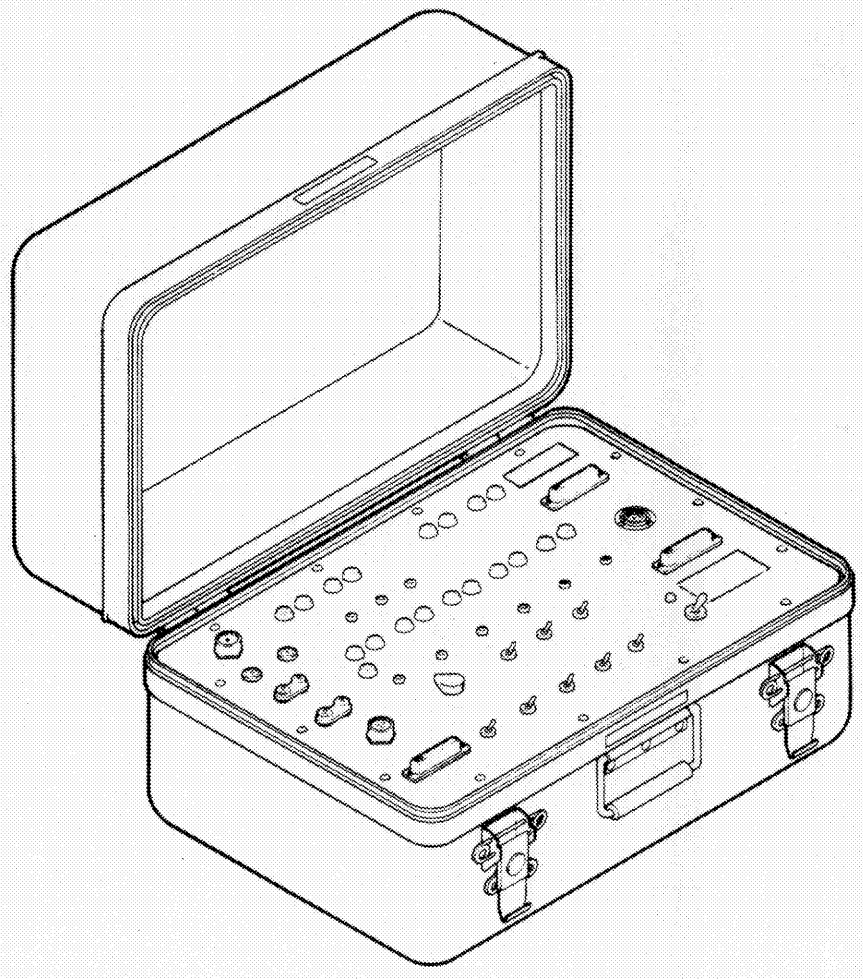
ARMY TM 11-6625-3214-14 & P
NAVY ET800-AB-OMP-010/TS-4254-GRC215
AIR FORCE TO 33D7-47-121-1

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST



TEST SET, REMOTE CONTROL SET TS-4254/GRC-215 (NSN 6625-01-266-7556)

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

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
TM 11-6625-3214-14&P
Technical Manual
Navy ET800-AB-OMP-010/TS-4254-GRC215
Technical Order
TO 33D7-47-121-1

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

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

TEST SET, REMOTE CONTROL SET TS-4254/GRC-215 (NSN 6625-01-266-7556)

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, T.O. 00-5-1. Forward direct to prime ALC/MST.

For Navy, mail comments to the Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC, 20363-5100.

In either case a reply will be furnished direct to you.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

SECTION I
INTRODUCTION

1-1. SCOPE.

This manual contains operation and maintenance instructions for the Remote Control Set (RCS) Test Set TS-4254/GRC-215 as shown in Figure 1-1. The material includes operating instructions, functional descriptions, maintenance and troubleshooting procedures, Repair Parts and Special Tools Lists, and instructions for preparation for use, storage and shipment.

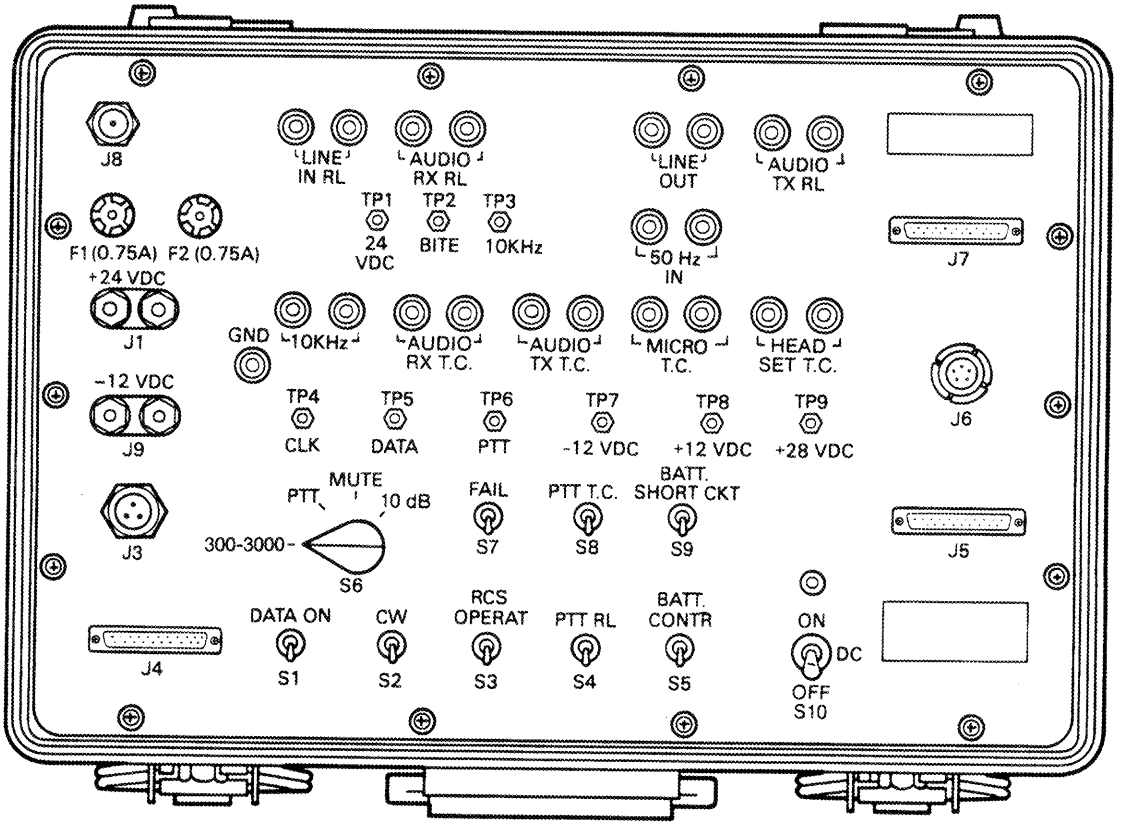


Figure 1-1. Remote Control Set Test Set

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-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790.2, Vol 2, chapter 17.

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

b. Reporting of 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.

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

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

a. Army. If your RCS Test Set needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your 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, US 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.

1-4. DESTRUCTION OF MATERIAL TO PREVENT ENEMY USE

a. Army. The destruction of Army electronic material to prevent enemy use shall be in accordance with TM 750-244-2.

b. Navy. Navy Personnel 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.

1-5. EQUIPMENT DATA

a. Electrical Characteristics

Power Source: +24.0 and -12.0 VDC
Power Output: +24.0 VDC

b. Physical Characteristics

Width: 17 in.	Height: 10.25 in.
Depth: 12 in.	Weight: 17 lbs.

1-6. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

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

SECTION II
FUNCTIONAL DESCRIPTION

2-1. GENERAL

This section contains a general description and purpose for the RCS Test Set TS-4254/GRC-215, listings of controls, functional descriptions of major components and block diagrams.

2-2. DESCRIPTION

This equipment can test and verify the operation of the RCS and its subassemblies: DC/DC Converter, Tone Converter, and Remote Location (RL). The RCS Test Set performs tests on reverse voltage protection, short-circuit protection, battery charging voltage, DC/DC Converter supply voltages, and BIT circuitry. It filters and separates audio, data, and PTT Push-To-Talk signals from the RL. The RCS makes these signals available for measurement on front panel jacks. Front panel switches create test conditions to verify operation of the RCS. Test points on the front panel provide measuring points for voltages and signals that the Unit Under Test (UUT) supplies.

2-3. CONTROLS AND INDICATORS

Figures 2-1 and 2-2 illustrate the locations of front panel controls. Table 2-1 lists the controls by callout number and gives a description of each control.

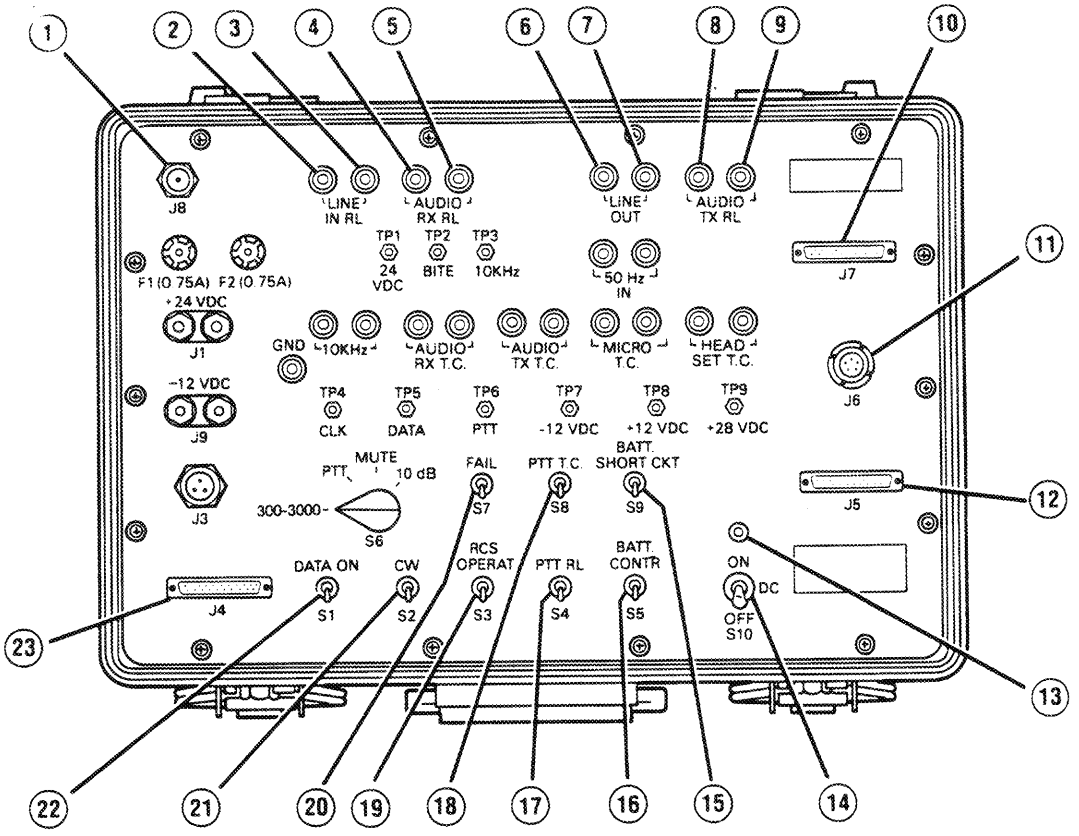


Figure 2-1. Remote Control Set Test Set Front Panel

Table 2-1. Remote Control Set Test Set Controls and Indicators (1 of 5)

Fig. and Index No.	Name	Purpose
2-1-(1)	J8	Connects +24.0 VDC supply to RL.
-(2)	E13	Input for audio and serial data generated by RL.
-(3)	E14	Chassis ground.
-(4)	E15	Audio received through RL.
-(5)	E16	Chassis ground.
-(6)	E17	Monitoring point for audio and serial data from RL.

2-3. CONTROLS AND INDICATORS (Cont.)

Table 2-1. Remote Control Set Test Set Controls and Indicators (2 of 5)

Fig. and Index No.	Name	Purpose
2-1-⑦	E18	Chassis ground.
-⑧	E20	Input for audio transmitted through RL to Receiver-Exciter (R/E).
-⑨	E19	Chassis ground.
-⑩	J7	Connects +12 and -12 VDC from DC/DC Converter to TP8 and TP7 of the test set.
-⑪	J6	Connects test set inputs for headset and microphone to tone converter.
-⑫	J5	Connects DC/DC Converter to test set.
-⑬	DS1	Indicates +24 VDC to test set.
-⑭	S10	Controls +24 and -12 VDC to test set.
-⑮	S9	Shorts +28 VDC from Battery Charger to test short circuit protection.
-⑯	S5	Simulates presence of rechargeable battery.
-⑰	S4	Grounds pin 23 of J4 to simulate a PTT signal to RL from ECCM.
-⑱	S8	Grounds pin C of J6 to simulate a PTT signal to the Tone Converter.
-⑲	S3	Grounds pin 16 of J4 through a 10K resistor to simulate a signal applied by the ECCM to interlock ON/OFF switch on RCS operation.
-⑳	S7	Simulates a fail signal from the R/E to DC/DC Converter by connecting +24 VDC to pin 9 of J5.
-㉑	S2	Grounds pin 13 of J4 to simulate signal by ECCM to RCS for CW mode.
-㉒	S1	Activates the RCS at each data change, by grounding pin 22 of J4.
-㉓	J4	Connects Remote Location to test set.

2-3. CONTROLS AND INDICATORS (Cont.)

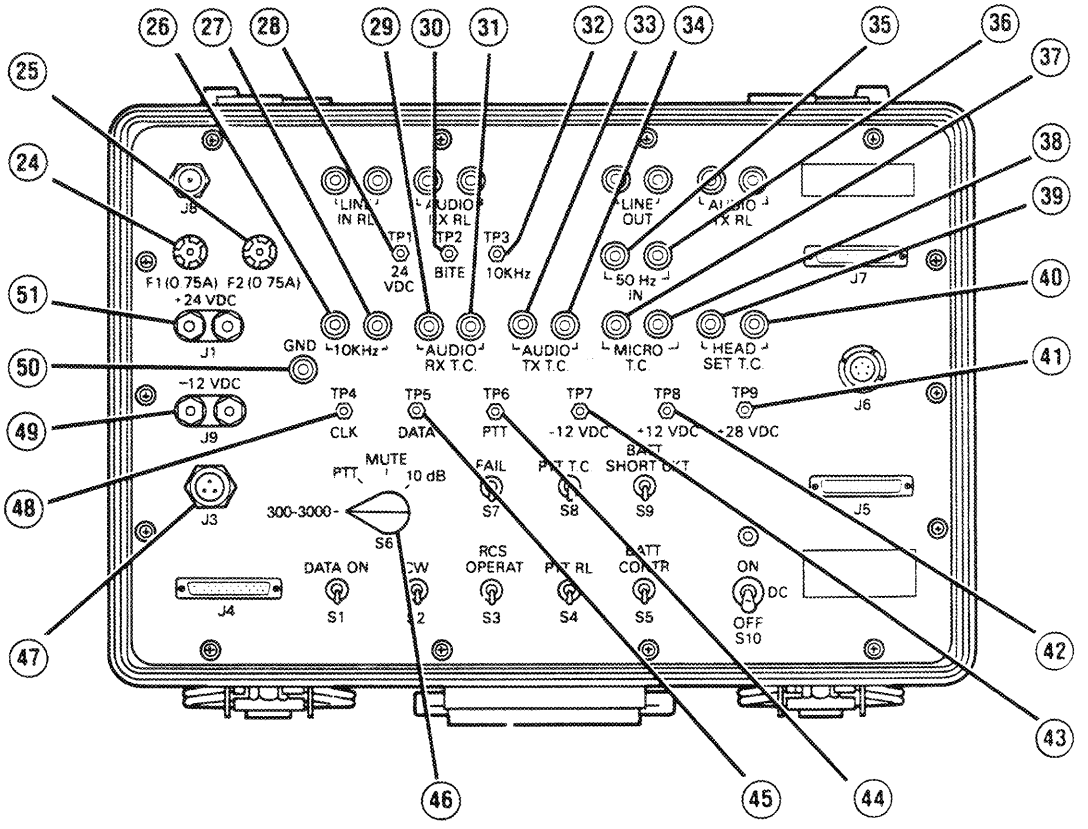


Figure 2-2. Remote Control Set Test Set Front Panel

Table 2-1. Remote Control Set Test Set Controls and Indicators (3 of 5)

Fig. and Index No.	Name	Purpose
2-2-(24)	F1	0.75 amp fuse.
-(25)	F2	0.75 amp fuse.
-(26)	E27	Input for 10-KHz used by R/E for synchronization of RCS.
-(27)	E28	Chassis ground.
-(28)	TP1	+24 VDC supply from battery.
-(29)	E29	Audio input to DC/DC Converter simulating receive audio from R/E.
-(30)	TP2	BITE signal from RCS.
-(31)	E30	Chassis ground.

2-3. CONTROLS AND INDICATORS (Cont.)

