TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL

MAINTENANCE MANUAL

MEASURING SET, STANDING WAVE RATIO AN/USM-37E

(NSN 6625-00-197-6910)

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help 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 back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DR-SEL-ME-MP, Fort Monmouth, New Jersey 07703. In either case, a reply will be furnished direct to you.

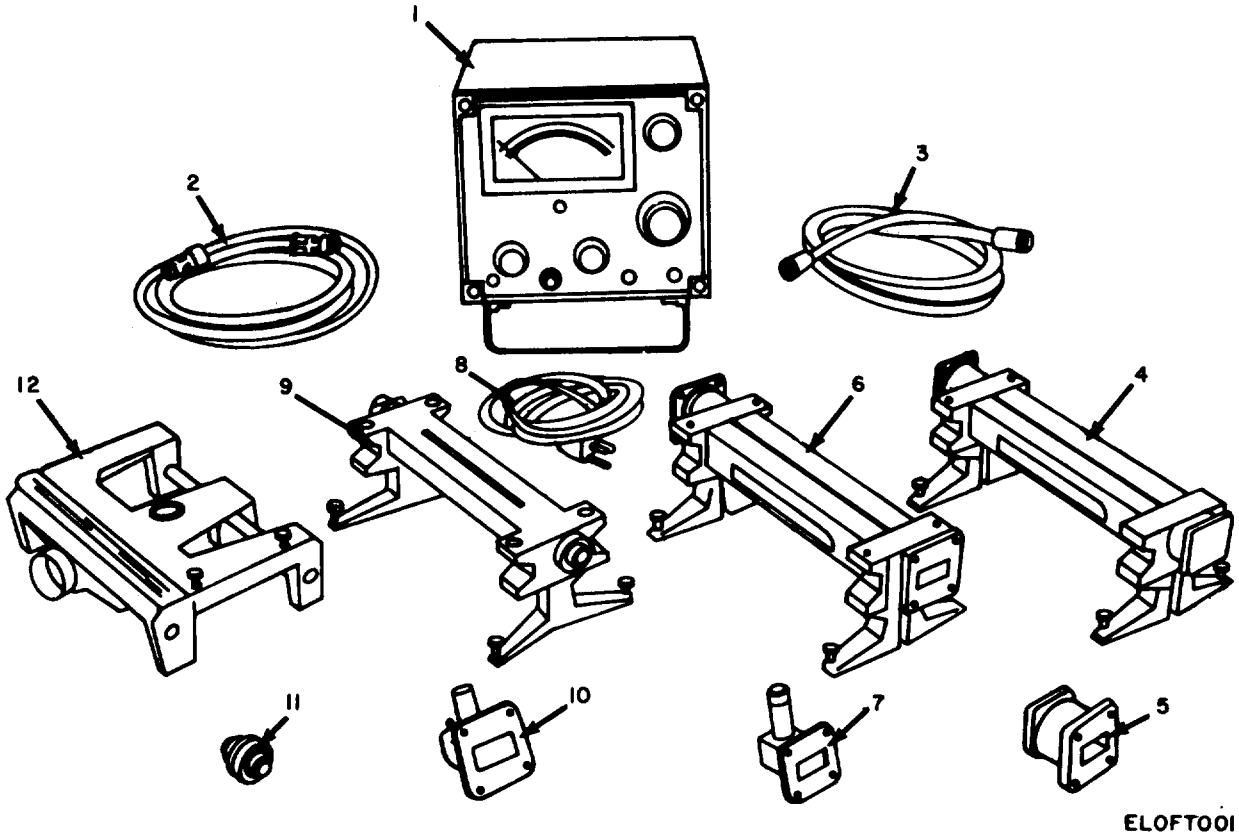
TABLE OF CONTENTS

			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
		Administrative storage	1-4	1-1
		Destruction of Army electronics materiel	1-5	1-1
		Reporting equipment improvement recommendations (EIR)	1-6	1-1
	II.	Description and data		
		Purpose and use	1-7	1-1
		Description	1-8	1-1
		Tabulated data	1-9	1-2
CHAPTER	2.	SERVICE UPON RECEIPT AND INSTALLATION		
		Unpacking	2-1	2-1
		Checking unpacked equipment	2-2	2-2
		Assembly of equipment	2-3	2-2
CHAPTER	3.	OPERATING INSTRUCTIONS		
SECTION	I.	Controls and preliminary procedures		
		Operator's controls	3-1	3-1
		Preliminary starting procedures	3-2	3-1
		Signal source	3-3	3-2
		Check of crystal detector	3-4	3-2
	II.	Operation under usual conditions		
		Operating procedures for VSWR measurements using the slotted line technique	3-5	3-3
		Load impedance measurements	3-5	3-6
		Operating procedures for attenuation measurements	3-7	3-10
		Battery operation	3-8	3-11
		Additional applications	3-9	3-11
		Stopping procedures	3-10	3-11

