

**MIL-HDBK 172A**  
**Volume I**  
**11 March 1964**

**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**  
**DEPARTMENT OF THE NAVY PUBLICATION**

**TM 11-487H-1/1**  
**NAVSHIPS 93003A**

**MILITARY STANDARDIZATION HANDBOOK**  
**ELECTRONIC TEST EQUIPMENT**

**This copy is a reprint which includes current  
pages from Changes 1 and 2.**

**FSC 6625**

## DEPARTMENT OF DEFENSE

MIL-HDBK-172A, Volume I  
Electronic Test Equipment  
11 March 1964

1. This Military Standardization Handbook was developed by the Department of Defense in coordinated cooperation with the Department of the Army, Navy, and Air Force in accordance with established procedure.
2. This publication was approved 11 March 1964 for printing and inclusion in the Military Standardization Handbook Series.
3. This handbook constitutes a directory of electronic test equipment used in the Department of Defense in the standardization, design, development, procurement and maintenance of military electronic, electrical, and related equipment.
4. Every effort has been made to include the latest data and information pertaining to the test equipment concerned. The present edition is the initial increment of Revision A of this handbook and is planned for maintenance by Change Notices issued quarterly to constitute a complete revision annually. Users of this handbook are encouraged to comment and report inaccuracies, omissions, etc., to Commanding General, U. S. Army Electronics Command, Fort Monmouth, New Jersey, 07703.

**MIL-HDBK-172A, VOL I/TM 11-487H-1/1**  
**\*C2**

CHANGE

No. 2

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 11 January 1965**MILITARY STANDARDIZATION HANDBOOK**  
**ELECTRONIC TEST EQUIPMENT**

MIL-HDBK-172A, Vol I/TM 11-487H-1/1, 11 March 1964, is changed as follows:

1. The following pages are to be added to the basic manual:

Category	Page
11 .....	457-632
12 .....	633-714
13 .....	715-728
14 .....	729-754
APPENDIX B .....	755, 756

2. File this page in front of manual for reference purposes.

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\*This change supersedes categories 11 through 14 of MIL-HDBK-172 (TM 11-487H-1), 20 September 1957. MIL-HDBK-172 (TM 11-487H-1), 20 September 1957, is superseded in its entirety.

By Order of the Secretary of the Army:

Official:

**J. C. LAMBERT,**  
Major General, United States Army,  
The Adjutant General.

**HAROLD K. JOHNSON,**  
General, United States Army,  
Chief of Staff.

Distribution:

*Active Army:*

CNGB (3)  
CofEngrs (10)  
OCC-E (10)  
CofT (10)  
USCONARC (2)  
ARADCOM (2)  
OS Maj-Co'md (4)  
LOGCOMD (2)  
USA Maint Bd (2)  
USA CD Agcy (1)  
USAARTYBD (2)  
USARADB (2)  
USAAESWBD (2)  
USAIB (1)  
USAATBD (1)  
USAMC (10)  
USAECOM (50)  
USASCOM (20)  
USAMICOM (10)  
USAMUCOM (13)  
USAWECOM (10)  
USATECOM (10)  
USAMOCOM (10)  
USASCC (2)  
USAAVNC (4)  
WRAMC (1)  
USAADC (1)  
BAMC (1)  
USMA (2)

USACGSC (4)  
USAAMS (6)  
USAADS (4)  
USAIS (6)  
USASCS (10)  
USASESCS (6)  
USAARMS (6)  
USA Elct Mat Spt Agcy (100)  
USASA (2)  
USA Elct Mat Agcy (100)  
Armies (2) except First USA (4)  
WSMR (2)  
Ft Mason (2)  
Ft McClellan (2)  
Ft Ord (2)  
Ft Bragg (2)  
A Dep (1) except  
Letterkenny (2)  
Sacramento (2)  
Lexington (2)  
Tobyhanna (2)  
Ft Worth (2)  
Sharpe (3)  
Arsenals (Ord) (1) except  
Edgewood (2)  
Frankford (2)  
Redstone (2)  
Detroit (2)

Army Tml (1) except  
Brooklyn (2)  
Boston (2)  
New Orleans (2)  
PG (2) except  
USAEPG (6)  
USAELRDL (24)  
USA Natick Lab (4)  
USAERDL (2)  
USA CBR Lab (1)  
Proc Dist (1)  
Sig Fld Maint Shops (2)  
MDW (1)  
Units organized under following  
TOE's (1 copy each):  
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11-22  
11-55  
11-95  
11-155  
11-555  
11-558  
11-587  
11-592  
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NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.



MIL-HDBK-172A, VOL I/TM 11-487H-1/1  
\*C1

**MILITARY STANDARDIZATION HANDBOOK  
ELECTRONIC TEST EQUIPMENT**

CHANGE

No. 1

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 17 November 1964

MIL-HDBK-172A, Vol I/TM 11487H-1/1, 11 Match 1964, is changed as follows:

1. The following pages are to be added to the basic manual.

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5.....	289-308
6.....	309-356
7.....	357-380
8.....	361-380
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APPENDIX B.....	455 and 456

2. Mark out page numbers 169 and 170 on the authentication page and file this page in back of manual. Category 3 will begin on page 169.

3. File this page in front of manual for reference purposes.

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\*This change supersedes categories 3 through 10 of MIL-HDBK-172 (TM 11-487H-1), 20 September 1957.

By Order of the Secretary of the Army:

Official:

**J. C. LAMBERT,**  
Major General, United States Army,  
The Adjutant General.

**HAROLD K. JOHNSON,**  
General, United States Army,  
Chief of Staff.

Distribution:

*Active Army:*

CNGB (3)	USAAMS (6)
CofEngrs (5)	USAADS (4)
Dir of Trans (5)	USAIS (6)
OCC-E (5)	USASCS (10)
USAMC (10)	USAESCS (6)
USAECOM (50)	USAARMS (6)
USASMC (20)	USASA (2)
USAMICOM (10)	USAADEA (1)
USAMUCOM (10)	US Army Tml (1)
USAWECOM (10)	Arsenals (1)
USATECOM (10)	USACDCADA (1)
USAMOCOM (10)	USACDCARMA (1)
USCONARC (2)	USACDCARTYA (1)
ARADCOM (2)	USACDCAVNA (1)
OS Maj Comd (4)	USACDCCARMSA (1)
LOGCOMD (2)	USACDCEA (1)
USASCC (2)	USACDCIA (1)
USAAVCOM (4)	USACDCINTA (1)
WRAMC (1)	USACDCCBRA (1)
USAADCEN (1)	USACDCSWA (1)
BAMC (1)	USACDCTA (1)
USAARTYBD (2)	USACDCQMA (1)
USARADB (2)	USACDCOA (1)
USAAESWBD (2)	Army Dep (1) except
USAIB (1)	LXAD, SAAD, LEAD,
USA Arctic Test Bd (1)	TOAD, FTWOAD, SHAD (2)
USAMB (2)	Proving Ground:
USMA (2)	APG (2)
USACGSC (4)	Yuma (2)

DPG (1)  
JPG (1)  
EPGA (1)  
Armies (2) except  
1st (4)  
NLABS (2)  
USA CBR Lab (1)  
Harry Diamond Lab (2)  
Proc Dist (1)  
Sig Fld Maint Shops (2)  
MDW (1)  
Instl:  
WSMR, Ft Mason, Ft McClellan,  
Ft Ord, Ft Bragg, Ft Shafter (2)  
Units organized under following  
TOE's (1 each):  
11-6  
11-15  
11-22  
11-55  
11-95  
11-155  
11-555  
11-558  
11-587  
11-592  
11-597

NG: State AG (3).

USBAR: None.

For explanation of abbreviations used, see AR 32-50.

**ELECTRONIC TEST EQUIPMENT**

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\*This publication supersedes Category 1, Voltage and Current Measuring Equipment and category 2, Frequency Measuring Equipment, of MIL-HDBK-172 (TM 11-487H-1), 20 September 1957

## **INTRODUCTION**

### **1. Purpose**

This publication consists of two volumes, Volume I, Unclassified; Volume II, Classified. It presents data and information on the technical, physical, operational, and logistical characteristics of electronic test equipment used in the Department of Defense. It is intended primarily for use by standardization, design, development, and procurement activities of the Department of Defense, and in the technical planning and coordinating of logistical operations involving the use and maintenance of military and technical equipment in a theater of operations.

### **2. Scope**

This publication contains information on electronic test equipment of the Army, Navy, and Air Force used in the calibration, adjustment, maintenance, and repair of communication, radar, countermeasures, meteorological, photographic, power, and other technical equipment employed for military purposes.

### **3. Arrangement of Content**

a. Items of equipment are grouped into Functional Classification Categories. This system of identifying test equipment according to functional and application is explained in Functional Classification and Definitions for Electronics Test and Measuring Equipment, ETE 215/11, 15 May 1956, published by the Office of the Assistant Secretary of Defense (R&D). The primary Functional Classification Categories fourteen in number are listed in the contents.

b. To further identify specific types of test equipment, each primary Functional Classification category is broken down as exemplified below:

#### **EXAMPLES:**

#### **1. Voltage and Current Measuring Equipment**

##### **1.1 Voltage and/or Current Meter**

##### **1.1/Voltmeter**

##### **1.1.1.1 Electronic Voltmeter**

#### **6. Impedance and Standing Wave Ratio Measuring Equipment**

##### **6.1 Impedance Measuring Equipment**

##### **6.1.1 Resistance Meter**

##### **6.1.4 Combination Type Impedance Measuring Equipment**

##### **6.1.4.4 "Q" Meter**

#### **12. Miscellaneous Test Equipment**

##### **12.11 Meter**

##### **12.11.1 Modulation Meter**

### **4. Page Identification**

This publication is divided into the fourteen primary Functional Classification categories by separators. Each item of equipment is covered on the front and back of a single loose-leaf page, inserted in its proper order by category number, and then in alpha-numerical sequence by its nomenclature type designation within such category.

### **5. Tables of Contents**

a. To locate a primary category of test equipment items according to purpose and use, refer to the table of contents.

- b. To locate a specific equipment, refer to the contents listing that follows the appropriate separator.

## **6. Appendixes**

- a. Appendix A is a glossary of standard abbreviations used throughout the publication.
- b. Appendix B lists each item of equipment cross-referenced to its appropriate Functional Classification-or category-number.

## **7. Definitions and Details of Content**

a. Normally, only the latest model at the time of data preparation of an item of test equipment is presented. The nomenclature type-designation printed at the top of each page indicates the specific item or model. The use of parentheses ( ) in the type-designation at the top of each page is intended to indicate coverage of more than one model of the item.

b. The status type classifications-of items of equipment covered in this handbook are defined below. Also included are items which have not been assigned formal or official type classifications, which, nevertheless, have been issued and are available for, or are in, current use.

c. *U.S. Army Definitions.*

- (1) *Standard A (STD-A).* The most advanced and satisfactory items currently available to fill operational requirements.
- (2) *Standard B (STD-B).* Items which have limited acceptability to fill operational requirements. These items normally are used and issued as substitutes for Standard A items.
- (3) *Standard C (STD-C).* Items which have only marginal acceptability for operating requirements, and are being forced out of the system as stocks of more acceptable items become adequate to meet requirements.
- (4) *Limited Production Type (LP).* An item under development, commercially available, or available from other Government agencies for which an urgent operational requirement exists and for which no other existing item is adequate; which appears to fulfill an approved qualitative materiel requirement or other DA approved requirements, and to be promising enough operationally to warrant initiating procurement and/or production for troop issue prior to completion of development and/or test or adoption as a standard item.
- (5) *Limited Standard Type (LS).* Items which are not acceptable for United States Army operational requirements and will not, therefore, be counted as assets against operational requirements. Items in this category will be limited to
  - (a) Those which are not acceptable to materiel operational requirement, but which are useful in training.
  - (b) Those which are not acceptable to materiel operational requirements of the United States Army, but which are being retained to meet peculiar requirements other than those in the immediately preceding subparagraph. Items will be classified under the provisions of this paragraph only at the request of the Deputy Chief of Staff for Logistics, Department of the Army.
- (6) *Obsolete (OBS).* Items which are no longer acceptable for United States Army use.

d. *U. S. Navy Definitions.*

- (1) *Standard.* The most advanced and satisfactory articles adopted, and those which are preferred for procurement.

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- (2) *Limited Standard.* Articles which do not have satisfactory military characteristics as standard articles, but are usable substitutes, for standard articles. Complete major units will not be procured, but component parts and accessories and complimentary articles, even though they may be limited standard articles, may be procured if necessary and economical, to maintain the complete major units in serviceable condition throughout a reasonable life expectancy.
  - (3) *Substitute Standard.* Articles which do not have as satisfactory military characteristics as standard articles and, when necessary, may be procured to supplement the supply of standard articles.
  - (4) *Planned Standard.* Those articles under evaluation which have been indicated by the Ship Characteristics Board for installation through the Ship Improvement Guide or new construction and conversion projects. Approval for service use prior to installation is required for articles in this category.
  - (5) *Obsolescent.* Those articles which do not have satisfactory military characteristics. Complete units, component parts, accessories, and complementary articles will normally not be procured for the specific purpose of maintaining this equipment; however, spare parts common to other equipment in the supply establishment may be used for their maintenance.
  - (6) *Obsolete.* Those articles that have been declared unsuitable for their original military purpose. Disposal of stocks of obsolete articles will, in all cases, be expedited.
- e. *U. S. Air Force Definitions.*
- (1) *Standard.* An item that meets an established need and is considered suitable for Air Force use.
  - (2) *Alternate Standard.* An item that may not be so satisfactory as a standard item, but which is a usable alternate for procurement in quantity in place of the standard item when the standard item cannot be procured in quantities to satisfy Air Force needs.
  - (3) *Limited Standard.* An item in stock that is not so satisfactory as either standard or alternate standard items but which is usable in place thereof. Limited standard items may be used until stocks are exhausted. Limited standard end items will not be procured. Additional parts and components may be procured when necessary to maintain the item in serviceable condition.
  - (4) *Tentative Standard.* An item that appears promising enough operationally to warrant the risk of initiating production of limited quantities prior to the completion of development or prior to completion of testing.
  - (5) *Obsolete.* An item that no longer meets Air Force needs.
- f. Data pertaining to major units, dimensions, and weight of each equipment are listed for information purposes only. Where a complete detailed listing of component parts is needed, refer to the appropriate supply documents for the specific items of equipment concerned.

**8. Currency of Information**

Information and data in this handbook is current as of the date printed on the first page of coverage for each item of equipment.

**9. Miscellaneous**

Blank spaces have been left under appropriate headings, to permit the reader to enter any data that could not be determined during preparation of this publication as such information becomes available.

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**CATEGORY 1**

**VOLTAGE AND CURRENT MEASURING**

**EQUIPMENT**

**AGO 10038A 1**

## CATEGORY 1

## VOLTAGE AND CURRENT MEASURING EQUIPMENT

Functional classification	Name of equipment	Type No.	Page No.
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1.2.4.....	Battery Tester.....	TS-287/GM.....	61
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\*MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

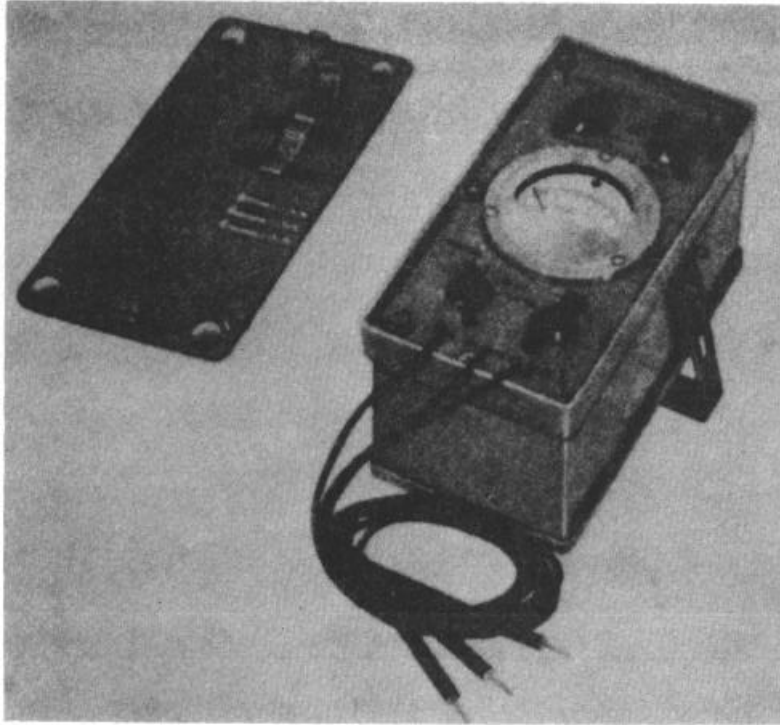
Cog Serv: USA FSN: 6625-519-0112

USA line Item No: 628135

MULTIMETER AN/PRM-15

Functional Class: 1.1.3.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-B	-----	-----	-----
Manufacturer:	A. W. Barber Laboratories			

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, pocket-sized, ruggedized volt-ohmmeter, used to measure direct voltage and dc resistance in high impedance circuits. Indication is on a dial calibrated in volts and megohms. This instrument is intended for use by all maintenance echelons. Battery condition test facilities are provided with go-no-go indications on the dial labeled "GOOD" and "REPLACE".

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Volt-Ohmmeter 1-107, but improved mechanically. Similar to AN/PRM-16 which uses an ac power supply instead of batteries.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The meter is 3.5 inches, hermetically sealed, with a sensitivity of 100 microamperes per full scale deflection. The compartment for batteries which supply necessary power is in a separate but mechanically and electrically interlocking case which is detachable from the unit.

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**AN/PRM-15 MULTIMETER**

---

*Power Supply:* 45 volts dc (plate power), 3 volts dc (ohmmeter), 1 1/2/ volts dc (filament power). Voltage is supplied by one 45-volt Battery BA-414/U and three 1.5-volt Battery BA-30.

*Voltage Range:* 0 to 1000 volts dc in 6 steps: 0 to 2.5, 10, 25, 100, 250, and 1000 volts: or 0 to  $\pm 500$  volts dc in 6 steps: 0 to  $\pm 1.25$ ,  $\pm 5$ ,  $\pm 12.5$ ,  $\pm 50$ ,  $\pm 125$ ,  $\pm 500$  volts

*Resistance Range:* 0 to 100 megohms in 6 steps: Rx1, Rx10, Rx100, Rx1K, Rx10K, Rx100K.

*Input Impedance:* 11 megohms on dc voltage ranges

*Accuracy:*  $\pm 3\%$  of full scale readings.

*Ambient Temperature:*  $\pm 25^{\circ}\text{C}$

*Major Units:* TS-618(XC)/U; 8 3/4; 4 1/2; 2 1/2

**TUBES, CRYSTALS, TRANSISTORS:**

1 Raytheon - CK525AX

**REFERENCE DATA AND LITERATURE:**

MIL-M-1127(SigC)

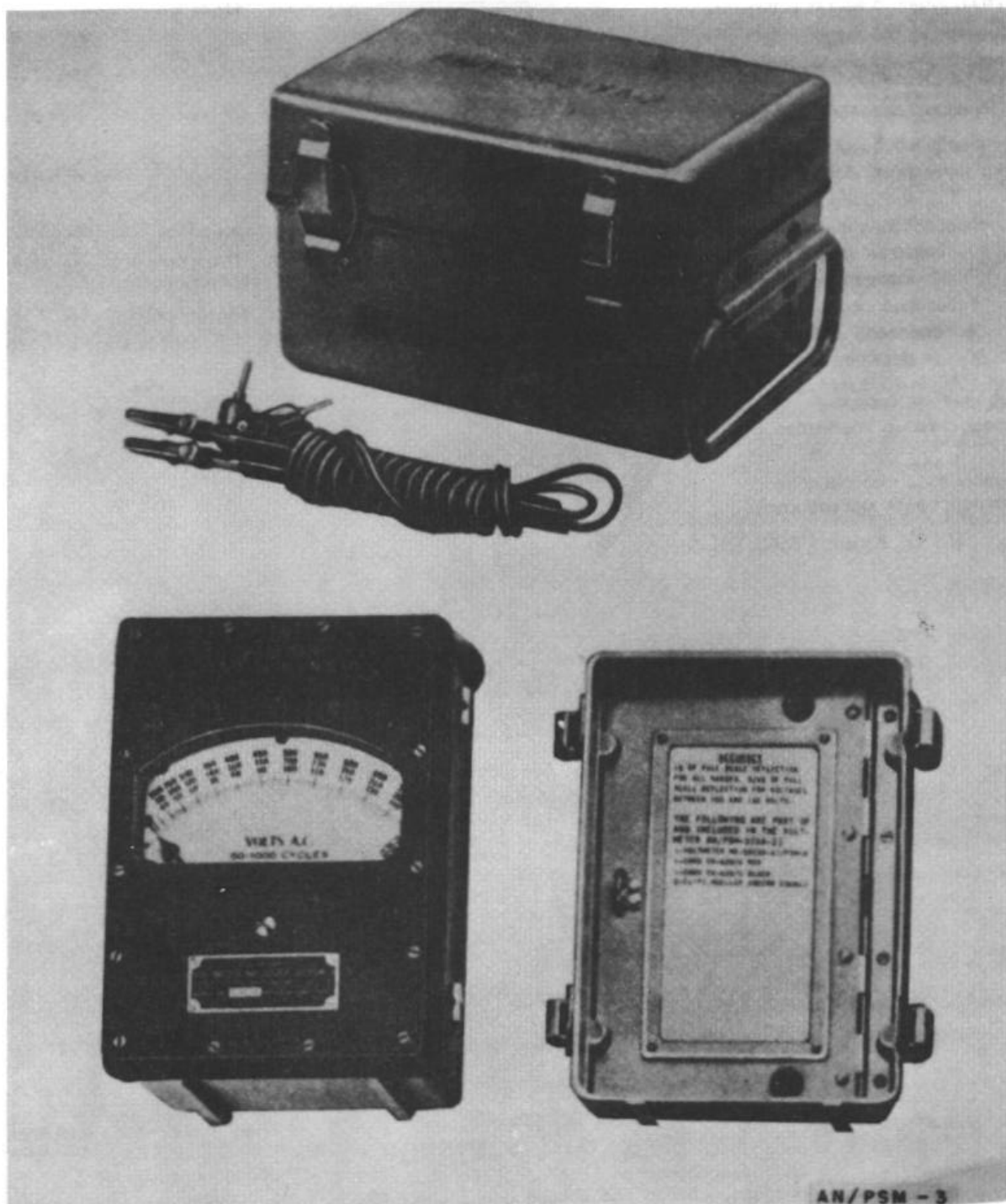
TM 11-5090

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

16 September 1954  
 Cog Serv: USA FSN:  
 USA Line Item No: 696610

VOLTMETER AN/PSM-3  
 Functional Class: 1.1.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Weston Electrical Instrument Corp.			



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**AN/PSM-3 VOLTMETER**

---

**FUNCTIONAL DESCRIPTION:**

Voltmeter AN/PSM-3 is a precision measuring apparatus applicable in organizational, field, and depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Voltmeter IS-185 except for internal wiring changes and an internal transformer.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 50 to 1,000 cy

*Burden:* 6 va (approx)

*Impedance:* 40.65; 166; 1,000; 4,340; 16,100; and 102,500 ohms on 15-, 30-, 75-, 300- and 750-v ranges respectively at 60 cy

*Sensitivity:* 2.7, 5.6, 13.3, 28.9, 53.7, and 136.7 ohms/v for 15-, 30-, 75-, 150-, 300-, and 750-v ranges respectively

*Temp Range:* -65° C to +65° C (operating) ; -65° C to ± 85° C (nonoperating)

*Accuracy:* ±1% of full-scale deflection on all ranges: ±.75 " of full-scale deflection between 100 and 130 v on the 150-v range

*Major Units:* 1 ME-59/PSM-3; 7 1/2 x 5 1/2 x 3 1/2

**TUBES, CRYSTAL, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

USAF Exhibit MCREE-718

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

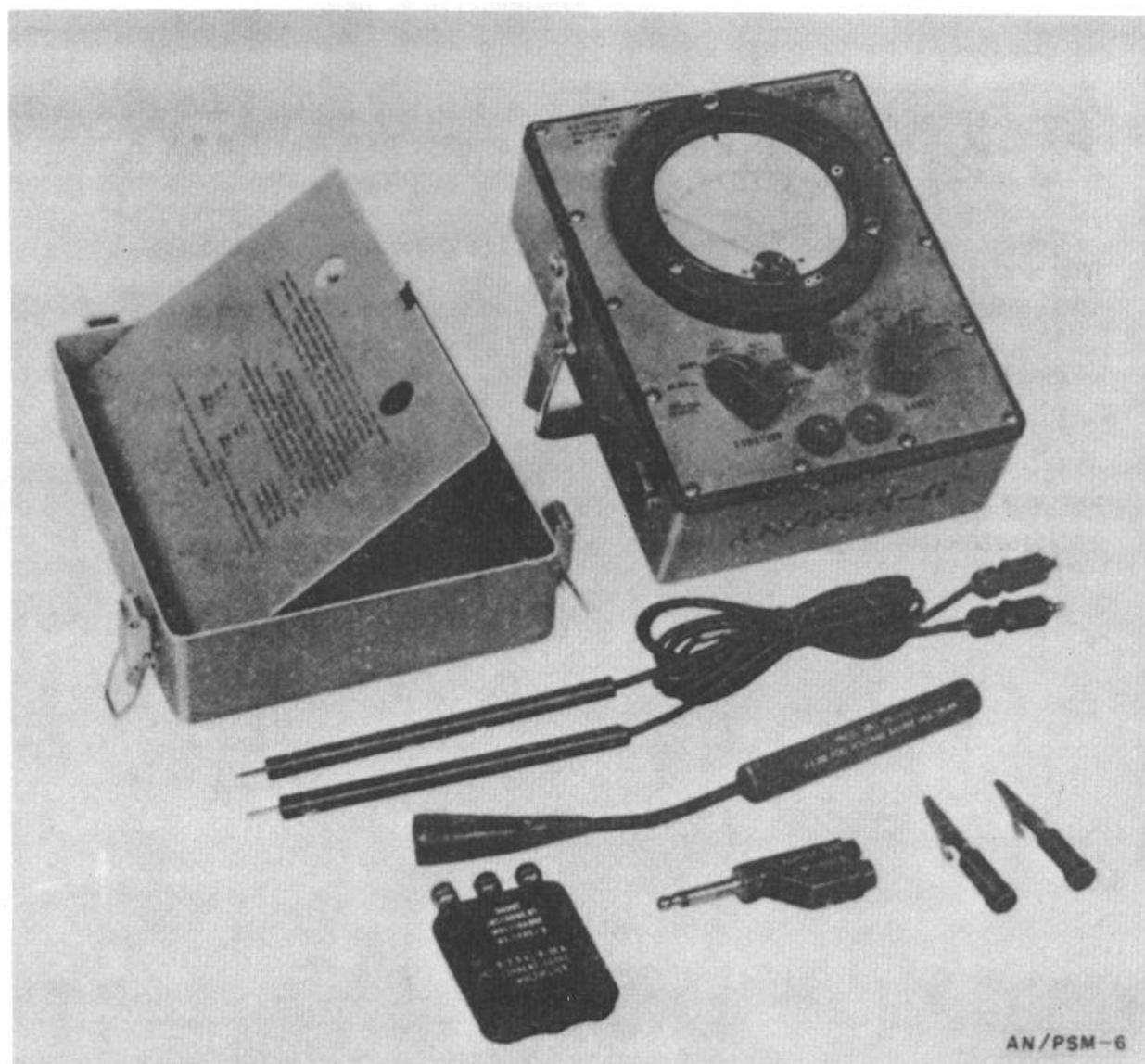
Cog Serv: USA FSN: 6625-668-9507

USA Line Item No:

MULTIMETER AN/PSM-6

Functional Class: 1.1.3.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	L/Std	-----
Manufacturer:	Bruno-New York Industries corp.			



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**AN/PSM-6 MULTIMETER**

---

**FUNCTIONAL DESCRIPTION:**

Multimeter AN/PSM-6 is a portable, multirange instrument for use in circuit analysis and troubleshooting on electrical and electronic equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes Multimeter TS-352/U.

Equipment Required But Not Supplied: One mercuric oxide battery.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 1.34 v, 13.4 v dc

*Freq Range:* 0 to 30 kc

*Voltage Range:* 0 to .5, 2.5, 10, 50, 250, 500, 1,000 v ac, dc; to 5,000 v dc (with multiplier)

*Current Range:* 0 to 100 ua; 0 to .5, 2.5, 10, 50, 250, 500, 1000, ma; 0 to 2.5, 10 amp (with multiplier)

*Resistance Range:* 0 to 1,000; 10,000; 100,000; 1,000,000; 10,000,000 ohms

*Sensitivity:* 1,000 ohms/v ac; 1,000 and 20,000 ohms/v dc

*Accuracy:*  $\pm 4\%$

*Major Units:* 1 ME-70/PSM-6; 8 x 7 x 4 1/4; 6.75 lbs

1 MX-1409/U; 3 x 2 1/6 x 3/4; .19 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AN 16-30PSM61, AN 16-30PSM62, AN 16-30PSM64

MIL-M-4552



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28 June 1954

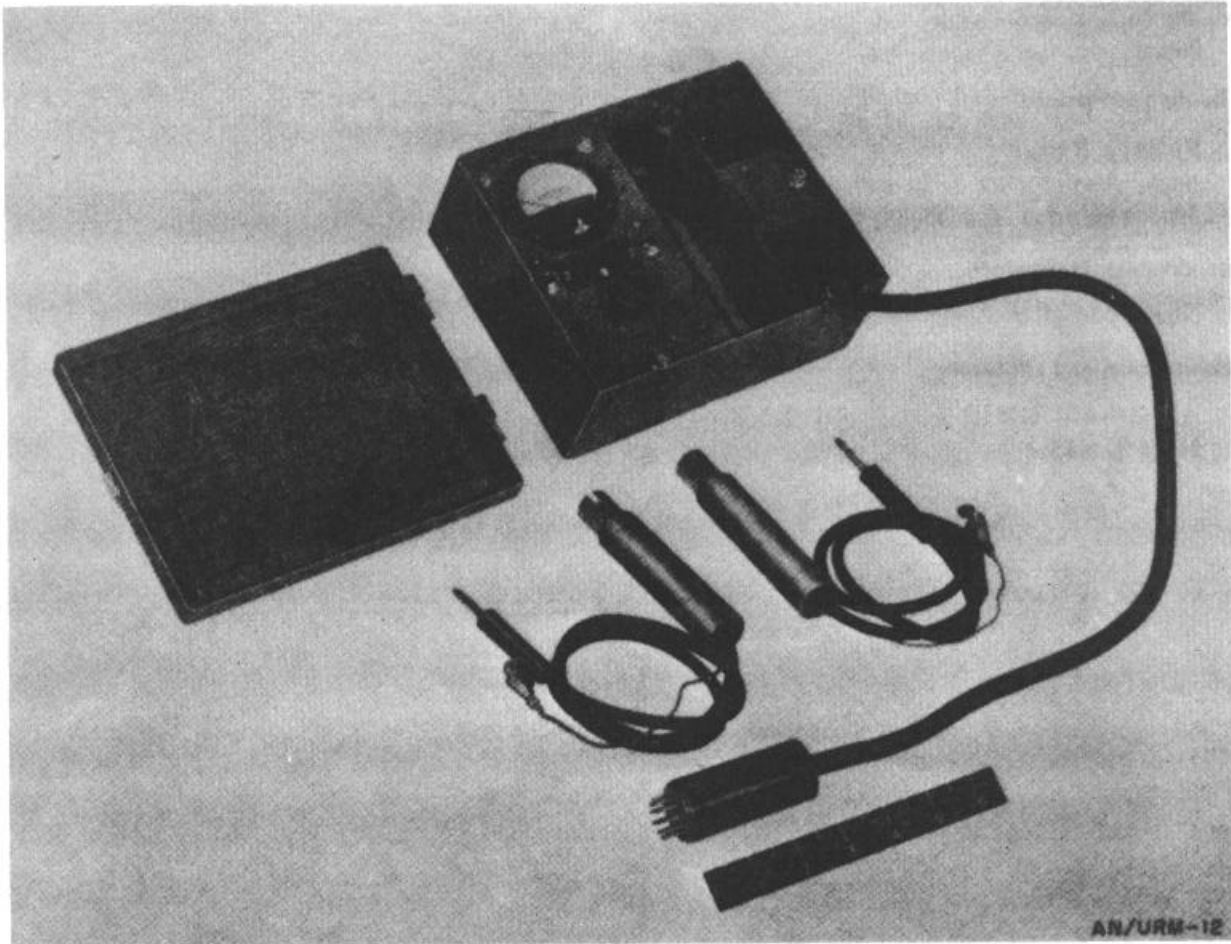
Cog Serv: USA FSN:

USA Line Item No:

VOLTAGE POINT TEST SET AN/URM-12

Functional Class: 1.1.1.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A-Std	-----
Manufacturer:	Bendix Aviation Corp.			



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## **AN/URM-12 VOLTAGE POINT TEST SET**

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### **FUNCTIONAL DESCRIPTION:**

Voltage Point Test Set AN/URM-12 is a portable voltmeter used in checking voltages on sub-chassis of radio sets.

Two rf probes, furnished with this equipment, can be inserted in the tube sockets of the rf monitor chassis to permit alignment of the transformers located on the monitor chassis.

### **RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

### **TECHNICAL DESCRIPTION:**

*Voltage Range:* .3 to 400 v ac, dc

*Basic Movement:* 0 to 100 ua

*Major Units:* 1 ME-36/URM-12; 6 11/16 x 4-1/16 x 2 3/4; 1.75 lbs

### **TUBES, CRYSTALS, TRANSISTORS:**

None

### **REFERENCE DATA AND LITERATURE:**

AN 16-30URM12-1, AN 16-30URM12-2, AN 16-30URM12-4.

MIL-T-945



3 August 2954

Cog Serv: USA FSN:

USA Line Item No: 627308

SIMULATOR, MICROPHONE AN/URM-14

Functional Class: 1.1.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Bendix radio Division, Bendix Aviation Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose equipment which measures the level of audio voltage applied to the microphone input circuit of transmitters having carbon microphone input. In testing radio sets, the microphone simulator has application in checking the clipping level and measuring the audio gain of the modulator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used with Receiver-Transmitter RT-173/ARC-33.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The microphone simulator is basically a voltmeter with rectifiers and multipliers to permit measurement of audio voltage. Applied audio voltage is passed through the microphone simulator's crystal rectifiers where it is converted to direct current and then conducted to the voltmeter.

*Pwr Supply:* None

*Freq Range:* 100 to 10,000 cycles per second

*Basic Meter Movement:* 0 to 100 microamperes

*Voltage Range:* 0 to 3 volts

*Input and Output Impedances:* 500, 1000, 5000 ohms

*Major Units:* SM-30/URM-14; 6 1/2; 4 9/16; 3 5/8; 2.25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AN 16-30URM141 (Operating Instructions)

AN 16-30URM14-2 (Service Instructions)

AN 16-30URM14-4 (Parts Breakdown)

MIL-M-4673 (USAF)

20 August 1954

Cog Serv: USA FSN: 6625-644-5755

USA Line Item No: 685655

TEST SET, ELECTRON TUBE AN/USM-31

Functional Class: 1.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	-----	-----
Manufacturer:	Weston Electrical Instrument Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Electron Tube Test Set AN/USM-31 is used in performing dynamic and static tests on receiving-type electron tubes, as well as in testing transmitting, thyratron, and gas tubes. An adapter kit is included to provide facilities for testing special tubes.

