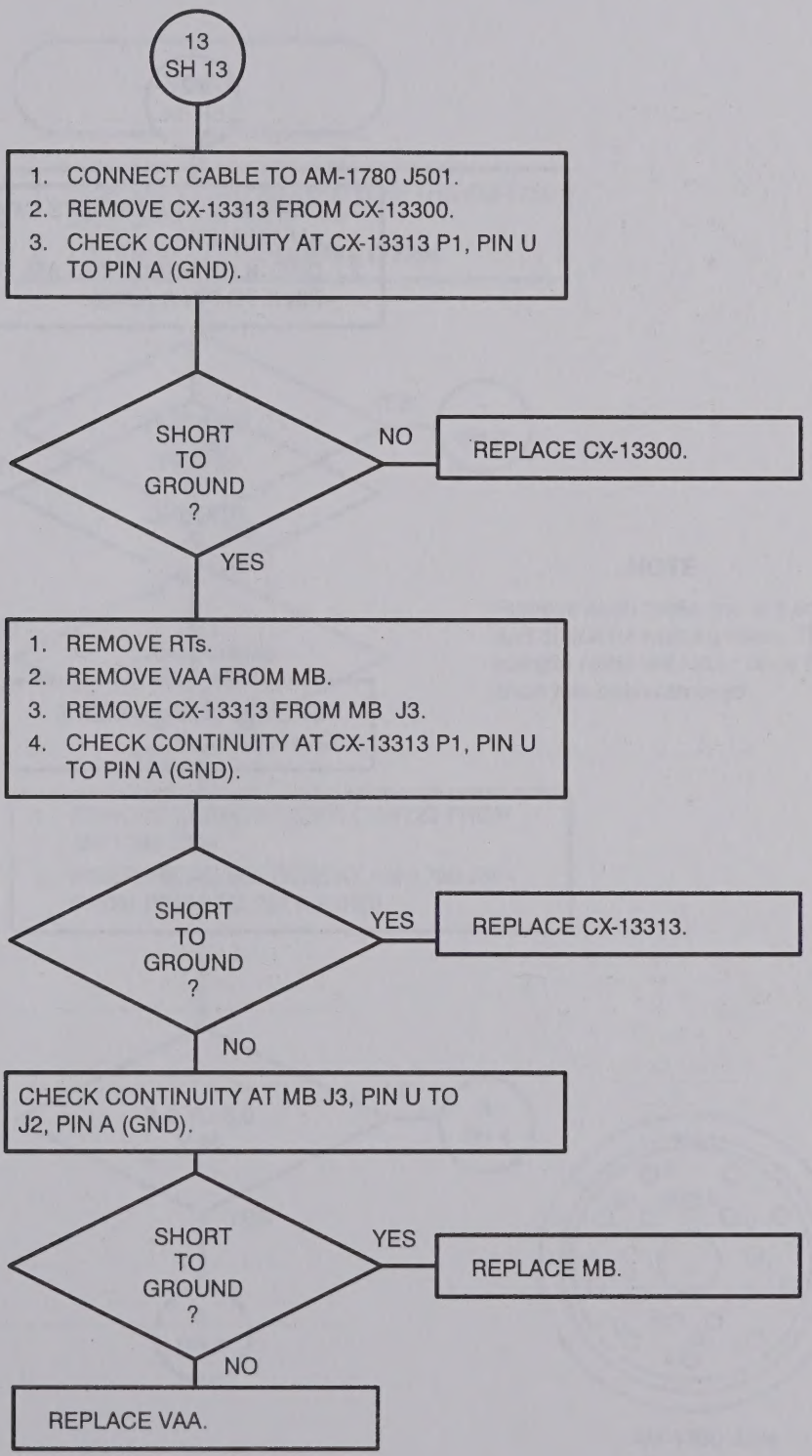
(Sheet 13 of 14)



MB J3
CX-13313 P1



MB J2

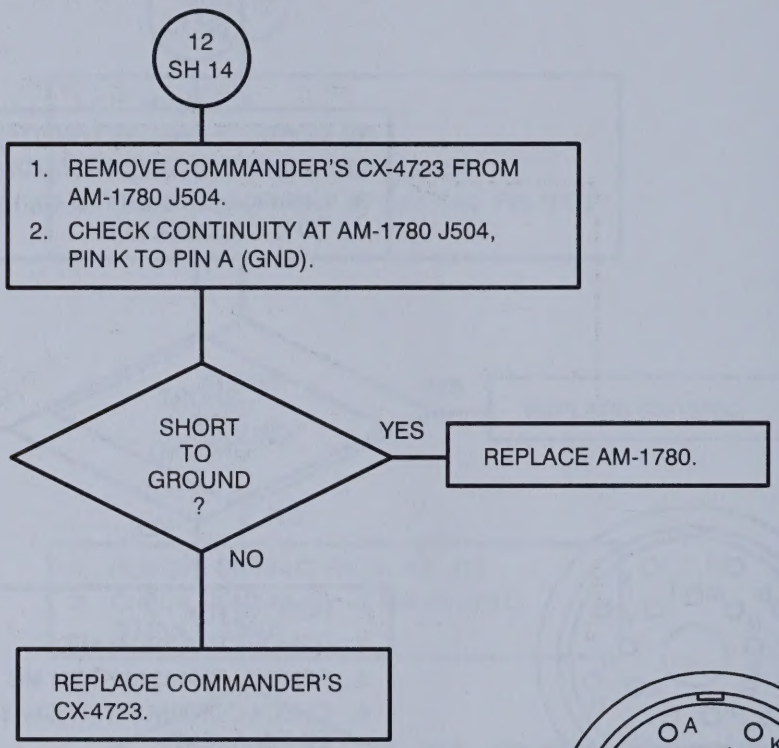


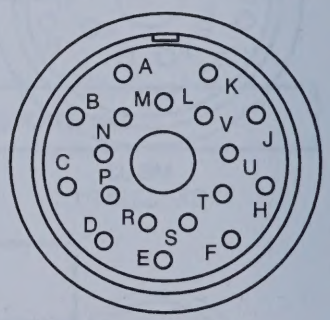
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 27

NO RT-A MODULATION FROM COMMANDER'S C-2298.

(Sheet 14 of 14)





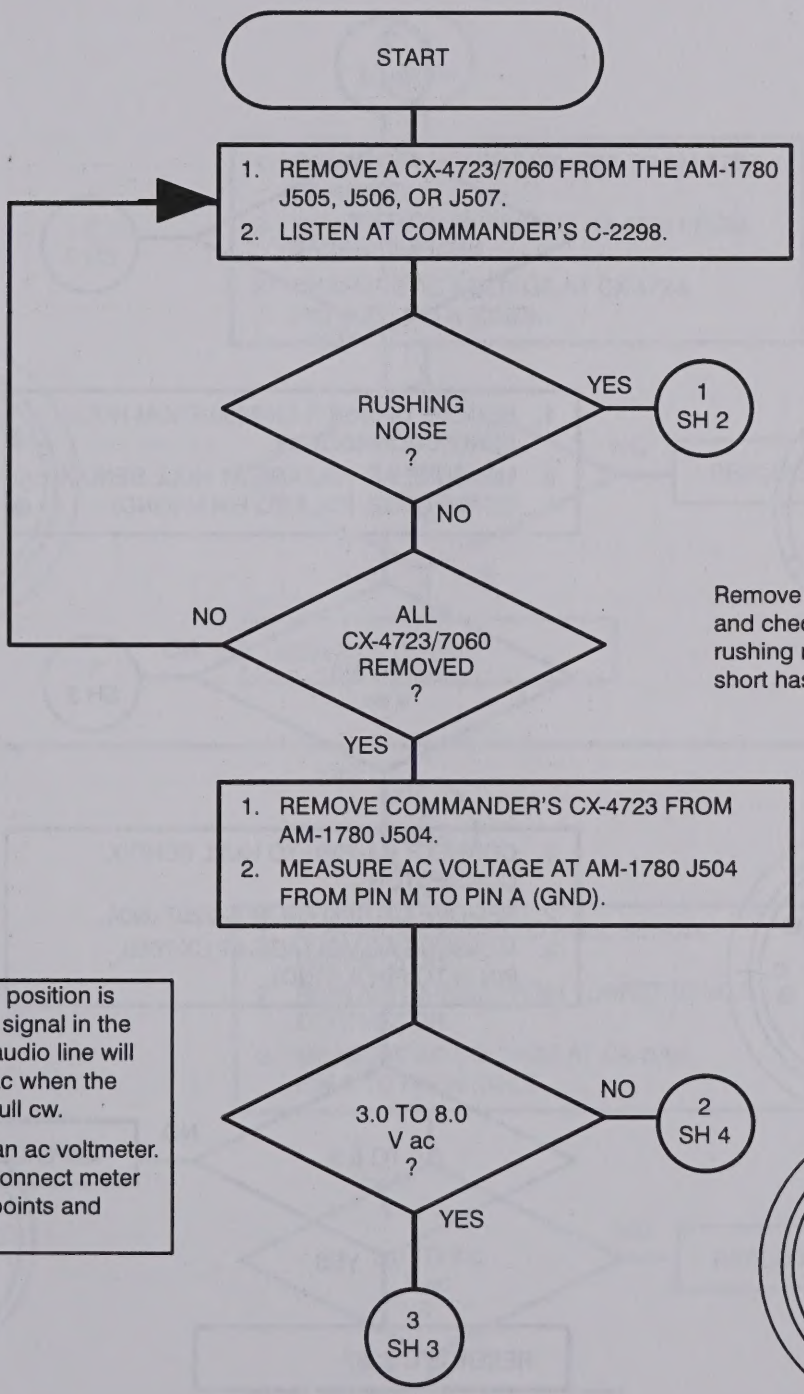
AM-1780 J504

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 28

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

(Sheet 1 of 6)

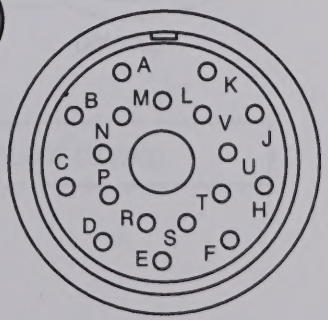


NOTE:

Remove each cable one at a time and check for rushing noise. The rushing noise will return once the short has been removed.

The RT in the SQ OFF position is used to provide an ac signal in the system. The variable audio line will produce 3.0 to 8.0 V ac when the volume control is set full cw.

Set up multimeter as an ac voltmeter. Use the 20 V range. Connect meter probes between test points and chassis ground.



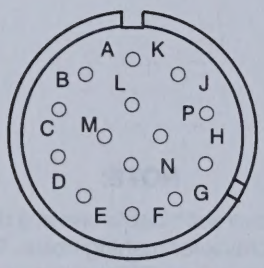
AM-1780 J504

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

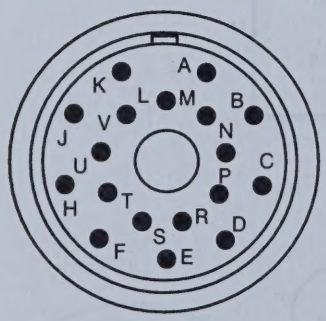
Chart 28

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

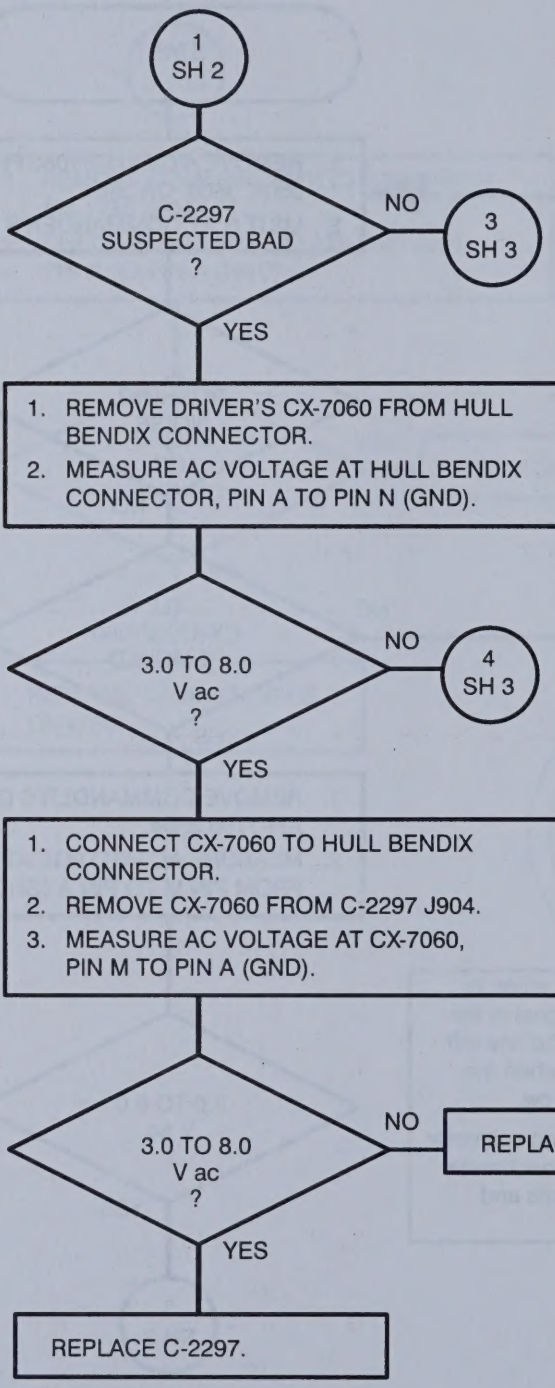
(Sheet 2 of 6)



HULL BENDIX CONNECTOR



CX-7060

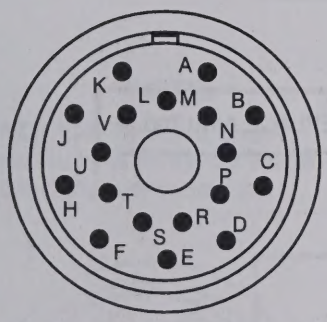


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

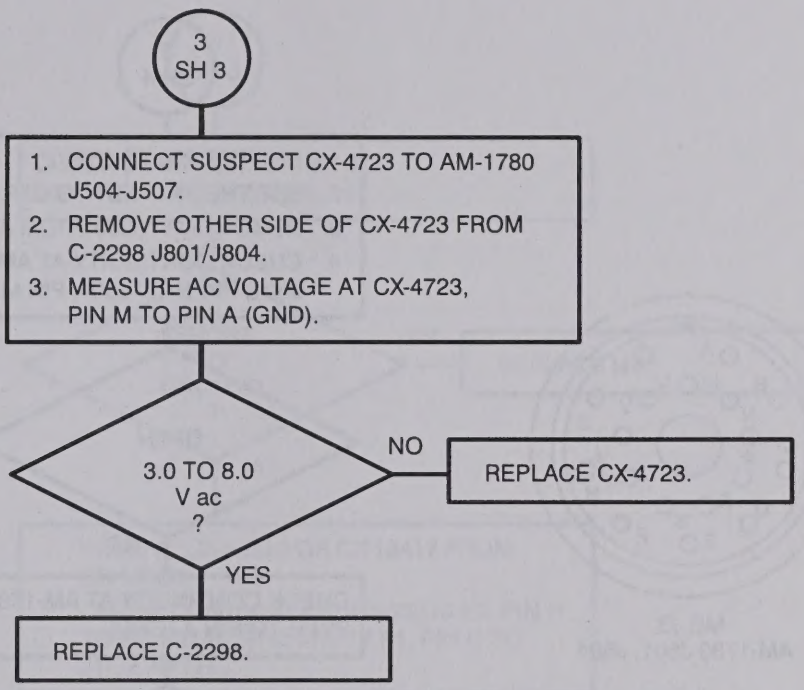
Chart 28

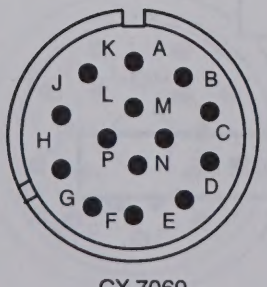
NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

(Sheet 3 of 6)

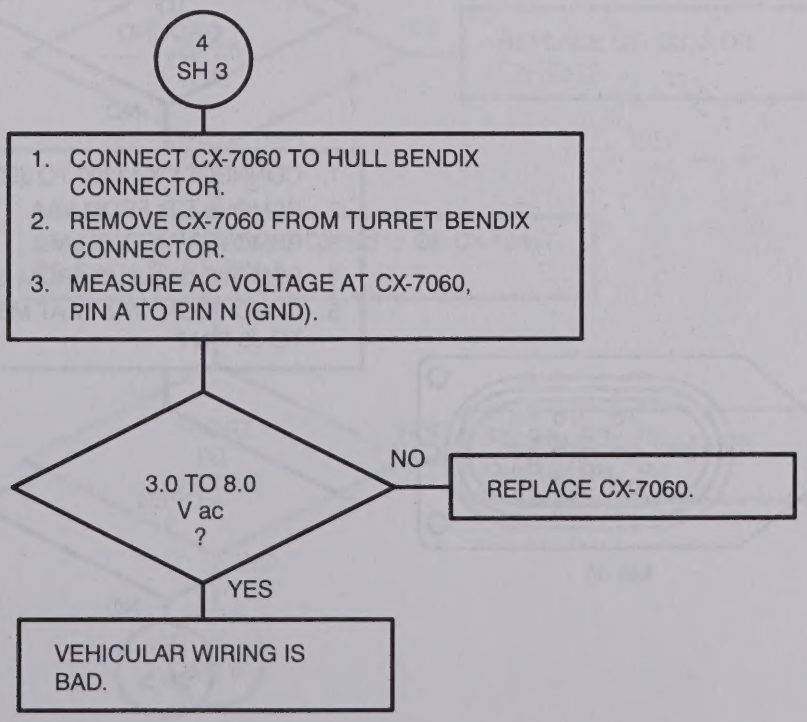


CX-4723





CX-7060

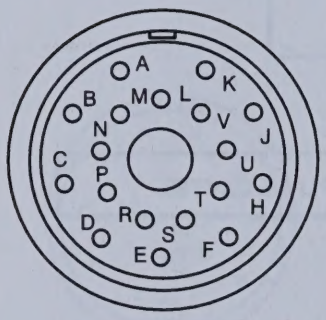


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

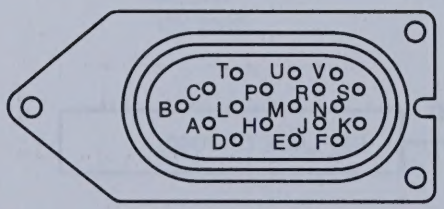
Chart 28

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

(Sheet 4 of 6)



MB J3,
AM-1780 J501, J504



MB J5

2
SH 4

1. SET THE RTs TO STBY.
2. SET THE VAA CB1 TO OFF.
3. REMOVE CX-13300 FROM AM-1780 J501.
4. CHECK CONTINUITY AT AM-1780 J501, PIN H TO J504, PIN M.

OPEN ?

YES → REPLACE AM-1780.

NO

CHECK CONTINUITY AT AM-1780 J501, PIN H TO PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE AM-1780.

NO

1. CONNECT CX-13300 TO J501.
2. REMOVE RTs FROM VAA.
3. REMOVE VAA FROM MB.
4. REMOVE CX-13313 FROM MB J3.
5. CHECK CONTINUITY AT MB J3, PIN H TO J5 PIN F.

OPEN ?

YES → REPLACE MB.

NO

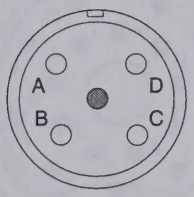
5
SH 5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 28

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

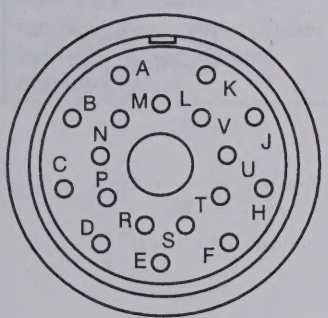
(Sheet 5 of 6)



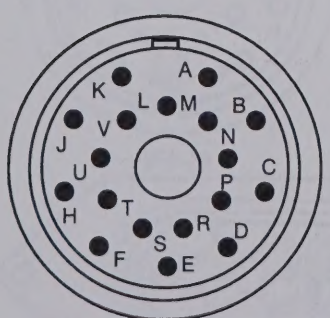
MB J2

NOTE:

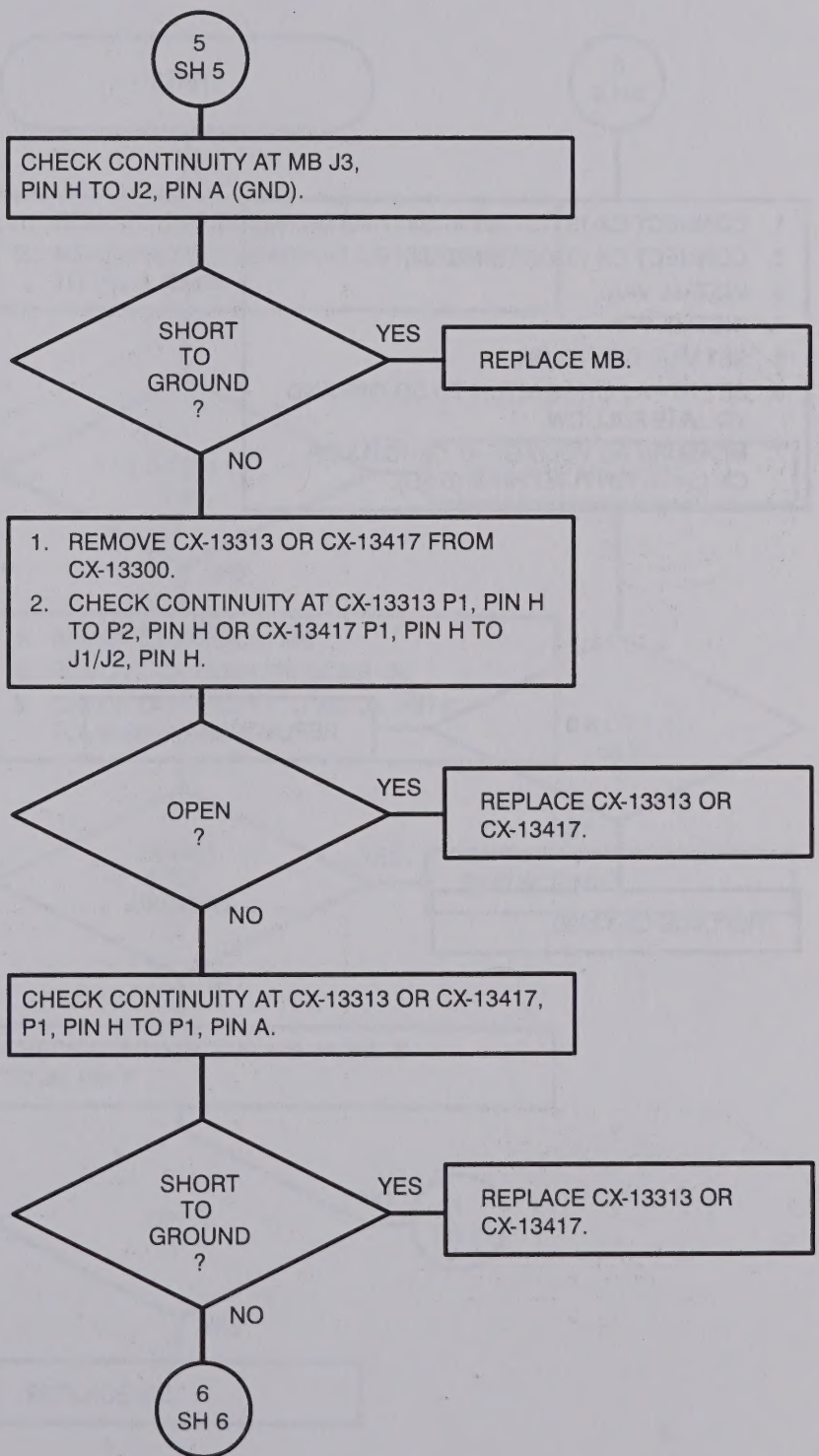
If CX-13417 present, check continuity at connector where CX-13300 was connected.



MB J3
CX-13313 P1
CX-13417 J1, J2



CX-13313 P2
CX-13417 P1

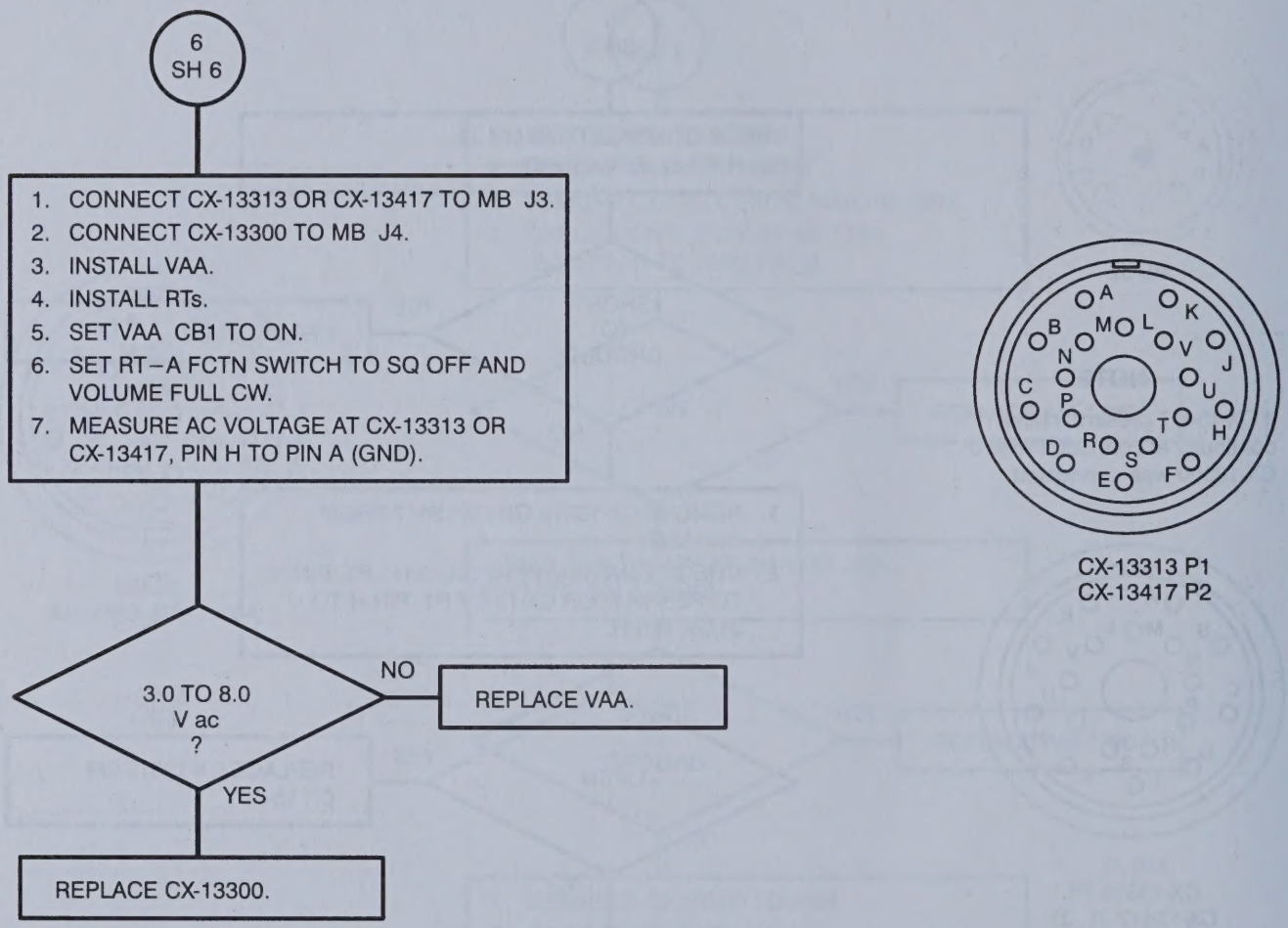


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 28

NO RT-A MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT A.

(Sheet 6 of 6)



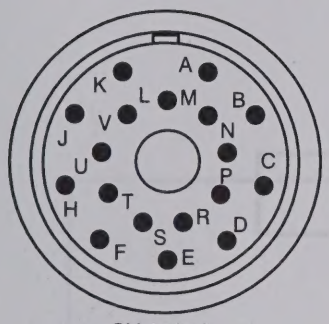
CX-13313 P1
CX-13417 P2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 29

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH IN THE ALL POSITION.

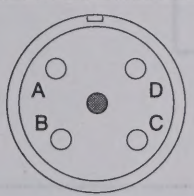
(Sheet 1 of 2)



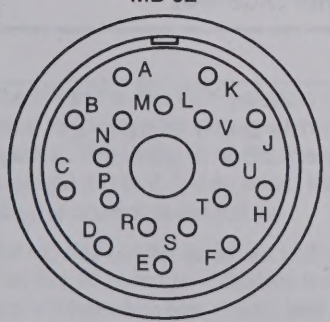
CX-13300

The RT in the SQ OFF position is used to provide an ac signal in the system. The fixed audio line will produce 1.5 to 3.5 V ac.

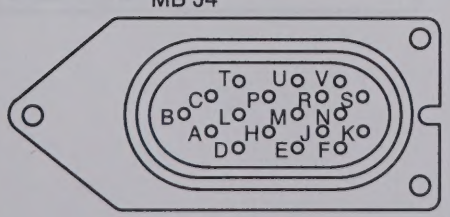
Set up multimeter as an ac voltmeter. Use the 20 V range. Connect meter probes between test points and chassis ground.



MB J2



MB J4



MB J5

START

1. REMOVE CX-13300 FROM AM-1780 J503.
2. MEASURE AC VOLTAGE AT CX-13300, PIN K TO PIN A (GND).

1.5 TO 3.5 V ac ?

YES → REPLACE AM-1780.

NO

1. REMOVE VAA FROM MB.
2. REMOVE CX-13300 FROM MB J4.
3. CHECK CONTINUITY AT MB J4, PIN K TO J2 PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE MB.

NO

CHECK CONTINUITY AT MB J4, PIN K TO J5, PIN P.

OPEN ?

NO → 1 SH 2

YES

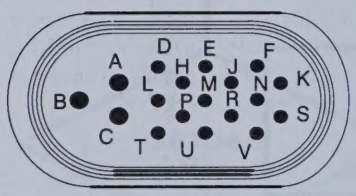
REPLACE MB.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

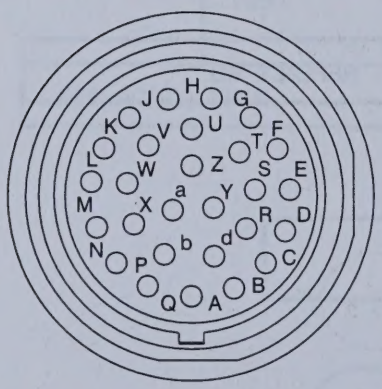
Chart 29

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH IN THE ALL POSITION.

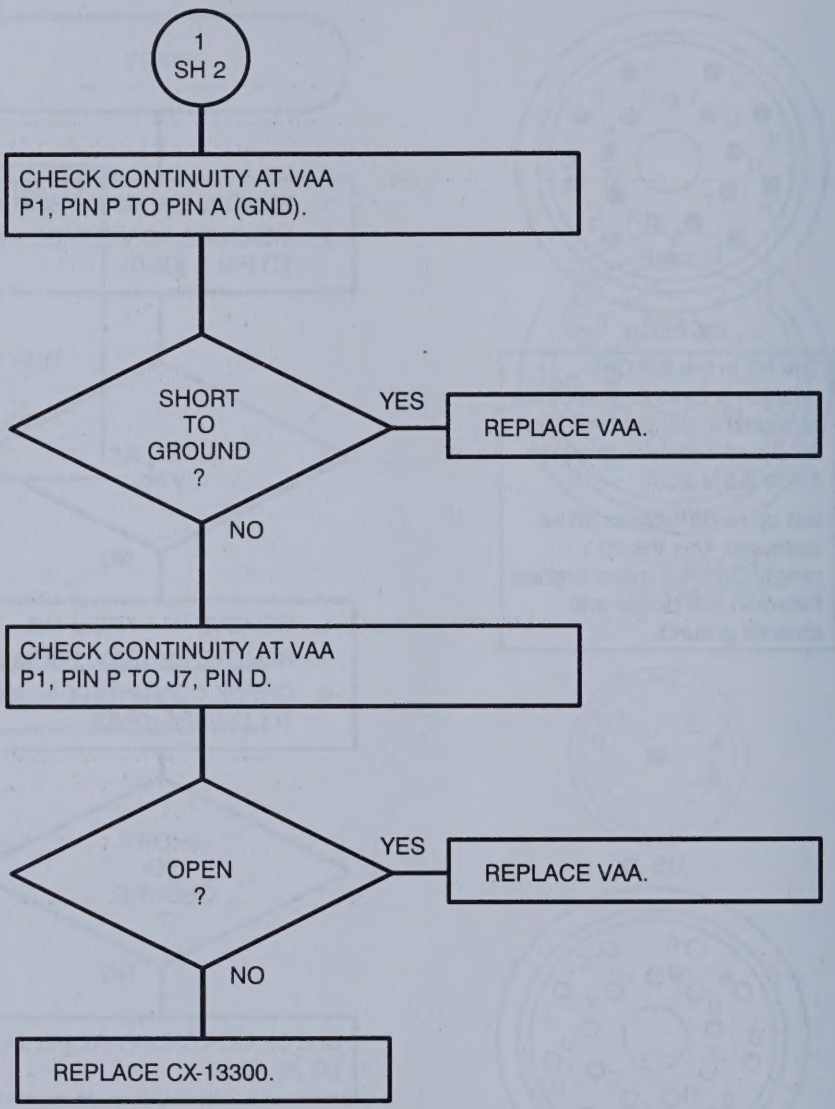
(Sheet 2 of 2)



VAA P1



VAA J7

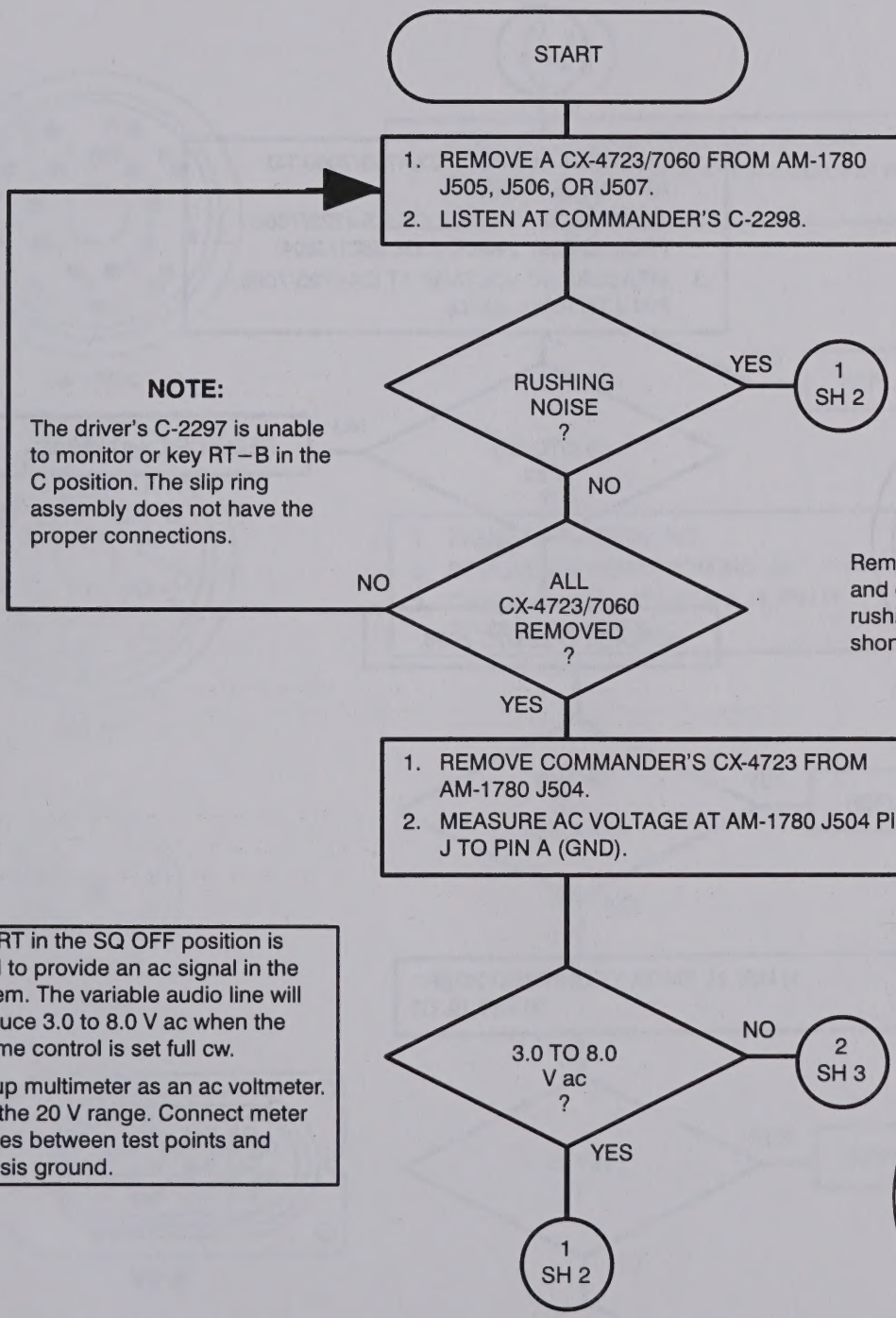


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 30

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 1 of 4)



NOTE:

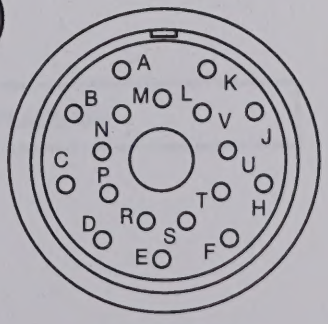
The driver's C-2297 is unable to monitor or key RT-B in the C position. The slip ring assembly does not have the proper connections.

NOTE:

Remove each cable one at a time and check for rushing noise. The rushing noise will return once the short has been removed.

The RT in the SQ OFF position is used to provide an ac signal in the system. The variable audio line will produce 3.0 to 8.0 V ac when the volume control is set full cw.

Set up multimeter as an ac voltmeter. Use the 20 V range. Connect meter probes between test points and chassis ground.



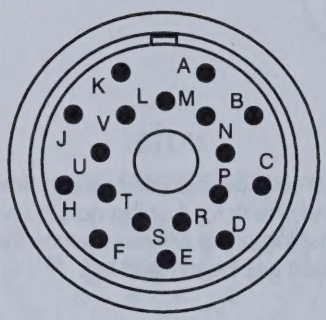
AM-1780 J504

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

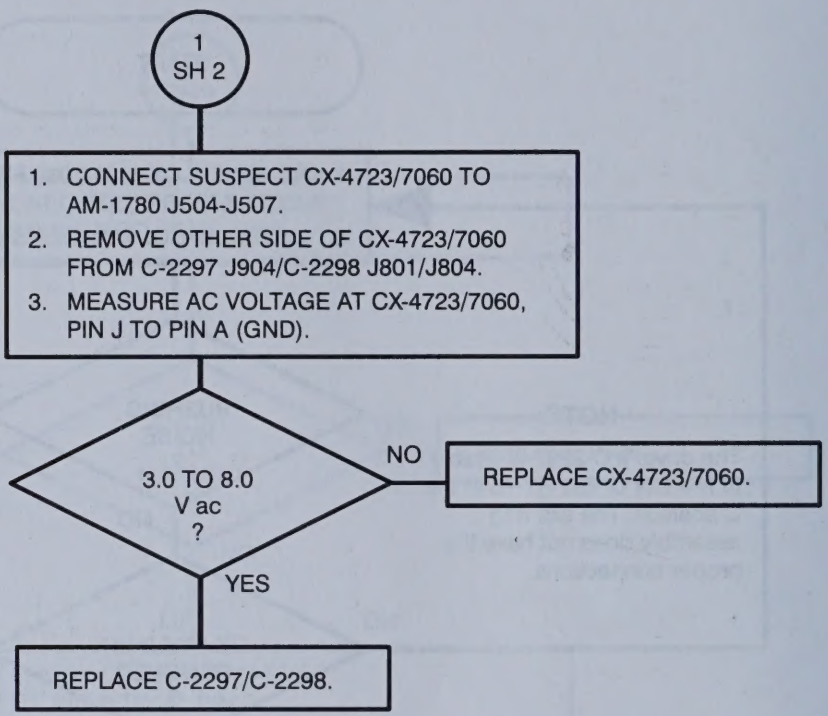
Chart 30

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 2 of 4)



CX-4723/7060

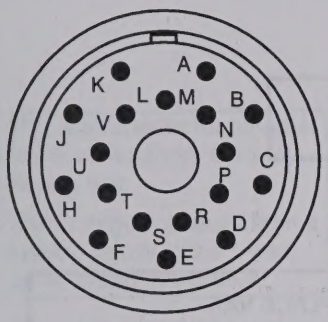


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

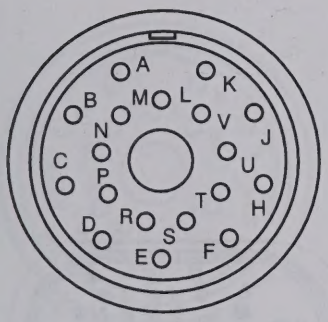
Chart 30

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

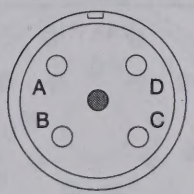
(Sheet 3 of 4)



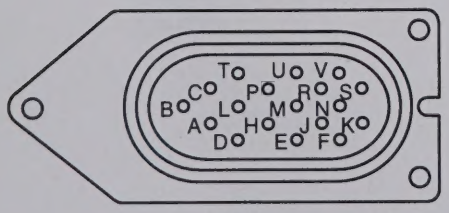
CX-13300



MB J4



MB J2



MB J5

2 SH 3

1. REMOVE CX-13300 FROM AM-1780 J503.
2. MEASURE AC VOLTAGE AT CX-13300, PIN H TO PIN A (GND).

3.0 TO 8.0 V ac ?

YES → REPLACE AM-1780.

NO

1. REMOVE VAA FROM MB.
2. REMOVE CX-13300 FROM MB J4.
3. CHECK CONTINUITY AT MB J4, PIN H TO J2, PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE MB.

NO

CHECK CONTINUITY AT MB J4, PIN H TO J5, PIN N.

OPEN ?

YES → REPLACE MB.

NO

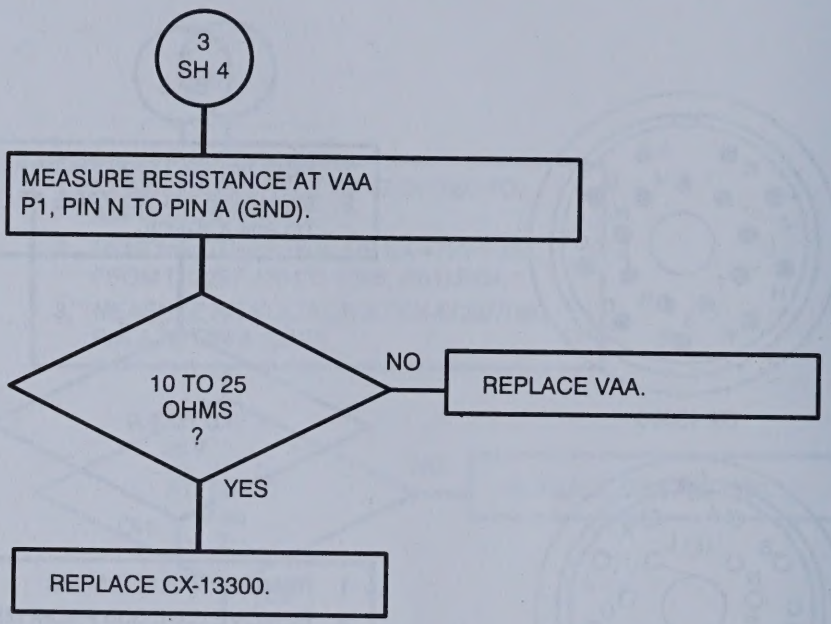
3 SH 4

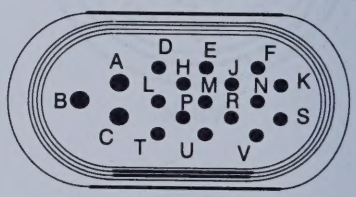
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 30

NO RT-B MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 4 of 4)





VAA P1

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 31

RT-B WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH SET TO C.

(Sheet 1 of 2)

START

1. REMOVE COMMANDER'S CX-4723 FROM J504 OF AM-1780.
2. MEASURE VOLTAGE AT AM-1780 J504, PIN F TO PIN A (GND).

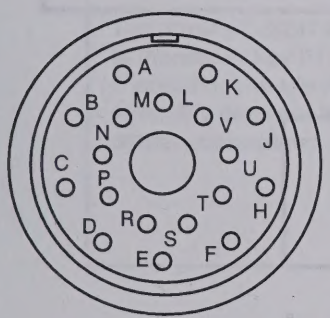
This step checks for an open in the commander's RT-B keying line.

This voltage is present from a biasing circuit in the 1 watt audio board of the VAA.

1.0 TO 2.5 V dc ?

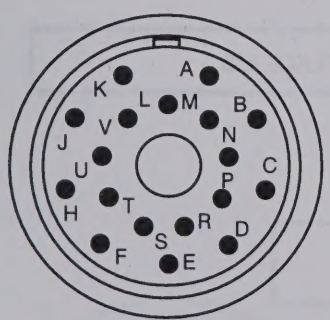
NO → 1 SH 2

YES



AM-1780 J504

1. CONNECT COMMANDER'S CX-4723 TO J504.
2. REMOVE THE CX-4723 FROM C-2298 J801/J804.
3. MEASURE VOLTAGE AT CX-4723, PIN F TO PIN A (GND).



CX-4723

1.0 TO 2.5 V dc ?

NO → REPLACE CX-4723.

YES

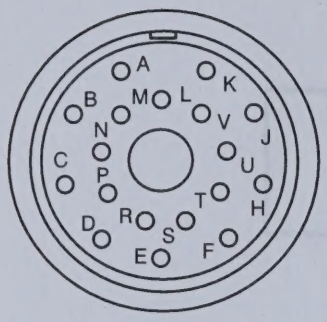
REPLACE COMMANDER'S C-2298.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

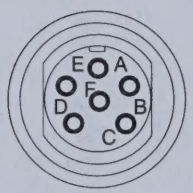
Chart 31

RT-B WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH SET TO C.

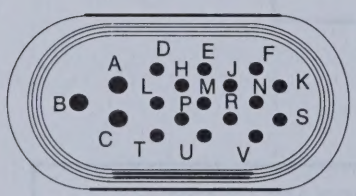
(Sheet 2 of 2)



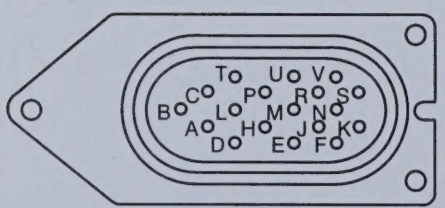
MB J4,
AM-1780 J503, J504



VAA J4



VAA P1



MB J5

1
SH 2

1. REMOVE CX-13300 FROM J503 OF AM-1780.
2. CHECK CONTINUITY AT AM-1780 J503, PIN S TO J504, PIN F.

OPEN ? — YES → REPLACE AM-1780.

NO

1. REMOVE VAA FROM MB.
2. REMOVE CX-13300 FROM MB J4.
3. CHECK CONTINUITY AT MB J4, PIN S TO J5, PIN S.

OPEN ? — YES → REPLACE MB.

NO

CHECK CONTINUITY AT VAA P1, PIN S TO J4, PIN C.

OPEN ? — YES → REPLACE VAA.

NO

REPLACE CX-13300.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 32

NO RT-B MODULATION AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 1 of 5)

START

1. REMOVE A CX-4723/7060 FROM THE AM-1780 J505, J506, OR J507.
2. PRESS COMMANDER'S PTT AND COUNT INTO HS.

SIDETONE RETURNS ?

YES → 1 SH 2

NO

NOTE:

The driver's C-2297 is unable to monitor or key RT-B in the C position. The slip ring assembly does not have the proper connections.

ALL CX-4723/7060 REMOVED ?

NO → (back to step 1)

YES

NOTE:

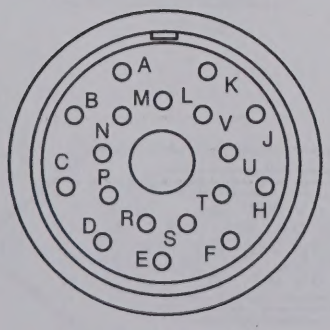
Remove each cable one at a time and check for rushing noise. The rushing noise will return once the short has been removed.

1. REMOVE CX-13300 AT AM-1780 J503.
2. REMOVE COMMANDER'S CX-4723 FROM AM-1780 J504.
3. CHECK CONTINUITY AT AM-1780 J504, PIN V TO J503, PIN U.

OPEN ?

YES → REPLACE AM-1780.

NO → 2 SH 3



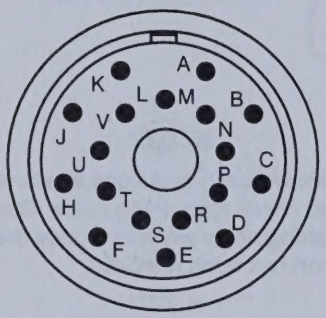
AM-1780 J503, J504

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

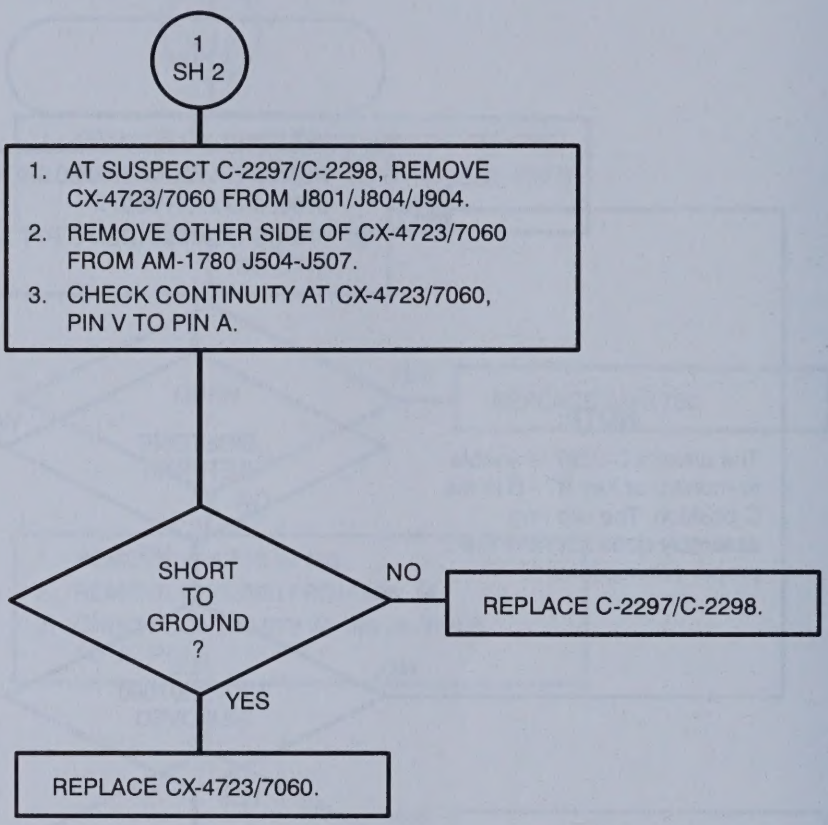
Chart 32

NO RT-B MODULATION AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 2 of 5)



CX-4723/7060

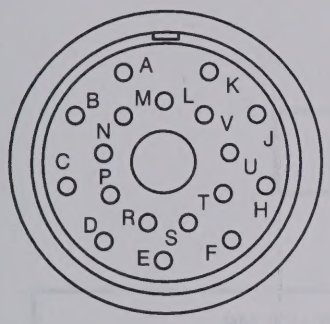


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

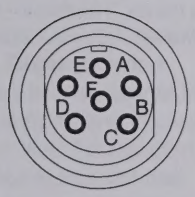
Chart 32

NO RT-B MODULATION AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

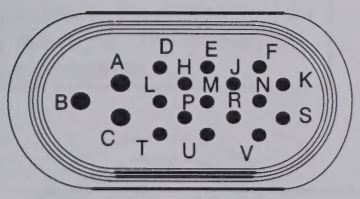
(Sheet 3 of 5)



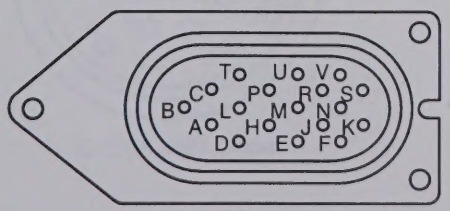
MB J4,
AM-1780 J504



VAA J4



VAA P1



MB J5

2
SH 3

CHECK CONTINUITY AT AM-1780 J504, PIN V TO PIN A (GND).

SHORT TO GROUND ?

YES → REPLACE AM-1780.

NO

1. CONNECT ALL CABLES TO AM-1780 J503, J504-J507.
2. REMOVE VAA FROM MB.
3. MEASURE RESISTANCE AT VAA J4, PIN D TO P1, PIN U.

20 TO 28 KOHMS ?

NO → REPLACE VAA.

YES

1. REMOVE CX-13300 FROM MB J4.
2. CHECK CONTINUITY AT MB, J4, PIN U TO J5, PIN U.

OPEN ?

YES → REPLACE MB.

NO

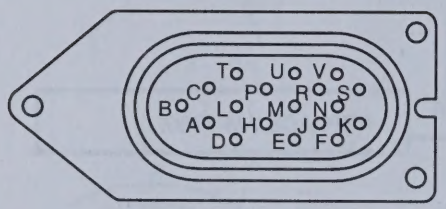
3
SH 4

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 32

NO RT-B MODULATION AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 4 of 5)



MB J5

3
SH 4

CHECK CONTINUITY AT MB, J5, PIN U TO PIN A (GND).

SHORT TO GROUND ?

YES

REPLACE MB.

NO

1. REMOVE CX-13313 FROM CX-13300.
2. CONNECT CX-13300 THAT WAS REMOVED FROM MB J4 TO CX-13313.
3. CONNECT CX-13300 THAT WAS REMOVED FROM CX-13313 TO MB J4.
4. REINSTALL VAA AND RT.
5. MOVE CX-13300 AT AM-1780 J501 TO J503.
6. CONNECT LOOSE CX-13300 TO J501.
7. SET CB1 TO ON AND RT-B TO SQ ON.
8. PRESS COMMANDER'S PTT AND COUNT INTO HS.

SIDETONE HEARD ?

YES

REPLACE CX-13300 CONNECTED TO MB J3.

NO

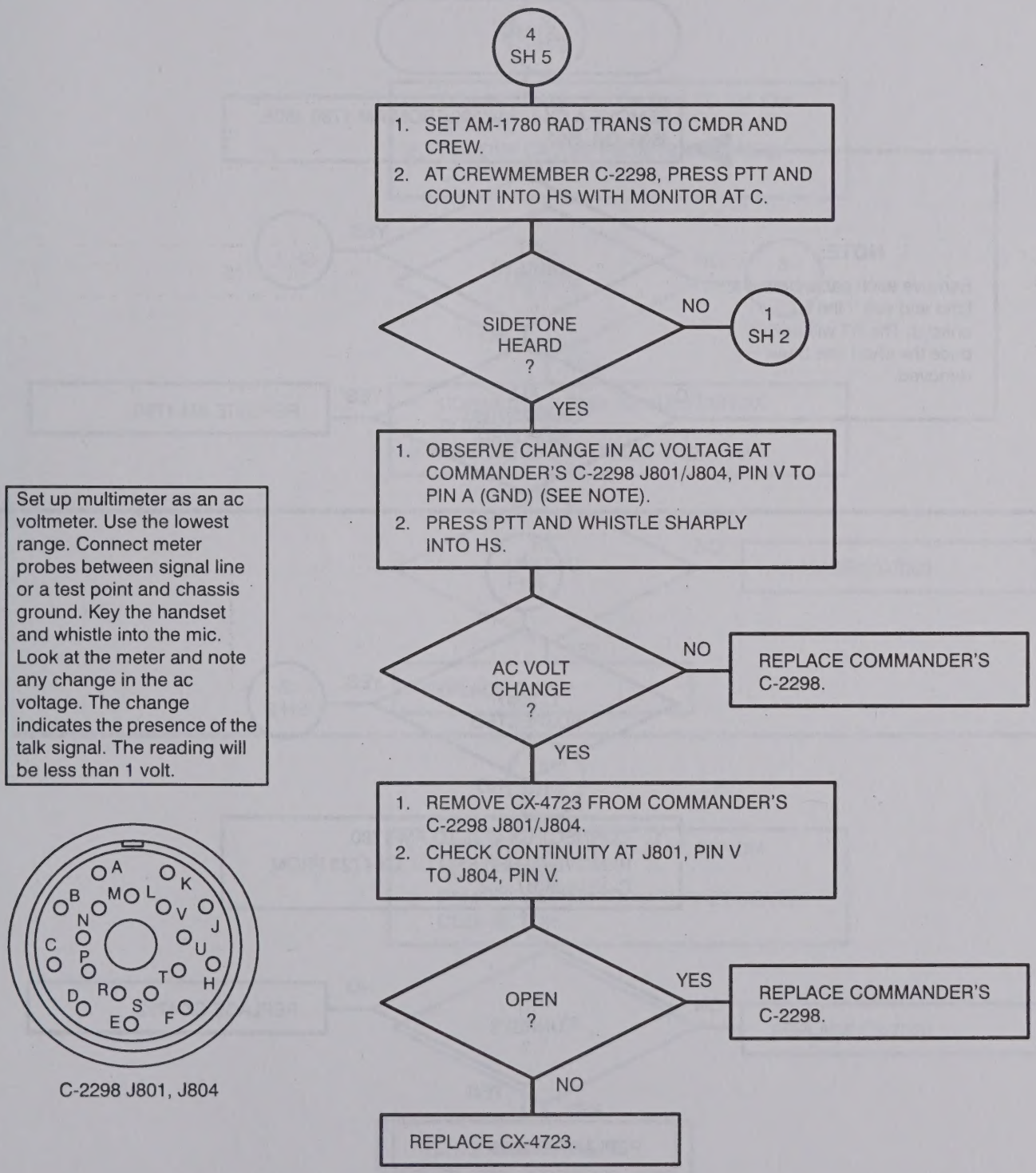
4
SH 5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 32

NO RT-B MODULATION AT COMMANDER'S C-2298. MONITOR SWITCH AT C.

(Sheet 5 of 5)



Set up multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or a test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in the ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt.

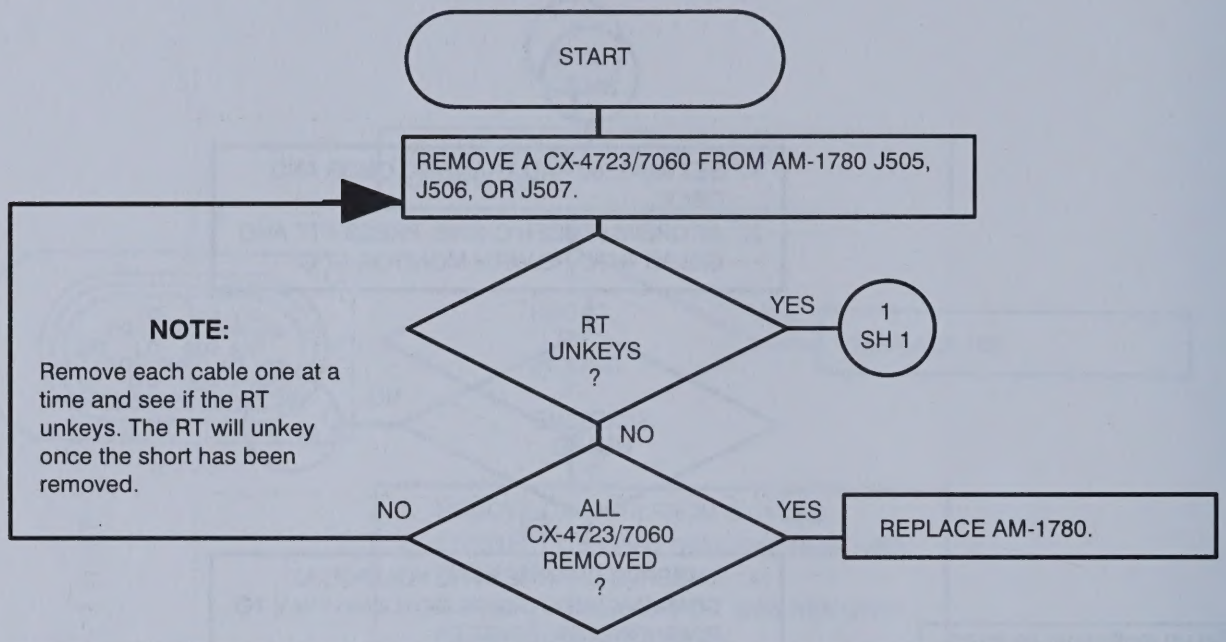
C-2298 J801, J804

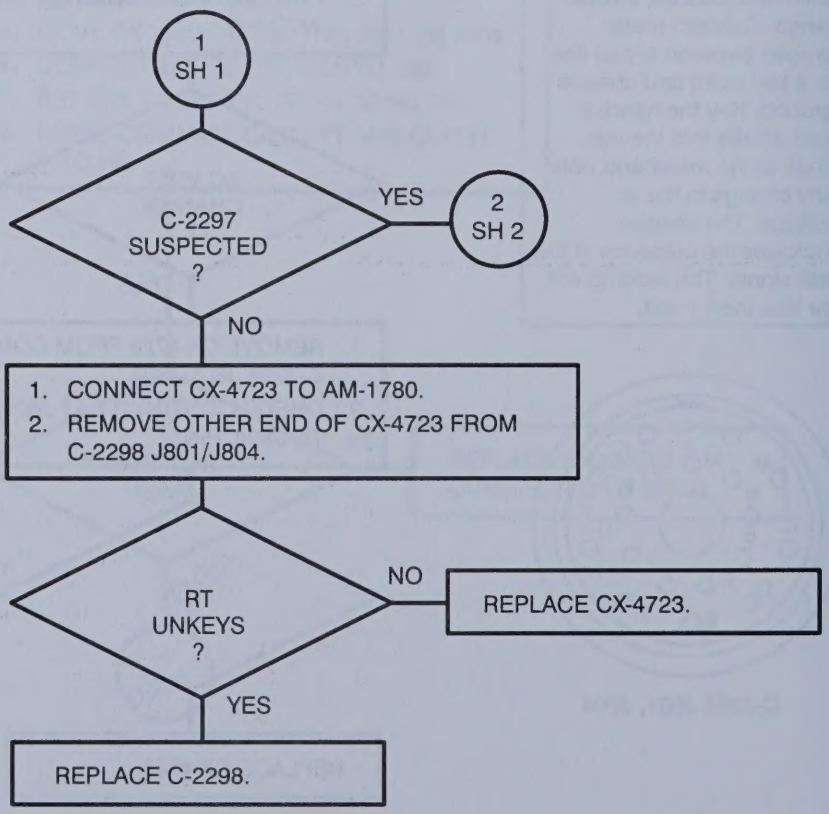
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 33

RT CONTINUOUSLY KEYED WHEN RADIO TRANS SWITCH IS PLACED TO CDR AND CREW.

(Sheet 1 of 2)



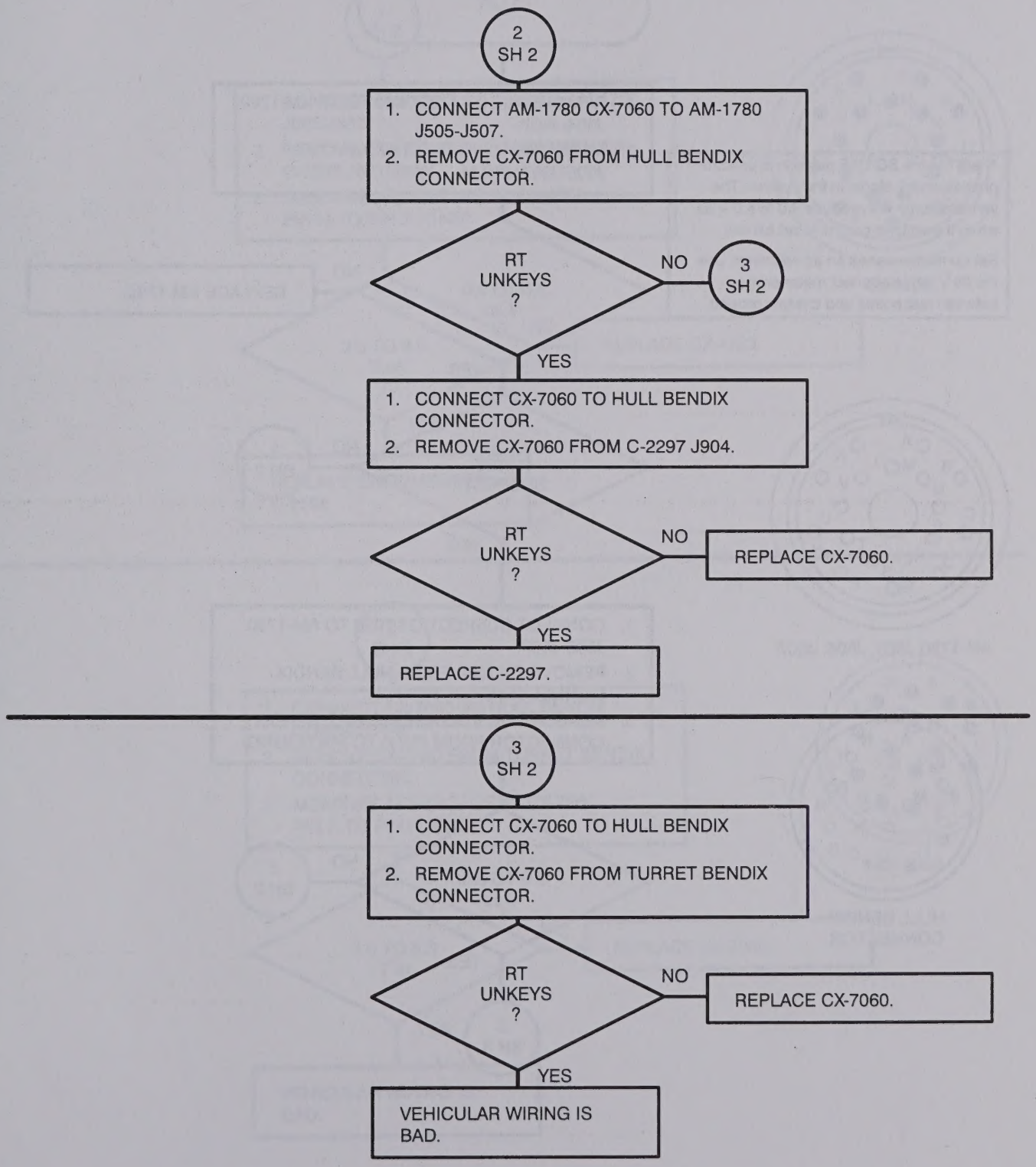


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 33

RT CONTINUOUSLY KEYED WHEN RADIO TRANS SWITCH IS PLACED TO CDR AND CREW.

(Sheet 2 of 2)



2.2. TROUBLESHOOTING FLOWCHARTS. Continued

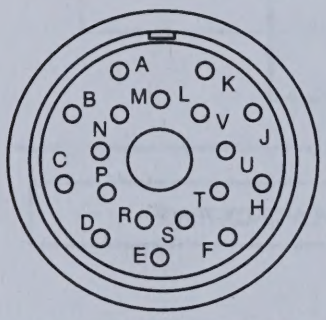
Chart 34

NO RT-A MONITORING. CREWMEMBER'S C-2298 MONITOR SWITCH TO A.

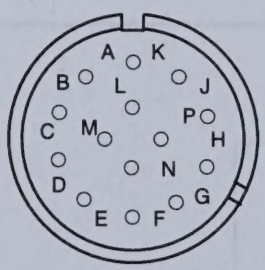
(Sheet 1 of 3)

The RT in the SQ OFF position is used to provide an AC signal in the system. The variable audio will produce 3.0 to 8.0 V ac when the volume control is set full cw.

Set up multimeter as an ac voltmeter. Use the 20 V range connect meter probes between test points and chassis ground.



AM-1780 J505, J506, J507



HULL BENDIX CONNECTOR

START

1. REMOVE ALL CX-4723/7060 FROM AM-1780 J504-J507.
2. MEASURE AC VOLTAGE AT AM-1780 J505-J507, PIN M.

3.0 TO 8.0 V ac ?

NO → REPLACE AM-1780.

YES

C-2297 SUSPECT ?

NO → 1 SH 2

YES

1. CONNECT SUSPECT CX-7060 TO AM-1780 J505-J507.
2. REMOVE CX-7060 FROM HULL BENDIX CONNECTOR.
3. MEASURE AC VOLTAGE AT HULL BENDIX CONNECTOR FROM PIN A TO PIN N (GND).

3.0 TO 8.0 V ac ?

NO → 2 SH 2

YES

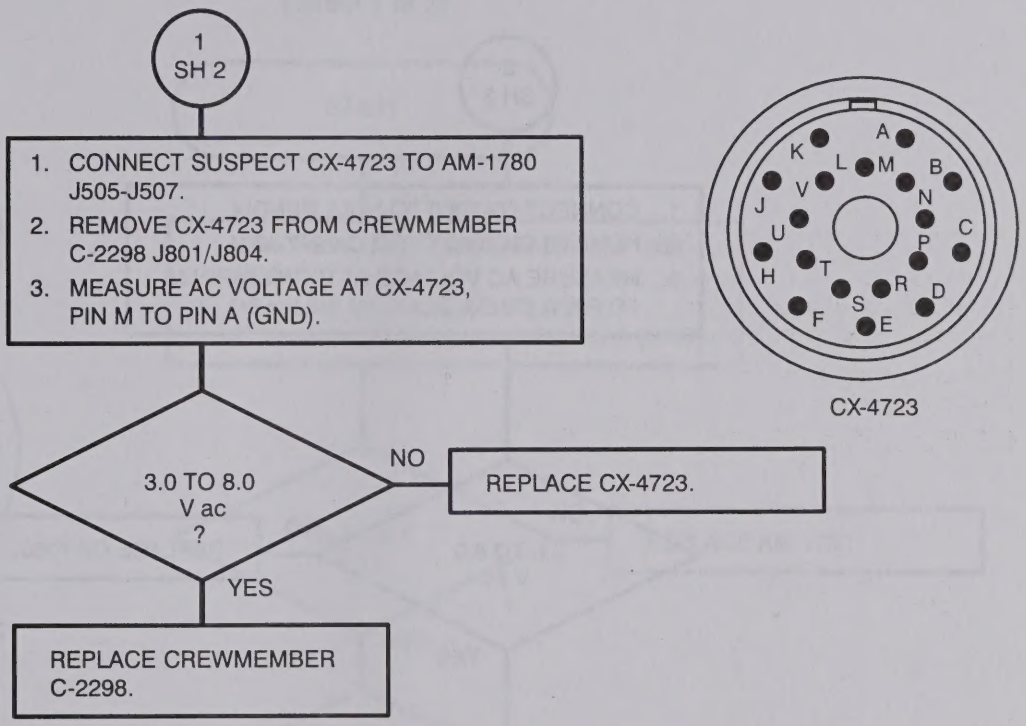
3 SH 3

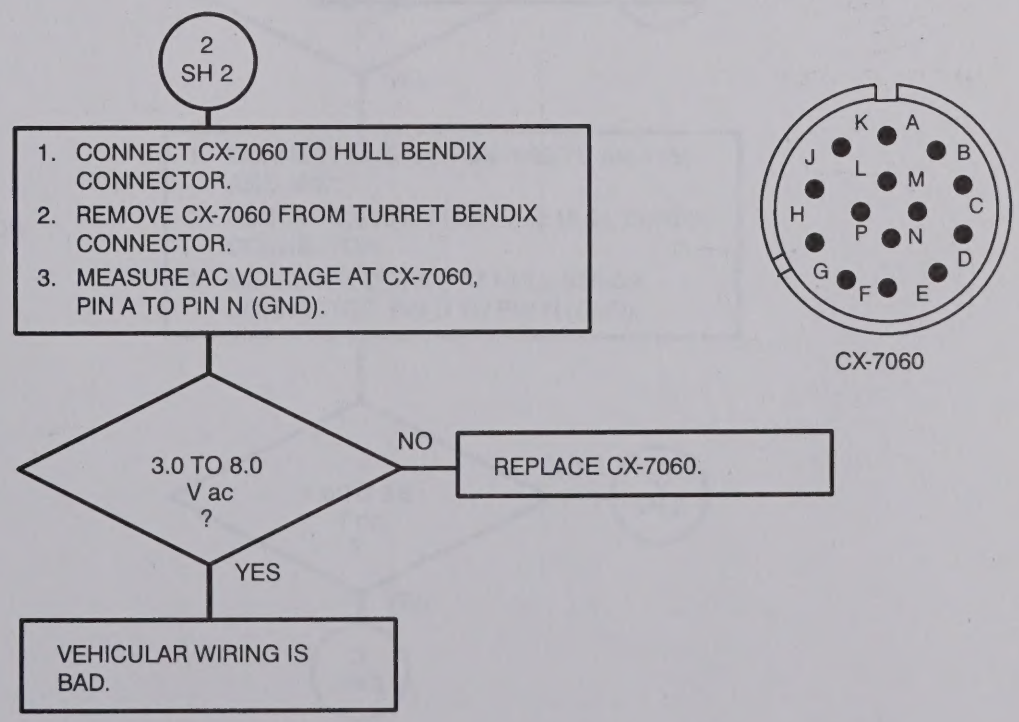
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 34

NO RT-A MONITORING. CREWMEMBER'S C-2298 MONITOR SWITCH TO A.

(Sheet 2 of 3)



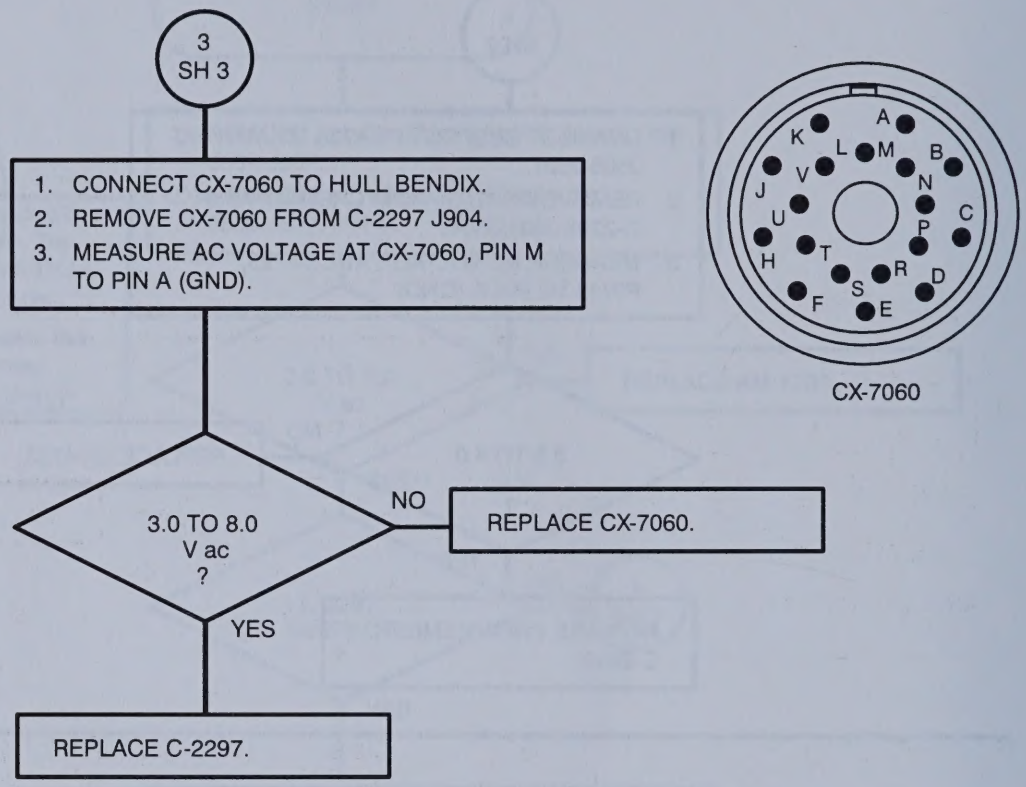


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 34

NO RT-A MONITORING. CREWMEMBER'S C-2298 MONITOR SWITCH TO A.

(Sheet 3 of 3)

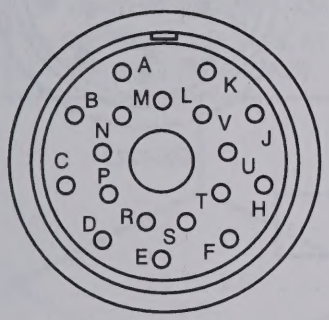


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

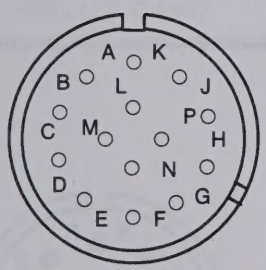
Chart 35

RT-A WILL NOT KEY. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL OR A.

(Sheet 1 of 3)



AM-1780 J505, J506, J507



HULL BENDIX CONNECTOR

START

1. REMOVE ALLX-4723/7060 FROM AM-1780 J504-J507.
2. MEASURE VOLTAGE AT AM-1780 J505, J506, OR J507, PIN D TO PIN A (GND).

1.0 TO 2.5 V dc ?

NO → REPLACE AM-1780.

YES

C-2297 SUSPECT ?

NO → 1 SH 2

YES

1. CONNECT SUSPECT CX-7060 TO AM-1780 J505-J507.
2. REMOVE CX-7060 FROM THE HULL BENDIX CONNECTOR.
3. MEASURE VOLTAGE AT HULL BENDIX CONNECTOR, PIN D TO PIN N (GND).

1.0 TO 2.5 V dc ?

NO → 2 SH 2

YES

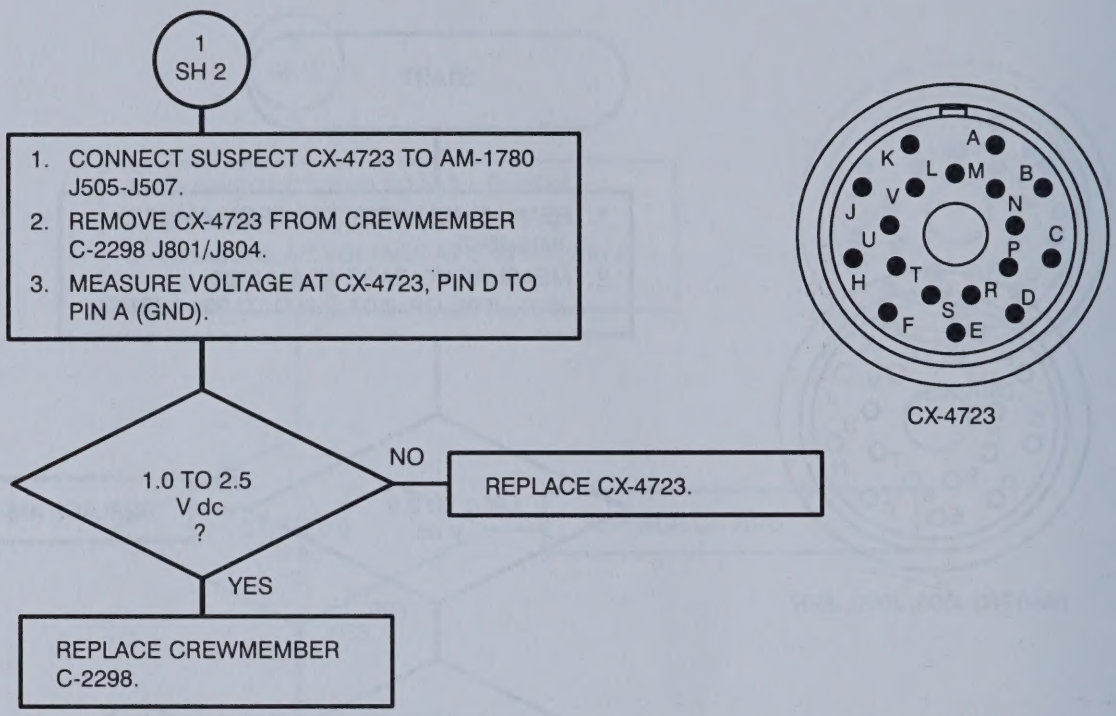
3 SH 3

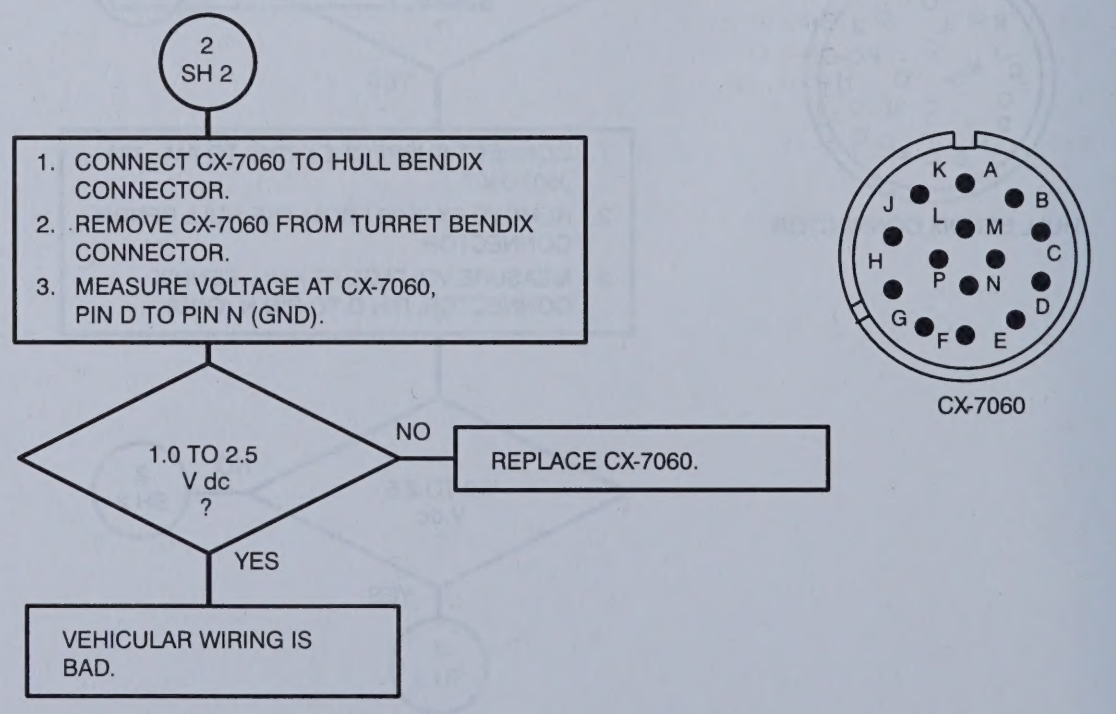
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 35

RT-A WILL NOT KEY. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL OR A.

(Sheet 2 of 3)



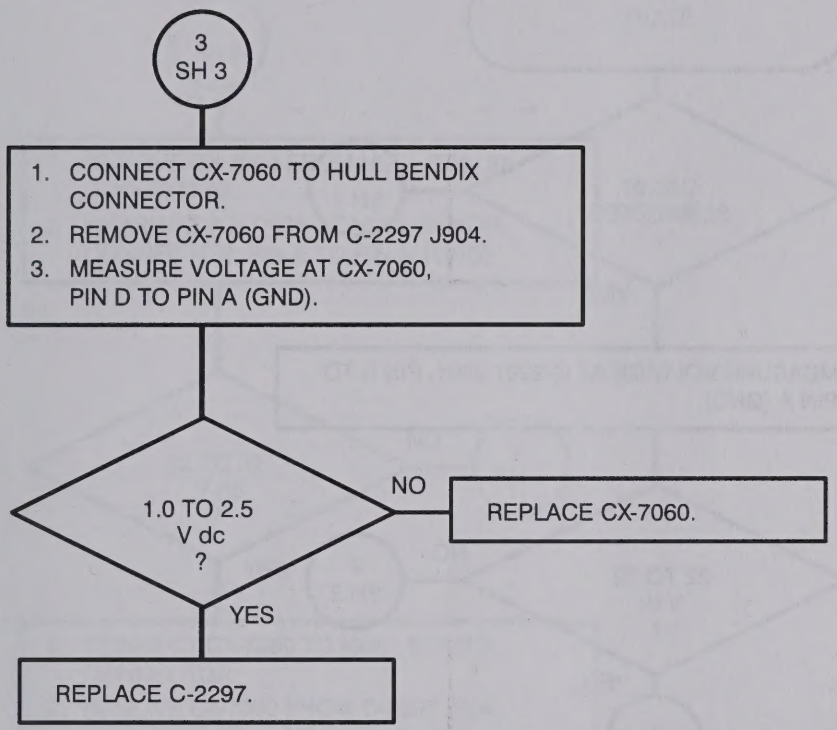


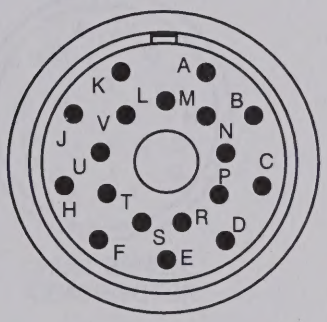
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 35

RT-A WILL NOT KEY. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL OR A.

