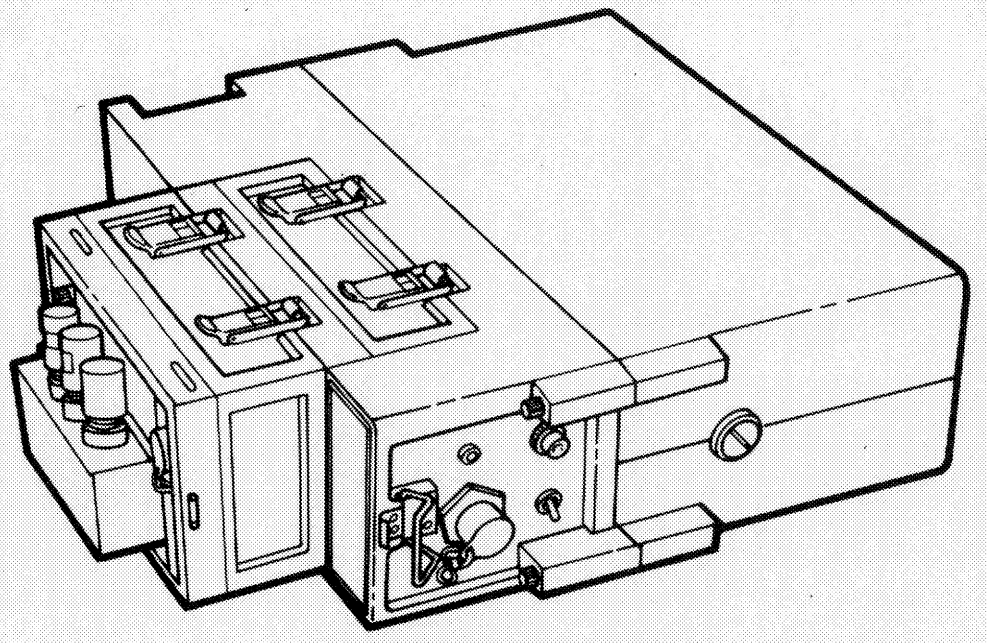
ARMY TM 11-5895-1309-24
NAVY EE162-FG-MMI-010/W110-CV3968
AIR FORCE TO 31R2-2GRC215-22

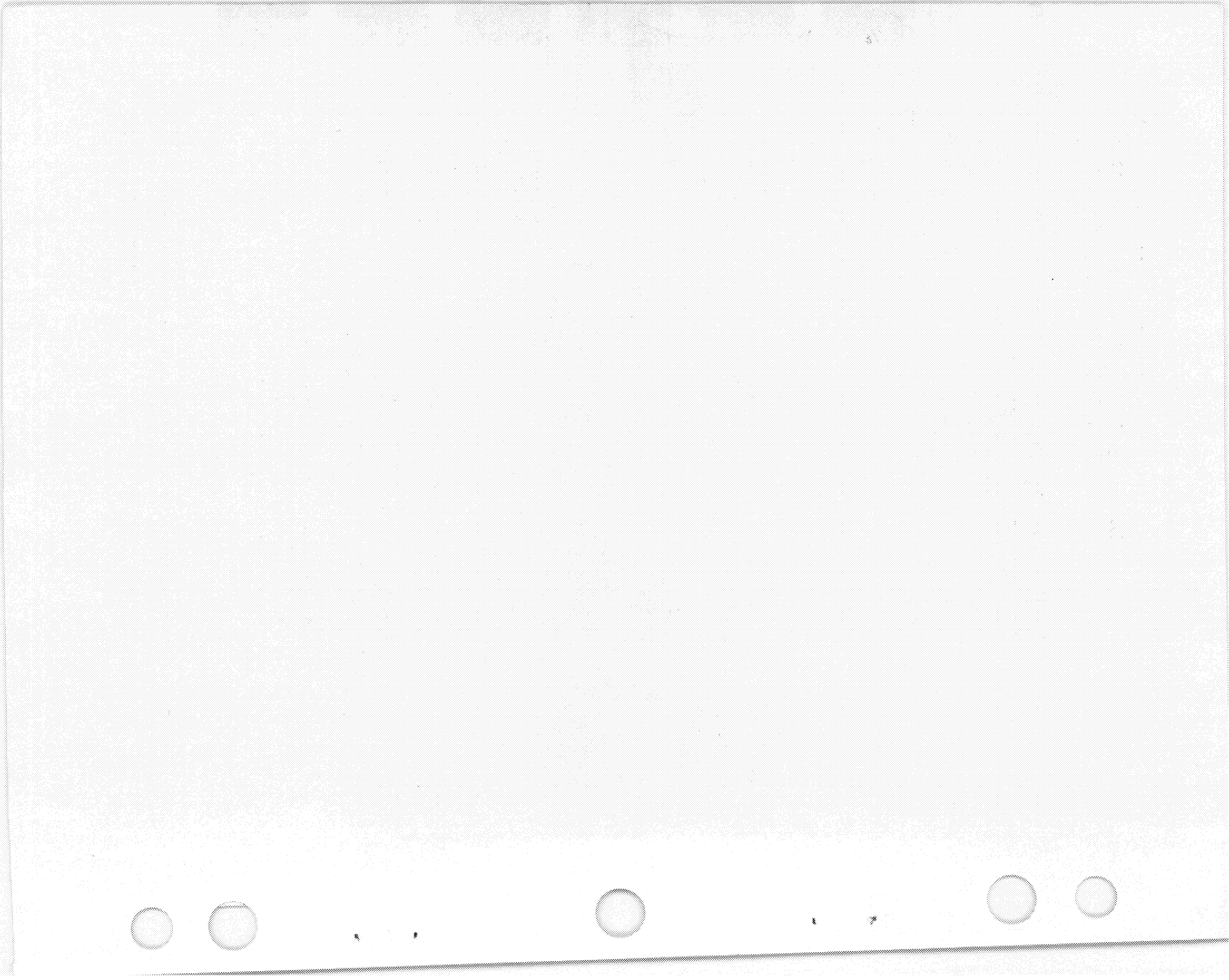
UNIT, INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL



CONVERTER CV-3968/GRC-215 (NSN 5895-01-205-0645)

DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

1 FEBRUARY 1989



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 INSULATING 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

NOTE: DON'T WAIT UNTIL AN ACCIDENT HAPPENS! READ ABOUT ARTIFICIAL RESPIRATION IN FM21-11. AIR FORCE PERSONNEL REFER TO AFOSH 127-50 AND AFOSH 127-66, CHAPTER 10.

CAUTION

- Prior to removing or installing a component, ensure that power to the component has been turned off. Cables disconnected with voltage present may arc or short. This can damage the connector.
- Whenever Remote Location case is loose, support Battery weight until it is removed from connector.
- Battery or Battery/Chassis connector can be damaged by mishandling.

CAUTION

This equipment contains certain static-sensitive solid state devices that are subject to damage from electrostatic discharge (ESD). Effective control of electrostatic discharge is maintained only through continuous strict observance of the following maintenance procedures:

- Any maintenance requiring disassembly of the equipment must be performed at an approved work station. The work station must include a grounded surface and grounded wrist strap, in accordance with DOD-HDBK-263.
- All maintenance personnel must have completed training in the handling of static-sensitive devices before working on this equipment. Maintenance personnel must wear the grounded wrist strap and be at an approved work station when performing maintenance.
- The static-sensitive subassemblies or circuit cards must be stored in approved electrostatic-free material when not installed in the equipment.

Technical Manual
No. 11-5895-1309-24
Technical Manual
No. EE162-FG-MMI-010/W110-CV3968
Technical Order
TO 31R2-1GRC-215-22

DEPARTMENTS OF THE ARMY,
THE NAVY, AND THE AIR FORCE

Washington, DC, 1 February 1989

UNIT, INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL CONVERTER CV-3968/GRC-215 (NSN 5895-01-205-0645)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of 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 back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ME-PS, Fort Monmouth, New Jersey 07703-5000.

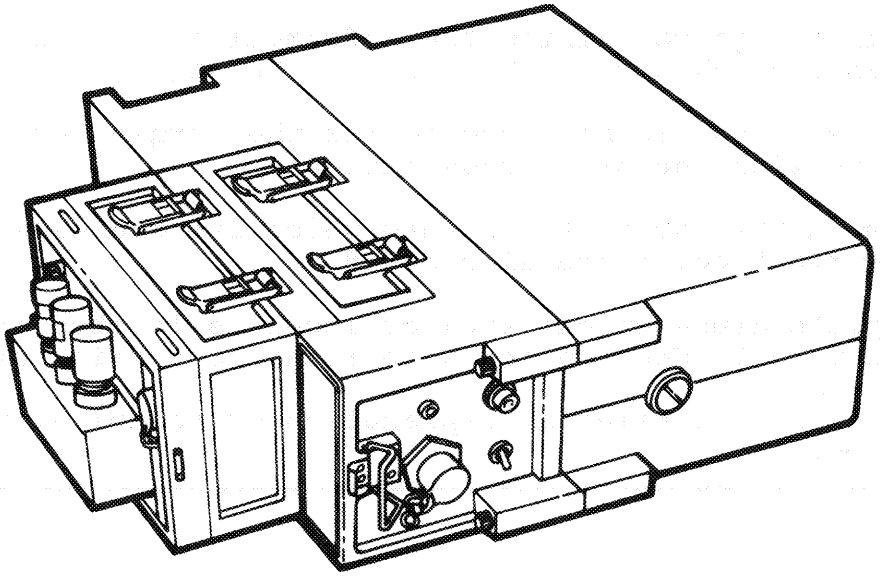
For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, TO 00-5-1. Forward direct to prime SM-ALC/MMEDT McClellan AFB, CA 95652-5609.

For Navy, mail comments to the Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 003-242, Washington, DC 20363-5100.

In either case, a reply will be furnished directly to you.

HOW TO USE THIS MANUAL

- The front cover index identifies frequently used information. Each item is boxed and identified by topic and page number.
- The first page containing the information you are looking for has a black box on the edge of the page.
- Bend the manual in half and follow the margin index to the page with the black edge marker.
- Topics in the table of contents which are the same as topics on the front cover are also boxed.
- A complete alphabetical subject index is located in the back of the manual. Use the index to locate specific information.
- The glossary contains an explanation of technical terms and acronyms.



CONVERTER CV-3968/GRC-215

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

a. Type of Manual. Unit, Intermediate Direct Support and General Support Maintenance.

b. Equipment Name and Model Number. Converter CV-3968/GRC-215

c. Purpose of Equipment. The Converter CV-3968/GRC-215 (consisting of the R/E terminal and Remote Location Assembly) provides the capability for both remote operation of the Manpack Radio (RT-1511/GRC-215) and telephone communications between the local and remote operator. The converter is part of Radio Set AN/GRC-215.

d. Maintenance Category Cross-Reference. Army maintenance categories are referenced in this manual. Navy and Air Force personnel will contact their same-level maintenance group. Refer to the following cross-reference list.

Army	Navy	Air Force
Unit	Organizational	Organizational

1-2. 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. Air Force personnel will use AFR 66-1 for maintenance reporting and TO 00-35D-54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.4A, and unsatisfactory material/conditions utilizing the PMS Feedback Report.

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

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS (Cont.)

c. Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 5538/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-3. CONSOLIDATED INDEX OF PUBLICATIONS AND BLANK FORMS

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

b. Navy. Navy personnel refer to NAVSUP 2002.

c. Air Force. For technical publications, Air Force personnel refer to Numerical Index and Requirement Table (NI & RT). For non-technical publications refer to AFR 0-2. For forms, refer to AFR 0-9.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

a. Army. If your equipment needs improvement, let us know. Send us and EIR. You, the user, are the only one who can tell us what you don't like about youre equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

b. Navy. Navy personnel are encouraged to submit EIR's through their local Beneficial Suggestion Program.

c. Air Force. Air Force personnel are encouraged to submit EIR's in accordance with AFR 900-4.

1-5. DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

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

b. Navy. Navy personnel will comply with the local Command Material Destruction Plan.

c. Air Force. Air Force personnel comply with TM 750-244-2 or the Local Emergency Destruction Plan.

1-6. PREPARATION FOR STORAGE OR SHIPMENT

a. Army. Before placing equipment into administrative storage, insure that equipment is operational. If operational, put into storage using appropriate corrosion control techniques. When removing from storage, again perform operational tests and Unit PMCS, (if available) to determine mission capability.

b. Navy. Refer to NAVSUP PUB 503.

c. Air Force. Refer to AFM 66-267 (storage) and AFR 67-31 (shipment).

1-7. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS

COMMON NAME	OFFICIAL NOMENCLATURE
Remote control set (RCS) unit	Converter CV-3968/GRC-215, P/N A3023801
Remote location assy	Remote Location, A1, P/N A3026043
Keyer/converter	Converter, Keyer, A1A1, P/N A3026045
Battery BB-590	Battery BB-590, A1A2, P/N A3026046
Battery charger	Battery Charger, A1A1A4, P/N A3031260
R/E terminal	R/E Terminal, A2, P/N A3026044
Tone converter	Tone Converter, A2A1, P/N A3026047
DC/DC converter	DC/DC Converter, A2A2, P/N A3026048
ECCM	Controller, Receiver-Transmitter, C-11670/G, P/N A3023813

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Team Terminal remote control set has these features:

- It allows remote control of Team Terminal R/T functions except On/Off.
- It permits voice communication between local and remote operators.
- It utilizes frequency-shift keying to transmit signals on a telephonic-pair (the interconnecting cable between remote location and R/E terminal).
- Team Terminal R/T frequency, power output or mode change data (from remote location) are sent encoded with tones whose frequency is in the audio band. During this data transmission, the remote location applies a "mute" signal to the telephonic-pair line (WF-16/U cable) to inhibit audio from local operator. This improves signal-to-noise ratio of data. Transmission rate is fixed to get best bit-error rate.
- Team Terminal R/T has an overall built-in-test equipment (BITE) function. Tone converter BITE light indicates BITE status.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

(1) Keyer/Converter Assembly, A1A1. Converts data into FSK audio tones for transmission over WF-16/U cable. Consists of front panel assembly (3), RCS remote chassis (2), and case assembly (5).

(2) RCS Remote Chassis. Part of keyer/converter assembly (1).

(3) Front Panel Assembly, A1A1A1. Part of keyer/converter (1).

(4) Battery, A1A2. Provides remote location with operating power, using either Battery, Rechargeable BB-590 or Battery, Lithium BA-5590/U.

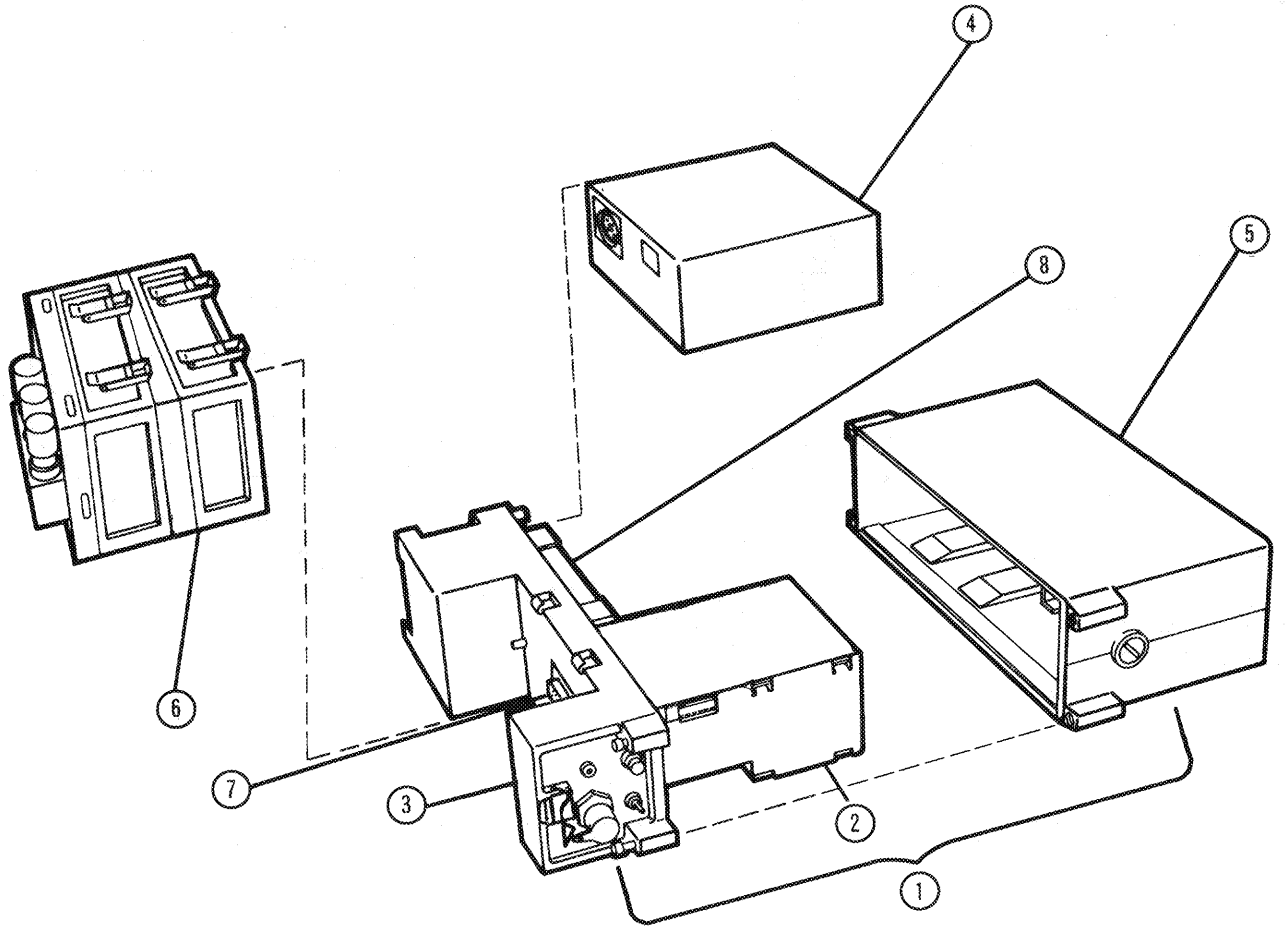
(5) Case Assembly. Houses keyer/converter assembly and battery.

(6) R/E Terminal, A2. Consists of two modules. One, the tone converter, converts FSK audio tones into control signals to be sent to the Team Terminal. The other, dc/dc converter module, provides regulated power to the tone converter.

(7) J3. Interface connector between remote location and ECCM module when in remote configuration.

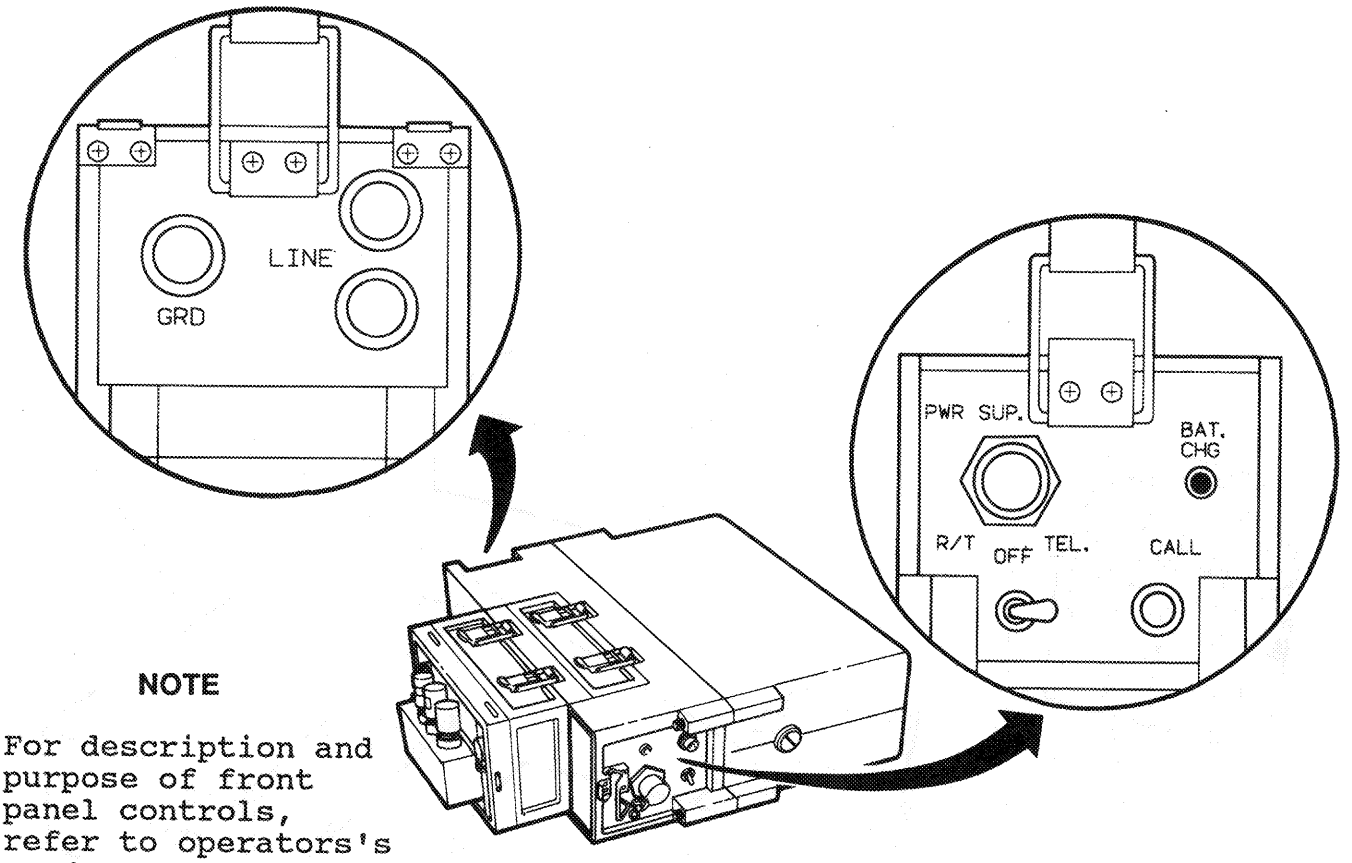
(8) J2. Battery connector.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Cont.)



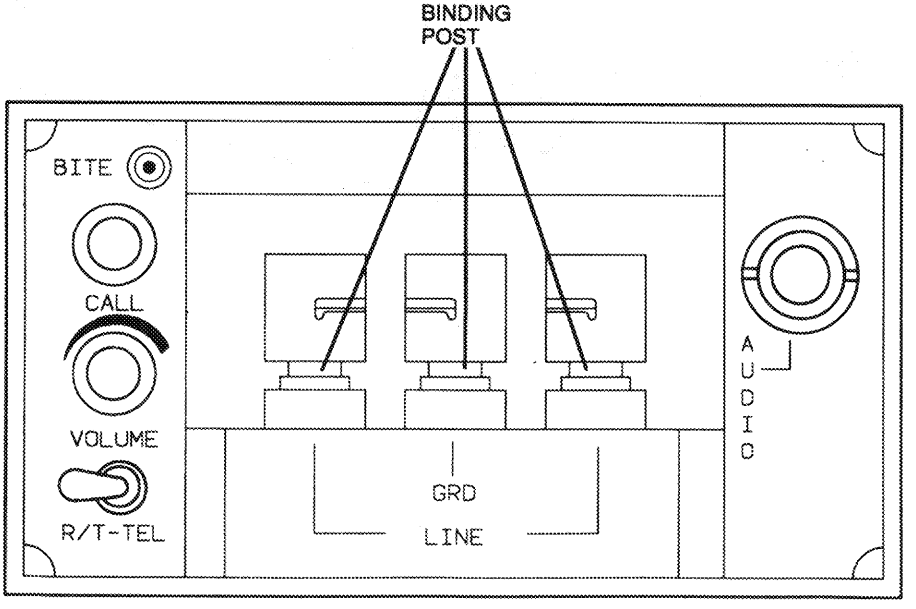
REMOTE CONTROL SET CONFIGURATION

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Cont.)



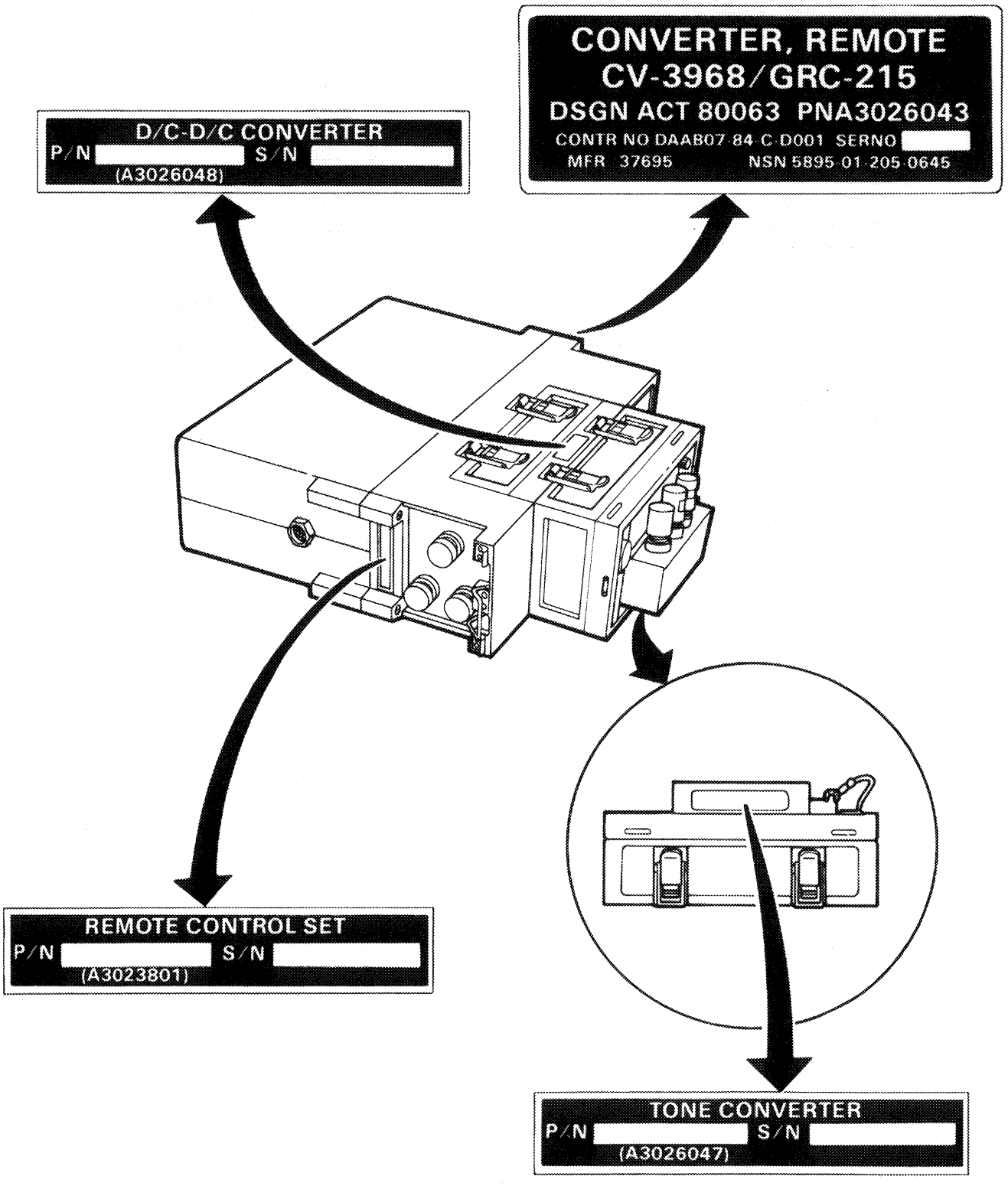
NOTE

For description and purpose of front panel controls, refer to operators's TM for the system.



FRONT VIEW

1-10. IDENTIFICATION AND INSTRUCTION PLATES



1-11. EQUIPMENT DATA

a. Electrical Characteristics:

Frequency Response	300 to 3000 Hz
Call/BITE frequency	3196 Hz
PTT frequency	3305 Hz
Mute frequency	3421 Hz
Frequency stability	± 0.01 %
Audio level	0 dBm
PTT level	3 dBm
BITE level	6 dBm
Mute level	6 dBm
Frequency reference out	10 kHz
Operating voltage, remote location	24 Vdc internally generated
Operating voltage, R/E terminal	24 Vdc externally generated
Power consumption, remote location	3 W
Power consumption, R/E terminal	3 W
Battery BB-590 life (At transmit to receive ratio 1:9)	Below -30°F (-34°C): 10 hrs. -30°F (-34°C) and above: 20 hrs.

b. Physical Characteristics:

Separation distance	Up to 1 mile
Size, remote location	
width	11 in.
height	7.6 in.
depth	3.1 in.
Size, R/E terminal	
width	5.5 in.
height	4.4 in.
depth	3.1 in.
Weight, remote location	8.2 lbs.
Weight, R/E terminal	3.0 lbs.

1-12. SAFETY, CARE, AND HANDLING

CAUTION

Prior to removing or installing a component or cable, ensure that power to the component has been turned off. Removing and connecting cables while power is applied may result in an arc or short. This can produce damage to the connector.

Make all cable connections by hand. Do not use tools. When tools are used to make connections, connectors may be overtightened and damage to the connector and pins may occur.

CAUTION

The Converter CV-3968/GRC-215 contains certain static-sensitive solid state devices which are subject to damage from electrostatic discharge (ESD). Effective control of ESD is maintained only through continuous, strict observance of the following maintenance procedures.

- Any maintenance requiring disassembly of the equipment must be performed at an approved work station. The work station must include a grounded surface and grounded wrist strap in accordance with DOD-HDBK-263.
- All maintenance personnel must have completed training in the handling of static-sensitive devices before working on this equipment. Maintenance personnel must wear the grounded wrist strap and be at an approved work station when performing maintenance.
- The static sensitive subassemblies or circuit cards must be stored in approved electrostatic free material when not installed in the equipment.

Section III. PRINCIPLES OF OPERATION

1-13. FUNCTIONAL DESCRIPTION OF CONVERTER, CV-3968/GRC-215

The remote control set permits an operator located up to 1 mile from the Team Terminal R/T to conduct:

- Remote control of Team Terminal R/T operation
- Two-way voice communications by way of Team Terminal R/T
- Two-way communications with site operator at Team Terminal R/T

The remote control set consists of remote location assembly, battery, cable WF-16/U, and R/E terminal.

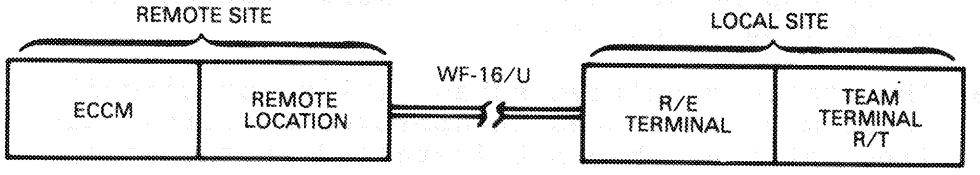
a. Remote location converts operational change information (selected at ECCM control module) into FSK modulated audio tones (data). Remote location also processes voice, or intercom communications for transmission to R/E terminal.

b. WF-16/U cable interconnects the remote location and R/E terminal to function as a transmission line to R/E terminal.

c. R/E terminal converts audio tones into control signals for Team Terminal R/T, two-way voice communications, or intercom communications between two operators.

d. A replaceable, rechargeable battery provides remote location with operating power. Team Terminal R/T supplies operating power to R/E Terminal.

e. ECCM module generates all control functions for remote control of Team Terminal receive-transmit functions. The ECCM module is not part of the RCS.



1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS

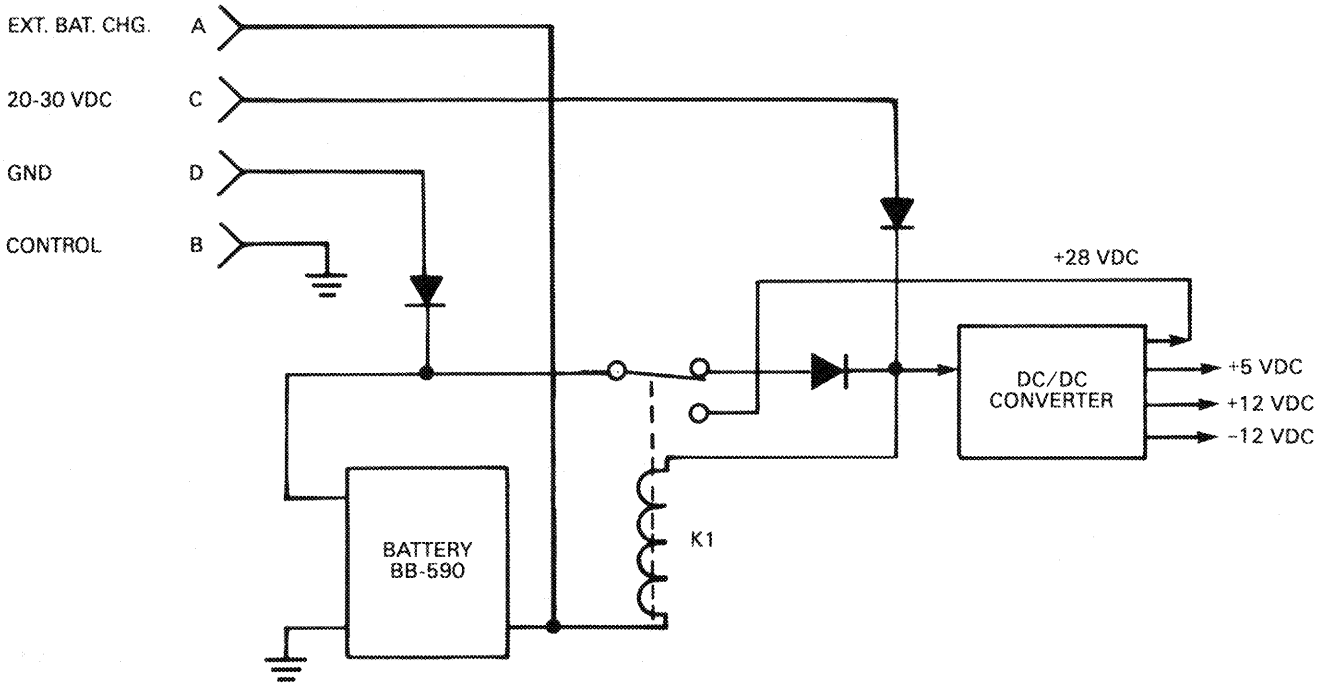
a. Remote Location Assy. Consists of keyer/converter module and battery in a portable, durable, metallic case.

(1) Battery. Rechargeable (NICAD) type BB-590. Provides operating power for remote location. Rechargeable from external power supply.

1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

(2) Keyer/Converter. Module contains circuitry for internal power supply and for data encoder.

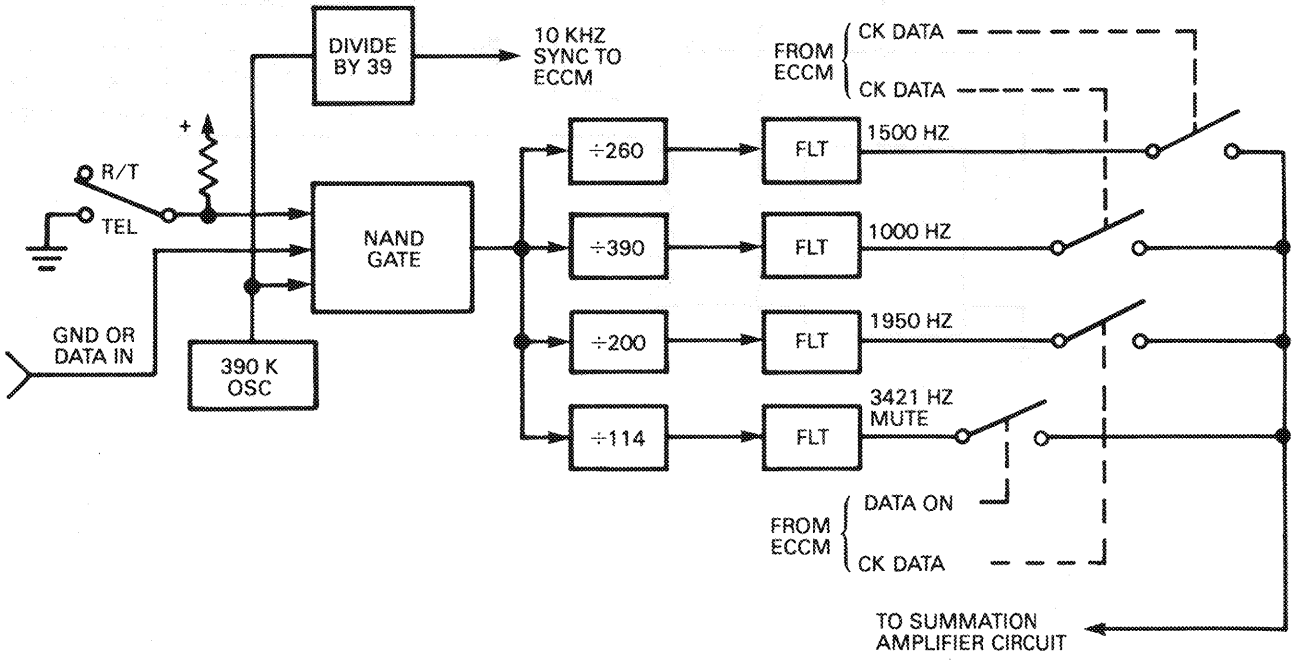
(3) Battery Charger A1A1A2A4. Battery Charger generates +5, +12, and -12 Vdc operating voltages for remote location. It also generates +28 Vdc for recharging battery. Applying an external power source to front panel J1 causes relay to switch to that source for charging current and operating power. Charge-current limiting prevents damage to battery.



1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

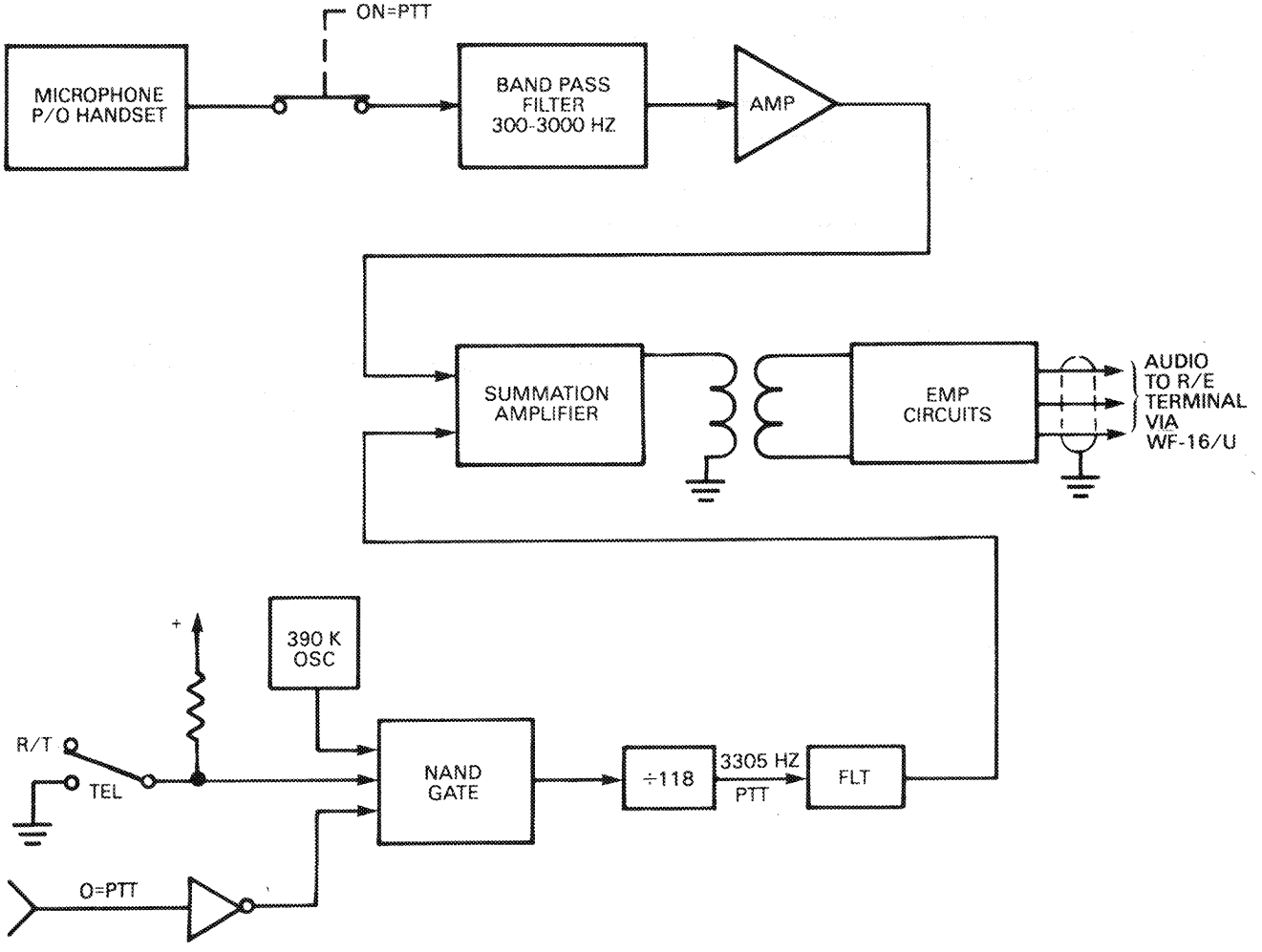
(4) Timing/logic converter (CCA A1A1A2A2). Converts terminal R/T control inputs from ECCM into change data. This data must be modulated for transmittal over the telephonic-pair to terminal R/T.

