DEPARTMENT OF THE ARMY TECHNICAL MANUAL

# OPERATOR'S AND ORGANIZATIONAL

# MAINTENANCE MANUAL

## TEST SET, AUDIO

## AN/GRM-65

## (NSN 6625-00-9351500)

**This copy is a reprint which includes current pages from Changes 1 through 3**

HEADQUARTERS, DEPARTMENT OF THE ARMY

**WARNING**

**DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT**

**Be careful when working on the 115-volt ac line connections and the +50-, +150-, and +250-volt dc power supply circuits. Serious injury or DEATH may result from contact with these points.**

**DON'T TAKE CHANCES!**

TECHNICAL MANUAL

No. 11-6625-659-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *24 October 1967*

**Operator's and Organizational Maintenance Manual**

**TEST SET, AUDIO FREQUENCY AN/GRM-65**
**(NSN 6625-00-9351500)**

**TABLE OF CONTENTS - Continued**

# CHAPTER 1
# INTRODUCTION

## Section I. GENERAL

### 1-1. Scope

*a*. This manual describes Test Set, Audio frequency AN/GRM-65 (fig. 1-1) and covers its installation, limited operation, and operator's and organizational maintenance. It includes instructions for operation under usual conditions, cleaning and inspection of the equipment, and replacement of parts available to the operator and organizational repairman.

*b*. Operation of Test Set, Audio frequency AN/GRM-65, in conjunction with other test equipment (para 1-8) to test components of Radio Set AN/GRC-50(*) (V) (para 1-4a) is covered in TM 11-5820-461-35.

*c* . Official nomenclature followed by (*) is used to indicate all models of the equipment items covered in this manual; therefore, Radio Set AN/GRC-50(*) (V) represents Radio Sets AN/ GRC-50(V) 1, 2, 3, 4, 5, and AN/GRC-50A(V) 1, 2, 3, 4, 5, 6, and 7.

### 1-2. Indexes of Publications

*a*. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

*b*. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

### 1-3. Forms and Records

*a*. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

*b*. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29iAFR 7113/MCO P4030.29A, and DSAR 4145.8.

*c.* Discrepancy in Shipment Report (DISREP) (SF .61). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33A/ AFR 75-18/MCO P4610.19B and DSAR 4500.15.

#### 1-3.1. Reporting of Errors

You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, New Jersey 07703. A reply will be furnished direct to you.

#### 1-3.2. Reporting Equipment

Improvement Recommendations (EIR) EIR's will be prepared using DA Form 2407 (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, New Jersey 07703. A reply will be furnished direct to you.

#### 1-3.3. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

#### 1-3.4. Destruction of Army Electronics Materiel

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

## Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

*a.* Test Set, Audio frequency AN/GRM-65 (audio test set) when used with additional test equipment (para 1-8) permits the operator to check the performance, alignment, and trouble

shooting of the assemblies of Radio Set AN/ GRC-50(*) (V) shown below:

| *Assembly* | *Used in* |
|---|---|
| Transmitter current regulator assembly 2A6. | Transmitter, Radio T 893(P)/GRC. |
| Transmitter baseband assembly 2A3. | T-893(P)/GRC. |
| Receiver signaling unit assembly :1A6. | Receivers, Radio R 1148(P)/GRC and R 1331( P)/GRC. |
| Receiver baseband assembly 3A3. | R-1148(P)/GRC and R 1331(P)/GRC. |

*b.* The audio test set is enclosed in a metal cabinet that houses groups of multiposition rotary switches, toggle switches, indicator lights, meters, jacks (for auxiliary equipment connection), as well as a power supply which provides the required operating voltages. The inside of Cover, Test Set CW-954/GRM-65 (cover) is arranged to store the technical manuals.

*c.* The audio test set is divided into five functional areas: current regulator, baseband, signaling unit, power, and receptacles and connectors for unit under test and for auxiliary test equipment connection. The power supply provides a remote control +10 to 45 volts direct current (dc), regulated dc voltages of + 150 and +250, as well as 6.3 volts alternating current (ac), which supply the necessary power for the assemblies under test. The power supply is controlled by an interlock circuit which prevents the application of power to a unit inadvertently plugged into the wrong multipin panel connector. The audio test set is used with auxiliary test equipment which provides test signals and additional monitoring facilities.

*d*. The test setups for checking the associated AN/GRC-50(*) (V) assemblies are given in TM 11-5820-461-35. The functions tested by these setups are:

(1) Transmitter baseband assembly 2A3: pulse-code modulation (pcm), frequency division multiplex (fdm), and order wire.

(2) Receiver baseband assembly 3A3: pcm, fdm, and order wire.

(3) Current regulator assembly 2A6: oscillator current regulation, mixer current regulation, and amplifier current regulation.

(4) Signaling unit 3A6: ringing circuit, 1,600-Hertz (Hz) oscillator, and 1,000-Hz oscillator.

### 1-5. Technical Characteristics

*a. Power Supply.*

Input voltage.....115 volts ac, +5%.
Input power.....300 watts.
Input frequency.....50 to 60 Hz.
Output .....+ 250 volts dc (0.03% reg).
+ 150 volts dc (0.05% reg).
10 to 45 volts dc (0.03% reg).
6.3 volts ac

*b. Miscellaneous.*

Ambient operating .....+50° F. to 140° F. (10° C. temperature range-. to 60° C.).
Storage temperature ..80° F. to 160° F. (27' C. to range ..... 72° C.).
Weight.....61 pounds (27.7 kg) (with ..... doors).

### 1-5.1. Items Comprising an Operable Test Set, Audio Frequency AN/GRM-65 (NSN 6625-00-935-1500)

| *NSN* | *Qty* | *Nomenclature* | *Fig No.* |
|---|---|---|---|
| 6625-00-935-4199 | 1 | Test Set, Audio Frequency TS-2124/GRM-65 | 1-1 |
| 6625-00-935-1476 | 1 | Cover, Test Set CW-95,4GRM-65 | 1-1 |

### 1-6. List of Components and Spares

*a. Components* (fig. 1-1).

**NOTE**

This listing is based on the original shipment by the contractor on Order No. FR-36-039-H-6-32182(E).

| *Quantity* | *Item* | *Dimensions (in.) Height* | *Width* | *Depth* | *Unit weight (lb)* |
|---|---|---|---|---|---|
| 1 | Test Set, Audio Frequency TS-2124/GRM-65 | 27 (68.6 cm) | 18 1/2 (47 cm). | 17 1/2 (44.4 cm). | 65 (25.4 kg). |
| 1 | Cover. Test Set CW-954'GRM-65 | | | | |
| 1 | Running spares (*b* below) set | 26 (66 cm) | 1 1/2 (3.8 cm). | 17 1/2 (44.4 cm). | 5 (2.27 kg). |
| 2 | Technical manuals | | | | |