(Sheet 3 of 3)





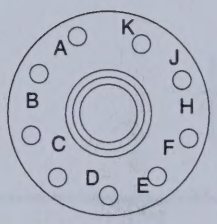
CX-7060

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

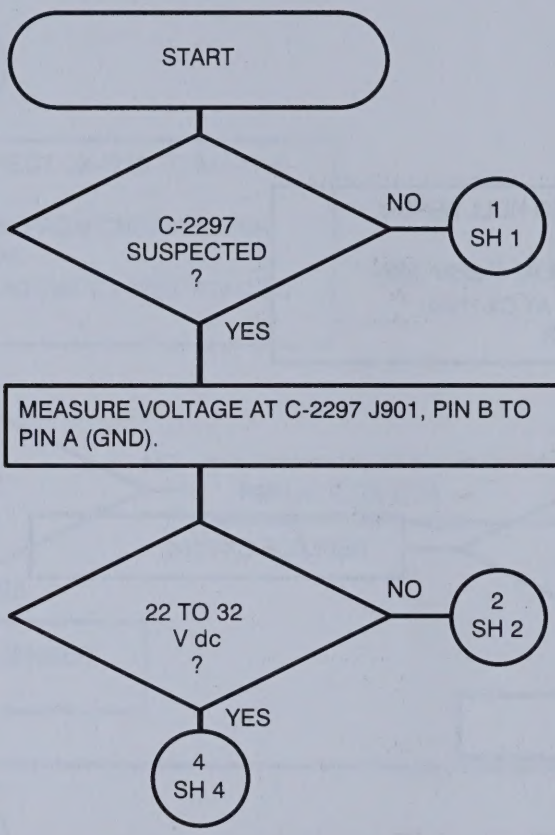
Chart 36

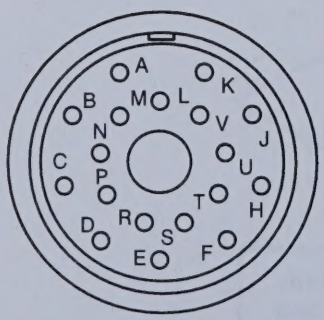
NO RT-A MODULATION FROM CREWMEMBER C-2298.

(Sheet 1 of 6)

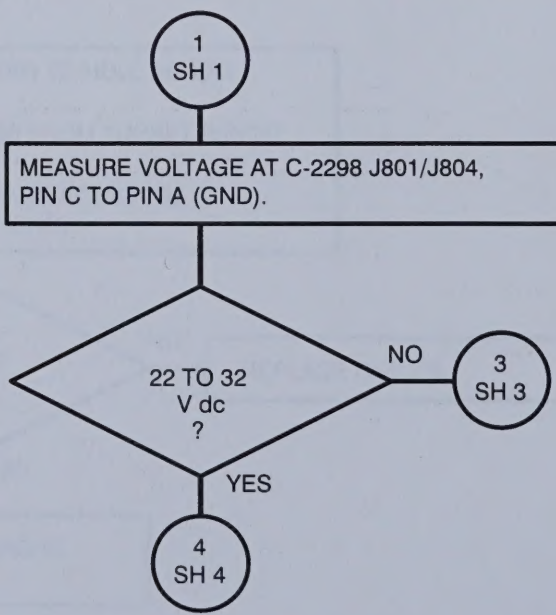


C-2297 J901





J801, J804

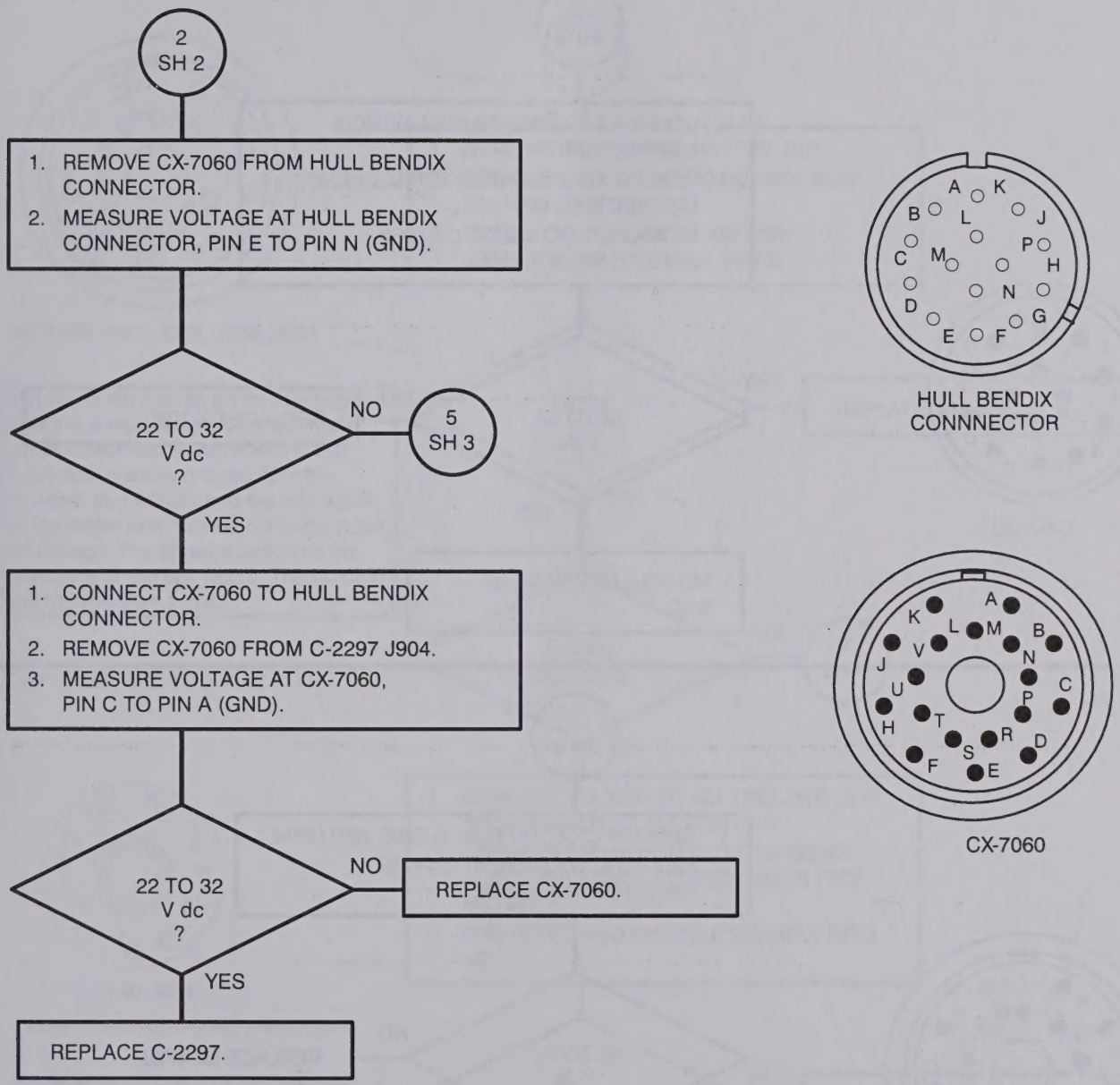


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 36

NO RT-A MODULATION FROM CREWMEMBER C-2298.

(Sheet 2 of 6)

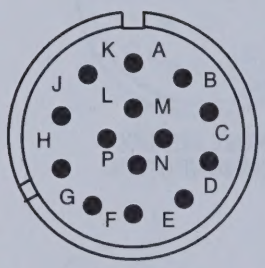


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 36

NO RT-A MODULATION FROM CREWMEMBER C-2298.

(Sheet 3 of 6)



CX-7060

5
SH 3

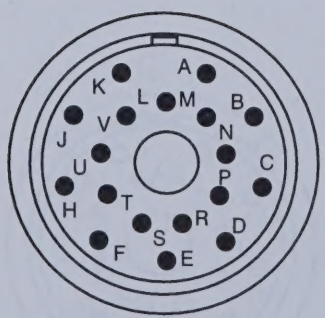
1. CONNECT CX-7060 TO HULL BENDIX CONNECTOR.
2. REMOVE CX-7060 FROM TURRET BENDIX CONNECTOR.
3. MEASURE VOLTAGE AT CX-7060, PIN E TO PIN N (GND).

22 TO 32 V dc ?

NO → REPLACE CX-7060.

YES

VEHICULAR WIRING IS BAD.



CX-4723

3
SH 3

1. REMOVE CX-4723 FROM C-2298 J801/J804.
2. MEASURE VOLTAGE AT CX-4723, PIN C TO PIN A (GND).

22 TO 32 V dc ?

NO → REPLACE CX-4723.

YES

REPLACE C-2298.

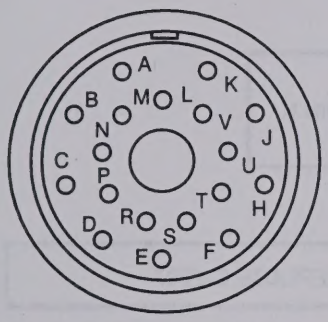
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

4.2

Chart 36

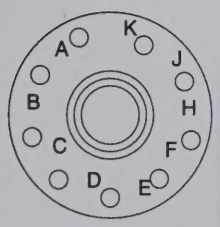
NO RT-A MODULATION FROM CREWMEMBER C-2298.

(Sheet 4 of 6)



AM-1780 J501, J505, J506, J507

Set up multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or a test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in the ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt.



C-2297 J901

4 SH 4

1. REMOVE CX-13300 AT AM-1780 J501.
2. REMOVE SUSPECT CX-4723/7060 FROM AM-1780 J505-J507.
3. CHECK CONTINUITY AT AM-1780 J505-J507, PIN K TO J501, PIN U.

OPEN ?

YES → REPLACE AM-1780.

NO

C-2297 SUSPECT ?

NO → 7 SH 6

YES

1. CONNECT CX-7060 TO AM-1780 J505-J507 AND CX-13300 TO AM-1780 J501.
2. OBSERVE CHANGE IN AC VOLTAGE AT C-2297 J901, PIN K TO PIN A (GND) (SEE NOTE).
3. PRESS PTT AND WHISTLE SHARPLY INTO HS.

AC VOLT CHANGE ?

NO → REPLACE C-2297.

YES

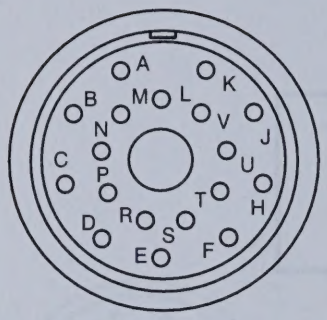
6 SH 5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

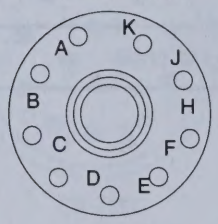
Chart 36

NO RT-A MODULATION FROM CREWMEMBER C-2298.

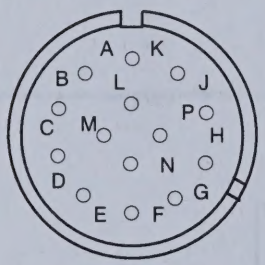
(Sheet 5 of 6)



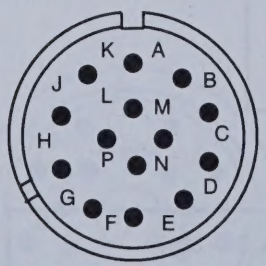
C-2297 J904



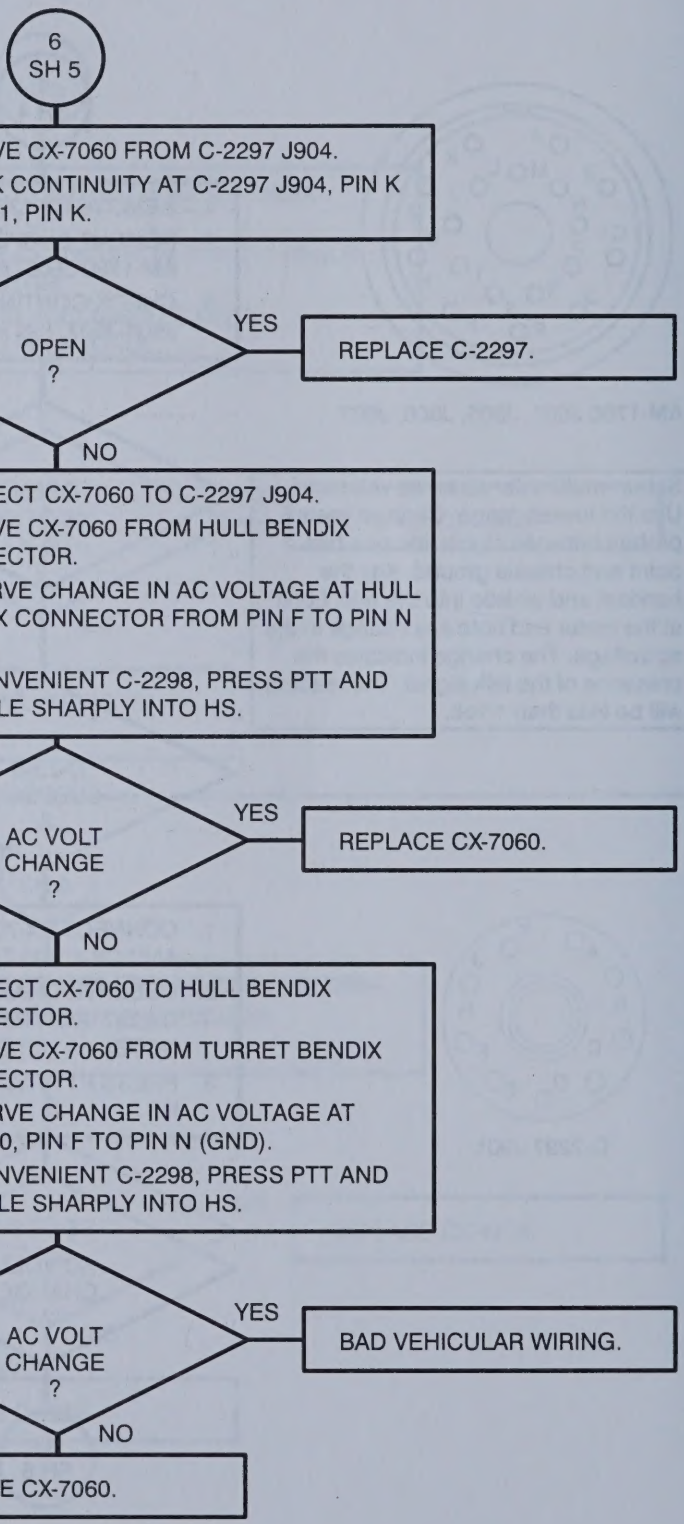
C-2297 J901



HULL BENDIX CONNECTOR



CX-7060



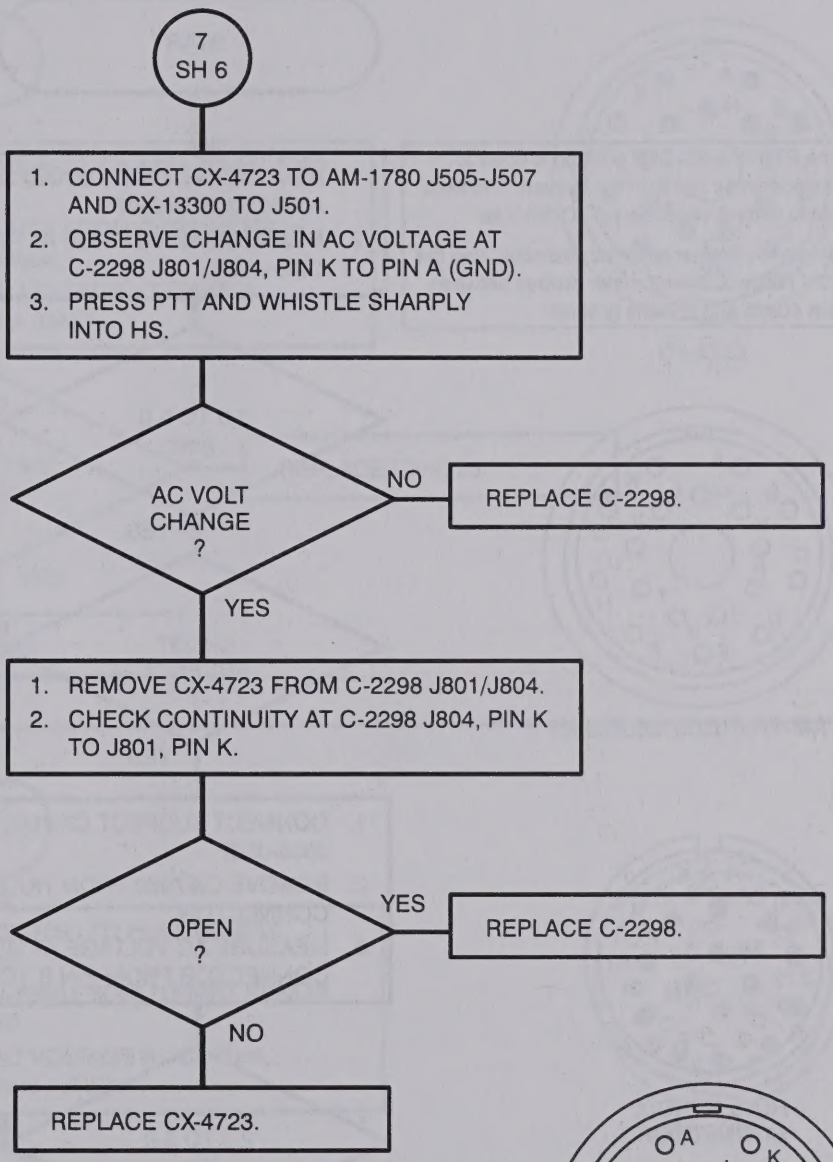
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

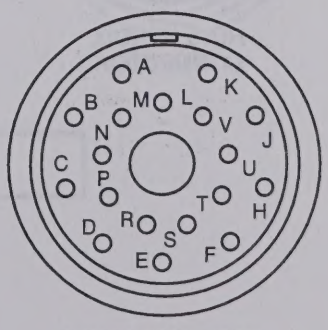
4.2

Chart 36

NO RT-A MODULATION FROM CREWMEMBER C-2298.

(Sheet 6 of 6)





C-2298 J801, J804

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

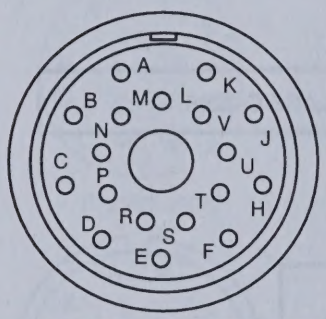
Chart 37

NO RT-A MONITORING. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL.

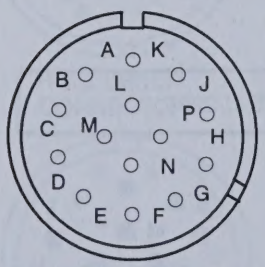
(Sheet 1 of 3)

The RT in the SQ OFF position is used to provide an ac signal in the system. The fixed audio line will produce 1.5 TO 3.5 V ac.

Set up multimeter as an ac voltmeter. Use the 20 V range. Connect meter probes between test points and chassis ground.



AM-1780 J505, J506, J507



HULL BENDIX CONNECTOR

START

1. REMOVE ALL CX-4723/7060 CABLES FROM AM-1780 J504-J507.
2. MEASURE AC VOLTAGE AT PIN L OF AM-1780 J505-J507.

2.0 TO 5.0 V ac ?

NO → REPLACE AM-1780.

YES

C-2297 SUSPECT ?

NO → 1 SH 2

YES

1. CONNECT SUSPECT CX-7060 TO AM-1780 J505-J507.
2. REMOVE CX-7060 FROM HULL BENDIX CONNECTOR.
3. MEASURE AC VOLTAGE AT HULL BENDIX CONNECTOR FROM PIN B TO PIN N (GND).

2.0 TO 5.0 V ac ?

NO → 2 SH 2

YES

3 SH 3

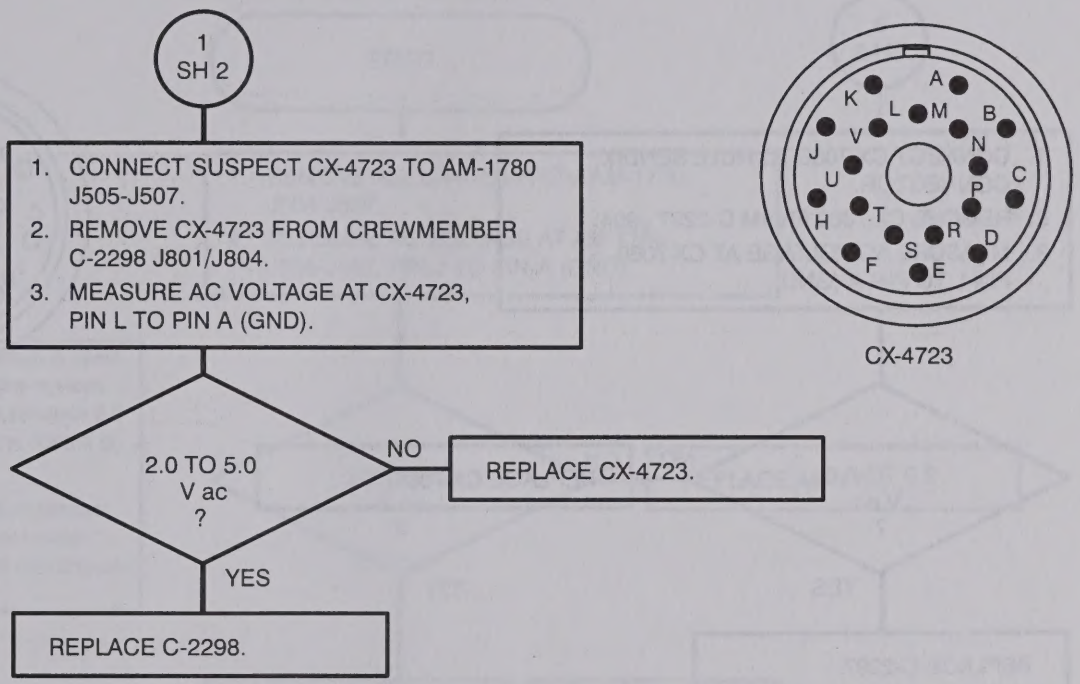
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

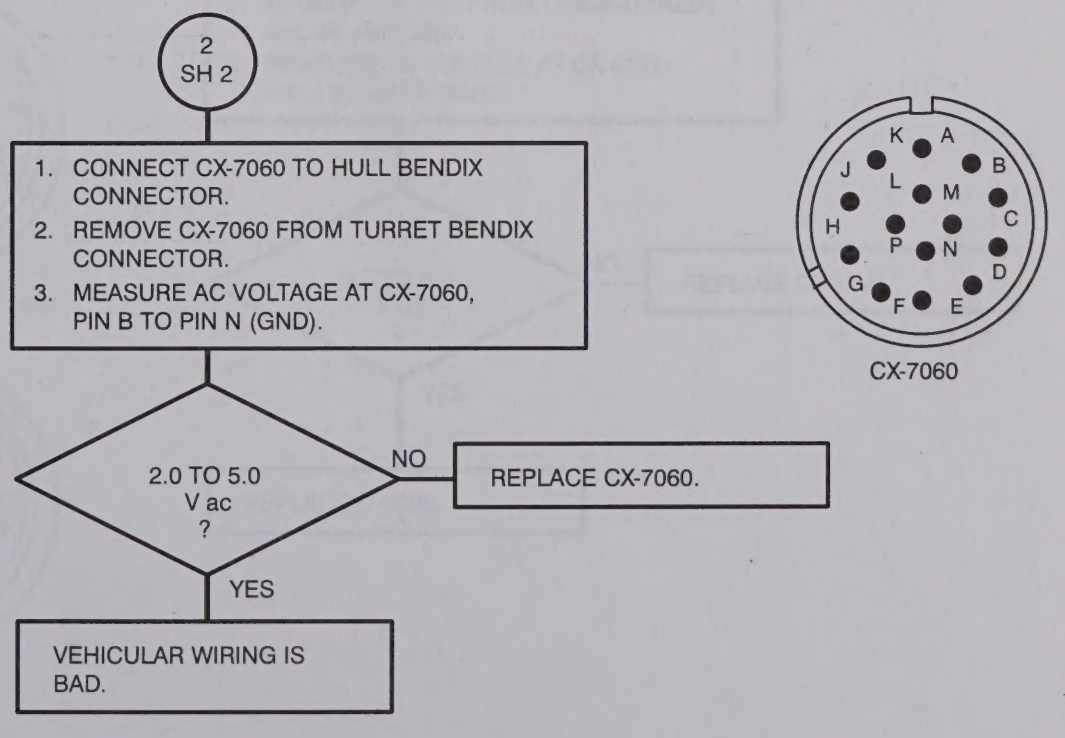
4.2

Chart 37

NO RT-A MONITORING. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL.

(Sheet 2 of 3)



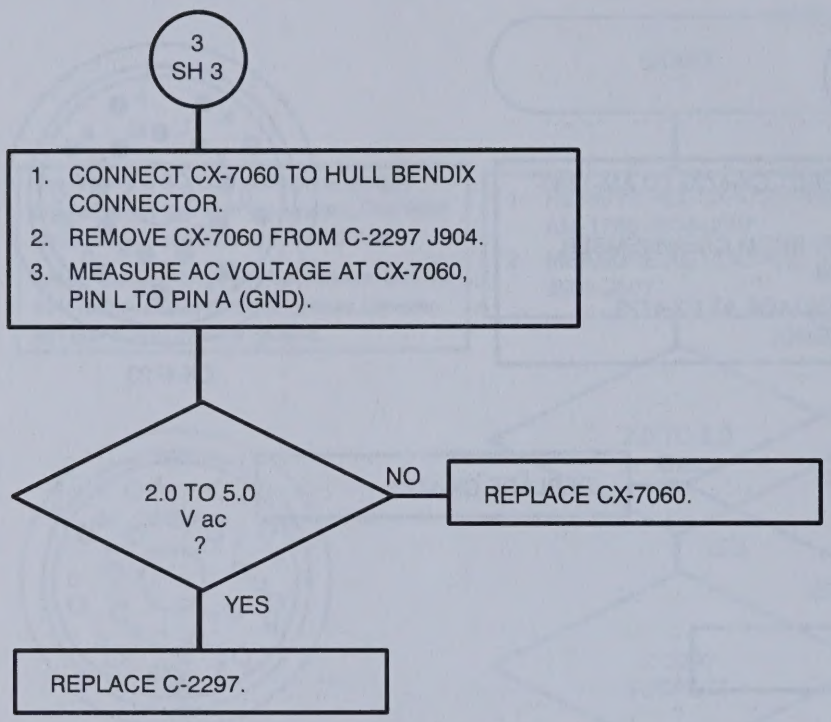


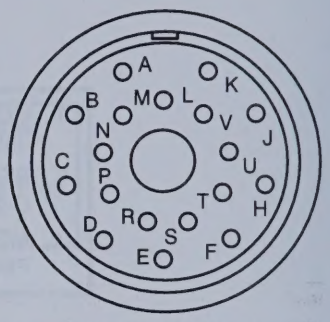
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 37

NO RT-A MONITORING. CREWMEMBER C-2298 MONITOR SWITCH SET TO ALL.

(Sheet 3 of 3)





C-2297 J904

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

4.2

Chart 38

NO RT-B MONITORING. CREWMEMBER C-2298 MONITOR SWITCH SET TO C.

(Sheet 1 of 1)

The RT in the SQ OFF position is used to provide an ac signal in the system. The variable audio line will produce 3.0 to 8.0 V ac when the volume control is set full cw.

Set up multimeter as an ac voltmeter. Use the 20 V range. Connect meter probes between test points and chassis ground.

START

1. REMOVE ALL CX-4723 FROM AM-1780 J504-J507.
2. MEASURE AC VOLTAGE AT AM-1780 J505-J507, PIN J TO PIN A (GND).

3.0 TO 8.0 V ac ?

NO → REPLACE AM-1780.

YES

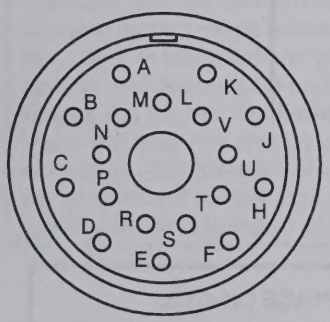
1. CONNECT THE SUSPECT CX-4723 TO AM-1780 J505-J507.
2. REMOVE CX-4723 FROM CREWMEMBER C-2298 J801/J804.
3. MEASURE AC VOLTAGE AT CX-4723, PIN J TO PIN A (GND).

3.0 TO 8.0 V ac ?

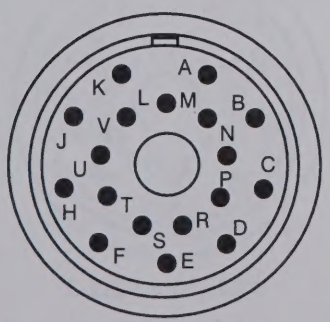
NO → REPLACE CX-4723.

YES

REPLACE C-2298.



AM-1780 J505, J506, J507



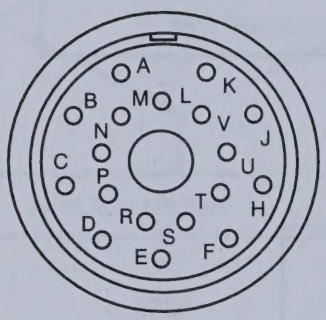
CX-4723

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 39

RT-B WILL NOT KEY FROM CREWMEMBER C-2298. MONITOR SWITCH SET TO C.

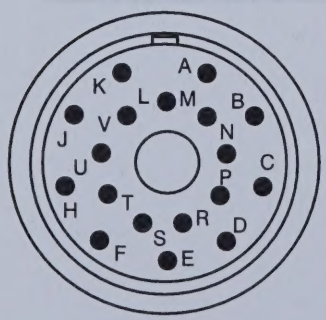
(Sheet 1 of 1)



AM-1780 J505, J506, J507

NOTE:

The driver's C-2297 is unable to monitor or key RT-B in the C position. The slip ring assembly does not have the proper connections.



CX-4723

START

1. REMOVE ALL CX-4723 CABLES FROM AM-1780 J504-J507.
2. MEASURE VOLTAGE AT SUSPECT AM-1780 J505-J507, PIN F TO PIN A (GND).

1.0 TO 2.5 V dc ?

NO → REPLACE AM-1780.

YES

1. CONNECT SUSPECT CX-4723 TO AM-1780 J505-J507.
2. REMOVE SUSPECT CX-4723 FROM C-2298 J801/J804.
3. MEASURE VOLTAGE AT CX-4723, PIN F TO PIN A (GND).

1.0 TO 2.5 V dc ?

NO → REPLACE CX-4723.

YES

REPLACE C-2298.

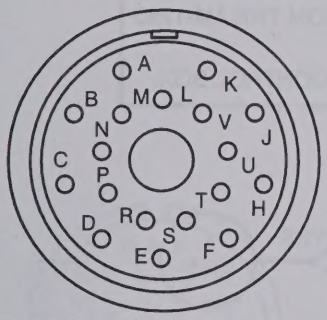
4.2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 40

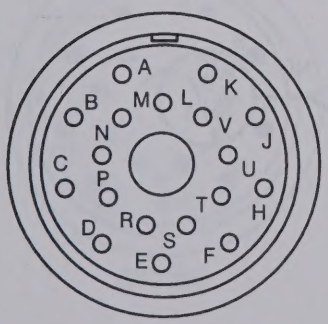
NO RT-B MODULATION FROM CREWMEMBER C-2298.

(Sheet 1 of 1)



AM-1780 J503, J505, J506, J507

Set up for multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in the ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt.



C-2298 J801, J804

START

1. REMOVE CX-13300 AT AM-1780 J503.
2. REMOVE SUSPECT CX-4723 FROM AM-1780 J505-J507.
3. CHECK CONTINUITY AT AM-1780 J503, PIN U TO J505-J507, PIN V.

OPEN ?

YES → REPLACE AM-1780.

NO

1. CONNECT CX-4723 TO AM-1780 J505-J507 AND CX-13300 TO J503.
2. OBSERVE CHANGE IN AC VOLTAGE AT C-2298 J801/J804, PIN V TO PIN A (GND) (SEE NOTE).
3. PRESS PTT AND WHISTLE SHARPLY INTO HS.

AC VOLT CHANGE ?

NO → REPLACE C-2298.

YES

1. REMOVE CX-4723 FROM C-2298.
2. CHECK CONTINUITY AT C-2298 J804, PIN V TO J801, PIN V.

OPEN ?

NO → REPLACE CX-4723.

YES

REPLACE C-2298.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 1 of 10)

START

1. REMOVE A CX-4723/7060 FROM THE AM-1780 J505, J506, OR J507.
2. LISTEN AT COMMANDER'S CONTROL BOX.

RUSHING NOISE HEARD ?

YES → 1 SH 2

NO

ALL CX-4723/7060 REMOVED ?

NO → (back to step 1)

YES

1. REMOVE COMMANDER'S CX-4723 FROM AM-1780 J504.
2. MEASURE AC VOLTAGE AT AM-1780 J504, PIN L TO PIN A (GND).

2.0 TO 5.0 V ac ?

NO → 3 SH 4

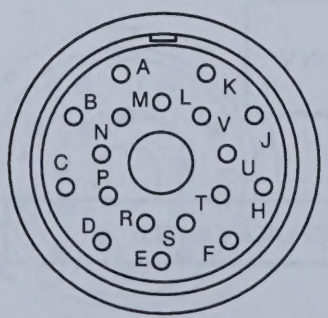
YES → 2 SH 3

NOTE:

Remove each cable and check for rushing noise. The rushing noise will return once the short has been removed.

The RT in the SQ OFF position is used to provide an AC signal in the system. The fixed audio line will produce 1.5 to 3.5 V ac from the radio.

Set up multimeter as an ac voltmeter. Connect meter probes between test points and chassis ground.



AM-1780 J504

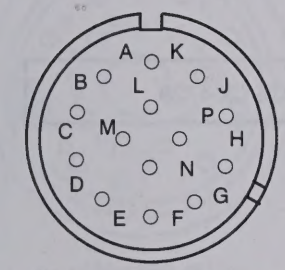
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

4.2

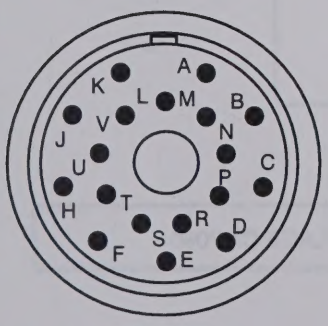
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

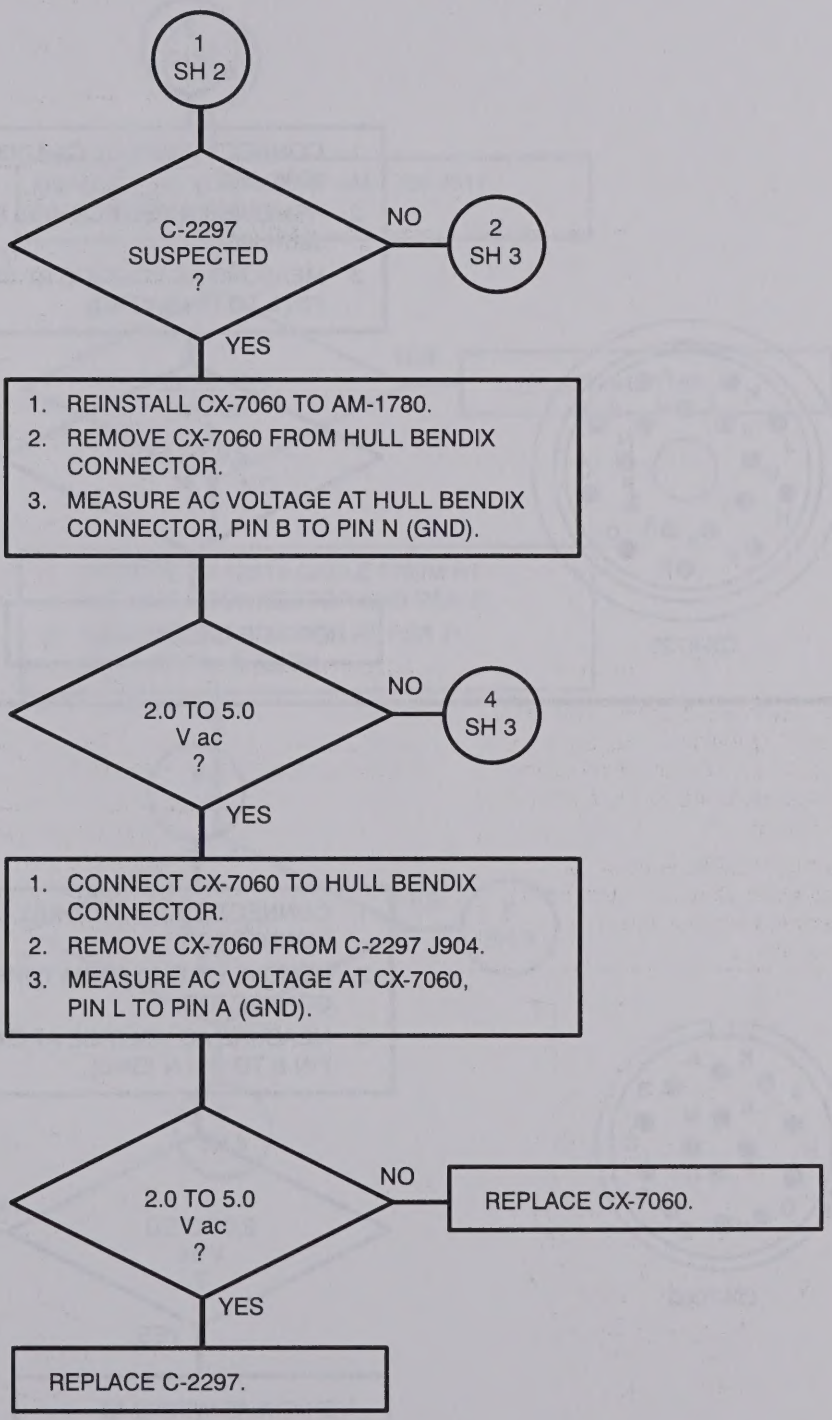
(Sheet 2 of 10)



HULL BENDIX CONNECTOR



CX-7060

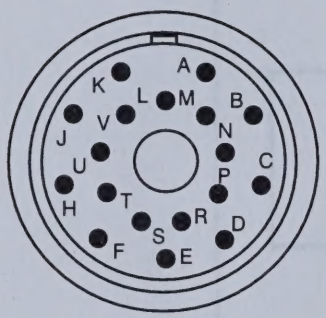


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

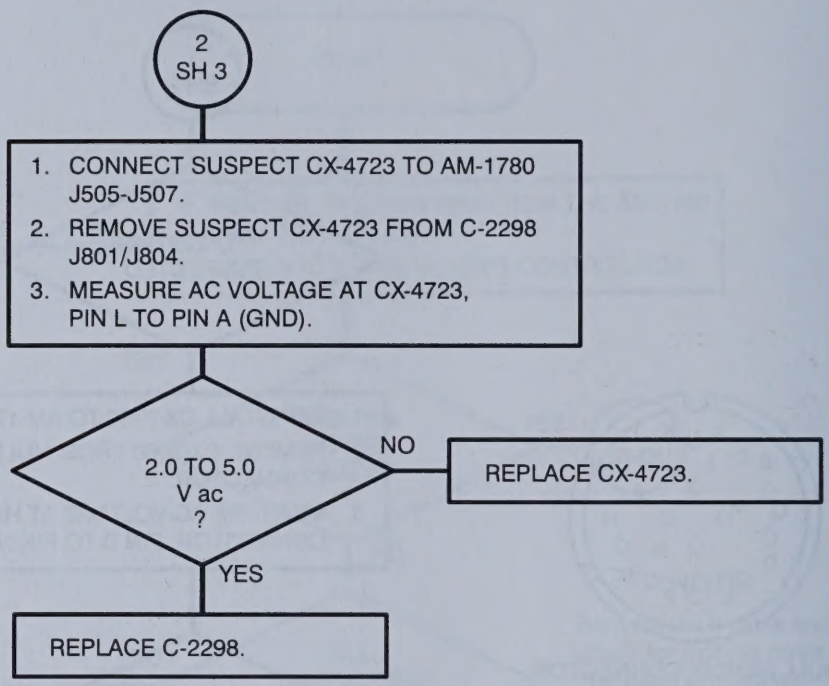
Chart 41

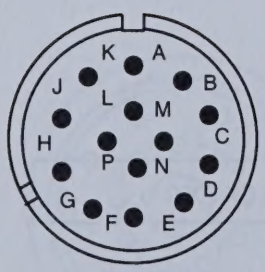
NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 3 of 10)

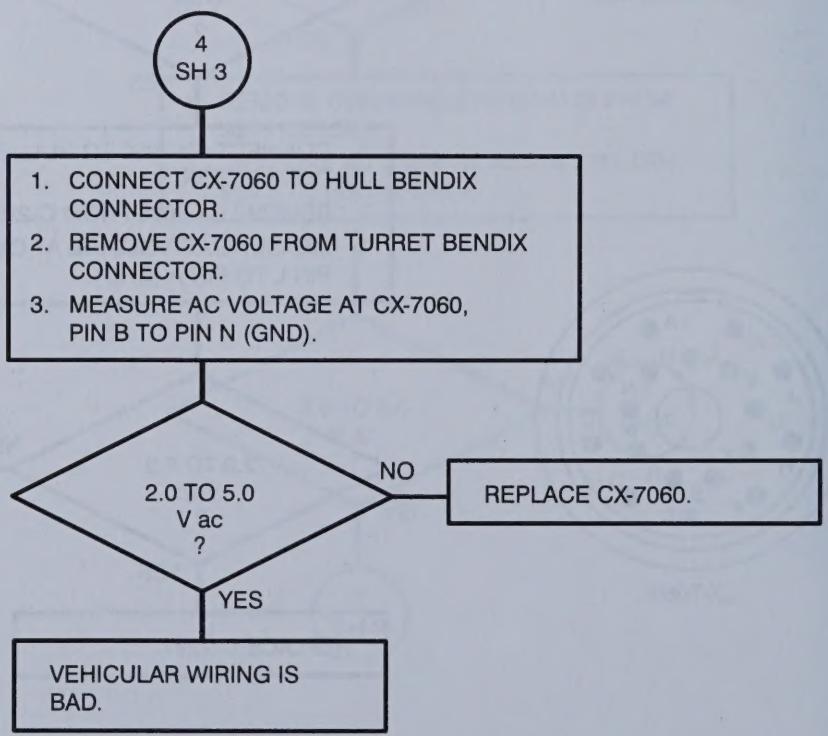


CX-4723





CX-7060



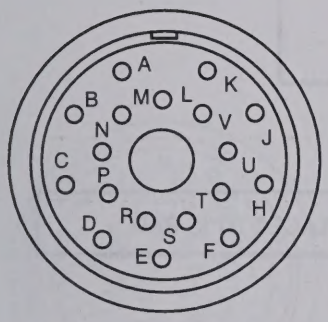
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

4.2

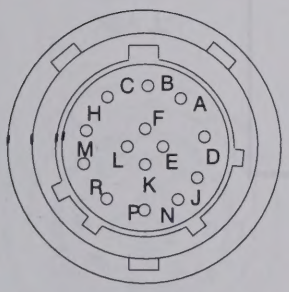
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 4 of 10)



AM-1780 J511



PSA J1

3
SH 4

MEASURE AC VOLTAGE AT AM-1780 J511, PIN K TO PIN A (GND).

85 TO 196 mV ac ?

YES

REPLACE AM-1780.

NO

1. REMOVE CX-13314 CABLE FROM RT AUD/DATA CONNECTOR AND PSA J1.
2. MEASURE AC VOLTAGE AT PSA J1, PIN F TO PIN A (GND).

1.5 TO 3.5 V ac ?

YES

6
SH 9

NO

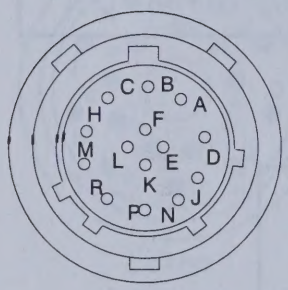
5
SH 5

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 5 of 10)



PSA J1

5
SH 5

1. REPLACE RT.
2. SET RT AS FOLLOWS:
   CHAN: MAN
   FCTN: SQ OFF
   VOL: FULL CW
3. MEASURE AC VOLTAGE AT PSA J1, PIN F TO PIN A (GND).

1.5 TO 3.5 V ac ?

YES → REPLACED RT IS BAD.

NO

1. SET RT TO STBY.
2. SET THE AM-1780 MAIN PWR TO OFF.
3. REMOVE RT FROM PSA.
4. REMOVE CX-13300 FROM AM-1780 J501.
5. CHECK CONTINUITY AT PSA J1, PIN F TO PIN A (GND).

SHORT TO GROUND ?

YES → 8 SH 7

NO → 7 SH 6

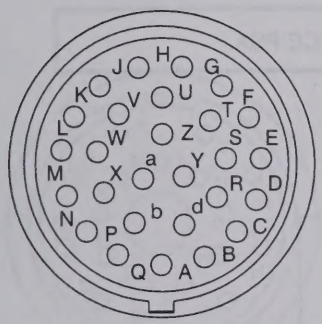
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

4.2

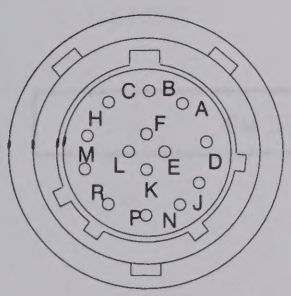
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

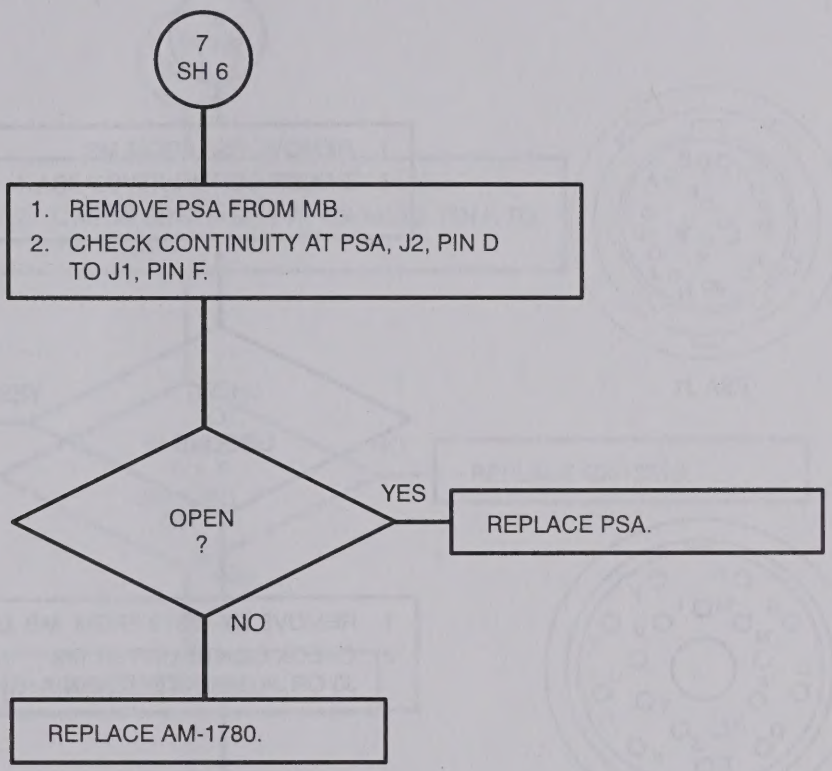
(Sheet 6 of 10)



PSA J2



PSA J1

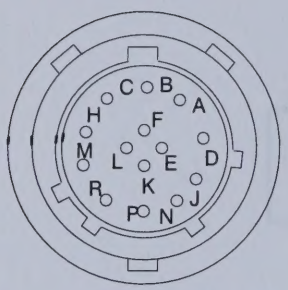


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

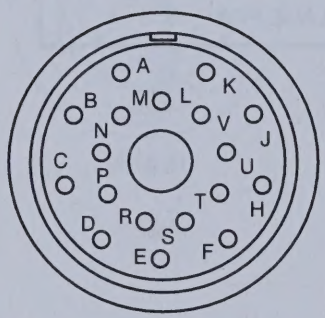
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

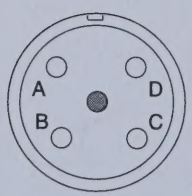
(Sheet 7 of 10)



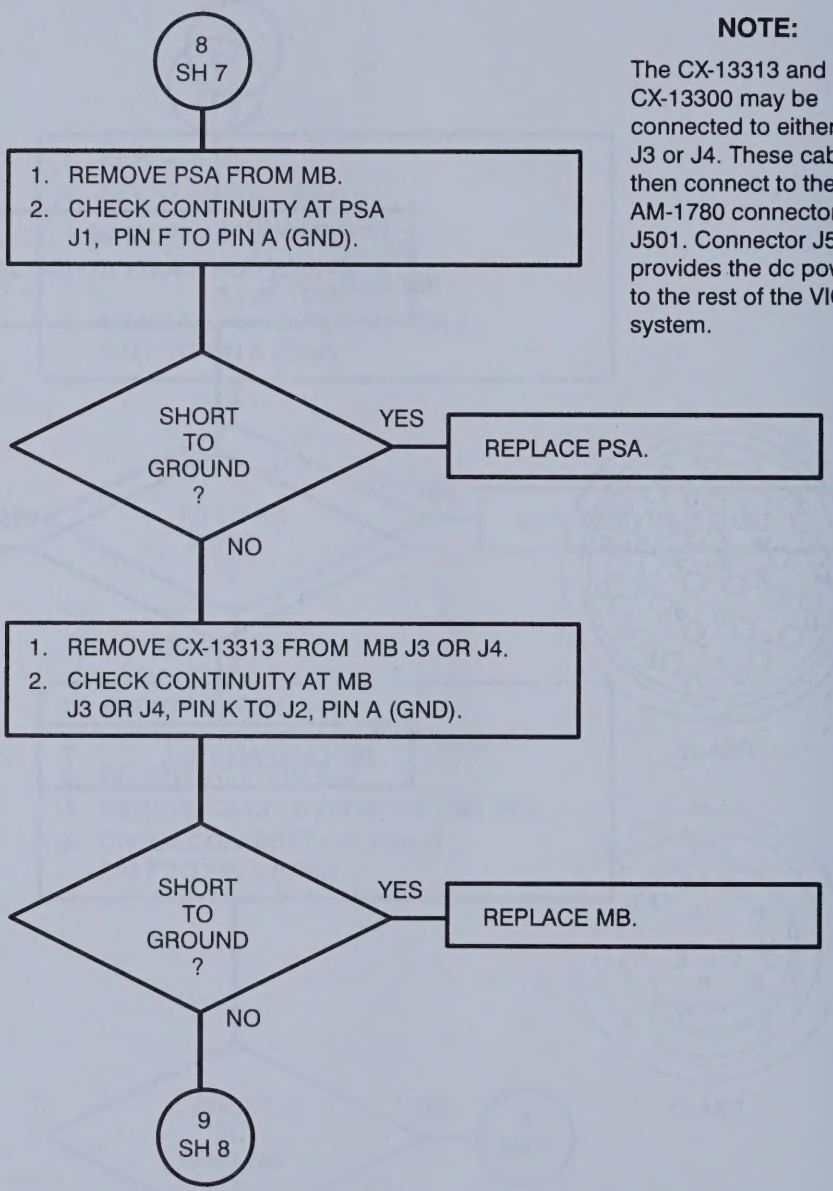
PSA J1



MB J3, J4



MB J2



NOTE:

The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.

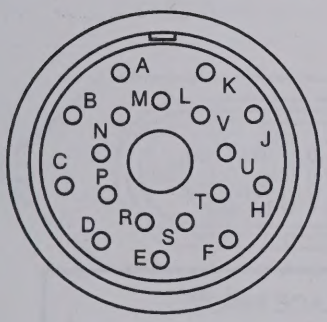
4.2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

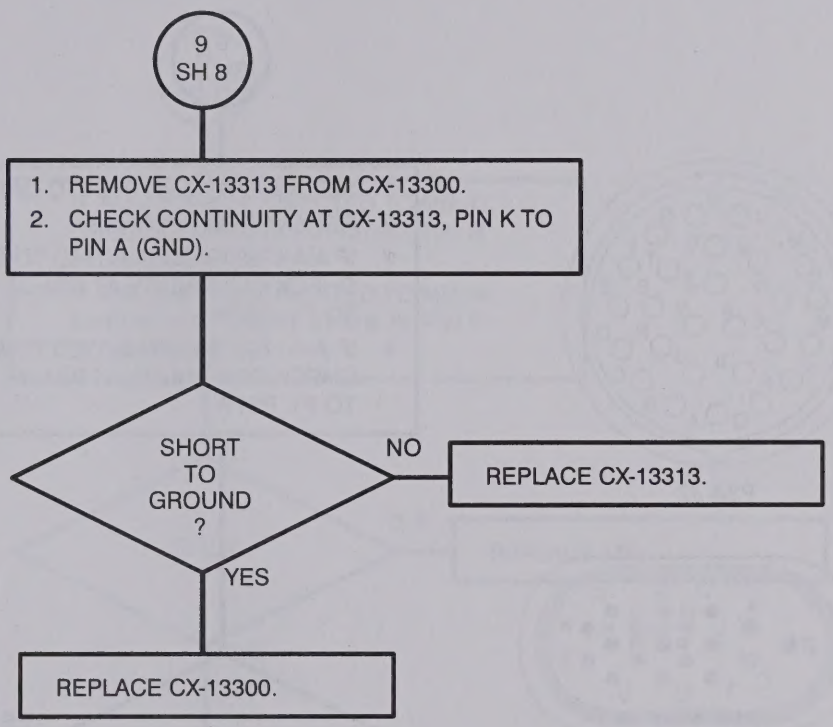
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 8 of 10)



CX-13313

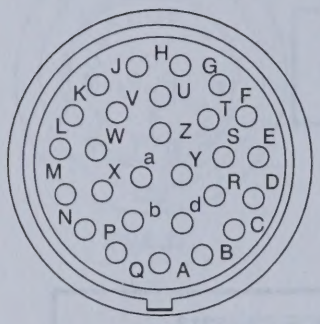


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

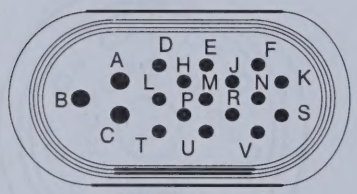
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

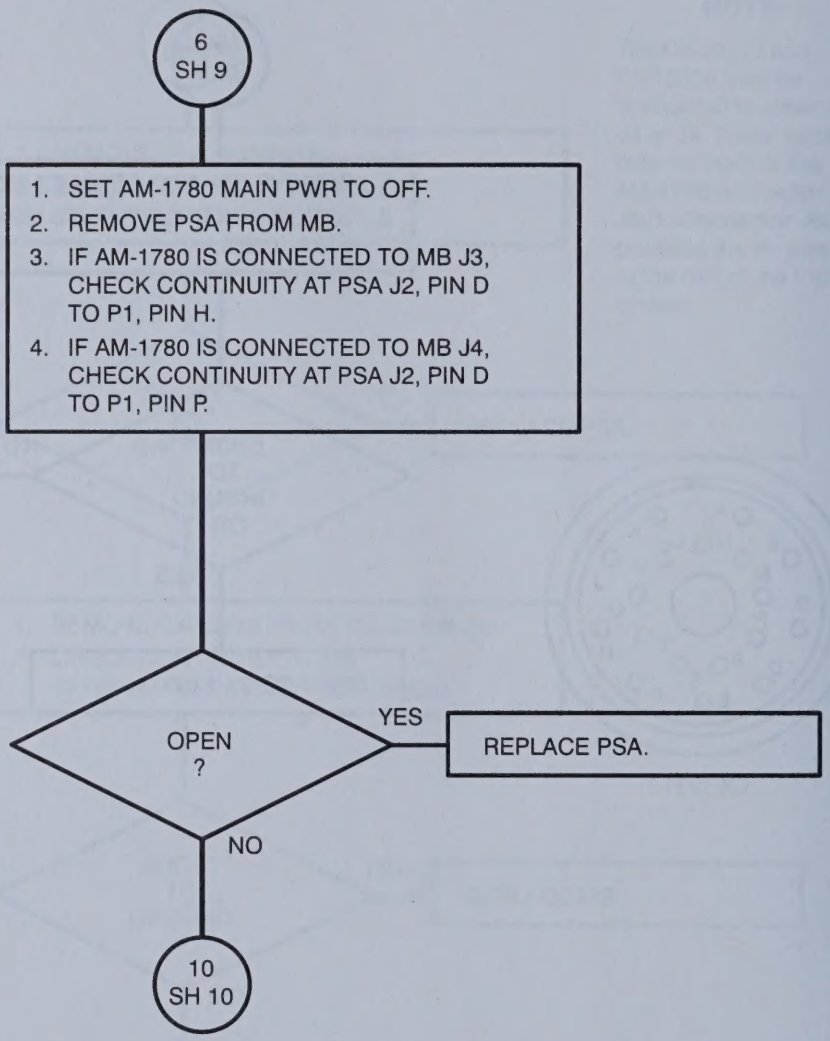
(Sheet 9 of 10)



PSA J2



PSA P1



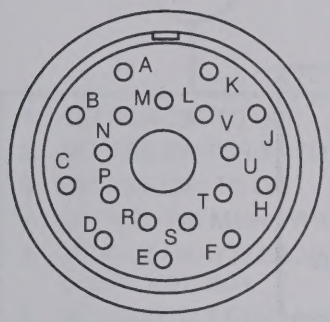
4.2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

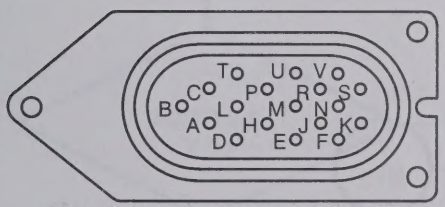
Chart 41

NO SRM MONITORING AT COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

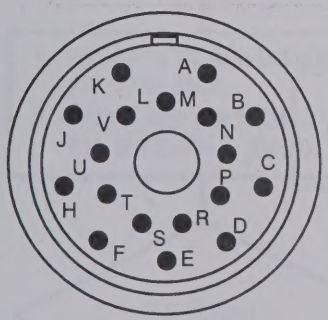
(Sheet 10 of 10)



MB J3, J4,
CX-13313 P1



MB J5



CX-13313 P2

10
SH 10

1. IF AM-1780 IS CONNECTED TO MB J3, CHECK CONTINUITY AT MB J5, PIN H TO J3, PIN K.
2. IF AM-1780 IS CONNECTED TO MB J4, CHECK CONTINUITY AT MB J5, PIN P TO J4, PIN K.

OPEN ?

YES → REPLACE MB.

NO

1. REMOVE CX-13313 FROM CX-13300.
2. CHECK CONTINUITY AT CX-13313 P1, PIN K TO P2, PIN K.

OPEN ?

YES → REPLACE CX-13313.

NO

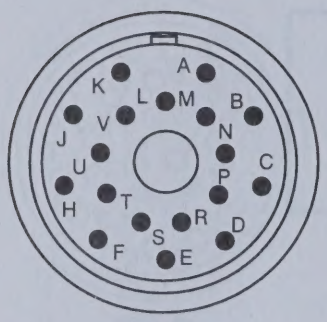
REPLACE CX-13300.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

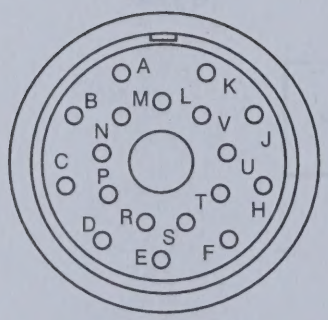
Chart 42

SRM WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 1 of 4)



CX-13300



CX-13313

START

1. SET AM-1780 MAIN PWR TO OFF.
2. SET PSA CB1 TO OFF.
3. SET PSA SWITCH S1 TO LCL.
4. REMOVE CX-13300 FROM AM-1780 J501.
5. SET PSA CB1 TO ON.
6. MEASURE VOLTAGE AT CX-13300, PIN S TO PIN A (GND).

1.0 TO 2.5 V dc ?

YES → 1 SH 2

NO

1. REMOVE CX-13313 FROM CX-13300.
2. MEASURE VOLTAGE AT CX-13313, PIN S TO PIN A (GND).

1.0 TO 2.5 V dc ?

YES → REPLACE CX-13300.

NO → 2 SH 3

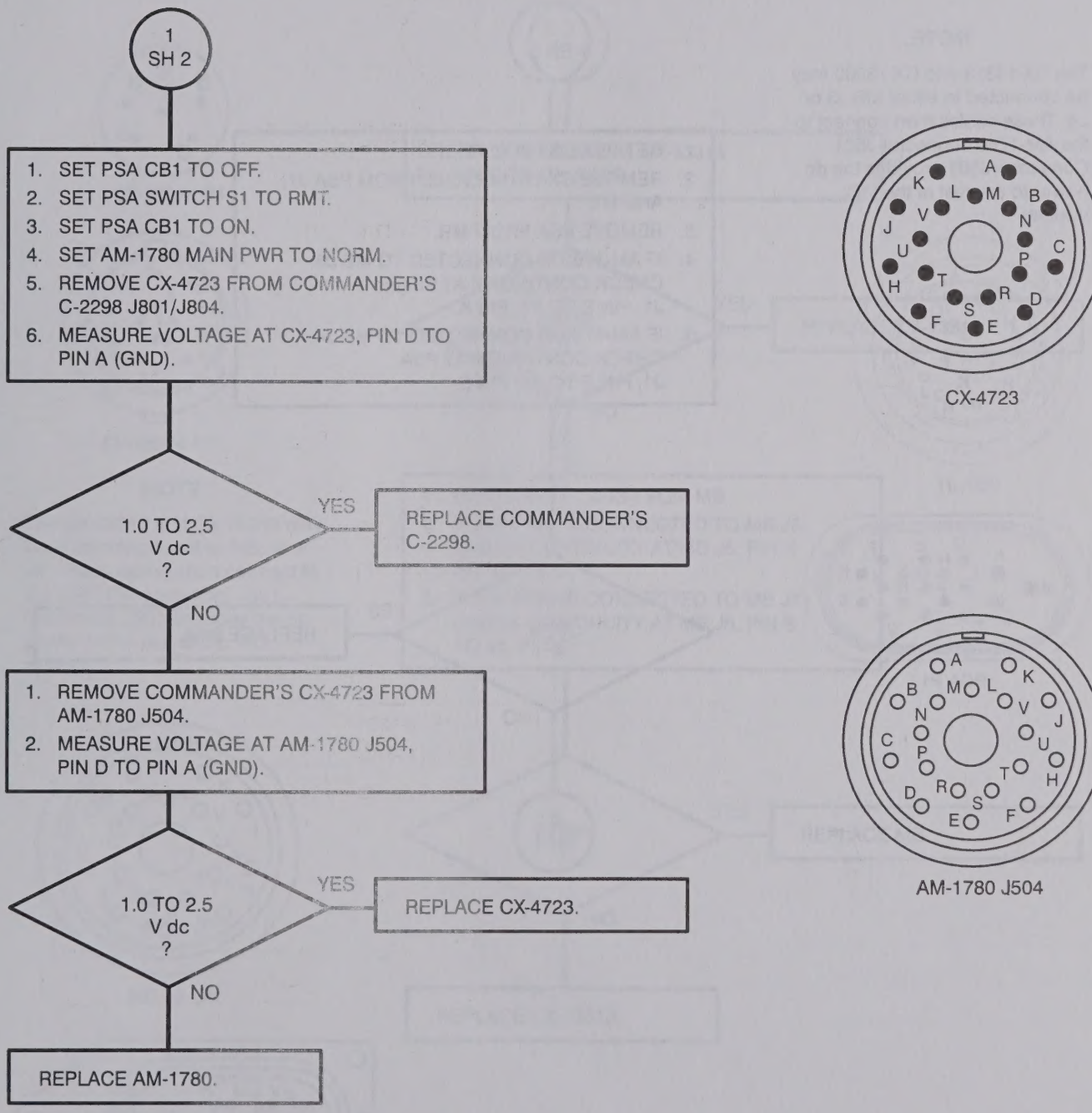
4.2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 42

SRM WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 2 of 4)



2.2. TROUBLESHOOTING FLOWCHARTS. Continued

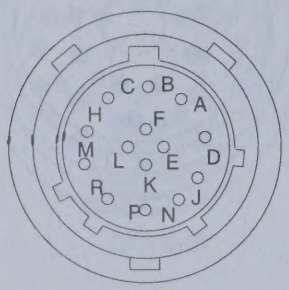
Chart 42

SRM WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

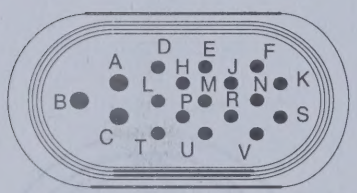
(Sheet 3 of 4)

NOTE:

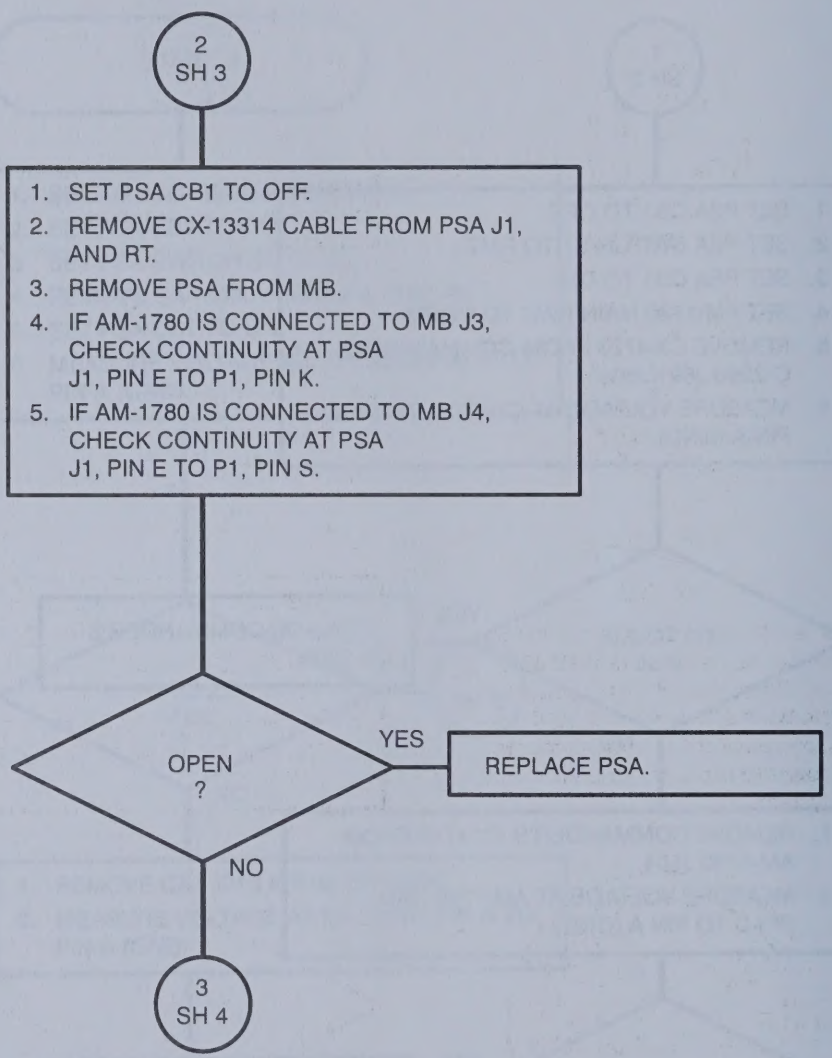
The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.



PSA J1



PSA P1

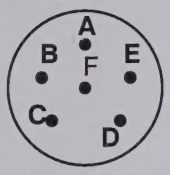


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

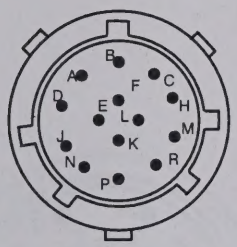
Chart 42

SRM WILL NOT KEY FROM COMMANDER'S C-2298. MONITOR SWITCH AT ALL POSITION.

(Sheet 4 of 4)



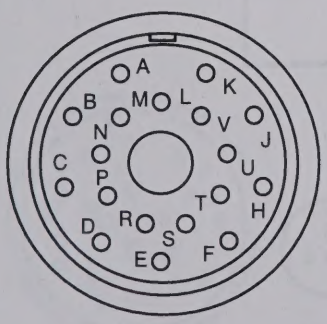
CX-13314 P1



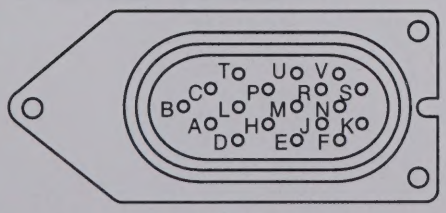
CX-13314 P2

NOTE:

The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.



MB J3, J4



MB J5

3
SH 4

CHECK CONTINUITY AT CX-13314 P1, PIN C TO P2, PIN E.

OPEN ?

YES → REPLACE CX-13314.

NO

1. REMOVE CX-13313 FROM MB.
2. IF AM-1780 IS CONNECTED TO MB J3, CHECK CONTINUITY AT MB J5, PIN K TO J3, PIN S.
3. IF AM-1780 IS CONNECTED TO MB J4, CHECK CONTINUITY AT MB J5, PIN S TO J4, PIN S.

OPEN ?

YES → REPLACE MB.

NO

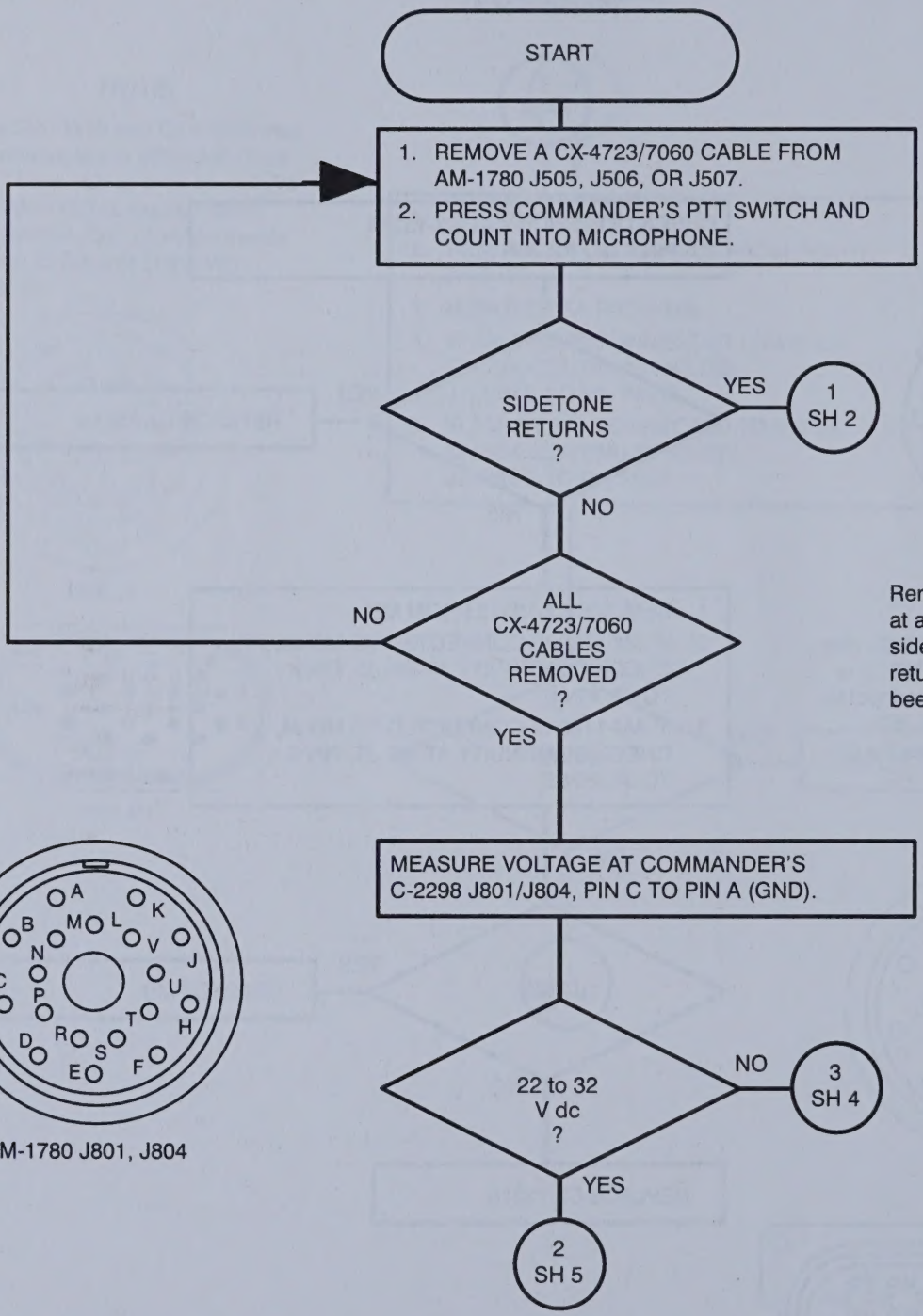
REPLACE CX-13313.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 1 of 12)



NOTE:

Remove each cable one at a time and check for sidetone. The sidetone will return after the short has been removed.

AM-1780 J801, J804

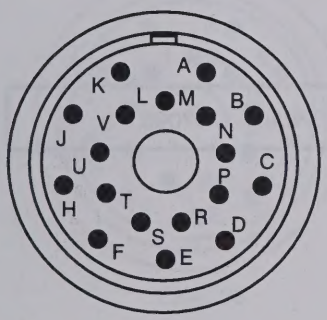
4.2.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

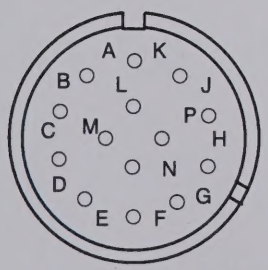
Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

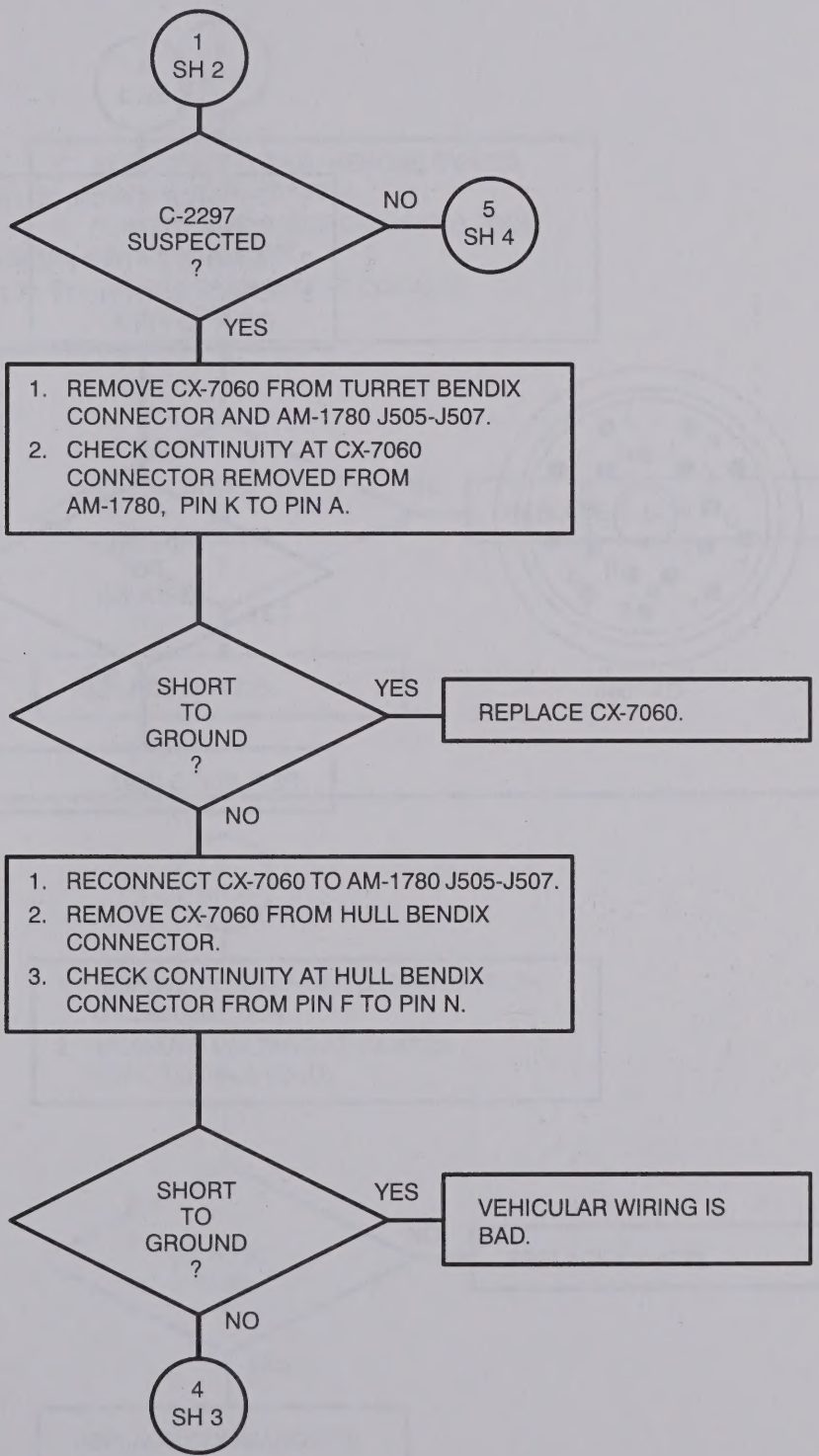
(Sheet 2 of 12)



CX-7060



HULL BENDIX CONNECTOR

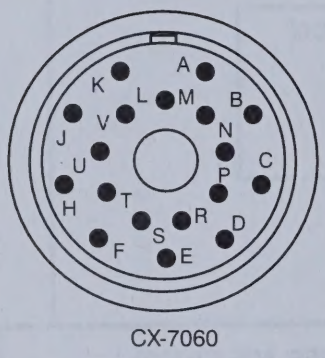


2.2. TROUBLESHOOTING FLOWCHARTS. Continued

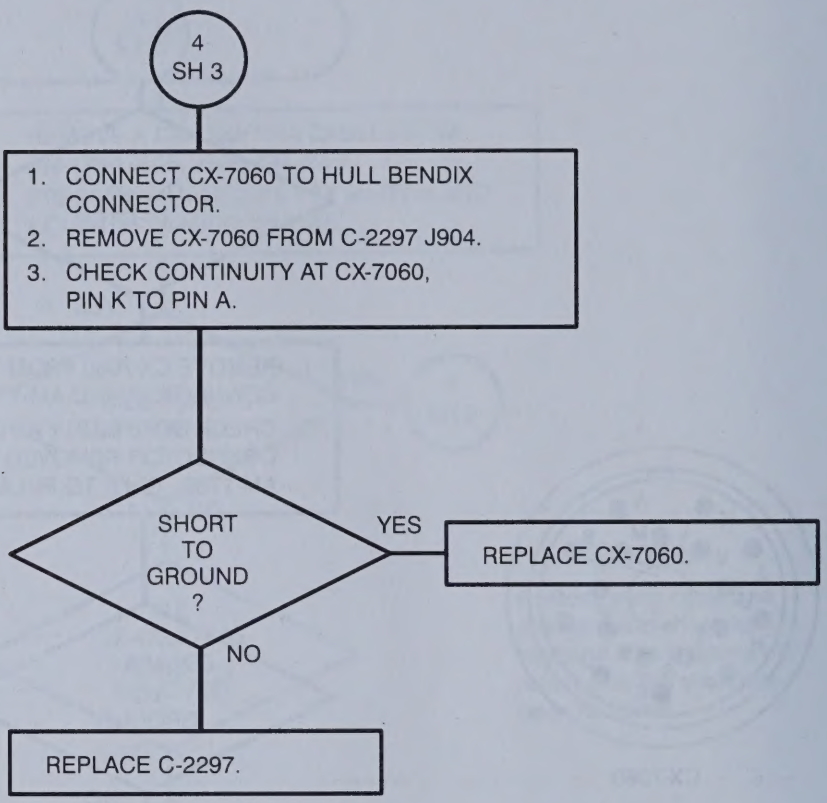
Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 3 of 12)



CX-7060



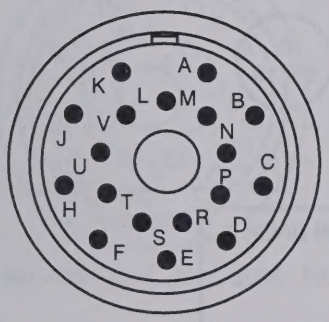
4.2.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 4 of 12)



CX-4723

5
SH 4

1. AT SUSPECT C-2298, REMOVE CX-4723 FROM C-2298 J801/J804.
2. REMOVE OTHER SIDE OF CX-4723 FROM AM-1780 J504-J507.
3. CHECK CONTINUITY AT CCX-4723, PIN K TO PIN A.

SHORT TO GROUND ?

NO → REPLACE C-2298.

YES → REPLACE CX-4723.

3
SH 4

1. REMOVE COMMANDER'S CX-4723 FROM C-2298 J801/J804.
2. MEASURE VOLTAGE AT CX-4723, PIN C TO PIN A (GND).

22 TO 32 V dc ?

NO → REPLACE CX-4723.

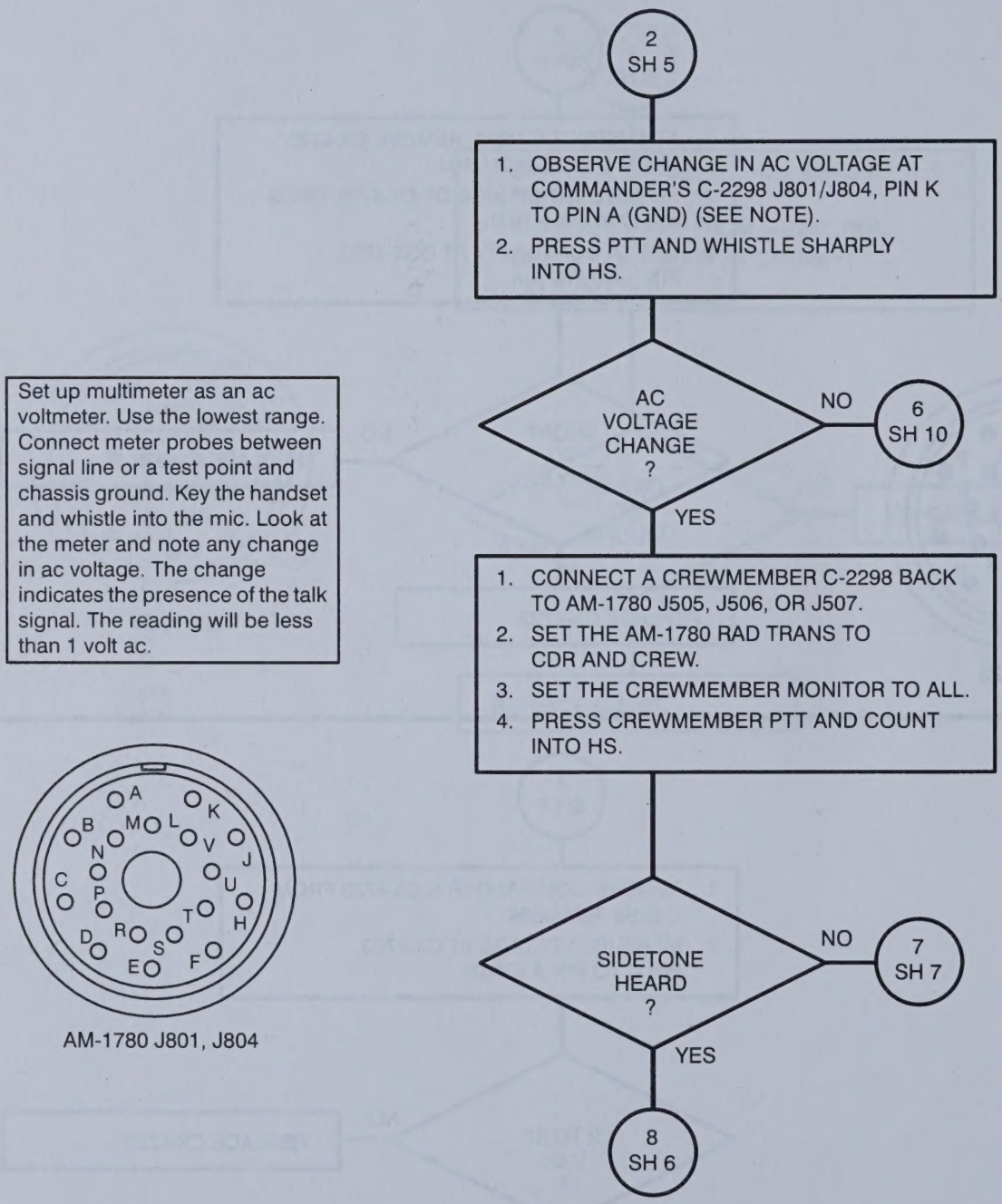
YES → REPLACE COMMANDER'S C-2298.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 5 of 12)



Set up multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or a test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt ac.

AM-1780 J801, J804

4.2.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

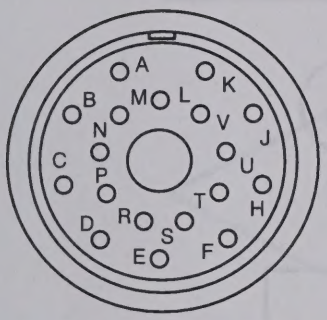
Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 6 of 12)

8
SH 6

1. REMOVE CREWMEMBER CX-4723 FROM AM-1780 J505, J506, OR J507.
2. REMOVE COMMANDER'S CX-4723 FROM AM-1780 J504.
3. CHECK CONTINUITY AT AM-1780 J505, J506, OR J507, PIN K TO J504, PIN K.



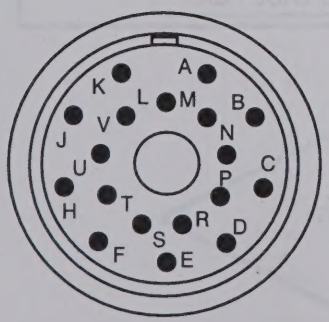
AM-1780 J504, J505, J506, J507

OPEN ?

YES → REPLACE AM-1780.

NO

1. CONNECT COMMANDER'S CX-4723 TO AM-1780 J504.
2. REMOVE COMMANDER'S CX-4723 FROM C-2298 J801/J804.
3. CHECK CONTINUITY AT AM-1780 J505, J506, OR J507, PIN K TO CX-4723, PIN K.



CX-4723

OPEN ?

YES → REPLACE COMMANDER'S C-4723.

NO

REPLACE COMMANDER'S C-2298.

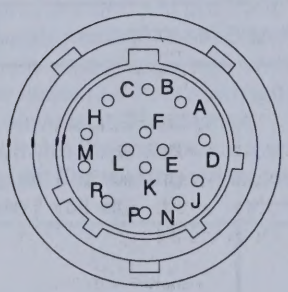
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

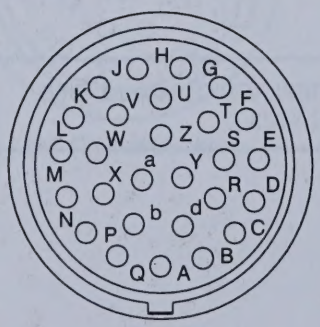
NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 7 of 12)

Set up multimeter as an ac voltmeter. Use the lowest range. Connect meter probes between signal line or a test point and chassis ground. Key the handset and whistle into the mic. Look at the meter and note any change in ac voltage. The change indicates the presence of the talk signal. The reading will be less than 1 volt ac.



