# TM 11-6625-1633-12

**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**

## OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

**INCLUDING**

**REPAIR PARTS AND SPECIAL TOOL LISTS**

# GENERATOR, SIGNAL AN/URM 149

**(NSN 6625-00-903-3501)**

This copy is a reprint which includes current pages from Changes 1 and 2.

**HEADQUARTERS DEPARTMENT 0F THE ARMY**
**OCTOBER 1967**

**WARNING**

Be careful when working on the 115-volt/230-volt ac line connections move power when making any inspections inside the equipment; voltages as high as 600 volts are present at some components.

**DO NOT TAKE CHANCES!**

TECHNICAL MANUAL
NO. 11-6625-1633-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *18 October 1967*

# OPERATOR'S AND ORGANIZATIONAL MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS
# GENERATOR, SIGNAL AN/URM-149 (NSN 6625-00-903-3501)


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# CHAPTER 1

# INTRODUCTION

## Section I. GENERAL

### 1-1. Scope

This manual describes Generator, Signal AN/URM-149 (fig. 1-1) and provides instructions for installation, operation and operator and organizational maintenance. It includes instructions for operation under usual and unusual conditions and for replacement of parts which are available to the operator and organizational repair technician.

### 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 4030.29/AFR 7113/MCO P 4030.29A, and DSAR 4145.8.

*c. Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.3.3A ARF 75-18/MCO P4610.19B and DSAR 4500.15.

#### 1-3.1. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

#### 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, NJ 07703.

#### 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

Generator, Signal AN/URM-149 is a portable signal generator capable of producing unmodulated or frequency modulated (FM) signals in the 600- to 1,850-magacycle (me) signal range. The AN/URM-149 is used for testing, aligning, and repairing FM receivers operating within its frequency range.

### 1-5. Technical Characteristics

| | |
|---|---|
| Frequency range | 600 to 1,850 mc. |
| Type of output | RF; unmodulated or frequency modulated. |
| Internal modulation characteristics: | |
| Frequencies available | 1 kc, 1.6 kc, 20 kc, 68 kc, and 108 kc. |
| Deviation | 0 to 300 kc. |

External modulation characteristics:
- Input impedance (EXT PULSE) ..... 50 ohms nominal.
- Input impedance (EXT SINE)..... 136 ohms nominal.
- Modulating frequency range (sine wave)..... 250 cps to 108 kc.
- Modulating pulse repetition frequency ..... 300 to 380,000 pps.
- Deviation ..... 0 to 300 kc
- RF output impedance ..... 50 ohms nominal.
- RF output voltage..... 0.1 μv to 100,000 μv into 50 ohms
- RF output power..... -7 to -127 dbm into 50 ohms.
- Line-voltage input ..... 115 volts ± 10% or 230 volts ± 10%, 50 to 60 cps.
- Weight ..... 121 lb.

## 1-6. Components of Generator, Signal AN/URM-149

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

| *Quantity* | *Item* | *Dimensions (in.)* | | | *Unit weight (lb.)* |
|---|---|---|---|---|---|
| | | *Height* | *Depth* | *Width* | |
| 1 | Generator, Signal SG-155/U. | 12 | 12 | 17 | 80 |
| 1 | Case, Signal Generator CY-3986/U. | 26 5/16 | 16 15/32 | 20 19/32 | 40 |
| 1 | Cable Assembly, Radio Frequency CG-3169A/U. | | | 72 | 1 |
| 1 | Technical manual, TM 11-6625-1633-12 | 10 ¼ | | 7 5/8 | ¼ |

*b. Running Spares. (fig. 1-1).*

| *Quantity* | *Item* | *Quantity* | *Item* |
|---|---|---|---|
| 3 | Fuse, Cartridge, 3 amp: 81349; F02A250V3A. | 2 | Lamp, Glow: 81349; NE51 |
| 2 | Fuse, Cartridge, 2 amp: 81349; F02A250V2A. | 3 | Lamp, Incandescent: 96906, MS15571-2 |

### 1-6.1. Items Comprising an Operable Generator, Signal AN/URM-149 (NSN 6625-00-903-3501)

| NSN | QTY | Nomenclature | Fig. No. |
|---|---|---|---|
| 5995-00-935-2618 | 1 | Cable Assembly, Radio Frequency CG-3169A/U | 1 |
| 6625-00-903-3500 | 1 | Generator, Signal SG-155/U | 1 |

## 1-7. Description of Generator, Signal AN/URM-149

(fig. 1-1)

*a.* The AN/URM-149 consists of Generator, Signal SG- 155/U (housed in Case, Signal Generator CY-3986/U) and Cable Assembly, Radio Frequency CG-3169A/U.

*b.* Generator. Signal SG- 155/U (signal generator) consists of a panel-chassis assembly contained in an aluminum dust cover with gray enamel finish. The front panel is equipped with two handles to facilitate movement of the equipment and to protect the controls All operating control, power cable, and receptacles for interconnecting the signal generator are mounted on the front panel.

*c.* Case, Signal Generator CY-3986/U (transit case) is a waterproof, aluminum case with storage compartments for Cable Assembly, Radio Frequency CG-3169A/U and this manual. The cover of the transit case is held in place by eight truck-type latches. The transit case is equipped with two handles to facilitate moving the equipment. To operate the signal generator while in the transit case, remove the latched cover.

*d.* Cable Assembly, Radio Frequency CG-3169A/U (RF cable) is a 6-foot cable with male connectors at both ends; it is used to connect the signal generator to the equipment under test.

# CHAPTER 2
# INSTALLATION

## 2-1. Packaging

When packaged for domestic shipment, the components of the AN/URM-149 are placed in a fiberboard carton with fiberboard cushioning and the carton is sealed (fig. 2-1). When packaged for oversea shipment, the components of the AN/URM-149 are wrapped in fiberboard packing and placed in a fiberboard carton 21 1/2 inches by 18 inches by 26 1/2 inches, with a volume of 5:9 cubic feet and a unit weight of 122 pounds. The carton is then placed within a water-vapor-proofed metalized cloth bag and the opening is heat sealed. The bag is then placed into a wooden shipping crate that is lined with waterproof paper. The top is nailed on the crate and the crate is secured with metal straps.

## 2-2. Uncrating, Unpacking and Checking Equipment

*a*. *General*. When the equipment is received, it should be unpacked, while sheltered from the elements, in a location near the intended place of use.

*b*. *Uncrating and Unpacking Instructions.*

(1) Place the packing case near the intended place of use.

(2) Slit the sealing tape along the centerline and at the ends.

(3) Open the carton and remove the transit case from the carton.

(4) Inspect the equipment for possible damage that may have occurred during shipment. If the shipment has been damaged, report the damage according to instructions in paragraph 1-3.