This equipment is provided with a means of introducing an ac signal into the grid bias line for measuring the ac component in the plate circuit.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Vacuum Tube Analyzing Equipment OD-7, except that it provides additional transconductance, voltage, and current ranges. It is also similar to Weston Model 686, Type 9A, except that the commercial model does not include an adapter kit.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 185 w, 115 or 210 v  $\pm 10$  v, 50 to 60 cy, 1 phase ac

*Grid Current Range:* 0 to 15; 1,500 ma dc (zero centered)

*Element Current Range:* 0 to 5, 10, 50, 100 ma dc

*Control Grid Voltage Range:* 0 to 10, 50 v dc

*Heater Voltage Range:* 0 to 2, 4, 8, 20, 50, 125 v ac

*Element Voltage Range:* 0 to 150, 300 v dc

*Major Units:* TV-8/USM-31; 26 1/8 x 19 7/8 x 7 3/8; 105 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OB2, (1) 3A4, (1) 5U4G, (1) 6C4, (1) 6X4

**REFERENCE DATA AND LITERATURE:**

NavShips 91734, NavShips 91849

A-331 (Ships)

17 June 1954

Cog Serv: USA FSN: 6625-648-9172

USA Line Item No: 628140

MULTIMETER AN/USM-33

Functional Class: 1.1.3.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Weston Electrical Instrument Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, ac, clamp-on line type multimeter. The instrument measures voltages and currents within its indicating and freq ranges. The special feature of clamping on a line makes possible the measurements of current without electrically altering the circuit to be measured, making for convenient, fast operation. The special included leads are required to make voltage measurements. The meter is housed in a watertight enclosure for protection against inclement weather conditions.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The meter has a basic dc indicating type movement with a germanium diode crystal rectifier in a bridge rectifier circuit to adapt it for ac measurements. Shunt and series resistor circuits select the ranges and types of operation through a switching arrangement. The clamp constitutes the secondary of the transformer to create a magnetic linkage between the meter circuits and the line whose current is to be measured.

*Pwr Supply:* None required

*Freq Range:* 50 to 1000 cycles per second

*Current Measuring Range:* 0 to 15, 60, 150, and 600 amperes

*Voltage Measuring Range:* 0 to 300, and 600 volts

*Accuracy of Indication:*  $\pm 2\%$  for full-scale deflection at  $+25^{\circ}\text{C}$  and 60 cycles per second; less than  $\pm 3\%$  additional for full-scale deflection from  $-40^{\circ}\text{C}$  to  $\pm 25^{\circ}\text{C}$ ; less than  $\pm 2\%$  additional of full-scale deflection from  $+25^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ ;  $\pm 2\%$  additional full-scale deflection, maximum change from 60 cycles per second to any other freq between 50 and 1000 cycles per second.

*Major Units:* 1 ME-79/USM-33; 3 1/2; 14 1/2; 6; 7.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-1N34 (crystal rectifier)

**REFERENCE DATA AND LITERATURE:**

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Slav: USA FSN:

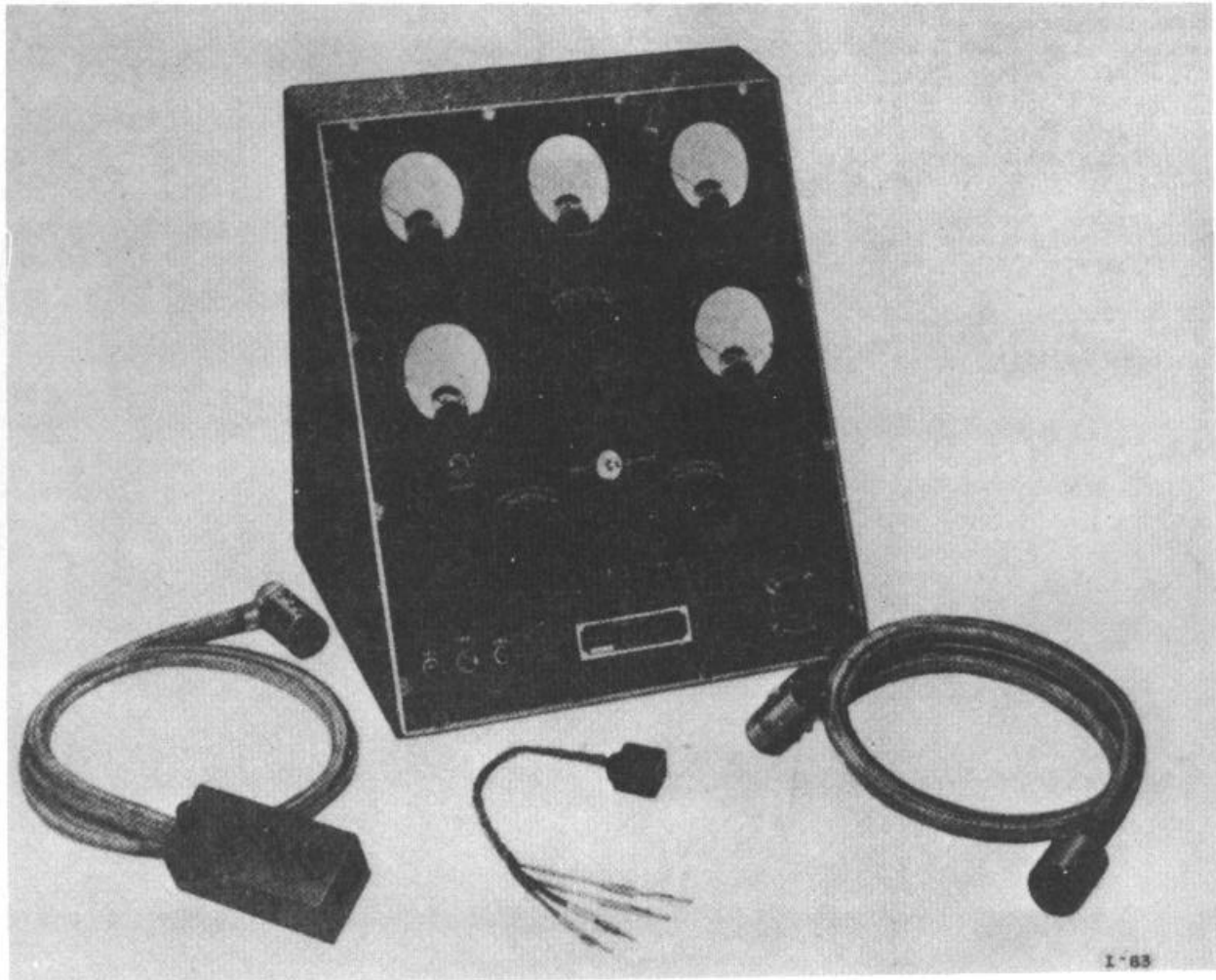
USA Line Item No:

TEST SET I-83

Functional Class: 1.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----

Manufacturer:



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**I-83 TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set I-83 is used primarily in measuring the input and output characteristics of low wattage dynamotors.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment replaces Test Set 1-63-A.

**TECHNICAL DESCRIPTION:**

Ripple Voltage Range: 12 to 200 v

Input Voltage: 0 to 35 v, 0 to 10 amp

Output Voltage: 0 to 500 v, 0 to 250 ma

Major Units: 1 I-83; 12 3/8 x 10 1/2 x 12 1/8; 20 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Spec 71-1113

14 July 1954

Cog Serv: USA FSN: 6625-649—3066

USA Line Item No: 684350

TEST SET I-100-B  
Functional Class: 1.1.3.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Bendix Radio Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable, self-contained test set designed to provide a rapid, reliable means of checking loop-orienting circuits of Radio Compass Units BC433-G and R-5/ARN-7 and for checking the loop motor, autosyn, compensator, and indicators of Radio Compasses SCR-269G and AN/ARN-7. It tests components by means of substitution of various parts and by taking voltage and current measurements of the components under test in actual operation.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Test Set I-100 was the experimental model for this equipment and the first production model was Test Set I-100-A.

Test Sets I-100-A and I-100-B are interchangeable, both electrically and physically. The resistors and capacitors of Test Set I-100B are in accordance with JAN specifications. Test Set I-100-B also employs hermetically sealed meters.

**TECHNICAL DESCRIPTION:**

*Pwr Supply:* 115 volts, 400 cycles per second, 90 to 115 watts

*Vacuum-Tube Voltmeter Ranges:*

*Alternating Volts:* 0 to 2.5, 10, 50, and 250 volts

*Direct Volts:* 0 to 10, 50, and 250 volts

*Milliammeter Ranges:*

*Alternating Current:* 0 to 250, 500, and 750 milliamperes

*Direct Current:* 0 to 500 milliamperes

*Major Units:* 1 BC-713-B; 12 5/8" x 6.3/4" x 11 1/4"; 13.0 lbs.

1 BC-714B; 12 5/8" x 5 7/8" x 10 3/16"; 18.5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

2 JAN-5Z4, 1 JAN-6B8, 1 JAN-6F6, 1 JAN-6H6, 1 JAN-6J5, 2 JAN-0D3/VR150, 2 JAN-2050 or 2051.

**REFERENCE DATA AND LITERATURE:**

TO 16401100-3 (Maintenance Instructions)

TO 16-55443 (Spare Parts List)

USAF Spec 71-1142

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

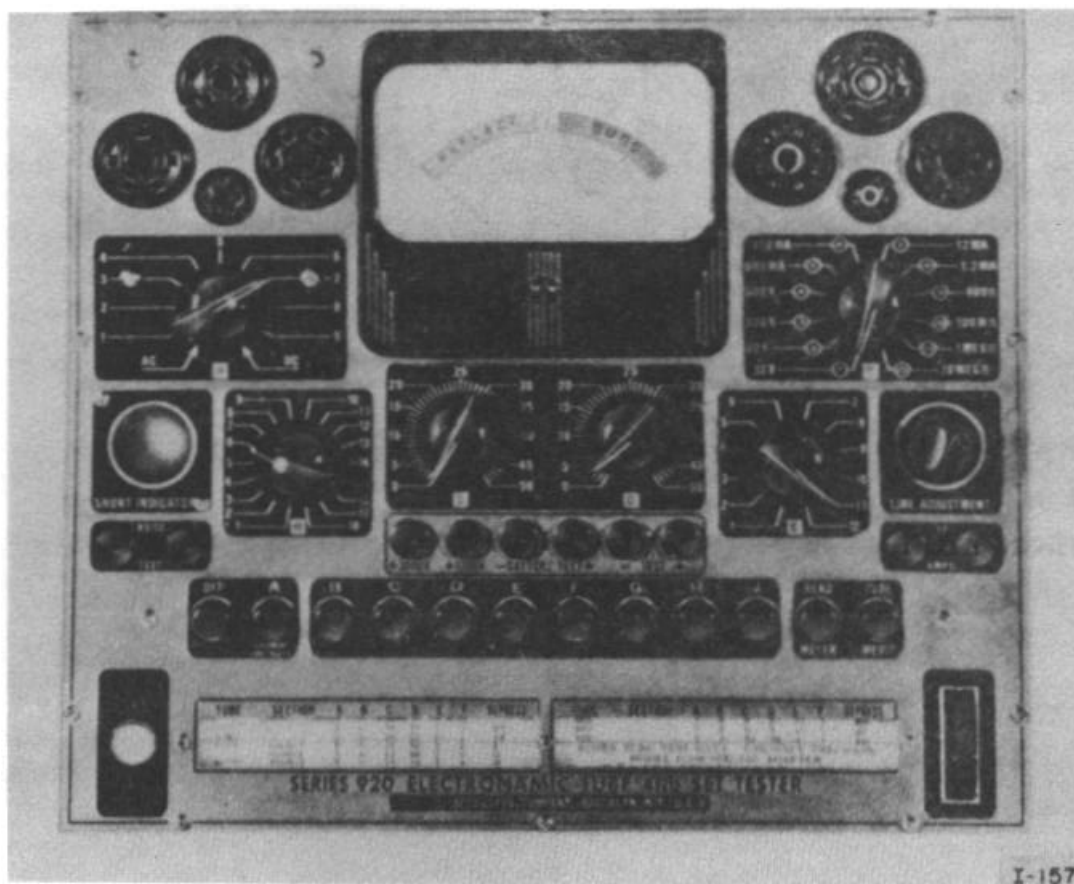
Cog Slav: USA FSN: 6625-153-4024

USA Line Item No:

TEST SET I-157

Functional Class: 1.1.3.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Western Electric Company, Inc.			



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**I-157 TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set I-157 is a portable instrument used in measuring ac and dc voltage, resistance, decibels, and dc current. It also permits a direct-reading test for batteries, pilot lights, and qualitative analysis of mica, paper, and electrolytic capacitors.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 110 to 125 v, 50 to 60 cy ac  
*Voltage Range:* 0 to 3,000 v ac, dc at 1,000 ohms  
*Output Voltage Range:* 0 to 3,000 v  
*Current Range:* 0 to 12 amp dc  
*Resistance Range:* 0 to 10 meg  
*Attenuation Range:* -10 to +64 db  
*Battery Testing Range:* 1.5 to 135 v  
*Filament Voltage Range:* 1.4 to 110 v  
Major Units: 1 I-157

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-1209



**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A****1 March 1964****TEST UNIT I-176****Cog Serv: USA FSN: 6625-251-3568****USA Line Item No:****Functional Class: 1.1.3**

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-C	-----	-----	-----
<b>Manufacturer:</b>	Weston Electrical Instrument Co.			



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**I-176 TEST UNIT**

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**FUNCTIONAL DESCRIPTION:**

Test Unit I-176 is a portable, multirange, high-sensitivity meter used in measuring current, voltage, and resistance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set I-5-K.

Equipment Required But Not Supplied: Batteries: (1) BA-2, (1) BA-30

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 1.5 v, 22.5 v dc

*Ranges:*

*Alternating Current:* 0 to .5, 1, 5, 10 amp

*Alternating Voltage:* 0 to 5, 25, 100, 250, 1,000 v

*Direct Current:* 0 to 50 ua; 0 to 1, 10, 100, 500 ma; 0 to 1, 5 amp

*Direct Voltage:* 0 to 5; 25; 100; 250; 1,000; 5,000 v

*Resistance:* 0 to 1,000; 100,000; 10,000,000 ohms

*Sensitivity:* 1,000 ohms/v ac; 1,000 or 20,000 ohms/v dc

*Accuracy:*  $\pm 4\%$  (full scale dc) ;  $\pm 5\%$  (full scale ac)

*Major Units:* 1 I-176 8 1/2"x11 1/2"x5 1/2"; 9 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-2626, TO 16-2CAA-6, TO 16-2CAA-7

Army Spec 71-1767

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

6 July 1955

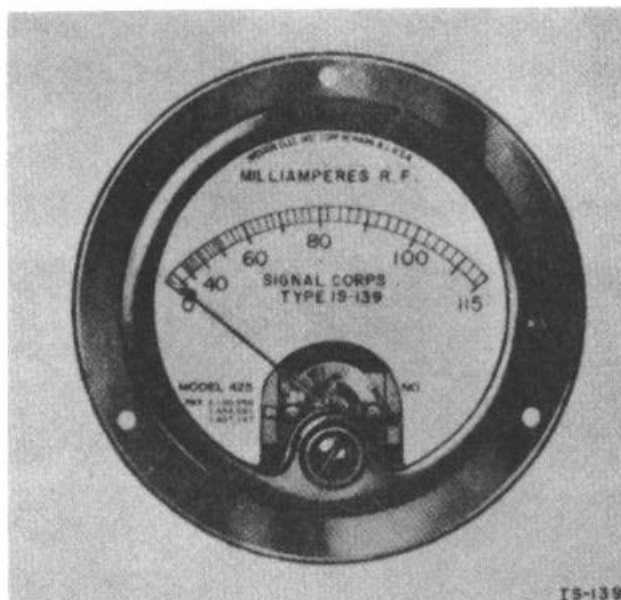
AMMETER IS-139

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 1.1.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-A	-----	-----	-----
<b>Manufacturer:</b>	Weston Electrical Instrument Corp.			

**FUNCTIONAL DESCRIPTION:**

Ammeter IS-139 is a portable, flush mounted, rf thermomilliammeter used in measuring alternating current. The instrument is calibrated for nonmagnetic panel mounting.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Thermomilliammeter, Weston Model 425.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 20 kc to 65 mc

*Current Range:* 0 to 115 ma

*Pwr Drain:* .15 to .4 w/amp

*Internal Resistance:* 5.2 ohms

*Accuracy:*  $\pm 2\%$  of indicated reading at full scale

*Major Units:* 1 IS-139 2 21/50"x3 1/2" dia; .5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 16-40IE9-5

USA Spec 71-515-B(SigC)

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

20 August 1954

Cog Serv: USAF FSN:

USA Line Item No:

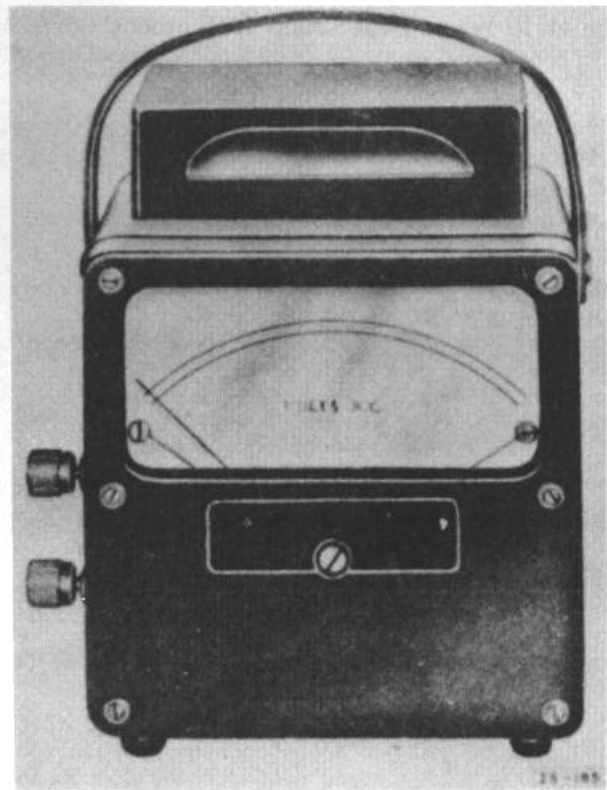
VOLTMETER IS-185

Functional Class: 1.1.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	L/Std	-----

Manufacturer:

Weston Electrical Instrument Corp.



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**IS-185 VOLTMETER**

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**FUNCTIONAL DESCRIPTION:**

Voltmeter IS-185 is a magnetically shielded, ac iron-vane type equipment incorporating a frequency-compensated movement. It permits accurate voltage measurements on alternating voltages of nonsinusoidal wave forms.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Weston Electrical Instrument Corp. Model 433.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 24.4 w, 115 v, 25 to 60 cy ac

*Freq Range:* 25 to 2,400 cy

*Alternating Voltage Range:* 0 to 150 v

*Input Impedance:* 3,000 ohms

*Meter Resistance:* 3,000 ohms

*Accuracy:* :  $\pm 1.25\%$  at 25° C

*Major Units:* 1 IS-185 5 3/4"x7" x 3 1/2"; 2.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

CO AN 08-105-3

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1967

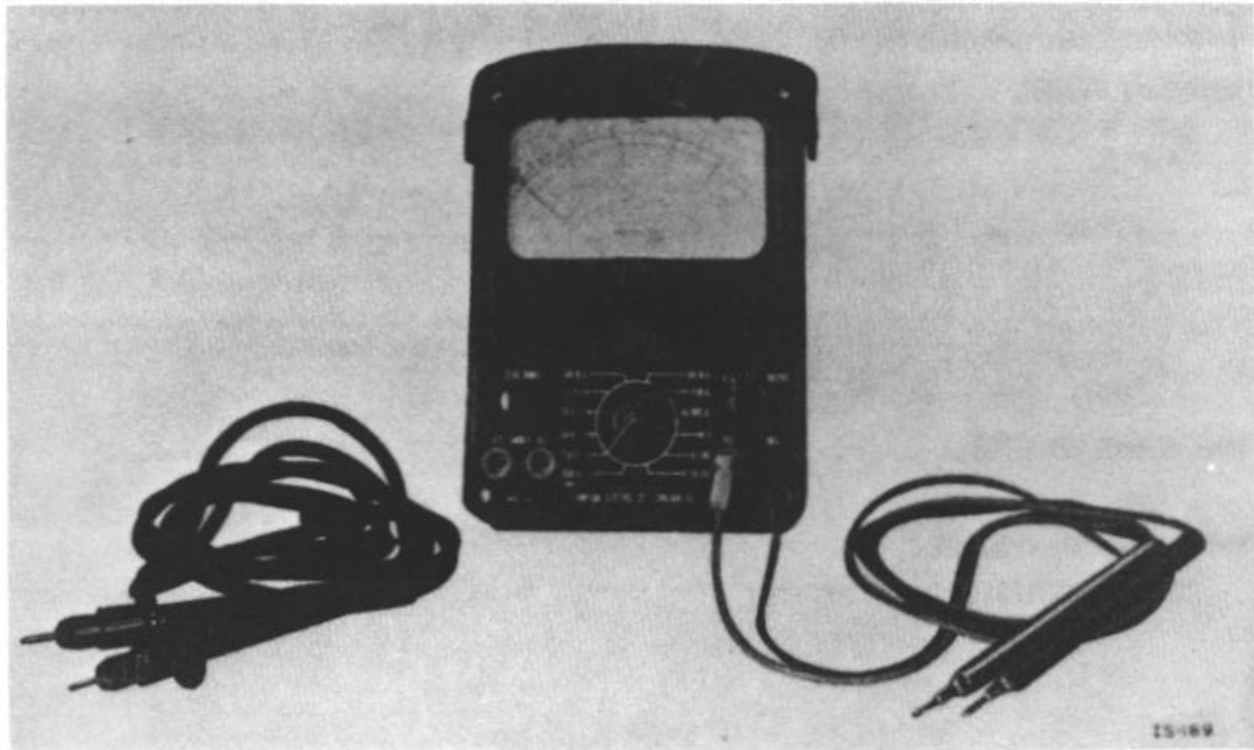
VOLTMETER IS-189

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 1.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-C	-----	-----	-----
Manufacturer:	Simpson Electric Co.			



AGO 10038A 31

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**IS-189 VOLTMETER**

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**FUNCTIONAL DESCRIPTION:**

Voltmeter IS-189 is a portable combination test equipment used in measuring ac and dc voltage, direct current, resistance, and power.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, similar to Simpson Model 260, is part of Test Equipment AN/APM-1A and Radar Test Sets AN/APM-16, -21, -33, 41, -48, AN/CPM-1, -2, -3, -7, -8, and -9.

Equipment Required But Not Supplied: (1) BA-42, (2) BA-208/U

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 1.5 v, 6 v dc

*Ranges:*

*Voltage:* 0 to 2.5; 10; 50; 250; 1,000; 5,000; 10,000 v ac, dc

*Attenuation:* 0 to +52 db in five ranges

*Current:* 0 to 100 ua; 0 to 10, 100, 500 ma dc

*Resistance:* 0 to 1,000; 100,000; 10,000,000 ohms

*Sensitivity:* 1,000 ohms/v ac; 20,000 ohms/v dc

*Accuracy:*  $\pm 2\%$  (dc);  $\pm 5\%$  (ac)

*Major Units:* 1 IS-189 3"x5 1/2"x7"; 3 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 16-40IS189-2, TO 1655-173



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

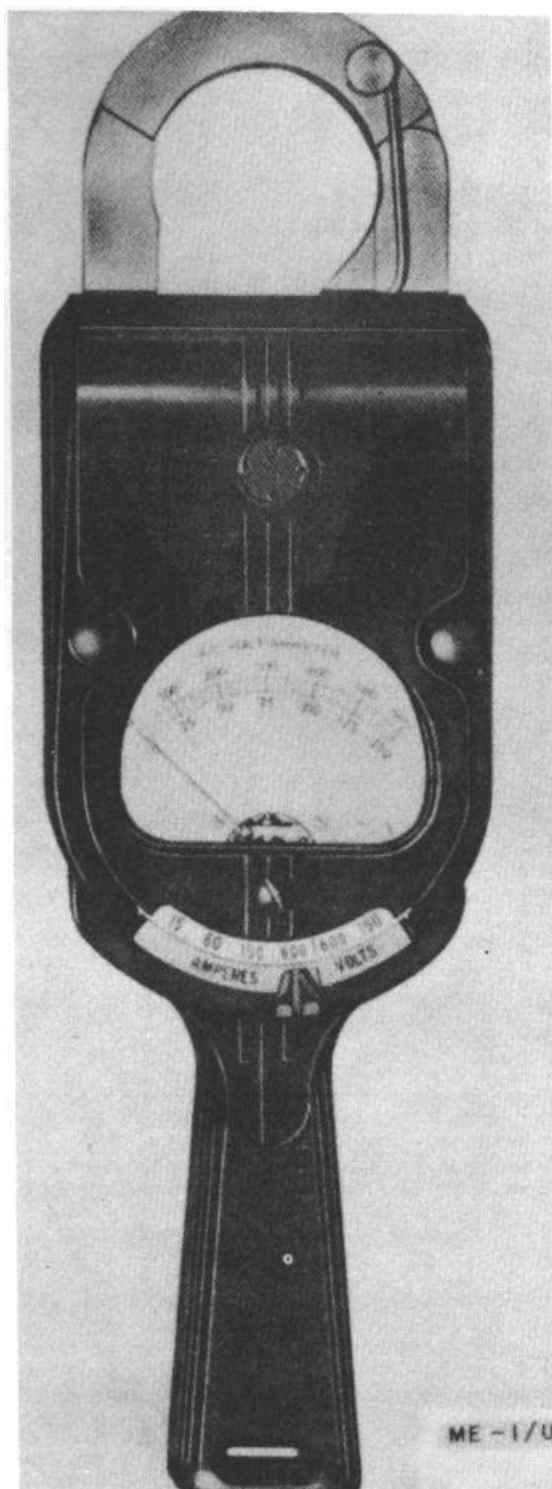
MULTIMETER ME-1/U

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 1.1.3.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-C	-----	-----	-----
Manufacturer:	General Electric Co.			





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**ME-6D/U ELECTRONIC MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

Multimeter ME-1/U is a portable hook-on type voltammeter used in measuring alternating current and voltage.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Hook-on Voltammeter, General Electric Type AK-1.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 25 to 90 cy

*Voltage Range:* 0 to 150, 600 v

*Current Range:* 0 to 15, 60, 150, 600 amp

*Accuracy:*  $\pm 3\%$  (center of freq range)

*Major Units:* 1 ME-1/U 13 1/2"x3 3/16"x4"; 3.5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Instruction Book

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

22 June 1955

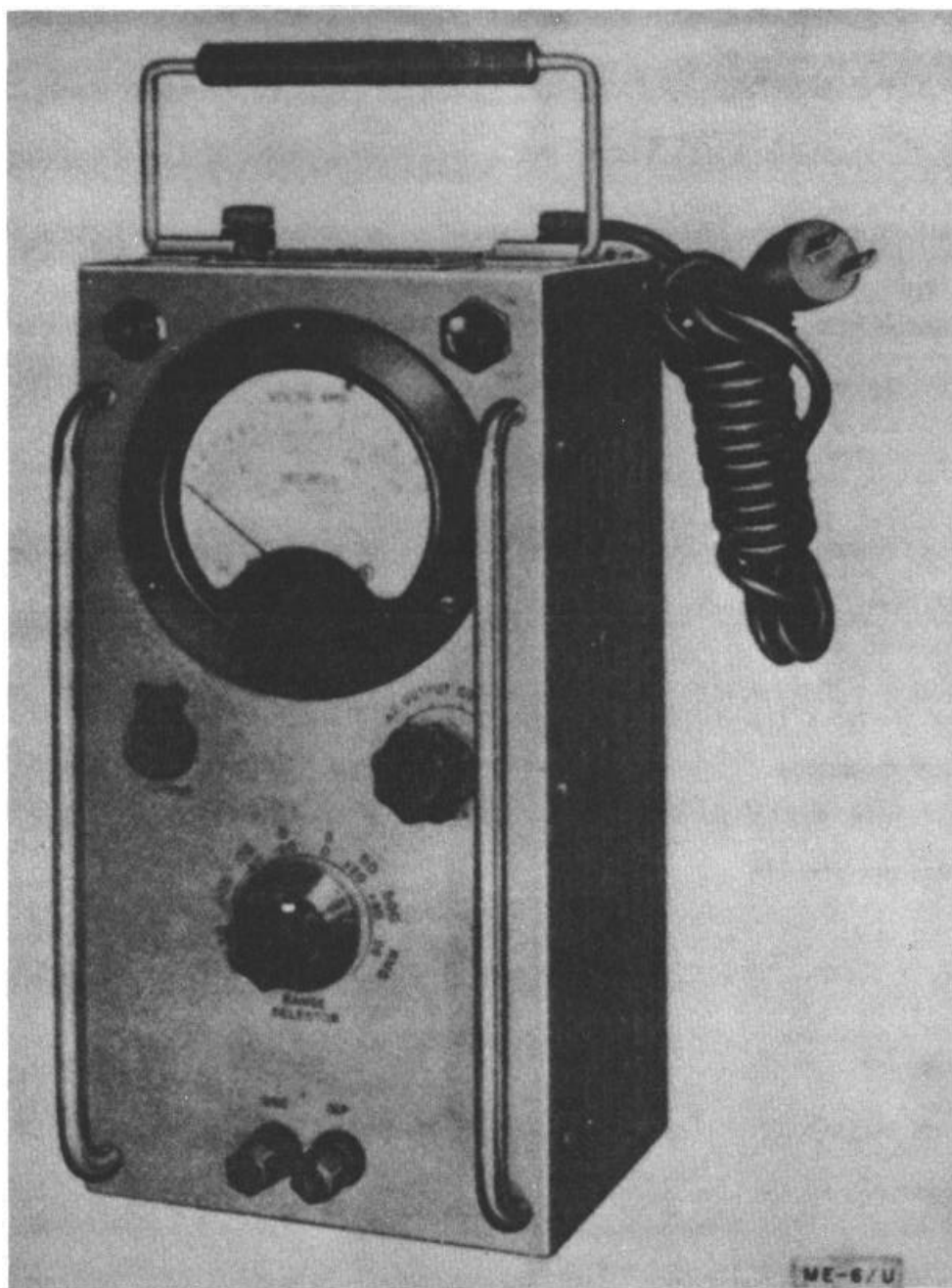
Cog Serv: USN FSN: 6625-643-1663

USA Line Item No: 614830

ELECTRONIC MULTIMETER ME-6D/U

Functional Class: 1.1.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Obs	-----	Std	-----
Manufacturer:	The Daven Co.			



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**ME-6D/U ELECTRONIC MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

A portable test instrument with a wide range of applications. This equipment is a highly sensitive vacuum tube voltmeter which accurately measures ac voltages. It also serves as a flat, high-gain, wideband amplifier. A single panel meter is calibrated in ac volts and decibels. Meter readings are substantially independent of variations in line voltage, tube aging, and replacement of circuit components.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This model differs radically from previous models of the ME-6/U. It is neither mechanically nor electrically interchangeable.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The circuit consists of a multistage amplifier terminated by electron tube type diodes connected in a bridge circuit. A panel mounted meter indicates rectified current. The meter is designed with sloped pole pieces so that indications are proportional to the log of the rectified current. The rectified current is accurately proportional to the input voltage of the working range of the instrument. Stability of the amplifier gain is achieved by feeding back amplified voltage to part of the input circuit. A jack is provided for inserting a telephone plug when the set is used as a high-gain amplifier.

*Pwr Supply:* 117 volts, ac, 50 to 400 cycles per second, single-phase

*Freq Range:* 15 cycles per second to 250 kilocycles per second

*Voltage Range:* 500 microvolts to 500 volts, ac, in 6 steps; 0.005, 0.05, 5, 50, 500 volts, rms

*Meter Scale:* ac Voltage: 0.5 to 5 volts

*Decibels:* -5 to +17 (based on 0 decibel = 0.001 watt in 600 ohms)

*Rectifier Voltage:* 250 volts, dc (approximately)

*Maximum Voltage Gain:* 4500 (approximately)

*Major Units:* 1 ME-6D/U 5 13/16"x6 1/2"x11 7/32"; 9.6 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-5879, 2 JAN-6AH6, 1 JAN-5726/6AL5W, 1 JAN-OA2WA, 1-2A12

**REFERENCE DATA AND LITERATURE:**

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

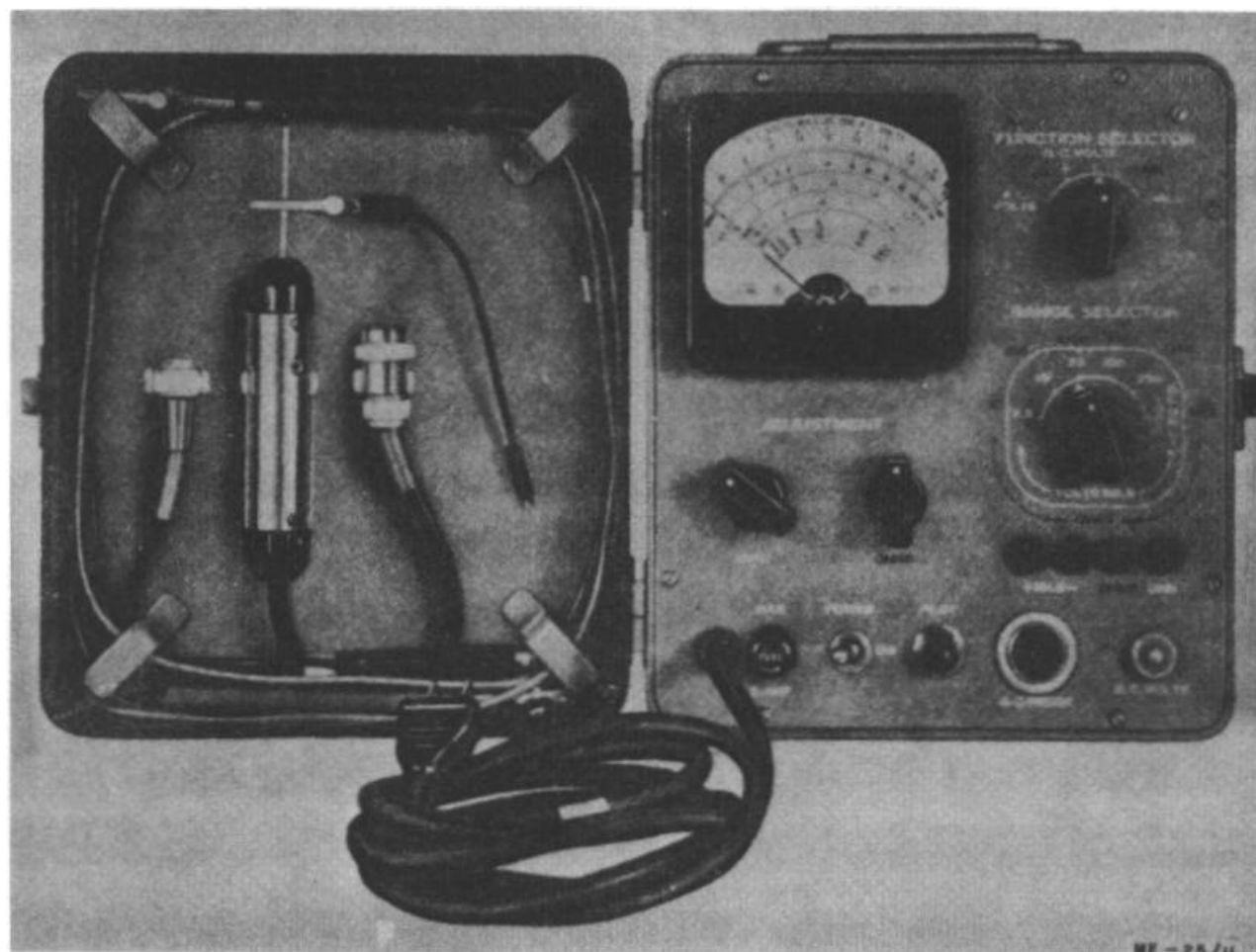
16 September 1954  
Cog Serv: USN FSN:  
USA Line Item No:

MULTIMETER ME-25A/U

Functional Class: 1.1.3.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std-B	-----

Manufacturer:



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**ME-25A/U MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

Multimeter ME-25A/U is a portable combination electronic volt ohm milliammeter used in measuring ac and dc voltage, resistance, and direct current.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes Vacuum Tube Volt-Ohm-Milliammeter OBQ.