PSA J1



PSA J2

7
SH 7

1. OBSERVE CHANGE IN AC VOLTAGE AT PSA J1, PIN N TO PIN A (GND) (SEE NOTE).
2. PRESS PTT AND WHISTLE SHARPLY INTO HS.

AC VOLTAGE CHANGE ?

NO → 9 SH 8

YES

1. SET AM-1780 MAIN PWR TO OFF.
2. REMOVE PSA FROM MB.
3. CHECK CONTINUITY AT PSA, J1, PIN N TO J2, PIN E.

OPEN ?

YES → REPLACE PSA.

NO

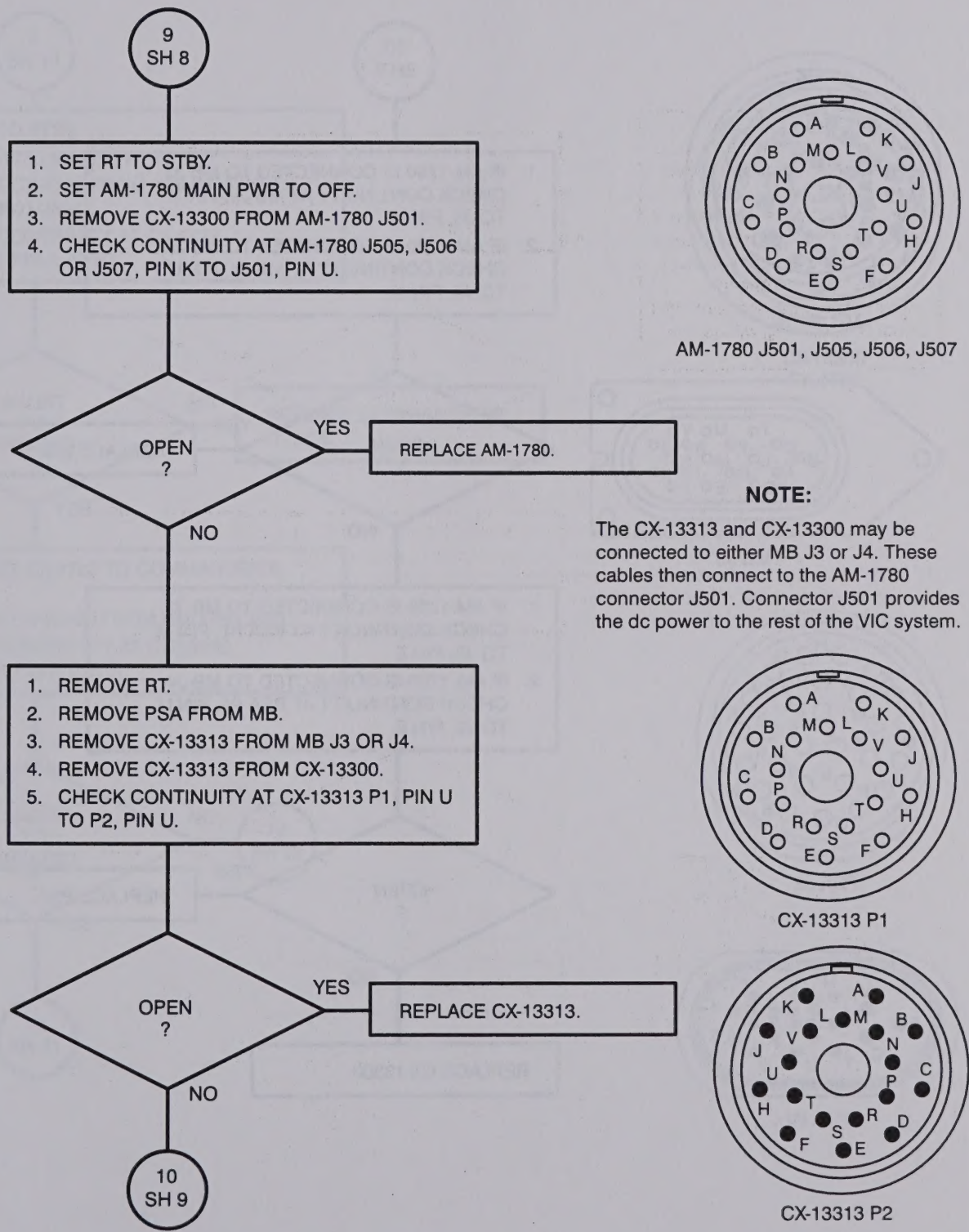
REPLACE RT.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 8 of 12)



AM-1780 J501, J505, J506, J507

NOTE:

The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.

CX-13313 P1

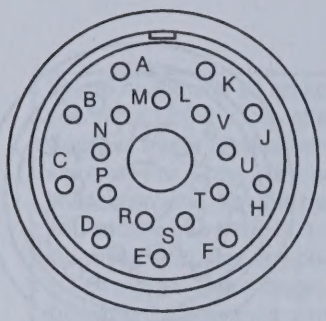
CX-13313 P2

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

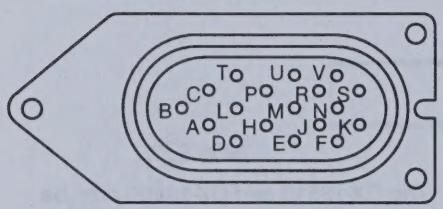
Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

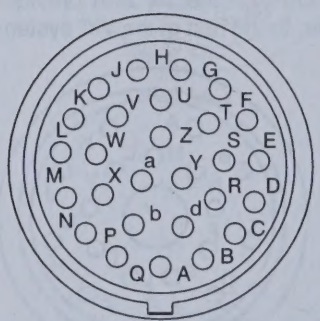
(Sheet 9 of 12)



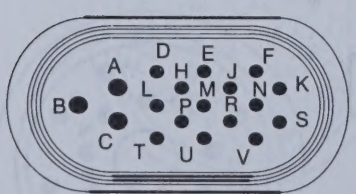
MB J3, J4



MB J5



PSA J2



PSA P1

10
SH 9

1. IF AM-1780 IS CONNECTED TO MB J3, CHECK CONTINUITY AT MB J3, PIN U TO J5, PIN M.
2. IF AM-1780 IS CONNECTED TO MB J4, CHECK CONTINUITY AT MB J4, PIN U TO J5, PIN U.

OPEN ?

YES → REPLACE MB.

NO

1. IF AM-1780 IS CONNECTED TO MB J3, CHECK CONTINUITY AT PSA P1, PIN M TO J2, PIN E.
2. IF AM-1780 IS CONNECTED TO MB J4, CHECK CONTINUITY AT PSA P1, PIN U TO J2, PIN E.

OPEN ?

YES → REPLACE PSA.

NO

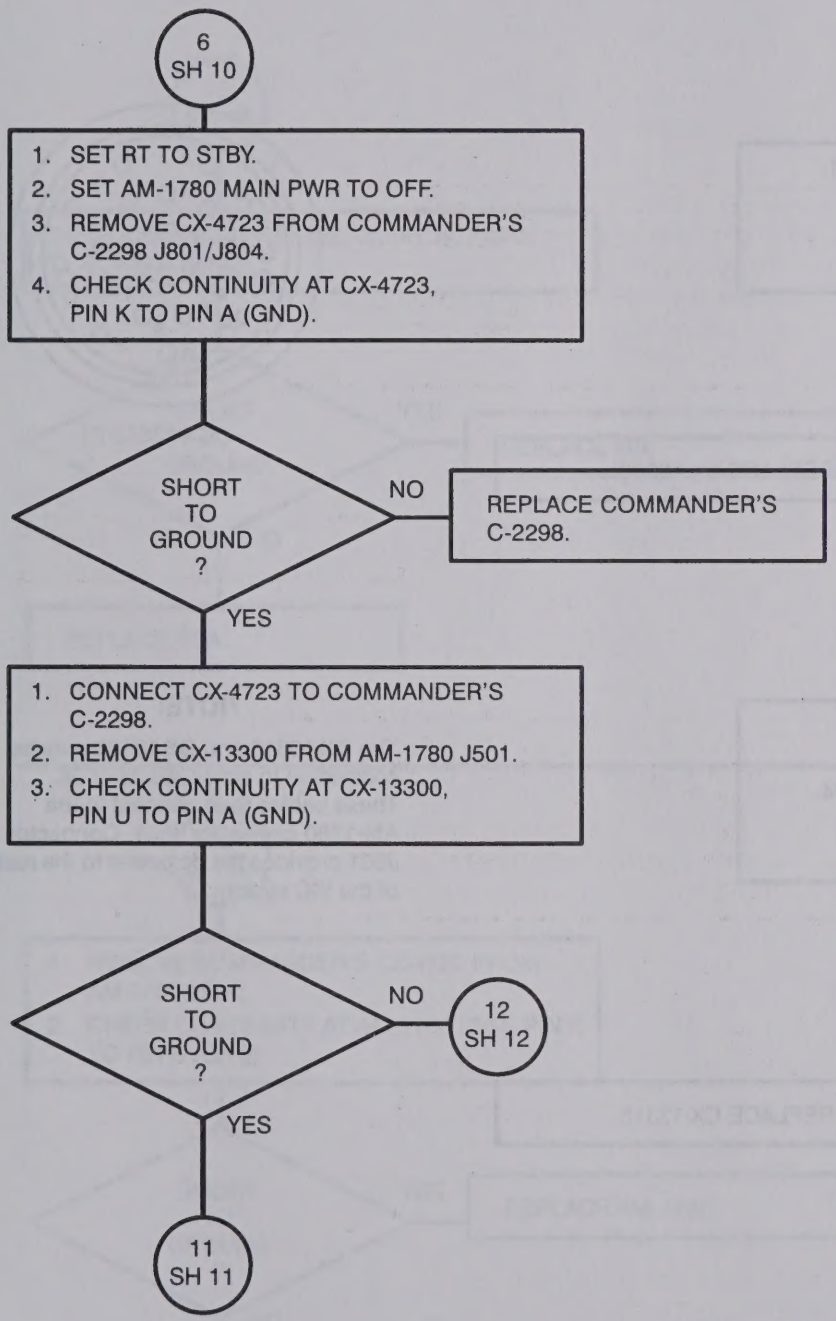
REPLACE CX-13300.

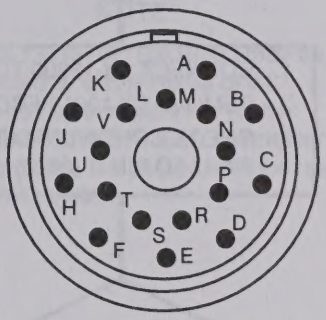
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 10 of 12)





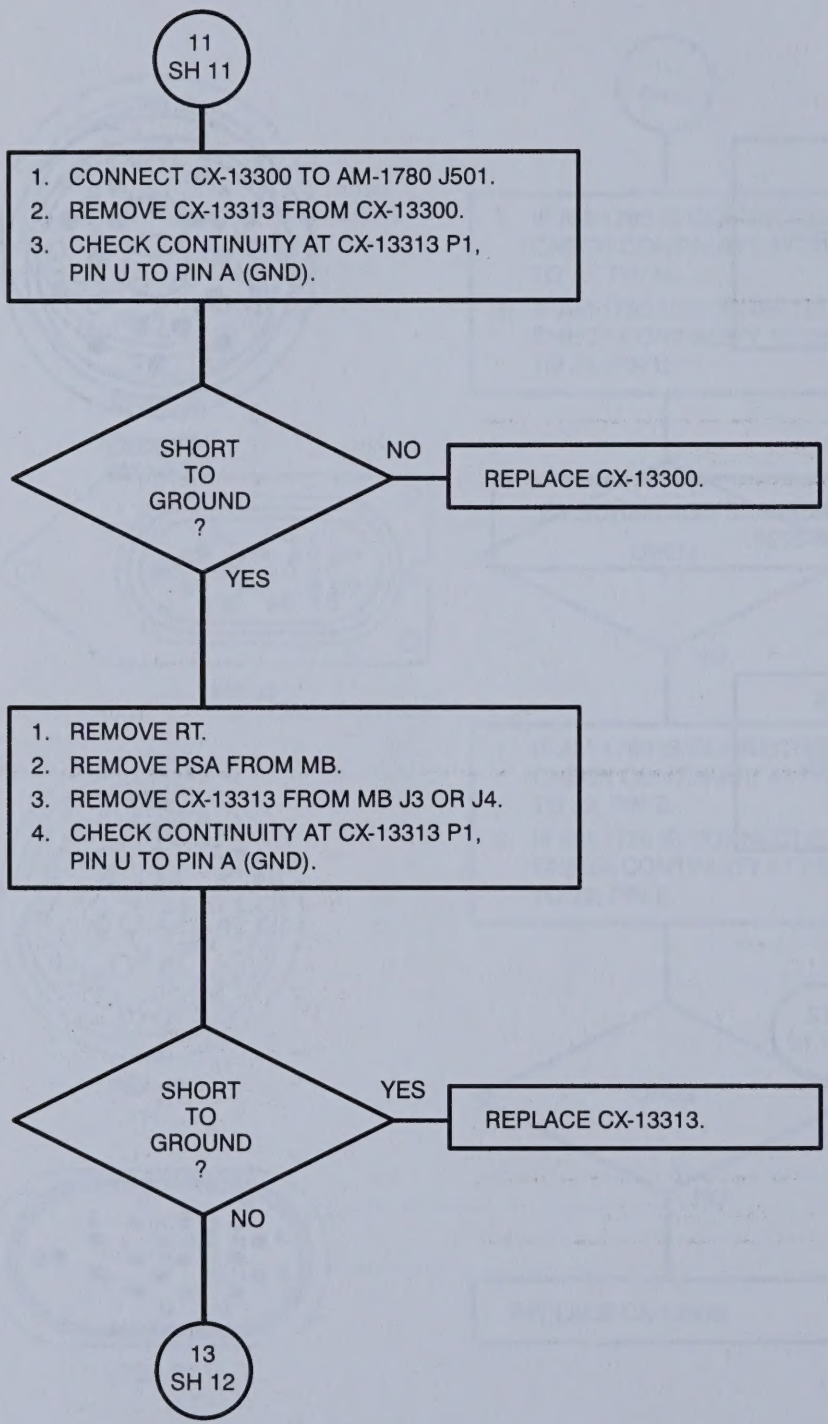
CX-13300
CX-4723

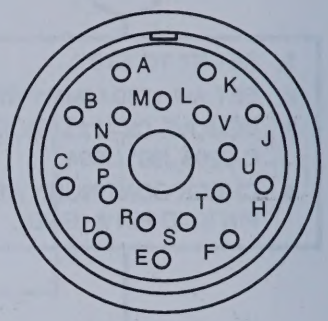
2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

(Sheet 11 of 12)





CX-13313 P1

NOTE:

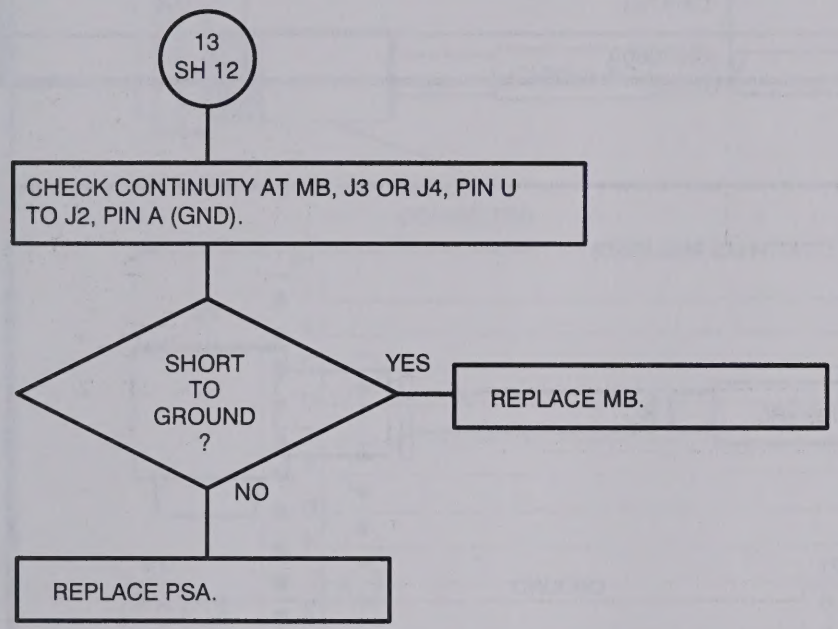
The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.

2.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 43

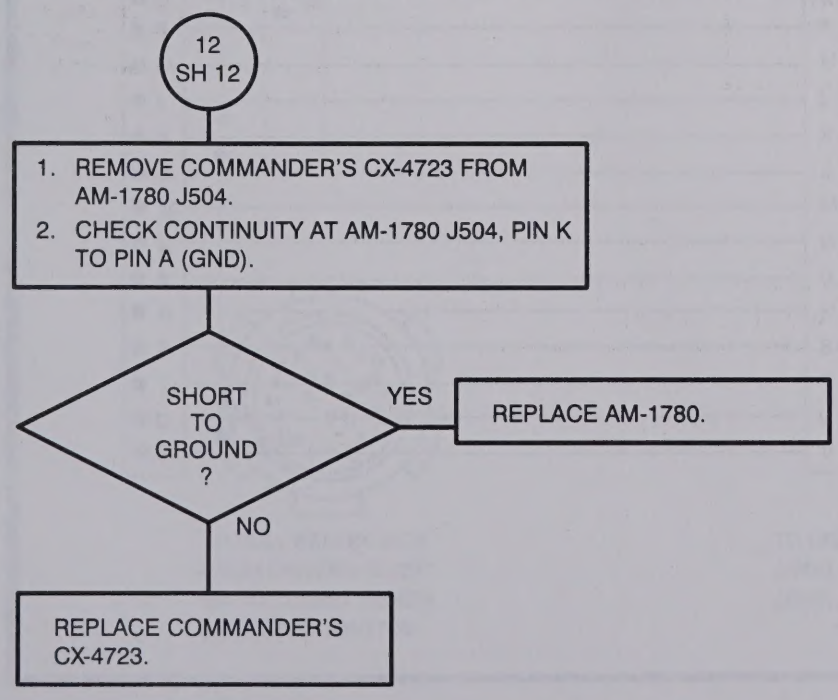
NO RT MODULATION AT SRM FROM COMMANDER'S C-2298.

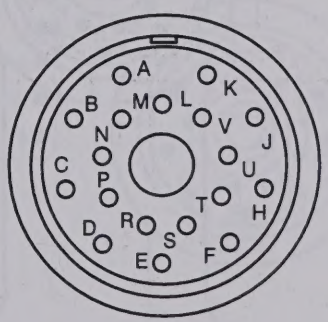
(Sheet 12 of 12)



NOTE:

The CX-13313 and CX-13300 may be connected to either MB J3 or J4. These cables then connect to the AM-1780 connector J501. Connector J501 provides the dc power to the rest of the VIC system.





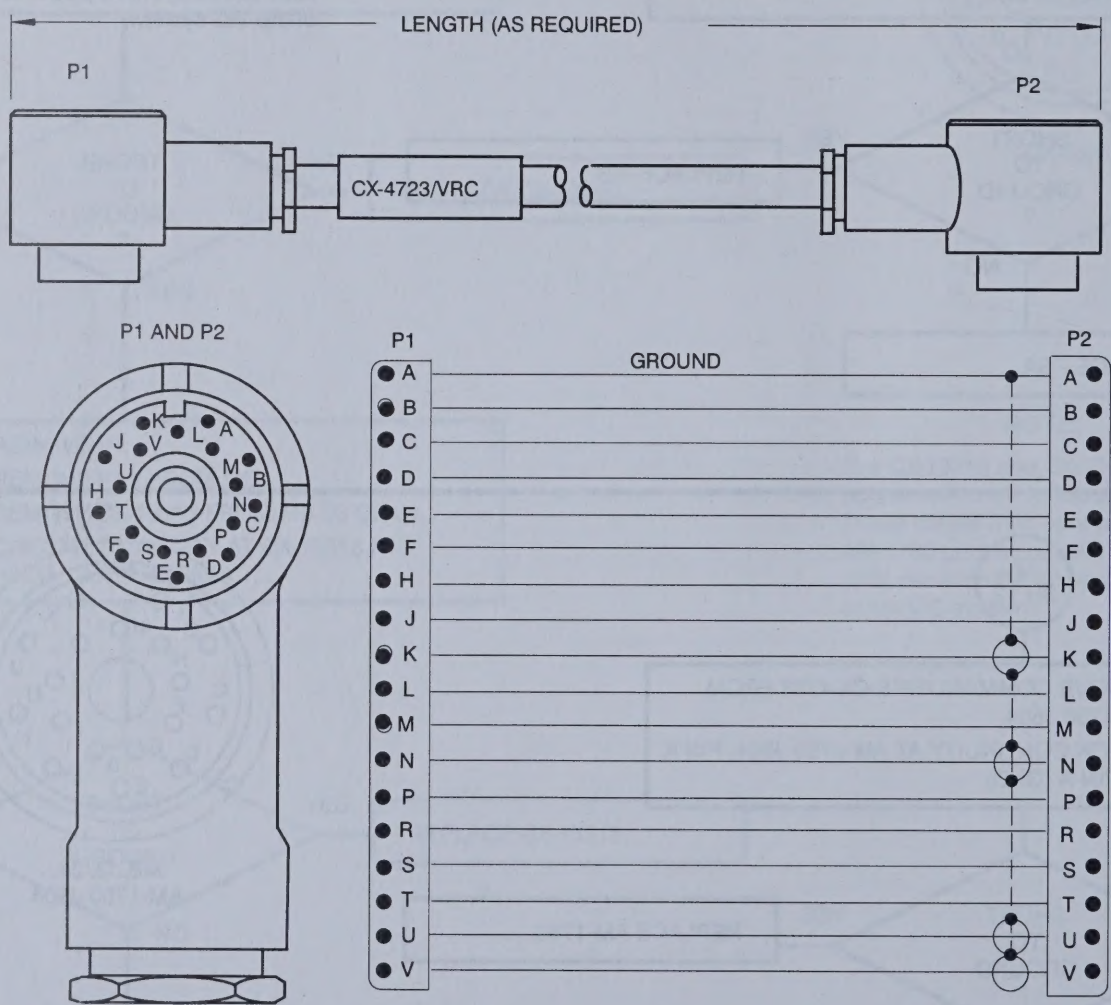
MB J3, J4,
AM-1780 J504

2.3. CABLE SCHEMATICS.

a. Index of Cable Schematics.

COMMON NAME	NOMENCLATURE	PAGE
VIC Cable	CX-4723	2-164
VIC Cable	CX-7060A	2-165

b. CX-4723 (VIC Cable)

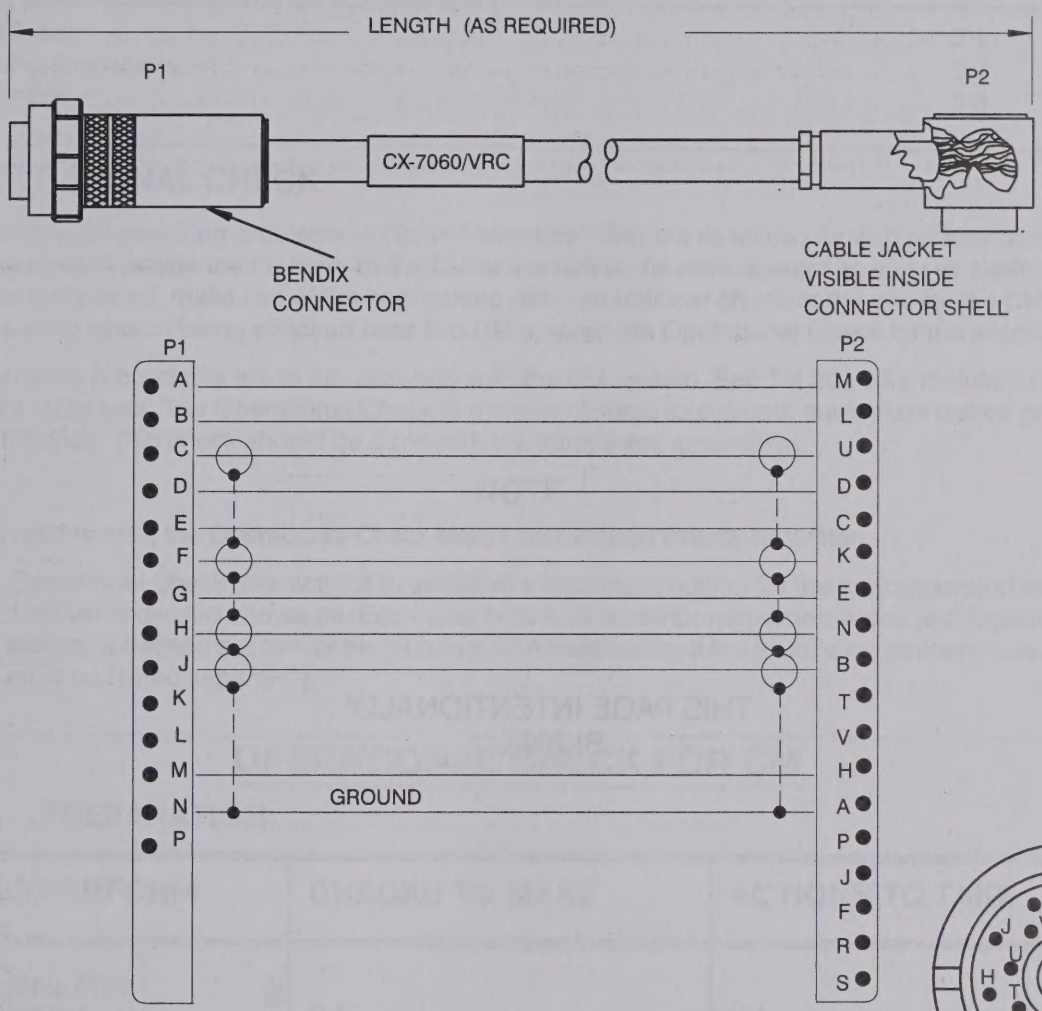


TO JACK OF VARIOUS COMPONENTS C-2297 (J904), C-2298, C-10456, C-10680 (J801 OR J804) C-2299 (J701 OR J702), C-2742 (J71 OR J72), AM-1780/VRC (J504, J506, J507)

CX-4723 (VIC Cable)

2.3. CABLE SCHEMATICS. Continued

c. CX-7060 (VIC Cable)



CX-7060 (VIC Cable)

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CHAPTER 3

CONTROL-MONITOR (CM) (C-11291 SERIES)

Subject	Para	Page
Operational Check	3.1	3-1
Troubleshooting Flowcharts	3.2	3-4
Cable Schematics	3.3	3-10

3.1. OPERATIONAL CHECK.

General guidelines for checking problems in Control-Monitors (CM) are as follow: As with an Intercom System (VIC), it is important to isolate the problem to the CM or the rest of the radio system as early as posible. Once the problem is so isolated, make use of the appropriate radio operational check or the one for the CM which follows. If the radio system being checked uses two CM's, rerun the Operational Check for the second CM.

These maintenance procedures are to be used only with the CM system. See TM 20-1 for maintenance procedures for radio sets. The Operational Check is a series of steps to evaluate equipment before placing the equipment in service. This check should be done with the equipment assembled.

NOTE

To get valid results, the Operational Check **MUST** be followed exactly as written.

Step 1 of the Operational Check lists actions to establish a starting condition for the performance checklist that follows. The checklist is divided into steps. Each step tests how a component works alone and together in a system. This system is defined as: one or two RTs in a VAA installation. If the installation contains two systems, each system must be tested separately.

OPERATIONAL CHECK FOR CM

STEP 1. PREPARATION:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.1 Set RT:		
FCTN to STBY		
CHAN to 1	N/A	N/A
MODE to SC	N/A	N/A
RF PWR to HI	N/A	N/A
VOL to Mid-Range	N/A	N/A
DIM to Full CW	N/A	N/A
COMSEC to CT	N/A	N/A
1.2 Set VAA:		
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
1.3 Set CM:		
RADIO to 1	N/A	N/A
DIM to Full CW	N/A	N/A
1.4 Handset(s) (HS):	Ensure HS is operational	Install known good HS
If VAA is used, connect to VAA J3 (RT-A) or J2 (RT-B) *	N/A	N/A

* If VAA is an A ,C or D model. Disconnect W-4 cable from VAA and RT. Connect H-250 to RT AUD/DATA. W-4 only needs to be connected when transmitting packet Data.

3.1. OPERATIONAL CHECK. Continued

STEP 2. POWER CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.1 Set VAA CB1 to ON	VAA CB1 trips?	NO: Go to Step 2.2 YES: Remove CX-13290 from VAA J9
	VAA CB1 still trips?	YES: Perform Op Check on radio system and go to Step 2.2 NO: Go to TS Chart 1
2.2 Set RT FCTN to REM Press RT CALL and HS PTT*	N/A RT display is blank?	N/A NO: Continue ↓ YES: Perform Op Check on radio
	RT display reads FAIL 4?	NO: Continue ↓ YES: Replace RT
	RT display reads CALL?	YES: Go to STEP 3 NO: Replace RT

STEP 3. CM SELF-TEST:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
3.1 Set CM FCTN to TST	All segments blank?	NO: Continue ↓ YES: Go to TS Chart 2
	Some segments blank?	NO: Continue ↓ YES: Replace CM
	"Gd" dsiplayed?	YES: Go to STEP 4 NO: Replace CM

These maintenance procedures are to be used only with the CM system. See TM 20-1 for maintenance procedures for radio sets. The Operational Check is a series of steps to evaluate equipment before placing the equipment in service. This check should be done with the equipment assembled.

* NOTE: This test RT for proper operation with CM. Call Display may be delayed up to 12 seconds.

3.1. OPERATIONAL CHECK. Continued

STEP 4. CM FUNCTIONAL CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
4.1 Set CM FCTN to RF Observe displays	Control "M" lit?	YES: Continue ↓ NO: Replace CM
	* All displays correct?	YES: Go to Step 4.2 NO: Go to TS Chart 3
4.2 Press INIT up and release	RF "M" lit?	YES: Go to Step 4.3 NO: Replace CM
4.3 Set FCTN to CHAN; INIT up and release	CHAN display reads "1"?	YES: Go to Step 4.4 NO: Replace CM
4.4 Set FCTN to RT MODE; INIT up and release	MODE display reads "FH"?	YES: Go to Step 4.5 NO: Replace CM
4.5 Set FCTN to COMSEC; INIT up and release	COMSEC display reads "CT"?	YES: Go to Step 4.6 NO: Replace CM
4.6 Set FCTN to VAR; INIT up and release	VAR display reads "2"?	YES: Continue ↓ NO: Replace CM
	RADIO 2/3 present?	NO: Continue ↓ YES: Go to Step 4.7
	Another CM present?	YES: Run STEPS 3 and 4 for 2nd CM NO: STOP, OPERATIONAL CHECK COMPLETE
4.7 Set RADIO to 2/3; set CM to display messages (below)	Rerun Steps 4.1 – 4.6	END OF OPERATIONAL CHECK

* NOTE:

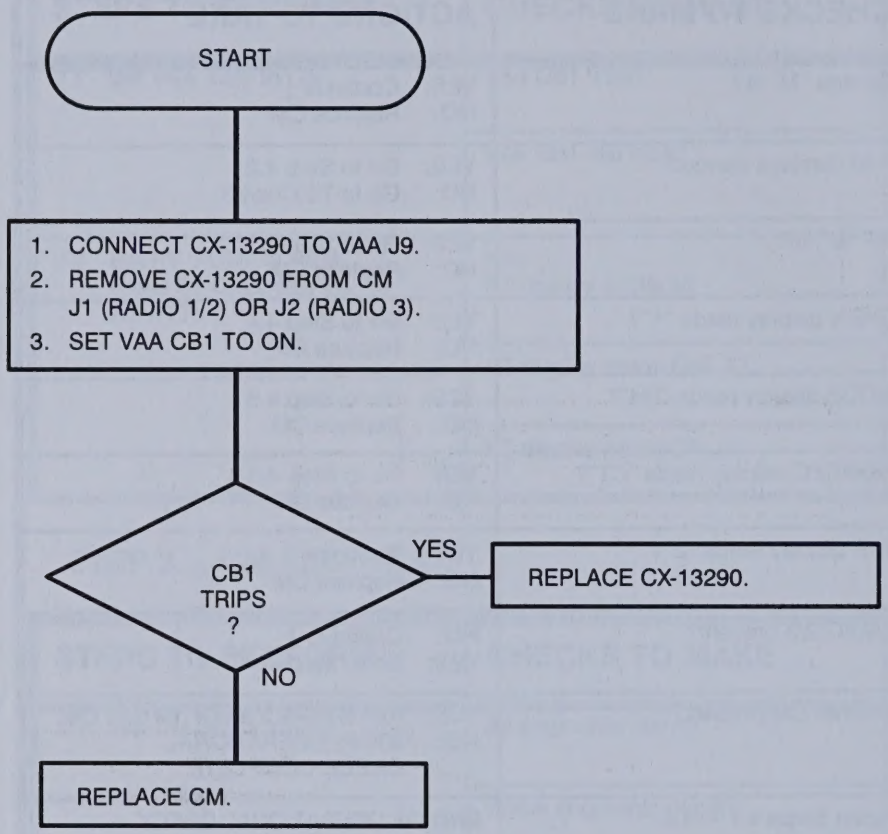
Display	Message
RF	LO
RT MODE	SC
CHAN	0
VAR	(blank)
COMSEC	PT

3.2. TROUBLESHOOTING FLOWCHARTS.

Chart 1

VAA CB1 TRIPS WHEN SET TO ON.

(Sheet 1 of 1)

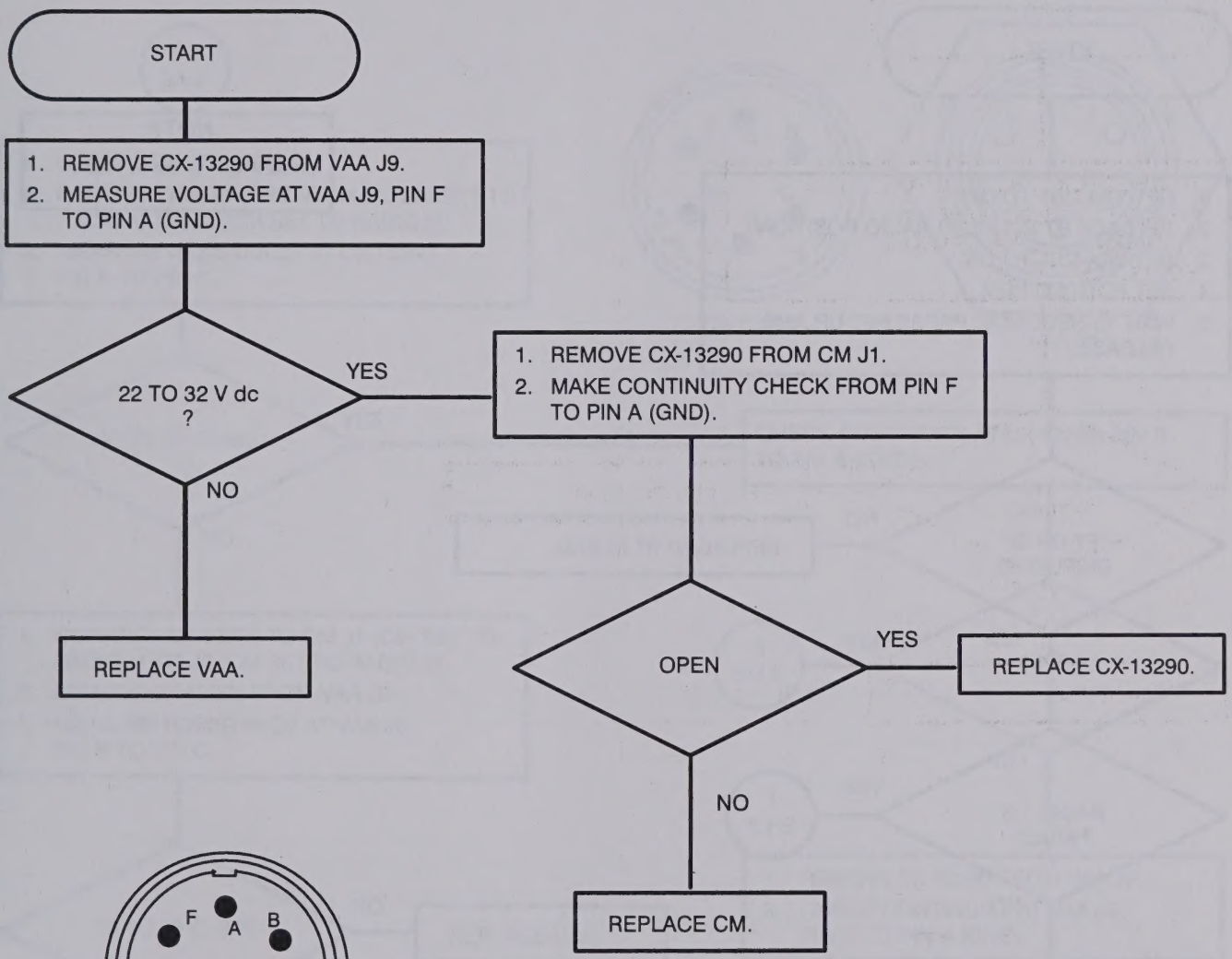


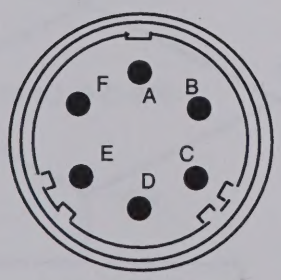
3.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 2

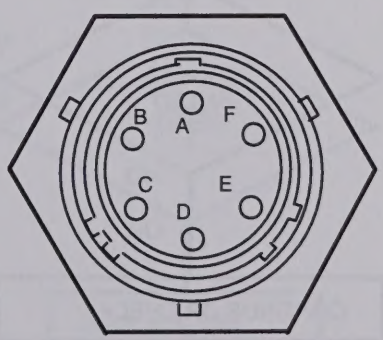
CONTROL-MONITOR DISPLAY DOES NOT LIGHT.

(Sheet 1 of 1)





CX-13290



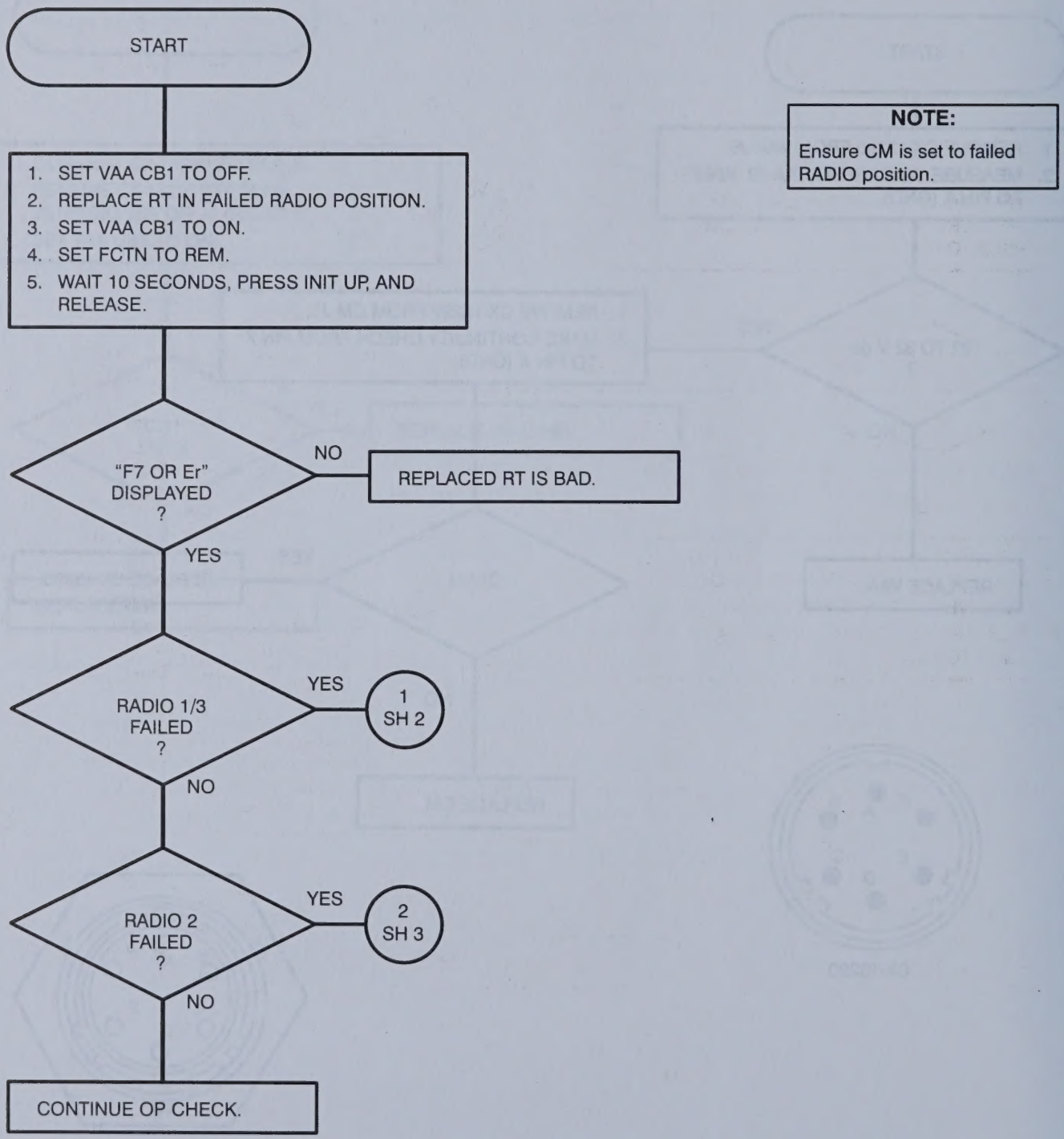
VAA J9

3.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

CONTROL-MONITOR DISPLAY INCORRECT.

(Sheet 1 of 4)

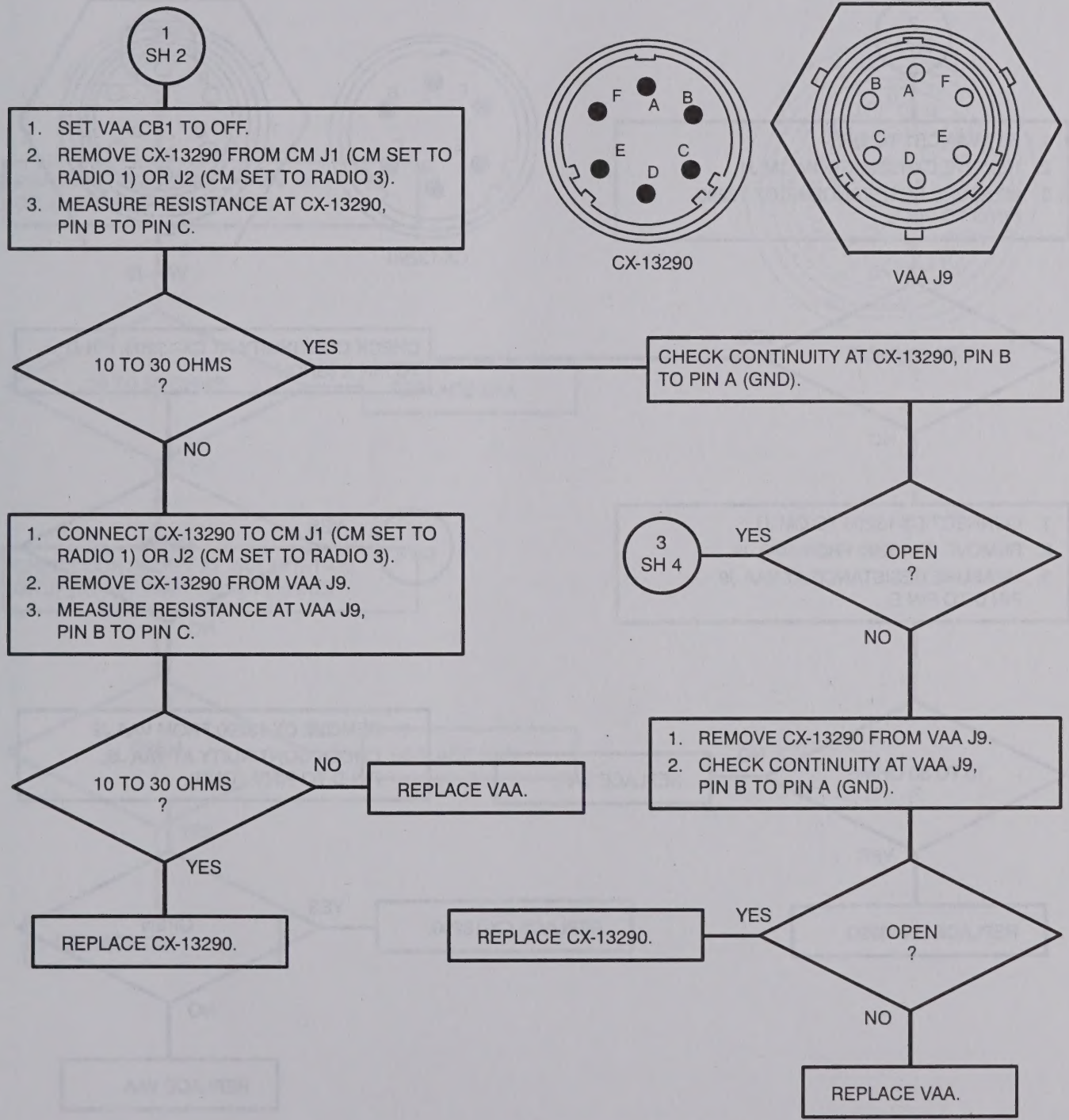


3.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

CONTROL-MONITOR DISPLAY INCORRECT.

(Sheet 2 of 4)

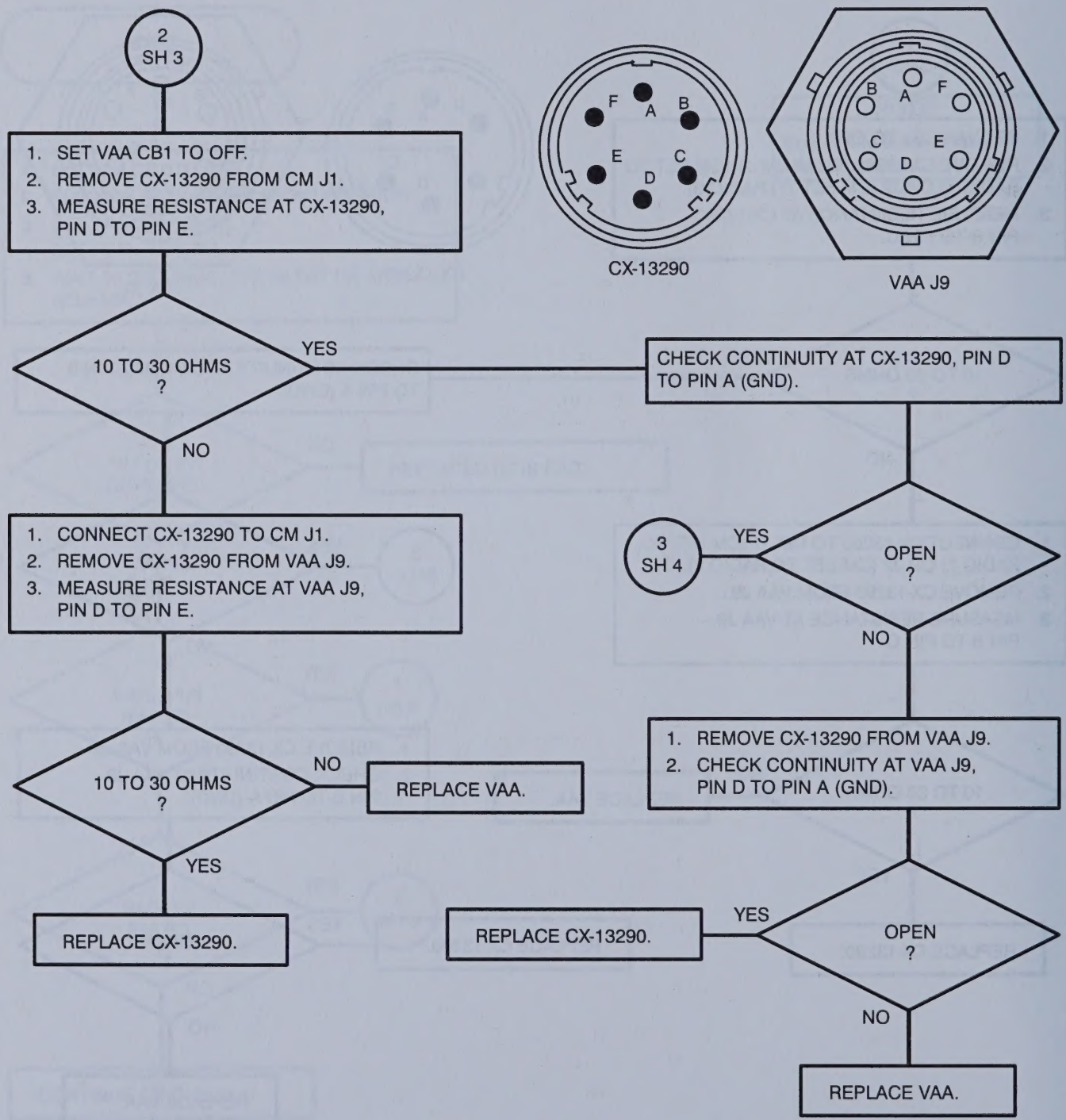


3.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

CONTROL-MONITOR DISPLAY INCORRECT.

(Sheet 3 of 4)

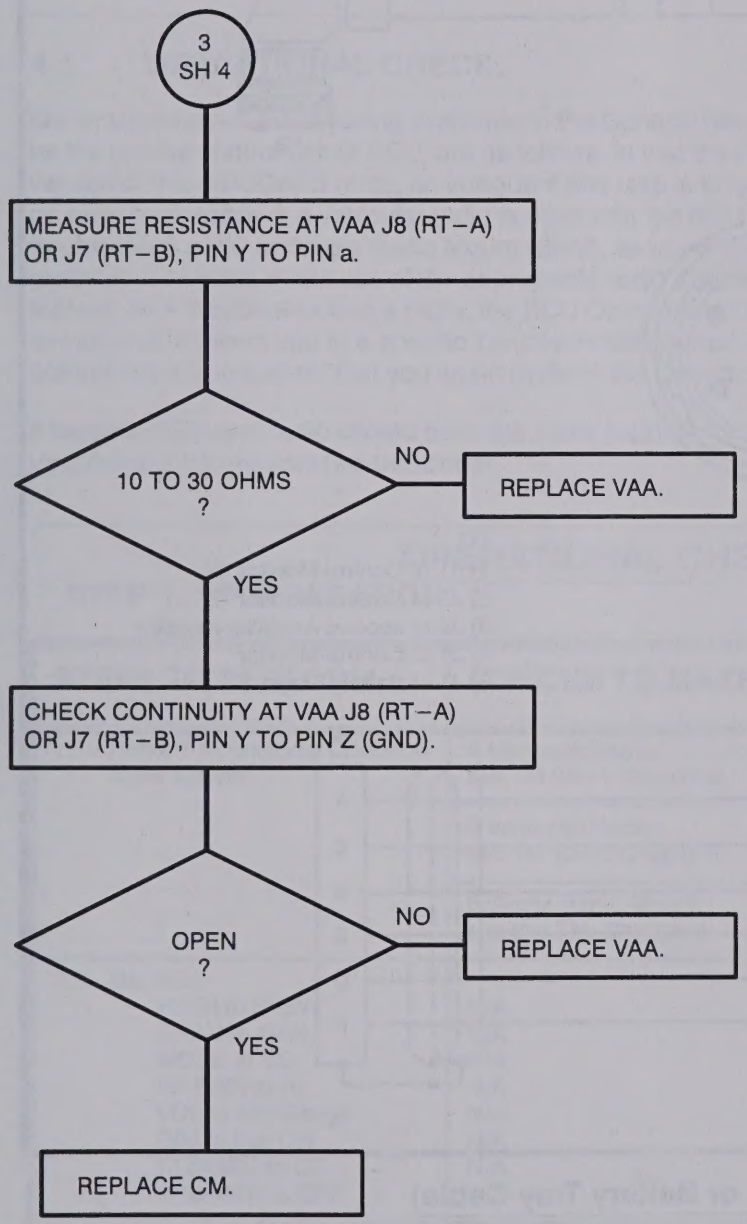


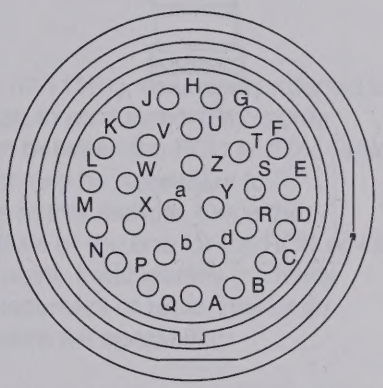
3.2. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 3

CONTROL-MONITOR DISPLAY INCORRECT.

(Sheet 4 of 4)

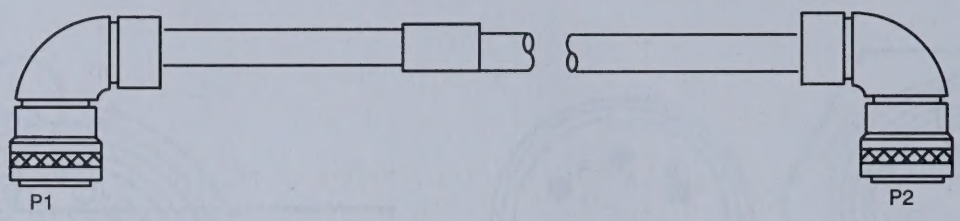


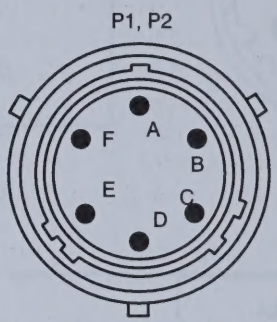


VAA J8/J7

3.3. CABLE SCHEMATICS.

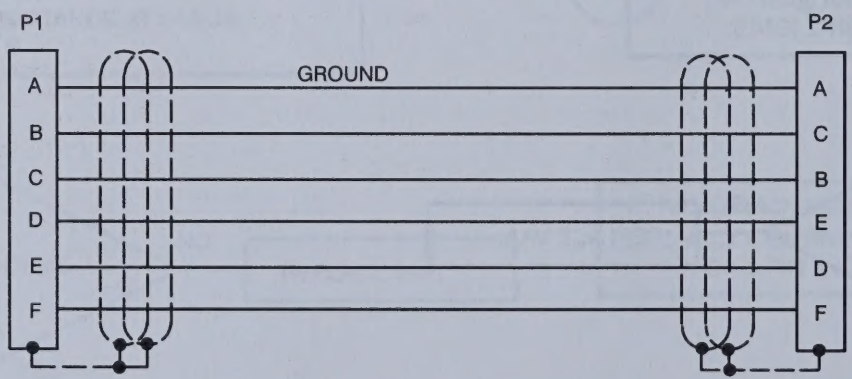
a. CX-13290 (CM or Battery Tray Cable)





TO:
1) J9 of Amplifier-Adapter
2) J3 of Control-Monitor "A"
3) J2 of Control-Monitor "A"
4) J3 of Power Supply Adapter
5) J4 of Power Supply Adapter

TO:
1) J1 of Control-Monitor "A"
2) J3 of Control-Monitor "B"
3) J9 of second Amplifier-Adapter
4) J1 of Control-Monitor
5) J1 of Battery Tray



CX-13290 (CM or Battery Tray Cable)

CHAPTER 4

CONTROL, RECEIVER-TRANSMITTER (RCU) (C-11561)

Subject	Para	Page
Operational Check	4.1	4-1
Troubleshooting Flowcharts	4.2	4-5

4.1. OPERATIONAL CHECK.

General guidelines for checking problems in the Control, Receiver-Transmitter (C-11561), commonly referred to as the remote control unit or RCU, are as follows. In that the RCU is always used in conjunction with some version of the SINCGARS radio, an important first step is to isolate the problem between the RCU and the radio as early as possible. If a vehicular radio is used with the RCU being checked, it may be necessary to troubleshoot a VIC or Single Radio Mount (SRM), as covered in other chapters of this manual. Once the problem is isolated, make use of the appropriate radio troubleshooting procedure or the one for the RCU which follows. As in troubleshooting a radio, the RCU Operational Check is the start point. It will identify the faulty component or direct you to a specific Troubleshooting Chart to use. Once replacement or repair has been completed, it is important that you again perform the Operational Check to ensure full operability.

If feasible, RCU and radio should be at the same location for troubleshooting. If co-location cannot be achieved, troubleshooting requires two personnel.

OPERATIONAL CHECK FOR RCU

STEP 1. PREPARATION:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.1 Perform Operational Check on radio system	If Manpack Radio, see TM 20-1 Chapter 2	PASS: Go to Step 1.2 FAIL: Troubleshoot manpack radio
	If Vehicular Radio, see TM 20-1 Chapter 3	PASS: Go to Step 1.2 FAIL: Troubleshoot vehicular radio
	If Single Radio Mount, see this TM Chapter 5	PASS: Go to Step 1.2 FAIL: Troubleshoot SRM
1.2 Set RCU: FCTN to STBY CHAN to MAN MODE to SC RF PWR to HI VOL to Mid-Range DIM to Full CW COMSEC to CT SPEAKER to OFF	 N/A N/A N/A N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A N/A N/A N/A
1.3 Handset (HS), H250: Connect to RCU AUD/DATA	Ensure HS is operational	Install known good HS
1.4 Main battery *	Ensure good power	Install known good battery, if required
1.5 Hold-Up Battery (HUB)	Ensure good HUB	Install known good HUB, if required

* If RCU is vehicular mounted perform STEP 6 at this time and return to STEP 1.5.

4.1. OPERATIONAL CHECK. Continued

STEP 2. POWER/COMSEC CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.1 Set RCU FCTN to SQ ON	N/A	N/A
	RCU display lights?	YES: Go to Step 2.2 NO: Replace RCU battery box
	RCU display then lights?	YES: Go to Step 2.2 NO: Replace RCU
2.2 Set RCU FCTN to STBY (Do not set FCTN to OFF; fill data will be lost at both RCU and RT)	N/A	N/A
Connect field wire from RCU to RT, VAA, or SRM	N/A	Go to Step 2.3
2.3 Set RT FCTN to REM	N/A	N/A
Set RCU:		
FCTN to LD	N/A	N/A
DATA to OFF	N/A	N/A
(RCU display changes to RT info after 15 seconds)	RCU display reads OFF?	YES: Go to Step 2.4 NO: Replace RCU
2.4 Clear COMSEC alarm	Alarm clears?	YES: Go to Step 2.5 NO: Replace RCU
2.5 Load COMSEC data	Variable loads?	YES: Go to STEP 3 NO: Replace RCU

STEP 3. RCU/RT SELF-TEST:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
3.1 Set RCU FCTN to TST	RCU display reads GOOD for RCU self-test?	YES: Continue ↓ NO: Replace RCU
	RCU display reads GOOD for RT self-test?	YES: Continue ↓ NO: Replace RT
	RCU display then reads OPEN?	NO: Go to STEP 4 YES: Go to TS Chart 1

4.1. OPERATIONAL CHECK. Continued

STEP 4. RCU LOAD CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
4.1 Set RCU: FCTN to LD MODE to SC	 N/A N/A	 N/A N/A
4.2 RCU: Load SC frequencies: CHAN 1: 41000 CHAN 2: 54000 CHAN 3: 75000	 N/A N/A N/A	 N/A N/A N/A
4.3 Set RT: FCTN to LD MODE to SC	SC frequencies load in RT?	YES: Go to Step 4.4 NO: Go to TS Chart 2
4.4 Set RT FCTN to REM	N/A	N/A
4.5 RCU: Load FH test sync time (82/02:36)	Test sync time loads in RCU?	YES: Go to Step 4.6 NO: Replace RCU
4.6 RCU: Press CALL pushbutton	RCU display reads 00?	YES: Go to Step 4.7 NO: Replace RCU
4.7 RCU: Load Battery Life Condition	Battery Life Condition loads in RCU?	YES: Go to Step 4.8 NO: Replace RCU
4.8 RCU: Press CALL pushbutton twice	RCU display reads [RT XX]?	YES: Go to STEP 5 NO: Replace RCU

4.1. OPERATIONAL CHECK. Continued

STEP 5. TRANSMIT/RECEIVE CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
5.1 Set RCU: FCTN to ICM COMSEC to PT	 N/A N/A	 N/A N/A
5.2 RCU: Press CALL and PTT, and release	RCU display reads CALL?	YES: Go to Step 5.3 NO: Go to TS Chart 3
5.3 RCU: Press PTT and count into HS	Voice heard at RT?	YES: Go to Step 5.4 NO: Go to TS Chart 4
5.4 RT: Press CALL and PTT, and release	RT display reads CALL?	YES: Go to Step 5.5 NO: Go to TS Chart 5
5.5 RT: Press PTT and count into HS	Voice heard at RCU?	YES: Go to Step 5.6 NO: Go to TS Chart 6
5.6 RCU: Press CALL and PTT, and release	RCU display reads CALL?	YES: Go to Step 5.3 NO: Go to TS Chart 3
5.7 Set RCU FCTN to LD LS-685: Connect to RCU, and turn speaker ON	N/A Rushing noise heard?	N/A YES: End of Dismounted RCU Operational Check NO: Go to TS Chart 7

STEP 6. VEHICULAR POWER CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
6.1 Set RCU: FCTN to OFF CHAN to MAN MODE to SC RF PWR to HI VOL to Mid-Range DIM to Full CW COMSEC to CT SPEAKER to OFF	 N/A N/A N/A N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A N/A N/A N/A
6.2 VAA/ PSA CB1 to ON	DS1 lights? *	YES: Go to Step 6.3 NO: Troubleshoot Power to VAA/PSA
6.3 Set RCU FCTN to SQ ON	RCU display lights?	YES: End of RCU Vehicular Power Check NO: Go to TS Chart 8

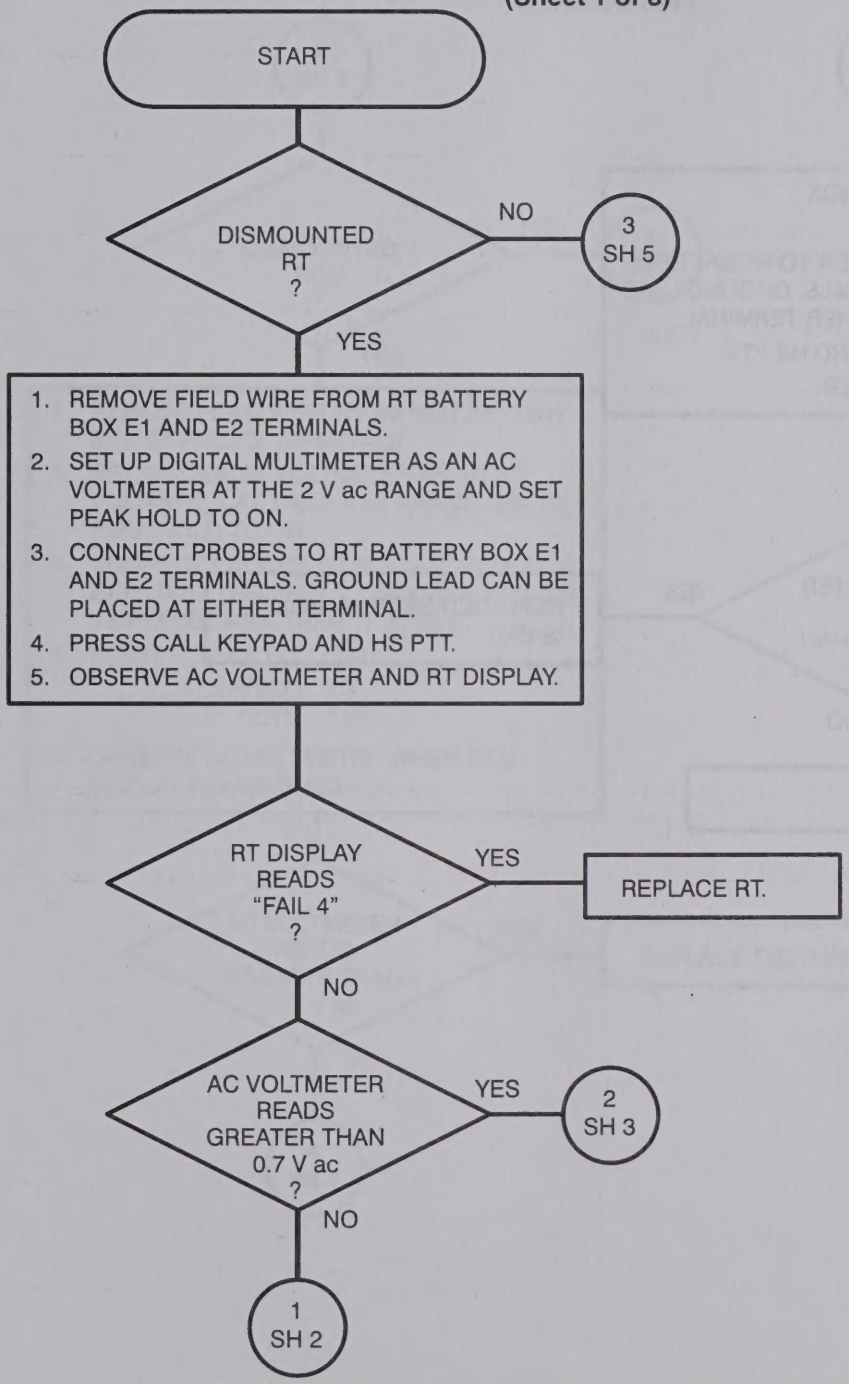
* Continously flashing, DS1 indicates a problem, replace VAA.

4.2. TROUBLESHOOTING FLOWCHARTS.

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 1 of 8)

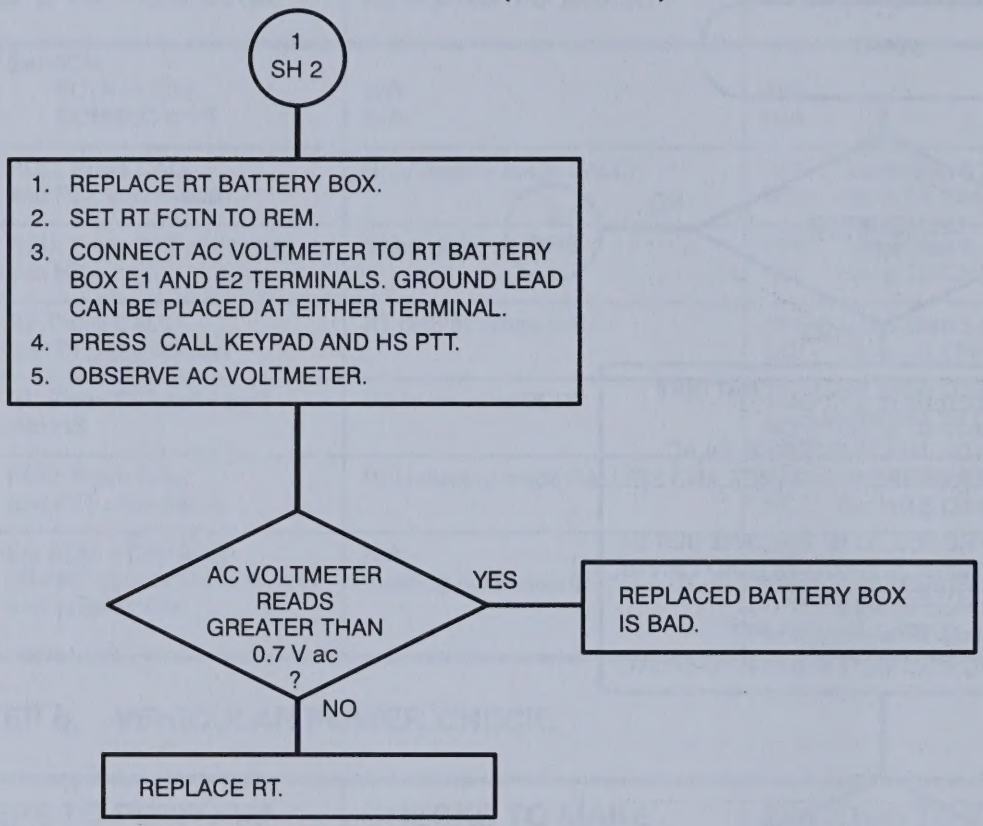


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 2 of 8)

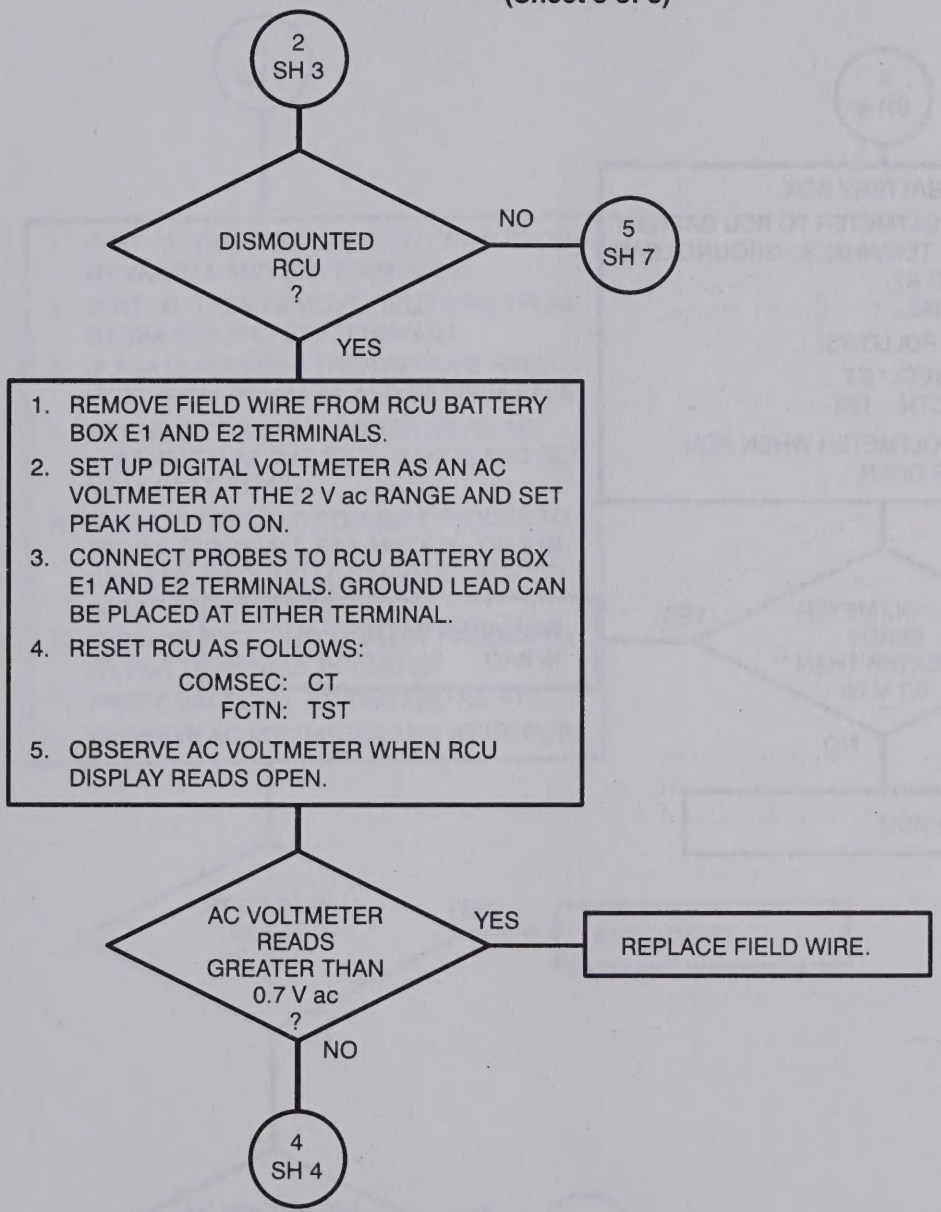


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 3 of 8)

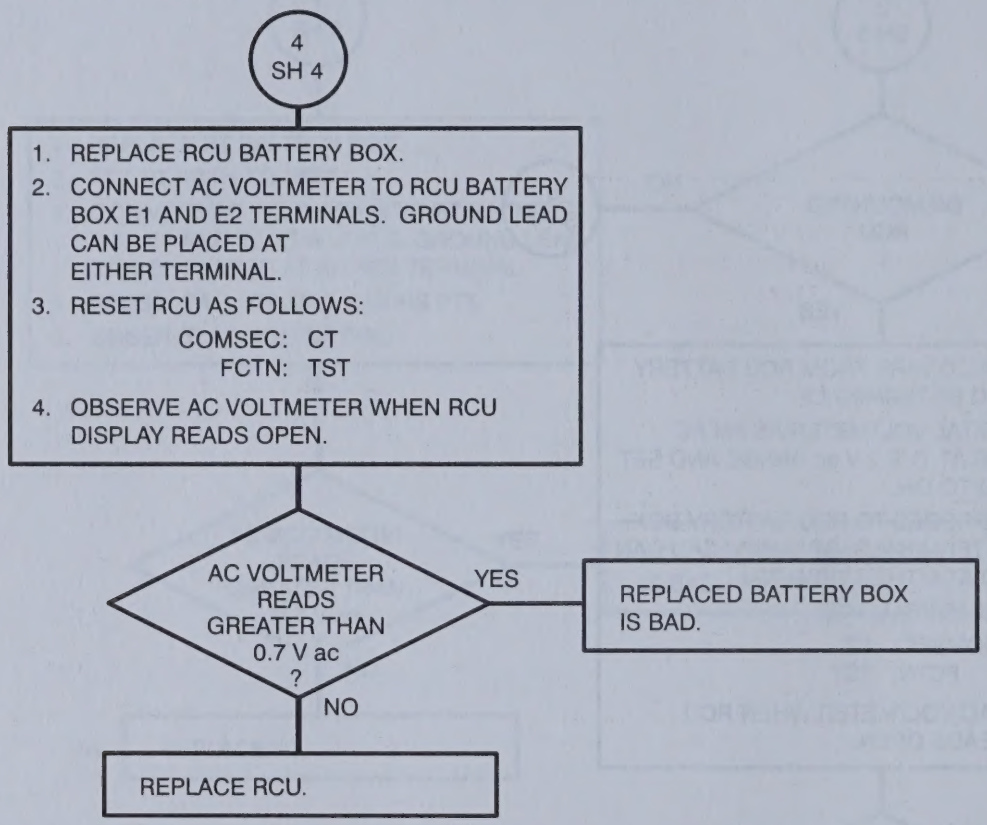


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 4 of 8)

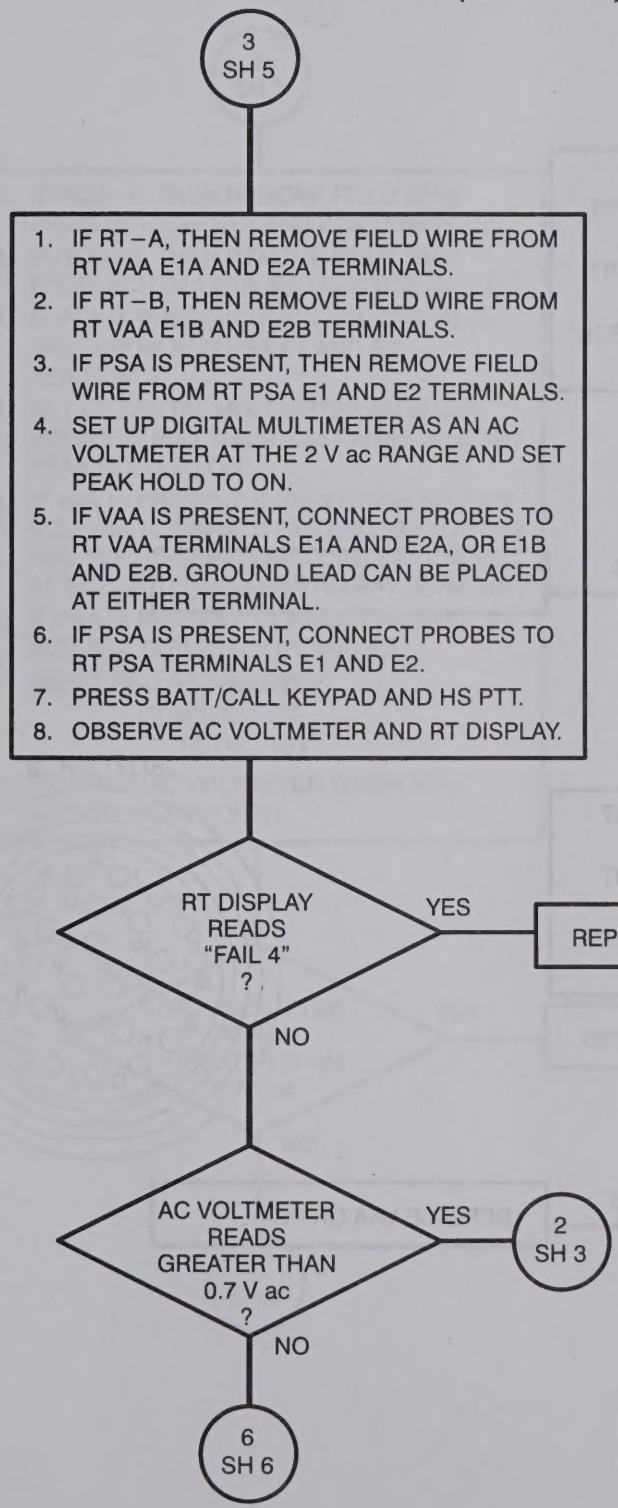


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 5 of 8)

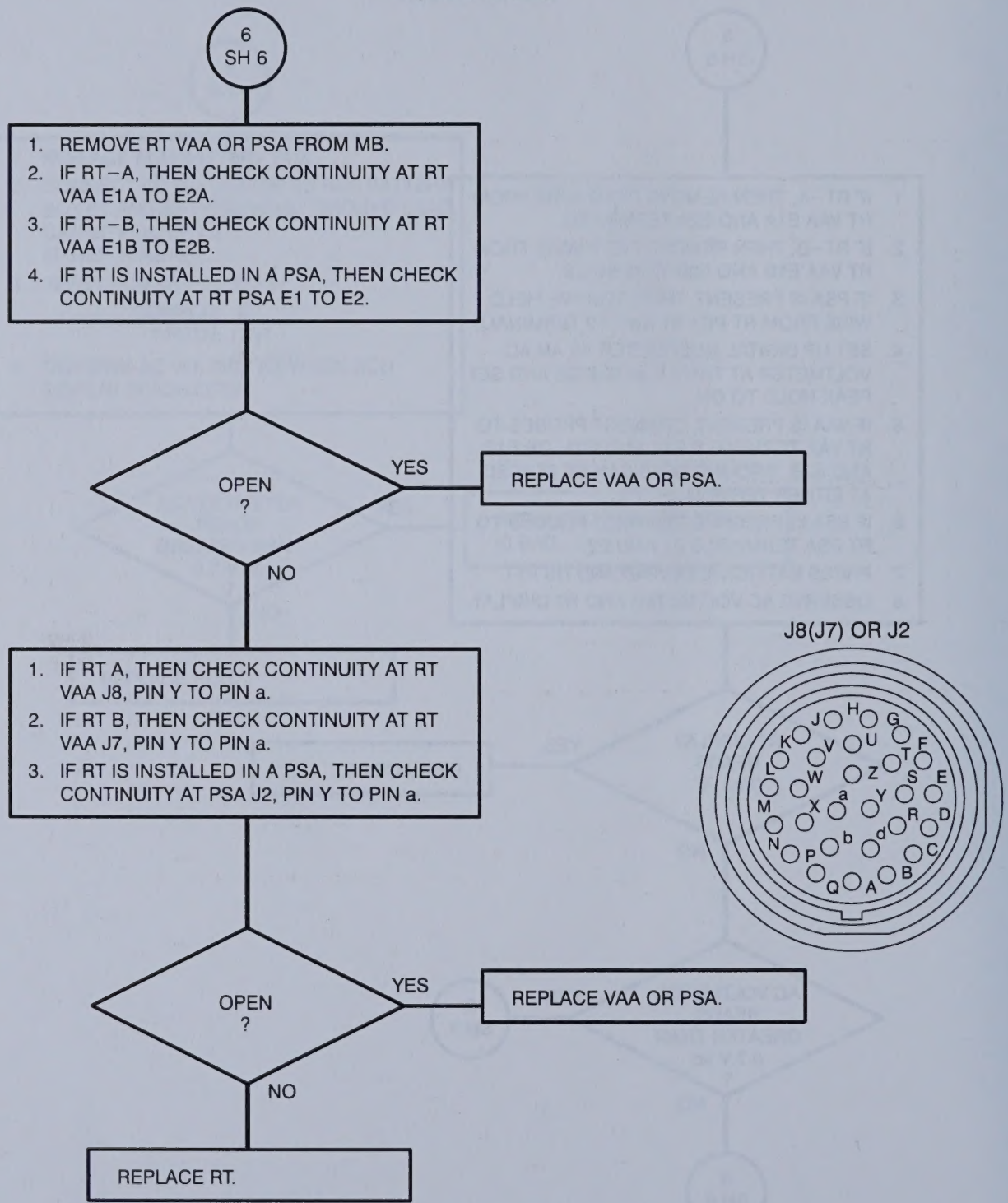


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 6 of 8)

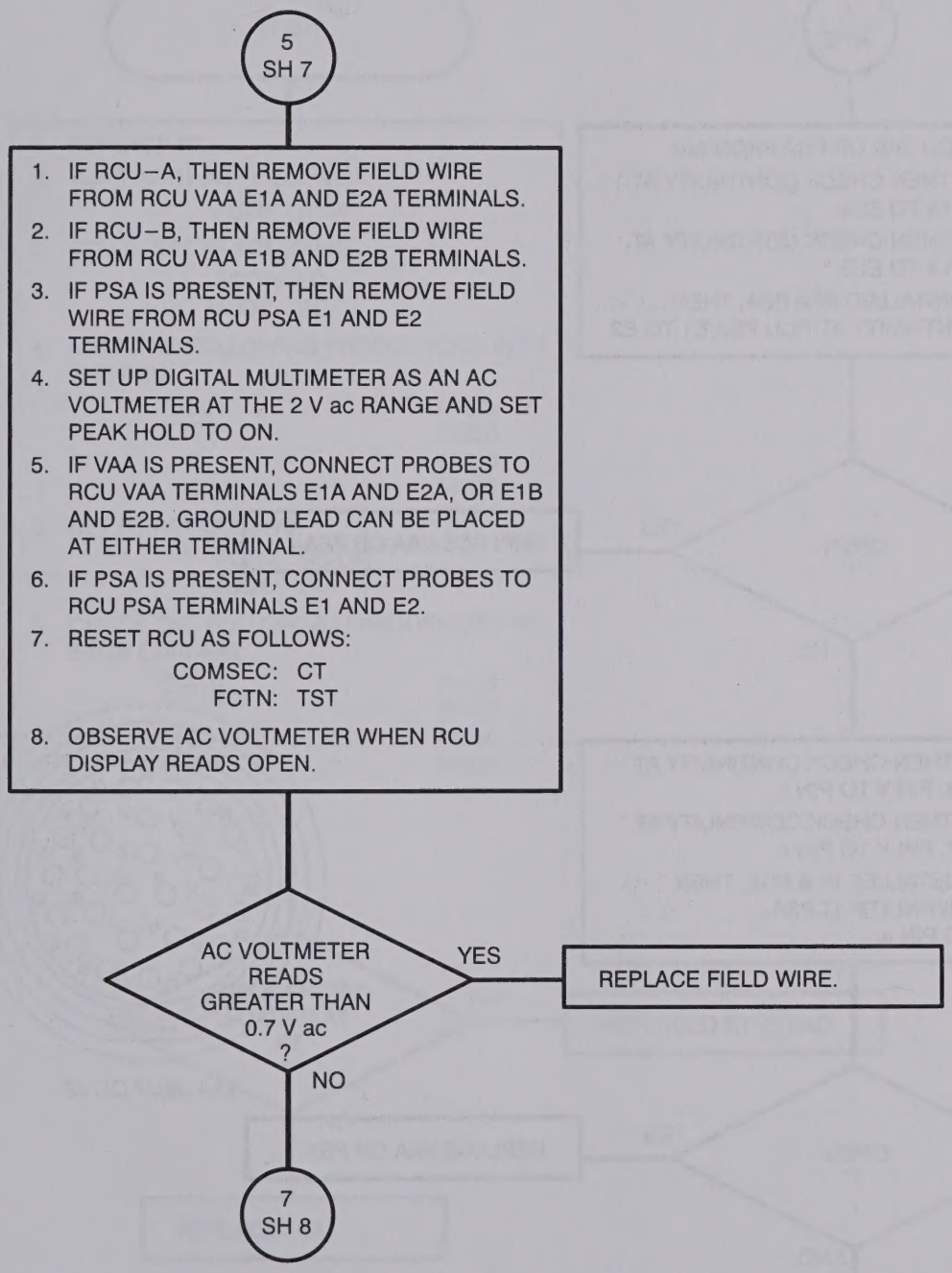


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 7 of 8)

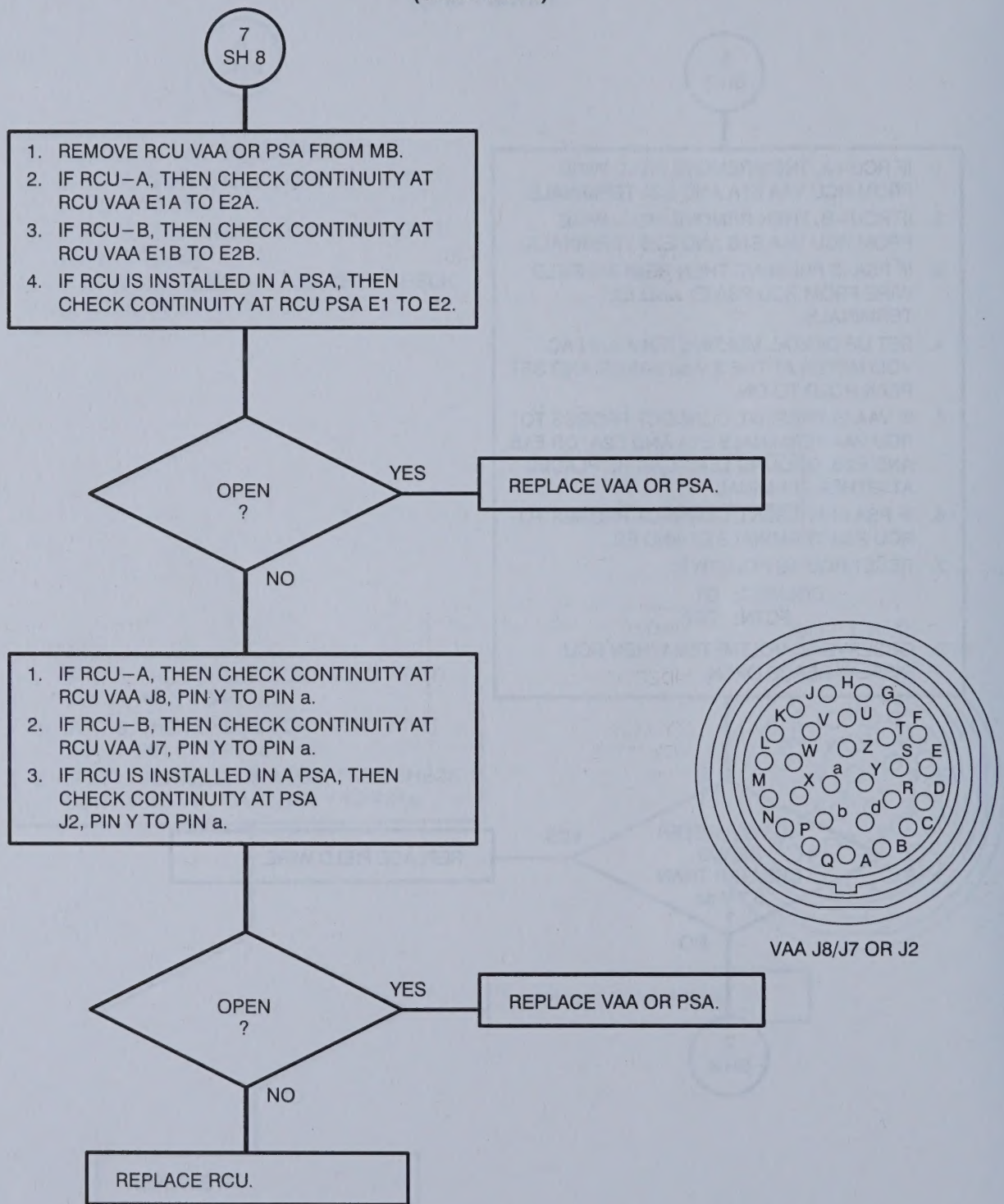


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

RCU DISPLAY READS "OPEN" DURING SELF-TEST.