(5) Check the contents of the packing cases with the master packing slip. Check the quantity against the items listed in paragraph 1-6. If a packing list is not available, check against the basic issue items list (appx B). Report all discrepancies in accordance with TM 38-750. Shortages of a minor assembly or part that does not affect functioning of the equipment should not prevent use of the equipment.

*c*. If the equipment has been used or reconditioned, 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 modified, see that any operational changes resulting from the modification have been entered in the equipment manual.

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

## 2-3. Seating of Tubes and Fuses

Generator, Signal SG-155/U is shipped with tubes and fuses installed.

*a*. Check for breakage and proper seating of tubes (fig. 4-1). To reach the tubes proceed as follows:

(1) Release the two cam locks at rear of the unit.

(2) Grasp the front panel handles and pull the chassis out of the case.

*b*. Check to see that 3.0 and 2.0-ampere, 250-volt fuses are installed in the proper fuseholders (fig. 4-1).

## 2-4 Installation of Signal Generator

The signal generator should be placed on a firm support in a position convenient to the bench facilities for the equipment being tested. It should be within 5 feet of a 115 or 230-volt alternating current (ac), 50- to 60 cps source and within 6 feet from the equipment to be tested. No further installation procedures are required, other than making the connections necessary for the various types of operation.

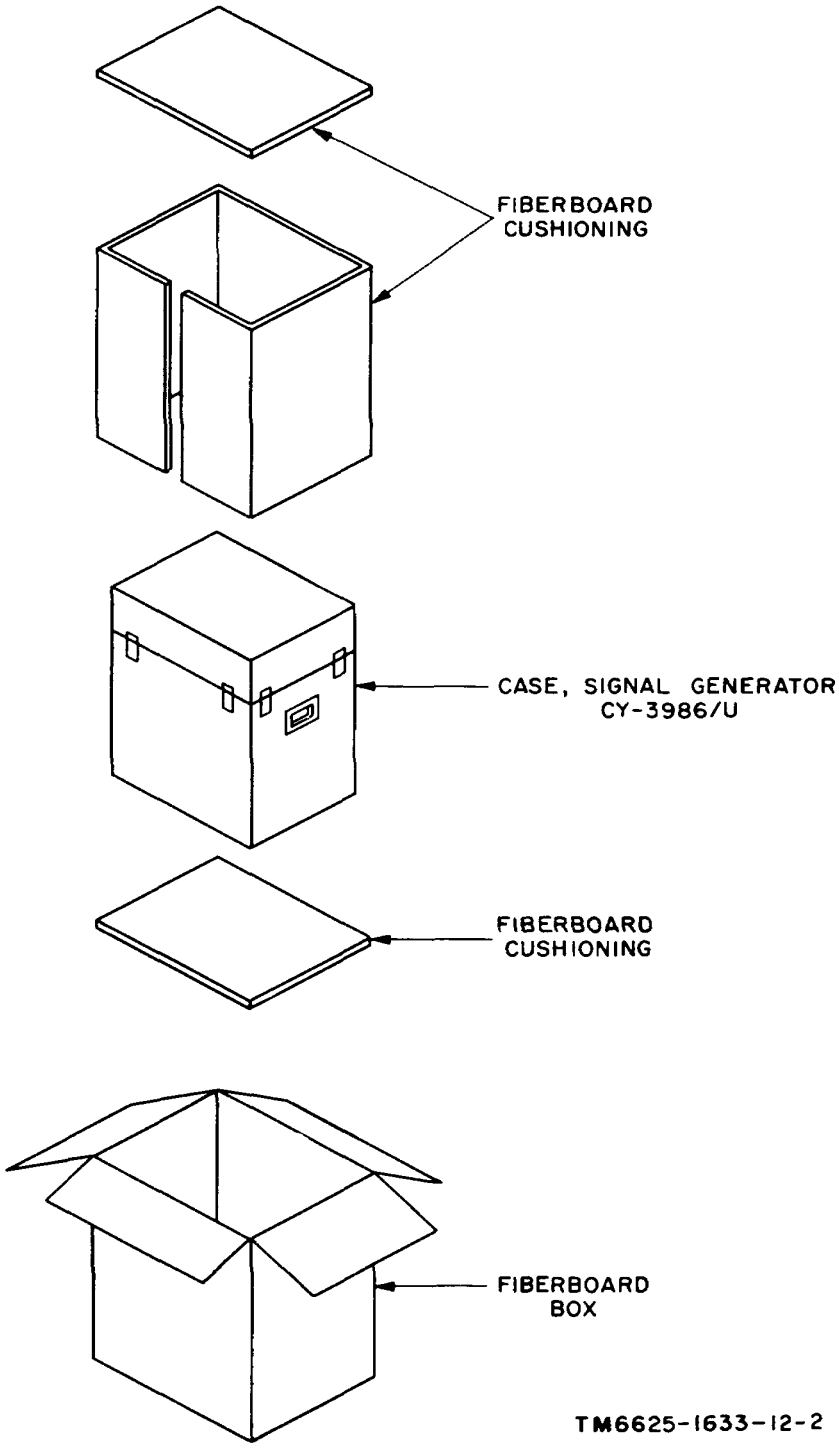


*Figure 2-1. Packaging materials.*

# CHAPTER 3

# OPERATING INSTRUCTIONS

## Section I. OPERATOR'S CONTROLS AND INDICATORS

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

### 3-1 Damage From Improper Settings

***Caution*: Improper setting of the 115V-230V switch may result in damage to the equipment.**

The 115V-230V switch, behind the button plug on the rear of the unit, must be properly positioned for the line voltage being used.

### 3-2 Generator, Signal SG-155/U Operating Controls and Indicators

(fig. 3-1)

| Control | Function |
|---|---|
| Power OFF switch | When set to On (up) position, connects generator to ac power source. |
| POWER indicating lamp | A red lens indicator which glows when power is turned on. |
| KLYSTRON indicating lamp | A yellow lens indicator which glows when delayed klystron beam voltage has been applied. |
| MODULATION selector switch | A five position switch for selection of mode of operation of signal generator as follows: |

| Position | Action |
|---|---|
| OFF | Disables klystron and places signal generator in standby condition. The power monitor bridge can be balanced at this time. (See ZERO SET control.) |
| CW | Allows calibration of POWER SET meter by use of POWER SET control knob. Cw rf output is provided when switch is in this position. |
| INT SINE | Connects power to internal oscillator which permits internal sine wave modulation of klystron. |
| EXT SINE | Connects modulation amplifier input to EXT SINE jack on front panel |
| EXT PULSE | Connects input of modulation amplifier to EXT PULSE jack on the front panel |

