

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

SPECTRUM ANALYZER

AN/UPM-58

This reprint includes all changes in effect at the time of publication; changes 1 through 3.
--

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1957

TECHNICAL MANUAL }
 No. 11-5099

HEADQUARTERS,
 DEPARTMENT OF THE ARMY
 WASHINGTON 25, D. C., 28 May 1957

SPECTRUM ANALYZER AN/UPM-58

	Paragraph	Page
CHAPTER 1. INTRODUCTION		
Section I. General	1, 2	2
II. Description and data	3-8	2
CHAPTER 2. OPERATION		
Section I. Service upon receipt of Spectrum Analyzer AN/UPM-58.....	9-11	5
II. Controls and instruments	12, 13	7
III. Operation	14-26	9
CHAPTER 3. ORGANIZATIONAL MAINTENANCE		
Section I. Organizational tools and equipment.....	27, 28	21
II. Preventive maintenance services	29-33	21
III. Troubleshooting at organizational maintenance level	34-37	26
CHAPTER 4. THEORY		
Section I. Introduction	38-41	29
II. Block diagram	42, 43	33
III. Detailed functioning of circuits	44-66	37
CHAPTER 5. FIELD MAINTENANCE		
Section I. Troubleshooting at field maintenance level	67-75	56
II. Repairs.....	76-85	73
III. Calibration and alinement	86, 87	75
IV. Final testing	88-95	76
CHAPTER 6. SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE		
Section I. Shipment and limited storage.....	96, 97	78
II. Demolition of materiel to prevent enemy use	98, 99	78
INDEX		80

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual contains instructions for the installation, operation, maintenance, and repair of Spectrum Analyzer AN/UPM-58 (fig. 1).

b. Forward comments on this publication directly to: Commanding Officer, United States Army Signal Publications Agency, Fort Monmouth, New Jersey.

2. Forms and Records

a. *Unsatisfactory Equipment Report.* Fill out and forward DA Form 468 (Unsatisfactory Equipment Report), to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-38.

b. *Damaged or Improper Shipment.* Fill out and

forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58.

c. *Preventive Maintenance Forms.*

- (1) Prepare DA Form 11-238 (Operator First Echelon Maintenance Checklist) for Signal Corps Equipment (Radio Communication, Direction Finding, Carrier, Radar) (fig. 15) in accordance with instructions on the back of the form.
- (2) Prepare DA Form 11-239 (Second and Third Echelon Maintenance Checklist) for Signal Corps Equipment (Radio Communication, Direction Finding, Carrier, Radar) (fig. 16) in accordance with instructions on the back of the form.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Spectrum Analyzer AN/UPM-58 (fig. 1) is a 1.87-centimeter spectrum analysis unit used to analyze power in pulsed or continuous-wave (cw) radar and beacon signals from 15,800 to 16,200 megacycles (mc). The equipment may also function as a synchroscope for large amplitude-pulsed signals. As a spectrum analyzer, it is capable of resolving into distinct transients, the spectrum resulting from the pulse modulation of radar transmitters whose modulation pulses vary in width from .2 to 2 microsecond (μ sec) and in repetition rate from 100 to 10,000 pulses per second (pps). Spectrum Analyzer AN/UPM-58 can accommodate input radio-frequency (RF) power up to +30 decibels referred to 1 milliwatt (dbm). The desired input level is obtained by means of a variable attenuator that provides 50 decibels (db) of attenuation. The attenuator is calibrated in 1-db steps for the first 45 db and uncalibrated for the rest of its range. The frequency of a spectrum line can be determined with an absolute accuracy of ± 10 mc and a relative accuracy of ± 5 mc. When functioning as a

synchroscope, large amplitude-pulsed signals can be displayed on the cathode-ray tube (crt) screen in A-scope manner. Externally triggered sweeps of approximately 5 or 150 μ sec duration may be selected for sweeping the input pulse.

4. Technical Characteristics

a. *Analyzer Characteristics.*

Frequency coverage 16,000 mc ± 200 mc.

Frequency meter accuracy:

Absolute ± 10 mc.

Relative, over 100-mc range ± 5 mc.

RF input attenuation:

Calibrated 0 to 45 db.

Uncalibrated 46 to 50 db.

Measurable input pulse modulation:

Pulse width 2 μ sec or less.

Resolution At least 50 distinct transients between third minimum points.