- Data transmission. To change terminal R/T operating frequency, for example, ECCM generates serial digital logic signals (change data) representing desired change. logic CCA converts change data from ECCM into three tones (1000, 1500 and 1950 Hz) for transmittal to R/E terminal. With R/T-TEL switch in R/T position, data from ECCM enables 390 kHz to be applied to certain frequency dividers. The dividers generate three tones that represent this data. Data also enables clock pulses from ECCM to control the divider outputs so the tones are transmitted with the clock "in sync" with the data stream. Whenever data is being transmitted, logic CCA applies a 3421 Hz mute tone to the transmission line to prevent audio RX from R/E terminal degrading the signal-to-noise ratio of the data stream.



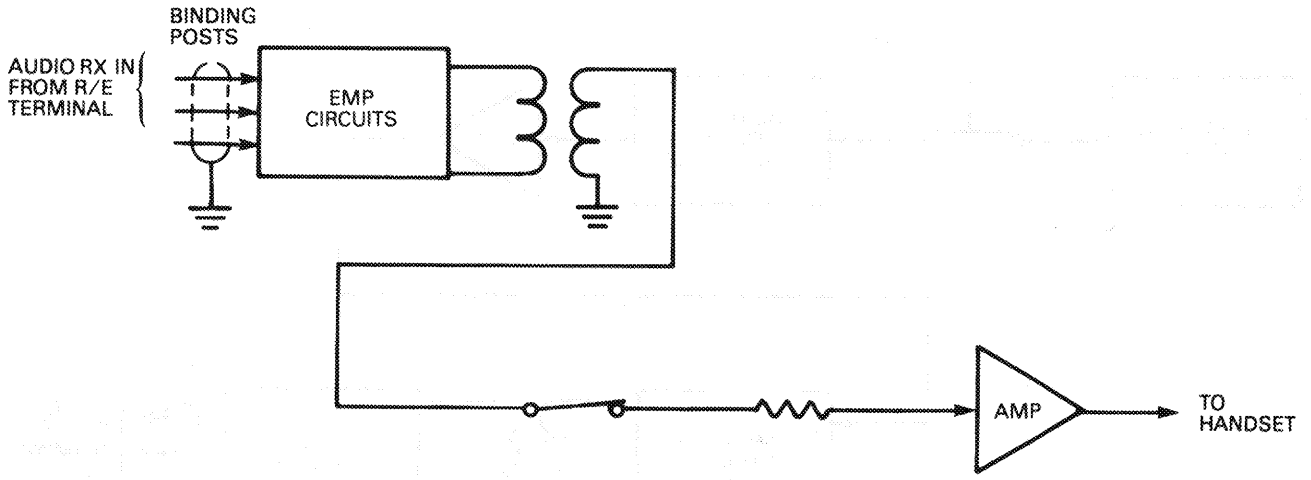
1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

- Audio TX. Audio (voice) from remote operator is enabled by PTT signal generated at ECCM when PTT button on remote operator's handset is depressed. Remote location transmits a 3305 Hz PTT tone to R/E terminal along with the audio signal, limited to 300-3000 Hz, to be decoded at R/E terminal. The 3305 Hz PTT tone is developed from a NAND gate and divider circuit that receives 390 kHz when R/T-TEL switch is in R/T position and handset PTT is depressed. The output of the PTT divider circuit is sent to the summation amplifier, coupled through EMP circuits and WF-16/U cable to the R/E terminal.



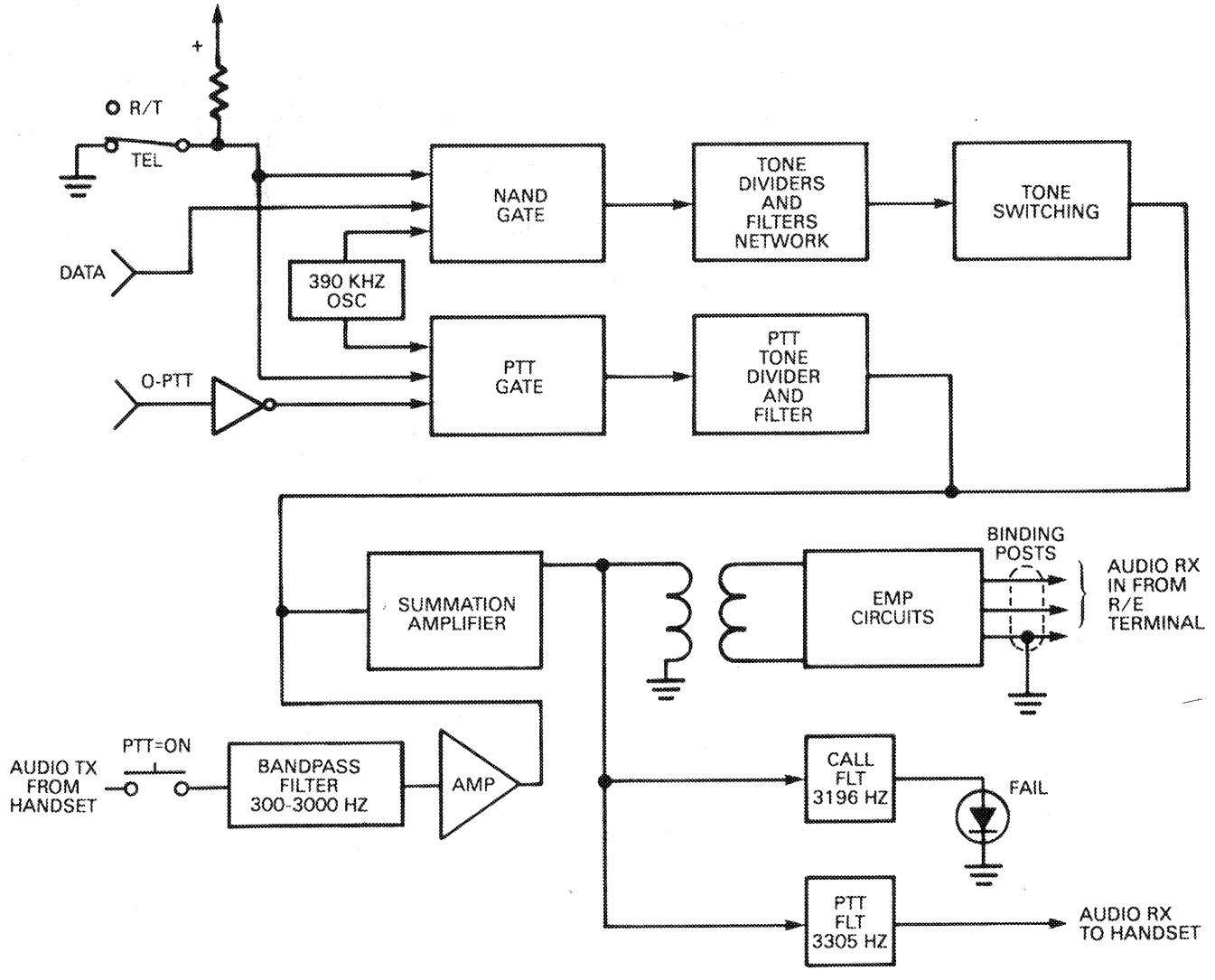
1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

- Audio RX. Audio received at the Team Terminal R/T is applied to the R/E terminal which sends it to the remote location. At the remote location the signal is received on the binding posts, where it is applied to the EMP circuit. The EMP circuit provides circuitry with protection from voltage spikes that could occur from electromagnetic induction on the field wire. The output of the EMP circuit is an impedance matching transformer. The received signal is applied to an amplifier and then the operator handset/headset.



1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

- Communication between two operators. Remote location R/T-TEL switch in TEL position inhibits PTT tone and data transmission by removing gating to tone generator circuitry. Call and fail signals remain enabled and voice communication between operators is possible. An additional 3305 Hz PTT filter placed in the signal path to handset audio prevents the operator from hearing 3305 Hz tone in R/T operation.

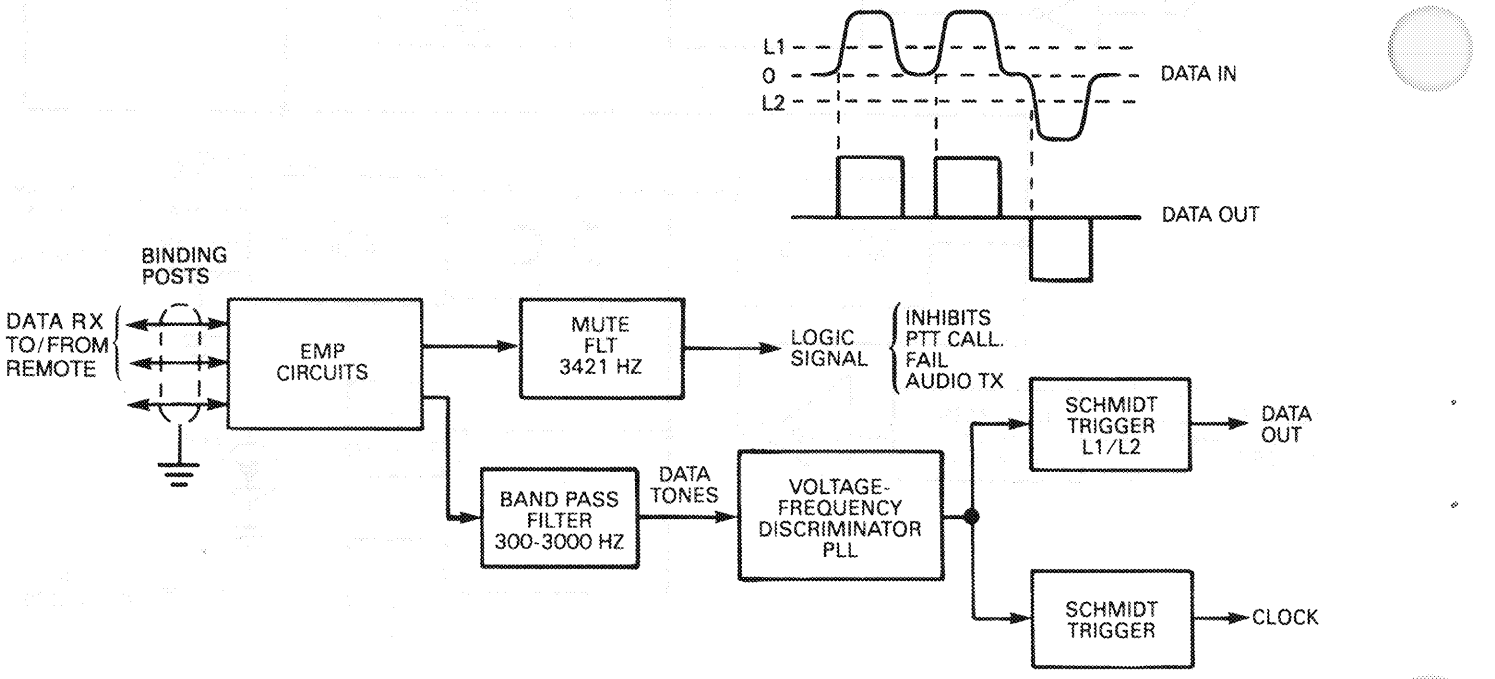


1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

b. R/E Terminal. Consists of two modules: tone converter and dc/dc converter. These modules contain circuitry that perform conversion functions and provide stabilized operating voltage.

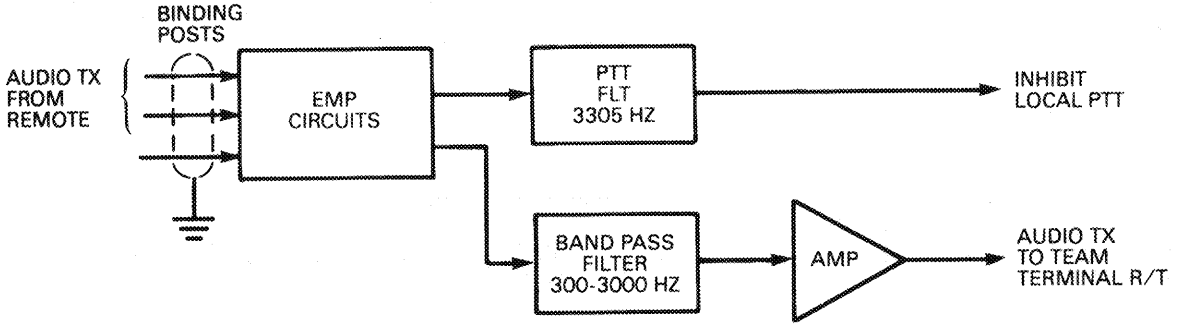
(1) Tone Converter. Circuitry on three CCA's provides these operational modes:

- Data RX. Data stream from remote location always has a 3421 Hz mute tone present along with the three data tones. Tone converter detects this tone by a filter and generates a logic signal that inhibits PTT, fail (or call), and audio TX signals at R/E terminal. At R/E terminal, a voltage-frequency discriminator converts the data tones to three voltages, depending on the tone frequency. These voltages cause two Schmitt trigger circuits, with thresholds L1 and L2, to generate a waveform identical to data generated at remote location. In the same manner, the clock signal is converted, which cancels effects of phase differences in tones. Circuit delays do not change data frequency because the clock is subject to the same delay.

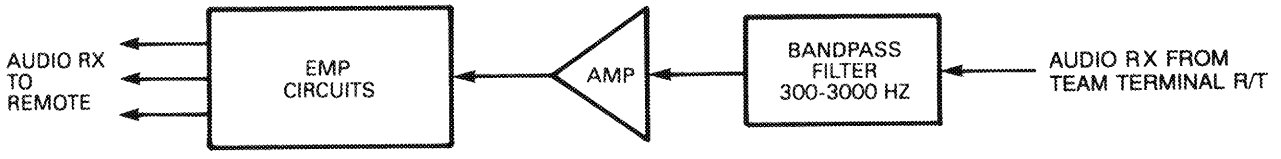


1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

- Audio TX. Remote location always transmits a 3305 Hz PTT tone along with audio. Tone converter filters the PTT tone from the audio signal, and converts PTT to a logic signal that inhibits audio (voice) transmission by local operator. The operator hears audio in his handset but is unable to transmit. (The local PTT signal is inhibited by presence of change data from remote location. Voice transmission by local operator is only permitted when remote operator is not transmitting.)



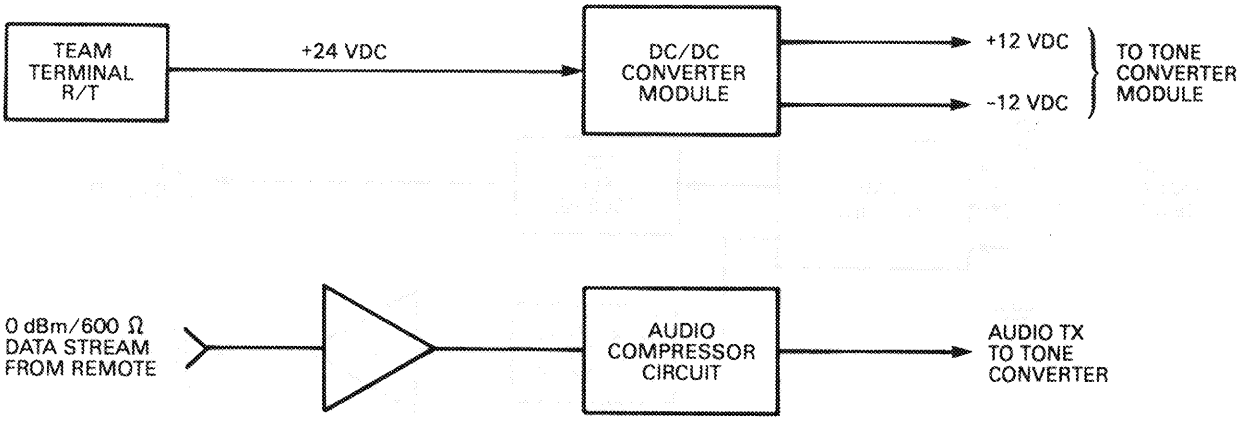
- Audio RX. Received audio signal from Team Terminal R/T is applied to remote location and R/E terminal audio connector.



- Communication between two operators. With R/T-TEL switch in TEL position, audio RX signal, from Team Terminal R/T, and PTT line of local operator are inhibited. However, remote PTT and data decoder remain active to prevent blocking remote operator functions if local R/T-TEL switch is in TEL position. Fail and call signals are enabled.

1-14. FUNCTIONAL DESCRIPTION OF MAJOR COMPONENTS (Cont.)

(2) DC/DC Converter. The dc/dc converter functions as a stabilized, regulated power supply. It converts voltage supplied by Team Terminal R/T to +12 and -12 Vdc required by tone converter. The module contains an audio compressor on audio TX line between Team Terminal R/T and tone converter. This ensures that Team Terminal R/T audio input will be a constant-level signal which compensates for signal loss due to length of wire between remote location and R/E terminal.



CHAPTER 2
UNIT MAINTENANCE

Section I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT

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

b. Navy. Navy personnel refer to applicable Tables of Allowance (TA).

c. Air Force. Air Force personnel refer to applicable Tables of Allowance (TA).

2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools, TMDE, and support equipment and their purposes are listed in the Maintenance Allocation Chart (MAC), Appendix B.

2-3. REPAIR PARTS

Repair parts used during unit maintenance are listed and illustrated in the repair parts and special tools list located in TM 11-5895-1309-24P (Army), EE162-FG-PLD-010/W110-CV3968 (Navy), TO 31R2-2GRC215-24 (Air Force).

Section II. SERVICE UPON RECEIPT

2-4. UNPACKING

Unpacking requires no special procedures for removing the converter from its storage container. Use normal care in handling electronic equipment. Prevent damage to exterior controls and indicators. Avoid jarring unit during removal.

2-5. CHECKING UNPACKED EQUIPMENT

a. Inspect equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF-364, Report of Descrepancy (ROD).

b. Check the equipment against the packing slip to see if shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Refer to DA Pam 25-30 to see if your equipment has had any Modification Work Orders (MWO) applied.

2-6. PRELIMINARY SERVICING OF EQUIPMENT

a. Check all front panel connectors for broken, bent, or missing pins.

b. Check all front panel mounted switches, lamps or other hardware for damage.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-7. GENERAL

Preventive maintenance procedures help maintain the equipment in a serviceable condition. They include items to be checked and procedures for checking them. The checks and services described in the PMCS table outline inspections that are to be made at specific monthly (M) and quarterly (Q) intervals.

a. Routine Checks. The following items are not listed in the PMCS table. Defects that can be found by these checks should be reported and corrected when found.

- Cleaning and dusting.
- Checking for frayed or loose cables.
- Checking for broken or dented equipment.
- Checking for loose screws, bolts, and nuts.
- Covering unused receptacles.

b. Explanation of Columns

(1) Item number column. This column is used as a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

(2) Interval column. This column specifies the frequency of the check, M for Monthly checks and Q for Quarterly checks.

(3) Item to be inspected column. This column specifies the item to be checked.

(4) Procedures column. This column describes the procedure by which the check is to be performed.

c. Instructions for Reporting and Correcting Deficiencies. If your equipment does not perform as required, refer to the trouble-shooting procedures within this chapter. Report any malfunctions or failures on proper DA Form 2404, or refer to DA Pam 738-750.

NOTE

If your equipment must be in operation all the time, only do items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

2-8. UNIT PMCS TABLE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Item No.	Interval		Item To Be Inspected	Procedures
	M	Q		
1	●		End item equipments	Inspect for completeness.
2	●		Communications equipment performance	Initiate system off-line-BIT. If BIT fails, refer to troubleshooting procedures in Section IV, Chapter 2.

SECTION IV. UNIT TROUBLESHOOTING

2-9. PRELIMINARY

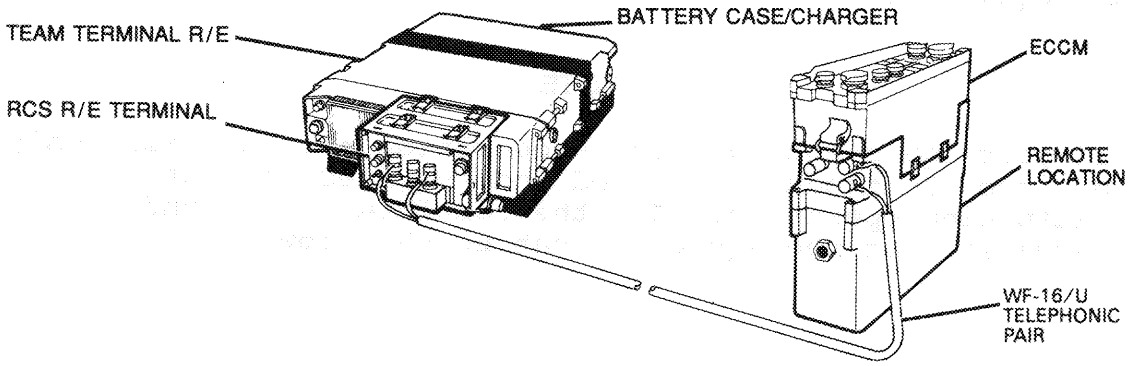
Prior to troubleshooting, perform the following:

a. Ensure the RT unit is functioning properly. With the RT installed in Radio Set AN/GRC-215, perform a BIT check of both the AN/GRC-215 and RT-1511/GRC-215 using TM 11-5895-1220-12, Navy EE160-RG-OMI-010/W110-GRC215, Air Force TO 31R2-2GRC215-1.

b. Ensure remote location and RT batteries are charged. The remote location battery is not charged automatically. The vehicular mount contains a feeder cable for charging the remote control set battery (see TM 11-5895-1220-12). Ensure BAT CHG light is on during charging.

c. Ensure the handset is functioning properly.

d. Attach both the remote location and the R/E terminal to a known good ECCM and Team Terminal R/E unit, respectively. Complete a system BIT check at the Team Terminal first (see TM 11-5895-1220-12). The BIT light on the R/E terminal will indicate a failure in the R/E terminal.



2-10. UNIT TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

TEAM TERMINAL REMOTE CONTROL INOPERATIVE OR FAILS SPECIFICATIONS

NOTE

The CV-3968/GRC-215 cannot be operated independently from the RT-1511/GRC-215. Troubleshooting is performed with the two units connected as illustrated in para. 2-9.

1. Unable to remotely control Team Terminal R/E.

   Perform actions prescribed in para. 2-9a through d to test integrity of the RT unit, RCS battery case/charger, handset, and to ensure all batteries are charged. Ensure all connections are secure, proper, and the telephonic pair cable is not broken or frayed.

   Replace faulty Remote Control Unit with known-good unit by verifying suspected component with same check prescribed in para. 2-9d. Notify Intermediate Maintenance of fault.

2. Battery voltage low. Battery will not recharge. BAT CHG light off during recharge. Reduced operating time.

   Perform actions prescribed in para. 2-9a through d to test integrity of the RT unit, RCS, battery case/charger, and handset. Measure battery voltage as described in para 2-15.

   Replace battery, para. 2-13. Recharge battery. If recharge is unsuccessful, replace faulty remote control unit with known-good unit by verifying suspected component with same check prescribed in para. 2-9d. Notify Intermediate Maintenance of fault.

3. Operators unable to conduct voice communications.

   Perform actions prescribed in para. 2-9a through d to test integrity of the RT unit, RCS, handset, and to ensure all batteries are properly charged. Ensure all connections are secure, proper, and the telephonic pair cable is not broken or frayed.

   Replace faulty Remote Control Unit with known-good unit by verifying suspected component with same check prescribed in para. 2-9d. Notify Intermediate Maintenance of fault.

Section V. UNIT MAINTENANCE

2-11. GENERAL

Unit maintenance includes routine maintenance, such as removing dirt and dust, visual inspection, and replacement of faulty remote control set, battery, carrying straps, and connector covers.

2-12. ROUTINE MAINTENANCE

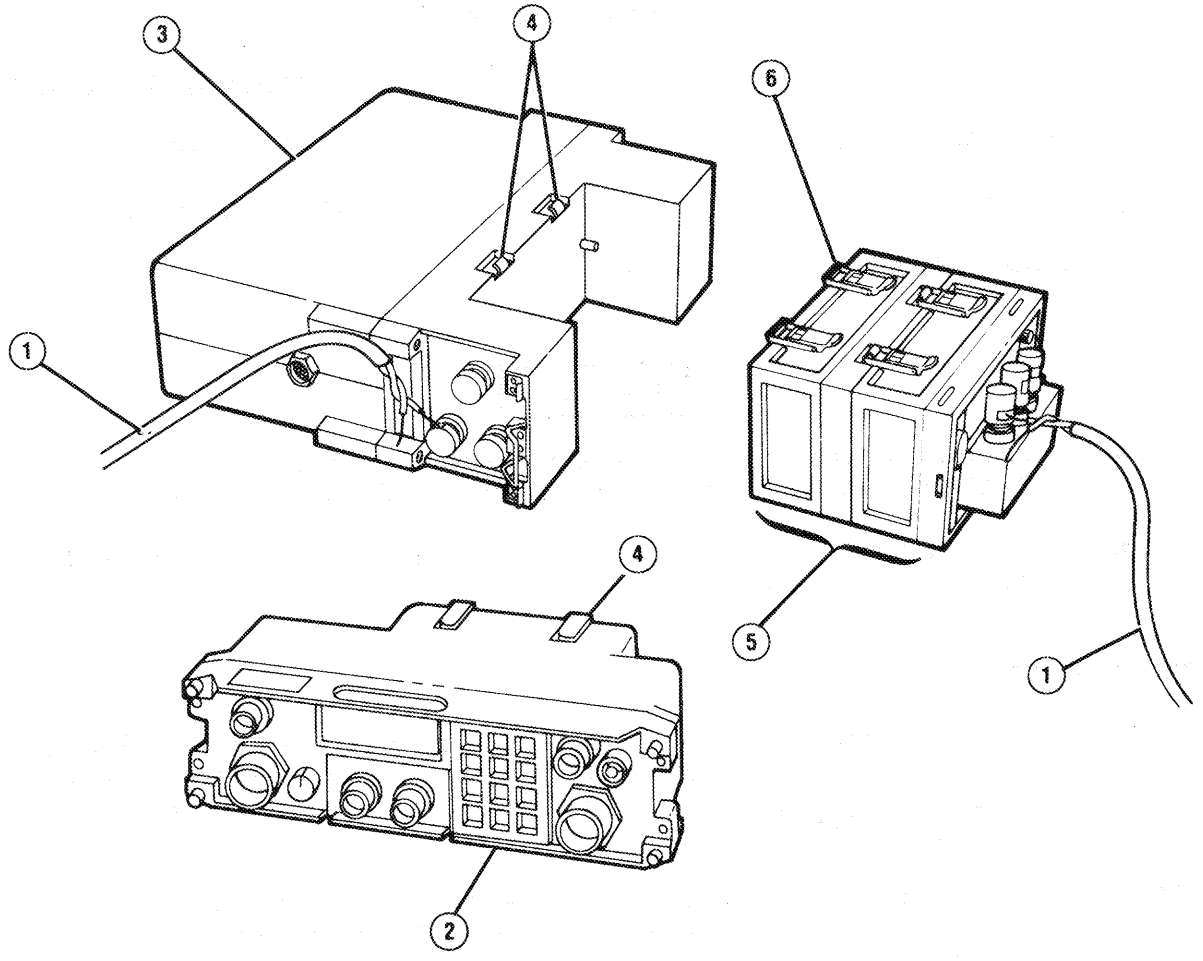
Prior to performing any routine maintenance procedures:

a. Disconnect WF-16/U (1) .

b. Disconnect ECCM (2) from Remote Location (3) by loosening seven retaining clips (4), and the R/E Terminal (5) from the RT unit by loosening the four retaining clips (6).

c. For visual inspection and routine cleaning instructions, refer to paragraph 2-6 and 2-7.

2-12. ROUTINE MAINTENANCE (Cont.)



2-13. REPLACEMENT OF BATTERY (A1A2)

INITIAL SETUP

Tools

Wrench, Hexagonal (5mm)

Materials/Parts

Battery, BB-590, A1A2, P/N A3026046

Equipment Condition

Power removed.

WF-16/U wire removed.

CAUTION

- Whenever Remote Location case is loose, support Battery weight until it is removed from connector.
- Battery or Battery/Chassis connector can be damaged by mishandling.

REMOVE BATTERY MODULE:

STEP 1. If R/E terminal (1) is still connected to remote location (2) remove R/E terminal (1) by loosening four retaining clips (3) two on either side of dc/dc converter Module (4).

STEP 2. On remote location (2), using a 5mm hexagonal key wrench, loosen four captive retaining screws (5), and remove remote location chassis (6) from case (7).

STEP 3. Remove battery (8) by disconnecting from chassis (6).

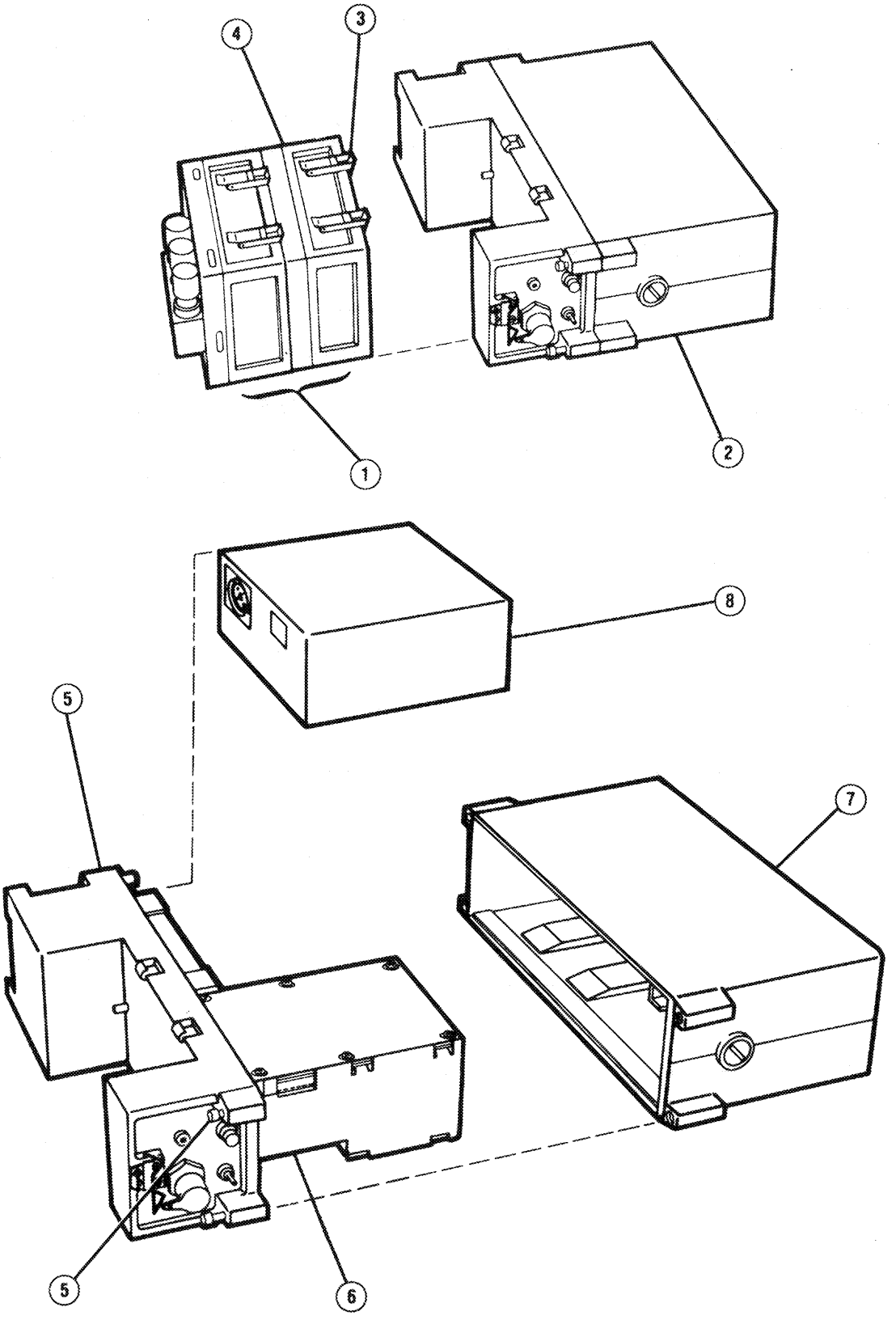
REPLACE BATTERY MODULE:

STEP 1. While supporting battery weight, push battery (8) onto chassis connector.

STEP 2. Slide remote location chassis (6) and battery (8) into case (7) and using a 5mm hexagonal key wrench, secure four captive screws (5), one in each corner of chassis (6).

STEP 3. Reconnect R/E terminal (1) to remote location (2) by tensioning all four retaining clips (3), on dc/dc converter module (4).

2-13. REPLACEMENT OF BATTERY (A1A2) (Cont.)



2-14. REPLACEMENT OF FAULTY REMOTE CONTROL SET (A1)

A malfunction in the remote control set requires that the entire unit be returned to higher level maintenance. Re-attach the remote location assembly and R/E terminal and forward to Intermediate Maintenance.

After replacing the faulty unit, verify the replacement unit corrects fault symptoms by observing for proper equipment operation and no fault indications.

2-15. REDUCED REMOTE LOCATION OPERATING TIME

INITIAL SETUP

Test Equipment

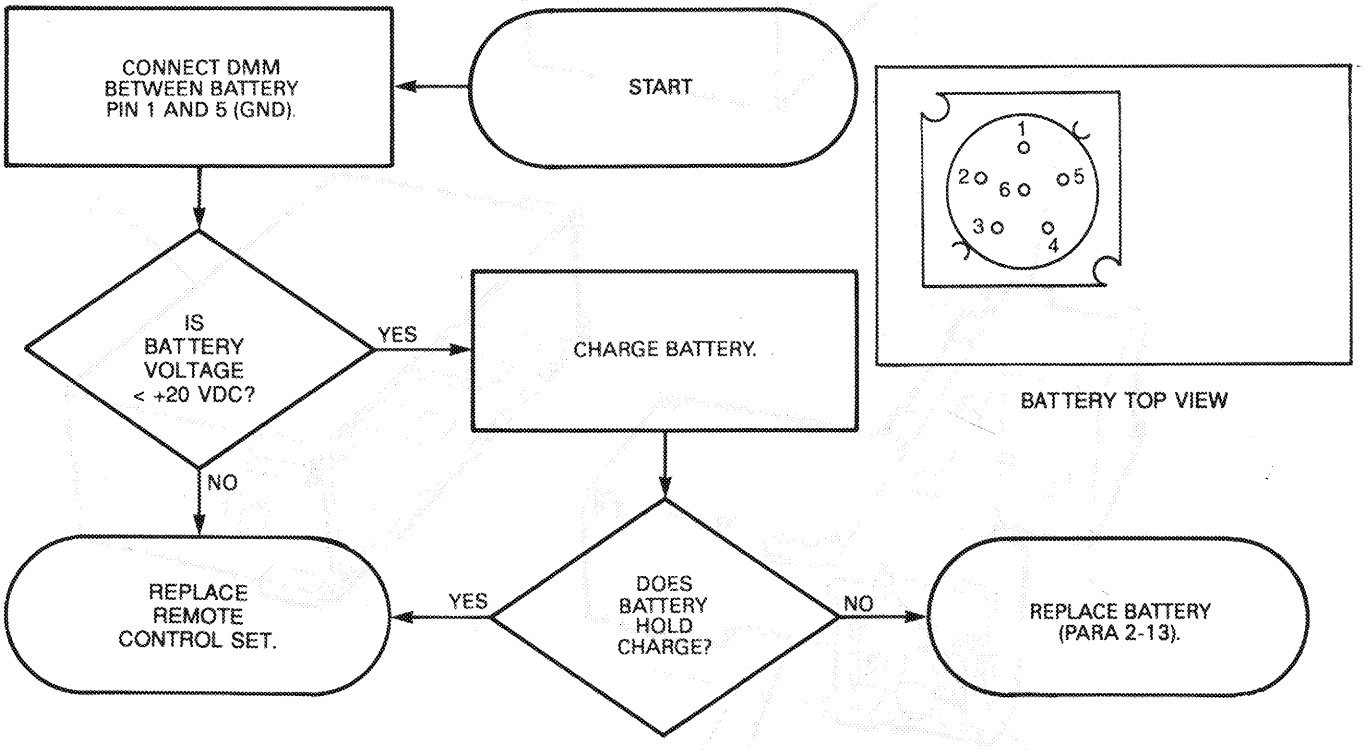
Digital Multimeter, AN/PSM-45

Tools

Wrench, Hexagonal (5mm)

Equipment Condition

Remove battery from remote location (para. 2-13)



Section VI. PREPARATION FOR STORAGE OR SHIPMENT

2-16. GENERAL

a. Army. Refer to paragraph 1-6a for administrative storage.

b. Navy. Refer to NAVSUP PUB 503.

c. Air Force. Refer to AFM 66-267 (storage) and AFR 67-31 (shipment).

2-17. MARKING

The marking on the exterior of the container shall be in accordance with MIL-STD-129H.

CHAPTER 3
INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

NOTE

Intermediate Direct Support Maintenance is not allocated for the Remote Control Set.

Section I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

3-1. COMMON TOOLS AND EQUIPMENT

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

b. Navy. Navy personnel refer to applicable Tables of Allowance (TA).

c. Air Force. Air Force personnel refer to applicable Tables of Allowance (TA).

3-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools, TMDE, and support equipment and their purposes are listed in the Maintenance Allocation Charts, Appendix B.

3-3. REPAIR PARTS

Repair parts used during Intermediate General Support Maintenance are listed and illustrated in the repair parts and special tools list located in TM 11-5895-1309-24P (Army), EE162-FG-PLD-010/W110-CV3968 (Navy), TO 31R2-2GRC215-24 (Air Force).

SECTION II. INTERMEDIATE GENERAL SUPPORT TROUBLESHOOTING

3-4. GENERAL

The following troubleshooting procedures will help technicians at the Intermediate General Support Maintenance level in isolating a fault to a defective subassembly, module, or component. The Symptom Index provides quick reference to Troubleshooting Flow Charts located in this section. Flow charts provide step-by-step procedures which pinpoint the source of a fault. For replacement of bad components, refer to General Support Maintenance, Section III of this Chapter. For troubleshooting a defective keyer-converter chassis, refer to FO-1.