| Control | Function |
|---|---|
| INTERNAL MODULATION FREQUENCY selector switch. | A five position switch (1000~ 1600~, 20KC, 68KC, or 108KC) for selection of frequency of internal oscillator modulator. |
| DEVIATION METER RANGE selector switch | A three-position switch (75KC, 150KC, or 300KC) for selection of range to be read on deviation meter. |
| Center frequency selector handwheel | Selects output frequency of klystron. The frequency is indicated on the 600-1850MC FREQUENCY MC counter. |
| ZERO SET control | Balances the power monitor bridge when the MODULATION selector switch is in the OFF position. This condition is indicated on POWER SET meter. |
| POWER SET control | Sets the power reference level on the POWER SET meter and thereby calibrates the MICROVOLTS -DBM indicator dial when MODULATION selector switch is in the CW position. |
| ATTENUATOR control | Controls rf power output which is read on the MICROVOLTS -DBM indicator dial. |
| DEVIATION control | A potentiometer that controls the deviation which is indicated on DEVIATION meter. |
| DEVIATION meter | Indicates deviation from klystron center frequency. |
| POWER SET meter | Indicates either balancing of power monitor bridge or calibration of MICROVOLTS -DBM dial, depending on setting of MODULATION selector switch. |
| 600-1850 MC FREQUENCY MC counter | Shows output frequency of klystron in 1 megacycle steps. |
| MICROVOLTS -DBM dial | Indicates output of signal generator into 50-ohm load in -DBM and MICROVOLTS simultaneously. |

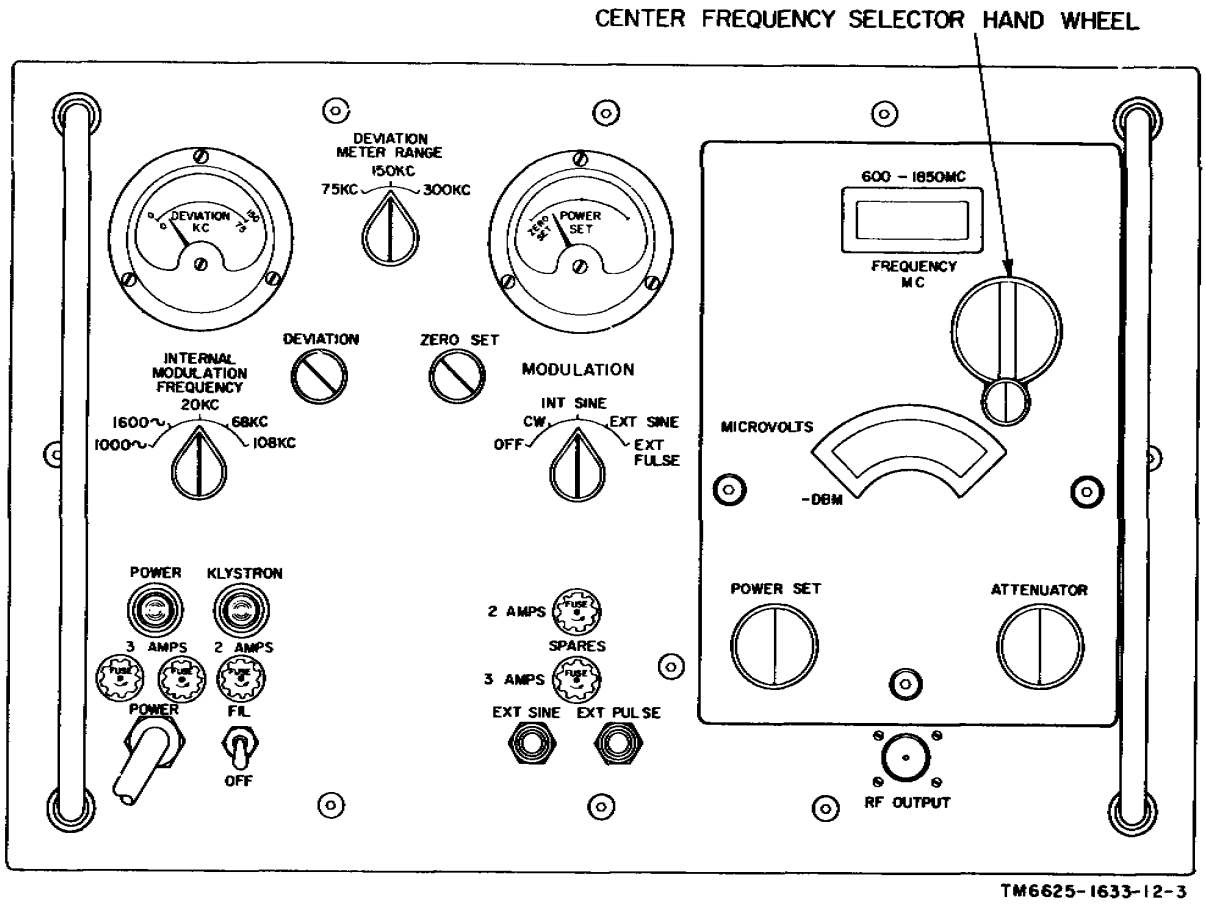


*Figure 3-1. Generator, Signal SG-155/U, operator's controls and indicators.*

## Section II. OPERATION UNDER USUAL CONDITIONS

### 3-3. Types of Operation

*a.* The signal generator may be operated as any of the following:

(1) Continuous wave (cw) signal generator.
(2) Internally modulated (sine wave) FM signal generator.
(3) Externally modulated (sine wave) FM signal generator.
(4) Externally modulated (pulse) generator.

*b.* For any type of operation, perform the following procedures:

(1) Starting procedure (para 3-4).
(2) Operating procedures (para 3-5).
(3) Stopping procedure (para 3-6).

### 3-4. Starting Procedure

***Caution:*** **Check to see that the 115V-23OV switch, behind the ACCESS PORT button plug on the rear of the unit, is properly portioned for the line voltage to be used.**

*a. Preliminary.* Before connecting the power cord, set the panel controls as follows:

| Control | Position |
|---|---|
| Power OFF switch | OFF. |
| MODULATION selector switch | OFF. |
| POWER SET control | Center position (approximately). |
| ZERO SET control | Center position (approximately). |

*Note.* If an abnormal indication is obtained during the starting procedure, refer to the daily preventive maintenance checks and services chart (para 4-5) for corrective measures.

*b. Starting.*

(1) Connect the power cord to a suitable power source.

(2) Connect the RF cable to the front panel RF OUTPUT connector and to the equipment under test.

(3) Set power OFF switch to the up position. The POWER indicating lamp should glow immediately and, after 60 seconds, the KLYSTRON yellow pilot should glow to indicate that the klystron beam supply has been energized. Allow a 15-minute warm-up period to minimize oscillator drift.

(4) Turn the center frequency selector handwheel until the desired operating frequency is registered on the 600-1850MC FREQUENCY MC counter.

(5) Adjust the ZERO SET control until a ZERO SET reading is indicated on the POWER SET meter.

(6) Set tile MODULATION selectors switch to OFF.

(7) Adjust the POWER SET control until the POWER SET meter pointer is aligned with the red center mark on the meter.

## 3-5. Operating Procedures

*a. Cw Generator Operation*

(1) Set the MODULATION selector switch to CW.