Equipment Required But Not Supplied: Battery: (1) BA-30

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 12 w, 105 to 125 v, 50 to 1,600 cy, 1 phase ac; 1.5 v dc

*AC Voltage Range:* Measured and calibrated in peak-to-peak and rms: 0 to 1, 2.5, 10, 25, 100, 250 v rms; 0 to 2.5, 10, 25, 100, 250, 1,000 v peak-to-peak

*Freq Range:* 50 cy to 100 mc

*Input Impedance:* 13 meg shunted by 7 uuf

*Accuracy:*  $\pm 5\%$  of full scale

*Measured in avg value, calibrated in rms:* 0 to 1,000 v

*Freq Range:* 50 to 3,000 cy

*Input Impedance:* 5 meg shunted by 10 uuf

*Accuracy:*  $\pm 5\%$  of full scale

*DC Voltage Range:* 0 to 1, 2.5, 10, 25, 100, 250, 1,000 v; 0 to 5,000 v (with probe)

*Input Impedance:* 13.3 meg, 66.5 meg (with probe)

*Accuracy:*  $\pm 5\%$

*Resistance:* 0 to 1,000; 10,000; 100,000 ohms; 1, 10, 1,000 meg

*Accuracy:* Within  $3^\circ$  arc

*Direct Current:* 0 to 2.5, 10, 25, 100, 250, 1,000 ma

*Accuracy:*  $\pm 3\%$  (full scale)

*Major Units:* 1 ME-25A/U 9 3/4"x8 7/8"x 6 5/8"; 13 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6AL5, (1) 6x4, (1) 12AU7

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91415

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

28 October 1954

MULTIMETER METER ME-26/U

Cog Serv: USN FSN:

USA Line Item No:

Functional Class: 1.1.3.1.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-A	-----	Std (Minor)	-----
<b>Manufacturer:</b>	Hewlett-Packard Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Multimeter Meter ME-26/U is a portable, vacuum tube, ac-dc voltmeter and ohmmeter. It is used in measuring af, supersonic, rf, and VHF voltage; antenna voltage, current, and power; transmission line characteristics; standing waves; dc voltage in high impedance circuits; as well as gain in audio, video, and vhf amplifiers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to High Frequency Vacuum-Tube Voltmeter, Hewlett-Packard Model 410A.

Equipment Required But Not Supplied: Battery: (2) BA-30

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 40 w, 115v, 50 to 60 cy, 1 phase ac; 3 v dc

*Freq Range:* 20 cy to 700 mc (on ac voltage measurement)

*Freq Response:* Flat within  $\pm$  db to 700 mc; at 20 cy drop off is less than 1 db. Probe resonant freq is 2,000 mc (approx) ; however, indications to 3,000 mc are obtainable.

*Input Impedance:*

*Input Capacitance:* 1.3 uuf across the input resistance

*Input Resistance:* 10 meg at low freq (below .02 mc)

*Resistance Range:* .2 to 500 meg in seven ranges

*Voltage Range:* 0 to 300 v rms ac in six ranges; 0 to 1,000 v dc in seven ranges  $\pm 3\%$

*Major Units:* 1 ME-26/U 12 1/16"x7 5/16"x6 1/4"; 16 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N34, (1) 5Y3GT, (2) 6AG7, (1) 6SN7GT

**REFERENCE DATA AND LITERATURE:**

AGO 10038A 39

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

16 September 1954

AMMETER ME-29/U

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 1.1.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	General Electric Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Ammeter ME-29/U is a portable unit used in checking direct current in tube circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes Test Meter TS-199/CPM-4.

**TECHNICAL DESCRIPTION:**

Basic Meter Movement: 1 ma full scale deflection

Current Range: 0 to 1, 5, 10, 50, 100, 500 ma dc

Resistance: 125 ohms

Accuracy:  $\pm 2\%$  (full scale reading)

Major Units: 1 ME-29/U 4" x 5"x 8"; 3 lbs

**TUBES, CRYSTALS, TRANSISTORS**

None

**REFERENCE DATA AND LITERATURE:**

Exhibit WLENG-108-A

USAF Dwg D/L51C54261

AGO 10038A 41

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

9 September

Cog Serv: USA FSN:

USA Line Item No: 696825

VOLTMETER, ELECTRONIC ME-30A/U

Functional Class: 1.1.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std	-----	Std	-----
<b>Manufacturer:</b>	Hewlett-Packard Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable general purpose vacuum tube voltmeter used to measure voltage in the audio, supersonic, and lower RF regions, amplifier gain, network response, output level, hum level, power circuit voltages, video voltages, carrier voltages, capacity, and coil figure of merit. The instrument may also be used as a high gain, broadband amplifier to increase sensitivity of oscilloscopes, bridges, and other equipment requiring additional sensitivity. Indication is on a meter dial in rms volts and dbm. This instrument has a wide voltage range with high sensitivity at all ranges and good stability. The high input impedance causes a minimum of disturbance to the circuit whose voltage is measured. The large overvoltage capacity minimizes the probability of damaging the meter movement or associated circuitry due to overloads.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Hewlett-Packard Vacuum Tube Voltmeter Model 400D.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The voltmeter input terminals feed into a cathode follower with a grid impedance of 10 megohms. High stability for the cathode follower is accomplished by 35 decibels of local feedback. Range switching for the voltmeter is accomplished by tapping the resistor of the cathode follower. The output of the cathode follower is applied to a maximally flat-maximally stable four-stage amplifier which is stabilized with 56 to 60 decibels of negative feedback at midband. The output of the amplifier is applied to a fullwave rectifier circuit. The rectifier in turn feeds a dc indicating meter.

*Pwr Supply:* 115 to 230 volts,  $\pm 10\%$ , ac, 50 to 1000 cycles per second, single phase, 70 watts.

*Freq Range:* 10 cycles per second to 4 megacycles per second.

*Voltage Range:* 0 to 300 volts, ac, in 12 ranges: 0 to 0.001, 0.003, 0.010, 0.030, 0.100, 0.300, 1.00, 3.00, 10.0, 30.0, 100.0, 300.0 volts.

*Calibration:* Calibrated to read rms value of sine wave. Voltage indication is proportional to average value of applied wave. This minimizes errors due to turn-over and waveform variation. It has linear voltage scales with decibel calibration from -12 to +2 dbm. There are 10 decibel intervals between voltage ranges. Dbm can be read directly from -72 to +52. (0 dbm = 1 milliwatt into 600 ohms.)

*Input Impedance:* 10 megohms shunted by 15 micromicrofarads on 1.0 volt to 300 volt ranges; 10 megohms shunted by 25 micromicrofarads on 0.001 volt to 0.8 volt ranges.

*Amplifier:* Maximum output is 0.15 volt rms corresponding to full scale deflection of meter. Internal impedance is 50 ohms. Gain is approximately 150 when the instrument is on the 0.001 volt range.



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**ME-30A/U VOLTMETER, ELECTRONIC**

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*Accuracy:*

±2% from 20 cycles per second to 1 megacycle per second (full scale)

±3% from 20 cycles per second to 2 megacycles per second (full scale)

±5% from 10 cycles per second to 4 megacycles \*r second (full scale)

*Major Units:* 1 ME-30A/U 10 3/4" x 7" x 10 1/2"; 19 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

6 JAN-6CB6, 1 JAN-6AX5GT, 1 JAN-6AU5, 1 JAN-OB2

**REFERENCE DATA AND LITERATURE:**

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

23 March 1956

RF AMMETER ME-32/U

Cog Serv: USN FSN: 6625-542-8332

USA Line Item No:

Functional Class: 1.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	T/Std	-----
Manufacturer:	Arcturus Manufacturing Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, rf ammeter for measuring alternating current.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Arcturus type CA-1024.

**TECHNICAL DESCRIPTION:**

Circuit Information: The basic meter movement is a D'Arsonval type used in conjunction with a thermocouple.

Pwr Supply: None required.

Current Range: 0 to 120 milliamperes.

Accuracy:  $\pm 2\%$ .

Major Units: 1 ME-32/U 4"x 5"x2"

**TUBES, CRYSTALS. TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AGO 10038A 45

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

AMMETER ME-65/U

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 1.1.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-A	-----	-----	-----
<b>Manufacturer:</b>	Westinghouse Electric and Manufacturing Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Ammeter ME-65/U is a portable unit used in measuring alternating current. Application is in field, depot, and laboratory testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Ammeter, Westinghouse Model PY-5.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 25 to 135 cy

*Current Range:* 0 to 2, 5, 20, 50, 100, 200 amp ac

*Accuracy:*  $\pm 1\%$  between 15°C and 35°C

*Major Units:* 1 ME-65/U 4" x 8 1/16"x 7 1/4"; 6.25 lbs

**TUBES, CRYSTALS. TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AGO 10038A 47

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

6 July 1955

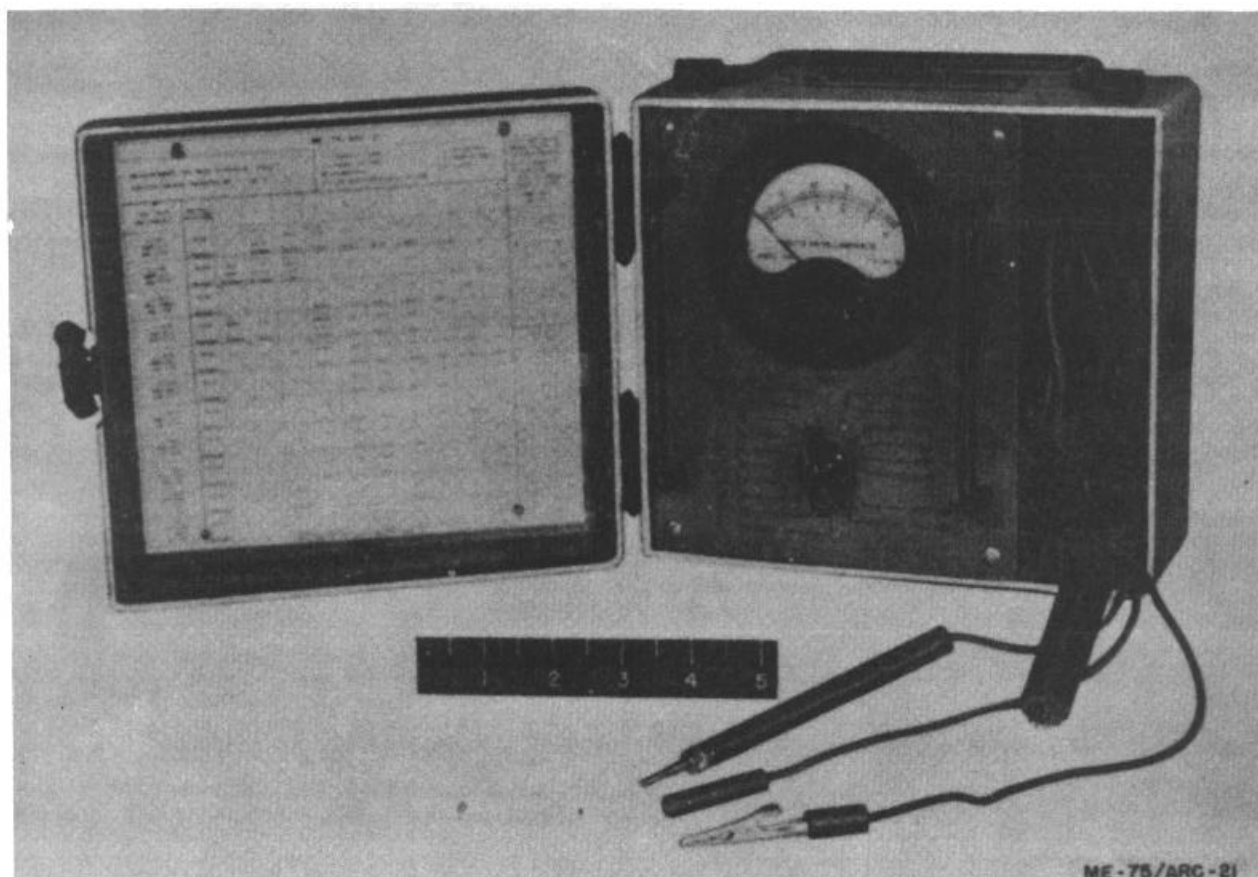
Cog Serv: USAF FSN:

USA Line Item No:

MULTIMETER ME-75/ARC-21

Functional Class: 1.1.3.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Radio Corporation of America			



AGO 10038A 49

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**ME-75/ARC-21 MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

Multimeter ME-75/ARC-21 is a portable instrument used in testing Radio Sets AN/ARC-21 and AN/ARC-21X only. A self-explanatory chart permits personnel unfamiliar with either the meter or the radio set to perform the necessary operational checks.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

Freq Range: To 400 cy for ac measurement

Voltage Range:

With Leads: 50 v ac (full scale); 15 v, 50 v, 150 v, 500 v, 1,500 v dc (full scale)

With Probes: .1 v dc (full scale, w/high input impedance)

With Plugs: 10 v ac (full scale)

Current Range: 50 ma, 500 ma dc (full scale, with plugs)

Basic Meter Sensitivity: 50 ua (20,000 ohms/v) full scale

Accuracy:  $\pm 5\%$

Major Units: 1 ME-75/ARC-21 7 1/2"x6 3/4"x4"; 5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(2) RETMA-CX-L3E2D

**REFERENCE DATA AND LITERATURE:**

MIL-8182 (USAF)

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

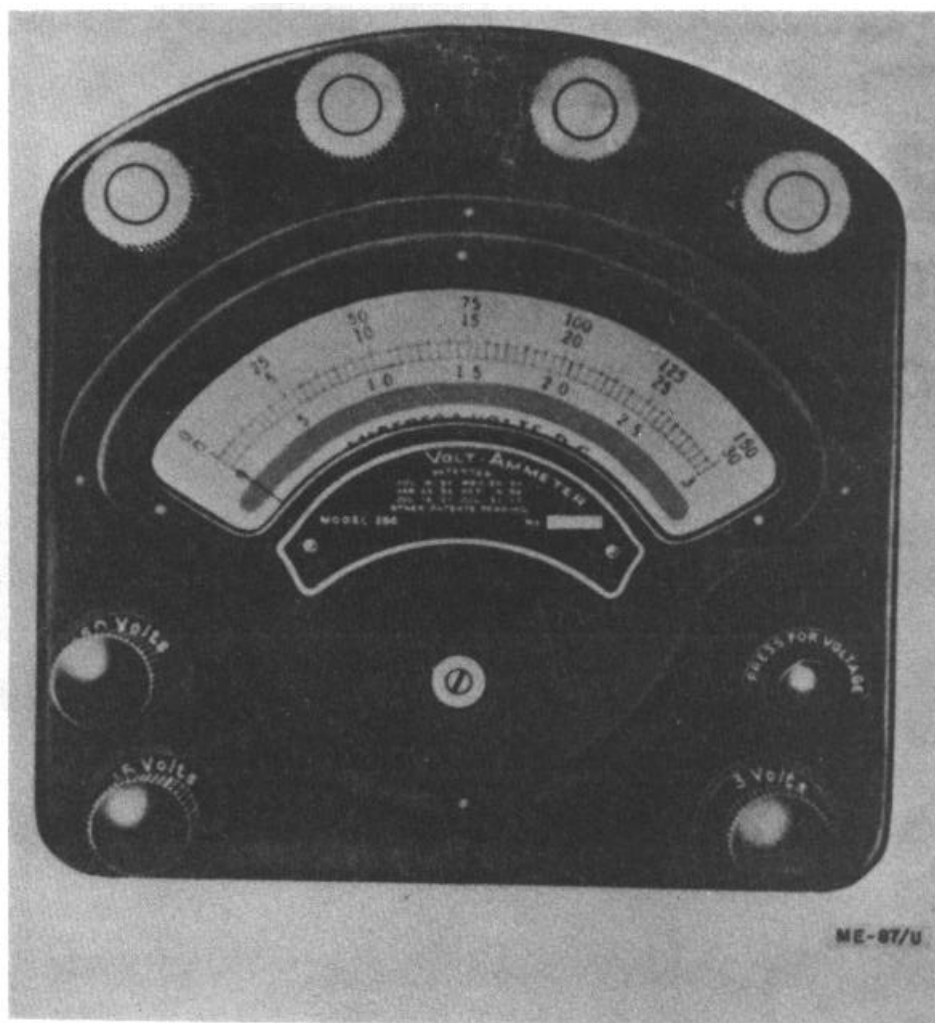
MULTIMETER ME-87/U

Cog Serv: USA FSN: 6625-223-5248

USA Line Item No:

Functional Class: 1.1.3.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Weston Electric Instruments, Inc.			



AGO 10038A 51

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**ME-87/ U MULTIMETR**

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**FUNCTIONAL DESCRIPTION:**

Multimeter ME-87/U is a portable instrument used in measuring dc voltage and current.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

All models of the equipment, as well as Voltmeter 1-50, are identical except for maintenance parts.

**TECHNICAL DESCRIPTION:**

*Voltage Range:* 0 to 150 v dc  $\pm 1\%$

*Current Range:* 0 to 30 amp dc  $\pm 2\%$

*Sensitivity:* 100 ohms/v (voltage range); 500 ohms/v (current range)

*Major Units:* 1 MW 7/U 6"x5 5/8"x3"

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITIERATURE:**

1 March 1964

TEST SET TS-26-/TSM

Cog Serv: USA FSN: 6625-244-0502

USA Line Item No:

Functional Class: 1.1.3.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	J.H. Bunnell and Co.			

**FUNCTIONAL DESCRIPTION:**

Test Set TS-26/TSM is a portable voltohmmeter used in measuring insulation and conductor resistance, battery and line voltage, and in detecting grounds, crosses, short circuits, and. open circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Voltohmmeter TS-291A/U and Weston Model 564.

Equipment Required But Not Supplied: Batteries: (1) BA41, (1) BA-59

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 4.5 v or 45 v dc

*Voltage Range:* 0 to 3, 80, 300, 600 v dc

*Resistance Range:* 0 to 1,000; 10,000; 100,000; 1,000,000 ohms; to 10 meg (extended)

*Sensitivity:* 1,000 ohms/v

*Accuracy:* :±2%

*Major Units:* 1 TS-26/TSM 5 ½"x8 5/32 "x7 1/8"

**TUBES, CRYSTALS, TRANSISTORS:**

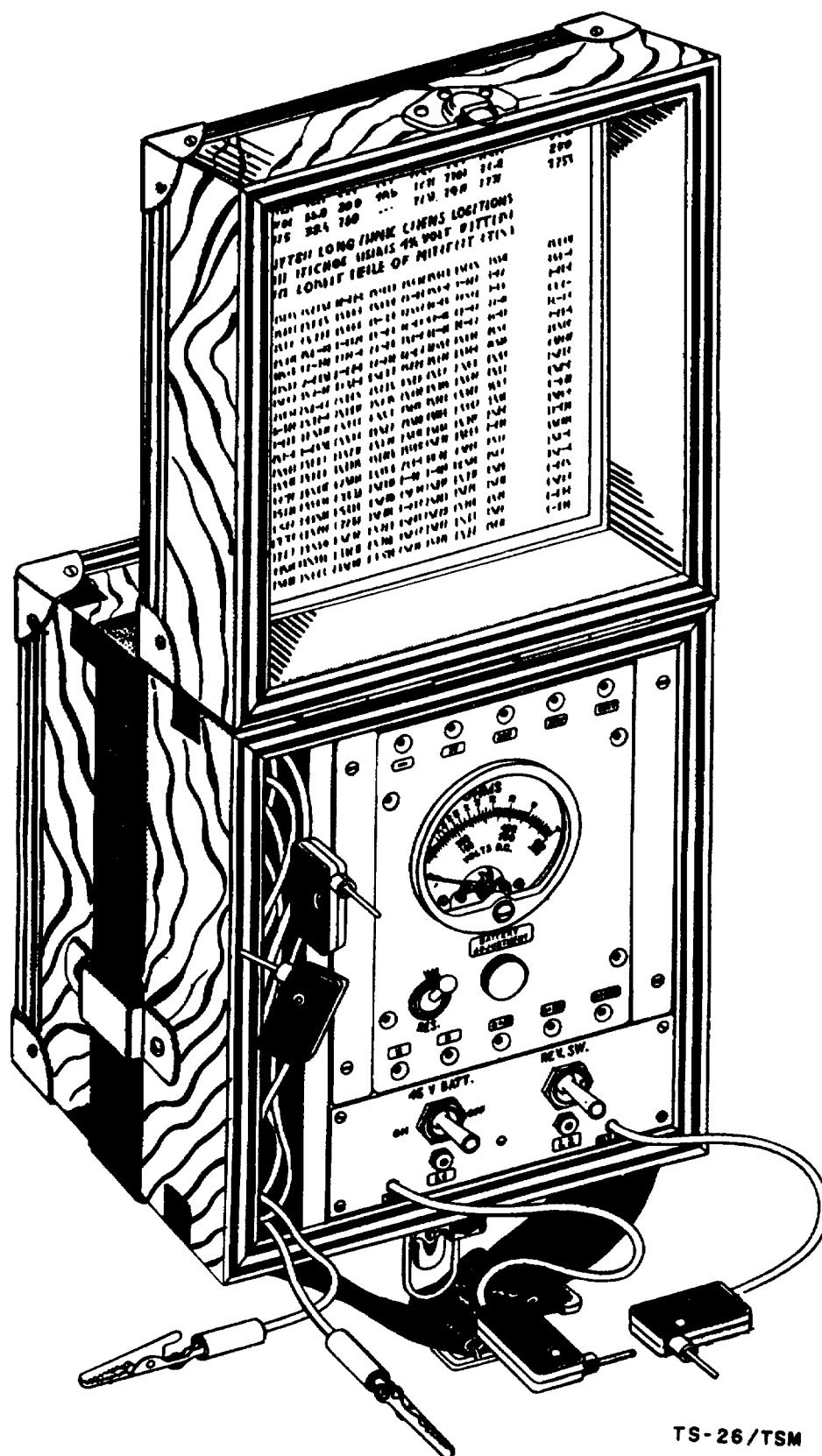
None

**REFERENCE DATA AND LITERATURE:**

TM 11-2017 (TO 16-35TS265)

MIL-T-2502; Dwg SC-A-7895





## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

BATTERY TESTER TS-183A/U

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 1.2.4

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std-B	-----
Manufacturer:	Aircraft Electronic Associates			

**FUNCTIONAL DESCRIPTION:**

Battery Tester TS-183A/U is a portable unit used in measuring the load and open circuit voltages of dry batteries.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Voltage Range:* 0 to 2, 10, 50, 200 v dc

*Voltmeter Sensitivity:* 1,000 ohms/v

*Major Units:* 1 TS-183A/U 15" x 9 1/2" x 7 1/8"; 14.6 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

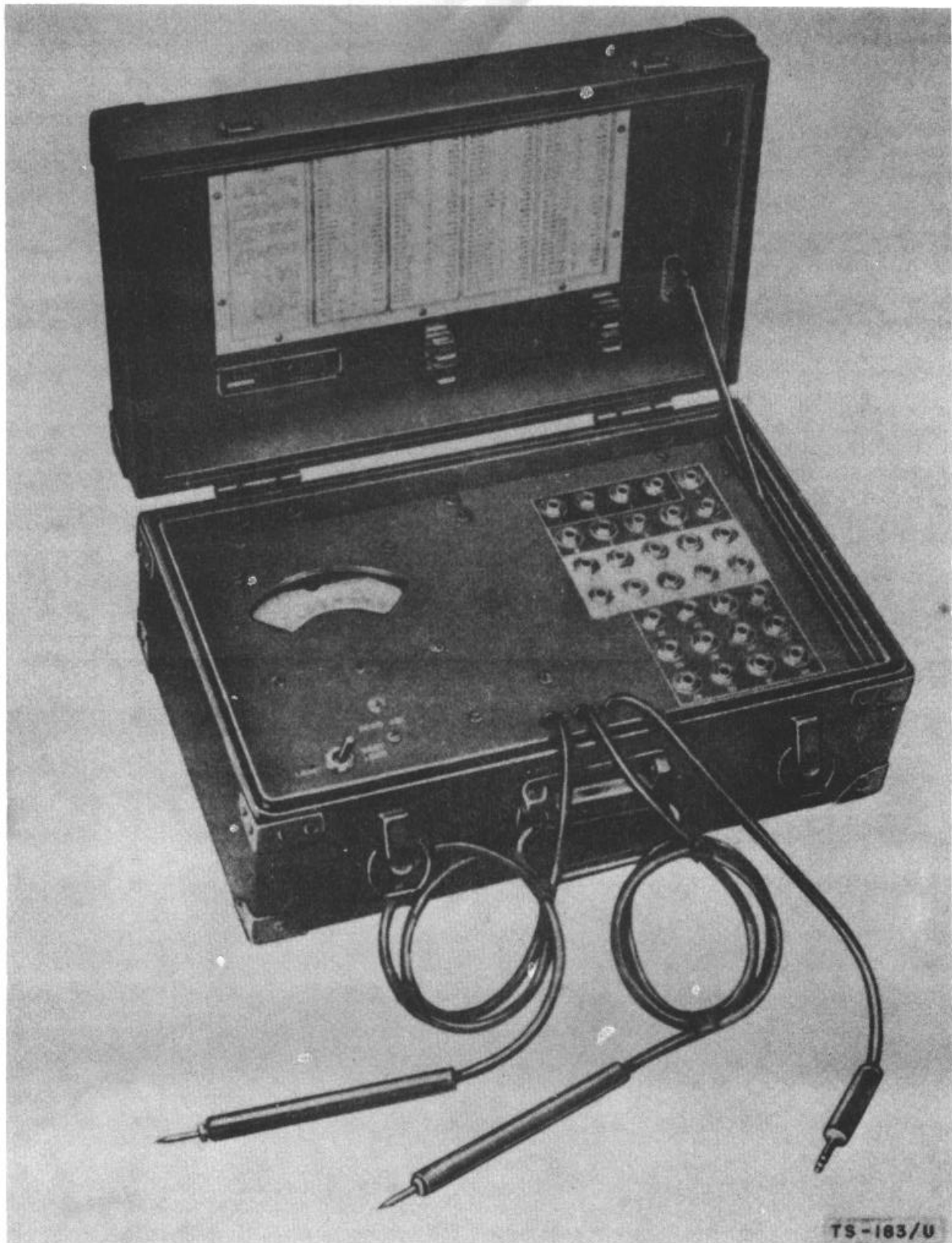
None

**REFERENCE DATA AND LITERATURE:**

TM 11-2571 (TO 16-35TS183-5), TO 16-35TS183-101

Sig C Spec A71-3149

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A



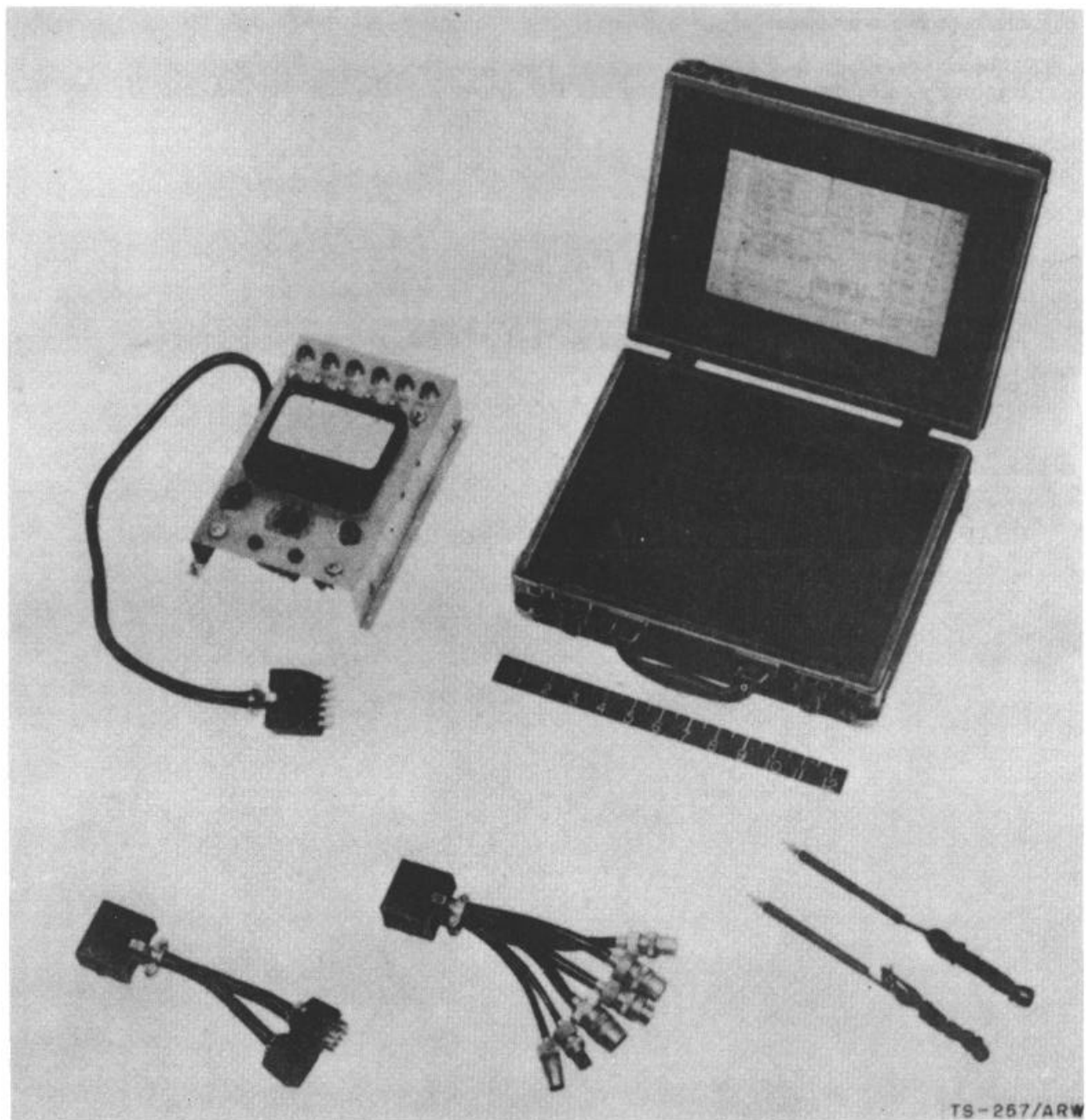
MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

17 September 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

TEST SET TS-257/ARW

Functional Class: 1.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer:	Technicontrol Engineering Co.			



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**TS-257/ARW TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set TS-257/ARW is a portable instrument used in measuring voltage and current, as well as providing lamp indicator and auxiliary control circuits necessary in preflight or bench testing of radio receivers and their associated servomechanisms.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

Equipment Required But Not Supplied: Batteries: (1) BA-35, (1) BA-210/U; (1) Head Set HS-23 or HS-33.

**TECHNICAL DISSCRITION:**

*Pwr Requirements:* 1.5 v, 6 v de

*Ranges:*

*External:* 0 to 10, 300 v dc; 0 to 50,000 ohms

*Internal:* 0 to 5, 10, 50, 100, 300 v dc; 0 to 15, 30 m

*Accuracy:*  $\pm 3\%$  of full scale

*Major Units:* 1 TS257/ARW 12 1/4" x 11 5/8" x 7 1/2"; 5 lbs.

**TUIII, CRYSTAS, TNSISTORS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS257-2

USAF Exhibit MCREE545; USAF Spec 71-5056; Dwgs 46D40807, 49D12653



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

22 June 1955

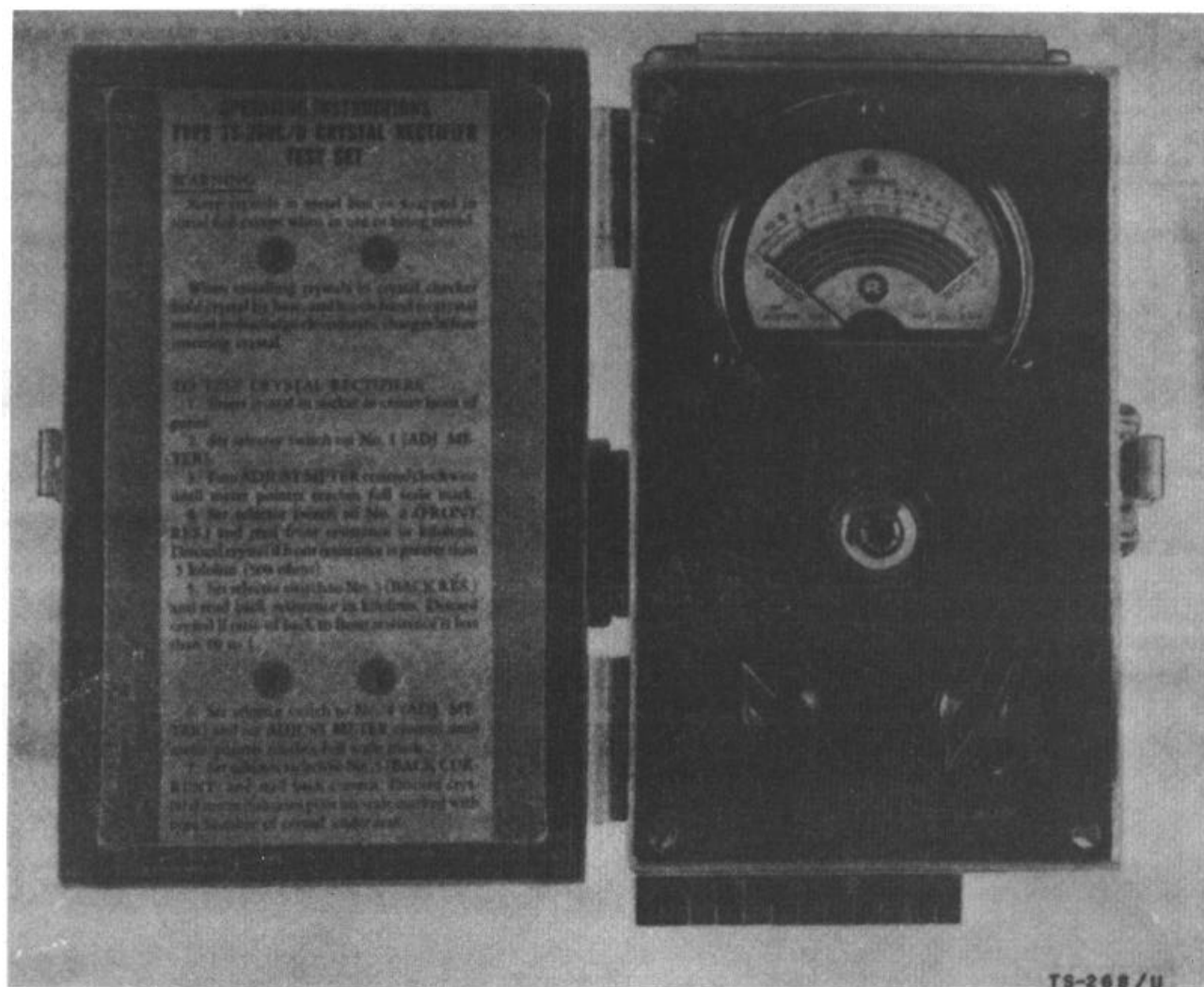
CRYSTAL RECTIFIER TEST SET TS-268E/U

Cog Serv: USA FSN: 6625-649-4702

USA Line Item No: 612250

Functional Class: 1.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	George Voron and Co.			



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**TS-268E/U CRYSTAL RECTIFIER TEST SET**

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**FUNCTIONAL DESCRIPTION:**

A portable self-contained test set designed to make rapid qualitative tests on specific types of radio frequency crystal rectifiers. It measures the forward and the backward resistance of the crystal under test in order to obtain a ratio which indicates quality. The condition of the crystal rectifier can also be determined by measurement of backward current flow. Maximum allowable current values are listed in the cover of the test set.

All controls necessary for operation are readily accessible on the panel of the equipment. The panel also incorporates a meter which is calibrated in kilohms for resistance measurements and in milliamperes for current readings.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS268D/U except that the "E" has two crystal holders and no colored scales for acceptance or rejection of crystals.