(Sheet 8 of 8)

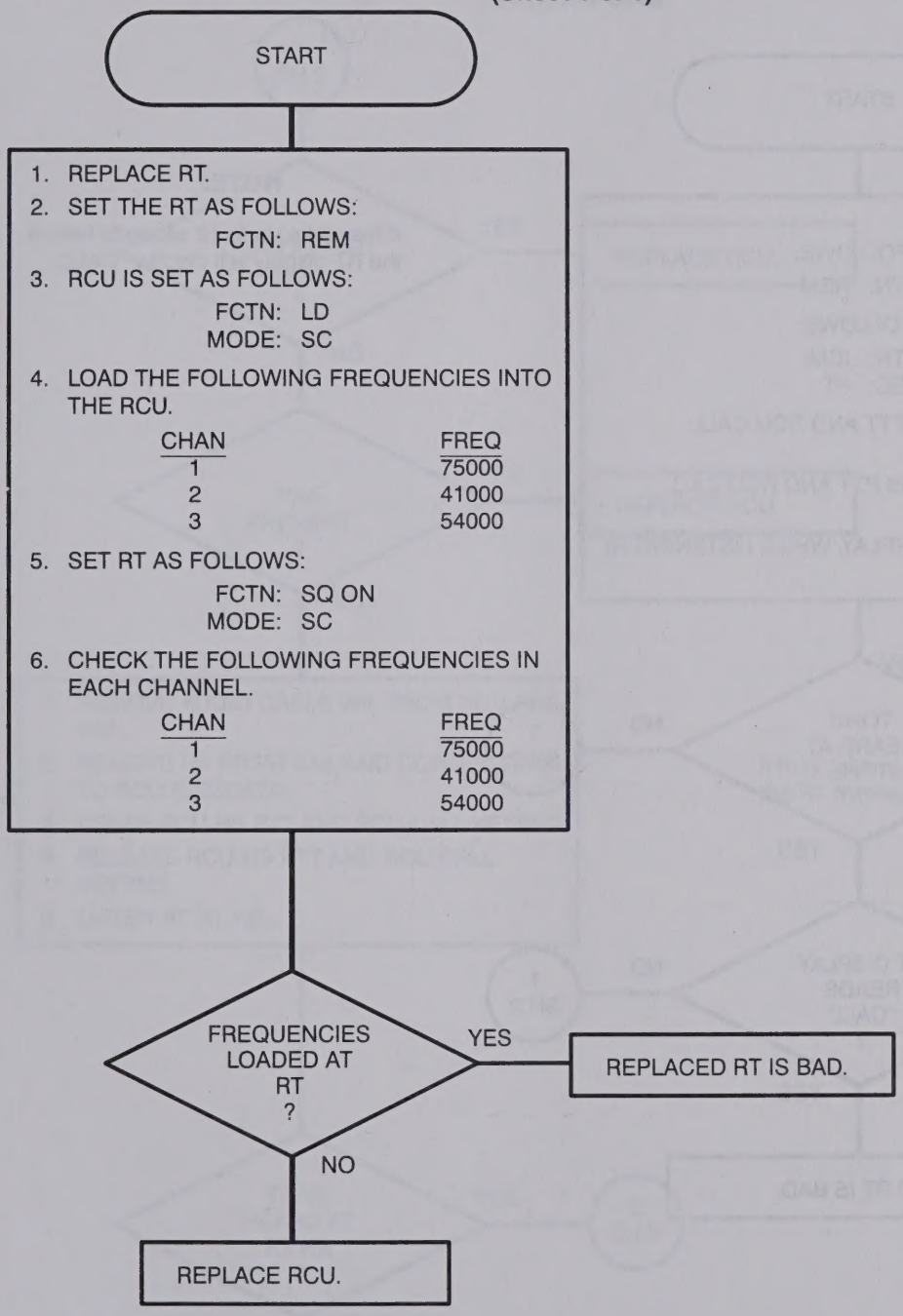


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

RT WILL NOT LOAD FREQUENCIES FROM RCU.

(Sheet 1 of 1)

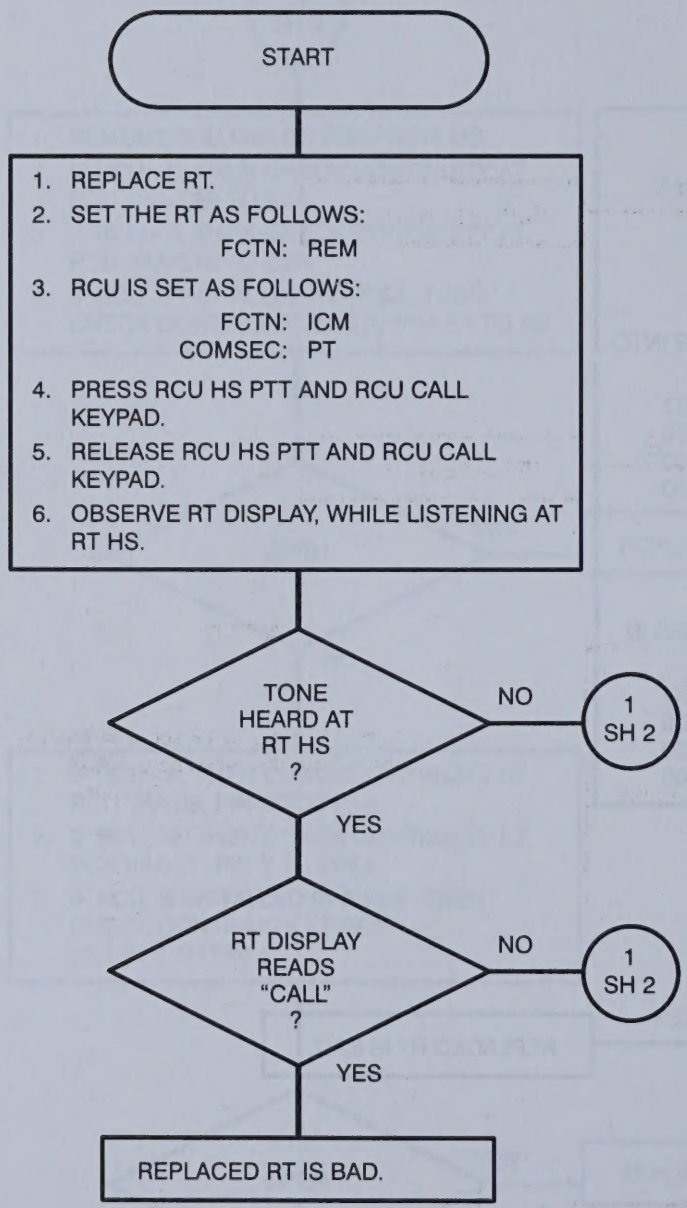


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

NO CALL FUNCTION AT THE RCU.

(Sheet 1 of 3)



NOTE:

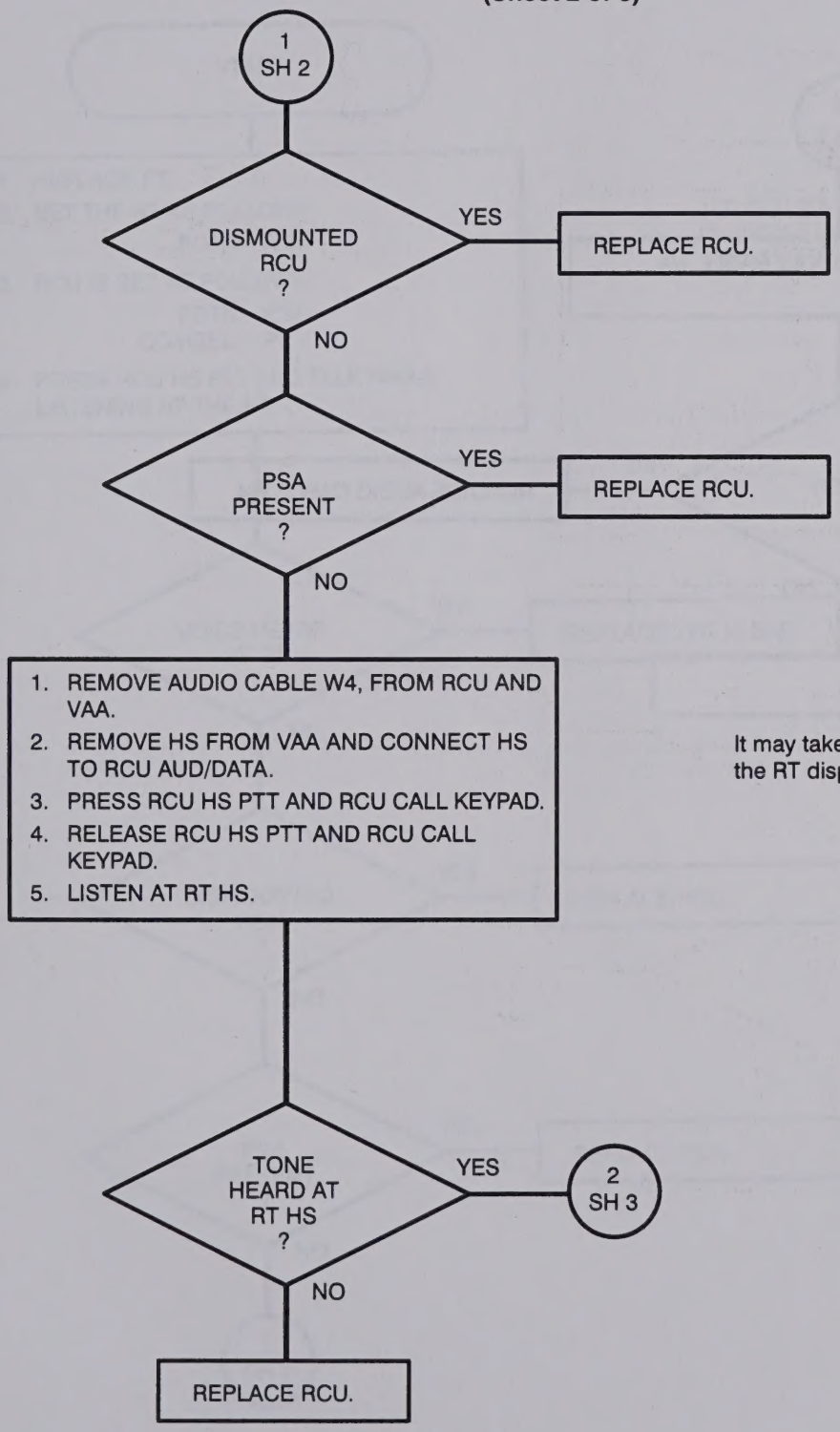
It may take up to 12 seconds before the RT display will display "CALL".

4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

NO CALL FUNCTION AT THE RCU.

(Sheet 2 of 3)



NOTE:

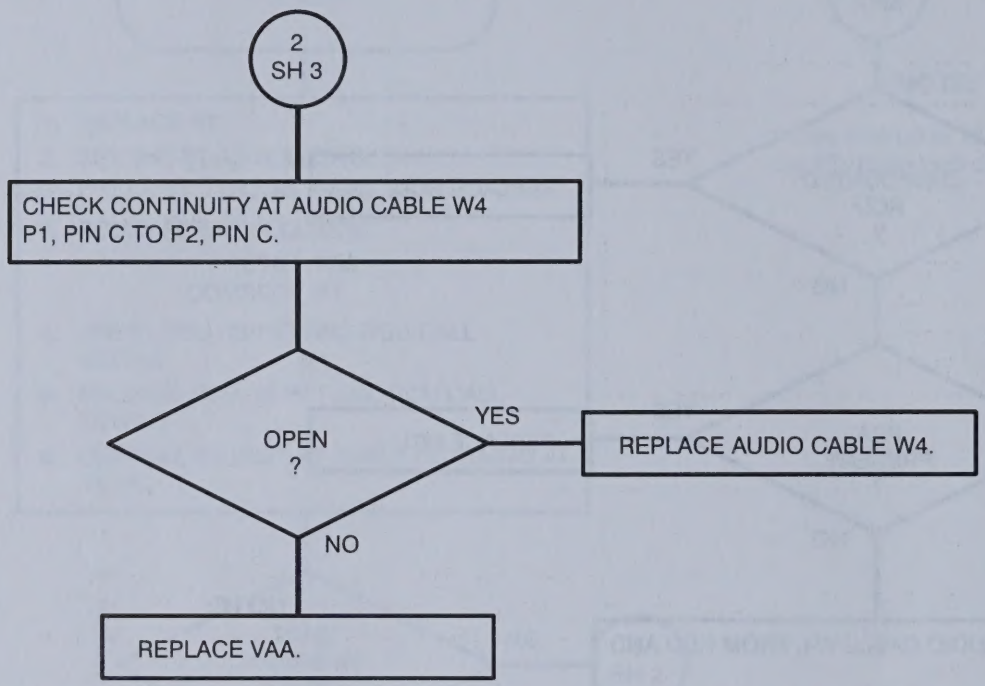
It may take up to 12 seconds before the RT display will display "CALL".

4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

NO CALL FUNCTION AT THE RCU.

(Sheet 3 of 3)

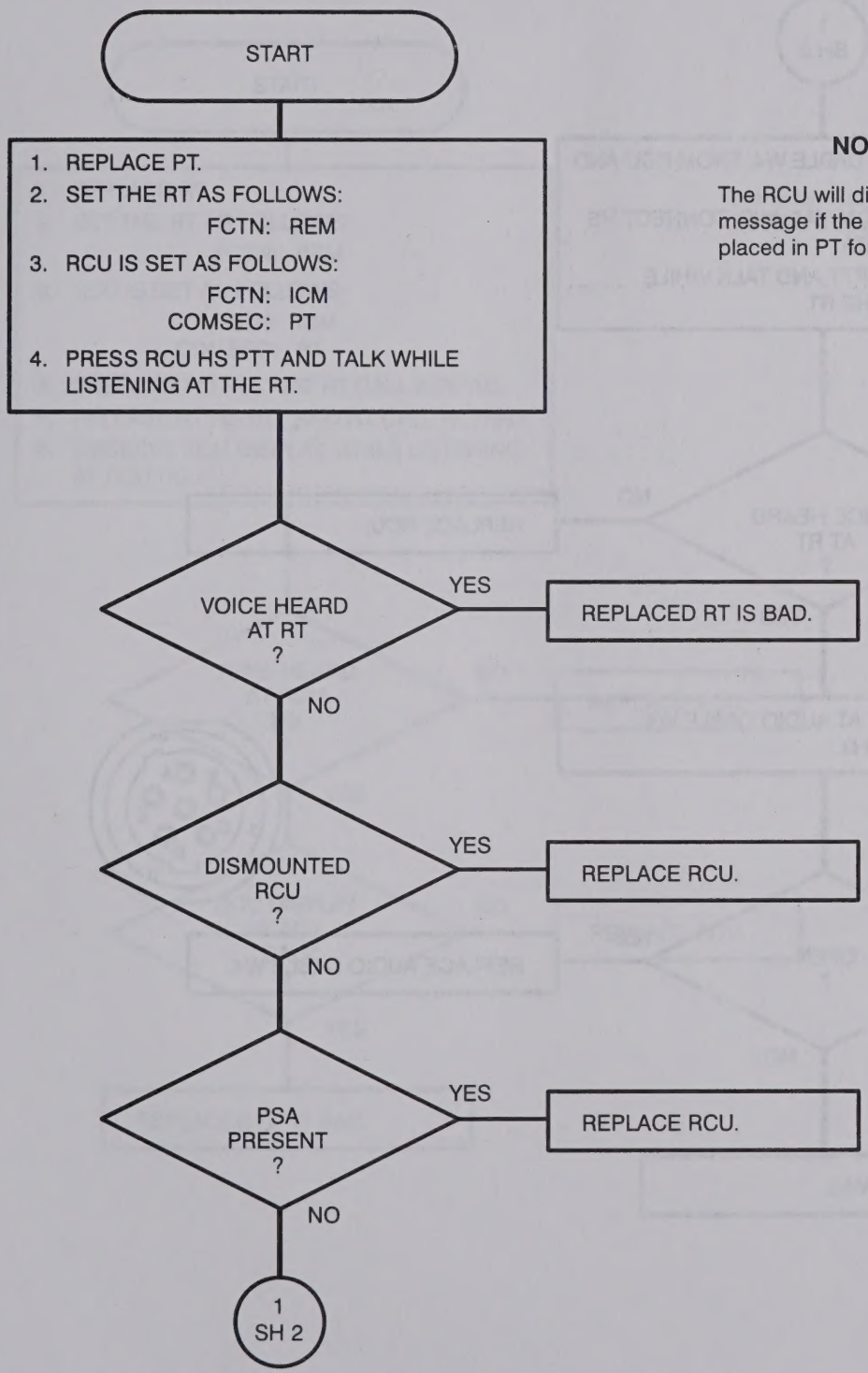


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4

NO INTERCOM TALK FUNCTION FROM RCU TO RT.

(Sheet 1 of 2)



NOTE:

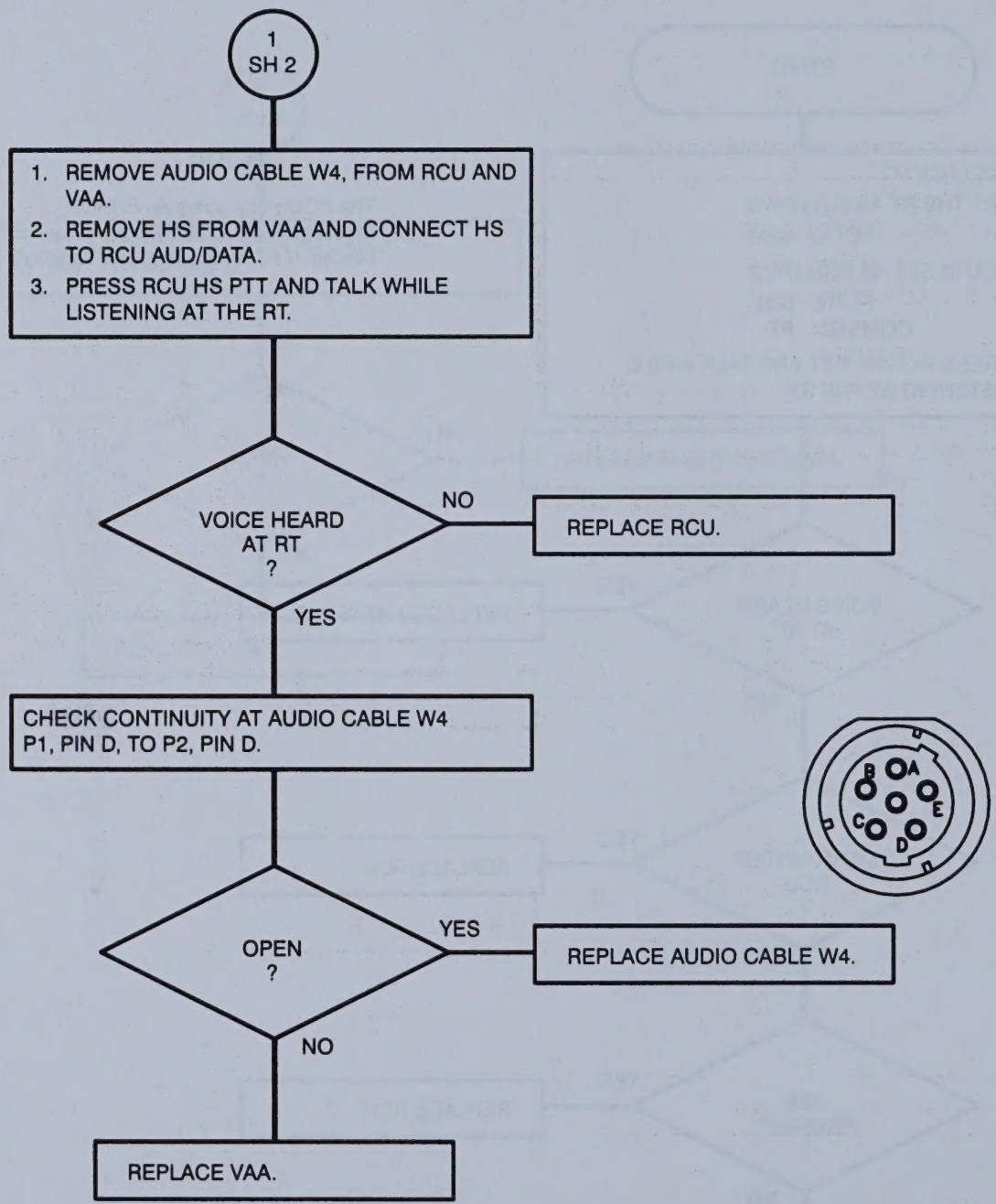
The RCU will display an ERROR message if the COMSEC switch is not placed in PT for the intercom function.

4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4

NO INTERCOM TALK FUNCTION FROM RCU TO RT.

(Sheet 2 of 2)

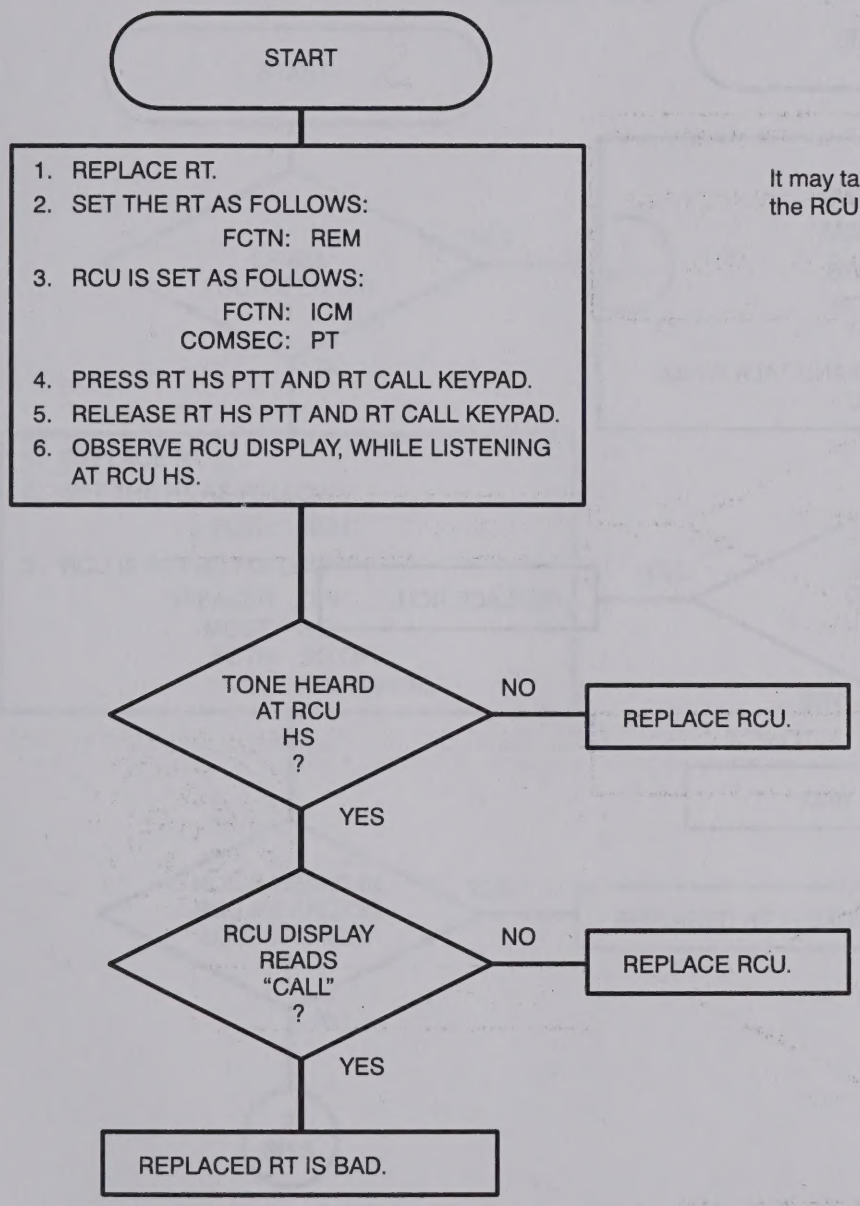


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

NO CALL FUNCTION AT THE RT.

(Sheet 1 of 1)



NOTE:

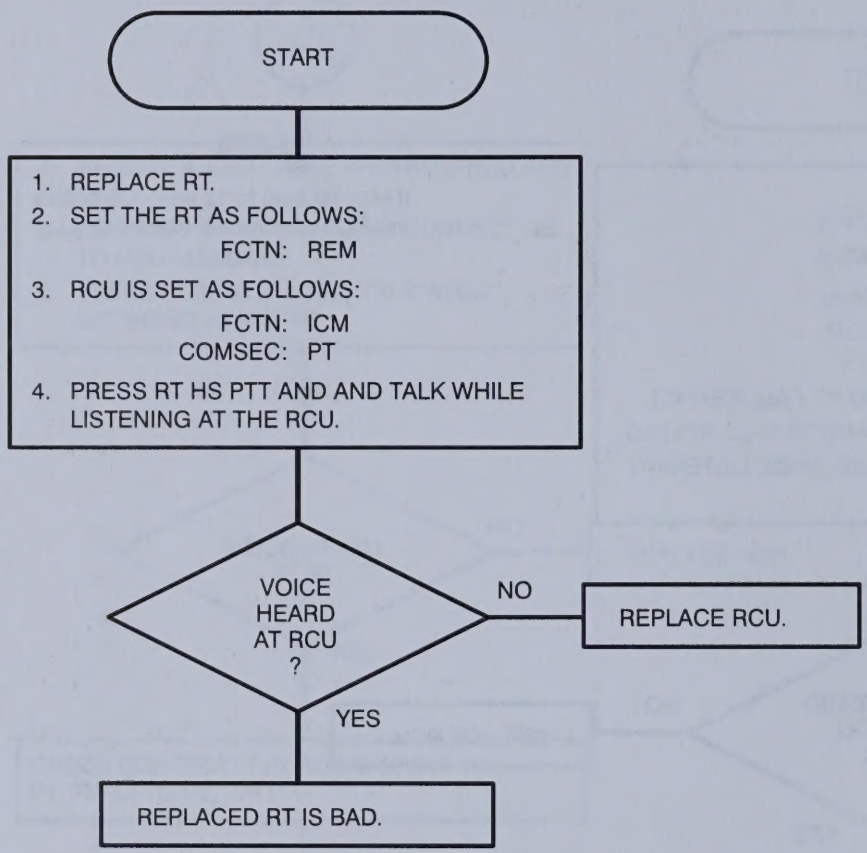
It may take up to 12 seconds before the RCU display will display CALL.

4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

NO INTERCOM TALK FUNCTION FROM RT TO RCU.

(Sheet 1 of 1)

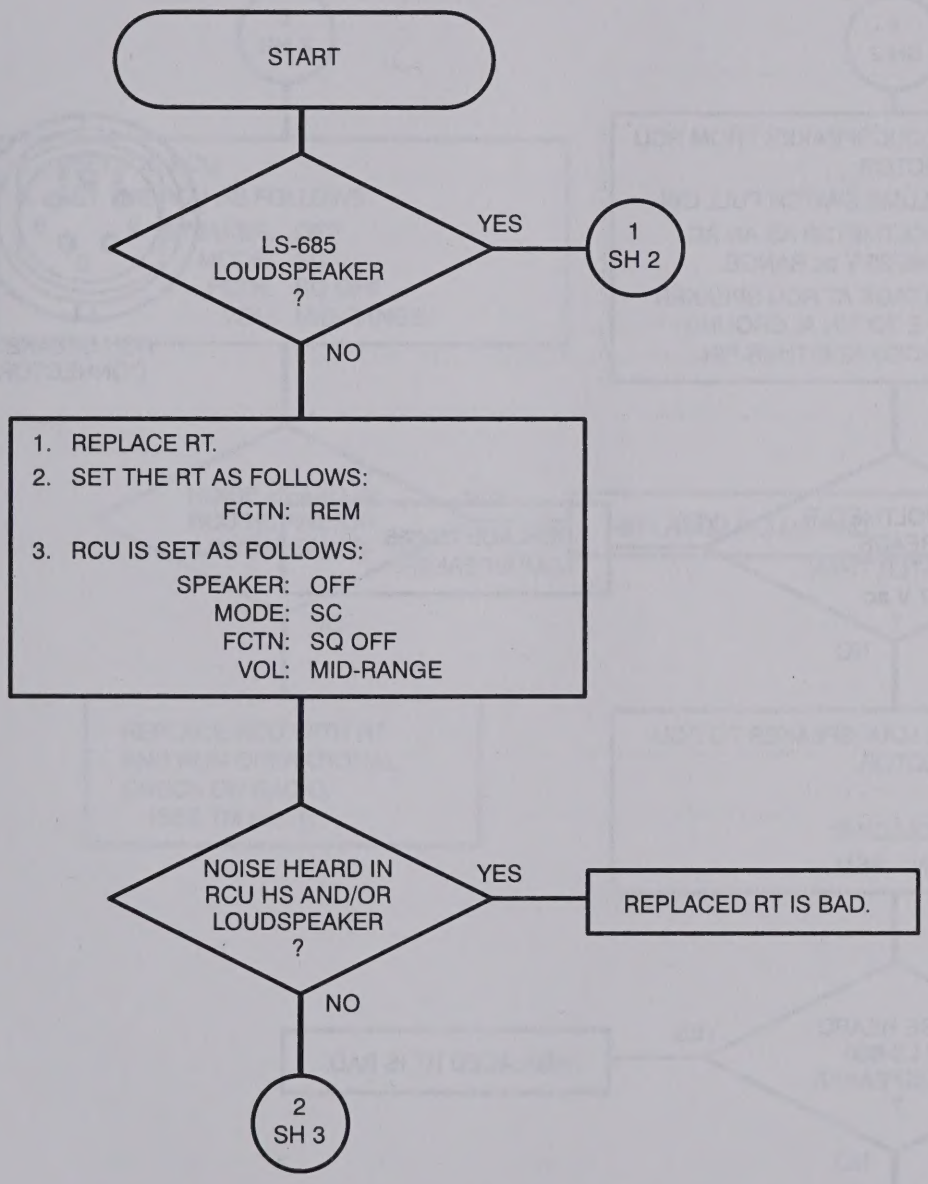


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RCU IS PLACED IN "SQ OFF".

(Sheet 1 of 3)

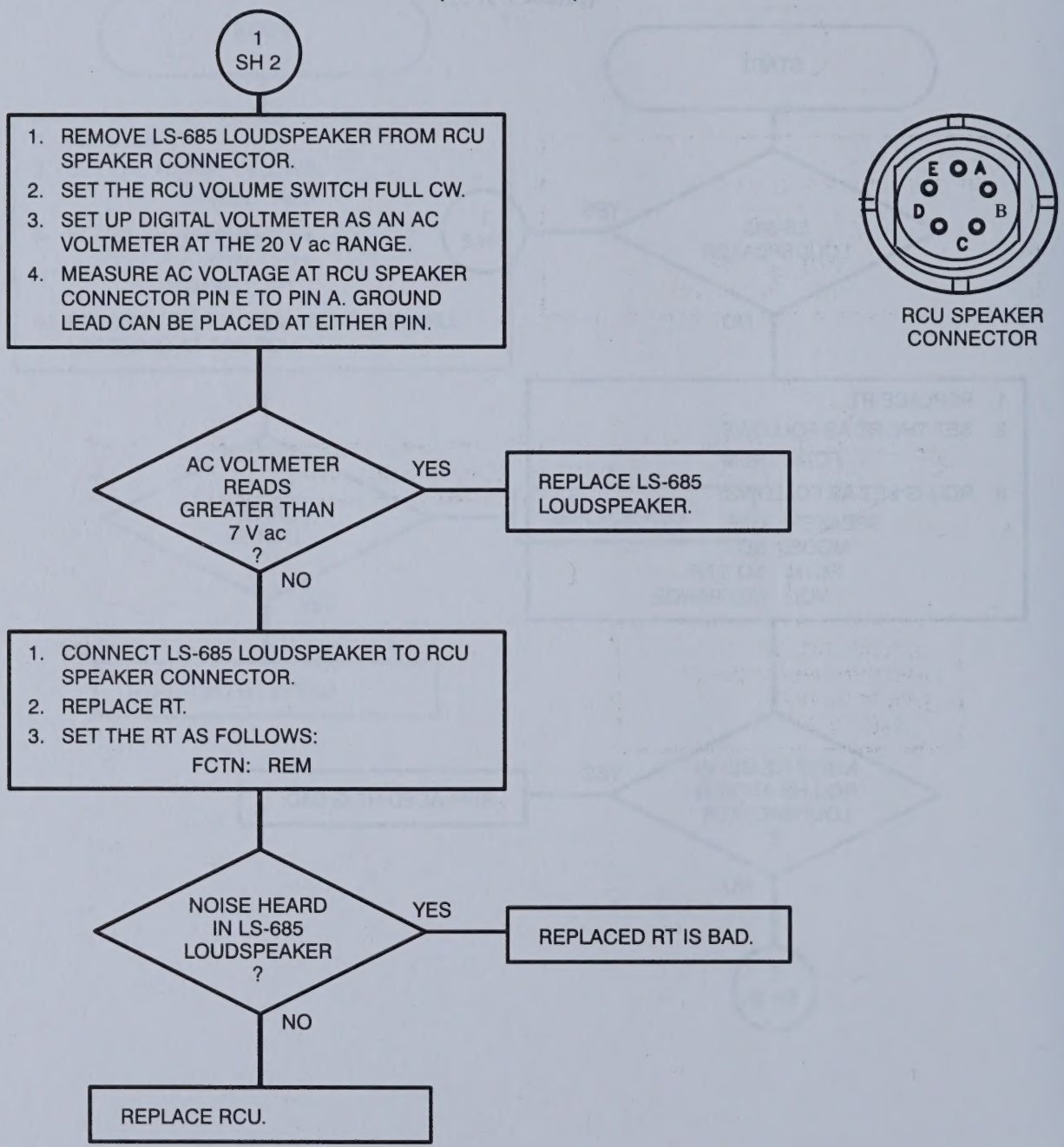


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RCU IS PLACED IN "SQ OFF".

(Sheet 2 of 3)

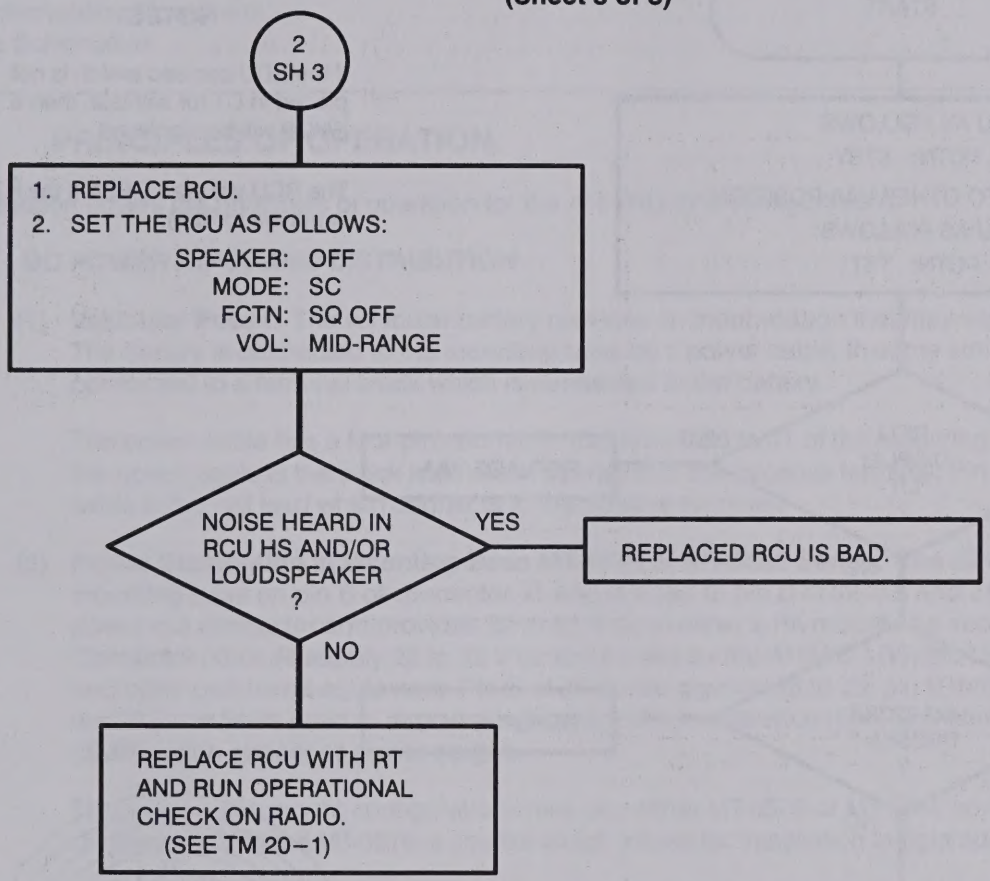


4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RCU IS PLACED IN "SQ OFF".

(Sheet 3 of 3)



4.2. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8

RCU DISPLAY DOES NOT LIGHT (VAA OR PSA DS1 LIT).

(Sheet 1 of 1)

START

1. SET THE RCU AS FOLLOWS:
   FCTN: STBY
2. MOVE RCU TO OTHER VAA POSITION.
3. SET THE RCU AS FOLLOWS:
   FCTN: TST

RCU DISPLAY LIT ?

YES → REPLACE VAA.

NO

AM-7239B PRESENT ?

YES → REPLACE RCU.

NO

1. REMOVE RCU FROM THE VAA.
2. MEASURE VOLTAGE AT VAA J7, PIN F TO PIN Z (GND).

12.5 TO 13.5 V dc ?

YES → REPLACE RCU.

NO

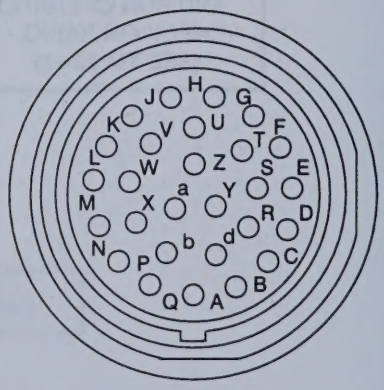
REPLACE AM-7239/A.

NOTES

:

If the RCU comsec switch is not placed in CT for self-test, then a FAIL 9 will be displayed.

The RCU will read OPEN if the RT is not set to REM.



VAA J8/J7

CHAPTER 5

SINGLE RADIO MOUNT (SRM)

Subject	Para	Page
Principles of Operation	5.1	5-1
Operational Check	5.2	5-4
Troubleshooting Flowcharts	5.3	5-10
Cable Schematics	5.4	5-49

5.1. PRINCIPLES OF OPERATION.

This section covers the principles of operation for the AN/VRC-87C configurations.

a. DC POWER INPUT AND DISTRIBUTION.

(1) **Vehicular Power.** The vehicular battery provides an input voltage that may vary from 22 to 32 V dc. The battery is connected to the mounting base by a power cable. In some vehicles, the cable is connected to a terminal block which is connected to the battery.

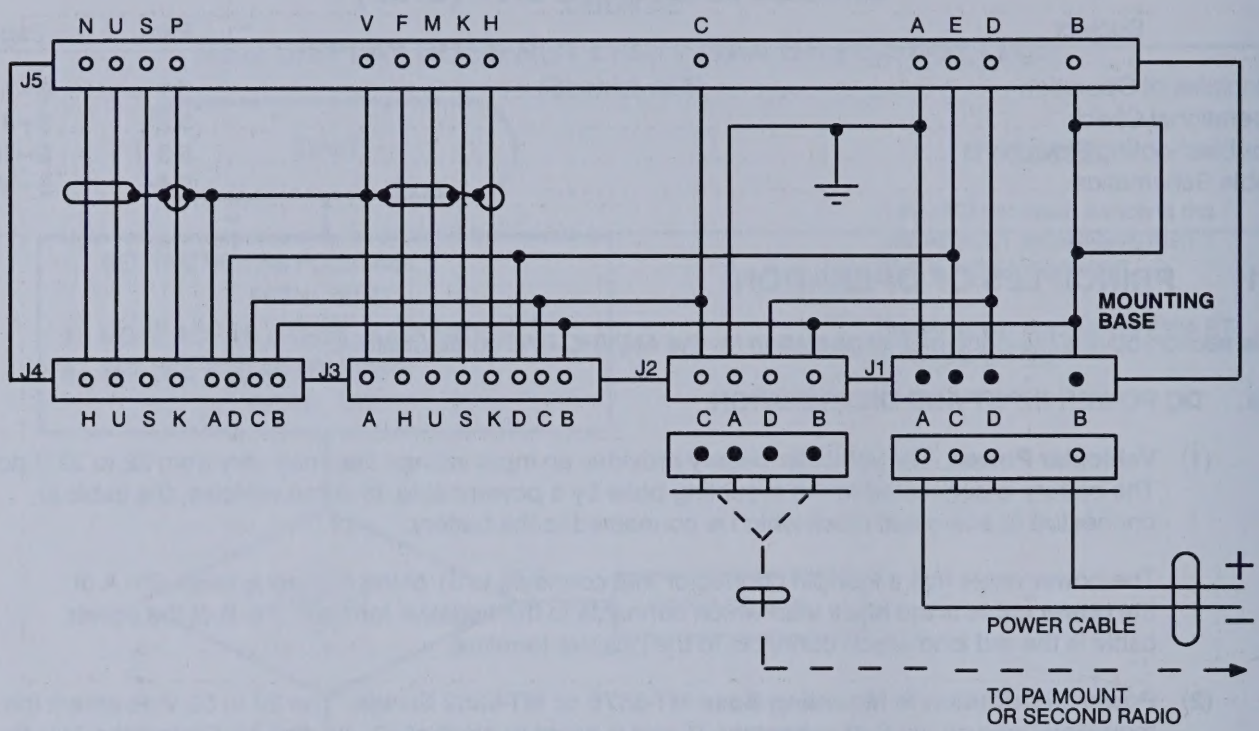
The power cable has a four-pin connector that connects to J1 of the mounting base. Pin A of the power cable is the black lead which connects to the negative terminal. Pin B of the power cable is the red lead which connects to the positive terminal.

(2) **Power Distribution in Mounting Base MT-6576 or MT-6352 Series.** The 22 to 32 V dc enters the mounting base on pin B of connector J1 and is wired to pin B of J2, J3, and J4. Connector J2 is the power out connector and provides 22 to 32 V dc to either a PA mount or a second mounting base. Connector J3 or J4 supply 22 to 32 V dc to be used by the AN/VIC-1(V), the LS-671 loudspeaker, and other peripheral equipment. Pin B of J1 is also connected to J5, pin B through FL1 and FL2. FL1 and FL2 are filters used to remove electromagnetic interference (EMI) and electromagnetic pulse (EMP) which appear as power surges.

The single radio mount configurations may use either MT-6576 or MT-6352 series. The only difference is that the MT-6576 is smaller which allows for installation in tight spaces.

(3) **Power Distribution in Power Supply Adapter MX-10862.** The 22 to 32 V dc from J5, pin B of the mounting base enters the power supply adapter through P1, pin B. Power supply adapter P1, pin B is connected to CB1, which provides over-current protection for the A1 module in the power supply adapter. CR1 is a reverse polarity diode in case the battery voltage is applied incorrectly. A switch S1 is provided to place the power supply adapter in local or remote mode. In local mode the voltage present at P1, pin B, energizes relay K1. In remote mode, the voltage sent from a AN/VIC-1(V) or LS-671 loudspeaker to P1, pin E, energizes relay K1.

5.1. THEORY OF OPERATION. Continued



(4) Power Supply Module. The filtered 22 to 32 V dc is applied to power supply A1. This power supply is a dc-to-dc converter which takes the 22 to 32 V dc and produces the following voltages:

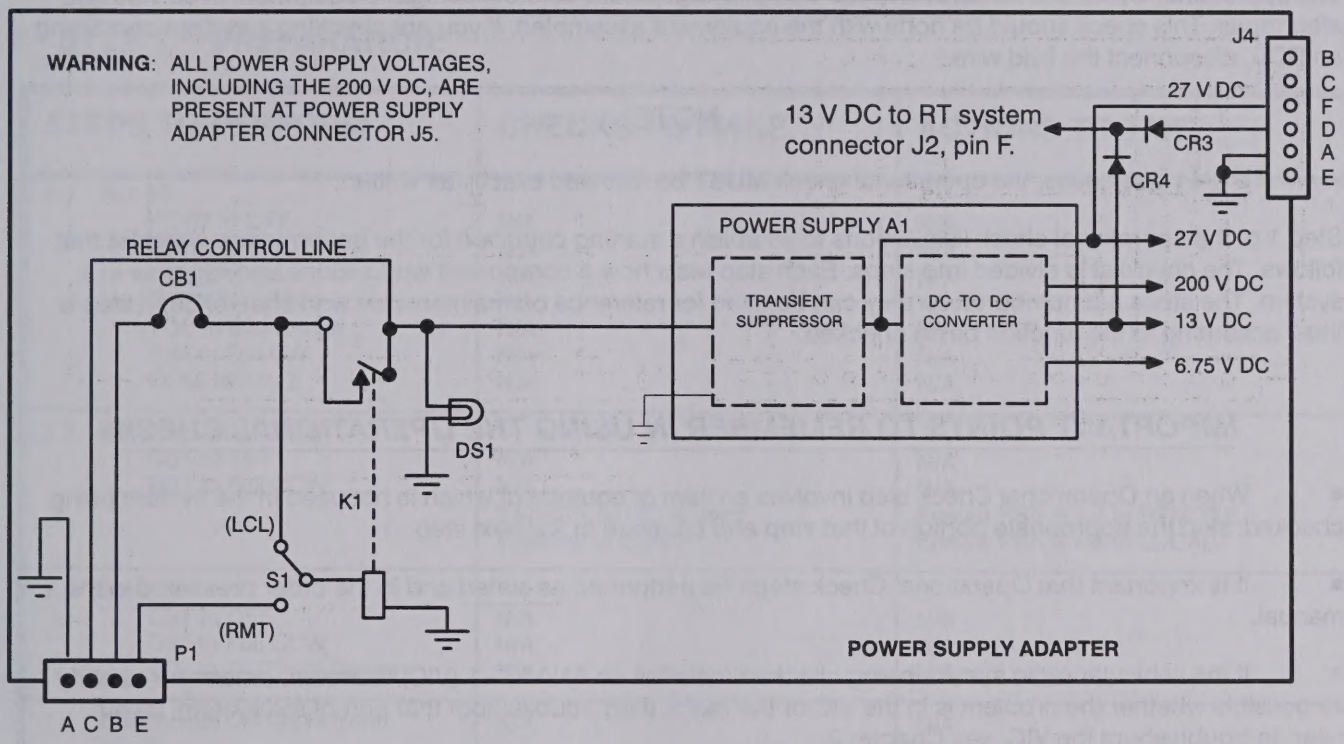
6.5 to 7.25 V dc
12.6 to 13.4 V dc
180.0 to 220.0 V dc

Input voltages less than 22 V dc will not harm the equipment. Voltages in excess of 35 V dc are shunted to ground by the transient suppressor. All power supply output voltages (except the 27 V dc line) can withstand a short circuit up to 10 seconds. Prolonged short circuits (greater than 10 seconds) may damage the power supply. These voltages are used by RT, RCU, control-monitor, and battery tray.

All power supply voltages are present at power supply adapter connector J5. The CX-13291 cable connects at J5 to a power amplifier mount, however the voltage lines are disconnected. The power amplifier mount contains a power supply and does not need these voltages.

5.1. THEORY OF OPERATION. Continued

MX-10862/VRC Power Distribution



(5) Power Distribution in Battery Tray CY-8664 (Refer to PDD8). The CX-13290 cable is used to connect power supply adapter connector J4 to battery tray connector J1. The 22 to 32 V dc present at power supply adapter connector J4, pin F, is sent through the cable to battery tray connector J1, pin F. This voltage energizes battery tray relay K1 to the closed position. K1 will remain energized from 2 to 32 V dc. The battery box is connected to battery tray connector P1, to provide the 13 V dc to the RT. The 13 V dc exits battery tray J1, pin E, through the cable to power supply adapter connector J4, pin D. Pins E and A are ground at power supply adapter connector J4. Pins D and A are ground at battery tray connector J1.

A test switch is provided on the battery tray to test the battery voltage . If the test switch is pressed and the battery is good, then DS1 lights. If the test switch is pressed and the battery is bad, then DS1 does not light.

5.2. OPERATIONAL CHECK.

The operational check is a series of steps to evaluate equipment before placing the equipment in service and after repair. This check should be done with the equipment assembled. If you are checking a system containing an RCU, disconnect the field wire.

NOTE

To get valid results, the operational check **MUST** be followed exactly as written.

Step 1 of the operational check lists actions to establish a starting condition for the performance checklist that follows. The checklist is divided into steps. Each step tests how a component works alone and together in a system. The steps are numbered so they can be used for reference on maintenance worksheets. Each step is titled according to the function being checked.

IMPORTANT POINTS TO REMEMBER IN USING THE OPERATIONAL CHECK

- When an Operational Check step involves an item of equipment which is not used in the system being checked, skip the appropriate portion of that step and continue to the next step.

- It is important that Operational Check steps be performed as stated and in the order presented in the manual.

- If the vehicular radio system being checked includes an AN/VIC-1 (VIC) intercom, determine as early as possible whether the problem is in the VIC or the radio; then troubleshoot that part of the system. If you need to troubleshoot the VIC, see Chapter 2.

- Once you have completed the Operational Check, and the problem appears to be solved, make a communications check (unless prohibited by unit SOP or the tactical situation) and repeat the Operational Check to ensure the system is completely operational.

5.2. OPERATIONAL CHECK. Continued

OPERATIONAL CHECK FOR SRM

STEP 1. PREPARATION:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.1 Set RT:		
FCTN to OFF	N/A	N/A
CHAN to 1	N/A	N/A
MODE to SC	N/A	N/A
RF PWR to HI	N/A	N/A
VOL to Mid-Range	N/A	N/A
DIM to Full CW	N/A	N/A
COMSEC to Z	N/A	N/A
1.2 Set PSA: (MX-10862)		
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
	If LS-671 or VIC is used:	Ensure PSA is set to REMOTE.
	If neither is used:	Ensure PSA is set to LOCAL.
1.3 Set LS-671:		
CB1 to OFF	N/A	N/A
DS1 to Full CCW	N/A	N/A
VOL to OUT/Mid-Range	N/A	N/A
1.4 Disconnect CX-13314 from RT J4.	N/A	N/A
1.5 Handset (HS), H-250: Connect to RT AUD/DATA J4	Ensure that HS used is operational	Install a known good HS

5.2. OPERATIONAL CHECK. Continued

STEP 2. POWER CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.1 Set PSA CB1 to ON Set LS-671 CB1 ON	PSA CB1 trips?	NO: Continue ↓ YES: Go to TS Chart 1
	PSA DS1 lights?	YES: Continue ↓ NO: Go to TS Chart 2
	LS-671 CB1 trips?	NO: Continue ↓ YES: Replace LS-671
	LS-671 DS1 lights?	YES: Go to Step 2.2 NO: Go to TS Chart 3
2.2 Set RT FCTN to Z-FH	RT display lights?	YES: Go to Step 3 NO: Go to TS Chart 4
	RT display reads GOOD?	YES: Continue ↓ NO: Replace RT if it reads other than GOOD
	RT HUB lit?	NO: Go to Step 3 YES: Replace HUB
	RT HUB still lit?	NO: Go to Step 3 YES: Replace RT
2.3 On Battery Tray: Press S1 switch (TEST) "IN"	Battery Tray DS1 lights?	YES: Go to STEP 3 NO: Go to TS Chart 5

5.2. OPERATIONAL CHECK. Continued

STEP 3. RT SELF-TEST:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
3.1 Set RT COMSEC to CT Set RT FCTN to TST	RT passes self-test?	YES: Go to Step 3.3 NO: Disconnect cables/HS from RT; rerun self-test, go to Step 3.2
3.2 Connect CX-13314 to RT AUD/ DATA J4. Connect HS to RT AUD/ FILL J3	RT then passes self-test?	YES: Reconnect cables/HS; go to Step 3.3 NO: Replace RT
	Audio heard at HS or LS-671?	YES: Go to Step 3.3 NO: Go to TS Chart 6
3.3 Set FCTN to LD Set CHAN to MAN Set DATA to OFF	RT display reads 30000?	YES: Continue ↓ NO: Replace RT
	COMSEC alarm heard at HS/loudspeaker?	YES: Go to Step 3.4 NO: Replace RT
3.4 Press PTT twice	COMSEC alarm clears? STEADY TONE MUST BE HEARD **	YES: Go to STEP 4 NO: If no external devices, replace RT NO: If using external devices, go to TS Chart 7

STEP 4. LOAD CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
4.1 Load RT with SC frequencies: Chan 1: 41000 Chan 2: 54000 Chan 3: 75000	SC frequencies load properly?	YES: Go to Step 4.2 NO: Replace RT
4.2 Set RT MODE to FH Load COMSEC and FH data in RT*	RT accepts fill?	YES: Go to Step 4.3 NO: Go to TS Chart 8
4.3 Load test sync time (82/09:36)	Test sync time loads properly?	YES: Go to Step 4.4 NO: Replace RT.
4.4 Set RT to STBY	RT shuts down properly?	YES: Go to Step 4.5 NO: Replace RT
4.5 Set CB1 to OFF Wait 1 min. Set CB1 to ON Set FCTN to SQ ON	N/A N/A RT retains COMSEC, FH, and SC data in both FH and SC modes?	N/A N/A YES: Go to STEP 5 NO: Replace RT

* NOTE: If using an Automated Net Control Device (ANCD), follow ICOM Fill procedure to load COMSEC keys and FH data in all 6 channels. Otherwise, load COMSEC keys and FH data in Channels 1, 2, and 3.

** If RT-1523C is present go to step 4. RT does not transmit a beeping tone and will have a steady tone at power up.

5.2. OPERATIONAL CHECK. Continued

STEP 5. TRANSMITTER CHECKS:*

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
5.1 Disconnect RF cable from RT ANT Connect test set cable from test set RADIO to RT ANT. Connect vehicular antenna cable to test set ANT Set test set MODE to FWD PWR Set RT: CHAN to 1 MODE to SC	N/A N/A N/A N/A N/A N/A	N/A N/A N/A N/A N/A N/A
5.2 Press PTT and test set Push-To-Test	Test set reads 2W or greater.	YES: Go to Step 5.3 NO: Go to TS Chart 9
5.3 Set test set MODE to RVS PWR Press PTT and test set Push-To-Test	N/A Test set reads no more than 1/3** of FWD PWR?	N/A YES: Go to Step 5.4 NO: Go to TS Chart 9
5.4 Press PTT	RT SIG display reads 4 or more?	YES: Go to Step 5.5 NO: Replace RT
5.5 Set RT CHAN to 2 Repeat FWD and RVS PWR check for CHAN 2	N/A Test set reads no more than 1/3** of FWD PWR?	N/A YES: Go to Step 5.6 NO: Go to TS Chart 9
5.6 Set RT CHAN to 3 Repeat FWD and RVS PWR check for CHAN 3	N/A Test set reads no more than 1/3** of FWD PWR?	N/A YES: Go to Step 5.7 NO: Go to TS Chart 9
5.7 Set RT to CHAN 1 Press PTT, count into HS	N/A Sidetone heard?	N/A YES: Go to Step 5.8 NO: Got to TS Chart 10
5.8 Set test set MODE to FREQ Press PTT and test set Push-To-Test	N/A Test set reads 40998 to 41002?	N/A YES: Go to Step 5.9 NO: Replace RT
5.9 Set RT CHAN to 2 Press PTT and test set Push-To-Test	N/A Test set reads 53998 to 54002?	N/A YES: Go to Step 5.10 NO: Replace RT
5.10 Set RT CHAN to 3 Press PTT and test set Push-To-Test	N/A Test set reads 74998 to 75002?	N/A YES: Go to Step 5.11 NO: Replace RT
5.11 Set RT FCTN to RXMT Connect HS to RT RXMT Listen at HS	N/A N/A Rushing noise heard at HS?	N/A N/A YES: Go to Step 5.12 NO: Replace RT
5.12 Press PTT	SIG display reads 4 or more?	YES: Go to STEP 6 NO: Replace RT

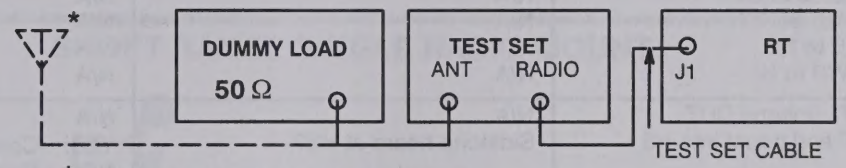
* If unit SOP or tactical situation prohibits transmitting, use dummy load realize that antenna cannot be checked.

** If radio is used for data transmission, use 1/4 rather than 1/3 for these checks

5.2. OPERATIONAL CHECK. Continued

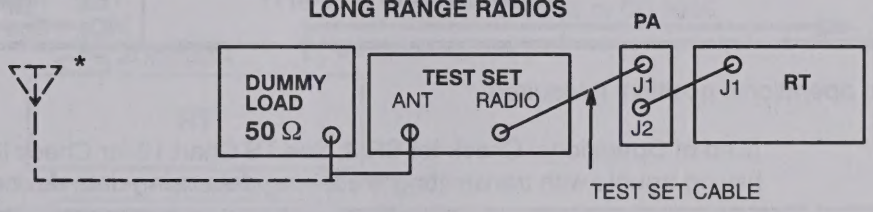
For testing RF in Sc mode, use the following test setup:

SHORT RANGE RADIOS



* INDICATES ANTENNA DISCONNECTED

LONG RANGE RADIOS



* INDICATES ANTENNA DISCONNECTED

STEP 6. RECEIVER CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
6.1 Disconnect vehicular antenna cable from test set ANT	N/A	N/A
Set test set MODE to SENS SQ	N/A	N/A
Set RT:		
COMSEC to PT	N/A	N/A
CHAN to 3	N/A	N/A
6.2 Press test set Push-To-Test	Test tone heard in HS?	YES: Go to Step 6.3 NO: Replace RT
6.3 Connect HS to RT AUD/FILL	N/A	N/A
Set RT FCTN to SQ ON	N/A	N/A
Press test set Push-To-Test	Test tone heard in HS?	YES: Go to STEP 7 NO: Replace RT

5.2. OPERATIONAL CHECK. Continued

STEP 7. LS-671 CHECKS:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
7.1 Connect HS to LS-671 J2	N/A	N/A
Push LS-671 Volume IN	N/A	N/A
Set RT:		
COMSEC to CT	N/A	N/A
FCTN to SQ ON	N/A	N/A
MODE to SC	N/A	N/A
RF PWR to HI	N/A	N/A
7.2 Pull LS-671 Volume OUT	N/A	N/A
Press PTT and count into HS	Sidetone heard at HS?	YES: Continue ↓ NO: Go to TS Chart 11
	Sidetone heard at LS-671?	YES: Replace LS-671 NO: End of Operational Check*

* Return HS to operational position, if required.

(End of Operational Check for SRM; See TS Chart 12 for Check if having trouble with transmitting / receiving data using data device..)

5.3. TROUBLESHOOTING FLOWCHARTS.

This paragraph provides the unit maintainer with a general use schematic (Short Range Single Radio Mount) plus 12 Troubleshooting Charts. The unit maintainer is directed to one or more specific Troubleshooting Chart from the Operational Check. Use of Troubleshooting Charts prior to application of the Operational Check, represents poor use of unit maintainer time, can result in false pulls, and is strongly discouraged.

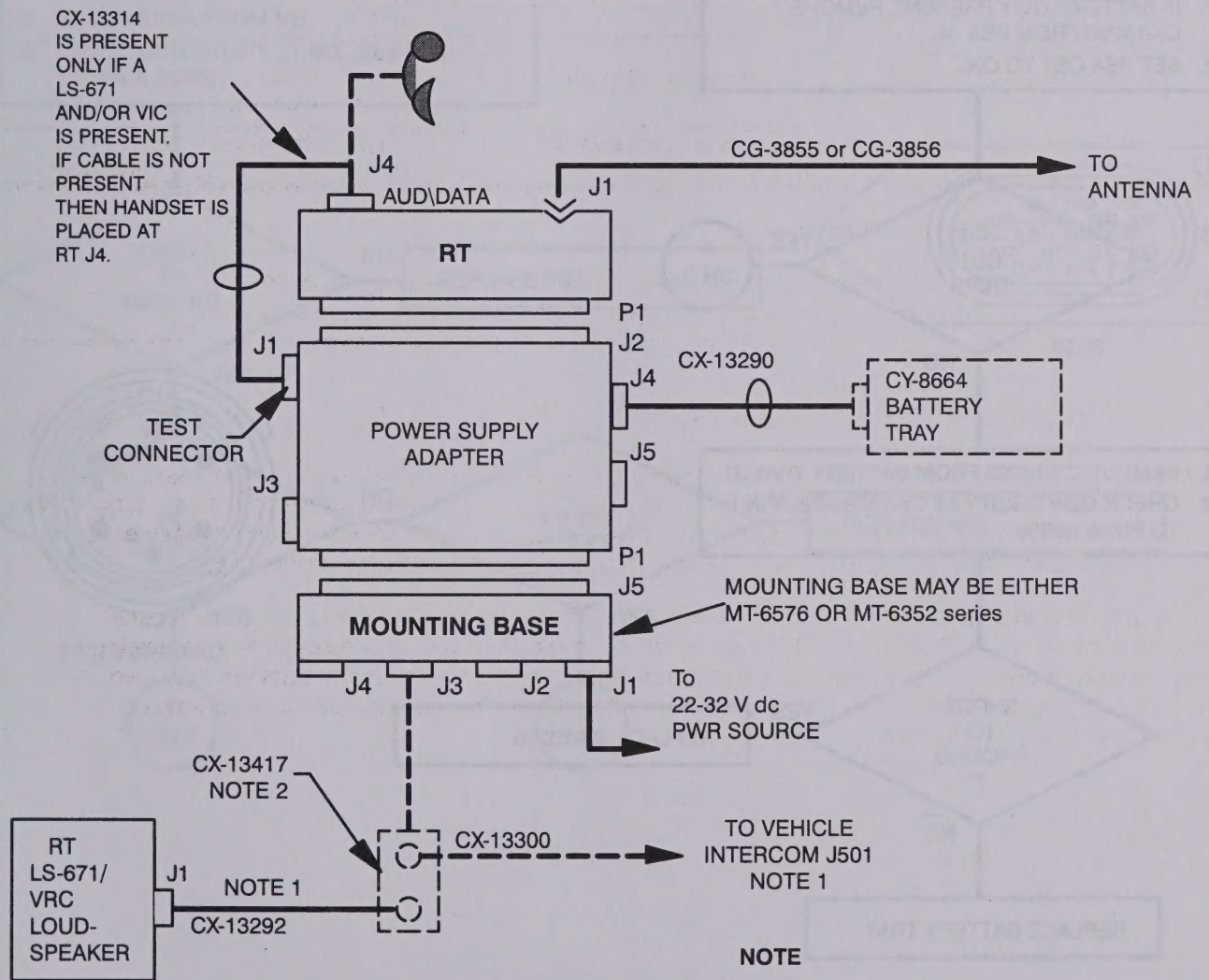
After application of the Operational Check and one or more Troubleshooting Charts, if required, the unit maintainer will perform the prescribed LRU replacement or repair. To ensure that the system is completely operational following such maintenance action, the unit maintainer again applies the complete Operational Check. If the system then passes all steps of the Operational Check, the system may be declared fully operational and returned to service.

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

NOTE

- The following troubleshooting flowcharts are used with short range radio single radio mount systems.
- If the communications system includes a vehicular intercom VIC, begin troubleshooting with chapter 2.

SHORT RANGE SINGLE RADIO MOUNT



NOTE

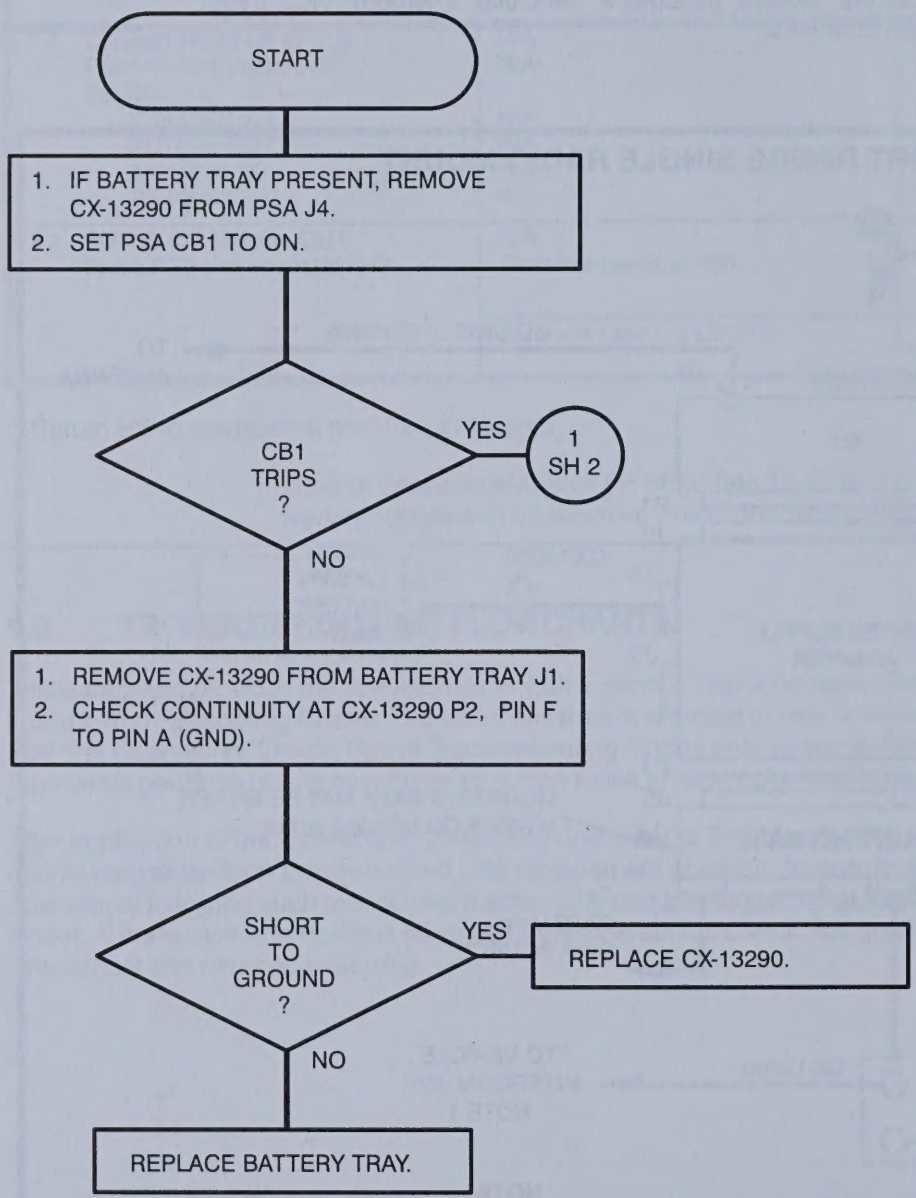
1. If the splitter cable (CX-13417) is not present, the loudspeaker cable (CX-13292) may be connected directly to J3 or the vehicle intercom may be connected to J3 via the VIC interface cable (CX-13313).
2. CX-13292 and CX-13300 may be connected to either mating connector of CX-13417.

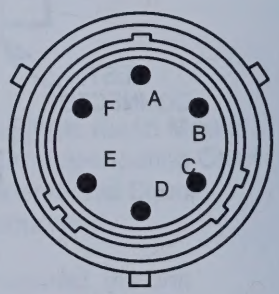
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

PSA CB1 TRIPS WHEN SET TO "ON".

(Sheet 1 of 4)





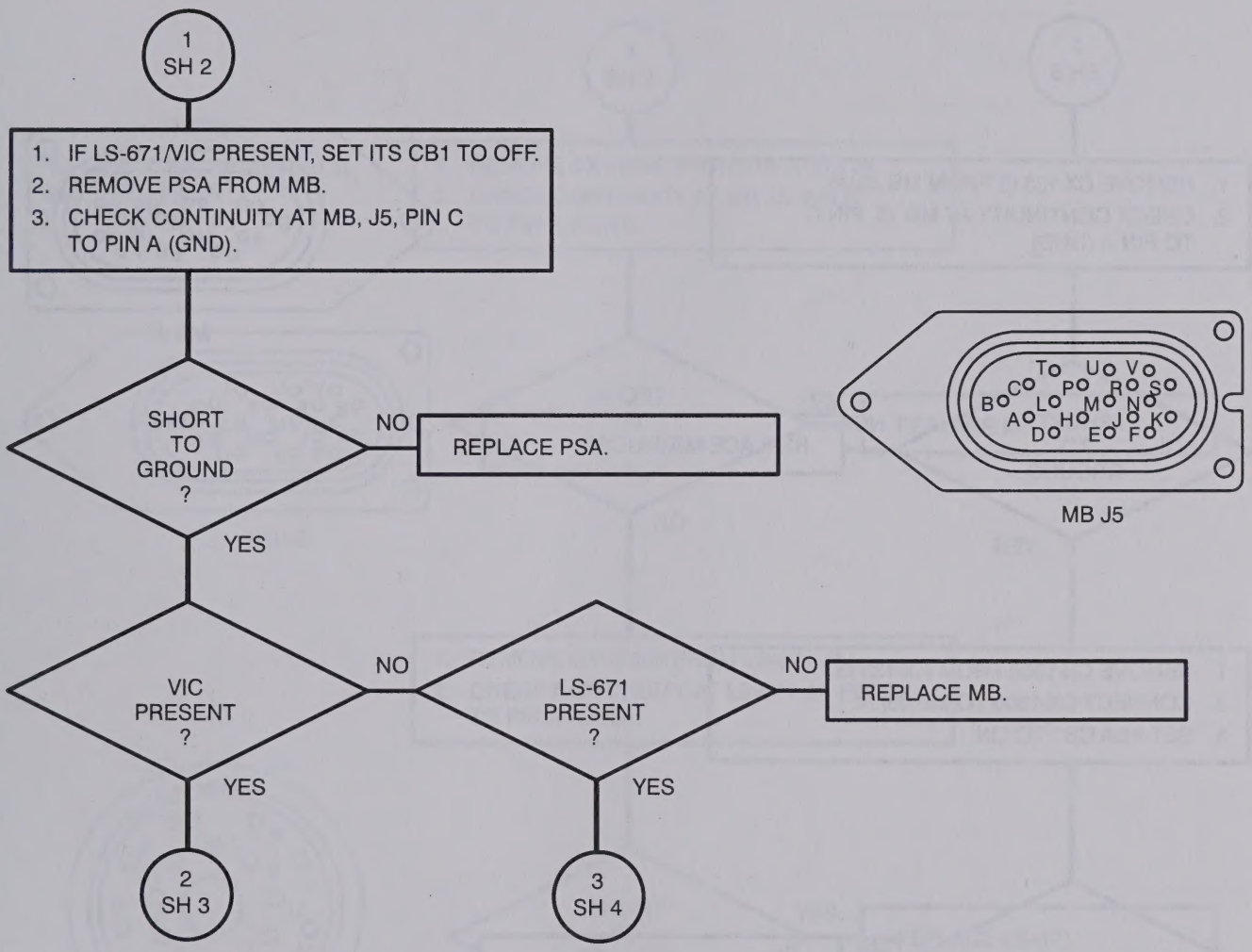
CX-13290 P1, P2

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

PSA CB1 TRIPS WHEN SET TO "ON".

(Sheet 2 of 4)

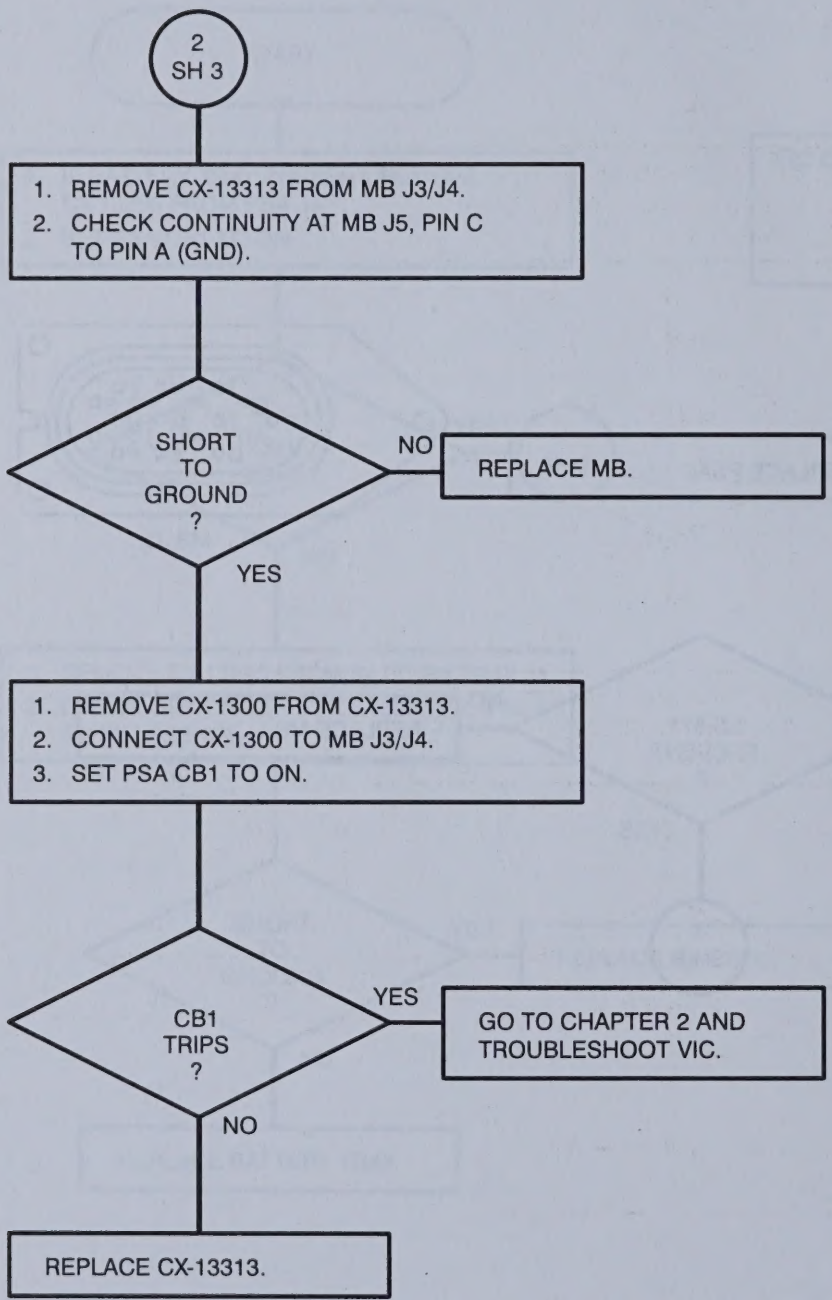


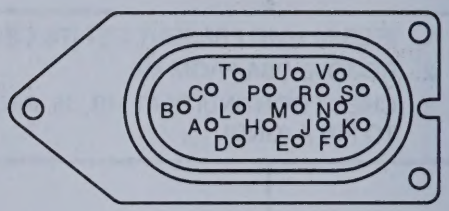
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

PSA CB1 TRIPS WHEN SET TO "ON".

(Sheet 3 of 4)





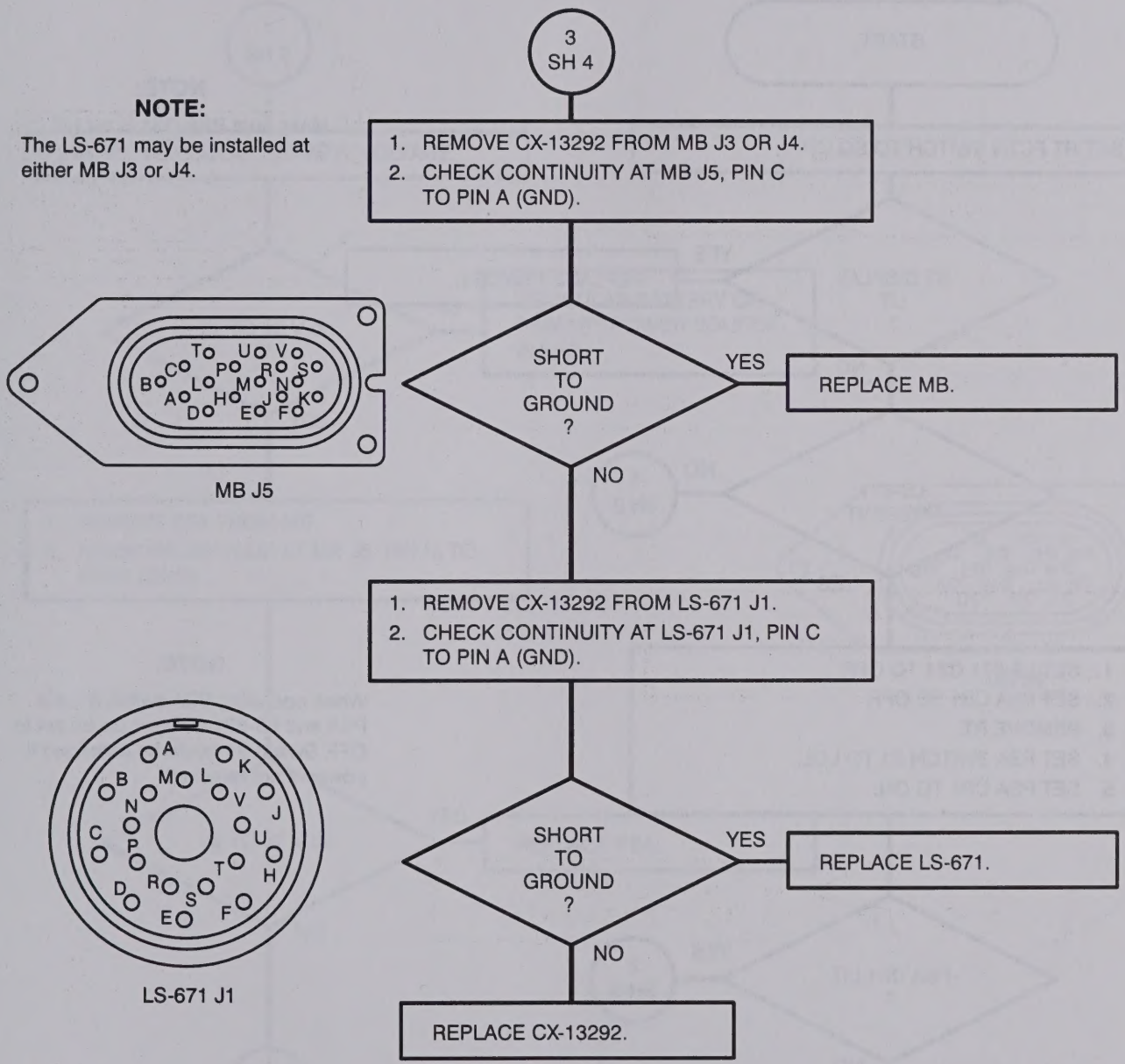
MB J5

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

PSA CB1 TRIPS WHEN SET TO "ON".

(Sheet 4 of 4)

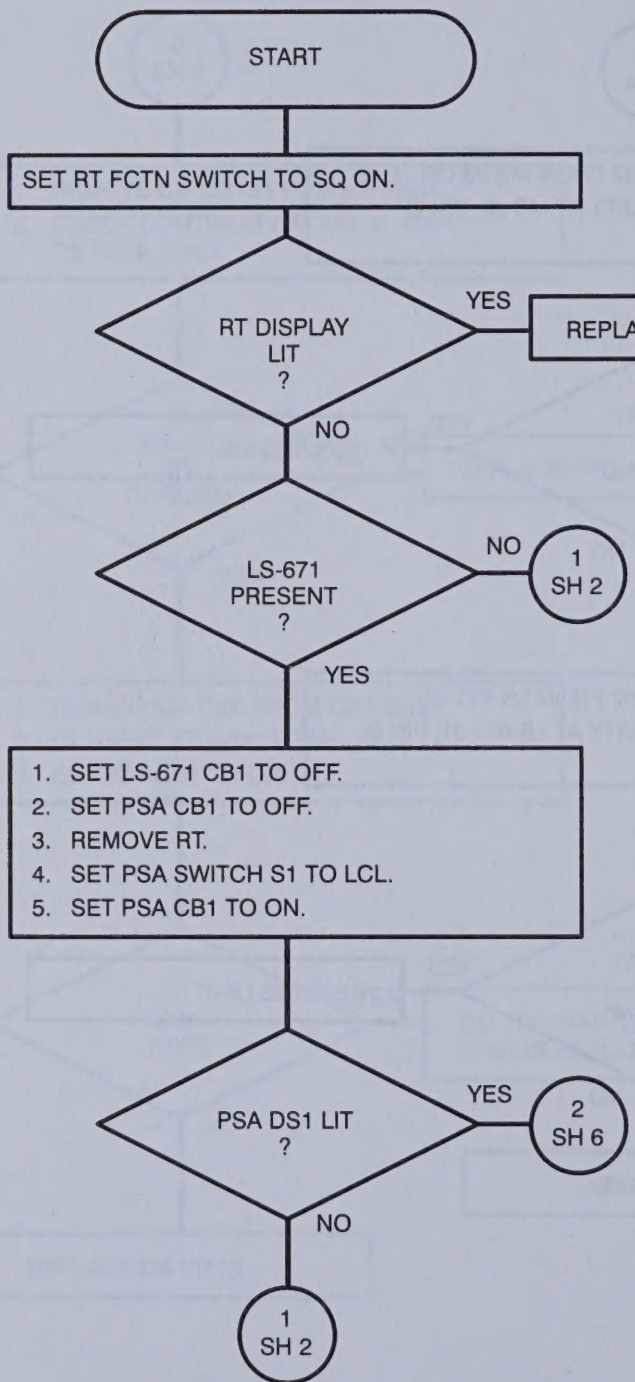


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 1 of 9)



NOTE:

Make sure PSA DS1 is set full CCW.

NOTE:

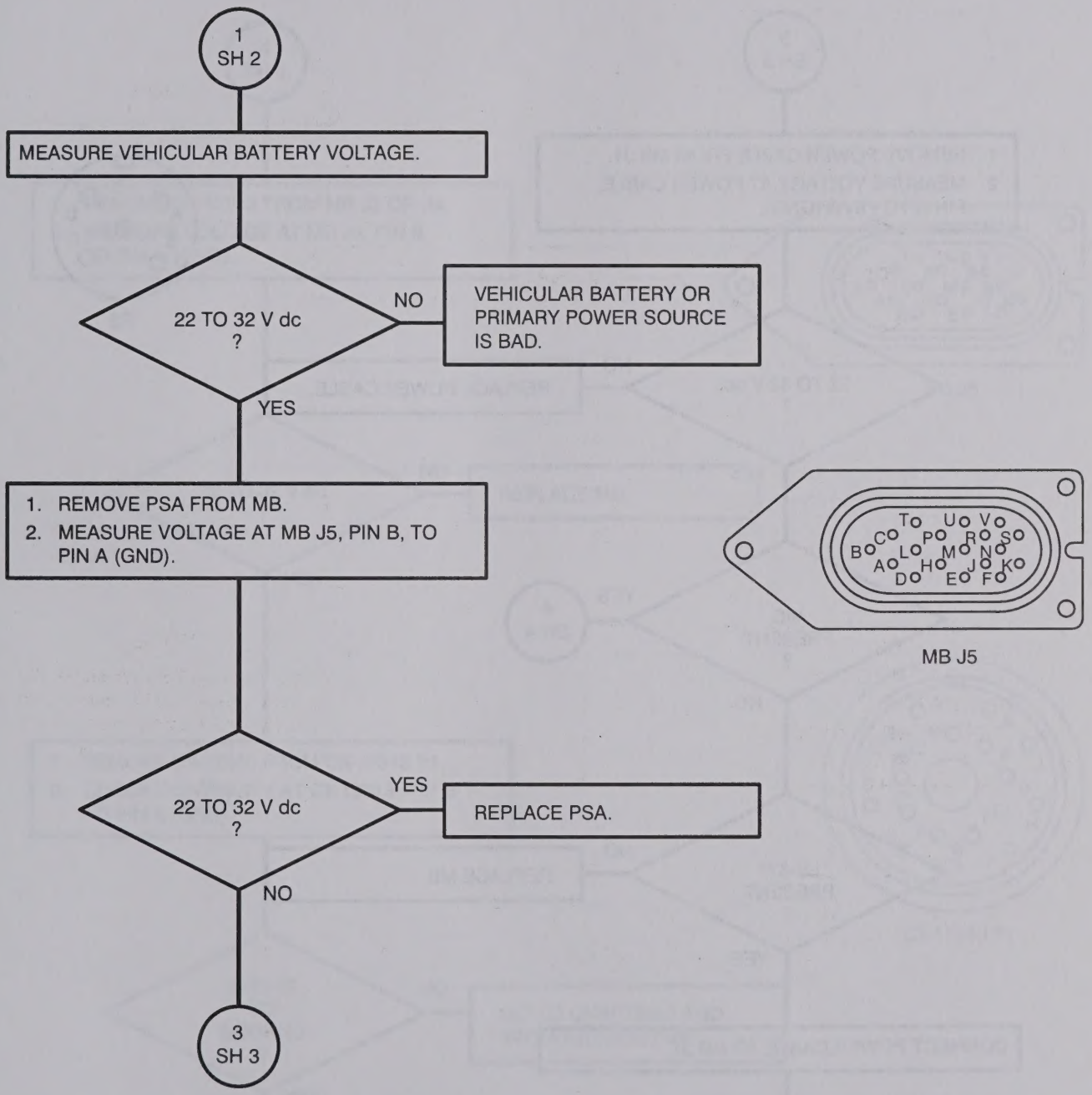
When operating PSA switch S1, the PSA and LS-671 CB1's must be set to OFF. Switch S1 could be damaged if power is not removed.