(2) Adjust the ATTENUATOR control until the MICROVOLTS -DBM dial indicates THE DESIRED power output.

*b. Internally modulated {Sine Wave) FM Signal Generator Operation*

(1) Set the MODULATION selector switch to INT SINE.

(2) Set the INTERNAL MODULATION FREQUENCY selector switch to the desired modulation frequency.

(3) Set the DEVIATION METER RANGE selector switch to the desired range.

(4) Adjust the DEVIATION control knob until the DEVIATION KC meter indicates the desired deviation.

(5) Adjust the ATTENUATOR control knob to the desired power output as indicated on the MICROVOLTS -DBM dial.

*c. Externally Modulated (Sine Wave) FM Signal Generator Operation.*

(1) Connect an external sine wave generator, with a frequency range of 250 to 108 kilocycles (kc), to the EXT SINE jack.

(2) Set external sine wave generator output signal to 2 volts root mean square (rms) and at the desired frequency within above limits.

(3) Set the MODULATION selector switch to EXT SINE.

(4) Repeat the procedures given in b(3) through (5) above.

*d. Externally Modulated (Pulse) Generator.*

(1) Connect an external pulse generator, with a pulse repetition frequency (prf) of 300 to 380,000 pulses per second (pps) to the EXT PULSE jack.

(2) Set external pulse generator output to 2-volt pulses and at desired prf within above limits.

(3) Set the MODULATION selector switch to EXT PULSE

(4) Repeat b(3) through (5) above.

## 3-6. Stopping Procedure

*a*. Set the power OFF switch to the OFF position.

*b*. Remove power from the external modulating generator (if used).

*c*. Disconnect the ac line cord from the power source.

*d*. Disconnect the RF cable from the RF OUTPUT and the equipment under test.

*e*. Disconnect the external generator cable from EXT SINE or EXT PULSE jack (if used).

*f* Store the signal generator and RF cable in the transit case.

## Section III. OPERATION UNDER UNUSUAL CONDITIONS

### 3-7 General

The operation of the signal generator may be difficult in regions where extreme cold, heat, humidity and moisture, and sand conditions, prevail. Uniformity of characteristics over a wide temperature range is always difficult and can cause erratic outputs unless additional precautions are taken. Paragraphs 3-8, 3-9 and 3-10 outline procedures that minimize the effects of these unusual climatic conditions.

### 3-8 Operation in Arctic Climate

Subzero temperature and climatic conditions associated with cold weather affect the efficient operation of test equipment. Instructions and precautions for operation under such adverse conditions follow:

*a*. Handle the signal generator carefully.

*b*. Keep the equipment warm and dry. Keep the filaments of the tubes lighted constantly, unless this condition overtaxes the power source.

*c*. If the instrument is removed from its case for service, move it into a heated inclosure where there is no danger of a cold draft when a door is opened. If the inclosure is so constructed that this condition is impossible, place a blanket or some barrier between the source of the draft and the equipment.

*d*. When equipment that has been exposed to the cold is brought into a warm room, condensation will cause moisture to form on the equipment until it reaches room temperature. When the equipment has reached room temperature, dry it thoroughly. Condensation also occurs when the equipment warms up during the day after exposure during a cold night.

### 3-9. Operations in Tropical Climates

When operated in tropical climates, test equipment may be installed in tents or huts. Ventilation is usually very poor, and the relative humidity causes condensation on the equipment whenever the temperature of the equipment becomes lower than the surrounding air. To minimize this condition, place lighted electric bulbs under the equipment or keep the power switch on.

### 3-10 Operation in Desert Climates

*a*. The main problem that arises with equipment operation in desert areas is the large amount of sand, dust, or dirt that enters the moving parts of test equipment. The ideal preventive precaution is to house the equipment in a dustproof shelter. However, such a building is seldom available and would require air conditioning. The next best precaution is to make the building in which the equipment is located as dustproof as possible with available materials. Hang wet sacking over the windows and doors, cover the inside walls with heavy paper, and secure the side walls of tents with sand to prevent their flapping in the wind.

*b*. Never tie power cards, signal cords, or other wiring connections to either the inside or the outside of tents. Desert areas are subject to sudden wind squalls that may jerk the connections loose or break the lines.

*c*. Keep the equipment as free from dust as possible. Make frequent preventive maintenance checks. Pay particular attention to lubrication Excessive amounts of dust, sand, or dirt that come into contact with oil and grease result in grit, which will damage the equipment.

*d*. A drastic fall in temperature at night often causes condensation on the equipment. To minimize condensation, cover the equipment with a tarpaulin or similar material.

# CHAPTER 4

# MAINTENANCE INSTRUCTIONS

## 4-1. Scope of Maintenance

The maintenance duties assigned to the operator and organizational repairman of Generator, Signal SG-155/U are listed below together with a reference to the paragraphs covering the specific maintenance functions.

*a*. Daily preventive maintenance checks and services (para 4-5).

*b*. Weekly preventive maintenance checks and services (para 4-6).

*c*. Monthly preventive maintenance checks and services (para 4-7).

*d*. Cleaning (para 4-8

*e*. Touchup painting (para 4-9)

*f*. Troubleshooting (para 4-10) .

*g*. Repairs and adjustments.

(1) Replacement of POWER and KLYSTRON indicator lamps (para 4-12a*)*.

(2) Replacement of 3 AMPS; POWER and 2 AMPS FIL fuses para 4-12b).

## 4-2. Special Tools and Equipment Required for Maintenance

*a. Tools.* The tools required for organizational maintenance are contained in Tool Kits, Radio and Radar Repairman TK-87/U and TK-88/U.

*b. Materials.* The materials required for organizational maintenance are contained in Tool Kits, Radio and Radar Repairman TK87/U and TK-88/U except for the following:

(1) Bleached lint-free cheesecloth.

(2) Cleaning Compound (FSN 7930-395-9542).

## 4-3. Preventive Maintenance

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

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

*b. Preventive Maintenance Checks and Services.* The preventive maintenance checks and services charts (paras 4-4 and 4-5) outline 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 what the normal conditions are; 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, higher category 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.

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

Preventive maintenance checks and services of Generator, Signal AN/URM-149 are required daily, weekly and monthly.

*a.* Paragraph 4-5 specifies checks and services that must be accomplished daily and 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 standby condition.

b. Paragraphs 4-6 and 4-7 specify additional checks and services that must be performed on a weekly and monthly basis.

