

TM 11-6625-2954-14&P

---

TECHNICAL MANUAL

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

FOR

SIGNAL GENERATOR SG-1144/U  
(NSN 6625-01-075-8478)

This copy is a reprint which includes current pages  
from Changes 1 and 2. Title was changed by Change 2.

---

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 JANUARY 1980

OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT  
 AND GENERAL SUPPORT MAINTENANCE MANUAL  
 (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR

SIGNAL GENERATOR SG-1144/U

(NSN 6625-01-075-8478)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or 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 directly to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DR-SEL-ME-MP, Fort Monmouth, NJ 07703. A reply will be furnished to you.

	Paragraph	Page
CHAPTER 1. INTRODUCTION		
SECTION I. General		
scope . . . . .	1-1	1-1
Consolidated Index of Army publications and Blank Forms . . . . .	1-2	1-1
Maintenance Forms, Records and Reports . . . . .	1-3	1-1
Reporting equipment improvement recommendations (EIR). . . . .	1-4	1-1
Administrative storage . . . . .	1-5	1-1
Destruction of Army electronic material. . . . .	1-6	1-1
II. Description and data		
Purpose and use. . . . .	1-7	1-1
Description of equipment . . . . .	1-8	1-2
Components. . . . .	1-9	1-2
Tabulated data. . . . .	1-10	1-2
CHAPTER 2. SERVICE UPON RECEIPT AND INSTALLATION		
SECTION I. Site and shelter requirements		
Siting . . . . .	2-1	2-1
Shelter requirements . . . . .	2-2	2-1
II. Service upon receipt of material		
Packing data . . . . .	2-3	2-1
Unpacking . . . . .	2-4	2-1
Checking unpacked equipment . . . . .	2-5	2-1
III. Installation instruction		
Tools, test equipment and materials required . . . . .	2-6	2-2
Assembly and installation . . . . .	2-7	2-2
IV. Preliminary adjustment and alignment		
Power requirement . . . . .	2-8	2-2
Circuit alignment . . . . .	2-9	2-2
CHAPTER 3. OPERATING INSTRUCTIONS		
SECTION I. Controls and indicators		
Damage from improper settings . . . . .	3-1	3-1
Operator's controls . . . . .	3-2	3-1
II. Operation under usual conditions		
Preliminary starting procedure . . . . .	3-3	3-4
Operating procedure . . . . .	3-4	3-4
Standby and shutdown . . . . .	3-5	3-5
Operation unusual conditions . . . . .	3-6	3-6

			paragraph	Page
CHAPTER	8.	ALIGNMENT AND ADJUSTMENT		
SECTION	I.	General		
		General . . . . .	8-1	8-1
		Maintenance diagrams . . . . .	8-2	8-1
		Tools and test equipment . . . . .	8-3	8-1
	II.	Alignment		
		Alignment . . . . .	8-4	
		Preliminary . . . . .	8-4a	8-1
		Internal tones and FM alignment . . . . .	8-4b	8-2
		Rf output level calibration . . . . .	8-4c	8-3
		Amplitude modulation titration . . . . .	8-4d	8-5
		Limiter amplifier A10A3 adjustment . . . . .	8-4e	8-6
		Frequency meter assembly A3 calibration . . . . .	8-4f	8-7
		Input sensitivity adjustment fixed oscillator divider assembly A8A1 . . . . .	8-4g	8-9
		Input sensitivity adjustment variable oscillator divider assembly A9A1 . . . . .	8-4h	8-10
		Oscillator assembly A7 alignment . . . . .	8-4i	8-11
		Modulator assembly A9A3 adjustment . . . . .	8-4j	8-12
CHAPTER	9	GENERAL SUPPORT TESTING PROCEDURES		
SECTION	I.	General		
		General . . . . .	9-1	9-1
		Modification work orders . . . . .	9-2	9-1
	II.	Testing procedures		
		Physical tests and inspections . . . . .	9-3	9-1
		Test equipment . . . . .	9-4	9-1
		Output frequency accuracy . . . . .	9-5	9-2
		Output voltage accuracy . . . . .	9-6	9-3
		Auxiliary rf output . . . . .	9-7	9-5
		Rf harmonic spurious output . . . . .	9-8	9-7
		Rf non-harmonic related spurious output . . . . .	9-9	9-8
		Percent modulation . . . . .	9-10	9-9
		Internal AM audio tones . . . . .	9-11	9-9
		Modulation distortion . . . . .	9-12	9-10
		External AM . . . . .	9-13	9-11
		External AM sensitivity . . . . .	9-14	9-12
		Deviation accuracy . . . . .	9-15	9-13
		Internal FM audio tones . . . . .	9-16	9-14
		FM distortion . . . . .	9-17	9-15
		Spurious amplitude modulation . . . . .	9-18	9-16
		External FM sensitivity . . . . .	9-19	9-17
		External modulation voltage . . . . .	9-20	9-19
CHAPTER	10.	ILLUSTRATIONS		
		Scope . . . . .	10-1	10-1
CHAPTER	11.	REPAIR PARTS AND SPECIAL TOOLS LIST		
		Scope . . . . .	11-1	11-1
		Special tools . . . . .	11-2	11-1
APPENDIX	A	REFERENCES . . . . .	.....	A-1
APPENDIX	B	COMPONENTS OF END ITEM LIST (not applicable)		
APPENDIX	C	MAINTENANCE ALLOCATION . . . . .	.....	C-1