CAUTION

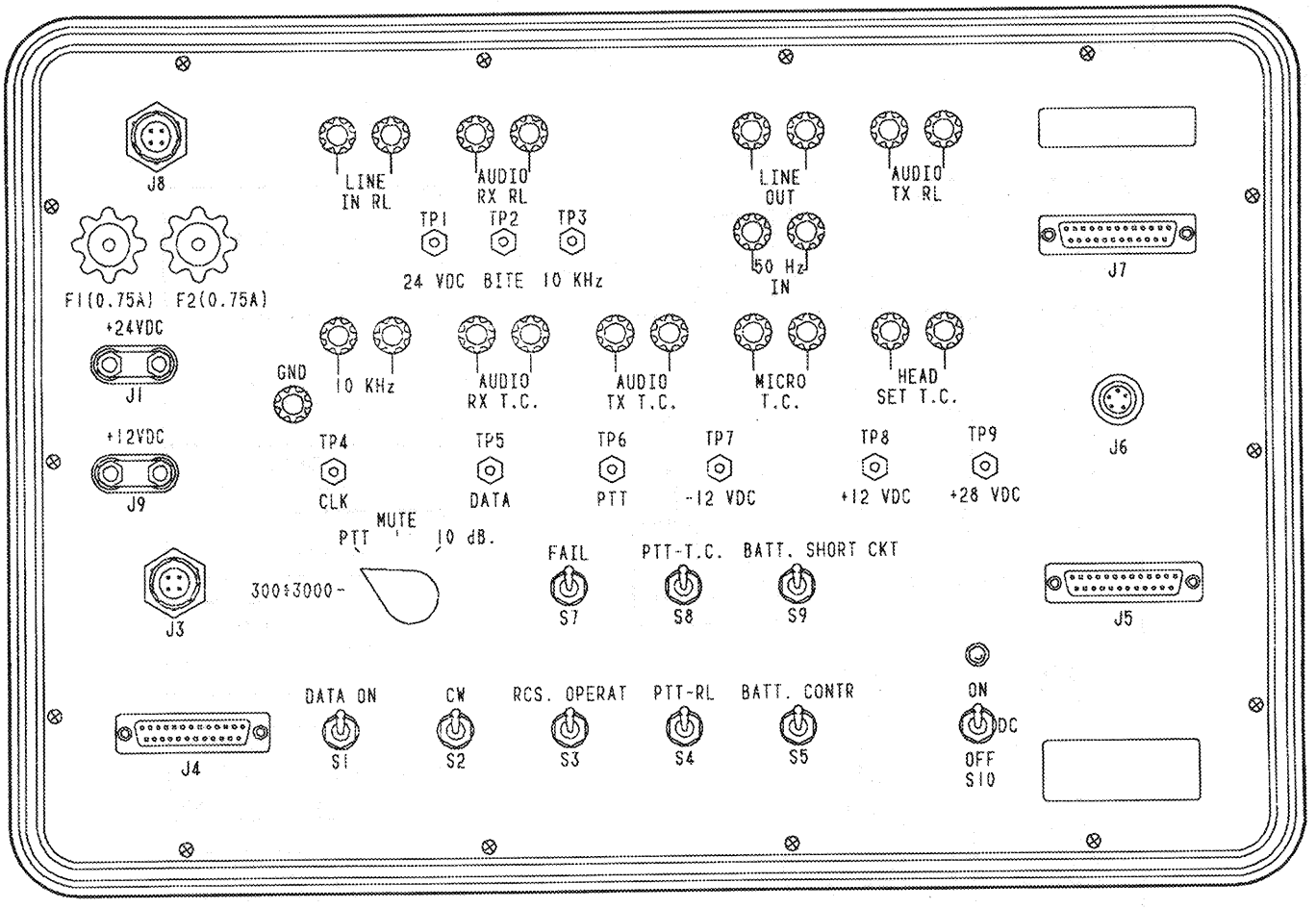
This equipment contains certain static-sensitive, solid-state devices which are subject to damage from electrostatic discharge. Effective control of electrostatic discharge is maintained only through continuous, strict observance of the following maintenance procedures.

- Any maintenance requiring disassembly of the equipment must be performed at an approved work station. The work station must include a grounded surface and grounded wrist strap in accordance with DOD-HDBK-263.
- All maintenance personnel must have completed training in the handling of static-sensitive devices before working on this equipment. Maintenance personnel must wear the grounded wrist strap and be at an approved work station when performing maintenance.
- The static-sensitive subassemblies or circuit cards must be stored in approved electrostatic-free material when not installed in the equipment.

3-5. PRELIMINARY TROUBLESHOOTING PROCEDURES

The Test Set, Remote Control TS-4254/GRC-215 allows for troubleshooting and functional testing of the Converter CV-3968/GRC-215 and its components by providing the necessary interface and loads. This test set includes cables W1, W33, W62, W64, W65, and W66. See TM 11-6625-3214-14&P, Navy ET800-AB-OMP-010/TS4244G, Air Force TO 33D7-47-121-1 for complete operating and maintenance instructions of the test set. Remove unit under test (UUT) battery, and set R/T-OFF-TEL switch on remote location front panel, to OFF position. Connect UUT as shown. Connect other test equipment following directions given in troubleshooting flow charts when directed.

For System BIT check refer to TM 11-5895-1218-12 Army, EE150-LQ-0MI-010/W110-TRC179V1 Navy, TO 31R2-2TRC179-21 Air Force.



TEST SET, REMOTE CONTROL TS-4254/GRC-215
(Commonly referred to as Test Fixture)

3-6. OPERATIONAL CHECK

INITIAL SETUP

Test Equipment

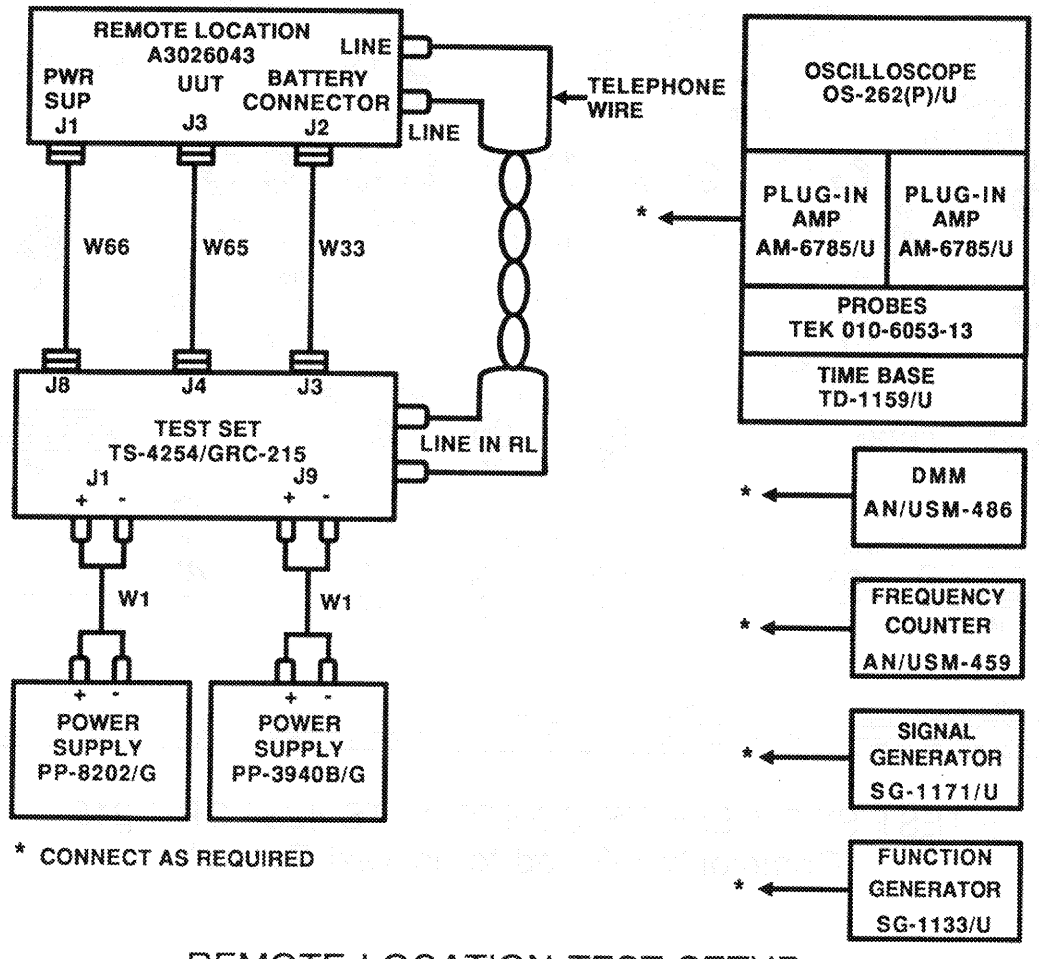
Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Frequency Counter, AN/USM-459
Power Supply, PP-3940B/G
Signal Generator, SG-1171/U
Memory Oscilloscope, OS-262(P)/U
Plug-in Amp, AM-6785/U (2 each)
Plug-in T.B., TD-1159/U
Distortion Analyzer, TS-4084/G
Function Generator, SG-1133
Test Set, Remote Control, TS-4254/GRC-215
Probes, TEK 010-6053-13 (2 each)

Equipment Conditions

Power OFF.
RCS case and battery removed (para 2-13).
Connect test fixture as shown.
All test fixture switches OFF (down).
Power supplies set to:
PP-8202/G +25 Vdc
PP-3940B/G +12 Vdc

Tools

Tool Kit, TK-17
Workstation, Static



REMOTE LOCATION TEST SETUP

3-6. OPERATIONAL CHECK (Cont.)

a. Remote Location

(1) Reverse polarity voltage protection check

STEP 1. Disconnect test cable W66 from remote location jack J1.

STEP 2. Perform forward bias resistance check of diode, by setting DMM to measure resistance, 2 diode range; connecting black lead (-) to J1-D and red lead (+) to remote location chassis. Observe that DMM measured resistance.

STEP 3. Perform reverse bias resistance check of diode by connecting red lead (+) to J1-D and black lead (-) to remote location chassis. Observe that DMM measured resistance is greater than that measured in step 2 above.

STEP 4. Disconnect DMM, and connect test cable W66 to J4.

(2) Data TX (transmission) check.

STEP 1. Turn power supplies on and adjust PP-3940B/G output to +12 Vdc and PP-8202/G to +25 Vdc.

STEP 2. Set signal generator for 50 Hz square wave pulse at 5 Vpp (measure with oscilloscope) and then connect to 50 Hz input connector on test set.

STEP 3. Set TEL/OFF/RT switch on remote loacation to RT. Set test set switches S1 to DATA ON, S3 to RCS OPERAT, S10 to ON, and S6 to 300-3000.

STEP 4. Using oscilloscope on settings 200 mV and 5 mS, check that waveform at LINE OUT jack on test set is similar to view CC in diagram A.

STEP 5. Set test set MUTE switch to MUTE. Remove signal generator input cable from 50 Hz IN on test set.

STEP 6. Connect frequency counter to LINE OUT on test set. Correct frequency is 3,416 to 3,426 Hz. Remove frequency counter from LINE OUT then check LINE OUT, using oscilloscope, for signal level of 0.3 to 0.8 Vpp. Turn S1 to S1. No waveform will be present.

STEP 7. Repeat steps 1 thru 6 using +20 Vdc and +30 Vdc outputs on 25 Vdc power supply.

3-6. OPERATIONAL CHECK (Cont.)

(3) Audio TX check

STEP 1. Set test set switches S1 to S1, S3 to RCS OPERAT, S4 to PTT-RL, and S6 to 300-3000.

STEP 2. Set function generator to provide 1,000 Hz tone (sinewave) at 2.2 Vpp output (use oscilloscope). Connect to AUDIO TX RL jack on test set.

STEP 3. Using oscilloscope, measure test set LINE OUT for 0.6 to 1.3 Vpp. Using oscilloscope, measure RX AUDIO RL jack for 8.7 to 17.5 Vpp. Set S4 to S4 and check that audio TX has stopped.

STEP 4. Remove function generator input to test set. Connect frequency counter to LINE OUT on test set. Set switches S4 to PTT-RL and S6 to PTT. Correct measurement on frequency counter will be 3,300 Hz to 3,310 Hz.

(4) Audio RX (receive) check.

STEP 1. Set switches S3 to RCS OPERAT, S6 to 300-3000 and all other switches down.

STEP 2. Set function generator output to 1,000 Hz tone at 2.2 Vpp (use oscilloscope) and connect to LINE IN RL on test set.

STEP 3. Using oscilloscope, measure AUDIO RX RL jack for for 1,000 Hz tone at 3.4 to 8.8 Vpp level.

(5) CW TX Check.

STEP 1. Set test set switches S1 to S1, S2 to CW, S3 to RCS OPERAT, S4 to PTT-RL, and S6 to PTT.

STEP 2. Using frequency counter, check LINE OUT for 3,300 to 3,310 Hz. Using oscilloscope, measure output signal level for 0.2 to 0.6 Vpp.

STEP 3. Disconnect field wire from LINE IN RL on test set. Using frequency counter, check AUDIO RX RL jack for 3,300 to 3,310 Hz.

(6) ECCM power supply, synchronization, and Bite check

STEP 1. Reconnect field wire to LINE IN RL on test set. Set switches S3 to RCS OPERAT, S6 to 300-3,000, and all other switches to down.

3-6. OPERATIONAL CHECK (Cont.)

STEP 2. Using DMM, measure from test set TP1 to GND for +24 Vdc (+20 to +30 Vdc).

STEP 3. Turn S1 to DATA ON and, using oscilloscope, measure TP3 for 10 kHz sync signal. Set S1 to S1.

STEP 4. Set function generator to provide 3,196 Hz at 2.2 Vpp (use frequency counter and oscilloscope) and connect to test set LINE IN RL jack. Using DMM, measure TP2 for presence of 4.5 to 5.5 Vdc.

STEP 5. Using oscilloscope, check AUDIO RX RL jack for 3,150 to 3,250 Hz at 6.7 to 22.0 Vpp

(7) Check of battery charger for remote location.

STEP 1. Set test set switch S5 to up position. Using DMM, measure from TP9 to ground on test set for +26 to +30 Vdc.

STEP 2. Set S5 to S5 position. No voltage will be present.

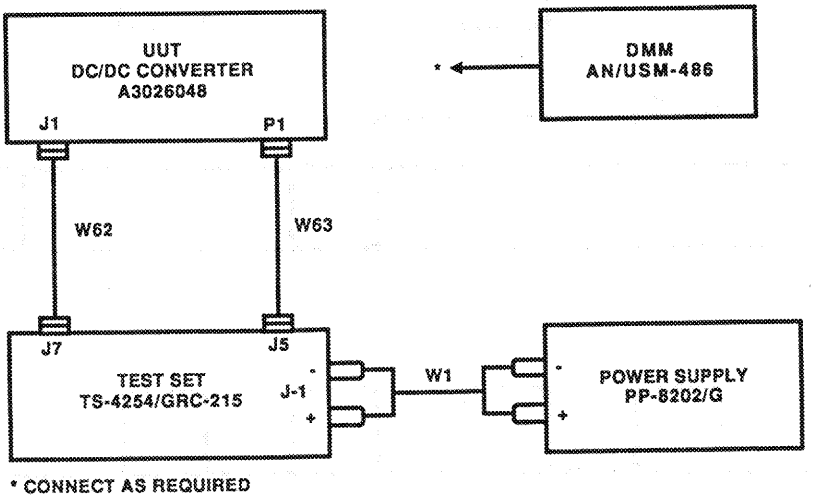
b. DC/DC CONVERTER CHECK

(1) Test Setup (below)

Test equipment is set up according to the dc/dc converter test setup illustration.

(2) Check of tone converter's power supply

Adjust power supply for +24 Vdc. Using DMM, check test set TP7 to GND for -12 Vdc and TP8 to GND for +12 Vdc.



DC/DC Converter Test Setup

3-6. OPERATIONAL CHECK (Cont.)

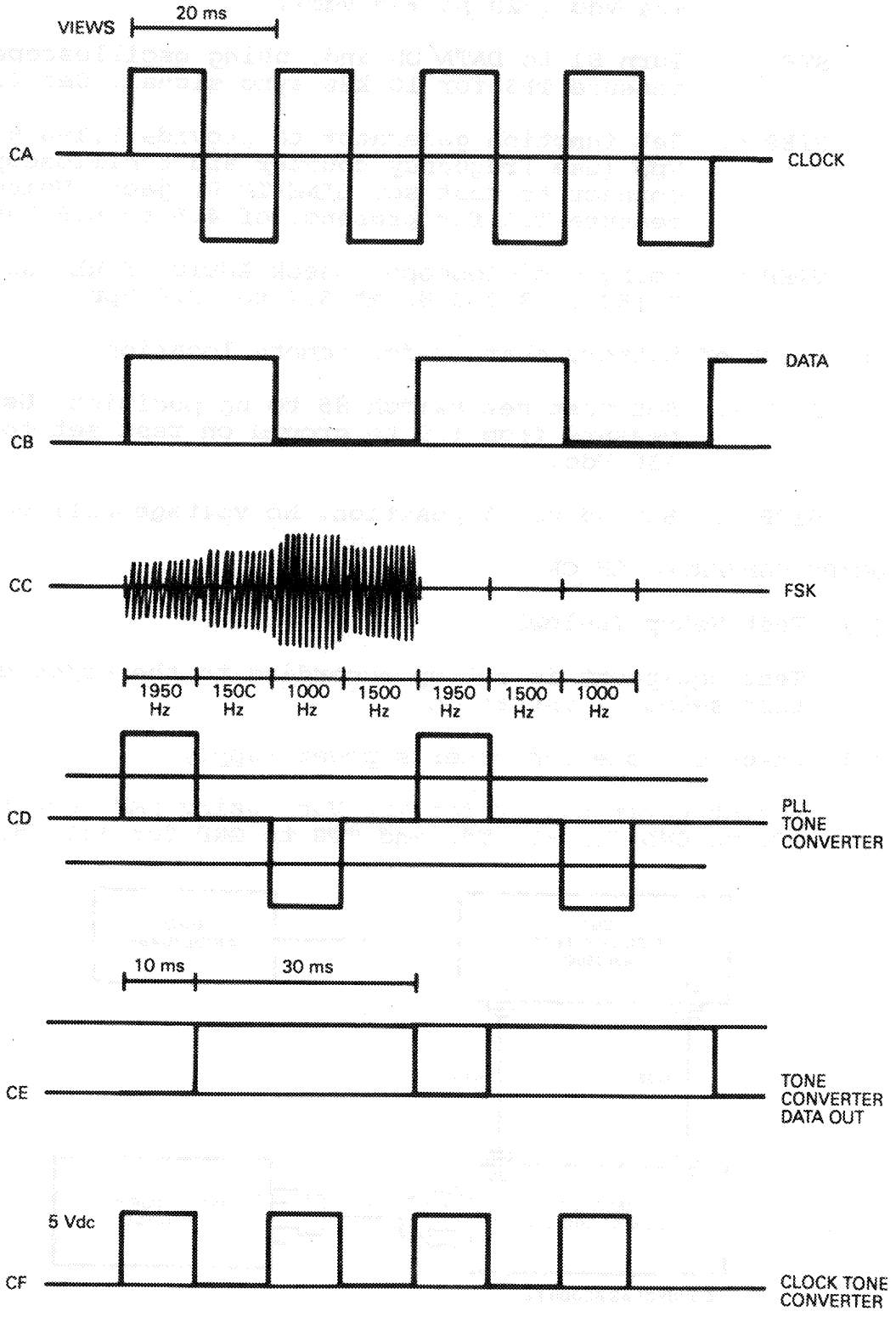


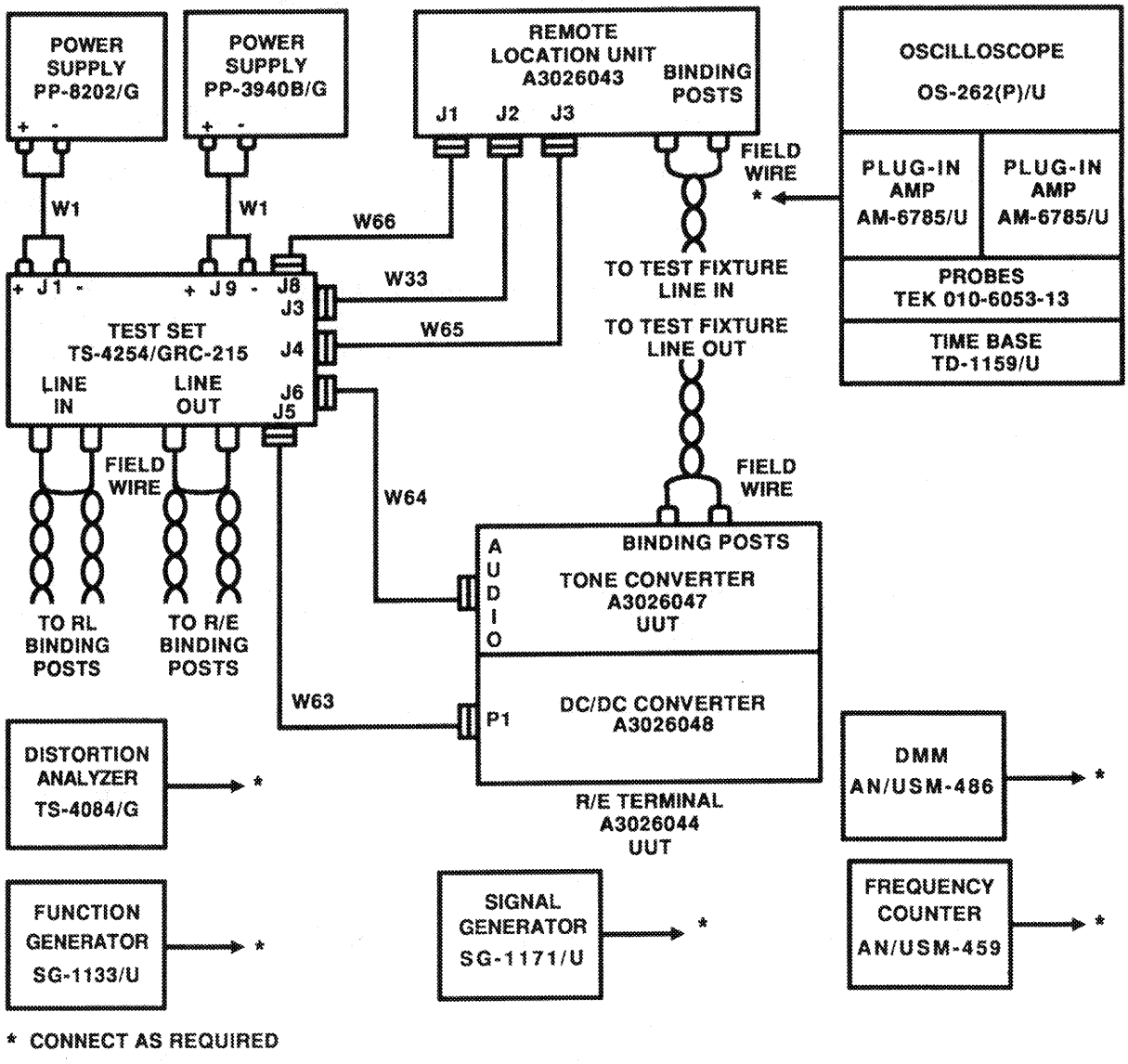
Diagram A - Typical Waveforms

3-6. OPERATIONAL CHECK (Cont.)

c. TONE CONVERTER CHECK

(1) Test setup

- A known good remote location unit and a dc/dc converter unit, are needed to check the tone converter. Therefore, perform operational checks of the remote location (para. 3-6a) and dc/dc converter (para. 3-6b) first.
- Set up equipment according to remote control test setup below.



TONE CONVERTER TEST SETUP

3-6. OPERATIONAL CHECK (Cont.)

(2) Data RX check

STEP 1. Ensure TEL/OFF/RT switches on RL and RE are set to RT. Using oscilloscope, set signal generator to 50 Hz square wave with a logic level of 5 Vpp and connect to 50 Hz IN jack of test set. Set switches S1 to DATA ON, S2 to S2, S3 to RCS OPERAT, S4 to S4, S6 to 10dB ATT, and S10 to ON.

STEP 2. Using oscilloscope, check that waveforms from TP4 (CLK) and TP5 (DATA)) on the test set are similiar to views CF and CE in diagram A.

(3) Audio TX check

STEP 1. Set switches S1 to S1, S2 to S2, and S4 to PTT-RL.

STEP 2. Using oscilloscope, set function generator for a tone of 1,000 Hz at 2.2 Vpp, and connect to Audio TX RL jack of test set.

STEP 3. Using oscilloscope, check Audio TX TC output of the test set for a tone of 1,000 Hz at 1.3 to 3.5 Vpp (Note: waveform will be slightly distorted due to frequency hetrodyning).

(4) Audio RX check

STEP 1. Set switches S1 to S1, S2 to S2, S3 to RCS OPERAT, and S4 to S4.

STEP 2. Using oscilloscope, set function generator for a tone of 1,000 Hz at 8.5 Vpp and connect to Audio RX TC input of the test set.

STEP 3. Using oscilloscope, check Audio RX RL of the test set for a tone of 2.1 to 5.5 Vpp.

STEP 4. Using oscilloscope, measure 2.7 to 7.0 Vpp on tone converter's binding posts (LINE).

(5) Check of PTT (push-to-talk)

STEP 1. Set switches S1 to S1, S2 to S2, S3 to RCS OPERAT, and S6 to 10dB ATT.

STEP 2. On test set, set switch S4 to PTT-RL and to S4 positions, checking for a signal on the test set PTT output (TP6) of PTT = 0 and PTT = +5 Vdc.

3-6. OPERATIONAL CHECK (Cont.)

(6) Fail light check

STEP 1. Using the frequency counter and then the oscilloscope set the function generator to 10 kHz at 6.5 Vpp and connect to 10 kHz input of test set. Set switches S3 to RCS OPERAT, S7 to FAIL, and all other switches to down position.

STEP 2. Check on RE for LED FAIL (BITE) light on.

STEP 3. Using oscilloscope, check the AUDIO RX RL jack of the test set for a 3,200 (3,195 to 3,205 Hz) tone.

(7) Check of Call Circuit

STEP 1. Set the function generator frequency to 10 KHz at 5 Vpp, and connect to test set TP3 10 kHz. Set switches S3 to RCS OPERAT, S6 to 10 dB ATT, and all other switches to down position.

STEP 2. Press CALL button on tone converter. Using oscilloscope, check at test set AUDIO RX RL for an intermittent 3,200 Hz (3,195 to 3,205) tone.

STEP 3. Press CALL button on RL and check for flashing BITE LED on the RE tone converter.

(8) Check communication between two operators

STEP 1. Set R-T/TEL switches on remote location and tone converter to the TEL position. Set test set S6 to 10 dB ATT.

STEP 2. Set switches S3 to RCS OPERAT and S8 to PTT TC.

STEP 3. Using function generator, send a 1,000 Hz tone at 2.5 Vpp over the MICRO TC input jack of the test set. NOTE: only insert red lead of signal generator in right post.

STEP 4. Using oscilloscope, check for a 1,000 Hz tone at 1.9 to 5.0 Vpp at test set AUDIO RX RL jack.

STEP 5. Set switches S4 to PTT-RL and S8 to S8.

STEP 6. Using function generator, send a 1,000 Hz tone at 2.5 Vpp on AUDIO TX RL input of test set.

STEP 7. Ensure volume control on RE tone converter is fully Cw. Using oscilloscope, check the HEADSET TC jack (left binding post) of test set for a 1,000 Hz tone at 0.4 to 1.1 Vpp.

3-6. OPERATIONAL CHECK (Cont.)

(8) Check communication between two operators (Cont.)

STEP 8. Place R/T Tel switches (on remote location and tone converter) to R/T.

(9) Audio bandwidth check

STEP 1. Connect function generator to test set AUDIO TX RL jack and distortion analyzer to the AUDIO TX TC jack. Set distortion analyzer to measure dBm.

STEP 2. Adjust function generator for 2.2 Vpp output.

STEP 3. Very slowly change (scan) frequency range (output) of generator from 50 to 5,000 Hz, while observing the dBm measurements on the distortion analyzer, to find the frequency of maximum value of audio output (note frequency).

STEP 4. Scan frequency range from the frequency of step 4 upward to 5,000 Hz to find the highest frequency at which the attenuation is 3 dB below the maximum output. Frequency will be above 3,000 Hz.

STEP 5. Connect function generator to test set AUDIO RX TC jack and distortion analyzer to test set AUDIO RX RL of test fixture. Set switch S4 to S4.

STEP 6. Adjust the function generator for 8.5 Vpp output level and repeat the operation described in steps 3, 4, and 5. Frequency should be above 3,000 Hz.

(10) Audio distortion check

STEP 1. Set switches S3 to RCS OPERAT, S4 to PTT-RL, and S6 to 10 dB ATT.

STEP 2. Adjust function generator for 1,000 Hz at 2.2 Vpp.

STEP 3. Connect function generator to test set AUDIO TX RL jack and the distortion analyzer to AUDIO TX TC.

STEP 4. Using the distortion analyzer, measure the amount of distortion of the output level. Should be less than 5 percent.

STEP 5. Connect generator to test set AUDIO RX TC jack. Set S4 to S4, and S8 to PTT-TC.

STEP 6. Using distortion analyzer, measure distortion at test set AUDIO RX RL jack. Distortion should be less than 5 percent.

3-7. SYMPTOM INDEX

The following chart is intended to assist Intermediate General Support Maintenance in rapid identification to a faulty module/CCA for repair or replacement as authorized by the Maintenance Allocation Chart (MAC). Equipment containing faults not correctable by this chart should be sent to the next higher maintenance activity.

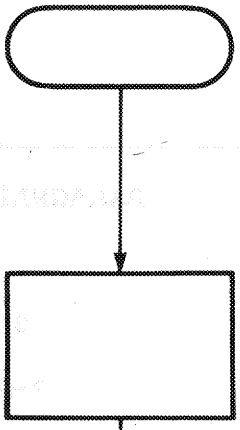
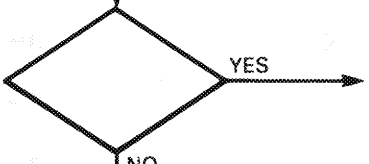
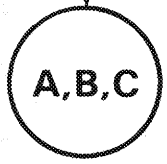
NOTE

The remote location assy must be put back together and tested after each corrective action has been completed. If the first corrective action does not correct the problem, go to the next corrective action.

3-8. FLOW CHARTS AND HOW TO USE THEM

The flowcharts make troubleshooting easier and give maintenance personnel a clear path to follow.

To use the flowchart begin at start and follow the path indicated by the arrow. Perform the task given by the symbol block and then follow the arrow to the next block. At the decision symbol be sure to follow the correct path indicated by YES or NO.

SYMBOL	MEANING
	Start and finish symbol indicates starting and finishing points.
	Task symbol indicates what to do and where to do it.
	Decision symbol (yes or no) indicates that a decision must be made. The direction to go from the decision symbol depends on the decision made.
	Continuation symbol indicates that the path continues to or comes from another Flow Chart.

3-9. BATTERY BB-590/U WILL NOT RECHARGE

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Test Set, Remote Control TS-4254/GRC-215

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

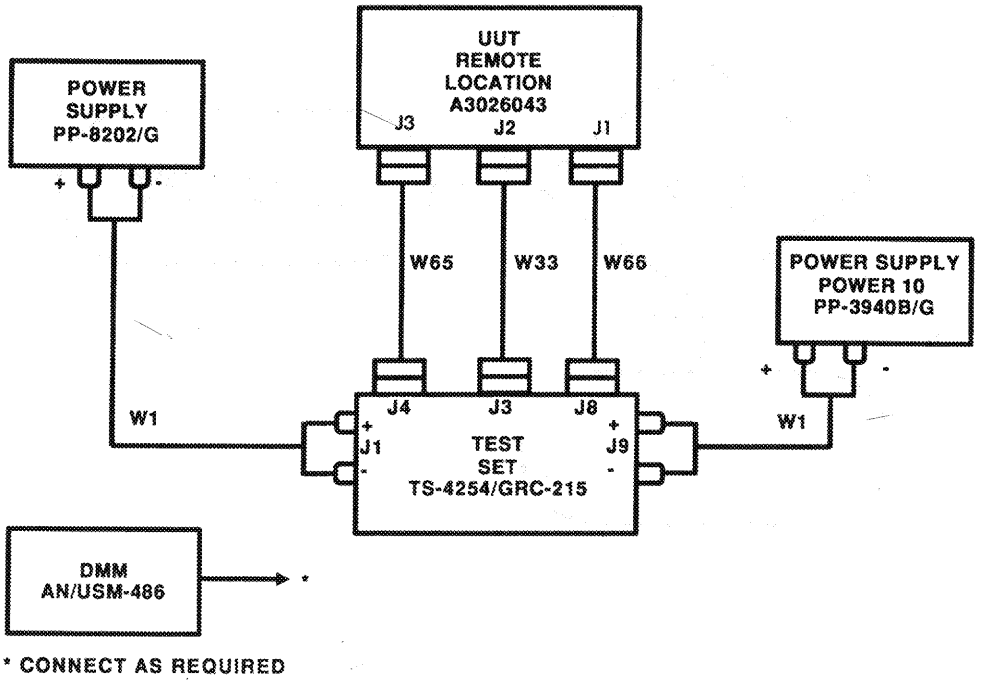
Remove battery from remote location (para. 2-13)
Adjust PP-8202/G for +25 Vdc, adjust PP-3940B/G for +12 Vdc. (verify with DMM).
Set test fixture switches S3, S5, S9 and S10 to ON (up), all others OFF (down), or as directed.
UUT and test equipment connected as shown.

WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

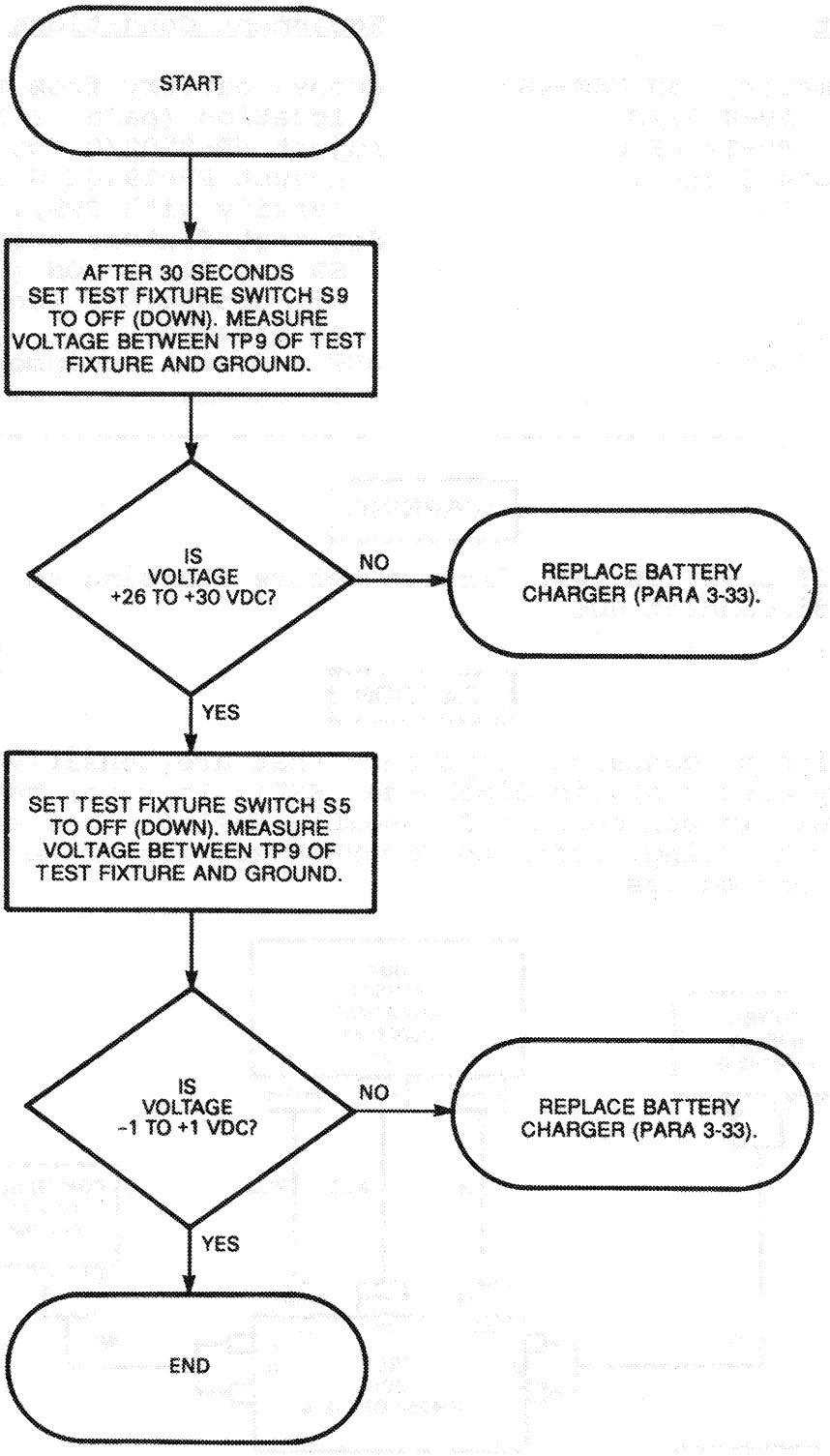
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.



* CONNECT AS REQUIRED

3-9. BATTERY BB-590/U WILL NOT RECHARGE (Cont.)



3-10. NO DATA TX AT REMOTE LOCATION ASSY

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Frequency Counter, AN/USM-459
Power Supply, PP-3940B/G
Signal Generator, SG-1171/U
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location test fixture, and test equipment as shown in test setup.
Set remote R/T OFF-TEL switch to R/T
Set signal generator output to 50 Hz/+5Vpp (square wave) level.
Set PP-8202/G to +25 Vdc, and set PP-3940B/G to +12 Vdc (verify with (DMM).
Set test fixture switches S1 and S3 to ON (up); set all others OFF (down) or as directed.

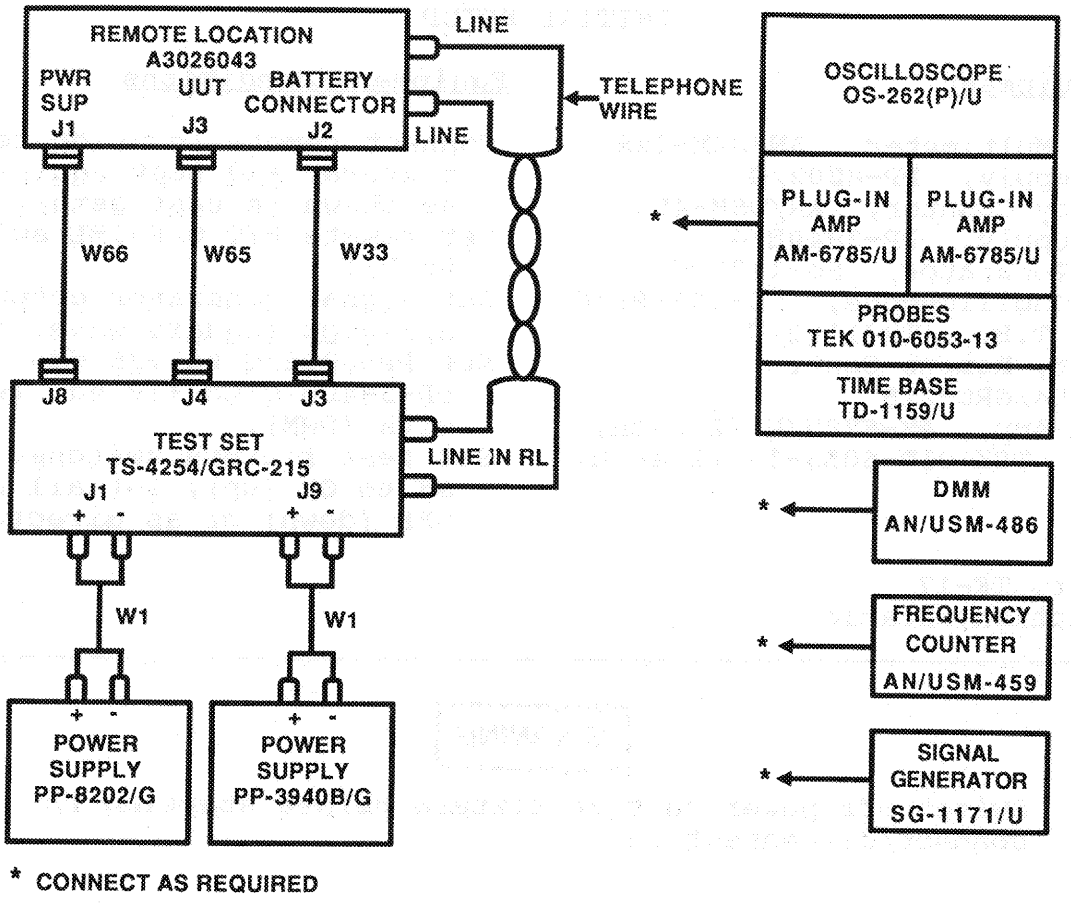
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

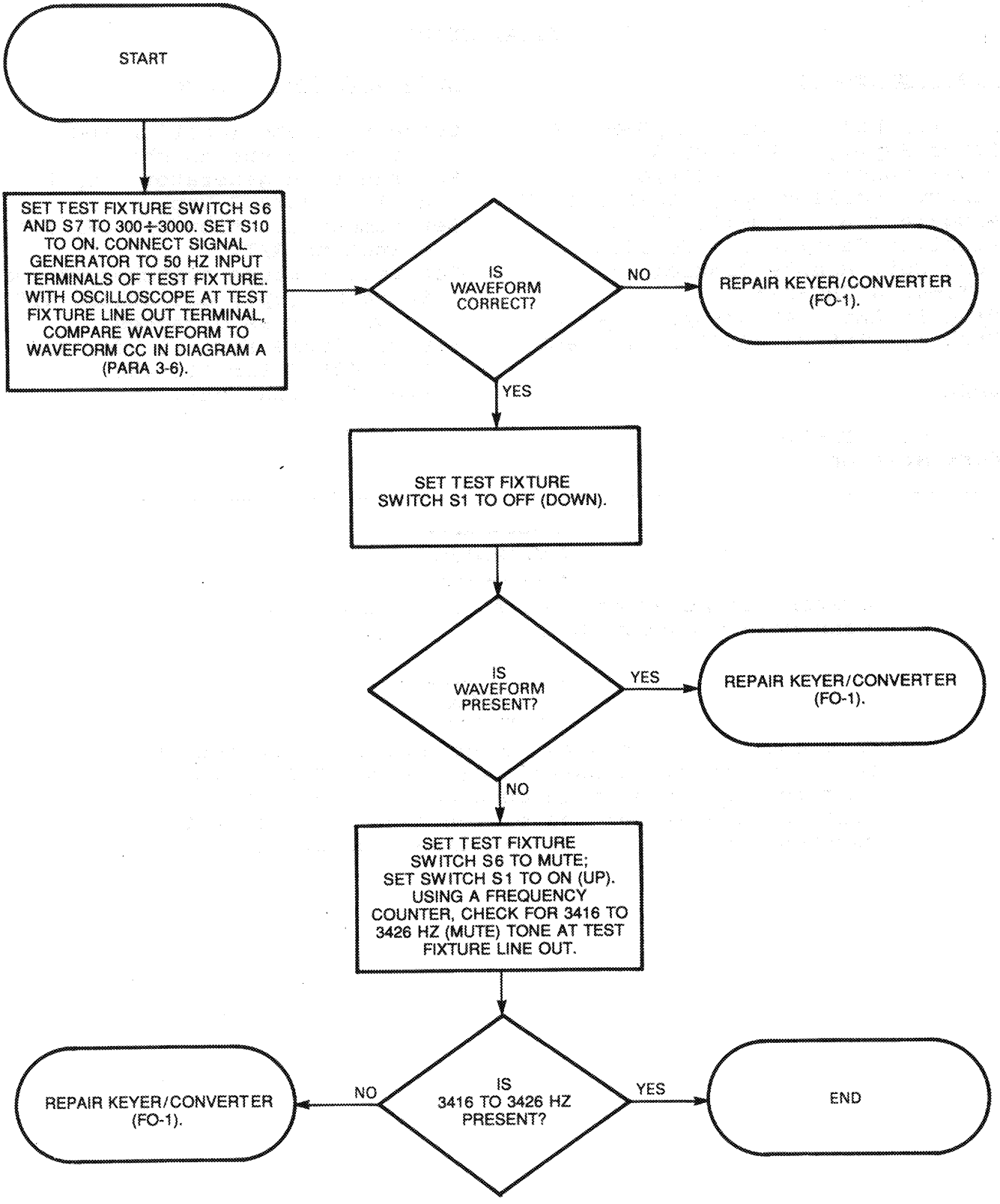
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-10. NO DATA TX AT REMOTE LOCATION ASSY (Cont.)



