TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL,

DIRECT SUPPORT,

AND GENERAL SUPPORT MAINTENANCE

M A N U A L

SIGNAL GENERATOR

AN\URM-127

(NSN 6625-00-783-5965)

HEADQUARTERS, DEPARTMENT OF THE ARMY

3 MAY 1983

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

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

Dangerous voltages exist in this equipment (115 volts AC). Serious injury or DEATH may result from contact with terminals carrying these voltages. Unless directed otherwise, make sure the power switch is in the off position before starting any maintenance procedures. Do not attempt internal service or adjustment unless another person capable of rendering first aid, or is able to summon first aid is present. Follow the five emergency steps below.

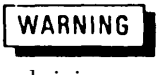
HOW TO USE THIS MANUAL

This manual tells you about your Signal Generator AN/URM-127 and contains instructions about how to use it during maintenance while you are working on other electronic equipment.

The technical manual for the electronic equipment you are maintaining will tell you where to make certain connections and when to use dummy loads which are part of your signal generator set.

In this manual, paragraphs are numbered sequentially, If you are looking for specific information, use the table of contents on the next page to locate the paragraph, section, chapter, and page where the topic is discussed.

Whenever you see the symbols shown below, heed their instructions! Always follow safe operating and maintenance practices.



This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

"Note" indicates points of particular interest or more efficient and convenient operation.

CHANGE
No.1

TM 11-6625-683-14
C1
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 July 1989

OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT AND

GENERAL SUPPORT MAINTENANCE MANUAL
SIGNAL GENERATOR AN/URM-127

(NSN 6625-00-783-5965)

TM 11-6625-683-14.3 May 1983 , is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

Remove pages	Insert pages
1-1 thru 1-4	1-1 thru 1-4
A-1	A-1/(A-2 blank)

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

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Chief of Staff

Official:

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Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-36 Operator, Unit, and DS/GS requirements for AN/URM-127.

Technical Manual

No.11-6625-683-14

HEADQUARTERS

DEPARTMENT OF THE ARMY
Washington, DC 3 *May 1983*

{ OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL }

{ SIGNAL GENERATOR AN/URM-127 (NSN 6625-00-783-5965) }

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703

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

***This manual supersedes TM 11-6625-633-15, 22 August 1866, includlng all changes.**

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. Scope

This manual describes Signal Generator AN/URM-127, and covers the installation, operation, organizational, direct support, and general support maintenance instructions for the equipment.

1-2. Consolidated Index Of Army Publications and Blank Forms Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records And Reports

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

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-1l-2/DLAR 4140.55/SECNAVINST 4355. 18/AFR 400-54/MCO 4430.3J

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

1-4. Administrative Storage

Delete.

1-5. Destruction of Army Electronics Materiel

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

1-6. Reporting Equipment Improvement Recommendations (EIR)

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

Section II. EQUIPMENT DESCRIPTION

1-7. Identification

a. This publication contains operating and maintenance instructions for Signal Generator AN/URM-127 (NSN 6625-00-783-5965) (Burton Manufacturing Company part number SG-334).

b. A serial number is contained on the generator identification plate to complete the identification for each unit.

1-8. Purpose and Specifications of Equipment

a. Signal Generator AN/URM-127 provides a variable electrical output signal at the selected frequency for use in calibrating various electronic devices. The output signal is a sine wave of adjustable amplitide, with a decimal multiplier/divider selector switch and vernier control.

b. The specifications of Signal Generator AN/URM-127 are contained in table 1-1.

Table 1-1 Specification for Signal Generator AN/URM-127

Parameter	Specification
Freq.Accuracy	± 2% overall
Number of Bands	4
Band 1 (X1)	20 to 200 cps
Band 2 (X10)	200 to 2000 cps
Band 3 (X100)	2000 to 20,000 cps
Band 4 (X1000)	20,000 to 200,000 cps
Band Overlap	5%
Power Output	200 milliwatts at 500 ohms load
Signal Amplitude	0 to 10 VAC (RMS) (7 Increments)
Output Load	1000 ohms (for calibrated output voltage)
Output Waveform	Sine wave (1% max distortion)
Calibration Monitor	Read type, 60 cps and 40 cps, ± 1%
Amplitude Monitor	Voltmeter (Panel Mounted)
Hum Level	80 db less that fundamental output voltage
Input Power	115 VAC, + 10% 50 70 or 380 420 cps, 10
Power Consumption	6.5 VA, 0.055 AMP
Ambient Conditions	
Temperature	40 to + 50°C (- 40 to + 122°F)
Altitude	0 to 50,000 ft non operating 0 - 10,000 ft operating
Envelope Dimensions	13 in. w × 8-3 4 in. h × 7-1 4 in. lg
Weight	13.3 lbs
Specification	MIL-G-27724A (USAF)

1-9. Items Comprising an Operable Equipment

A view of major and minor components is contained in figure 1–1. Each item is identified by a number that corresponds with the component listed in table 1-2.

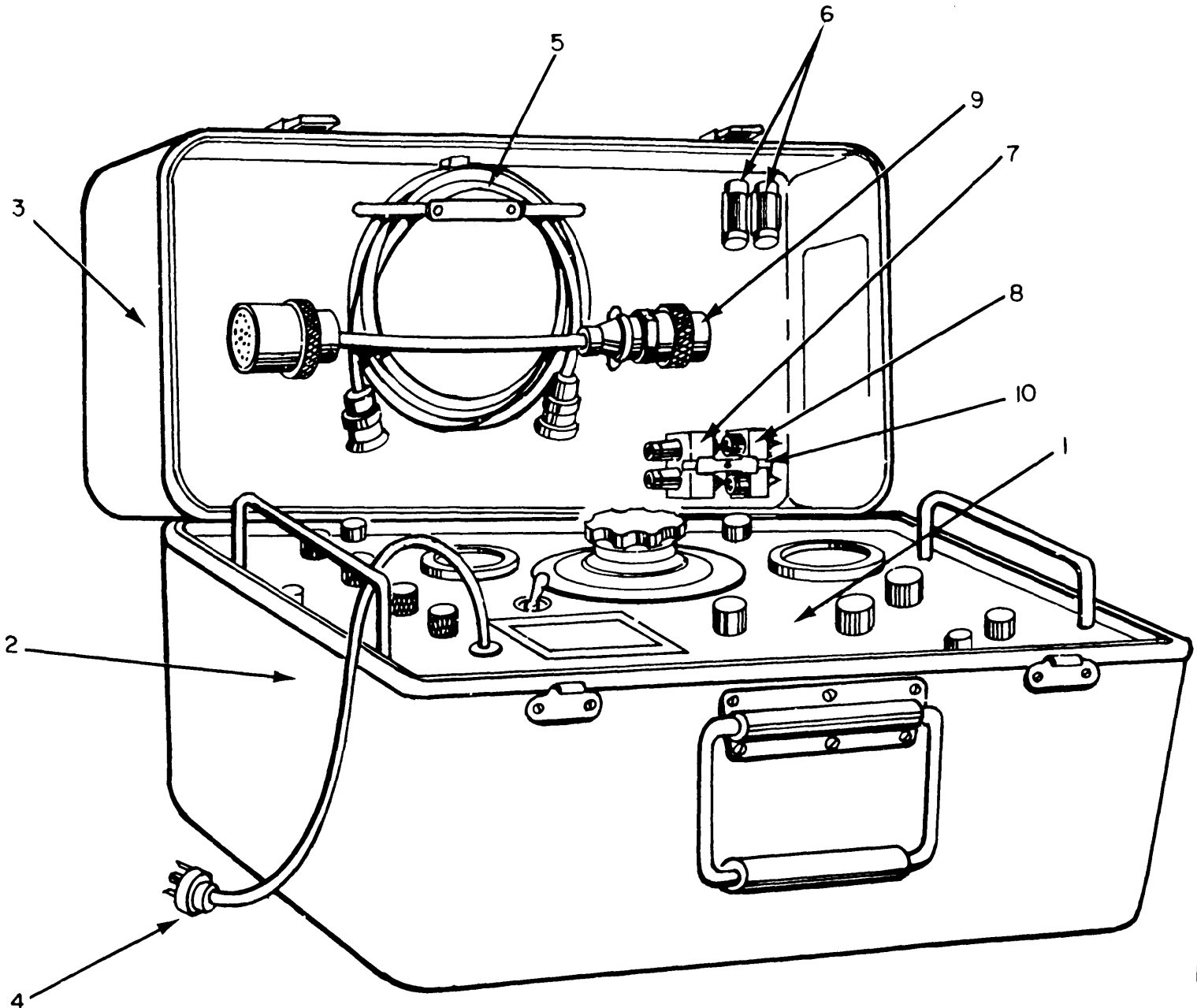

Figure 1-1. Signal Generator AN/URM-127.

Table 1-2. Location and Description of Componects.

Item No.	Description	AN type No.	NSN or part No.	Mfg Code	use
1	Signal generator	SG-377/URM-127	-	89120 and 80058	Generates a voltage in the audio frequency range.
2	Case	-	4344021	26126	Contains the signal generating unit.
3	Case cover	-	4344021-1	26126	Contains the signal generator accessories.
4	Power cable	-	4344116	26126	Supplies ac voltage to the signal generator during operation.
5	Cable assembly	CG-409E/U	5995-00-070-8747	80058	Connects signal generator to a unit undergoing maintenance.
6	Fuse	MIL-F-15160/02	F02A250V1-4A	81349	Prevents circuit overloading.
7	Dummy load	DA-35/U	5985-00-224-5419	80058	Matches impedance when in use with a different specified input impedance.
8	Adapter	UG-514/U	5935-00-549-1159	80058	Allows connecting to the signla generator for banana plugs.
9'	Cable assembly	-	MS21993-2	81349	Connects signal generator to an alternate power source during field operation.
10	Clamp	-	4344017	-	Holds dummy load and adapter in case cover.
11	Wiring diagram in plastic envelope	-	- 2000-181	- 26216	For signal tracing during maintenance.