**TECHNICAL DESCRIPTION:**

*Pwr Supply:* 1.5 volts supplied by one Battery BA30 (1.5 volts)

*Resistance Range:* 0 to 10,000 ohms

*Current Range:* 0 to 1 milliampere, dc

*Basic Meter Resistance:* 100 ohms

*Basic Meter Accuracy:*  $\pm 2\%$  of full scale

*Temp Range:*  $-20^{\circ}\text{C.}$  ( $-4^{\circ}\text{F.}$ ) to  $+49^{\circ}\text{C.}$  ( $+120^{\circ}\text{F.}$ )

*Type Crystals Checked:* 1N21, 1N21A, 1N21B, 1N23 1N23A, 1N23B, 1N25. and 1N26

*Major Units:* 1 TS268E/U 0.32; 6 1/2" x 10 1/2" x 8"; 8 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 33A1-12-46-1; TM 11-1242

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

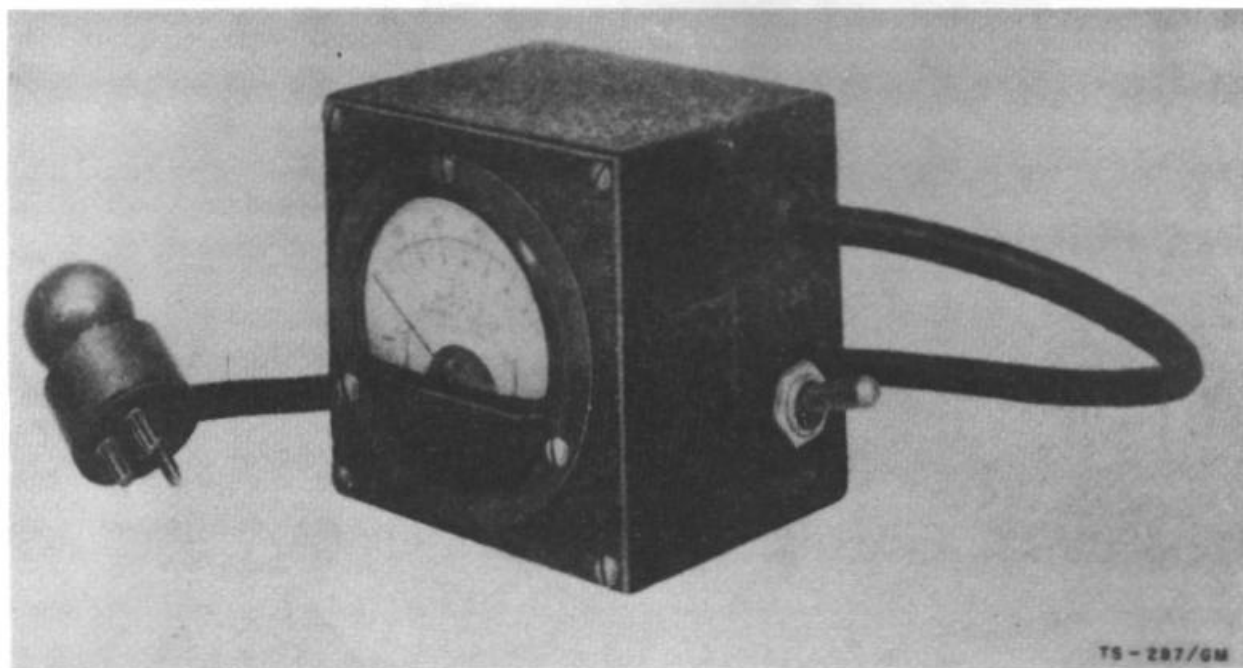
BATTERY TESTER TS-287/GM

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 1.2.4

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Julien P. Friez and Sons			

**FUNCTIONAL DESCRIPTION:**

Battery Tester TS-287/GM is a dual scaled voltmeter used in testing and checking closed circuit voltages of radiosonde batteries under load.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Loaded Range:* 0 to 7.5, 150 v dc

*Major Units:* 1 TS-278/GM 3" x 3" x 3"

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Instruction Book

Sig C Spec 71-4945; Dwgs SC-D-17152, SC-D-17153



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Serv: USA FSN: 6625-498-3677

USA Line Item No:

MULTIMETER TS-297/U

Functional Class: 1.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-C	Std	Std	-----
Manufacturer:	Chicago Industrial Instrument Co.			



AGO 10038A 63

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**TS-297/U MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

Multimeter TS-297/U is a portable test instrument used in the maintenance and repair of electronic equipment. It checks voltage, current, or resistance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment replaces Test Set I-77, Test Unit 1-236, and Multimeters I-239 and TS-380/U.

Equipment Required But Not Supplied: Battery: (1) BA-42

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 1.5 v dc

*Voltage Range:* 0 to 4, 10, 40, 100, 400, 1,000 v ac, dc

*Current Range:* 0 to 4, 40, 100, 400 ma dc

*Resistance Range:* 0 to 1,000; 10,000; 100,000 ohms

*Sensitivity:* 1,000 ohms/v

*Major Units:* 1 TS-297/U 6 1/8" x 3 1/4" x 3 1/4"; 3.3 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-5500, TO 16-2CCB-1, TO 16-35TS297-5

MIL-M-10263

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

5 November 1954		VOLTMETER TS-340/U		
Cog Serv: USA FSN:				
USA Line Item No:		Functional Class: 1.1.1.5		
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	Std	-----
Manufacturer:	Weston Electrical Instrument Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Voltmeter TS340/U is a portable electrodynamic-type instrument used in measuring alternating and direct voltage.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment is similar to Weston Model 455.

#### TECHNICAL DESCRIPTION:

*Freq Range:* 25 to 400 cy

*Voltage Range:* 0 to 150, 300, 750 v ac, dc

*Accuracy:*  $\pm 5\%$

*Major Units:* 1 TS-340/U 6 5/8" x 5 3/4" x 3 1/2"; 3.6 lbs.

#### TUBES, CRYSTALS, TRANSISTORS:

None

#### REFERENCE DATA AND LITERATURE:

Sig C Spec 71-2202A

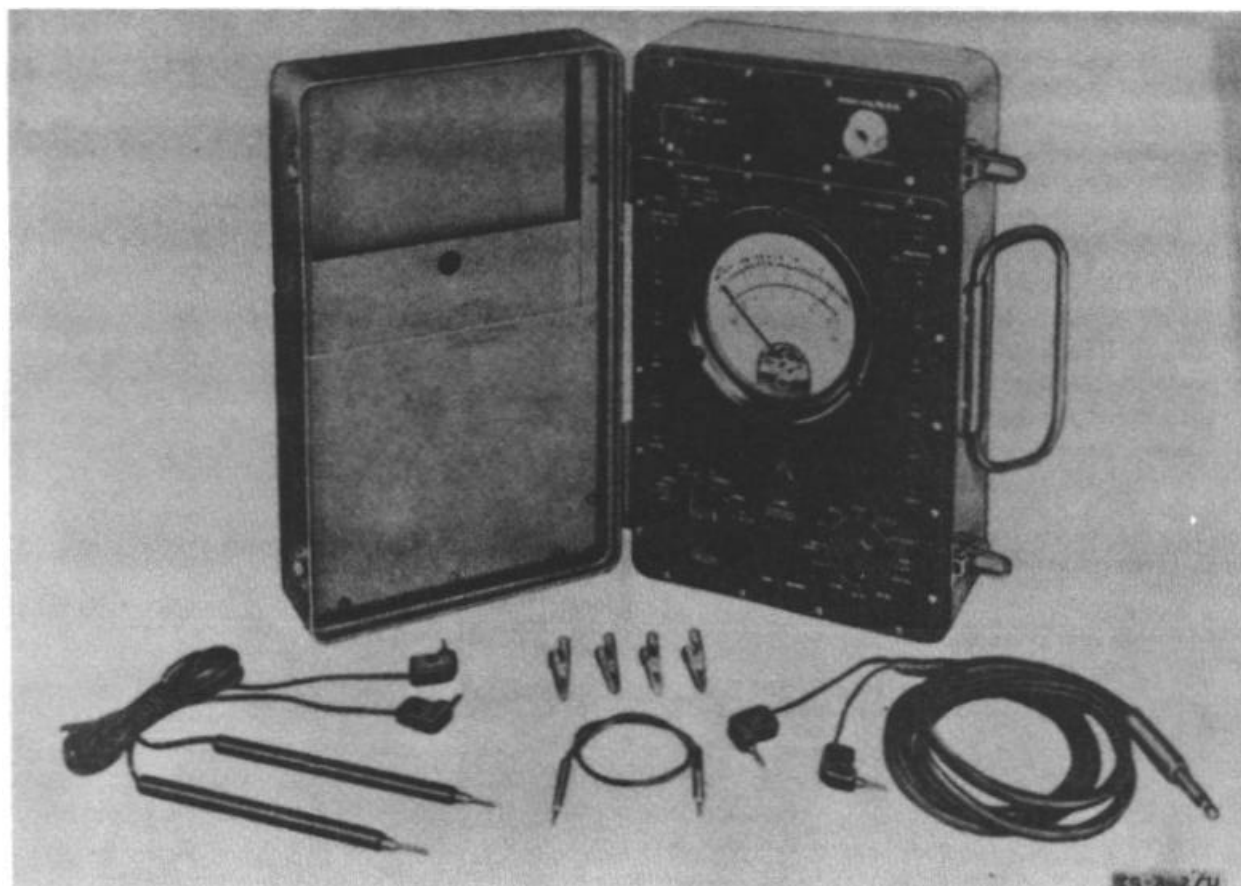
MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

16 September 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

MULTIMETER TS-352B/U

Functional Class: 1.1.3.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	L/Std	L/Std	-----
Manufacturer:	Phaostron Co.			



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**TS-352B/U MULTIMETER**

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**FUNCTIONAL DESCRIPTION:**

Multimeter TS-352B/U is a portable multirange circuit-analysis and trouble-shooting instrument used on electrical and electronic equipment, giving accurate readings, on all ranges, under climatic extremes.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Test Set AN/GPM-1, supersedes Ohmmeter I-67, Test Unit I-176, Voltmeter IS-189, Receiver Analyzer Equipment OE-11, and Test Meter TS-80/U. The main multimeter panel, including all electrical components except the 5,000-volt multiplier and the batteries, is known as Multimeter ME-9/U. The multiplier, providing a 5,000-volt dc range at 20,000 ohms per volt sensitivity, is known as Multiplier Kit MX-815/U.

Equipment Required But Not Supplied: Batteries: (1) BA-30, (3) BA-31

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 15 v dc

*Freq Range:* 25 to 5,000 cy

*Voltage Range:* 0 to 2.5; 10; 50; 250; 500; 1,000 v ac, dc  $\pm 39^\circ$

*Current Range:* 0 to 250 ua, 2.5, 10, 50, 100, 500 ma; 2.5, 10 amp dc

*Resistance Range:* 0 to 300; 30,000; 300,000 ohms; 3, 30 meg

*Major Units:* 1 ME-9G/U; 9" x 7" x 5 1/2"; 4.69 lbs.

1 MX-815B/U; 2 1/4" x 7" x 2 1/4"; .5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS352-31, TO 16-35TS352-32, TO 16-35TS352-34

MILM4269

1 March 1964

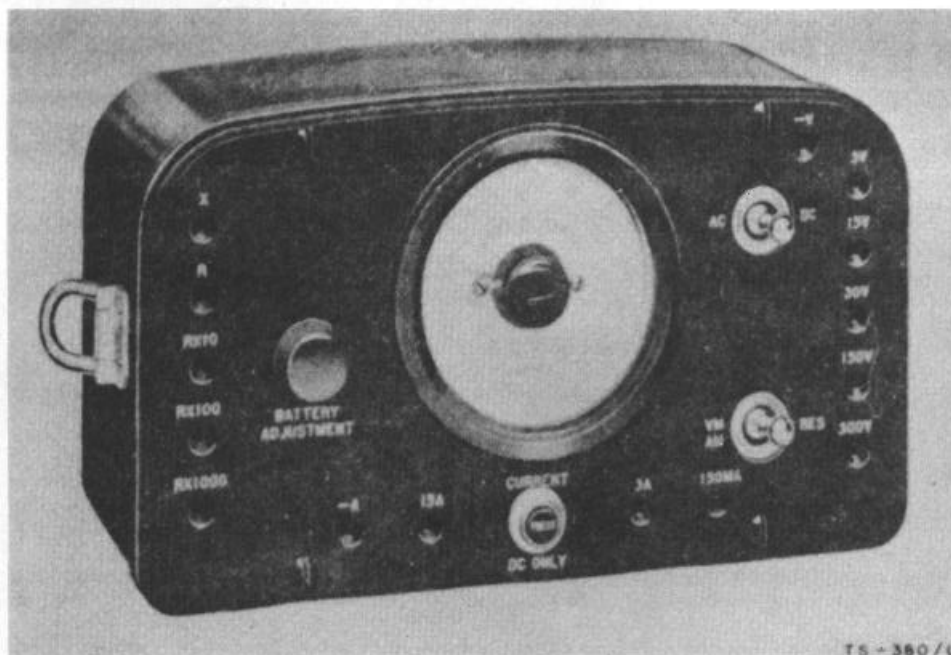
Cog Serv: USA FSN: 6625-188-3104

USA Line Item No:

MULTIMETER TS-380/U

Functional Class: 1.1.3.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-B	-----	-----	-----
Manufacturer:	Western Electric Co.			

**FUNCTIONAL DESCRIPTION:**

Multimeter TS-380/U is a portable volt-ohmmilliammeter used in measuring ac and de voltage, direct current, and resistance of ground wire communication equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Volt-Ohm-Milliammeter, Western Electric D-166852.  
Equipment Required But Not Supplied: Battery; (1) BA-31

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 4.5 v dc  
*Voltage Range:* 0 to 3, 15, 30, 150, 300 v ac, dc  
*Current Range:* 0 to .15, 3, 15, amp dc  
*Resistance Range:* 0 to 1,000; 10,000; 100,000; 1,000,000 ohms  
*Accuracy:*  $\pm 2\%$  (dc);  $\pm 5\%$  (ac)  
*Major Units:* 1 TS-380/U 7 1/2" x 4" x 3"; 3.25 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-2042 (TO 140-10)

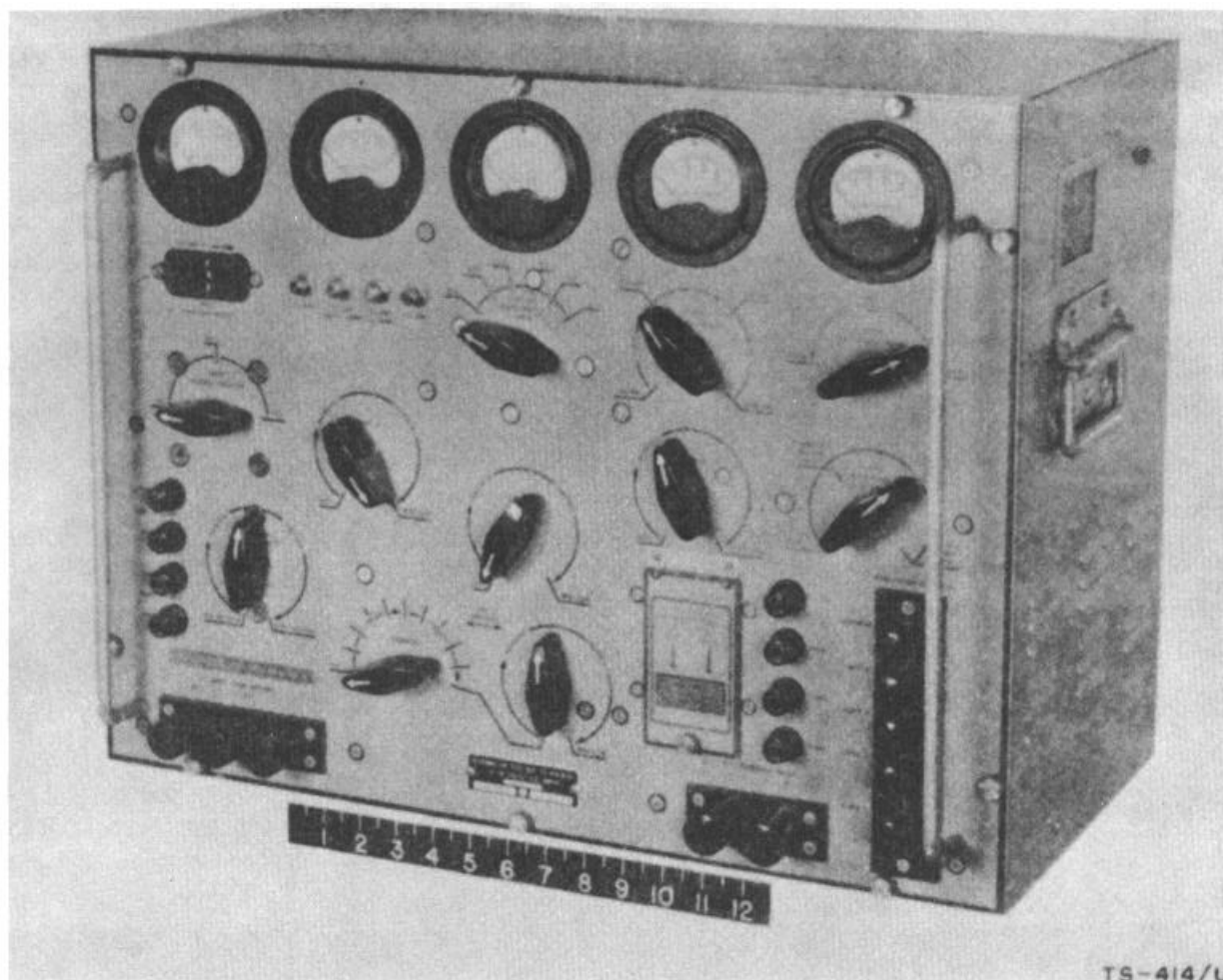
MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

28 October 1954  
Cog Serv: USAF FSN  
USA Line Item No

DYNAMOTOR TEST SET TS-414A/U

Functional Class:1.2.2.

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	United Manufacturing Co.			



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**TS-414A/U DYNAMOTOR TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Dynamotor Test Set TS-414A/U is a portable equipment used in measuring input and output voltages and currents, as well as the output ripple of single or multiple output dynamotor units.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Both models of this equipment are electrically, but not mechanically, interchangeable.

**TECHNICAL DESCRIPTION:**

*Dynamotor Input Pwr Requirements:*

*Current:* 0 to 50 amp

*Pwr:* 700 w at 14 v; 1,400 w at 28 v

*Voltage:* 14 or 28 v

*Dynamotor Output Loads:*

No. 1: 2,500 v, .5 amp

No. 2: 500 v, .5 amp

No. 3: 25 v, 5 amp

No. 4: -250 v, 25 ma

*Temp Range:* -40°C to +55°C

*Major Units:* 1 TS414A/U 18" x 23 1/2" x 12"; 65 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITIERATURE:**

USAF Spec 71-5056A; Spec MIID4629



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

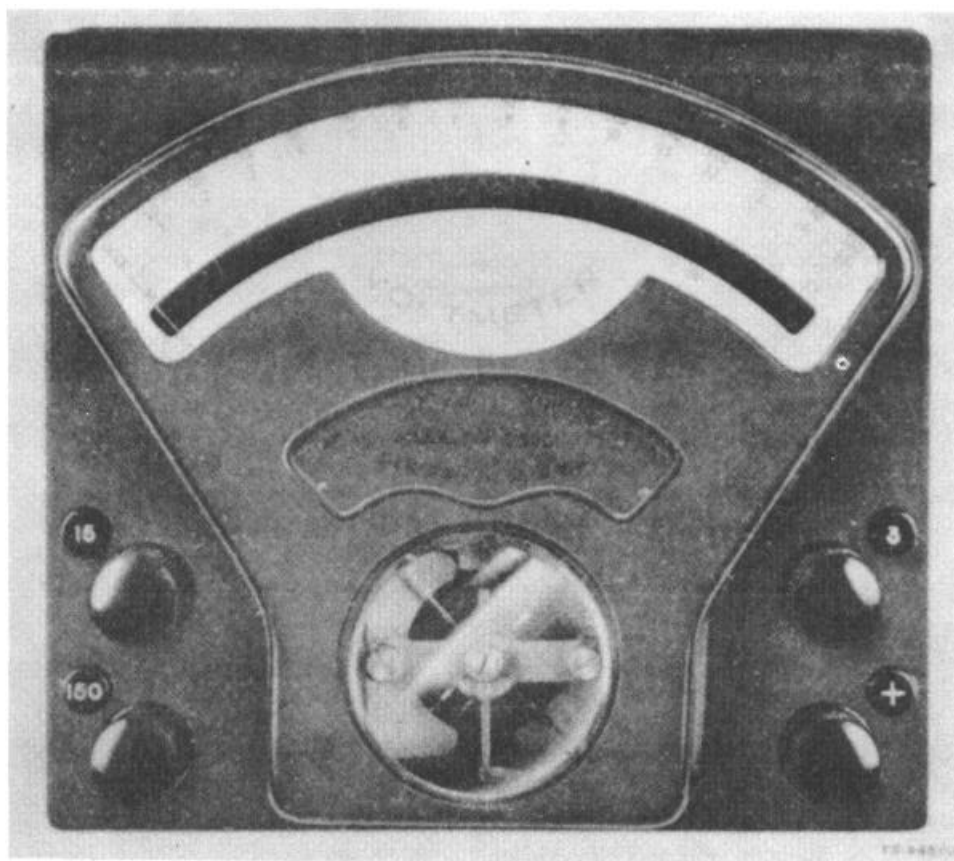
VOLTMETER TS-443/U

Cog Serv: USA FSN: 6625-193-7187

USA Line Item No:

Functional Class: 1.1.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	Weston Electrical Instrument Corp.			



AGO 10038A 73

## TS-443/ U VOLTMETER

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### FUNCTIONAL DESCRIPTION:

Voltmeter TS-443/U is a portable, multi-range apparatus used in measuring de voltage.

### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment is similar to dc Voltmeter, Weston Model 1.

### TECHNICAL DESCRIPTION:

*Voltage Range:* 0 to 3, 15, 150 v dc

*Sensitivity:* 100 ohms/v

*Accuracy:* +.256/e

*Major Units:* 1 TS-443/U 4 3/4" x 11" x 9 5/10"; 10 lbs.

### TUBES, CRYSTALS, TRANSISTORS:

None

### REFERENCE DATA AND LITERATURE:

Instruction Book

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1944

Cog Serv: USA FSN: 6625-243-0562

USA Line Item No:

ELECTRONIC MULTIMETER TS-505/U

Functional Class: 1.1.3.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	L/Std	L/Std	-----
Manufacturer:	Specialty Assembly and Packing Company, Inc.			



AGO 10038A 75

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**TS-505/U ELECTRONIC MULTIMETER**

---

**FUNCTIONAL DESCRIPTION:**

Electronic Multimeter TS505/U is a portable, vacuum-tube voltmeter and dc ohmmeter used in measuring ac and dc voltage and resistance over wide ranges. The peak-indicating ac meter scale registers rms voltage, and a zero center scale measures dc voltage of unknown polarity. The set contains an ac rectifier probe and a dc probe.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Test Set AN/GPM-1, supersedes Voltmeter TS375/U.  
Equipment Required But Not Supplied: Battery: (2) BA-30

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 v  $\pm 15$  v, 20 va, 50 to 1,600 cy ac; 3 v dc

*Freq Range:* 30 cy to 500 mc

*Voltage Range:* 0 to 200 v rms in seven ranges (ac); 0 to 1,000 v in nine ranges (dc)

*Resistance Range:* 0 to 1,000 meg in seven ranges  $\pm 4\%$

*Input Impedance:* 6 meg (min) shunted by 2 uuf at af; 50 meg on 1,000-v dc and  $\pm 500$ -v dc ranges; 20 meg on all other dc ranges

*Indicating Meter:* 1 ma dc (full-scale deflection)

*Accuracy:*  $\pm 4\%$  (full scale dc v); -61/o (full scale for ac sinusoidal input from 30 cy to 500 Mc)

*Major Units:* 1 TS-505/U 6 1/4" x 9 1/8" x 9 3/4"; 15 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6AL5 or 5726, (2) 6AU6, (1) 6X4, (1) 12AT7, (2) 991

**REFERENCE DATA AND LITERATURE:**

TM 11-5511

MIL-M-3138

MIL-HDBK-172A, VOL I/TM 11487H-1//NAVSHIPS 93003A

13 December 1954

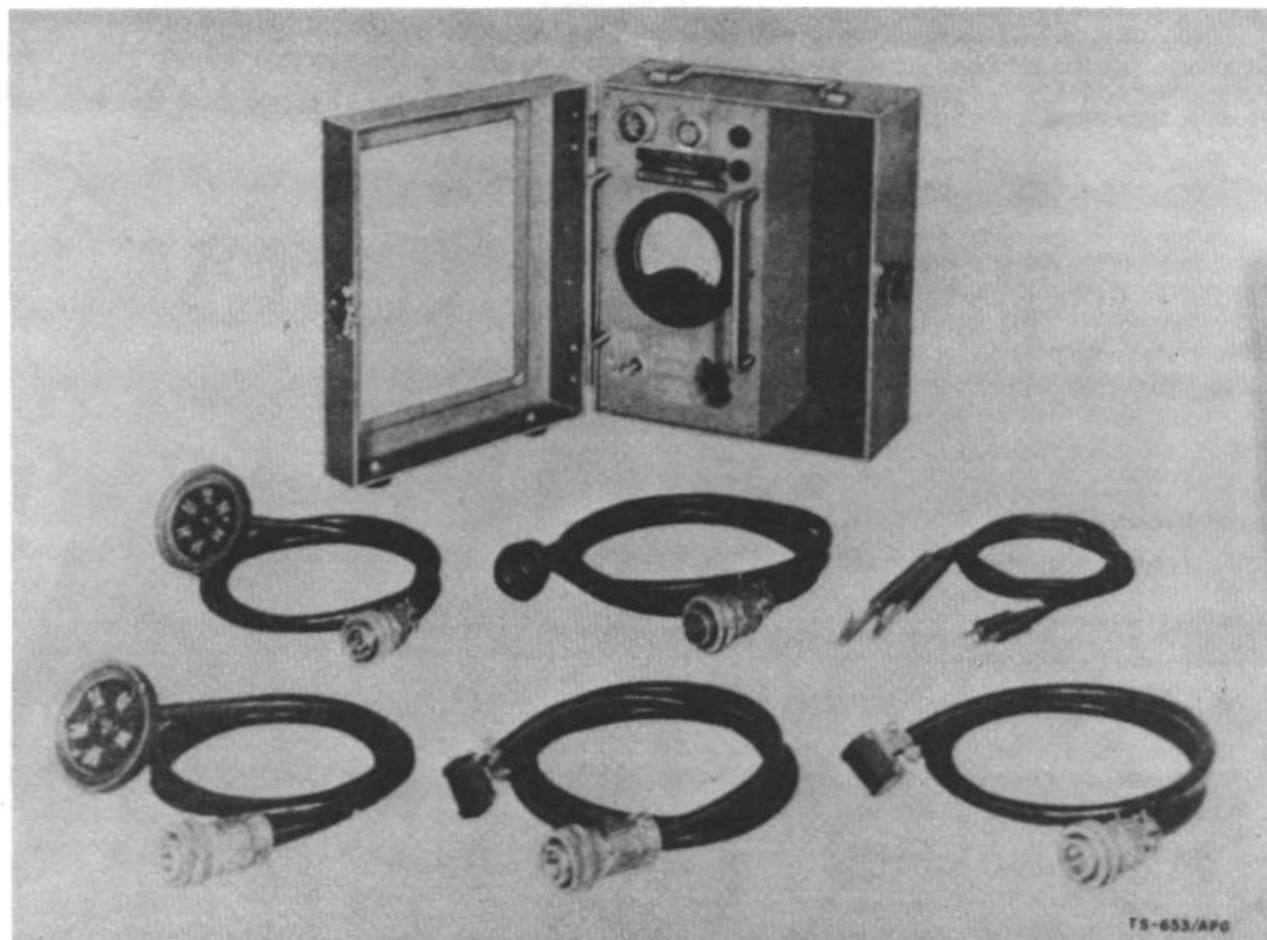
SYNCHRO PHASING TESTER TS-653/APG

Cog Serv: USA FSN:

Functional Class: 1.2.6.

USA Line Item No:

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Monument Engineering Co.			



AGO 10038A 77

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**TS-653/APG SYNCRO PHASING TESTER**

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**FUNCTIONAL DESCRIPTION:**

Synchro Phasing Tester TS-653/APG is a portable instrument used in adjusting aircraft type selsyn generators, differentials, and control transformers to minimum, maximum, or zero ; voltage. It may also be applied as a voltmeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Both models of this equipment, which supersedes Phasing Analyzer TS-215/AP, are identical except for the addition of a Marion Meter in the A model.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 v, 50 to 800 cy ac

*Voltmeter Frequency Range:* 50 to 800 cy

*Voltage Range:* 0 to 1.5, 30, 300 v ac

*Sensitivity:* 2,000 ohms/v

*Major Units:* 1 TS53/APG 9" x 8" x 5"; 6.5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS653-6, TO 16-35TS6538

USAF Spec 7189; Dwg 48D13172

MIL-HDBK-172A, VOL I/TM 1187H-1 /1 /NAVSHIPS 93003A

20 August 1954

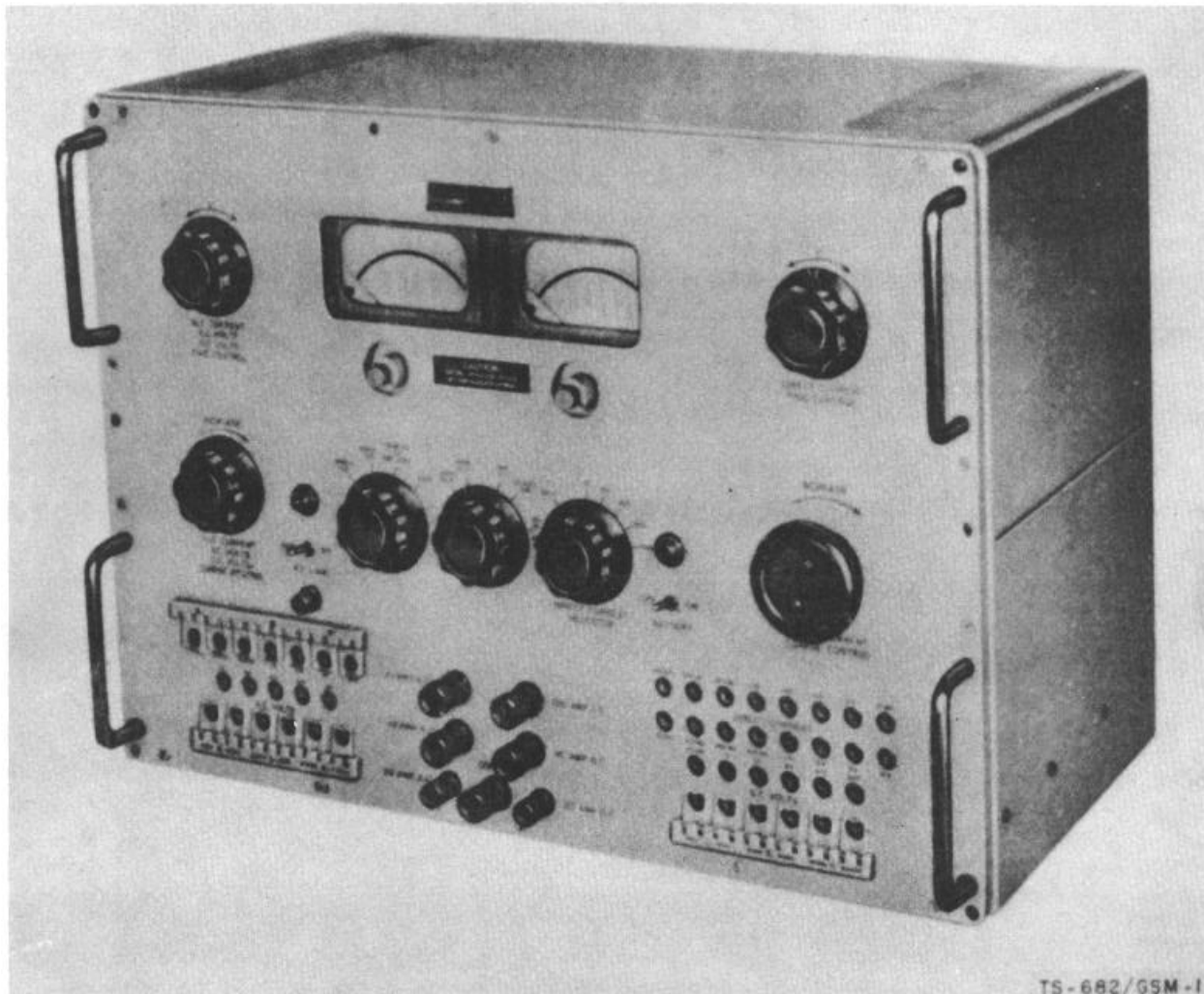
Cog Slav: USA FSN:

USA Line Item No:

METER TEST SET TS-682/GSM-1

Functional Class: 1.1.3.2.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Espey Manufacturing Co.			





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**TS-682/GSM-1 METER TEST SET**

---

**FUNCTIONAL DESCRIPTION:**

Meter Test Set TS-682/GSM-1 is a portable test instrument used in measuring performance characteristics of ac and dc voltmeters and ammeters. It consists primarily of a meter test set and associated equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Meter Test Equipment AN/GSM-1.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 V, 60 cy ac; 12 v dc

*Current Range:* 0 to 100, 200, 400 ua dc; 0 to 1, 2, 4, 10, 20, 40, 100, 200, 400 ma dc; 0 to 100, 200, 400 ma ac;

0 to 1, 2, 4, 10, 20, 40, 100 amp ac, dc

*Voltage Range:* 0 to 100 mv dc; 0 to 1; 2; 4; 10; 20; 40; 100; 200; 400; 1,000; 2,000 v ac, dc

*Accuracy:*  $\pm 1\%$

*Major Units:* 1 TS-682/GSM-1 21" x 13 1/3"x 30"; 265 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 3B28

**REFERENCE DATA AND LITERATURE:**

TM 11-2535A

MIL-T-11656



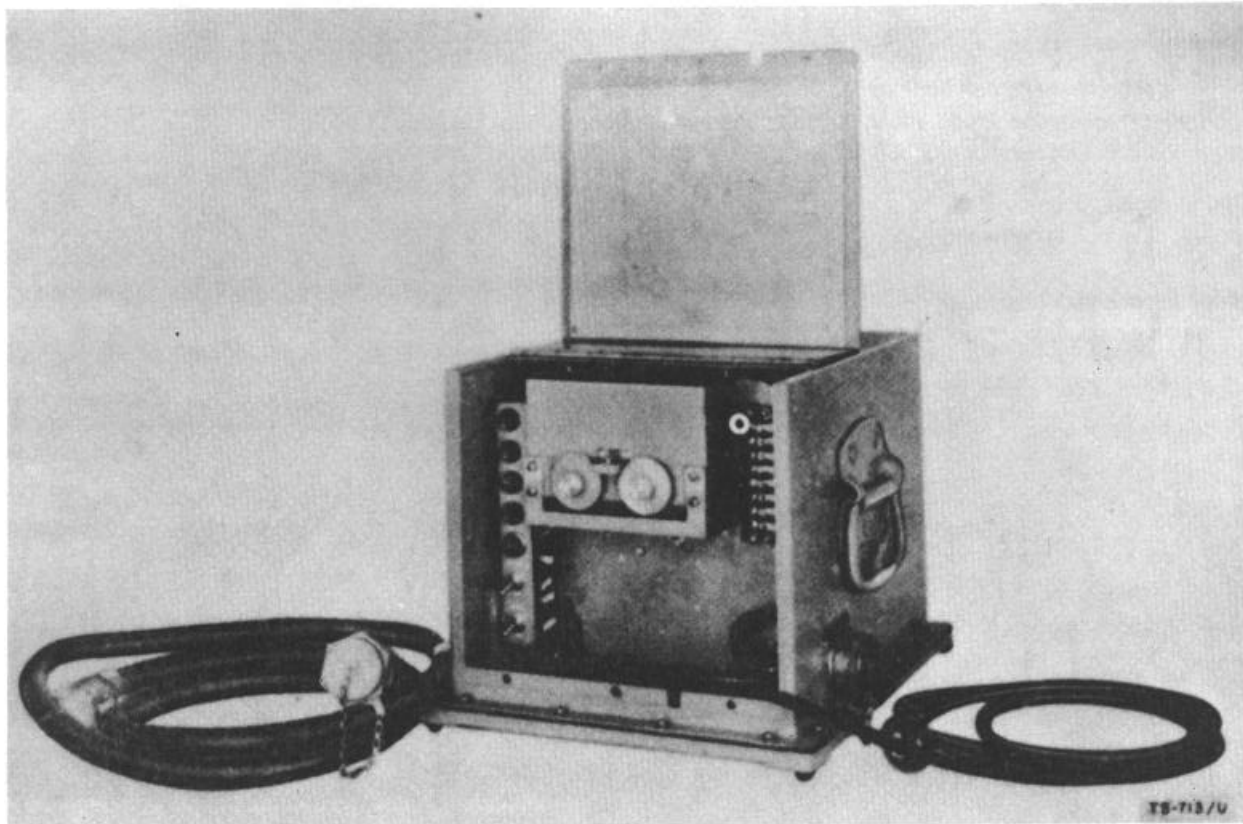
## MIL-HDBK-172A, VOL I/TM 11487H-1/1/NAVSHIPS 93003A

23 November 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

SYNCHRO TEST SET TS-713/U

Functional Class: 1.2.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Airborne Instruments Laboratories, Inc.			