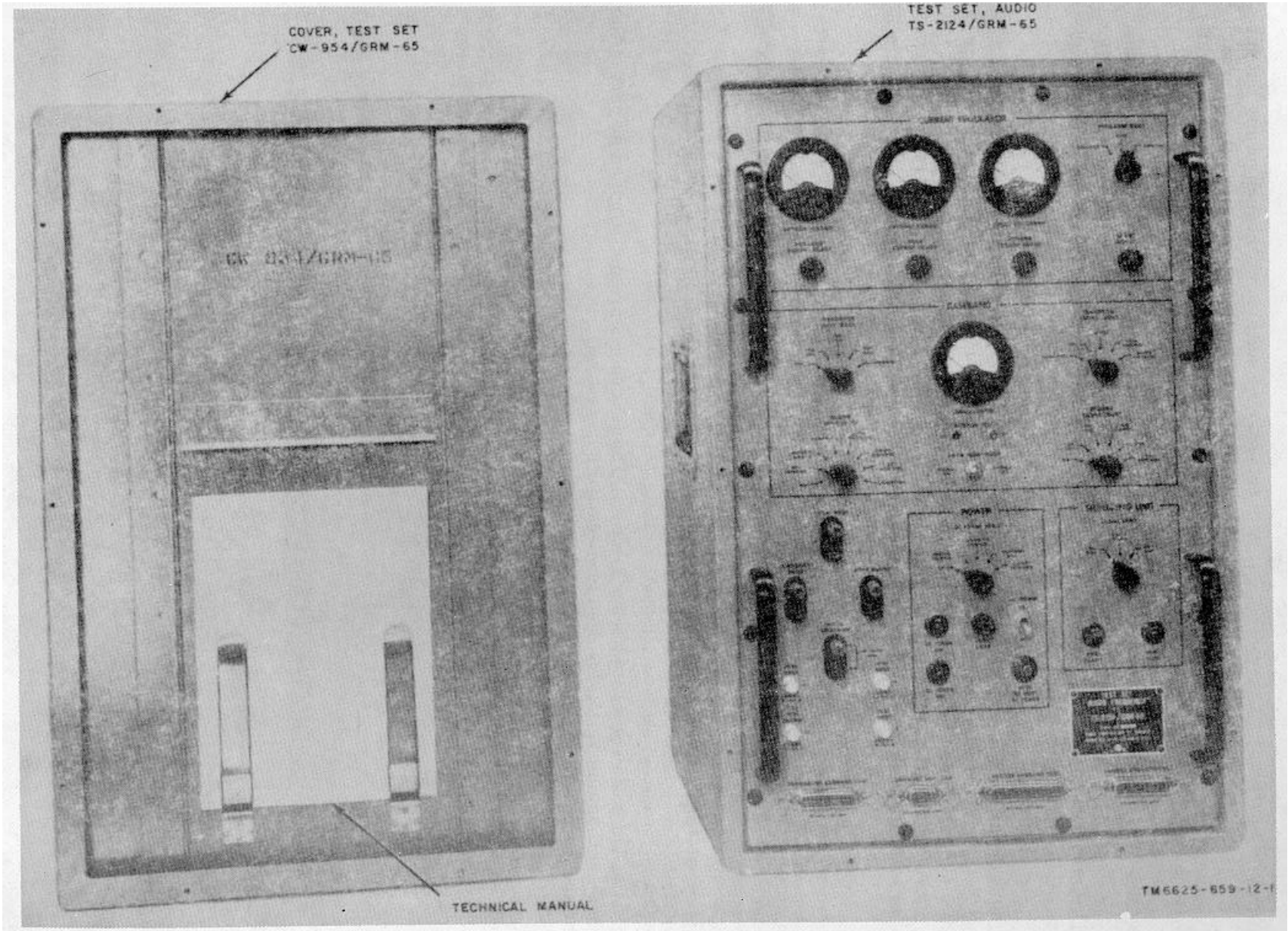


*Figure 1-1. Test Set, Audio Frequency AN/GRM-65, less running spares.*

*b. Running Spares.*

| *NSN* | Quantity | *Item* |
|---|---|---|
| 6240-00-878-6055 | 2 | Lamp, incandescent, type 47, 849546-18, 49617 |
| 5920-00-284-9220 | 5 | Fuse, 1-ampere, F02A2 50V1.0A, 81349 |
| 5920-00-043-2641 | 5 | Fuse, 0.25-ampere, F02A2 50V0.25A, 81349 |

## 1-7. Description of Test Set, Audio AN/G RM-65

(fig. (1-1))

Test Set, Audio Frequency AN/GRM-65 consists of Test Set, Audio Frequency TS-2124/GRM-65 which is housed in a rectangular metal cabinet, the front cover (CW-954/GRM-65) of which is secured with 10 captive screws. The cabinet can be placed on a suitable workbench or any flat surface that permits free air circulation through the bottom and top louvers. A hinged rear (liftoff) door, secured with seven quarter-turn fasteners, provides access to the cabinet interior. The ac power cables are fastened to the inside of the rear door. The controls for the adjustment of the dc power supply can be reached with the rear door open (fig. 1-2).

## 1-8. Additional Equipment Required

*a. Test Equipment.* The test equipment given below is not supplied as part of the audio test set, but is required for the test setups to check out the associated AN/GRC-50(*) (V) assemblies.

| | | | *Assembly under test* | | | |
|---|---|---|---|---|---|---|
| *Nomenclature* | *NSN* | *Technical manual* | *2A3* | *3A3* | *2A6* | *3A6* |
| Counter. Electronic Digital-Readout AN USM-207 | 6625-00-911-6368 | TM 11-6625-700-10 | X | X | | X |
| Voltmeter. Electronic ME-30(*)/Ua | 6625-00-643-1670 | TM 11-6625-320-12 | X | X | | X |
| Generator, Signal AN,USM-205 | 6625-00-788-9672 | TM 11-6625-665-15 | X | X | | X |
| Multimeter MIE-26(*) Ub | 6625-00-360-2493 | TM 11-6625-200-15 | | | | X |

aME-:30(*) U represents Voltmeter, Meter ME-30A/U and Voltmeters, Electronic ME-30B/U, ME-30C/U, ME-30D/U, ME-30E:U.
bME-26(*) U represents Multimeters ME-26A/U, ME-26B/U, ME-26CIU, and ME-30/U.

*b. Cables.* The test cables listed below are required when the audio test set is used to check out the associated AN/GRC-50(*) (V) assemblies.- The test cables are not supplied as part of the audio test set.

| | | *Connector type* | | | |
|---|---|---|---|---|---|
| *Cable designation* | *Qty* | *P1* | *P2* | *Cable type* | *Cable length (in.)* |
| Test cable A | 1 | UG-88/U | U-274-MB | RG-58C/U | 36 ±1 (91.8 ±-2.54 cm) (A, fig. 1-3). |
| Test cable B | 3 | U-274-MB | U-274-MB | RG-58C/U | 30 ±1 (71.5 ± 2.54 cm) (B, fig. 1-3). |