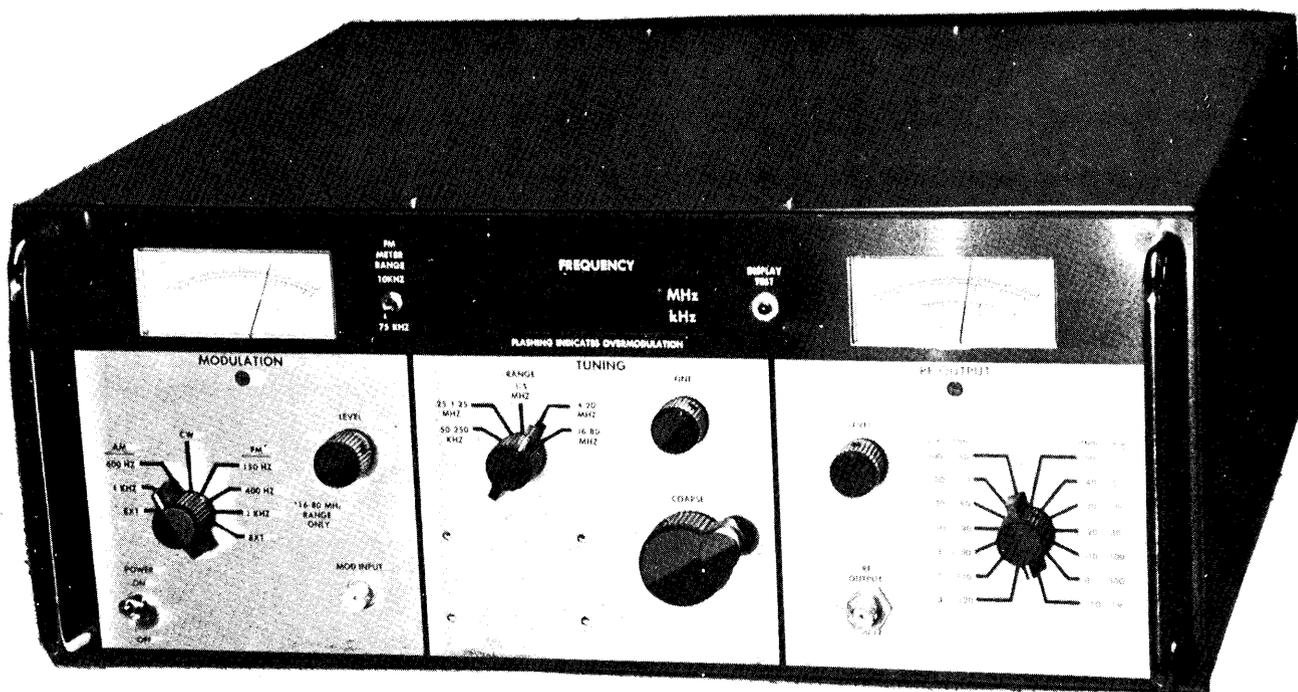
LIST OF ILLUSTRATIONS

Number	Title	Page
1-1	Generator,Signal: SG-114/U -left front view . . . . .	
2-1	Packaging diagram . . . . .	1-0
3-1	Operators controls and indicators . . . . .	3-2
3-2	Rear panel . . . . .	3-3
6-1	Functional block diagram . . . . .	6-4
7-1	50% Amplitude modulation pattern . . . . .	7-10
7-2	Display segment presentations. . . . .	7-22
7-3	oscillator A7 Output waveforms . . . . .	7-33
7-4	Fixed oscillator divider A8 Output waveforms . . . . .	7-35
7-5	Variable divider A9A1 output waveforms. . . . .	7-38
7-6	Bandpass filter A9A2 output waveforms . . . . .	7-41
9-1	Test setup, output frequency accuracy . . . . .	9-2
9-2	Test setup, output voltage accuracy . . . . .	9-4
9-3	Test setup, auxiliary rf output. . . . .	9-6
9-4	Test setup, spurious output and percent modulation . . . . .	9-7
9-5	Test setup, internal audio tones. . . . .	9-9
9-6	Test setup, modulation distortion. . . . .	9-10
9-7	Test setup, external am . . . . .	9-11
9-8	Test setup, external am sensitivity . . . . .	9-12
	Test setup, deviation accuracy.. . . .	9-13
9-10	Test setup, internal fm audio tones . . . . .	9-14
9-11	Test setup, fm distortion . . . . .	9-15
9-12	Test setup, spurious am . . . . .	9-16
9-13	Test setup, external fm . . . . .	9-18
10-1	Wiring diagram, mainframe. . . . .	10-3
10-2	Parts location, mainframe . . . . .	10-5
10-3	Schematic diagram, power supply A2 . . . . .	10-11
10-4	Schematic diagram, RF circuit breaker assembly A12A1. . . . .	10-13
10-5	Schematic diagram, variable oscillator divider assembly A9A1 . . . . .	10-15
10-6	Schematic diagram,bandpass filter assembly A9A2 . . . . .	10-17