Section III. THEORY OF OPERATION

1-10. Signal Generator Sectionalization

The signal generator is a solid state unit with the four following sections. An RC bridge oscillator circuit of the double feedback Wien bridge type (fig. 1-2). An output voltmeter. A power supply and an output attenuator. These circuits and the front panel controls associated with them are shown in the block diagram (fig. 1-3).

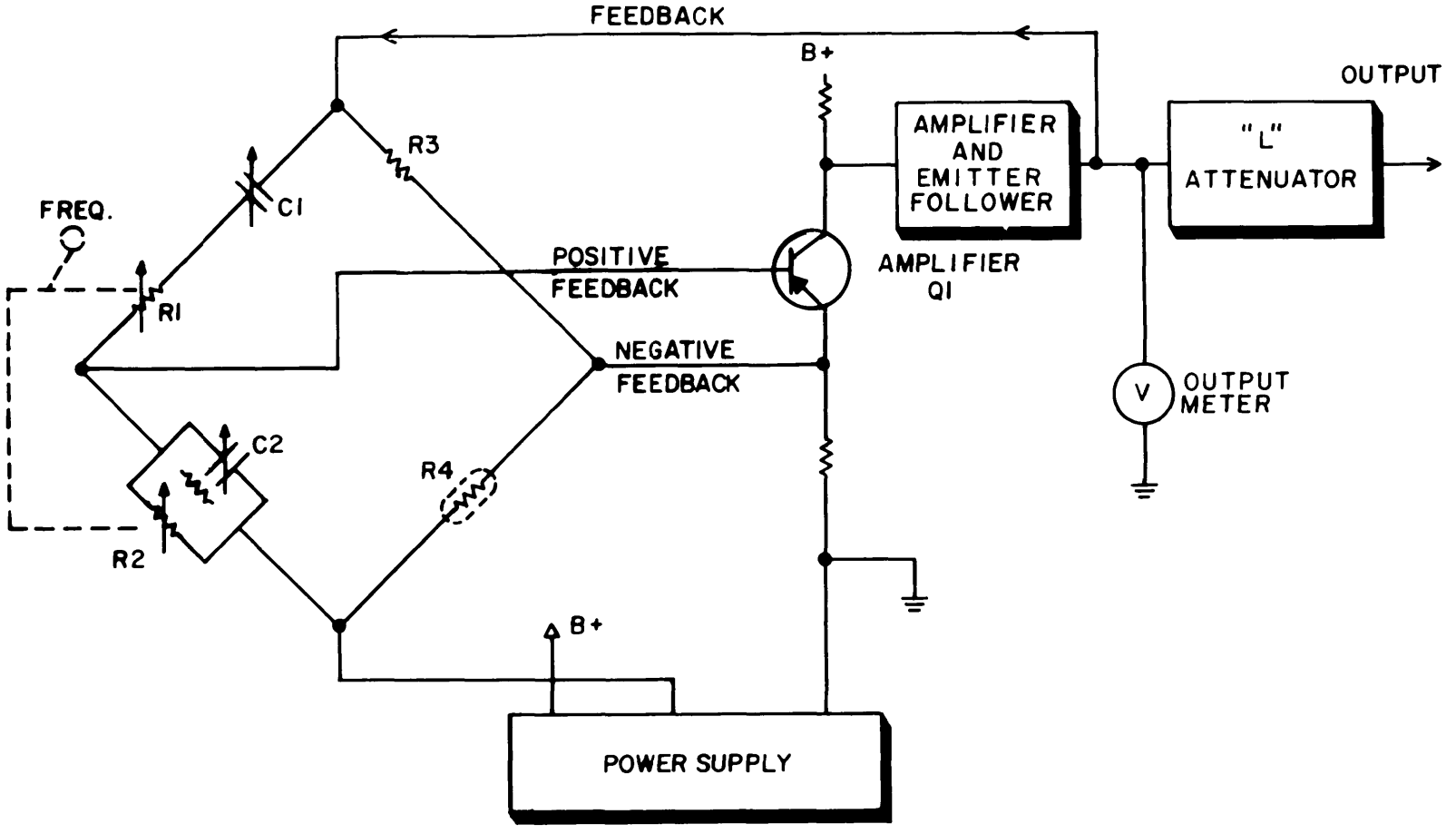

Figure 1-2. Wien Bridge Circuit.

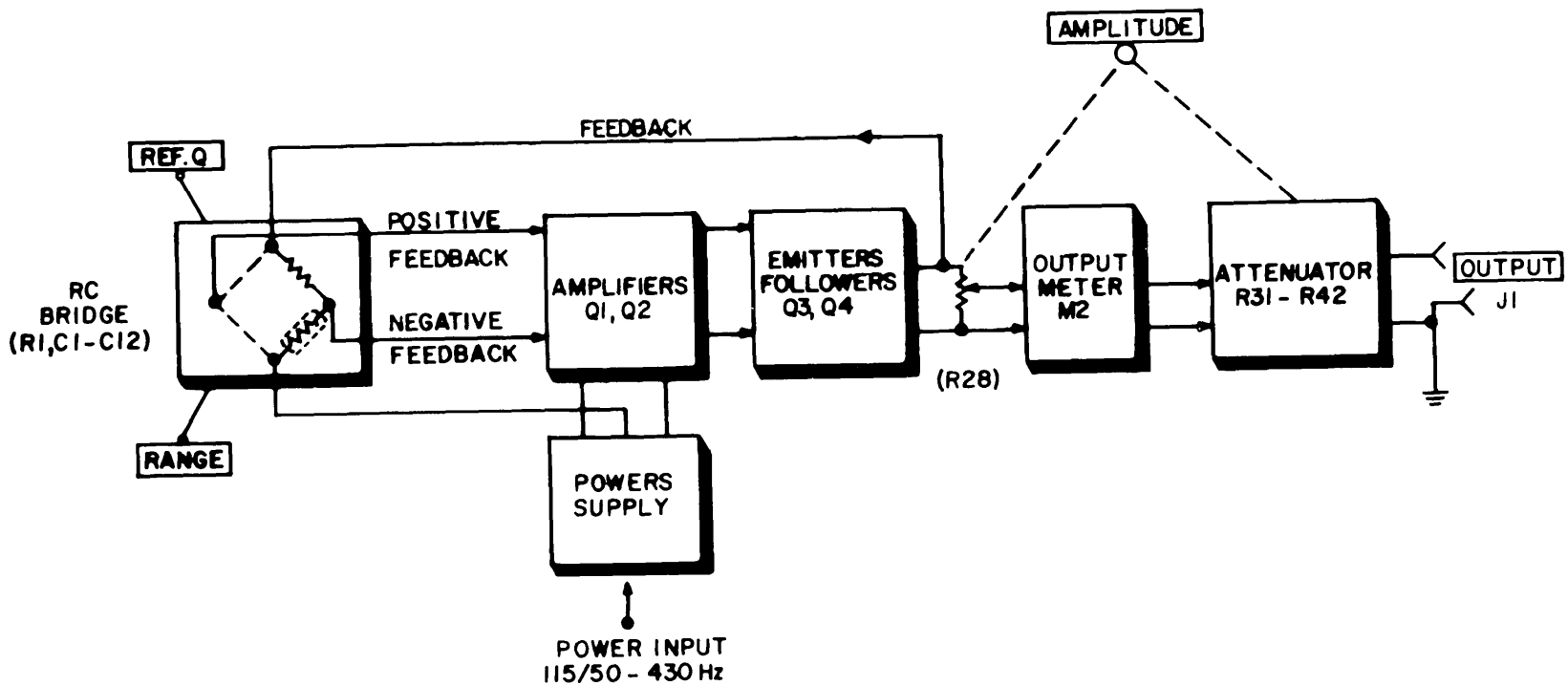

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Figure 1-3. Signal Generator Block Diagram.

a. RC Bridge Oscillator.

(1) The RC bridge oscillator consists of an RC bridge, a two-stage amplifier, and two emitter followers in push-pull combination. The output of this circuit is a sine wave signal which is returned to the RC bridge as feedback, and applied to the output attenuator.

(2) The RC bridge consists of an RC frequency-selective network and a resistive voltage divider network. The RC frequency-selective network supplies positive feedback to the amplifier and determines the frequency of oscillation. The resistive voltage divider network supplies negative feedback to the amplifier. The frequency-selective network is similar to one leg of a Wien bridge; the resistive voltage divider, the other leg.

(3) As in any oscillator, an in-phase feedback voltage (from the oscillator circuit output) is necessary to maintain oscillation. The proper phase relationship at the desired frequency is maintained by the RC components in the bridge.

(4) The frequency-selective network consists of a series branch, C 1 and R1, and a parallel branch, C2 and a parallel branch, C2 and R2, as shown in figure 1-2. For the frequency at which Xc = R in the series and parallel branches, the positive feedback voltage to the amplifier is maximum and is in phase with the oscillator circuit output voltage figure 1-4. Only that frequency at which Xc = R will be amplified; at frequencies where Xc does not equal R, the positive feedback voltage is not of the right phase and is insufficient to sustain oscillation. Figure 1-4 shows the positive feedback curve and phase relationship for frequencies above and below the frequency where Xc = R.