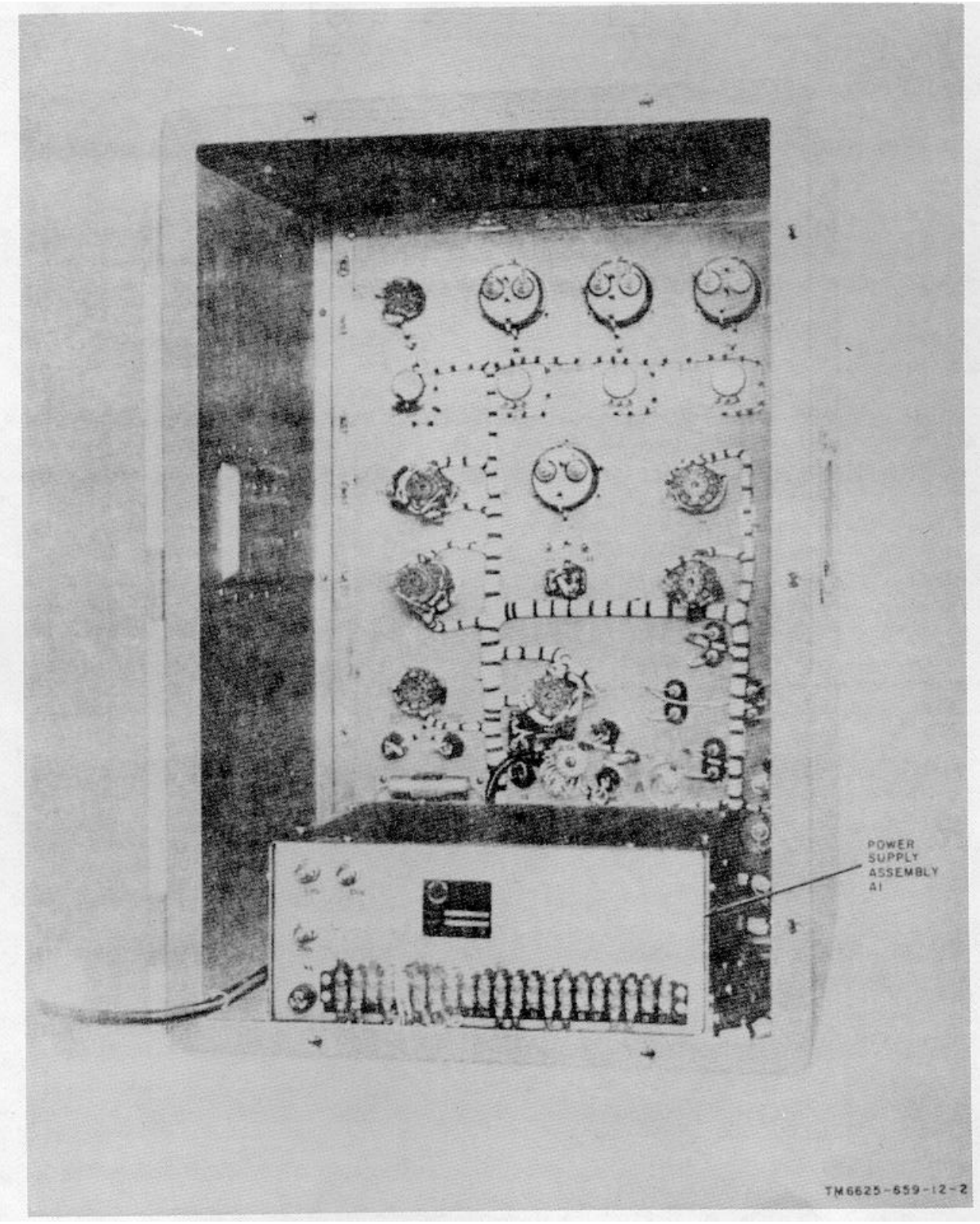


*Figure 1-2. Interior of TS-124/GRM-65.*

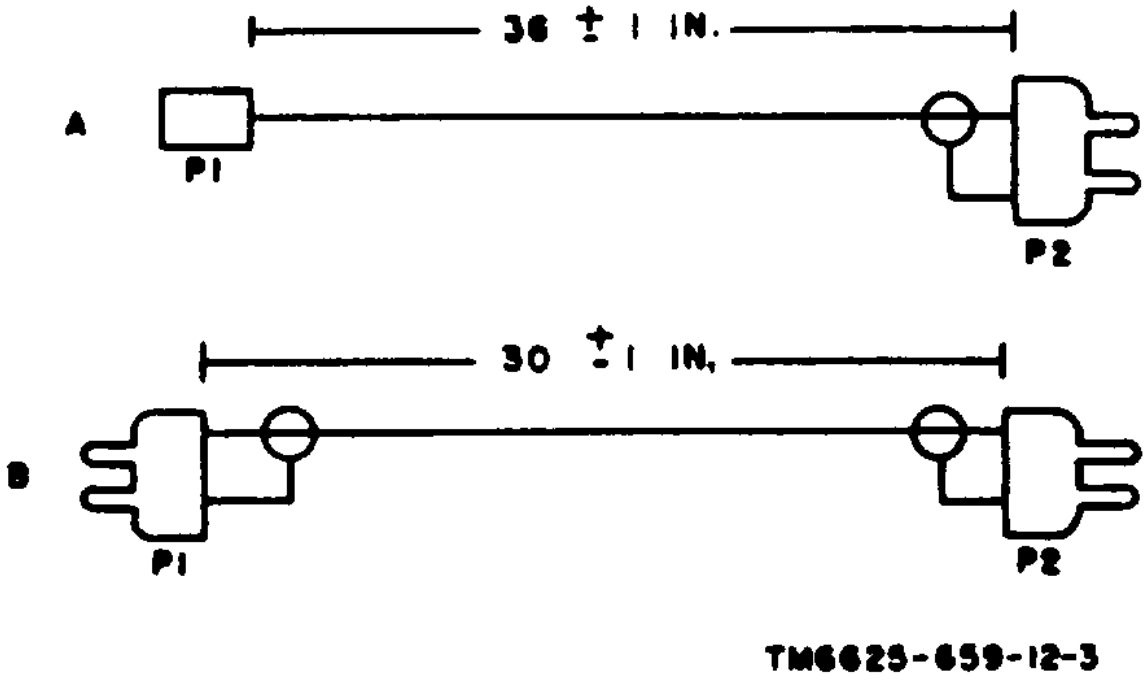


*Figure 1-3. Test cable details*

# CHAPTER 2
# INSTALLATION

## Section I. SERVICE UPON RECEIPT OF EQUIPMENT

### 2-1. Unpacking

*a. Packing Data.* Methods to be used in packing the equipment for shipment will vary depending on the type of shipping container available. A typical shipping box and its contents are shown in figure 2-1.

*b. Dimensions*. When the audio test set is packed for shipment, its outside dimensions are 34 3 4 inches (88.3 centimeters (cm) high by 23 1 4 inches (59.1 cm) wide by 24 inches (61 cm) deep; the volume is 11.4 cubic feet (0.323 cubic meter): and the packed weight is 95 pounds (43 kilograms (kg)).

*c. Removing Contents.*

(1) Cut and fold back the metal straps.

**CAUTION**

**Do not attempt to pry off the top and sides; equipment damage may result.**

(2) Remove the nails from the top and one side of the box with a nailpuller. Remove the top and the side.

(3) Remove the envelope that contains the manuals.

(4) Remove the outer carton that is wrapped in the waterproof barrier.

(5) Open the outer carton and remove the carton that contains the spare part and the tools.

(6) Remove the inner carton that is wrapped in a moisture-vaporproof barrier.

(7) Open the moisture-vaporproof barrier and the inner carton.

### 2-2. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6.

b. Check to see that the equipment is complete as listed on the packing slip. Report all discrepancies in accordance with instructions given in AR 735-11-2. Shortage of a minor assembly or part that does not affect the proper functioning of the equipment should not prevent use of the equipment.

c. If the equipment has been used or reconditioned, check to see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. If the equipment has been modified, check to see that any operational instruction changes resulting from the modification have been entered in the equipment manual.

**NOTE**

**Current MWO's applicable to the equipment are listed in DA Pam 310-7.**

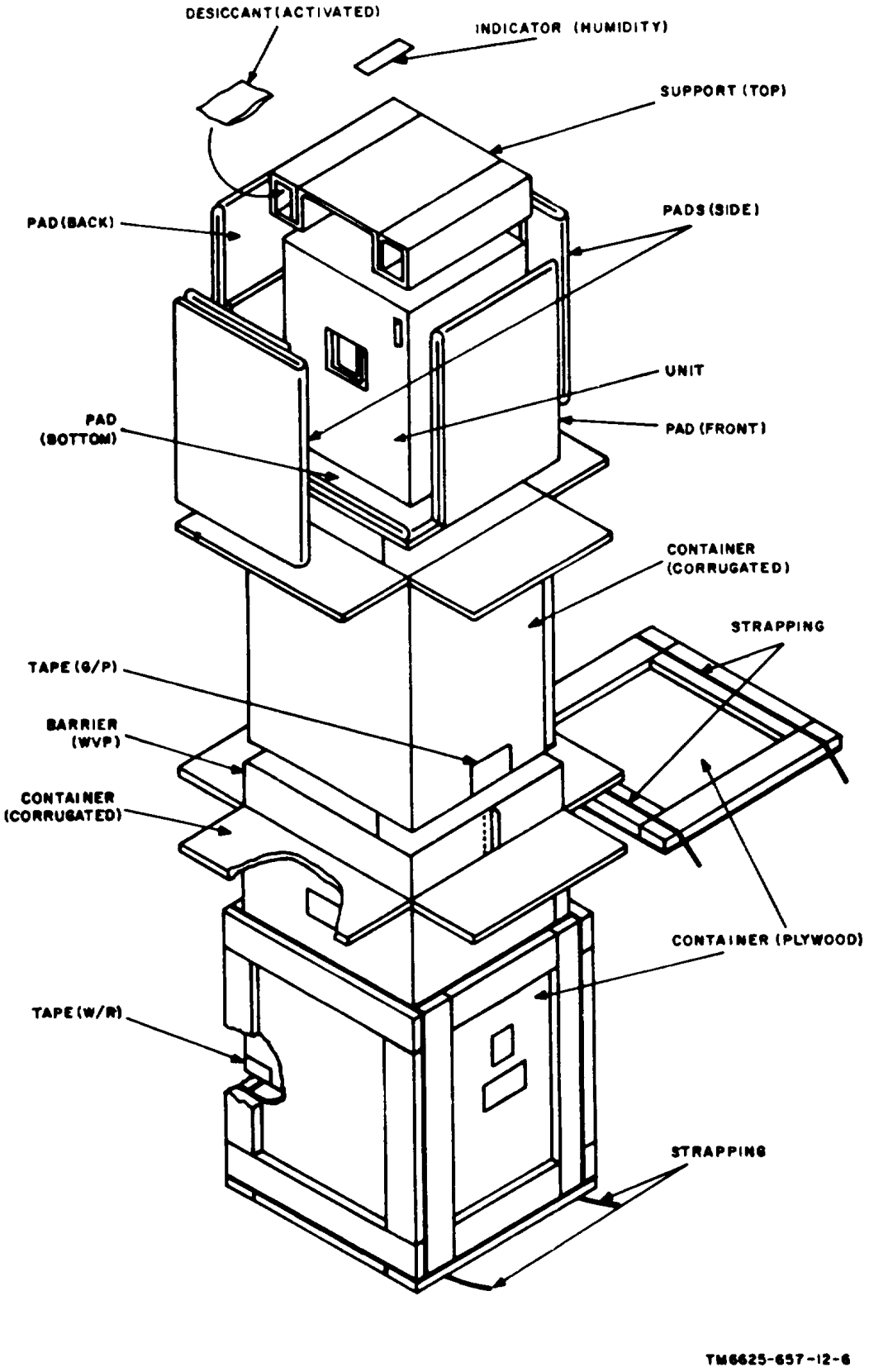


*Figure 2-1. Typical packaging diagram.*

# CHAPTER 3
# OPERATING INSTRUCTIONS

## Section I. OPERATOR'S CONTROLS AND INDICATORS

***Note.*** **This section covers only the items used by the operator; items used by maintenance personnel are covered in the instructions for the appropriate maintenance category.**

### 3-1. Placement of Equipment

Before operating the audio test set, mount the unit on a suitable workbench or any solid flat surface. The top and bottom louvers must be free of all obstructions which would impede or block the flow of air; proper cooling of the audio test set requires the circulation of air through the cabinet.

### 3-2. Test Set, Audio TS-2124/GRM-65 Controls and Indicators

The operating controls, indicators, fuses, and connectors are listed in the charts given in paragraphs 3-3 through 3-7. Throughout this manual, the AN/GRC-50(*)(V) assembly under test is referred to as AUT. In this manual the TS-2124,/'GRM-45 is referred to as the audio test set.

### 3-3. Power and Switching Section Controls, and Indicators

| *Control or indicator* | *Function* |
|---|---|
| AC POWER switch | When set to ON, applies 115-volt ac power to audio test set. When set to OFF, removes 115-volt ac power from audio test set |
| AC POWER ON indicator | Illuminates when 115-volt ac power is applied to audio test set. |
| FUSE 1 AMP, powerline fuse | Protects equipment against damage from 115-volt ac line surges, application of wrong voltage, or short circuit due to malfunction in audio test set. |
| PUSH TO RESET DC POWER switch | When depressed, energizes power relay that turns on dc power supply (AUT must be connected to proper connector, and DC POWER SELECT switch set to power position). |
| DC POWER ON indicator | Illuminates when de power is turned on (as result of depressing PUSH TO RESET DC POWER switch). |
| DC POWER SELECT switch | Switches dc power to AUT. |

| *SW pan* | *Action* |
|---|---|
| OFF | Removes power supply output from load. |
| RECEIVER BASEBAND | Applies power supply output to receiver baseband receptacle J4. |
| TRANSMITTER BASEBAND | Applies power supply output to transmitter baseband receptacle J9. |

| *Control or indicator* | *Function* | |
|---|---|---|
| | *SW pos* | *Action* |
| | SIGNALING UNIT | Applies power supply output to signaling unit receptacle J1. |
| | CURRENT REGULATOR | Applies power supply output to current regulator receptacle J11. |

**3-4. Current Regulator Section Controls and Indicators**

| *Control or indicator* | *Function* | |
|---|---|---|
| REGULATOR SELECT switch | Selects oscillator, mixer, or amplifier current regulator circuit of AUT current regulator 2A6 for monitoring and adjustment. | |
| | *Sw pos* | *Action* |
| | OSCILLATOR | Selects AUT oscillator regulator circuit. |
| | MIXER | Selects AUT mixer regulator circuit. |
| | AMPLIFIER | Selects AUT amplifier regulator circuit. |
| CATHODE VOLTAGE meter | Indicates 0 to 50-volt dc cathode voltage of selected regulator circuit, | |
| CATHODE CURRENT meter | Indicates 0- to 15-ma cathode current of selected regulator circuit. | |
| COLLECTOR CURRENT meter | Indicates 0- to 150-microampere collector current of selected regulator circuit. | |
| OSCILLATOR CURRENT ADJUST control[a] | Adjusts AUT oscillator cathode current regulator circuit. | |
| MIXER CURRENT ADJUST control[a] | Adjusts AUT mixer cathode current regulator circuit. | |
| AMPLIFIER CURRENT ADJUST control[a] | Adjusts AUT amplifier cathode current regulator circuit. | |
| 50 VDC ADJUST control | Adjusts to 10- to 45- dc power supply output. | |

[A] Controls imitate -893(P)/GRC potentiometers R14, RI5, and R16 (TM 11-5820-461-12).