Table 2-1. Remote Control Set Test Set Controls and Indicators (4 of 5)

Fig. and Index No.	Name	Purpose
2-2- (32)	TP3	10-KHz clock generated by RL for ECCM module.
- (33)	E31	Audio input to Tone Converter simulating transmit audio from RL.
- (34)	E32	Audio input to Tone Converter simulating transmit audio from RL.
- (35)	E25	Input for 50-Hz clock signal to be converted by divide by 2 shift register to simulate data burst signal from Electronic Counter-Counter Measure (ECCM) module.
- (36)	E26	Chassis ground.
- (37)	E36	Connector for Audio RX from Tone Converter to be connected to headset.
- (38)	E35	Connector for Audio RX from Tone Converter to be connected to headset.
- (39)	TP9	+28 VDC battery charge voltage.
- (40)	E34	Input for MICRO T.C. (right) to be applied to the Tone Converter.
- (41)	TP8	+12 VDC generated by DC/DC Converter.
- (42)	E33	Input for MICRO T.C. (left) to be applied to the Tone Converter.
- (43)	TP7	-12 VDC generated by DC/DC Converter.
- (44)	TP6	PTT signal from DC/DC Converter.
- (45)	TP5	Serial Data generated by the RCS for R/E.
- (46)	S6	Selects test to be performed on serial data input from Remote Location.
- (47)	TP4	50-Hz clock signal for R/E.
- (48)	J3	Connects Battery Charger of Remote Location to test set

2-3. CONTROLS AND INDICATORS (Cont.)

Table 2-1. Remote Control Set Test Set Controls and Indicators (5 of 5)

Fig. and Index No.	Name	Purpose
2-2 - (49)	J9	Connects -12 VDC supply to test set, (BLK -12 VDC, RED DC Return).
- (50)	GND	Chassis ground.
- (51)	J1	Connects +24 VDC supply to test set.

Table 2-2. Remote Control Set Test Set Cable Assemblies

Cable	Part Number	Title
W1	569712-801	DC Power Cable
W33	3-94304//B	None
W62	3-94305//B	None
W63	3-94306//B	None
W64	3-94307//B	None
W65	3-94308//B	None
W66	3-94309//B	None

2-4. FUNCTIONAL DESCRIPTION OF REMOTE CONTROL SET TEST SET

The TS-4254/GRC-215 tests the reverse voltage and short-circuit protection, fault indicators, voltage levels, and charging currents of the RCS using front panel switches and test points. Two external power supplies provide operating voltages. +24.0 VDC connects through DC power cable W1 to connector J1. Switch S10 connects the voltage through fuse F2 to current-limiting resistors R4 and R5. (See FO-1.) Diode A1CR3 regulates the voltage to +12 and +5 VDC, respectively. The voltage of -12 VDC connects through the second cable W1 to connector J9. Switch S10 connects the voltage through fuse F1. Diode A1CR3 protects against reverse voltage, overvoltage, and transients. LED DS1 indicates the presence of the DC voltage when switch S10 closes. Pin C of connector J8 supplies a voltage of +24 VDC to the Remote Location (RL). Pin D of connector J8 provides a return path to ground.

2-4. FUNCTIONAL DESCRIPTION OF REMOTE CONTROL SET TEST SET (Cont.)

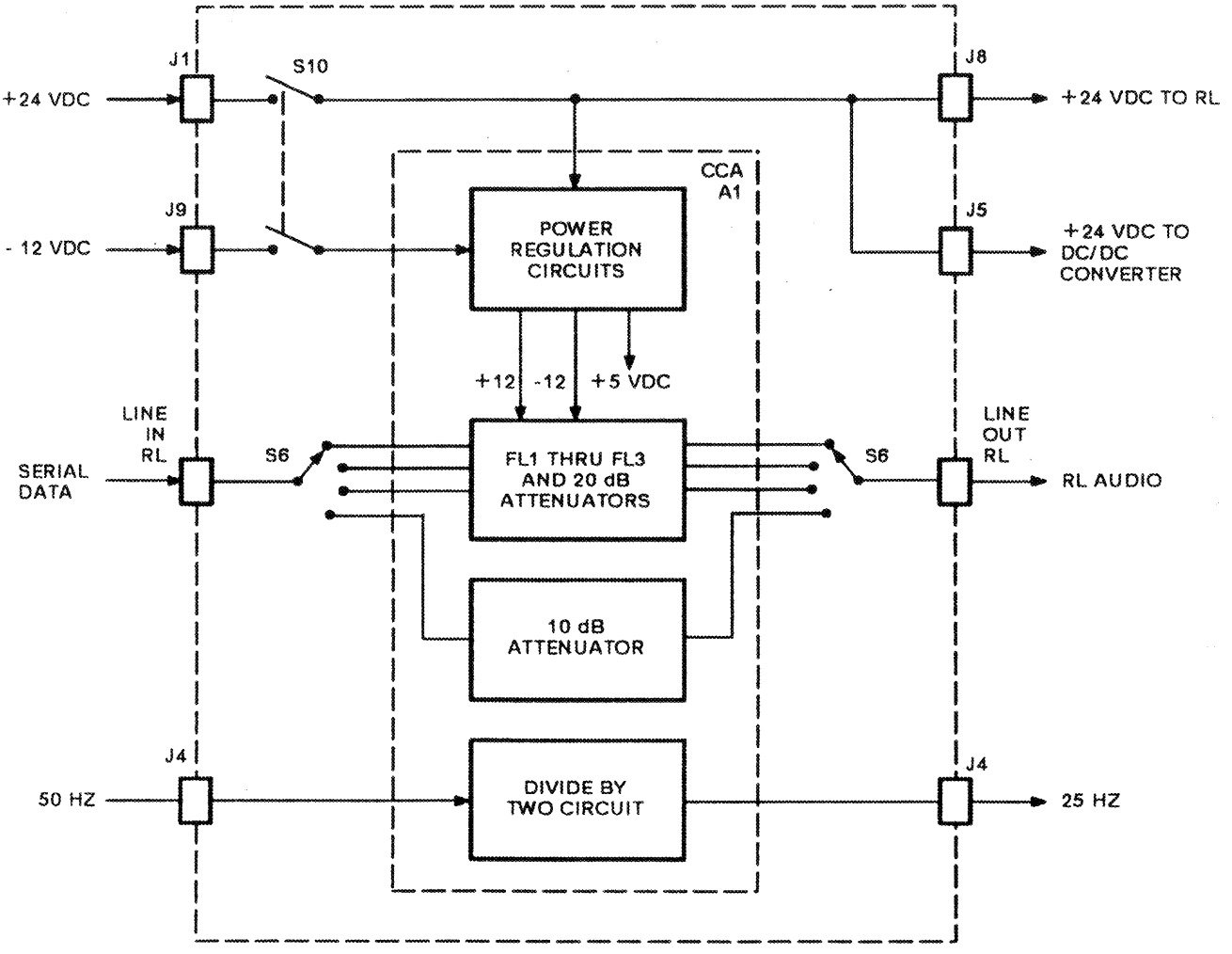


Figure 2-3. Block Diagram

J5 connects the test set to the DC/DC Converter to simulate connection of the Receiver/Exciter (R/E). Pin 3 of connector J5 supplies +24 VDC to the DC/DC Converter. Pin 1 supplies a return path to ground. The +24 VDC also connects through R6 and switch S7 to pin 9 to simulate the R/E BITE signal to the DC/DC Converter. When switch S7 closes a fault condition is indicated. Pin 2 connects the 50-Hz clock signal generated by the R/E Terminal to TP4 for monitoring. Serial control data from the R/E Terminal connects to the test set through pin 5 and is made available at TP5. The remote PTT signal from the DC/DC Converter connects to front panel TP6 through pin 23 of connector J5. Audio RX signals, simulating audio from the R/E, are applied to the DC/DC converter through the front panel connector Audio RX TC to pin 8 of connector J5. The Audio RX output, through the Tone Converter, can be monitored at HEAD SET TC. An Audio TX signal is input to the Tone Converter through front panel connector MICRO TC. Pins A and B of connector J6, simulate transmit audio from the RL. The Audio TX signal is sent from the DC/DC Converter

2-4. FUNCTIONAL DESCRIPTION OF REMOTE CONTROL SET TEST SET (Cont.)

through pins 24 and 25 of connector J5. These signals can be monitored at Audio TX TC. The 10-KHz clock signal, normally generated by the R/E, can be applied through front panel connector 10-KHz and connected to pin 6 of connector J5.

A second connector, J7, interfaces with the DC/DC Converter. It connects voltages +12 and -12 VDC, generated by the DC/DC Converter, to the test set. The +12 VDC connects through pin 4 of connector J7 to load resistor R5 and TP8. The -12 VDC connects through pin 19 to load resistor R4 and TP7. This allows measurement of the two supply voltages, normally connected to the Tone Converter, under a 160-mA load.

The +28 VDC of the battery charger connects to the test set through pin A of connector J3 to load resistor R3. A 200-mA load is placed on the charging voltage to simulate connection of a battery. The +28 VDC is made available at pin A of connector J3 when switch S5 is closed. It signals the presence of a rechargeable battery by grounding pin C of connector J3. The charging voltage is available for measurement at TP9 on the front panel. Switch S9 simulates a short across the +28 VDC supply by connecting pins A and B of connector J3 to test short circuit protection.

Connector J4 connects the test set to the RL and verifies operation by simulating connection of the ECCM module. A 50-Hz clock signal, normally from the ECCM, is applied to pin 2 of connector J4 through the 50-HZ IN connector on the front panel. This 50-Hz signal is also applied to IC U1, a divide-by-two integrated circuit. The resulting 25-Hz signal is sent through pin 5 of connector J4 to the RL, simulating the data burst generated by the ECCM. Switch S2 grounds pin 13 of connector J4, simulating the CW mode signal by the ECCM to the RCS. Switch S3 grounds pin 16 through resistor R7 to interlock the RCS ON/OFF switch to ON when RCS operates. Switch S1 grounds pin 22 to simulate the signal by the ECCM to the RCS to activate at every frequency data modification. Switch S4 grounds pin 23 to simulate the PTT signal applied to the RCS. Pin 6 connects the 10-KHz clock from the RCS to front panel TP3. The BITE signal from the RL connects through pin 9 of connector J4 to TP2. The +24 VDC battery voltage from RL connects to TP1 through pin 3 of connector J4 for measurement. The Audio TX RL connector on the front panel is the input for audio. This simulates transmit audio coming from the ECCM. The audio signal connects to pin 24 of connector J4. Audio RX RL is receive audio from the RL. It connects through pin 8 of connector J4. Resistor R2 presents a matching 600 ohm impedance to the input from the RL. Switch S6 is used to select voice audio, the 3305-Hz PTT signal, the 3421-Hz mute signal, or the serial data signal for measurement. An active bandpass filter separates the signal from other RL signals. In positions 1 through 3, the signal is first attenuated by a 20 dB attenuator and then filtered by a bandpass filter that consists of an operational amplifier. The output connects by switch S6 to Line Out on the front panel. In position 4, the input signal is attenuated by a 10 dB attenuator and connects directly to Line Out without filtering.

SECTION III
PREPARATION FOR USE

3-1. GENERAL

This section contains instructions for preparation for use of Remote Control Set Test Set TS-4254/GRC-215. These include instructions for unpacking, if any special procedures are required, inspecting unpacked equipment for damage, and any preliminary servicing procedures required to prepare the equipment for operation.

3-2. UNPACKING

No special procedures are required for removing the test set from its shipping container. Use normal care in handling electronic equipment. Avoid jarring test set during removal.

3-3. CHECKING UNPACKED EQUIPMENT

a. Reporting of 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.

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

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

3-4. PRELIMINARY SERVICING OF EQUIPMENT

Prior to placing the Test Set in service, perform the following visual inspection procedures. Do not connect unit to primary power source or any other equipment during these procedures.

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 IV
OPERATION

4-1. GENERAL

This section contains operating procedures for the RCS Test Set TS-4254/GRC-215.

4-2. INITIAL POSITION OF CONTROLS.

Table 4-1 lists the initial positions of the front panel controls prior to operating the equipment. See Figures 2-1 and 2-2 for location of front panel controls.

Table 4-1. Initial Position of Controls

Fig. and Index No.	Control Name	Position
2-1- (22), (21), (19), (17), (16)	S1 thru S5	S1 thru S5 respectively
- (20), (18), (15)	S7 thru S9	S7 thru S9 respectively
- (14)	S10	OFF
2-2- (46)	S6	300 - 3000

4-3. OPERATING INSTRUCTIONS

Position the initial control settings as shown in Table 4-1. The test set lid stores the cable assemblies. Connect cable W1 to connector J1 on the test fixture and connect to the external power supply, adjusted to +24.0 VDC. Prior to connecting -12 VDC from the power supply to J9 of test set, remove any jumper from the negative (-) output of the power supply to GND of the power supply. Then connect the negative output of the power supply to J9 BLK jack and the positive (+) output of the power supply to J9 RED jack. This is necessary to ensure proper equipment operation and to prevent a short circuit. Connect the other cable W1 to connector J9 on the test set and connect to the other power supply, adjusted to +12.0 VDC. Follow the test procedures in the technical manual for the UUT. When the test procedures are completed, switch S10 to OFF, S1 through S5 to S1 through S5 respectively, S6 position 1, and S7 through S9 to S7 through S9 respectively.

SECTION V
MAINTENANCE

5-1. GENERAL

This section contains operational check procedures, the symptom index, troubleshooting flowcharts, and removal/replacement procedures for Remote Control Set Test Set TS-4254/GRC-215.

The operational check is performed using the following test equipment.

Test Equipment

Digital Multimeter, AN/USM-486
Power Supply, PP-8202/G
Power Supply, PP-3940B
Function Generator, SG-1133/U
Lead, Test Minigrabbers Test Clips to BNC Male ITT Pomona (3787-C-48)
Oscilloscope, AN/USM-488
600 Ohm Load, Pomona
W1 DC Power Cables (2), 569712-801 (P/O TS-4254/GRC-215)

CAUTION

Prior to connecting -12 VDC from the power supply to J9 of Test Set remove any jumper from the negative (-) output of the power supply to GND of the power supply. Then connect the negative output of the power supply to J9 BLK jack and the positive (+) output of the power supply to J9 RED jack. This is necessary to ensure proper equipment operation and to prevent a short circuit.

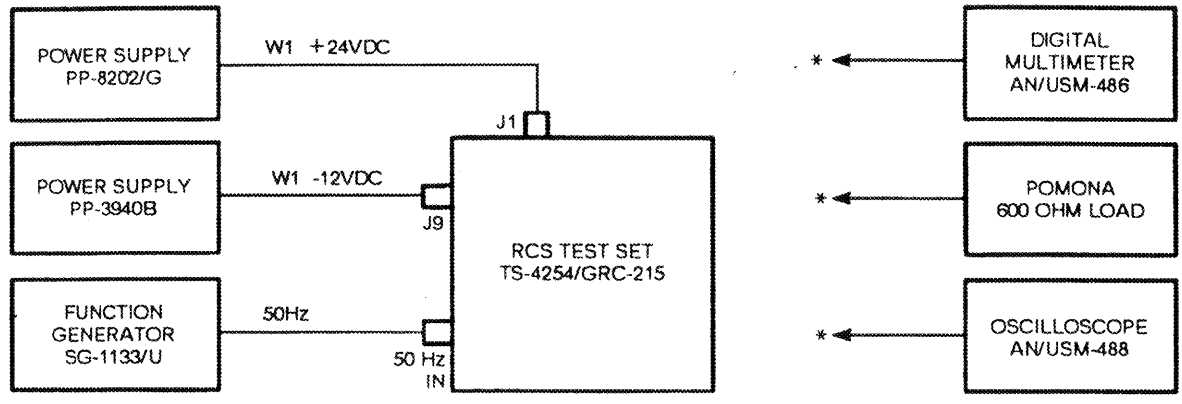


Figure 5-1. Operational Test Setup

5-2. OPERATIONAL CHECK OF REMOTE CONTROL SET TEST SET

a. Continuity and Resistance Check

1. Disconnect power cables W1 from J1 and J9 and disconnect the function generator. Measure for less than 1.5 ohms of resistance between the following points:

FROM	TO
AUDIO RX RL Black	Chassis Ground
J9 Red	GND
50 HZ IN Black	GND
J1 Black	GND
J4 pin 1	GND
J4 pin 2	50 HZ IN Red
J4 pin 3	TP1
J4 pin 6	TP3
J4 pin 8	AUDIO RX RL Red
J4 pin 9	TP2
J4 pin 24	AUDIO TX RL Red
J5 pin 1	GND
J8 pin D	GND
J5 pin 2	TP4
J5 pin 3	J8 pin C
J5 pin 5	TP5
J5 pin 6	10 KHZ Red
J5 pin 8	AUDIO RX TC Red
J5 pin 23	TP6
J5 pin 24	AUDIO TX TC Red
J5 pin 25	AUDIO TX TC Black
J6 pin A	MICRO TC left
J6 pin B	MICRO TC right
J6 pin C	GND (Set S8 to PTT T.C.)
J6 pin D	HEADSET TC Black
J6 pin E	HEADSET TC Red
J7 pin 4	TP8
J7 pin 19	TP7
AUDIO TX RL Black	GND
10 KHZ Black	GND
LINE OUT Black	GND
LINE IN RL Black	GND
AUDIO RX TC Black	GND

2. Set S9 to BATT SHORT CKT. Set S5 as listed below, and verify continuity or an open circuit between the following points:

SET-UP	FROM	TO	RESISTANCE
S5 to BATT CONTR	J3 pin A	J3 pin C	less than 1.5 ohms
S5 to S5	J3 pin A	J3 pin C	more than 20 Megohms

5-2. OPERATIONAL CHECK OF REMOTE CONTROL SET TEST SET (Cont.)