			Paragraph	Page
SECTION	III.	Operation under unusual conditions and preparation for movement		
		Operation in Arctic climates	3-11	3-12
		Operation in desert climates	3-12	3-12
		Operation in tropical climates	3-13	3-12
		Repacking instructions	3-14	3-12
CHAPTER	4.	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS		
SECTION	I.	Preventive maintenance checks and services		
		General	4-1	4-1
		Tools and equipment	4-2	4-1
	II.	Troubleshooting and maintenance of the AN/USM-37E		
		Visual inspection	4-3	4-2
		Cleaning	4-4	4-2
		Paints and finishes	4-5	4-2
		Touchup painting instructions	4-6	4-2
CHAP'TER	5.	MATERIEL USED IN CONJUNCTION WITH MAJOR ITEM		
		General	5-1	5-1
		Operational procedures for making VSWR measurements using the standing wave detector technique	5-2	5-1
APPENDIX	A.	REFERENCES		
	B.	COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST		B-1
	C.	MAINTENANCE ALLOCATION		C-1

LIST OF ILLUSTRATIONS

Figure	*Title*	*Page*
1-1	Standing Wave Ratio Measuring Set AN/USM-37E	
2-1	Packaging Diagram for Standing Wave Ratio Measuring Set AN /USM-37E	2-1
2-2	Assembly of Carriage and Slotted Section	2-3
3-1	Front Panel Controls and Indicators, IM-157E/U	3-1
3-2	Test Setup for Making VSWR Measurements using the Slotted Lihe Technique	3-4
3-3	Conversion Chart, Decibels (DB) to VSWR a. Converting DB to SWR. b. Expanded Section.	3-5
3-4	Summary of Impedance Measurement Rules	3-7
3-5	Shift of Minimum with Load and Short	3-8
3-6	Smith Chart	3-9
3-7	Test Setup for Making Attenuation Measurements	3-10
5-1	Test Setup for Making VSWR Measurements using the Standing Wave Detector Technique	5-1



1. Standing Wave Ratio Indicator IM-157E/U
2. RF cable Assembly CG-1651/U
3. RF Cable Assembly CG-1963/U
4. Waveguide Slotted Section IM-216/USM-37E
5. Adapter UG-1389/U
6. Waveguide Slotted Section IM-215/USM-37E
7. Waveguide Adapter UG-1053A/U
8. Power cable assembly
9. Coaxial Slotted Section IM-214/USM-37E
10. Waveguide Adapter UG-397/U
11. Waveguide Probe MX-1546/USM-37E
12. Slotted Line Coaxial-Waveguide Carriage MX-8355/USM-37E

Figure 1-1. Standing wave ratio measuring set AN/USM-37E.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual covers Measuring Set, Standing Wave Ratio AN/USM-37E, and includes a description of the equipment, operating procedures and operator and organizational maintenance. Throughout this manual, the major component of the test set, Standing Wave Ratio Indicator IM-157E/U will be referred to as the SWR Indicator.

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.

1-3. 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 (TAMMS).

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

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 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. Administrative Storage

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

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 Measuring Set, Standing Wave Ratio AN/USM-37E needs improvement, let us know. Send us an E IR. 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 Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DR-SEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you a reply.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

In high-frequency systems, standing wave measurements are the customary means of investigating the impedance, and/or impedance match of transmission lines, various types of terminations (such as antennas, detectors, and loads) and other devices (such as attenuators, connectors, transitions, etc.). The AN/USM-37E is a complete laboratory-quality test set for making accurate standing-wave measurements in waveguide and coaxial transmission systems over the frequency range of 3.0 to 12.4 gHz.

1-8. Description

The components of the AN/USM-37E are illustrated in figure 1-1, and described below.

a. Indicator, Standing Wave Ratio IM-157E/U. The major component of the AN/USM-37E is the SWR Indicator. It is a solid-state direct-reading instrument for measuring VSWR and attenuation. The instrument is essentially a high-gain low-noise tuned amplifier, feeding an indicator calibrated for signal inputs from either the crystal or bolometer type square-law detectors. The SWR scales on the indicator are calibrated to provide direct VSWR readings. The DB scales provide attenuation readings directly in decibels. Measurements of high accuracy and resolution are obtained by expanding selected portions of the ordinary scales for fullscale presentation. The gain, bandwidth and pass frequency of the amplifier are controlled from the front panel. A rear-panel output jack permits connection of a dc recorder if a permanent record of meter indications is desired. The input signal is obtained from either a crystal or bolometer type detector. Crystal and bolometer detectors produce low-level signal outputs that require the high-gain amplification afforded by the SWR Indicator before being applied to the indicator proper. The instrument can also be used as a high-gain tuned amplifier by making use of its amplifier output terminals on the rear panel. Power requirements are either 115 volts or 230 volts + 10%, 50 to 1,000 Hz. A rear-panel switch permits the selection of 115-volt or 230-volt operation. The SWR Indicator can also be used as a portable instrument with 36 hours of uninterrupted service available from the rechargeable battery pack.

b. Cables CG-1963/U, CG-2651/U, and Power Cable. Three cables are provided with the AN/USM-37E.