

TECHNICAL MANUAL

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

**SIGNAL GENERATOR
AN/USM-44B
(NSN 6625-00-176-5708)**

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

**SIGNAL GENERATOR AN/USM-44B
(NSN 6625-00-176-5708)**

REPORTING OF ERRORS

You can improve this manual by recommending improvements using DA Form 2028-2 (Test) located in the back of the manual. Simply tear out the self addressed form, fill it out as shown on the sample, fold it where shown, and drop it in the mail. If there are no blank DA Form 2028-2 (Test) forms in the back of your manual, use the standard DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forward to the Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, New Jersey 07703.

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

		Paragraph	Page
CHAPTER	1. INTRODUCTION		
Section	I. General	1-1	1-1
	II. Description and data	1-6	1-1
CHAPTER	2. SERVICE UPON RECEIPT AND INSTALLATION.....	2-1	2-1
CHAPTER	3. OPERATING INSTRUCTIONS		
Section	I. Controls and instruments	3-1	3-1
	II. Operation under usual conditions	3-3	3-3
	III. Operation under unusual conditions	3-12	3-5
CHAPTER	4. OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS		
	I. Operator and organizational tools and equipment	4-1	4-1
	II. Lubrication instructions	4-3	4-1
	III. Preventive maintenance checks and services	4-4	4-1
	IV. Troubleshooting	4-7	4-1
	V. Maintenance of the AN/USM-44B	4-8	4-4
CHAPTER	5. FUNCTIONING OF EQUIPMENT	5-1	5-1
CHAPTER	6. GENERAL SUPPORT MAINTENANCE INSTRUCTIONS		
Section	I. General	6-1	6-1
	II. General support tools and equipment	6-4	6-1
	III. Troubleshooting	6-6	6-1
	IV. Maintenance of Signal Generator AN/USM-44B	6-11	6-20
	V. General support testing procedures	6-13	6-32
APPENDIX	A. REFERENCES.....		A-1
	B. MAINTENANCE ALLOCATION		
Section	I. Introduction		B-1
	II. Maintenance allocation chart		B-3
INDEX.....			Index 1

LIST OF ILLUSTRATIONS

Number	Title	Page
1-1	Generator, Signal AN/USM-44B (less running spares)	1-0
2-1	Generator, Signal AN/USM-44B packing diagram	2-1
2-2	Rear deck, tube location diagram	2-2
2-3	Modulation oscillator and calibration amplifier deck and casting compartments, tube and crystal location diagram	2-3
2-4	115/230 vac input powerselectorswitchS2 location	2-4
3-1	Generator, SignalTS-510B/U controls, indicators, and fuses	3-1
4-1	Lubrication of Generator, Signal TS-510B/U	4-2
4-2	FuseholderMX-1730U, exploded view	4-5
4-3	Fuse alignment in MX-1730JU	4-5
5-1	Generator, SignalTS-510BIU, Block Diagram	5-2
5-2	Rf range-switching components	5-4

LIST OF ILLUSTRATIONS (cont)

<i>Number</i>	<i>Title</i>	<i>Page</i>
5-3	Rf variable frequency tuning components	5-5
5-4	Rf oscillator circuit, schematic diagram	5-6
5-5	Rf buffer amplifier circuit, schematic diagram	5-7
6-6	Rf power amplifier, output attenuator, and envelope detector, schematic diagram	5-8
5-7	Rf output meter, schematic diagram	5-10
5-8	Differential and sine wave amplifiers, schematic diagram	5-11
5-9	Pulse and modulator amplifiers, schematic diagram	5-12
5-10	Modulator circuit, schematic diagram	5-13
5-11	Modulation oscillator circuit, schematic diagram.....	5-14
5-12	Modulation meter amplifiers, schematic diagram	5-15
5-13	Percent modulation meter, rectifier, and bridge circuit, schematic diagram	5-16
5-14	Calibrator-oscillator circuit, schematic diagram	5-17
5-15	Calibrator-amplifier-circuit, schematic diagram	5-18
5-16	Primary ac power input circuit, schematic diagram	5-19
5-17	Filament power supply circuit, schematic diagram	5-20
5-18	- 165 volt regulated power supply, schematic diagram	5-21
5-19	225 volt regulated power supply, schematic diagram	5-22
5-20	25 volt regulated power supply, schematic diagram	5-23
6-1	Read deck tube sockets and transistor socket, voltage and resistance diagram	6-2
6-2	Modulation oscillator and calibration amplifier, tube socket voltage and resistance diagram	6-3
6-3	Modulator and ALC circuit board, transistor socket voltage diagram	6-4
6-4	Resistor and capacitor mounting boards, voltage and resistance diagram	6-5
6-5	Modulation oscillator, modulation meter, and calibration-amplifier tube socket waveform diagram	6-6
6-6	Modulator and ALC circuit board transistor socket waveform diagram	6-7
6-7	Transistor lead configurations	6-8
6-8	Inside read deck, component locations	6-8
6-9	Right side view, component locations	6-9
6-10	Read deck, component locations	6-10
6-11	Front Panel, Rear View, Component Locations	6-11
6-12	Rf oscillator, rf power amplifier tuning compartments, and crystal calibrator, component locations	6-12
6-13	Rf oscillator upper tube compartment, component locations	6-13
6-14	Rf power amplifier upper tube compartment, component locations	6-14
6-15	Crystal calibrator, bottom view, component locations	6-15
6-16	Envelope detector (bolometer), component locations	6-15
6-17	Rf oscillator and power amplifier turrets, component locations	6-16
6-18	Attenuator probe, component locations	6-16
6-19	Modulator and automatic leveling control (ALC) circuit board, component locations	6-17
6-20	Replacement of rf oscillator, rf buffer, and amplifier tubes	6-21
6-21	Special rf power amplifier wrench, storage location	6-22
6-22	Attenuator probe and drive cable details	6-24
6-23	Percent modulation meter and power supply, adjustment location	6-26
6-24	ALC circuit board and modulation oscillator, adjustment location	6-27
6-25	Crystal calibrator and rf oscillator, adjustment location	6-28
6-26	Typical rf oscillator coil, frequency adjustments for ranges A, B, and C	6-29
6-27	Frequency dial calibration and rf oscillator drift test connections	6-33
6-28	Crystal calibrator accuracy test connections	6-38
6-29	Maximum rf output power test connections	6-41
6-30	Attenuator accuracy test connections	6-42
6-31	Uncalibrated rf output power level test connections	6-48
6-32	Modulation meter accuracy and external AM test connections	6-50
6-33	External pulse modulation and residual level test connections	6-56
FO-1	Color code markings for MIIL-STD resistors, capacitors and indicators	(Located in back of manual)
FO-2(A)	Generator, Signal AN/USM-N44B, schematic diagram (Sheet 1 of 2)	(Located in back of manual)
FO-2(B)	Generator, Signal AN/ISM-44B, schematic diagram (Sheet 2 of 2)	(Located in back of manual)