3. Set S9 to S9. Set switches as listed below, and verify continuity or an open circuit between the following test points:

SET-UP	FROM	TO	RESISTANCE
S2 to CW	J4 pin 13	GND	less than 1.5 ohms
S2 to S2	J4 pin 13	GND	more than 20 Megohms
S1 to DATA ON	J4 pin 22	GND	less than 1.5 ohms
S1 to S1	J4 pin 22	GND	more than 20 Megohms
S4 to PTT RL	J4 pin 23	GND	less than 1.5 ohms
S4 to S4	J4 pin 23	GND	more than 20 Megohms
S8 to PTT T.C.	J6 pin C	GND	less than 1.5 ohms
S8 to S8	J6 pin C	GND	more than 20 Megohms

4. Set switches as listed below and measure the resistance with the positive and negative probes connected to the following test points:

SET-UP	FROM	TO	RESISTANCE
S9 to BATT SHORT CKT	J3 pin A	J3 pin B	less than 1.5 ohms
S9 to S9	J3 pin A	J3 pin B	126 to 154 ohms
S9 to BATT SHORT CKT	J3 pin B	TP9	less than 1.5 ohms
S9 to S9	J3 pin B	TP9	126 to 154 ohms
S3 to RCS OPERAT	J4 pin 16	GND	9.0 to 11.0 Kohms
S3 to S3	J4 pin 16	GND	more than 20 Megohms
S7 to FAIL	J5 pin 9	J5 pin 3	162.0 to 198.0 Kohms
S7 to S7	J5 pin 9	J5 pin 3	more than 20 Megohms
N/A	TP7	GND	67.5 to 82.5 ohms
N/A	TP8	GND	67.5 to 82.5 ohms

5. Measure between AUDIO RX RL Red and Black terminals for 558 to 682 ohms.

6. Switch S6 between positions 300-3000, PTT, and MUTE and measure between LINE IN RL Red and Black terminals for 558 to 682 ohms in each position.

7. Repeat step 5 for LINE OUT Red and Black terminals.

8. Set S6 to 10 dB position and measure between LINE IN RL Red and Black terminals for 584 to 876 ohms.

9. Repeat step 7 for LINE OUT Red and Black terminals.

10. Perform a diode check between J5 pin 1 and J8 pin C.

5-2. OPERATIONAL CHECK OF REMOTE CONTROL SET TEST SET (Cont.)

b. Input Power Check

1. Reconnect the test set as shown in figure 5.1 and adjust the PP-8202/G power supply to +24.0 (+23.0 to +25.0) VDC. Set the function generator for a output of a 50 Hz square wave at 5 Vpp. Ensure offset is used and square wave goes from 0 up (+) to 5 Vpp.

2. Switch S10 to ON and verify that LED DS1 is lit.

3. Set S7 to ON and measure for +24.0 (+23.0 to +25.0) VDC between the following points:

FROM	TO
J8 pin C	GND
J5 pin 3	GND
J5 pin 9	GND

4. With the oscilloscope measure for a 25 Hz squarewave with a peak value of 4 to 5 Vpp between J4 pin 5 and GND.

c. Serial Data Test

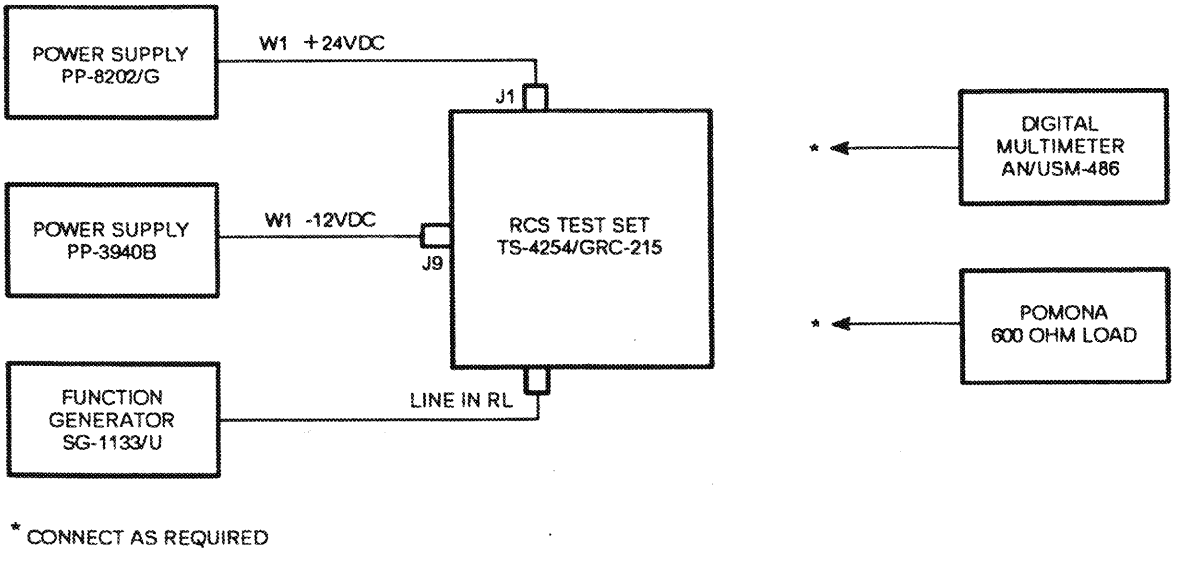


Figure 5-2. Serial Data Test Setup

1. Set up test equipment as shown in figure 5-2. Adjust the PP-3940B power supply to +12.0 (+11.5 to +12.5) VDC.

5-2. OPERATIONAL CHECK OF REMOTE CONTROL SET TEST SET (Cont.)

2. Set S6 to position (1) 300-3000. Disconnect function generator from test set. Connect function generator across 600 ohm load to the multimeter. Adjust the function generator for a sine wave output of 1000 Hz at 775 mV. Disconnect function generator from 600 ohm load and multimeter. Reconnect function generator to LINE IN RL jack on test set.

3. Measure for 57 to 97 mV at LINE OUT.

4. Set S6 to position (2) PTT. Disconnect function generator from test set. Connect function generator across 600 ohm load to the multimeter. Adjust the function generator for a sine wave output of 3305 Hz (+/- 2 Hz) at 775 mV. Disconnect function generator from 600 ohm load and multimeter. Reconnect function generator to LINE IN RL jack on test set.

5. Measure for 57 to 97 mV at LINE OUT.

6. Set S6 to position (3) MUTE. Disconnect function generator from test set. Connect function generator across 600 ohm load to the multimeter. Adjust the function generator for a sine wave output of 3421 Hz at 775 mV. Disconnect function generator from 600 ohm load and multimeter. Reconnect function generator to LINE IN RL jack on test set.

7. Measure for 57 to 97 mV at LINE OUT.

8. Set S6 to position (4) 10 dB. Disconnect function generator from test set. Connect function generator across 600 ohm load to the multimeter. Adjust the function generator for a sine wave output of 1000 Hz at 775 mV. Disconnect function generator from 600 ohm load and multimeter. Reconnect function generator to LINE IN RL jack on test set.

9. Place the Pomona 600 ohm load across the LINE OUT terminals and measure for 230 to 270 mV across the 600 ohm load.

d. Continuity Testing of Associated Cables.

1. Test continuity of each cable (UUT), W1, W33, W62, W63, W64, W65, and W66 for less than 0.5 ohms resistance with DMM.

5-3. SYMPTOM INDEX

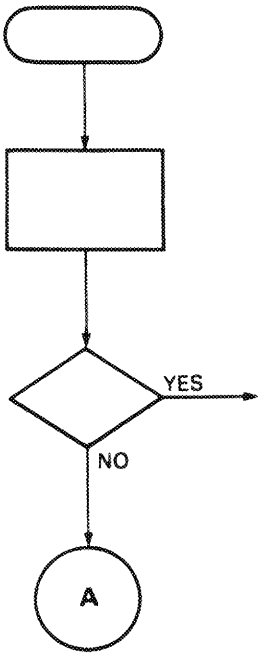
The following chart is intended to assist in rapid identification and replacement of faulty components.

SYMPTOM	TROUBLESHOOTING FLOWCHART PARAGRAPH
LED DS1 Does Not Light	5-6
+12, -12, or +5 VDC Missing	5-7
FL1, FL2, or FL3 Faulty	5-8

5-4. FLOWCHARTS 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 flowchart.

5-5. TROUBLESHOOTING

INITIAL SETUP

Test Equipment	Equipment Condition
Digital Multimeter, AN/USM-486 Power Supply, PP-8202/G Power Supply, PP-3940B Function Generator, SG-1133/U Oscilloscope, AN/USM-488 600 Ohm Load, Pomona W1 DC Power Cables (2), 569712-801 (P/O TS-4254/GRC-215)	First Power Supply adjusted to +24.0 (+23.0 to +25.0) VDC. Second Power Supply adjusted to +12.0 (+11.5 to +12.5) VDC. Test Set Switches: S1 thru S5 to S1 thru S5 respectively S6 to position 1 S7 thru S9 to S7 thru S9 respectively S10 to OFF
Tools Tool Kit TK-17	

CAUTION

Prior to connecting -12 VDC from the power supply to J9 of Test Set remove any jumper from the negative (-) output of the power supply to GND of the power supply. Then connect the negative output of the power supply to J9 BLK jack and the positive (+) output of the power supply to J9 RED jack. This is necessary to ensure proper equipment operation and to prevent a short circuit.

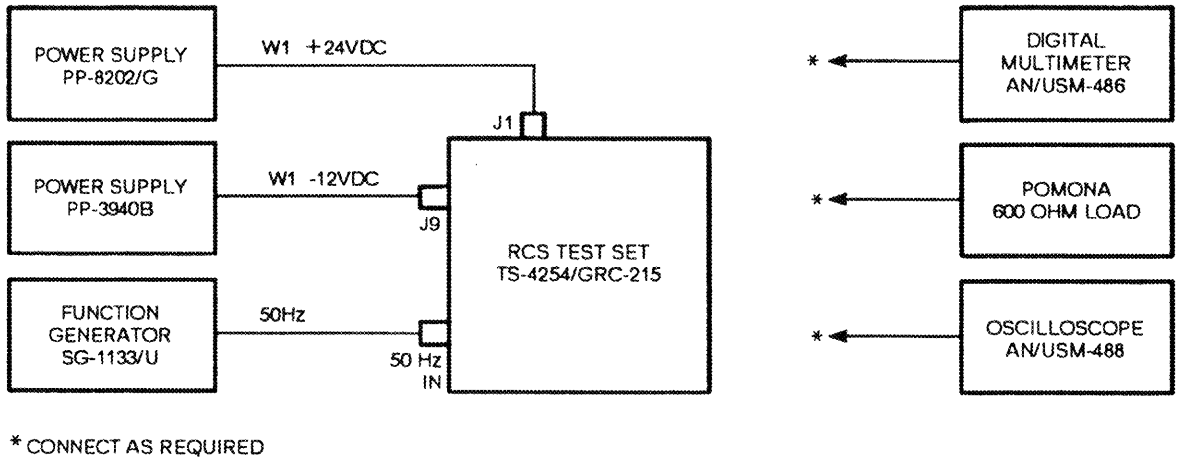
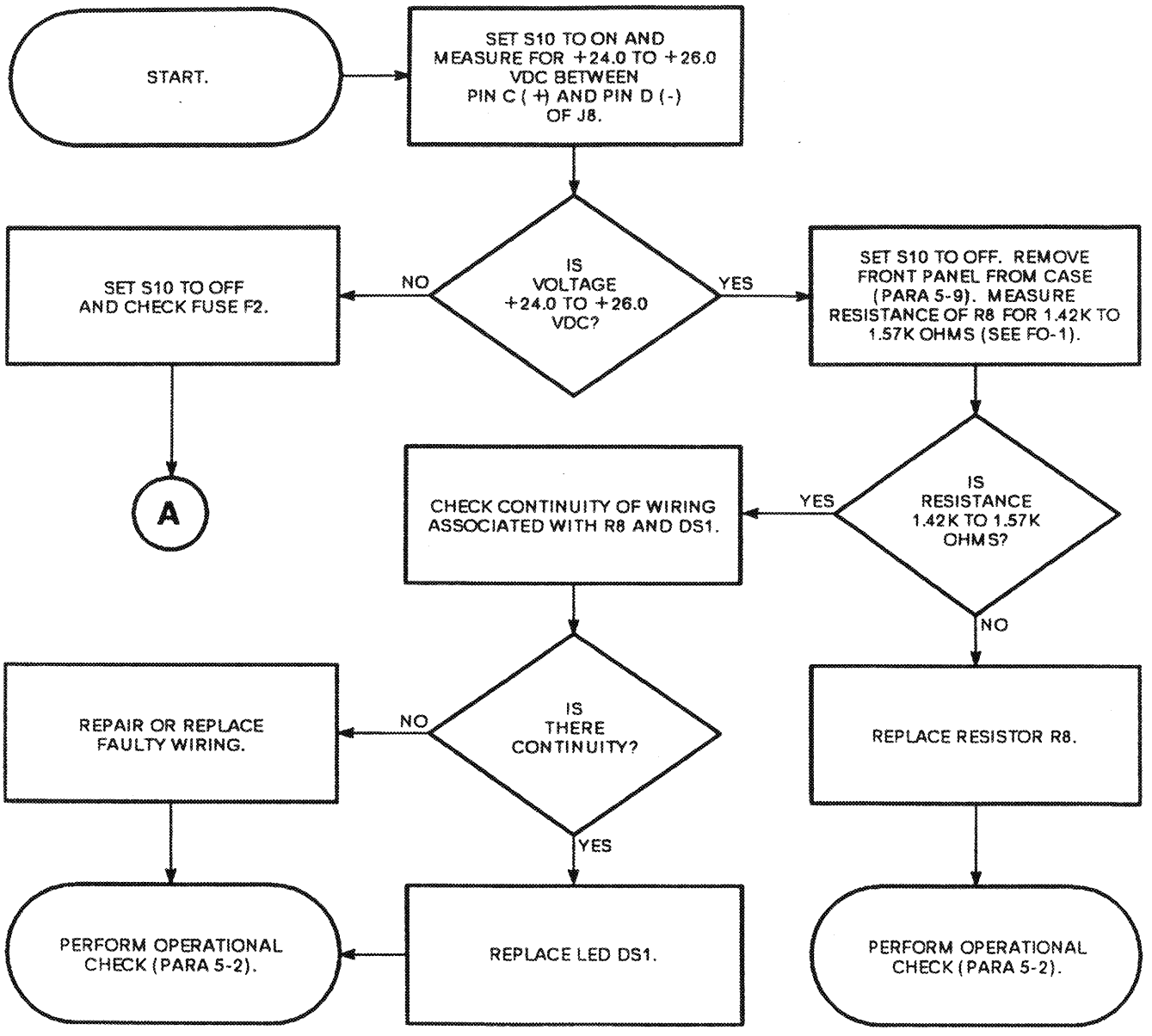


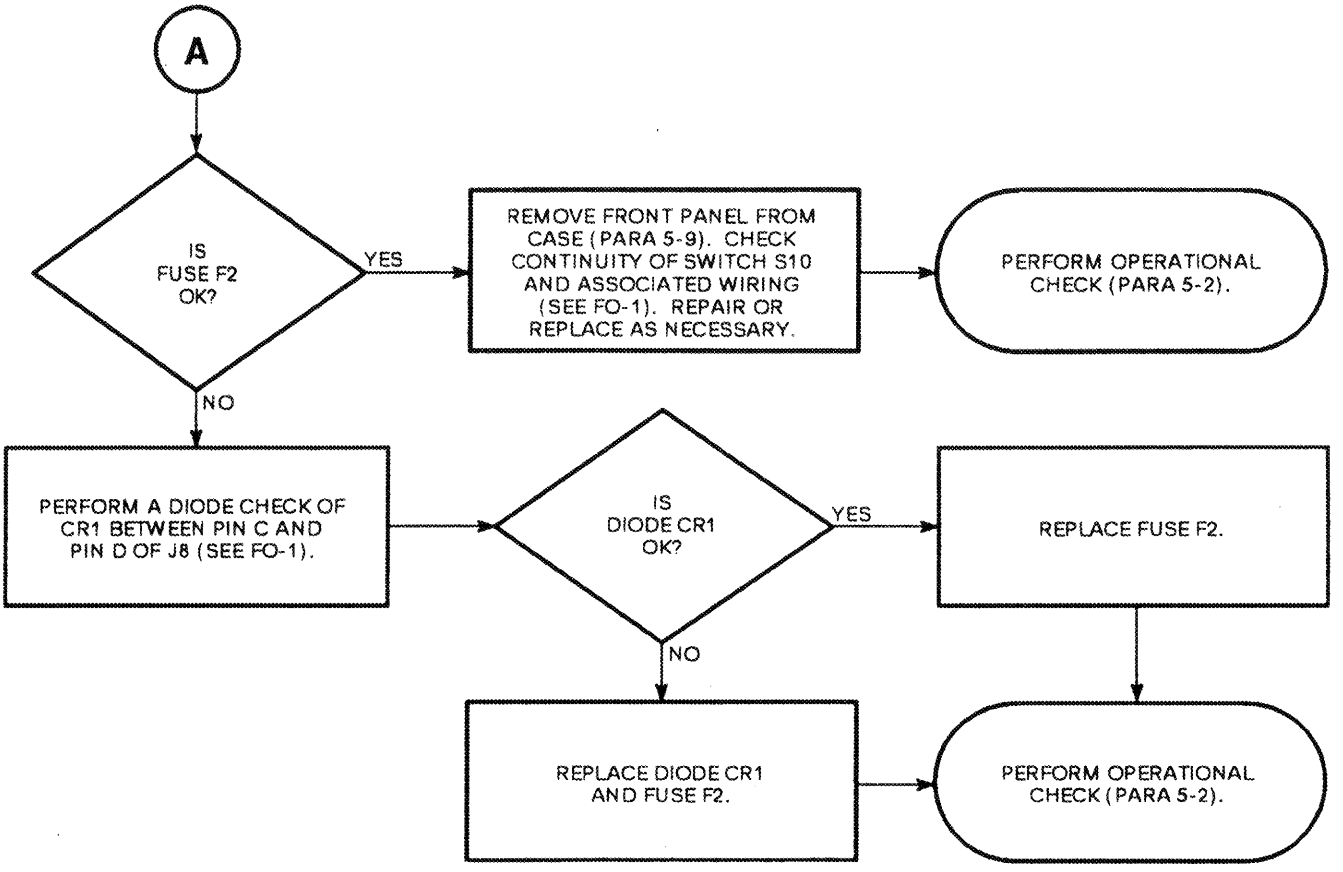
Figure 5-3. Initial Setup

5-6. LED DS1 DOES NOT LIGHT

Refer to paragraph 5-5 for initial setup illustration and test equipment listing.