## 4-5 Daily Preventive Maintenance Checks and Services Chart

| Sequence No. | Item | Procedure | References |
|---|---|---|---|
| 1 | Completeness | Check to see that the equipment is complete. | Appx B, para 1-6 |
| 2 | Exterior surfaces | Clean the exterior surfaces, including all meter glasses and indicator lenses. Check all meter glasses and indicator lenses for cracks. | Para 4-8 |
| 3 | Connectors | Check the tightness of all connectors. | |
| 4 | Controls and indicators | While making the operating checks, sequence 5 through 24, observe that the mechanical action of each control is smooth and free of external or internal binding and that there is no excessive looseness. Check the meters for sticking or bent pointers. Check for burned-out pilot lights. | Para 3-5 |
| 5 | Preliminary | ***Caution:*** **Check to see that the 230V-115V switch, behind the ACCESS PORT button plug on the rear of the unit, is properly positioned for the line voltage to be used.**<br>Before connecting the power cord, set the controls as follows:<br>*a.* Power OFF switch at OFF<br>*b.* MODULATION selector switch at OFF.<br>*c.* POWER SET control to center position (approximately).<br>*d.* ZERO SET control to center position (approximately). | <br><br><br><br>Para 3-5, fig 3-1<br><br><br><br> |
| 6 | Power cord | Connect the power cord to the power source. | Fig. 1-1, 3-1 |
| 7 | Power OFF switch | Set power OFF switch to up position. POWER indicator lamp glows. | Para 4-11, 3-2 |
| 8 | KLYSTRON indicator lamp | 60 seconds after turning power on, KLYSTRON indicator lamp glows. | Para 4-11, 3-2 |
| 9 | Center frequency selector handwheel | Adjust center frequency selector handwheel until FREQUENCY MC digital readout indicates 600. | Fig. 1-1 |
| 10 | MODULATION selector switch. | Set MODULATION selector switch to OFF. | Para 4-12, 3-2 |

| Sequence No. | Item | Procedure | References |
|---|---|---|---|
| 11 | ZERO SET control | Adjust ZERO SET control until POWER SET meter indicates ZERO SET. | |
| 12 | MODULATION selector switch. | Set MODULATION selector switch to CW. | |
| 13 | POWER SET control | Adjust POWER SET control until POWER SET meter pointer is aligned with red reference line. | |
| 14 | MODULATION selector switch. | Set MODULATION selector switch to INT SINE. | |
| 15 | DEVIATION METER RANGE switch. | Set DEVIATION METER RANGE switch to 300KC. | |
| 16 | INTERNAL MODULATION FREQUENCY switch. | Set INTERNAL MODULATION FREQUENCY switch to 1000~. | |
| 17 | DEVIATION control | Adjust DEVIATION control and note that a full-scale deflection (300KC) is possible as indicated on DEVIATION KC meter. | |
| 18 | INTERNAL MODULATION FREQUENCY switch. | Set INTERNAL MODULATION FREQUENCY switch to 1600~ and repeat sequence No. 17. | |
| 19 | INTERNAL MODULTION FREQUENCY switch. | Set INTERNAL MODULATION switch to 20KC and repeat sequence No. 17. | |
| 20 | INTERNAL MODULATION FREQUENCY switch. | Set INTERNAL MODULATION switch to 68KC and repeat sequence No. 17. | |
| 21 | INTERNAL MODULATION FREQUENCY switch. | Set INTERNAL MODULATION switch to 108 KC and repeat sequence No. 17. | |
| 22 | Center frequency selector handwheel. | Adjust center frequency selector handwheel until FREQUENCY MC digital readout indicates 1000. Repeat sequence No. 10 through 21. | |
| 23 | Center frequency selector handwheel. | Adjust center frequency selector handwheel until FREQUENCY MC digital readout indicates 1400. Repeat sequence No. 10 through 21. | |
| 24 | Center frequency selector handwheel. | Adjust center frequency selector handwheel until FREQUENCY MC readout indicates 1850. Repeat sequence No. 10 through 21. | |

## 4-6. Weekly Preventive Maintenance Checks and Services Chart

| Sequence No. | Item | Procedure | References |
|---|---|---|---|
| 1 | Cords and cables..... | Inspect cords and cables for cuts, cracks, strain, fraying, or deterioration. | Fig. 1-1 |

| Sequence No. | Item | Procedure | References |
|---|---|---|---|
| 2 | Handles and latches | Hand-check for looseness of handles and latches. | Fig. 1-1. |
| 3 | Preservation | Inspect exposed metal surfaces for rust and corrosion. If present, correct according to instructions as found in TB SIG 364 and TM 9-213. | TB SIG 364, TM 9-213, para 4-10. |

## 4-7. Monthly Preventive Maintenance Checks and Services Chart

| Sequence No. | Item | Procedure | References |
|---|---|---|---|
| 1 | Pluckout items ..... | Inspect seating of readily accessible items of fuses, connector, tribes, and lamps. Use only direct pressure to insure item is fully seated. | |
| 2 | Resistors and capacitors..... | Inspect resistors and capacitors for cracks, blistering, or other defects. | |
| 3 | Publications ..... | See that all publications are complete, serviceable, and current. | DA Pam 310-4 |
| 4 | Modifications..... | Check DA Pam 310-7 to see if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL MWO's must be scheduled. | DA Pam 310-7 and TM 38-750 |

## 4-8. Cleaning

Inspect the exterior surfaces of Generator, Signal SG-155/U. The exterior surfaces must be free from dirt, grease, and fungus.

*a*. Remove loose dirt with a clean, soft cloth.

***Warning*: Prolonged breathing of cleaning compound is dangerous. Make sure that 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 your hands.**

b. Remove grease, fungus, and ground-in dirt from the case and covers of the signal generator; use a cloth dampened (not wet) with cleaning compound (FSN 7930-395-9542).

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

***Caution*: Do not press the meter faces (glass) when cleaning; the meters may become damaged.**

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

## 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 prevent it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213.

## 4-10. General Troubleshooting Information

Troubleshooting of the signal generator is based on the operational checks in the daily preventive maintenance checks and services chart. To troubleshoot the equipment, perform all the functions in the daily preventive maintenance checks and services chart (para4-5), until an abnormal condition or result is observed. Perform the checks and

corrective measures indicated in the troubleshooting chart (para 4-11). If the corrective measures indicated do not result in correction of the trouble, higher category of maintenance is required.

## 4-11. Troubleshooting Chart

| Item No. | Trouble symptom | Probable trouble | Checks and corrective measures |
|---|---|---|---|
| 1 | POWER lamp does not light. | *a*. Defective indicator lamp. | *a*. Check POWER indicator lamp. Replace if necessary (para 4-12*a*). |
| | | *b*. Defective 3 AMPS POWER fuse. | *b*. Check 3 AMPS POWER fuses.<br>*Note*. Defective line fuse usually indicates some other trouble. If fuse replacement continues to result in blown fuse, higher category repair is required. |
| | | *c*. Defective ac line cord. | *c*. Refer to higher category of maintenance for repair. |
| 2 | KLYSTRON lamp does not light 60 seconds after POWER lamp. | Defective indicator lamp. | Check KLYSTRON lamp. Replace if necessary (para 4-12a). |
| 3 | POWER SET control adjustment does not cause POWER SET meter pointer to indicate power. | Defective 2 AMPS FIL fuse. | Check KLYSTRON 2 AMPS fuse.<br>*Note*. Defective line fuse usually indicates some other trouble. If fuse replacement continues to result in blown fuse, higher category repair is required. |

## 4-12. Repairs and Adjustments

a. Replacement of POWER and KLYSTRON Indicator Lamps.