LIST OF TABLES

<i>Number</i>	<i>Title</i>	<i>Page</i>
1-1	Items Comprising an Operable AN/USM-44B	1-3
3-1	Operator controls and indicators	3-2
4-1	Operator/Crew Preventive Maintenance Checks and Services	4-3
4-2	Organizational Preventive Maintenance Checks and Services	4-3
4-3	Organizational Preventive Maintenance Checks and Services	4-4
4-4	Troubleshooting	4-4
6-1	General Support Tools and Test Equipment	6-1

<i>Number</i>	<i>Title</i>	<i>Page</i>
6-2	General Support Troubleshooting Chart	6-18
6-3	Physical Tests and Inspection	6-32
6-4	Frequency Dial Calibration and Rf Oscillator Drift Tests	6-34
6-5	Crystal Calibrator Accuracy Tests	6-39
6-6	Maximum Rf Output Power Tests	6-41
6-7	Attenuator Accuracy Tests	6-43
6-8	Uncalibrated Rf Output Power Level Tests	6-49
6-9	Modulation Meter Accuracy and External AM Tests	6-49
6-10	Internal Amplitude Modulation Tests	6-52
6-11	External Pulse Modulation and Residual Level Tests	6-53

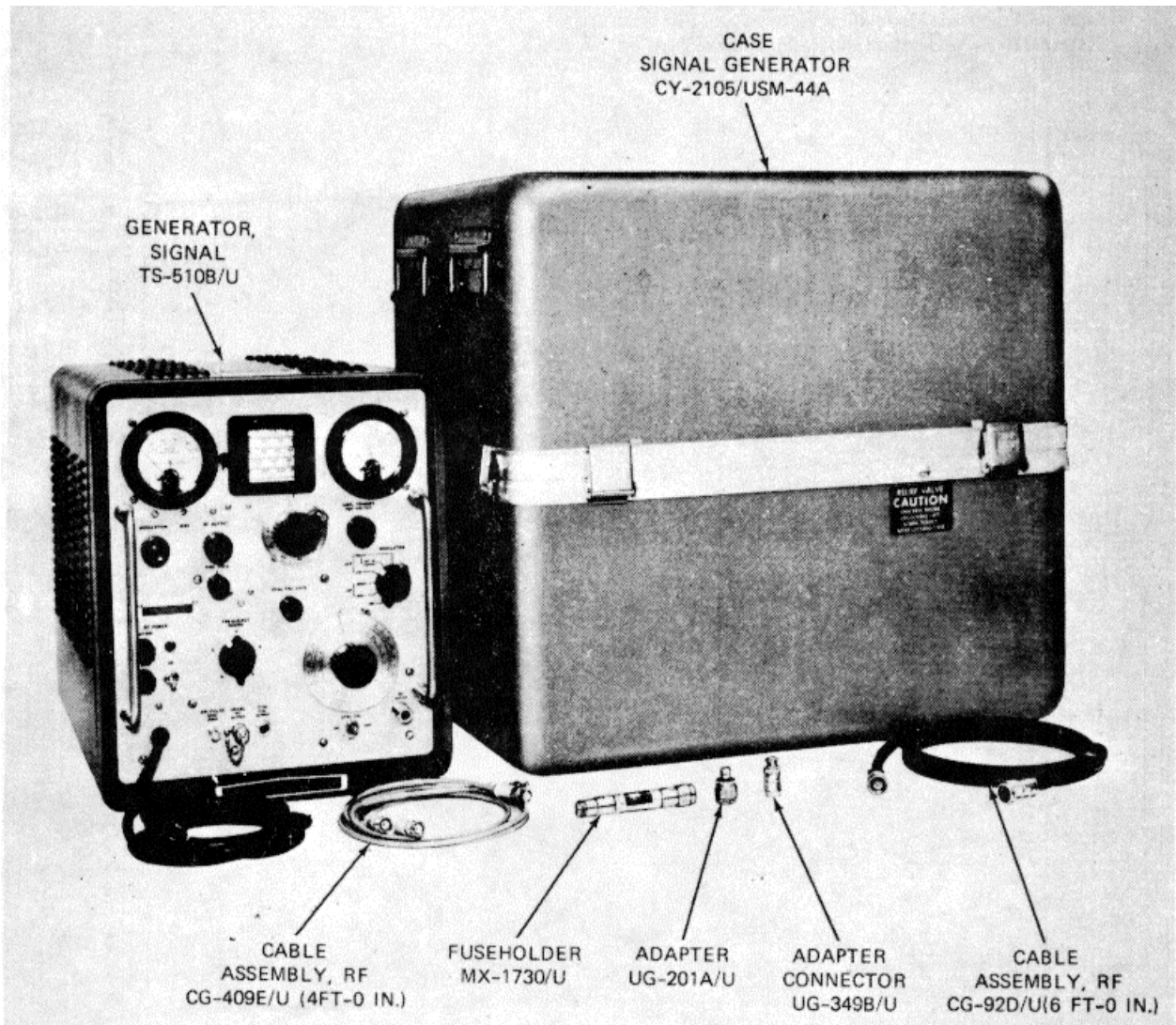


Figure 1-1. Generator, Signal AN/USM-44B (less running spares)

EL6625-508-14-TM-I

CHAPTER 1 INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. This manual describes Generator, Signal AN/USM-44B (fig. 1-1) and includes instructions for installation, operation, and operator, organization direct support, and general support maintenance.

b. A list of references is contained in appendix A.

c. The maintenance allocation chart (MAC appears in appendix B.

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 the equipment.

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

1-3. Forms and Records

a. *Reports of Maintenance and Unsatisfactory Equipment*. Maintenance forms, records, and report which are to be used by maintenance personnel at

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/AFR71-13/MCO P4030.29A, 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 4610.33A/AFR75-18/MCO P4610.19B and DSAR 4500.15.

1-4. Administrative Storage

For procedures, forms and records, and inspections required during administrative storage of this equipment, refer to TM 740-90-1.

1-5. Destruction of Electronic Material

Demolition and destruction of electronic equipment will be under the direction of the commander and in accordance with TM 750-244-2.