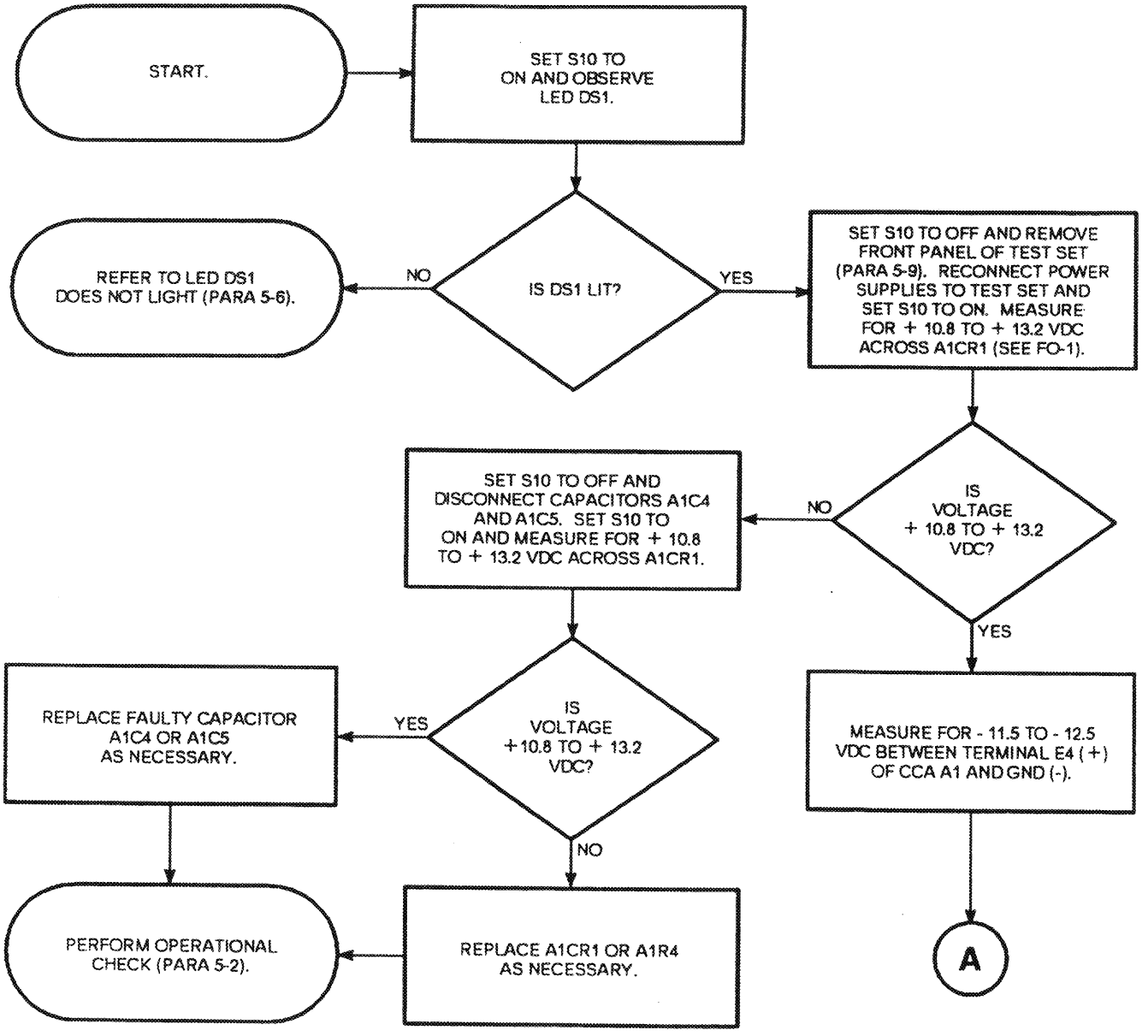


5-6. LED DS1 DOES NOT LIGHT (Cont.)

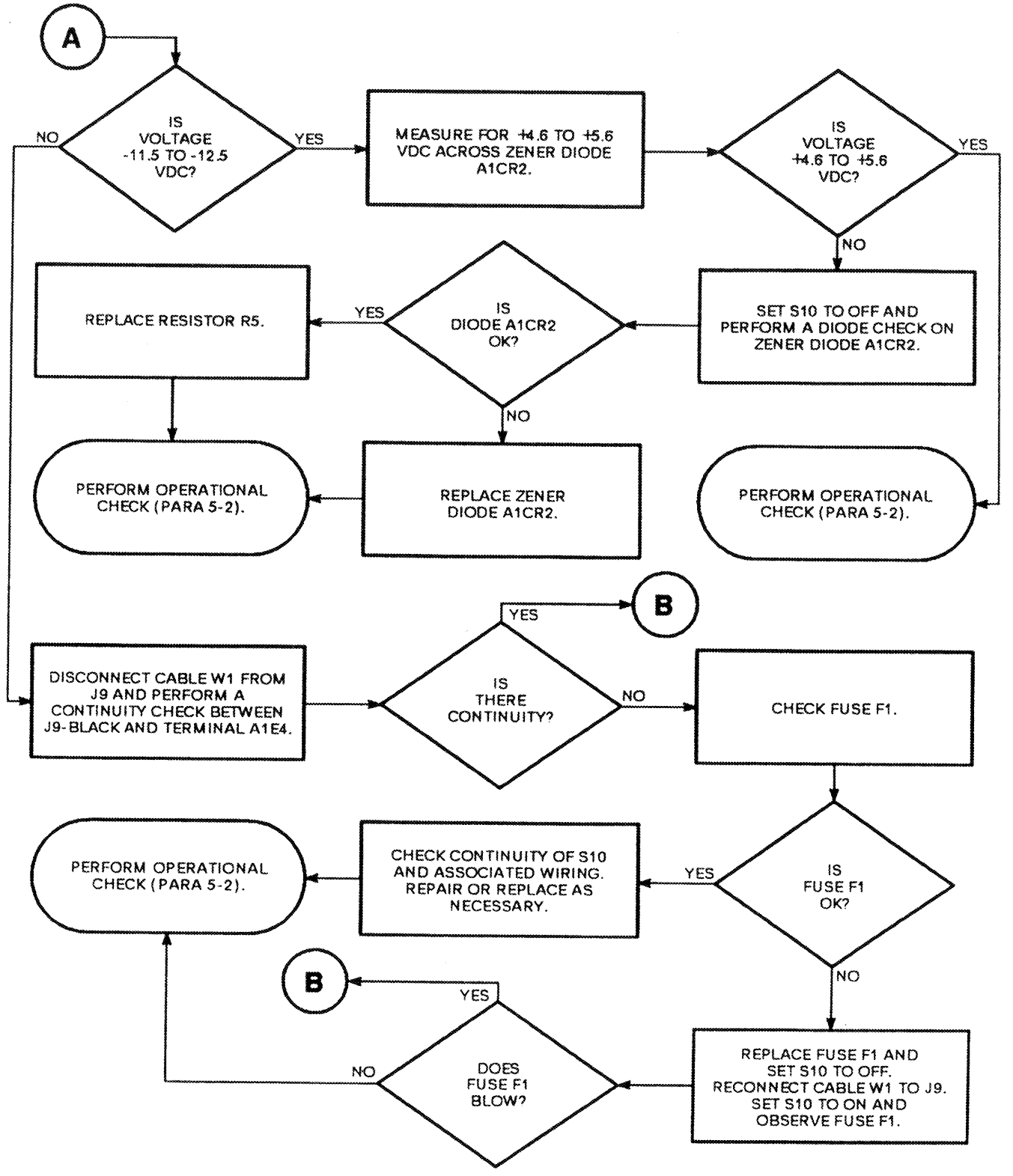


5-7. +12, -12, OR +5 VDC MISSING

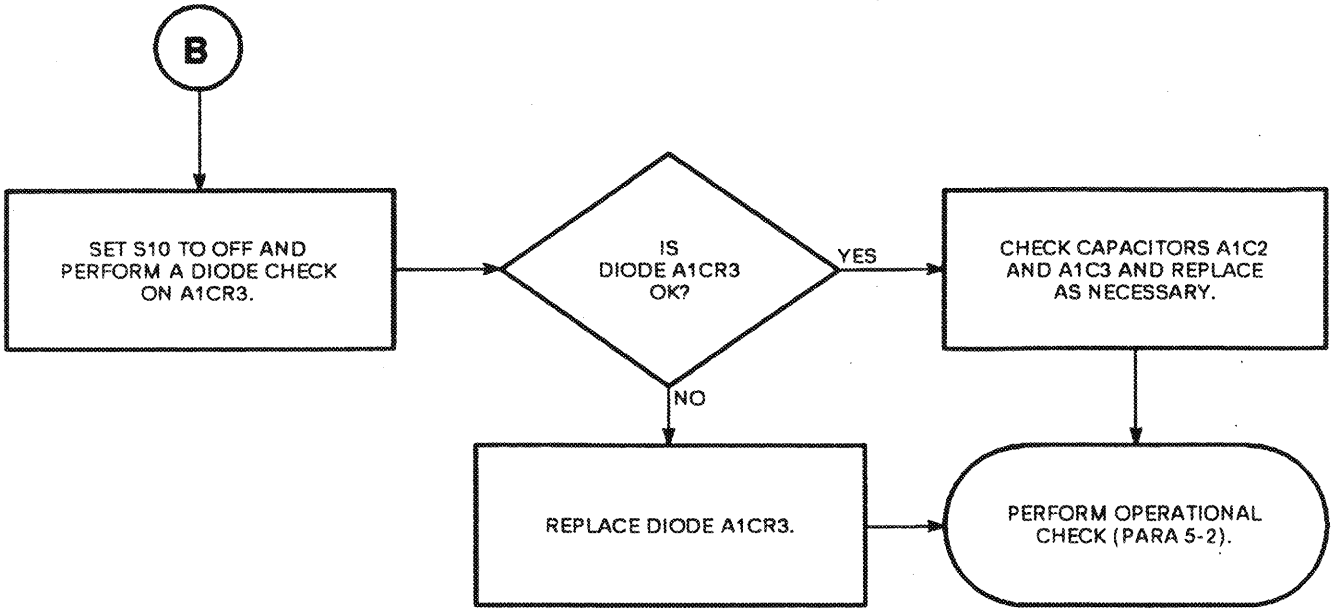
Refer to paragraph 5-5 for initial setup illustration and test equipment listing.



5-7. +12, -12, OR +5 VDC MISSING (Cont.)

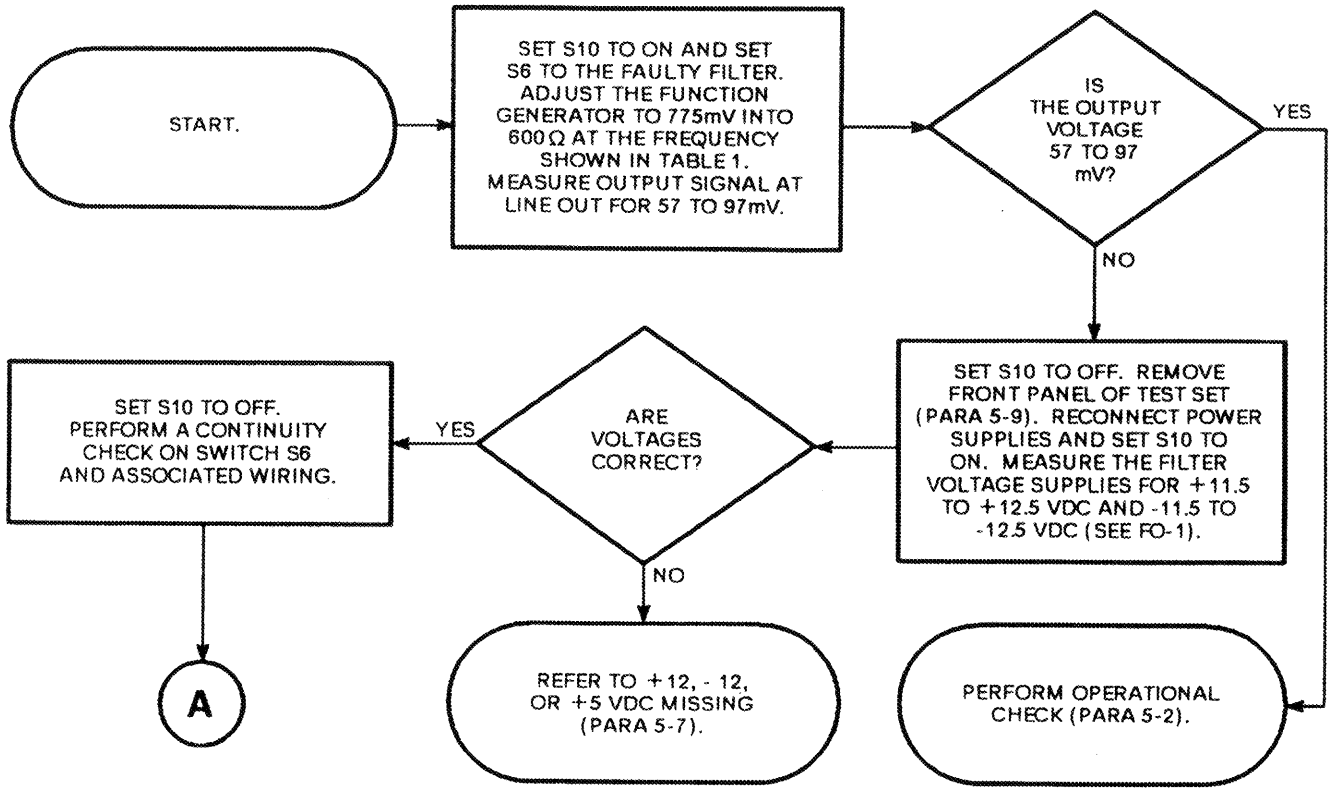


5-7. +12, -12, OR +5 VDC MISSING (Cont.)



5-8. FL1, FL2, OR FL3 FAULTY

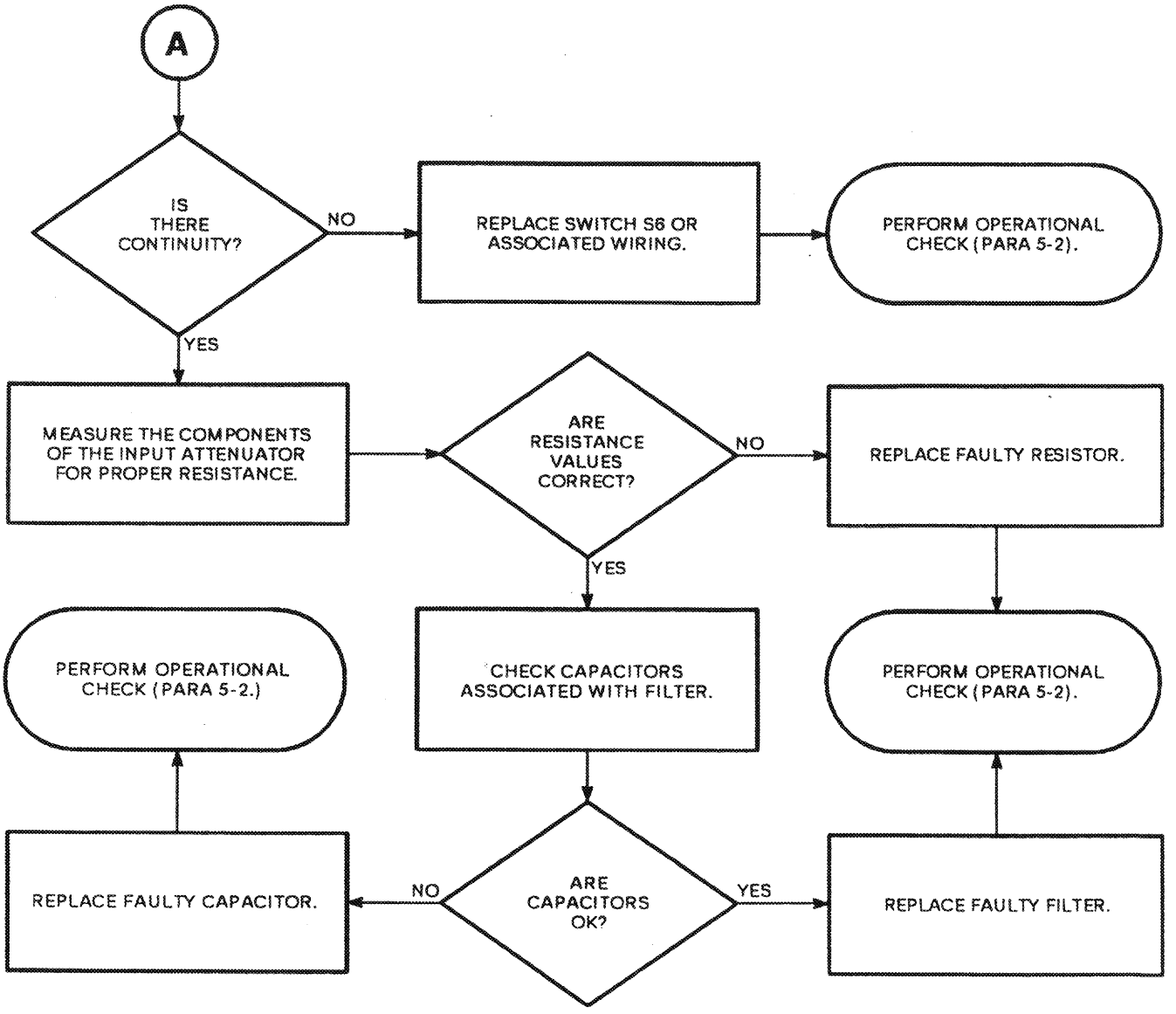
Refer to paragraph 5-5 for initial setup illustration and test equipment listing.