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**TS-713/U SYNCRO TEST SET**

---

**FUNCTIONAL DESCRIPTION:**

Synchro Test Set TS713/U is a portable equipment used in simulating the output of antenna selsyns. Application is in depot testing of radar antenna systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 120 V, 60 cy, 1 phase ac

*Driven Speeds:* 3.3 rpm, 5 rpm, 6.6 rpm, 10 rpm

*Selsyn Ratio:* 1 to 1; 36 to 1

*Major Units:* 1 TS-713/U 11 1/4" x 14 3/4" x 13"; 60 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 16-30FPS3-13

Watson Laboratories Exhibit ENG2144

## MILIHDBK-172A, VOL I/TM 11-487H1/1 /NAVSHIPS 93003A

1 March 1964

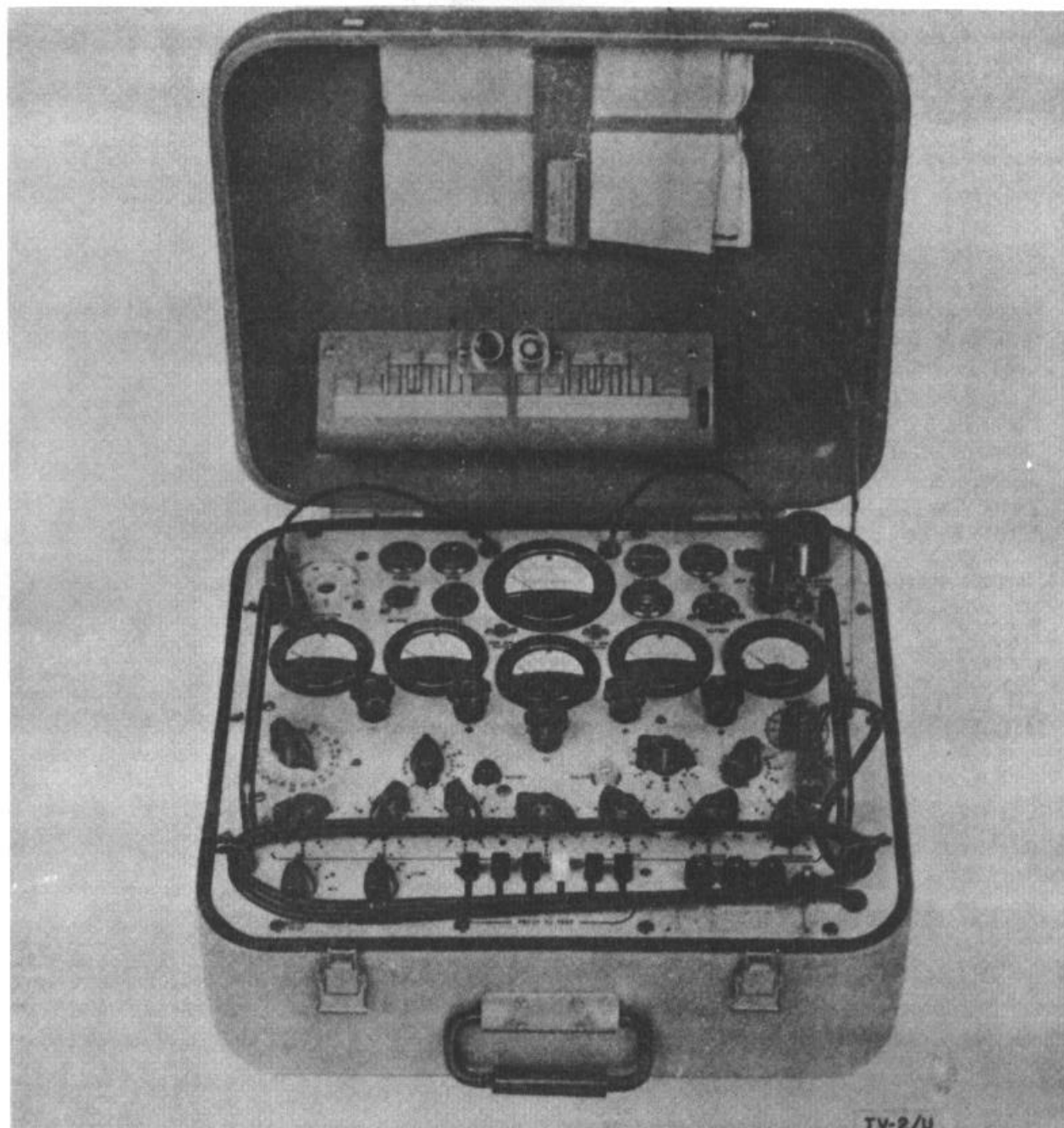
Cog Serv: USA FSN:

USA Line Item No:

TEST SET, ELECTRON TUBE TV-2/U

Functional Class: 1.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Obs	L/Std	-----
Manufacturer:	CBS-Columbia, Inc.			



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**TV-2/U TEST SET, ELECTRON TUBE**

---

**FUNCTIONAL DESCRIPTION:**

Electron Tube Test Set TV-2/U is a portable instrument used in measuring dynamic mutual conductance qualities of commercial and JAN type electron tubes of the receiving and low power transmitting class. It detects internal shorts and gas in vacuum tubes, detects and measures leakage between tube elements, measures gas current and filament voltage, and checks tube and pilot lamp filament circuit continuity, emission of rectifier tubes, electron ray tube operation, firing point of thyratrons, and ballast tubes for proper operation.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is designed to replace Tube Tester I-177.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 100 w, 115 or 230 v  $\pm 10\%$ , 50 to 1,000 cy, 1 phase ac

*Emission Current Indication:* 3.5 ma, 12.5 ma, 56 ma, 119 ma (max)

*Filament Range:* .55 to 125 v

*Filament Voltage Indication:* 0 to 3, 10, 30, 100 v dc

*Gas Regulator Current Indication:* 1.3 ma, 5 ma, 10 ma (min); 3.5 ma, 30 ma, 50 ma (max)

*Grid Bias Indication:* 0 to 5, 10, 50 v dc  $\pm 2\%$

*Leakage Indication:* 0 to .25, .5, 1 meg

*Mutual Conductance Range:* 0 to 80,000 umhos

*Plate Voltage Indication:* 0 to 250 v dc  $\pm 5\%$

*Screen Voltage Indication:* 0 to 250 v dc  $\pm 5\%$

*Signal Level Indication:* .25 v, .5 v, 2.5 v ac; 50 to 1,000 cy

*Temp Range:* -4°F to +125°F

*Major Units:* 1 TV-2/U 8 1/2" x 13 1/4" x 17 1/2"; 45 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(2) 6X4, (1) 83

**REFERENCE DATA AND LITERATURE:**

TM 11-2661

MILT-10441, 27 November 1951

MIL-HDBK-172A, VOL I/TM 11487H-1/1/NAVSHIPS 93003A

1 March 1964

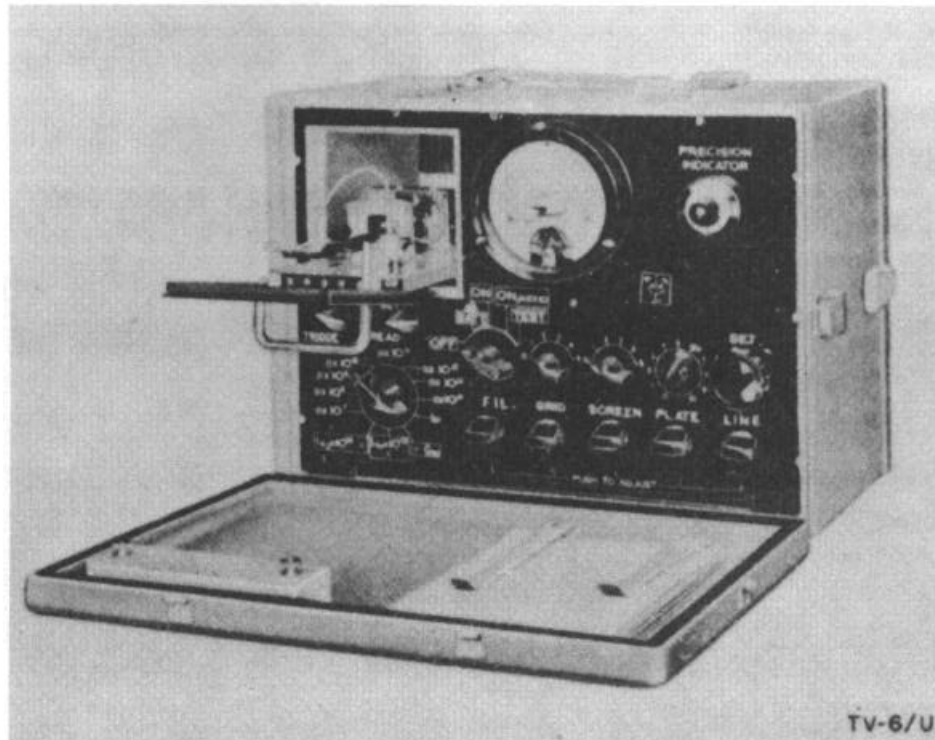
Cog Slav: USA FSN:

USA Line Item No:

TEST SET, ELECTRON TUBE TV-6/U

Functional Class: 1.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	Std	-----
Manufacturer:	Bendix Aviation Corp.			



AGO 10038A 85

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**TV-6/U TEST SET, ELECTRON TUBE**

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**FUNCTIONAL DESCRIPTION:**

Electron Tube Test Set TV-6/U is a portable instrument used in measuring high resistance and in checking subminiature electrometer tubes employed in radiac and other equipment. It measures grid current, plate current, transconductance, and leakage, as well as grid and plate voltages of electrometer tubes. Application is in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, similar to Bendix Model 602, supersedes Tube Tester TV-5/U.  
Equipment Required But Not Supplied: Batteries: (12) BA-30, (7) BA-34

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* Battery operated

*Voltage Range:* 0 to 1.5 v dc (fil) ; 0 to 7.5 v (grid, screen) ; 0 to 15 v (plate)  $\pm 5\%$

*Current Range:* 0 to 100 ua, 0 to 1,000 ua (plate) ;  $10^{-12}$  to  $10^{-14}$  amp (grid)  $\pm 5\%$

*Resistance Range:* 0 to  $10^{-15}$  ohms  $\pm 5\%$

*Transconductance Range:* 0 to 1,000 umhos  $\pm 5\%$

*Major Units:* 1 TV-6/U 11" x 15 3/16" x 10 1/2"; 40 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-5087



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

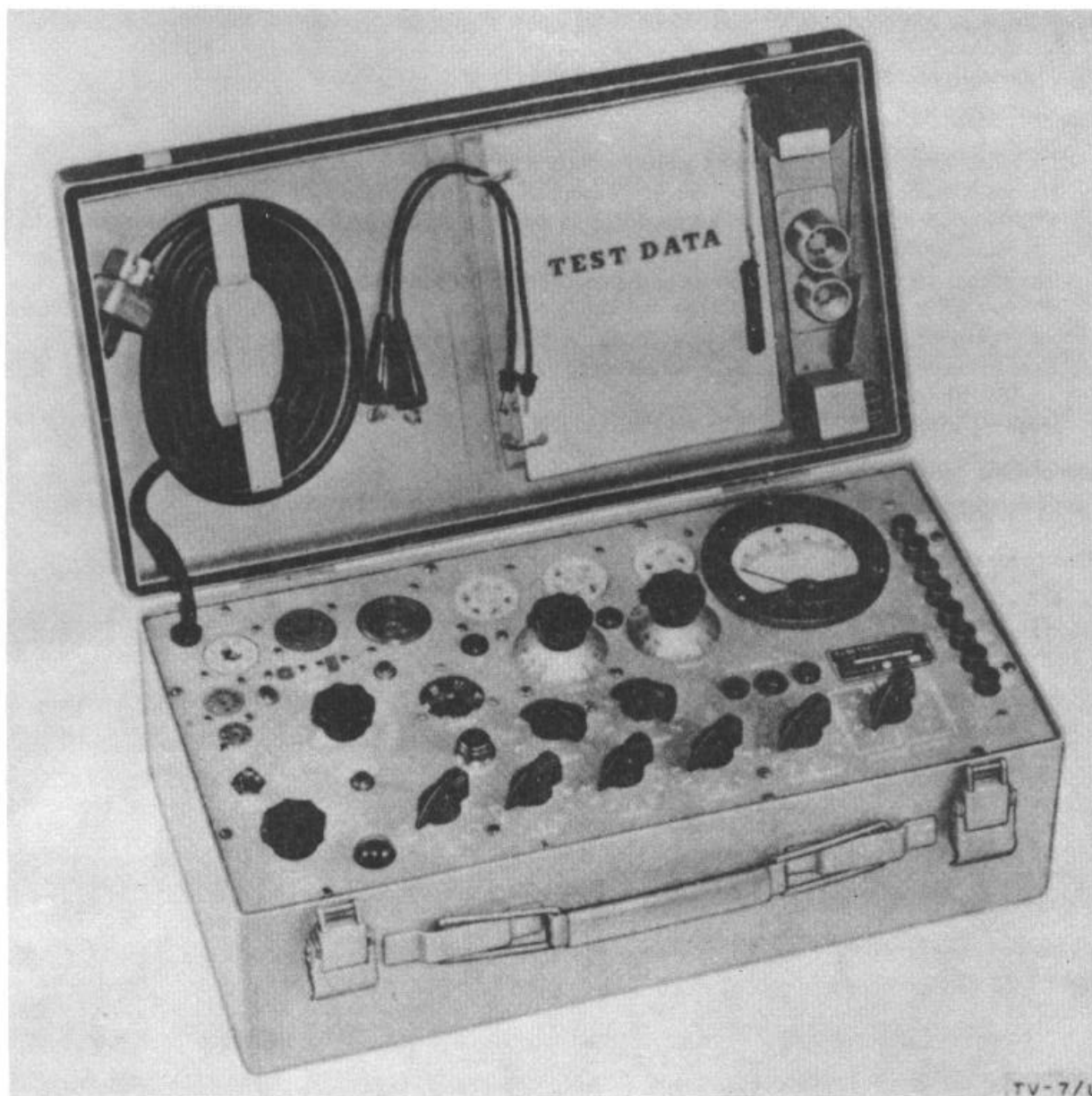
Cog Serv: USA FSN:

USA Line Item No:

TEST SET, ELECTRON TUBE TV-7/U

Functional Class: 1.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	A/Std	Std	-----
Manufacturer:	Hickok Electrical Instrument Co.			



AGO 10038A 87

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**TV-7/U TEST SET, ELECTRON TUBE**

---

**FUNCTIONAL DESCRIPTION:**

Electron Tube Test Set TV-7/U is a portable instrument used in measuring conductance, detecting and measuring internal shorts, checking emission, detecting gas and intermittent contacts of commercial and JAN type electron tubes, and testing pilot lamps having miniature bases. Application is in organizational and field testing and maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set AN/GPM-1.

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 55 w, 115 v  $\pm 10\%$ , 50 to 1,000 cy ac

*Mutual-Conductance Range:* 0 to 3,000; 6,000; 15,000; 30,000 umhos  $\pm 10\%$

*Filament Range:* 1.1 v, 1.5 v, 2 v, 2.5 v, 3 v, 4.3 v, 5 v, 6.3 v, 7.5 v, 10 v, 12.6 v, 20 v, 25 v, 35 v, 50 v, 75 v, 117 v

*Gas Check Sensitivity:* 1 ua (min) of gas current within tube

*Short Check Indication:* Leakage or shorting between tube elements is indicated on neon lamp when less than 100 v ac, peak, is placed across them.

*Temp Range:* -4°F to +125°F (operating) ; -80°F to +160°F (nonoperating for 72 hr continuous exposure)

*Major Units:* 1 TV-7/U 5 3/4" x 15 1/2" x 8 1/2"; 25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 5Y3GT, (1) 83

**REFERENCE DATA AND LITERATURE:**

MIL-T-12424

MIL-T-11754



**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A**

**CATEGORY 2**

**FREQUENCY MEASURING EQUIPMENT**

## CATEGORY 2

## FREQUENCY MEASURING EQUIPMENT

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MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

22 June 1954

Cog Serv: USN FSN:

USA Line Item No: 697559

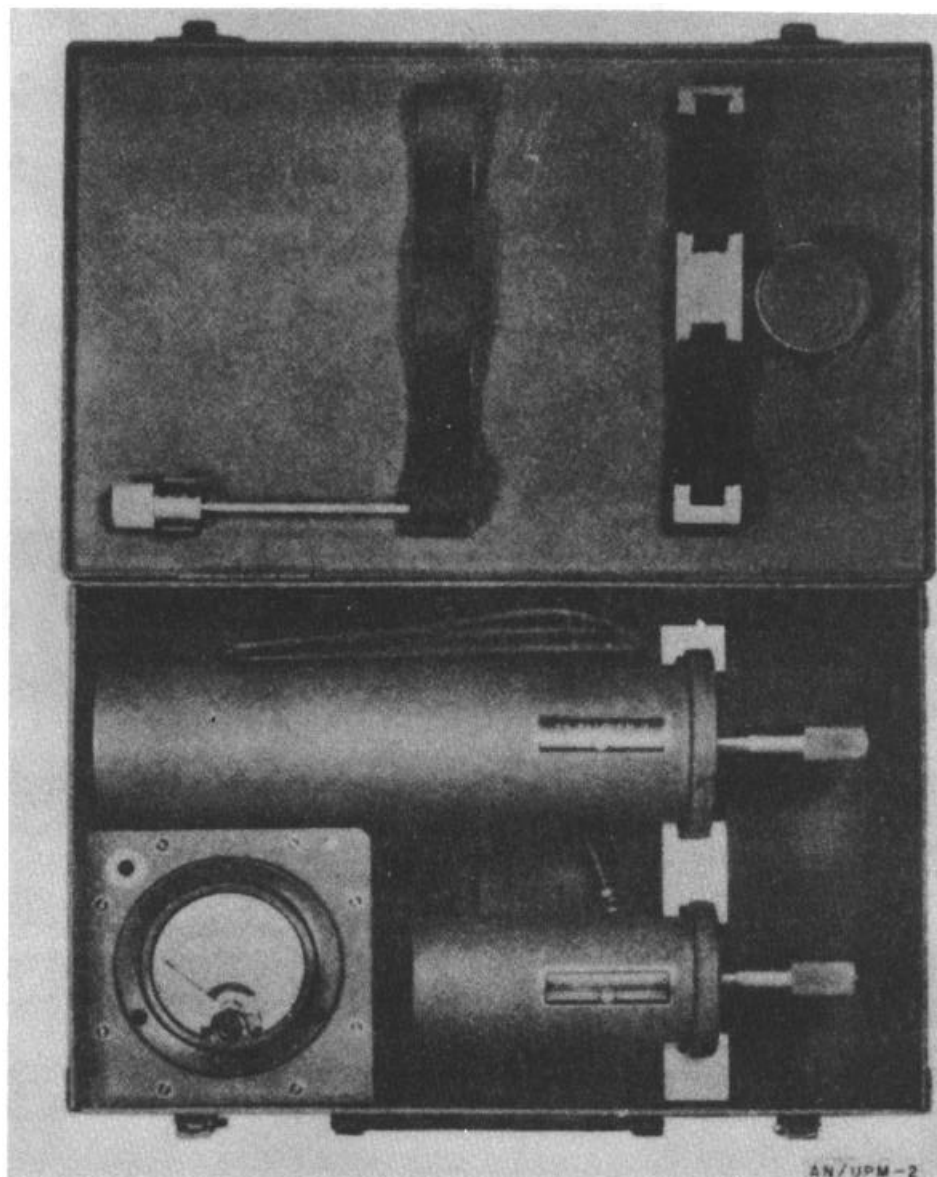
WAVEMETER TEST SET AN/UPM -2

Functional Class:2.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	-----	-----

Manufacturer:

G. Kalhart Co.



AGO 10038A 93

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**AN/UPM-2 WAVEMETER TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Wavemeter Test Set AN/UPM-2 is a portable, absorption-type test set used in CW frequency measurements of jamming transmitters of radar counter-measures systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment can be used with a cathode-ray-tube oscilloscope for visual determination of resonance.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 80 to 1,220 mc in two bands

TS-211/UPM-2: 80 to 360 mc

TS-212/UPM-2: 330 to 1,220 mc

*Sensitivity:* 5mw

*Accuracy:* +1 mc

*Major- Unit.*, 1 TS-211/UPM-2 4 3/4"x3"x12.5/16"; 3.75 lbs

1 TS-212/UPM-2 4 1/2"x1/2"x79/16 "; 2.5 lbs.

**TUBES, CRYSTALS, TRANSISTORS:**

(2) 1N25

**REFERENCE DATA AND LITERATURE:**

AN 08-30UPM-2 NAVSHIPS 900,452-1B

28 June 1954

Cog Slav: USN FSN: 6625-669-0090

USA Line Item No: 685689

TEST SET, RADAR AN/UPM-30

Functional Class: 2.2.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer:	Johnson Service Co.			

No. Illustration Available

**FUNCTIONAL DESCRIPTION:**

Radar Test Set AN/UPM-80 is a portable, hand-tuned microwave coaxial-type echo box or resonant cavity used in checking the overall performance of radar systems.

**RELATIONSHIP TO SIMILAR QUIPMENT:**

None

**TECHNICAL DESCRIPTION:***Freq Range:* 1,150 to 13850 mc  $\pm$  5 mc*Type of Reception:* Pulse*Type of Emission:* Pulse*Decay:* 3.5 db/usec*Sensitivity:* 1-db power loss for 50-yd ringtime*Temp Coefficient:* -.105% ringtime/deg F at 68°F*Temp Range:* -65.2°F to +140°F*Major Units:*, TS545/UP; 11 9/16,"x8 1/6,"x9 5/8"; 251/4 lbs.**TUBES, CRYSTALS TRANSISTORS**

(3) IN21B

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS, 91213

BuShips Spec CS 1241A and Ships-R-81

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

22 May 1956

Cog Serv: USAF FSN: 6625-553-0118

USA Line Item No:

ANTENNA TEST SET AN/UPM-34

Functional Class: 2.4.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	General Precision Laboratory, Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable test instrument used in test flight operations for the determination of the antenna constant over a known distance. The test set is designed to count the cycles of a sine or square wave input signal by means of a mechanical counter. A remote "Start-Stop" switch permits the starting and stopping of the counting process. Results can be used to adjust the ground speed voltage slope by means of a calibrated potentiometer.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The test set contains a frequency divider circuit and a pulse shaping circuit. The frequency divider circuit consists of four stages, each of which reduces the input frequency by a factor of 2. Thus the frequency is cut down in a 16 to 1 ratio. Feedback is utilized to reduce the frequency division from a factor of 16 to 15. The pulse shaping circuit actuates the mechanical counter which registers one digit for every fifteen input pulses.

*Pwr Supply:* 115 volts  $\pm 10\%$ , ac, 50 to 1000 cycles per second, single-phase, 80 watts minimum

*Freq Range:* 25 to 300 cycles per second

*Type of Reception:* Will accept a sine wave or pulse signal of 30 to 300 millivolts at 25 to 300 cycles per second

*Counter Calibration:* 1 to 99,999 cycles

*Accuracy:* 0.01%

*Operating Temp:* -40°C (-40°F) to +55°C (+131°F)

*Amplitude:* 30 millivolts rms minimum to 300 millivolts rms maximum

*Major Units:* 1 AN/UPM-34 10"x18 1/2"x15" ; 41 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

6 JAN-5751WA, 1 JAN-5814WA, 1 JAN-6AU6WA, 1 JAN-5R4WGY, 1 JAN-6XW4, 1 JAN-5651, 2 JAN-6005, 1 JAN-6080

**REFERENCE DATA AND LITERATURE:**

TO 33AA20-2-1 (Operation Instructions)

TO 33AA20-2-2 (Service Instructions)

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

28 June 1956

Cog Slav: USAF FSN: 6625-519-3817

USA Line Item No:

SIGNAL COMPA ATOR AN/UPM-36

Functional Class: 2.5.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer:

General Precision Laboratory, Inc.

No Illustration Available

## FUNCTIONAL DISCRIPTION

A portable special purpose equipment used to compare the frequencies of incoming signals on two input lines; one is a reference line, and the other is a comparison line. Frequency relations are indicated by the rotation rate of a break in a ring-shaped pattern on the face of a cathode ray tube. A stationary pattern indicates that both frequencies are identical; any difference between the two is indicated by the fact that the break rotates in either a clockwise or counterclockwise direction depending upon whether the comparison line is at a higher or lower frequency than the reference line. Sense and magnitude of the difference in frequencies can be determined.

## RELATIONSHIP TO SMILAR EQUIPMENT:

Used to test Radar Set AN/APN-81 ( ).

## TECHNICAL DESCRIPTION:

*Circuit Information:* A crystal controlled oscillator produces a fundamental frequency of 128 kc. Two frequency divider circuits divide this signal; the first, to either 8 kc or 4 kc; the second divides the output of the first, either 8 kc or 4 kc, by 54. In the circle generator circuit, the signal is amplified and fed to both a 90° phase shift amplifier and a straight amplifier. The resulting signals, applied to the vertical and horizontal deflection plates of the cathode ray tube, cause the electron beam to sweep a circle each time the wave undergoes a complete cycle. The marker pulse generator circuit provides one pulse output to the CRT for each triggering pulse applied to its input. The triggering pulse may be obtained from three external sources in the prime equipment or from the internal signal generator. A positive (intensifying) or negative (blanking) pulse output is then applied to the control grid of the CRT, intensifying or blanking out the electron beam for the duration of the pulse.

*Primary Power Supply:*

*Comparator (Less synchro):* 115 volts  $\pm$  10%, ac, 50 to 1,000 cycles per second, single-phase, 80 watts

*Synchro excitation:* 115 volts  $\pm$  10%, ac, 380 to 420 cycles per second, single-phase

*Relay Actuation:* 28 volts, dc

*Input Signals:**Circle Input:*

*Freq:* 74 and 148 cycles per second

*Amplitude at Stated Freq:* 80 to 130 millivolts at 74 cycles per second and 100 to 150 millivolts at 148 cycles per second

*Minimum Input Impedance:* 100,000 ohms

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**AN/UPM-36 SIGNAL COMPARATOR**

---

*Marker Input (external):*

*Freq:* 74 and 148 cycles per second and harmonics

*Minimum Input Impedance:* 100,000 ohms

*Output Signals:*

4-kc Sine Wave:

*Amplitude:* 300 millivolts rms into 300-ohm load

*Harmonic Distortion:* Less than 5%

*Freq Stability:*  $\pm 0.05\%$

8-kc Sine Wave:

*Amplitude:* 300 millivolts rms into 300-ohm load

*Harmonic Distortion:* Less than 5%

*Freq Stability:*  $\pm 0.05\%$

*Synchro:*

*3-Wire Voltage:* 10 volts leg to leg

*Excitation Voltage:* 115 volts, 400 cycles per second

*Temp Range:* 40° C (-40°F) to +55°C (+131°F)

*Major Units:* 1AN/UPM-6 16 1/2" x 20 3/4" x 24 3/4"; 73 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

14 JAN-5814WA, 4 JAN-5751WA, 1 JAN-2BP1, 1 JAN-5Y3GTA

**REFERENCE DATA AND LITERATURE**

TO 33A1-8-9-1 (Operating Instructions)

TO 33A1-8-9-2 (Service Instructions)

TO 33A1-8-9-4 (Illustrated Parts Breakdown)

MIL-C4689



## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Serv: USA FSN: 6625-649-4355

USA Line Item No: 616820

FREQUENCY METER AN/URM-32

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-B	-----	L/Std	-----
Manufacturer:	Radio Frequency Laboratories			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, self-contained, crystal controlled heterodyne type meter used for field and depot testing of continuous wave or modulated carrier wave RF transmitters and signal generators. A single calibrated control and a calibrated chart are used in making frequency measurements. Crystal check points are provided on the chart. A voltmeter mounted on the front panel checks B+ and A+ voltages. Two internal frequency calibrating crystals are included.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

The AN/URM-32 is a replacement for SCR-211, TS-174/U, TS-175/U, TS-323/UR and Navy type LM.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The unknown signal is heterodyned with that of a variable frequency oscillator. The resulting beat frequency signal is audio-modulated by a combination audio amplifier and modulator to give an aural indication when sine wave signals are being measured. As zero-beat is approached by variation of the frequency of the variable frequency oscillator, the aural indication will diminish until it disappears at zero-beat. The VFO is then heterodyned to the nearest crystal check point of the crystal oscillator, and a correction knob is used to make these two signals zero-beat when the VFO indicates the check frequency, by applying a tuning correction to the VFO. Then the original operation of heterodyning to the unknown signal is repeated. In this way, required accuracy is maintained.

*Pwr Supply:* 115 volts, dc, from 2 batteries BA-419/U, and 6 volts, dc, from 1 battery BA-412/U. (Has provisions for receiving power from Power Supply PP-1243/U.)

*Freq Range:* 125 kilocycles per second to 1000 megacycles per second

*Type of Transmission:* Continuous Wave, Modulated Carrier Wave

*Internal Modulation Freq Range:* 600 to 1200 cycles per second (900  $\pm$  300 cycles per second)

*B+ Voltage:* +121.5 volts, dc

*A+ Voltage:* +5.4 volts, dc

*RF Input:* 0.1 volt, max

*RF Output:* 100 microvolts min into 50 ohms

*Audio Output Impedance:* 600 ohms

*Accuracy:*  $\pm$  0.01% of indicated freq

*Stability:*  $\pm$  0.01%

*Temp Range:* -20°C to +55°C, operational; -62°C to + 71°C, nonoperational

*Humidity Range:* Up to 95 %, operational

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**AN/URM-32 FREQUENCY METER**

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*Alt Range:* Up to 10,000 feet, operational; up to 50,000 feet, nonoperational

*Internal Crystals:* 1 and 5 megacycles per second

*Major Units:* 1 AN/URM-32 13 3/8"x11 1/4"x14 1/2"; 50 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-6C4W, 1 JAN-5814A, 2 JAN-12AT7WA, 1 JAN-OB2

**REFERENCE DATA AND LITERATURE:**

Spec. No. SCL1341, dated 15 January 1951

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Slav: USA FSN: 6625-668-9749

USA Line Item No: 616830

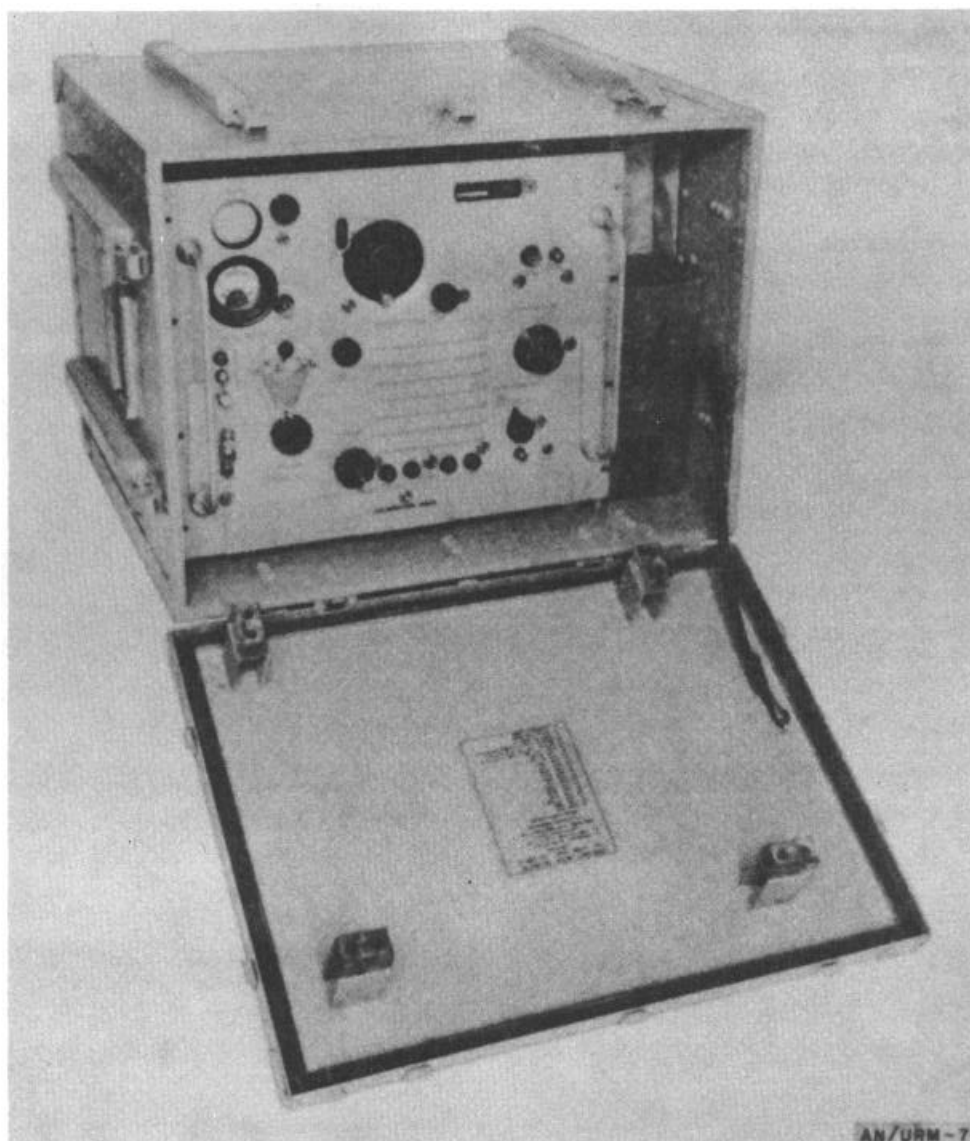
FREQUENCY METER AN/URM-79

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer:

Sparks Withington Co.