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 2 of 9)



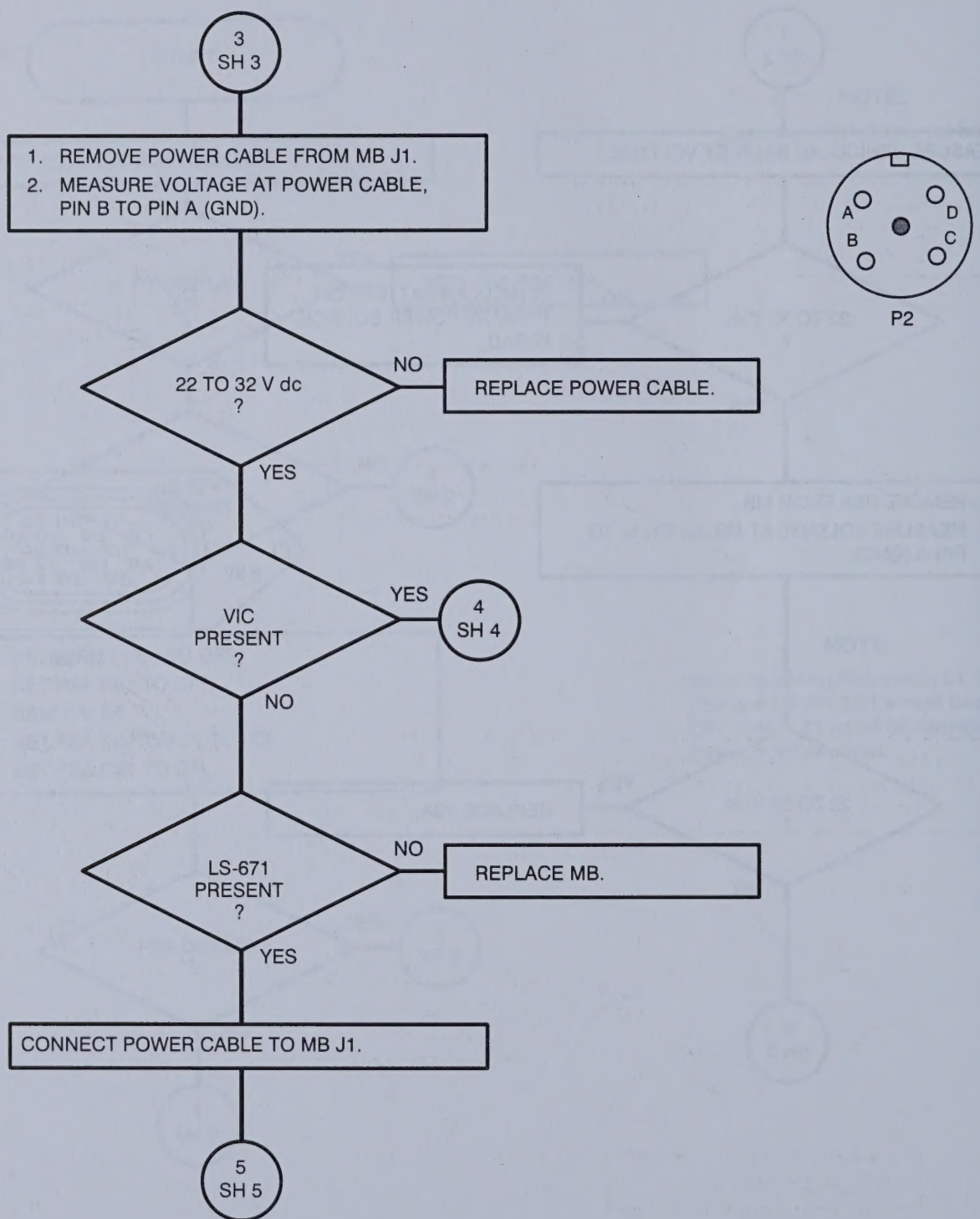
MB J5

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 3 of 9)

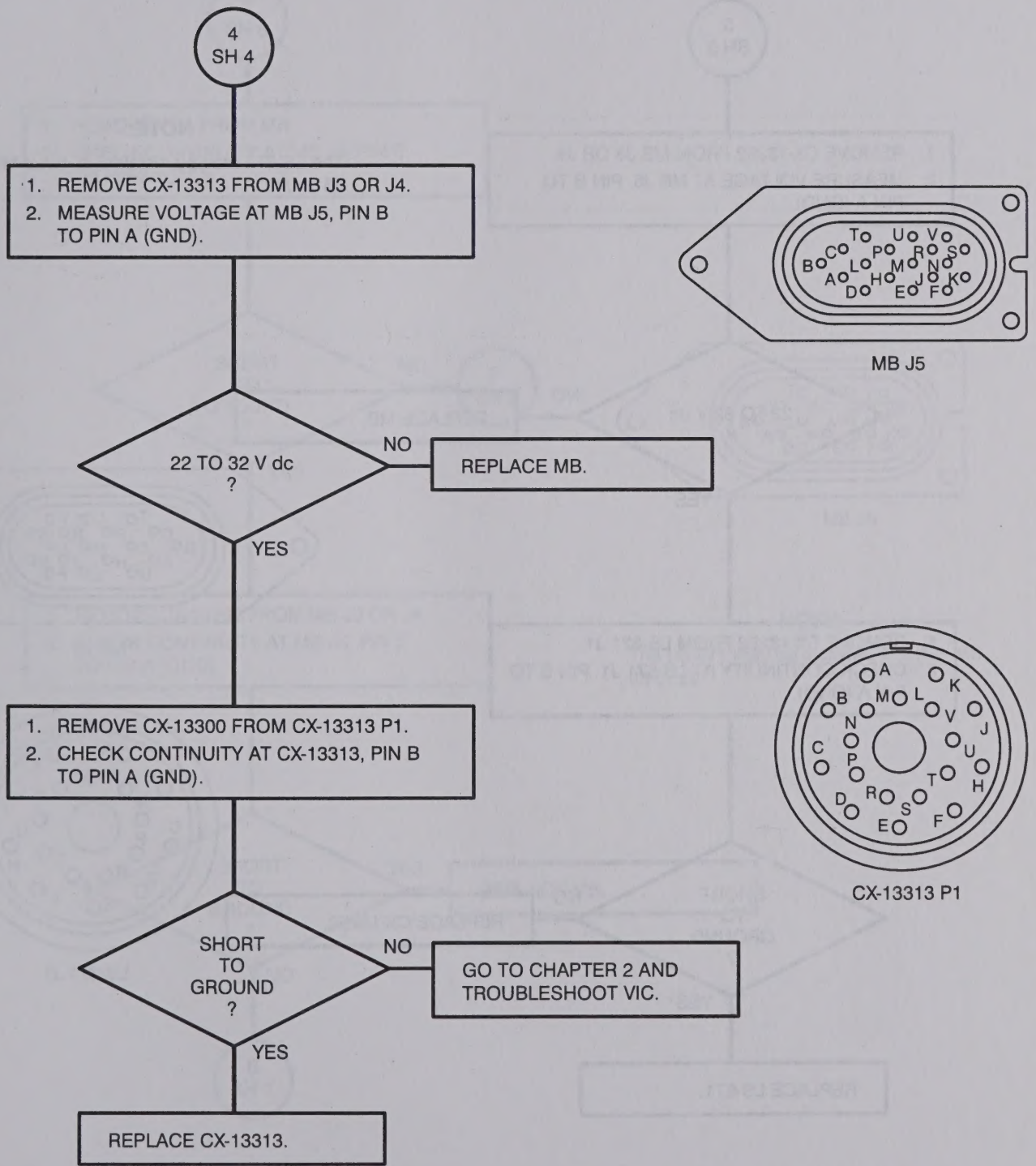


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 4 of 9)

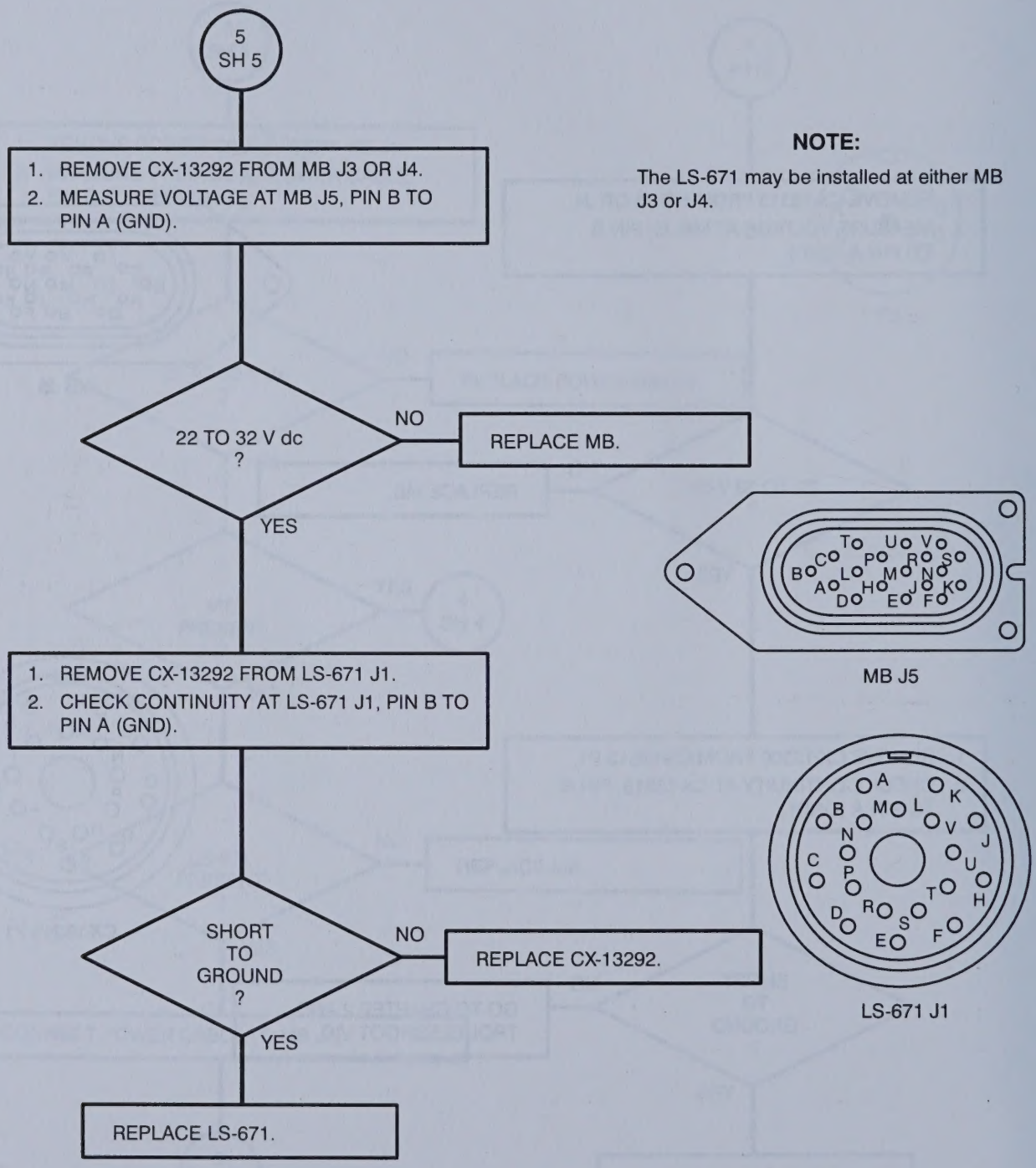


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 5 of 9)

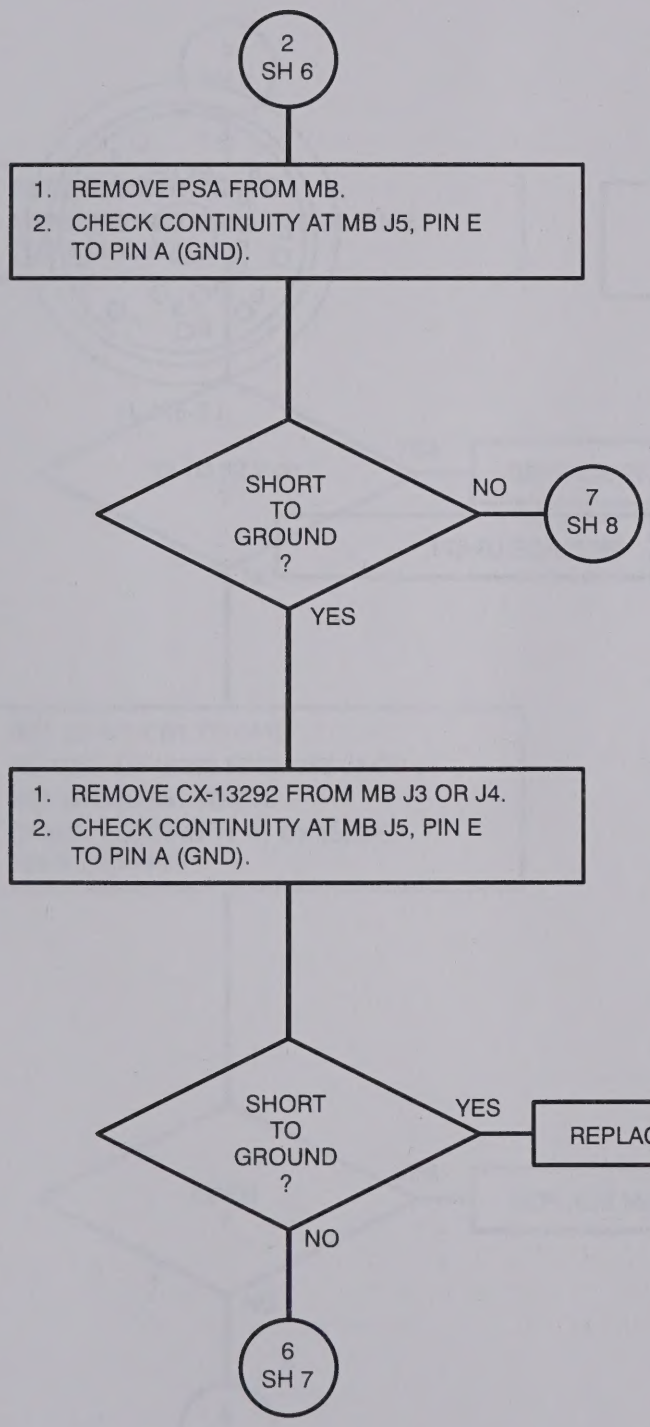


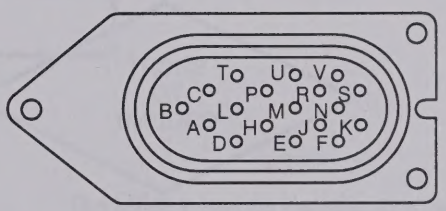
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 6 of 9)





MB J5

NOTE:

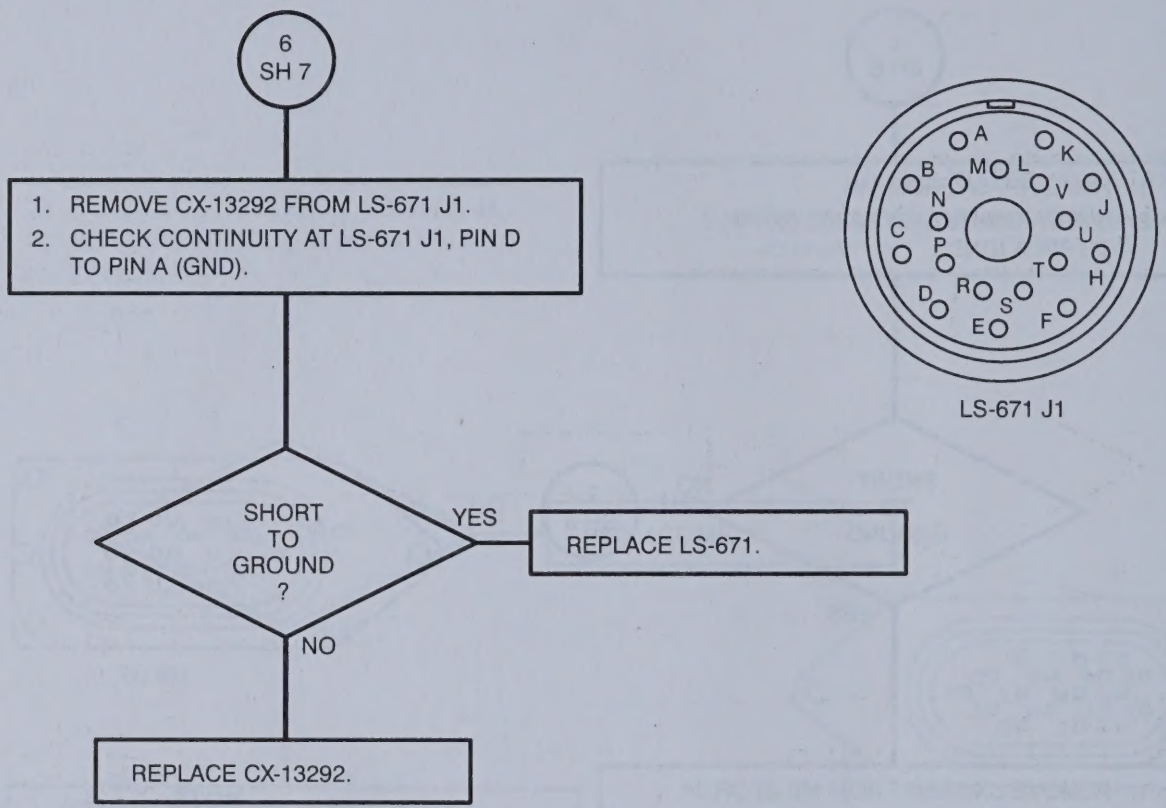
The LS-671 may be installed at either MB J3 or J4.

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 7 of 9)

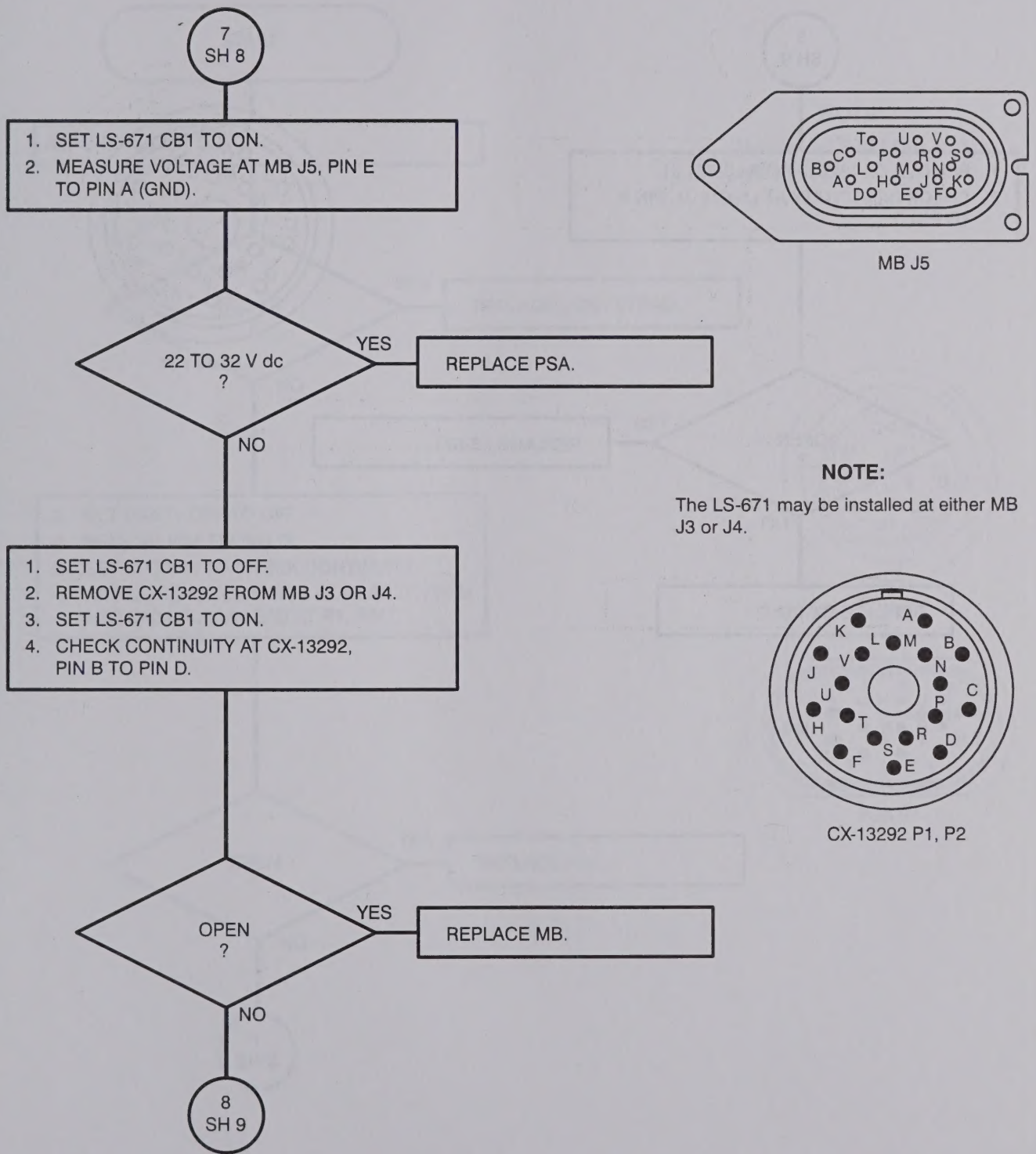


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 8 of 9)



MB J5

NOTE:

The LS-671 may be installed at either MB J3 or J4.

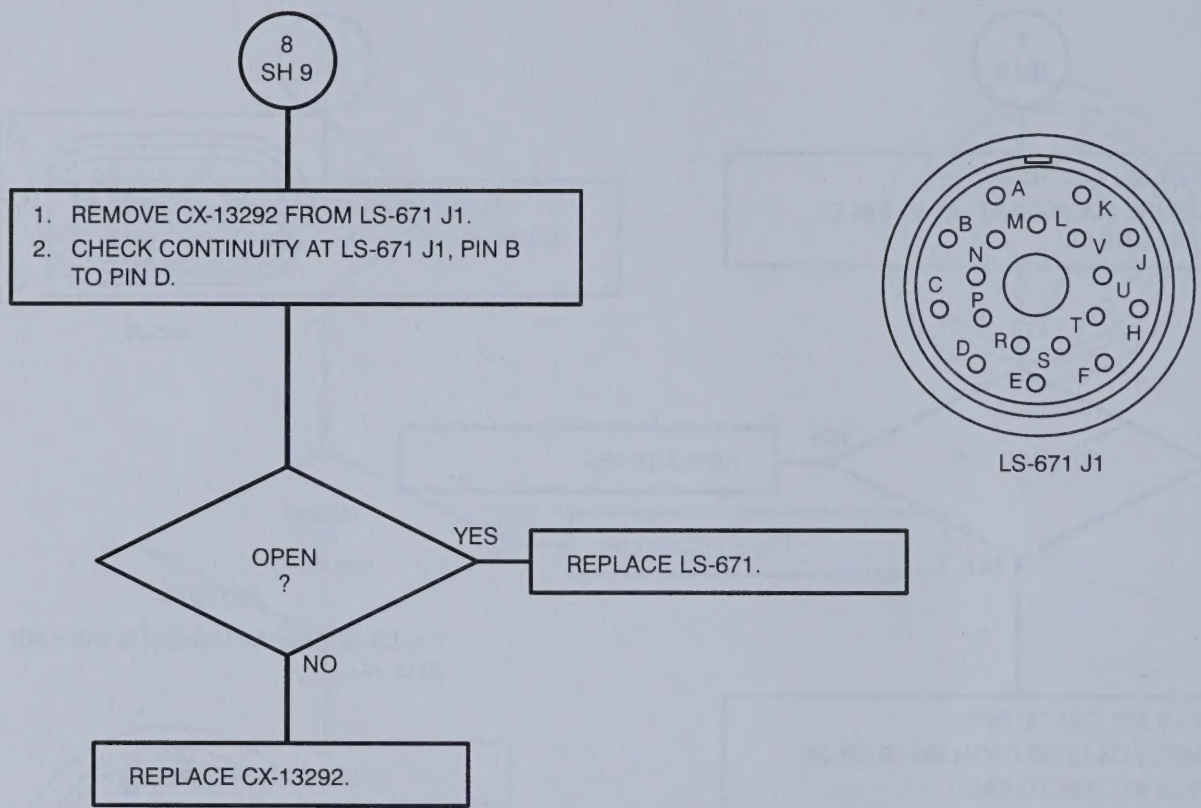
CX-13292 P1, P2

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

PSA DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 9 of 9)

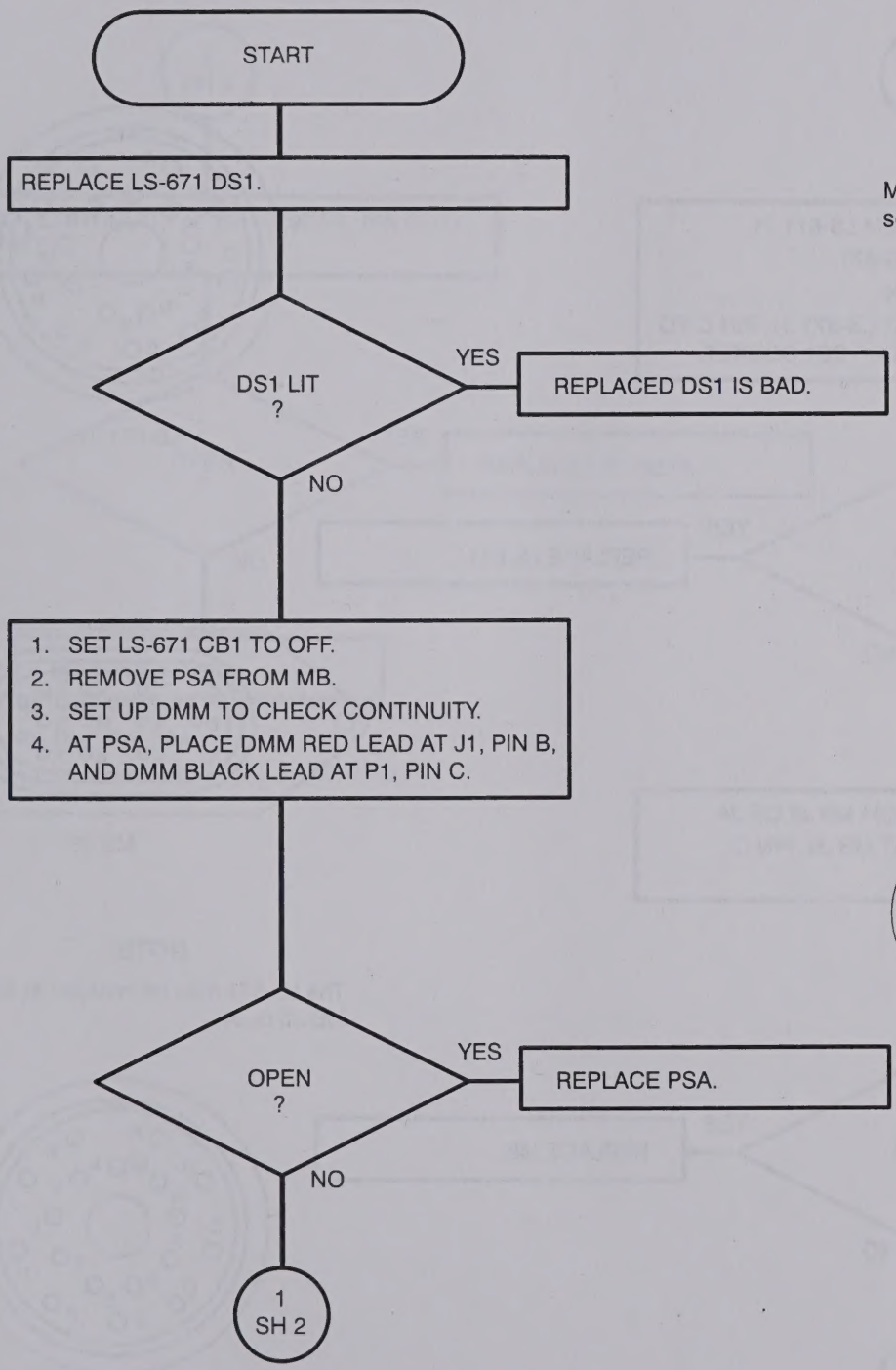


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

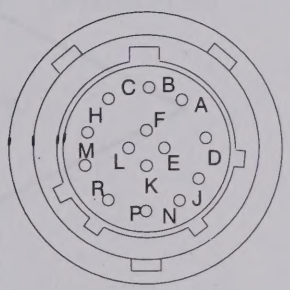
LS-671 DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 1 of 3)

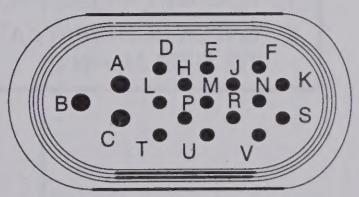


NOTE:

Make sure LS-671 DS1 is set full CCW.



PSA J1



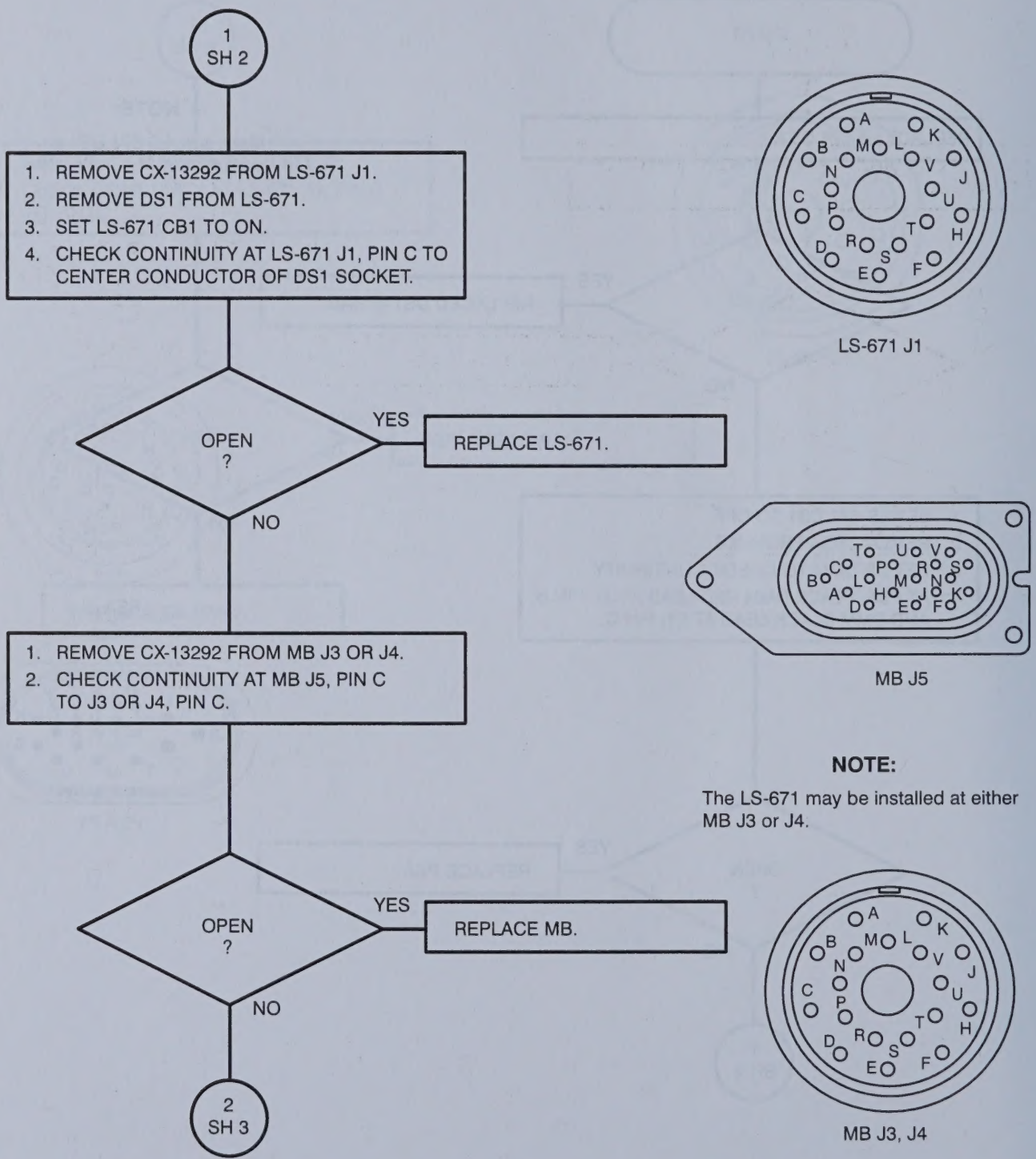
PSA P1

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

LS-671 DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 2 of 3)



LS-671 J1

MB J5

NOTE:

The LS-671 may be installed at either MB J3 or J4.

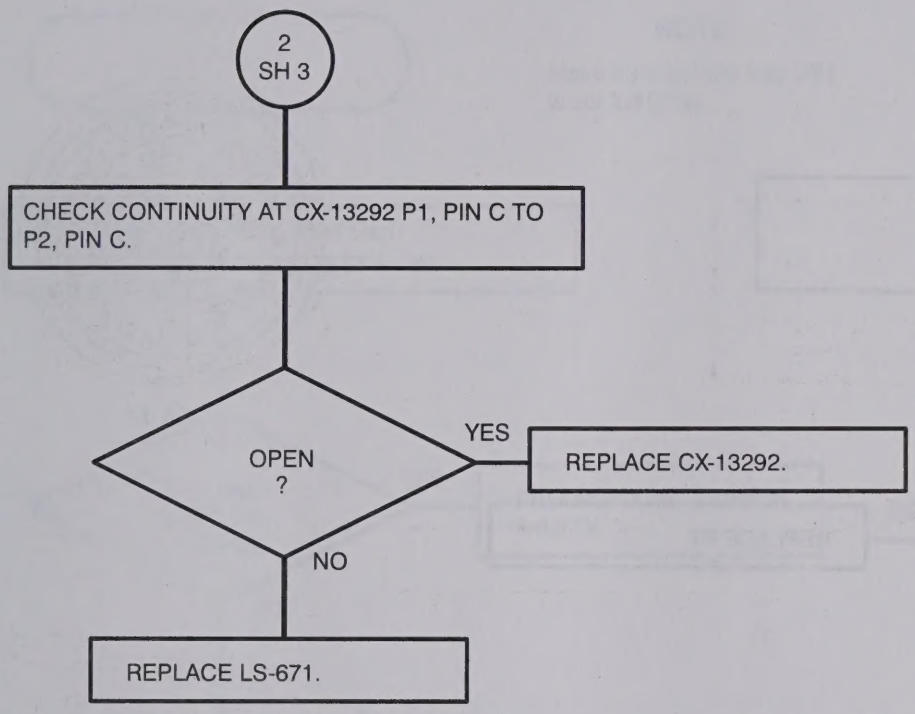
MB J3, J4

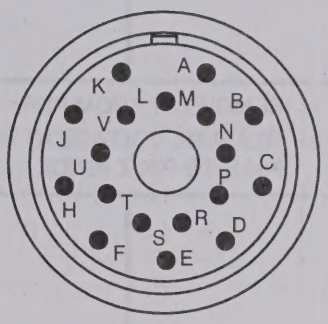
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

LS-671 DS1 NOT LIT WHEN CB1 IS SET TO "ON".

(Sheet 3 of 3)





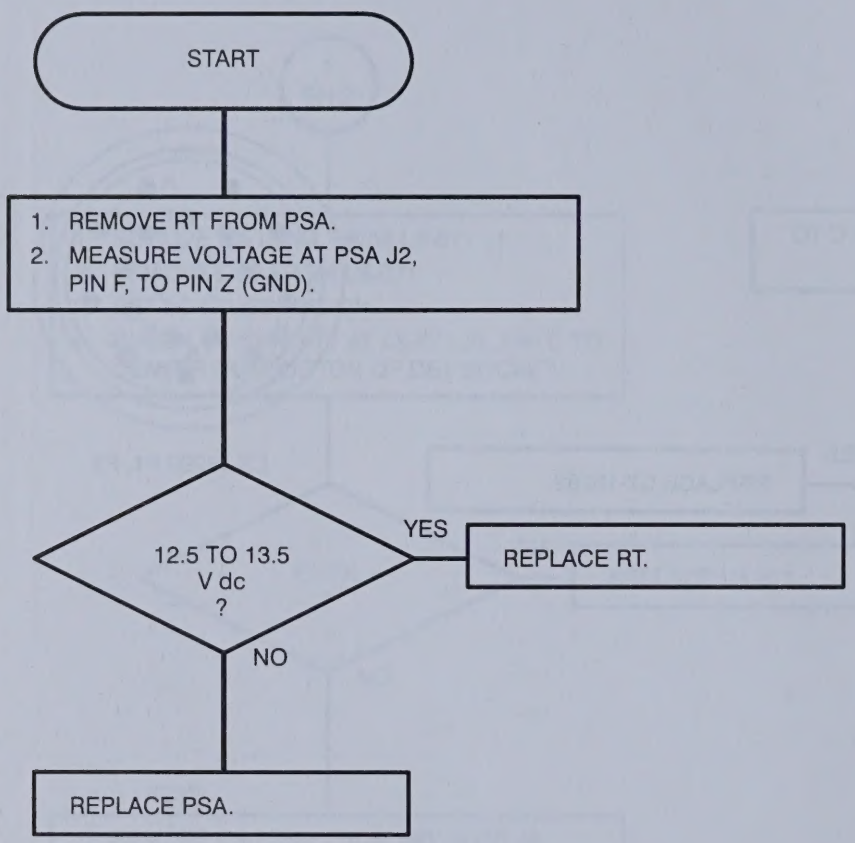
CX-13292 P1, P2

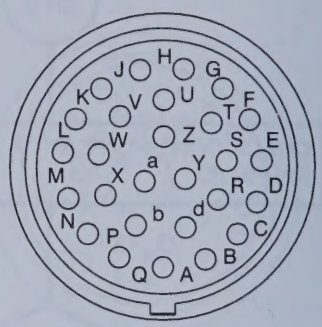
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4

RT DISPLAY DOES NOT LIGHT. PSA CB1 SET TO "ON".

(Sheet 1 of 1)





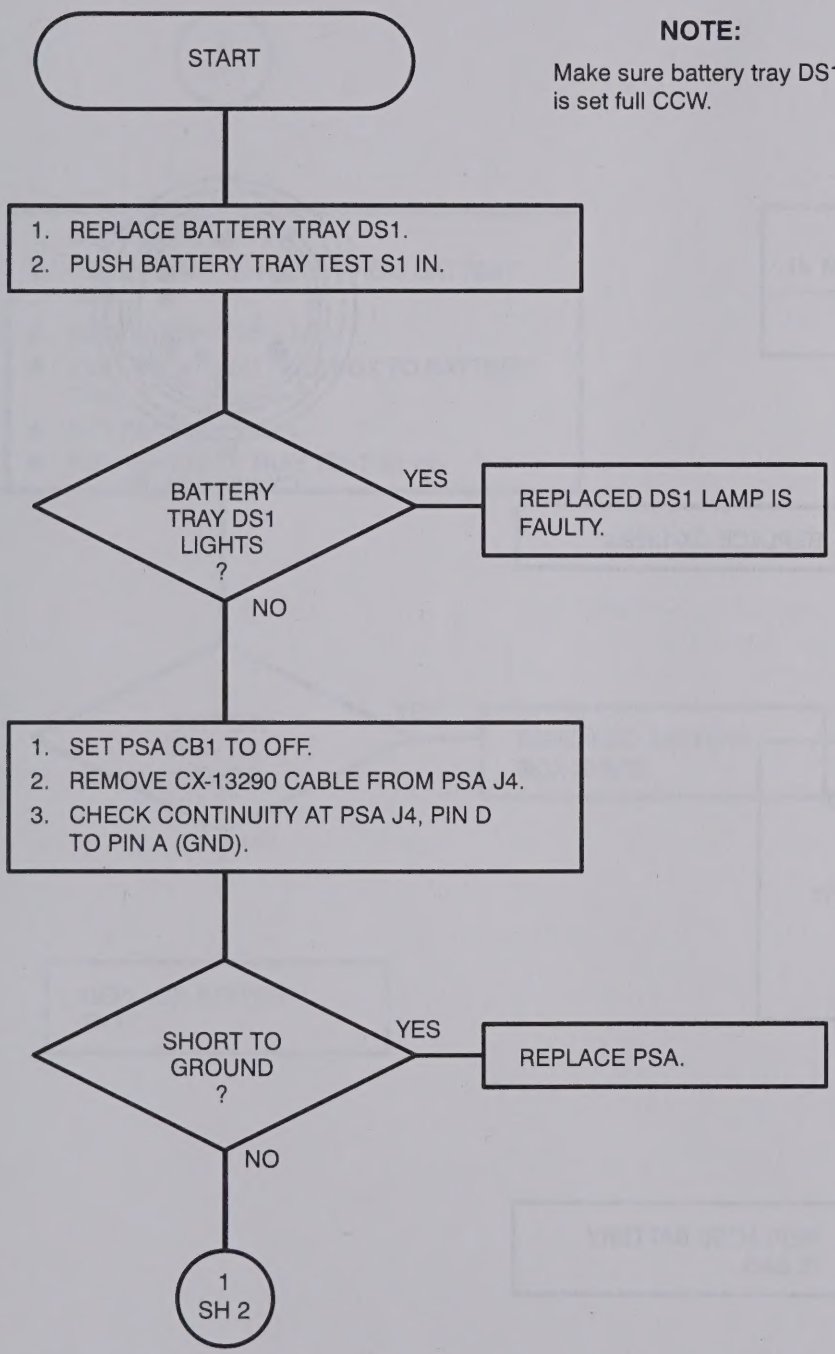
PSA J2

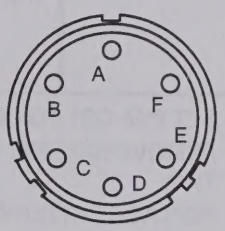
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

BATTERY TRAY DS1 DOES NOT LIGHT DURING TEST.

(Sheet 1 of 3)





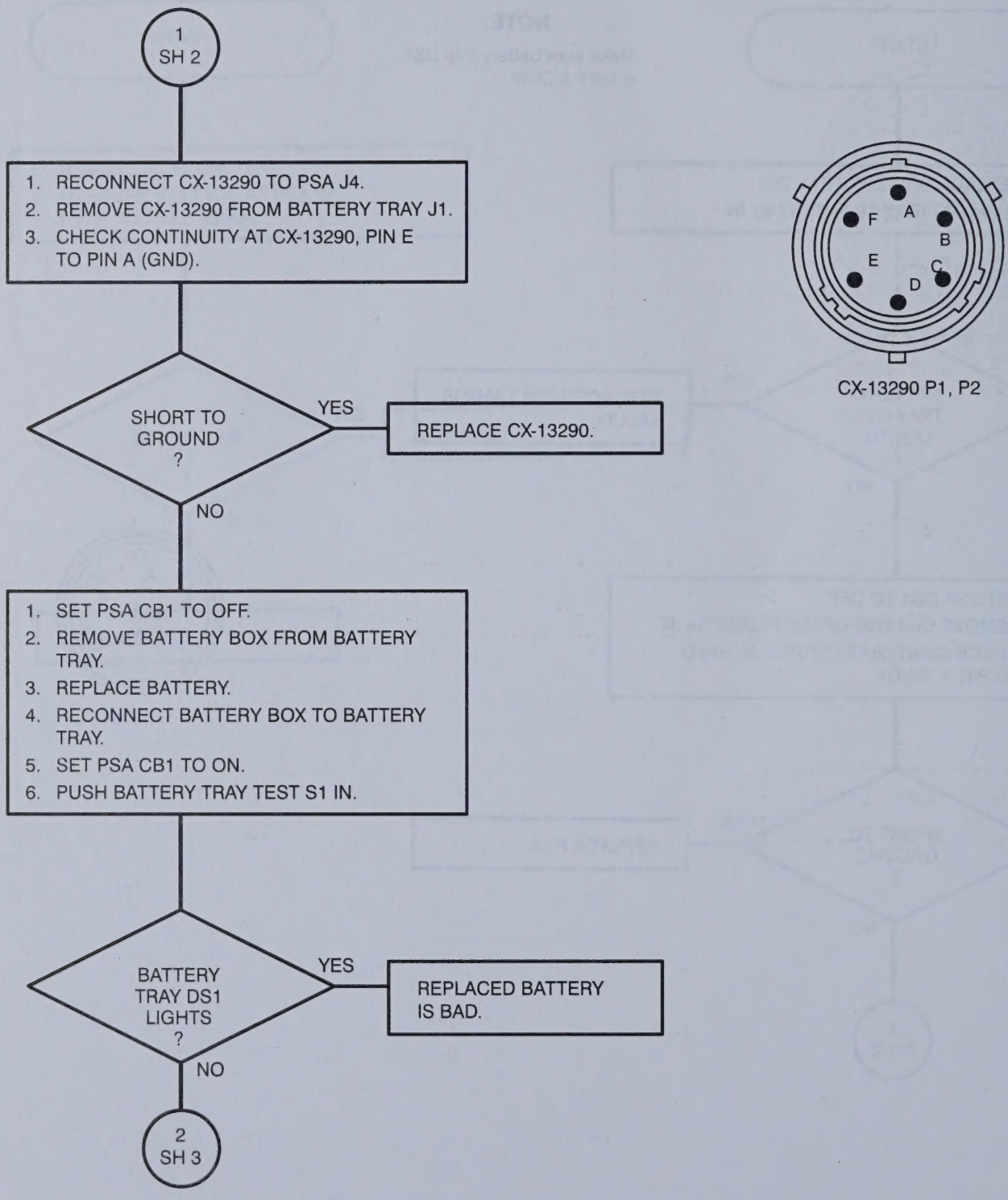
PSA J4

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

BATTERY TRAY DS1 DOES NOT LIGHT DURING TEST.

(Sheet 2 of 3)



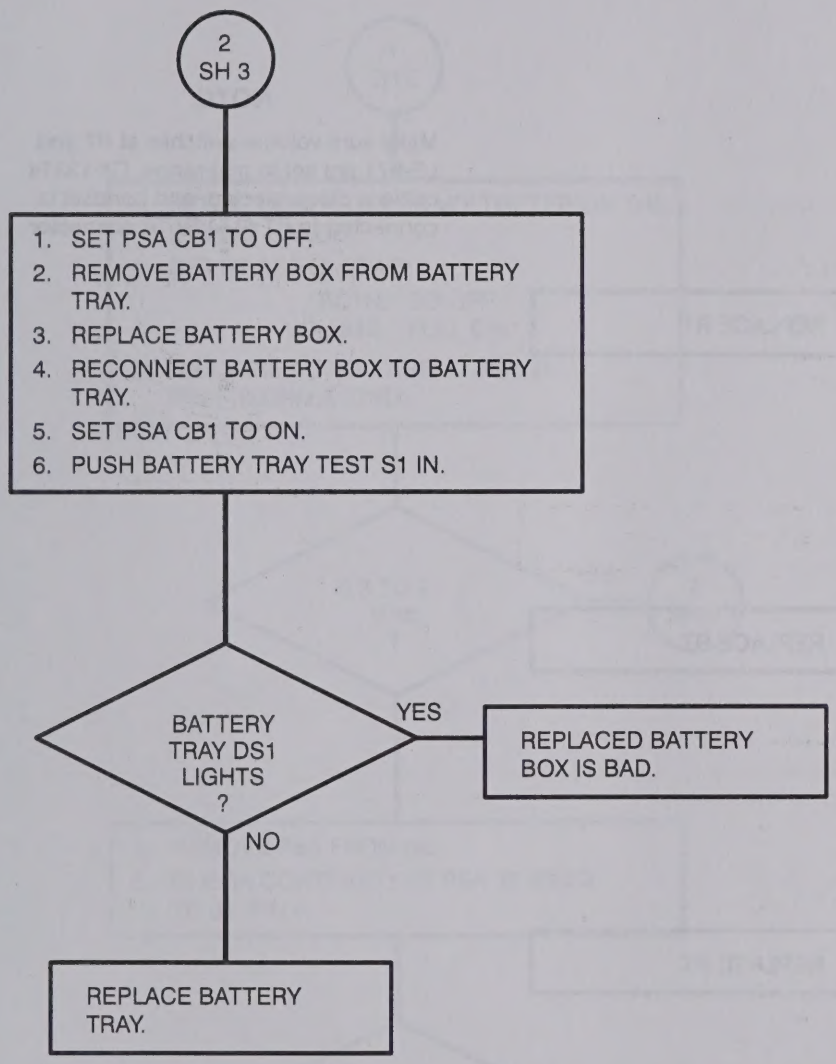
CX-13290 P1, P2

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

BATTERY TRAY DS1 DOES NOT LIGHT DURING TEST.

(Sheet 3 of 3)

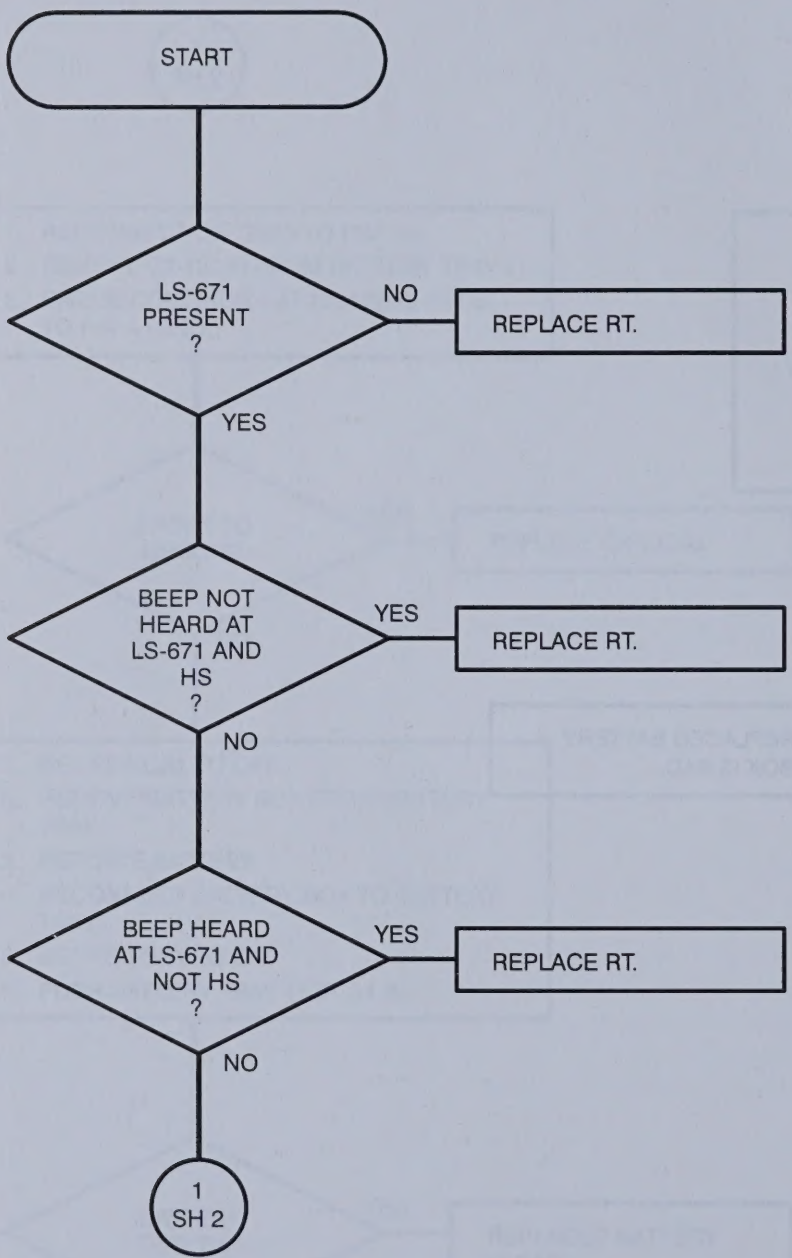


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RT IS IN SELF-TEST.

(Sheet 1 of 3)



NOTE:

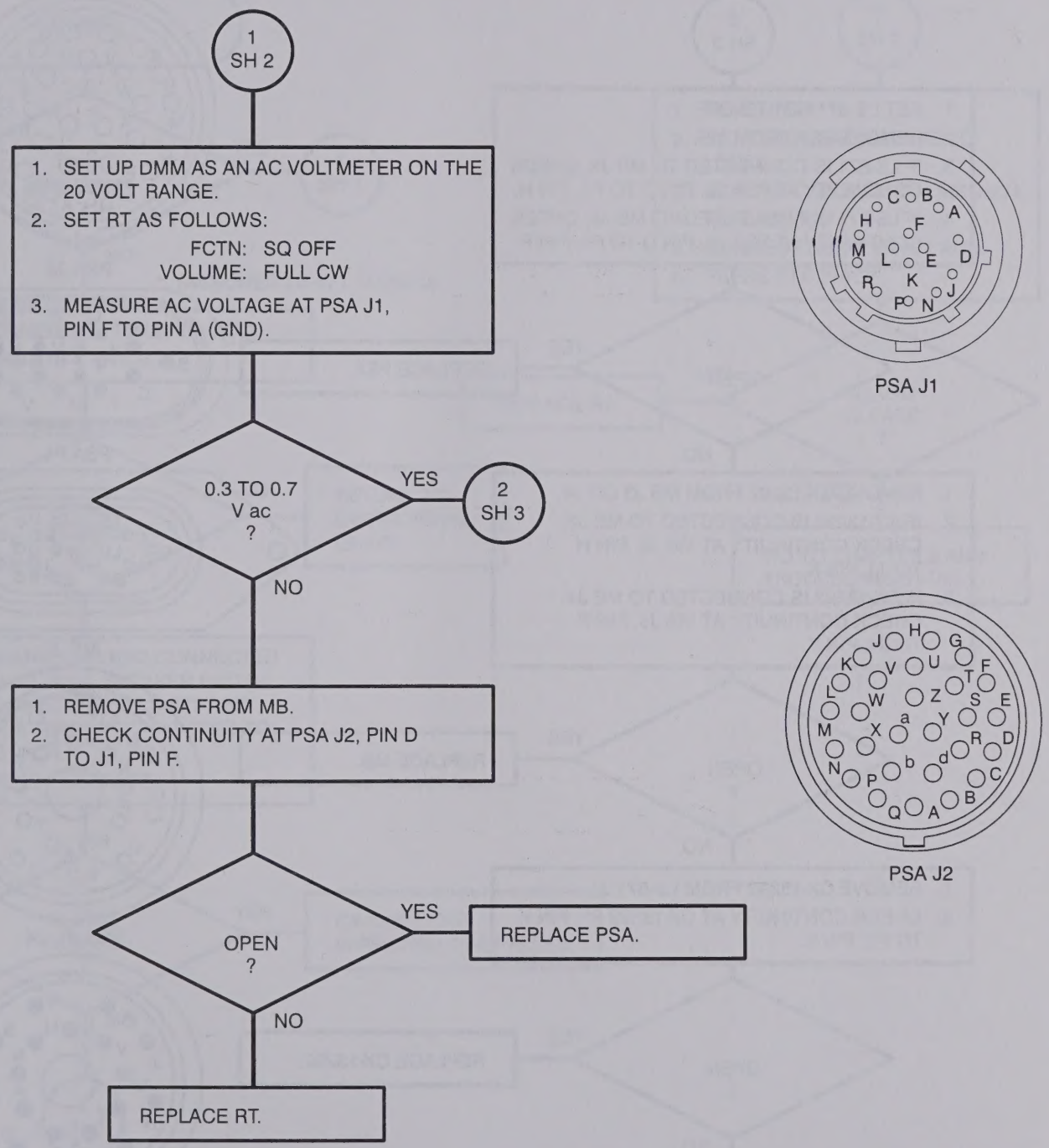
Make sure volume switches at RT and LS-671 are set to mid-range, CX-13314 cable is disconnected, and handset is connected to RT AUD/DATA connector.

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RT IS IN SELF-TEST.

(Sheet 2 of 3)

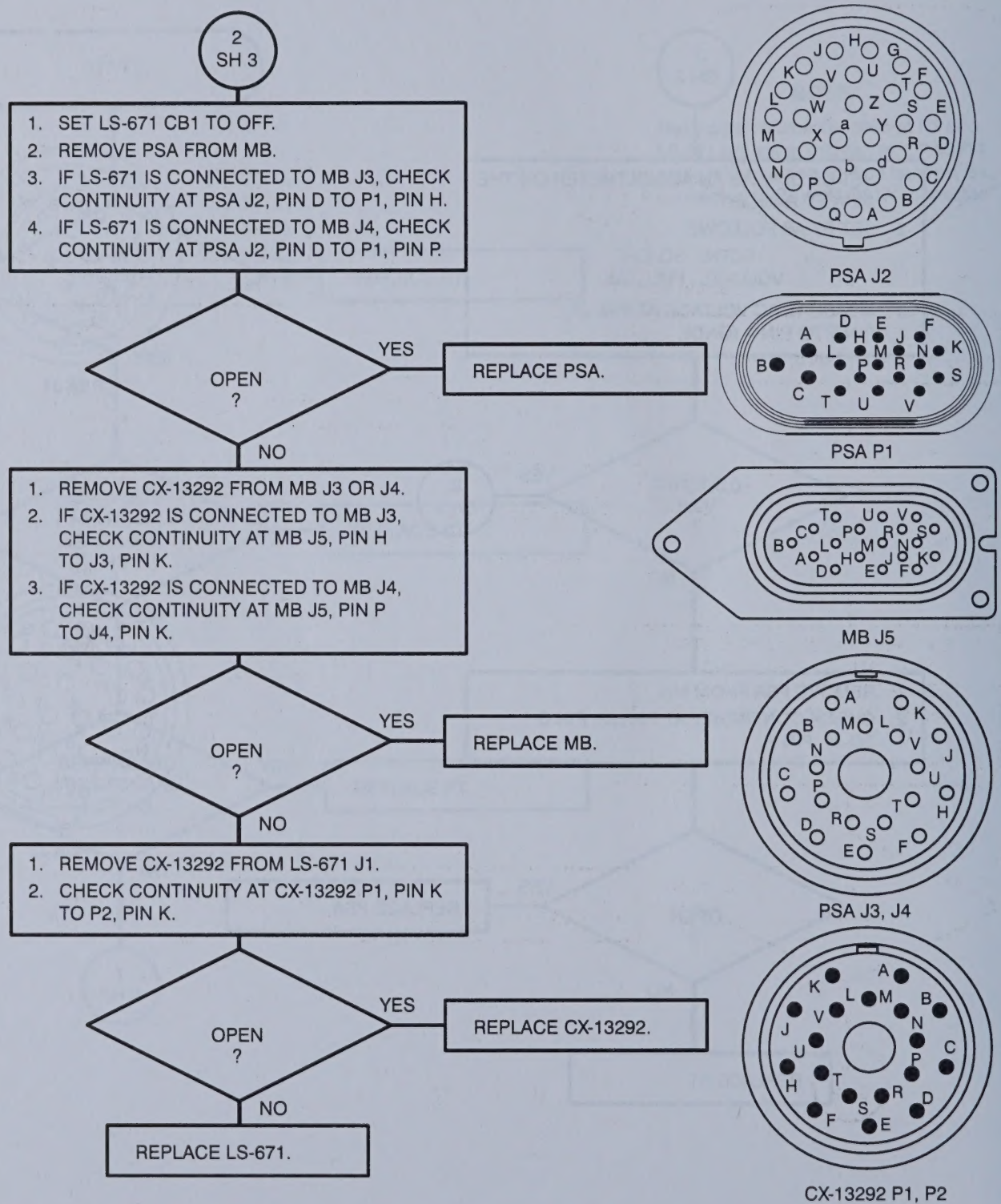


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

NO AUDIO HEARD AT HANDSET AND/OR LOUDSPEAKER WHEN RT IS IN SELF-TEST.

(Sheet 3 of 3)

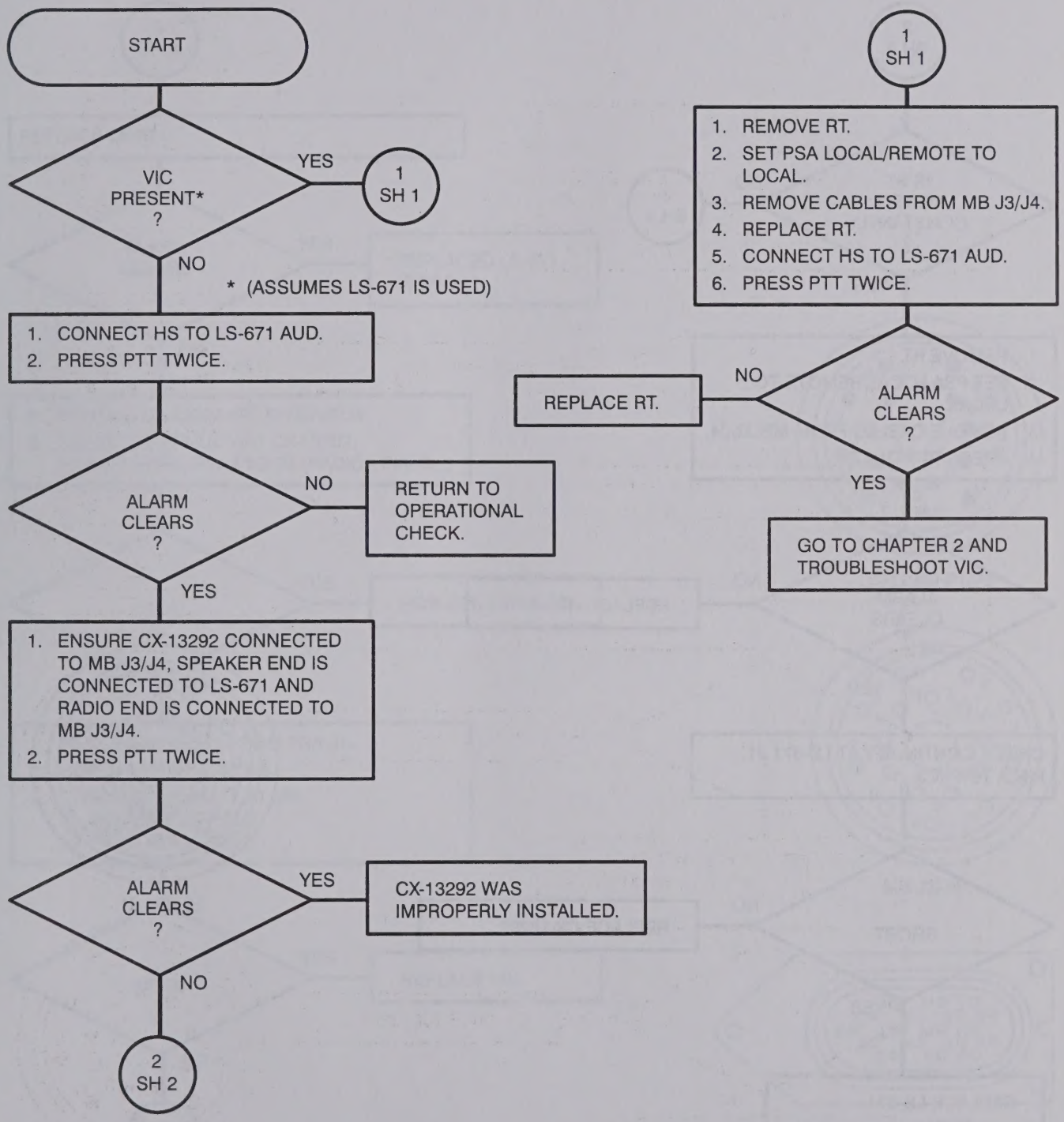


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 7

COMSEC ALARM WILL NOT CLEAR (EXTERNAL DEVICES PRESENT).

(Sheet 1 of 4)

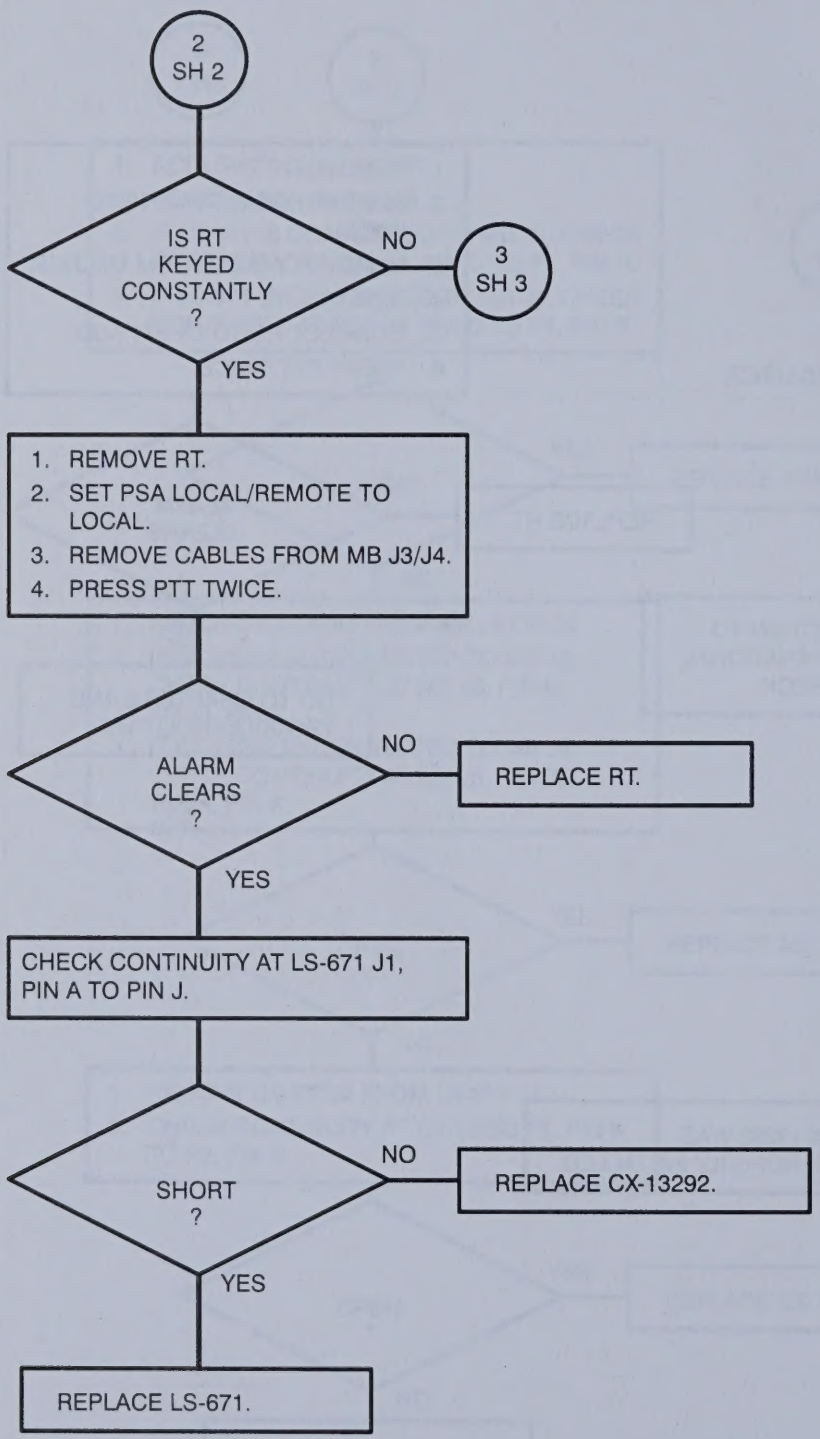


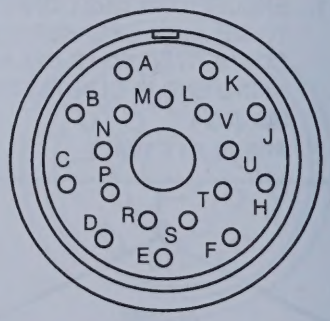
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 7

COMSEC ALARM WILL NOT CLEAR (EXTERNAL DEVICES PRESENT).

(Sheet 2 of 4)





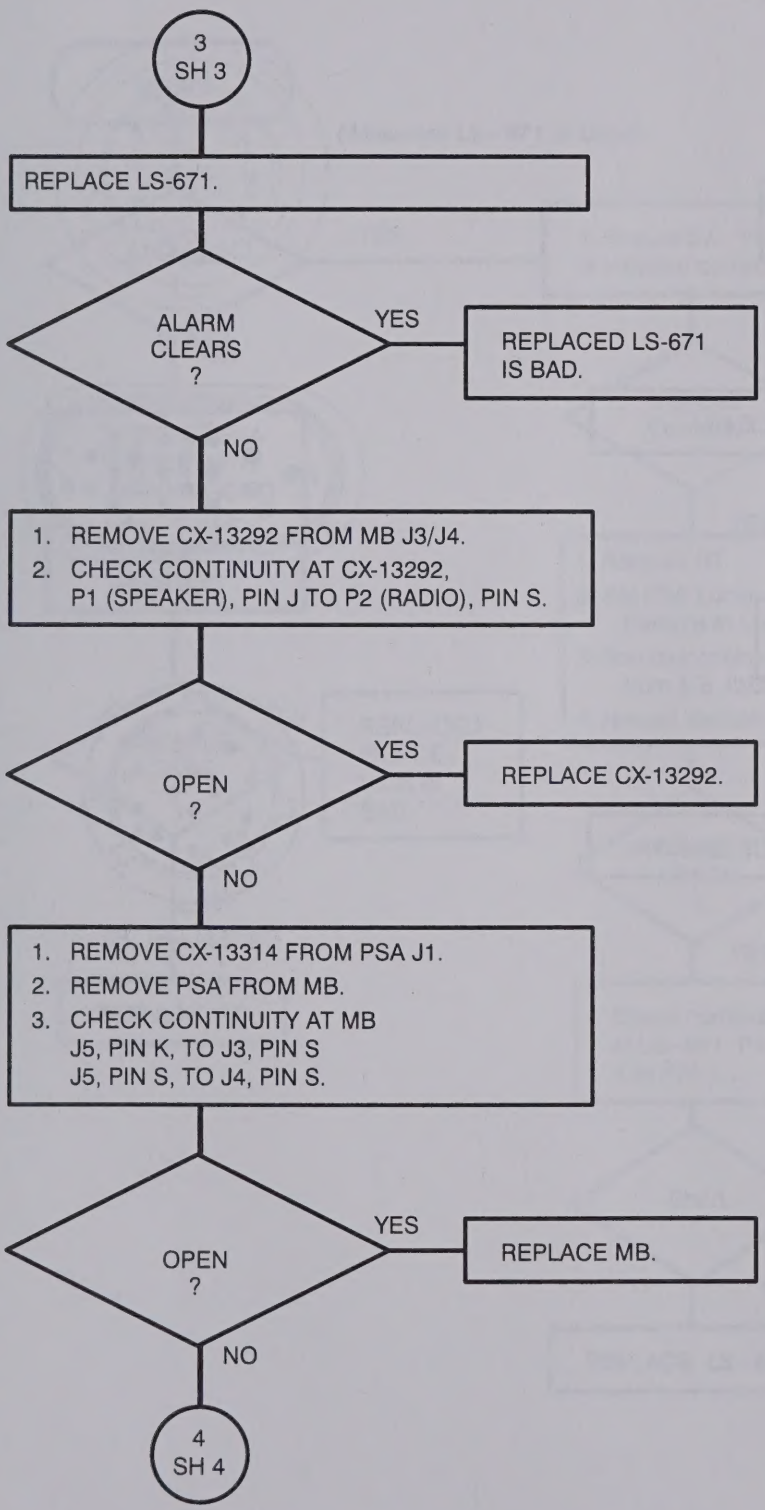
LS-671 J1

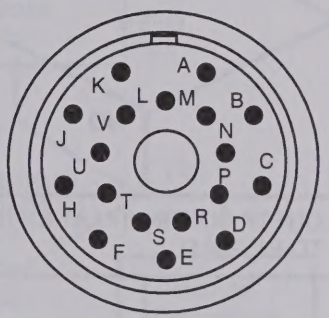
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 7

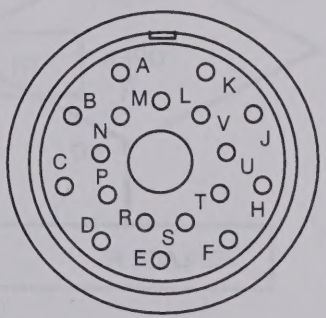
COMSEC ALARM WILL NOT CLEAR (EXTERNAL DEVICES PRESENT).

(Sheet 3 of 4)

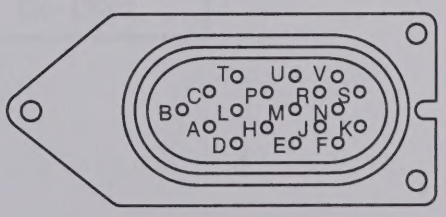




CX-13292 P1/P2



MB J3/J4



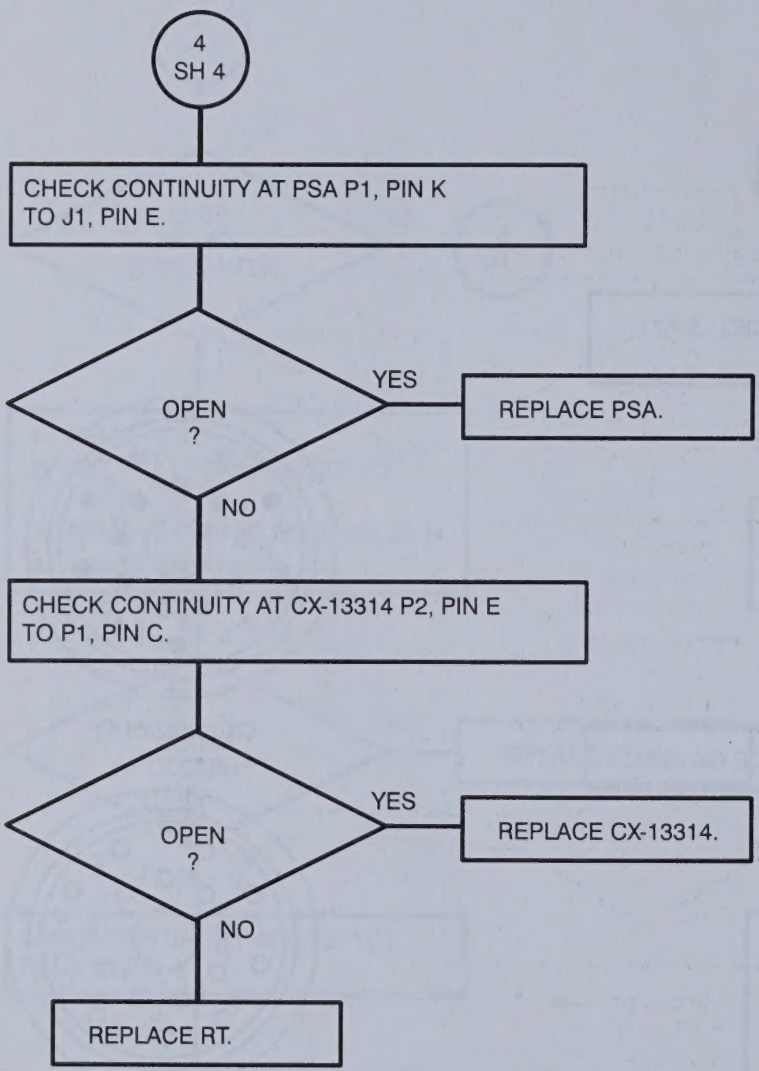
MB J5

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 7

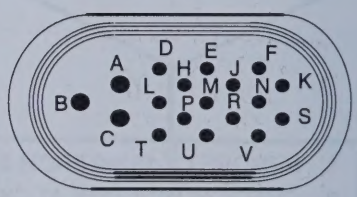
COMSEC ALARM WILL NOT CLEAR (EXTERNAL DEVICES PRESENT).

(Sheet 4 of 4)

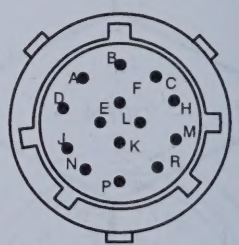




PSA J1



PSA P1



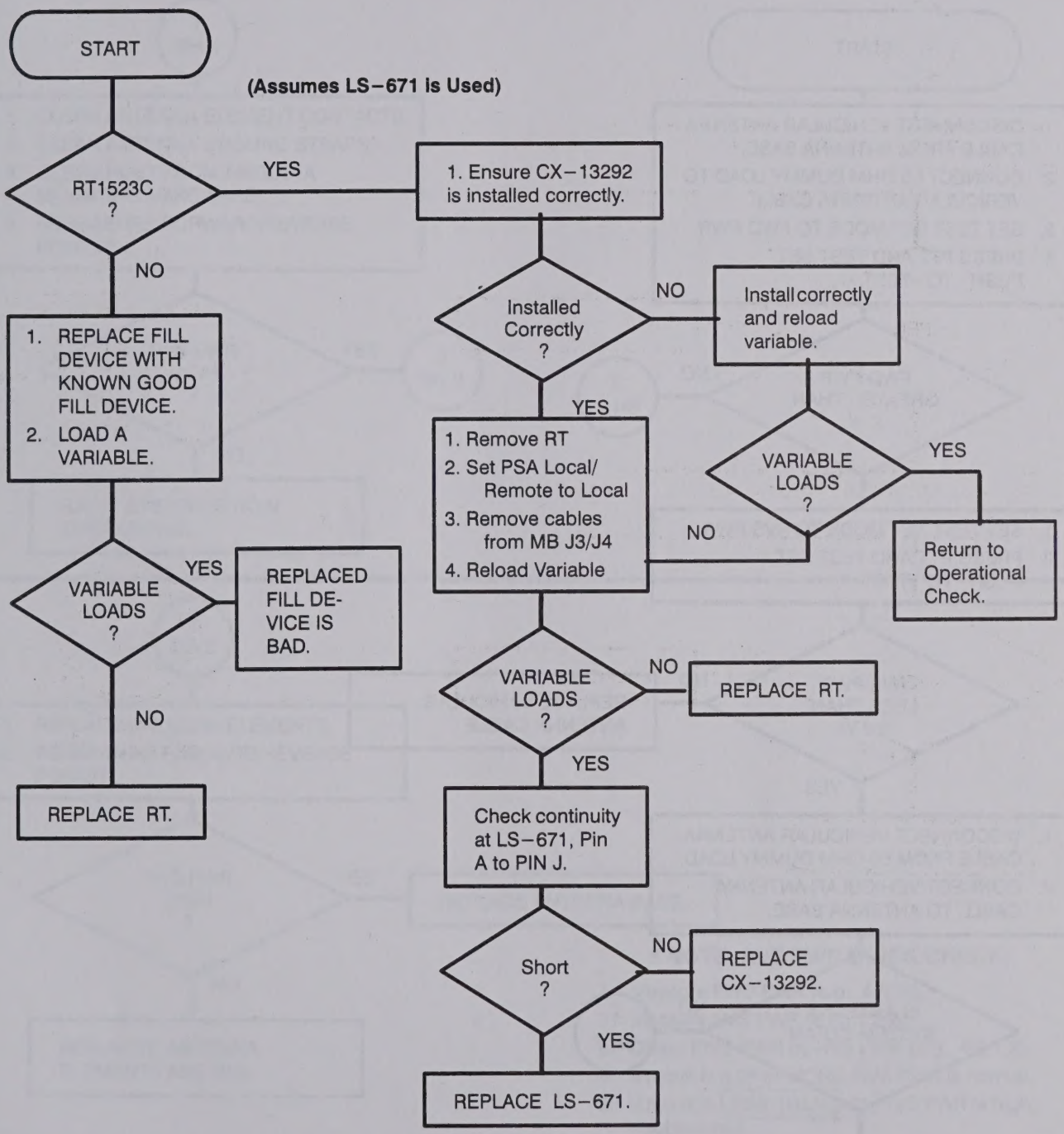
CX-13314 P1, P2

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8

VARIABLE WILL NOT LOAD.

(Sheet 1 of 1)

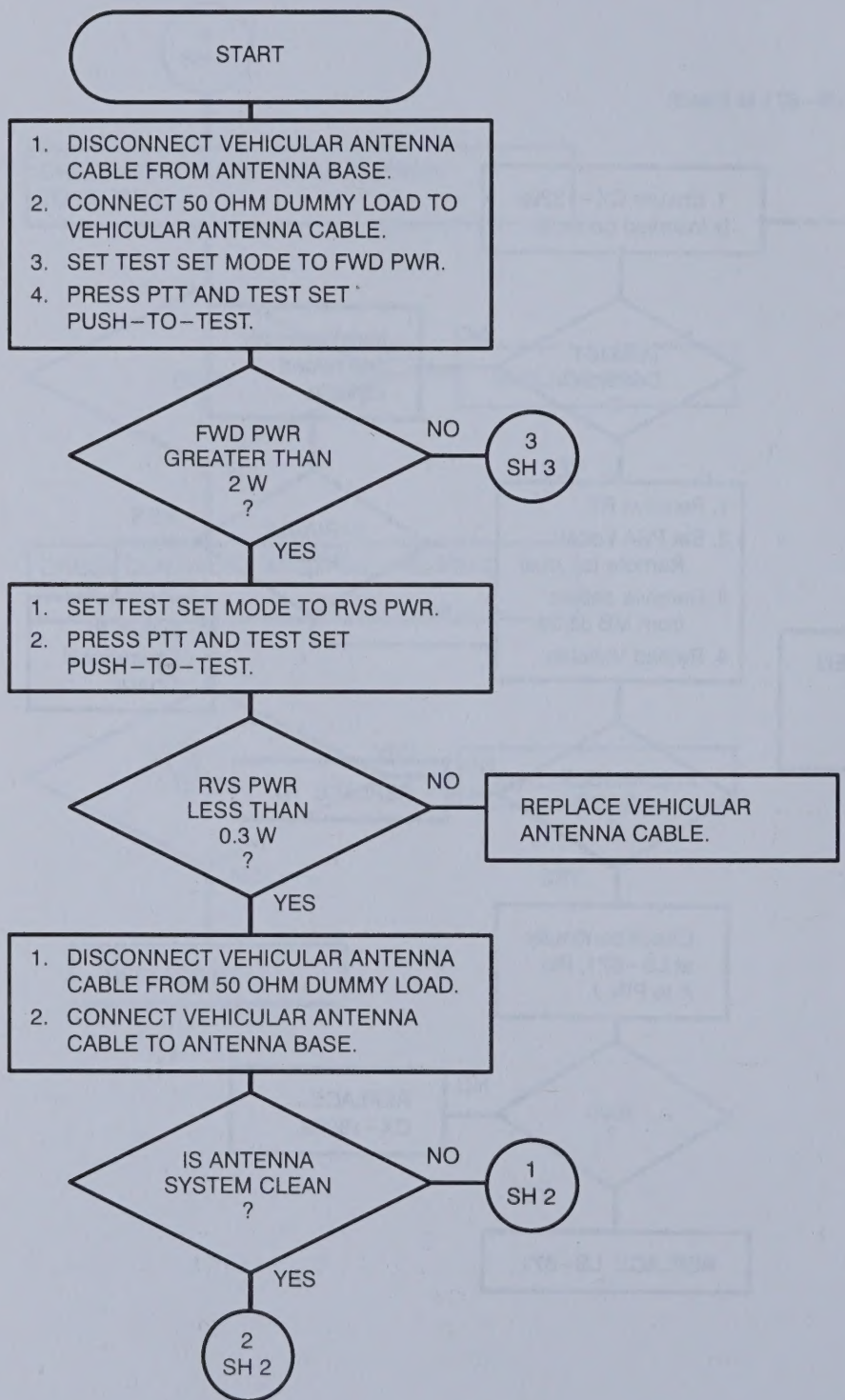


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

FAILED FORWARD AND REVERSE POWER CHECK.