**3-5. Baseband Section Controls, Indicators, and Connectors**

| *Control, indicator, or connector* | *Function* | |
|---|---|---|
| TRANSMITTER INPUT SELECT switch | Connects receptacles J5, J6, and J7 to AUT selected input. | |
| | *SW pos* | *Action* |
| | PCM | Connects input signal from audio test set to AUT pcm input circuit |
| | FDM (600) | Connects input signal from audio test set to AUT 600-ohm fdm input circuit. |
| | FDM (135) | Connects input signal from audio test set to AUT 135-ohm fdm input circuit. |
| | TEST TONE | Connects input signal from audio test set to AUT test tone input circuit |

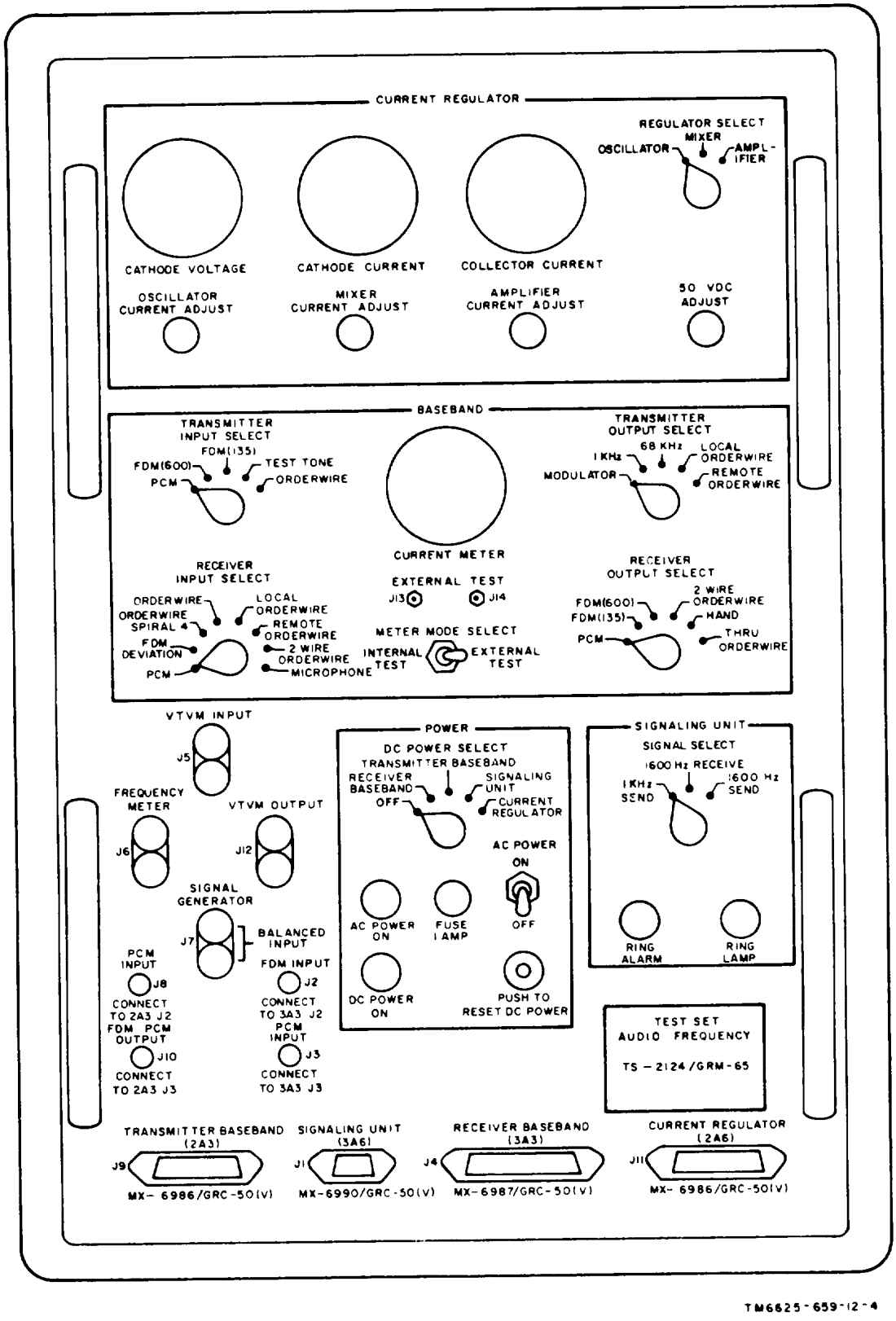


*Figure 3-1. Front panel controls and indicators.*

| *Control, indicator, or connector* | *Function* |
|---|---|
| | *SW pos* — *Action* |
| ORDERWIRE | Connects input signal from audio test set to AUT order wire input circuit. |
| TRANSMITTER OUTPUT SELECT switch--------- | Connects connector J12 to AUT selected output. (Used in conjunction with TRANSMITTER INPUT SELECT switch.) |
| Sw | Action |
| | MODULATOR ---------- Connects AUTO modulator output to audio test set. |
| | 1 KHz ---------- Connects AUT 1-kHz output to audio test set. |
| | 68 KHz---------- Connects AUT 68-kHz output to audio test set. |
| | LOCAL ORDERWIRE ---- Connects AUT local order wire output to audio test set |
| | REMOTE ORDERWIRE - Connects AUT remote order wire output to audio test set. |
| RECEIVER INPUT SELECT switch ---------- | Connects receptacles J5, J6, and J7 to AUT selected input. (Used in conjunction with RECEIVER OUTPUT SELECT switch.) |
| | *Sw pos* — *Action* |
| | PCM---------- Connects input signal from audio test set to AUT pcm input. |
| | FDM DEVIATION---------- Connects input signal from audio test set to AUT fdm input. |
| | ORDERWIRE SPIRAL --- Connects input signal from audio test set to AUT order wire spiral 4 input. |
| | ORDERWIRE---------- Connects input signal from audio test set to AUT order wire input. |
| | LOCAL ORDERWIRE ---- Connects input signal from audio test set to AUT local order wire input. |
| | REMOTE ORDERWIRE - Connects input signal from audio test set to AUT remote ring input. |
| | 2 WIRE ORDERWIRE --- Connects audio test set to AUT remote order wire 2-wire output. |

| *Control, indicator, or connector* | *Function* | |
|---|---|---|
| | *SW pos* | *Action* |
| | MICROPHONE | Connects audio test set input signal to AUT handset microphone input. |
| RECEIVER OUTPUT SELECT switch | | Connects connector J12 and/or CURRENT METER to AUT selected output. |
| | PCM | Connects AUT pcm output to audio test set. |
| | FDM (135) | Connects AUT fdm 135 ohm output to audio test set. |
| | FDM (600) | Connects AUT fdm 600-ohm output to audio test set. |
| | 2 WIRE ORDERWIRE | Connects AUT transmitter sidetone order wire to audio test set. |
| | HAND | Connects AUT receiver handset output to audio test set. |
| | THRU ORDERWIRE | Connects AUT through-order wire output to audio test set. |
| CURRENT METER | | Indicates - to 50-microampere current of various circuits selected. Selection is determined by RECEIVER INPUT SELECT, RECEIVER OUTPUT SELECT, and METER MODE SELECT switches, in addition to EXTERNAL TEST jacks J13 and J14. |
| EXTERNAL TEST jacks J13 and J14 | | Test jacks for using CURRENT METER in external test mode. |
| METER MODE SELECT switch | | Permit selection of input to CURRENT METER. |
| | *Sw pos* | *Action* |
| | INTERNAL TEST | Permits use of CURRENT METER through RECEIVER INPUT SELECT and RECEIVER OUTPUT SELECT switches. |
| | EXTERNAL TEST | Permits use of CURRENT METER through test jacks J13 and J14. |