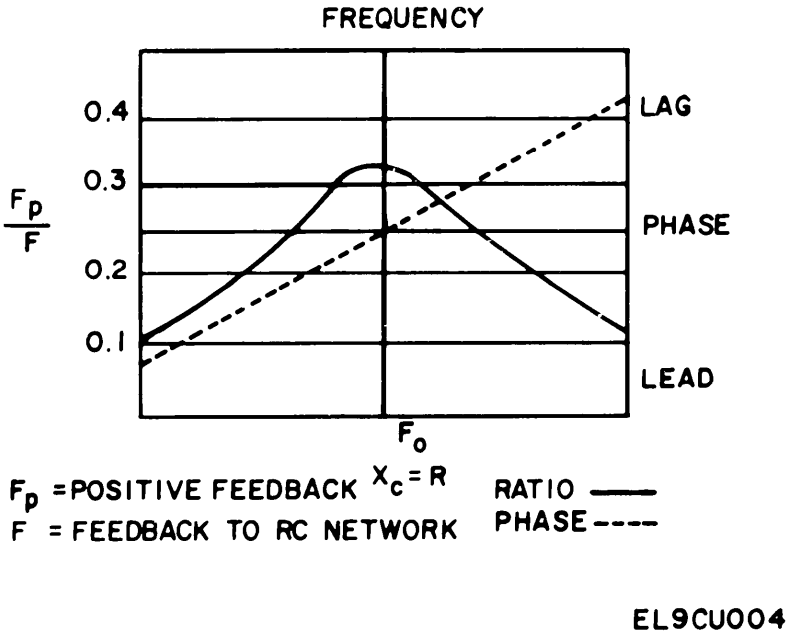


Figure 1-4. RC Network Characteristics

(5) The resistive voltage divider network consists of R3 and R4 which provide negative feedback voltage to maintain the oscillator circuit output at a constant level. The negative feedback developed is in part due to the resistance of R4 which is controlled by the amount of current passing through it. If the oscillator circuit output changes, the value of current flowing through R4 changes, changing its resistance and accordingly changing the negative feedback. Increasing the negative feedback results in a decrease in the net input to the amplifier and thus the output signal decreases. The oscillator output is maintained at approximately 33 volts peak-to-peak.

(6) Two amplifiers, Q1 and Q2, amplify the signal and apply it to complementary emitter followers Q3 and Q4. The emitter followers are forward biased by CR1 and CR2 and under a no-signal condition are conducting slightly to minimize cross-over distortion. The oscillator circuit output is coupled to the L type attenuator.

(7) The current sensitive resistor (R4) balances automatically the division ratio of the resistive voltage divider network, thereby controlling the amount of negative feedback. This system maintains the RC oscillator output at a constant level.

b. *Output Voltmeter.*

(1) The output voltmeter displays the amplitude of the signal generator output in volts between the combination of the amplifier and the emitter followers and ground.

(2) The output voltage control is continuously adjustable and regulates the amplitude of signal generated by the oscillator.

c. *Power Supply.*

(1) The power supply receives the alternating-current from a nominal 115 volts source or receptacle through the power cord and protective fuses. A transformer and rectifying diodes distributes exact amounts of power to all sections of the signal generator.

(2) Refer to the signal generator schematic in the rear of this manual for detailed wiring of the power supply section starting with plug P1, through the fuses, the power switch and transformer T1, past test points E4 and E5, to diodes CR9 and CR10.

d. *Attenuator.*

(1) The attenuator is an L type attenautor which provides continuous control of the oscillator output voltage while maintaining constant output impedance.

(2) The letter L is formed by the two resistors attached to each step of the attenuator at switch S4 sections 1, 2 and 3. For example, referring to the signal generator schematic in the rear of this manual, R37 and R31 form the letter L.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND MONITORS

2-1. General

a. As the operator of Signal Generator AN/URM-127 you will be concerned with the controls and monitors.

b. Refer to figure 2-1 which is the front panel view of your signal generator. It is not necessary to remove the unit from the case for use. It is only removed from the case for maintenance. The only maintenance you the user will have to perform will not require you to remove the unit from the case.

c. Now refer to table 2–1. This table lists the controls that are on the front panel and tells what they do.

d. Table 2–2 lists the panel monitors which indicate what is taking place when you are adjusting the controls.

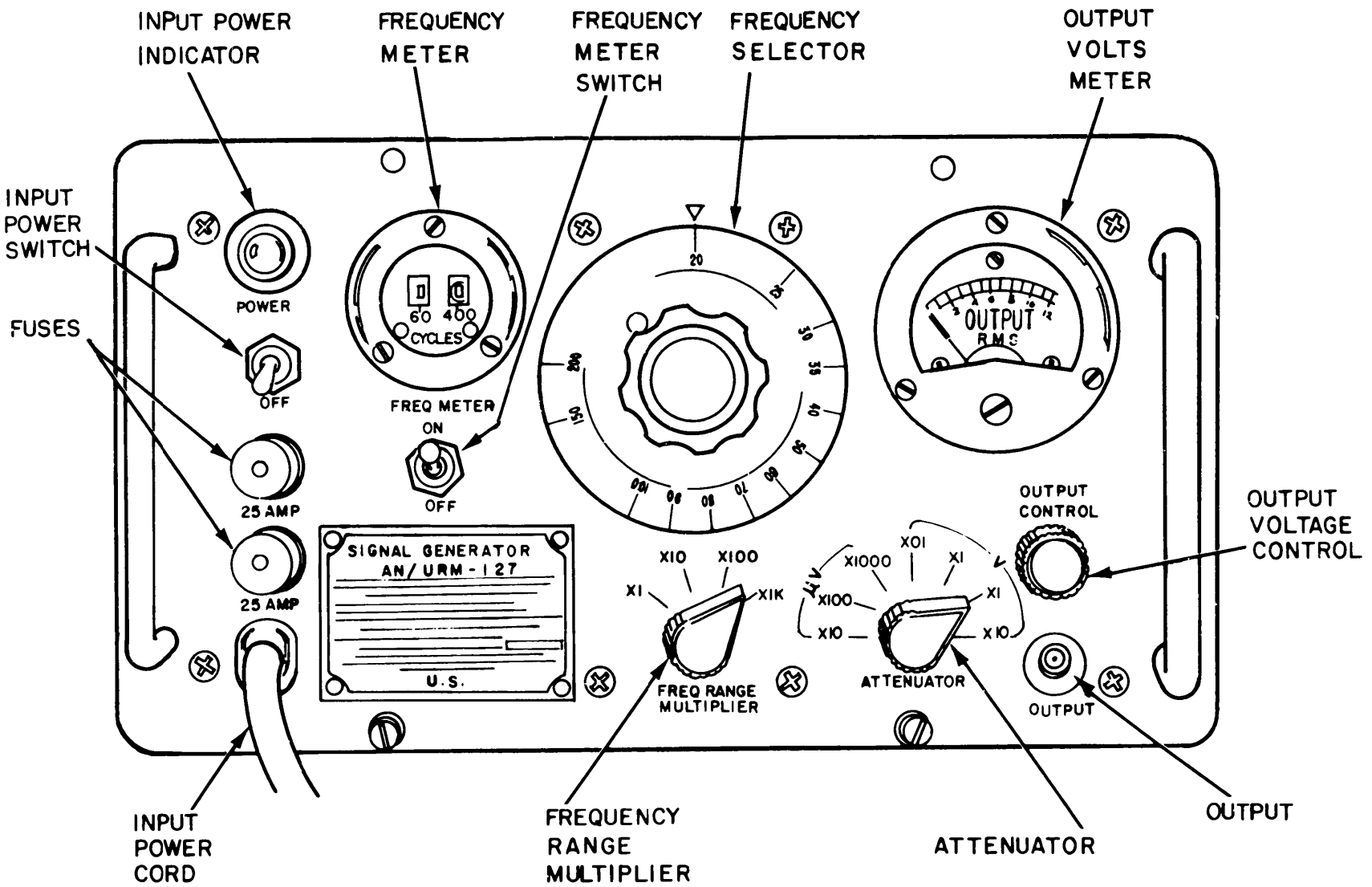


Figure 2-1. Signal Generator AN/URM-127, Front Panel View.

Table 2-1. Front Panel Controls

CONTROL	MARKING	USE
Input power witch Fuses	POWER ON-OFF" 0,25 AMP	Shuts off power input to signal generator, Prev'ents circuit overloading.
Frequency meter switch	FREQ METER ON-OFF"	Connects reed type frequency meter into circuitry,
Frequency range switch	FREQ RANGE MULTIPLIER	Changes signal frequency to selected band,
Frequency selector Attenuator switch	FREQ RANGE DIAL ATTENUATOR	Vernier adjustment of out put frequency, Changes output voltage scale by multiples of 10.
output voltage control	OUTPUT CONTROL	Increases output voltage by clockwise adjustment.

Table 2-2. Panel Monitors

MONITOR	MARKING	USE
Input power indicator	POWER ON-OFF"	Illuminates when power is ON to signal generator.
Frequency meter	FREQ METER	Reeds vibrate at frequencies of 60 Hz or 400" Hz.
Voltrneter	output RMs	Indicates output voltage in same increments as ATTENUATOR.

2-2. Preparation for Use

a. Open the cover of the signal generator and check that all components are there as shown in figure 1-1. If not, refer to paragraph 1-3c.

b. Check that the correct fuses are in both 0.25 AMP fuseholders, Reinsert both fuses and caps.

c. Turn signal generator POWER switch to OFF.

d. Turn FREQ METER switch to OFF.

e. The next step is connecting the power cord to a source of power.

WARNING

HIGH VOLTAGE is used in the operation of this signal generator. DEATH ON CONTACT may result if frayed wires or damaged plug prongs are accidently touched. Inspect your power cord and plug before use and observe all safety precautions.

f. Observe whether the power outlet or receptacle is a two prong or a three prong type. The three prong type, the third prong being ground, is recommended. Consult your advisor or supervisor if you do not have the three prong type receptacle and if you have not been instructed in the use of two to three prong adapters.

g. Connect the power cable to power source receptacle.

h. Turn POWER switch to ON and observe that the POWER indicator light glows.

i, Allow approximately 5 minutes for the signal generator to warm up if is being used at normal room temperature. The signal generator may be used after 1 minute warmup in an emergency situation. A 10 minute warmup is required in sub-zero temperatures.

j. The signal generator may be operated on input power frequencies as low as 40 Hertz for periods of not more than 15 minutes; it may also be operated on power input frequencies up to 2000" Hz for periods not in excess of 2 hours.