AGO 10038A 103

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**AN/URM-79 FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION**

Frequency Meter AN,URM-79 is a portable instrument used in calibrating radio transmitters and receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Freq Range:* 100 kc to 20 mc

*Calibration Data:* 50,000 dial divisions

*Major Units:* FR-4/U; 19" x 18 1/8" x 15' 21/22"

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-2094

MIL-F-11068(SigC)

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Serv: USA FSN: 6625-649-4286

USA Line Item No: 616831

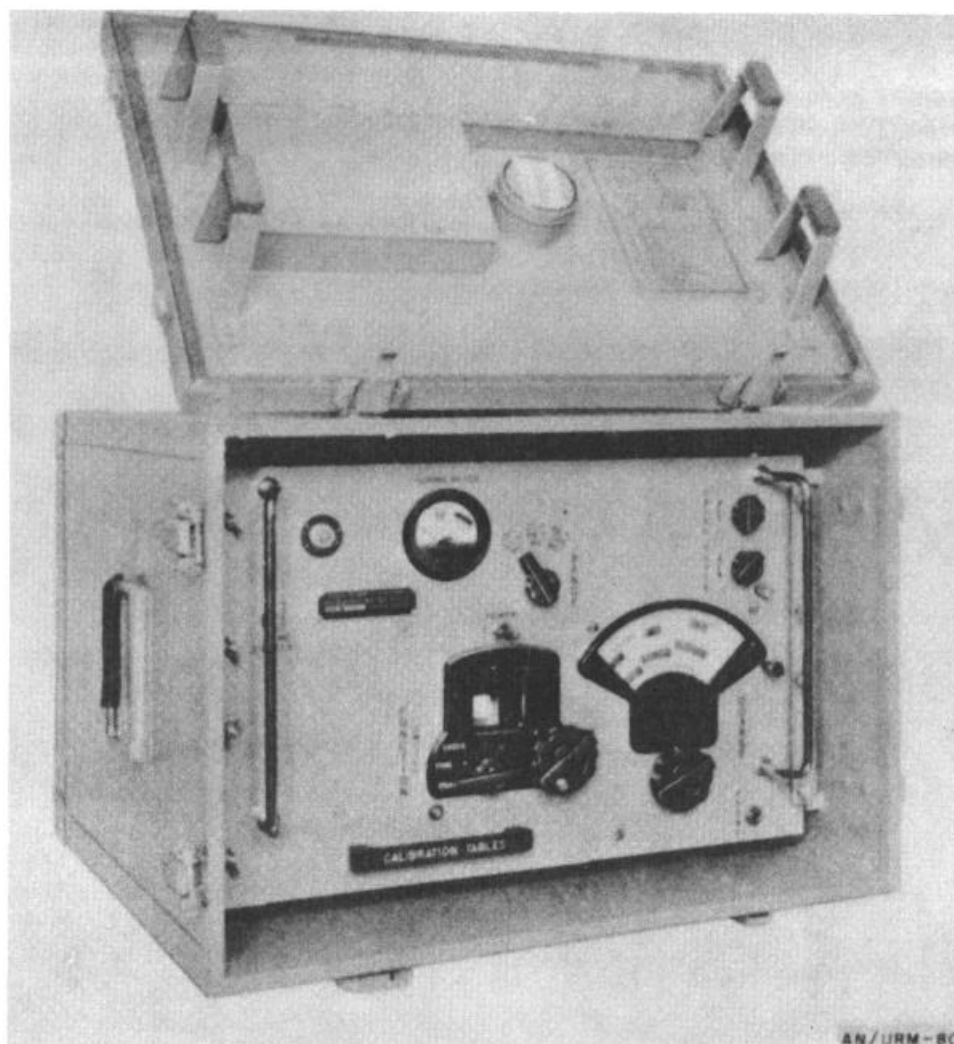
FREQUENCY METER AN/URM-80

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----

Manufacturer:

Lavoie Laboratories, Inc.



AGO 10038A 105

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**AN/URM-80 FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION:**

Frequency Meter AN/URM4O is a portable instrument used in making precision frequency measurements, as well as in calibrating radio transmitters and receivers.

**REATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Freq Range:* 10 to 100 mc

*Major Units:* FR5/U

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OA2, (1) OB2, (2) 6AH6, (3) 6AK6, (5) 6AU6, (1) 6BA6, (3) 6BN6, (1) 6C4, (2) 6X4, (7) 12AT7, (1) 5814

**REFERENCE DATA AND LITERATURE**

MIL-F-11069(SigC)

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

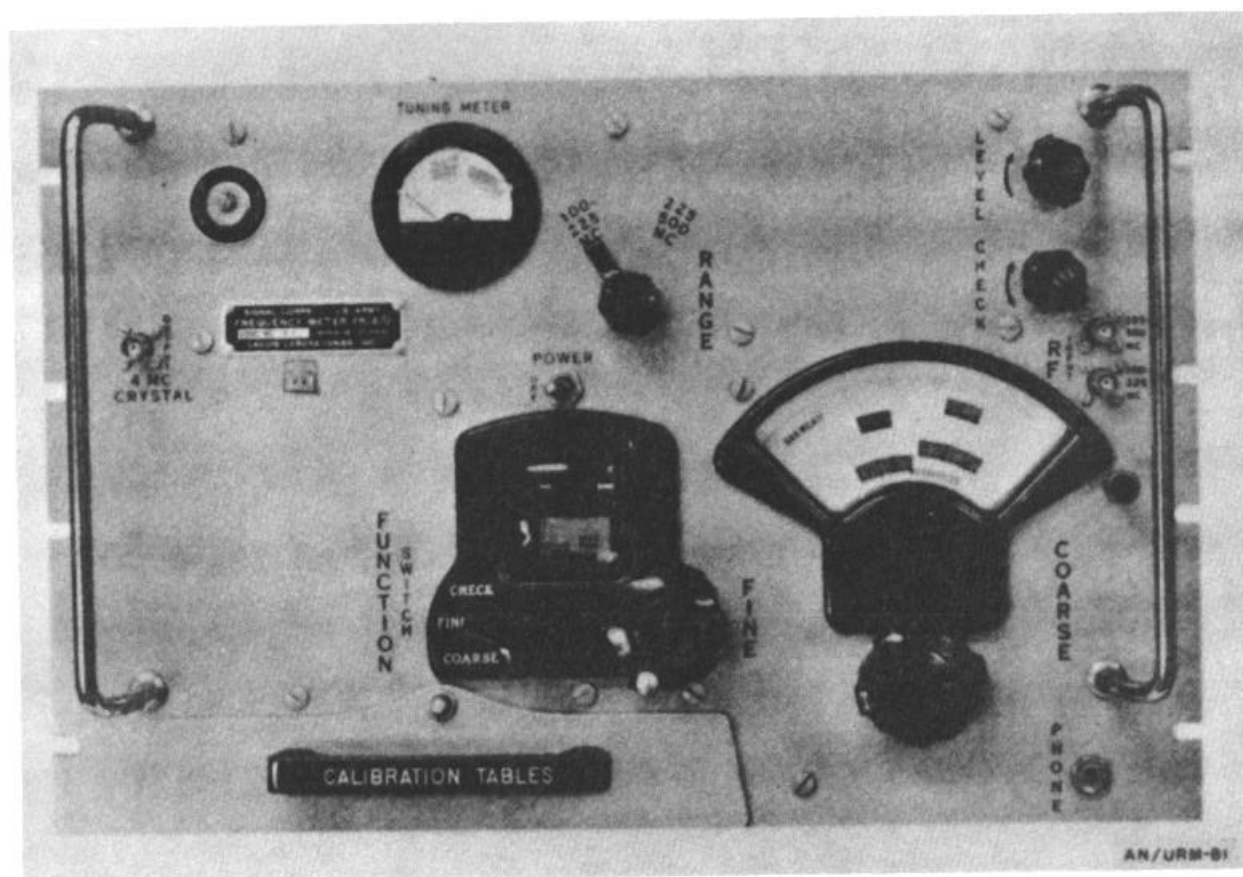
Cog Serv: USA FSN: 6625-669-0082

USA Line Item No: 616833

FREQUENCY METER AN/URM-81

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	Lavoie Laboratories, Inc.			



AGO 10038A 107

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**AN/U RM-81 FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION:**

Frequency Meter AN/URM-81 is a portable instrument used in making precision frequency measurements and in calibrating radio transmitters and receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Freq Range:* 100 to 500 mc

*Major Units:* AN,/URM-81, FR6/'U

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

MILF-10636 (SigC)



## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

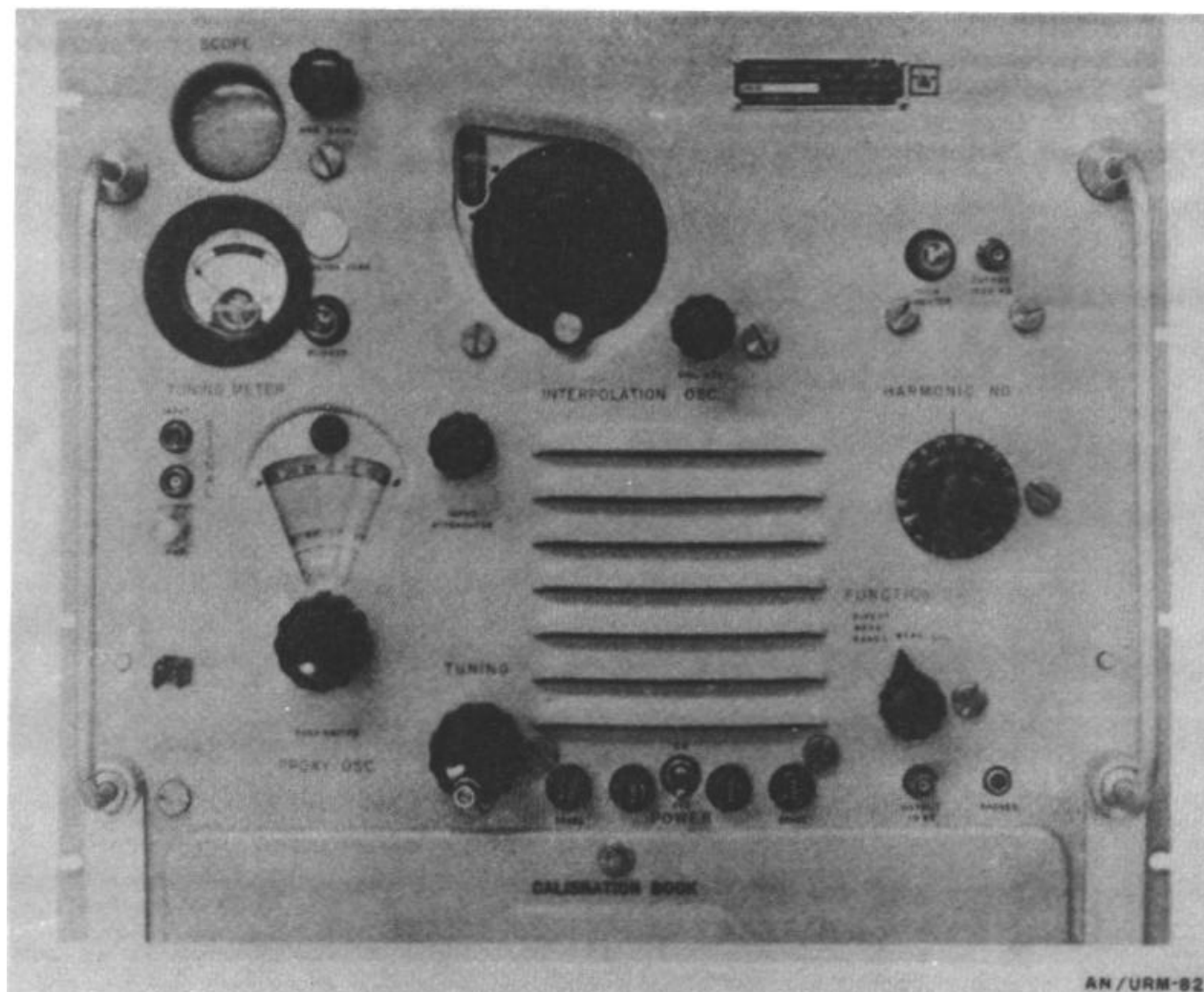
Cog Serv: USA FSN: 6625-669-0082

USA Line Item No: 6168833

FREQUENCY METER AN/URM-82

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	-----	-----
Manufacturer:	Sparks Withington Co.			



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**AN/URM-82 FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION:**

Frequency Meter AN/URM-82 is a portable instrument used in making precision frequency measurements and in calibrating radio transmitters and receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Freq Range:* 100 kc to 20 mc

*Calibration Data:* 50,000 dial divisions

*Major Units:* FR4/U

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

6 July 1955

Cog Serv: USA FSN:

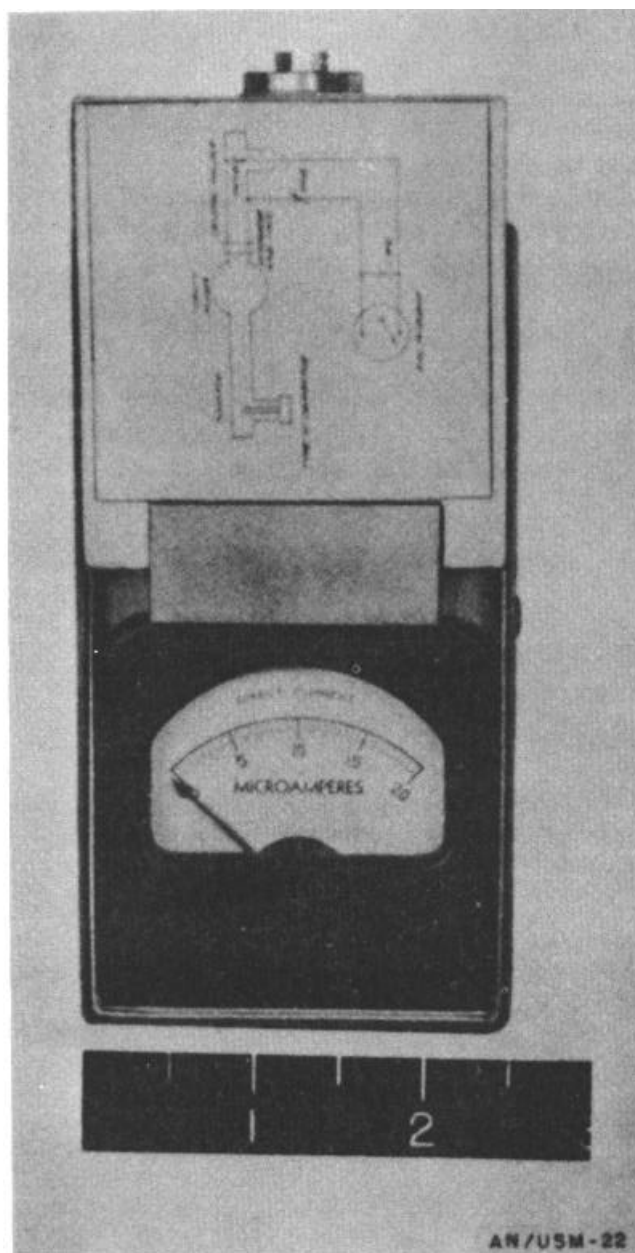
USA Line Item No:

WAVEMETER AN/USM-22

Functional Class: 2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer:



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**AN/USM-22 WAVEMETER**

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**FUNCTIONAL DESCRIPTION:**

Wavemeter AN/USM-22 is a portable, miniature, cavity-type frequency meter used as a go-no-go check for radar beacons. Application is in organizational testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Freq Range:* 9,310 mc

*Current Range:* 0 to 20 ua

*Temp Range:* -50°C to +60°C (nonoperating)

*Accuracy:* +.00322% of ref freq;  $\pm .3$  mc of ref freq

*Major Units:* AN/USM-22; 46 5/8" x 6 5/16" x 4 1/4"; 4.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N23B

**REFERENCE DATA AND LITERATURE**

TO 16-30USM22-4

MILW-4851; USAF Dwgs 50C13668B, 51D12954

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

28 March 1956

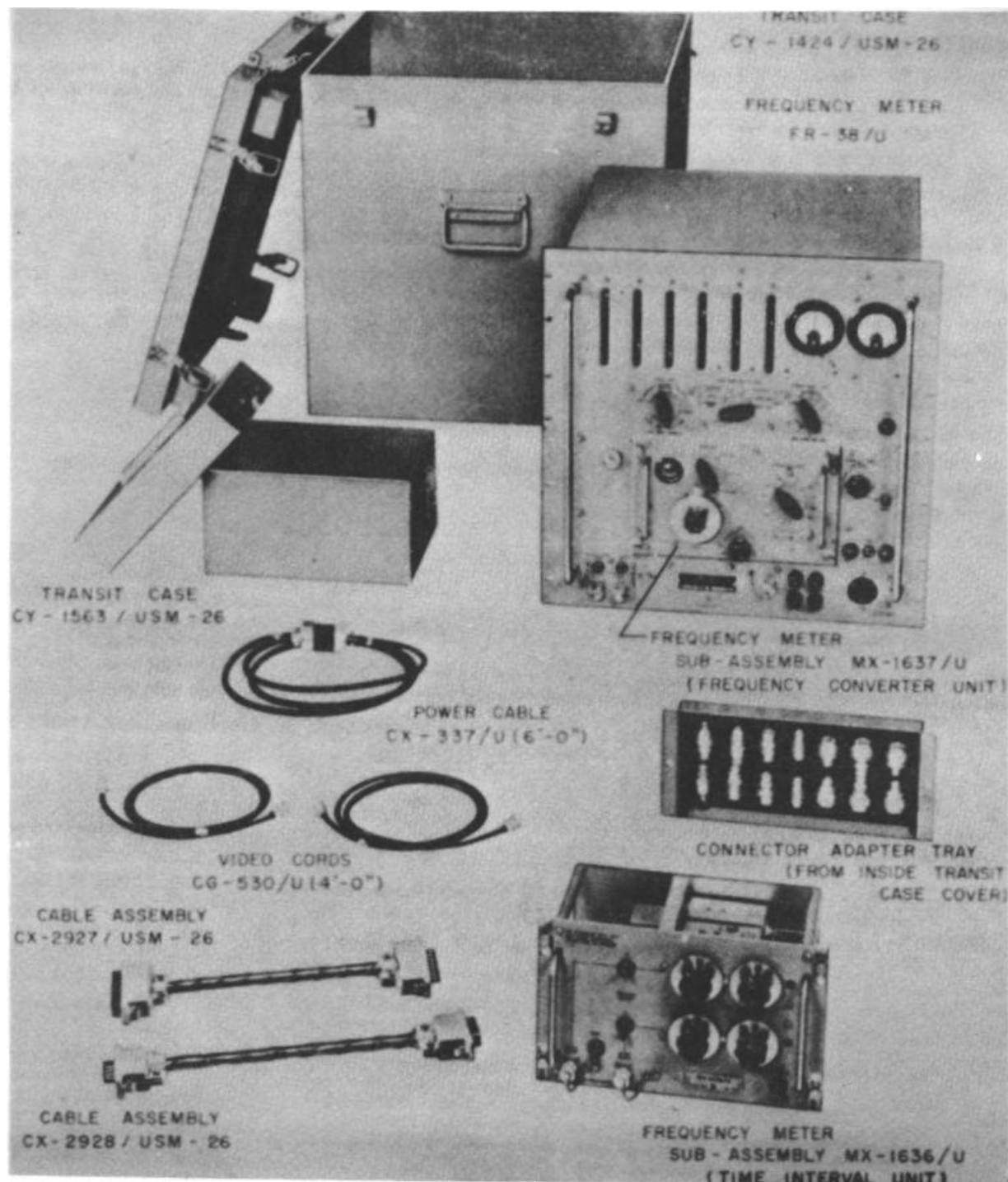
Cog Serv: USA FSN: 6625-543-1356

USA Line Item No: 616840

FREQUENCY METER AN/USM-26

Functional Class: 2.4.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	L/Std	-----
Manufacturer:	Hewlett-Packard Co.			



**AN/USM-26 FREQUENCY METER****FUNCTIONAL DESCRIPTION:**

A general purpose instrument used for frequency and time interval measurements. It is used for measuring transmitter oscillator and crystal frequencies, electronic, electrical and mechanical time interval, pulse length and repetition rates, frequency rates and frequency drifts.

**RELATIONSHIP TO SIMILAR EQUIPMENT****TECHNICAL DESCRIPTION:**

*Circuit Information:* The counting circuit consists of a signal gate, a time base section, a gate section and the counters. Frequencies to be measured are supplied through the signal gate to the counters. When the signal gate is open, cycles are passed on to the counter circuits. When the gate is closed, the counters display the counted value. The signal-gate is operated by the time base section which is the frequency standard for the equipment. The gate section opens and closes the signal gate and also controls the display time and resets the counter to zero. Time interval measurements are made by reversing the above process and counting the cycles of the crystal oscillator output which occurs during the unknown time interval. Measurements are displayed on six decade indicators calibrated in kilocycles, microseconds, milliseconds or seconds, according to control setting.

*Pwr Supply:* 115 volts,  $\pm 11.5$  volts, ac, 50 to 1000 cycles per second, single-phase

*Freq Range:* 10 cycles per second to 100 megacycles per second

*Type of Reception:* Continuous Wave, Pulsed

*Time Interval Range:* 1.0 microsecond to 10,000,000 seconds

*Input Impedance:* 1.0 megohm shunted by 40 micromicrofarads

*Input Signal Requirements:*

*Freq Count Measurements:*

*Sine Waves:*

<i>Frequency</i>	<i>Minimum amplitude</i>
1.0 cycle per second to 1.0 megacycle per second	0.2volt rms
1.0 megacycle per second to 2.0 megacycles per second	0.3 volt rms
1.0 megacycle per second to 2.0 megacycles per second	0.5 volt rms
2.0 megacycles per second to 4.0 megacycles per second	0.6 volt rms
4.0 megacycles per second to 8.0 megacycles per second	0.8 volt rms
8.0 megacycles per second to 10 megacycles per second	1.0 volt rim

*Pulses:* Capable of counting 0.1 microsecond pulses with an amplitude of 2.0 volts and repetition period of 0.2 microsecond or greater.

*Accuracy:*

*Freq Measurements:*

*Freq Range:*

*Maximum error*

1.0 to 3000 cycles per second -----  $\pm 0.03$  %

3000 cycles per second to 10 megacycles per second -----  $\pm 0.001$  %

*Timer Interval Measurements:*  $\pm 0.00$  %

*Major Units:* FR-38A/U; 19 7/32" x 19" x 18 5/8"; 109 lb.

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**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A**

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**FREQUENCY METER AN/USM-26**

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**TUBES, CRISTAL TRANSISTORS:**

1 JAN-OB2WA, 1 JAN45Y3WGTA, 3 JAN-5R4WGA, 7 JAN-6AH6, 6 JAN6AU6WA, 5  
JAN6CB6, 3 JAN-12AT7WA, 2 JAN-5654/6AK5W, 1 JAN-5687, 7 JAN-5725/6AS6W,  
2 JAN-5727/2D21W, 3 JAN-5726/6AL5W, 1 JAN-5844, 38 JAN-5963, 2 JAN-6O05/  
6AQ5W, 2 JAN-6080WA, 63 G-11A Crystal diodes

**REFERECE DATA AND LITERATURE:**

AN16-30USM26-1 (Operating Instructions)  
AN16-30USM26-2 (Service Instructions)  
AN16-30USM26-3 (Overhaul Instructions)  
AN16-SOUSM264 (Illustrated Parts Breakdown)  
Spec. MILF-7847(Aer), dated 15 December 1951



MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

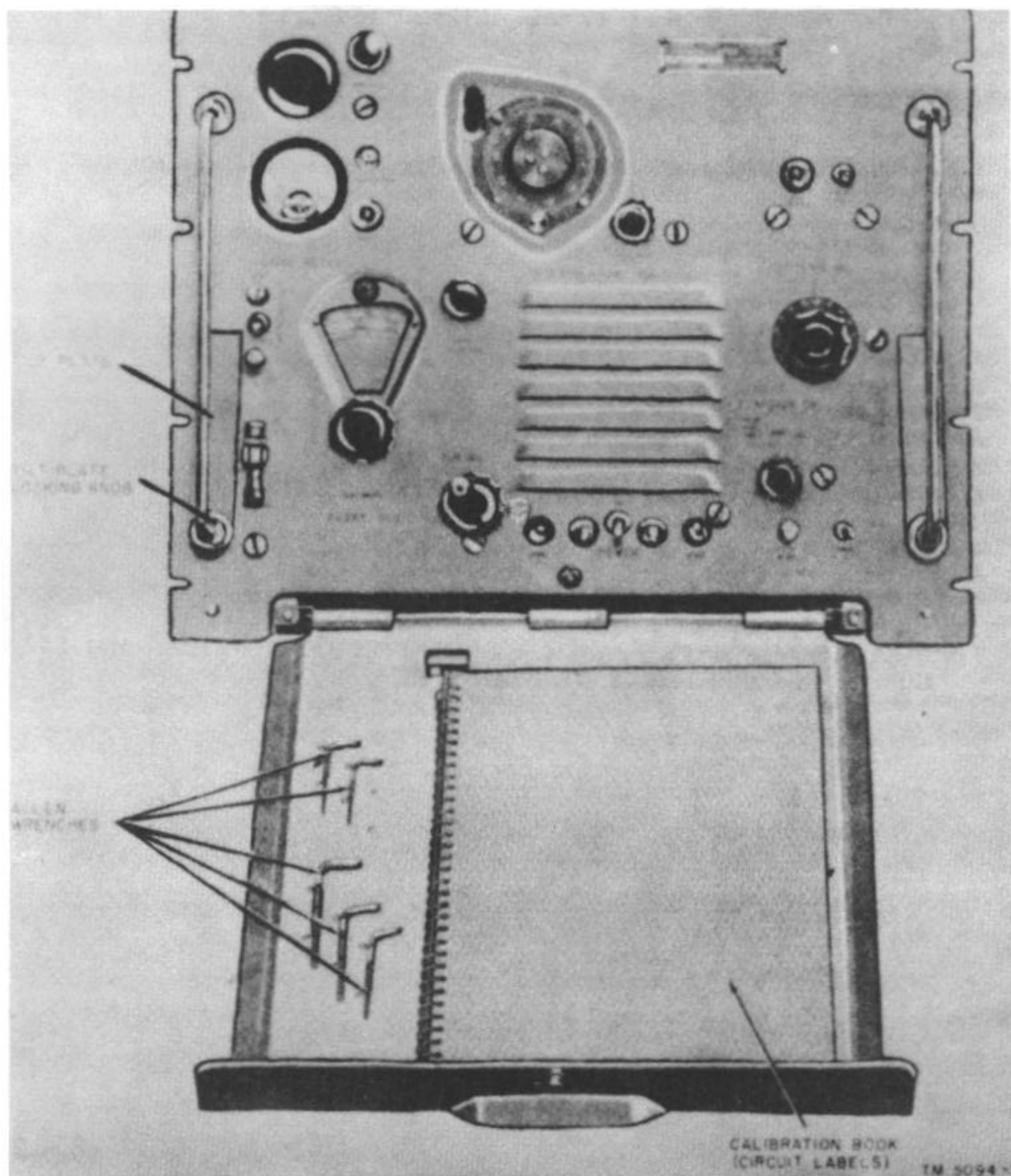
Cog Serv: USA FSN: 6625-669-0080

USA Line Item No: 616910

FREQUENCY METER FR-4/U

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Sparks-Withington			





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**FR-4/U FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, heterodyne type frequency meter used to measure frequencies and to calibrate field radio receivers and transmitters. A blinker light (or earphones for an audible indication) is used for making accurate zero-beat settings. All controls, dials, connections, and carrying handles are/located on the front panel. It is designed for rack mounting or for use as a table model with tilt base for ease of viewing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Pwr Supply:* 115 or 230 volts  $\pm 10\%$ , o, ac, 50 to 1000 cycles per second, single phase, 136 watts

*Freq Range:* 100 kilocycles per second to 20 megacycles per second in seven bands

*Oscillator Freq:*

*Proxy:* 100 to 250 kilocycles per second

*Crystal:* 1250 kilocycles per second

*Blocking:* 10 kilocycles per second

*Interpolation:* 15 to 20 kilocycles per second

*Freq Multiplication:* 2 to 80 times proxy oscillator frequency

*Harmonic Selector:* 9th through 26th harmonic of 10 kilocycles, per second

*Type of Reception:* Continuous wave

*RF Output:* 100 microvolts minimum across 51 ohms on any harmonic

*Audio Pwr Output:* 2 milliwatts minimum across 600 ohms

*Freq Stability:* 0.0001 %

*Accuracy:*  $\pm 0.001\%$  of frequency calibration

*Method of Interpolation:* Built-in oscilloscope

*Major Units:* 1 FR-4/U 15 3/4" x 19" x 18 1/8"; 86 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

7 JAN-6AU6, 8 JAN-12AT7, 2 JAN-5654, 3 JAN-5670, 3 JAN-5725, 3 JAN-5751, 1 JAN-2BP1, 1 JAN-OA2, 1 JAN-5YSGT, 1 JAN-Y6G

**REFERENCE DATA AND LITERATURE:**

TO 16-35FR4-6 (Instruction Book)

**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A****1 March 1964****Cog Serv: USA FSN: 6625-669-0086****USA Line Item No: 616911****FREQUENCY METER FR-5/U****Functional Class: 2.1.1**

	<b>USA</b>	<b>USN</b>	<b>USAF</b>	<b>USMC</b>
<b>STATUS OR TYPE CLASS.:</b>	<b>Std-A</b>	-----	-----	-----
<b>Manufacturer:</b>	Lavoie Laboratories			

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable, general purpose, heterodyne type frequency meter used for calibrating the frequency of radio receivers and transmitters. Provision is made for attachment of headphones. All controls, dials, connections, and a set of carrying handles are located on the front panel. Designed for rack mounting or use as a table model with tilt base for ease of viewing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This meter is part of Frequency Meter Set AN/URM-5, but can be used independently as an end item.

**TECHNICAL DESCRIPTION:**

*Pwr Supply:* 115 or 230 volts,  $\pm 10\%$ , ac, 50-1000 cycles per second, single phase

*Freq Range:* 10 to 100 megacycles per second

*Type of Reception:* Continuous Wave

*Standard Freq Available:* 3.6 megacycles per second  $\pm 0.0001\%$

*Calibration:* Internal permanent film scale, multiplying book supplied

*Type of Connectors:* BNC

*Freq Stability:* 0.0001%

*Accuracy:*  $\pm 0.001\%$  of frequency calibration

*Temp Range:* -4°F to 125°F

*Major Units:* 12 1/4" x 19" x 15"; 60 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

2 JAN-6AK6, 1 JAN-6AH6, 6 JAN-6AU6, 1 JAN6C4, 7 JAN-12AT7, 1 JAN-5814, 6 JAN6BA6/W, 3 JAN-6BN6, 1 JANA)B2, 1 JAN-OA2, 2 JAN-6X4/W

**REFERENCE DATA AND LITERATURE:**

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Serv: USA FSN: 6625-649-4280

USA Line Item No: 616912

FREQUENCY METER FR-6/U

Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	Lavoie Laboratories			

No Illustration Available

**FUNCTIONAL DESCRIPTION.**

A portable, general purpose, heterodyne type frequency meter used for calibrating the frequency of radio receivers and transmitters. Provision is made for attachment of headphones. All controls, dials, connections and a set of carrying handles are located on the front panel. Designed for rack mounting or use as a table model with tilt base for ease of viewing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This meter is part of Frequency Meter Set AN/URM-5, but can be used independently as an end item.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The incoming signal whose frequency is unknown is mixed with that of a variable-tuned interpolation oscillator added to a harmonic of a fixed crystal oscillator. The resulting IF signal is amplified by a band-pass IF amplifier and passed through a harmonic sequency selector which eliminates some of the undesirable harmonics and passes the desired harmonic. A cavity-type filter eliminates most of the remaining undesirable harmonics and amplifies the desired harmonic. An LC type audio-modulator modulates the filtered and amplifier IF signal. This audio-modulated signal is detected and amplified. The resulting audio signal is applied to the headphones jack. Maximum aural indication is obtained by tuning the interpolation oscillator to a frequency which when mixed with the incoming signal's frequency will give the exact IF which will be passed by the IF amplifier, selector, and filter without attenuation. The tuning knob of the interpolation oscillator is mechanically coupled to a drum containing a roll of microfilm on which a calibration chart has been printed. This is read through an optical magnifying system to the required accuracy.

Self calibration at a standard frequency is provided from the output of an internal crystal oscillator, which is substituted for the unknown signal for that purpose.

*Pwr Supply:* 115 or 230 volts,  $\pm 10\%$ , ac, 50 to 1000 cycles per second, single phase

*Freq Range:* 100 to 500 megacycles per second

*Type of Reception:* Continuous Wave

*Fundamental Freq Range:* 2.67 to 2.745 megacycles per second

*Standard Freq Available:* 4.0 megacycles per second  $\pm 0.0001\%$

*Type of Connectors:* BNC

*Calibration:* Internal permanent film scale, multiplying book supplied

*Freq Stability:* 0.0001%

*Accuracy:*  $\pm 0.001\%$  of frequency calibration

*Temp Range:*  $-4^{\circ}\text{F}$  to  $+125^{\circ}\text{F}$

*Major Units:* .1 FR-6/U 121/4" x 19" x 15"; 60 lbs

**FR-6/U FREQUENCY METER**

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**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-6AK6, 5 JAN-6AH6. 6 JAN-6AU6, 4 JAN-12A17, 1 JAN-5814, 1 JAN6BA6/W, 3 JAN6BN6, 1 JAN4B2, 1 JANA2, 2 JAN6X4/W

**REFERENCE DATA AND LITERATURE:**

MIL-F-10636(SigC) and Amendment I

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

20 August 1954

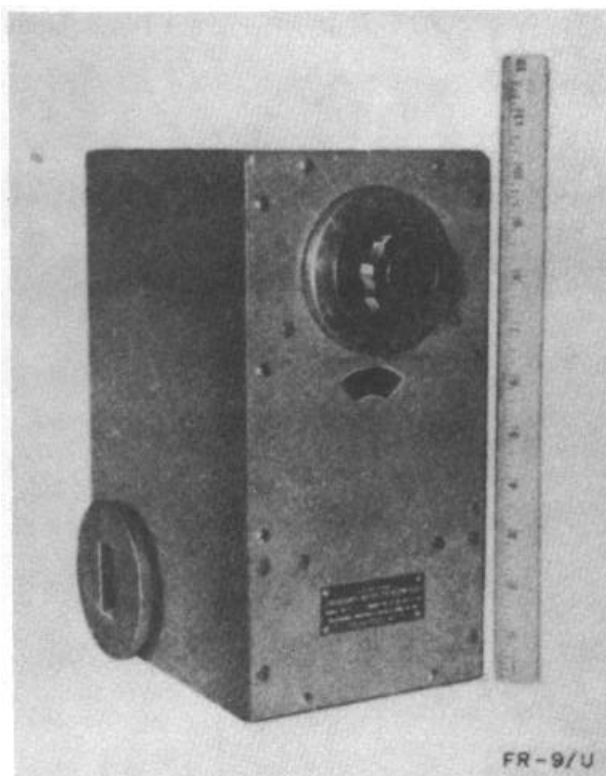
Cog Serv: USAF FSN:

USA Line Item No:

FREQUENCY METER FR-9/U

Functional Class: 2.3.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Polytechnic Research and Development Co.			



AGO 10038A 123

## FR-9/U FREQUENCY METER

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### FUNCTIONAL DESCRIPTION:

Frequency Meter FR-9/U is a portable, precalibrated, transmission-type equipment used in measuring rf signals.

### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment is similar to Polytechnic Research and Development Co. Type 555B.

### TECHNICAL DESCRIPTION:

*Freq Range:* 5,850 to 7,050 mc

*Insertion Loss:* 6.7 to 10.6 db

*Loaded Q:* 6,950 to -14,500

*Accuracy:*  $\pm 0.005\%$  (relative over any adjacent band of 60 mc);  $\pm 0.03\%$  (absolute);  $\pm 0.1$  mc  
(over any adjacent band of 8 mc)

*Major Units:* 1 FR-9/U 10 1/4" x 6 1/4" x 7 13/16"; 15 lbs

### TUBES, CRYSTALS, TRANSISTORS:

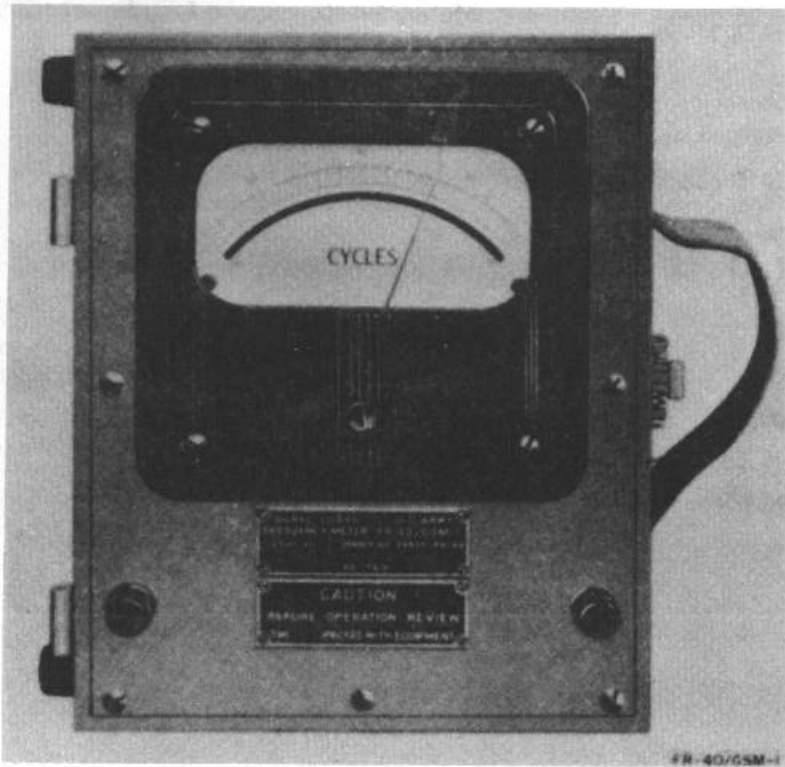
None

### REFERENCE DATA AND LITERATURE:

Instruction Book  
USAF Dwg 1330

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964				
Cog Serv: USA FSN: 6625-265-6659			FREQUENCY METER FR-40/GSM-1	
USA Line Item No: 616915			Functional Class: 2.5.1	
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Weston Electrical Instrument Corp.			