**3-6. Signaling Unit Section Co ntrols and Indicators**

| *Control or indicator* | *Function* | |
|---|---|---|
| | *SW pos* | *Action* |
| SIGNAL SELECT switch | | Selects AUT oscillator circuit. |
| | 1 KHz SEND | Activates AUT 1-kHz oscillator for send mode. |
| | 1600 Hz RECEIVE | Activates AUT 1,600-Hz oscillator for receive mode. |

| *Control or indicator* | *Function* | |
|---|---|---|
| | *SW pos* | *Action* |
| | 1600 Hz SEND | Activates AUT 1,600-Hz oscillator for send mode. |
| RING ALARM indicator (green). | Illuminates when AUT 1-kHz and,/or 1,600-Hz oscillators are functioning properly | |
| RING LAMP indicator (green). | Same as RING ALARM indicator above. | |

**Note. When the audio test set is first turned on, and the AUT is properly activated, both the RING ALARM and the RING LAMP indicators will illuminate. Before testing signaling unit assembly 3A6, allow ample time to warm up and extinguish these indicators.**

### 3-7. Connector and Receptacle Section

| *Control or receptacle* | *Function* |
|---|---|
| VTVM INPUT connector J5 | Connects vacuum-tube voltmeter to monitor input test signals from a signal generator connected to connector J7. |
| FREQUENCY METER connector J6 | Connects frequency counter to monitor test signals from signal generator connected to connector J7. |
| Signal generator connector J7 | Connects signal generator to audio test set. |
| VTVM OUTPUT connector J12 | Connects vacuum-tube voltmeter to AUT output. |
| PCM INPUT connector J8 | Connects audio test set pcm signal to AUT (transmitter baseband). |
| FDM INPUT connector J2 | Connects audio test set fdm signal to AUT. |
| PCM OUTPUT connector J10 | Connects AUT pcm signal to audio test set. |
| PCM INPUT connector J3 | Connects audio test set pcm signal to AUT (receiver baseband). |
| TRANSMITTER BASEBAND (2A3) receptacle MX-6986/GRC-50(V). | Connects AUT baseband assembly 2A3 to audio test J9, set through MX-6986/GRC-50(V). |
| SIGNALING UNIT (3A6) receptacle J1, MX-6990/GRC-50(V). | Connects AUT signaling unit 3A6 to audio test set through MX-6990/GRC-50((V). |
| RECEIVER BASEBAND (3A3) receptacle J4, MX-6987/GRC-50(V). | Connects AUT baseband assembly 3A3 to audio test set through MX-6987/GRC-50(V). |
| CURRENT REGULATOR (2A6) receptacle J11, MX4986/GRC-50(V). | Connects AUT current regulator 2A6 to audio test set through MX-6986/GRC-50(V). |

## Section II. OPERATION UNDER USUAL CONDITIONS

### 3-8. Types of Operation

*a*. Test Set, Audio AN/GRM-65, when used with additional test equipment (para 1-8), permits the operator to check the performance, alignment, and troubleshooting of the assemblies of Radio Set AN/GRC-50(*)(V) shown below:

| *Assembly* | *Used in* |
|---|---|
| Transmitter current regulator assembly 2A6. | Transmitter, Radio T-893(P)/GRC. |
| Transmitter baseband assembly 2A3. | T-893(P)/GRC. |
| *Assembly* | *Used in* |
| Signaling unit assembly 3A6. | Receivers, Radio R-1148(P)/GRC and R-1331(P)/GRC. |
| Receiver baseband assembly 3A3. | R-1148(P)/GRC and R-1335(P)/GRC. |

*b*. For any type of operation, perform procedures as follows:

(1) Preliminary starting procedure (para 3-9).
(2) Starting procedure ('para 3-10).
(3) Operating procedures (para 3-11 through 3-14)

(4) Stopping procedure (para 3-15).

**3-9. Preliminary Starting Procedures**

*a.* Check to see that the top and the bottom louvers are free from obstructions.

*b.* Remove the front cover by unscrewing the 10 captive screws.

*c.* Set the AC POWER switch to OFF.

*d.* Release the seven quarter-turn fasteners on the rear hinged door and swing it open. Push the power cable through the hole in the door.

**3-10. Starting Procedure**

a. Insert the proper cable from Test Facilities Kit MK-715/GRC-50(V) into receptacle J1, J4, J9, or J11 as required for the test being performed.

b. Connect the ac power cable to a 115-volt ac power source.

c. Set the AC POWER switch to ON; the AC POWER ON indicator should illuminate.

**Notes:**

1. TRANSMITTER BASEBAND (2A3) receptacle J9, SIGNALING UNIT (3A3) receptacle J1, RECEIVER BASEBAND (3A3) receptacle J4, and CURRENT REGULATOR (2A6) receptacle J11 are interlocked to prevent damage to the AUT if 'it is accidentally plugged into the wrong connector. This interlock circuitry prevents the application of dc power to that receptacle having the wrong AUT inserted.

2. Operation of the interlock circuit can be checked without using the AN/GRC-50(*) (V) assemblies by using jumper wires on the proper pin jacks of the terminal box on the cable of the MK-715/GRC-50 (V) (para 4-4).

**3-11. Testing Transmitter Baseband Assembly 2A3**

*a.* Start the equipment as described in paragraph 3-10.

*b.* Connect MX-6986/GRC-50(V) P1 to receptacle J9 on the panel.

*c.* Set the DC POWER SELECT switch to TRANSMITTER BASEBAND.

*d.* Connect transmitter baseband assembly 2A3 to MX-6986/GRC-50(V) J35.

*e.* Connect one coaxial cable assembly CG1060C/U (part of MK-715/GRC-50(V)) between J8 on the audio test set and J2 on the transmitter baseband assembly 2A3, and another CG-1060C/U between J10 on the audio test set and J3 on the transmitter baseband assembly 2A3.

*f.* Push the PUSH TO RESET DC POWER switch; the DC POWER ON indicator should illuminate.

*g.* Refer to TM 11-5820-461-35 for procedures on checking transmitter baseband assembly 2A3 with the audio test set.

3-12. Testing Receiver Baseband Assembly 3A3

*a.* Start the equipment as described in paragraph 3-10.

*b.* Connect MX-6987/GRC-50(V) P1 to receptacle J4 on the panel.

*c.* Set the DC POWER SELECT switch to RECEIVER BASEBAND.

*d.* Connect receiver baseband assembly 3A3 to MX-6987/GRC-50(V) J39.

*e.* Connect one coaxial cable assembly CG1060C/U (part of the MK-715/GRC-50(V)) between J2 on the audio test set and J2 on the receiver baseband assembly 3A3, and another CG-1060C/U between J3 on the audio test set and J3 on the receiver baseband assembly 3A3.

*f.* Push the PUSH TO RESET DC POWER switch; the DC POWER ON indicator should illuminate.

*g.* Refer to TM 11-5820-461-35 for procedures on checking receiver baseband assembly 3A3 with the audio test set.

**3-13. Testing Current Regulator Assembly 2A6**

*a.* Start the equipment as described in paragraph 3-10.

*b.* Connect MX-6986,/GRC-50(V) P1 to receptacle J11 on the panel.

*c.* Set the DC POWER SELECT switch to CURRENT REGULATOR.

*d.* Connect current regulator assembly 2A6 to MX-6986/GRC-50(V) J35.

*e.* Push the PUSH TO RESET DC POWER switch; the DC POWER ON indicator should illuminate.

*f.* Refer to TM 11-5820-46135 for procedures on checking current regulator assembly 2A6 with the audio test set.

**3-14. Testing Signaling Unit 3A6**

*a.* Start the equipment as described in paragraph 3-10.

*b.* Connect MX-6990/GRC-50(V) P1 to receptacle J1 on the panel.

*c.* Set the DC POWER SELECT switch to SIGNALING UNIT.

*d.* Connect signaling unit assembly 3A6 to MX-6990/GRC-50(V) J14.

*e.* Push the PUSH TO RESET DC POWER switch the DC POWER ON indicator should illuminate.

*f.* Refer to TM 11-58-246135 for procedures on checking signaling unit assembly 3A6 with the audio test set.

**3-15. Stopping Procedures**

*a.* Set the AC POWER switch to OFF.

*b.* Set the DC POWER SELECT switch to OFF.

*c.* Set all switches on the additional test equipment to OFF.

*d.* Remove all the jumper wires and cables from the equipment.

*e.* Remove the ac power cable from the ac power source.

# CHAPTER 4

# MAINTENANCE

## Section I. GENERAL

***Note.*** **Do not apply torque to check the bolts, the screws, or the nuts for tightness**

### 4-1. Scope of Maintenance

The maintenance duties assigned to the operator and organizational maintenance man of Test Set, Audio AN/GRM-65 are listed below together with a reference to the paragraphs covering the specific maintenance function. These duties do not require special tools or test equipment.

*a.* Operator's daily preventive maintenance checks and service chart (para 4-4).

*b.* Operator's weekly preventive maintenance checks and services chart (para 4-5).

*c.* Organizational monthly preventive maintenance checks and services chart (para 4-7).

*d.* Organizational quarterly preventive maintenance checks and services chart (para 4-8).

*e.* Cleaning (para 4-6).

*f.* Operator's troubleshooting (para 4-1 4-11, and 4-12).

*g.* Repairs and adjustments.

(1) Replacement of pilot lamps (para 4-13*a*).

(2) Replacement of fuses (para 4-13*c*).

### 4-2. Preventive Maintenance

Preventive maintenance is the systematic care servicing, and inspection of equipment to prevent the occurrence of trouble, reduce downtime, and assure that the equipment is serviceable.