S6	FUNCTION GENERATOR FREQUENCY
300-3000	1000 Hz
PTT	3305 Hz
MUTE	3421 Hz

TABLE 1

5-8. FL1, FL2, OR FL3 FAULTY (Cont.)



5-9. REMOVAL/REPLACEMENT OF FRONT PANEL AND COMPONENTS (SEE APPENDIX C)

WARNING

All Removal/Replacement procedures are performed with power removed. For safety purposes disconnect power cables before beginning procedures.

REMOVAL:

1. Remove 14 cross-tip screws (1) and flatwashers (2) securing front panel (3) to case (4).
2. Lift front panel (3) away from case (4).
3. Position front panel so component to be replaced is accessible.
4. Tag and unsolder wires from components being replaced.
5. Loosen and remove any hardware securing component and remove component.

REPLACEMENT:

1. Position component.
2. Replace and tighten any hardware that secures component.
3. Solder wires to replacement component and remove tags.
4. Position front panel (3) in case (4).
5. Tighten 14 cross-tip screws (1) and flatwashers (2) that attach front panel (3) to case (4).
6. Perform Operational Check (para. 5-2).

5-9. REMOVAL/REPLACEMENT OF FRONT PANEL AND COMPONENTS (SEE APPENDIX C) (Cont.)

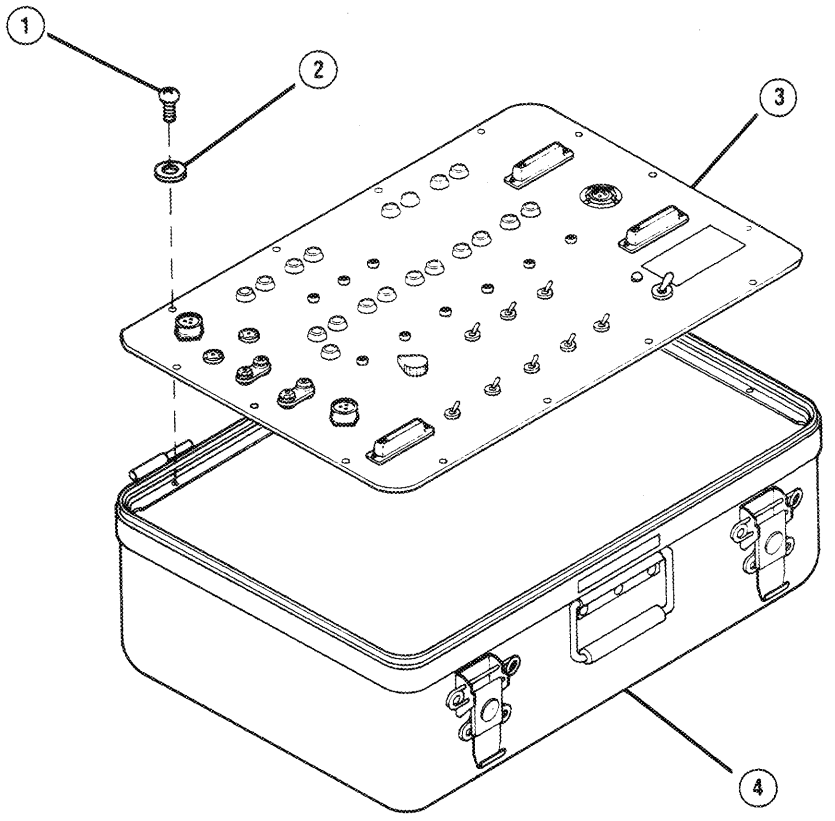


Figure 5-4. Front Panel Removal/Replacement

SECTION VI
PREPARATION FOR STORAGE OR SHIPMENT

6-1. GENERAL

a. Army. Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness.

b. Navy. Refer to NAVSUP PUB 503.

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

6-2. MARKING

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

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 RCS Test Set TS-4254/GRC-215.

A-2. PUBLICATIONS

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

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

First Aid for Soldiers . . . . . FM 21-11

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

Marking for Shipment and Storage MIL-STD-129H

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

Quality Deficiency Report . . . . . SF 368

Report of Discrepancy (ROD) . . . . . SF 364

Reporting of Item and Packaging Discrepancies . . . . . SECNAVINST 4355.18

Reporting of Transportation Discrepancies in Shipment . . . . . NAVSUPINST 4610.33C

Ships Maintenance and Material Management (3-M) Manual, Promulgation of . . . . . OPNAVINST 4790.2A

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

Transportation Discrepancy Report (TDR) . . . . . SF 361

Unit, Intermediate Direct Support, and General Support Maintenance Manual For Converter CV-3968/GRC-215 (NSN 5895-01-205-0645) . . . . . TM 11-5895-1309-24
Navy EE162-FG-MMI-010/W110-CV3968
Air Force TO 31R2-2GRC215-22

Unsatisfactory Equipment Reporting TO-00-35D54

APPENDIX B
MAINTENANCE ALLOCATION CHART

B-1. GENERAL

This appendix provides a summary of the maintenance operations for the RCS Test Set TS-4254/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 equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

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 material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army 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

TEST SET, REMOTE CONTROL, TS-4254/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	TEST SET, REMOTE CONTROL TS-4254/GRC-215 (950578-801)	REPLACE				0.05			
		TEST				1.0		1-5,10,11 12	A,E
		REPAIR				1.0		6-9	A,D,E,F
01	CASE, TEST SET	REPAIR				0.5		6	
02	FRONT PANEL ASSY (1-94283.0000//A)	REPAIR				1.0			B,E,F
0201	CCA A1 (1-94359.0000//B)	REPAIR				1.0			B,E,F
0202	PLATE ASSEMBLY, REMOTE	TEST				0.3		1	B,E,F
		REPAIR				0.5		6	
03	CABLE ASSY, W33 (3-94304.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	
04	CABLE ASSY, W62 (3-94305.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	
05	CABLE ASSY, W63 (3-94306.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	
06	CABLE ASSY, W64 (3-94307.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	
07	CABLE ASSY, W65 (3-94308.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	
08	CABLE ASSY, W66 (3-94309.0000//B)	TEST				0.3		1	C
		REPAIR				0.5		6	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TEST SET, REMOTE CONTROL, TS-4254/GRC-215

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	H	MULTIMETER, DIGITAL AN/USM-486	6625-01-145-2430	FLUKE 8050A-01
2	H	POWER SUPPLY PP-8202/G	6130-00-160-0827	HP 62748
3	H	POWER SUPPLY PP-3940B	6130-01-164-0548	POWER-10 4006
4	H	FUNCTION GENERATOR SG-1133/U	6625-01-028-4989	HP 3312A
5	H	OSCILLOSCOPE AN/USM-488	6625-01-187-7847	TEKTRONIX 2235L
6	H	TOOL KIT, ELECT. TK-17 (INCL. METRIC)	5180-01-195-0855	JENSEN JTK-17RM
7	H	WORKSTATION, STATIC	4940-01-087-3458	3M 8021
8	H	REPAIR KIT, PCB MK-772/U	5999-00-757-7042	
9	H	MAINTENANCE KIT, PCB MX-10897/G	5895-01-267-9473	PACE MODEL RNR P/N 8007-0117
10	H	CABLE ASSEMBLY W1* (2EA)		ELMER 569712.801//B
11	H	LEAD, TEST MINIGRABBER TEST CLIPS TO BNC MALES	6625-01-040-0572	ITT POMONA 3787-C-48
12	H	LOAD, 600 OHM		ITT POMONA MDP-R-600
		**PP-8214/G (NSN 6130-00-150-0028) PROVIDES IDENTICAL CAPABILITY WHEN SOURCE POWER IS 230V, 50 CYCLE. AIR FORCE USE ONLY.		
		** IT IS PART OF THE TEST SET.		

SECTION IV REMARKS
FOR
REMOTE CONTROL SET TEST SET TS-4254/GRC-215

REFERENCE CODE	REMARKS
A	CONSISTS OF TEST/REPAIR TO FRONT PANEL ASSEMBLY OR CABLE ASSEMBLIES. INCLUDES PERFORMANCE CHECK.
B	TEST/REPAIR AS PART OF NEXT HIGHER ASSEMBLY.
C	CONSISTS OF POINT-TO-POINT CONTINUITY CHECKS.
D	CABLE ASSEMBLY, W1 (569712.801//B) IS NOT REPAIRABLE.
E	ELECTROSTATIC SENSITIVE DEVICES.
F	PIECE PART REPAIR.

APPENDIX C
OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

TABLE OF CONTENTS

SECTION I
INTRODUCTION

1. Scope

This manual lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of organizational, direct support, and general maintenance of Remote Control Test Set, TS-4254/GRC-215. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numeric sequence, with the parts in each group listed in ascending item number sequence. Figure numbers are listed directly beneath the group header. Bulk materials are listed in item name sequence.

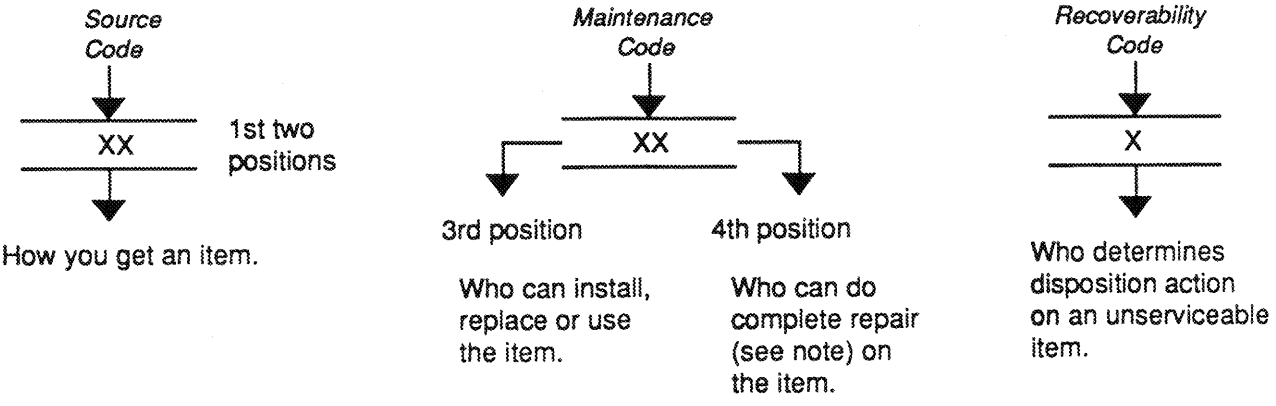
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in (column (5)) for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listings, followed by a list in alphameric sequence of all part numbers appearing in the listing. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

3. Explanation of Columns (Section II and III)

a. Item No. (Column (1)). Indicates the number used to identify items called out in the illustration.

b. SMR Code (Column (2)). The source, maintenance, and recoverability (SMR) code is a five-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



NOTE

Complete repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) *Source Code.* The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	*Explanation*
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the third position of the SMR code. **NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MO – Made at org/ AVUM category MF – Made at DS/ AVUM category MH – Made at GS category ML – Made at Specialized Repair Activity (SRA) MD – Made at Depot	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the description and usable on code (UOC) column and listed in the Bulk Material group of the repair parts list. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at a higher category, order the item from the higher category of maintenance.
AO – Assembled by org/ AVUM category AF – Assembled by DS/ AVIM category AH – Assembled by GS category AL – Assembled by SRA AD – Assembled by Depot	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the category of maintenance indicated by the source code. If the disposition code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher category,order the item from the higher category of maintenance.

XA – Do not requisition an "XA" coded item. Order its next higher assembly.
XB – If an "XB" item is not available from salvage, order it using the FSCM and part number given.
XC – Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturers part number.
XD – Item is not stocked. Order an "XD" coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

(2) *Maintenance Code.* Maintenance codes tell you the category of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code. entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following categories of maintenance.

Code	*Application/Explanation*
C –	Crew or operator maintenance done within organizational or aviation maintenance.
Q –	Organizational or aviation unit category can remove, replace, and use the item.
F –	Direct support or aviation intermediate category can remove, replace, and use the item.
H –	General support category can remove, replace, and use the item.
L –	Specialized repair activity can remove, replace, and use the item.
D –	Depot category can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i.e., perform all authorized repair functions). This position will contain one of the following maintenance codes:

NOTE

Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Code	*Application/Explanation*
O –	Organizational or aviation unit is the lowest category that can do complete repair of the item.
F –	Direct support or aviation intermediate is the lowest category that can do complete repair of the item.
H –	General support is the lowest category that can do complete repair of the item.
L –	Specialized repair activity (designate the specialized repair activity) is the lowest category that can do complete repair of the item.
D –	Depot is the lowest category that can do complete repair of the item.
Z –	Nonreparable. No repair is authorized.
B –	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user category.

(3) *Recoverability Code.* Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability codes	*Application/Explanation*
Z	– Nonreparable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in the third position of SMR Code.
O	– Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit category.
F	– Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate category.
H	– Reparable item. When uneconomically reparable, condemn and dispose of the item at general support category.
D	– Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.
L	– Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	– Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/ directives for specific instructions.

c. FSCM (Column (3)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. Part Number (Column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. Description and Usable on Code (UOC) (Column (5)). This column includes the following information.

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) In the Special Tools section, the basis of issue (BOI) appears as the last line in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(3) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both section II and section III.

f. Qty (Column (6)). Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

4. Explanation of Columns (Section IV)

a. National Stock Number (NSN) Index.

(1) *Stock number column.* This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. When requisitioning items use the complete NSN (13 digits).

(2) *Fig. column.* This column lists the number of the figure where the item is identified/located. The illustrations are in numerical sequence in sections II and III.

(3) *Item column.* The item number identifies the item associated with the figure listed in the adjacent Fig. column. This item is also identified by the NSN listed on the same line.

b. Part Number Index. Part numbers in this index are listed by part number in ascending alphameric sequence.

(1) *FSCM column.* This column lists the Federal supply code for manufacturer (FSCM).

(2) *Part number column.* This column indicates the part number assigned to the item.

(3) *Stock number column.* This column lists the National stock number for the associated part number and manufacturer identified in the part number and FSCM columns to the left.

(4) *Fig. column.* This column lists the number of the figure where the item is identified/located in sections II and III.

(5) *Item column.* The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

5. Special Information

a. Associated Publications. None.

b. National Stock Numbers. National stock numbers (NSN's) that are missing from P source coded items have been applied for and will be added to this TM by future change/revision when they are entered in the Army Master Data File (AMDF). Until the NSN's are established and published, submit exception requisitions to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-MM, Fort Monmouth, NJ 07703-5000 for the part required to support your equipment.

NOTE

An item SMR coded "H" in the third, fourth, and fifth position is interpreted as Intermediate for Air Force Repair.

6. How to Locate Repair Parts

a. When National stock number or part number is not known.

(1) *First.* Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) *Second.* Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) *Third.* Identify the item on the figure and note the item number.

(4) *Fourth.* Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.

(5) *Fifth.* Refer to the Part Number Index to find the NSN, if assigned.

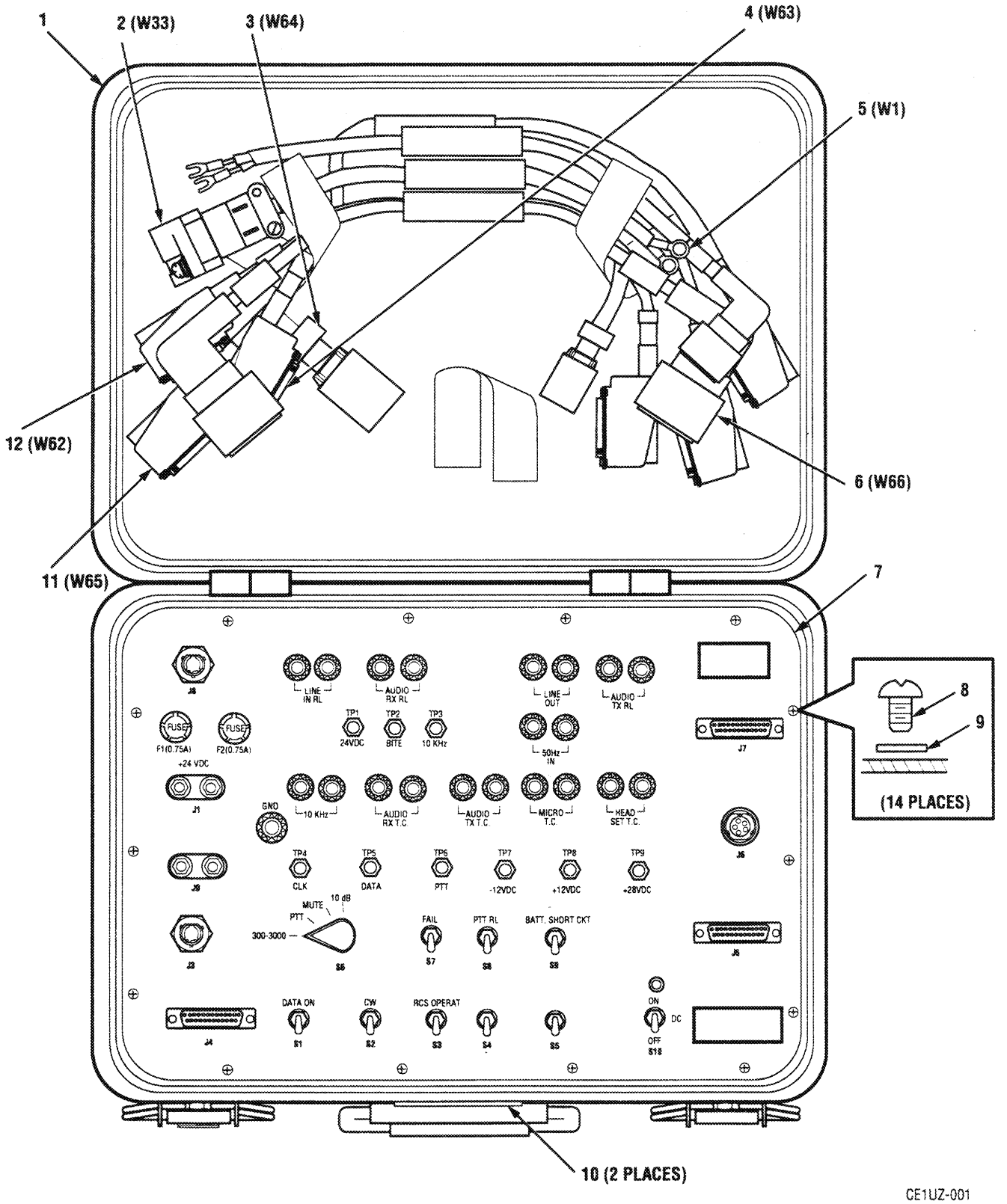
b. When National stock number or part number is known.