2-3. Initial Calibration

a. Install Cable CG-409E/U on the OUTPUT jack and install Dummy Load DA-35/U on the cable.

b. Connect the dummy load to a test oscilloscope and an RF voltmeter. A T-adapter and two BNC cables or a banana type lug will be required. An N to BNC adapter may also be required depending on the type of oscilloscope input connector.

NOTE

Your Dummy Load DA-25/U contains a 1000 ohm resistor which is used for proper input voltage calibration. Adapter Connector UG-514/U is used for direct coupling to equipment being tested which has 1000 ohms input impedance.

c. Turn FREQ METER switch ON, turn FREQ RANGE MULTIPLIER switch to X10 and adjust vernier dial to 40 for 400 Hz output or turn FREQ RANGE MULTIPLIER switch to Xl and adjust vernier dial to 60 for 60 Hz output. Check that the applicable 60 or 400 reed vibrates,

d. Turn OUTPUT CONTROL dial fully clockwise. The panel voltmeter should read approximately 1.15. Check it with Electronic Voltmeter ME-30/U or equal.

e. Place the signal generator ATTENUATOR switch to each position and observe the output voltmeter voltage readout. Voltage should be approximately the same in each position.

f Refer to figure 2-2 and obtain the proper waveform as seen on your oscilloscope. Adjust the output control as instructed below the pictured

waveform.

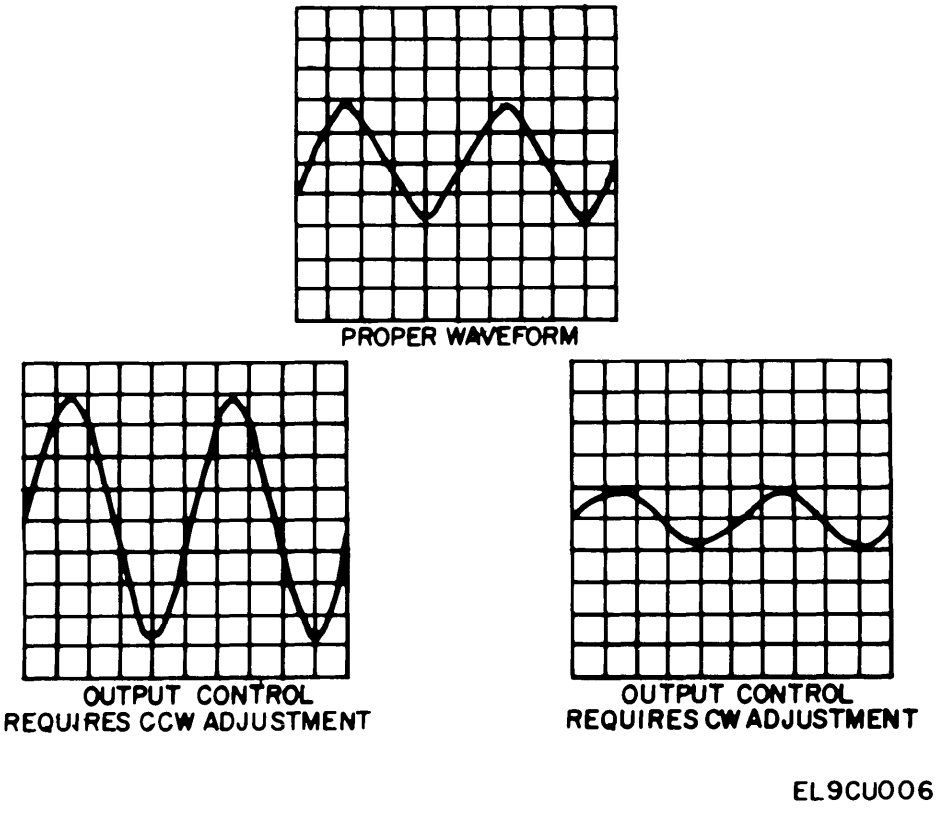


Figure 2-2. Obtainning a Proper Output Waveform.

Section II. OPERATION

2-4. Operation

a. Frequency range settings are made with the FREQ RANGE MULTIPLIER switch as shown in table 2-3.

Table 2-3. Frequency Range Settings

Frequency Range	Switch Position	Adjustment Within Range
20-200 Hz	Xl	Dial markings on large dial over switch
200-2000 Hz	X10	Dial markings on large dial over switch
2000-20,000 Hz	Xl00	Dial markings on large dial over switch
20,000-200,000 Hz	XIK	Dial markings on large dial over switch

EXAMPLE: Switch position Xl with Dial positioned at 40 sets the output frequency at 40 Hz.

b. Output signal amplitude (VAC) is selected by the Attenuator switch as shown in table 2-4.

Table .2-4. output Signal Amplitude

volts Output	Switch Position	Panel Voltmeter Reading (Adjust with Output Control Dial)
10 uV	uV X10	1.0
100 uV	uV Xl00	1.0
1000 u V	uV X1000	1.0
0.01 V	V X.01	1.0
0. 10V	V X.1	1.0
1.0 v	V Xl	1.0
10.0V	V Xl0	1.0

NOTE

If 1000 ohm load is required in application, install Dummy Load DA-35/U on the output cable of the signal generator. For

other requirements use Adapter Connector UG-514/U. The manual for the equipment being repaired will tell you what the input impedance is.

2-5. Stopping Procedures

a. Turn the OUTPUT VOLTAGE control fully counterclockwise.

b. Disconnect the signal generator from the equipment under maintenance.

c. Turn POWER ON-OFF switch OFF and observe that lamp goes out.

d. Disconnect all cables and store in cover of signal generator.

e. Disconnect dummy load and store in cover of signal generator.

f. Plug end of power cable into adapter cable, Part No. MS21993-2.

g. Close cover of unit and secure.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. Scope of Organizational 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 tables 3– 1 and 3–2 cover routine systematic care essential to proper upkeep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services tables outline the functions to be performed at specific intervals. These checks and services are designed to maintain Army equipment in a combat-serviceable condition; that is, in good physical and operational condition. To assist the organizational maintenance personnel in maintaining combat serviceability, the tables indicate what to check, how to check, and the normal conditions. If the defect cannot be remedied by the organizational repairperson, higher category of maintenance or repair is required. Records and reports of these checks and services must be made in accordance with TM 38-750.

3-2. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the equipment is required on a daily, weekly, and monthly basis as indicated in a and b below. Whenever a normal indication is not observed during the performance of the daily, weekly, or monthly preventive maintenance check, necessary corrective action must be taken.

a. Daily and Weekly. Table 3–1 specifies the preventive maintenance checks and services that must be performed daily and weekly or under the following special conditions when the equipment:

(1) Is initially installed.

(2) Is reinstalled after return from higher category of maintenance and repairs have been performed.

(3) Is maintained in a standby (ready for immediate operation) condition. Perform on a monthly schedule.

(4) Is being returned to service from limited storage.

b. *Monthly.* Table 3-2 specifies the preventive maintenance checks and services that must be performed monthly. A month is defined as approximately 30 calendar days of 8-hours-per-day operation. Adjustment of the monthly preventive maintenance interval must be made to compensate for any unusual operating conditions. For example, if the equipment is used 16 hours per day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. An AN/URM-127 maintained in a standby condition requires monthly preventive maintenance, but one in limited storage does not.

Table 3-1. Daily and Weekly Preventive Maintence Checks and Sevice

D—Daily **W—Weekly**

Total Task-Hours Required: 0.3 Total Task-Hours Required: 0.5

Interval and Sequence No.		ITEM TO BE INSPECTED PROCEDURE
D	W	
1	1	EXTERIOR Check for damage to knobs, power cord, and cabinet.
2	2	CONNECTORS Check tightness of all connectors.
3		OPERATION During operation of the equipment, be alert for an unusual performance or condition. Observe that the mechanical operation of each control is smooth and free of external and internal binding and that there is no excess looseness.
	3	CLEANLINESS OF EQUIPMENT Inspect equipment for exterior cleanliness. Follow the cleaning procedure in paragraph 3-3.
	4	CABLES Inspect cords, cables and wires for chafed, cracked or frayed insulation. Have connectors replaced that are broken, acred stripped or worn excessively.
	5	HANDLES AND LATCHES Inspect handles and latches for looseness. Have replaced or tightened as necessary.

Table 3-2 Monthly Preventive Maintenance Checks and Services.

M—Monthly

Total Task-Hours Required: 0.2

Sequence Number	ITEM TO BE INSPECTED PROCEDURE	Work Time (T/H)
1	JACKS AND PLUGS Inspect jacks and plugs for snug fit and good contact.	0.1
2	METAL SURFACES Inspect exposed metal surfaces for rust and corrosion. Touch up paint as required (para 3-4)	0.1

3-3. Cleaning

Inspect the exterior of the equipment. The exterior should be clean, and free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean, lint-free cloth.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gIoves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

b. Remove grease, fungus, and ground-in dirt from the cases; use a cloth dampened (not wet) with trichlorotrifluoroethane. After cleaning, wipe dry with a clean, lint-free cloth.

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

CAUTION

DO NOT press on the meter face (glass) when cleaning; the meter may become damaged.

d. Clean the front panel, meters, and control knobs; use a soft, clean, lint-free cloth. If necessary, dampen the cloth with water. Mild soap may be used for more effective cleaning. Wipe dry with a clean, lint-free cloth.

3-4. Touchup Painting Instructions

a. Refer to TB 43-0118 for instructions on painting and preserving Electronics Command equip-

ment. Intouchup painting a perfect match with the exact shade of the original paint surface may not be possible. This may be caused by changes such as in the original pigment because of oxidation and differences as a result of manufacture. The prevention of corrosion and deterioration is the most important consideration in touchup painting; appearance is secondary. This, however, should not be construed to mean that appearance of the equipment is not important. Touchup painting should be accomplished neatly and in good workmanshiplike manner. Inspection personnel in the field should make allowances for slight color mismatch where minor touchup has been done, but not for neglect, poor workmanship, or in cases where the need for refinishing is obvious.

b. 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.