10-7	Schematic diagram, modulator assembly A9A3 . . . . .	10-19
10-8	Schematic diagram, fixed oscillator divider assembly Anal . . . . .	10-21
10-9	Schematic diagram, display divider assembly A8A2 . . . . .	10-23
10-10	Schematic diagram, low-pass filter assembly A8A3 . . . . .	10-24
10-11	Schematic diagram, frequency meter A3 and frequency display A4 assemblies . . . . .	10-25
10-12	Schematic diagram, mixer and low-pass filter assembly A10A1. . . . .	10-27
10-13	Schematic diagram, amplifier and low-pass filter assembly A10A2. . . . .	10-29
10-14	Schematic diagram, limiter and detector assembly A10A3. . . . .	10-30
10-15	Schematic diagram, levelling and modulation assembly A6 . . . . .	10-31
10-16	Schematic diagram, modulation amplifier and oscillator assembly A5 . . . . .	10-33
11-1	Signal Generator SG1144/U . . . . .	11-3
11-2	Main frame assembly A1 . . . . .	11-5
11-3	Front panel, rearview (Part of A1) . . . . .	11-7
11-4	Rear panel (Part of A1) . . . . .	11-9
11-5	Power supply assembly A2 . . . . .	11-11
11-6	Power supply regulator assembly A2A1 . . . . .	11-13
11-7	Power supply regulator assembly A2A2 . . . . .	11-15
11-8	Frequency meter assembly A3. . . . .	11-19
11-9	Frequency display assembly A4. . . . .	11-21
11-10	Modulation circuit assembly A5. . . . .	11-25
11-11	Levelling circuit assembly A6 . . . . .	11-31
11-12	RF oscillator assembly A7 . . . . .	11-33
11-13	Fixed oscillator divider assembly A8 - cover removed . . . . .	11-35
11-14	Fixed oscillator divider circuit card assembly A8A1 . . . . .	11-39
11-15	Display divider assembly A8A2 . . . . .	11-43
11-16	Low-pass filter assembly A8A4. . . . .	11-45