(Sheet 1 of 3)

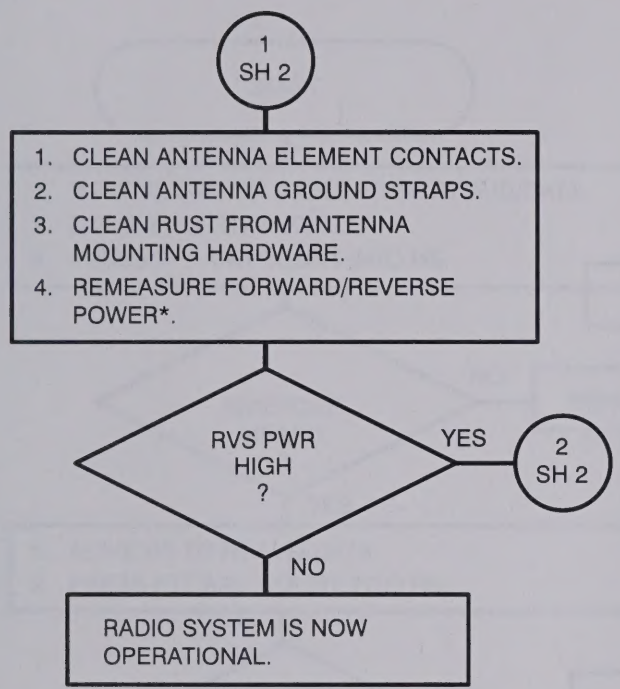


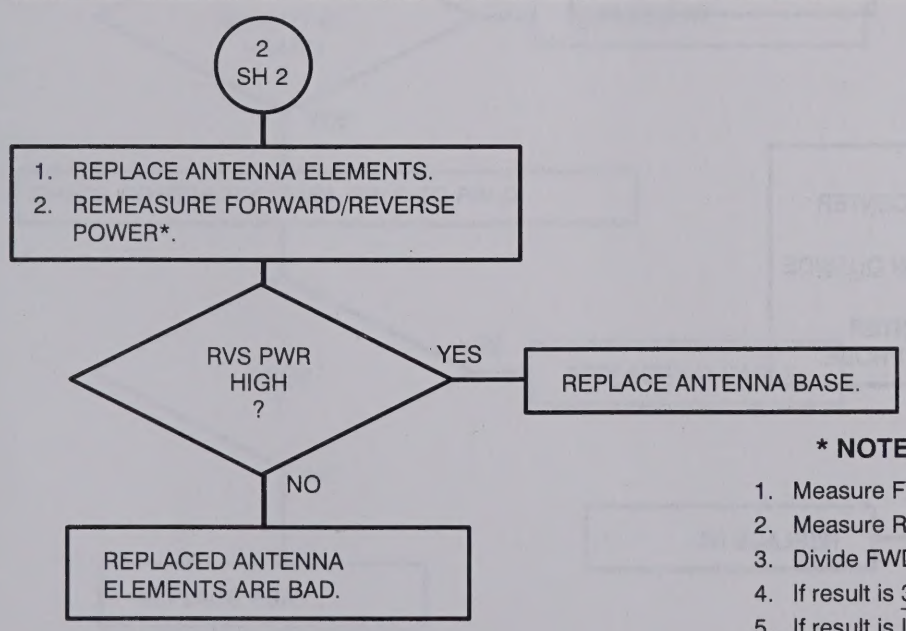
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

FAILED FORWARD AND REVERSE POWER CHECK.

(Sheet 2 of 3)





*** NOTE, RVS PWR QUICK CHECK:**

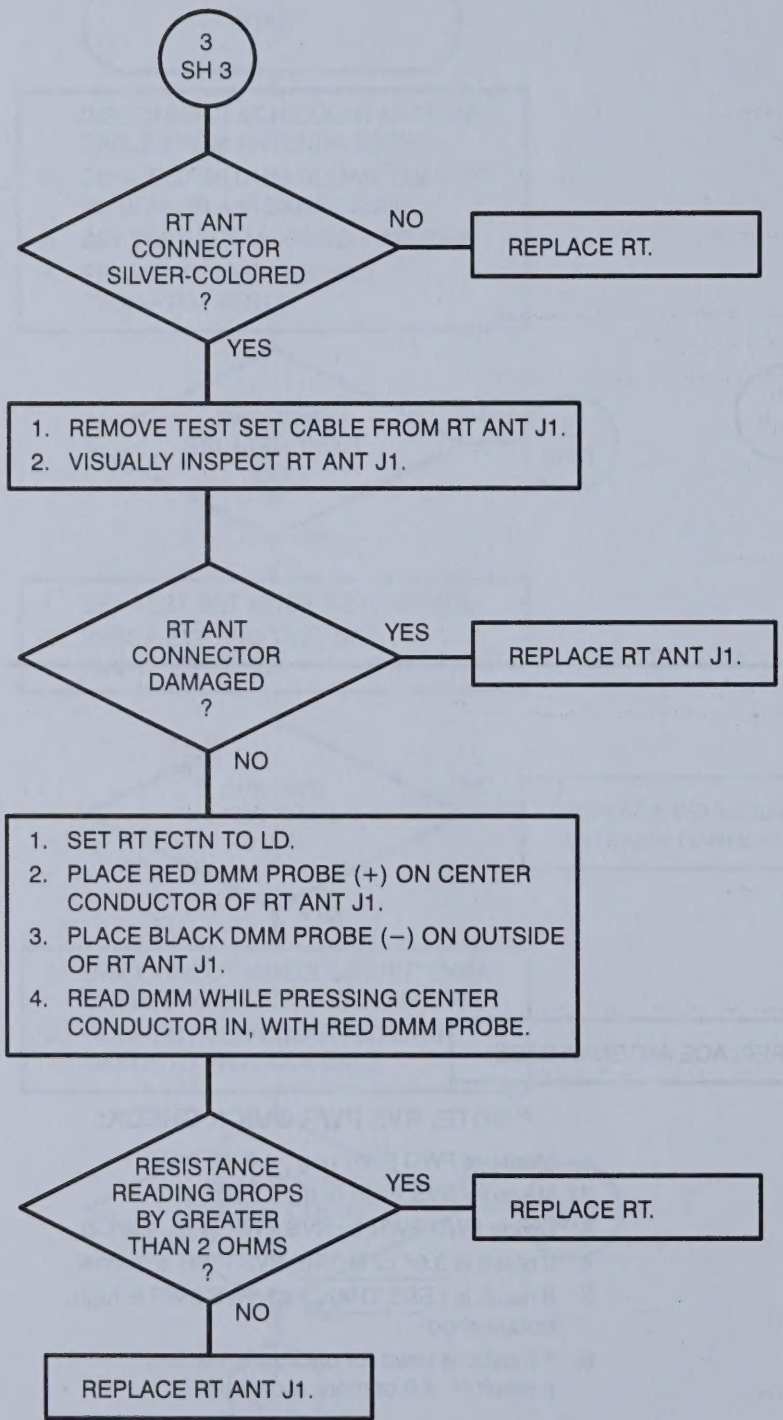
1. Measure FWD PWR (e.g., 4.6 W).
2. Measure RVS PWR (e.g., 1.2 W).
3. Divide FWD PWR by RVS PWR (e.g., 4.6/1.2).
4. If result is 3.0* or MORE, RVS PWR is normal.
5. If result is LESS THAN 3.0*, RVS PWR is high, troubleshoot.
6. * If radio is used for data transmission, a result of 4.0 or more is desired.

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 9

FAILED FORWARD AND REVERSE POWER CHECK.

(Sheet 3 of 3)

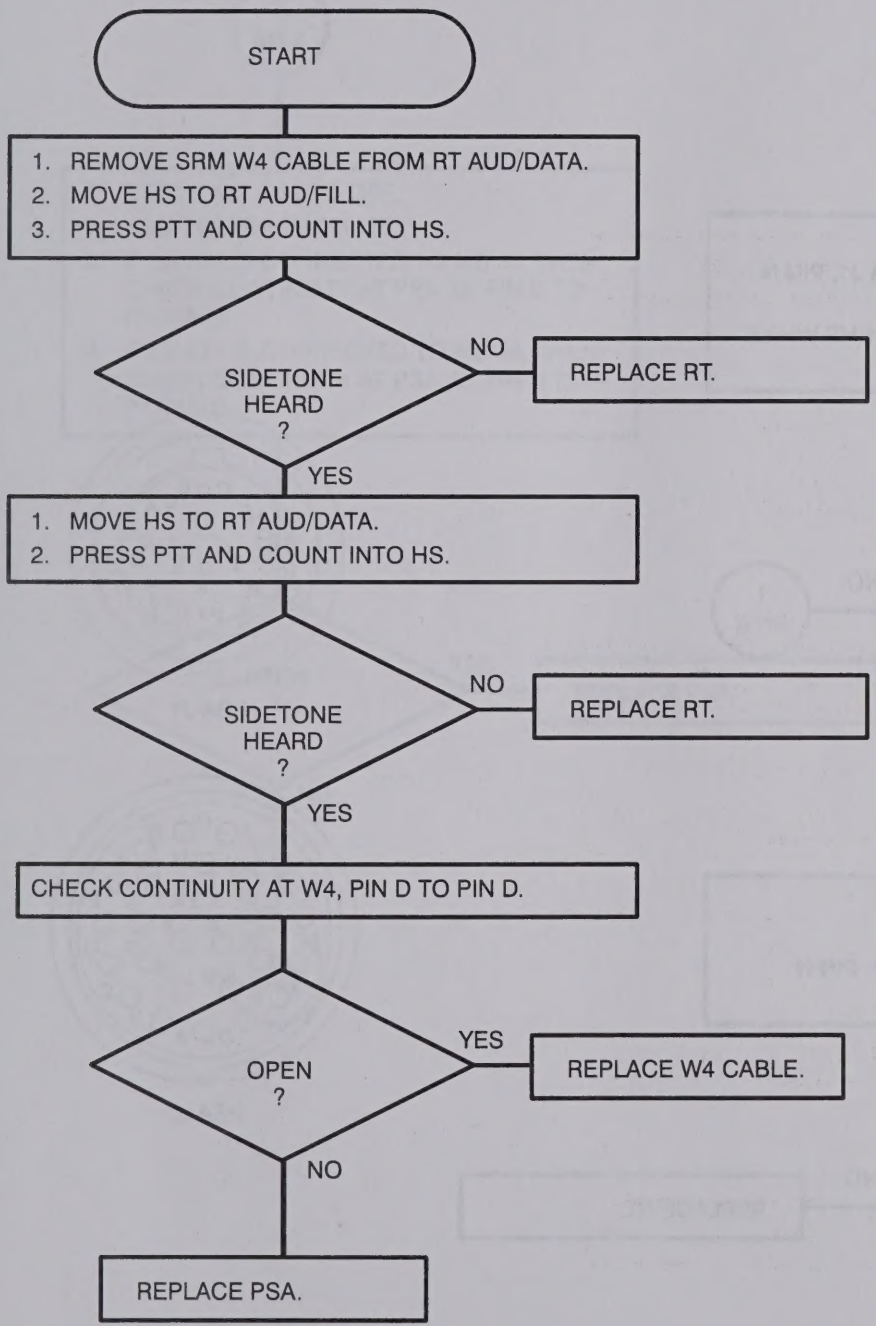


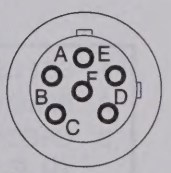
5.3. TROUBLESHOOTING FLOWCHARTS. Continued

Chart 10

NO SIDETONE WITH FORWARD/REVERSE POWER CORRECT.

(Sheet 1 of 1)





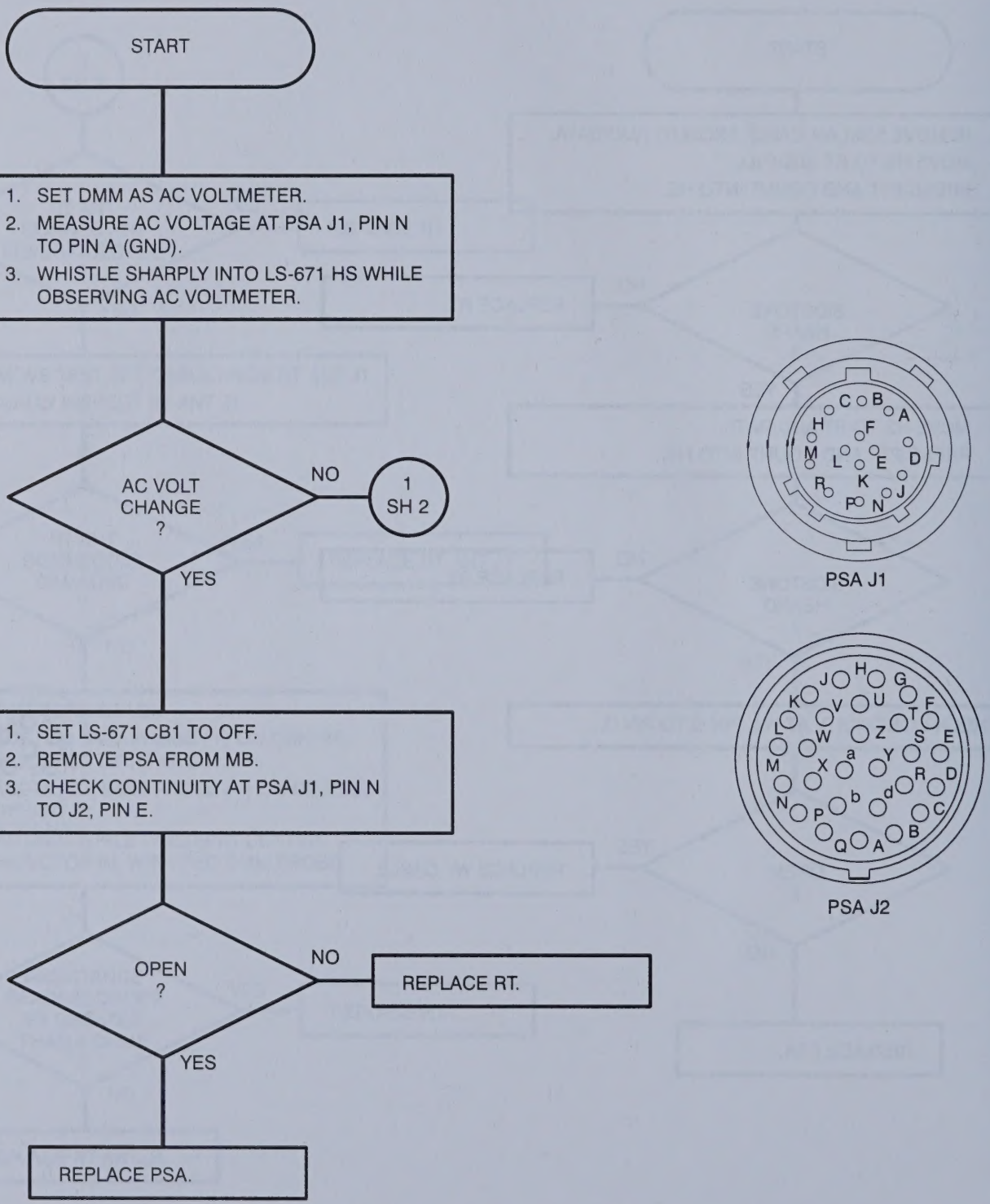
W4 P1, P2

5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11

NO SIDETONE HEARD AT THE LS-671.

(Sheet 1 of 3)

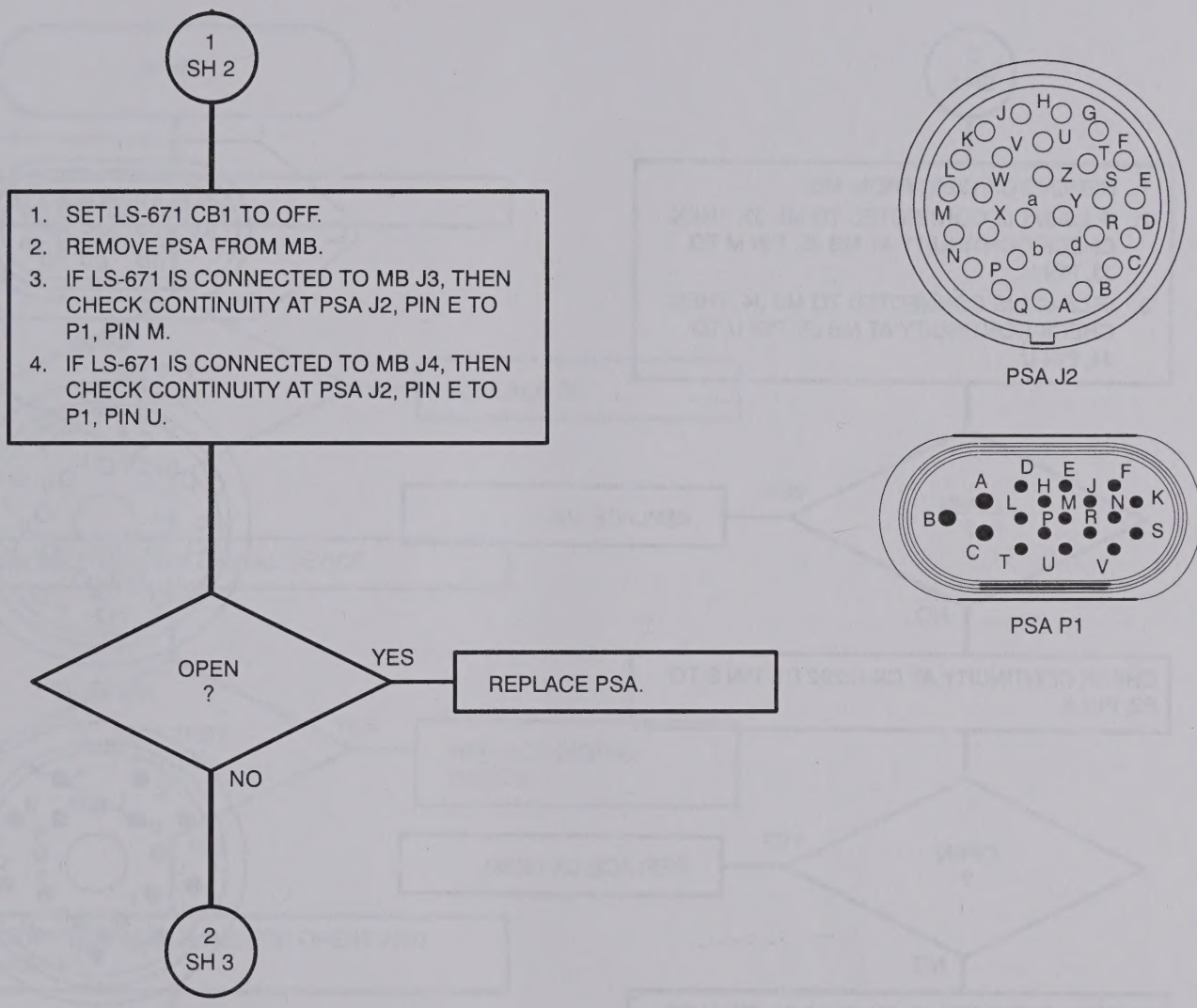


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11

NO SIDETONE HEARD AT THE LS-671.

(Sheet 2 of 3)

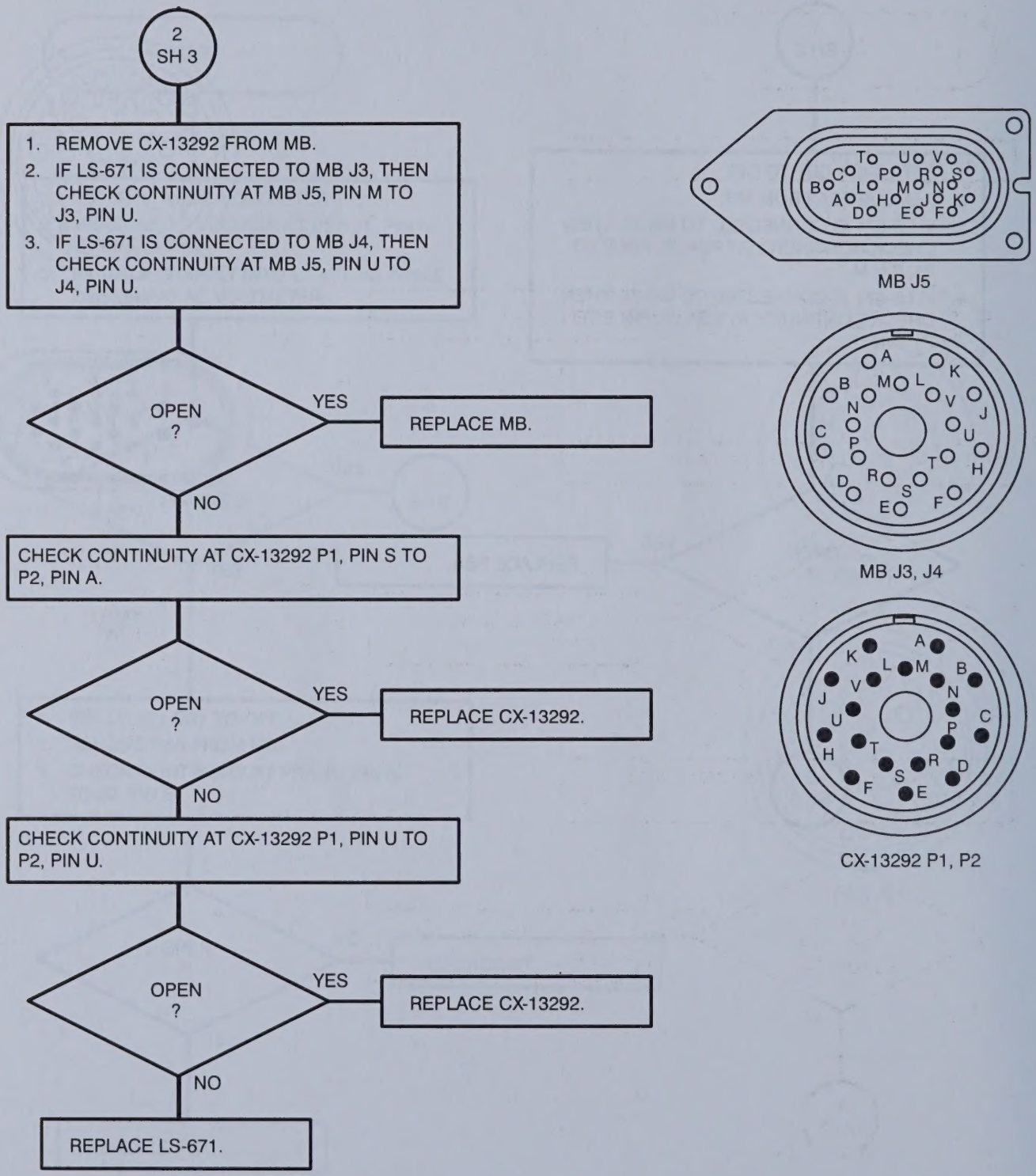


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11

NO SIDETONE HEARD AT THE LS-671.

(Sheet 3 of 3)

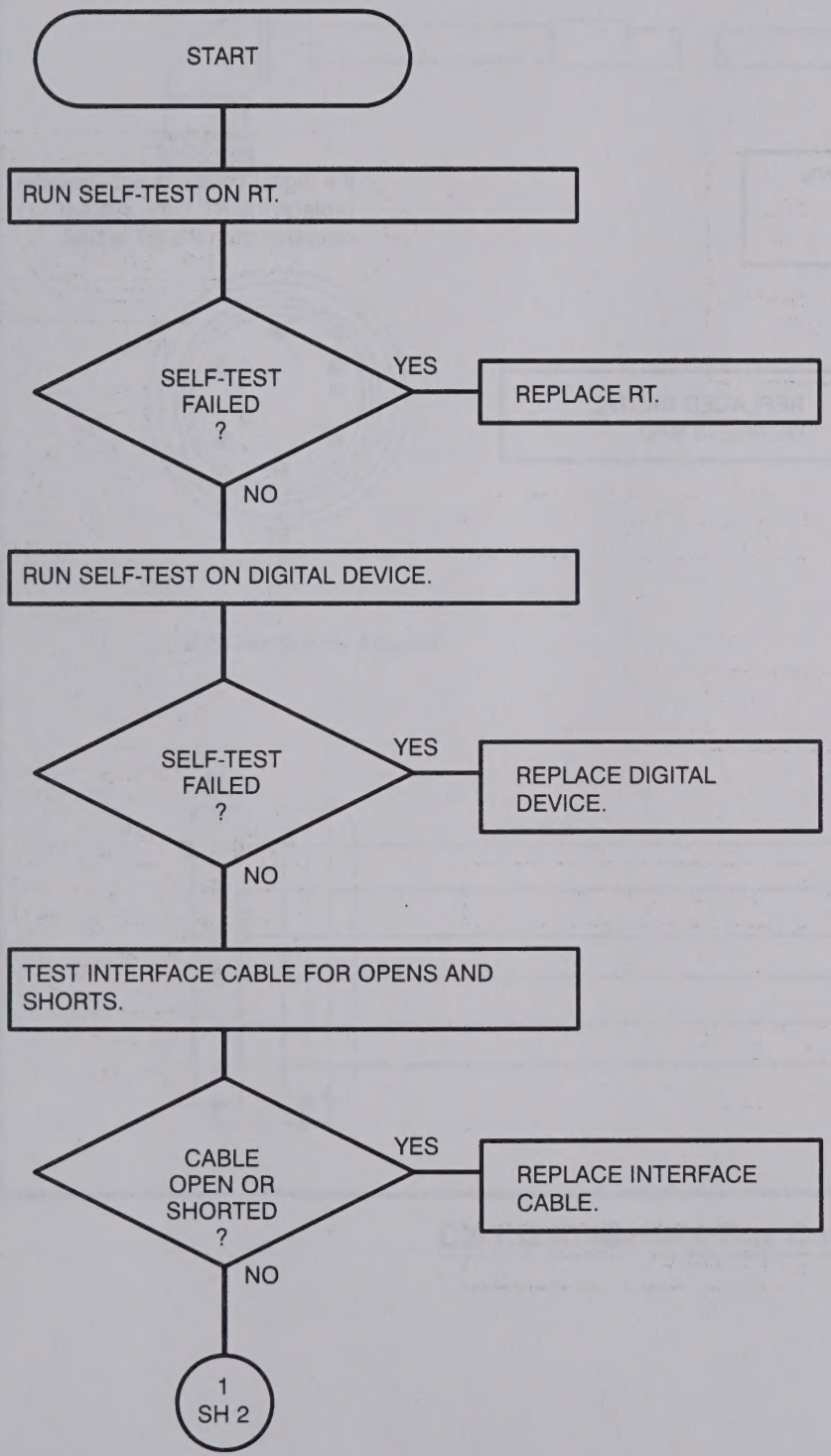


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12

RADIO WILL NOT OPERATE WITH DIGITAL DEVICES.

(Sheet 1 of 2)

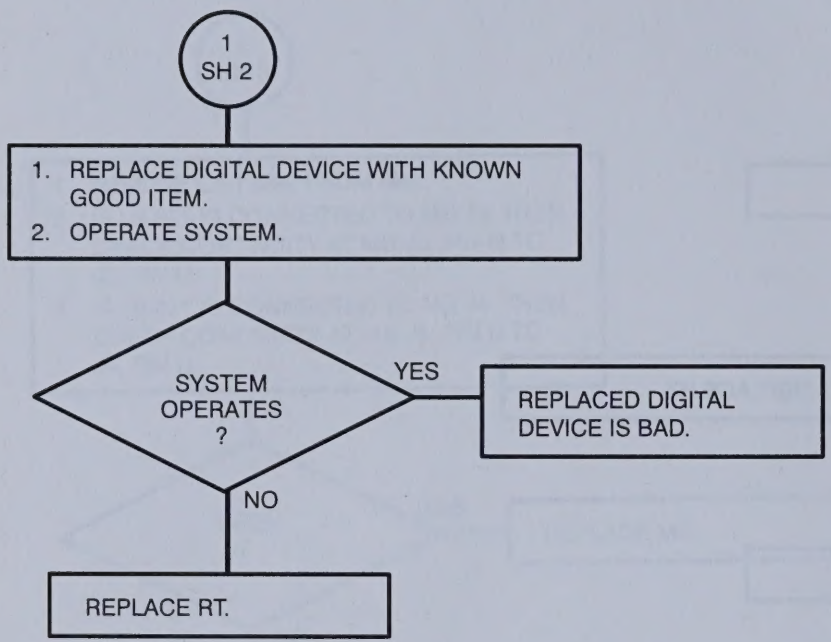


5.3. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12

RADIO WILL NOT OPERATE WITH DIGITAL DEVICES.

(Sheet 2 of 2)

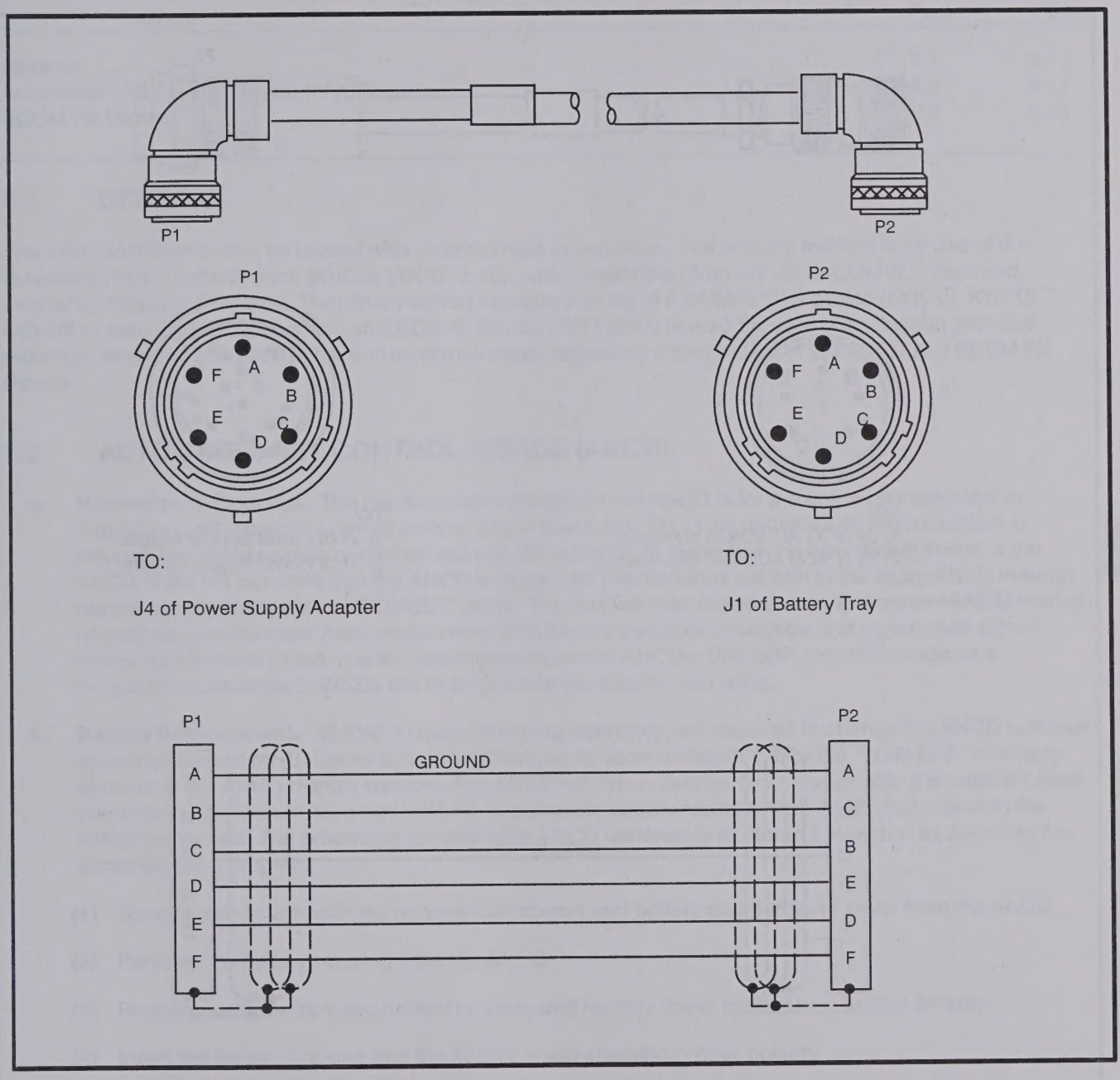


NOTE:

If a digital device is not available, replace the RT. If the system operates then the RT is bad.

5.4. CABLE SCHEMATICS.

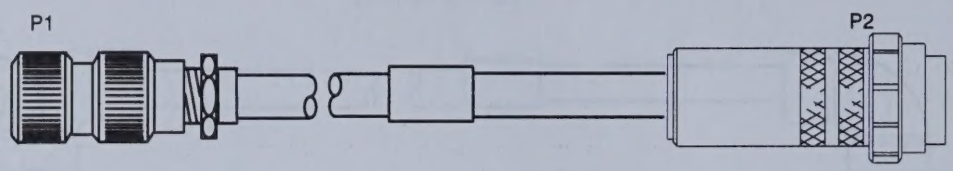
a. CX-13290 (Battery Tray Cable)

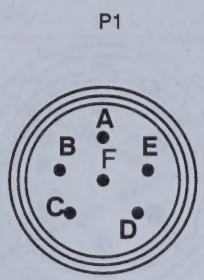


CX-13290 (Battery Tray Cable)

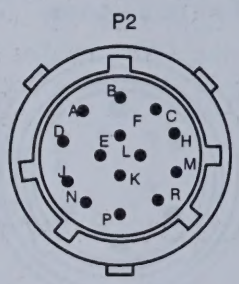
5.4. CABLE SCHEMATICS. Continued

b. CX-13314 (SRM W4 Cable)

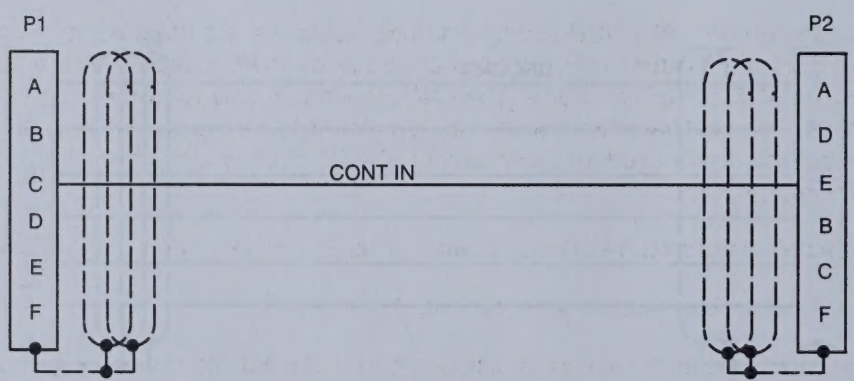




TO:
1) J4 of RT AUD/DATA connector
2) J3 of RCU AUD/DATA connector



TO:
1) J1 of Power Supply Adapter
2) J1 of Power Supply Adapter



CX-13314 (SRM W4 Cable)

CHAPTER 6

FILL DEVICES

Subject	Para	Page
General	6.1	6-1
Automated Net Control Device (ANCD)	6.2	6-1
ECCM Fill Device	6.3	6-3

6.1. GENERAL.

The SINCGARS radio may be loaded with required data in two ways. The primary method is by use of the Automated Net Control Device (ANCD) (AN/CYZ-10), which loads the radio with both COMSEC keys and frequency hopping (FH) data. The other method involves the use of a COMSEC fill device (KYK-13, KYX-15, KOI-18) to load COMSEC keys and an ECCM fill device (MX-18290) to load FH data. This chapter provides minimum essential guidance to the unit level maintainer regarding maintenance of the ANCD and ECCM Fill Device.

6.2. AUTOMATED NET CONTROL DEVICE (ANCD).

a. **Maintenance Concept.** The maintenance concept for the ANCD is for the unit level maintainer to requisition and repair all external parts in accordance with TM 11-5810-394-14&P. If the problem is internal, unit maintenance personnel will use BIT software to determine the operational status of the ANCD. If the BIT confirms that the ANCD is faulty, unit maintenance will turn in the faulty ANCD through normal supply channels to a COMSEC depot. The unit will then requisition a replacement ANCD through normal supply channels. Also, replacement ANCDs are available at brigade and higher level signal offices for temporary loan to units needing replacement ANCDs. Unit SOP should indicate how temporary replacement ANCDs are to be provided to subordinate units.

b. **Battery Replacement.** All ANCD users, including operators, are required to change the ANCD batteries whenever necessary. Batteries should be changed as soon as feasible after the "LOW BAT" message appears in the ANCD display window. The ANCD will retain data for two minutes after the batteries have been removed. You will have two minutes to complete battery replacement, or all data stored in the ANCD will be lost. The procedure for changing ANCD batteries is as stated below and as shown in the accompanying graphic.

(1) Using a coin or screwdriver, remove four screws and battery compartment cover from the ANCD.

(2) Remove the battery housing from the ANCD.

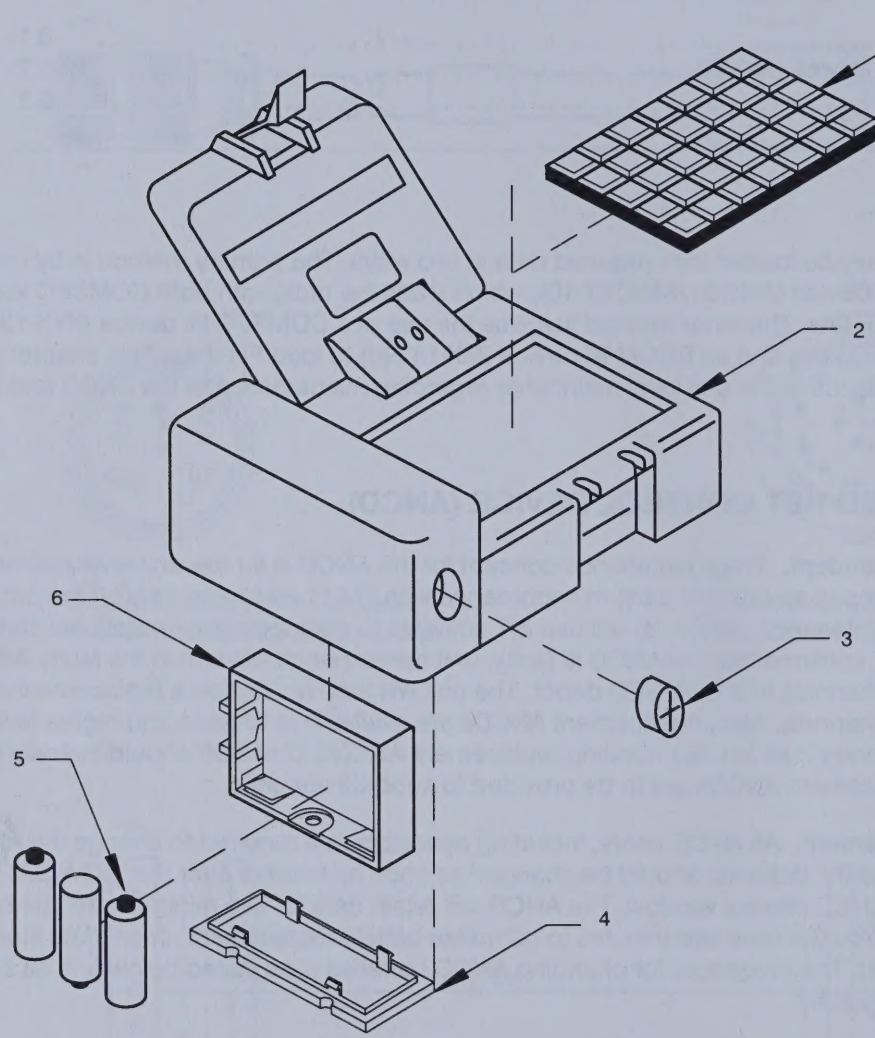
(3) Remove batteries from the battery housing and replace them, maintaining proper polarity.

(4) Insert the battery housing into the ANCD, again ensuring proper polarity.

(5) Install the battery cover and tighten screws to a firm setting.

(6) Turn the ANCD ON and verify that battery change was successful.

6.2. AUTOMATED NET CONTROL DEVICE (ANCD). Continued



LEGEND:

1. Keypad
2. ANCD Case
3. CIK
4. Battery Cover
5. Batteries
6. Battery Case

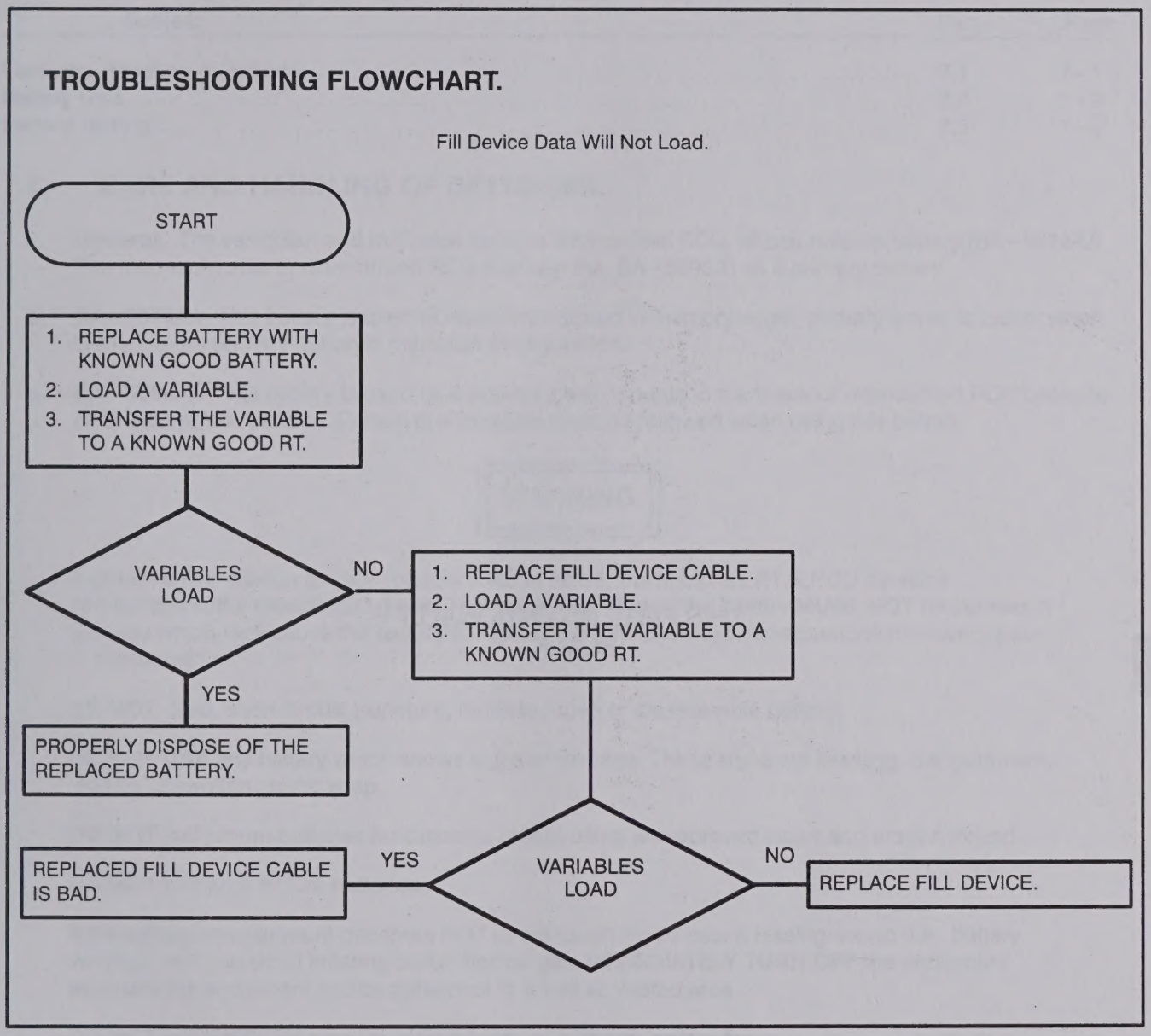
ANCD BATTERY REPLACEMENT

c. **Unit Level Maintenance Tasks.** See TB 11-5820-890-12, "Operator and Unit Maintenance for AN/CYZ-10 Automated Net Control Device (ANCD)", and TM 11-5810-394-14&P, "Operator's Unit, Direct Support, and Specialized Repair Activity Maintenance Manual with Repair Parts and Special Tools List for the Automated Net Control Device." (NOTE: There are no DS maintenance functions associated with the ANCD.)

6.3. ECCM FILL DEVICE (MX-18290).

a. If fill device will not accept a fill of FH data, troubleshoot as shown below.

TROUBLESHOOTING FLOWCHART.



b. If fill device is faulty, send device to DS level maintenance for repair.

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CHAPTER 7

BATTERIES

Subject	Para	Page
Care and Handling of Batteries	7.1	7-1
Battery Data	7.2	7-2
Battery Testing	7.3	7-4

7.1. CARE AND HANDLING OF BATTERIES.

a. General. The vehicular and manpack radio or dismounted RCU, all use hold up battery (BA-5372/U). The manpack radio or dismounted RCU also use the BA-5590/U as a primary battery.

b. BA-5372/U. This battery is used to retain data stored in memory when primary power is lost or when changing the primary batteryin manpack configuration.

c. BA-5590/U. This battery is used as a primary power source in manpack or dismounted RCU because of its high power density. Certain precaustions must be followed when using this battery.

WARNING

A lithium-sulfur dioxide (LI-SO_2) battery used to power the Manpack RT & RCU contains pressurized sulfur dioxide (SO_2) gas. The gas is **TOXIC**, and the battery **MUST NOT** be abused in any way which may cause the battery to rupture. Strictly follow these precautions to prevent injury to personnel:

DO NOT heat, short circuit, puncture, mutilate, open or disassemble battery.

DO NOT USE any battery which shows signs of damage. These signs are swelling, disfigurement, leaking or swollen plastic wrap.

DO NOT test lithium batteries for capacity, unless using an approved tester and are authorized.

DO NOT recharge lithium batteries.

If the battery compartment becomes HOT to the touch, if you hear a hissing sound (i.e., battery venting), or if you smell irritating sulfur dioxide gas, **IMMEDIATELY TURN OFF** the equipment. evacuate the equipment and/or personnel to a well ventilated area.

DO NOT use a **HALON** type fire extinguisher on a lithium battery fire.

DO NOT bypass the internal fuse or replace the fuse with a fuse of a different rating.

In the event of a fire near a lithium battery(ies), rapid cooling of the battery(ies) is important. Use a carbon dioxide (CO_2) extinguisher.

7.2. BATTERY DATA.

a. BA-5372/U. Nominal power drain in the OFF position is 0.2 mAH. It has the following characteristics:

- Nominal Voltage 6.5 V dc
- Weight 1.5 oz
- Capacity 6 + months (constant use)

b. BA-5590/U. This battery has a rated capacity of 12 amp-hours. Due to differences in usage, the number of operating hours is not predictable. The RT gives a rough estimate based upon the amount of time transmitting and receiving, if the battery condition is entered when the RT is placed into service. Refer to the chart below for typical battery life. The BA-5590 has the following characteristics:

- Nominal Voltage 12 V dc
- Weight 1.0 Kg (2.25 lbs.)
- Capacity 12 Amp-hours

MANPACK BATTERY

MANPACK RADIO MAIN POWER

(BA-5590: Approximate Length of Expected Service: RF PWR in HI)

VOICE/DATA: FH & CT	RT-1523	RT-1523A	RT-1523B
Normal (OPR)*	18 Hr	30 Hr	26 Hr
Heavy (NCS)**	11 Hr	18 Hr	15 Hr
Standby (STBY)	3+Mon	3+Mon	3+Mon

* *Operator usage rate is defined as 9 minutes of receiving/monitoring to every 1 minute of transmitting, on average.*

** *NCS usage rate is defined as 2 minutes of receiving/monitoring to every 1 minute of transmitting, on average.*

c. Storage. Extended periods of storage have minimal effect on lithium batteries. The BA-5590/U has an estimated shelf life of 5 to 10 years when stored a clean, dry, well ventilated area.

WARNING

DO NOT store lithium batteries with other hazardous materials.

DO NOT store lithium batteries near open flames or extreme heat.

CAUTION

DO NOT store lithium batteries in unused equipment for more than 30 days.

DO NOT accumulate or store waste batteries for more than 90 days.

DO store lithium batteries in a cool (less than 130 degrees F), dry well ventilated area. Bulk storage of batteries should be in a sprinkler protected area.

7.2 BATTERY DATA. Continued

d. Disposal. Most lithium batteries produced after January 1989 have a built-in Complete Discharge Device (CDD). Batteries with a CDD can be identified by an attention label over the switch and a card packed with each battery. This card provides instructions for discharging the battery with the CDD.

WARNING

If a lithium battery is damaged, malfunctions, or shows signs of overheating (i.e. too hot to hold during discharge, melted plastic case or a vented cell) you CAN NOT ensure that it will properly discharge. **DO NOT** attempt to discharge and turn in as **REACTIVE HAZARDOUS WASTE**.

DO NOT pack batteries in a box, barrel, or drum during discharge. Batteries should be temporarily stored in a cool, dry, well ventilated area. Batteries should have at least 2 inches clearence. Batteries should be stored for no less than 5 days and no more than 90 days after discharge.

DO NOT package batteries until they are cool to the touch.

Lithium batteries without a built-in Complete Discharge Device (CDD), **MUST BE** disposed as **REACTIVE HAZARDOUS WASTE**.

Completely discharged lithium are **NON-REACTIVE HAZARDOUS WASTE** under Ferderal Regulations and they may be disposed of as **NON-HAZARDOUS SOLID WASTE** IAW STATE and Local Laws. Coordination with your local IEO is required prior to disposal.

CAUTION

Lithium battery will generate heat during discharge.

If a new battery fails to operate your equipment, **DO NOT** attempt to discharge the battery with the CDD. Dispose of as **HAZARDOUS WASTE**.

If the battery has a CDD, the **CDD MUST** be activated prior to disposal.

For additional information regarding battery disposal, refer to **TB 43-0134, Battery Disposition and Disposal**.

7.3. BATTERY TESTING.

1. BA-5590/U

a. **General.** The high cost of high power lithium batteries and the safety aspects of partially depleted batteries has generated a need for an accurate and reliable capacity meter. The accuracy of the LS-94 is typically +/- 10% of the battery capacity, in an operating temperature range of 1 to 50 degrees Celsius. Batteries of the following types (BA-5598 and BA-5590) can be tested with the commercial Energage LS-94. The LS-94 has five status modes and seven state of charge levels, in increments of 10% to 70%. See Energage LS-94 Technical Manual for specifics.

b. **Setup.** When turned on, the LS-94 performs a power-on test. This test can be observed from the front panel display. After power-on test is performed allow the LS-94, 10 minutes warm-up time to ensure proper results.

SWITCH:	SETTING:
Battery Voltage Selector	15 V
Manufacturer Selector	A (For PCI/PCCI)
	B (For SAFT/Duracell)
	F (For BA-5588 PCI)

c. **Testing.** Testing process takes approximately 2 minutes.

CONNECT:	Battery with appropriate connector cable (each type is different)
PRESS:	The START TEST pushbutton momentarily.
OBSERVE:	The front panel display.

TESTS PERFORMED:	RESULTS POSSIBLE:
OCV (Open Circuit Voltage)	Pass or Fail
OCV (Closed Circuit Voltage)	Pass or Fail

NOTE

If either of these test fail **DO NOT RERUN TEST**. Dispose of faulty battery.

STATE OF CHARGE:	0 – 10%, 20%, 30%, 40%, 50%, 60%, 70 – 100%

NOTE

When testing old batteries, the RETEST light bar will turn on with one of the CAPACITY light bars. To verify reading, RERUN test by pressing the START TEST pushbutton. **DO NOT TEST** a battery more than three times consecutively.

2. BA-5372/U

a. SINCGARS RT tests HUB battery. HUB display when flashing indicates weak battery. HUB display (steady) indicates dead or missing HUB. No HUB display indicates Good HUB.

CHAPTER 8

COMPONENT REPLACEMENT/REPAIR

Subject	Para	Page
Inspection Procedures	8.1	8-1
Component Replacement	8.2	8-4
Component Repair	8.3	8-16

8.1. INSPECTION PROCEDURES.

The following chart shows, by radio system component, those items which should be inspected as a normal step in the maintenance process. Inspection consists of making those checks shown in the right column plus such other checks as the unit maintainer deems appropriate. Subsequent paragraphs provide guidance concerning replacement and repair of components. It should be noted that inspection requirements are in addition to checks made through application of the Operational Check and related use of Troubleshooting Flowcharts.

COMPONENT	ITEM	CHECK FOR:
a. RT/RCU/	Case	Cracked or dented? Screws missing
	Displays	Cracked? Discolored? Damaged?
	Controls	Knobs missing? Set screws missing? Knobs tightly mounted on shaft?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Connector caps (RT/RCU only)	Protective caps broken or missing? Chains or cords broken or missing?
b. Handset	N/A	Cracks in body? Cable torn or damaged? Connector broken? O-ring lubricated? Chips in pins? Packing nut tight?
c. Manpack Antenna	Base	Damaged or broken?
	Blades or Rods	Bent or damaged? Retaining cords serviceable? Antenna fully extendable?
	Connectors	Threads damaged or stripped? Good connection achieved?

8.1. INSPECTION PROCEDURES. Continued

COMPONENT	ITEM	CHECK FOR:
d. Vehicular Antenna	Element	Complete? Broken? Threads clean and lubricated?
	Base	O-ring distorted? Clean and lubricated?
	Safety wire	In place? Correctly installed?
	Mounting bracket	Complete? Broken?
	Ground	Correctly installed? Corroded or rusted? Good bond?
	Cables	Complete? Correctly routed? Pins bent or missing? Cover worn or torn? Connectors damaged?
e. Power Supply Adapter	Case	Cracked or dented? Hardware missing?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Protective caps	Protective caps broken or missing? Chains or cords broken or missing?
	DS1	Tight connection to chassis? Lens damaged or missing? Bulb burned out?
	Thumbscrews	Thumbscrews serviceable?
f. Battery Tray	Case	Cracked or dented?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Strike catches	Screws loose or missing? Catches damaged?
	Gasket	Cut or torn? Properly seated?
g. Control Monitor	Case	Cracked or dented? Screws missing?
	Displays	Cracked? Discolored? Damaged?
	Controls	Knobs missing? Set screws missing? Knobs tightly mounted on shaft?

8.1. INSPECTION PROCEDURES. Continued

COMPONENT	ITEM	CHECK FOR:
g. Control Monitor (Continued)	Cables	Complete? Correctly routed? Pins bent or missing? Cover worn or torn? Connectors damaged?
h. VIC-1 / AM-1780 / C-2297 / C-2298	Case	Cracked or dented? Screws missing? Bolts, washers, nuts missing?
	Controls	Knobs missing? Set screws missing? Knobs tightly mounted on shaft?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Cables	Complete? Correctly routed? Pins bent or missing? Cover worn or torn? Connectors damaged?
	DS1	Tight connection to chassis? Lens damaged or missing? Bulb burned out?
i. LS-671/VRC Loudspeaker	Case	Cracked or dented? Screws missing? Bolts, washers, nuts missing?
	Controls	Knobs missing? Set screws missing? Knobs tightly mounted on shaft?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Cables	Complete? Correctly routed? Pins bent or missing? Cover worn or torn? Connectors damaged?
	DS1	Tight connection to chassis? Lens damaged or missing? Bulb burned out?
j. Mounting Base	Frame	Cracked or dented? Hardware missing?
	Connectors	Threads damaged or stripped? Cracks or chips between contacts?
	Protective caps	Protective caps broken or missing? Chains or cords broken or missing?
	Thumbscrews	Thumbscrews serviceable?

8.2. COMPONENT REPLACEMENT.

The following charts show by radio system component, those actions required to remove and install each component. These charts cover all components of a short range , single radio mount system. Skip any component that is not a part of the system being worked on. The component that needs to be replaced will be identified by inspection, as noted above, or through application of the Operational Check and related Troubleshooting Flowcharts. A general rule is to remove only those components that are required for maintenance.

WARNING

REMOVE vehicular power from Mounting Base connector J1 before removing or replacing components. If vehicular power is not removed, some connectors will have 22 to 32 V dc present.

In replacing an LS-671 Loudspeaker, disconnect cable from Mounting Base connector J3 or J4. If cable is not disconnected, there will be 22 to 32 V dc present at pin B of the open cable connector.

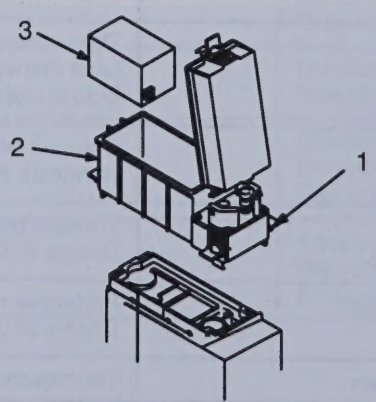
CAUTION

DO NOT under any circumstances remove component covers or remove modules from components. Opening components in the field will destroy them.

DO NOT tilt or twist the RT/RCU when removing it from, or replacing it in, a power supply adapter (PSA) to avoid damaging the connectors. The RT/RCU must be flat on the PSA when mating the connectors.

a. Remote Control Unit (RCU) (Dismounted):

TO REMOVE:	TO REPLACE:
(1) Set RCU FCTN to STBY	(1) Position battery in battery box
(2) Disconnect field fire from battery box terminal posts	(2) Fasten two latches to secure battery box lid
(3) Unfasten four battery box latches	(3) Position battery box on RCU
(4) Remove battery box	(4) Fasten latches to secure four battery box to RCU
(5) Unfasten two latches securing battery box lid	(5) Connect field wire to battery box terminal posts
(6) Remove battery	(6) Set RCU FCTN to SQ ON



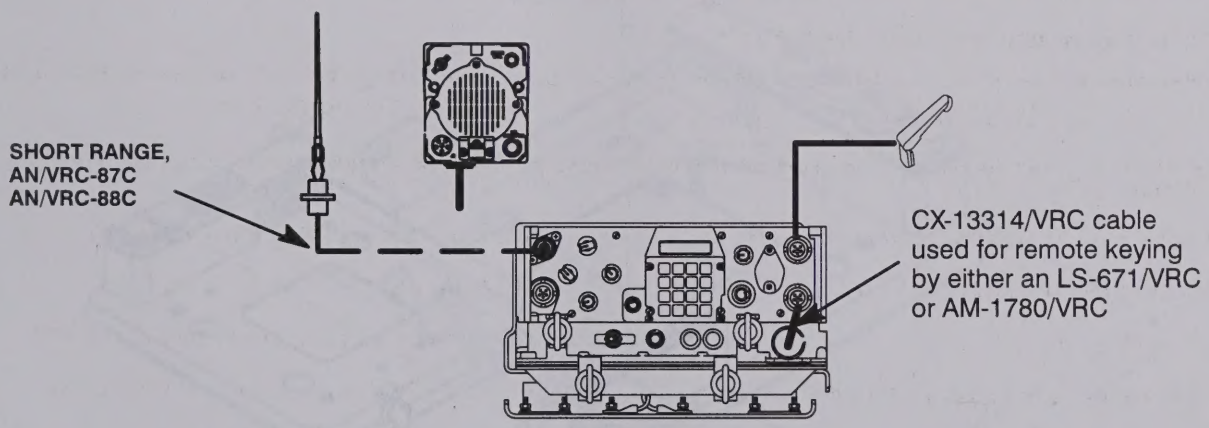
8.2. COMPONENT REPLACEMENT. Continued

b. Receiver-Transmitter (RT)/Remote Control Unit (RCU):

TO REMOVE:	TO REPLACE:
(1) Set PSA CB1 to OFF; if used, turn LS-671 CB1 to OFF	(1) Position RT/RCU in PSA
(2) Remove handset from RT/RCU AUD/FILL or AUD/DATA	(2) Tighten PSA thumbscrews to secure RT/RCU
(3) Remove CX-13314 from RT AUD/DATA, if present	(3) Connect RF cable to RT ANT J1, if present
(4) Remove RF cable from RT ANT J1, if present	(4) Connect CX-13314 to RT AUD/DATA, if present
(5) Loosen PSA thumbscrews securing RT/RCU	(5) Connect handset to RT AUD/FILL, if CX-13314 is present, or AUD/DATA
(6) Pull RT/RCU straight forward to clear PSA	(6) Set PSA CB1 to ON; if used, turn LS-671 CB1 to ON

NOTE

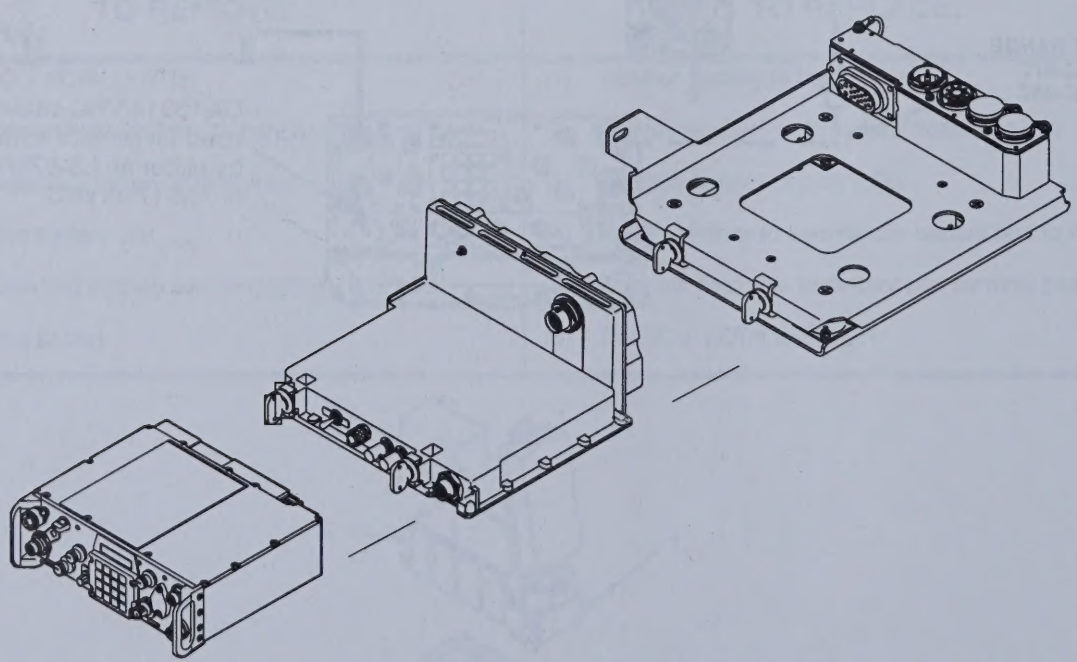
Remove holding battery before evacuating bad RT to Direct Support. The battery is removed to avoid compromise of any loaded variables.



8.2. COMPONENT REPLACEMENT. Continued

c. Power Supply Adapter (PSA):

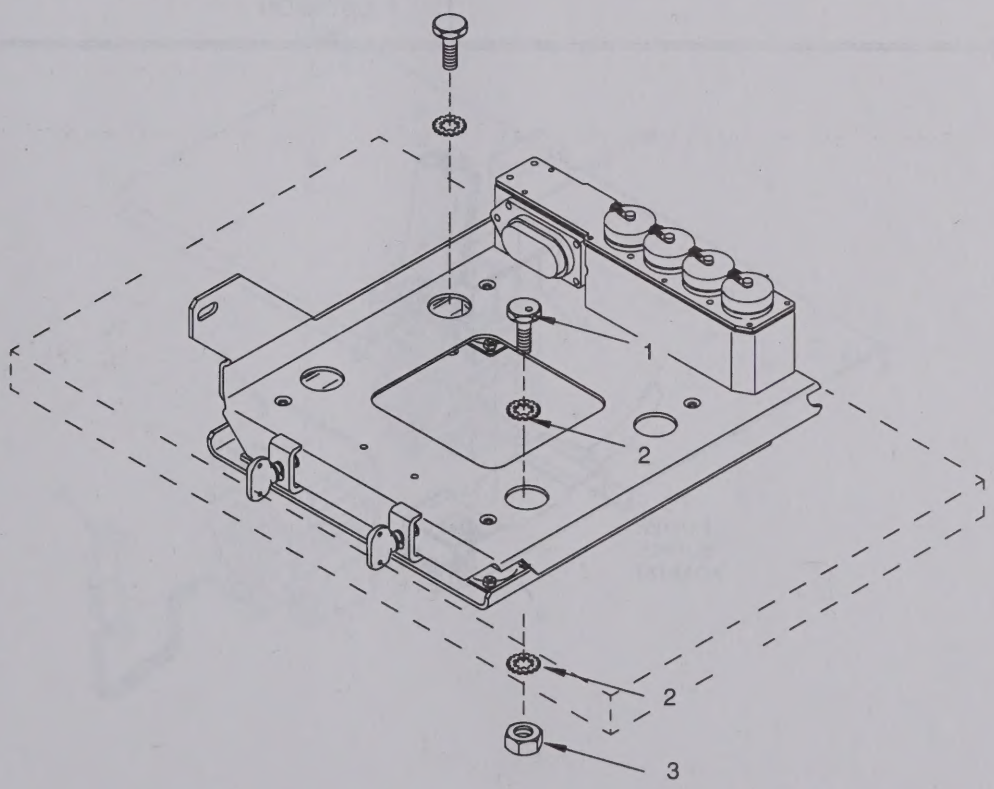
TO REMOVE:	TO REPLACE:
(1) Set PSA CB1 to OFF; if used, turn LS-671 CB1 to OFF	(1) Position PSA on MB, slide into correct position.
(2) Remove RT/RCU from PSA	(2) Secure PSA to MB by tightening thumbscrews
(3) Remove field wire from binding posts, if RCU is used to remote RT	(3) Set PSA S1 to REMOTE, if LS-671 or VIC present Set PSA S1 to LOCAL, if external equipment not used
(4) Remove CX-13290 from PSA J4, if battery tray is present	(4) Connect CX-13290 to PSA J4, if battery tray is present
(5) Loosen thumbscrews securing PSA to MB (MT-6576)	(5) Install RT/RCU on PSA
(6) Remove PSA from MB by pulling straight forward until clear of MB	(6) Connect CX-13314 to PSA J1, if battery tray is present
	(7) Connect field wire to binding posts, if RCU is used to remote RT
	(8) Set PSA CB1 to ON; if used, turn LS-671 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

d. Mounting Base (MB) (MT-6576):

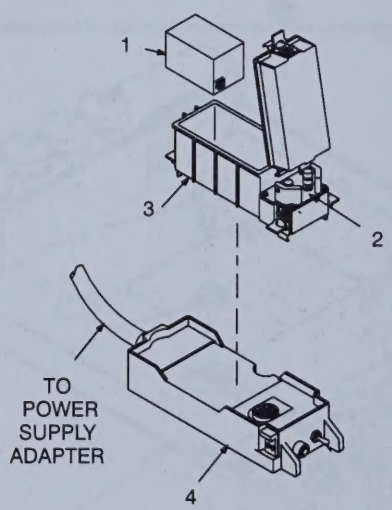
TO REMOVE:	TO REPLACE:
(1) Set PSA CB1 to OFF; if used, turn LS-671 CB1 to OFF	(1) Place MB in position on shelf
(2) Remove RT/RCU	(2) Replace bolts (1), lockwashers (2), and nuts (3) securing MB to shelf
(3) Remove PSA	(3) Connect all cables to MB connectors
(4) Remove all cables from MB connectors	(4) Replace PSA
(5) Remove bolts (1), lockwashers (2), and nuts (3) from MB	(5) Replace RT/RCU
(6) Remove MB from shelf	(6) Set PSA CB1 to ON; if used, turn LS-671 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

e. Battery Tray (CY-8664):

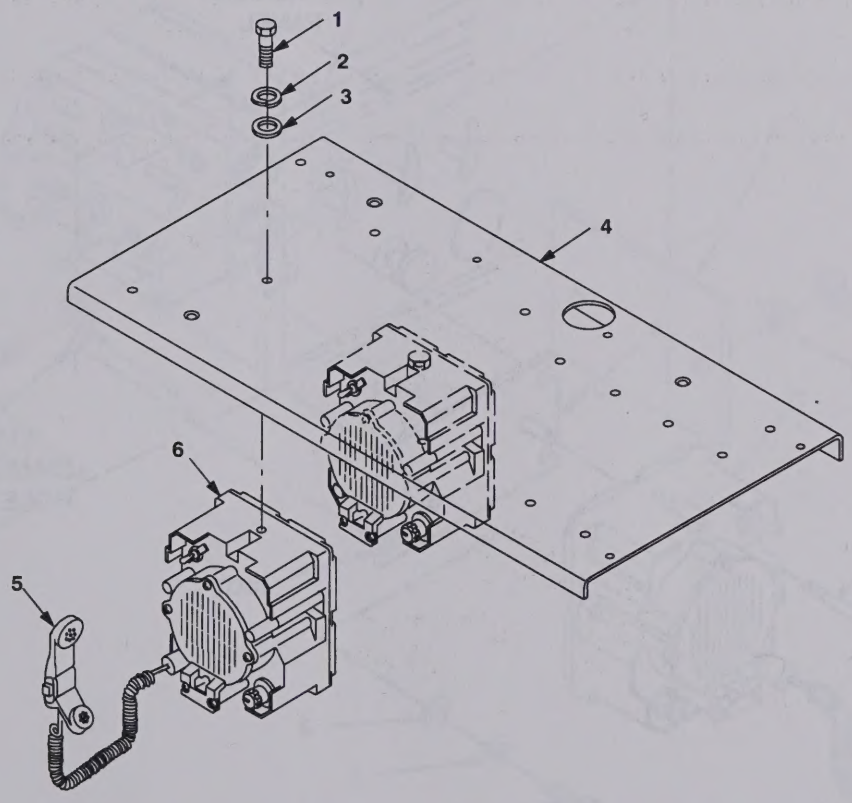
TO REMOVE:	TO REPLACE:
(1) Set PSA CB1 to OFF; if used, turn LS-671 CB1 to OFF	(1) Connect CX-13290 to battery tray J1
(2) Release four hold-down catches from battery tray (4) and remove battery box (3)	(2) Connect CX-13290 to PSA J4 and slide PSA into MB
(3) Remove battery (1) from battery box (3) by releasing hold-down clamp on battery box, if necessary	(3) Replace RT/RCU
(4) Remove RT/RCU	(4) Replace battery (1) in battery box (3), secure hold-down clamp on battery box
(5) Remove PSA, remove CX-13290 from PSA J4	(5) Secure battery box (3) to battery tray (4) with four hold-down catches
(6) Remove CX-13290 from battery tray J1	(6) Set PSA CB1 to ON; if used, turn LS-671 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

f. Loudspeaker (LS-671) (Shelf Mount):

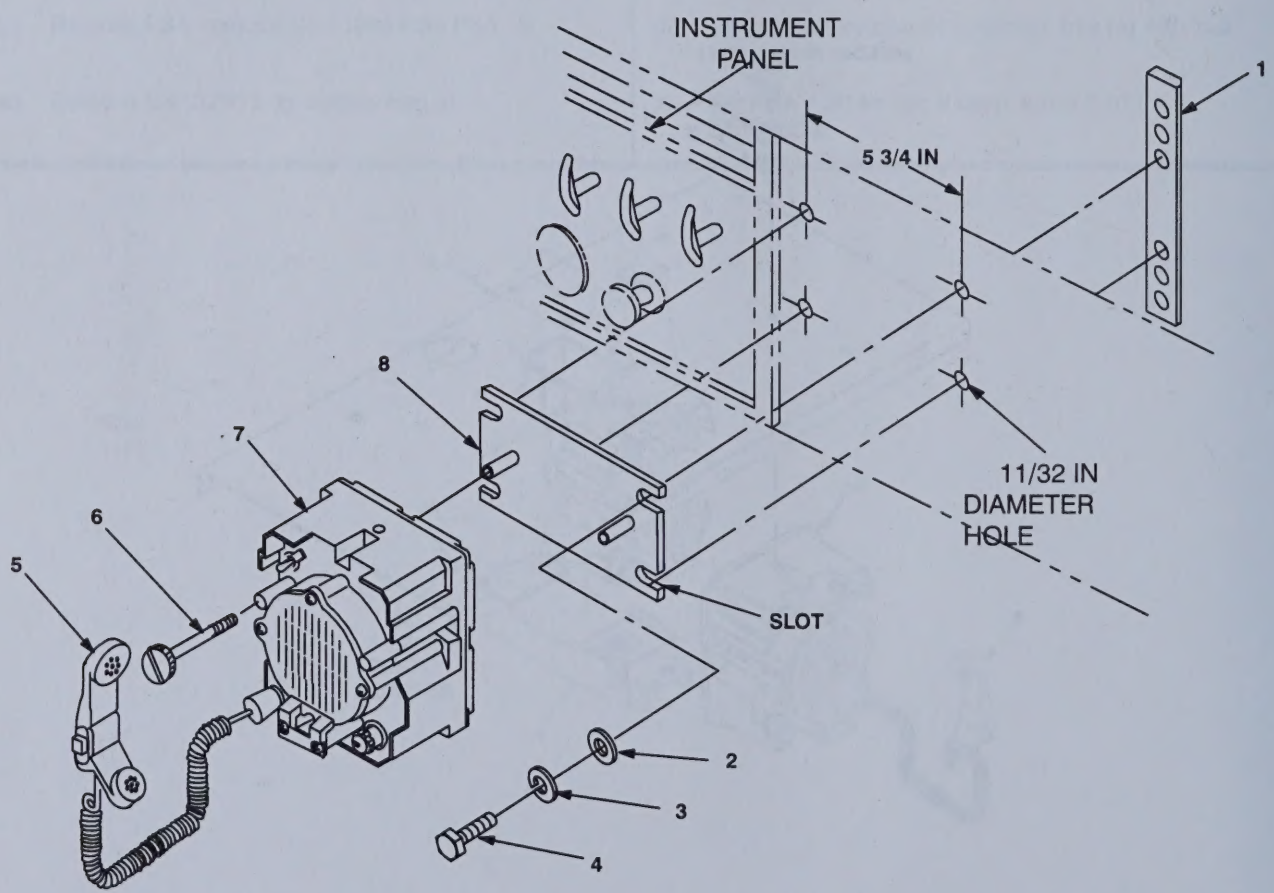
TO REMOVE:	TO REPLACE:
(1) Set LS-671 CB1 to OFF	(1) Place loudspeaker (6) in position under radio shelf (4)
(2) Remove mounting base from radio shelf (4)	(2) Replace retaining bolts (1) and washers (2, 3)
(3) Remove all cables from connectors	(5) Replace all cables on connectors
(4) Remove retaining bolts (1) and washers (2, 3)	(6) Replace mounting base on radio shelf (4)
(5) Remove loudspeaker (6) from radio shelf (4)	(5) Set LS-671 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

g. Loudspeaker (LS-671) (Dashboard Mount):

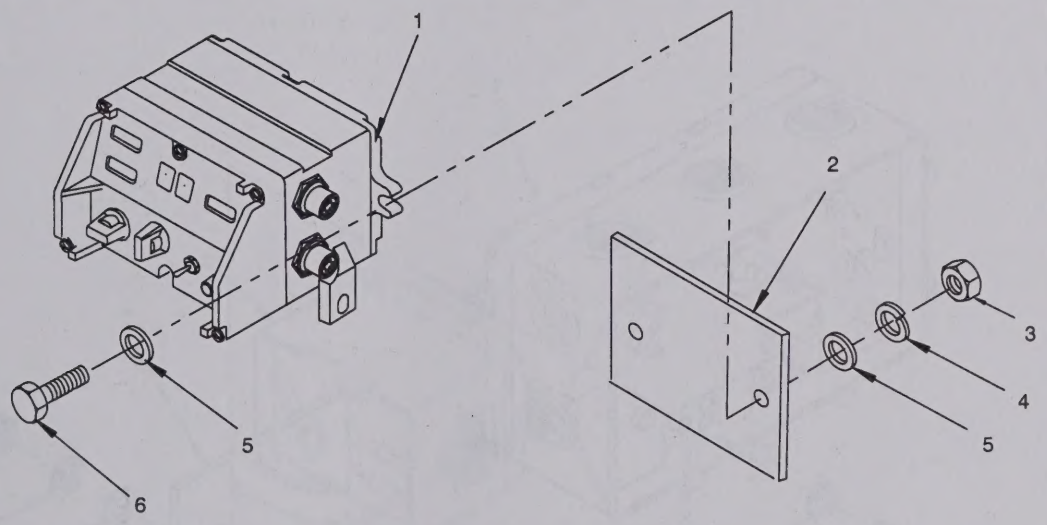
TO REMOVE:	TO REPLACE:
(1) Set LS-671 CB1 to OFF	(1) Place loudspeaker (7) in position on mounting plate (8)
(2) Remove all cables from connectors	(2) Replace two retaining screws (6)
(3) Remove two retaining screws (6)	(5) Replace all cables on connectors
(4) Remove loudspeaker (7) from mounting plate (8)	(6) Set LS-671 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

h. Control-Monitor (C-11291) (C-M):

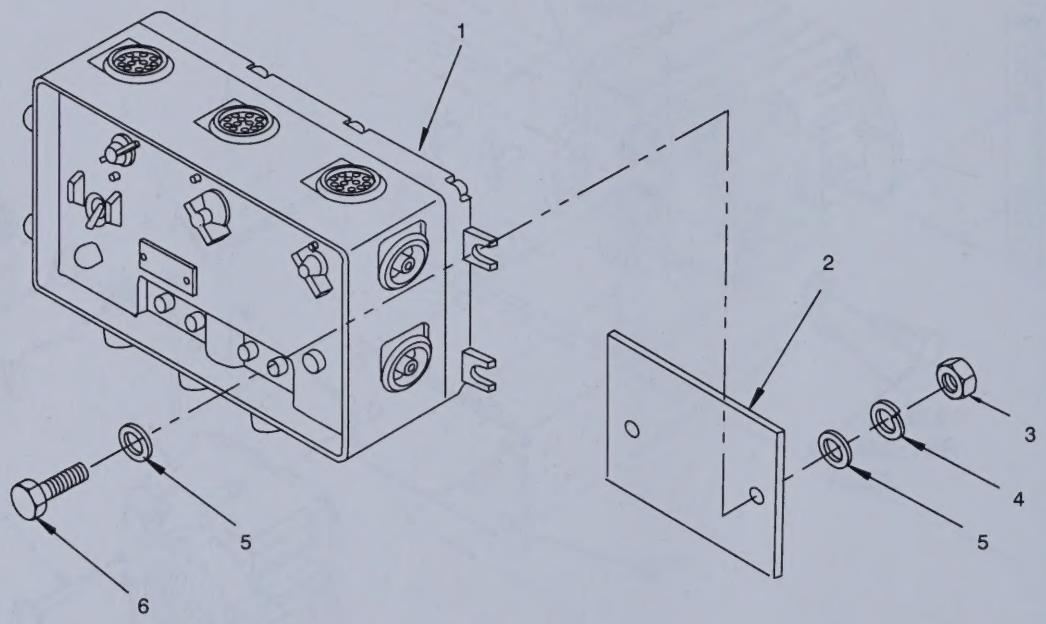
TO REMOVE:	TO REPLACE:
(1) Set VAA CB1 to OFF; if used, set LS-671 or VIC CB1 to OFF	(1) Place control-montior (1) in position on mounting plate (2)
(2) Remove all cables from control-monitor	(2) Replace bolts (6), washers (4, 5), and nuts (3) to secure control-monitor (1) to mounting plate (2)
(3) Remove bolts (6), washers (4, 5), and nuts (3) securing control-monitor (1) to mounting plate (2)	(3) Connect all cables to control-monitor
(4) Remove control-monitor (1) from mounting plate (2)	(4) Set VAA CB1 to ON; if used, set LS-671 or VIC CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

i. Amplifier Audio Frequency (AM-1780):

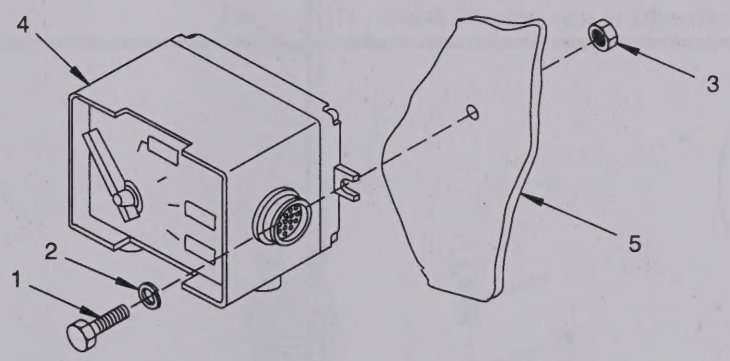
TO REMOVE:	TO REPLACE:
(1) Set AM-1780 CB1 to OFF	(1) Place AM-1780 (1) in position on mounting plate (2)
(2) Remove all cables from AM-1780	(2) Replace bolts (6), washers (4, 5), and nuts (3) to secure AM-1780 (1) to mounting plate (2)
(3) Remove bolts (6), washers (4, 5), and nuts (3) securing AM-1780 (1) to mounting plate (2)	(3) Connect all cables to AM-1780
(4) Remove control-monitor (1) from mounting plate (2)	(4) Set AM-1780 CB1 to ON



8.2. COMPONENT REPLACEMENT. Continued

j. Control Boxes (C-2297, C-2298):

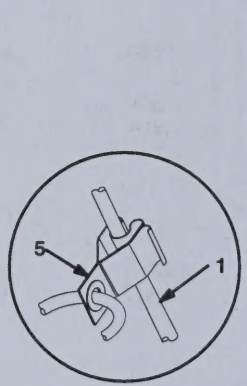
TO REMOVE:	TO REPLACE:
(1) Set AM-1780 CB1 to OFF	(1) Place control box (4) in position on mounting plate (5)
(2) Remove all cables from control box (4)	(2) Replace bolts (1), washers (2), and nuts (3) to secure control box (4) to mounting plate (5)
(3) Remove bolts (1), washers (2), and nuts (3) securing control box (4) to mounting plate (5)	(3) Connect all cables to control box (4)
(4) Remove control box (4) from mounting plate (5)	(4) Set AM-1780 CB1 to ON



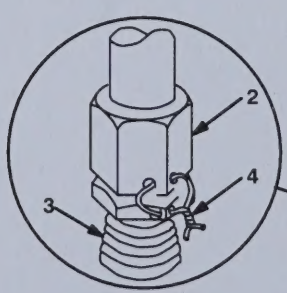
8.2. COMPONENT REPLACEMENT. Continued

k. Vehicular Antenna Elements:

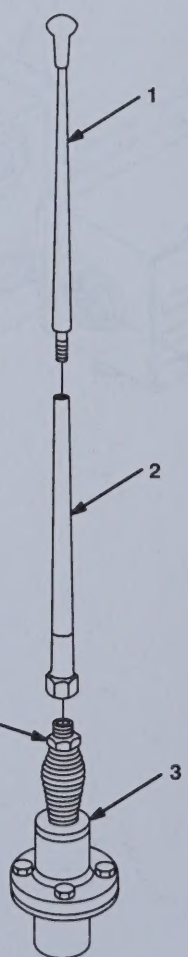
TO REMOVE:	TO REPLACE:
(1) Remove RF cable from antenna subassembly (refer to paragraph 8.2.l.)	(1) Apply silicone compound to element threads and assemble antenna elements (1, 2)
(2) Remove safety wire securing antenna element (2) to antenna base spring (3)	(2) Connect antenna element (2) to antenna base spring (3)
(3) Remove antenna elements (1, 2) from antenna base spring (3) by unscrewing antenna element (2)	(3) Install safety wire (4) to secure antenna element (2) to antenna base spring (3)
(4) Separate antenna elements (1, 2)	(4) Install RF cable to antenna subassembly (refer to paragraph 8.2.l.)
	(5) Attach clip (5) to antenna element (1). Tie rope to vehicle to position antenna in desired location.



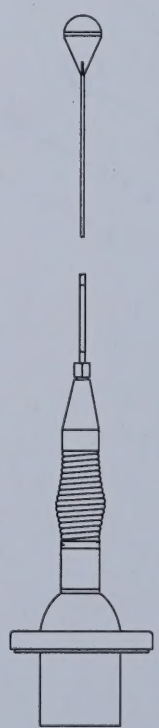
DETAIL B



DETAIL A



AS-3900

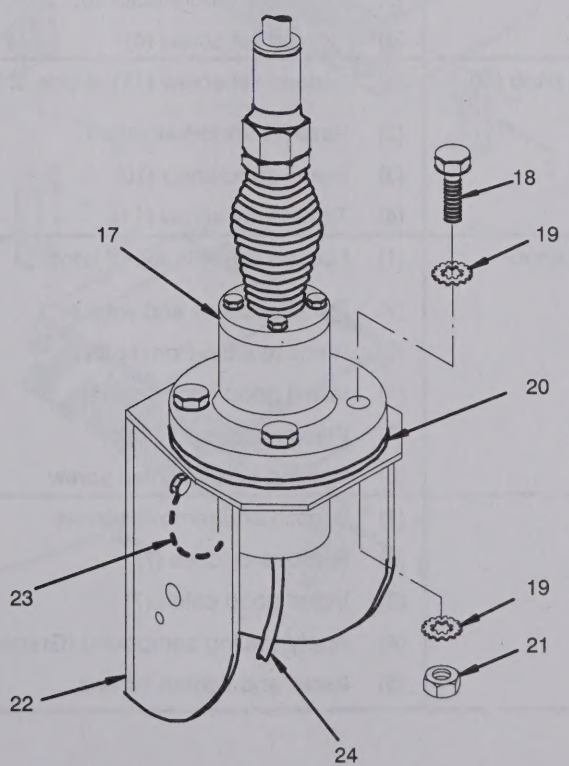


SLPA
AS-3916

8.2. COMPONENT REPLACEMENT. Continued

l. Vehicular Antenna Subassembly:

TO REMOVE:	TO REPLACE:
(1) Remove RF cable (24) from antenna subassembly (17)	(1) Apply thin coat of silicone compound to both sides of gasket (20); place on antenna mounting bracket (22) and align holes
(2) Remove antenna elements from antenna subassembly (17) (refer to paragraph 8.2.k.)	(2) Place antenna subassembly (17) on antenna mounting bracket (22) and align holes
(3) Remove 4 cap screws (18), 8 IET lockwashers (19), 4 nuts (21) securing antenna subassembly (17) and gasket (20) to antenna mounting bracket (22)	(3) Install screw and lockwasher securing ground (23) to antenna subassembly (17)
(4) Remove screw and lockwasher securing ground (23) to antenna subassembly (17)	(4) Coat washers (19) with RTV sealing compound
(5) Remove antenna subassembly (17)	(5) Install 4 cap screws (18), 8 IET lockwashers (19), and 4 nuts (21) securing antenna subassembly (17) and gasket (20) to antenna mounting bracket (22)
	(6) Install antenna elements to antenna subassembly (17) (refer to paragraph 8.2.k.)
	(7) Install RF cable (24) to antenna subassembly (17)



8.3. COMPONENT REPAIR.

The following charts show, by component, those items to be repaired at unit maintenance and those actions required by the Unit Maintainer to accomplish authorized repairs. While this paragraph contains instructions for complete disassembly of some components, Mounting Base MT-6576 series for example, the extent to which the Unit Maintainer will repair such items depends primarily upon unit SOP and maintenance policy.

The Antenna Connector J1 of the RT front panel is being changed from a DS to a unit maintenance task. The change requires application of a Modification Kit by DS maintenance. Once the modification is installed, the brass-colored J1 connector will be replaced by a silver-colored connector. When it becomes necessary to replace a silver-colored J1 connector, that task is a unit maintenance responsibility. Replacement of brass-colored J1 connectors continues to be a DS maintenance task, performed only when the item is damaged. This paragraph provides instructions for replacement of the silver-colored connector.