Section II. ORGANIZATIONAL MAINTENANCE

3-5. Equipment Required

a. To perform organizational inspection, troubleshooting, and maintenance, you will need to have Variable Transformer CN-16/U, Voltmeter ME-30/U, and Oscilloscope AN/USM-28lC. Items of test equipment equal to or better than these listed here can be used if it is necessary.

b. You will not have to fabricate any special fixtures or jigs to maintain this signal generator.

3-6. Organizational Inspection

a. If the signal generator has been stored in excess of two years, perform the following pre-test procedure to assure proper operation of the power supply filter capacitor.

(1) Operate the signal generator for 30 minutes at 57.5 VAC, 60-400 Hz, 1 phase input.

(2) Adjust the input to the required value using a variable transformer between the power supply and the power cable. Check input voltage prior to connecting to the signal generator.

(3) Remove the variable transformer from the power cable and connect the power cable to the electrical power source.

b. With the power switch ON, check that the POWER lamp illuminates.

c. Connect Dummy Load DA-35/U to Cable CH-405/U and connect cable signal generator OUTPUT connector.

d. Adjust OUTPUT control to obtain a 10 reading on the panel voltmeter.

e. Turn FREQ METER switch ON, turn FREQ RANGE MULTIPLIER switch to X 10 and adjust vernier dial to 40 for 400 Hz output or turn FREQ RANGE MULTIPLIER switch to Xl and adjust vernier dial to 60 for 60 Hz output. Check that the applicable 60 or 400 reed vibrates.

3-7. Organizational Troubleshooting

a. Replacement of Fuses. Should your signal generator appear inoperable a check of the fuses should be made. Turn the fuse caps in the direction of the arrows and lift the caps and fuses out. Visually check the fuses. If the fuse is blown you will see a burnt area in the middle of the fuse or the metal link inside the fuse will be separated. If the fuse is not blown, reinsert the fuse and cap in the opening. Under no circumstances should replacement fuses with a higher current rating be installed in the signal generator.

b. *Removal of Signal Generator Unit from Case.* It may be necessary to remove the signal generator unit from the protective carrying case to perform organizational maintenance. To do so, unscrew the raised retaining screws at the outer extreme edge of the front panel and, using the two handles, carefully raise the unit from the case. Be careful so as not to damage any internal components on the lip of the case while lifting the unit out.

c. *Replacement of POWER ON Larnp.* After ascertaining that the fuses are good, power may be going to the transformer but the POWER ON lamp may be burnt out. If so, remove the bulb and replace it with the same size and type bulb.

d. *Continuity Check.* Check wires and cables suspected of being defective. Make sure that the signal generator power cord is unplugged. Examine insulation and cable connectors for cracks. Repair at organizational maintenance level is dependent upon the extent of damage and the tools and supplies available to the organizational repairer. Consult the maintenance allocation chart (MAC) in the back of this book for further details as to the extent of repair allowed at your level of maintenance.

e. *Output Voltage Variation.* With a 115 VAC, 60 Hz single phase input and a 5 millivolt output into a 1000 ohm load, check voltage variation using the frequency selector and frequence range multiplier, between 20, 200, 2000, 20,000 and 200,000 Hz signals. Variation shall not exceed 2 decibels as observed on a voltmeter such as ME-30/U.

f. Output Gain *Control*. With input at 115 VAC, 60 Hz, 1 phase, set ATTENUATOR to 10 V position, and OUTPUT CONTROL to full counterclockwise position. Within the output frequencies of 20-200, 200-2000, 2000-20,000 and 20,000-200,000 the output reading shall not exceed 300 millivolts. With OUTPUT CONTROL fully clockwise, the output should exceed 10.5 volts.

g. *Attenuator and Output Accuracy*. With the output set at 10 volts at the ATTENUATOR X 10 position and the output frequency stepped at 110, 1100, 11,000 and 110,000 Hz check that the output voltage is 9.5 to 10.5. Set the attenuator and check voltages as shown in table 3–3.

Table 3-3. Voltage Check

ATTENUATOR POSITION	OUTPUT VOLTAGE READlNG
Xl	0.95 to 1.05 v
X.1	95 to 105 mV
X.01	9.5 to 10..5 mV
X.l000 uv	950 to 1050 uv
X.l00 uv	95 to 105 uv
X.l0 uv	7.0 to 12,0 uv

3-8. Preparation for Storage or Reship ment

a. Reinstall all accessories in the signal generator case cover as shown in figure 1 –2.

NOTE

To avoid damage to front panel assure that power cable is plugged into adapter cable.

b. Pack in an adequate shipping container using a generous amount of (’cushioning material.

c. Use gummed tape, preferable 3 inch #60 commercial or waterproof tape Mil-spec PPP–T–76 and seal the box at the seams.

Section III. DIRECT AND GENERAL SUPPORT MAINTENANCE

3-9. Special Tools

Repair of Signal Generator AN/URM - 127 can be accomplished with those tools and test equipment listed in the maintenance allocation chart in the appendix at the rear of this manual. No special tools or equipment is necessary.

3-10. Test Equipment Required

Refer to table 3--4 for a listing of the test equipment required to maintain Signal Generator AN/URM-127. Equivalent items may be used provialed they meet or exceed the specifications requirements of the listed item.

Table 3-4. Test Equipment Required

Nomenclature	Common name	Equivalent item
Analyzer, Spectrum TS-723/U	Distortion analyzer	HP Model 334A
Counter, Electronic Digital Readout AN/USM-207 or AN/USM-459	Frequency Counter	HP 5245L or 5345A
Multimeter AN/USM-223 or AN/USM-45	Multimeter	Simpson Model 260-5
Oscilloscope AN/USM-281C	Oscilloscope	Tektronix Model 5440
Voltmeter, Electronic ME-30/U	RF voltmeter	HP Model 400EL or 334A
Test Set, Transistor *TS-1836C/U*	Transistor test set	Hickok Transistor Test Set
Amplifier AM-1881/U	Amplifier	Burton Model AM-348 or RF 815
Transformer, Variable Power CN -16/U	Variac	W10MT3AS3 (7910809)
Tool Kit, Electronic Equipment TK - 100/G	Electronic tools	

3-11. Troubleshooting

a. Conduct a visual inspection of the equipment prior to starting detailed troubleshooting procedures. The failure cause may be obvious damage, dirt or corrosion.

b. You may be able to pinpoint the failure cause by reading the information supplied on the maintenance requests form if one has been attached to the

generator.

c. If the failure cause is located and corrected, it will not be necessary to perform the remainmg checks in the following troubleshooting table. If this is the case, obtain a copy of the current calibration bulletin and perform periodic calibration of the signal generator. If the failure cause cannot be readily located proceed with the steps in the following troubleshooting table until the point of failure is located. Then consult the maintenance allocation chart at the back of this manual and the parts manual to see if the part that has failed is authorized to be replaced at general support level of maintenance. If so, obtain the part through normal supply channels and replace it. If the part is not available and repair of that particular section of the signal generator is not authorized at your level of maintenance, return the signal generator to the owner/operator. Tell the owner that depot maintenance will be required. Under normal circumstances the owner will turn in the signal generator (following procedures in para 3-8) and requisition a replacement signal generator.

3-12. Schematic Diagram

Figure FO-3-3 located in the back of this manual is a schematic diagram of Signal Generator AN/URM-127. As you proceed through the troubleshooting table it will be necessary to locate the components on the schematic diagram. By locating each component on the diagram you can determine which stage or section of the signal generator contains the fault.

3-13. Test Oscilloscope Waveforms

The following troubleshooting table contains a waveform figure reference designation. Consult figure 3-1 for the exact location of each test point and adjustment.