## FR-40/GSM-1 FREQUENCY METER

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### FUNCTIONAL DESCRIPTION

Frequency Meter FR40/GSM-1 is a portable test instrument used in calibrating and testing power line frequency meters, as well as in checking the frequency of ac power sources.

### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment, similar to Frequency Meter, Weston Model 339, is part of Meter Test Equipment AN/GSM-1.

### TECHNICAL DESCRIPTION:

*Pwr Requirements:* 115 v  $\pm$  15 v, 50 to 70 cy, 1 phase ac

*Freq Range:* 50 to 70 cy

*Type of Reception:* CW

*Accuracy:*  $\pm$ .5%

*Major Units:* 1 FR-40/GSM-1 8 3/16" x 10 7/16" x 8 1/4"; 23 lbs

### TUBE, CRYSTALS, TRANSISTORS:

None

### REFERENCE DATA AND LITERATURE:

TM 11-2535A

Army Spec 71-1689



**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A****1 March 1964****Cog Serv: USA FSN: 6625-669-0078****USA Line Item No: 616916****FREQUENCY METER FR-43/URM-18****Functional Class: 2.1.1**

	<b>USA</b>	<b>USN</b>	<b>USAF</b>	<b>USMC</b>
<b>STATUS OR TYPE CLASS.:</b>	<b>Std-A</b>	<b>-----</b>	<b>Std</b>	<b>-----</b>
<b>Manufacturer:</b>	General Radio Co.			

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable, general purpose, frequency transfer unit used in transferring an unknown frequency for measurement against a frequency standard, or for transferring a frequency of known value (determined against the standard) to an output circuit. The approximate value of an unknown frequency, or the approximate value of a desired frequency in the output circuit can be read directly. When used with a frequency standard, it provides means for rapidly identifying the harmonics of the standard; for accurately matching the heterodyne frequency meter to the unknown frequency; for use as a substitute source in measuring frequencies under conditions of noise, fading or of intermittent operation of the transmitter; and for obtaining a frequency of any desired value, accurately known in terms of the frequency standard. The frequency transfer unit can also be used as a calibrated frequency meter and detector. A direct-reading frequency scale is provided for the fundamental and selected harmonic ranges, covering 20 to 1 in frequency.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Part of Frequency Meter Group OA-166/URM-18 which is part of Frequency Calibrator Meter Set AN/URM-18, it can be used as an individual item of test equipment. Similar to General Radio Type 1106-A.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This unit consists of a heterodyne frequency meter (with harmonic generating circuits and output control) and a heterodyne detector (with audio-frequency amplifier and regeneration control).

*Pwr Supply:* 115 volts  $\pm 10\%$  or 230 volts  $\pm 10\%$ , ac, 50 to 60 cycles per second, single phase, 40 watts

*Freq Range:* 100 to 2,000 kilocycles per second in three ranges: 1 kilocycle intervals from 100 to 400 kilocycles per second, 5 kilocycle intervals from 400 to 1000 kilocycles per second, 10 kilocycle intervals from 1000 to 2000 kilocycles per second

*Input Impedance:* 50 to 65 ohms

*Output Impedance:* 600 ohms

*Accuracy:*  $\pm 0.1\%$

*Major Units:* 1 FR43/URM-18 10 1/2" x 19" x 12"; 47.75 lbs

**TUBES, CRYSTAL, TRANSISTORS:**

3 JAN-6SJ7, 1 JAN-6J5GT, 1 JAN-6SN7GT, 1 JAN-6H6, 1 TAN-6X5GT, 1 JAN-0D3

**REFERENCE DATA AND LITERATURE:**

Instruction Book

4 October 1954

Cog Serv: USA FSN:

USA Line Item No:

TUNED CAVITY FR-73/UP

Functional Class: 2.2.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Johnson Service Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, self-contained and precalibrated frequency measuring absorption type cavity, designed to measure the frequency of radio frequency signals transmitted by radars operating in its range. Resonance is achieved at the frequency to be measured by variation of the length of the cavity. It is manually tuned by a mechanical coupling to the indicating dial knob. Resonance is indicated by a maximum reading of an externally connected dc milliammeter. Frequency is read directly in megacycles per second from the meter dials. Provisions are made for mounting the milliammeter, capacitor, spare crystal holder, and desiccator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* Waveguide input is coupled to the cavity through an inductive loop. The activity exhibits its lowest possible impedance at resonance. Another inductive loop removes part of the energy from the cavity.

A crystal detector rectifies the energy removed and the rectified signal is brought to terminals for connection to the indicating device.

*Pwr Supply:* None

*Freq Range:* 1215 to 1370 megacycles per second

*Type of Reception:* Continuous Wave and Pulsed

*Pwr Input:* 1 watt average

*Major Units:* 1 FR-73/UP 22 1/2" x 32 5/8" x 22 1/2"; 120 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Navy Spec. Ships-T-502 (BuShips)

**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A**

1 March 1964

Cog Serv: USA FSN: 6625-498-3451

USA Line Item No: 617040

**FREQUENCY MIETER I-129-B**

Functional Class: 2.2.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-A	-----	-----	-----
<b>Manufacturer:</b>	James Millen Manufacturing Co.			



**I-129-B FREQUENCY METER SET**

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**FUNCTIONAL DESCRIPTION:**

Frequency Meter Set I-129-B is a portable unit consisting of four absorption-type meters used in measuring frequencies of oscillators or other rf sources. It also determines fundamental frequencies of oscillators or selects the correct harmonics from a harmonic crystal oscillator or frequency multiplier.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models A and B of this equipment are identical except for frequency range. Model BM is similar to Model B except for the addition of a pilot lamp indicator loop.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 1.5 to 41 mc in four bands

*Type of Reception:* CW

*Accuracy:*  $\pm 3\%$

*Major Units:* 1 I-129-B 12 7/8" x 5 1/8" x 3 1/8"; 2.25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-304

SigC Spec 71-1388, Dwg 1606

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

Cog Serv: USA FSN: 6625-408-4639

USA Line Item No: 616920

FREQUENCY METER TS-29/FMQ-1

Functional Class: 2.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Bendix Aviation Corp.; Julian P. Friege Co.			

**FUNCTIONAL DESCRIPTION:**

Frequency Meter TS-29 /FMQ-1 is used in converting radiosonde receiver af output into pulsating dc for visual reading on a dc ammeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 115 v, 58 to 62 cy ac

*Freq Range:* 0 to 200 cy

*Type of Emission:* Audio sine, sawtooth, square wave

*Accuracy:*  $\pm 2\%$

*Major Units:* 8-3/4" x 19" x 10"; 38 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 0A3, (1) 0D3, (2) 5Y3GT, (1) 6J5, (1) 6ZY5G, (2) 884

**REFERENCE DATA AND LITERATURE:**

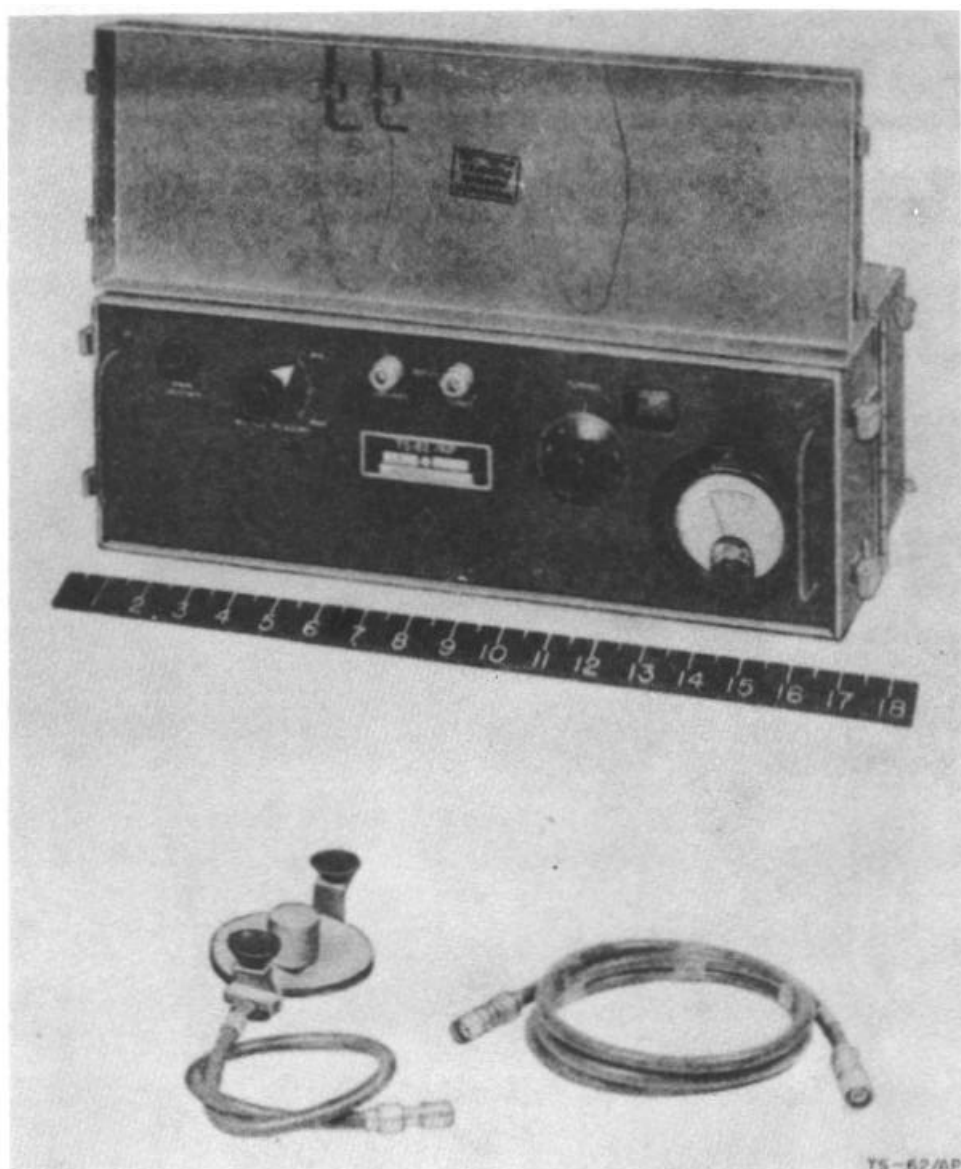
MIL-R-15823

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

16 September 1954  
Cog Serv: USAF FSN:  
USA Line Item No: 685030

TEST SET TS-62/AP  
Functional Class: 2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	S/Std	L/Std	-----
Manufacturer:	Western Electric Co.			



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**TS-62/AP TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set TS62/AP is a portable, manually tuned, high-Q resonant cavity used in rapid routine analyses of the overall performance of radar systems. It determines the frequency of CW, MCW, or pulsed rf transmitters, measures relative power output, detects double moding of magnetrons, and indicates receiver signal-to-noise ratio.

**RELATIONSHIP TO SIMILAR EQUIPMENT**

This equipment, Western Electric Type X-63628, is identical with Echo Box TS-218/UP except for frequency range.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 9,320 to 9,420 mc  $\pm$  3 mc

*Type of Reception:* CW, MCW, pulse

*Input Impedance:* 50 ohms

*Decay:* 3 db/usec

*Operating "Q":* 50,000 to 80,000

*Ringtime:* 2.5 statute mi

*Temp Range:* -40°F to +120°F

*Accuracy:* +3 db (relative pwr)

*Major Units:* TS-62/AP 18 1/4" x 6 1/32" x 11 3/8"; 10 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N23

**REFERENCE DATA AND LITERATURE:**

AN 1635TS62-3, SHIPS 366

USAF Spec 71-5072-A

Navy Spec X-63628



**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A**

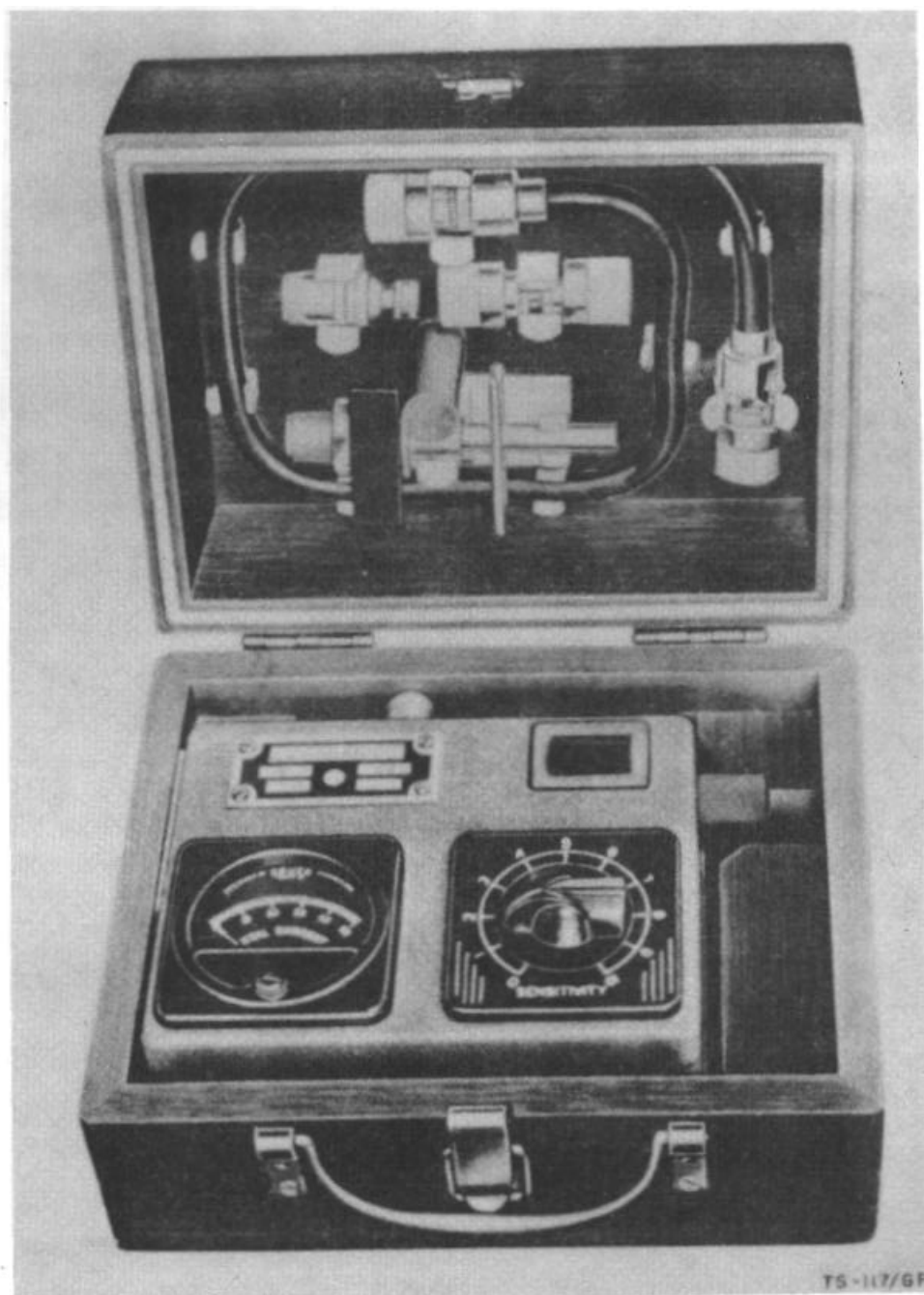
1 March 1964

Cog Serv: USA FSN: 6625-243-0516

USA Line Item No: 697570

**WAVEMETER TEST SET TS-117/GP****Functional Class: 2.2.3**

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std-A	Std	Std	-----
<b>Manufacturer:</b>	Lavoie Laboratories and Sperry Gyroscope Co.			





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**TS-117D/GP WAVEMETER SET**

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**FUNCTIONAL DESCRIPTION:**

Wavemeter Test Set TS-117/GP is a portable absorption-type meter used in measuring relative field strength, as well as the frequency of pulsed or CW oscillators. It may also be applied in tuning klystrons and similar devices.

**RELATIONSHIP TO SIMILAR QUIPIMEW:**

This equipment, part of Test Set AN/MPM-2, supersedes Test Set TS-/AP and Thermistor Frequency Meter 60ABM.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 2,400 to 3,400 mc

*Type of Reception:* CW, pulse

*Pwr, Range:* 100 to 1,000 uw

*Sensitivity:* 500 uw

*Impedance:* 50 ohms (input); 90 ohms (output)

*Q:* 1,000 to 2,000

*Temp Range:* 40°C to +48.8°C

*Accuracy:*  $\pm 5$  mc (at 3,256 mc);  $\pm 1\%$  (at all other freq)

*Major Units:* TS117/GP 4 3/4" X 5 7/8" X 2 3/4"; 3.36 lbs

**TUSES, CRYSTALS TRANSISTORS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

CO AN 1635TS117-3, SIG 7-TS-117/GP, TM 11-2538

MILT-11559

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

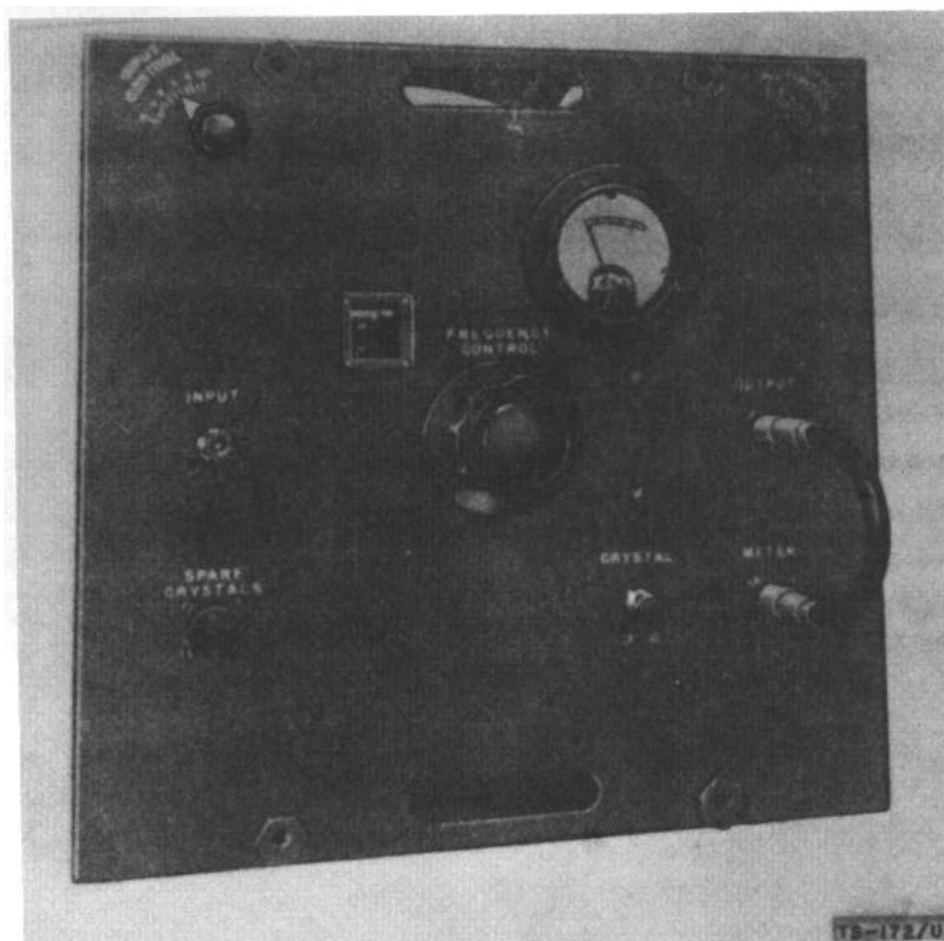
5 November 1954

Cog Serv: USA FSN: 6625-620-3678

USA Line Item No: 685193

TEST SET TS-172/UP  
Functional Class: 2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	L/Std	-----
Manufacturer:	Western Electric Co.			



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**TS-172/UP TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set TS-172/UP is a portable, handtuned, high-Q resonant cavity used in making quick, rough analyses of the overall performance of radar systems, in determining frequency of CW, modulated carrier or pulsed rf transmitters, in measuring relative power output, in detecting double moding of magnetrons, and in indicating the signal-to-noise ratio of receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT**

This equipment is similar to Test Set TS-91/TPS-1 except for frequency range. Where greater stability is desired and a lower ringtime is satisfactory, this equipment may be replaced by Test Set TS-545/UP.

Equipment Required But Not Supplied: (1) Oscilloscope TS-34A/AP

**TECHNICAL DESCRIPTION:**

*Freq Range:* 1,215 to 1,360 mc  $\pm 5$  mc

*Impedance:* 50 ohms

*Ringtime:* 10 statute mi

*Temp Range:* -40°F to +120°F

*Accuracy:*  $\pm 3$  db (rel pwr)

*Major Units:* 1 TS-172/UP 15" x 15" x 18 1/2"; 21 lbs

**TUBES, CRYSTAL, TRANSISTORS**

(1) 1N21B or 1N22

**REFERENCE DATA AND LITERATURE:**

CO AN 16-5TS172-M

Navy Spec RE9496

## MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

23 November 1954

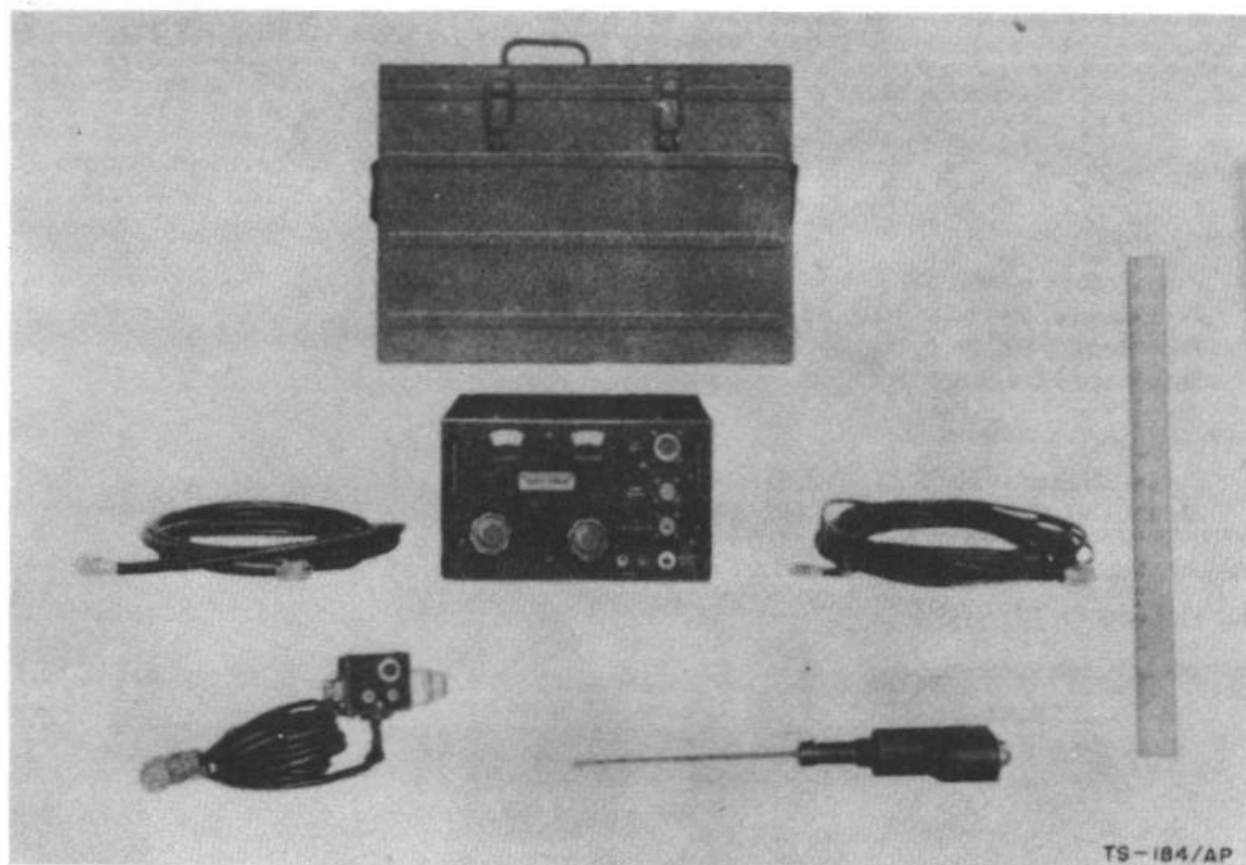
Cog Slav: USA FSN:

USA Line Item No:

TEST SET TS-184A/AP

Functional Class:2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	Radio Corporation of America, Victor Div.			



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**TS-184A/AP TEST SET**

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**FUNCTIONAL DESCRIPTION:**

Test Set TS-184A/AP is a portable, handtuned, echo box and attenuator used in making quick, rough analyses of overall performance of radar systems. It may be used in checking the absolute frequency, system sensitivity, antenna and loop performance, and antenna-lobe pattern of radar sets. With a voltmeter, the unit aligns the transmitter to operating frequency, the receiver to transmitter frequency, and the antenna trimmers to load, and adjusts receiver gain control and other controls to optimum settings. Applied with a reflectometer, it performs standing wave ratio measurements on antenna systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are similar except for frequency range and attenuators. This equipment is also similar to Test Set TS-228/AP except for frequency range.

Equipment Required But Not Supplied: (1) Headset HS3; (1) Voltmeter IS-189

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 28 v dc

*Freq Range:* 400 to 430 mc  $\pm$  1 mc

*Pwr Range:* 500 w (peak)

*Impedance:* 50 ohms

*Decay Time:* 3 db/usec

*Q:* 30,000

*Temp Range:* -40°F to +122°F

*Major Units:* 6 7/8" x 11 3/4" x 10"; 28 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6J6

**REFERENCE DATA AND LITERATURE:**

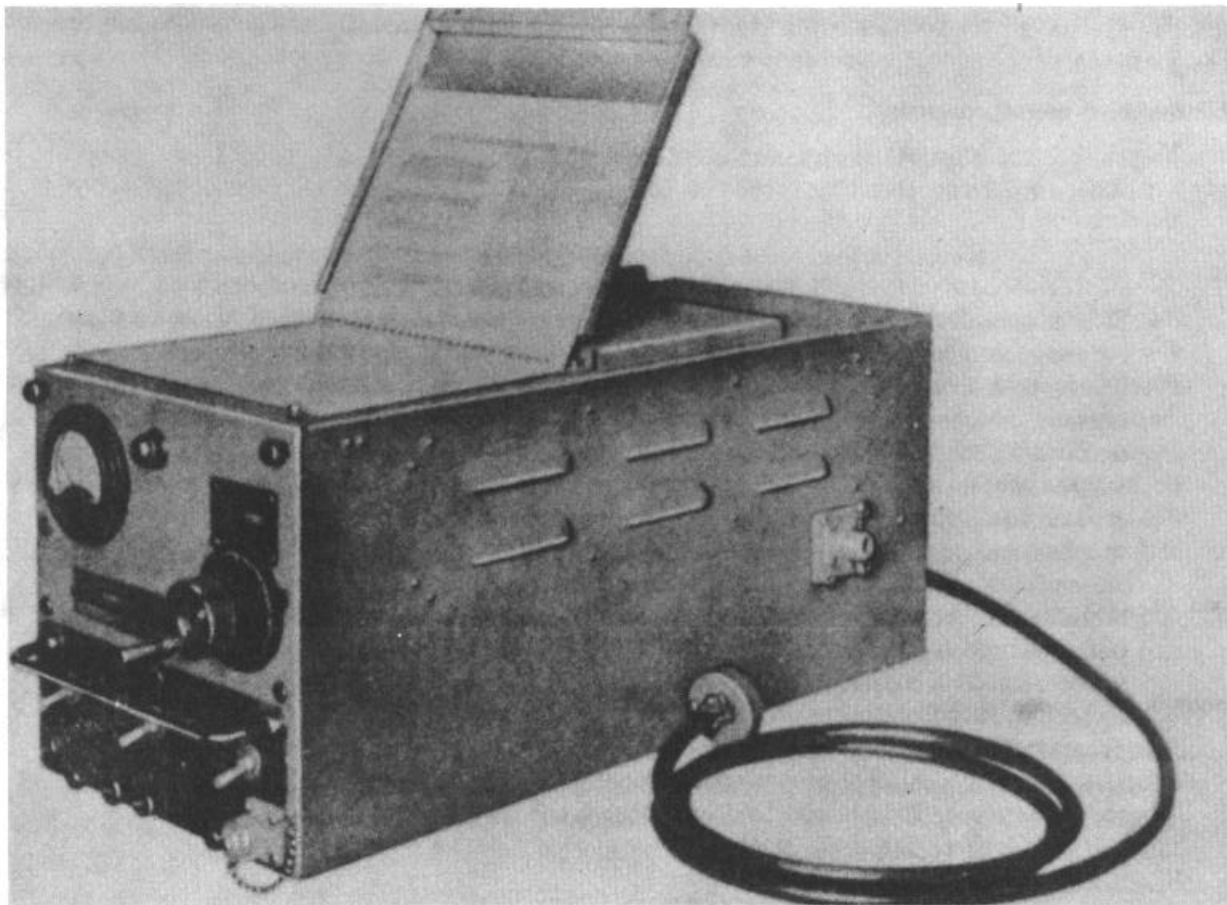
AN 16-35TS184-3

USAF Spec R7101

Cog Serv: USA FSN: 6625-510-1830  
USA Line Item No: 616986

FREQUENCY METER TS-186D/UP  
Functional Class: 2.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	Federal Manufacturing and Engineering Corp.			



TS-186D/UP

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**TS-186D/UP FREQUENCY METER**

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**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, crystal-controlled, heterodyne-type meter designed to measure the frequencies of transmitters, oscillators, and signal generators. The meter is intended to operate with both visual and aural indication of signals by means of a beat-indicating meter, headphones, and a video output jack for observation on an oscilloscope, if desired. A vernier tuning dial and an associated calibration chart are used when making frequency measurements. This meter is used in field and depot testing.

**RELATIONSHIP TO SIMILR EQUIPMENT:**

Similar to TS-186C/UP except that detector mixer tube Type 12AT7 is used in the TS-186D/UP and Type CC51 is used in the TS-186C/UP.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Radio frequency input is received from a waveguide where it is adapted to a coaxial cable. It enters a detector mixer where it is mixed with the output of a heterodyne oscillator. From there the difference signal is amplified in an audio amplifier. There is a crystal oscillator which is used to check the frequency calibration of the heterodyne oscillator, by taking the place of the input signal. This checking is done at definite check points near the frequency at which measurement will be made. A dc milliammeter helps to indicate zero beat as well as measure the grid current of the crystal oscillator, the cathode current of the detector mixer, the cathode current of the heterodyne oscillator, and the cathode current of the indicator. A selector switch determines which value will be measured. The indicator circuit causes a dip in the meter near zero beat, but since it does not respond to frequencies less than 100 cycles per second, a pair of headphones is necessary to determine actual zero beat. The video output is made available through a video jack leading from the detector mixer to feed a usable signal to an outside oscilloscope.

*Pwr Supply:* 115 volts  $\pm 10\%$ , ac, 50 to 1000 cycles per second, single phase, 70 watts

*Freq Range:* 100 to 10,000 megacycles per second

*Fundamental Freq Range:* 500 to 1250 megacycles per second

*Type of Reception:* Continuous Wave, Modulated Carrier Wave, Pulsed

*Dial Calibration:* 16,500 dial divisions

*Signal Input:* 500 microvolts to 1 volt

*Audio Signal Output:* 10 microwatts to 20 watts

*Sensitivity:* A 1000 microvolt input signal within the range of 500 to 1250 megacycles per second produces an audio-output signal of 20 milliwatts.

*Audio Amplifier Range:* 100 to 100,000 cycles per second

*Accuracy of Freq Measurements:*  $\pm 0.01\%$  (Crystal:  $\pm 0.002\%$ )

*Audio Output Impedance:* 600 ohms (to match headset impedance)

MIL-HD8K-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

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TS-186D/UP FREQUENCY METER

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*Temp Range:* -40°C. to +55°C

*Humidity Range:* 0 to 95% relative humidity

*Pressure Range:* Up to 10,000 feet

*Major Units:* 1 TS-186D/UP 9 1/2" x 8 1/2" x 20"; 42.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-2C40, 1 JAN-6SN7, 1 JAN-12AT7, 1 JAN-5Y3GT/G, 4 JAN-6SJ7, 2 JAN-OD3/VR150

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91592

TO 33A1-5-38-1



28 October 1954

Cog Serv: USA FSN:

USA Line Item No: 614780

ECHO BOX TS-218A/UP

Functional Class: 2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	General Communications Co.			

**FUNCTIONAL DESCRIPTION:**

Echo Box TS-218A/UP is a portable high-Q resonant cavity used in making rapid, rough analyses of the performance of radar systems. It is employed in determining the frequency of rf transmitters, measuring relative power output, detecting double moding of magnetrons, indicating receiver signal-to-noise ratio and making spectrum analyses of transmitters.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are similar, differing only in construction and method of operation.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 8,990 to 9,170 mc  $\pm 5$  mc

*Type of Reception:* CW, MCW, pulse

*Impedance:* 51 ohms

*Decay:* 6 db/usec

*Ringtime:* 15 to 25 usec

*Temp Range:* -40°F to +120°F

*Accuracy:*  $\pm 3$ db (rel pwr)

*Major Units:* 1 TS-218A/UP 11" x 16" x 8 5/8"; 16.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N23B

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91083, TO 16-55-328

Navy Spec R-7448

23 November 1954

Cog Serv: USA FSN:

USA Line Item No:

WAVEMETER TS-247/APM-48

Functional Class:

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----

Manufacturer: Harvey Radio Laboratory, Inc.