(l) Turn the lens counterclockwise and remove it from the lampholder.

(2) Press in on the defective lamp and turn it counterclockwise to unlock it from the lampholder.

(3) Insert the new lamp into the lampholder. Press in on the lamp and turn it clockwise to lock it in place.

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

*b. Replacement of 3 AMPS POWER and 2 AMPS FIL Fuses.*

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

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

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

***Note.*** **Be sure the fuse is of the same rating as the defective fuse.**

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

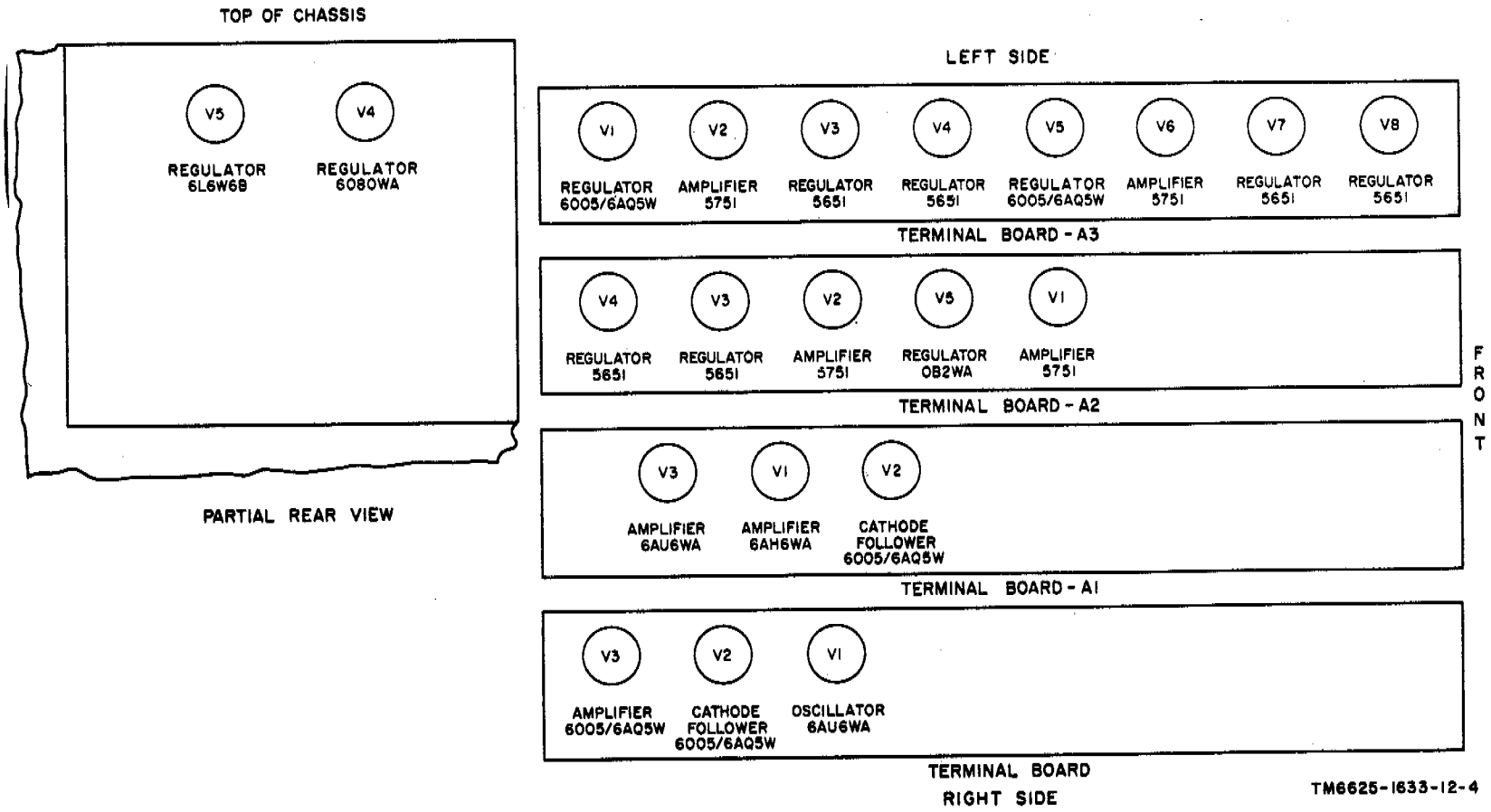


*Figure 4-1. Tube location diagram.*

# CHAPTER 5

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

## Section I. SHIPMENT AND LIMITED STORAGE

### 5-1. Disassembly of Equipment

Disassemble the AN/URM-149 as follows:

*a*. Remove the RF cable from the RF OUTPUT jack.

*b*. Slide the signal generator into the transit case.

*c*. Place the RF cable and technical manuals in the storage areas provided in the transit case.

*d*. Place the transit case cover in the proper position and secure it with the eight trunk latches.

### 5-2. Repackaging for Shipment or Limited Storage

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

*a. Material Requirements.* The following materials are required for packaging Generator, Signal AN/URM-149. For stock number of materials, refer to SB 38-100.

| Material | Quantity |
|---|---|
| **Fiberboard, corrugated .....** | **20 sq ft** |
| **Gummed paper tape .....** | **8 ft** |
| **Fiberboard shipping box .....** | **1** |

***b.*** *Box Size.* The dimensions of the shipping box required for the AN/URM-149 are 21 1/2 inches by 18 inches by 26 1/2 inches. The volume is 5.9 cubic feet, and the unit weight is 122 pounds.

*c. Shipping Container.* Place the equipment within the fiberboard box as shown in figure 2-1 and seal with gummed paper tape.

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

### 5-3. Authority for Demolition

*a*. 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 order of the commander.

*b*. If a destruction plan is not provided by higher authority, one should be prepared by the organization using the equipment. In this plan, personnel should be assigned specific destruction tasks, but all personnel in the using organization should be familiar with all aspects of the complete destruction plan. The plan must be adequate and easily carried out in the field and must provide for as complete a destruction as available time, equipment, and personnel will permit. Because the time required for complete destruction may not always be available, the destruction plan must establish priorities so that essential parts of the equipment will be destroyed in the order of their importance. Systematic destruction of the same important units of equipment of a given type will prevent the enemy from learning the important features of the equipment or from assembling a complete equipment by cannibalization of partially destroyed equipment. Adequate destruction of some units of equipment should always be accomplished rather than partial destruction of all units.

Which of the methods listed in paragraph 5-4 is to be used depends on the time available for destruction.