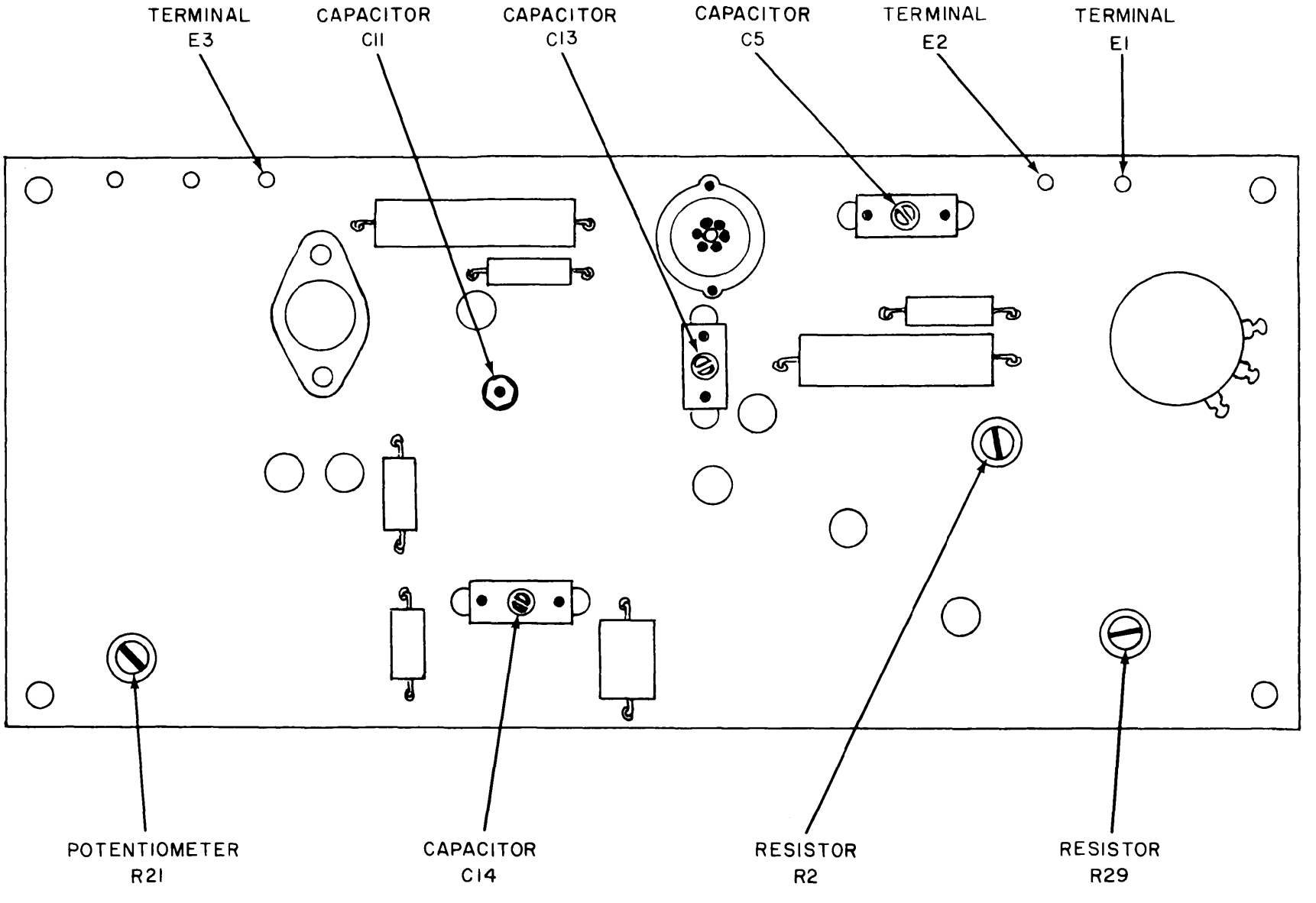


Figure 3-1. Signal Generator AN URM-127. Component Circuit Board.

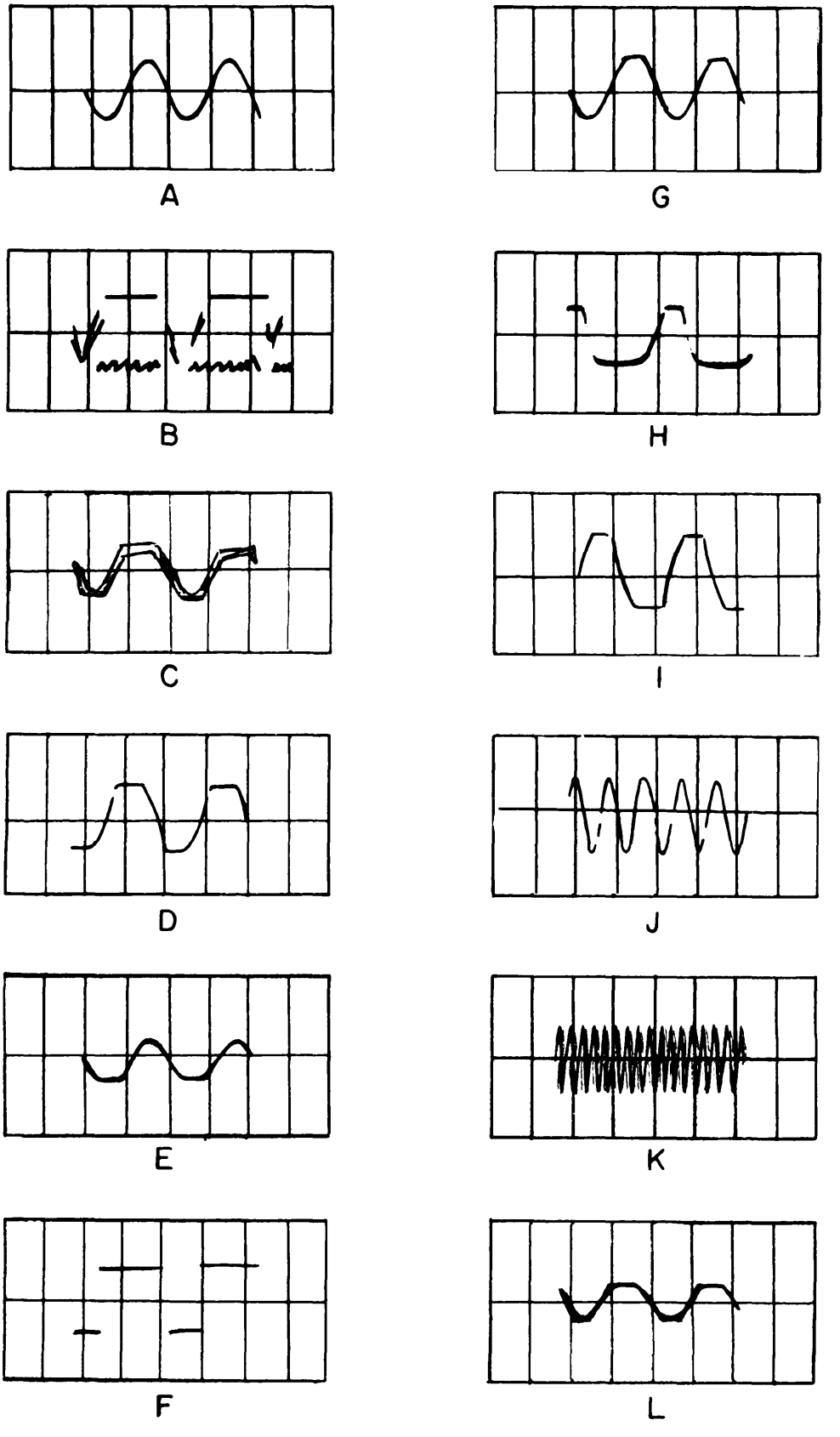


Figure 3-2. Oscilloscope Waveform Patterns.

3-14. Test Points

a. Only one major test point is on the signal generator. This test point is the output connector located on the front panel and is labeled 0UTPUT.

b. Twelve secondary test points are found on the signal generator circuit board identified as E 1 through E12. The test points are identified on the schematic diagram, figure FO 3-3 and also in figure 3-1.

c. In addition to the waveform patterns obtained at specific test points there are certain voltages and resistance values that are obtained during a troubleshooting or repair exercise. Refer to table 3-6 for these values. These values need not be exact even though minimum/maximum values are not listed. If the voltage or resistance obtained at a specified test point is near the listed value, that is an indication that the components near that stage are good. If you do not obtain a reading somewhere near the specified amount or if the waveform obtained is nowhere near the pattern shown for that test point, that is most likely the area where the faulty component is. At this finding, refer- to the foldout schernatic diagram where you will find the actual value of each component.

WARNING

Disconnect the 115 vo1t AC POWER cord before attempting to measure individual componects. Make sure that capacitors have had the voltage discharged from them because some of them are capable of storing large amounts of voltage that can be dangerous to your health under certain circumstances.

Table 3-5. Troubleshooting Procedures

TROUBLE INDICATION	TEST SETTING	Reference DESIGNATOR & FAILURE	WAVEFORM[b] FIGIJRE REFERENCE
Voltage output decreases at 200 kHz output and waveform is slightly distorted.	Input: 110-120 VAC -60	R8 Open	
Output signal will appear for approximately 1 second when main frequency dial is turned rapidly CCW, otherwise no output signal is shown.	Output frequency set for 10,000 Hz Output attenuator set at X10	R9 Open R10 Open	7-5G
Output signal is clipped at one end.			
Output signal is clipped at low temperature (below 20 “F). No difference at normal temperature.	output control turned fully clockwise	R11 Open	
Possible parasitic oscillations on slope of output signal.	Output voltmeter should read between 11 and 12 volts with a dummy load connected to the output	R13 Open C16 Open	
Output voltage decreases to approximately 6v or output signal clipped and distorted.		R16 Open	7-5H
Low and distorted output signal. Voltage at test points E3 and E12 = 30v.		R21, R24 Open or CR7, 06 Shorted	7-51
Voltage at test points E3 and E 12 = 60v. oscilloscope connected across E3 and E 12.		R22, R23, CR7 Open or Q5, Q7 Shorted	7-5J
No output signal. Voltage at test points E3 and E12 is 12v.		R25 Open	
No output signal and no dc voltage.		R26 Open	
No pilot light.		R27 Open	
No output voltage, or output voltage will not adjust to zero.		R28 Open	
output signal normal. No output meter indication.		R29 Open R30 Open	
Output voltage in one or more attenuator switch positions incorrect.		R31 thru R42 Open	
No output signal. Voltage at test points E3 and E 12 is 20v. Q3 will get hot.		CR1 or CR2 Open	
Slight increase in distortion.		CR1 or CR2 Shorted	
Indication on output meter is approximately half voltage.		Shorted or Open CR3, CR4, CR5, CR6	
Low output signal or motorboating (oscillating) signal. Voltage at test points E3 and E 12 approximately 12 vdc.		CR8 Shorted	
No pilot light and no output voltage.		F1 or F2 Blown	
No output signal.		R1, R1B, R1C, R1D, R1E, R1F Open	
No output Signal.		R4, R5 Open	
No output signal.	Input: 110-120 VAC 60 Hz	R6 Open	