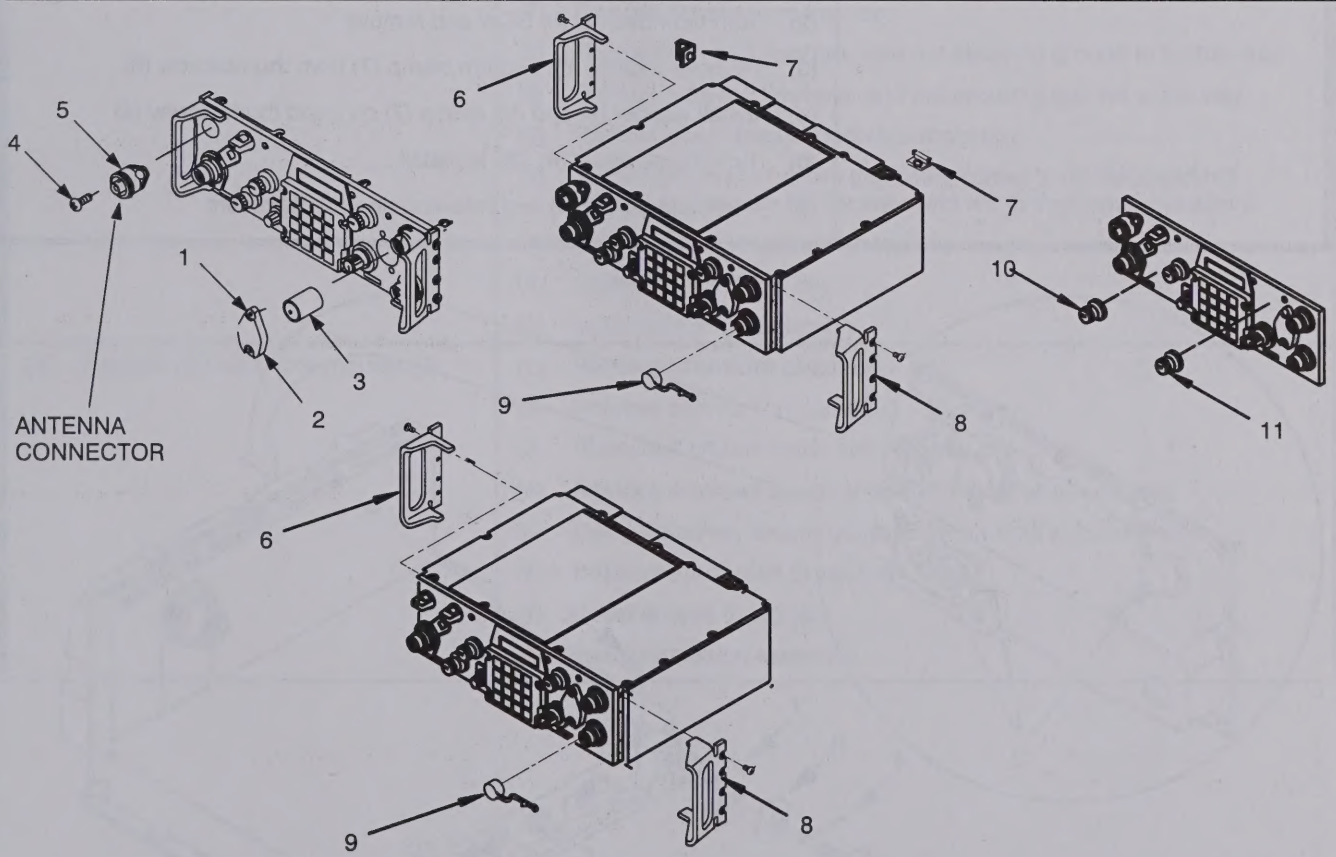
a. RECEIVER-TRANSMITTER (RT)(RT-1523 SERIES)/REMOTE CONTROL UNIT (RCU)(C-11561):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace handle (6) on RT/RCU	(1) Remove connector cover (9) from handle (6) (RT-1523/RCU) (2) Remove 4 screws from side of RT (RT-1523/RCU), or 2 screws from top of handle (RT-1523A) (3) Install new handle (6) (4) Replace screws and tighten (5) Replace connector cover (9) (RT-1523/RCU)
(2) Replace silver-colored antenna connector (5) (applies to part number A3167886-1 only)	(1) Remove screws (4) from connector (5) (2) Remove connector (5) (3) Install good connector (5) (4) Tighten set screw (4)
(3) Replace front panel control knob (10) (RT-1523/RCU)	(1) Loosen set screw (11) at side of knob (10) (2) Remove knob from shaft (3) Install good knob (10) (4) Tighten set screw (11)
(4) Replace front panel control knob (RT-1523A)	(1) Loosen screw in top of knob (2) Remove screw and washer (3) Remove knob from shaft (4) Install good knob (5) Place washer on shaft (6) Holding knob, tighten screw
(5) Replace strike catch (7)	(1) Loosen and remove screws (2) Remove catches (7) (3) Install good catch (7) (4) Apply sealing compound (Grade H) to screws (5) Install and tighten screws

8.3. COMPONENT REPAIR. Continued

a. RECEIVER-TRANSMITTER (RT)(RT-1523 SERIES)/REMOTE CONTROL UNIT (RCU)(C-11561): Continued

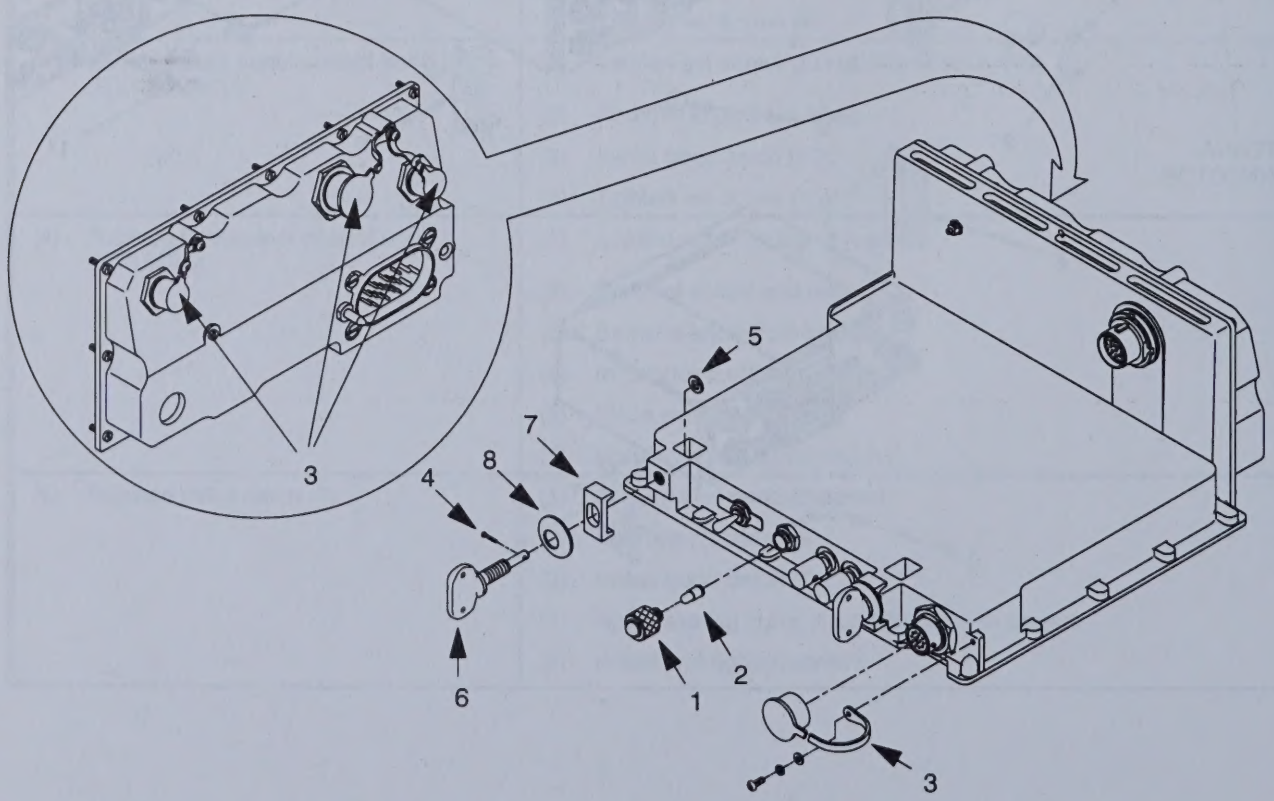
MAINTENANCE REQUIREMENT:	ACTIONS:
(6) Replace connector cover (9)	(1) Remove connector cover (9) from handle (6) (RT-1523/RCU) (2) Remove screw securing cover to handle (RT-1523A) (3) Install new connector cover (9) (4) Tighten screw to handle (RT-1523A)
(7) Replace hold-up (HUB) battery (3)	(1) Fully loosen captive screws (1) (2) Remove cover (2) (3) Remove battery (3) (4) Install battery with correct polarity (5) Install cover and tighten screws



8.3. COMPONENT REPAIR. Continued

b. POWER SUPPLY ADAPTER (PSA) (MX-10862):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace DS1 lamp/lens (1, 2)	(1) Turn lens (1) CCW to remove (2) Pull lens from holder (3) Replace lamp/lens (1, 2) (4) Insert lens and turn CW to tighten
(2) Replace connector cover (3)	(1) Remove retaining hardware (2) Remove cover (3) (3) Install good cover (4) Install retaining hardware and tighten
(3) Replace thumbscrew (6)	(1) Remove pin spring (4) and retaining ring (5), if present (2) Turn thumbscrew (6) CCW and remove (3) Remove washer (8), and rim clamp (7) from thumbscrew (6) (4) Install washer (8) and rim clamp (7) on good thumbscrew (6) (5) Turn thumbscrew (6) CW to install (6) Install pin spring (4) and retaining ring (5), if present



8.3. COMPONENT REPAIR. Continued

c. MOUNTING BASE (MT-6576):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace connector assembly (1)	(1) Remove screw and 2 washers securing ground to lower rear of connector assembly (6) (2) Remove screw and 2 washers securing ground to top of connector assembly (6) (3) Remove 5 screws, with 2 washers each, securing connector assembly to MB (4) Lift connector assembly from MB (5) Position good connector assembly on MB (6) Secure connector assembly to MB using 5 screws, 2 washers each (ensure lockwasher is between screw head and flat washer) (7) Replace top and rear grounds using screw and 2 washers each (ensure lockwasher is between ground and connector assembly)
(2) Replace ground lead (5, 6, 7)	(1) Remove connector assembly (1) (2) Remove screws from tray top (3) Remove screw, 3 washers, and nut securing ground to bottom tray (4) Remove screw, 3 washers, and nut securing ground to top tray (5) Position good ground lead on bottom tray (6) Secure ground to bottom tray using screw, 3 washers, and nut (see fig and ensure IET lockwashers are in their proper position) (7) Repeat step 6 for ground to top tray (8) Install screws to top tray (9) Install connector assembly
(3) Replace all four shock mounts (2)	(1) Remove connector assembly (2) Remove screws from top tray (3) Remove 4 ground leads from top tray (4) Remove 4 screws securing bottom tray to shock mounts (5) Using 4 screws, secure good shock mounts to bottom tray (6) Install ground leads to top tray (7) Install screws to top tray (8) Install connector assembly

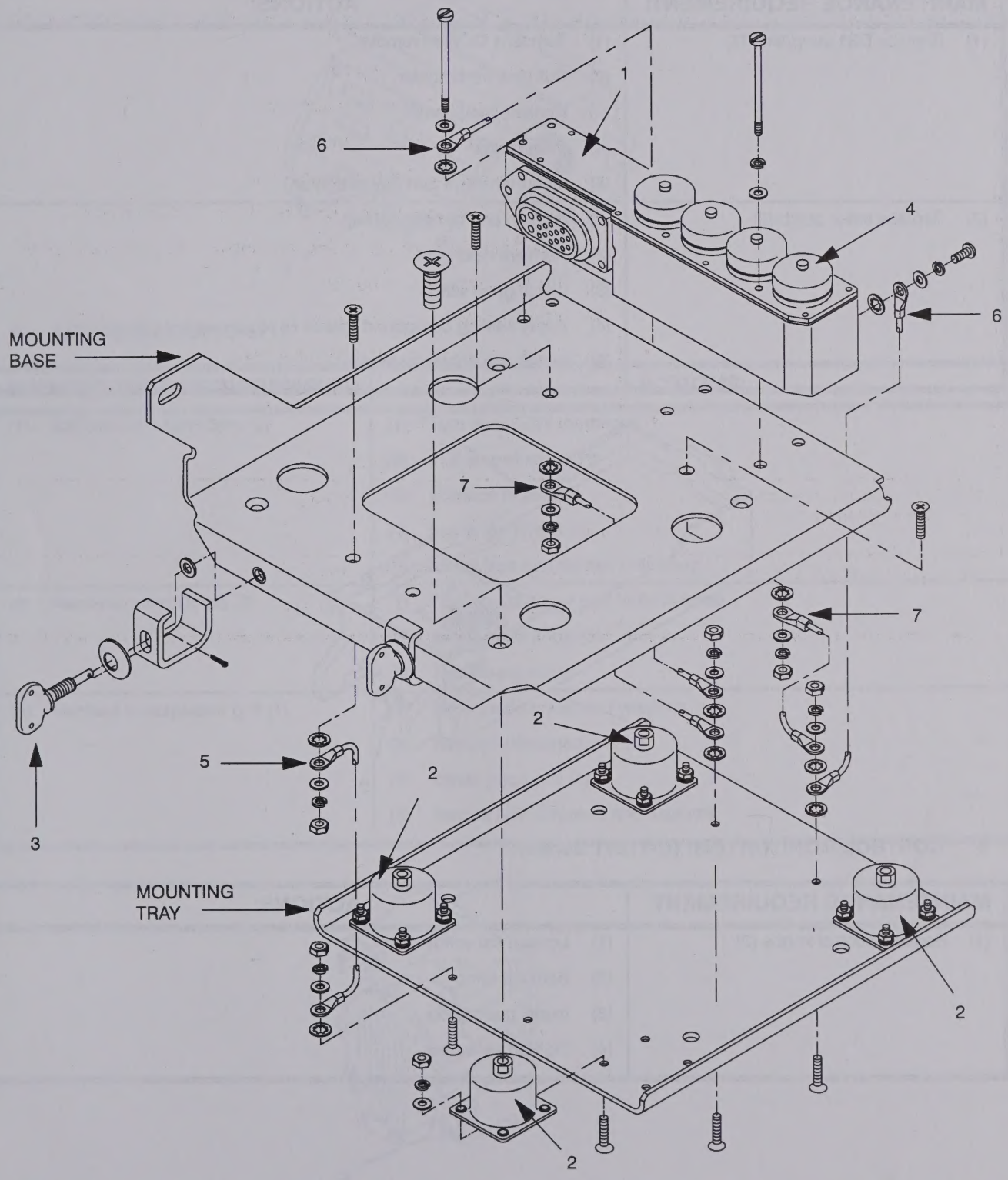
8.3. COMPONENT REPAIR. Continued

c. MOUNTING BASE (MT-6576): Continued

MAINTENANCE REQUIREMENT:	ACTIONS:
(4) Replace thumbscrew (3)	(1) Remove connector assembly (2) Remove screws from top tray (3) Remove ground leads from top tray (4) Remove spring pin from thumbscrew (5) Remove washer from thumbscrew end (6) Remove thumbscrew, rim clenching clamp, and retaining ring (7) Install rim clenching clamp and retaining ring on good thumbscrew (8) Install thumbscrew in top tray (9) Place flat washer on thumbscrew (10) Install spring pin in end of thumbscrew (11) Install 4 ground leads to top tray (12) Install screws to top tray (13) Install connector assembly
(5) Replace seal screw on back of connector assembly	(1) Remove seal screw with O-ring (2) Install good seal screw and O-ring
(6) Replace connector cover (4)	(1) Remove connector cover from retainer (2) Secure connector cover to retainer

8.3. COMPONENT REPAIR. Continued

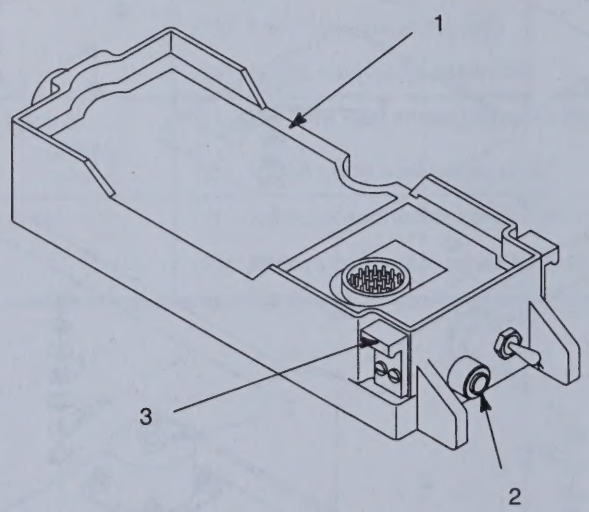
c. MOUNTING BASE (MT-6576): Continued



8.3. COMPONENT REPAIR. Continued

d. BATTERY TRAY (CY-8664):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace DS1 lamp/lens (2)	(1) Turn lens CCW to remove (2) Pull lens from holder (3) Replace lamp/lens (4) Install lamp (5) Install lens and turn CW to tighten
(2) Replace strike catch (3)	(1) Loosen and remove screws (2) Remove catch (3) Install good catch (4) Apply sealing compound (grade H) to screws (5) Install and tighten screws

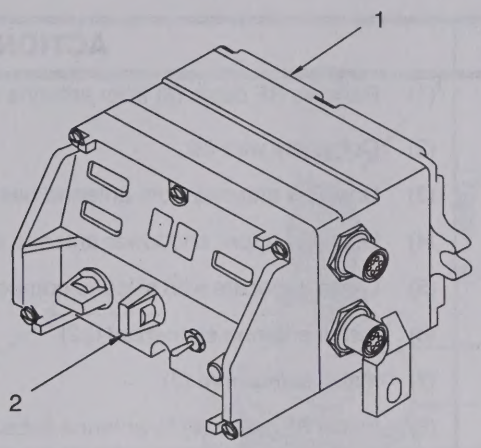


e. CONTROL-MONITOR (CM) (C-11291 Series):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace control knobs (2)	(1) Loosen set screw (2) Remove knob (3) Install good knob (4) Tighten set screw

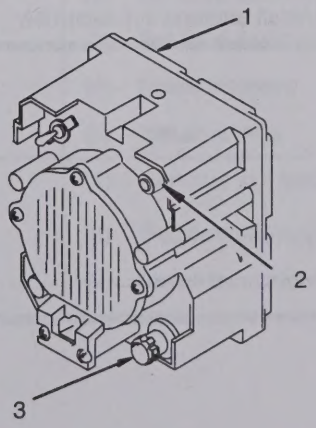
8.3. COMPONENT REPAIR. Continued

e. CONTROL-MONITOR (CM) (C-11291 Series): Continued



f. LOUDSPEAKER LS-671:

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace DS1 lamp/lens (2)	(1) Turn lens CCW to remove (2) Pull lens from holder (3) Replace lamp/lens (4) Install lamp/lens (2) (5) Install lens and tighten until snug
(2) Replace control knob (3)	(1) Loosen set screw and remove knob (2) Install good knob (3) (3) Tighten set screw
(3) Replace loudspeaker grill (1)	(1) Remove 6 screws and washers (2) Remove damaged grill (1) (3) Install good grill (1) (4) Secure with 6 screws and washers



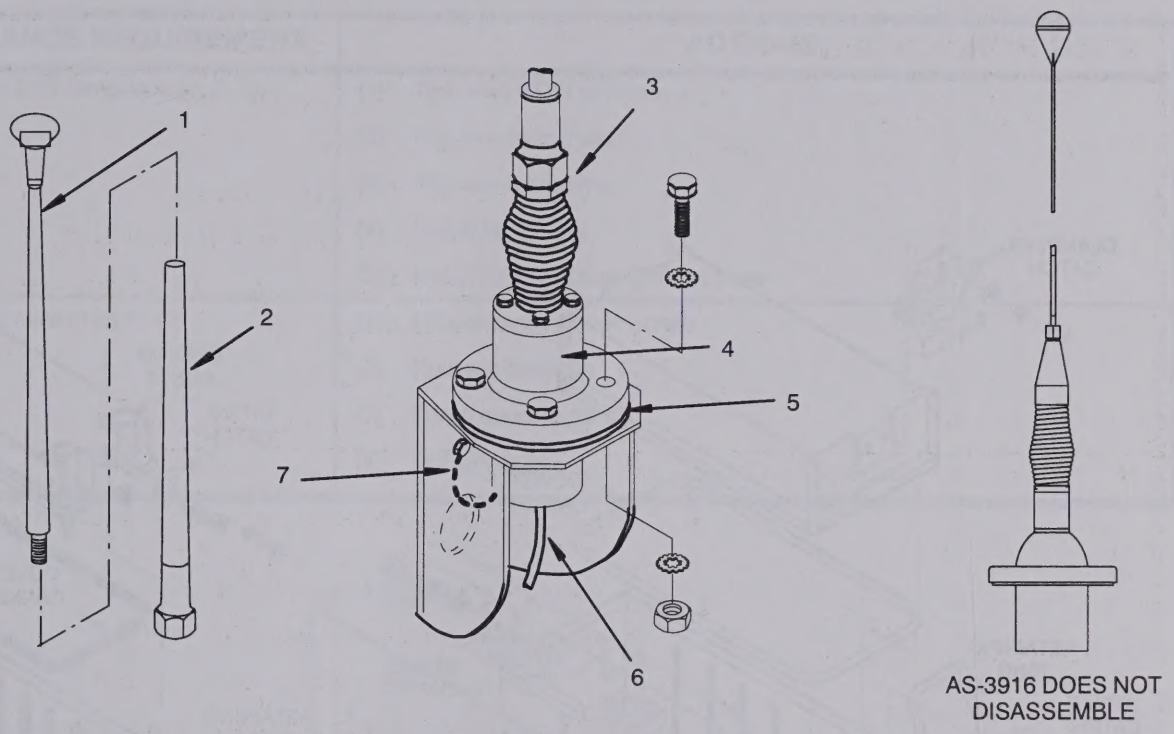
8.3. COMPONENT REPAIR. Continued

g. VEHICULAR ANTENNAS (AS-3900) (AS-3916 is not repairable):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace/clean/lubricate antenna elements (1, 2) (AS-3916 does not disassemble)	(1) Remove RF cable (6) from antenna subassembly (2) Cut safety wire (3) (3) Unscrew antenna from antenna base (4) Unscrew upper and lower antenna elements (1, 2) (5) Clean, lubricate with silicone compound, or replace as appropriate (6) Install antenna elements (1, 2) (7) Install safety wire (3) (8) Install RF cable (6) to antenna subassembly
(2) Replace antenna subassembly (4)	(1) Remove antenna elements (1, 2) (2) Remove 4 bolts, with 2 washers each, and 4 nuts from antenna base and bracket (3) Remove ground strap (7) from antenna subassembly (4) Remove gasket (5) and replace if required (5) Install good gasket on top of mounting bracket (6) Position good antenna subassembly on mounting bracket and install ground strap (7) (7) Coat all washers with Type III RTV compound (8) Install washer on each of 4 bolts (9) Install 4 bolts in base (10) Install washers and nuts and tighten (11) Install antenna elements
(3) Replace ground strap	(1) Remove antenna subassembly (2) Remove ground strap (7) from antenna mounting bracket (3) Install ground strap (7) to antenna mounting bracket (4) Install antenna subassembly

8.3. COMPONENT REPAIR. Continued

g. VEHICULAR ANTENNAS (AS-3900/3916): Continued

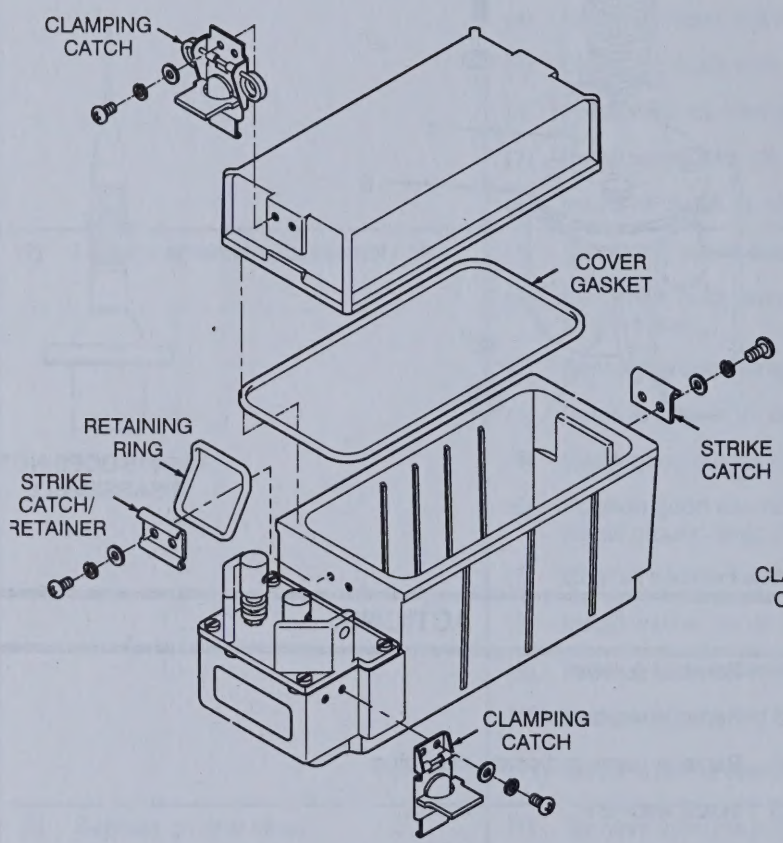


h. BATTERY BOX (CY-8523A/B):

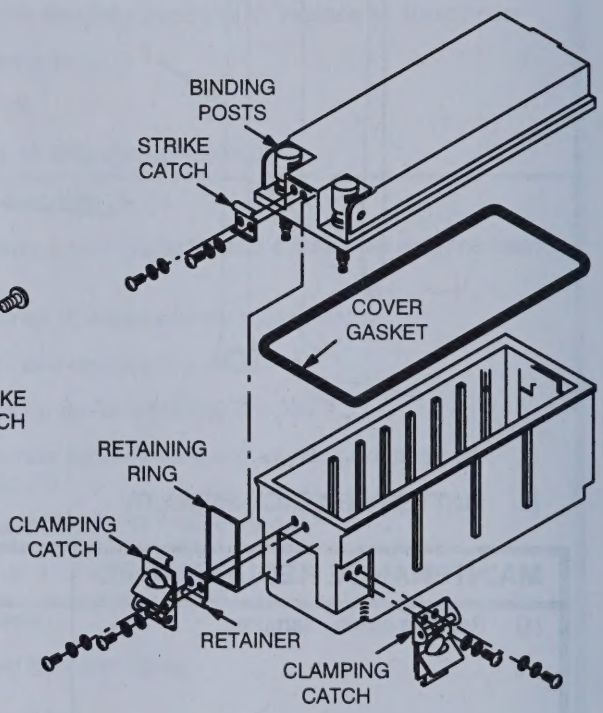
MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace catch, clamping	(1) Remove screws (2) Remove washers (3) Replace damaged catch, clamping (4) Install washers (5) Install screws
(2) Replace strike catch	(1) Remove screws (2) Remove washers (3) Replace damaged strike catch (4) Install washers (5) Install screws
(3) Replace battery box cover (CY-8523A/PRC only)	(1) Remove two catch, clamping (2) Replace damaged battery box cover (3) Install two catch, clamping

8.3. COMPONENT REPAIR. Continued

h. BATTERY BOX (CY-8523A/B): Continued



CY-8523A

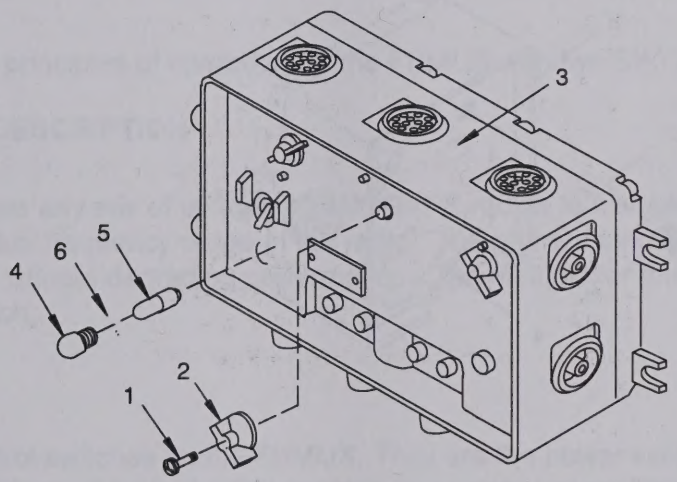


CY-8523B

8.3. COMPONENT REPAIR. Continued

i. AMPLIFIER AUDIO FREQUENCY (AM-1780):

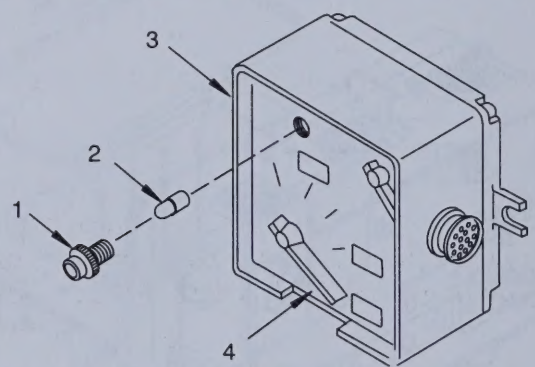
MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace DS1 lamp/lens (4, 5, 6)	(1) Turn lens CCW to remove (2) Pull lens from holder (3) Replace lamp/lens (4) Install lamp/lens (5) Install lens and turn CW to tighten
(2) Replace control knob (2)	(1) Loosen and remove screw (2) Remove knob (2) (3) Install good knob (2) (4) Tighten screw



8.3. COMPONENT REPAIR. Continued

j. CONTROL BOX (C-2297 / C-2298):

MAINTENANCE REQUIREMENT:	ACTIONS:
(1) Replace DS1 lamp/lens (1, 2)	(1) Turn lens CCW to remove (2) Pull lens from holder (3) Replace lamp/lens (4) Install lamp/lens (2) (5) Install lens and turn CW to tighten
(2) Replace selector knob (4)	(1) Loosen and remove screw (2) Remove knob (4) (3) Install good knob (4) (4) Tighten screw



CHAPTER 9

FREQUENCY HOPPING MULTIPLEXER

Subject	Para	Page
PRINCIPLES OF OPERATION	9.1	9-1
EQUIPMENT CONFIGURATION	9.1	9-3
OPERATIONAL CHECK	9.3	9-6
TROUBLESHOOTING FLOW CHARTS	9.4	9-9
CABLES	9.5	9-16
MAINTENANCE PROCEDURES	9.6	9-19

9.1 PRINCIPLES OF OPERATION

9.1.1 GENERAL

This section covers the principles of operation for the FHMUX with two SINCGARS installations.

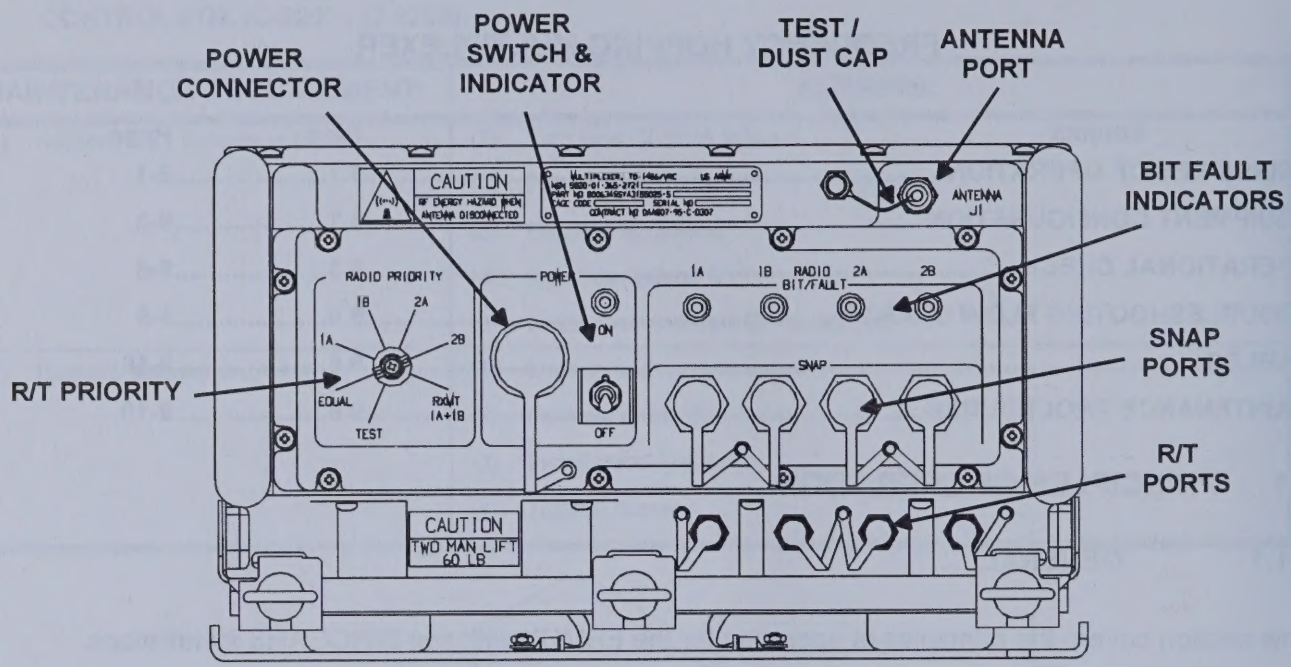
9.1.2 FUNCTIONAL DESCRIPTION

The multiplexer combines any mix of up to four SINCGARS radios to a single antenna. The multiplexer operates across the entire frequency range of the radio. The primary function is to allow all radios to operate simultaneously without degrading performance. The multiplexer has a built-in self-test (BIT) and a radio priority switch.

9.1.3 CONTROLS

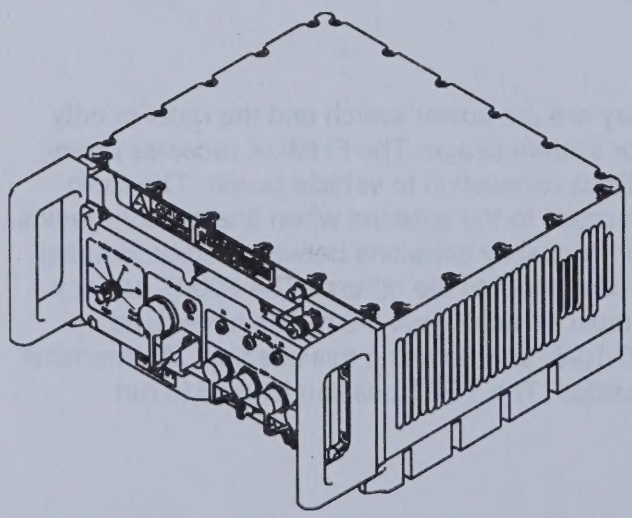
There are only two control switches on the FHMUX. They are the power switch and the radio priority switch. The power switch must be in the ON position for system usage. The FHMUX receives power from the vehicles power system via SINCGARS or by direct connection to vehicle power. The radio priority switch is used to give the selected radio higher access to the antenna when one or more radios are operating at the same time. It also compensates for frequency collisions between radios insuring maximum performance for the selected radio with minimum affect to the others. The RXMT position allows for priority to a SINCGARS retransmit station, it must be noted that the radios have to be configured as a retransmit station (see TM 11-5820-890-10-8) prior to using this position. A retransmit capability cannot be attained by simply selecting this position. The TEST position is used to run OFF-LINE BIT.

PRINCIPLES OF OPERATION (continued)

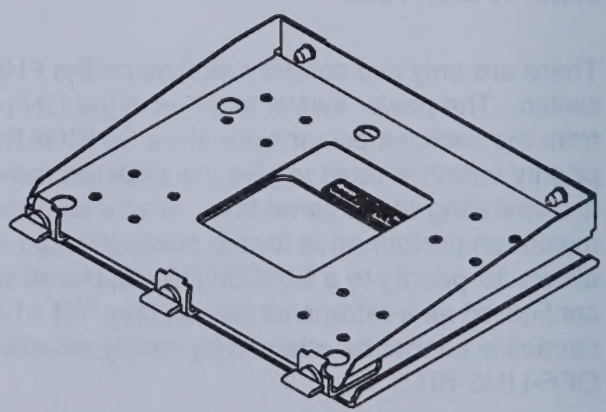


FHMUX (MULTIPLEXER) TD-1456/VRC FRONT PANEL CONTROLS

9.1.4 MAIN COMPONENTS OF THE FHMUX



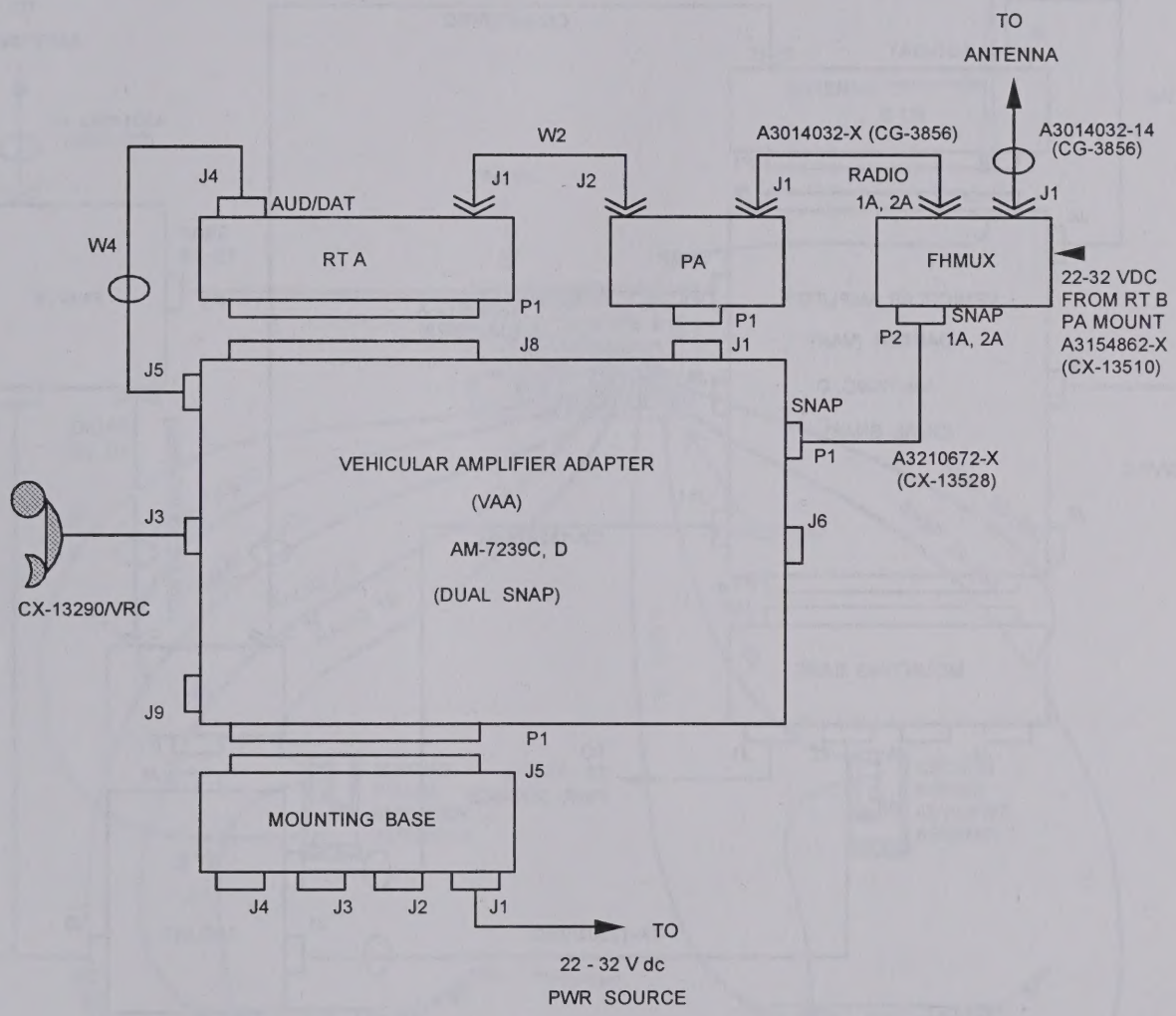
MULTIPLEXER
FREQUENCY HOPPING
TD-1456/VRC



MOUNTING BASE
ELECTRICAL EQUIPMENT
MT-6845/VRC

9.2 EQUIPMENT CONFIGURATION

Long Range Radio, RT A (with FHMUX)



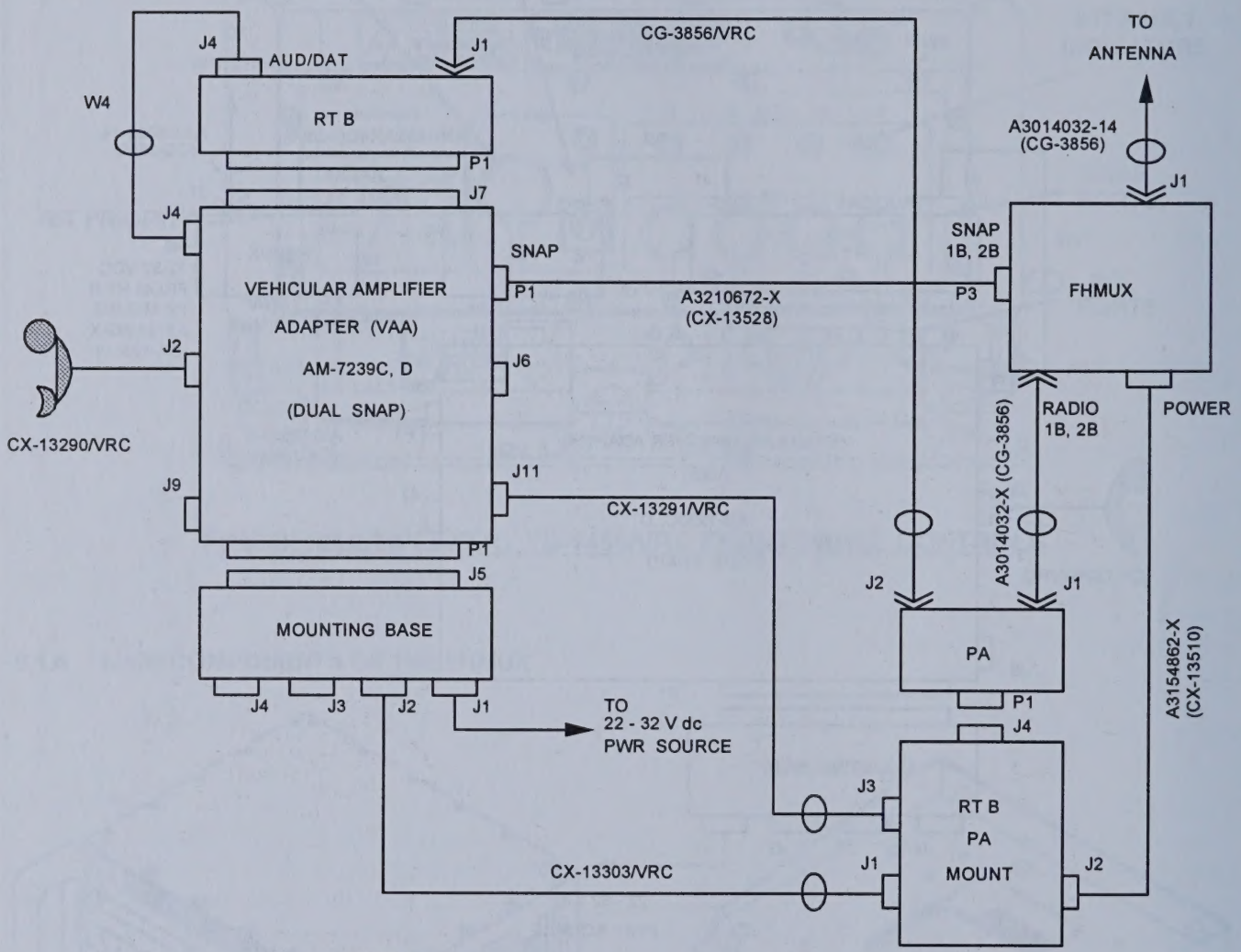
NOTES:

1. 1A refers to RT A of Radio Set #1
   2A refers to RT A of Radio Set #2

2. "-X" or "-XX" in cable part numbers indicates varing cable lengths depending on the particular installation.

9.2 EQUIPMENT CONFIGURATION (continued)

Long Range Radio, RT B (with FHMUX)



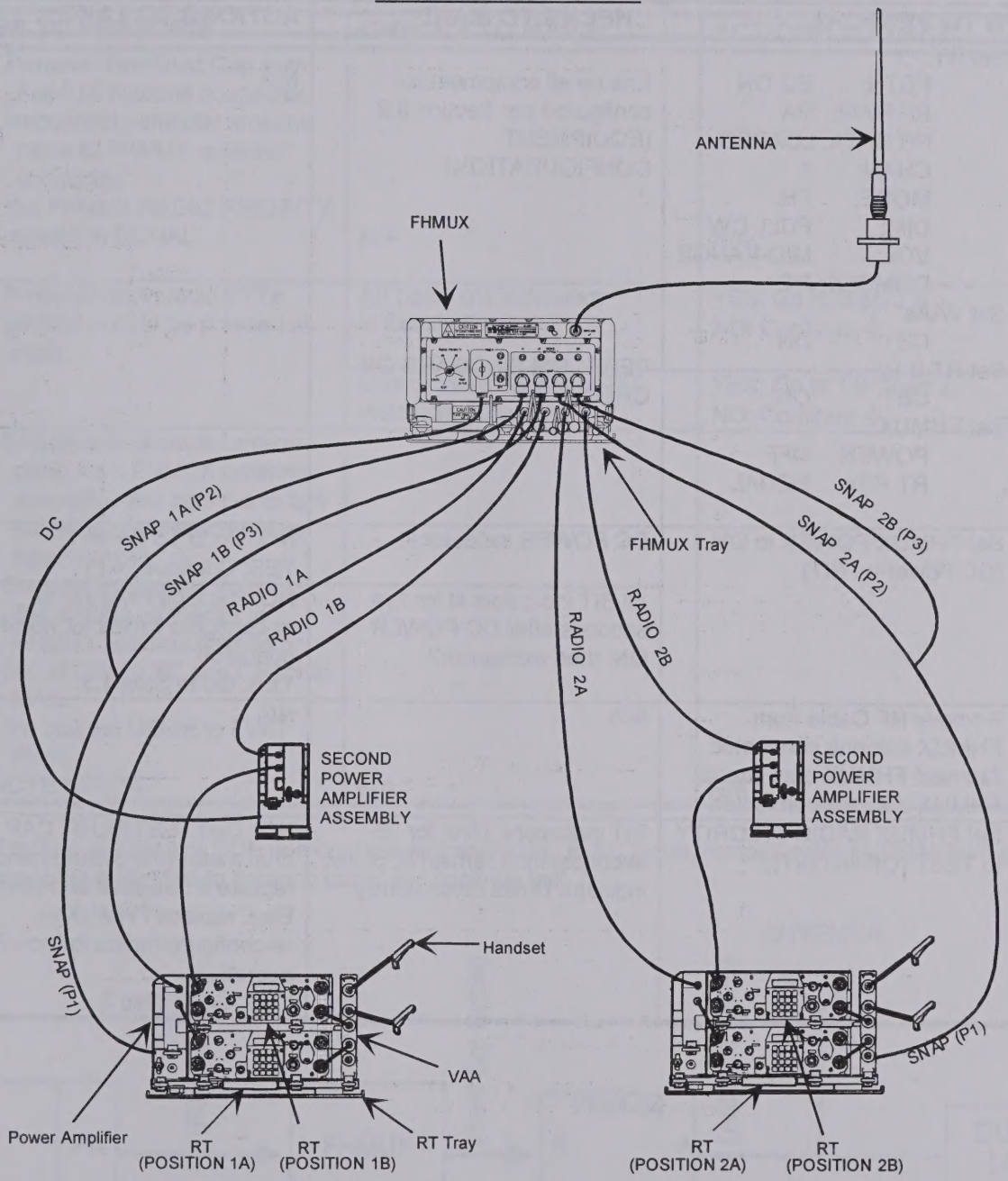
NOTES:

1. 1A refers to RT A of Radio Set #1
   2A refers to RT A of Radio Set #2

2. "-X" or "-XX" in cable part numbers indicates varing cable lengths depending on the particular installation.

9.2 EQUIPMENT CONFIGURATION (continued)

Dual Long/Long Range (LR/LR), (two AN/VRC-92s) with MULTIPLEXER



9.3 OPERATIONAL CHECK

STEP 1. PREPARATION/DC POWER-UP BIT and OFF-LINE BIT:

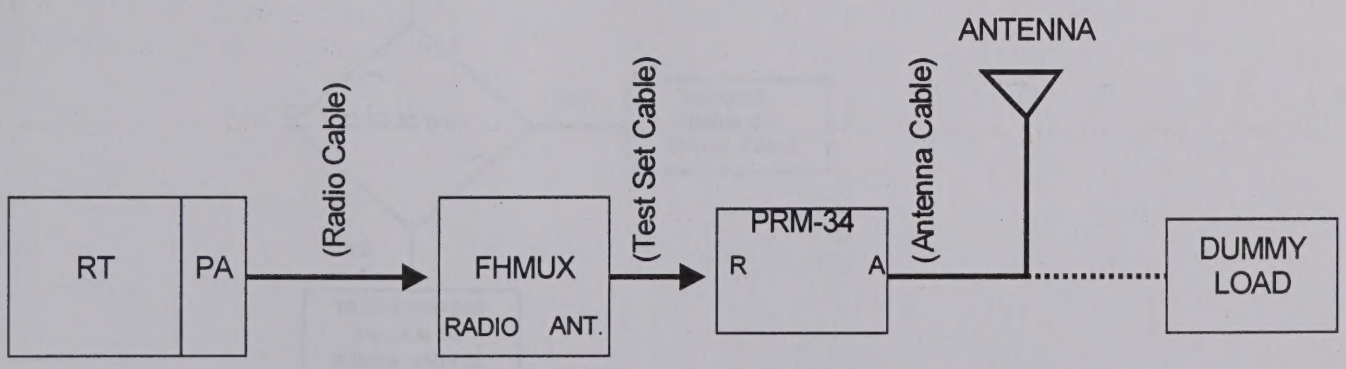
STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
1.1 Set RT: FCTN: SQ ON RF PWR: PA FH DATA: LOADED CHAN: 1 MODE: FH DIM: FULL CW VOL: MID-RANGE COMSEC: PT Set VAAs: CB1: ON Set RT B PA: CB1: ON Set FHMUX: POWER: OFF RT PRI: EQUAL	Ensure all equipment is configured per Section 9.2 (EQUIPMENT CONFIGURATION) PERFORM SINCGARS OP CHECK	N/A
1.2 Set FHMUX POWER to ON (DC Power-up BIT).	DC POWER indicator lit	NO: Go to TS Chart 1 YES: Continue ↓
	All BIT indicators lit for five seconds after DC POWER ON, then extinguish?	NO: Replace FHMUX or re-configure radios for non-FHMUX operation. YES: Go to Step 1.3
1.3 Remove RF Cable from FHMUX antenna connector. Connect FHMUX dust cap to FHMUX antenna connector.	N/A	N/A
1.4 Set FHMUX RADIO PRIORITY to TEST (Off-line BIT).	BIT indicators blink for 35 seconds, then remain lit; power indicator blinks continuously.	NO: Test TEST/DUST CAP with ohm meter (50±5 ohms) and replace if defective and re-run BIT. Else, replace FHMUX or re-configure radios for non-FHMUX operation. YES: Go to Step 2

9.3 9.3 OPERATIONAL CHECK (continued)

STEP 2. TRANSMIT/RECEIVE/ON-LINE BIT CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.1 Remove Test/Dust Cap from FHMUX antenna connector. Reconnect vehicular antenna cable to FHMUX antenna connector. Set FHMUX RADIO PRIORITY switch to EQUAL	N/A	N/A
2.2 Press all (four) radio PTTs (all four should be pressed at once).	**All** (four) BIT indicators lit/flashing?	YES: Go to Step 2.3 NO: Continue ↓
	One or more but not all BIT indicators lit/flashing?	YES: Go to TS Chart 2 NO: Continue ↓
2.3 Disconnect vehicular antenna cable from FHMUX antenna connector and connect to test set antenna connector (See figure below). Connect Test cable from Test Set RADIO connector to FHMUX antenna connector. Set all RTs to SC and CHAN to MAN. Set test set MODE to FWD PWR. SEE NOTE BELOW	N/A	N/A

NOTE: If tactical situation or SOP does not permit transmitting in SC mode, remove antenna cable from antenna base. Connect dummy load to antenna cable and continue test.



STEP 2.3 TEST SET-UP

9.3 OPERATIONAL CHECK (continued)

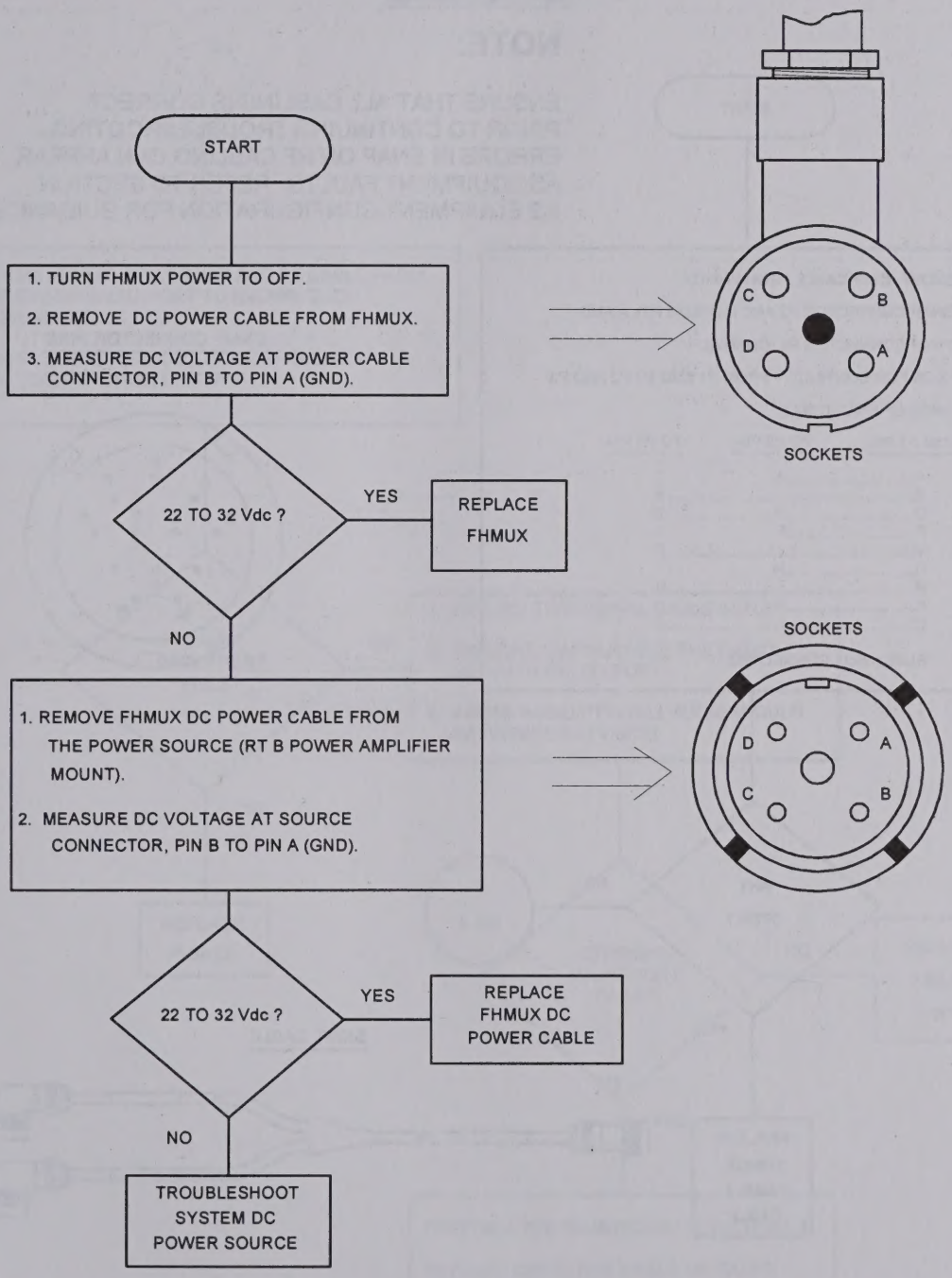
STEP 2. TRANSMIT/RECEIVE/ON-LINE BIT CHECK:

STEPS TO PERFORM	CHECKS TO MAKE	ACTIONS TO TAKE
2.4 Press radio 1A PTT and test set PTTest (record result).	Test set reads 15 W or greater FWD PWR?	NO: Go to TS chart 3 YES: Go to step 2.5
2.5 Press radio 1B PTT and test set PTTest.	Test set reads 15 W or greater FWD PWR?	NO: Go to TS chart 3 YES: Go to step 2.6
2.6 Press radio 2A PTT and test set PTTest.	Test set reads 15 W or greater FWD PWR?	NO: Go to TS chart 3 YES: Go to step 2.7
2.7 Press radio 2B PTT and test set PTTest.	Test set reads 15 W or greater FWD PWR?	NO: Go to TS chart 3 YES: Go to step 2.8
2.8 Set test set MODE to RVS PWR.	N/A	N/A
2.9 Press radio 1A PTT and test set PTTest (only 1 radio need be checked for reverse power).	Test set reads less than 1/3 of radio 1A FWD PWR?	YES: If dummy load used, go to step 2.10 YES: If antenna used, end of test. NO: Go to TS chart 4
2.10 Disconnect dummy load from antenna cable. Reconnect vehicular antenna cable to antenna base.	N/A	N/A
2.11 Press radio 1A PTT and test set PTTest. SEE NOTE	Test set reads less than 1/3 of radio 1A FWD PWR?	YES: End of test. NO: Go to TS chart 4

NOTE: Perform this test only when transmitting in SC mode is permitted.

9.4 TROUBLESHOOTING FLOWCHARTS

Chart 1
FHMUX POWER indicator not lit.
(Sheet 1 of 1)



9.4 TROUBLESHOOTING FLOWCHARTS (continued)

Chart 2
One of more, but not all BIT indicators lit.
(Sheet 1 of 2)

NOTE:

ENSURE THAT ALL CABLING IS CORRECT PRIOR TO CONTINUING TROUBLESHOOTING. ERRORS IN SNAP OR RF CABLING CAN APPEAR AS EQUIPMENT FAULTS. REFER TO SECTION 9.2 EQUIPMENT CONFIGURATION FOR GUIDANCE.

START

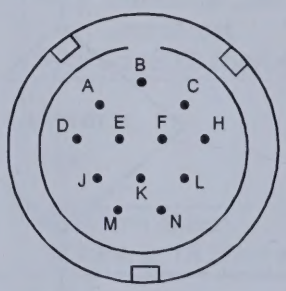
1. REMOVE SNAP CABLE FROM FHMUX
   SNAP CONNECTOR P2 AND P3 FROM RTs A AND B
   SNAP CONNECTOR P1 (ON VAA).
2. CHECK FOR CONTINUITY FROM P1 END TO P2 AND P3 ENDS OF SNAP CABLE:

FROM P1 PIN:	TO P2 PIN:	TO P3 PIN:
A	A	
B		A
D	D	D
F	F	
M		F
H	H	
N		H
K	K	
C		K

ELSE = NOT CONNECTED

SNAP CONNECTOR PINS

APPLICABLE TO ALL ENDS

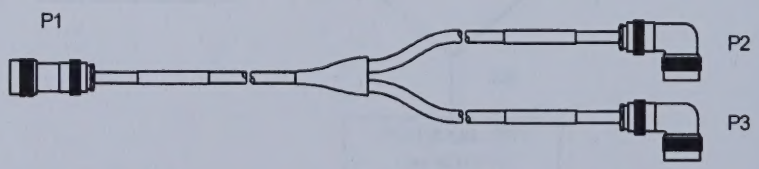


ANY OPEN ?

NO → 1 SH 2

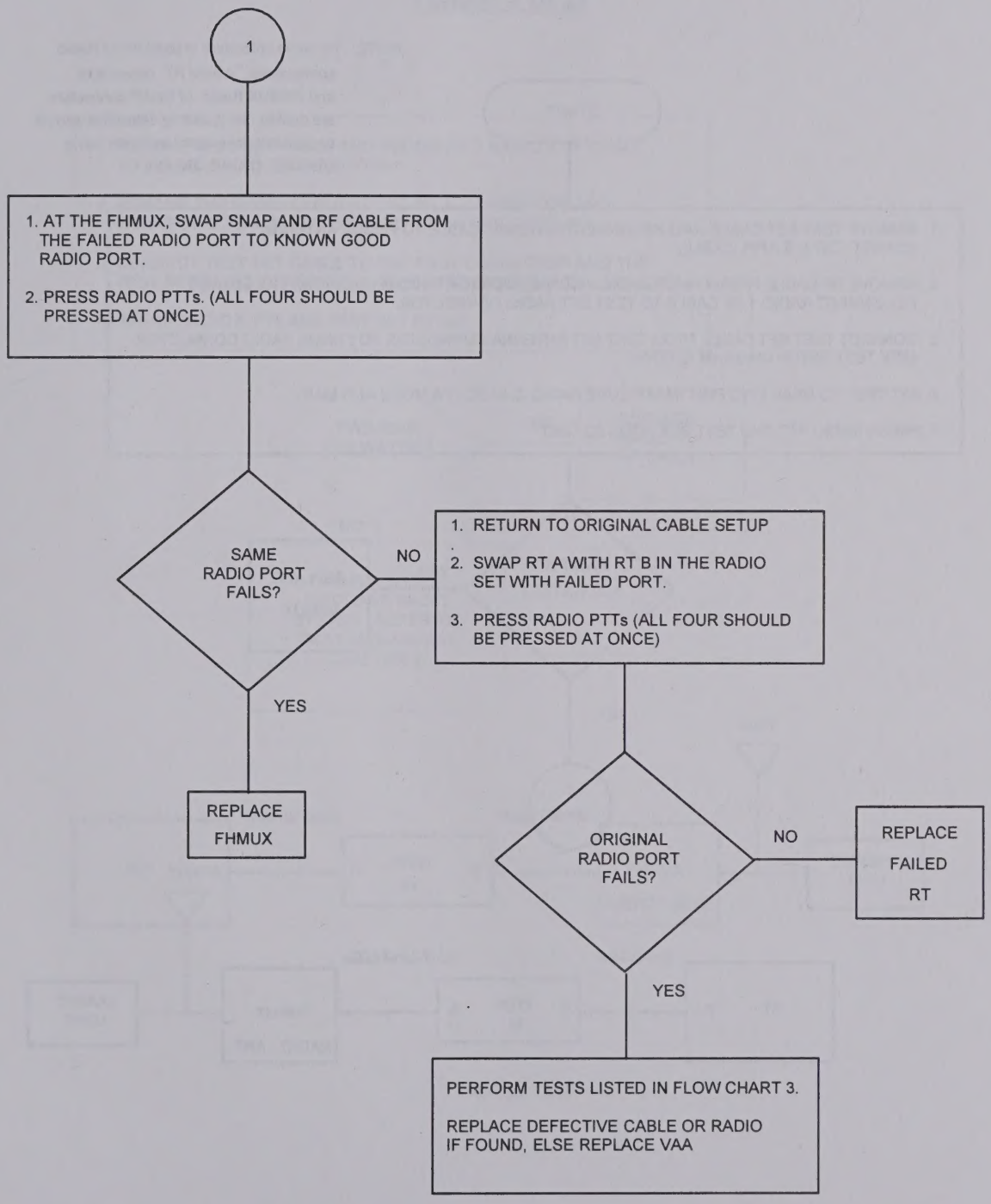
YES → REPLACE FHMUX SNAP 1 CABLE

SNAP CABLE



9.4 TROUBLESHOOTING FLOWCHARTS (continued)

Chart 2
One of more, but not all BIT indicators lit.
(Sheet 2 of 2)



9.4 TROUBLESHOOTING FLOWCHARTS (continued)

Chart 3
Test Set reads less than 15 Watts Forward power when RT PTT is pressed.
(Sheet 1 of 2)

NOTE: The same procedure is used for all Radio connections. Where RT connectors and FHMUX Radio or SNAP connectors are quoted, the following selections should be inserted dependent on Radio being checked: (1A, 1B, 2A, 2B)

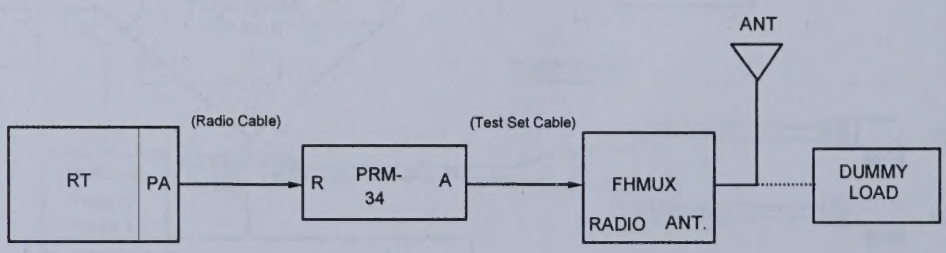
START

1. REMOVE TEST SET CABLE AND RECONNECT ANTENNA CABLE TO FHMUX ANTENNA CONNECTOR (AS APPLICABLE)
2. REMOVE RF CABLE FROM FHMUX RADIO 1 CONNECTOR (OR WHICHEVER RADIO FAILED) AND RECONNECT RADIO 1 RF CABLE TO TEST SET RADIO CONNECTOR.
3. CONNECT TEST SET CABLE FROM TEST SET ANTENNA CONNECTOR TO FHMUX RADIO CONNECTOR (SEE TEST SETUP DIAGRAM BELOW).
4. SET TEST TO READ FWD PWR (MAKE SURE RADIO IS IN SC , PA MODE AND MAN).
5. PRESS RADIO PTT AND TEST SET PUSH-TO-TEST.

FWD PWR > 30 WATTS ?

YES → REPLACE FHMUX

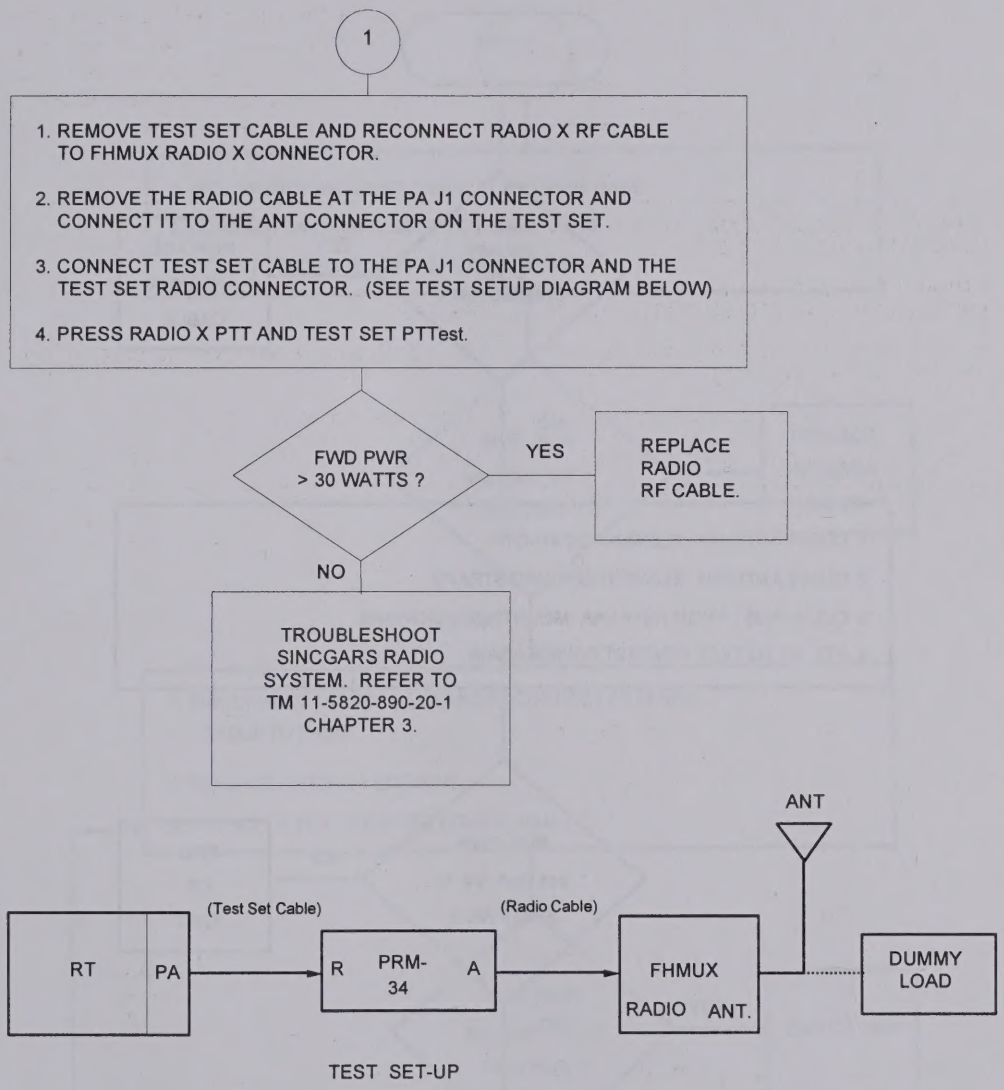
NO → 1 SH 2



TEST SET-UP

9.4 TROUBLESHOOTING FLOWCHARTS (continued)

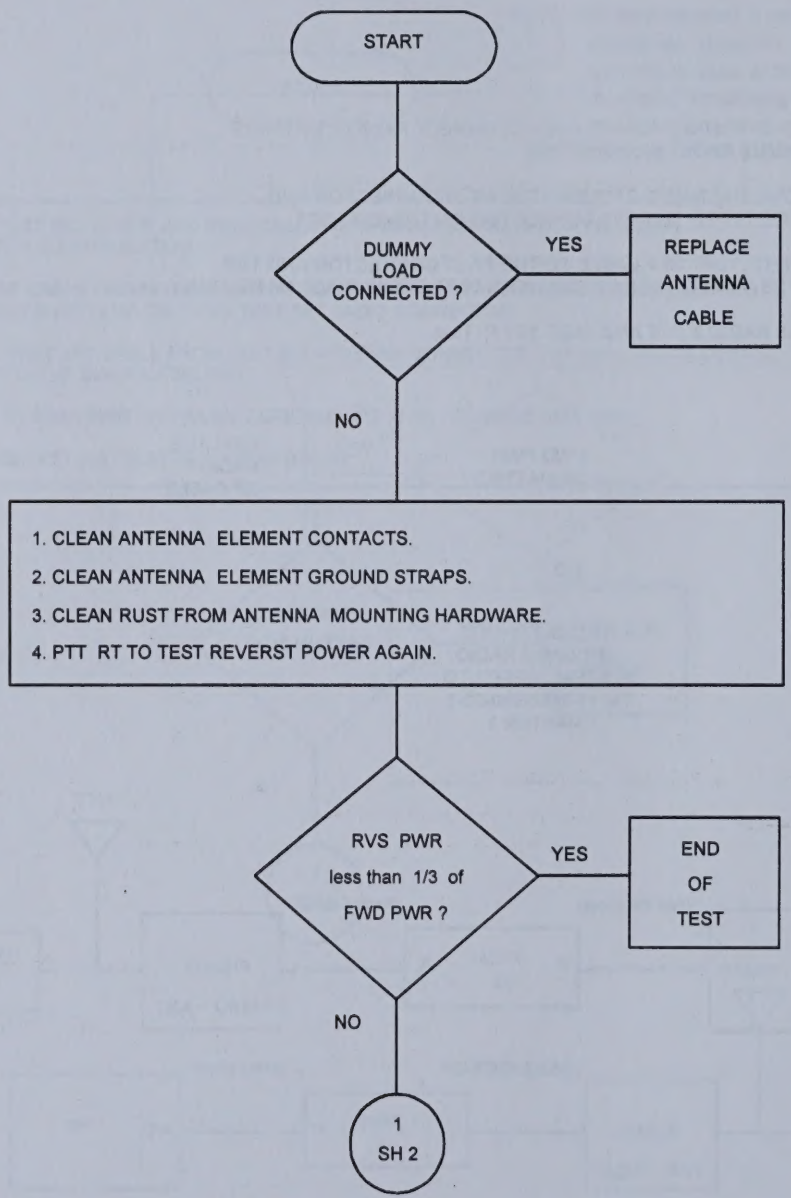
Chart 3
Test Set reads less than 15 Watts Forward power when RT PTT is pressed.
(Sheet 2 of 2)



TEST SET-UP

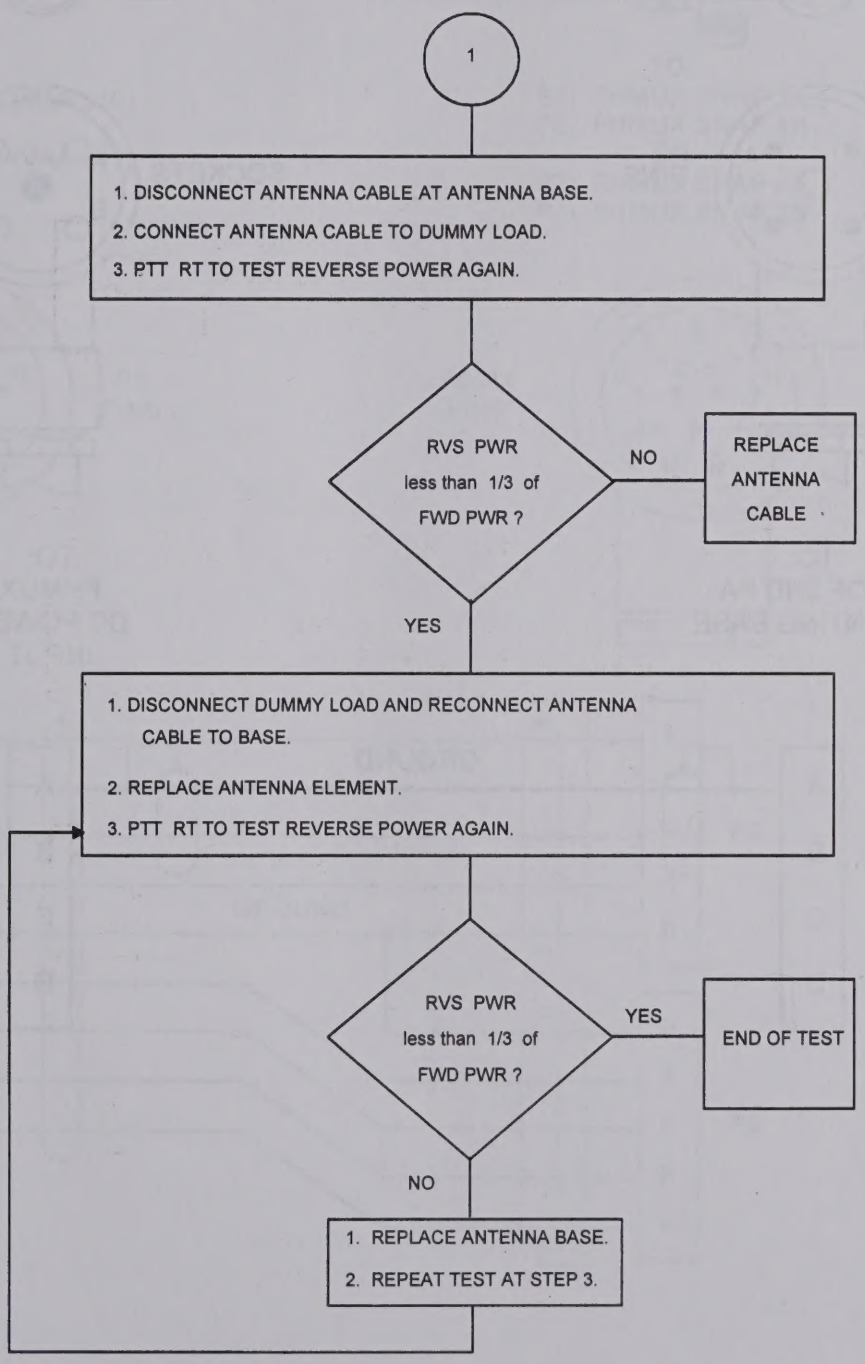
9.4 TROUBLESHOOTING FLOWCHARTS (continued)

Chart 4
Test Set does not read less than 1/3 of FWD PWR when RT PTT is pressed.
(Sheet 1 of 2)



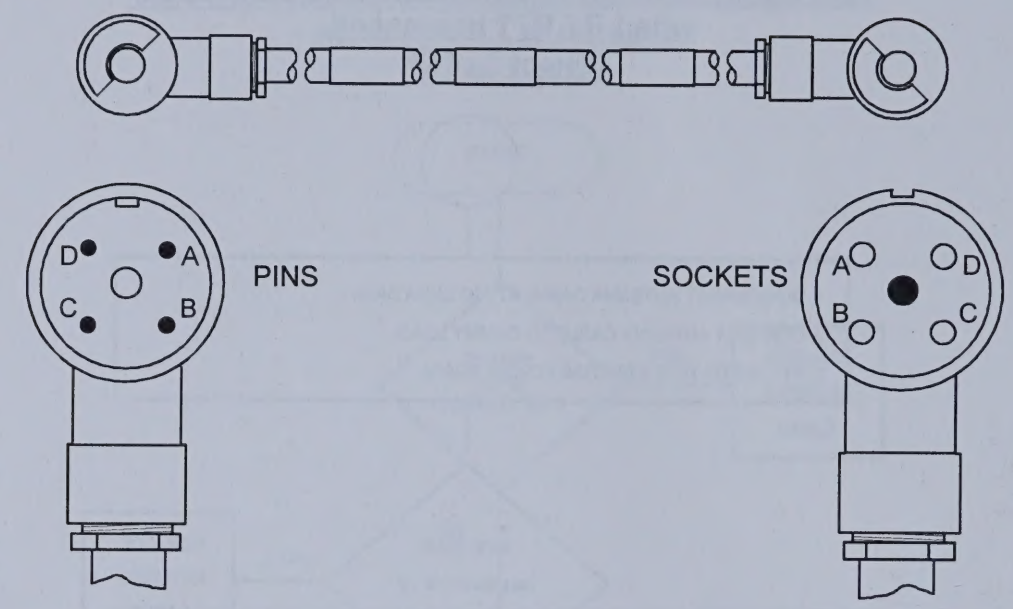
9.4 TROUBLESHOOTING FLOWCHARTS (continued)

Chart 4
Test Set does not read less than 1/3 of FWD PWR when RT PTT is pressed.
(Sheet 2 of 2)



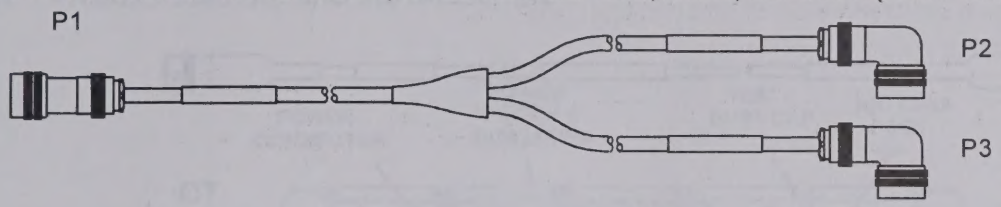
9.5 CABLES

9.5.1 A3154862-X CABLE ASSEMBLY, POWER, ELEC, CX-13510



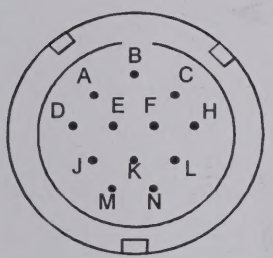
9.5 CABLES (continued)

9.5.2 A3210672-3 CABLE ASSY, SPECIAL PURPOSE, ELEC, CX-13528 (SNAP DATA, 1A/1B or 2A/2B)



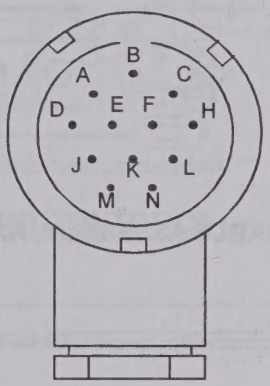
TO:
P1) RADIO 1A/1B (VAA J10)
OR
P1) RADIO 2A/2B (VAA J10)

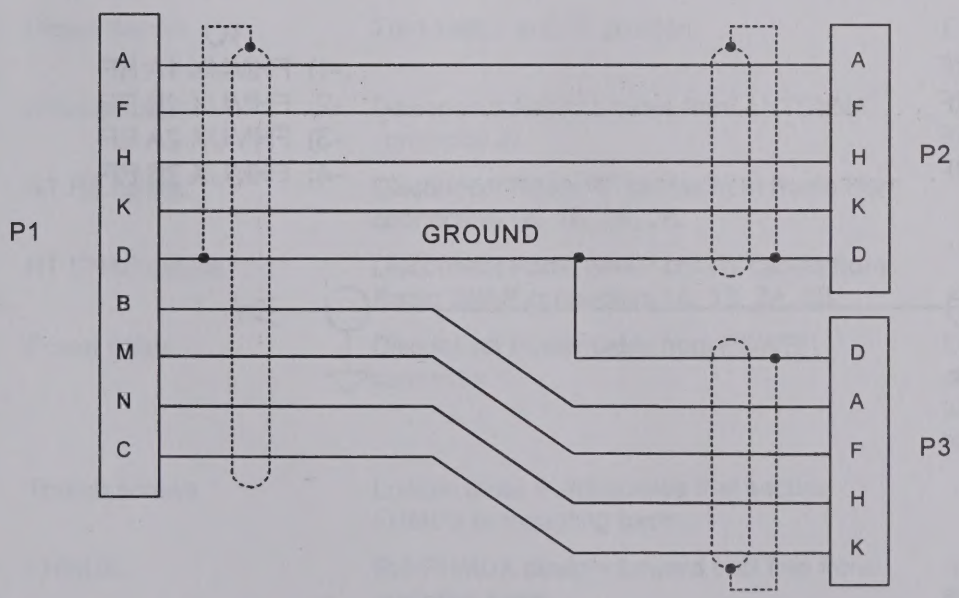
TO:
P2) FHMUX SNAP 1A
P3) FHMUX SNAP 1B
OR
P2) FHMUX SNAP 2A
P3) FHMUX SNAP 2B



P1
PINS

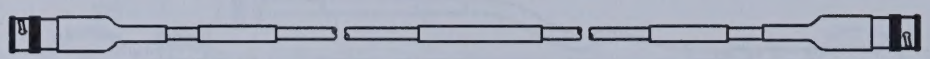
P2/P3
PINS





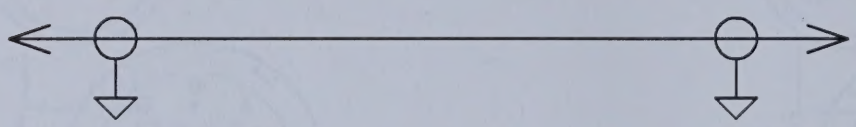
9.5 CABLES (continued)

9.5.3 A3014032-XX CABLE ASSEMBLY, RF, ELEC, CG-3856 (ANTENNA)

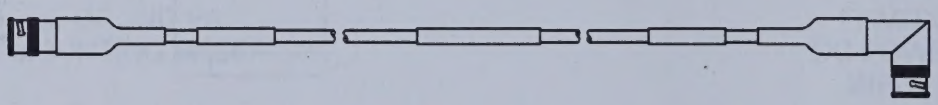


TO:
FHMUX
ANTENNA
CONNECTOR,
J1

TO:
VEHICULAR
ANTENNA
BASE

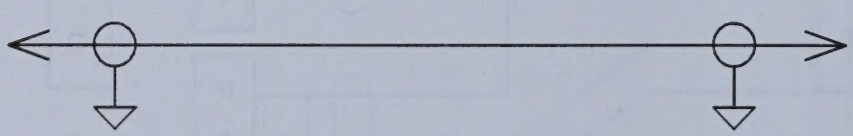


9.5.4 A3014032-X CABLE ASSEMBLY, RF, ELEC, CG-3856 (RADIO, 1A/1B/2A/2B)



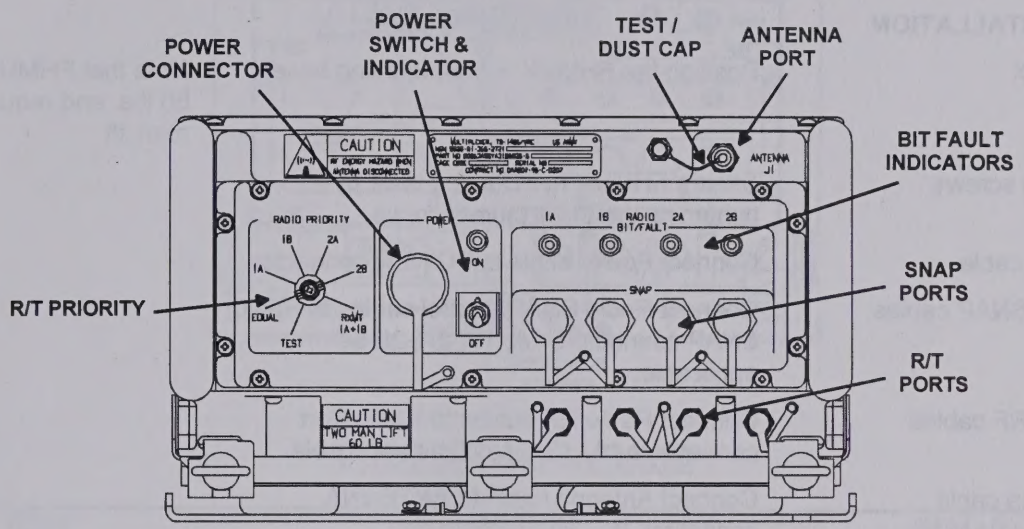
TO:
-1) RADIO 1A RF
-2) RADIO 1B RF
-3) RADIO 2A RF
-4) RADIO 2B RF

TO:
-1) FHMUX 1A RF
-2) FHMUX 1B RF
-3) FHMUX 2A RF
-4) FHMUX 2B RF



9.6 MAINTENANCE PROCEDURES

9.6.1 FHMUX REMOVAL AND INSTALLATION



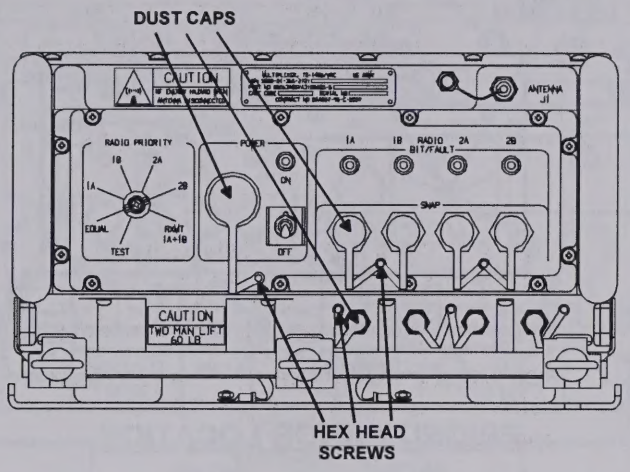
FRONT PANEL CONNECTORS AND CONTROLS

ITEM		ACTION	REMARKS
FHMUX REMOVAL			
a.	Power Switch	Turn switch to OFF position.	Ensure that all RTs are not actively in use.
b.	Antenna cable	Disconnect Antenna cable from ANTENNA connector J1.	
c.	RT RF cables	Disconnect Radio RF cables from Radio Port connectors 1A, 1B, 2A, 2B.	
d.	RT SNAP cables	Disconnect Radio SNAP control cables from Radio SNAP connectors 1A, 1B, 2A, 2B.	
e.	Power cable	Disconnect Power cable from POWER connector.	Ensure that connector is protected from shorting or turn off supplying power source.
f.	Thumb screws	Loosen three thumbscrews that secure FHMUX to mounting base.	
g.	FHMUX	Pull FHMUX straight forward until free from mounting base.	Note that FHMUX weighs 60 lbs. and requires a two man lift.