3-10. NO DATA TX AT REMOTE LOCATION ASSY (Cont.)



3-11. NO AUDIO TX AT REMOTE LOCATION ASSY

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Function Generator, SG-1133
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test equipment as shown.
Set function generator output at 1000 Hz/2.2 Vpp.
Set remote location R/T-OFF-TEL switch to R/T.
Set test fixture switches S3 and S4 to ON (up); all others Off (down), or as directed.
Set PP-8202/G for +25 Vdc, and PP-3940B/G for +12 Vdc, (verify with DMM).

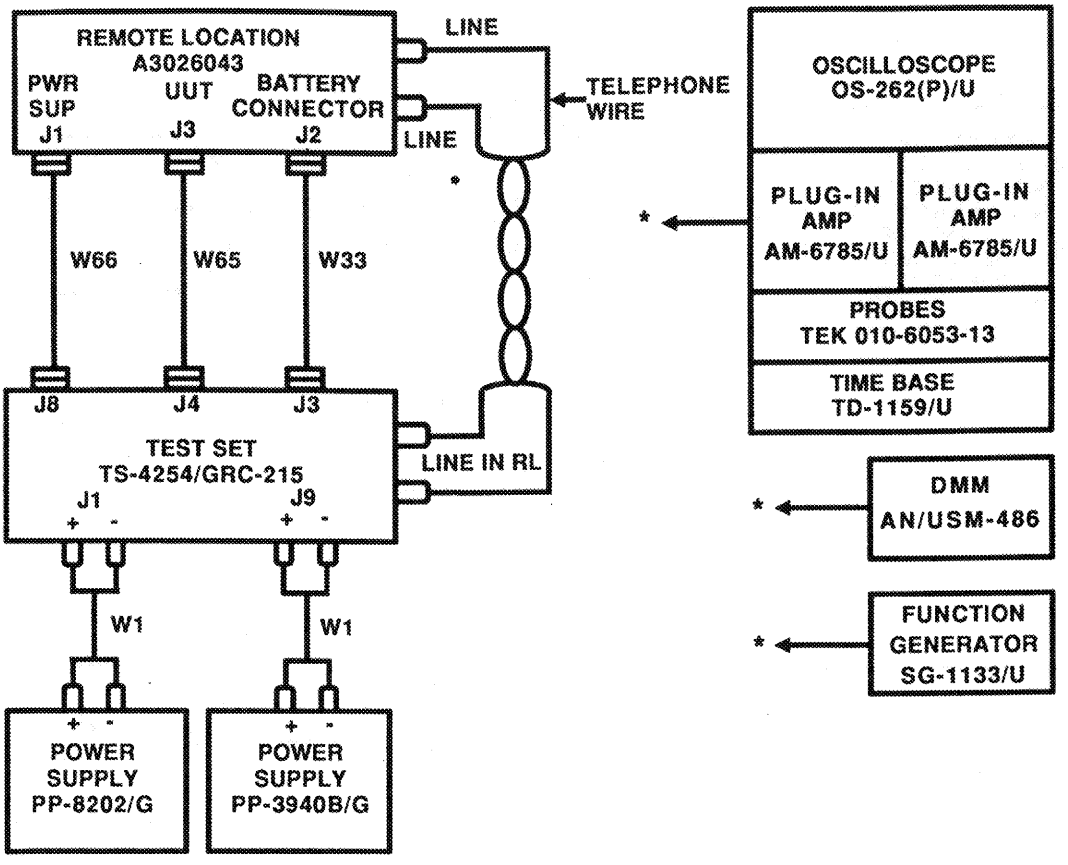
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

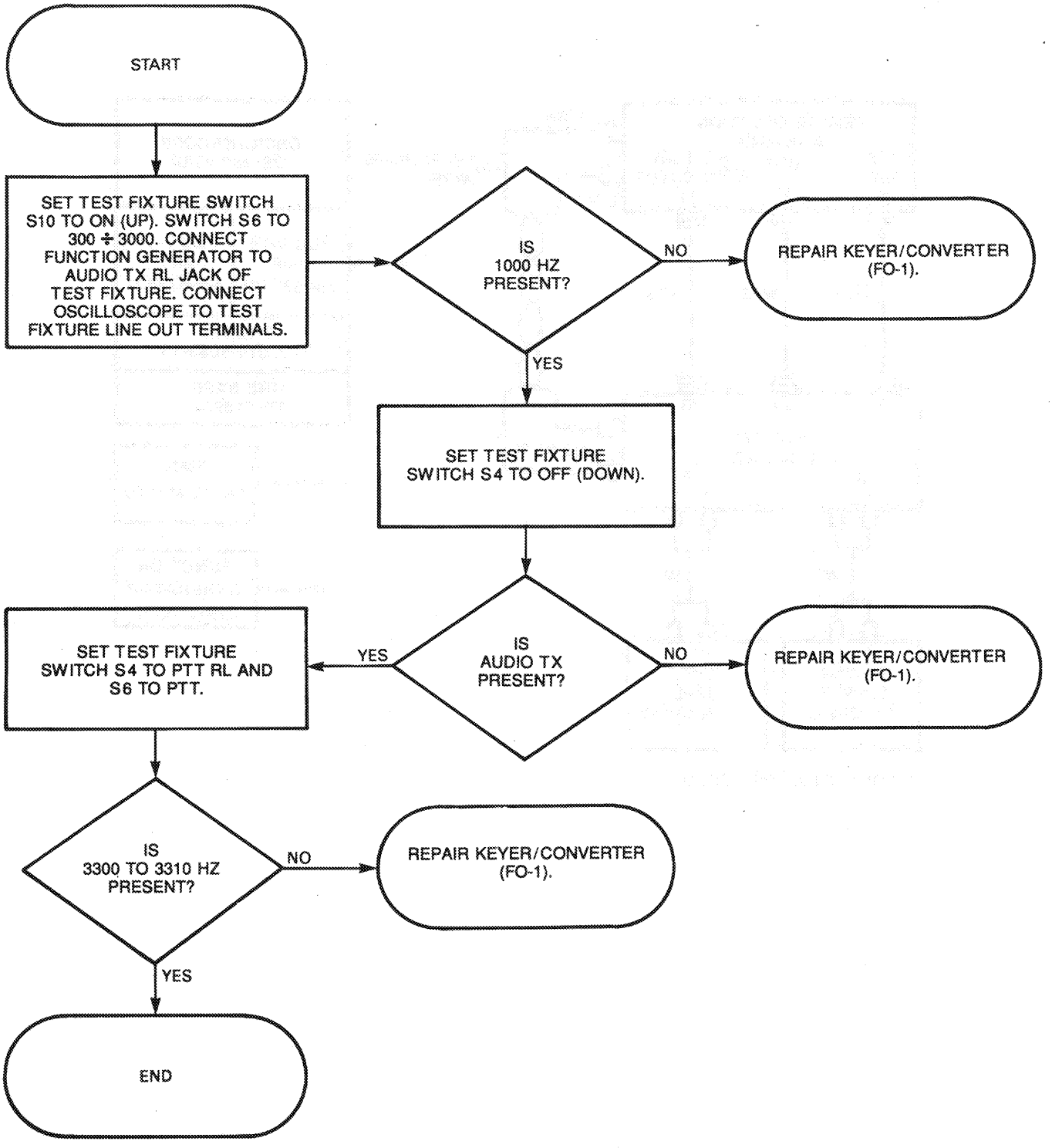
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-11. NO AUDIO TX AT REMOTE LOCATION ASSY (Cont.)



3-11. NO AUDIO TX AT REMOTE LOCATION ASSY (Cont.)



3-12. NO AUDIO RX AT REMOTE LOCATION ASSY

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Function Generator, SG-1133
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test equipment as shown.
Set test fixture switches S3 and S10 ON (up); all others OFF (down), or as directed.
Set the remote location R/T-OFF-. TEL switch to R/T.
Set function generator to 1,000 Hz at 2.2 Vpp and connect to test fixture LINE IN jacks.
Set the PP-8202/G for +25 Vdc, and the PP-3940B/G for +12 (verify with DMM).

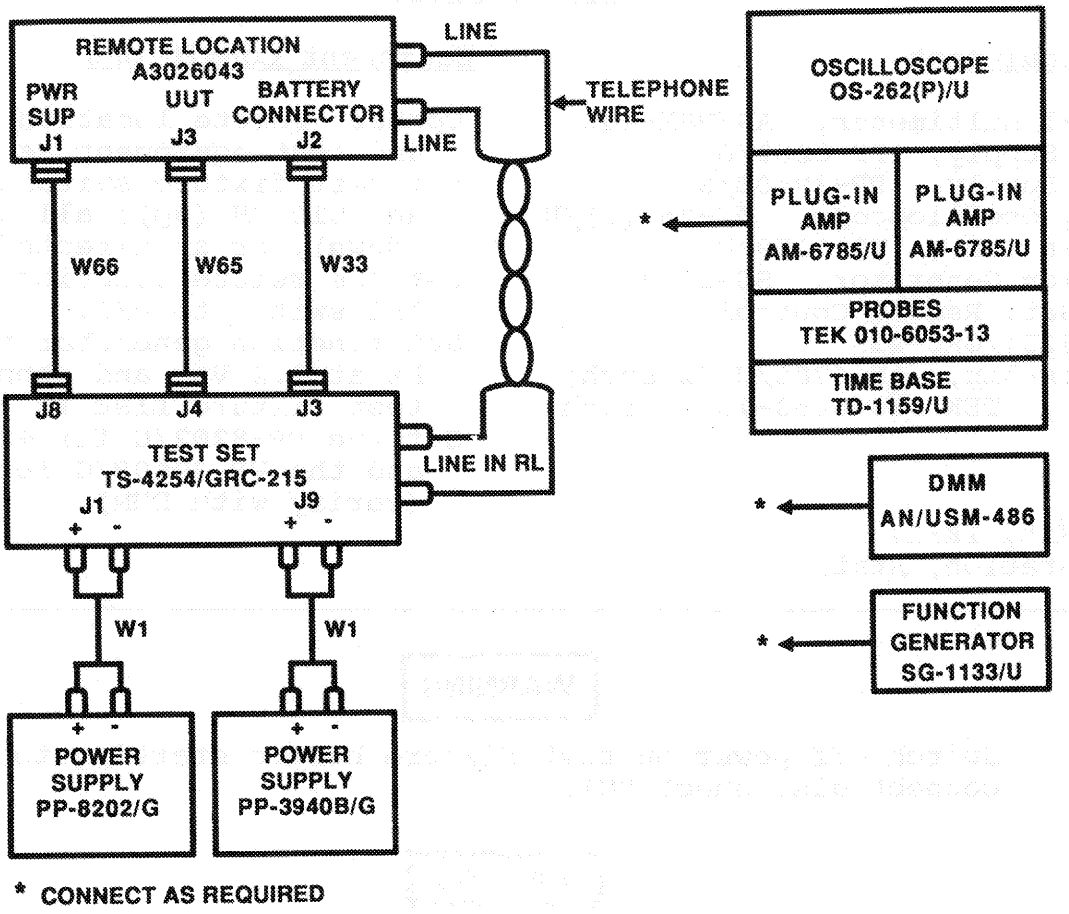
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

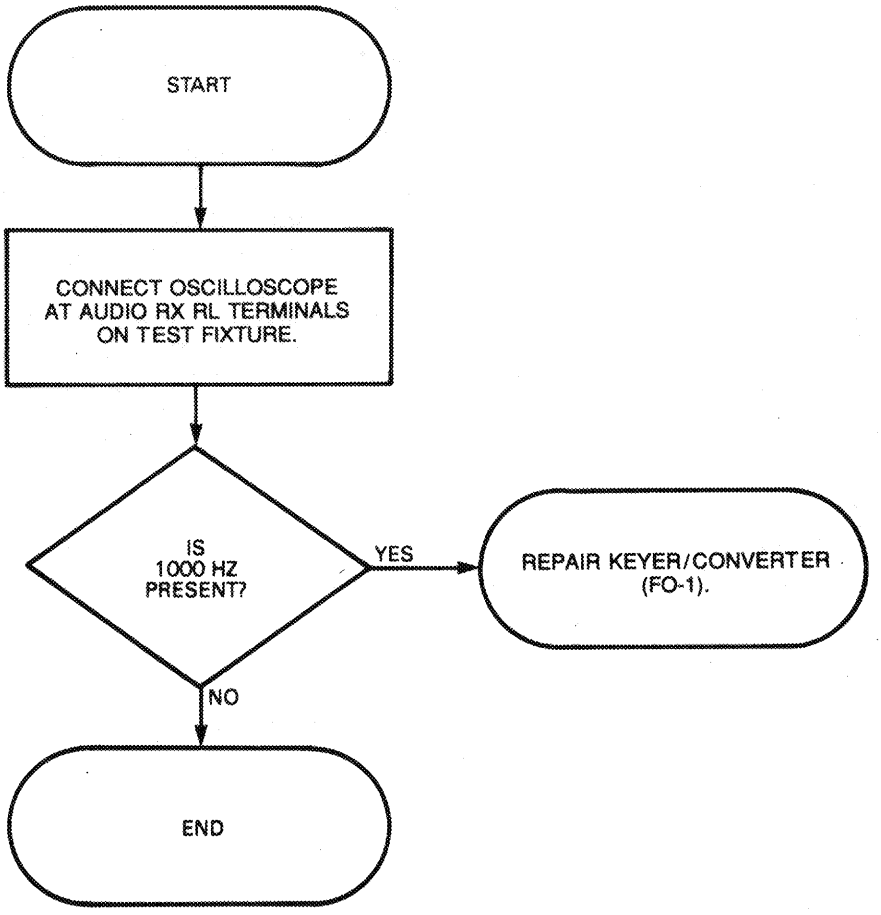
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-12. NO AUDIO RX AT REMOTE LOCATION ASSY (Cont.)



3-12. NO AUDIO RX AT REMOTE LOCATION ASSY (Cont.)



3-13. NO CW TRANSMISSION CAPABILITY

INITIAL SETUP

Test Equipment

Power Supply, PP-8202/G
Frequency Counter, AN/USM-459
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test fixture as shown.
Set test fixture switches S2, S3, S4, and S10 to ON (up); set S1 to OFF (down); set S6 to PTT.
Set remote location R/T-OFF-TEL switch to R/T position.
Set PP-8202/G to +25 Vdc, and set PP-3940B/G to +12 Vdc, (verify with DMM).

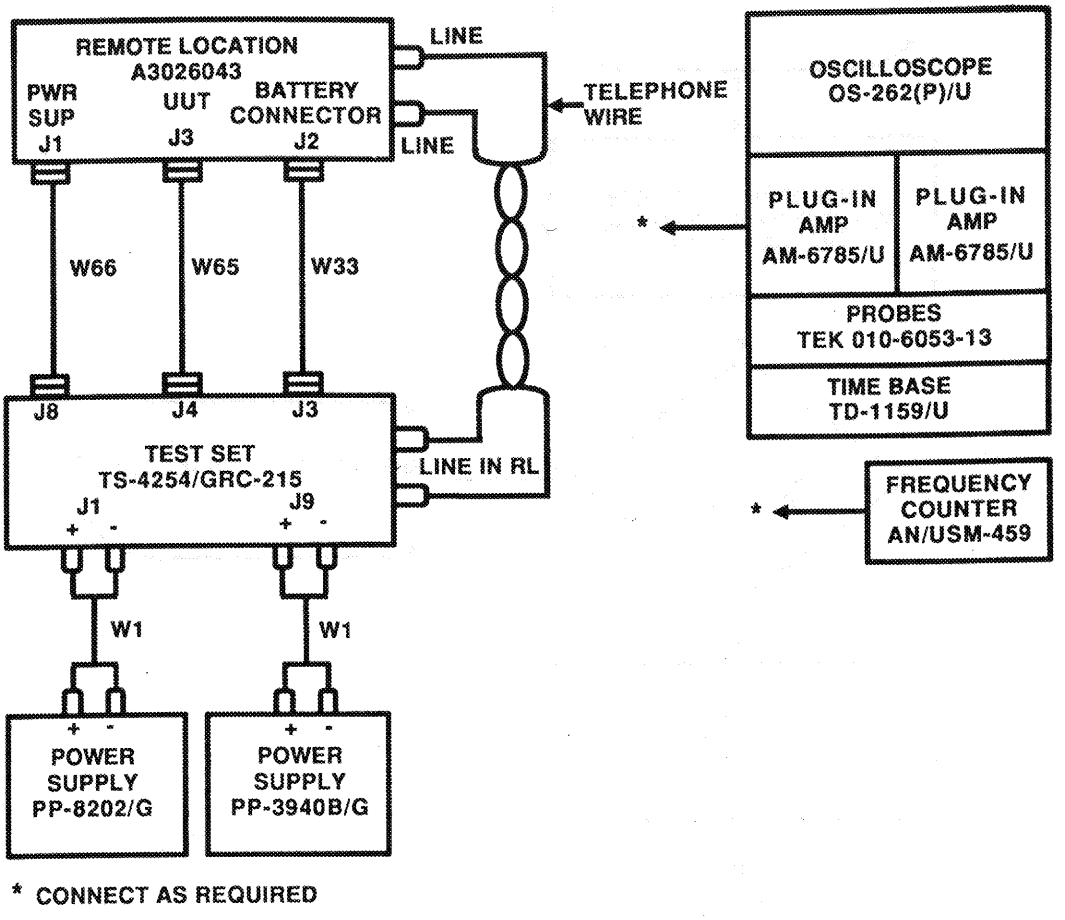
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

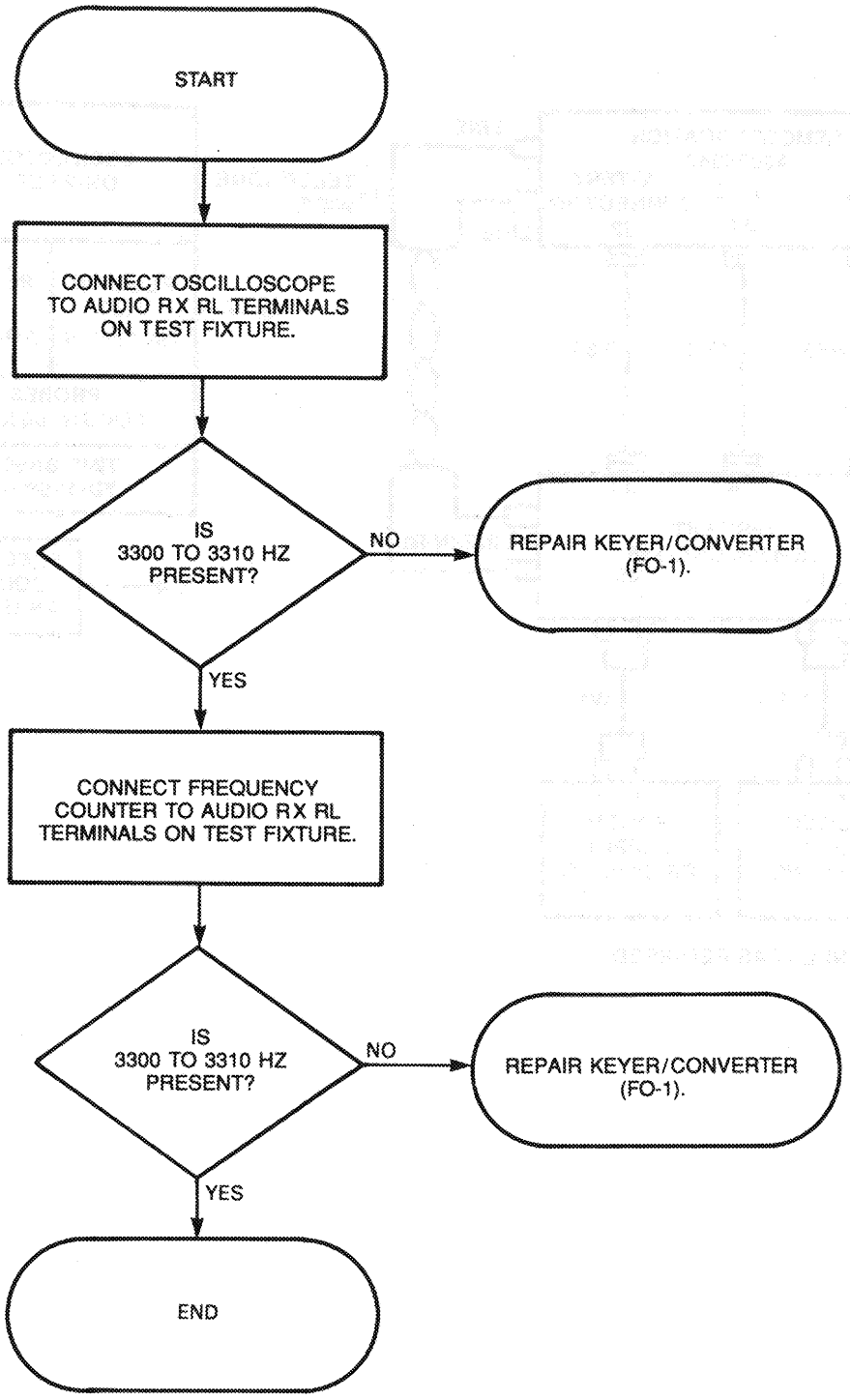
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-13. NO CW TRANSMISSION CAPABILITY (Cont.)



3-13. NO CW TRANSMISSION CAPABILITY (Cont.)



3-14. AT ECCM, NO OPERATING VOLTAGE

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Test Set, Remote Control TS-4254/GRC-215

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test fixture as shown.
Set test fixture switches S3 and S10 to ON (up); set S1, S2, S4, and S5 to OFF (down).
Set PP-8202/G to 25 Vdc, and set PP-3940B/G to +12 Vdc (verify with DMM).
DMM set to measure +DC.

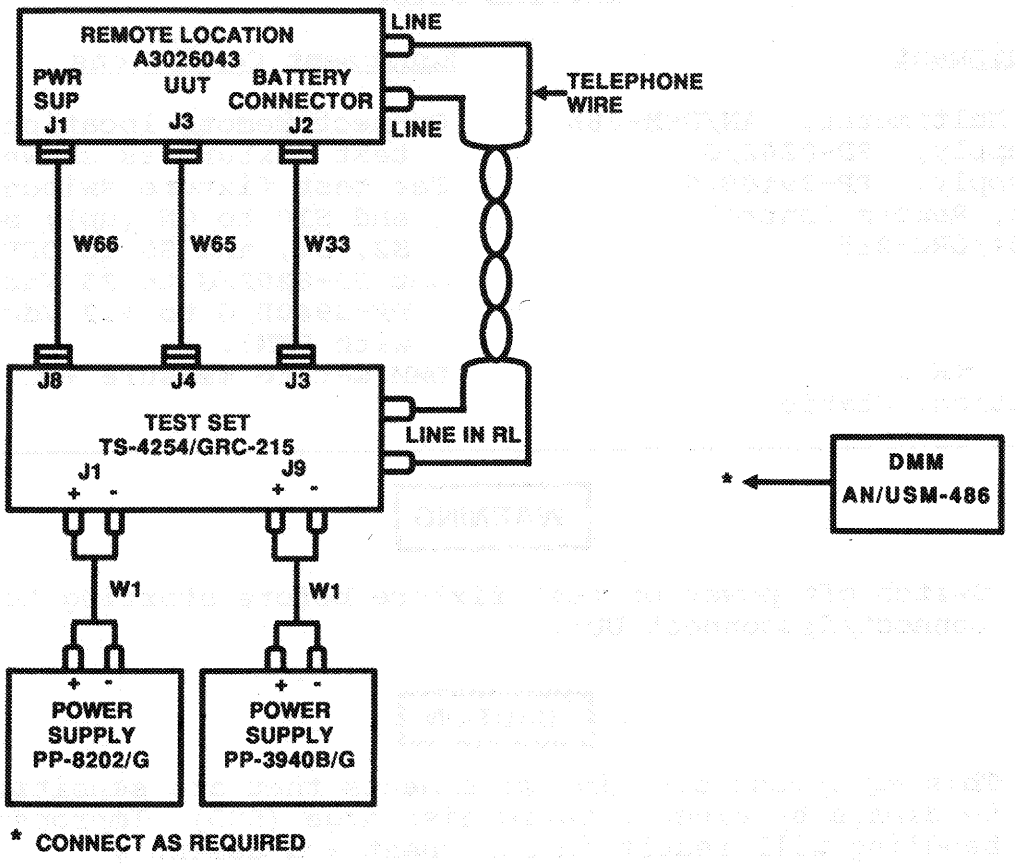
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

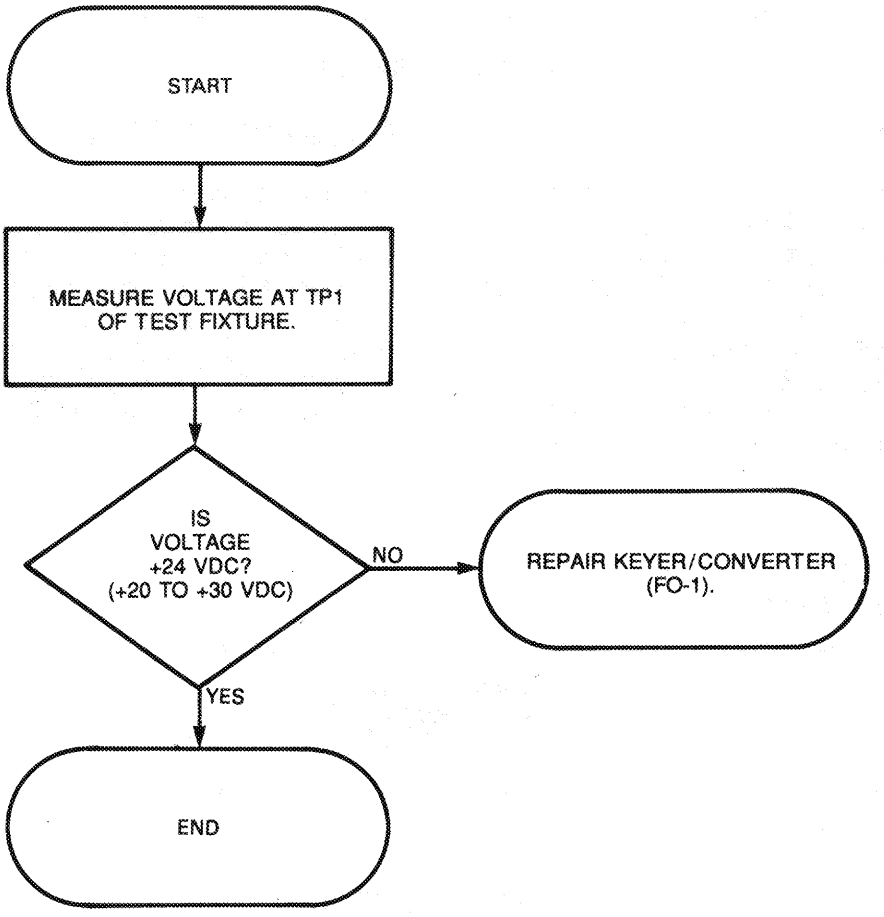
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-14. AT ECCM, NO OPERATING VOLTAGE (Cont.)



3-14. AT ECCM, NO OPERATING VOLTAGE (Cont.)



3-15. NO 10 KHZ SYNC SIGNAL TO ECCM

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test fixture as shown.
Set test fixture switches S3 and S10 to ON (up); set S1, S2, S4, and S5 to OFF (down).
Set PP-8202/G for +25 Vdc, and set PP-3940B/G for +12 Vdc, (verify with DMM).

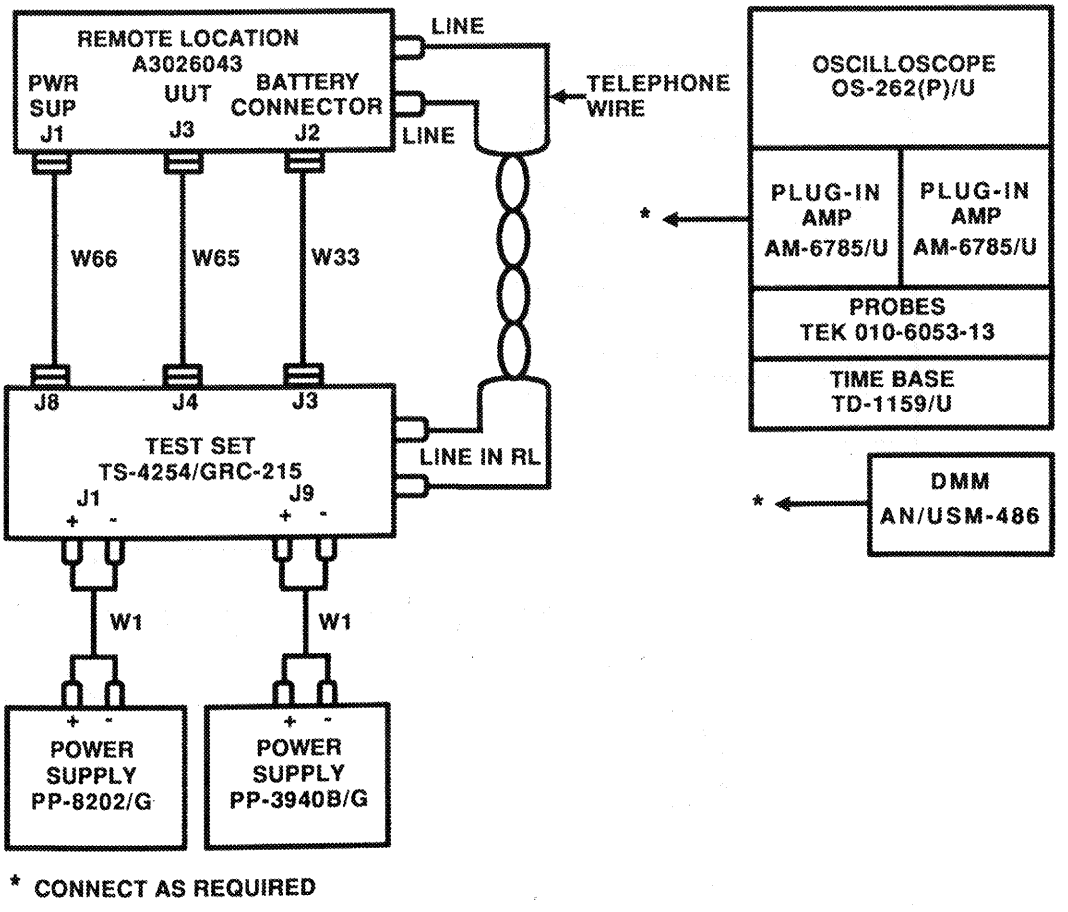
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

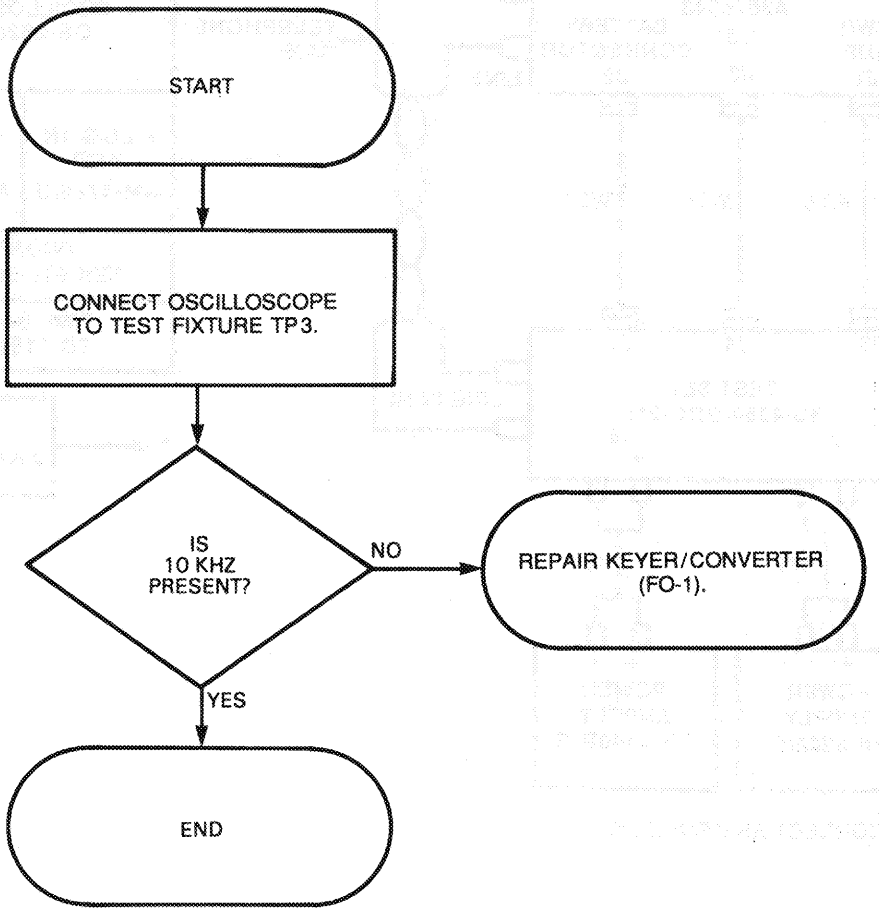
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-15. NO 10 KHZ SYNC SIGNAL TO ECCM (Cont.)



3-15. NO 10 KHZ SYNC SIGNAL TO ECCM (Cont.)



3-16. NO BIT INDICATION

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Test Set, Remote Control TS-4254/GRC-215
Function Generator, SG-1133

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Connect remote location and test fixture as shown.
Set test fixture switches S3 and S10 to ON (up); set S1, S2, S4, and S5 to OFF (down).
Set DMM to measure +DC
Set PP-8202/G to +25 Vdc, and PP-3940B/G to +12 Vdc (verify with DMM)
Set function generator to 3196 Hz at 2.2 Vpp and connect to test fixture LINE IN jack.

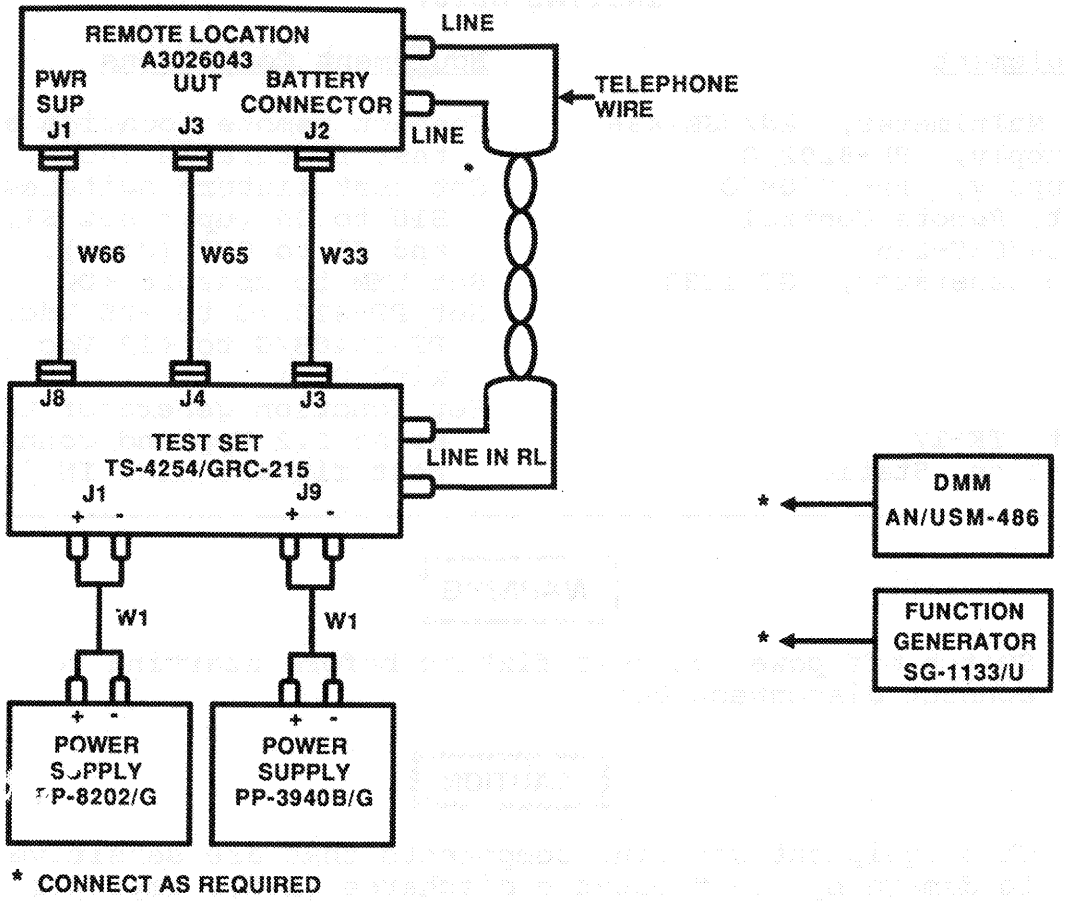
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

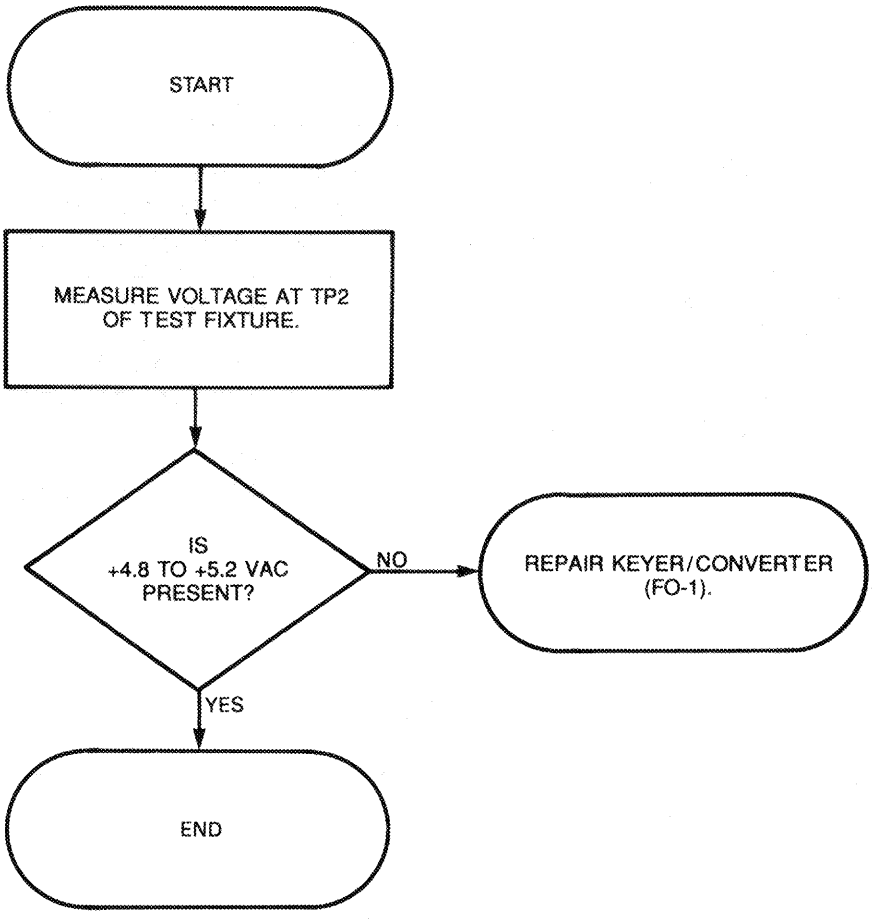
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-16. NO BIT INDICATION (Cont.)