## 5-4. Methods of Destruction

Any or all of the methods of destruction given below may be used. The time available will be the major determining factor for the methods to be used when destruction of the equipment is undertaken. The tactical situation also will determine in what manner the destruction order will be carried out.

*a. Smash.* Use sledges, axes, hammers, crowbars, and any other heavy tools available to smash the signal generator.

(1) Remove the signal generator chassis from the case and use the heaviest tool on hand to smash the transformers, coils, meters, and tuning mechanisms.

(2) Use whatever tool is convenient to smash electron tubes, resistors, capacitors and knobs.

*b. Cut.* Use axes, handaxes, machetes, and similar tools to cut cabling, cording and wiring. Cut all cords and cables in a number of places.

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

*c. Burning.* Burn cords, wiring, and technical manuals. Use gasoline, oil, flame-throwers, and similar tools.

*d. Explode.* Use explosives to complete demolition or to cause maximum damage when time does not permit demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired.

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

# APPENDIX A

# REFERENCES

Following is a list of references available to the operator and organizational repairman of Generator, Signal AN/URM-149.

| | |
|---|---|
| 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 | Index of Modification Work Orders. |
| 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 38-750 | Army Equipment Record Procedures. |

# APPENDIX B

# BASIC ISSUE ITEMS

## Section I. INTRODUCTION

### B-1. General

This appendix lists items for Generator Set AN/URM-149, the component items comprising it, and the items which accompany it, or are required for installation, operation, or operators maintenance.

*Notes.*

1. Technical Manual TM 11-6625 - 1633-12 may be requisitioned through pin point account number if assigned; otherwise through nearest Adjutant General Facilities.

2. A quantity of one technical manual is packed with each equipment. Where a valid need exists, additional copies may be requisitioned and kept on hand.

### B-2. Explanation of Columns

An explanation of the columns in section II is given below.

*a. Source, Maintenance, and Recoverability Codes, Column 1.*

*(1) Source code, column 1a.* The selection status and source for the listed item is noted here. The source code used is—

| Code | Explanation |
|---|---|
| P – | Applies to repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories. |

(2) *Maintenance code, column lb.* The lowest category of maintenance authorized to install the listed item is noted here. The maintenance code used is as follows:

| Code | Explanation |
|---|---|
| C | Operator/Crew |

(3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

*Note.* When no code is indicated in the recoverability column, the part will be considered expendable.

| Code | Explanation |
|---|---|
| R – | Applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis. |

*b. Federal Stock Number, Column 2.* The Federal stock number for the item is indicated in this column.

*e. Description, Column 3.* The Federal item name, a five digit manufacturer's code, and a part number are included in this column.

*d. Unit of Issue, Column 4.* The unit used as a basis of issue (e.g. ea, pr, ft, yd, etc.) is noted in this column.

*e. Quantity Incorporated in Unit Pack, Column* 5. Not used.

*f. Quantity Incorporated in Unit, Column* 6. The total quantity of the item used in the equipment is given in this column.

*g. Quantity Authorized, Column* 7 . The total quantity of an item required to be on hand and necessary for the operation and maintenance of the equipment is given in this column.

*h. Illustration, Column 8.*

(1) *Figure number, column 8a.* The number of the illustration in which

the item is shown in this manual is indicated in this column.

(2) *Item or symbol number, column 8b*. The call out number used to reference the item in the illustration appears in this column.

## B-3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

| Code | Manufacturer |
|---|---|
| 81349 | Military Specifications |
| 96906 | Military Standards |

## SECTION II. BASIC ISSUE ITEMS LIST

| (1) (A) SRCE CD | (1) (B) MNTC CD | (1) (C) REC CD | (2) FEDERAL STOCK NUMBER | MODEL 1 | 2 | 3 | 4 | 5 | 6 | (3) DESCRIPTION | (4) UNIT OF ISSUE | (5) QTY INC IN UN PK | (6) QTY INC IN UNIT | (7) QTY AUTH | (8) ILLUSTRATIONS (A) FIGURE NUMBER | (8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 6625-903-3501 | | | | | | | GENERATOR, SIGNAL AN/URM-149<br>This item is non-expendable) | | | | | 1 | |
| | | | | | | | | | | TECHNICAL MANUAL TM11-6625-1633-12 | ea | | 1 | 1 | 1 | |
| | C | R | 5995-935-2618 | | | | | | | CABLE ASSEMBLY, RADIO FREQUENCY<br>CG3-3169A/U | ea | | 1 | 1 | 1 | |
| | C | R | 6625-935-1494 | | | | | | | CASE, SIGNAL GENERATOR CY-3986/U | ea | | 1 | 1 | 1 | |
| | C | R | 6625-903-3500 | | | | | | | GENERATOR, SIGNAL SG-155/U | ea | | 1 | 1 | 1 | |
| P | C | | 5920-010-6652 | | | | | | | FUSE, CARTRIDGE<br>81349; F02A250V3A | ea | | 3 | 5 | 1 | F1, F2, F4 |
| P | C | | 5920-280-4960 | | | | | | | FUSE, CARTRIDGE<br>81349; F02A250V2A | ea | | 2 | 5 | 1 | F5, F3 |
| P | C | | 6240-223-9100 | | | | | | | LAMP, GLOW<br>81349; NE51 | ea | | 2 | 1 | 1 | DS1, DS2 |
| P | C | | 624-155-8706 | | | | | | | LAMP, INCANDESCENT<br>96906; MS15571-2 | ea | | 3 | 2 | 1 | A4DS1, A4DS2, A4DS3 |
| | | | | | | | | | | NO ACCESSORIES TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT. | | | | | | |
| | | | | | | | | | | NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT. | | | | | | |