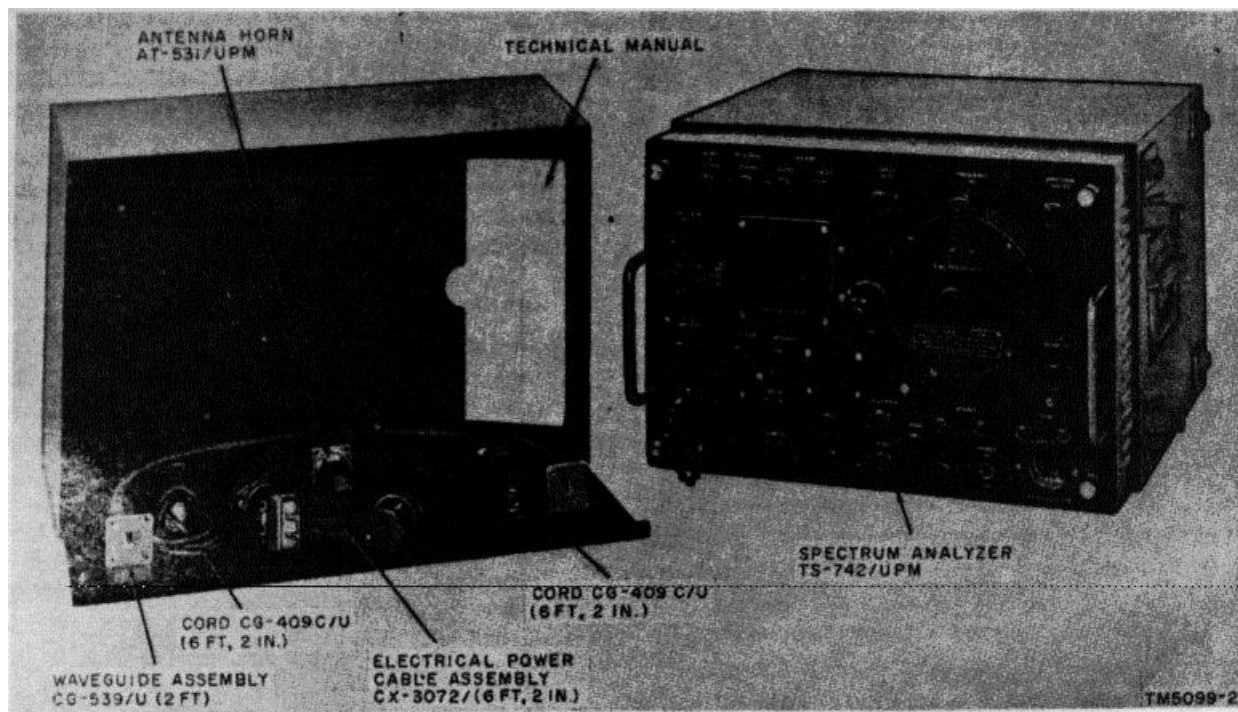


Figure 1. Spectrum Analyzer AN/UPM-8, components.

IF characteristics:

First IF 45 mc.
 Second IF 5 mc.
 First IF bandwidth 700 kc.
 Second IF bandwidth 50 kc.
 Gain control 0 to 40 db.

Sensitivity to cw:

For 1-inch crt deflection -60 dbm.
 For minimum discernible signal ... -70 dbm.
 Maximum dispersion 1 inch per mc.
 Sweep frequency range 5 to 40 cps, continuously variable.

b. Synchroscope Characteristics.

Triggered sweep speeds 5 and 150 μ sec.
 Natural deflection sensitivity 115 to 160 volts per inch.

c. General Characteristics.

Power input 165 watts at 105 to 125 volts, 50 to 1,000 cps.

Power output:

Plate supply +300 volts, electronically regulated.
 IF strip B+ +135 volts, electronically regulated.
 Klystron reflector supply -87 to -261 volts, gas diode regulated.
 Crt high voltage 1,600 volts.

Number of tubes 28.

Weight 75 lb.

5. Table of Components

(fig. 1)

The components of Spectrum Analyzer AN/UPM-58 are listed in the table below.

Component	Read No.	Length (in.)	Depth (in.)	Height (in.)	Volume (cu ft)	Weight (lb)
Spectrum Analyzer TS-742/UPM	1	19	18 7/32	12 1/32	2.1	75
Technical manual	2	7 7/8		10 1/4		
Antenna Horn AT-531/UPM	1	3.6				
Waveguide Assembly CG-539/U (2 ft)	1	24				
Cord CG-409C/U (6 ft, 2 in.)	2	74				
Electrical Power Cable Assembly CX-3072/U (6 ft, 2 in.)	1	74				
Set of running spares (par. 7)	1					
Total						75