9.6.1 FHMUX REMOVAL AND INSTALLATION (continued)

ITEM	ACTION	REMARKS
FHMUX INSTALLATION		
a. FHMUX	Position the FHMUX in the mounting base.	Note that FHMUX weighs 60 lbs. and requires a two man lift.
b. Thumb screws	Secure FHMUX to mounting base by tightening the three thumbscrews.	
c. Power cable	Connect Power cable to POWER connector.	
d. Radio SNAP cables	Connect Radio SNAP control cables to Radio SNAP connectors 1A, 1B, 2A, 2B as applicable.	
e. Radio RF cables	Connect Radio RF cables to Radio Port connectors 1A, 1B, 2A, 2B as applicable.	
f. Antenna cable	Connect Antenna cable to ANTENNA connector J1.	
g. Power Switch	Turn switch to ON position and confirm BIT.	See Section 9.3, Operational Check

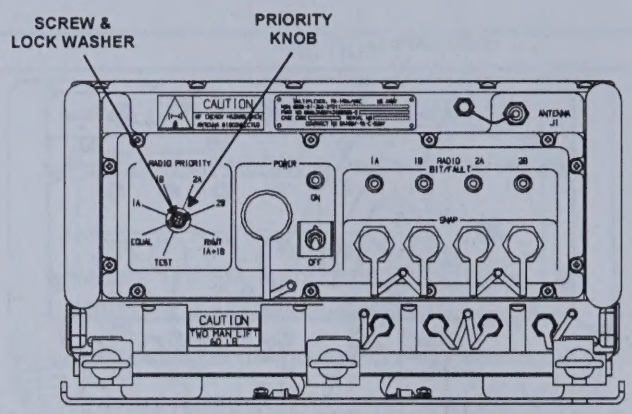
9.6.2 DUST CAP REPLACEMENT



DUST CAP LOCATIONS

ITEM	ACTION	REMARKS
DUST CAP REMOVAL		
a. Dust Cap removal	Gently pull the attaching strap on the dust cap and remove the strap from the hex head screw.	If another dust cap shares the attaching screw, remove both straps as required.
DUST CAP INSTALLATION		
a. Dust Cap installation	Place the new strap over the hex head screw and gently pull the strap while pressing on the strap over the screw head. The strap will snap into place.	Replace any other strap removed to gain access to the replaced strap using the same procedure (which strap is on top does not matter).

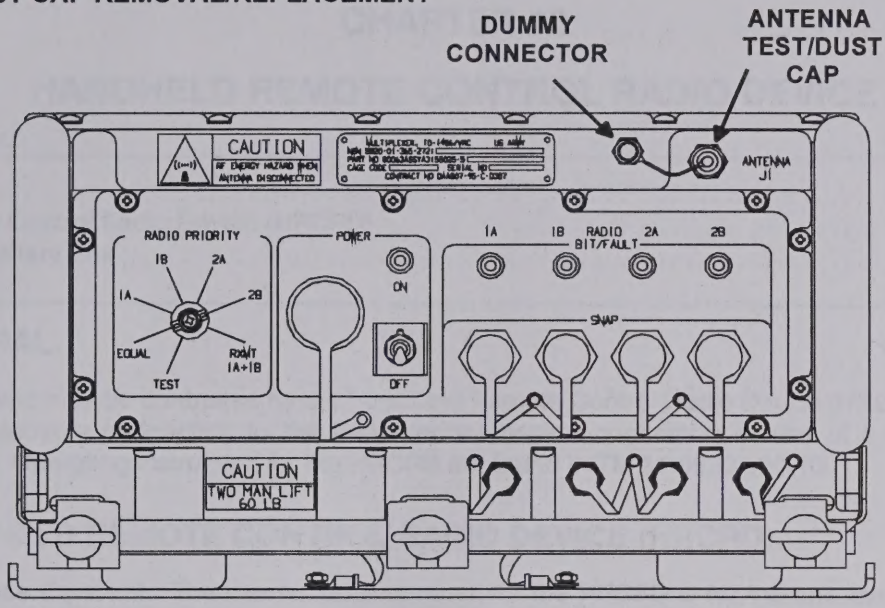
9.6.3 PRIORITY SWITCH KNOB REMOVAL AND REPLACEMENT



PRIORITY KNOB LOCATION

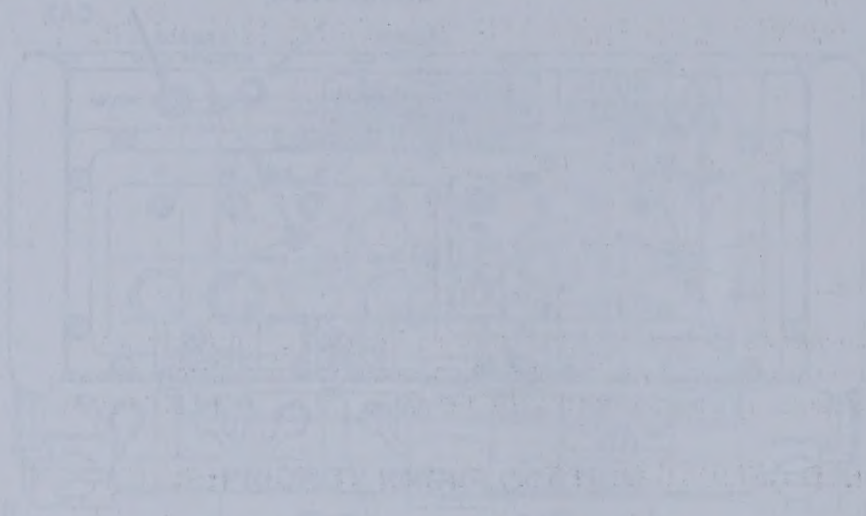
ITEM	ACTION	REMARKS
KNOB REMOVAL		
a. Power Switch	Turn switch to OFF position.	Ensure that all RTs are not actively in use.
b. Knob screw	Loosen and remove the screw and lock washer from the front of the knob.	Hold the knob with other hand while removing the screw. **CAUTION** Do Not use the switch stop to prevent the knob from turning.
c. Knob removal	Pull the knob straight off the shaft.	
KNOB INSTALLATION		
a. Knob installation	Push the knob straight onto the shaft.	The knob can only be installed in one orientation. With the shaft turned fully counter clockwise the white line of the knob is in the TEST position.
b. Knob screw	Install the screw and lock washer to the front of the knob. (Torque to 9 +/- 1 inch lbs.)	Hold the knob with other hand while tightening the screw. **CAUTION** Do Not use the switch stop to prevent the knob from turning.

9.6.4 TEST/DUST CAP REMOVAL/REPLACEMENT



TEST CAP REPLACMENT

ITEM	ACTION	REMARKS
TEST/DUST CAP REMOVAL		
a. Power Switch	Turn switch to OFF position.	Ensure that all RTs are not actively in use.
b. Dummy BNC connector	Loosen and remove the dummy BNC connector.	
c. Test/Dust Cap removal	Remove the test/dust cap from the antenna connector J1 and the lanyard holder from the removed dummy BNC connector.	
TEST/DUST CAP INSTALLATION		
a. Test/dust cap installation	Connect the test/dust Cap to the Antenna connector J1.	
b. Dummy BNC connector	Install the dummy BNC connector through the test/dust cap lanyard holder. (Torque to 50 +/- 5 inch lbs.)	



CHAPTER 10

HANDHELD REMOTE CONTROL RADIO DEVICE

Subject	Para	Page
General	10.1	10-1
Handheld Remote Control Radio Device (HRCRD)	10.2	10-1
Remote Control Battery Box	10.3	10-2

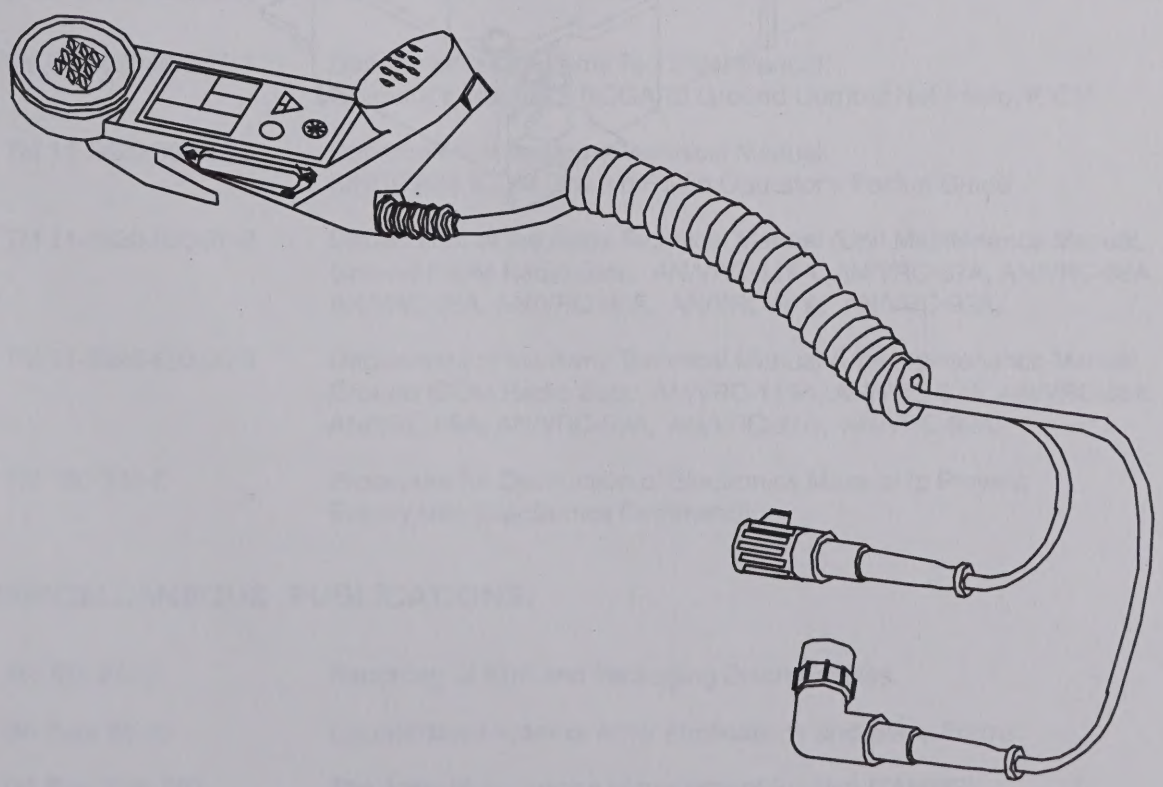
10.1. GENERAL.

The SINCGARS radio may be controlled by the Handheld Remote Control Radio Device (HRCRD). The use of the HRCRD requires either a connection to the VAA (control-monitor connector) or use of a special battery box (CY-8523C/PRC). Operating instruction for the HRCRD are found in TM 11-5820-890-10.

10.2. HANDHELD REMOTE CONTROL RADIO DEVICE (HRCRD).

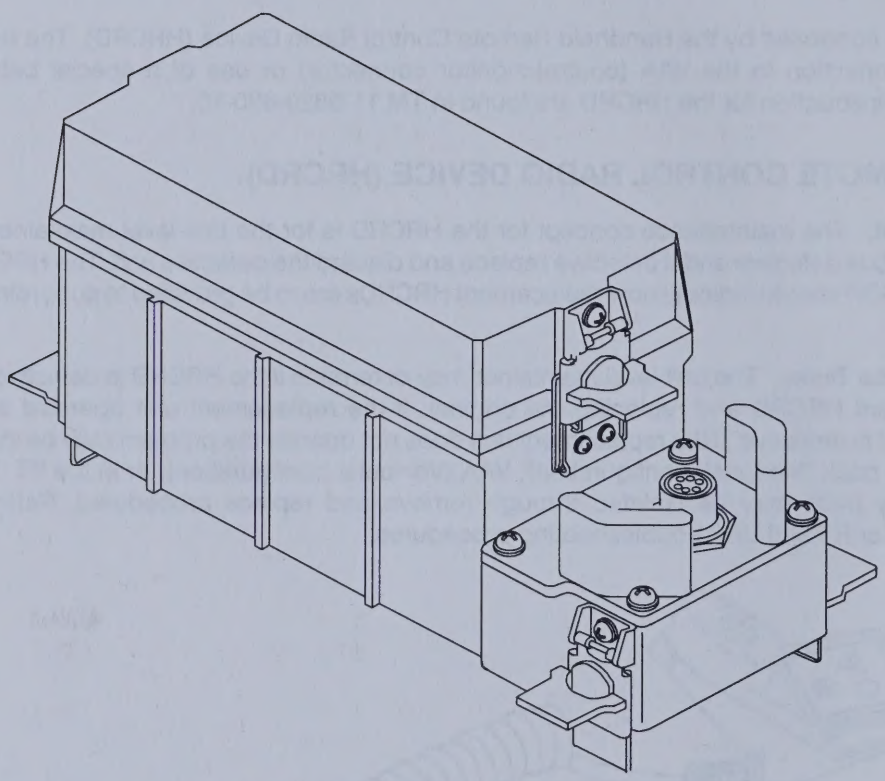
a. **Maintenance Concept.** The maintenance concept for the HRCRD is for the unit level maintainer to determine if the HRCRD is defective and if defective replace and discard the defective unit. The HRCRD is not repairable. Unit SOP should indicate how replacement HRCRDs are to be provided to subordinate units.

b. **Unit Level Maintenance Tasks.** The unit level maintainer may determine if the HRCRD is defective by obtaining a replacement HRCRD and replacing the original. If the replacement unit operates as it should, the original unit is defective. If the replacement unit does not operate the problem may be in the remote control battery pack (Manpack configuration), VAA (Vehicular configuration), or in the RT. The remote control battery pack may be isolated through remove and replace procedures. Refer to TM 11-5820-890-20-1 for RT and VAA troubleshooting procedures.



10.3. REMOTE CONTROL BATTERY BOX.

a. **Maintenance Concept.** The battery box CY-8523C/PRC is necessary to operate the HRCRD in a MANPACK configuration. The unit level maintainer will determine if the battery box is defective and replace as necessary.



APPENDIX A

REFERENCES

A.1. SCOPE. This appendix lists all forms, field manuals, technical manuals, and miscellaneous publication references in this manual.

A.2. FORMS.

DA Form 2028	Recommended Changes to Publications and Blank Forms.
DA Form 2028-2	Recommended Changes to Equipment Technical Publications.
SF 361	Discrepancy in Shipment Report (DISREP).
SF 364	Report of Discrepancy (TDR).
SF 368	Product Quality Deficiency Report (ROD).

A.3. FIELD MANUALS.

FM 21-11	Artificial Respiration.

A.4. TECHNICAL MANUALS.

TM 11-5820-890-10-1	Department of the Army Technical Manual: Operator's Manual SINCGARS Ground Combat Net Radio, ICOM
TM 11-5820-890-10-6	Department of the Army Technical Manual: SINCGARS ICOM Ground Radio Operator's Pocket Guide
TM 11-5820-890-20-2	Department of the Army Technical Manual (Unit Maintenance Manual, Ground ICOM Radio Sets: AN/VRC-119A, AN/VRC-87A, AN/VRC-88A, AN/VRC-89A, AN/VRC-90A, AN/VRC-91A, AN/VRC-92A)
TM 11-5820-890-20-3	Department of the Army Technical Manual (Unit Maintenance Manual, Ground ICOM Radio Sets: AN/VRC-119A, AN/VRC-87A, AN/VRC-88A, AN/VRC-89A, AN/VRC-90A, AN/VRC-91A, AN/VRC-92A)
TM 750-244-2	Procedure for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

A.5. MISCELLANEOUS PUBLICATIONS.

AR 735-244-2	Reporting of Item and Packaging Discrepancies.
DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).

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APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B.1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B.2. MAINTENANCE FUNCTIONS.

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination; e.g., by sight, sound, or feel.

b. *Test.* To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics with established standards through examination; e.g., by sight, sound, or feel.

c. *Service.* Operations required periodically to keep an item in proper operating condition; i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. *Adjust.* To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

f. *Remove/Install.* To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of enplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

g. *Replace.* To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position code of the SMR code.

h. *Repair.* The application of maintenance services[1], including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

B.2. MAINTENANCE FUNCTIONS. Continued

i. *Overhaul.* That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications; i.e., DMWR. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

j. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

B.3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. *Column 1, Group Number.* Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. *Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance Function.* Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph 2.)

d. *Column 4, Maintenance Level.* Column 4 specifies the level of maintenance authorized to perform the function listed in Column 3 by listing a work time figure in the appropriate subcolumn(s). This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C ..... Operator or crew
O ..... Unit Maintenance
F ..... Direct Support Maintenance
H ..... General Support Maintenance
D ..... Depot Maintenance

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[1] Services - inspect, test, service, adjust, aline, calibrate, and/or replace.

[2] Fault locate/troubleshoot - the process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or unit under test (UUT).

[3] Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant; (i.e., assigned an SMR code) for the level of maintenance under consideration.

[4] Actions - welding, grinding, riveting, straightening, facing, remachining, and/or resurfacing.

B.3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II. Continued

e. *Column 5, Tools and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function. The codes are identified in Section III.

f. *Column 6, Remarks.* This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B.4 EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. *Column 1, Remarks Code.* The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. *Column 2, Maintenance Level.* The lowest level of maintenance authorized to use the tool or test equipment.

c. *Column 3, Nomenclature.* Name or identification of the tool or test equipment.

d. *Column 4, National Stock Number.* The national stock number of the tool or test equipment.

e. *Column 5, Tool Number.* The manufacturer's part number.

B.5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. *Column 1, Remarks Code.* The code recorded in Column 6, Section II.

b. *Column 2, Remarks.* This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
00	SINCGARS-V Family of Radios	Inspect	0.1						
01	Radio Set AN/PRC-119A	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Repair		0.1					
0101	Receiver-Transmitter Radio	Replace		0.1					
	RT-1523(C)/U			(Ref Group Number 26)					
	RT-1523A(C)/U			(Ref Group Number 80)					
	RT-1523B(C)/U			(Ref Group Number 52)					
	RT-1523C(C)/U			(Ref Group Number 55)					
	RT-1523D(C)/U (Unit 1)			(Ref Group Number 81)					
0102	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C
0103	Battery Box	Replace		0.1					
	CY-8523A/PRC			(Ref Group Number 20)					
	CY-8523B/PRC			(Ref Group Number 84)					
	CY-8523C/PRC (Unit 3)								AN,AO
02	Radio Set AN/PRC-119	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Repair		0.1					
0201	Receiver-Transmitter Radio	Replace		0.1					
	RT-1439/VRC (Unit 1)			(Ref Group Number 27)					
0202	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C
0203	Battery Box	Replace		0.1					
	CY-8523A/PRC			(Ref Group Number 20)					
	CY-8523B/PRC			(Ref Group Number 84)					
	CY-8523C/PRC (Unit 3)								AN,AO

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0204	Cable Assembly, Special Purpose, Electrical CX-13293/VRC (2 FT, 1 IN)	Inspect			0.1				
		Test			0.1			7	
		Replace		0.1					
		Repair			0.1			12	V
03	Radio Set AN/VRC-87A	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
0301	Receiver-Transmitter Radio	Replace		0.1					
	RT-1523(C)/U		(Ref Group Number 26)						
	RT-1523A(C)/U		(Ref Group Number 80)						
	RT-1523B(C)/U		(Ref Group Number 52)						
	RT-1523C(C)/U		(Ref Group Number 55)						
	RT-1523D(C)/U (Unit 1)		(Ref Group Number 81)						
0302	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC		(Ref Group Number 29)						
	AM-7239A/VRC		(Ref Group Number 86)						
	AM-7239B/VRC		(Ref Group Number 51)						
	AM-7239C/VRC		(Ref Group Number 56)						
	AM-7239D/VRC (Unit 5)		(Ref Group Number 87)						
04	Deleted								
05	Radio Set AN/VRC-87	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
0501	Receiver-Transmitter Radio	Replace		0.1					
	RT-1439/VRC (Unit 1)		(Ref Group Number 27)						

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0502	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
06	Deleted								
07	Radio Set AN/VRC-88A	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
0701	Receiver-Transmitter Radio	Replace		0.1					
	RT-1523(C)/U			(Ref Group Number 26)					
	RT-1523A(C)/U			(Ref Group Number 80)					
	RT-1523B(C)/U			(Ref Group Number 52)					
	RT-1523C(C)/U			(Ref Group Number 55)					
	RT–1523D(C)/U (Unit 1)			(Ref Group Number 81)					
0702	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
0703	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0704	Battery Box CY-8523A/PRC	Replace		0.1					
	CY-8523B/PRC			(Ref Group Number 20)					
	CY-8523C/PRC (Unit 3)			(Ref Group Number 84)					AN,AO
08	Deleted								
09	Radio Set AN/VRC-88	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
0901	Receiver-Transmitter, Radio RT-1439/VRC (Unit 1)	Replace		0.1					
				(Ref Group Number 27)					
0902	Amplifier-Adapter, Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
0903	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C
0904	Battery Box CY-8523A/PRC	Replace		0.1					
	CY-8523B/PRC			(Ref Group Number 20)					
	CY-8523C/PRC (Unit 3)			(Ref Group Number 84)					AN,AO
0905	Cable Assembly, Special Purpose, Electrical CX-13293/VRC (2 FT, 1 IN)	Inspect			0.1				
		Test			0.1			7	
		Replace		0.1					
		Repair			0.1			12	V

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
10	Deleted								
11	Radio Set AN/VRC-89A	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
1101	Receiver-Transmitter	Replace		0.1					
	RT-1523(C)/U			(Ref Group Number 26)					
	RT-1523A(C)/U			(Ref Group Number 80)					
	RT-1523B(C)/U			(Ref Group Number 52)					
	RT-1523C(C)/U			(Ref Group Number 55)					
	RT-1523D(C)/U (Unit 1) Qty (2)			(Ref Group Number 81)					
1102	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM-7239D/VRC (Unit 5)			(Ref Group Number 87)					
1103	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC			(Ref Group Number 30)					
	AM-7238A/VRC			(Ref Group Number 85)					
	AM-7238B/VRC (Unit 6)			(Ref Group Number 54)					
12	Radio Set AN/VRC-89	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
1201	Receiver-Transmitter Radio	Replace		0.1					
	RT-1439/VRC (Unit 1) Qty (2)			(Ref Group Number 27)					

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1202	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC		(Ref Group Number 29)						
	AM-7239A/VRC		(Ref Group Number 86)						
	AM-7239B/VRC		(Ref Group Number 51)						
	AM-7239C/VRC		(Ref Group Number 56)						
	AM–7239D/VRC (Unit 5)		(Ref Group Number 87)						
1203	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC		(Ref Group Number 30)						
	AM-7238A/VRC		(Ref Group Number 85)						
	AM-7238B/VRC		(Ref Group Number 54)						
13	Radio Set AN/VRC-90A	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
1301	Receiver-Transmitter, Radio	Replace		0.1					
	RT-1523(C)/U		(Ref Group Number 26)						
	RT-1523A(C)/U		(Ref Group Number 80)						
	RT-1523B(C)/U		(Ref Group Number 52)						
	RT-1523C(C)/U		(Ref Group Number 55)						
	RT–1523D(C)/U (Unit 1)		(Ref Group Number 81)						
1302	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC		(Ref Group Number 29)						
	AM-7239A/VRC		(Ref Group Number 86)						
	AM-7239B/VRC		(Ref Group Number 51)						
	AM-7239C/VRC		(Ref Group Number 56)						
	AM–7239D/VRC (Unit 5)		(Ref Group Number 87)						

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1303	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC			(Ref Group Number 30)					
	AM-7238A/VRC			(Ref Group Number 85)					
	AM-7238B/VRC (Unit 6)			(Ref Group Number 54)					
14	Radio Set AN/VRC-90	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
1401	Receiver-Transmitter Radio RT-1439/VRC (Unit 1)	Replace		0.1					
				(Ref Group Number 27)					
1402	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
1403	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC			(Ref Group Number 30)					
	AM-7238A/VRC			(Ref Group Number 85)					
	AM-7238B/VRC (Unit 6)			(Ref Group Number 54)					
15	Radio Set AN/VRC-91A	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1					
		Repair		0.1					

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1501	Receiver-Transmitter, Radio	Replace		0.1					
	RT-1523(C)/U		(Ref Group Number 26)						
	RT-1523A(C)/U		(Ref Group Number 80)						
	RT-1523B(C)/U		(Ref Group Number 52)						
	RT-1523C(C)/U		(Ref Group Number 55)						
	RT–1523D(C)/U (Unit 1) Qty (2)		(Ref Group Number 81)						
1502	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC		(Ref Group Number 29)						
	AM-7239A/VRC		(Ref Group Number 86)						
	AM-7239B/VRC		(Ref Group Number 51)						
	AM-7239C/VRC		(Ref Group Number 56)						
	AM–7239D/VRC (Unit 5)		(Ref Group Number 87)						
1503	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC		(Ref Group Number 30)						
	AM-7238A/VRC		(Ref Group Number 85)						
	AM-7238B/VRC (Unit 6)		(Ref Group Number 54)						
1504	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C
1505	Battery Box	Replace		0.1					
	CY-8523A/PRC		(Ref Group Number 20)						
	CY-8523B/PRC		(Ref Group Number 84)						
	CY-8523C/PRC (Unit 3)								AN,AO
16	Radio Set AN/VRC-91	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1					5	B
		Remove/Install		0.1				5	
		Repair		0.1				5	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1601	Receiver-Transmitter Radio RT-1439/VRC (Unit 1) Qty (2)	Replace		0.1 (Ref Group Number 27)					
1602	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
1603	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC			(Ref Group Number 30)					
	AM-7238A/VRC			(Ref Group Number 85)					
	AM-7238B/VRC			(Ref Group Number 54)					
1604	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					
		Repair		0.1					C
1605	Battery Box	Replace		0.1					
	CY-8523A/PRC			(Ref Group Number 20)					
	CY-8523B/PRC			(Ref Group Number 84)					
	CY-8523C/PRC (Unit 3)								AN,AO
1606	Cable Assembly, Special Purpose, Electrical CX-13293/VRC (2 FT, 1 IN)	Inspect			0.1				
		Test			0.1			7	
		Replace		0.1					
		Repair			0.1			12	V
17	Radio Set AN/VRC-92A	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1701	Receiver-Transmitter, Radio RT-1523(C)/U	Replace		0.1					
	RT-1523A(C)/U			(Ref Group Number 26)					
	RT-1523B(C)/U			(Ref Group Number 80)					
	RT-1523C(C)/U			(Ref Group Number 52)					
	RT-1523D(C)/U			(Ref Group Number 55)					
	(Unit 1) Qty (2)			(Ref Group Number 81)					
1702	Amplifier-Adapter, Vehicular AM-7239/VRC	Replace		0.1				5	
	AM-7239A/VRC			(Ref Group Number 29)					
	AM-7239B/VRC			(Ref Group Number 86)					
	AM-7239C/VRC			(Ref Group Number 51)					
	AM-7239D/VRC			(Ref Group Number 56)					
	(Unit 3)			(Ref Group Number 87)					
1703	Amplifier, Radio Frequency AM-7238/VRC	Replace		0.1					
	AM-7238A/VRC			(Ref Group Number 30)					
	AM-7238B/VRC			(Ref Group Number 85)					
				(Ref Group Number 54)					
1704	Auxiliary Kit, Electronic Equipment MK-2312/VRC	Replace		0.1				5	
				(Ref Group Number 37)					
18	Radio Set AN/VRC-92	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
1801	Receiver-Transmitter Radio RT-1439/VRC	Replace		0.1					
	(Unit 1) Qty (2)			(Ref Group Number 27)					

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1802	Amplifier-Adapter Vehicular	Replace		0.1				5	
	AM-7239/VRC			(Ref Group Number 29)					
	AM-7239A/VRC			(Ref Group Number 86)					
	AM-7239B/VRC			(Ref Group Number 51)					
	AM-7239C/VRC			(Ref Group Number 56)					
	AM–7239D/VRC (Unit 5)			(Ref Group Number 87)					
1803	Amplifier, Radio Frequency	Replace		0.1					
	AM-7238/VRC			(Ref Group Number 30)					
	AM-7238A/VRC			(Ref Group Number 85)					
	AM-7238B/VRC (Unit 6) Qty (2)			(Ref Group Number 54)					
1804	Auxiliary Kit Electronic Equipment	Replace		0.1				5	
	MK-2312/VRC			(Ref Group Number 37)					
19	Control Monitor	Inspect			0.1				
	C-11291/VRC	Test		0.1					A
	(Unit 7)	Test			0.2			6-14,71,72, 75,76	D
		Replace		0.1				5	
		Repair		0.1				5	C
		Repair			0.1			9-12,71,75	D
1901	Chassis Electrical Equipment	Inspect					0.1		
		Test					0.1	15,16	
	Control Monitor (7A1)	Replace			0.1			9,11,12,71, 75	D
		Repair					0.1	9,11,12,71, 75	D,E
190101	Case Control Monitor (7A1A2)	Repair					0.1	9,11,12,18, 71,75	D
19010101	Backplane Assembly (7A1A2A1)	Replace					0.3	12,17,18	
		Repair					0.1	18	
190102	Panel Control Monitor (7A1A1)	Repair					0.2	9,11,12,18, 71,75	D

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
19010201	CCA-Display (7A1A1A1)	Replace					0.2	12,18	
		Repair					0.1	18	
20	Battery Box CY-8523A/PRC (Unit 3)	Inspect			0.1				
		Test			0.1			6-9,11,13, 71,72,75,76	D
		Replace		0.1					
		Repair			0.1			9,11,12,26, 71,75	H,D
21	Deleted								
22	Battery Tray CY-8664/VRC (Unit 12)	Inspect		0.1					
		Test		0.1				1-5	
		Test			0.1			6-9,11-13, 71,72,75,76	D
		Replace		0.1				5	
		Repair		0.1				5	C
		Repair			0.1			9,11,12,71, 75	D
2201	ECA-Battery Tray (12A1)	Repair			0.1			9,11,71,75	D
220101	Chassis Electrical-Electronic Eqpt-Assy of	Repair			0.1			9,11,71,75	D
23	Fill Device	Inspect		0.1					
	Electronic Counter	Inspect			0.1				
	Counter Measures	Inspect					0.1		
	MX-18290/VRC (Unit 10)	Test		0.1					I
		Test			0.1			9,13,71,72, 75,76	D,I
		Test					0.5	7,9,12,13, 27,71,72,75 76	D
		Service	0.1					5	B
		Repair		0.1				5	C
		Repair					0.5	9,11,12,57, 71,75	D,E
2301	CCA-Fill Device 10A1	Test					0.5	15,60,65	
		Replace					0.1	9,11,12,18, 71,75	D

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
24	Fill Device	Inspect		0.1					
	Electronic Counter	Inspect			0.1				
	Counter Measures	Inspect					0.1		
	MX-10579/VRC	Test		0.1					I
	(Unit 10)	Test			0.1			11,13,71,72 75,76	D,I
		Test					0.5	7,11,13,27, 71,72,75,76	D
		Service	0.1					5	B
		Repair		0.1				5	C
		Repair					0.5	9,11,12,57, 71,75	D,E
2401	CCA–Fill Device	Test					0.5	15,25,	
	10A1	Replace					0.1	11,12,18,71 72,75,76	D
25	Adapter, Power	Inspect		0.1					
	Supply	Test		0.1				1-5	
	MX-10862/VRC	Test			0.1			6-9,11-13, 71,72,75,76	D
	(Unit 8)	Replace		0.1				5	
		Repair		0.1				5	C
		Repair			0.1			5,9,11,71, 75	D
2501	Case, Power Supply, Adapter (8A2)	Repair			0.1			5,9,11,71, 75	D
250101	Casting, Electrical Equipment Assy	Repair			0.1			9,11,71,75	D
2502	Heatsink, Power	Test					0.5	19,48,52	AM
	Supply Adapter (8A1)	Replace			0.1			5,9,11,71, 75	D
		Repair					0.2	5,9,11,71, 75	D,AM
250201	CCA-Transient/ Protection (8A1A1)	Repair					0.2	18	
250202	CCA-Filter, Transient Protection/ Regulator (8A1A2)	Repair					0.2	18	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
26	Receiver-Transmitter Radio RT-1523(C)/U (Unit 1)	Inspect			0.1				
		Test			0.5			6-9,12-14 28,71,72, 75,76	D
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			9,12,71,75	D
2603	Power Supply Module Assy (1A3)	Replace			0.1			9,11,12,71, 75	D,AM
2605	Control Counter-Counter Measures Electronic (1A5)	Test					0.5	15,60,64	
		Replace			0.1			9,12,71,75	D
		Repair					0.1	12,18,35	
260501	Electronic Components Assembly-ECCM (1A5A1)	Inspect					0.1		
		Repair					0.1	12,18	
26050101	CCA-Memory (1A5A1A1)	Repair					0.6	18,24	
2605010101	Electronic Components Assembly (1A5A1A1U3)	Remove/Install					0.3	24,31	L,AB
2605010102	Electronic Components Assembly (1A5A1A1U4)	Remove/Install					0.3	24,31	L,AB
2605010103	Electronic Components Assembly (1A5A1A1U5)	Remove/Install					0.3	24,31	L,AB
2605010104	Electronic Components Assembly (1A5A1A1U10)	Remove/Install					0.3	24,31	L,AB

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
2605010105	Electronic Components Assembly (1A5A1A1U2)	Remove/Install					0.3	24,32	L,AB
2605010106	Electronic Components Assembly (1A5A1A1U8)	Remove/Install					0.3	24,31	L,AB
2605010107	Electronic Components Assembly (1A5A1A1U9)	Remove/Install					0.3	24,31	L,AB
26050102	CCA-Interleaver (1A5A1A2)	Repair					0.6	18,24	
2605010201	Electronic Components Assembly (1A5A1A2U2)	Remove/Install					0.3	24,31	L,AC
2605010202	Electronic Components Assembly (1A5A1A2U9)	Remove/Install					0.3	24,31	L,AC
2605010203	Electronic Components Assembly (1A5A1A2U8)	Remove/Install					0.3	24,31	L,AC
2605010204	Electronic Components Assembly (1A5A1A2U4)	Remove/Install					0.3	24,32	L
2605010205	Electronic Component Assembly (1A5A1A2U3)	Remove/Install					0.3	24,32	L

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
2605010206	Electronic Component Assembly (1A5A1A2U1)	Remove/Install					0.3	24,33	L
2608	IF/Demodulator (1A8)	Replace			0.2			9,11,12,71, 75	D,AM
2609	Tuner/Mixer (1A9)	Test					0.5	19,22,30, 37,39	E
		Replace			0.2			9,11,12,71, 75	D
		Repair					0.1	12,34	E
260901	CCA-Tuner Mixer (1A9A1)	Inspect					0.1		
		Repair					0.6	18,24	
2610	Synthesizer Electrical Frequency (1A10)	Adjust					0.5	19,22,26 34,37,39	M
		Test					0.5	12,19,22, 34,37,39	E
		Replace			0.2			9,11,12,71, 75	D
		Repair					0.1	12,34	E
261001	CCA-Dual Mode PLL Filter (1A10A1)	Inspect					0.1		
		Repair					0.7	12,18,24	
26100101	Electronic Components Assembly (1A10A1U8)	Remove/Install					0.3	24,42	L
261002	CCA-Low Level VCO (1A10A2)	Inspect					0.1		
		Repair					0.6	18,24	
26100201	Electronic Component Assembly (1A10A2U1)	Remove/Install					0.3	24,31	L,AE
2611	Exciter/Power Amplifier (1A11)	Test					0.5	19,22,37,58	E
		Replace			0.2			9,11,12,71, 75	D
		Repair					0.6	12,18	E

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
261101	CCA-Power Amplifier (1A11A1)	Inspect Repair					0.1 0.7	 18	
261102	CCA-ALC (1A11A2)	Inspect Repair					0.1 0.7	 18,24	
26110201	Electronic Components Assembly (1A11A2U1) (1A11A2U6) (Qty 2)	Remove/Install					0.3	24,42	L
261103	CCA-Modulator (1A11A3)	Inspect Repair					0.1 0.7	 12,18,24	
26110301	Electronic Component Assembly (1A11A3U6)	Remove/Install					0.3	24,31	L
2616	Receiver-Transmitter Sub-Assembly (1A17)	Repair Repair		0.1	0.2			5 9,12,71,75	C D
261601	Panel Receiver (1A17A1)	Repair Repair		0.1	0.1			5 12	C
26160101	CCA-Display (1A17A1A1)	Inspect Test Replace Repair			0.5		0.1 0.5 0.6	 15,60,66 9,12,71,75 18,24,26	 D
2616010101	Electronic Components Assembly (1A17A1A1U7)	Remove/Install					0.3	24,33	L
2616010102	Electronic Components Assembly (1A17A1A1U4)	Remove/Install					0.3	24,33	L,AF

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
2616010103	Electronic Components Assembly (1A17A1A1U3)	Remove/Install					0.3	24,31	L
261602	Chassis Electrical Equipment	Inspect					0.1		
		Test					0.5	15,60,67	
	R/T Sub Assembly (1A17A2)	Replace			0.2			9,12,71,75	D
		Repair					1.0	12,18,44	
26160201	Backplane Assembly Chassis Electrical Equipment (1A17A2A1)	Repair					0.6	18	
26160202	Chassis Electrical Equipment	Repair			0.2			9,71,75	D
		Repair					0.2	9,71,75	D
2617	CCA-COMSEC (1A16)	Inspect					X		
		Test					X	TBD	
		Replace			0.1			9,12,71,75	D
		Repair					X	TBD	
27	Receiver-Transmitter Radio RT-1439/VRC (Unit 1)	Inspect			0.1				
		Test			0.5			6-8,11-14, 28,45,71, 72,75,76	D
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			11,12,71,75	D
2701	Network Impedance Matching (1A1)	Inspect					0.1		
		Test				0.5		19,20,22 29,30	F
		Test					0.5	19,20,22 29,30	
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.5	12,18	
270101	CCA-Antenna Decoder (1A1A1)	Repair					0.6	18	

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270102	CCA-Antenna Matching (1A1A2)	Repair					0.6	18	
2702	CCA-Remote I/O (1A2)	Inspect					0.1		
		Test				0.5		15,23	F
		Test					0.5	15,23	
		Replace			0.1			11,12,71,75	D
		Repair					0.6	18,24	
2703	Power Supply Module Assy (1A3)	Inspect				0.1			AG
		Test				0.5			
		Replace			0.1			11,12,71,75	D
		Repair				0.3		12	
270301	CCA-Filter, Power Supply	Inspect				0.1			
		Repair				0.6		12,18	
270302	CCA-Switching	Inspect				0.1			
		Repair				0.6		12,18	
270303	CCA-Regulator, Power Supply	Inspect				0.1			
		Repair				0.6		12,18	
2704	Electronic Components Assy-Control (1A4)	Inspect					0.1		
		Test				0.5		15,23	F
		Test					0.5	15,23	
		Replace			0.1			11,12,71,75	D
		Repair					0.2	12,18,24	
270401	CCA-Microprocessor/ Memory (1A4A1)	Repair					0.6	18,24	
270402	CCA-Control I/O (1A4A2)	Repair					0.6	18,24	
2705	Control Counter Counter-Measures Electronic (1A5)	Test				0.5		15,25	F
		Test					0.5	15,25	E
		Replace			0.1			11,12,71,75	D
		Repair					0.1	12,18,35	E
270501	Electronic Components Assembly-ECCM (1A5A1)	Inspect					0.1		
		Repair					0.1	12,18	

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27050101	CCA-Memory (1A5A1A1)	Repair					0.6	18,24	
27050102	CCA-Interleaver (1A5A1A2)	Repair					0.6	18,24	
2706	CCA-Two Wire Interface (1A6)	Inspect					0.1		
		Test				0.5		19-22	F
		Test					0.5	19-22	
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.6	18	
2707	CCA-Switching (1A7)	Inspect				0.1			
		Test				0.5		19,22,36,37	F
		Replace			0.1			11,12,71,75	D
2708	IF/Demodulator (1A8)	(Ref Group Number 2608)							
2709	Tuner/Mixer (1A9)	(Ref Group Number 2609)							
2710	Synthesizer Electrical Frequency (1A10)	(Ref Group Number 2610)							
2711	Exciter/Power Amplifier (1A11)	(Ref Group Number 2611)							
2712	CCA-Audio Power Supply (1A12)	Inspect				0.1			
		Test				0.5		19,22,36,37	F
		Replace			0.1			11,12,71,75	D
2713	CCA-Audio Control (1A13)	Inspect					0.1		
		Test				0.5		15,25	F
		Replace			0.1			11,12,71,75	D
2714	CCA-Audio/Data I/O (1A14)	Inspect					0.1		
		Test				0.5		19,22,36,37	F
		Replace			0.1			11,12,71,75	D
2715	CCA-Data Rate Adapter (1A15)	Test				0.5		15,43	G
		Replace			0.1			11,12,71,75	D

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2716	Receiver-Transmitter Sub-Assembly (1A16)	Inspect			0.2				
		Replace			0.4			9-12	D
		Repair		0.1				5	C
		Repair			0.2			9-12	D
271601	Panel Receiver-Transmitter (1A16A1)	Replace			0.2			9-12	D
		Repair		0.1				5	C,E
		Repair			0.1			12	N
27160101	CCA-Display (1A16A1A1)	Inspect				0.1			
		Test				0.2		15,43	
		Replace			0.5			12,18	
		Repair				0.6		18,26	
271602	Chassis Electrical Equipment (1A16A2)	Inspect				0.2			
		Test				0.2		15,43	
		Replace			0.2			12	
		Repair				1.0		12,18,44	
27160201	Backplane Assembly Chassis Electrical (1A16A2A1)	Replace				0.2		12,44	
		Repair				0.6		18	
27160202	Chassis Electrical Equipment	Repair			0.2			11,71,75	D
		Repair				0.2		11,71,75	D
28	Control Receiver-Transmitter C-11561(C)/U (Unit 19)	Inspect		0.1					
		Inspect			0.1				
		Test		0.1					A
		Test			0.5			6-9,12,13, 71,72,75,76	D
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			9,12,71,75	D
2801	Power Supply-Assembly (19A1)	(Ref Group Number 2603)							
2802	Control Assembly (19A2)	Inspect					0.1		
		Test					0.2	15,60,74	
		Replace			0.1			9,12,71,75	D
		Repair					0.1	9,12,71,75	D

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280201	CCA-SRCU CPU (19A2A1)	Repair					0.3	12,18,24	
280202	CCA-SRCU Interface (19A2A2)	Repair					0.3	12,18,24	
2811	CCA-COMSEC (19A11)		(Ref Group Number 2617)						
2813	Control,Receiver-Transmitter Sub-Assembly (19A13)	Repair Repair		0.1	0.2			5 9,12,71,75	C D
281301	Panel, Control Assembly (19A13A1)	Repair Repair		0.1	0.1			5 12	C
28130101	CCA-Display (19A13A1A3)		(Ref Group Number 26160101)						
281302	Chassis, Electrical-Control (19A13A2)	Test Replace			0.2		0.7	15,60,67,73 9,12,71,75	AM D
29	Amplifier-Adapter Vehicular AM-7239/VRC (Unit 5)	Inspect Test Adjust Replace Repair Repair		 0.1 0.1 0.1	0.1 0.1 0.1			 6-9,11-13, 71,72,75,76 5 5 5 9,11,12,71, 75	 D O H D
2901	Chassis,Electrical Equipment, Amplifier-Adapter (5A3)	Inspect Test Replace Repair Repair			 0.3 0.3 		0.1 0.5 0.6	 19,22,46 9,11,12,71, 75 9,11,12,71, 75 9,11,12, 18,47,71,75	 AM D D,AI AM
290101	ECA-Power Control	Repair			0.2			9,11,12,71, 75	D

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29010101	Terminal Board Assembly	Repair			0.1			12	
29010102	Case, Electronics Assembly	Repair			0.2			9,11,12,71, 75	D
290102	ECA-One Watt Audio Amplifier	Repair			0.3			9,11,12,71, 75	D
29010201	Wiring Harness, Branched-One Watt Audio-W1	Repair			0.2			9,11,12,71, 75	D
29010202	Case-One Watt Audio Amplifier	Repair			0.2			9,11,12,71, 75	D
290103	Cable Assembly Special Purpose Electrical, Branched-Major-W3	Repair			0.5			9,11,12,71, 75	D
290104	Wiring Harness-J7-J11-W2	Repair			0.4			9,11,12,71, 75	D
2902	Power Supply Amplifier-Adapter (5A1)	Inspect					0.1		
		Test					0.5	19,48,52	AM
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.5	12,18	AM
290201	CCA-Filter Transient Protection/ Regulator (5A1A2)		(Ref Group Number 250202)						
290202	CCA-Transient Protection/ Regulator (5A1A1)		(Ref Group Number 250201)						
290203	Heatsink Electrical Electronic Component Power Supply	Repair					0.3	9,11,12,18, 71,75	D,AM

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			C	O	F	H	D		
2903	CCA-One Watt, Audio Amplifier (5A2)	Replace			0.2			9,11,12,71, 75	D,AM
30	Amplifier, Radio Frequency AM-7238/VRC (Unit 6)	Inspect			0.1				
		Test			0.4			7,9,11-13, 45,71,72, 75,76	D,P
		Replace		0.1					
		Repair			0.5			9-12,71,75	D
3001	Heatsink, Electrical-Electronic Component Amplifier, RF (6A3)	Replace			0.1			9,11,12,71, 75	D,AM
3002	Case, Amplifier, RF (6A1)	Inspect					0.1		
		Test					0.5	19,51-53,56	AM
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.5	9,11,12,18, 54,71,75	D,AM
300201	CCA-Output Filter/Switch (6A1A1)	Repair					0.6	18	AM
300202	CCA-Input Filter/Switch (6A1A2)	Repair					0.6	18	AM
31	Deleted								
32	Antenna Vehicular AS-3684/VRC (Unit 4)	Inspect		0.1					
		Test		0.1				2,4,5	
		Replace		0.1				5	
		Repair		0.1				5	Q
3201	Antenna Sub Assembly (4A2)	Inspect			0.1				
		Test			0.1			7,9,11,28, 71,72,75,76	D,R
		Replace		0.1				5	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
33	Antenna Vehicular AS-3900/VRC (Unit 4)	Inspect		0.1					
		Test		0.1				2,4,5	
		Replace		0.1				5	
		Repair		0.1				5	Q
3301	Antenna Sub Assembly (4A2)	Inspect			0.1				
		Test			0.1			7,9,11,28, 71,72,75,76	D,R
		Replace		0.1				5	
34	Reserved for Antenna Vehicular, AS-3916/VRC								
35	Mounting Base, Electrical Equipment MT-6352/VRC (Unit 13)	Inspect		0.1					
		Test		0.1				1	
		Replace		0.1				5	
		Repair		0.1				5	
3501	Connector Assembly Electrical	Inspect			0.1				
		Test			0.2			7	
		Replace		0.1				5	
		Repair			0.2			9,11,12,71, 75	D
36	Mounting Base, Electrical Equipment MT-6576/VRC (Unit 9)	Inspect		0.1					
		Test		0.1				1	
		Replace		0.1				5	
		Repair		0.1				5	
3601	Connector Assembly Electrical (9A1)	Inspect			0.1				
		Test			0.2			7	
		Replace		0.1				5	
		Repair			0.2			9,11,12,71, 75	D
37	Auxiliary Kit, Electronic Equipment MK-2312/VRC	Remove/Install		0.2				5	
		Repair		0.2				5	C
3701	Mounting Base, Electrical Equipment MT-6353/VRC	Inspect		0.1					
		Test		0.2				1	
		Replace		0.2				5	
		Repair		0.2				5	C

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
370101	Chassis/Power Supply Assembly	Inspect			0.1				
		Test			0.1			7,9,11-13, 71,72,75,76	D
		Replace		0.2				5	
		Repair			0.2			9,11,12,71, 75	D
37010101	Power Supply	Inspect					0.1		
		Test					0.5	19,48,52	AM
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.5	12,18	AM
3701010101	CCA-Filter Transient Protection/ Regulator		(Ref Group Number 250202)						
3701010102	CCA-Transient Protection/ Regulator		(Ref Group Number 250201)						
37010102	Chassis, Electrical Equipment	Inspect					0.1		
		Test					0.3	9,11-13,71, 72,75,76	D,AM
		Replace			0.1				
		Repair		0.1				5	
		Repair			0.1			9,11,12,71, 75	D,AM
		Repair					0.4	9,11,12,55, 71,75	D
3701010201	Case, Power Supply	Repair					0.2	9,11,71,75	D
370102	Mounting Base, Electrical Equipment	Repair		0.1				5	
38	Auxiliary Kit Electronic Equipment MK-2499/VRC	Remove/Install		0.2				5	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
3801	Mounting Base, Electrical Equipment MT-6429/VRC	Test		0.1				1	
		Replace		0.1				5	Z
		Repair		0.2				5	Z
380101	Filter Assembly Electrical	Inspect			0.1				
		Test			0.1			7	
		Replace		0.1				5	Z
		Repair			0.2			9,11,12	D,Z,AL
39	Loudspeaker-Control Unit LS-671/VRC (Unit 15)	Inspect		0.1					
		Test		0.1				1-5	
		Test			0.1			9,11-13,71, 72,75,76	D
		Replace		0.1				5	
		Repair		0.1				5	C
		Repair			0.1			9,11,12,71, 75	D
40	Maintenance Group OA-9297/GRC (Unit 18)	Inspect			0.1				
		Test			0.5			6-8,13,14, 28	
		Repair			0.1			12	
4001	Interconnecting Device J-4501/GRC	Replace			0.1				
		Repair			0.1			12	
400101	Cable Assembly, Special Purpose Electrical-RFPA Adapter (18W3)	Replace			0.1				
		Repair			0.1			12	
400102	Chest, Tool and Equipment	Repair			0.1			12	
400103	Kit, Tool Electrical Equipment	Repair			0.1				
400104	Adapter, Test	Test			0.7			6-8,13,14, 28	
		Replace			0.1			12	
		Repair			0.4			7,8,12,26	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
400105	Parts Kit, Electronic Equipment	Repair			0.1				
400106	Cable Assembly, Special Purpose Electrical-Control Monitor (18W4)	Replace Repair			0.1 0.1			 12	
400107	Cable Assembly, Special Purpose Electrical-Audio (18W8)	Replace Repair			0.1 0.1			 12	
400108	Tablerunner, Static Control	Replace Repair			0.1 0.1				
400109	Wiring Harness Branched Receiver-Transmitter (18W2)	Replace Repair			0.1 0.2			 12	
400110	Wiring Harness Branched Amplifier Adapter (18W5)	Replace Repair			0.1 0.4			 12	
400111	Wiring Harness Control Monitor (18W6)	Replace Repair			0.1 0.2			 12	
400112	Wiring Harness RFPA (18W7)	Replace Repair			0.1 0.1			 12	
400113	Wiring Harness Branched Aux RFPA Mount (18W9)	Replace Repair			0.1 0.3			 12	
400114	Wiring Harness Branched Amp Adapter with RT (18W10)	Replace Repair			0.1 0.3			 12	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
400115	Wiring Harness Branched Battery Box (18W11)	Replace Repair			0.1 0.1			 12	
400116	Cable Assembly, Special Purpose Electrical-Audio (18W13)	Replace Repair			0.1 0.1			 12	
400117	Wiring Harness Branched Power Supply (18W14)	Replace Repair			0.1 0.1			 12	
400118	Wiring Harness, Branched-Battery Tray (18W15)	Replace Repair			0.1 0.1			 12	
400119	Wiring Harness, Loudspeaker - Control Unit (18W16)	Replace Repair			0.1 0.1			 12	
400120	Wiring Harness, Branched-SCRU-W17 (18W17)	Replace Repair			0.1 0.1			 12	
4002	Mounting Base, Electrical Equipment MT-6352/VRC (Unit 13)	Replace			0.1 (Ref Group Number 35)			12	S
4003	Receiver-Transmitter, Radio RT-1523(C)/U (Unit 1)	Replace			0.1 (Ref Group Number 26)				S
4004	Amplifier Adapter, Vehicular AM-7239/VRC (Unit 5)	Replace			0.1 (Ref Group Number 29)			5	S

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
4005	Fill Device Electronic Counter Counter Measures MX-18290/VRC (Unit 10)	Replace			0.1				S
					(Ref Group Number 23)				
4006	Fill Device Electronic Counter Counter Measures KYK-13/TSEC	Replace			0.1				T
41	Deleted								
42	Adapter Set, Test for AN/USM-410								U
43	Adapter Set, Test for AN/USM-465A								U
44	Case, Alignment Tool-Rcvr-Xmtr RT-1439/VRC, RT-1523(C)/U	Inspect Repair					0.1 0.1		
4401	Alignment Tool, System Connector	Adjust Replace Repair					0.1 0.1 0.3	 26	
45	Case, Alignment Tool-Amp. Adptr, Vehicular AM-7239/VRC	Inspect Repair					0.1 0.1		
4501	Alignment Tool System Connector J7 & J8	Adjust Replace Repair					0.1 0.1 0.3	 26	
4502	Alignment Tool Connector J1	Adjust Replace Repair					0.1 0.1 0.3	 26	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
46	Case, Alignment Tool-RFPA AM-7238/VRC	Inspect Repair					0.1 0.1		
4601	Alignment Tool Connector P1	Adjust Replace Repair					0.1 0.1 0.3	 26	
47	Case, Alignment Tool-CCA's	Inspect Repair					0.1 0.1		
48	Case, Alignment Tool-Mtg Base, Elec Equip MT-6353/VRC	Inspect Repair					0.1 0.1		
4801	Alignment Tool, Connector J4	Adjust Replace Repair					0.1 0.1 0.3	 26	
49	Maintenance Group OA-9263A/GRC (Unit 18)	Inspect Test Repair			0.1 0.5 0.1			 6-8,13, 14,28 12	
4901	Interconnecting Device J-4501/GRC		(Ref Group Number 4001)						
4902	Receiver-Transmitter Radio RT-1439/VRC (Unit 1)	Replace	(Ref Group Number 27)		0.1				S
4903	Amplifier Adapter Vehicular AM-7239/VRC (Unit 5)	Replace	(Ref Group Number 29)		0.1			12	S
4904	Mounting Base Electrical Equipment MT-6352/VRC (Unit 13)	Replace	(Ref Group Number 35)		0.1			12	S

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
4905	Fill Device Electronic Counter Counter-Measures MX-10579/VRC (Unit 10)	Replace			0.1 (Ref Group Number 24)				S
50	Cable Assembly, Special Purpose CX-13313/VRC	Replace		0.1					W
		Test			0.1			7	G
51	Amplifier-Adapter Vehicular AM-7239B/VRC (Unit 5)	Inspect			0.1				
		Test			0.1			6-9,11-13, 71,72,75,76	D
		Adjust		0.1				5	AJ
		Replace		0.1				5	
		Repair		0.1				5	H
		Repair			0.1			9,11,12,71, 75	D
5101	Power Supply Amplifier-Adapter (5A1)	Inspect					0.1		
		Test					0.5	19,48,52	AM
		Replace			0.1			9,11,12,71, 75	D
		Repair					0.5	12,18	AM
510101	CCA-Transient Protection/ Regulator (5A1A1)	Repair					0.6	12,18	AM
510102	CCA-Filter, Transient Protection/ Regulator (5A1A2)	Repair					0.6	12,18	AM
5102	CCA-One Watt, Audio Amplifier (5A2)	Replace			0.2			9,11,12,71, 75	D,AM

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
5103	Chassis,Electrical Equipment, Amplifier-Adapter (5A3)	Repair			0.5			9,11,12,71, 75	D,AI
		Inspect					0.1		
		Test					0.5	19,22,46	AM
		Replace			0.3			9,11,12,71, 75	D
		Repair					0.6	9,11,12,18, 47,71,75	AM
510301	Chassis, Electrical-Electronic Equipment, Adapter/Power Supply (5A3A1)	Repair			0.4			9,11,12,71, 75	D
51030101	Heatsink Elec-Electronic-Cmpnt-Power Supply-Assembly of	Repair			0.1			9,11,12,71, 75	D
51030102	Cover, Electrical-Electronic Component-Power Supply-Assembly of	Repair			0.1			9,11,12,71, 75	D
51030103	Cable Assembly Special Purpose Electrical, Branched-Major-W3	Repair			0.5			9,11,12,71, 75	D
510302	ECA-One Watt Audio Amplifier	Repair			0.3			9,11,12,71, 75	D
51030201	Wiring Harness, Branched-One Watt Audio-W1	Repair			0.2			9,11,12,71, 75	D
51030202	Case-One Watt Audio Amplifier-Assembly of	Repair			0.1			9,11,12,71, 75	D

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
510303	ECA-Power Control	Repair			0.2			9,11,12,71, 75	D
51030301	Case-Power Control, Assembly of	Repair			0.1			9,11,12,71, 75	D
52	Receiver-Transmitter Radio RT-1523B(C)/U (Unit 1)	Inspect			0.1				
		Test			0.5			6-9,12-14, 28,71,72, 75,76	D
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			9,12,71,75	D
5203	ECCM/Control Module (1A4)	Inspect					0.1		
		Test					0.5	15,60,68	
		Replace			0.1			9,12,71,75	
		Repair					0.1	12	
520301	CCA-ECCM/Data	Inspect					0.1		
		Repair					0.6	12,18	
520302	CCA-ECCM/ Microprocessor	Inspect					0.1		
		Repair					0.6	12,18	
520303	CCA-ECCM/ Interface	Inspect					0.1		
		Repair					0.6	12,18	
5205	IF/Demodulator (1A8)	(Ref Group Number 2608)							
5206	Tuner/Mixer (1A9)	(Ref Group Number 2609)							
5207	Synthesizer, Electrical Frequecny (1A10)	Adjust					0.5	19,22,26,34 37,39	M
		Test					0.5	12,19,22,34 37,39	E
		Replace			0.2			9,11,12,71, 75	D
		Repair					0.1	12,34	E
520701	CCA-Dual Mode PLL Filter (1A10A1)	Inspect					0.1		
		Repair					0.7	12,18,24	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
520702	CCA-Low Level VCO (1A10A2)	Inspect					0.1		
		Repair					0.6	18,24	
5208	Exiter/Power Amplifier (1A11)	Test					0.5	19,22,37,58	E
		Replace			0.2			9,12,71,75	D
		Repair					0.6	12,18	
520801	CCA-Power Amplifier (1A11A1)	Inspect					0.1		
		Repair					0.7	18	
520802	CCA-ALC (1A11A2)	Inspect					0.1		
		Repair					0.7	18	
520803	CCA-Modulator (1A11A3)	Inspect					0.1		
		Repair					0.7	18	
5212	Receiver-Transmitter Sub-Assembly (1A17)		(Ref Group Number 2616)						
5213	CCA-COMSEC (1A16)		(Ref Group Number 2617)						
53	Cable Assembly, Special Purpose, Electrical CX-13417/VRC	Test			0.1			9,11,71,72, 75,76	D,G
		Replace		0.1					
54	Amplifier, Radio Frequency AM-7238B/VRC (Unit 6)	Inspect			0.1				
		Test			0.4			12,71,72, 75,76	D,P
		Replace		0.1					
		Repair			0.5			12,71,75	D
55	Receiver-Transmitter, Radio RT-1523C(C)/U (Unit 1)	Inspect			0.1				
		Test			0.5			12,75,76	
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			12,75	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
5501	ECCM/Control (1A4)	Replace			0.1			75	AP
5502	Tuner/Mixer (1A9)	(Ref Group Number 2609)							
5503	Synthesizer (1A10)	Replace			0.1			75	AP
5504	Exciter/Power Amplifier (1A11)	(Ref Group Number 5208)							
5505	CCA-COMSEC (1A13)	Replace			0.1			75	AP
5506	Receiver-Transmitter Sub-Assembly (1A17)	Repair		0.1				5	C
		Repair			0.2			75	
550601	Panel, Receiver Transmitter (1A17A1)	Repair		0.1				5	C
		Repair			0.1			12	C
550602	Chassis,Electrical Equipment (1A17A2)	Replace			0.2			12,75	
		Repair			0.1			12	C
56	Amplifier-Adapter, Vehicular AM-7239C/VRC (Unit 5)	Inspect			0.1				
		Test			0.1			12,75,76	
		Adjust		0.1				5	AJ
		Replace		0.1				5	
		Repair		0.1				5	H
		Repair			0.1			12,75	C
5601	Power Supply-Vehicular Adapter (5A1)	Inspect			0.1				
		Repair			0.1			12,75	
560101	Assembly Major Harness (5A1W3)	Repair			0.1			26	
560102	Power Supply Assembly (5A1A1)	Inspect			0.1				
		Replace			0.1			12	
		Repair					0.3	12,18	

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
56010201	CCA-VA Power Supply (5A1A1A1)	Repair					0.3	12,18	
5602	ECA-Sidehat (5A2)	Inspect			0.1				
		Repair			0.2			12,25,75	
560201	Sidehat-Casting	Repair			0.1			5,75	
560203	CCA-INC II (5A2A5)	Replace			0.1			5	AP
560204	GPS Splitter Assembly (5A2A3)	Repair			0.1			12,75	
56020401	GPS Stub Cable Assembly (5A2A3A2)	Repair			0.1			5,12	
560205	INC Interface/ Harness Assembly (5A2W5)	Repair			0.1			12	
5603	ECA-Power Control (5A3)		(Ref Group 510303)						
560301	Case,Power Control		(Ref Group 51030301)						
57	Radio Set AN/PRC-119D	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Repair		0.1					
5701	Receiver-Transmitter, Radio RT-1523C(C)/U RT–1523D(C)/U (Unit 1)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
5702	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					C
		Repair		0.1					

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(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
5703	Battery Box CY-8523C/PRC	Replace		0.1					AN
58	Radio Set AN/VRC-87D	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
5801	Receiver-Transmitter, Radio RT-1523C(C)/U RT–1523D(C)/U (Unit 1)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
5802	Amplifier-Adapter Vehicular AM-7239C/VRC AM–7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	
59	Radio Set AN/VRC-88D	Inspect		0.1					
		Test	0.1						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
5901	Receiver-Transmitter, Radio RT-1523C(C)/U RT–1523D(C)/U (Unit 1)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
5902	Amplifier-Adapter Vehicular AM-7239C/VRC AM–7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	
5903	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					C
		Repair		0.1					

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5904	Battery Box CY-8523C/PRC (Unit 3)	Replace		0.1					AN
60	Radio Set AN/VRC-89D	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
6001	Receiver-Transmitter, Radio RT-1523C(C)/U RT-1523D(C)/U (Unit 1) Qty (2)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
6002	Amplifier-Adapter Vehicular AM-7239C/VRC AM-7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	
6003	Amplifier, Radio Frequency AM-7238B/VRC (Unit 6)	Replace		0.1 (Ref Group Number 54)					
61	Radio Set AN/VRC-90D	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
6101	Receiver-Transmitter,Radio RT-1523C(C)/U RT-1523D(C)/U (Unit 1)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
6102	Amplifier-Adapter Vehicular AM-7239C/VRC AM-7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
6103	Amplifier, Radio Frequency AM-7238B/VRC (Unit 6)	Replace		0.1 (Ref Group Number 54)					
62	Radio Set AN/VRC-91D	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	
6201	Receiver-Transmitter, Radio RT-1523C(C)/U RT–1523D(C)/U (Unit 1) Qty (2)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
6202	Amplifier-Adapter Vehicular AM-7239C/VRC AM–7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	
6203	Amplifier, Radio Frequency AM-7238B/VRC (Unit 6)	Replace		0.1 (Ref Group Number 54)					
6204	Antenna, Manpack AS-3683/PRC (Unit 2)	Replace		0.1					C
		Repair		0.1					
6205	Battery Box CY-8523C/PRC (Unit 3)	Replace		0.1					AN
63	Radio Set AN/VRC-92D	Inspect		0.1					
		Test	0.2						A
		Test		0.2				1-4	
		Service	0.1						B
		Remove/Install		0.1				5	
		Repair		0.1				5	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
6301	Receiver-Transmitter,Radio RT-1523C(C)/U RT–1523D(C)/U (Unit 1) Qty (2)	Replace		0.1 (Ref Group Number 55) (Ref Group Number 81)					
6302	Amplifier-Adapter Vehicular AM-7239C/VRC AM–7239D/VRC (Unit 5)	Replace		0.1 (Ref Group Number 56) (Ref Group Number 87)				5	
6303	Amplifier, Radio Frequency AM-7238B/VRC (Unit 6) Qty (2)	Replace		0.1 (Ref Group Number 54)					
6304	Auxiliary Kit, Electronic Equipment MK-2312/VRC	Replace		0.1 (Ref Group Number 37)				5	
80	Receiver-Transmitter, Radio RT-1523A(C)/U (Unit 1)	Inspect		0.1					
		Inspect			0.1				
		Test	0.1						A
		Test		0.1					A
		Test			0.5			12,13,71, 72,75,76	D
		Service	0.1						B
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			12,71,75	
8016	Front Panel	Repair		0.1				5	C
		Repair			0.2			12,71,75	
8017	Chasis Assy	Repair			0.2			12,71,75	
801701	Chasis Subassy	Repair			0.2			12,71,75	AK

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
81	Receiver-Transmitter, Radio RT-1523D(C)/U (Unit 1)	Inspect	0.1						
		Inspect		0.1					
		Inspect			0.1				
		Test	0.1						A
		Test		0.1					A
		Test			0.5			12,13 75,76	
		Service	0.1						B
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.1			12,75	
8116	Front Panel	Repair		0.1				5	C
		Repair			0.2			12,75	
8117	Chasis Assy	Repair			0.2			12,75	
811701	Chasis Subassy	Repair			0.2			12,75	AK
82	Mounting Base, Electrical Equipment MT-6352A/VRC (Unit 13)	Replace		0.2				5	
		Repair		0.1				5	C
		Test			0.1			72,76	D
		Repair			0.1			12,71,75	C
83	Control Monitor C-11291A/VRC (Unit 7)	Test		0.1					A
		Replace		0.3				5	
		Repair		0.1				5	C
		Inspect			0.1				
		Test			0.2			12,13,71, 72,75,76	D
		Repair			0.4			12,71,75	
84	Battery Box CY-8523B/PRC (Unit 3)	Replace		0.1					
		Repair		0.1				5	C
		Test			0.1			13,71,72, 75,76	D
		Repair			0.1			12,71,75	C
85	Amplifier, Radio Frequency AM-7238A/VRC (Unit 6)	Replace		0.3					
		Inspect			0.1				
		Test			0.1			12,13,45, 71,72,75,76	D
		Repair			0.1			12,71,75	C
8502	PA/Control Assy (6A1)	Replace			0.3			12,71,75	
		Repair			0.2			12,71,75	AK
		Inspect					0.1		
		Test					0.6	69,70	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
850201	PA/Control/CCA (6A1A1)	Replace					0.2	12	
		Repair					0.5	12,18	
	Repair					0.5	12,71,74,75		
86	Amplifier-Adapter, AM-7239A/VRC (Unit 5)	Adjust		0.1				5	AJ
		Replace		0.3					
		Repair		0.1				5	C
		Test			0.1			12,13,71, 72,75,76	D
		Repair			0.4			12,71,75	C
8602	Chasis Assy, Adptr	Replace			0.3			12,71,75	
		Repair		0.2				5	
		Repair			0.2			12,18,71,75	
		Inspect					0.1		
		Test					0.4	12,13,71, 72,75,76	D
		Repair					0.9	12,18,71,75	
860201	Chasis Subassy Adptr	Repair		0.1				5	
		Repair			0.2			12,71,75	
		Repair					0.1	12,71,75	
860202	Audio Harness Assy	Replace			0.3			12,71,75	
		Repair			0.5			12,26,71,75	
860203	Main Harness Assy	Replace					0.9	12,18,71,75	
		Repair					0.9	12,18,71,75	
87	Amplifier-Adapter, Vehicular AM-7239D/VRC (Unit 5)	Adjust		0.1				5	AJ
		Replace		0.3					
		Repair		0.1				5	C
		Test			0.1			12,13, 75,76	
		Repair			0.4			12,75	C
8702	Chasis Assy, Adptr	Replace			0.3			12,75	
		Repair		0.2				5	
		Repair			0.2			12,75	
		Inspect			0.1				
870203	Wiring Harness, Main	Test					0.3	7,12	
		Repair					0.2	12	
92	TD-1456/VRC (FHMUX)	Test	0.1						A
		Test		0.1				1-4	
		Test			0.5			7,13,75,76, 82	
		Replace		0.1					
		Repair		0.1				5	C
		Repair			0.2			12, 75	
9201	Matrix, Comm	Repair			0.2			12	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
920126	CCA, Pin Diode Dr	Replace			0.1			12	
		Test					1.0	77,78	
		Repair					3.0	12,18	
920157	Panel,Control,Elec	Repair			0.1			12,75	
9202	Power Supply–Synchronizer	Repair			0.2			12	
920211	CCA, Conflict/Rvs	Replace			0.1			12	
		Test					1.0	77,79	
		Repair					3.0	12,18	
920212	CCA, Pwr Supply	Replace			0.1			12	
		Test					1.0	77,80	
		Repair					3.0	12,18	
920214	CCA, Controller	Replace			0.1			12	
		Test					1.0	77,81	
		Repair					3.0	12,18	
9209	Tools and Equip	Repair			0.1				
920913	Cable Assembly	Repair			0.1			12,75	
93	MT–6845/VRC Mount	Replace		0.1				5	
		Repair		0.1				5	C
95	Interconnecting Group ON-373/GRC	Inspect			0.1				
		Test			0.3			72	
		Repair			0.1			12	
9501	Case Assembly-Transit	Repair			0.1			12,26	
9502	Power Supply	Test			0.1			71,72	S
		Repair			0.2			5	C
950201	Chasis/Power Supply Assembly	(Ref Group Number 370101)							S
9503	Wiring Harness, Electrical-RFPA Adapter (W3)	Replace			0.1				
		Repair			0.1			12	
9504	Wiring Harness, Branched, Electrical-Fill Device (W8)	Replace			0.1				
		Repair			0.1			12	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
9505	Wiring Harness, Branched-Receiver Transmitter (W2)	Replace Repair			0.1 0.1			 12	
9506	Wiring Harness, Branched-Control Monitor (W6)	Replace Repair			0.1 0.1			 12	
9507	Wiring Harness, Branched-Power Electrical (W4)	Replace Repair			0.1 0.1			 12	
9508	Parts Kit, Electronic Equipment	Repair			0.1				C
9509	Tool Kit, Electronic	Repair			0.1				C
9510	Tablerunner, Static Control	Replace Repair			0.1 0.1				
9511	Wiring Harness, Branched-Amplifier Adapter (W5)	Replace Repair			0.1 0.4			 12	
9512	Wiring Harness, Electrical-Power Supply (W7)	Replace Repair			0.1 0.1			 12	
9513	Wiring Harness, Branched-Aux RFPA Mount (W9)	Replace Repair			0.1 0.3			 12	
9514	Wiring Harness, Branched-Adapter Power Supply (W10)	Replace Repair			0.1 0.1			 12	
9515	Wiring Harness, Branched-Battery Box (W11)	Replace Repair			0.1 0.1			 12	
9516	Wiring Harness, Branched-Battery Tray (W12)	Replace Repair			0.1 0.1			 12	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
9517	Wiring Harness, Branched-Loud Speaker-Control Unit (W13)	Replace Repair			0.1 0.1			 12	
9518	Wiring Harness, Branched-RCU (W14)	Replace Repair			0.1 0.1			 12	
9519	Wiring Harness, Branched-Splitter Cable (W15)	Replace Repair			0.1 0.1			 12	
9520	Adapter, Test	Test Repair			0.3 0.3			7 12	
952001	Wiring Harness Test Adapter	Repair			0.3			12	
96	Interconnecting Group ON-373A/GRC	Inspect Test Repair			0.1 0.3 0.1			 76 12	
9601	Case Assembly-Transit	Repair			0.1			12,26	
9602	Power Supply	Test Repair			0.1 0.2			75,76 5	S C
960201	Chasis/Power Supply Assembly		(Ref Group Number 370101)						S
9603	Wiring Harness, Electrical-RFPA Adapter (W3)	Replace Repair			0.1 0.1			 12	
9604	Wiring Harness, Branched, Electrical-Fill Device (W8)	Replace Repair			0.1 0.1			 12	
9605	Wiring Harness, Branched-RCVR Transmitter (W2)	Replace Repair			0.1 0.1			 12	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
9606	Wiring Harness, Branched-Control Monitor (W6)	Replace Repair			0.1 0.1			 12	
9607	Wiring Harness, Branched-Power Electrical (W4)	Replace Repair			0.1 0.1			 12	
9608	Parts Kit, Electronic Equipment	Repair			0.1				C
9609	Tool Kit, Electronic	Repair			0.1				C
9610	Tablerunner, Static Control	Replace Repair			0.1 0.1				
9611	Wiring Harness, Branched-Amp Adapter (W5)	Replace Repair			0.1 0.4			 12	
9612	Wiring Harness, Electrical-Power Supply (W7)	Replace Repair			0.1 0.1			 12	
9613	Wiring Harness, Branched-Aux RFPA Mount (W9)	Replace Repair			0.1 0.3			 12	
9614	Wiring Harness, Branched-Adapter Power Supply (W10)	Replace Repair			0.1 0.1			 12	
9615	Wiring Harness, Branched-Battery Box (W11)	Replace Repair			0.1 0.1			 12	
9616	Wiring Harness, Branched-Battery Tray (W12)	Replace Repair			0.1 0.1			 12	

Section II. MAINTENANCE ALLOCATION CHART FOR ALL SINCGARS RADIO SETS

(1) GROUP NO.	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT	(6) REMARKS
			C	O	F	H	D		
9617	Wiring Harness, Branched-Loud Speaker-Control Unit (W13)	Replace Repair			0.1 0.1			 12	
9618	Wiring Harness, Branched-RCU (W14)	Replace Repair			0.1 0.1			 12	
9619	Wiring Harness, Branched-Splitter Cable (W15)	Replace Repair			0.1 0.1			 12	
9624	Wiring Harness, Branched-Amplifier-Adapter (W16)	Replace Repair			0.1 0.4			 12	
9625	Wiring Harness, Branched-Receiver-Transmitter (W17)	Replace Repair			0.1 0.3			 12	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR ALL RADIO SETS USING RT-1439/VRC, RT-1523(C)/U, RT-1523A(C)/U, RT-1523B(C)/U, OR RT-1523C(C)/U

(1) TOOL OR TEST EQUIP. REF. CODE	(2) MAINT. CATEGORY	(3) NOMENCLATURE		(4) NATIONAL/ NATO STOCK NO.	(5) TOOL NO.
1	0	Multimeter	AN/PSM-45	6625-01-139-2512	
2	0	Radio Test Set	AN/PRM-34	6625-01-094-5646	
3	0	Dummy Load, 50W	8085	5895-00-477-8165	
4	0	Connector Adapter	10519457	5935-00-739-2243	
5	0	Tool Kit Electronic Equipment	TK-101/G	5180-00-064-5178	
6	F	Function Generator	SG-1171/U	6625-01-133-6160	
7	FHD	Digital Multimeter	AN/USM-486	6625-01-145-2430	
8	F	Oscilloscope	AN/USM-488	6625-01-187-7847	
9	FHD	Maintenance Group	OA-9297/GRC	5820-01-270-3936	
10		(Deleted)			
11	FHD	Maintenance Group	OA-9263A/GRC	5820-01-304-2010	
12	FHD	Tool Kit Electronic Group	TK-105/G	5180-00-610-8177	
13	FD	Power Supply	6434B	6130-00-006-5224	
14	FD	Frequency Counter	TD-1225A(V)2/U	6625-01-121-6934	
15	HD	Digital Test Set	AN/USM-465A	6625-01-126-2473	
16	HD	Adapter, Test-ICD-C	J-4820/G	6625-01-298-4976	
17	D	Alignment Tool, Backplane	A3019131-1		
18	HD	Solder Repair Center	PRC-151	3439-01-109-8590	
19	HD	Test Station Electrical Equipment	AN/USM-410(V)2	6625-01-069-4223	
20	HD	Adapter, Test-C	J-4825/G	6625-01-300-3557	
21	H	CCA-Load Card-B	J-4834/G	6625-01-298-1404	
22	HD	AN/USM-410 ICD	ID-005C		
23	HD	Adapter, Test-ICD-B	J-4822/G	6625-01-298-4978	
24	D	SMD Solder Station	Dragon M111		
25	HD	Adapter, Test-ICD-A	J-4821/G	6625-01-298-4977	
26	FHD	Tool Kit Electronic Group	TK-100/G	5180-00-605-0079	
27	D	Tape Reader	KOI-18	5810-01-026-9620	
28	FD	Signal Generator	SG-1112	6625-00-566-3067	
29	HD	CCA-Load Card-C	J-4833/G	6625-01-298-1403	
30	HD	Network Analyzer	3577A/35677A	6625-01-238-9517	
31	D	Soldering Fixture-28 Pin	F2868-28		
32	D	Soldering Fixture-52 Pin	F2868-52		
33	D	Soldering Fixture-44 Pin	F2868-44		
34	HD	Case, Alignment Tool, CCAs	A3142120-1	5895-01-306-8076	
35	D	Alignment Tool, Circuit Card Assembly	A3019157-2		
36	D	Adapter, Test-B	J-4824/G	6625-01-300-3556	
37	HD	CCA-Load Card-A	J-4832/G	6625-01-298-1402	
38		(Deleted)			
39	HD	Adapter, Test-A	J-4823/G	6625-01-298-4979	
40		(Deleted)			
41		(Deleted)			
42	D	Soldering Fixture 36 Pin	F2868-36		

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR ALL RADIO SETS USING RT-1439/VRC, RT-1523(C)/U, RT-1523A(C)/U, RT-1523B(C)/U, OR RT-1523C(C)/U

(1) TOOL OR TEST EQUIP. REF. CODE	(2) MAINT. CATEGORY	(3) NOMENCLATURE		(4) NATIONAL/ NATO STOCK NO.	(5) TOOL NO.
43	HD	Adapter, Test-ICD-D	J-4819/G	6625-01-298-4975	
44	HD	Case, Alignment Tool-RCVR-XMTR RT-1439/VRC,RT-1523(C)/U	A3142114-1	5895-01-306-8074	
45	F	Attenuator 20dB	FH-50-20-100		
46	H	Adapter, Test-E	J-4827/G	6625-01-300-3559	
47	H	Case, Alignment Tool-Amp Adptr, Vehicular AM-7239/VRC	A3142116-1	5895-01-306-8075	
48	H	Adapter, Test-H	J-4829/G	6625-01-298-1400	
49	H	CCA-Adapter Card-D	J-4826/G	6625-01-300-3558	
50	H	Wiring Harness, Branched-ICD-G	J-4830/G	6625-01-298-1401	
51	H	Amplifier, Power	AM-7353/G	5895-01-255-4151	
52	H	Accessory Kit, Test Adapter Set	J-4831/G	6625-01-298-1399	
53	H	Adapter, Test-F	J-4828/G	6625-01-300-3560	
54	H	Case, Alignment Tool-Amp, RF AM-7238/VRC	A3142118-1	5895-01-306-8072	
55	H	Case, Alignment Tool-Mtg Base, Elec Equip MT-6353/VRC	A3142122-1	5895-01-306-8073	
56	H	Heatsink, Elec-Elek Cmpnt-Ampl, RF	A3013374-1	5999-01-179-2796	
57	H	Socket, Socket Wrench	SFS-121	5120-00-227-1033	
58	HD	Adapter, Test - I,J,K	J-4909/G	6625-01-318-1588	
59	HD	Adapter, Test-L	J-4997/G	6625-01-339-1119	
60	HD	CCA-Interconnect Device A5	J-4951/G	6625-01-323-6261	
61 – 63		Deleted			
64	HD	Adapter, Test - ICD A8	J-6000/G	6625-01-341-2900	
65	H	Adapter, Test - ICD A9	J-6001/G	6625-01-339-1122	
66	HD	Adapter, Test - ICD A12	J-6003/G	6625-01-339-1124	
67	HD	Adapter, Test - ICD A13	J-6004/G	6625-01-339-1125	
68	HD	Adapter, Test–ICD A11			
69	D	Test Adapter	J-6070/G	6625-01-362-5924	
70	D	Test Station, Electr	AN/GSM-340(V)3	6625-01-295-1928	
71	F,H,D	Interconnecting Group	ON-373/GRC	5895-01-335-7876	
72	F,H,D	Radio Test Set	AN/GRM-114B	6625-01-309-2824	
73	H,D	Adapter,Test	J-6097/G	6625-01-372-6673	
74	H	Adapter,Test	J-6098/G	6625-01-372-6674	
75	F,H,D	Interconnecting Group	ON-373A/GRC		
76	F,H,D	Radio Test Set	AN/GRM-122		
77	D	FHMUX Depot Test Station,	A3261244		
78	D	PDD Test Adapter,	A3261252		
79	D	CRP Test Adapter	A3261248		
80	D	Power Supply Test Adapter	A3261250		
81	D	Controller Test Adapter	A3261246		
82	F	FHMUX Tools And Equip	A3261219		

Section IV. REMARKS

(1) REMARKS CODE	(2) REMARKS
A	With Use of Built-In-Test Bit.
B	By replacement of Hold or Main Battery.
C	By replacement of piece parts.
D	Support Equipment to be used is determined by system and equipment availability. Use AN/GRM-122 and HP6434B as TMDE along with ON-373A for all systems, or AN/GRM-114B and HP6434B as TMDE along with the ON-373 for all systems except SIP, or use seperate TMDE and OA-9297 for ICOM, or use seperate TMDE and OA-9263A for Non-ICOM.
E	Specialized Repair Activity Authorized in Korea.
F	General support test only. Evacuate to depot for repair.
G	Test only. Discard upon failure.
H	All plugs, connectors and cable assemblies not separately listed are repairable at unit or direct support maintenance level.
I	Performance test.
J	Deleted.
K	Deleted
L	Assembly required.
M	Only items tagged by Direct Support as requiring frequency adjustments.
N	Deleted.
O	Set strapping option.
P	ALC and VSWR adjustments are included in the RFPA Test Procedures.
Q	Repair by replacement of antenna subassembly, and misc. piece parts.
R	Direct support test only. Discard upon failure.
S	Direct support maintenance will be responsible for all org level maintenance actions on the LRU's contained in the OA-9263A Maintenance Group, OA-9297 Maintenance Group, ON-373 Interconnecting Group, and ON-373A Interconnecting Group.
T	Reference Maintenance Allocation Chart in Technical Manual TM 11-5810-292-12.

Section IV. REMARKS

(1) REFERENCE CODE	(2) REMARKS
U	Reference Maintenance Allocation Chart in Technical Manual TM 11-6625-3094-24.
V	By replacement of Audio Connector.
W	Item is not part of SINCGARS systems, procured as part of Installation Kits for Ground Vehicles using VIC-1, and/or systems using KY-57.
X	Deleted.
Y	Deleted.
Z	Reference TM 11-5820-957-23P.
AA	Deleted.
AB	Only used on FGC26050101, ICCs 124000501 through 124002378.
AC	Only used on FGC26050102, ICCs 123001101 through 123002400.
AD	Deleted.
AE	Only used on FGC261002, ICCs 05002001 through 05017706.
AF	Only used on FGC26160101, ICCs 118000501 through 118002445.
AG	For Power Supply Part Number A301338-1 only. For all other Part Numbers, use FGC 2603 for Maintenance Functions.
AH	Deleted.
AI	Evacuate to GS if removal of J1, J7, or J8 is necessary to effect repair.
AJ	By Setting Local or Remote Power Control option.
AK	By Replacing Helical Thread Inserts.
AL	If Filter Assembly is part number A3014060-1, throw away upon failure and replace with new assembly.
AM	GS Repair/Screen may be available.
AN	Item is GFE.
AO	Compatible with all versions of the CY-8523A/PRC and CY-8523B/PRC without HRCRD functionality.
AP	Upon failure send tp Depot for special handling.

APPENDIX C

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS

SECTION I

INTRODUCTION

C.1. SCOPE.

This listing is for informational purposes only. It does not give the authority to requisition the listed items below. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

C.2. EXPLANATION OF COLUMNS.

a. Column (1)-Item Number. This number is assigned to the entry in the listing.

b. Column (2)-Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Unit Maintenance

c. Column (3)-National Stock Number. This is the National Stock Number assigned to the item: use it to request and requisition the item.

d. Column (4)-Description. Indicates the Federal item name. The last line for each item indicates the part number.

e. Column (5)-Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NSN	(4) DESCRIPTION	(5) U/M
1	O	8040-00-117-8510	Adhesive, Sealant. RTV Type III Clear	Tube
2	O	9150-00-857-9079	Grease (1), General Purpose. 130-AA	Lb.
3	O	8030-01-267-5398	Sealing Compound. MIL-S-22473 Grade H	Ea.
4	O	6850-00-177-5094	Silicone Compound. MIL-S-8660 Clear	Tube
5	O	8040-01-033-7507	Adhesive. 847	Tube
6	O	8040-01-281-2729	Adhesive. M46050-B-2-50	Ea.
7	O	6515-00-059-5235	Applicator, Disposable. GG-A-616	Pkg.
8	O	6810-01-190-2538	Isopropyl Alcohol, Technical. TTI 735	Can

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