(1) *First.* Using the Index of National stock numbers and part numbers, find the pertinent National stock number or part number. The NSN index is in National item identification number (NIIN) sequence (para 4*a*(1)). The part numbers in the part number index are listed in ascending alphameric sequence (para 4*b*). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) *Second.* After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

7. Abbreviations

Not applicable.



CE1UZ-001

Figure 1. Test Set, Remote Control Set TS-4254/GRC-215 (950578-801)

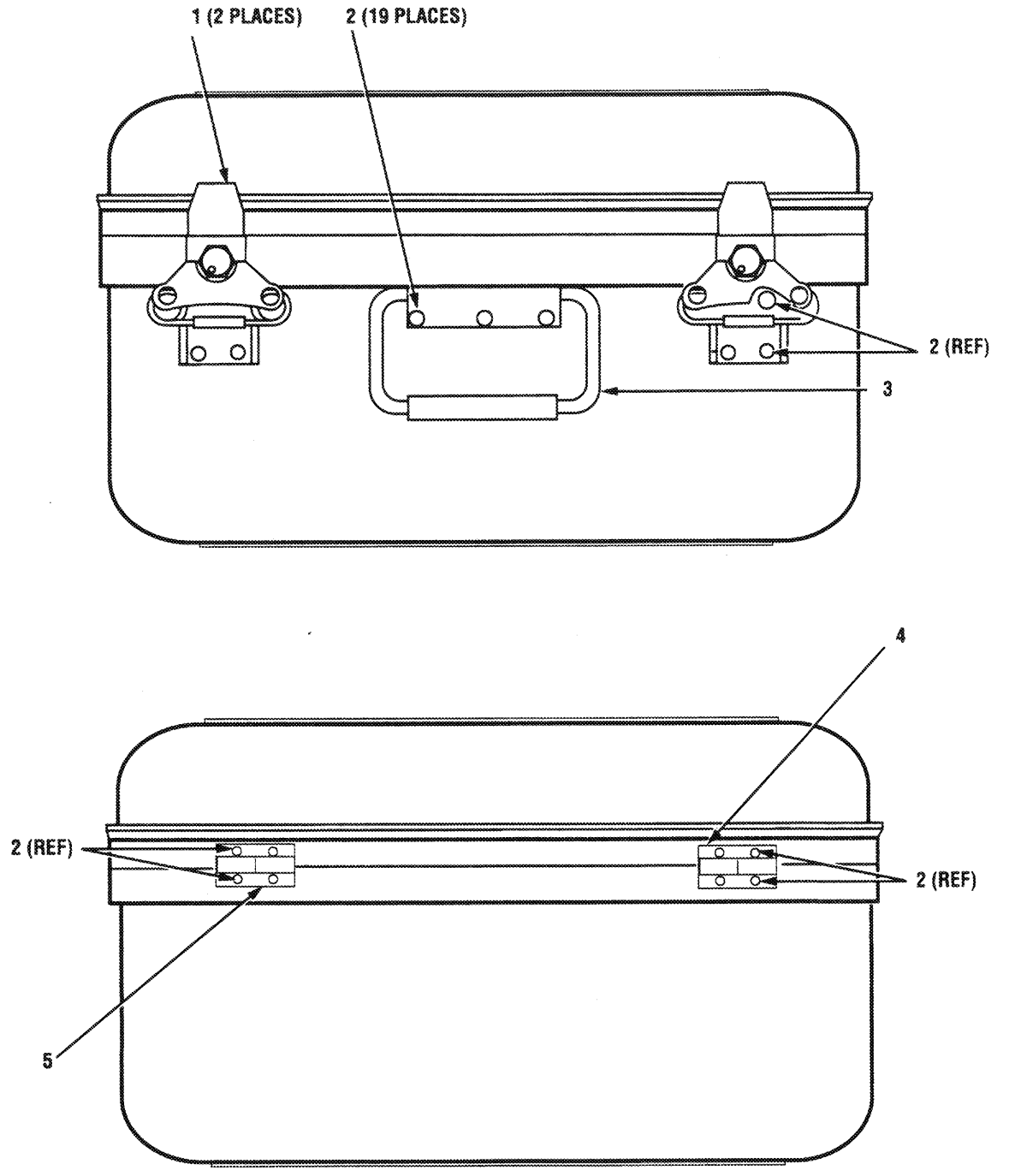
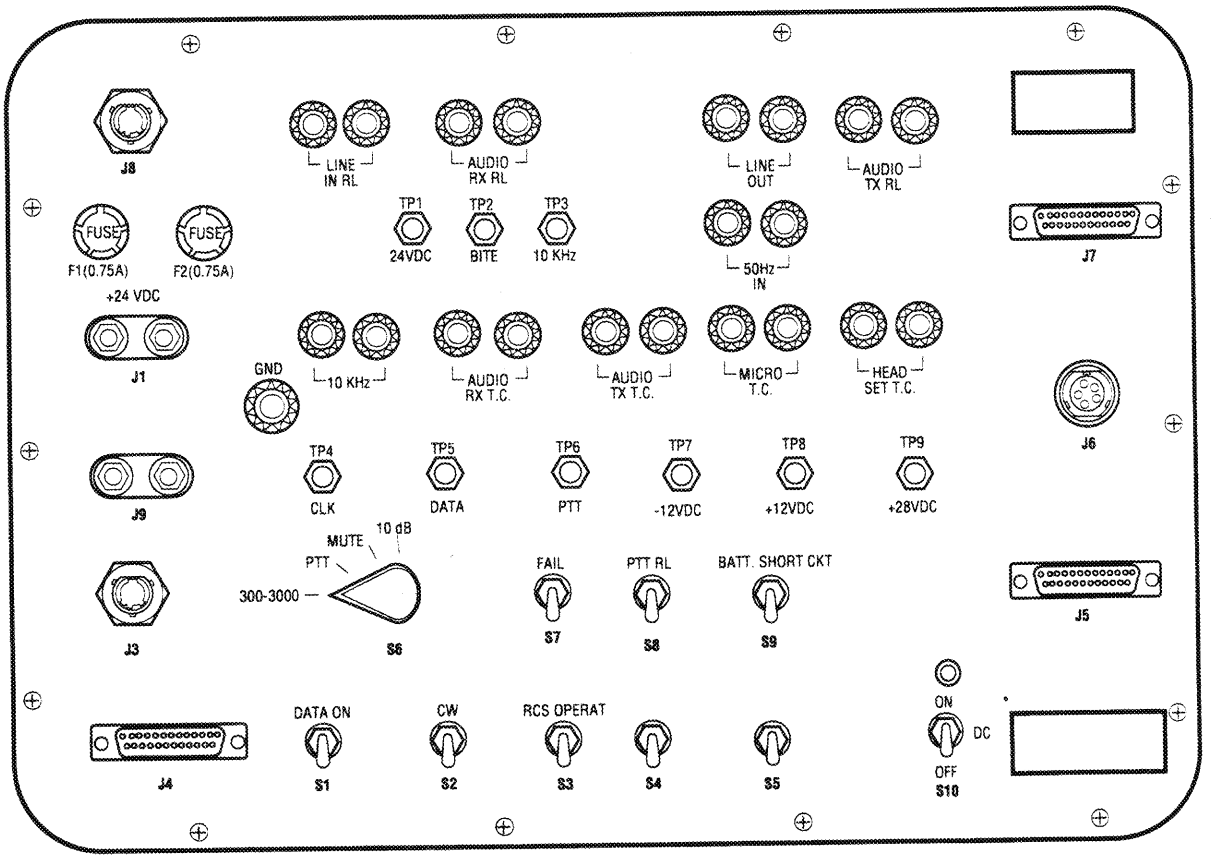


Figure 2. Case, Test Set (10644)



CE1UZ-003

Figure 3. Front Panel Assembly (1-94283.0000//A) (Sheet 1 of 5)

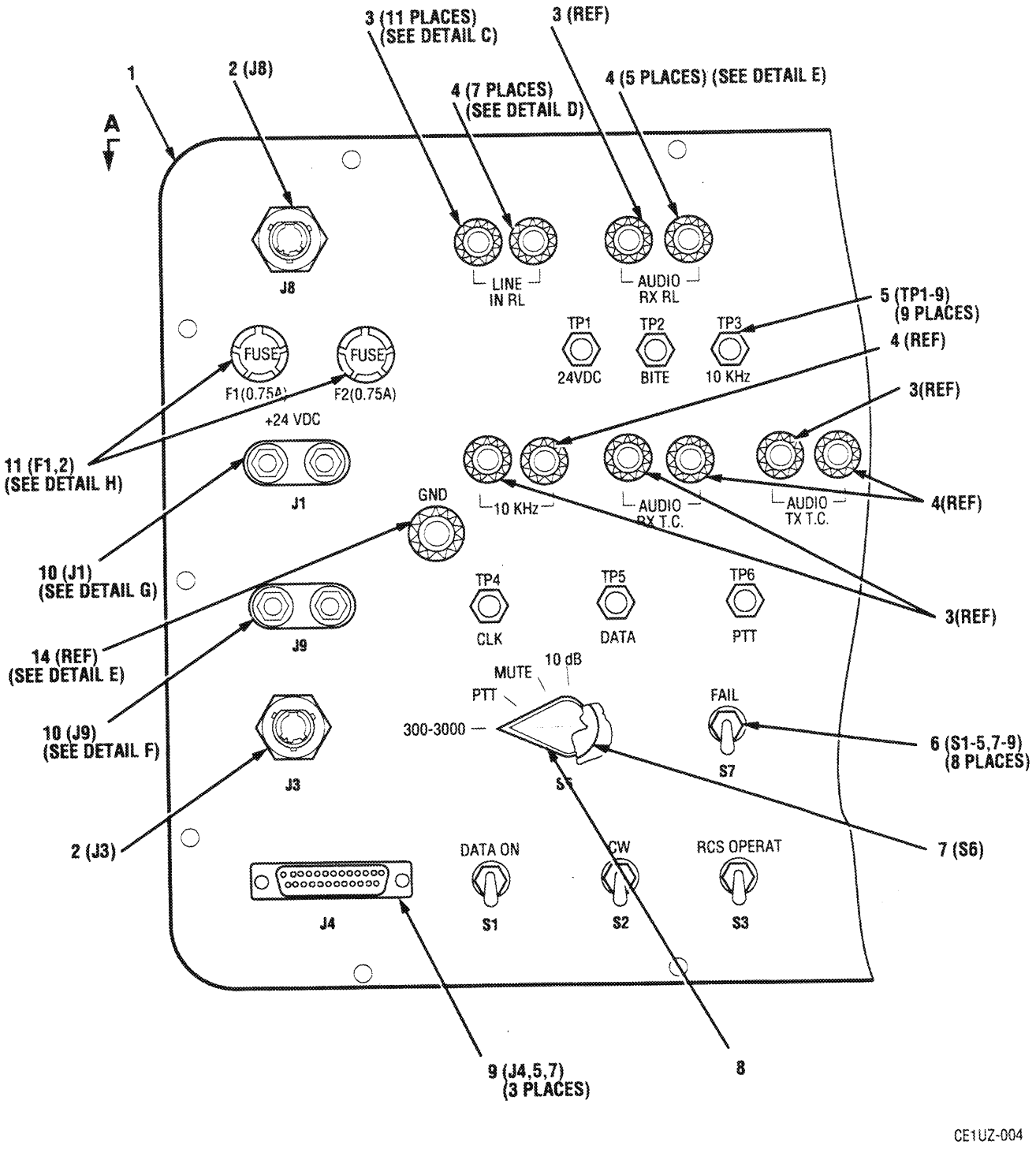


Figure 3. Front Panel Assembly (1-94283.0000//A) (Sheet 2 of 5)

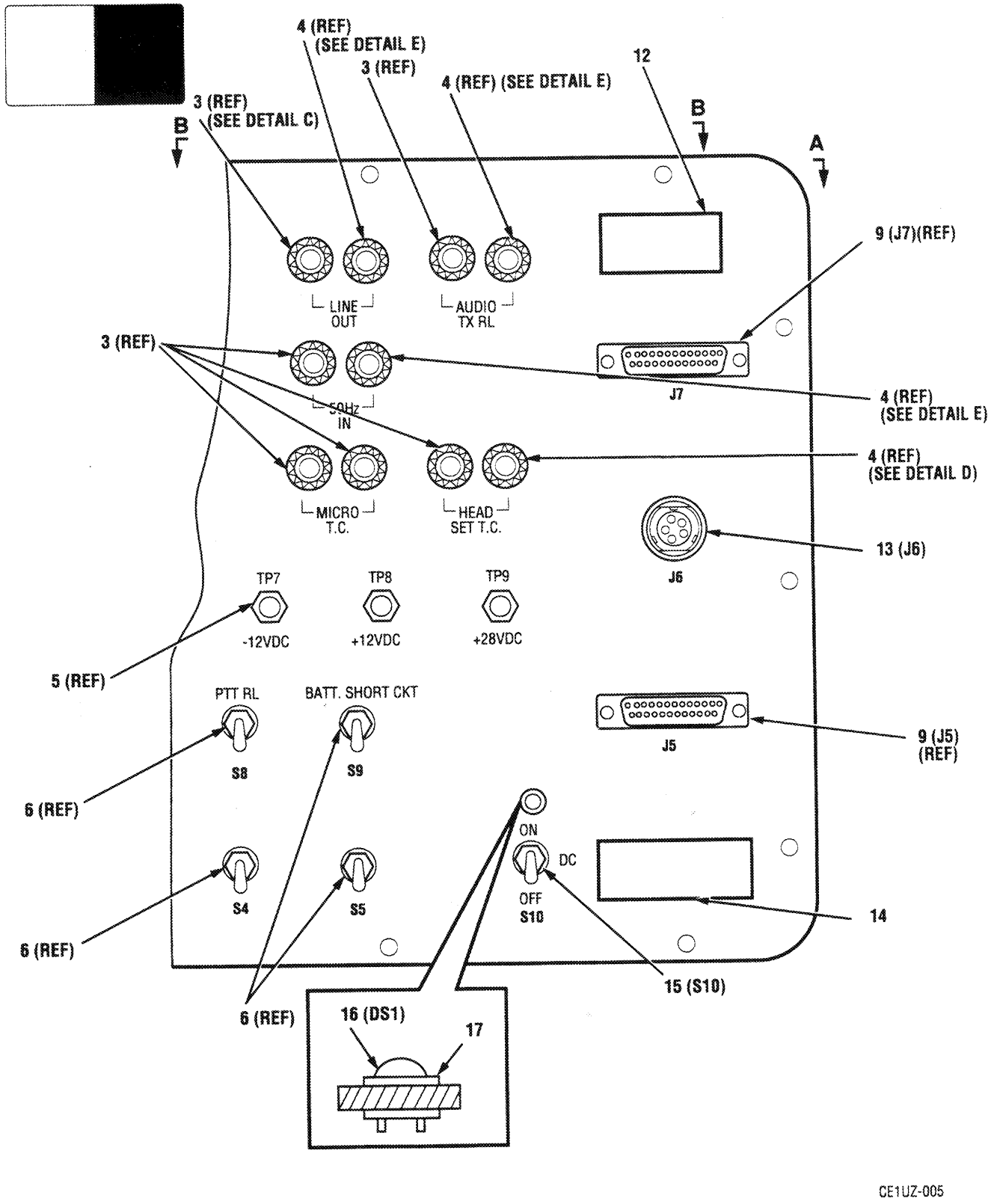


Figure 3. Front Panel Assembly (1-94283.0000//A) (Sheet 3 of 5)