3-16. NO BIT INDICATION (Cont.)



3-17. NO AUDIO TX AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Function Generator, SG-1133
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location.
Connect R/E terminal and test equipment as shown.
Set test fixture switches S1 and S2 to OFF (down); set S4 to OFF (down), set all other switches as directed.
Set function generator to 1000 Hz at 2.2 Vpp.
Set PP-8202/G to +25 Vdc, and PP-3940B/G to +12 Vdc (verify with DMM).

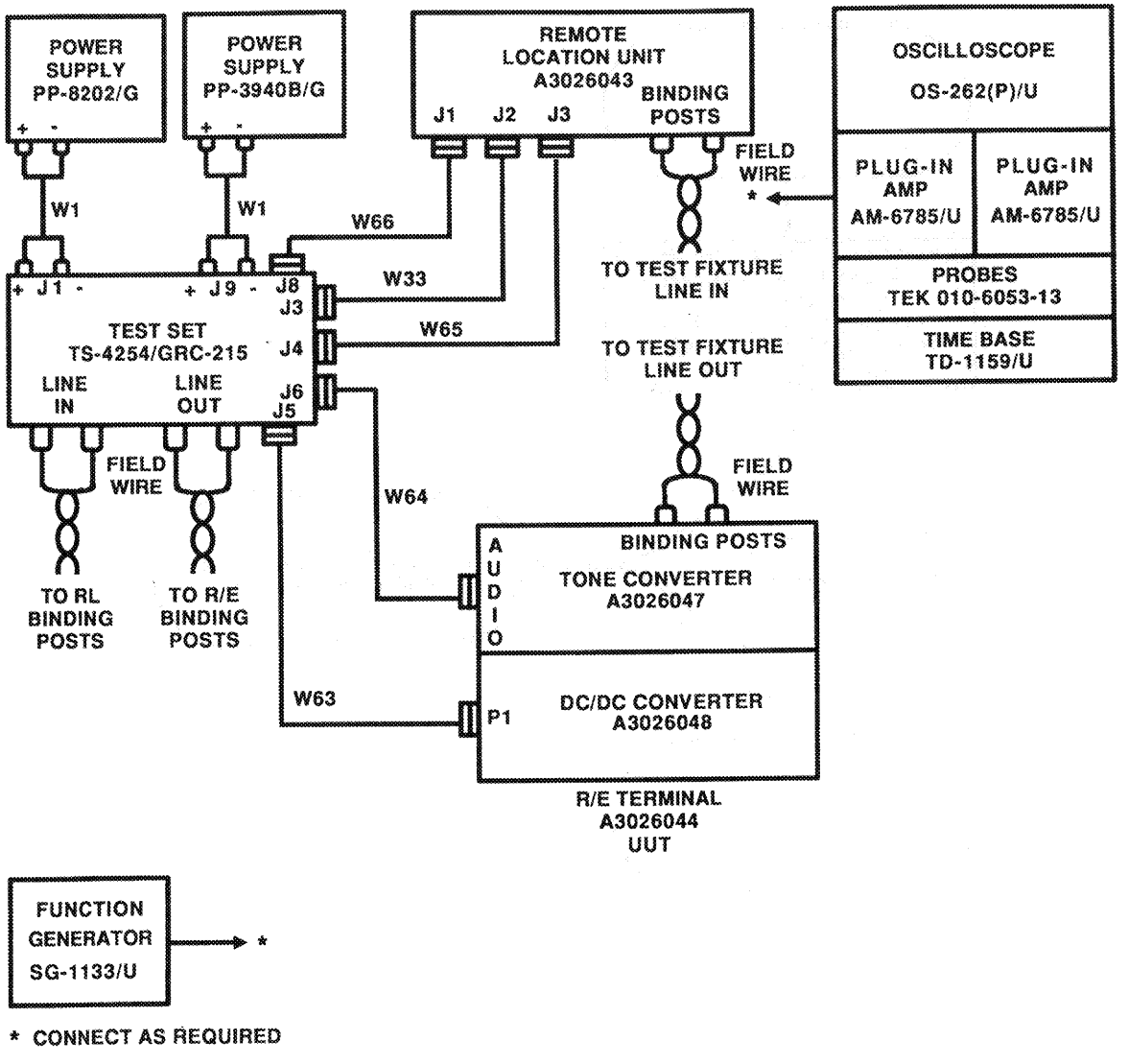
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

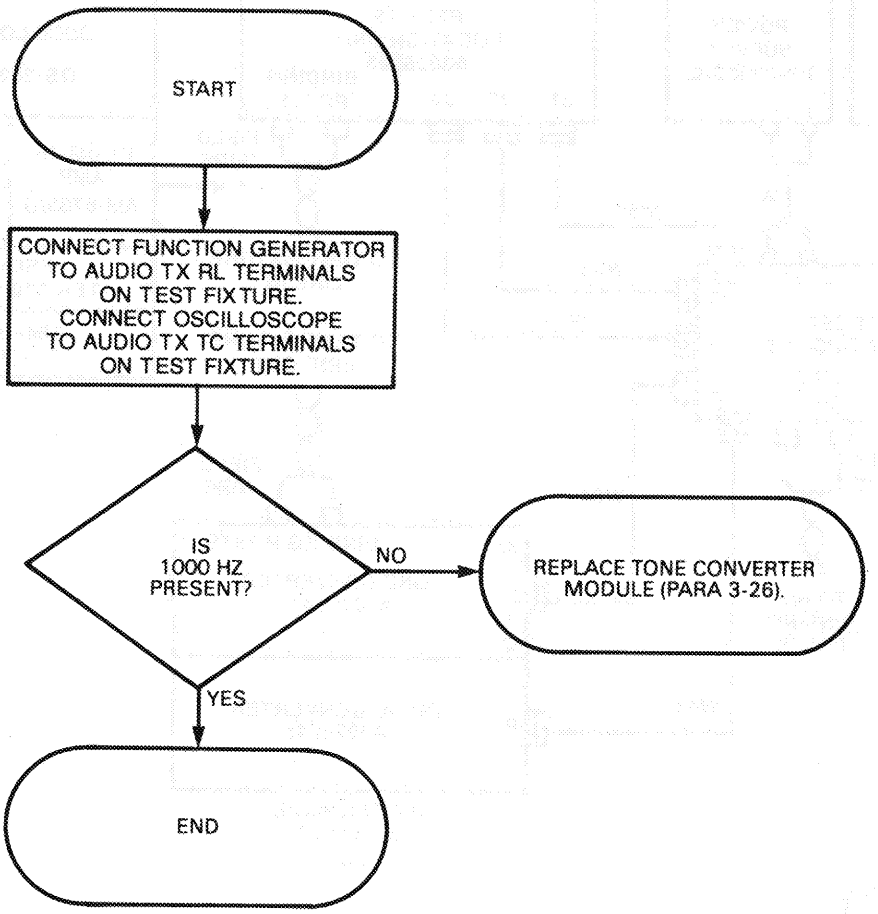
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-17. NO AUDIO TX AT R/E TERMINAL (Cont.)



3-17. NO AUDIO TX AT R/E TERMINAL (Cont.)



3-18. NO AUDIO RX AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Function Generator, SG-1133
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect R/E terminal and test equipment as shown.
Remote location R/T-OFF-TEL to R/T position.
Set test fixture switches S1, S2, and S4 to OFF (down); set S3 and S10 to ON (up), set all other switches as directed.
Set function generator to 1000 Hz at 8.5 Vpp.
Set PP-8202/G to +25 Vdc, and PP-3940B/G to +12 Vdc (verify with DMM).

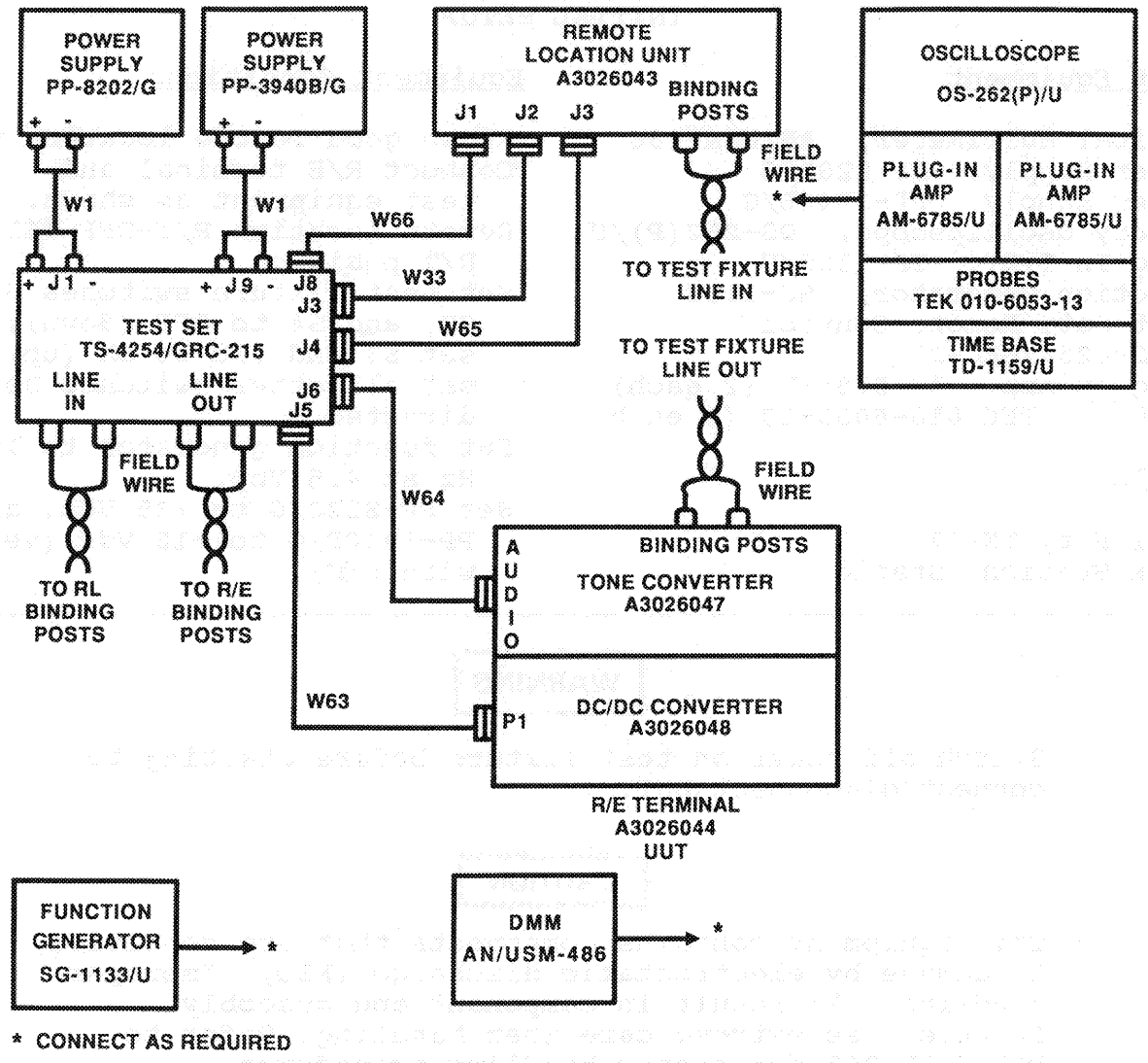
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

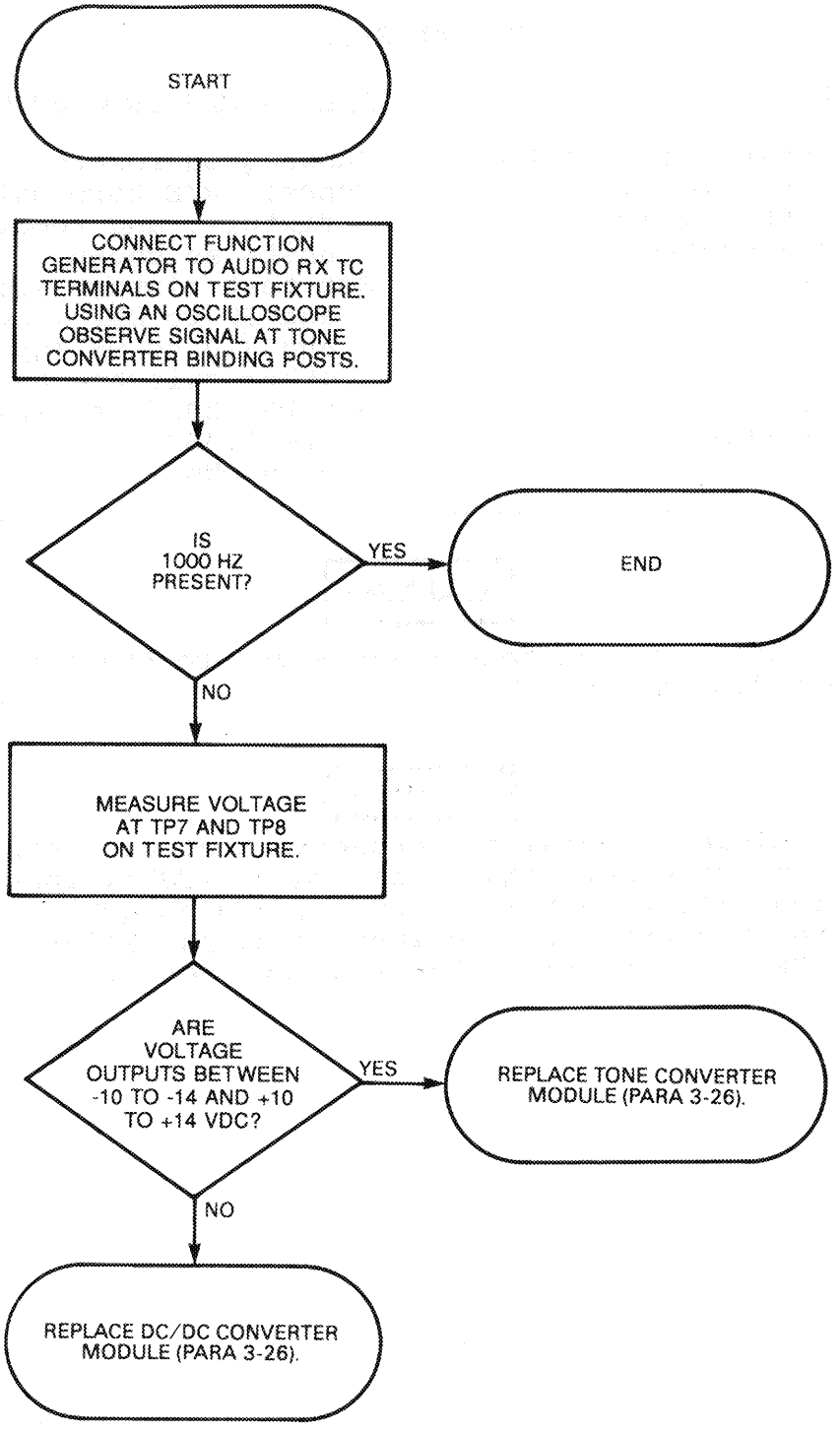
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-18. NO AUDIO RX AT R/E TERMINAL (Cont.)



3-18. NO AUDIO RX AT R/E TERMINAL (Cont.)



3-19. NO PTT SIGNAL AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Test Set, Remote Control TS-4254/GRC-215

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect R/E terminal, test fixture, and remote location units as shown.
Set test fixture switches S1 and S2 to OFF (down); set S3 and S10 to ON (up); set all other switches as directed.
Set PP-8202/G to +25 Vdc, and PP-3940B/G to +12 Vdc (verify with DMM).

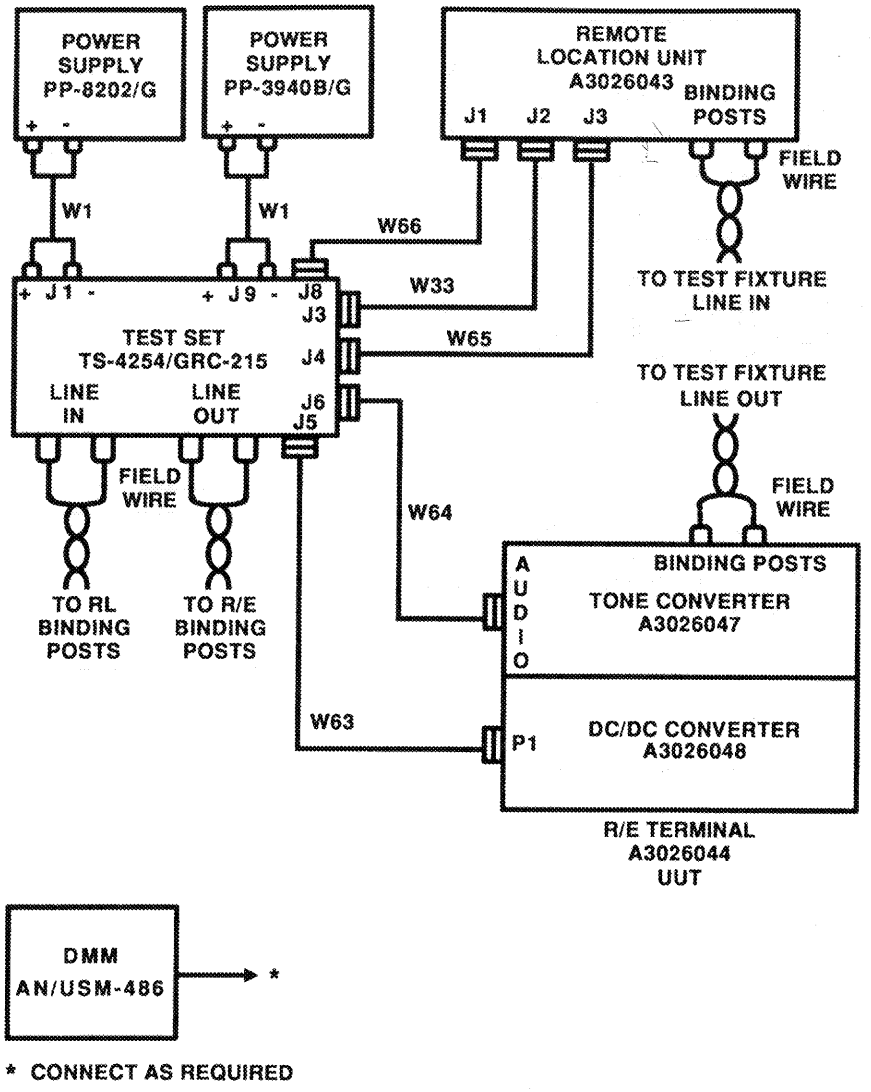
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

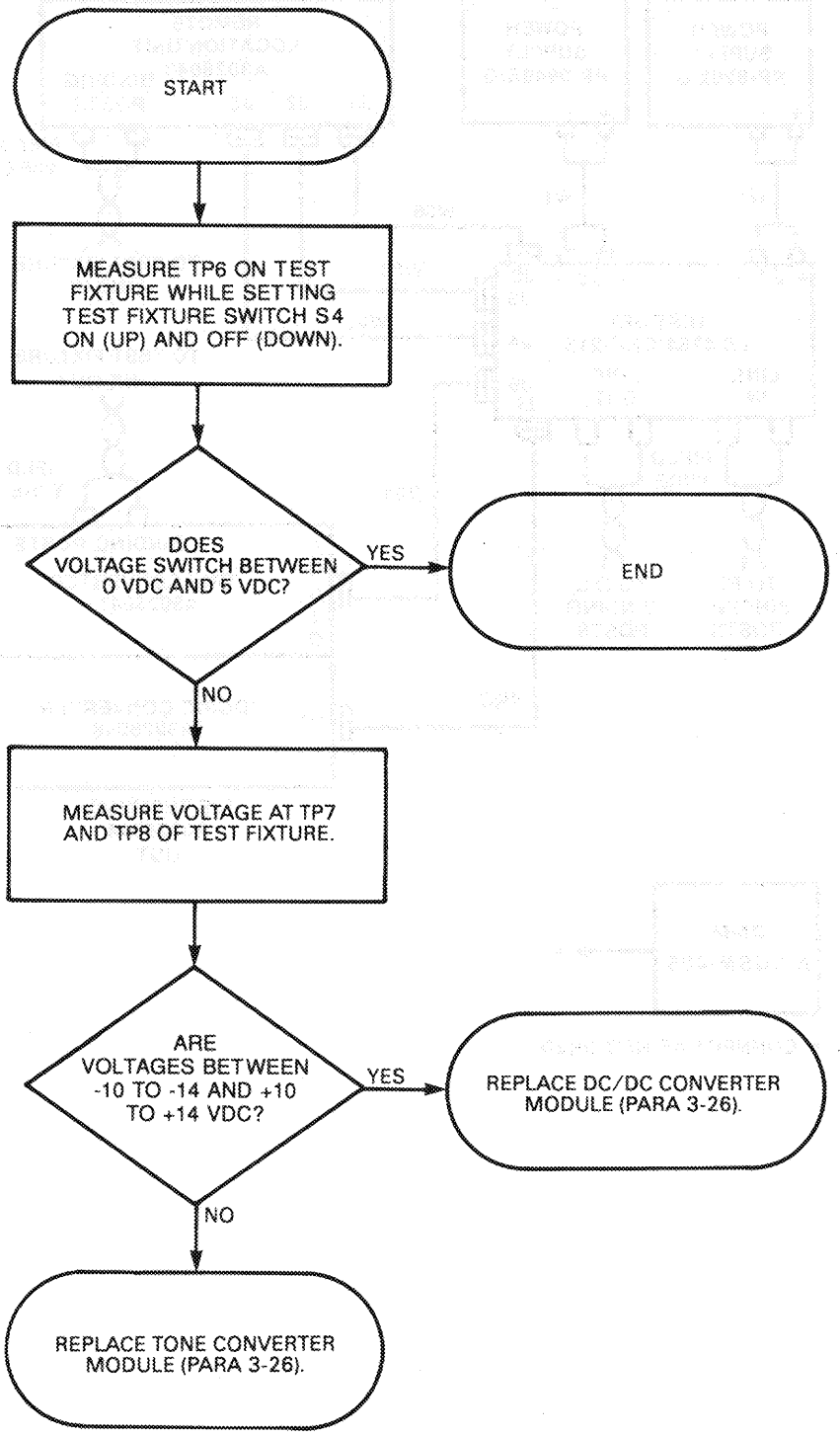
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-19. NO PTT SIGNAL AT R/E TERMINAL (Cont.)



3-19. NO PTT SIGNAL AT R/E TERMINAL (Cont.)



3-20. NO DATA RX AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Signal Generator, SG-1171/U
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect R/E terminal, test fixture, and remote location as shown.
Set test fixture switches S2 and S4 to OFF (down); set S1, S3, and S10 to ON (up); all others as directed.
Set signal generator for 50 Hz at 5 Vpp output.
Set PP-8202/G for +25 Vdc, and PP-3940B/G for +12 Vdc (verify with DMM).

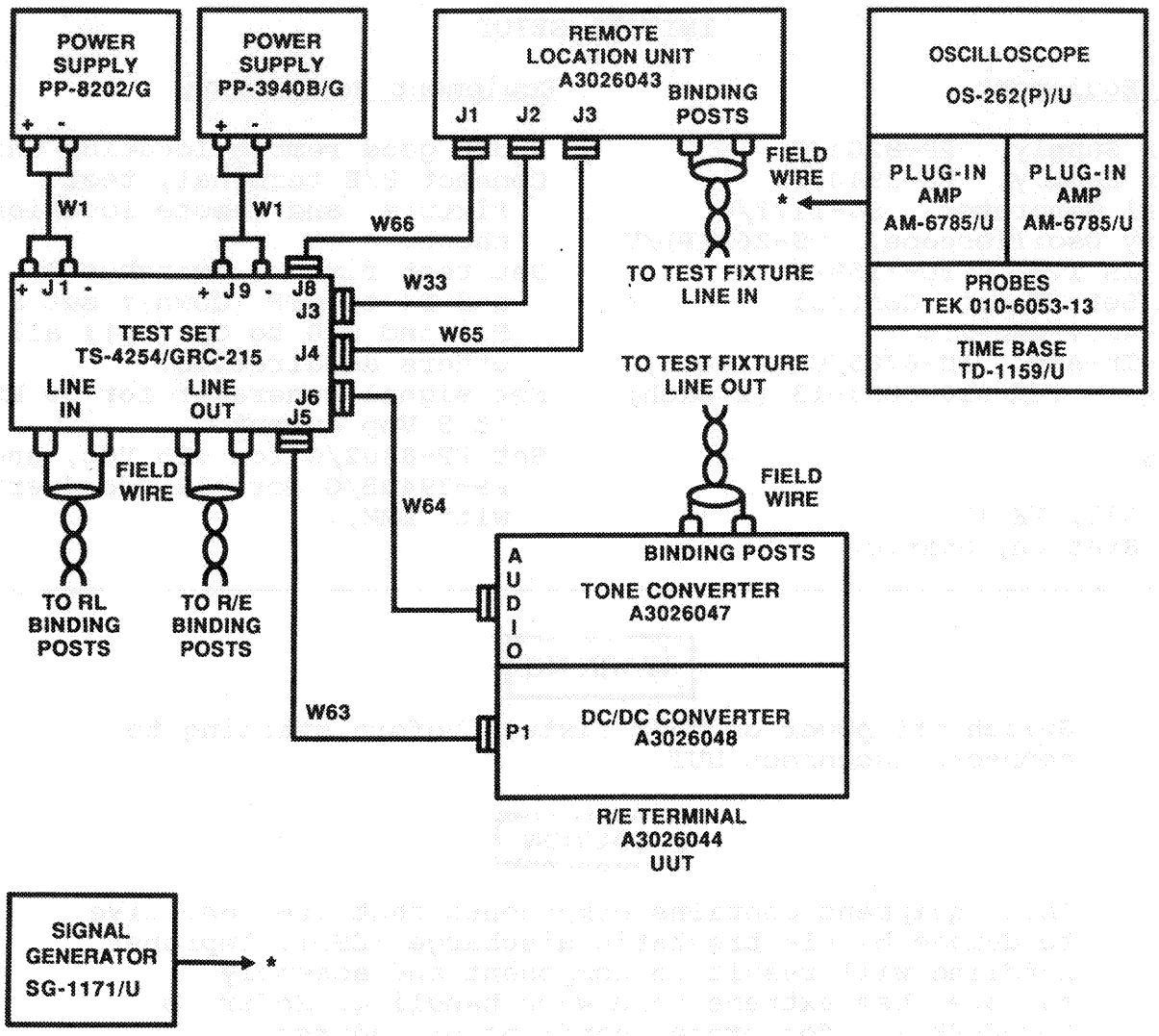
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

CAUTION

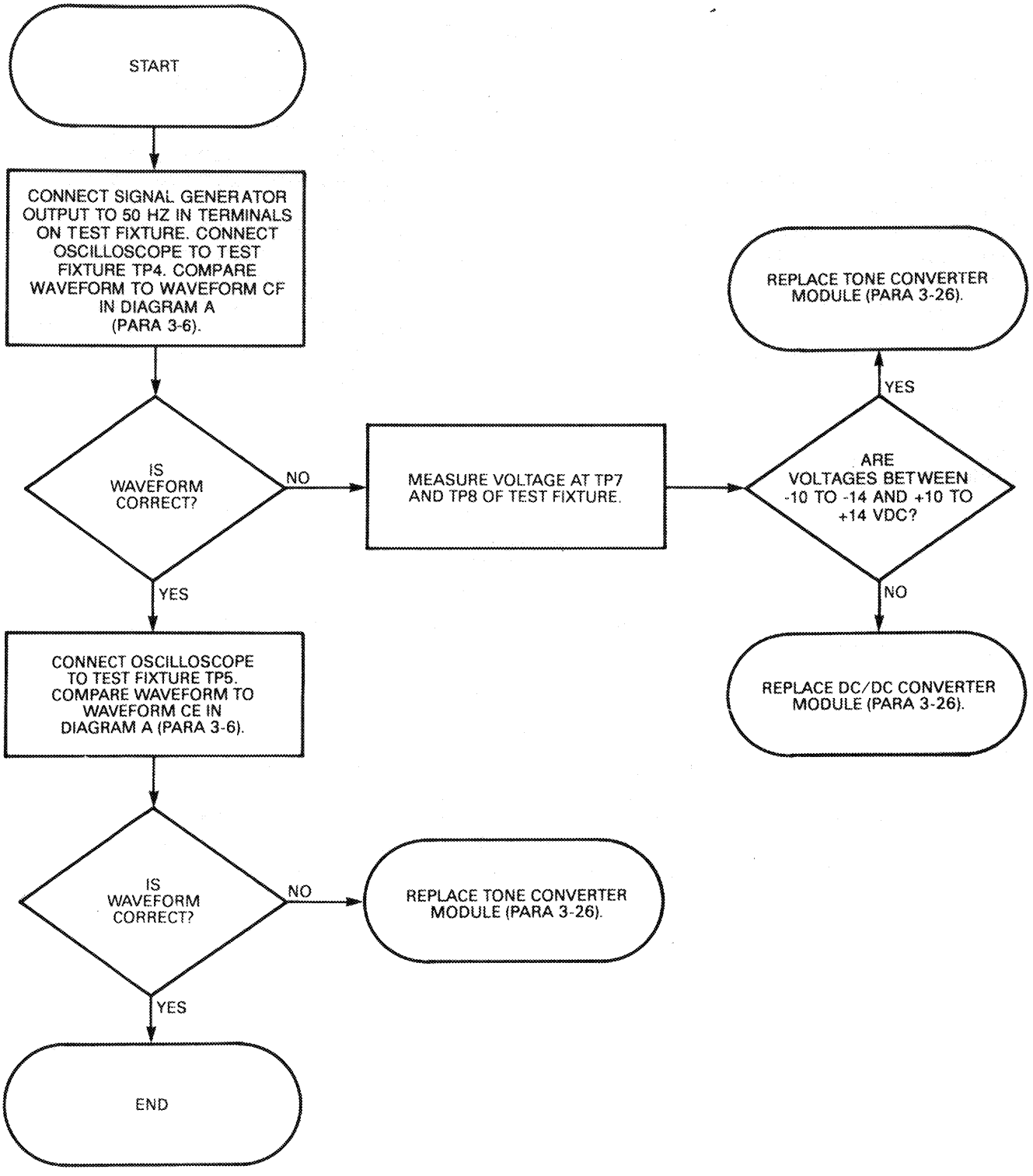
This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-20. NO DATA RX AT R/E TERMINAL (Cont.)



* CONNECT AS REQUIRED

3-20. NO DATA RX AT R/E TERMINAL (Cont.)



3-21. FAIL SIGNAL AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Signal Generator, SG-1171/U
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Test Set, Remote Control TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect R/E terminal, test fixture, and remote location as shown.
Set signal generator to 10 kHz.
Set all test fixture switches to OFF (down).
Set PP-8202/B to +25 Vdc, and PP-3940B/G to +12 Vdc (verify with DMM). Set both power supplies to ON.

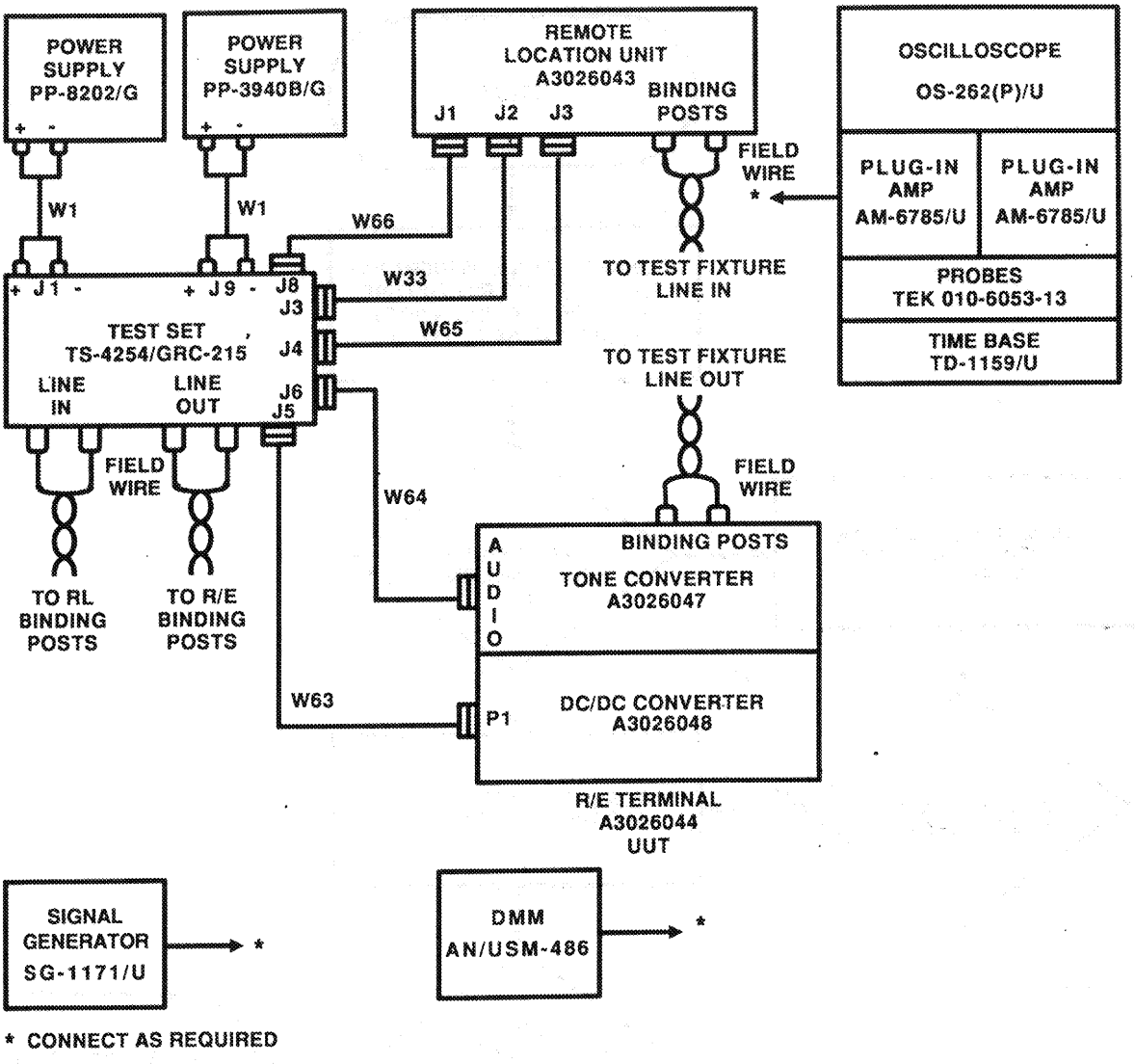
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

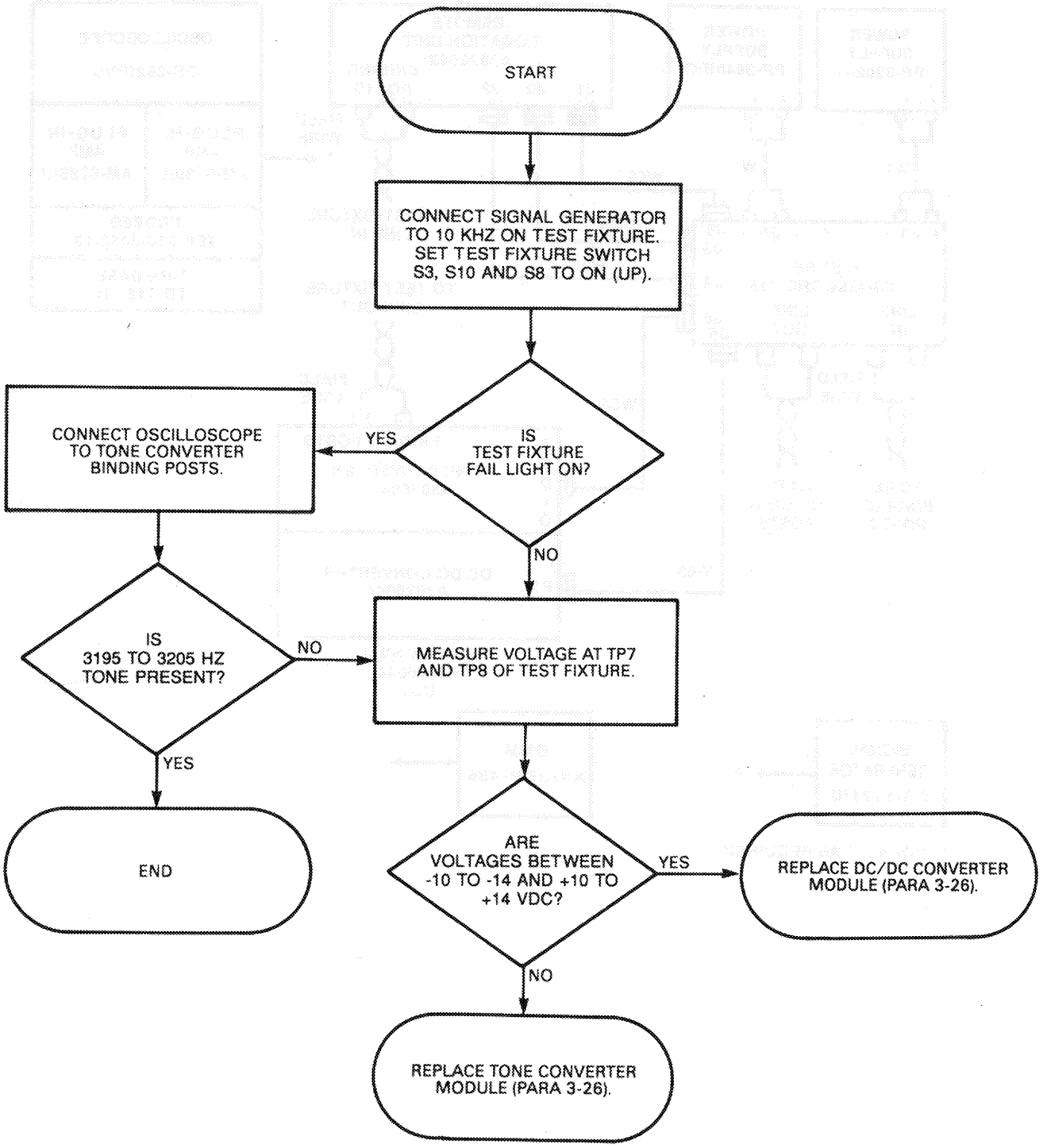
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-21. FAIL SIGNAL AT R/E TERMINAL (Cont.)



3-21. FAIL SIGNAL AT R/E TERMINAL (Cont.)



3-22. NO CALL SIGNAL AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Signal Generator, SG-1171/U
Test Set, Remote Control TS-4254/GRC-215

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect equipment as shown.
Set signal generator to 10 KHz square wave.
All test fixture switches OFF (down), or as directed.
Power supplies ON; PP-8202/G set to +25 Vdc, and PP-3940B/G set to +12 Vdc (verify with DMM).