Table 3-5. Troubleshooting Procedures-Countinued

TROBLE INDICATION	TEST SETTING	REFERENCE[a] DESIGNATOR & FAILURE	WAVEFORM[b] FIGURE REFERENCE
No output signal.		R12 Open	
No output signal.	Output frequency set for 10,000 Hz	L1 Open	
No output signal.	Output attenuator set at Xl0	R14 Open	
No output signal.		R18 Open	
No output signal.	Output control turned fully clockwise	R19 Open	
No output signal.		R20 Open	
No output signal.	Output voltmeter should read between 11 and 12 volts with a dummy load connected to the output	R28 Open	
No output signal.		Q 1 Shorted	
No output signal.		C15 Shorted	
No output signal.		C17 Shorted	
No output signal.		C18 Shorted	
No output signal.		C 19 Shorted	
Square wave output signal.		R2 or R3 open	7-5F
Output signal clipped and output voltage over 12v.		Glass Cracked R4 or R5	7-5D
Turn AC power switch on output signal will appear for approximately ().2 second on the oscilloscope connected across the output		R7 open R15 Open R17 open	
Increased ripple on output signal.		CR9 or CR10 Open	7-5K
Output signal clipped.		Q2 Shorted	7-5G
Output signal making a noise like motorboating. Low DC voltage (approximately 20V) across E3 and E12.		Q3 Shorted	
Low DC voltage (approximately 20v) across E:) and E 12.		Q4 Shorted	
Either no output signal or signal distorted on respective range Incorrect frequency.		Shorted or Open Cl thru C13	
Low output voltage (approximately 8v) and output signal clipped.		C15 Open C17 Open	7-5E
output meter pointer does not remain steady.		C18 Open	7-5C
Low DC voltage (approximately 25v) across E3 and E12. output signal distorted.		C20 Shorted	7-5L
F1 and F2 blown.		C21 Shorted	
output signal clipped with oscillations.		C21 Open	7-5b
DC voltage of (approximately 20V) appears across the output connector, when generator is set for 10v output signal		C22 Shorted	

[a] **Refer to figure 3-1 for test points and component location.**
[b] **Refer to figure 3-2 for oscilloscope waveform.**

Table 3-6. Electrical Values

TEST POINT	VALUE
E3 to E12	47 VDC
E5 to E4	102 AC
E7 to E8	20,000 ohms ± 2 percent
E7 to E6	20,000 ohms ± 2 percent
El - E2	33V Peak to Peak
E3 - E4	51 VAC
C21 - Neg	60 V

As stated above, the listed value is an exact amount, however each component is allowed a certain tolerance and will vary in value from one signal generator to another in order to create a balance to obtain the final result or output.

3-15. Disassembly of Major Components

a. No special instructions are required for disassembly.

b. No special tools are required.

3-16. Replacement of Potentiometer Assembly (R1a and Rib)

a. The replacement of potentiometer assembly (Rla and Rib) in the AN/URM-127, as in the case of all matched bridge circuits, requires the replacement of balancing resistors Rld and R1f, to achieve correct oscillation and performance of circuit.

b. The following steps depict the method of replacing the potentiometer and selection of appropriate balancing resistors Rld and Rlf.

(1) Disconnect signal generator from power source.

(2) Replace defective potentiometer assembly Rla and Rib.

(3) Before connecting potentiometer assembly into circuit, measure and record the actual resistance values of Rla and Rib.

(4) Disconnect, remove and discard resistors Rlf and Rld from printed circuit board.

(5) To select the resistor value required to replace R1d, use the measured value of Rla (step (3) above), refer to the resistance value chart, table 3-7, and read the corresponding total required value of Rlc and R1d.

Example: The corresponding total required value for a potentiometer reading 19960 ohms, would be 1858 ohms.

(6) Measure the actual value of Rlc (in circuit) and *subtract* value from required R1c + R1d value read on Resistance Value Chart (step (5) above), to determine correct value of Rid. The difference will be the replacement value of resistor R1d.

(7) Select the closest value available for R1d, and replace same in circuit.

(8) Repeat steps (5), (6), and (7) above for resistor Rlf.

(9) Connect potentiometer assembly Rla and Rlb in circuit, and check the signal generator in accordance with the calibration procedures.

(10) The following is an example of a typical resistor selection:

Measured value of Rla . . . . . 19870 ohms
Measured value of Rlc . . . .1788 ohms
The closest value of Rla from table 3-7 19880 ohms
Corresponding value of Rlc plus Rld
from table 3-7 . . . .1851ohms.
The difference (R1d):
(Rlc plus R1d) - Rlc = 1851-1788 = 63 ohms.
The closest standard value of Rld . . . .63 ohms.

Table 3-7. Resistance Value Chart

POTENTIOMETER	RESISTANCE
Rla or Rlb Ohms	Rlc+R1d or Rlc+R1f ohms
19600	1825
19640	1828
19680	1832
19720	1836
19760	1840
19800	1843
19840	1847
19880	1851
19920	1855
19960	1858
20000	1862
20040	1866
20080	1869
20120	187:3
201 60	1877
20200	1881
20240	1884
20280	1888
20320	1892
20360	1896
20400	1899

3-17. Power Supply Adjustment

a. Check if the fuses (.25 AMP) are in the fuse holders of the generator.

b. Connect dc voltmeter to points E3 (Plus) and E13 (Minus).

c. Connect ac voltmeter to power cable.

d. Connect the generator power cord to the output of a variable transformer.

e. Turn on the generator power switch.

f. Increase slowly AC voltage and read both DC and AC voltmeters on control panel.

g. When AC voltmeter reads 115 V, adjust potentiometer R21 on printed circuit board until DC voltmeter reads 47 V.

h. Change AC input from 115 V to 126.5 V and down to 103.5 V. The reading on DC voltmeter should remain constant within approximately 1 volt.

3-18. Output Voltage Adjustment

a. Connect generator output to oscilloscope and AC voltmeter.

b. Set oscilloscope on 10V/CM division and AC voltmeter on 30 V range.

c. Set generator FREQUENCY RANGE MULTIPLIER on X100 position.

d. Set generator OUTPUT CONTROL to maximum C.W. position.

e. Set generator ATTENUATOR to X10 position.

f. Adjust R2 to read 11.5 V on AC voltmeter.

g. Check the wave shape on the oscilloscope. The wave should be sinusoidal without any visible clipping or other distortion.

h. Adjust R29 to read 11.5 V on generator panel output meter.

3-19. Frequency Adjustment

a. Preliminary and 2000 - 20000 Hz Range Adjustment.

(1) Connect frequency counter to the generator output.

(2) Turn the main frequency adjust potentiometer shaft to maximum CCW position without dial.

(3) Adjust trimmer Cl1 until the output frequency is 21400 to 21500 Hz.

(4) Turn slowly potentiometer shaft CW until the frequency is as close as possible to 20000 Hz.

(5) Mount the frequency dial on the potentiometer shaft in the position which reads 200 on the dial.

(6) Turn frequency dial to 20 and read the output frequency which should be well within 1960 to 2040 Hz.

(7) Turn frequency dial to 110 and read the output frequency which should be well within 10780 to 11220 Hz.

(8) Check similarly position 40 (3920-4080 limits) and position 60 (5880-6120 Hz limits).

(9) Check the maximum CW frequency dial position. The frequency should be less than 1900 Hz.

NOTE

If after adjusting the error of the frequency dial exceeds ±2%, it might be necessary to shift the frequency range by changing slightly the dial position versus the potentiometer shaft.

b. 20000-200000 *Hz Range Adjustment.*

(1) Set FREQUENCY RANGE MULTIPLIER to X1000 position.

(2) Check trimmer C14. It should be in half-open position.

(3) Set frequency dial to 20.

(4) Adjust trimmers C5 and C13 to get output frequency as close as possible to 20,000 Hz.

(5) If the output voltage indicated by the panel meter (output control potentiometer should be still in maximum CW position) is lower than 11.5 V, increase capacitance of C5 and decrease capacitance of C13 until output frequency is 20,000 Hz again. Above maniuplation should be repeated until the proper frequency and output voltage is achieved.

(6) Set frequency dial to 200. Check the fre-

quency on the frequency counter. If the frequency s not 200,000 Hz adjust trimmer C14 until the frequency counter reads as closely as possible to 20,000 Hz.

(7) Set frequency dial back to 20 and read the frequency counter. If there is any significant difference, readjust slightly C5 or C13 and repeat adjustment described in (6) above.

c. 200-2000 Hz Range Adjustment

(1) Set FREQUENCY RANGE MULTIPLIER to X10 position.

(2) Set frequency dial to 200 and read the output frequency, it should be between 1960 and 2040 Hz.

(3) Set frequency dial to 20 and read the frequency counter. The frequency should be between 196 and 204 Hz.

(4) Set frequency dial on 110 and check the output. It should be within 1078 and 1122 Hz.

(5) If necessary test another listed value for C9 to balance frequency error on both ends of the range.

(6) Replace C9 capacitor on the printed circuit board if required.

d. 20-200 Hz Range Adjustment.

(1) Set FREQUENCY RANGE MULTIPLIER to (l position.

(2) Set frequency dial to 200 and read the output frequency, it should be between 196 and 204 Hz.

(3) Set frequency dial to 20 and read the frequency counter. The frequency should be between 19.6 and 20.4 Hz.

(4) Set frequency dial on 110 and check the output frequency. It should be within 107.8 and 112.2 Hz.

(5) If necessary, test another listed value for C7 to balance frequency error on both ends of the range.

(6) Replace C7 capacitor on the printed circuit board if required.

3-20. Wave Shape

Check the wave shape on the oscilloscope for at least one point for all positions of FREQUENCY RANGE MULTIPLIER. The wave should be sinusoidal and should not have any visible distortions.

3-21. Frequency Meter Test

a. Turn on the frequency meter switch on the panel.

b. Adjust the output frequency to 60 Hz until generator frequency meter responds as indicated by the frequency counter.

c. The output frequency should be within 59.4 and 60.6 Hz.

d. Adjust the output frequency to 400 Hz until generator frequency meter responds.

e. The output frequency as indicated by the frequency counter should be within 396 and 404 Hz.