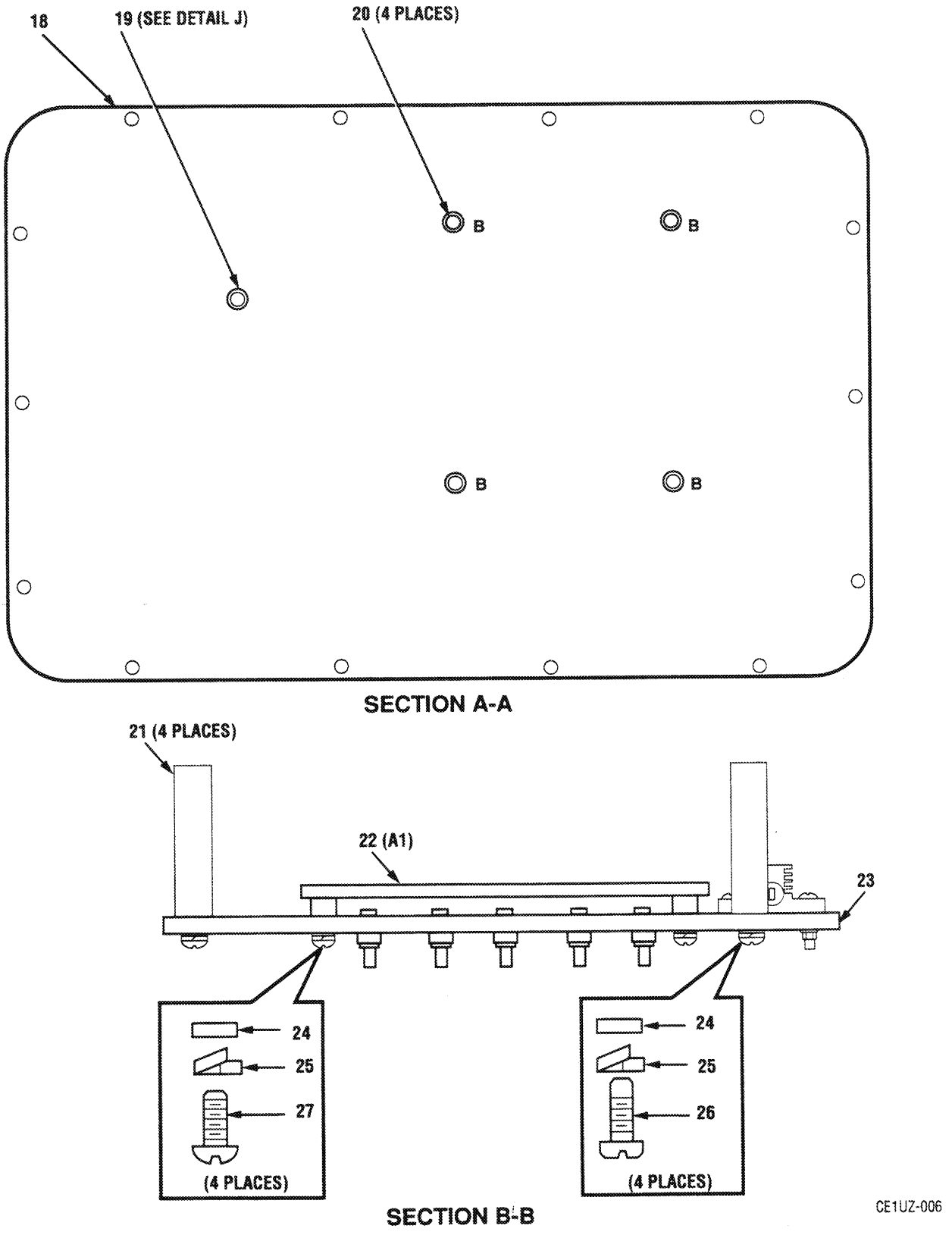


Figure 3. Front Panel Assembly (1-94283.0000//A) (Sheet 4 of 5)

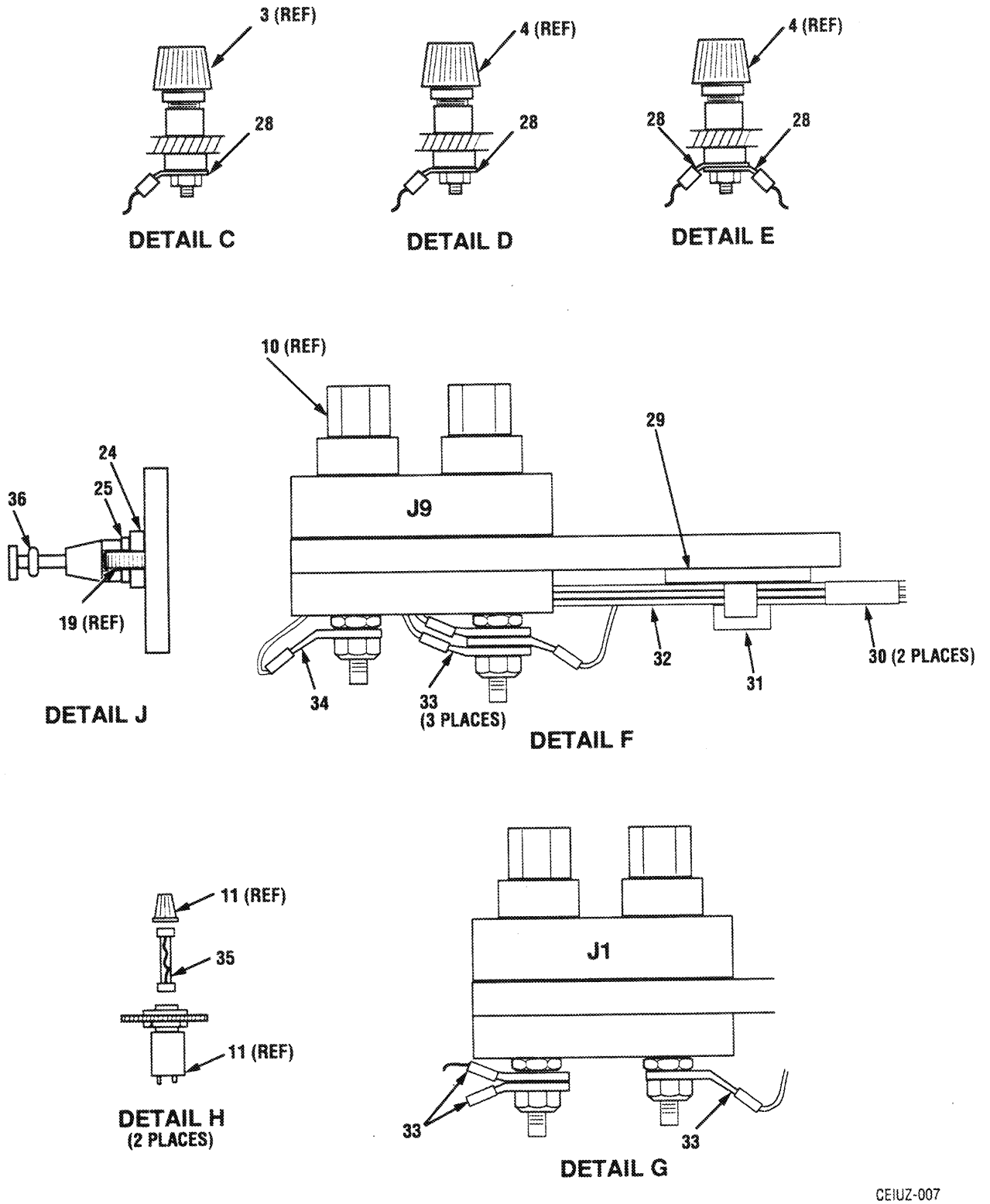
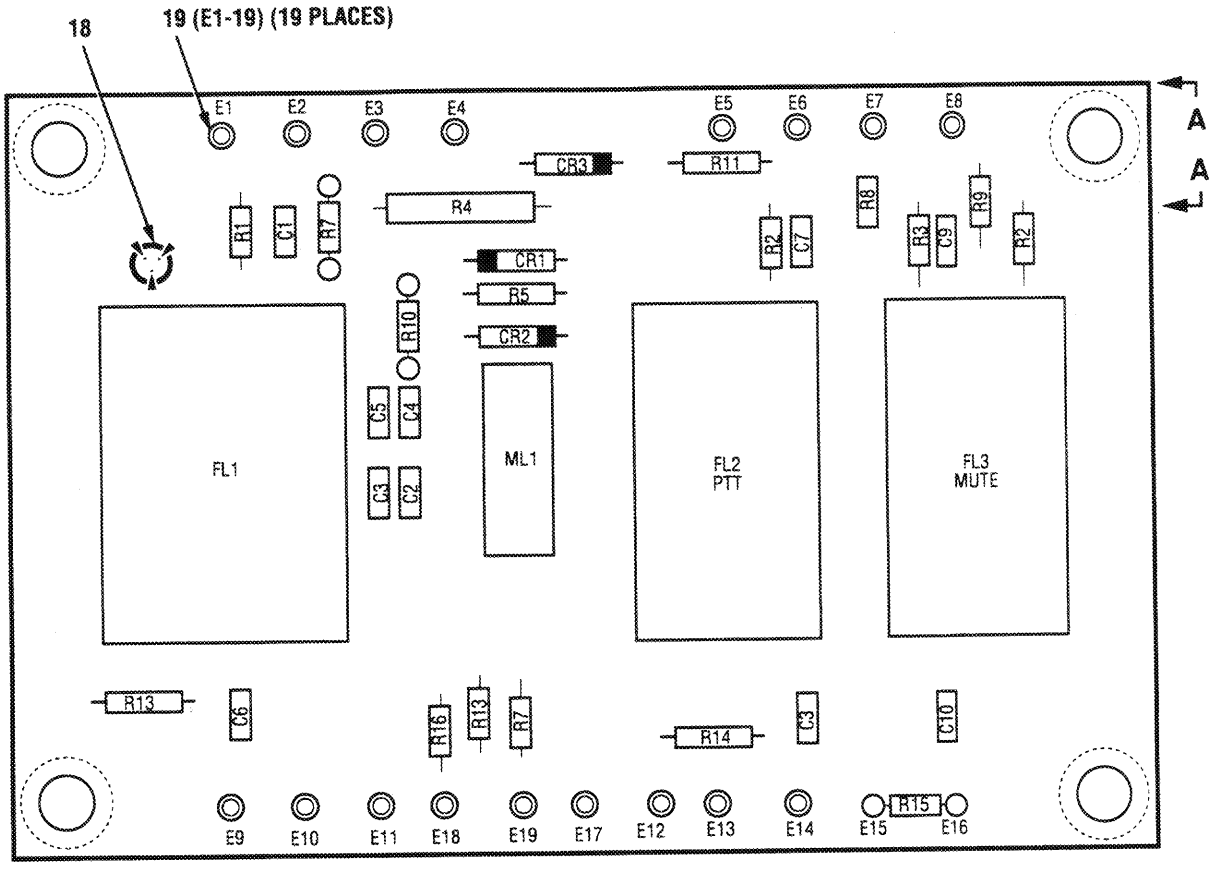


Figure 3. Front Panel Assembly (3-94283.0000//A) (Sheet 5 of 5)

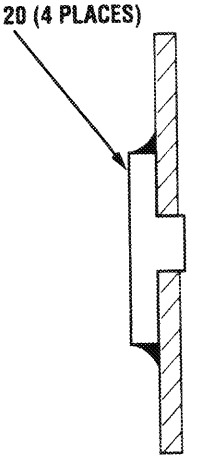


LEGEND

REF. DES.	ITEM NO.
CR1	1
CR2	2
CR3	3
C1	4
C2	5
C3	6
C4	5
C5	6
C6	4
C7	4
C8	4

REF. DES.	ITEM NO.
C9	4
C10	4
FL1	7
FL2	8
FL3	9
ML1	10
R1	11
R2	11
R3	11
R4	12
R5	13

REF. DES.	ITEM NO.
R7	14
R8	14
R9	14
R10	15
R11	15
R12	15
R13	15
R14	15
R15	15
R16	16
R17	16
R18	17



SECTION A-A

CE1UZ-008

NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY AN A1

Figure 4. Circuit Card Assembly A1 (1-94359.0000//B)

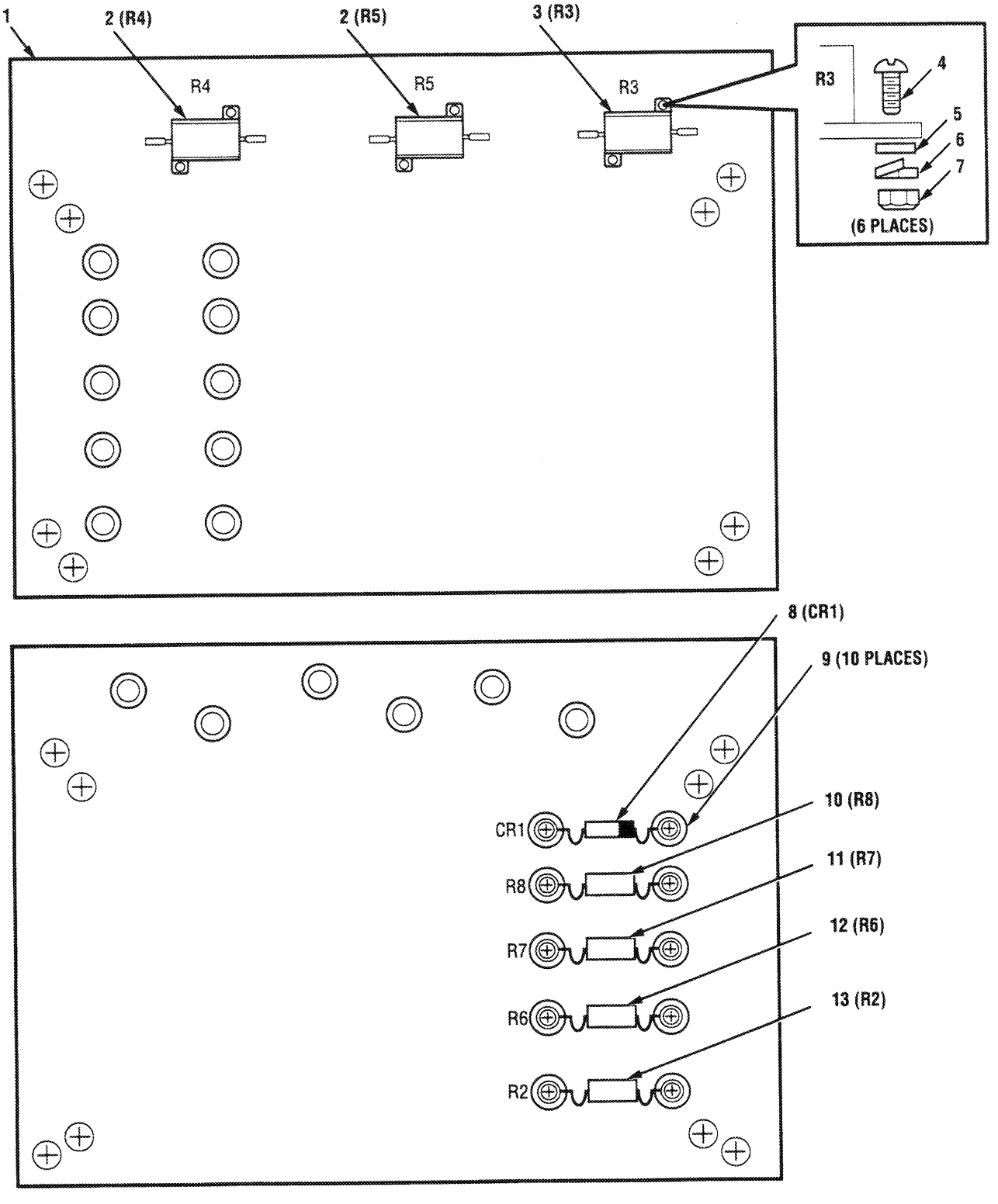
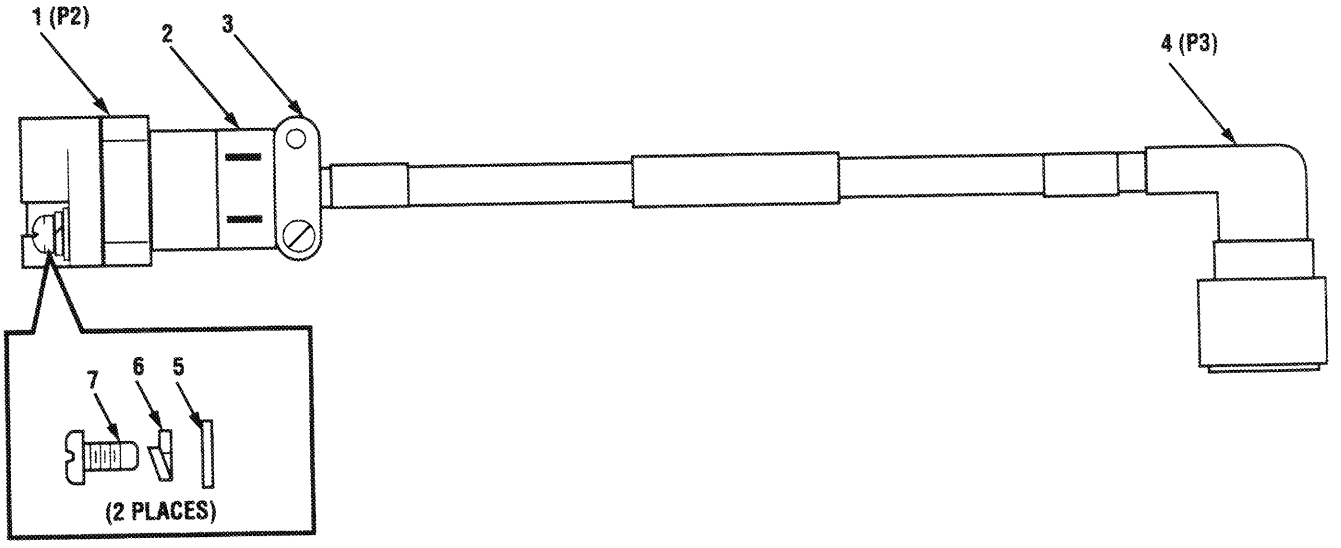