11-17	Variable oscillator divider assembly A9- cover removed . . . . .	11-47
11-18	Variable oscillator divider circuit card assembly A9A1 . . . . .	11-51
11-19	Bandpass filter assembly A9A2 . . . . .	11-55
11-20	Modulator assembly A9A3 . . . . .	11-57
11-21	Mixer and output circuit assembly A10 - cover removed . . . . .	11-59
11-22	Mixer and low-pass filter assembly A10A1 . . . . .	11-65
11-23	Amplifier and low-pass filter assembly A10A2 . . . . .	11-67
11-24	Limiter and detector assembly A10A3 . . . . .	11-69
11-25	RF amplifier assembly A11 . . . . .	11-71
11-26	RF circuit breaker assembly A12 -cover removed . . . . .	11-73
11-27	RF attenuator assembly A13 . . . . .	11-75
11-28	Extender board assembly A14 . . . . .	11-77

LIST OF TABLES

Number	Title	Page
1-1	Tabulated data . . . . .	1-2
3-1	Operators controls and indicators . . . . .	3-1
3-2	Preliminary control settings . . . . .	3-5
4-1	Operator/crew preventative maintenance checks and services. . . . .	4-2
5-1	Organizational preventative maintenance checks ad services. . . . .	5-2
7-1	List of general support test equipment. . . . .	7-1
7-2	Troubleshooting and fault isolation. . . . .	7-3
7-3	Power supply voltages . . . . .	7-4
7-4	DC return s . . . . .	7-4
7-5	Normal regulator input voltages . . . . .	7-5
7-6	Circuit breaker assembly A12 troubleshooting chart. . . . .	7-6
7-7	Variable oscillator divider A9A1 troubleshooting chart . . . . .	7-11
7-8	Bandpass filters A9A2 troubleshooting chart . . . . .	7-13
7-9	Modulator assembly A9A3 troubleshooting chart . . . . .	7-14
7-10	Fixed oscillator divider A8A1 troubleshooting chart . . . . .	7-17
7-11	Display divider A8A2 troubleshooting chart. . . . .	7-19
7-12	Low-pass filter assembly A8A3 troubleshooting chart. . . . .	7-21
7-13	Frequency meter A3 troubleshooting chart . . . . .	7-24
7-14	Mixer and low pass filter assembly A10A1 troubleshooting chart . . . . .	7-27
7-15	Levelling and modulation assembly A6 troubleshooting chart . . . . .	7-29
7-16	Modulator circuits assembly A5 troubleshooting chart . . . . .	7-31
7-17	Voltage measurements levelling circuit A6 and modulator circuit A9A3. . . . .	7-42
8-1	Test equipment . . . . .	8-1
9-1	Physical tests and inspection . . . . .	9-1
9-2	Test equipment . . . . .	9-2



EL5Y1001

FIGURE I-I. SIGNAL GENERATOR SG-II44/U

## CHAPTER 1

## INTRODUCTION

## Section 1. GENERAL

## 1-1. Scope

This manual describes Signal Generator SG-1144/U (herein referred to as signal generator) and covers the installation, operation, organizational, and general support maintenance instructions for the equipment. No direct support maintenance is authorized for this equipment.

55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 5400.15.

## 1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

## 1-4. Reporting Equipment Improvement Recommendations(EIR)

If your SG-1144/U 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. Put it on an SF 368 (Quality Deficiency). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DR-SEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

## 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 TM 38-750. The Army Maintenance Management System.

## 1-5. Administrative Storage

There are no special procedures for preparing this equipment for limited storage. Place equipment in an organizational storage room. Protect equipment from dust, humidity, and extreme temperature changes.

b. Report of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD) ) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

## 1-6. Destruction of Army Electronics Materiel

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

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR

## Section II. DESCRIPTION AND DATA

## 1-7. Purpose and Use

Signal Generator SG-1144/U is a general purpose, high -frequency signal generator set (fig. 1-1) that provides radio frequency (rf) signals use to test, evaluate and align radio receivers, rf equipment and amplifiers. The SG-1144/U provides continuous wave (cw), amplitude modulated (am), frequency modulated (fro), and square wave modulated signals in the frequency range of 50 Kilohertz (KHz) to 80 Megahertz (MHz) with an output level range of - 127 to +10 dbm. The output is calibrated, metered, and levelled across the entire range of frequencies and levels.

## 1-8. Description of Equipment

The SG-1144/U is a self-contained signal generator designed for bench use. Connection to the modulation input and rf output is made through type BNC connectors (M39012/16-0001). The physical characteristics are

Height: 7 1/8"  
Width: 17"  
Depth: 16 1/4"  
Weight: 31 pounds