*a. Systematic Care.* The procedures given in paragraphs 4-3 through 4-8 cover routine systematic care and cleaning essential to the proper upkeep and operation of the equipment.

*.b Preventative Maintenance Checks and Services*. The preventive maintenance checks and service charts (para 4-4, 4-5, 4-7, and 4-8) describe functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat-serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat-serviceability, the charts indicate what to check, how to check, and the normal conditions. The References column lists the illustrations, paragraphs, or manuals that contain detailed repair or replacement procedures. If the defect cannot be remedied by performing the corrective action indicated, a higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

### 4-3. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the audio test set are required daily, weekly, monthly, and quarterly.

*a.* Paragraph 4-4 specifies preventive maintenance checks and services that must be done daily under the special conditions listed below.

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each week if the equipment is maintained in a standby condition.

*b.* Paragraphs 4-5, 4 7, and 4-9 specify additional checks and services that must be performed on a weekly, monthly, and quarterly basis, respectively.

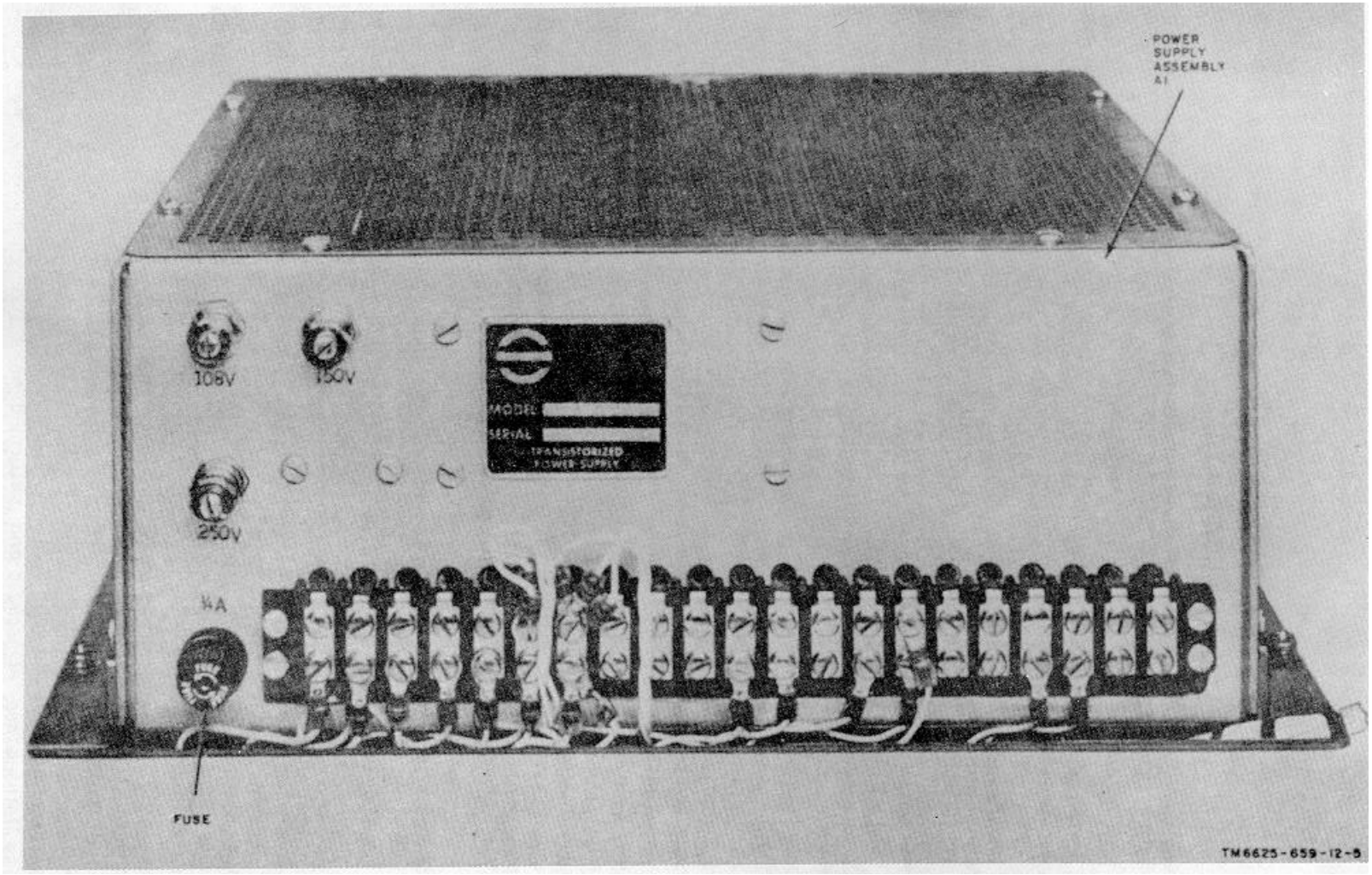


*Figure 4-1. Power supply, fuse location.*

## Section II. OPERATOR'S MAINTENANCE

### 4-4. Operator's Daily Preventive Maintenance Checks and Services Chart

| *Sequence No.* | *Item to be Inspected* | *Procedure* | *References* |
|---|---|---|---|
| 1 | Completeness | Check to see that equipment is complete. | Para 1-5.1, 1-6. |
| 2 | Cleanliness | Check to see that equipment is clean. | Para 4-6. |
| 3 | Connectors | Check tightness of all connectors. | |
| 4 | Meter glasses and indicator lenses. | Check all meter glasses and indicator lenses for cracks. | Para 4-12*a.*. |
| 5 | Controls and indicators | While making operating checks (sequence No. 6 through 1.3 below), observe that mechanical action of each knob, dial, and switch is smooth and free of external binding, and no excessive play is apparent. | |
| 6 | Preliminary setup | Set the controls as follows:<br>*a.* Set AC POWER switch to OFF.<br>*b.* Set DC POWER SELECT switch to OFF.<br>*c.* Connect ac power cable to 115-volt ac power source. | |
| 7 | AC POWER switch | Set AC POWER switch to ON; ` AC POWER ON indicator should illuminate. | Para 4-11. |
| 8 | DC POWER SELECT switch. | a. Set to RECEIVER BASE-BAND.<br>b. Connect MX-fi987 (GRC-50 TV) plug P1 to audio test set receptacle J4.<br>c. On MX-F,987 GRC-5,O(V) terminal box, connect juniper wire between tip jacks 48 and 49.<br>d. Depress PUSH TO RESET POWER switch; DC POWER ON indicator should Illuminate. | Para 4-11. |
| 9 | DC POWER SELECT switch. | a. Set DC POWER SELECT switch to TRANSMITTER BASEBAND.<br>b. Connect MX 6986/GRC-50 (V) plug P1 to audio test set receptacle J9.<br>c. On MX-6986(GRC-50(V) terminal box, connect jumper wire between tip jack 24 and 15.<br>d. Depress PUSH TO RESET DC POWER switch: DC POWER ON indicator should illuminate. | Para 4-11. |

| *Sequence No.* | *Item to be Inspected* | *Procedure* | *References* |
|---|---|---|---|
| 10 | DC POWER SELECT switch | a. Set DC POWER SELECT switch to SIGNALING UNIT.<br>b. Connect MX-6990/GRC-50(V) P1 to audio test set receptacle J1.<br>c. On MX-6990/GRC-50(V) terminal box, connect jumper wire between tip jacks 2 and 18.<br>d Depress PUSH TO RESET DC POWER switch; DC POWER ON indicator should illuminate. | Para 4-11. |
| 11 | DC POWER SELECT | a. Set DC POWER SELECT switch. switch to CURRENT REGULATOR.<br>b. Connect MX-6986/GRC-50(V) to audio test set receptacle J11.<br>c. On MX-6986/GRC-50(V) terminal box, connect jumper wire between tip jacks 1 and 12<br>d. Depress PUSH TO RESET DC POWER switch; DC POWER ON indicator should illuminate. | Para 4-11. |
| 12 | RING ALARM indicator. | a. Perform procedures given in sequence No. 10 above; leave jumper wire connected<br>b. On MX-6990/GRC-50(V) terminal box, connect second jumper wire between tip jacks 8 and 9.<br>c. RING ALARM indicator should illuminate. Remove second jumper wire and leave first jumper wire intact. | Para 4-11. |
| 13 | RING LAMP indicator. | a. Perform procedures given in sequence No 10 above; leave jumper wire connected.<br>b. On MX-6990/GRC-50(V) terminal box, connect a second jumper wire between tip jacks 8 and 10.<br>c. RING LAMP indicator should illuminate. Remove both jumper wires. | Para 4-11. |

**4-5. Operator's Preventive Maintenance Checks and Services Chart**

| *Sequence No.* | *Item to be Inspected* | *Procedure* | *References* |
|---|---|---|---|
| 1 | CABLES | Inspect cords, cables, and wires for chafed, cracked, or frayed insulation. Replace connectors that are broken, arced, stripped, or excessively worn. | |
| 2 | Handles and latches | Inspect handles, latches, and hinges for looseness; replace or tighten as necessary. | |

**4-6. Cleaning**

Inspect the exterior surfaces of the test set. The exterior surfaces should be free of dust, grease and fungus.

a. Remove dust and loose dirt with a clean, soft cloth.

**WARNING**

**Prolonged breathing of cleaning compound is dangerous; make sure adequate ventilation is provided. Cleaning compound is flammable; DO NOT use near a flame. Avoid contact with the skin; wash off any that spills on the hands.**

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with the cleaning compound.

c. Remove dust or dirt from plugs and jacks with a brush.