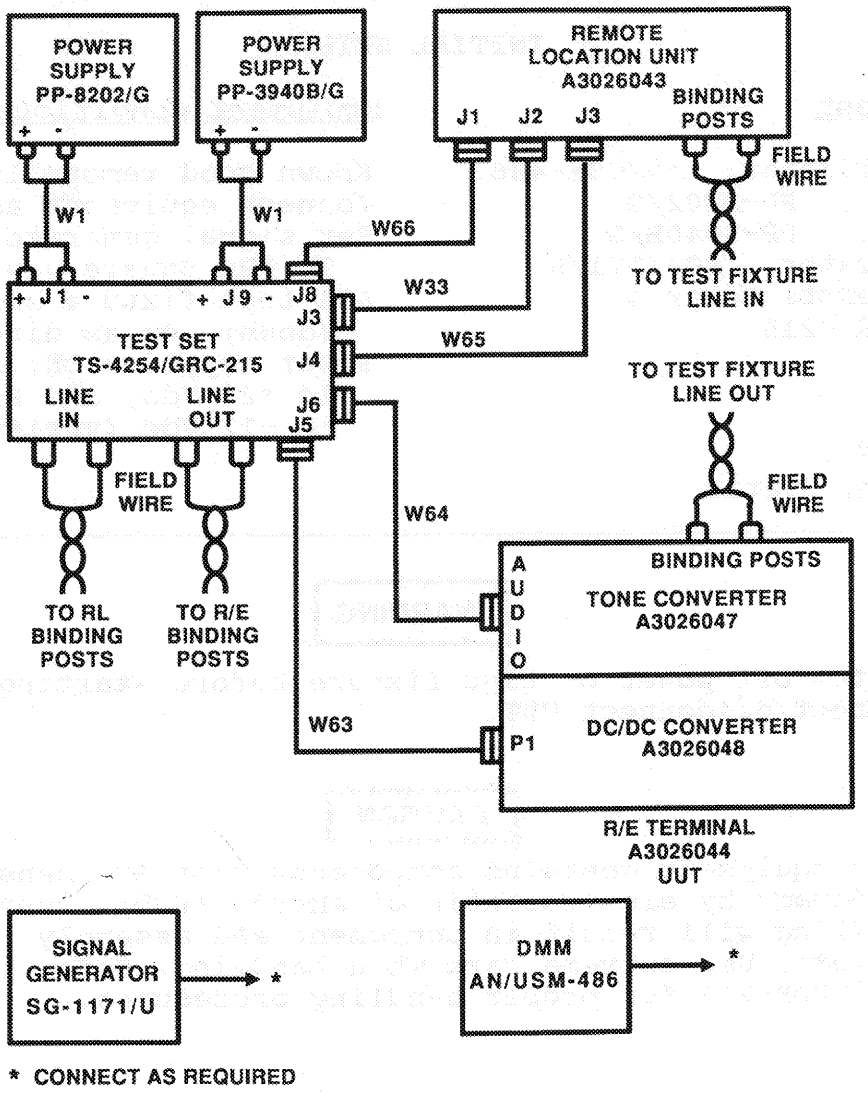
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

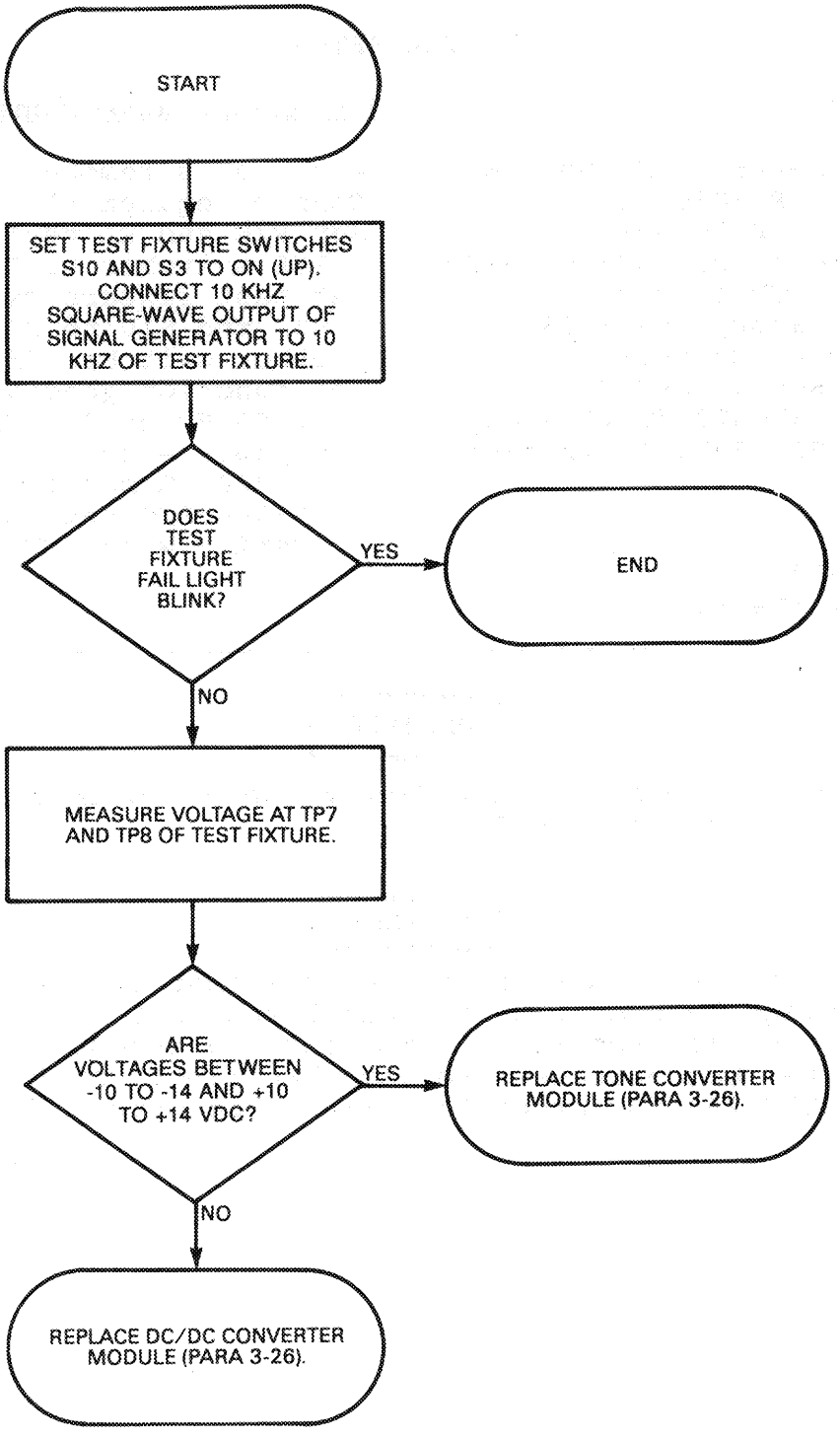
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-22. NO CALL SIGNAL AT R/E TERMINAL (Cont.)



3-22. NO CALL SIGNAL AT R/E TERMINAL (Cont.)



3-23. OPERATORS UNABLE TO COMMUNICATE

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B/G
Memory Oscilloscope, OS-262(P)/U
Plug-In T.B., TD-1159/U
Function Generator, SG-1133/U
Test Set, Remote Control Fixture, TS-4254/GRC-215
Plug-In-Amp, AM-6785/U (2 each)
Probes, TEK 010-6053-13 (2 each)

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Known good remote location unit.
Connect equipment as shown.
Set R/E and RL terminal R/T-OFF-TEL switches to TEL position.
Set test fixture switches S1, S3, and S10 to ON (up); all other switches OFF (down).
Set function generator output to 1,000 Hz at 2.2 Vpp.
Set power supplies to ON, with PP-8202/G set to +25 Vdc, and PP-3940B/G set to +12 Vdc (verify with DMM).

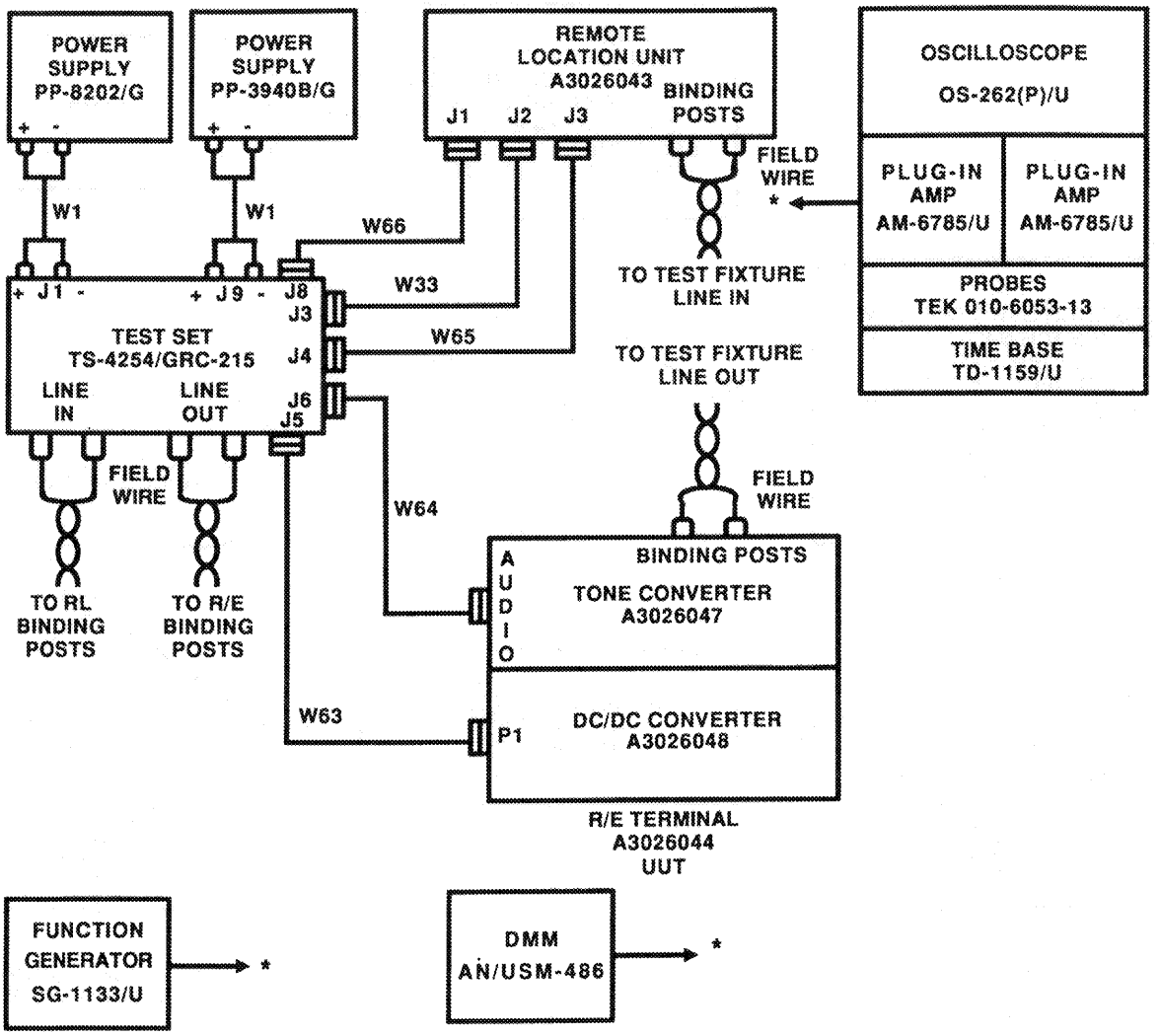
WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

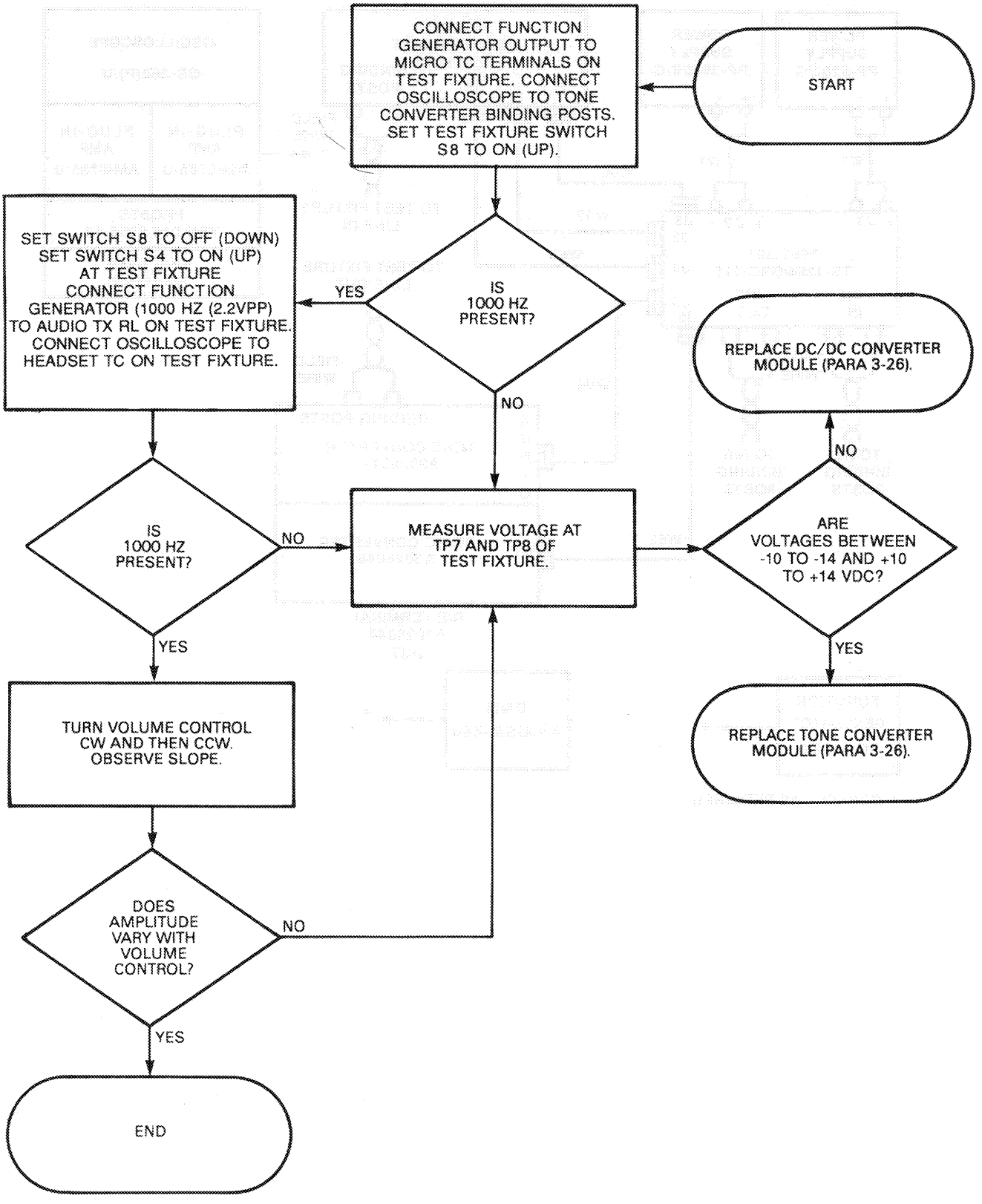
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.

3-23. OPERATORS UNABLE TO COMMUNICATE (Cont.)



3-23. OPERATORS UNABLE TO COMMUNICATE (Cont.)



3-24. NO OPERATING VOLTAGE AT R/E TERMINAL

INITIAL SETUP

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Test Set, Remote Control TS-4254/GRC-215

Equipment Conditions

Connect equipment as shown.

Adjust power supply to +24 Vdc (verify with DMM).

Tools

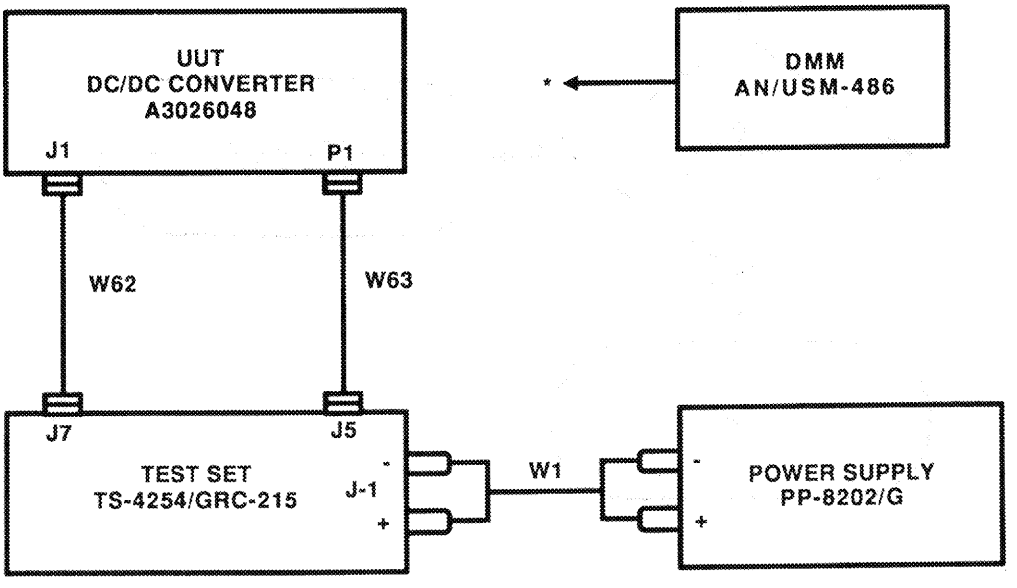
Tool Kit, TK-17
Work Station, Static

WARNING

Switch off power on test fixture before starting to connect/disconnect UUT.

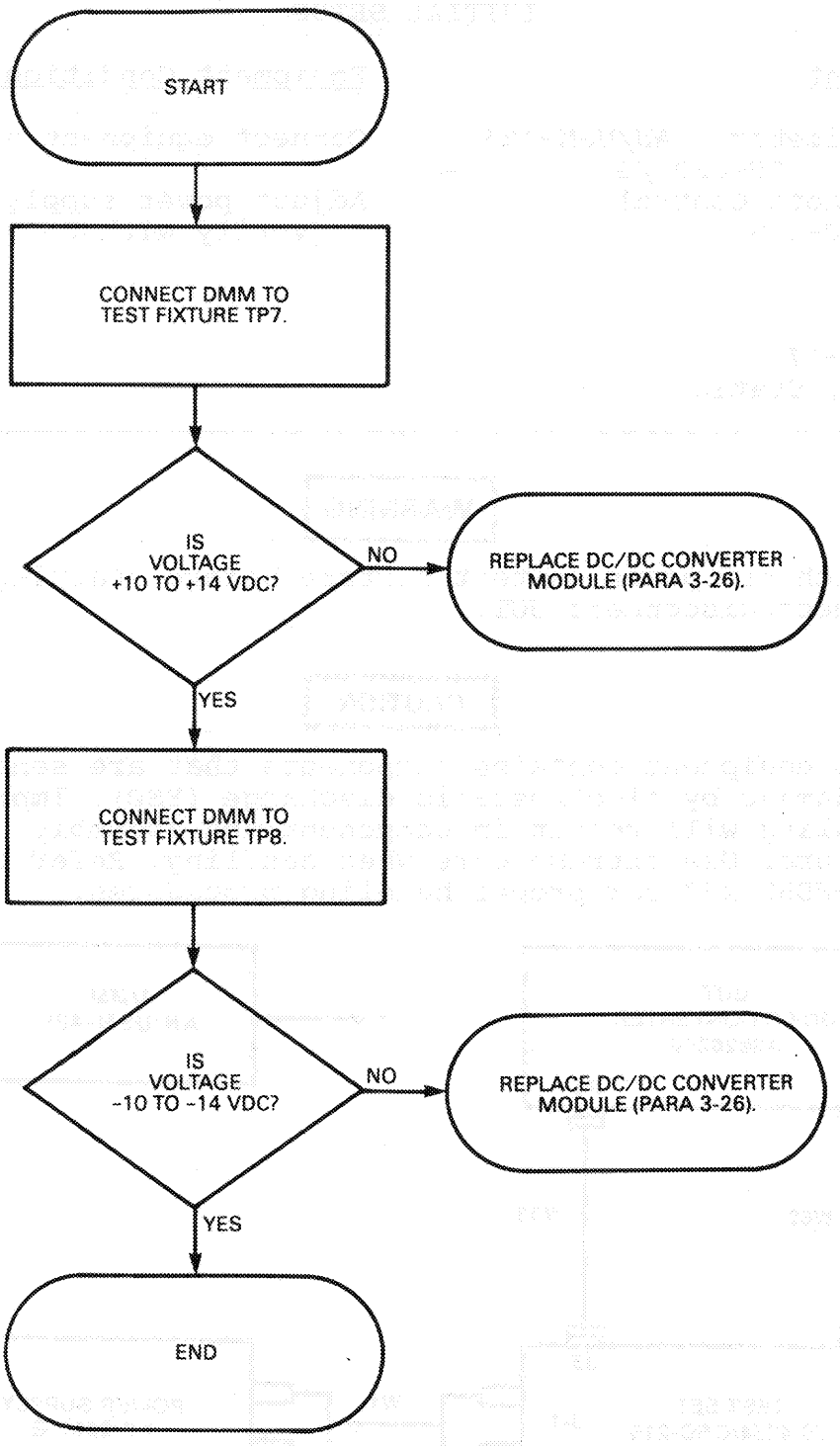
CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for proper handling procedures.



* CONNECT AS REQUIRED

3-24. NO OPERATING VOLTAGE AT R/E TERMINAL (Cont.)



Section III. INTERMEDIATE GENERAL SUPPORT MAINTENANCE

3-25. GENERAL

Maintenance at the Intermediate General Support Level is limited to replacement of defective modules, assemblies, components, and shielding strips. To facilitate maintenance of the Remote Location, removal and replacement procedures are provided.

Upon completion of replacement action, an Operational Check will be performed to ensure proper operation of the replacement component and it's related systems.

3-26. REPLACEMENT OF TONE CONVERTER MODULE (A2A1) OR DC/DC CONVERTER MODULE (A2A2)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Power removed.
Field wire removed.

Materials/Parts

Tone Converter, A2A1, P/N A3026047
DC/DC Converter, A2A2, P/N A3026048

REMOVE TONE CONVERTER OR DC/DC CONVERTER MODULE:

STEP 1. If R/E terminal assembly (1) is attached to remote location assembly (2), remove by releasing retaining clips (3), two on each side of dc/dc converter module (4).

STEP 2. Separate tone converter module (5) from dc/dc converter module 4 by releasing four retaining clips (6), two on either side of tone converter module (5).

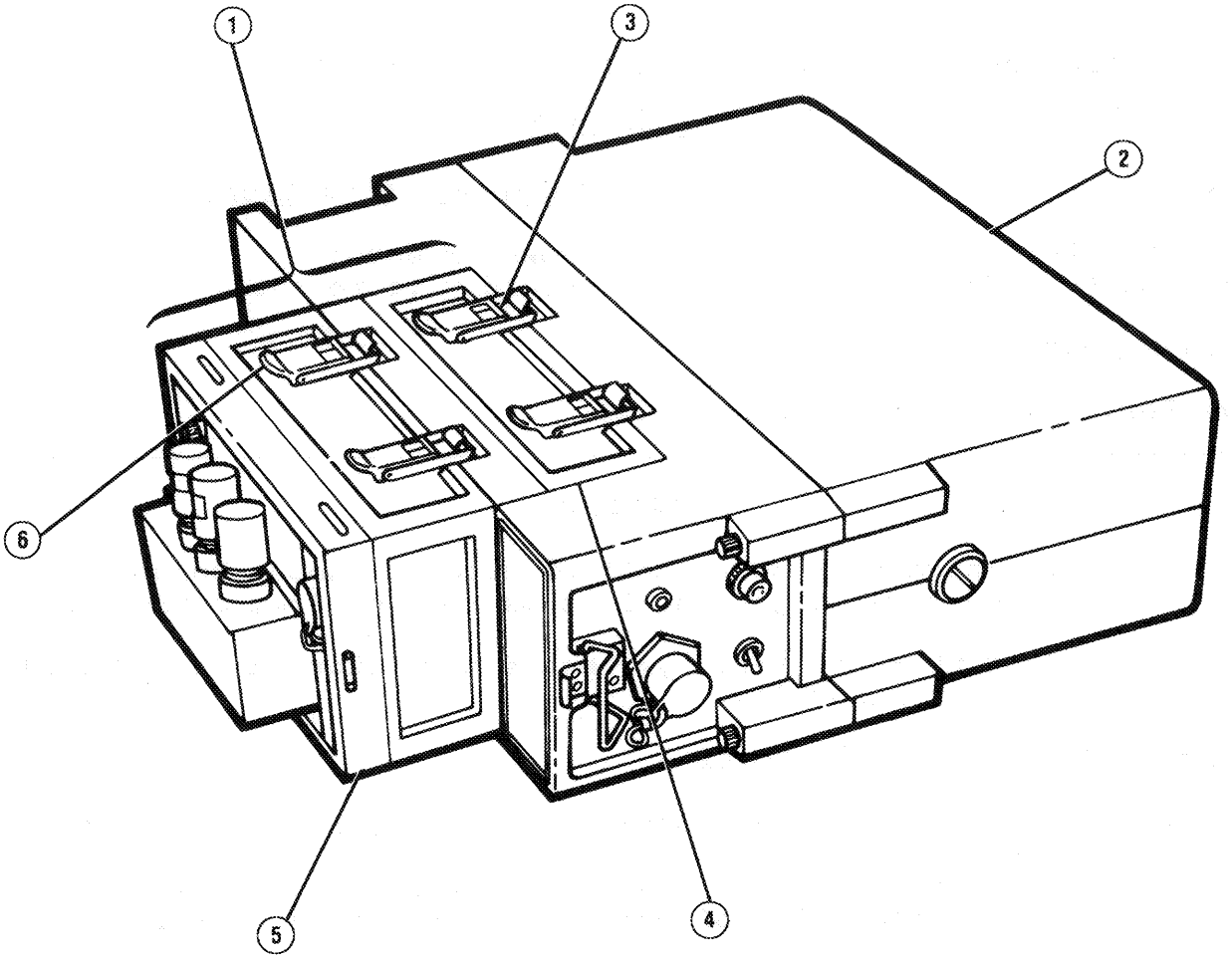
REPLACE TONE CONVERTER OR DC/DC CONVERTER MODULE:

STEP 1. Attach tone converter module (5) to dc/dc converter module (4) by tensioning four retaining clips (6).

STEP 2. Reconnect to remote location assembly (2) if removed during disassembly.

STEP 3. Perform operational check (para. 3-6).

3-26. REPLACEMENT OF TONE CONVERTER MODULE (A2A1) OR DC/DC CONVERTER MODULE (A2A2) (Cont.)



3-27. REPLACEMENT OF BATTERY MODULE (A1A2)

Replacement of battery module (A1A2) is a Unit Maintenance action (refer to para. 2-13).

3-28. REPLACEMENT OF KEYER/CONVERTER MODULE (A1A1)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Power removed.
Field wire removed.

Materials/Parts

Converter, Keyer, A1A1, P/N A3026045

CAUTION

- Whenever remote location case is loose, support battery weight until it is removed from connector.
- Battery or battery/chassis connector can be damaged by mishandling.

REMOVE KEYER/CONVERTER MODULE:

STEP 1. If R/E terminal assembly (1) is still connected to remote location assembly (2), remove R/E terminal assembly (1) by loosening four retaining clips (3), two on either side of dc/dc converter module (4).

STEP 2. On remote location assembly (2), using a 5 mm hexagonal key wrench, loosen four captive retaining screws (5), and remove keyer/converter module (6) from case (7).

STEP 3. Remove battery (8), (para. 2-13).

REPLACE KEYER/CONVERTER MODULE:

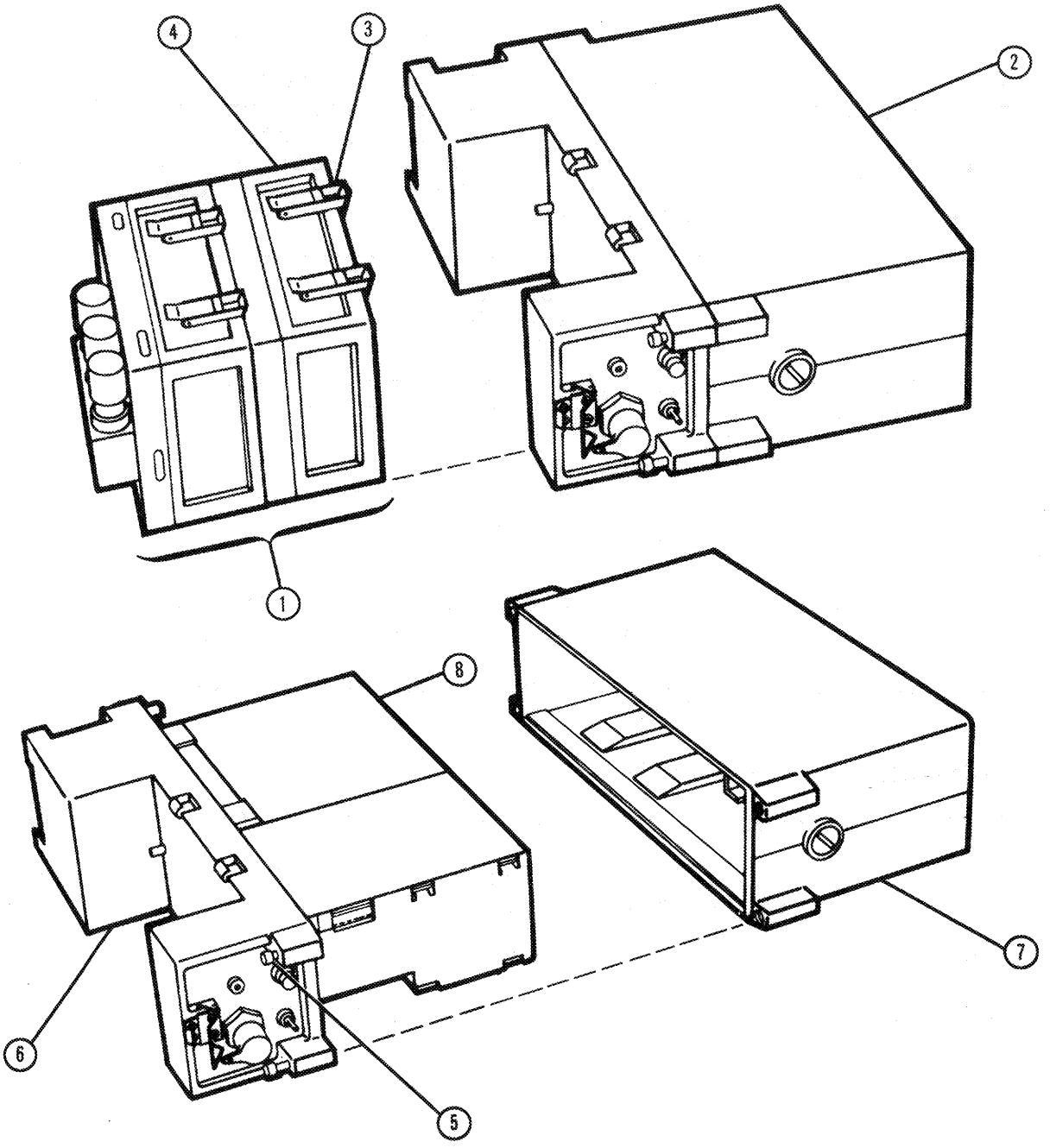
STEP 1. Replace battery (8), (para. 2-13).

STEP 2. Slide keyer/Converter Module (6) into remote location case (7) and using a 5 mm hexagonal key wrench, secure four captive screws (5), one in each corner of case (7).

STEP 3. Reconnect R/E terminal assembly (1) to remote location assembly (2) by tensioning all four retaining clips (3), on dc/dc converter module (4).

STEP 4. Perform operational check (para. 3-6).

3-28. REPLACEMENT OF KEYER/CONVERTER MODULE (A1A1) (Cont.)



3-29. REPLACEMENT OF RCS REMOTE CHASSIS

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Materials/Parts

RCS Remote Chassis, P/N A3030432

Equipment Conditions

Power removed.
Keyer/converter removed (para. 3-28).
Battery removed (para. 2-13).
Field wire removed.

CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for instructions.

REMOVE RCS REMOTE CHASSIS:

STEP 1. Remove six cross-tip screws (1), that attach remote chassis (2) to front panel (3).

STEP 2. Separate chassis from front panel and unplug P1 from J2 (4), on chassis.

REPLACE RCS REMOTE CHASSIS:

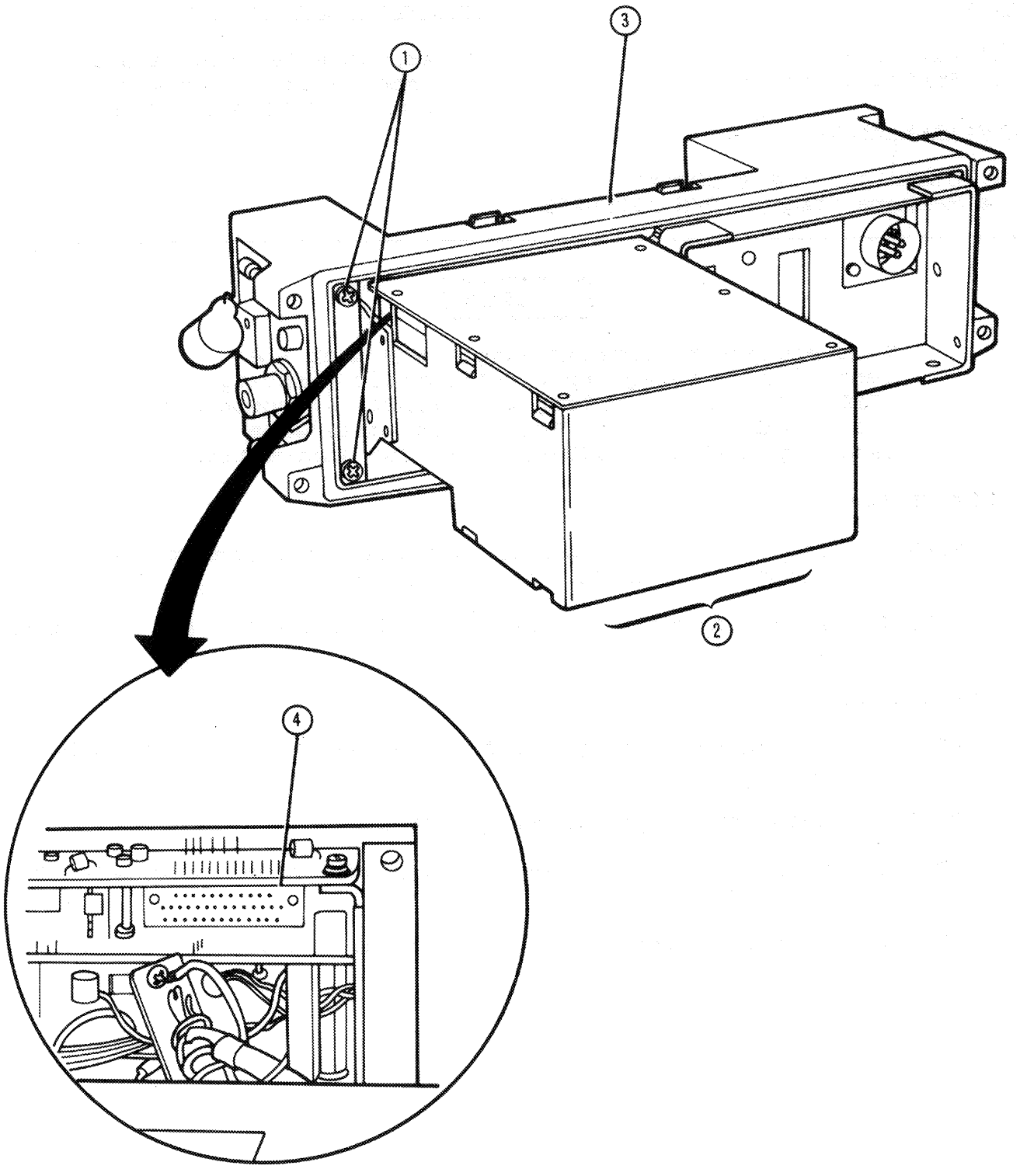
STEP 1. Connect P1 and J2 on chassis (4) to front panel (3).

STEP 2. Using six cross-tip screws (1), attach remote chassis (2) to front panel (3).

STEP 3. Replace keyer/converter (para. 3-28).

STEP 4. Perform operational check (para. 3-6).

3-29. REPLACEMENT OF RCS REMOTE CHASSIS (Cont.)



3-30. REPLACEMENT OF CCA (A1A1A1A1)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Keyer/converter module and RCS remote chassis removed (para's. 3-28 and 3-29).

Materials/Parts

CCA, A1A1A1A1, P/N A3030440
Wire Markers (tags), P/N A3056238

CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for instructions.

REMOVE CCA:

STEP 1. Tag for identification, unsolder, and remove five wires (1) from E1, E2, E3 and E4.

STEP 2. Remove three hex nuts (2), and remove CCA (3) from front panel (4).

REPLACE CCA:

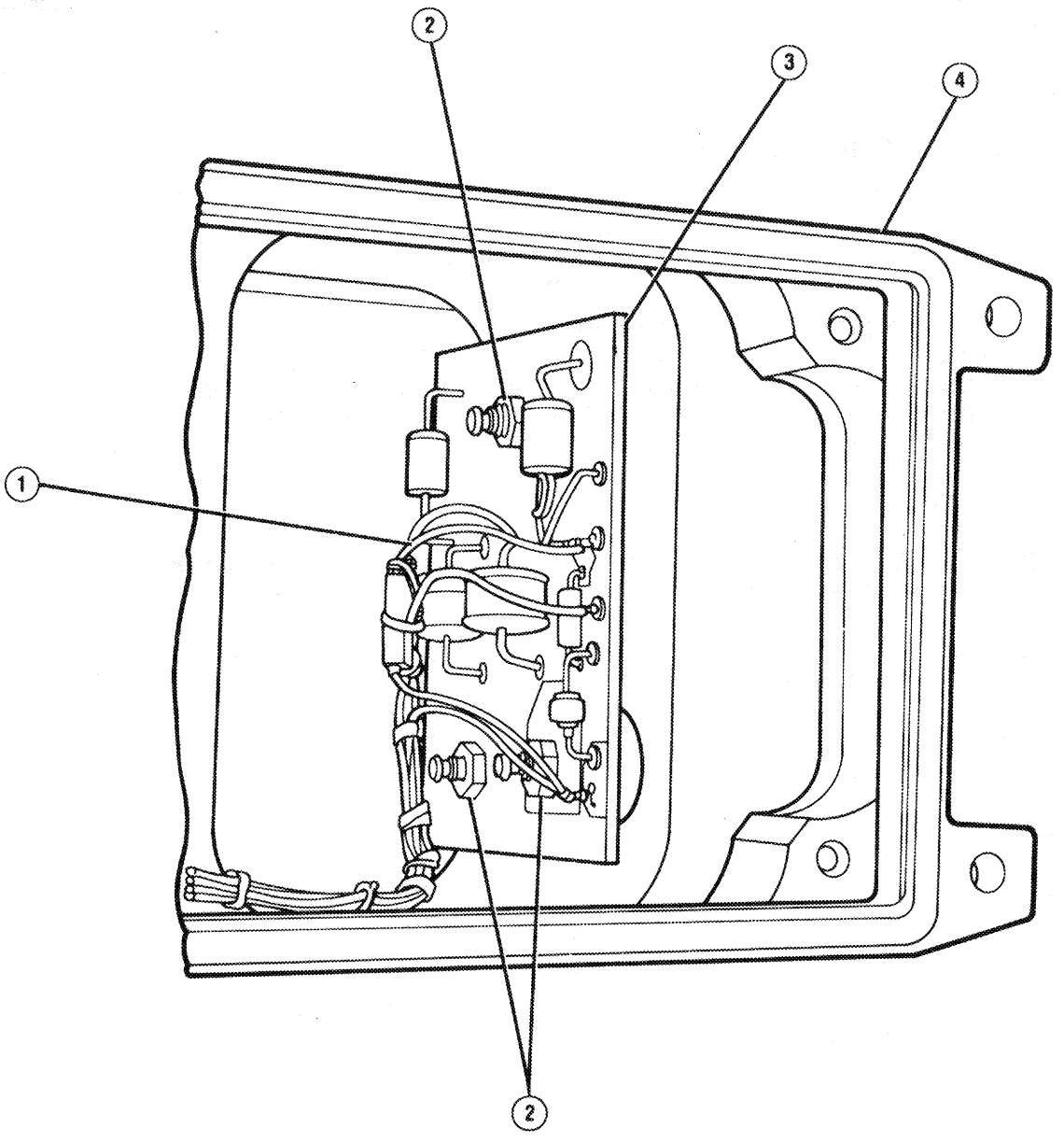
STEP 1. Attach new CCA (3) to front panel (4) using three hex nuts (2).

STEP 2. Resolder tagged wires (1) to CCA.

STEP 3. Replace keyer/converter and remote chassis (para's. 3-28 and 3-29).

STEP 4. Perform operational check (para. 3-6).

3-30. REPLACEMENT OF CCA (A1A1A1A1) (Cont.)



3-31. REPLACEMENT OF CCA (A1A1A2A2)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Equipment Conditions

Keyer/converter module removed (para. 3-28).

Materials/Parts

CCA, A1A1A2A2, P/N A3027437

CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for instructions.

REMOVE CCA:

STEP 1. Remove six cross-tip screws (1), remove RCS remote chassis cover (2).

STEP 2. Remove six cross-tip screws (3), attaching CCA (4) to chassis (5).

STEP 3. Carefully lift CCA (4) up to prevent damage to P1 (6) pins.