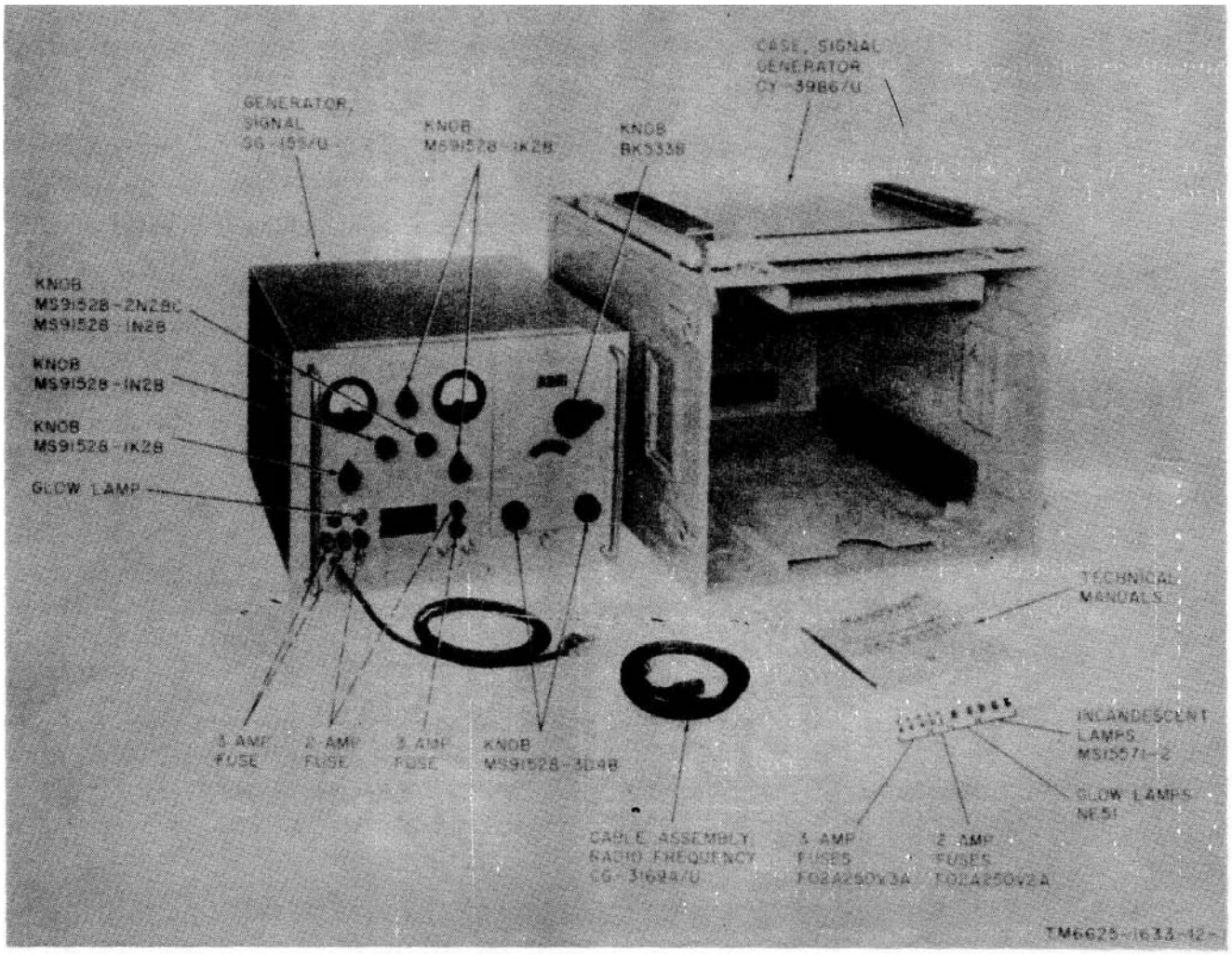


*Figure 1-1. Generator, Signal AN/URM-149*

# APPENDIX C
# MAINTENANCE ALLOCATION

## Section I. INTRODUCTION

### C-1. General

This appendix provides a summary of the maintenance operations for AN/URM-149. 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 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, 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 a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/ components.

### C-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 Category.* Column 4 specifies, by the listing of a "work time," figure in the appropriate sub-column(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. Sub-columns 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.

## C4. 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 GENERATOR, SIGNAL AN/URM-149

| (1) GROUP NUMBER | (2) COMPONENT/ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT | (6) REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | C | O | F | H | D | | |
| 00 | GENERATOR, SIGNAL AN/URM-149 | Inspect | | 0.1 | | | | | |
| | | Service | | 0.1 | | | | 1 | |
| | | Test | | | | 0.5 | | 2 thru 9 | |
| | | Adjust | | | | 1.0 | | 2 thru 9 | |
| | | Repair | | | | 1.0 | | 2 thru 9 | A |
| | | Repair | | | | | 1.5 | 2 thru 10 | |
| | | Overhaul | | | | | 4.0 | 2 thru 10 | |
| 01 | GENERATOR, SIGNAL SG-155/U | Test | | | | 0.5 | | 2 thru 9 | |
| | | Adjust | | | | 1.0 | | 2 thru 9 | |
| | | Repair | | | | 1.0 | | 2 thru 9 | A |
| | | Repair | | | | | 1.5 | 2 thru 9 | |
| 0101 | RF TUNING UNIT | Test | | | | 0.5 | | 2 thru 9 | |
| | | Adjust | | | | 0.5 | | 2 thru 9 | |
| | | Repair | | | | 1.0 | | 2 thru 9 | |
| 010101 | POTENTIOMETER AND GEAR ASSEMBLY | Repair | | | | 1.0 | | 2 thru 9 | |
| 0102 | TERMINAL BOARD TB2A1 | Repair | | | | 1.0 | | 2 thru 9 | A |
| 0103 | TERMINAL BOARD TB3A | Repair | | | | 1.0 | | 2 thru 9 | B |
| 0104 | TERMINAL BOARD TB4A3 | Repair | | | | 1.0 | | 2 thru 9 | B |
| 0105 | CHASSIS TERMINAL BOARDS | Repair | | | | 1.0 | | 2 thru 9 | B |
| 02 | CABLE ASSEMBLY CG-3169A/U | Test | | | | 0.3 | | 9 | |
| | | Repair | | | | 0.5 | | 2 | |
| 03 | CASE, SIGNAL GENERATOR CY-3986/U | Repair | | | | 0.5 | | 2 | |

## SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR GENERATOR, SIGNAL AN/URM-149

| TOOL OR TEST EQUIPMENT REF CODE | MAINTENANCE CATEGORY | NOMENCLATURE | NATIONAL/NATO STOCK NUMBER | TOOL NUMBER |
|---|---|---|---|---|
| 1 | O | TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G | 5180-00-064-5178 | |
| 2 | H, D | TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G | 5180-00-605-0079 | |
| 3 | H, D | ELECTRONIC VOLTMETER AN/URM-145 | 6625-00-973-3986 | |
| 4 | H, D | MODULATION METER ME-57/U | 6625-00-647-3737 | |
| 5 | H, D | FREQUENCY METER TS-186D/UP | 6625-00-376-1662 | |
| 6 | H, D | TEST SET, RADAR AN/UPM-98A | 6625-00-912-0429 | |
| 7 | H, D | OSCILLOSCOPE AN/USM-281A | 6625-00-228-2201 | |
| 8 | H, D | DIFFERENTIAL VOLTMETER ME-202 | 6625-00-709-0288 | |
| 9 | H, D | MULTIMETER TS-352B/U | 6625-00-553-0142 | |
| 10 | D | ANALYZER SPECTRUM | 6625-00-668-9418 | |

## SECTION IV. REMARKS
## GENERATOR, SIGNAL AN/URM-149

| REFERENCE CODE | REMARKS |
|---|---|
| A | Except replacement of klystron. |
| B | Entered for grouping of parts only, repair at general support. |

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
*General, United States Army,*
*Chief of Staff.*

Official:

KENNETH G. WICKHAM,
*Major General, United States Army*
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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.