**CAUTION**

**Do not push on the meter face (glass) when cleaning; the meter may become damaged.**

d. Clean the front panels, the meters, and the control knobs; use a soft, clean cloth. If dirt is difficult to remove, dampen the cloth with water; use mild soap if necessary.

## Section III. ORGANIZATIONAL MAINTENANCE

**4-7. Monthly Preventive Maintenance Checks and Services Chart Sequence**

| *Sequence No.* | *Item to be Inspected* | *Procedure* | *References* |
|---|---|---|---|
| 1 | Pluckout items | Inspect clamps, connectors, adapters, and lamps for proper seating. Check for wrong, bent, or broken parts. | Paras 4-13a and 4-13b. |
| 2 | Fuses | Check for proper fuses. Fuses should be of indicated value and located as follows: | Para 4-13c. |
| | | a. FUSE 1 AMP (slow-blow type) on front panel. | Fig. 3-1. |
| | | b. Power supply, 0.25 ampere, on power supply rear panel. | Fig. 4-1. |
| 3 | Hardware | Check to see that all bolts, nuts, and washers are present and , properly tightened. | |
| 4 | Connectors | Check to be sure that jacks, connectors, and adapters fit snugly and make good contact. | Para 4-13b |
| 5 | Exterior surfaces | Inspect exposed metal surfaces for rust, corrosion, and bare metal areas; clean and touch up paint as required. | Para 4-9. |
| 6 | Terminal blocks | Inspect terminal blocks for loose connections and cracked or broken insulation. | |

| Sequence No. | Item to be Inspected | Procedure | References |
|---|---|---|---|
| 7 | Records | If equipment records and log books are used, check to see they are properly filled out and kept up to date. | TM 38-750. |

**4-8. Quarterly Preventive Maintenance Checks and Services Chart**

| Sequence No. | Item to be Inspected | Procedure | References |
|---|---|---|---|
| 1 | Publication | Check to see that all publications are complete, serviceable, and current. | DA Pam 310-4 |
| 2 | Modifications | Check DA Pam 310-4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled. | TM 38-7560 and DA Pam 310-4. |
| 3 | Spare parts | Check all spare parts for general condition and method of storage. There should be no evidence of overstockage, and all shortages must be on valid requisitions. | Para 1-6. |

**4-9. Touchup Painting Instructions**

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to applicable cleaning and refinishing practices specified in TM 9-213 and TB SIG 364.

**4-10. Organizational General Troubleshooting Information**

Troubleshooting the equipment is based on the operational checks contained in the separator's daily preventive maintenance checks and services chart (para 4-4). To troubleshoot the equipment, perform all the functions starting with sequence No. 6 in the operator's daily preventive maintenance checks and services chart and proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the item number and refer to the troubleshooting chart (para 4-11). Perform the checks and corrective measures do not result in correction of the trouble, higher category of maintenance is required. Paragraphs 4-13a, 4-13b, and 413c contain additional information and step-by-step instructions for performing repairs during the troubleshooting procedures.

**4-11. Organizational Troubleshooting Chart**

The organizational troubleshooting chart lists abnormal conditions based upon the tests given in operator's daily preventive maintenance checks and services chart (para 4-4). If corrective measures indicated do not result in correction of the trouble, higher maintenance category is required.

| Item No. | Trouble symptom | Probable trouble | Checks and corrective measure |
|---|---|---|---|
| 1 | AC POWER ON indicator does not illuminate. | a. Defective AC POWER ON indicator. | a. Check AC POWER ON indicator (para 4-13a). |
| | | b. Defective FUSE 1 AMP | b. Check FUSE 1 AMP (para 4-13a). |
| | | c. Defective ac power cable | c. Check connections on ac power cable. |

| Item No. | Trouble symptom | Probable trouble | Checks and corrective measure |
|---|---|---|---|
| | | *d.* Ac cable not connected to ac source. | *d.* Connect ac cable to source. |
| | | *e.* AC POWER switch not set to ON | *e.* Set AC POWER switch to ON. |
| 2 | DC POWER ON indicator does not illuminate. | *a.* DC POWER SELECT switch not set to RECEIVER BASEBAND. | *a.* Set DC POWER SELECT switch to RECEIVER BASEBAND. |
| | | *b.* Jumper wire on MX-6987/ GRC-50(V) incorrectly connected. | *b.* Check connections (tip jacks 48 and 49). |
| | | *c.* PUSH TO RESET DC POWER switch not activated. | *c.* Press PUSH TO RESET DC POWER switch. |
| | | *d.* DC POWER ON indicator defective. | *d.* Check DC POWER ON indicator (para 4-13*a*). |
| 3 | DC POWER ON indicator does not illuminate. | *a.* DC POWER SELECT switch not set to TRANSMITTER BASEBAND. | *a.* Set DC POWER SELECT switch to TRANSMITTER BASEBAND. |
| | | *b.* Jumper wire on MX-6986/ GRC-50(V) incorrectly connected. | *b.* Check connections (tip jacks 24 and 35). |
| | | *c.* DC POWER ON indicator defective. | *c.* Check DC POWER ON indicator (pars 4-13a). |
| | | *d.* PUSH TO RESET DC POWER switch not activated. | *d.* Press PUSH TO RESET DC POWER switch. |
| 4 | DC POWER ON indicator does not illuminate. | *a.* DC POWER SELECT switch not set to SIGNALING UNIT. | *a.* Set DC POWER SELECT switch to SIGNALING UNIT. |
| | | *b.* Jumper wire on MX-6990/ GRC-50(V) incorrectly connected. | *b.* Check connections (tip jacks 12 and 13). |
| | | *c.* DC POWER ON indicator defective. | *c.* Check DC POWER ON indicator (para 4-13a). |
| | | *d.* PUSH TO RESET DC POWER switch not activated. | *d.* Press PUSH TO RESET DC POWER switch. |
| 5 | DC POWER ON indicator does not illuminate. | *a.* DC POWER SELECT switch not set to CURRENT REGULATOR. | *a.* Set DC POWER SELECT switch to CURRENT REGULATOR. |
| | | *b.* Jumper wire on MX-6986/ GRC-50(V) incorrectly connected. | *b.* Check connections (tip jacks 1 and 12). |
| | | *c.* DC POWER ON indicator defective. | *c.* Check DC POWER ON indicator (para 4-13a). |
| | | *d.* PUSH TO RESET DC POWER switch not activated. | *d.* Press PUSH TO RESET DC POWER switch. |
| 6 | RING ALARM indicator does not illuminate. | *a.* Jumper wire on MX4990/ GRC-50(V) incorrectly connected. | *a.* Check connections (tip jacks 7 and 9). |
| | | *b.* RING ALARM indicator defective. | *b.* Check RING ALARM indicator (par 4-13a). |
| 7 | RING LAMP indicator does not illuminate. | *a.* Jumper wire on MX-6990/ GRC-50(V) incorrectly connected. | *a.* Check connections (tip jacks 7 and 10). |
| | | *b.* RING LAMP indicator defective. | *b.* Check RING LAMP indicator (para 4-13a). |

**4-12. Supplementary Troubleshooting Information**

a. Abnormal Operation of Meter Circuits. DO NOT attempt to troubleshoot the meter circuits. The meters are very sensitive and subject to damage.

***Note*. If trouble is indicated in the meter circuits, higher category of maintenance is required.**

*b. Removal of Rear Door*. Perform the procedures listed in (1), (2), and (3) below.

(1) Remove the ac power cable from the ac power source before opening the rear door.

(2) With a screwdriver, release the seven quarter-turn fasteners on the rear (hinged, liftoff) door and swing it open.

(3) If required, the rear door can be lifted off the hinges. (Pull the ac power cable through the opening in the door before lifting the door.)

**4-13. Repairs and Adjustments**

*a. Replacement of Pilot Lamps.*

(1) Turn the lens that covers the defective pilot lamp counterclockwise; remove it from the lamp socket.

(2) Push in on the defective lamp and turn it counterclockwise to unlock it from the lamp socket. Remove the lamp.

(3) Insert the new -lamp into the lamp socket. Push in on the lamp and turn it clockwise to lock it in place.

**Note. Be sure that the pilot lamp is of the proper rating (type 47).**

(4) Replace the lens on the lamp socket and turn it clockwise to tighten it.

*b. Cable Repair*. Use electrical insulation tape to temporarily repair all breaks, cuts, kinks, deteriorations, strain, and fraying in the ac power cable and radio frequency (rf) cables until replacement cables are available.

*c. Fuse Replacement*

(1) Turn the fuseholder cap counterclockwise and remove it from the fuseholder.

(2) Remove the defective fuse from the fuseholder cap.

(3) Insert the new fuse in the fuseholder cap.

**Note. Be sure the fuse is of the proper rating.**

(4) Replace the fuseholder cap and fuse in the fuseholder and turn it clockwise to tighten it.

(5) The chart below lists the fuses and their location.

| Fuse | Location | Rating | |
|---|---|---|---|
| | | Amperes | Volts |
| FUSE 1 AMP | Front panel (fig. 3-1) | 1 | 250 |
| FUSE 1/4A | Power supply, rear (fig. 4-1) | 0.25 | 250 |

# CHAPTER 5

# SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

## Section I. SHIPMENT AND LIMITED STORAGE

### 5-1. Disassembly of Equipment

Disassemble Test Set, Audio AN/GRM-65 as follows:

*a.* Perform the stopping procedure (para 3-15).