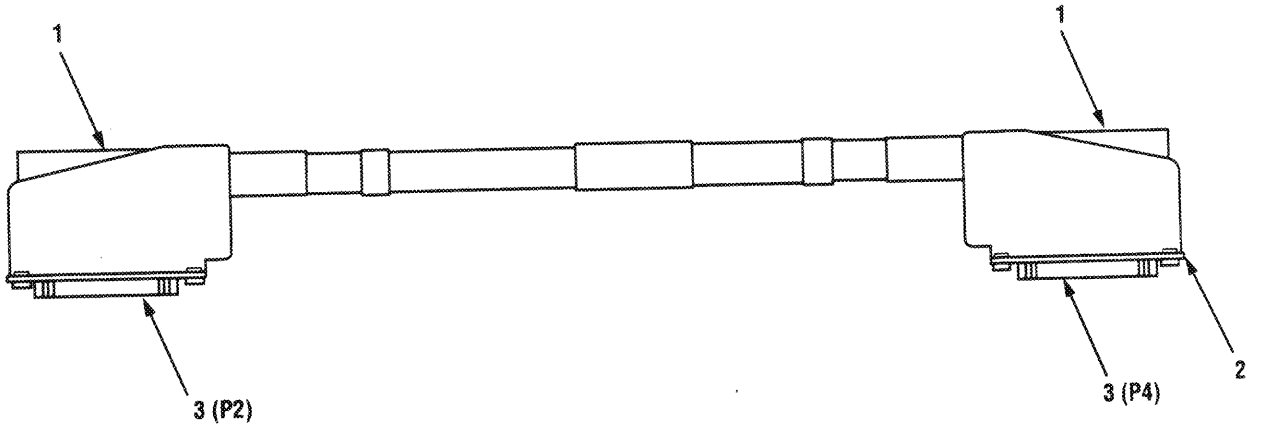
Figure 5. Plate Assembly, Remote (3-94394.0000//B)



NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W33

CE1UZ-010

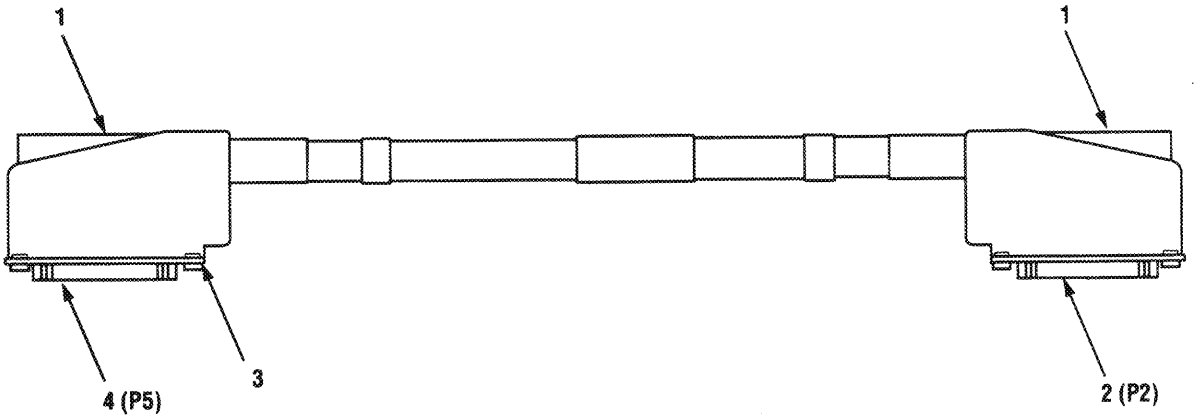
Figure 6. Cable Assembly W33 (3-94304.0000//B)



CE1UZ-011

NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W62

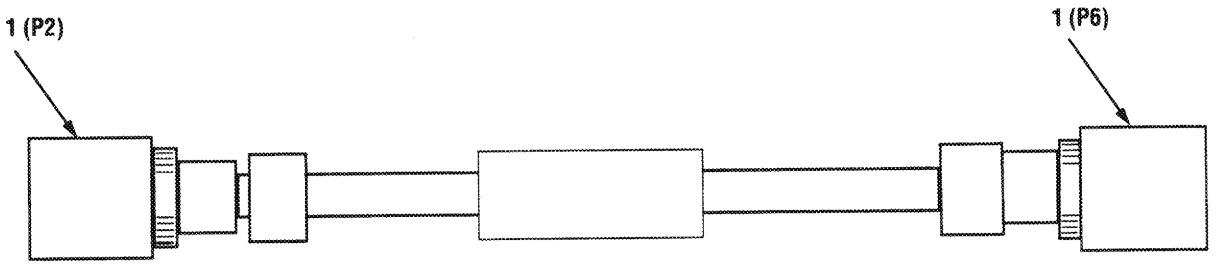
Figure 7. Cable Assembly W62 (3-94305.0000//B)



NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W63

CE1UZ-012

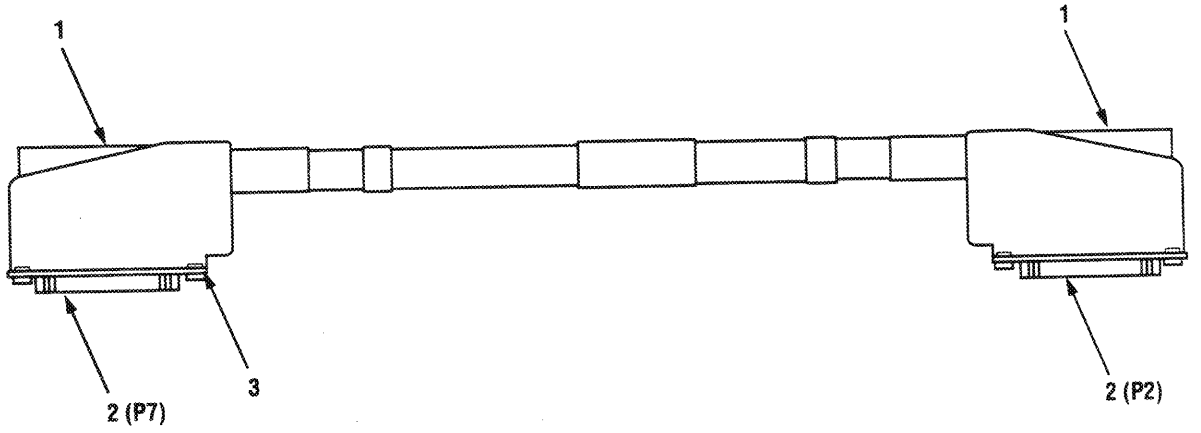
Figure 8. Cable Assembly W63 (3-94306.0000//B)



NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W64

CE1UZ-013

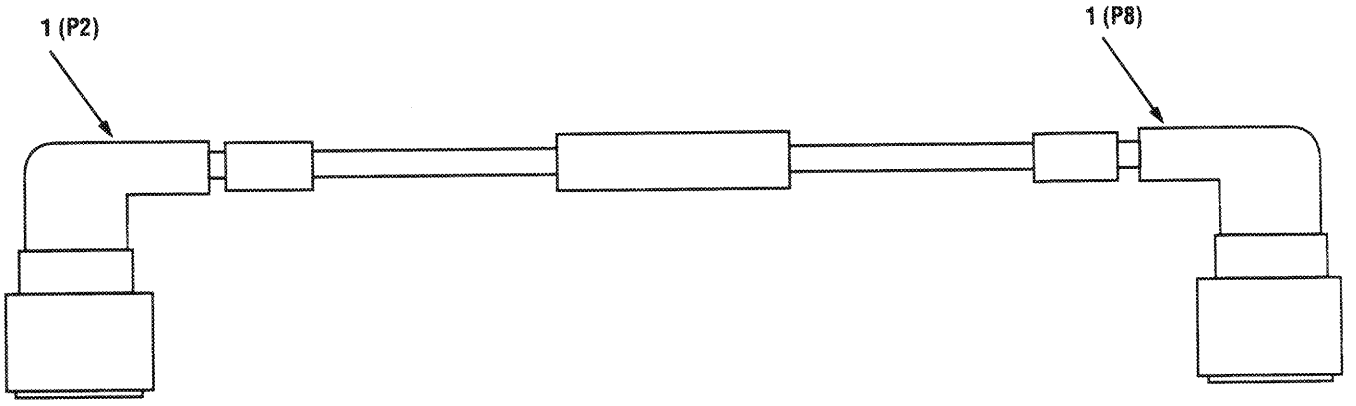
Figure 9. Cable Assembly W64 (3-94307.0000//B)



NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W65

CE1UZ-014

Figure 10. Cable Assembly W65 (3-94308.0000//B)



NOTE: ALL REFERENCE DESIGNATORS SHOULD BE PRECEDED BY A W66

CE1UZ-015

Figure 11. Cable Assembly W66 (3-94309.0000//B)

GLOSSARY

Section I. ABBREVIATIONS AND ACRONYMS

BITE	Built-In-Test Equipment
CCA	Circuit Card Assembly
CW	Continuous Wave
DMM	Digital Multimeter
ECCM	Electronic Counter-Counter Measures
EIR	Equipment Improvement Recommendations
GND	Ground
Hz	Hertz
IAW	In Accordance With
IC	Integrated Circuit
KHz	Kilohertz
LED	Light-emitting Diode
mA	Milliamps
MAC	Maintenance Allocation Chart
MDCS	Maintenance Data Collection Subsystem
MIL STD	Military Standard
mV	MilliVolts
MWO	Modification Work Order
NSN	National Stock Number
P/N	Part Number
PTT	Push-To-Talk
R/E	Receiver/Exciter
R/T	Receive/Transmit
RCS	Remote Control Set
RL	Remote Location
ROD	Report of Discrepancy
RPSTL	Repair Parts and Special Tools List
RX	Receive
TDR	Transportation Discrepancy Report
TP	Test Point
TX	Transmit
UUT	Unit-Under-Test
VDC	Volts Direct Current

Section II. DEFINITIONS OF UNUSUAL TERMS

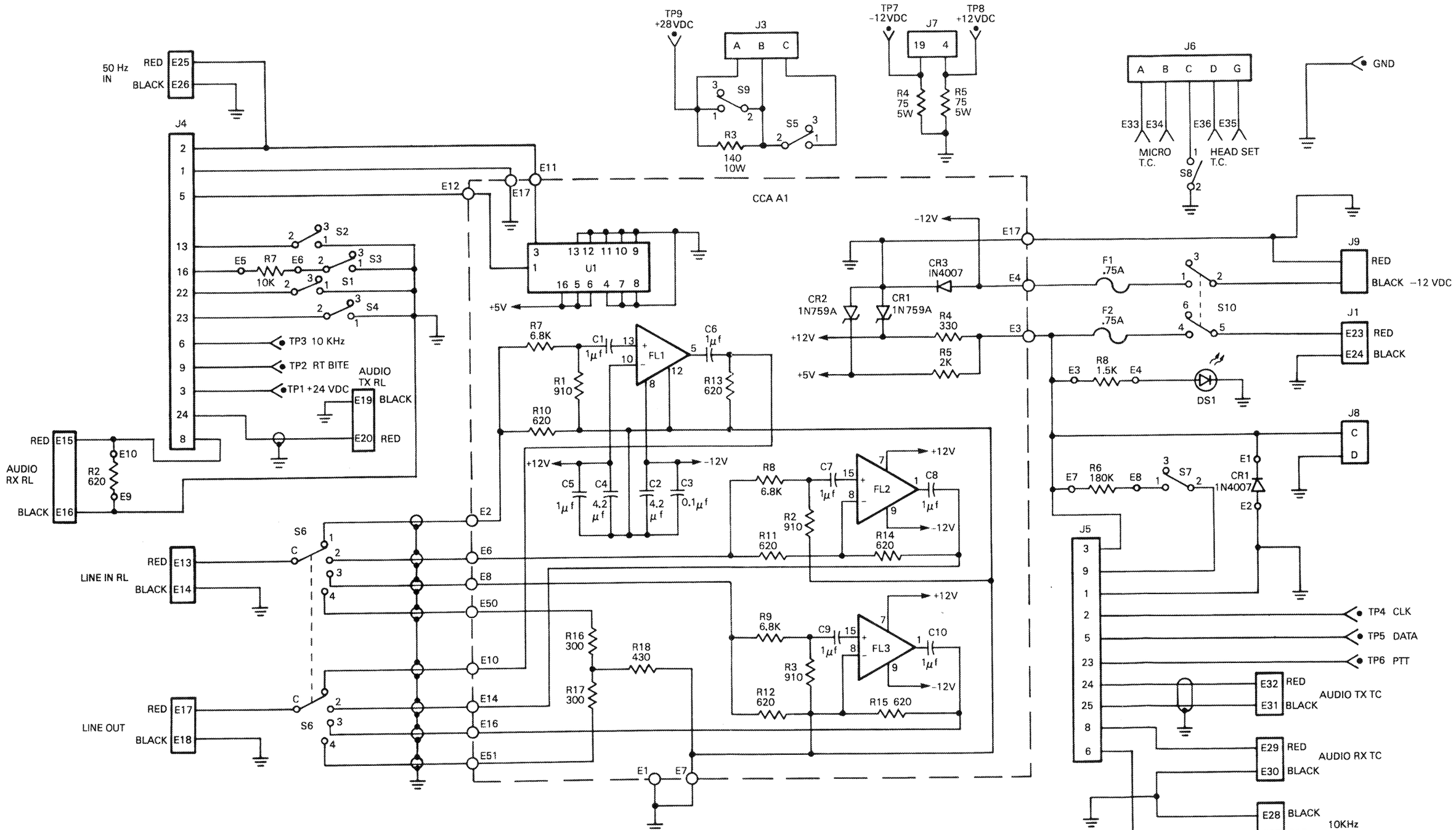
Active Filter. A filter that uses an amplifier with conventional passive filter elements to provide a desired pass or rejection characteristic.

Call. A tone sent on telephonic pair.

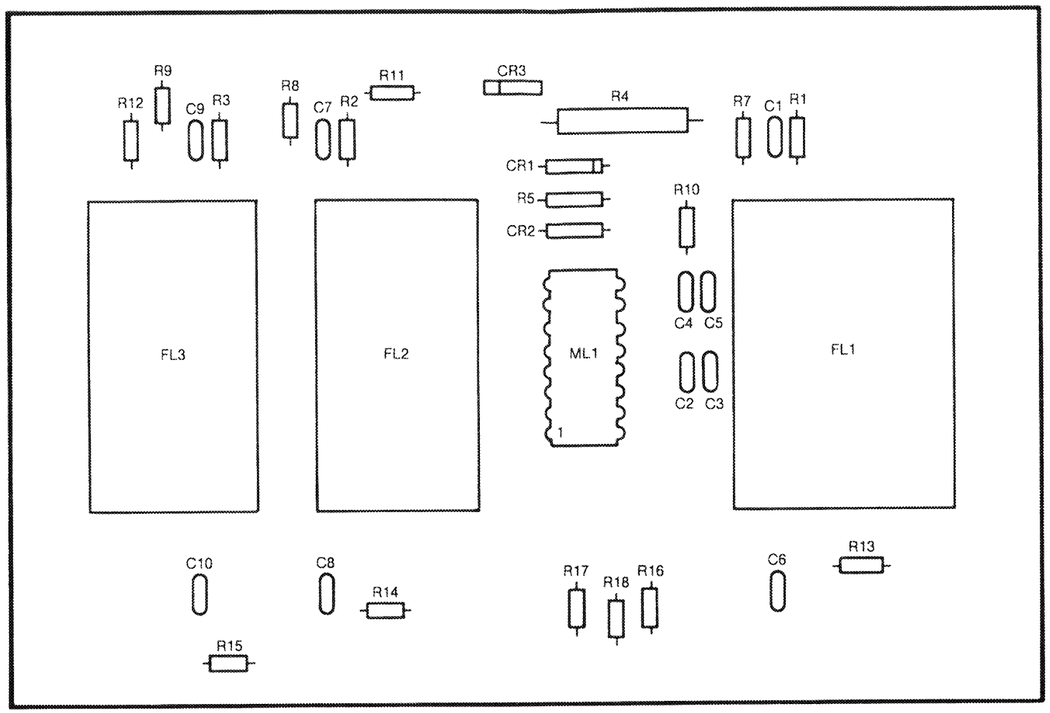
Mute. Tone sent with data stream that prevents voice communication between operators.

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.

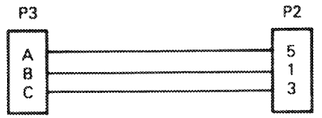


FO-1 SCHEMATIC DIAGRAM, TS-4254/GRC-215

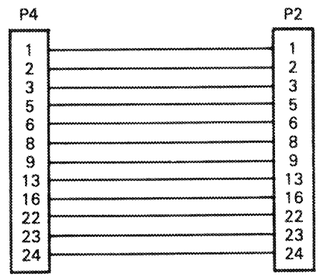


CE1UZ-017

FO-2 TEST SET CCA A1 PARTS LOCATION DIAGRAM



PIN ASSIGNMENTS FOR
CABLE ASSEMBLY W33



PIN ASSIGNMENTS FOR
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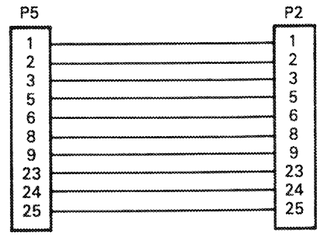

PIN ASSIGNMENTS FOR
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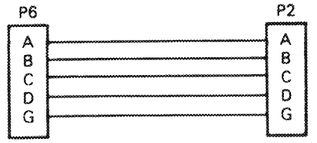
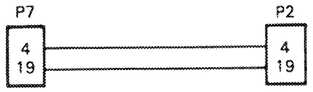
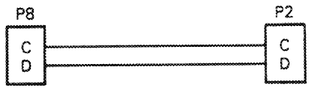


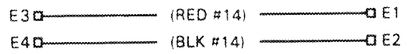
PIN ASSIGNMENTS FOR
CABLE ASSEMBLY W64



PIN ASSIGNMENTS FOR
CABLE ASSEMBLY W65



PIN ASSIGNMENTS FOR
CABLE ASSEMBLY W66



SCHEMATIC
CABLE ASSEMBLY W1
DC POWER

CE1UZ-018

FO-3 PIN ASSIGNMENTS, CABLE ASSY W1,
W33, W62, W63, W64, W65, AND W66