Section II. DESCRIPTION AND DATA

1-6. Purpose and Use

The generator, Signal AN/USM-44B, comprised of Generator, Signal TS-510B/U and various adapters and cable assemblies, is a general-purpose, very high frequency (vhf) signal generator set that provides, radio frequency (rf) signals used to test, evaluate, and align radio receivers, filters, amplifiers, and similar electronic networks. The TS-510B/U provides continuous-wave (cw), amplitude-modulated (am), or pulse-modulated signals in the frequency range of 10 MHz to 480 MHz at calibrated output levels of 0.1 microvolt to 1.0 volt. A direct reading frequency dial is calibrated to an accuracy of 0.5 percent and internal crystal calibrator provides frequency check points at 1 MHz and 5 MHz intervals with an error of less than 0.01 percent. The TS-510B/U can be internally amplitude modulated at 400 Hz or 1000 Hz, externally amplitude modulated from 20 Hz to 20 kHz, and externally pulse modulated.

1-7. Description

Generator, Signal TS-510B/U (fig. 1-1) is the only major unit supplied as part of the AN/USM-44B. It is housed in a metal cabinet designed for mobile, bench-

top operation. The front panel is equipped with handles for easy moving. All connectors and operating controls are mounted on the front panel.

1-8. Description of Minor Components

The minor assemblies of AN/USM-44B are included in figure 1-1. Special functions of the minor assemblies are listed below.

a. *Fuseholder MX-1730/U*. The MX-1730/U fuseholder prevents accidental burnout of TS-510B/U attenuator during transceiver testing. It places a fuse element between the transceiver and the attenuator. Several watts of rf power could otherwise be applied to the output attenuator should the transceiver be accidentally switched to the transmit mode of operation. The MX-1730/U in no way limits the usable output of the TS-510B/U.

b. *Cable Assembly, RF CG-92D/U*. The CG-92D/U (6 ft-0 in.) cable has type N male connectors on both ends, and is used to connect the TS-510B/U rf-output to the equipment under test.

c. *Cable Assembly, RF CG-409E/U*. Two CG-409E/U (4 ft-0 in.) cables are terminated with male BNC connectors each end and are used to connect