3-22. Attenuator Test

a. Connect the generator output to the amplifier and the voltmeter through a 1000 ohm dummy load.

b. Turn the ATTENUATOR switch on the control panel to X10 position.

c. Set multimeter to 10 V position.

d. Set the generator frequency to 110K.

e. Adjust the generator output to 10 V. Multimeter should indicate 10 V within plus or minus 5%.

f. Set the attenuator to Xl and correct if necessary the OUTPUT CONTROL to obtain 1 V reading on the generator output meter.

g. Set multimeter switch to 1 V position. The reading should indicate 1 V plus or minus 5%.

h. Repeat steps *f* and *g* above for attenuator settings of: x. 1, x. 01 and X10000. The output voltage should stay within plus or minus 5%.

NOTE

It may be necessary to use an amplifier in the test setup for the remaining steps.

i. Leave generator set for 110 KHz and 1 MV output (position x 1000).

j. Set multimeter to 1 V position.

k. Turn the METER switch on control panel to X100 (110K Hz).

1. The generator frequency may be adjusted slightly to obtain maximum reading on the multimeter. Adjust CALIBRATE potentiometer on control panel until multimeter indicates exactly .1 *V.*

NOTE

The above procedure calibrates the l00K Hz amplifier to an exact one-hundred amplification.

m. Change ATTENUATOR switch to X10 uV and multimeter to .01 V. Multimeter should indicate .01V plus or minus 5%.

n. Change ATTENUATOR switch to X10 uV and multimeter to .003 V. Multimeter reading should be within .7 and 1.2 MV.

APPENDIX A

REFERENCES

DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
TB 43-0118	Field Instructions for Painting and Pre-serving Communication Electronics.
TB 43-180	Calibration Requirements for the Maintenance of Army Materiel.
TB 385-4	Safety Precautions for Maintenance of Electrical/Electronics Equipment.
TM 11-6625-255-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Spectrum Analyzer TS-723A/U (NSN 6625-00-833-2602), TS-723B/U (NSN 6625-00-668-9418), TS-723C/U. and TS-723D/U (NSN 6625-00-668-9418).
TM 11-6625-320-12	Operator's and Organizational Maintenance Manual: Voltmeter, Meter MD-30A/U and Voltmeters, Electronic ME-30B/U, ME-30C/U, and ME-30E/U.
TM 11-6625-353-12	Operator's and Organizational Maintenance Manual: Amplifiers, Radio Frequency Am-1881/U and AM-3026/U.
TM 11-6625 -539-14-3	Operator's Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List: Test Set, Transistor TS-1836C/U.
TM 11-6625-654-14	Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools Lists) for Multimeter AN/USM-223.
TM 11-6625 -700-14-1	Operator's Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): Digital Readout Electronic Counter AN/USM-207A (Series Nos. 1A through 1100 A).
TM 11-6625-1703-15	Operator's Organizational, DS, GS and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Oscilloscope An/USM-281A.
TM 11-750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the AN/URM-127 to help you inventory items required for safe and efficient operation.

B-2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. Not applicable.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the AN/URM-127 in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the AN/URM-127 during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

B-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. *Part Number.* Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. *Location.* The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f Usable on Code. Not applicable.

g. Quantity *Required (Qty Reqd).* This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

(Next printed page is B-3)

SECTION III BASIC ISSUE ITEMS

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
1-1	11	7510-00-802-9469	2000-181 81920 ENVELOPE, TRANSPARENT			1		

APPENDIX D

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D-1. General

This appendix provides a summary of the maintenance operations for the AN/URM-127. 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.

D-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.

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 e 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.

D-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 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.

D-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. Nomenc*lature.* This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

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

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

D-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.

(Next printed page is D-3)

SECTION II MAINTENANCE ALLOCATION CHART
FOR

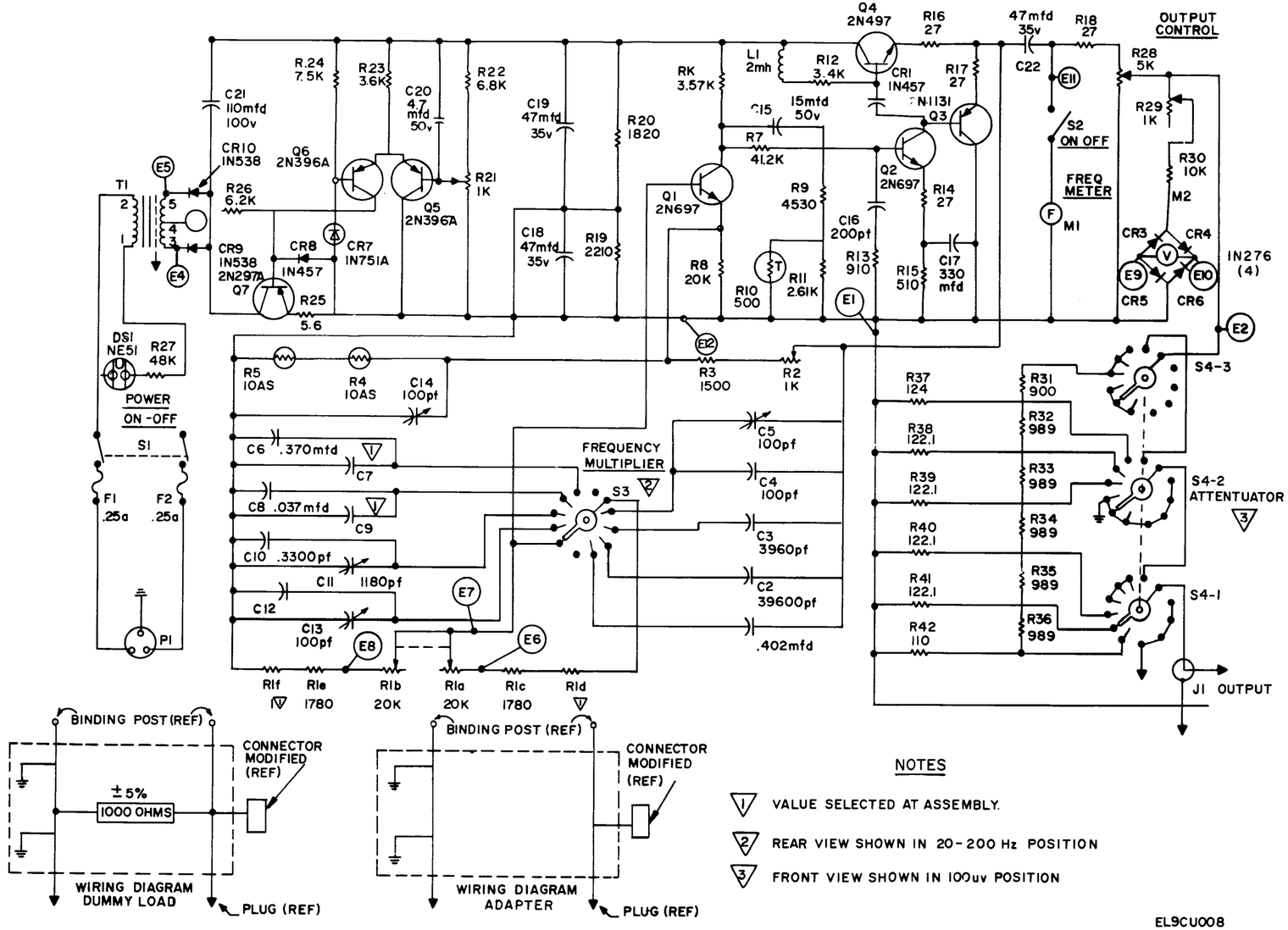
GENERATOR, SIGNAL AN/URM-127

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	GENERATOR SIGNAL AN/URM-127	Inspect		0.2					A
		Test		0.3					B
		Service		0.4					C
		Inspect				0.3		6	F
		Test				0.4		1,3,5,6	
		Service				0.2		6	G
		Adjust				0.3		1,3,5,6,7	D
		Repair				1.5		1 thru 7	E

SECTION III TOOL AND TEST EQUIPMENT REQUIF FOR GENERATOR, SIGNAL AN/URM-127

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
1	H	COUNTER, ELECTRONIC DIGITAL READOUT AN/USM-207A OR AN/USM-459	6625-00-044-3228 6625-01-061-8928	
2	H	MULTIMETER AN/USM-223 OR MULTIMETER AN/PSM-45	6625-00-999-7465	
3	H	OSCILLOSCOPE AN/USM-281	6625-00-228-2201	
4	H	TEST SET, TRANSISTOR TS-1836C/U (IF AVAILABLE)	6625-00-159-2263	
5	H	VOLTMETER, ELECTRONIC ME-30/U	6625-00-643-1670	
6	O, H	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
7	H	AMPLIFIER, RADIO FREQUENCY AM-1881/U	6625-00-092-7924	

REFERENCE CODE	REMARKS
A	VISUAL INSPECTION OF EXTERNAL CONTROLS AND COMPONENTS ONLY.
B	VISUAL INSPECTION OF THE POWER PILOT LIGHT LAMPS, OBSERVATION OF THE FREQUENCY METER AND VISUAL INSPECTION OF THE OUTPUT METER.
C	REPLACEMENT OF FUSES AND PILOT LIGHT, CLEANING OF EXTERNAL AREAS ONLY.
D	ADJUSTMENT OF ALL INTERNAL AND EXTERNAL CONTROLS.
E	BY REPLACEMENT OF ALL DEFECTIVE DISCRETE COMPONENTS.
F	COMPLETE VISUAL INSPECTION OF ALL INTERNAL AND EXTERNAL COMPONENTS.
G	ALL ITEMS CONTAINED IN C UNDER REMARKS IN ADDITION TO INTERNAL AREA.



FO-3 AN/URM-127 Signal Generator Schematic Diagram.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE SENT
10 July 1975

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

BE EXACT PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO	
2-25	2-28			Recommend that the installatior antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}. REASON: Experience has shown that with only a 1^{o} lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2^{o} without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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

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DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-683-14	3 MAY 83	Generator, Signal AN/URM-127

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

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