REPLACE CCA:

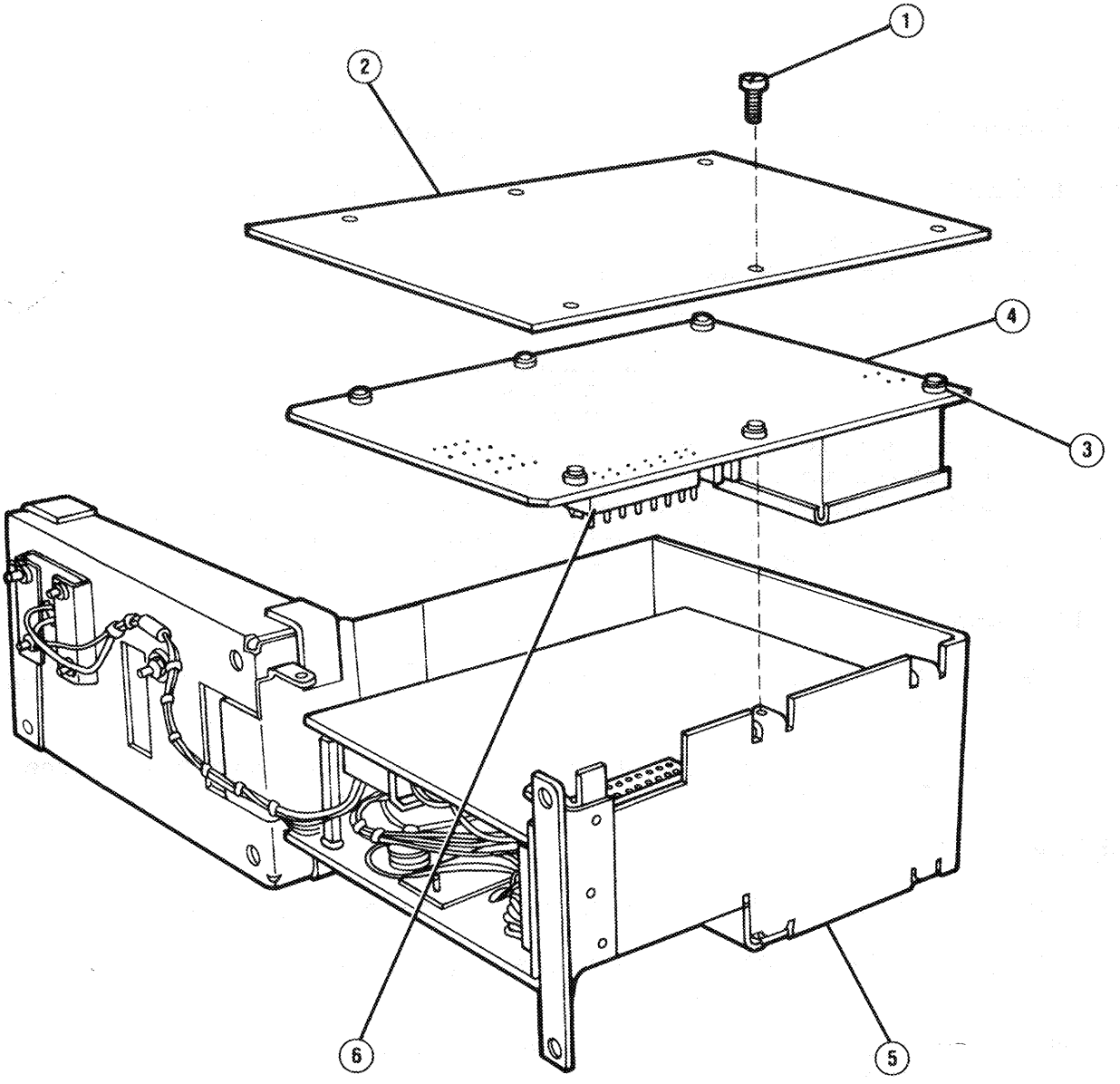
STEP 1. Install new CCA (4) into chassis (5) being careful not to damage P1 (6). Install and tighten into CCA (4), six cross-tip screws (3).

STEP 2. Replace RCS remote chassis cover (2) and fasten with six cross-tip screws (1).

STEP 3. Replace keyer/converter (para. 3-28).

STEP 4. Perform operational check (para. 3-6).

3-31. REPLACEMENT OF CCA (A1A1A2A2) (Cont.)



3-32. REPLACEMENT OF CCA (A1A1A2A3)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Materials/Parts

CCA, A1A1A2A3, P/N A3031534
Wire Markers (tags), P/N A3056238

Equipment Conditions

Keyer/converter, RCS remote chassis and CCA A1A1A2A2 removed (para's. 3-28, 3-29, and 3-31).

CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for instructions.

REMOVE CCA:

STEP 1. Remove six cross-tip screws (1), lift CCA (2) out and turn over.

STEP 2. Tag for identification, unsolder and remove 15 wires (3) from CCA (2).

REPLACE CCA:

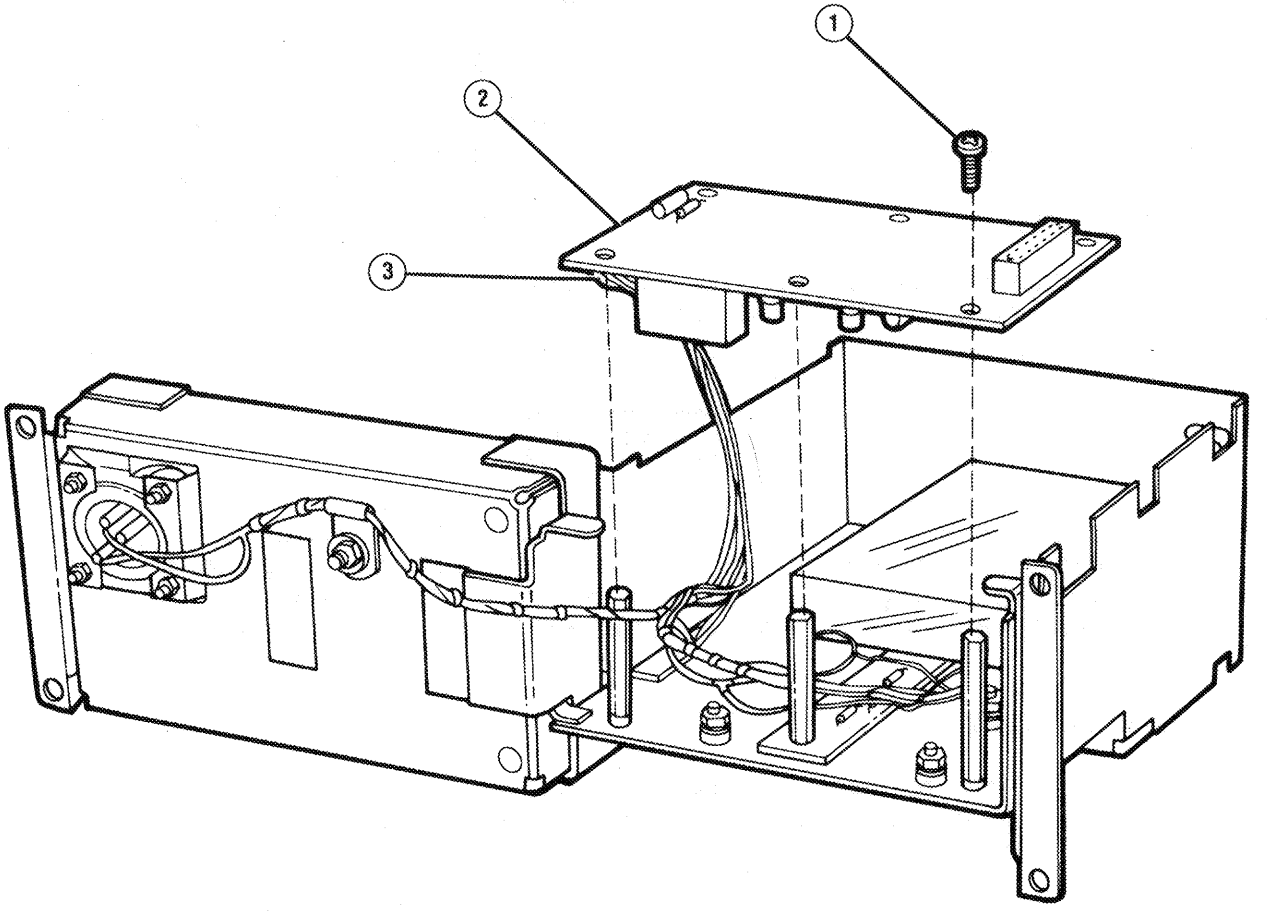
STEP 1. Resolder 15 tagged wires (3) to new CCA (2).

STEP 2. Replace CCA (2) into chassis and fasten with six cross-tip screws (1).

STEP 3. Replace CCA A1A1A2A2, RCS remote chassis and keyer/converter (para's. 3-28, 3-29, and 3-31).

STEP 4. Perform operational check (para. 3-6).

3-32. REPLACEMENT OF CCA (A1A1A2A3) (Cont.)



3-33. REPLACEMENT OF BATTERY CHARGER (A1A1A2A4)

INITIAL SETUP

Tools

Tool Kit, TK-17
Work Station, Static

Materials/Parts

Charger, Battery, A1A1A2A4, P/N A3031260
Wire Markers (tags), P/N A3056238

Equipment Conditions

Keyer/converter module, RCS remote chassis, CCA A1A1A2A2 and CCA A1A1A2A3 removed, (paras. 3-28,3-29,3-31 and 3-32).

CAUTION

This equipment contains components that are sensitive to damage by electrostatic discharge (ESD). Improper handling will result in component and assembly failure. Use extreme care when handling. Refer to DOD-HDBK-263 for instructions.

REMOVE BATTERY CHARGER:

STEP 1. Remove four cross-tip screws (1) from bottom of chassis (2) and lift battery charger (3) up and out of chassis box (4).

STEP 2. Tag for identification, unsolder and remove six wires (5) from battery charger (3).

REPLACE BATTERY CHARGER:

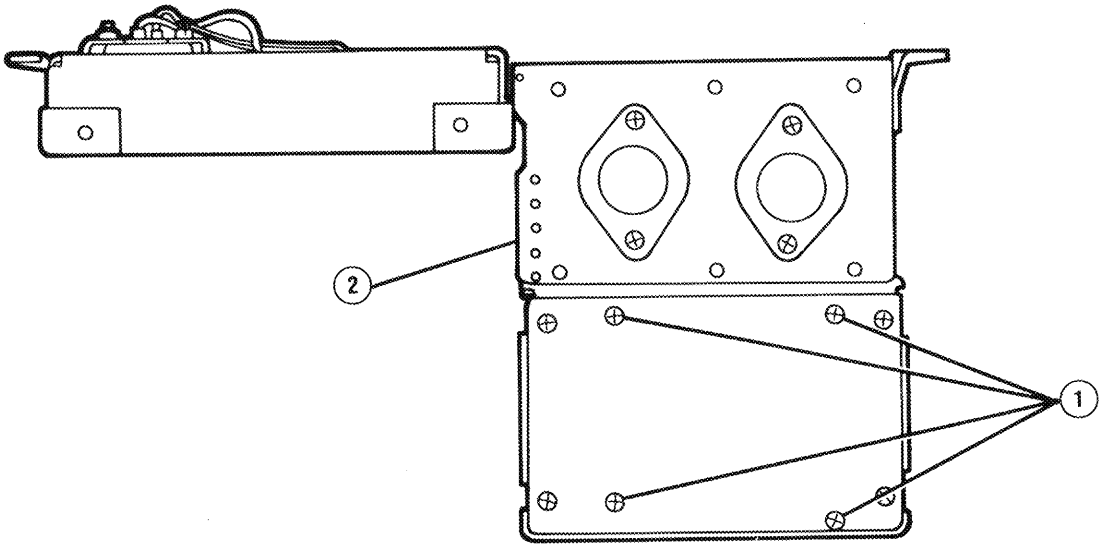
STEP 1. Solder tagged wires (5) to new battery charger (3).

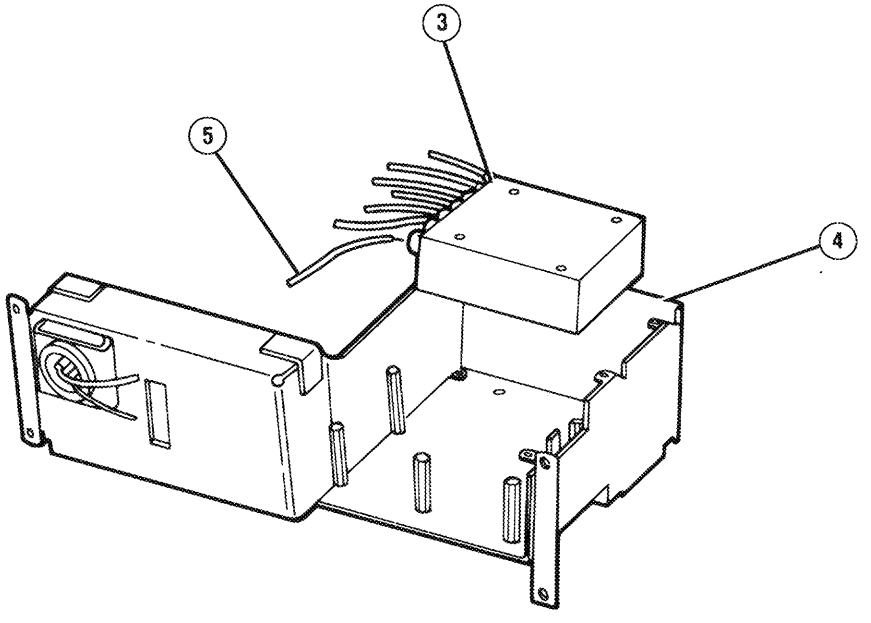
STEP 2. Place battery charger (3) into bottom of chassis (4), and install four cross-tip screws (1).

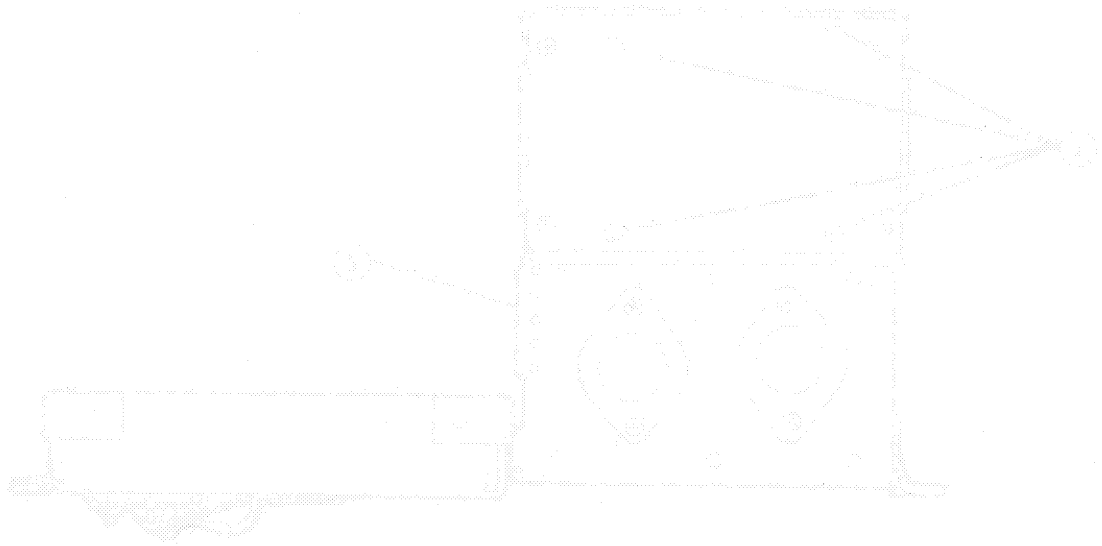
STEP 3. Replace CCA A1A1A2A3, CCA A1A1A2A2, RCS remote chassis and keyer/converter (para. 3-28, 3-29, 3-31 and 3-32).

STEP 4. Perform operational check (para. 3-6).

3-33. REPLACEMENT OF BATTERY CHARGER (A1A1A2A4) (Cont.)







APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists publications that are referenced in this manual that contain information applicable to the maintenance of the Converter, CV-3968/GRC-215.

A-2. PUBLICATIONS

Air Force Suggestion Program . . . . . AFR 900-4

Consolidated Index of Army Publications and Blank Forms . . . . . DA Pam 25-30

Maintenance Data Collection System . . . . . AFM 66-267

Maintenance Management Policy . . . . . AFR 66-1

Marking for Shipment and Storage MIL-STD-129H

Naval Supply Publication 2002 Navy Stocklist of Publications and Forms . . . . . NAVSUP 2002

Numerical Index of Departmental Forms . . . . . AFR 0-9

Numerical Index of Standard and Recurring Air Force Publications . . . . . AFR 0-2

Operator, Unit, Intermediate Direct Support and General Support Mainenance Manual Including Repair Parts and Special Tools List For Test Set, Remote Control TS-4254/GRC-215 (NSN 6625-01-266-7556) . . . . . TM 11-6625-3214-14&P/ ET800-AB-OMP-010/TS4254GRC215/ TO 33D7-47-121-1

Operator's and Unit Maintenance Manual for Radio Set AN/GRC-215 . . . . . TM 11-5895-1220-12/ EE160-RG-OMI-010/WW110-GRC215/ TO 31R2-2GRC215-1

Preservation, Packaging, and Packing of Military Supplies and Equipment, Volume 2 . . . . . NAVSUP PUB 503

Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command) . . . . . TM 750-224-2

Release for Shipment of Ground Communication Electronics Cryptographic Equipment . . . . . AF 67-31

Report of Discrepancy . . . . . SECANVIST 4355.18

Transportation Discrepancy Reprot (TDR) . . . . . NAVSUPINST 4610.33C

Ships Maintenance and Material Management (3-M) Manual, Promulgation of . . . . . OPNAVINST 4790.4A

The Army Maintenance Management System (TAMMS) . . . DA Pam 738-750

Unit, Intermediate Direct Support and General Support Maintenance Manual for Controller, Receiver-Transmitter C-11670/G (NSN 5895-01-205-0662) . . . . . TM 11-5895-1315-24/ EE005-FG-MMI-010/W110-C11670G/ TO 31R2-4-567-2

Unsatisfactory Equipment Reporting . . . . . TO 00-35D-54

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL

This appendix provides a summary of the maintenance operations for Converter CV-3968/GRC-215. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. MAINTENANCE FUNCTION

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment 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.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, aline, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to 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.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. 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 materiel 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 equipments/components.

B-3. COLUMN ENTRIES

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. 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 category. The number of task-hours specified by 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, troubleshooting 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. Subcolumns of column 4 are as follows:

UNIT

C - Operator/Crew
O - Organizational/Unit

INTERMEDIATE

F - Direct Support
H - General Support
L - Special Repair Activity (SRA)

DEPOT

D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. TOOL AND TEST EQUIPMENT REQUIREMENTS (SECT. III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Level. The codes in this column indicate the maintenance level allocated to tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

B-5. REMARKS (SECT. IV)

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

SECTION II MAINTENANCE ALLOCATION CHART
FOR
CV-3968/GRC-215

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINT. FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT.	(6) REMARKS
			UNIT		INTERMEDIATE		DEPOT		
			C	O	F	H	D		
00	CONVERTER CV-3968/GRC-215 (A3023801)	REPLACE		0.05					A
		TEST		0.10					B
		TEST				1.0		2-5, 7-14, 18	
		REPAIR		0.1				6;19	C
		REPAIR				1.0		1	D
		OVERHAUL					50.0	TBD	
01	REMOTE LOCATION A1 (A3026043)	TEST				1.0		2-5,7-14, 17,18	E,J
		REPAIR		0.1				6,19	H
		REPAIR				1.0		1,16,17, 20	E,J
0101	CONVERTER, KEYER A1A1 (A3026045)	TEST				1.0		2-5,18	E
		REPAIR				1.0		1,17	E
010101	CASE ASSEMBLY (A3030459)	REPAIR				0.5			H
010102	FRONT PANEL ASSEMBLY A1A1A1 (A3030434)	REPAIR				1.0			H
01010201	CCA A1A1A1A1 (A3030440)	REPAIR				0.5			H
010103	RCS REMOTE CHASSIS A1A1A2 (A3030432)	REPAIR				0.5			H
01010301	CCA A1A1A2A2 (A3027437)	REPLACE				0.2		1,17	J
		TEST				L(1.5)		TBD	I
		REPAIR				L(1.0)		TBD	G,I
01010302	BATTERY CHARGER A1A1A2A4 (A3031260)	REPLACE				0.2		1,17	
		TEST				L(1.5)		TBD	I
		REPAIR				L(1.0)		TBD	G,I
0101030201	POWER SUPPLY CCA #1 A1A1A2A4A1 (A3031069)	REPAIR				L(1.0)		TBD	I,H
0101030202	POWER SUPPLY CCA #2 A1A1A2A4A2 (A3031068)	REPAIR				L(1.0)		TBD	I,H
01010303	CCA A1A1A2A3 (A3031534)	REPLACE				0.2		1,17	
		TEST				L(1.0)		TBD	I
		REPAIR				L(1.0)		TBD	I
0102	BATTERY BB-590 A1A2 (A3026046)	REPLACE		0.1				6	
		TEST		0.1				15	
02	R/E TERMINAL A2 (A3026044)	TEST				1.0			H
		REPAIR				0.1			K

SECTION II MAINTENANCE ALLOCATION CHART
FOR
CV-3968/GRC-215

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINT. FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQPT.	(6) REMARKS
			UNIT		INTERMEDIATE		DEPOT		
			C	O	F	H	D		
0201	TONE CONVERTER A2A1 (A3026047)	REPLACE TEST TEST REPAIR				0.05 1.0 L(1.5) L(1.0)		 TBD TBD	 F I G,I
020101	FRONT TONE CONVERTER ASSEMBLY A2A1A1 (A3030366)	REPAIR				L(1.5)			H,I,G,J
02010101	CCA A2A1A1A1 (A3030370)	REPAIR				L(1.0)			I,H
02010102	BASE ASSEMBLY A2A1A1A2 (A3030369)	REPAIR				L(1.0)			I,H
02010103	BASE ASSEMBLY TLC LOCAL A2A1A1A3 (A3030371)	REPAIR				L(1.0)			I,J,H
0202	DC/DC CONVERTER A2A2 (A3026048)	REPLACE TEST TEST REPAIR				0.05 1.0 L(1.0) L(1.0)		 2,3,4,18 TBD TBD	 I G,I
020201	FRONT PANEL ASSEMBLY A2A2A1 (A3030372)	REPAIR				L(1.0)			I,H
02020101	CCA A2A2A1A3 (A3030931)	REPAIR				L(1.0)			I,H

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR CV-3968/GRC-215

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	H	TOOL KIT, ELEC. TK-17 (INCL. METRIC)	5180-01-195-0855	JENSEN JTK-17RM
2	H	TEST SET, REMOTE CONTROL TS-4254/GRC-215	6625-01-266-7556	MX 950578-801
3	H	MULTIMETER, DIGITAL AN/USM-486	6625-01-145-2430	FLUKE 8050A-01
4	H	POWER SUPPLY PP-8202/G *	6130-00-160-0827	HP-6274B
5	H	POWER SUPPLY PP-3940B/G	6130-01-164-0548	POWER-10 4006
6	O	WRENCH, HEXAGONAL (5mm.)	5120-01-045-4890	
7	H	FREQUENCY COUNTER AN/USM-459	6625-01-061-8928 011-030-041	HP 5328-010-
8	H	SIGNAL GENERATOR SG-1171/U	6625-01-133-6160	WAVETEK 148A
9	H	OSCILLOSCOPE/MEMORY OS-262(P)/U	6625-01-007-9416	TEK 7623A
10	H	PLUG-IN AMP AM-6785/U (2 ea.)	6625-00-361-5318	TEK 7A26
11	H	FUNCTION GENERATOR SG-1133/U	6625-01-128-4989	HP 3312A
12	H	PROBES (2 ea.)	6625-01-014-0391	TEK 010-6053-13
13	H	PLUG-IN T.B. TD-1159/U	6625-00-261-5139	TEK 7B53A
14	H	DISTORTION ANALYZER TS-4084/G	6625-01-217-0054 5003	TEK AA5001/TM
15	O	MULTIMETER AN/PSM-45	6625-01-139-2512	
16	H	MAINTENANCE KIT, PCB MX-10897/G	5895-01-267-9473 P/N 8007-0117	PACE MODEL RNR
17	H	WORK STATION, STATIC	4940-01-087-3458	3M 8021
18	H	KIT, TEST LEAD (FOR FLUKE)	6625-00-444-4041	
19	O	TOOL KIT TK-101/G	5180-00-064-5178	
20	H	REPAIR KIT, PCB MK-772/U	5999-00-757-7042	

* PP-8214/G (NSN 6130-00-150-0028) PROVIDES IDENTICAL CAPABILITY WHEN SOURCE POWER IS 230V, 50 CYCLE. AIR FORCE USE ONLY.

SECTION IV REMARKS
FOR
CV-3968/GRC-215

REFERENCE CODE	REMARKS
A	OPERATIONAL CHECK IN REMOTE MANPACK CONFIGURATION. UNIT MAINTENANCE ALSO CHECKS FOR SATISFACTORY BATTERY CHARGING.
B	INTERMEDIATE MAINTENANCE FAULT ISOLATES TO SUBASSEMBLY LEVEL (REMOTE LOCATION, DC/DC CONVERTER, AND TONE CONVERTER) AND PERFORMS OPERATIONAL TEST.
C	REPAIR BY REPLACING DEFECTIVE CONVERTER. UNIT MAINTENANCE ALSO REPLACES BATTERY, CARRYING STRAPS, AND CONNECTOR COVERS IN REMOTE LOCATION ASSEMBLY A1.
D	INTERMEDIATE MAINTENANCE FAULT ISOLATES/REPAIRS TO PIECE PART LEVEL EXCEPT CCA A1A1A2A2, BATTERY CHARGER A1A1A2A4, AND CCA A1A1A2A3 WHICH ARE REPLACED. R/E TERMINAL IS REPAIRED BY REPLACEMENT OF TONE CONVERTER A2A1 AND/OR DC/DC CONVERTER A2A2.
E	INTERMEDFIATE MAINTENANCE FAULT ISOLATES/REPAIRS TO PIECE PART LEVEL AND REPLACES SUBASSEMBLIES CCA A1A1A2, BATTERY CHARGER A1A1A2A4, AND CCA A1A1A2A3.
F	TESTED AS PART OF COMPLETE CONVERTER ASSEMBLY.
G	PIECE PART REPAIR.
H	TEST/REPAIR AS PART OF THE NEXT HIGHER ASSEMBLY.
I	SPECIALIZED REPAIR ACTIVITY (SRA). NOTE: INITIAL SRA REPAIR WILL BE PERFORMED BY CONTRACTOR. RETURN DEFECTIVE UNITS TO DEPOT.
J	ELECTRO-STATIC SENSITIVE COMPONENTS.
K	REPAIR BY REPLACEMENT OF TONE CONVERTER A2A1 AND/OR DC/DC CONVERTER A2A2.

APPENDIX C
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the Remote Control. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. EXPLANATION OF COLUMNS

a. Column(1), Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. E").

b. Column(2), Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance
L - Special Repair Activity

c. Column(3), National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column(4), Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column(5), Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). 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 NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O	6850-00-105-3084	TRICHLOROTRIFLUOROETHANE	oz
2	O	8305-00-267-8215	Cloth, Cheese cloth: Cotton; lintless, bleached, 36 in. (CCC-C-440, 81348) in Tool Kit TK-101/G	YD
3	O	8020-00-245-4509	Brush, squirrel tail hair bristles; 1 in. wd. (M-B-39, 81348) (15335001099)	EA
4	H	NOT AVAILABLE	Marker, Wire (tags); cloth, vinyl impregnated; adhesive backed. (B500, 85480) (A3056238, 80063)	sht

GLOSSARY

Section I. ABBREVIATIONS AND ACRONYMS

B

BIT . . . . . Built In Test

C

CCA . . . . . Circuit Card Assembly

D

dBm . . . . . Decibels measured in milliwatts
DC . . . . . Directional Coupler
DMM . . . . . Digital Multimeter

E

EMI . . . . . Electromagnetic Interference
EMP . . . . . Electromagnetic Pulse

H

Hz . . . . . Hertz

I

IC . . . . . Integrated Circuit
in. . . . . Inches

K

KHz . . . . . Kilohertz

L

LED . . . . . Light-emitting Diode
lbs. . . . . Pounds

M

mA . . . . . Milliamps
MAC . . . . . Maintenance Allocation Chart
MTOE . . . . . Modified Table of Organization and Equipment

N

NSN . . . . . National Stock Number

P

PEP . . . . . Peak Envelope Power
PMCS . . . . . Preventive Maintenance Checks and Services
P/N . . . . . Part Number
PTT . . . . . Push-To-Talk
PWM . . . . . Pulse Width Modulator

R

ROD . . . . . Report of Discrepancy
RF . . . . . Radio Frequency

T

TA . . . . . Table of Allowances
TMDE . . . . . Test, Measurement, and Diagnostic Equipment
TP . . . . . Test Point

U

UUT . . . . . Unit-Under-Test

V

V . . . . . Volts
Vac . . . . . Volts Alternating Current
Vdc . . . . . Volts Direct Current
VSA . . . . . Variable-Step Attenuator
VSWR . . . . . Voltage Standing Wave Ratio

Section II. DEFINITIONS OF UNUSUAL TERMS

AUDIO RX - Receive audio.

AUDIO TX - Transmit audio.

CALL - A tone sent on telephonic pair.

CLASS AB - An amplifier that operates between maximum plate current and cut-off.

CLOCK - An electronic signal for synchronizing functions and events.

DATA STREAM - Coded R/T control information sent over telephonic-pair.

dB, dBm - Decibels, milliDecibels; a unit for measuring ratio between two electronic power levels.

FREQUENCY-SHIFTING - Data transmission technique where tones (frequency) are coded (shifted) to duplicate data.

HANDSET - Device for voice communication.

MODULATE - To vary the frequency, amplitude, or phase of a carrier wave or signal.

MODULE - Self-contained, metallic structure provides environmental protection for circuitry.

MUTE - Tone sent with data stream that prevents voice communication between operators.

R/E TERMINAL - Attached to Terminal R/T (local), decodes Terminal R/T control data stream.

REMOTE LOCATION ASSY. - Attached to ECCM control module (remote). Generates control data stream.

SCHMITT-TRIGGER CIRCUIT - Electronic. Has a threshold which; when reached, circuit fires (triggers) acting as a pulse-shaper.

SIGNAL-TO-NOISE RATIO - Quality measurement of data stream; the higher the ratio the better the quality.

TONE - A signal whose frequency is in the audio range.

SUBJECT INDEX

E

F

H

I

K

M

O

P

R

R (Cont.)

S

T

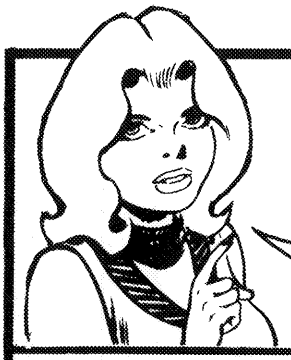
T (Cont.)

U

V

W

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



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DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		FO3		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE
I. M. DeSpiritof

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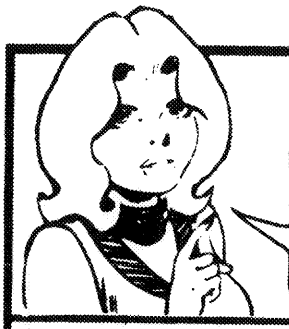

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CROSS REFERENCE TABLE			
REF DES	ASSEMBLY NUMBER	SCHEMATIC NUMBER	PRINTED WIRING BOARD
A1	A3026045	NA	NA
A1A1	A3030434	NA	NA
A1A1A1	A3030440	NA	A3030467
A1A2	A3030432	NA	NA
A1A2A2	A3027437	NA	A3027436
A1A2A2A1	A3027438	NA	NA
A1A2A2A2	A3030436	NA	NA
A1A2A2A3	A3027443	NA	A3027444
A1A2A2A4	A3030435	NA	NA
A1A2A2A5	A3030430	NA	A3030456
A1A2A2A6	A3027440	NA	NA
A1A2A2A7	A3030437	NA	NA
A1A2A2A8	A3030431	NA	A3030456
A1A2A2A9	A3027439	NA	A3030457
A1A2A2A11	A3030438	NA	NA
A1A2A2A12	A3030439	NA	NA
A1A2A3	A3027457	NA	A3027458
A1A2A4	A3030433-1	A3031148	NA

X XX X -X

- -X — PIN NUMBER
- X — SUB ZONE
- XX — DRAWING ZONE
- X — SHEET NO. OF ORIGIN OR DESTINATION

TYPICAL CIRCUIT CONTINUATION CODE

INTEGRATED CIRCUIT TABLE							
REFERENCE DESIGNATION	SECOND TAGGING LINE SYM	PART NUMBER	POWER INPUT PINS				
			+5V	+12V	-12V	GND	SEE NOTE
A1A2U1	M1	A3027281-1	NA	NA	NA	NA	——
A1A2A2A1U1	M2	A3030205-1	14	NA	NA	7	2.17
A1A2A2A1U2	M3	A3030209-1	14	NA	NA	7	2.17
A1A2A2A2U2	M4	A3030205-1	14	NA	NA	7	2.17
A1A2A2A2U1	M5	A3030215-1	14	NA	NA	7	2.17
A1A2A2A3U1	M6	A3026799-1	1	NA	NA	8	2.17
A1A2A2A3U4	M7	A3030206-1	16	NA	NA	8	2.17
A1A2A2A3U2,3	M8	A3030218-2	16	NA	NA	8	2.17
A1A2A2A4U2	M9	A3030206-1	16	NA	NA	8	2.17
A1A2A2A4U1,3	M10	A3030218-1	16	NA	NA	8	2.17
A1A2A2A5U1	M11	A3026990-2	NA	2,8	5	NA	——
A1A2A2A6U2	M12	A3030206-1	16	NA	NA	8	2.17
A1A2A2A6U1	M13	A3030218-1	16	NA	NA	8	2.17
A1A2A2A7U4	M14	A3030206-1	16	NA	NA	8	2.17
A1A2A2A7U2	M15	A3030215-1	14	NA	NA	7	2.17
A1A2A2A7U1,3	M16	A3030218-1	16	NA	NA	8	2.17
A1A2A2A8U1	M17	A3026990-2	NA	8	5	——	——
A1A2A2A9U1	M18	A3030792	NA	8	4	NA	——
A1A2A2A11U1	M19	A3030204-1	14	NA	NA	7	2.17
A1A2A2A12U1	M20	A3026990-3	NA	9,13	4	——	2.17
A1A2A3U1	M21	A3026992	NA	NA	NA	NA	2.17

NOTES:

1.0 SPECIFIC:

2.1 UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS.
RESISTORS ARE 5%,1/8W.
CAPACITANCE VALUES ARE IN MICROFARADS.
VOLTAGES ARE DC.
DIODES AND/OR TRANSISTORS ARE JANTX TYPE.
INDUCTANCE VALUES ARE IN MICROHENRIES.

2.2 PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER AND SUBASSEMBLY DESIGNATION 2A1A6A1.

2.3 FOR CONTINUATION OF CIRCUIT SEE SCHEMATIC A3030405 AND A3031149.

2.4 PART NUMBER A3030324-1.

2.5 PART NUMBER A3030325.

2.6 PART NUMBER A3030327-902.

2.7 PART NUMBER A3026777.

2.8 PART NUMBER A3030178.

2.9 PART NUMBER A3030187.

2.10 PART NUMBER A3030498-1.

2.11 PART NUMBER A3030194.

2.12 PART NUMBER A3030197.

2.13 PART NUMBER A3030523.

2.14 PART NUMBER A3026982.

2.15 PART NUMBER A3030326-1.

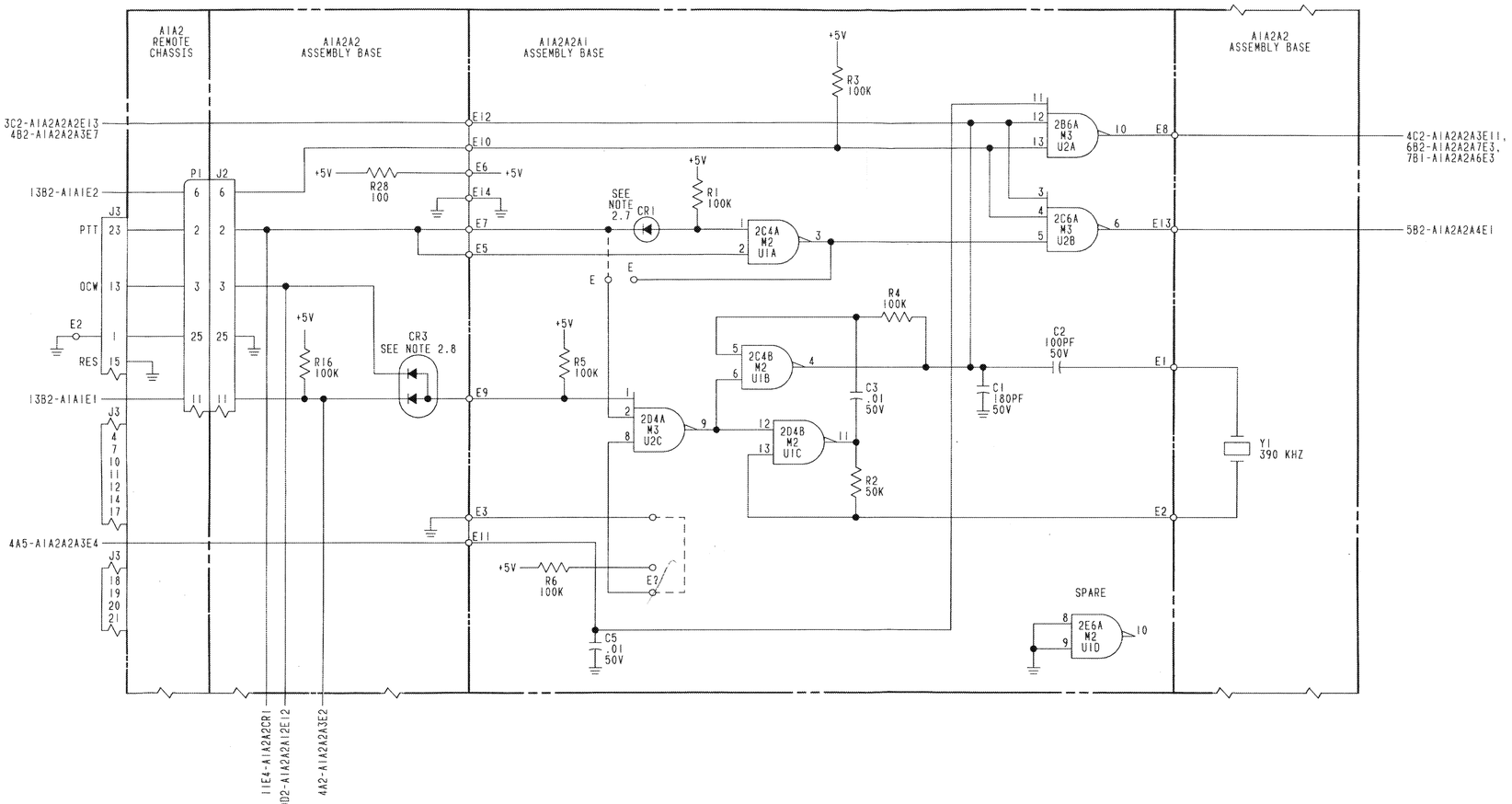
2.16 PART NUMBER A3030361.