*b.* Release the seven quarter-turn fasteners on the rear door and pull the ac power cable through the door hole.

*c.* Store the ac power cable in the rear door; refasten the door with the seven quarter-turn fasteners.

*d.* Replace the front cover and secure it with the 10 captive screws.

*e.* Store all the components of Test Facilities Kit MK-715/GRC-50(V) in the test facilities kit case.

### 5-2. Repacking for Shipment or Limited Storage (fig. 2-1)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Use the procedures given in a below whenever circumstances permit. The information concerning the original packaging (para 2-1) will also be helpful.

*a. Material Requirements*. The materials given in the chart below are required for packaging the audio test set. For stock numbers of materials, consult SB 38-100.

| Material | Quantity |
|---|---|
| Waterproof wrapping paper. | 12 sq ft (1.1 sq meters). |
| Paperboard cushioning. | 14 sq ft (1.3 sq meters). |
| Waterproof pressure sensitive adhesive tape (3 inches wide), | 16 ft (4.9 meters). |
| Gummed-paper tape (3 inches wide). | 15 ft (4.6 meters). |

*b. Packaging*. Package the items of the test set as follows:

(1) Technical manuals. Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the bag securely with waterproof pressure-sensitive tape.

(2) Running spares. Wrap each item with paperboard wrapping cushioning. Secure the cushioning with gummed paper tape.

(3) Test Set, Audio AN/GRM-65. Place the items packaged in (1) and (2) above and the minor assemblies within the space provided in the metal cabinet. Close and secure the front cover and the rear door. Cushion the case by wrapping it with paperboard wrapping cushioning. Secure the cushioning with gummed-paper tape. Overwrap the cushioned case with waterproof wrapping paper. Secure the waterproof wrapping paper with waterproof wrapping paper. Secure the waterproof wrapping paper with waterproof pressure-sensitive tape.

*c. Packing* (fig. 2-1).

(1) Place the audio test set in a wooden box.

(2) Place the packaged technical manuals on top of the audio test set.
(3) Nail down the lid of the wooden box.
(4) Strap the nailed wooden box only when it is to be shipped overseas.
(5) Mark the box as described in MIL STD-D-129B.

## Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

### 5-3. Authority for Demolition

The demolition procedures given in paragraph 5-4 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

### 5-4. Methods of Destruction

The tactical situation and time available will determine the method to be used when destruction of equipment is ordered. In most cases, it is preferable to completely demolish some portions of the equipment rather than to partially destroy all the equipment units.

*a. Smash*. Smash the interior units of the set.

(1) Smash the connectors, meters, knobs, dials, and power supply.

**Note. Heavy tools will effectively destroy the external parts mentioned in (1) above, but the rest of the exposed surfaces of the equipment are constructed of heavy aluminum; attempts to damage it by smashing will be useless.**

(2) Remove the panel from the cabinet, and smash as many of the exposed parts of the various chassis as possible.

*b. Cut.* Cut cabling, cording, and wiring. Cut the power cable. Cut all cords and cables in a number of places.

**Warning: Be extremely careful with explosives and incendiary devices. Use these items only where the need is urgent.**

*c. Burn*. Burn the technical manuals first. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar materials. Pour gasoline on the cut cables and internal wiring and ignite it. Use a flamethrower to burn the spare parts, or pour gasoline on the spares and ignite them. Use incendiary grenades to complete the destruction of the unit.

*d. Explode*. Use explosives to complete the demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired.

(1) Use a fragmentation grenade to destroy the interior of the test set. Open the rear door of the case and drop the grenade into the interior.
(2) For quick destruction of the test set, place an incendiary grenade on top of the unit. Get away from the unit after the grenade is placed.

*e. Dispose.* Bury or scatter destroyed parts or throw them in nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

## APPENDIX A

## REFERENCES

Following is a list of reference available to the operator and organizational repairman of Test set, Audio AN/GRM-65.

| | |
|---|---|
| AR 700-58 | Report of Packaging and Handling Deficiencies. |
| DA Pam 310-4 | Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9) Supply Bulletins, and Lubrication Orders. |
| DA Pam 310-7 | U. S. Army Equipment Index of Modification Work Orders. |
| MIL-STD-129B | Marking for Shipment and Storage. |
| SB 38-100 | Preservation, Packaging, and Packing Materials, Supplies, and Equipment used by the Army. |
| TB SIG 364 | Field Instructions for Painting and Preserving Electronics Command Equipment. |
| TM 9-213 | Painting Instructions for Field Use. |
| TM 11-5820-461-12 | Organizational Maintenance Manual: Radio Sets AN/GRC-50(V) 1, 2, 3, 4, and 5, and Radio Sets AN/GRC-50A(V) 1, 2, 3, 4, and 5. |
| TM 11-5820461-35 | Direct, General Support, and Depot Maintenance Manual: Radio Sets AN/ GRPC-50(V) 1, 2, 3, 4 and 5; Radio Sets AN/GRC-50A(V) 1, 2, 3, 4, 5, 6 and 7; and Test Facilities Kit MK-71'5/GRC-50(V). |
| TM 11-6625-200-12 | Organizational Maintenance Manual: Multimeters ME-26A/U, ME-26B/U, ME-26C/U, and ME-26D/U. |
| TM 11-6625-320-12 | Operator and Organizational Maintenance Manual: Voltmeter, Meter ME- 30A/U, and Voltmeters, Electronic ME-30B/U, ME-30C/U, and ME-30E/U. |
| TM 11-662-5-15 | Organizational, DS, GS, and Depot Maintenance Manual: Generator, Signal AN/USM-205. |
| TM 11-6625-700-10 | Operator's Manual: Digital Readout, Electronic Counter AN/USM-207. |
| TM 38-750 | Army Equipment Record Procedures. |

# APPENDIX B

# BASIC ISSUE ITEMS

**DELETED**

# APPENDIX C
# MAINTENANCE ALLOCATION

## SECTION I. INTRODUCTION

### C-1. General

This appendix provides a summary of the maintenance operations for AN/GRM-65. It authorizes categories 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.

### C-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. Align..* 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, align, 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. This function does not include the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

*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 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.

### C-3. Column Entries

a. *Column 1, Group Number.*. Column I 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 Category.* 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 category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, 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:

C - Operator/Crew
O - Organizational
F - Direct Support
H - General Support
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.

**C-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 Category*. The codes in this column indicate the maintenance category allocated the 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 (5digit) in parentheses.

**C-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 AUDIO FREQUENCY AN/GPR-65

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY C | O | F | H | D | (5) TOOLS AND EQUIPMENT | (6) REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 00 | TEST SET, AUDIO FREQUENCY AN/GRM-65 | Inspect | | 0.1 | | | | | A |
| | | Inspect | | | | | 0.3 | | B |
| | | Test | | 0.2 | | | | | C |
| | | Test | | | | | 0.4 | 1-7, 10, 11 | D |
| | | Service | | 0.1 | | | | | A |
| | | Service | | | | | 0.3 | | E |
| | | Adjust | | 0.2 | | | | | F |
| | | Adjust | | | | | 0.3 | 8.9 | G |
| | | Calibrate | | | | | 0.3 | | |
| | | Repair | | 0.2 | | | | | H |
| | | Repair | | | | | 2.0 | 8,9 | I |
| | | Overhaul | | | | | 5.0 | 1 thru | J |
| | | Rebuild | | | | | 5.0 | 1 thru 11 | J |

## SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR

## TEST SET AUDIO FREQUENCY AN/GCU-65

| TOOL OR TEST EQUIPMENT REF CODE | MAINTENANCE CATEGORY | NOMENCLATURE | NATIONAL/ NATO STOCK NUMBER | TOOL NUMBER |
|---|---|---|---|---|
| 1 | D | BRIDGE, RESISTANCE A-4/U | 6625-00-500-0937 | |
| 2 | D | MULTIMETER ME-26/U | 6625-00-360-2493 | |
| 3 | D | VOLTMETER, ELECTRONIC ME-202/U | 6625-00-709-0288 | |
| 4 | D | RESISTOR, DECADE ZM-16/U | 6625-00-669-0266 | |
| 5 | D | METER TEST SET TS-682/U | 6625-00-669-0747 | |
| 6 | D | MULTIMETER TS-352B/U | 6625-00-553-0142 | |
| 7 | D | TEST FACILITIES KIT kM-715/GRC-50(') | 6625-00-868-8335 | |
| 8 | D | TOOL KIT TK-1OO/G | 5180-00-605-0079 | |
| 9 | D | TOOL KIT TK-105/B | 5180-00-610-8177 | |
| 10 | D | OSCILLOSCOPE AN/USM-140 | 6625-00-987-6603 | |
| 11 | D | TRANSFORMER, VARIABLE POWER TF-518/CGM-67 | 6120-00-089-2729 | |

## SECTION IV. REMARKS
## TEST SET, AUDIO FREQUENCY AN/GRM-65

| REFERENCE CODE | REMARKS |
|---|---|
| A | Exterior only. |
| B | All inspection. |
| C | Operational only. |
| D | All tests. |
| E | All servicing. |
| F | Front panel only. |
| C | All adjustments. |
| H | Replacement of lamps, knobs, cables and fuses. |
| I | All repairs including power supply. |
| J | Plus shop support. |

# APPENDIX D
# ORGANIZATIONAL REPAIR PARTS

**DELETED**

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