2.17 THIS DEVICE REQUIRES SPECIAL HANDLING AND PROCESSING TO PREVENT DAMAGE FROM ELECTROSTATIC DISCHARGE TRANSIENTS.

2.18 REFERENCE:
ASSEMBLY NUMBER A3026043.

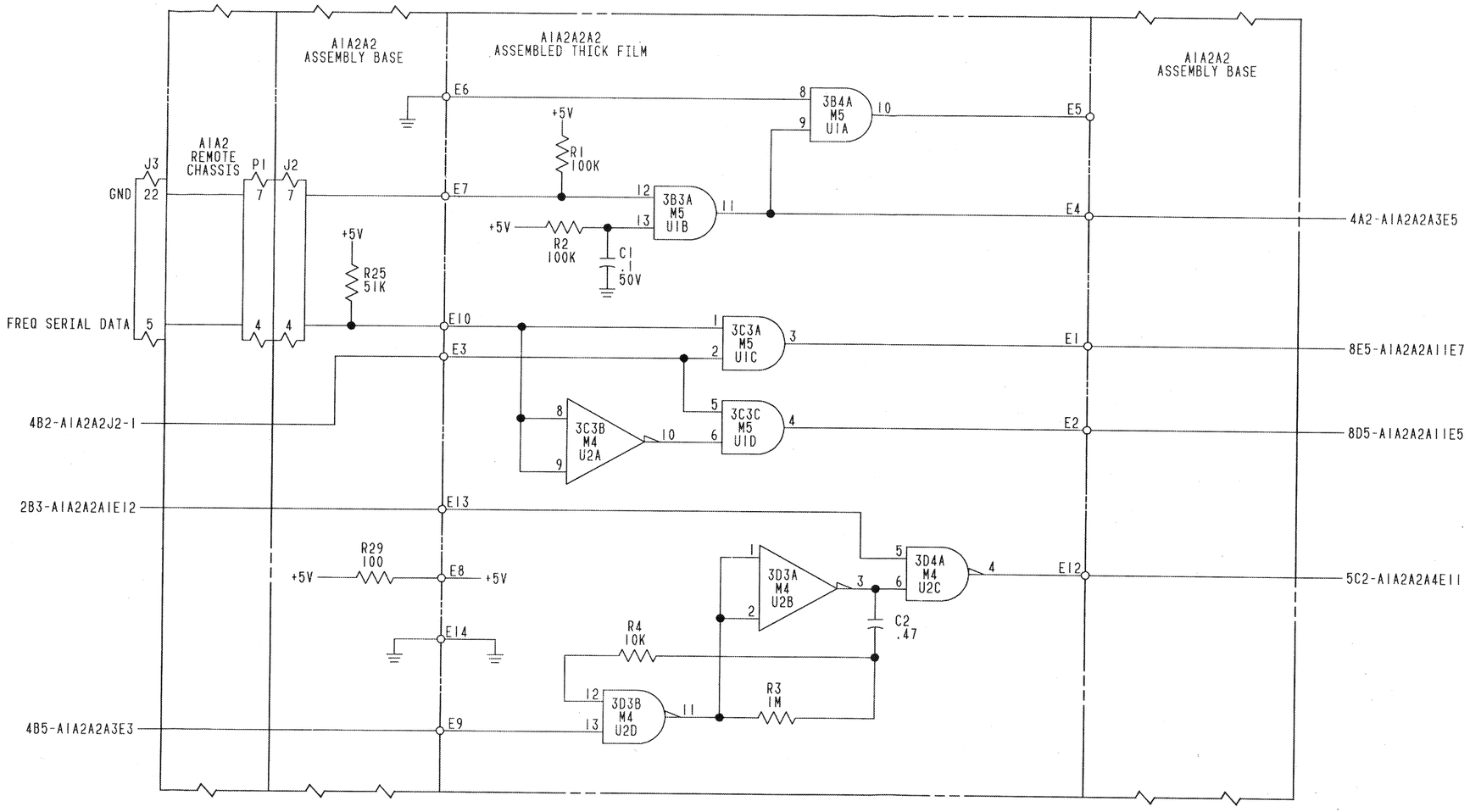
CEOKI-001

FO-1. Remote Location Chassis Schematic Diagram (Sheet 1 of 13)



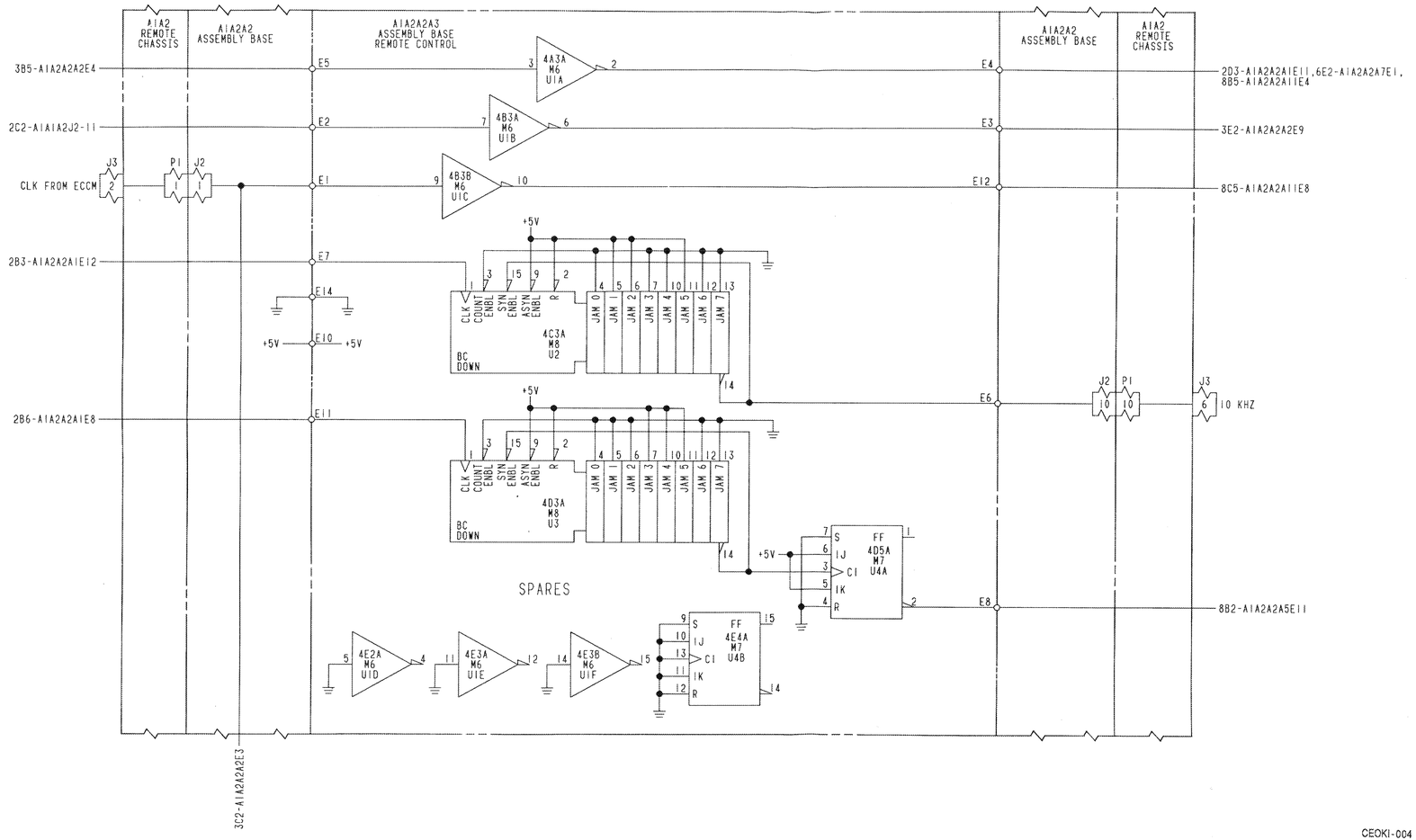
CEOKI-002

FO-1. Remote Location Chassis Schematic Diagram (Sheet 2 of 13)



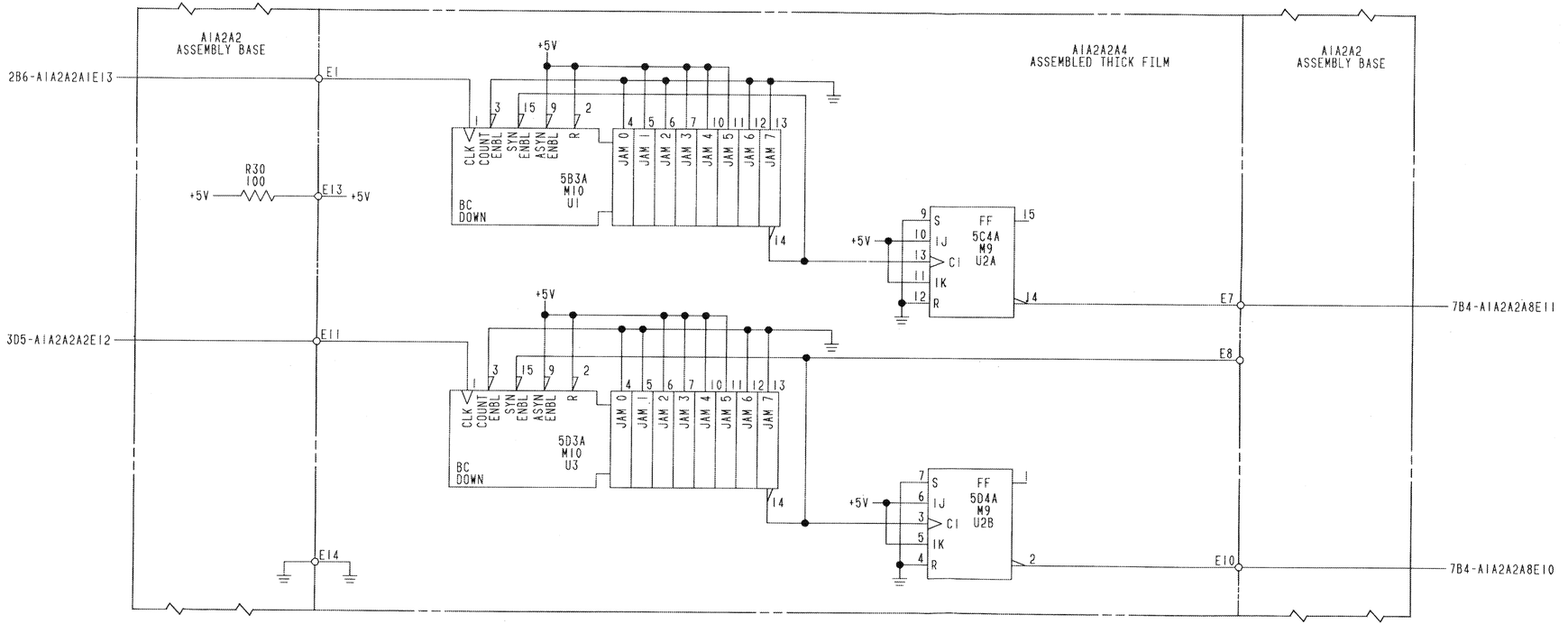
CEOKI-003

FO-1. Remote Location Chassis Schematic Diagram (Sheet 3 of 13)



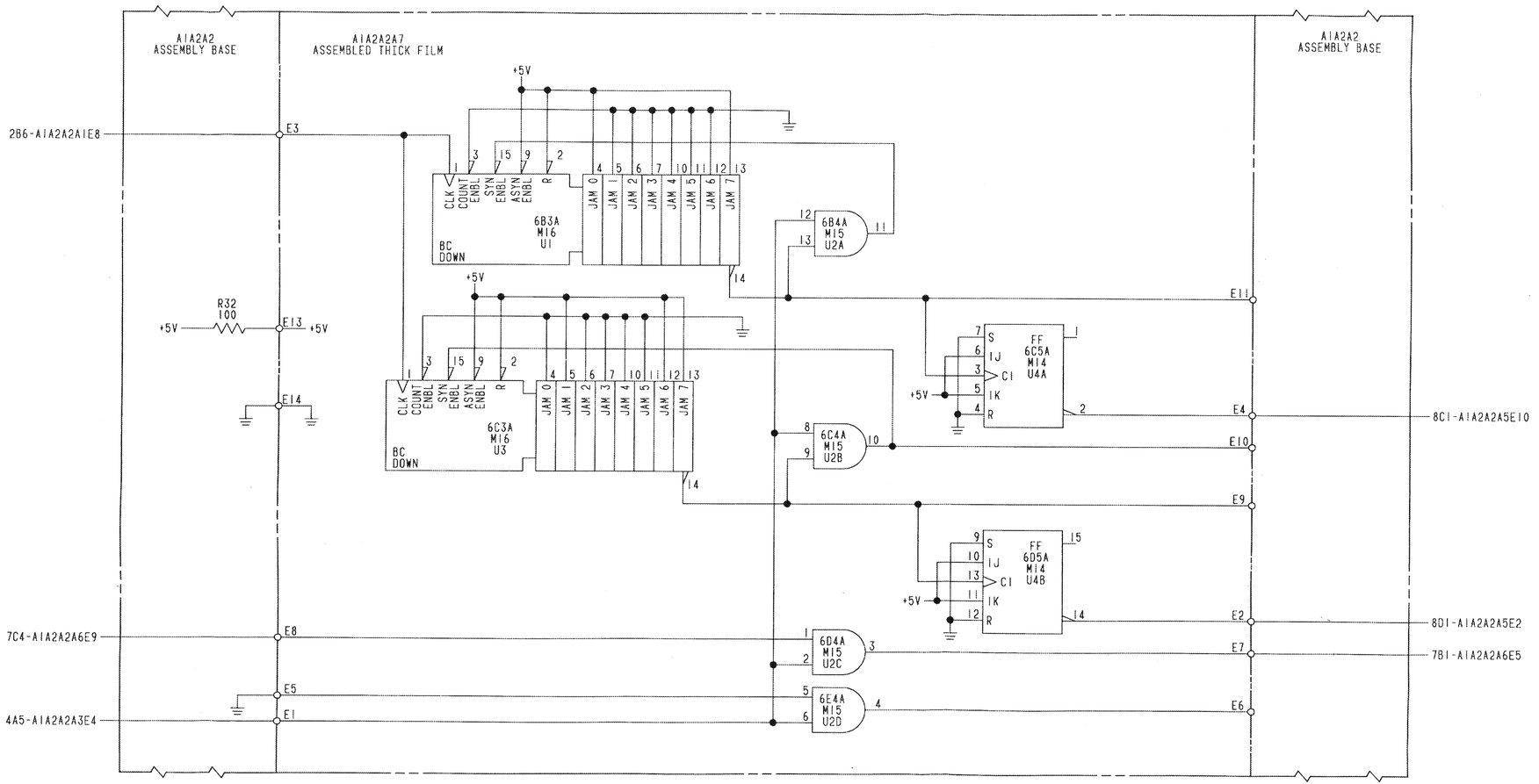
CEOKI-004

FO-1. Remote Location Chassis Schematic Diagram (Sheet 4 of 13)

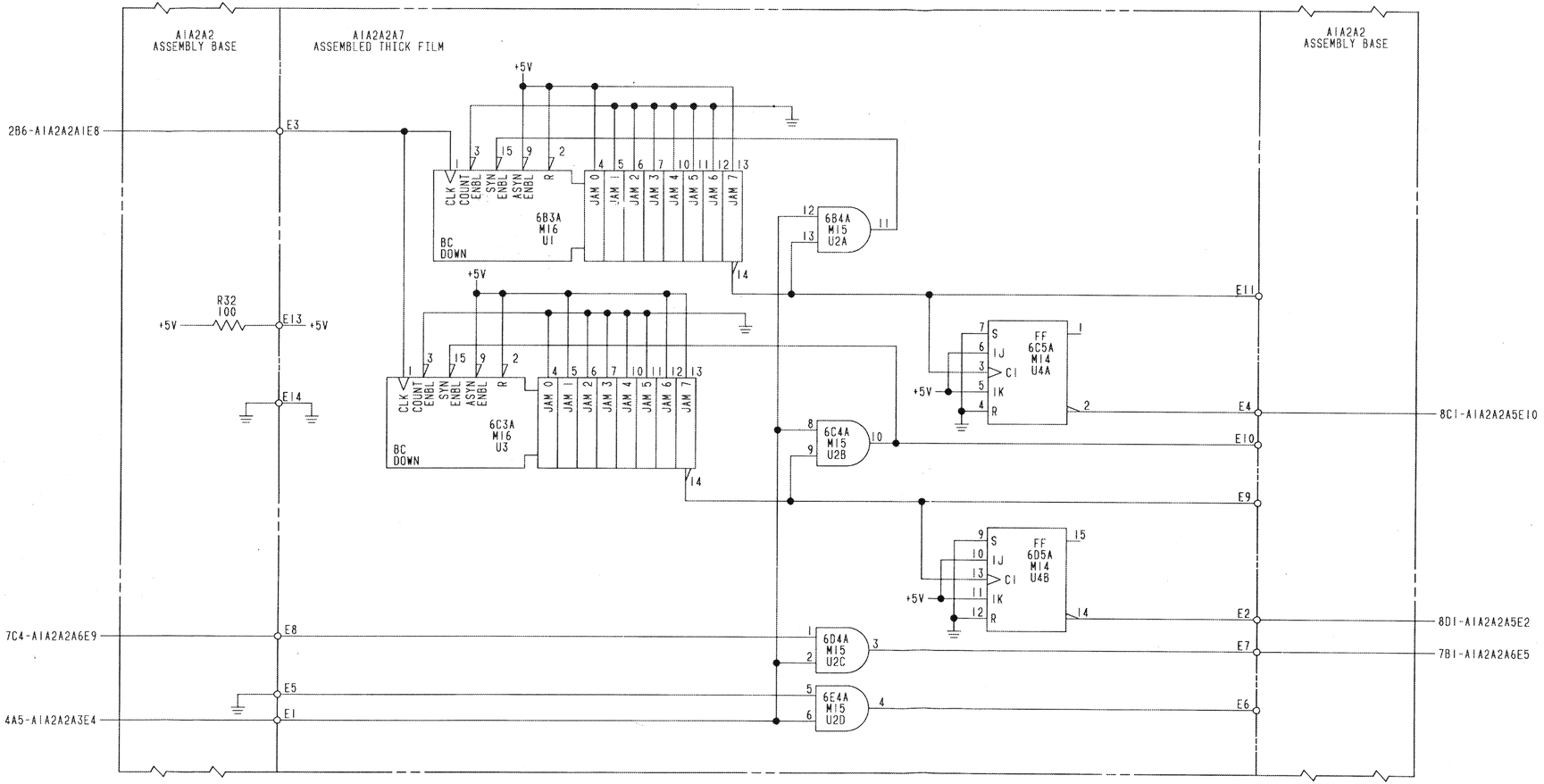


CEOKI-005

FO-1. Remote Location Chassis Schematic Diagram (Sheet 5 of 13)

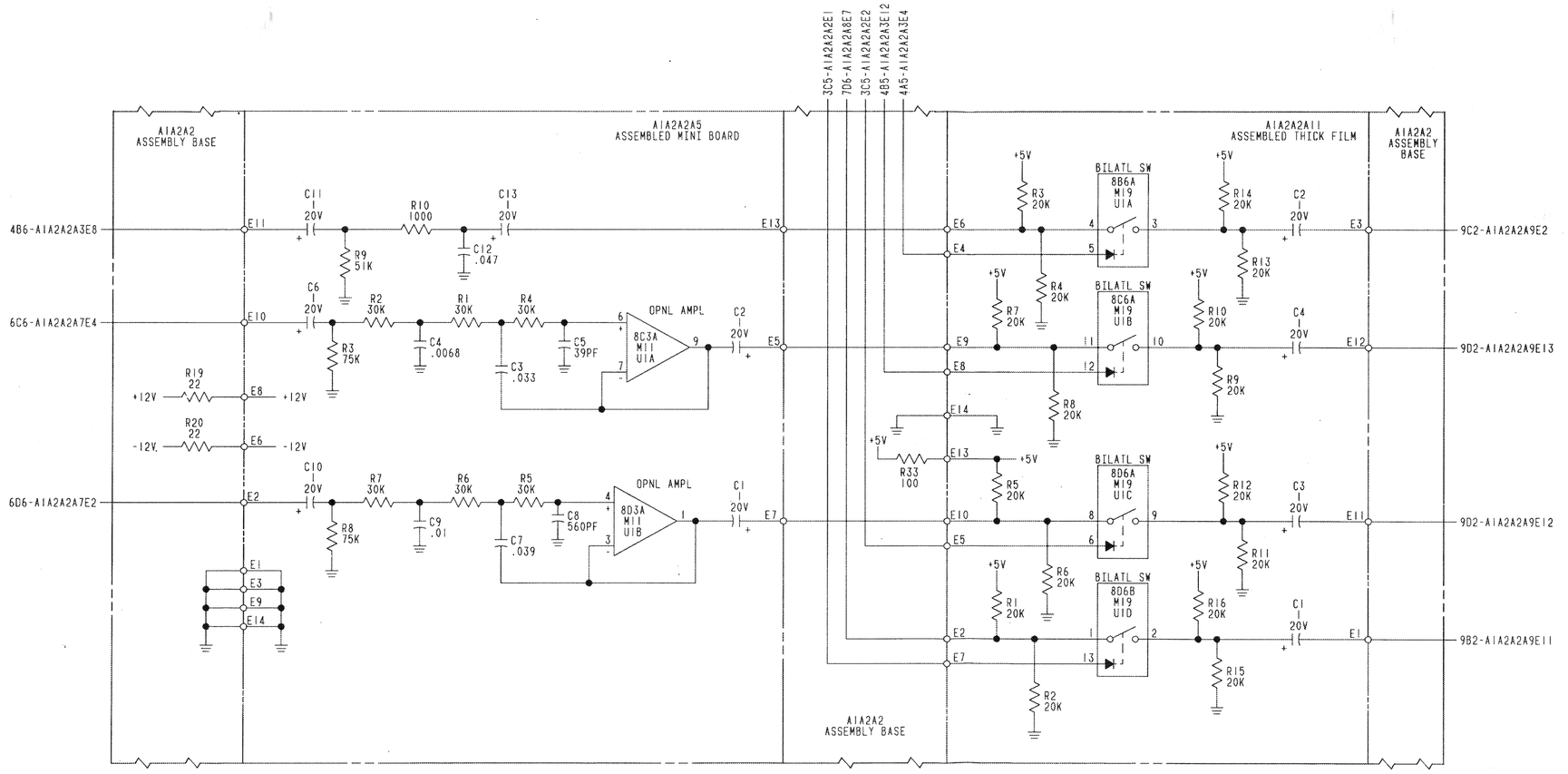


FO-1. Remote Location Chassis Schematic Diagram (Sheet 6 of 13)



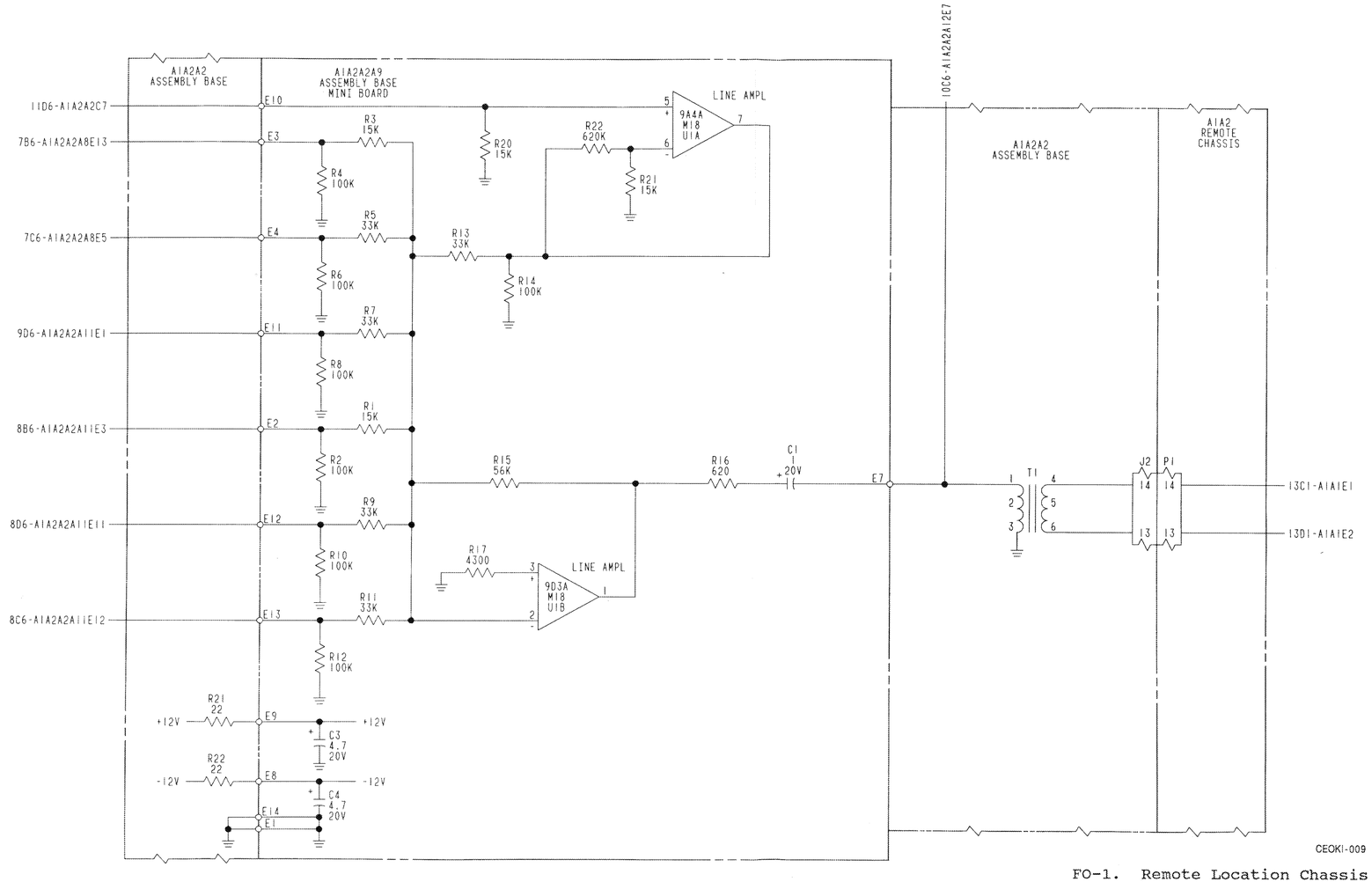
CEOKI-007

FO-1. Remote Location Chassis Schematic Diagram (Sheet 7 of 13)

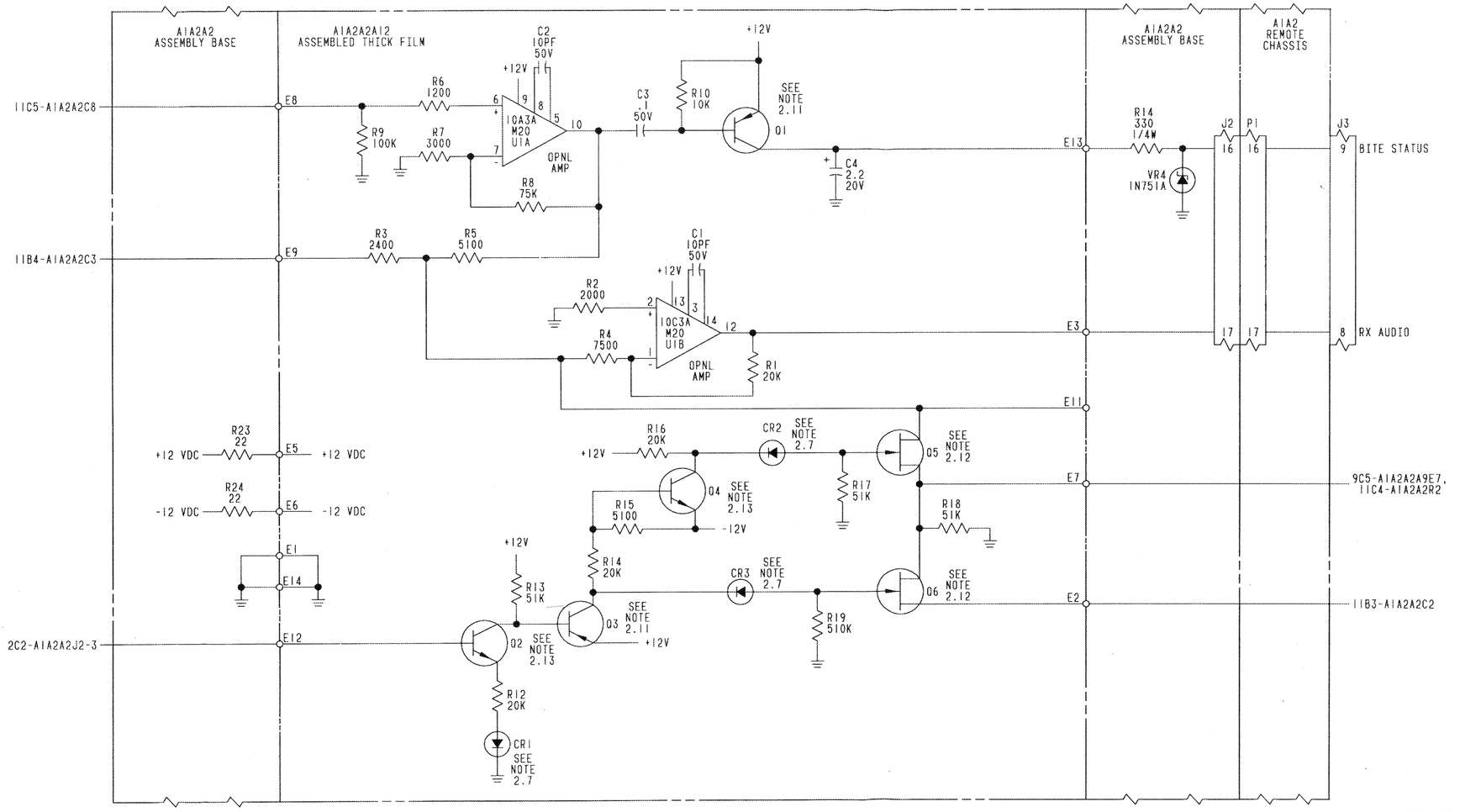


CEOKI-008

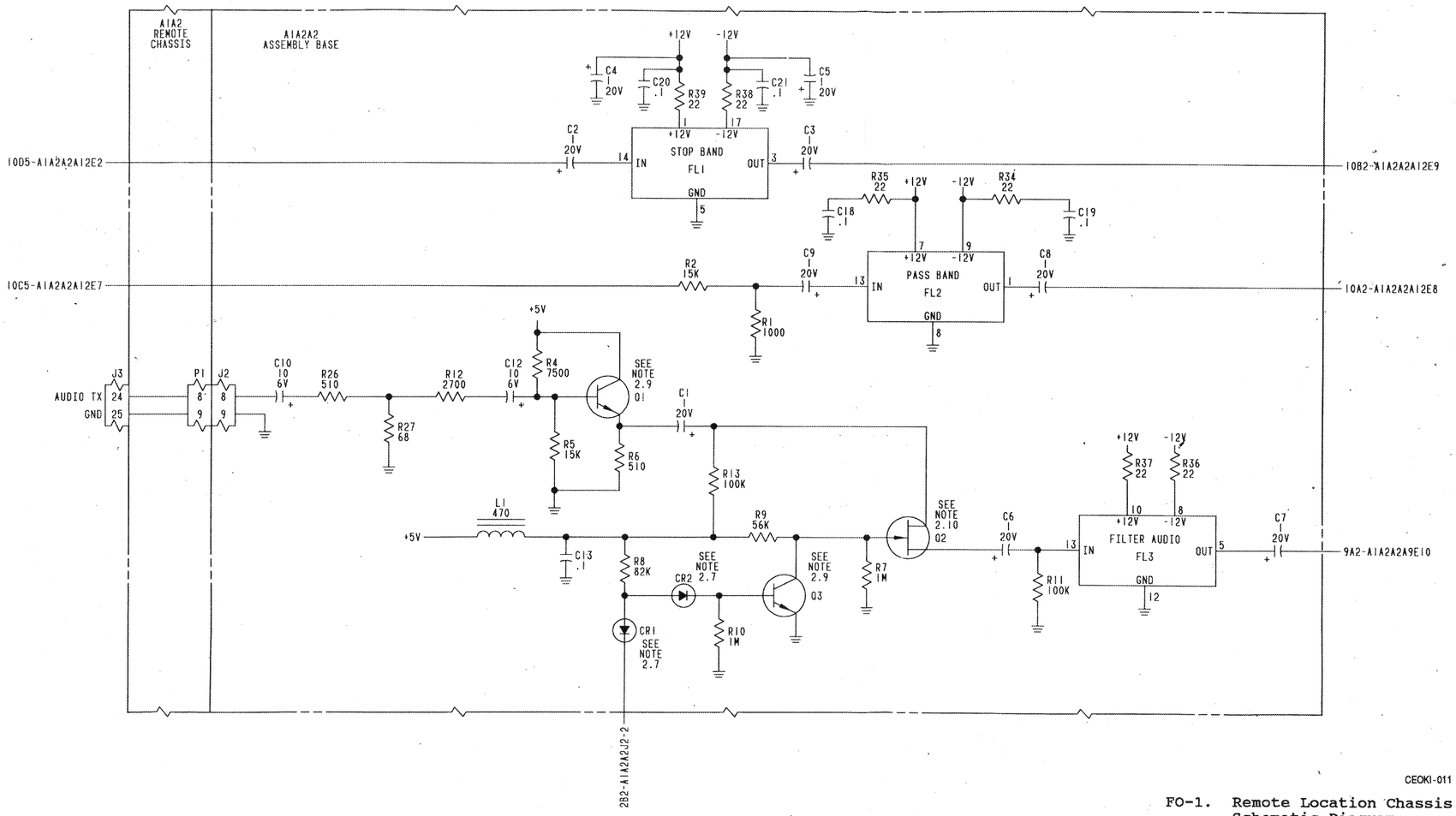
FO-1. Remote Location Chassis Schematic Diagram (Sheet 8 of 13)



FO-1. Remote Location Chassis Schematic Diagram (Sheet 9 of 13)

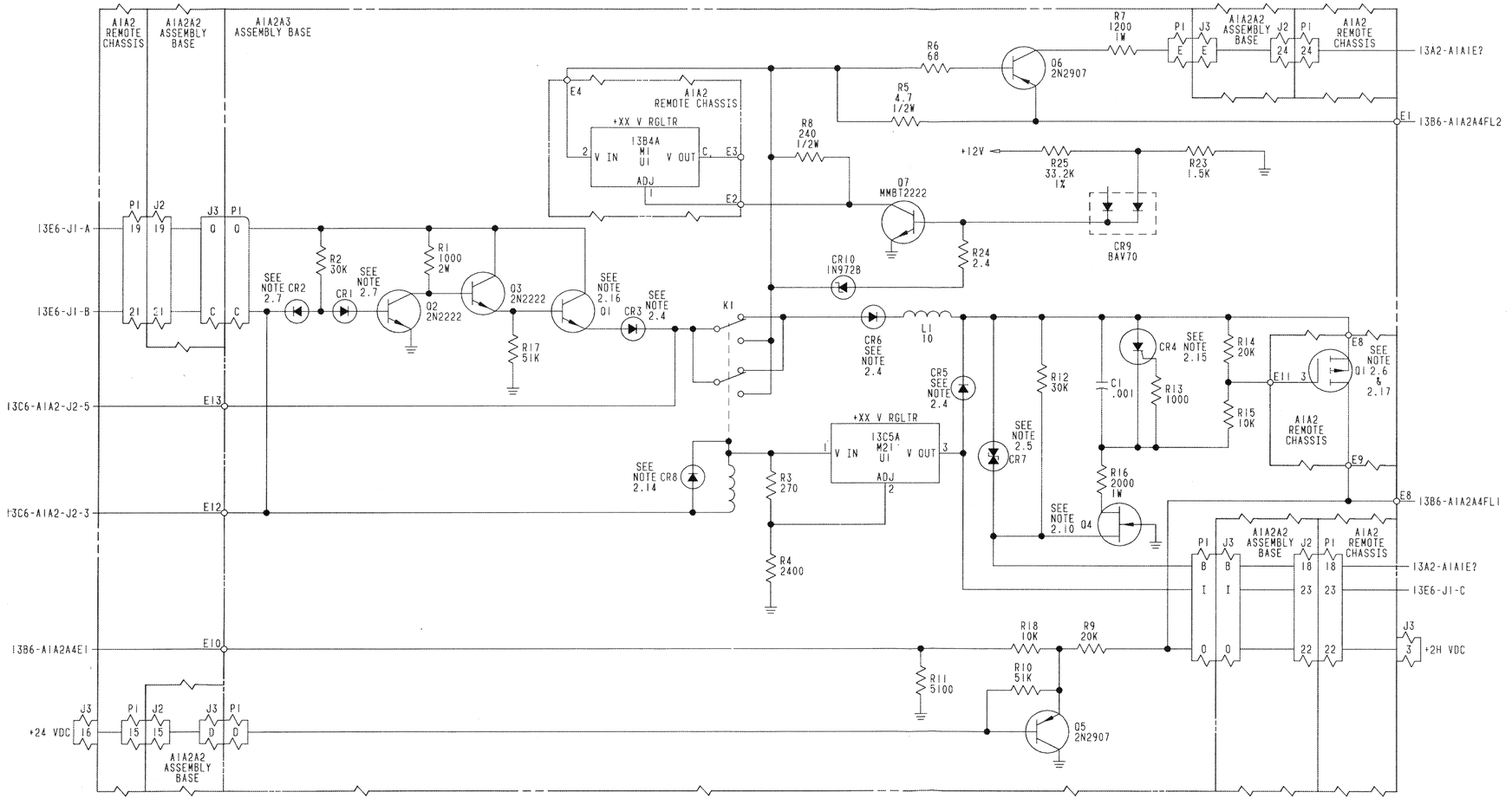


FO-1. Remote Location Chassis Schematic Diagram (Sheet 10 of 13)



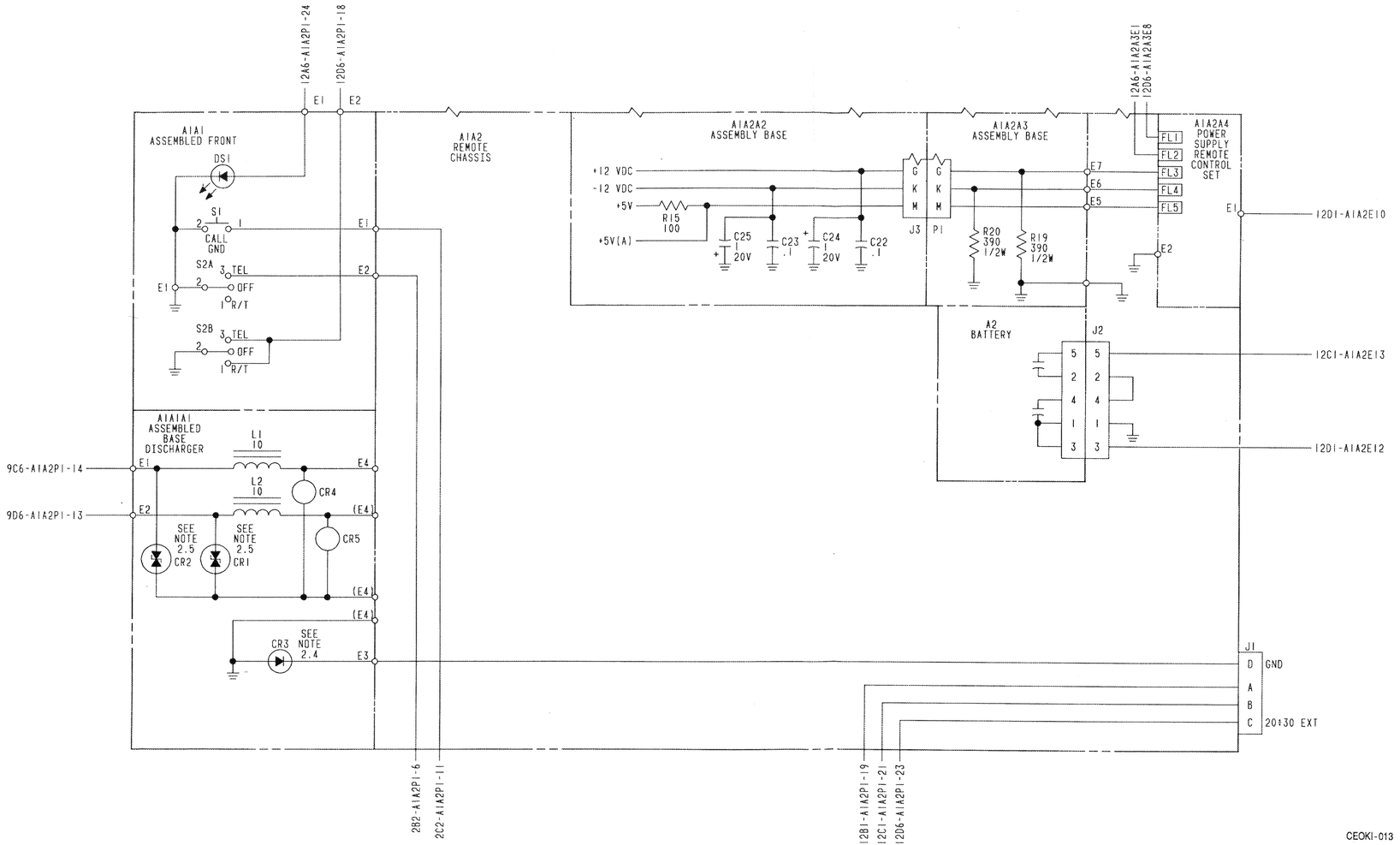
CEOKI-011

FO-1. Remote Location Chassis Schematic Diagram (Sheet 11 of 13)



CEOKI-012

FO-1. Remote Location Chassis Schematic Diagram (Sheet 12 of 13)



FO-1. Remote Location Chassis Schematic Diagram (Sheet 13 of 13)