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Wavemeter TS247/APM-48 is a portable transmission type frequency meter used in measuring the rf of radar transmitters and signal generators.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Pwr Requirements:* 25 w, 115 v, 50 to 1,600 cy ac

*Freq Range:* 215 to 275 mc

*Type of Reception:* CW, pulse

*Impedance:* 50 ohms

*Temp Range:* -67°F to +122°F

*Accuracy:* .2% (abs)

*Major Units:* 9" x 13" x 8"; 19.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 9002

**REFERENCE DATA AND LITERATURE:**

CO-AN 16-35TS247-2-M, TO 16-55-210

USAF Spec 371-5087

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

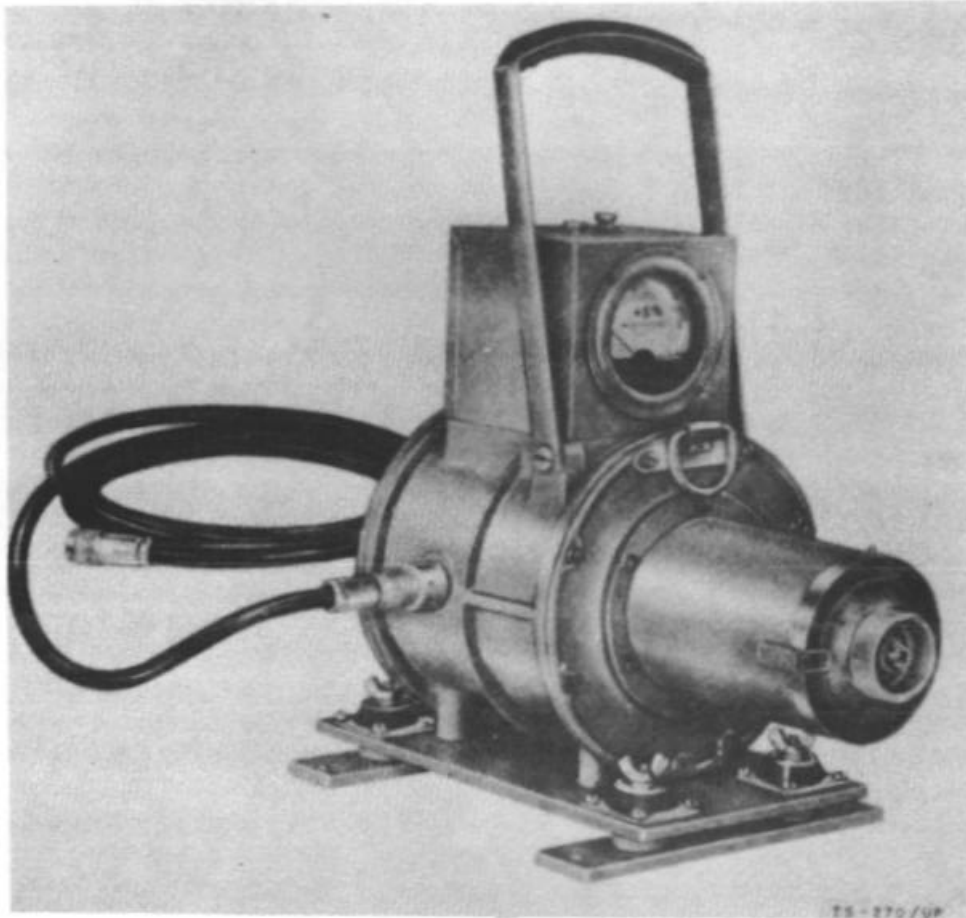
Cog Serv: USA FSN: 6625-257-2966

USA Line Item No: 614795

ECHO BOX TS-270B/UP

Functional Class: 2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-C	-----	Std	-----
Manufacturer:	Thomas A. Edison Co.; Johnson Service Co.			



TAGO 10038A 151

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**TS-270B/UP ECHO BOX**

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**FUNCTIONAL DESCRIPTION:**

Echo Box TS270B/UP is a portable, handtuned ringing cavity enabling quick, rough analyses of the overall performance of radar systems. It checks the frequency of radar transmitters and receiver local oscillators, performs spectrum analyses, makes rough relative power measurements, and checks TR recovery time.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

All models of the basic equipment, part of Radar Set AN/MPM-1A, are similar. The B model is similar to Echo Boxes 14ABA, OBU, and TS275/UP except for frequency range.

Equipment Required But Not Supplied: Antenna Assemblies: (1) AS23/AP, (1) AT-67/AP

**TECHNICAL DESCRIPTION:**

Freq Range: 2,630 to 2,970 mc

Voltage Standing Wave Ratio: 1 :10

Impedance: 50 ohms

Q: 47,000

Temp Range: -40F to +140F

Major Units: 1 TS-270B/UP 14 5/8" x 8" x 14 1/4"; 13 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

TM 11-1086

Army Spec 71-2398

1 March 1964

Cog Serv: USA FSN: 6625-669-0729

USA Line Item No: 617000

FREQUENCY METER TS-328A/U

Functional Class: 2.5.4

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-B	-----	Std	-----
Manufacturer:	J. B. T. Instrument Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Frequency Meter TS-328A/U is a portable, vibrating reed-type instrument used in checking 400-cycle power sources.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Test Set AN/MPM-23 is identical with Navy Type 22451 and similar to J. B. T. Instrument Company Models 33F and 33FX. Frequency Meter TS-328A/U is generally similar to TS-328/U and also to J. B. T. Instrument Company Model 33-FP-9M.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 380 to 420 cy

*Voltage Range:* 100 to 130 v ac

*Meter Rating:* 70 ohms/v at 400 cy

*Temp Coefficient:* .000075/deg F, inverse (approx)

*Accuracy:*  $\pm 3\%$  at 77°F with sine wave input

*Major Units:* 6 3/8" x 4" x 3 9/32"; 1.75 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Army Spec 7525; Navy Spec KS-9868

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

1 March 1964

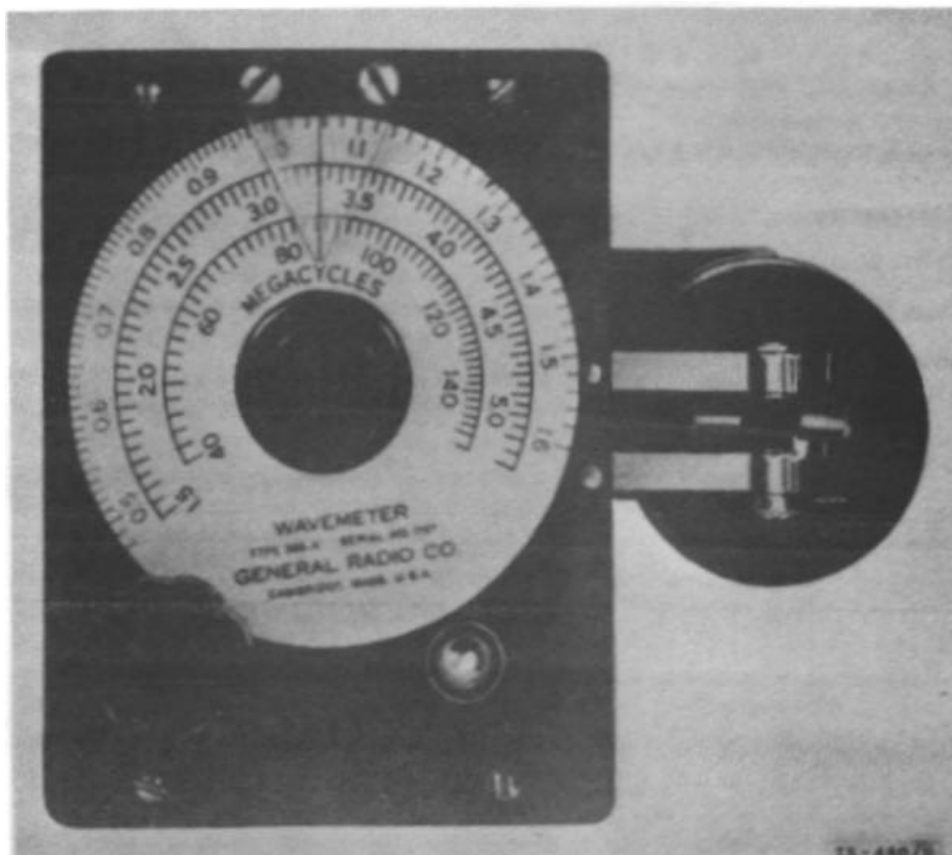
Cog Serv: USA FSN:

FREQUENCY METER TS-480/U

USA Line Item No:

Functional Class: 2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	Std	-----
Manufacturer:	General Radio Co.			



AGO 10038A 155

## TS-480/U FREQUENCY METER

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### FUNCTIONAL DISCRIPTION:

Frequency Meter TS-480/U is a portable, absorption-type instrument used in measuring the frequency of rf oscillations. It may also be employed in neutralizing amplifiers, indicating stray rf fields, and determining harmonic and parasitic oscillations.

### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment is similar to General Radio Type 566A.

### TECHNICAL DESCRIPTION:

*Freq Range:* .5 to 150 mc in five bands

*Type of Reception:* CW, pulse

*Accuracy:*  $\pm 3\%$

*Major Units:* 5 7/8" x 4 3/4" x 5 3/4"; 3 lbs

### TUBES, CRYSTALS TRANSISTORS:

None

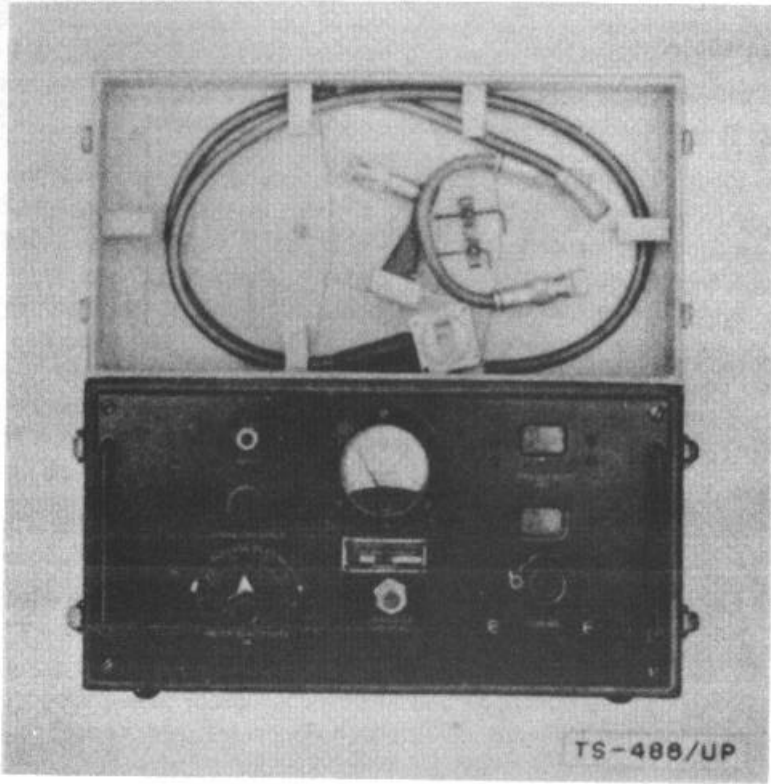
### REFERENCE DATA AND LITERATURE:

TM 11-5042

Spec MIL-E-3304

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

8 June 1956				
Cog Serv: USA FSN: 6625-500-2562			ECHO BOX (CAVITY, TUNED) TS-488A/UP	
USA Line Item No: 609502			Functional Class: 2.2.2.1	
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Aeromotive Equipment Corp.			





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**TS-488A/UP ECHO BOX (CAVITY, TUNED)**

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**FUNCTIONAL DESCRIPTION:**

A portable general purpose, field-type, hand tuned unit used to provide a simple and rapid means of determining the overall system performance of radar sets. It is used to make the following radar equipment checks: comparative measurement of the average power output of the radar transmitter, determination of the frequency spectrum, multiple moding, and frequency pulling of the radar transmitter, and the speed of recovery of radar T-R box and receiver. Resonance is indicated by meter deflections and frequency is read directly on the tuning dial.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS-488/U except the "A" model includes shock requirements.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Consists of a pickup antenna dipole, a tunable resonant cavity, a coupling loop, a crystal rectifier, and a direct current microammeter used as an output meter. A Transmitted pulse from the radar is fed into the echo box. The RF energy is stored in the resonant cavity during the transmitting cycle in the form of damped oscillations. At the completion of the transmitting cycle, the energy is reradiated back into the radar receiver where it appears as a signal on the indicator. The shape and character of the pattern shows the condition of the radar receiver. A portion of the energy stored in the echo box resonant cavity is rectified and measured on the output meter on the echo box panel. The meter serves as a tuning indicator for the echo box and also provides a comparative power output measurement for the radar transmitter.

*Pwr Supply:* None required

*Freq Range:* 8990 to 9610 megacycles per second

*Type of Reception:* Continuous Wave or Pulsed

*Ring-Time:* 25 microseconds or 4000 yards with a transmitted pulse width of % microsecond

*Q:* Approximately 60,000

*Freq Accuracy:* Difference between errors at frequencies 60 megacycles per second apart: 1.5 megacycles per second. The maximum frequency error over the range of 8990 to 9610 megacycles per second is  $\pm 8.0$  megacycles per second. (These accuracies are measured at 77°F.)

*Meter Range:* 0 to 20 microamperes

*Meter Sensitivity Control:* 0 to 25 decibels in 1 decibel divisions

*Temp Range:* -54°C. (-65°F.) to +60°C. (+140°F.)

*Major Units:* 1 TS-488A/UP 11 1/2" x 17 5/8" x 9"; 26.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-1N23B (Crystal Rectifier)

**REFERENCE DATA AND LITERATURE:**

TO 33A1-3-71-1, -2, -3, -4

MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A

3 November 1954

Cog Serv: USA FSN:

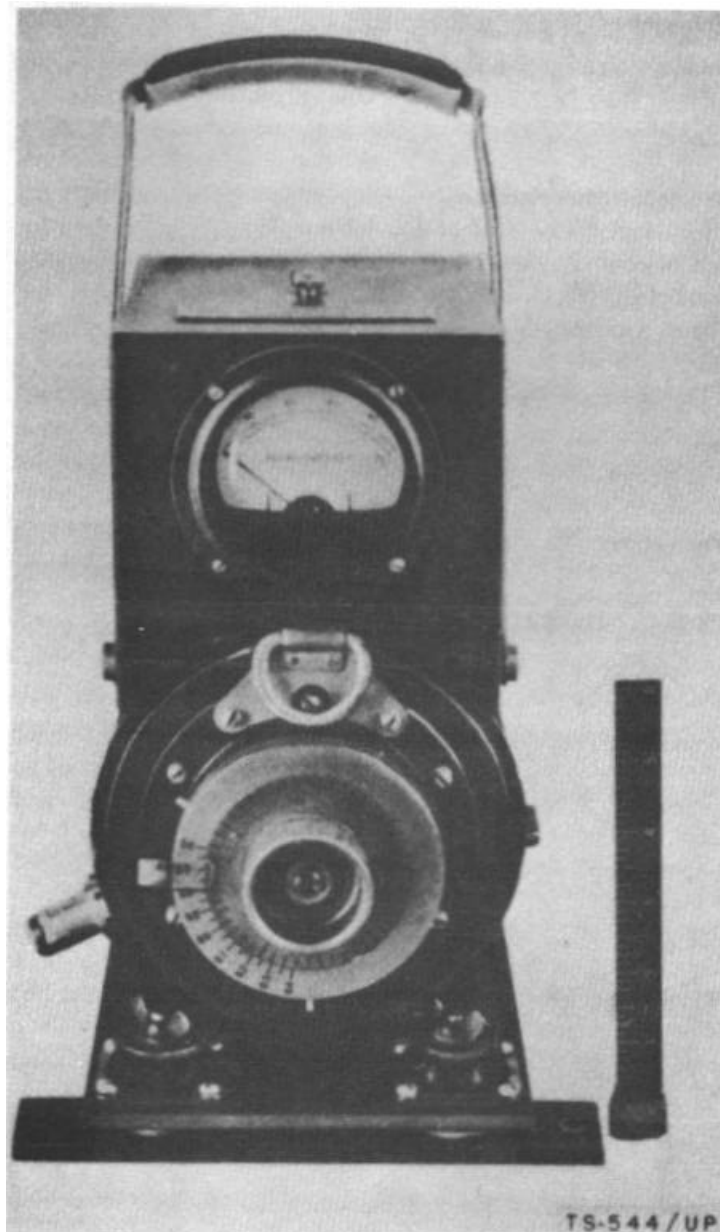
USA Line Item No:

ECHO BOX TS-544/UP

Functional Class: 2.2.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----

Manufacturer: Johnson Service Co.



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**TS-544/UP ECHO BOX**

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**FUNCTIONAL DESCRIPTION:**

Echo Box TS-544/UP is a portable handtuned ringing cavity used in making quick, rough analyses of the overall performance of radar systems. It determines the frequency of CW, MCW, or pulsed transmitters, measures relative power output, detects multiple moding of magnetrons, and indicates signal-to-noise ratio of receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Radar Equipment Mark XII.  
Equipment Required But Not Supplied: One directional coupler.

**TECHNICAL DESCRIPTION:**

*Freq Range:* 580 to 620 me  $\pm$ .5 mc  
*Input Voltage Standing Wave Ratio:* Less than 1:1  
*Input Impedance:* 50 ohms  
*Decay:* 2.9 db/usec (approx)  
*Ringtime:* 36.5 usec (approx)  
*Temp Range:* -54°C to +71°C  
*Major Units:* 1 TS-544/UP 10 1/2" X 8 1/2" x 13"; 8 lbs

**TUBE, CRYSTALS, TRANSISTORS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

Instruction Book  
USAF Spec R-7484A; Dwg 426

7 July 1955

Cog Serv: USA FSN: 6625-519-7590

PULSE TESTER TS-598A/U

USA Line Item No:

Functional Class: 2.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Elk Electronic Laboratories, Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A special purpose portable field maintenance test set used to measure the pulse repetition frequency (speed) and the duty cycle (percent make) of pulses arriving in either a continuous series or a short series of five or more pulses. Battery, ground, and loop pulses can be measured.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to T S598/U except for circuitry differences.

**TUCHNICAL DESCRIPTION:**

*Circuit Information:* The input pulses drive a relay which repeats pulses to a meter network. The milliammeter gives a direct indication of the characteristics of the incoming pulses. To measure a short burst of 5 or 10 pulses, provision is made so that the meter can be preset to the approximate rate at which the pulses will occur.

*Pwr Supply:* 26 volts  $\pm$ 4 volts, dc. Power consumption is approximately 0.5 watt.

*Pulse Repetition Freq:*

*Scale Calibration:* 0 to 15 pulses per second

*Normal Operating Range:* 8 to 12 pulses per second

*"Percent Make":*

*Scale Calibration:* 0% to 100%

*Normal Operating Range:* 30% to 70%

*Accuracy:*

*Pulse Repetition Freq:*  $\pm$ 5% (8 to 12 pps)

*"Percent Make":*  $\pm$ 5% (30% to 70% make scale)

*Major Units:* 1 TS-598A/U 6" x 11 1/2" x 6"; 7 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TO 33A1-10-21-11 (Operation and Service Instructions)

TO 33A1-10-21-24 (Parts Breakdown)

MIL-P-5177

## APPENDIX A

## GLOSSARY OF ABBREVIATIONS

This appendix is a listing of abbreviations used in this publication, arranged alphabetically. The exact word or phrase for which the abbreviation is used, is given in each case.

A/C .....	Augmented Carrier	Cu ft.....	cubic foot (feet)
A/Std.....	Alternate Standard	cw .....	continuous wave
abs.....	absolute	cy.....	cycle(s)
ac.....	alternating current	db .....	decibel(s)
ADF .....	Automatic Direction Finder	dbm .....	decibels (referred to 1 milliwatt)
af .....	audio frequency	dc.....	direct current
afc.....	audio frequency control	deg.....	degree
alt.....	altitude	Dept.....	Department
am .....	amplitude modulated (modulation)	dev.....	develop (development)
ame .....	amplitude modulated (modulation) equivalent	dia.....	diameter
amp .....	ampere(s)	div.....	division
ampl.....	amplifier	dab.....	double side band
ant .....	antenna	Dwg .....	Drawing(s)
approx.....	approximate (approximately)	dy.....	dynes
ARL.....	Aircraft Radio Laboratory	ea .....	each
ASO.....	Aviation Supply Office	Ed .....	Edition
assy .....	assembly	el.....	elevation
auto.....	automatic	elect. ....	electrolytic
avc.....	automatic volume control	equiv.....	equivalent
avg.....	average	ext.....	external
as.....	azimuth	F .....	Fahrenheit
bat .....	battery	fax .....	facsimile
bfo .....	beat frequency oscillator	M .....	filament
blk.....	black	fm .....	frequency modulated (modulation)
BuAer.....	Bureau of Aeronautics	fpm .....	feet per minute
BuOrd .....	Bureau of Ordnance	freq .....	frequency
BuShips .....	Bureau of Ships	fsk.....	frequency shift keyed (keying)
bw.....	bandwidth	FSN .....	Federal Stock Number
C.....	Centigrade	ft .....	foot (feet)
cal.....	calibrate	gen.....	generator
cgs.....	centimeter gram second	GFE .....	Government Furnished Equipment
chan.....	channel	h .....	henry(s)
CIC .....	Combat Information Center	RDBK.....	Handbook
ckt.....	circuit	hf .....	high frequency
Class.....	Classification	HI .....	High
cm.....	centimeter	hor .....	horizontal
Co.....	Company	hr .....	hour(s)
coax.....	coaxial	icw .....	interrupted continuous wave
Cog.....	Cognizant (Cognizance)	IF .....	Intermediate Frequency
COMM .....	Communication(s)	IFF.....	Identification Friend or Foe
cont'd .....	continued	in. (a) .....	inch (inches)
Corp.....	Corporation	Inc .....	Incorporated
cpm.....	cycles per minute	INPH.....	Interphone
cps .....	cycle(s) per second	int .....	internal
ctr .....	center	JAN .....	Joint Army-Navy
cu.....	cubic	kc.....	kilocycle(s) (or kilocycles per second)
		kV .....	kilovolt (s)

**MJL-HDBK-172A, VOL I/TM 11 187H1/1/NAVSHIPS 93003A**

kva.....	kilovolt-ampere (s)	Spec .....	Specification
kw .....	kilowatt(s)	sq.....	square
L/Std .....	Limited Standard	sb.....	single sideband
lb(s).....	pound(s)	Std.....	Standard
lf .....	low frequency	swr.....	standing wave ratio
lg .....	long	sync .....	synchronizing
lsb.....	lower sideband	T/Std.....	Tentative Standard
ma .....	milliampere (a)	temp .....	temperature
man .....	manual	term .....	terminal
max.....	maximum	TM .....	Technical Manual
mb .....	millibars	TO .....	Technical Order
me .....	megacycle ( ) (megacycles per second)	TR.....	Transmit-receive
mew .....	modulated continuous wave	TTY .....	Teletypewriter
meg .....	megohm	TV.....	Television
rnf .....	medium frequency	ua .....	microampere
mh .....	millihenry	udynes.....	microdynes
ml .....	mile	uf .....	microfarad
MIC.....	Microphone	uh .....	microhenry
MIL .....	Military	uhf .....	ultrahigh frequency
min.....	minimum or minute (s)	umhos .....	micromhos
mph .....	miles per hour	USA .....	United States Army
ms.....	millisec(s)	USAF.....	United States Air Force
mv .....	millivolt	usb.....	upper sideband
mw.....	milliwatt(s)	USCG .....	United States Coast Guard
naut.....	nautical	usec.....	Microsecond (s)
NAV .....	Navigation	USMC .....	United States Marine Corps
neg.....	negative	USN .....	United States Navy
neut.....	neutral	u/w .....	used with
No(s).....	Number(s)	uuf .....	micromicrofarad (s)
nom .....	nominal	uf .....	microvolt
Obs .....	Obsolete	uw.....	microwatt(s)
OD.....	Outside Diameter	v .....	volt(s)
opm .....	operations per minute	v/in.....	volt per inch
osc.....	oscillator	v/meter .....	volts per meter
P/Std.....	Planned Standard	v/usec.....	volt per microsecond
peak/in.....	peak per inch	va .....	voltampere
pf .....	power factor	vert .....	vertical
Pkg(s) .....	Package(s)	vf .....	voice frequency
pm .....	pulse modulated (modulation)	vhf .....	very high frequency
pos.....	positive	vlf .....	very low frequency
pps .....	pulses per second	vol.....	volume
prf .....	pulse repetition rate	vps.....	vibrations per second
pt .....	point	VSWR.....	Voltage Standing Wave Ratio
pwr.....	power	VTVM.....	Vacuum Tube Voltmeter
Qty.....	Quantity	vu .....	volume unit(s)
RADC .....	Rome Air Development Center	w.....	watt(s)
REC.....	Receiver	w/ .....	with
ref .....	reference	w/amp .....	watt per ampere
rf .....	radio frequency	w/mc .....	watt per megacycle
rms .....	root mean square	w/o .....	without
rpm .....	revolutions per minute	WADC .....	Wright Air Development Center
RT .....	Receive Transmit	wk .....	week
rtt .....	radio teletype (frequency shift keyed)	wpm .....	words per minute
S/Std.....	Substitute Standard	xmtr .....	transmitter
sec .....	second	xtal.....	crystal
shf.....	super high frequency	yd .....	yard
SigC.....	Signal Corps	yd/rev.....	yard per revolution
SOS.....	International distress signal (radio-telegraph)		

## MIL-NDIK-172A, VOL I/TM 11487H1/1/NAVSHIPS 93003A

## APPENDIX B

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**MIL-HDK-172A, VOL I/TM 11487H-1//NAVSHIPS 93003A**

Custodians:

Army	-EL
Navy	-BuShips
Air Force	-MAAMA

Preparing activity:

Army-EL  
6625-0072

User activities:

Army - GL, MO

**AGO 10038A**



## CATEGORY 3

## WAVE FORM MEASURING EQUIPMENT

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C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

6 Jul 1955

Cog Slav: USA FSN:

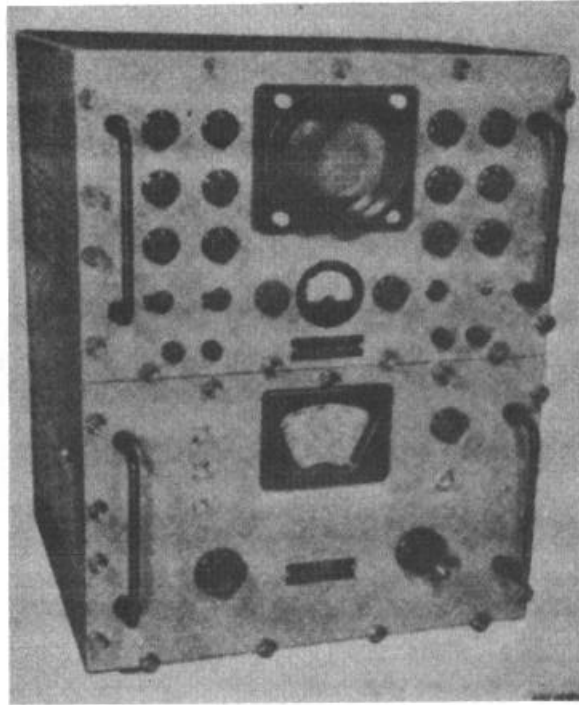
USA Line Item No:

SPECTRUM ANALYZER SET

AN/UPM-17

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Lavoie Laboratories, Inc.			

**FUNCTIONAL DESCRIPTION:**

Spectrum Analyzer Set AN/UPM-17 is a transportable, broad-band set used in the amplifier alignment of electronic countermeasures equipment. It measures frequency; determines bandwidth necessary for reproducing an rf pulse observed on the indicator; compares two rf signals differing by a small frequency separation; acts as a sensitive detector in rf power measurements; observes and measures the side-bands associated with AM and FM signals; and checks operation of a magnetron. It may also be employed to illustrate the method of Fourier analysis of transient phenomena. Information is displayed on a 5-inch cathode-ray tube.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, similar to Lavoie Laboratories Type 1469, is the production model of Spectrum Analyzer TS680(XA)/U.

**TECHNICAL DESCRIPTIONS**

*Power Requirements:* 300 w, 105/125 v, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 10 to 16,000 me in 8 bands

*Beat Frequency Oscillator:* 160 mc

*Intermediate Frequency:* 1 me, 64 me, 160 mc

*Sweep Frequency Range:* 5 to 30 cy

---

**SPECTRUM ANALYZER SET**  
**AN/UPM-17**

---

*Maximum Spectra Dispersion:* 100 kc/in. (4-in. scale)

*Maximum Deviation, Marker Frequency:*  $\pm 15$  mc

*Maximum Frequency Swing-of-Sweep Oscillator:* 25 mc

*Calibration:* 0 to 60 db (IF attenuation); 10 to 140 db (rf attenuation)

*Temperature Range:*  $-40^{\circ}$  C to  $+71^{\circ}$  C (nonoperating);  $0^{\circ}$  C to  $55^{\circ}$  C (operating)

*Humidity Range:* to 90%

*Altitude Range:* to 6,000 ft (operating); to 50,000 ft (nonoperating)

*Accuracy:*

*Amplitude Comparator:*  $\pm 1$  db

*IF Attenuation:*  $\pm 1$  db

*rf Tuning:*  $\pm 0.5\%$

*Spectrum Calibrator:*  $\pm 0.5$  mc

*Sweep Calibration:*  $\pm 10\%$

*Sweep Linearity:*  $\pm 5\%$

*Major Units:* IP-130/UPM-17 12 1/2" x 19 1/2" x 20 1/2"; 75 lbs

TN-188/UPM 12 1/2" x 19 1/2" x 20 1/2"; 50 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OB2WA, (6) IN158, (1) 2C37, (1) 6AF4, (1) 6AG5, (3) 6AN4, (2) 6AN6, (4) 6AU6WA,

(5) 12AT7WA, (17) 5654/6AK5W, (1) 5675, (1) 5725/6AS6W, (3) 5751WA, (3) 5814WA, (2) 6080

**REFERENCE DATA AND LITERATURE:**

MIL-S4469A (USAF)

C 1, MIL-HDBK-172A, VOL I/TM 11487H-1/1

28 June 1954

Cog Slav: USA FSN: 6625-643-3111

USA Line Item No: 685692

TEST SET, RADAR

AN/UPM-33

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	Std	L/Std	-----
Manufacturer:	Northeastern Engineering Co., Inc.			

**No Illustration Available****FUNCTIONAL DESCRIPTION,**

Radar Test Set AN/UPM-33 is a portable equipment used in checking the frequency of TR and RT boxes, signal generators, local oscillators, and magnetrons, as well as in measuring pulse width, rf spectrum width, and the Q of resonant cavities.

Application is in depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 125 w, 105 to 125 v, 50 to 1,200 cy, 1 phase ac

*Frequency Range:* 8,470 to 9,630 mc $\pm$  5 me

*Type of Reception:* cw, pulse

*Type of Emission:* cw, fm

*Frequency Check Point:* 9,310 mc  $\pm$  2 mc

*Intermediate Frequency:* 22.5 mc (1st); 3 mc (2nd)

*Over-a IF Bandwidth:* 50 kc

*Maximum Dispersion of Spectra:* 1.5 mc/in.

*Sweep Frequency:* 10 to 30 cy

*Frequency Swing of Analyzer Radio-frequency Oscillator:* 40 to 50 mc (sawtooth fm)

*Power Input:* 12 to 70 dbm

*Attenuation (Spectrum Amplitude):* 3 to 70 db

*Receiver Gain (2 IF stages, 1 video stage):* 100 db

*Sensitivity to Continuous Wave:*

*Spectrum-amplified Position:* 80 db below 1 w for 1 in. of deflection on oscilloscope screen

*Spectrum Position:* 55 db below 1 w for 1 in. of deflection on oscilloscope screen

*Signal Output:* 1 to 2 mw (approx)

*Pulse Length:* .5 to 5  $\mu$ sec

*Temperature Range:* -40° C to +55° C

<i>Major Units:</i>	CG-176/AP	5" x 2 1/4" x 2 7/16"	.75 lbs
	CG-182/APM-40	1 1/8" x 21/32" x 18"	.32 lbs
	TS-148/UP	15 11/16" x 13 13/32" x 9 1/8"	39 lbs
	UG-144/AP	1 5/8" x 1 5/8" x 31/500"	.06 lbs
	UG-183/U	21/2" x 1" x 1 1/2"	.4 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N23B, (1) 2K25, (1) 2X2A, (1) 3BP1, (1) 5R4GY, (1) 6AC7, (1) 6SA7, (3) 6SJ7, (3) 6SN7GT,  
(1) 6Y6G, (1) 884, (4) 991

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS148-5, NAVSHIPS 900,754, TM 11-1249  
Spec No. 16A46 (Aer)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1/

ANALYZER, SPECTRUM  
AN/UPM-58

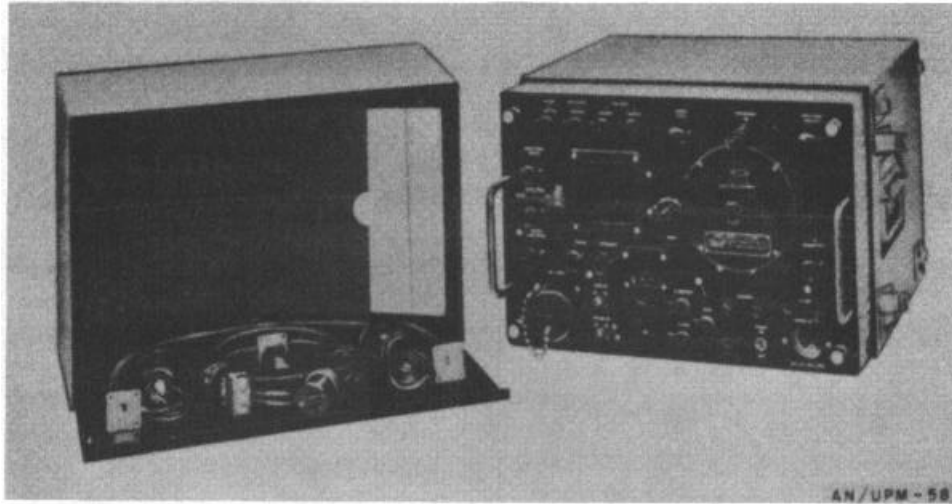
1 March 1964

Cog Serv: USA FSN: 6625-523-8576

USA Line Item No: 602637

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std-A	-----	-----	-----
Manufacturer:	Polarad Electronics Corp.			

**FUNCTIONAL DESCRIPTION:**

Spectrum Analyzer AN/UPM-58 is a portable instrument used in analyzing power or pulsed cw radar and beacon signals. The equipment also functions as a synchroscope visually indicating large amplitude pulsed signals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment Required But Not Supplied:* (1) Directional Coupler PRD 405 or equivalent

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 165 w, 105 to 125 v, 50 to 1,000 cy ac

*Frequency:* 16,000 mc  $\pm$ 250 mc

*IF Bandwidth:* 50, 700 kc

*Sweep Frequency:* 5 to 40 cy

*Power Output:*

*Plate Supply:* +300 v

*IF Strip B+:* + 135 v

*Klystron Reflector Supply:* -87 to -261 v

*Cathode-Ray Tube High Voltage:* -1,600 v

*Major Units:* TS-742/UPM 18 7/32"x12" x 19" 75 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 2X2A, (1) 3RP1, (1) 5Y3GT, (2) 6AH6, (1) 6AS7G, (7) 6AU6, (1) 6BA7, (1) 6X4, (7) 12AT7,  
(4) 5651, (1) 6005, (1) 6178

**REFERENCE DATA AND LITERATURE:**

TM 11-5099

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
AN/USM-24C

3 April 1956

Cog Serv: USN FSN: 6625-668-9460

USA Line Item No: 628920

Functional Class: 3.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	L/Std	-----
Manufacturer:	Waterman Products Co.			

**No Illustration Available****FUNCTIONAL DESCRIPTIONI**

This is a portable, general purpose instrument used to portray visually the time variation of a pulse or waveform, and to provide a means for determining the duration and instantaneous magnitude of the waveform. It is intended for use in checking and testing all types of electronic equipment such as transmitters, receivers, and amplifiers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This oscilloscope consists basically of the following eight circuits:

- (1) The Display Channel consists of a cathode ray tube, the controls for static adjustment, and a means for trace calibration.
- (2) The Vertical Channel transmits the signal from the input jack to the cathode ray tube and controls the amplitude of the signal without appreciably changing its waveform. It also provides a time delay to permit the time base, markers, and intensification circuits to start functioning before the vertical signal reaches the screen of the cathode ray tube.
- (3) The Horizontal Channel consists of an amplifier with suitable pass band and gain to amplify sweep voltages produced by the linear time base.
- (4) The Time Base Channel provides a linear time base so that the trace appears in a conventional notation, starting from left to right. Portions of the trace can be selected and expanded approximately 10 times for closer observation and measurement.
- (5) The Synchronization Channel provides a means of synchronizing the linear time base with a signal so that the trace appears stationary on the face of the cathode ray tube. The linear time base can be synchronized by the incoming signal, the internal trigger generator, or an external triggering pulse.
- (6) The Intensity Channel provides the modulation of the electron beam density which is proportional to the brilliance of the trace on the screen. Intensification is produced with a positive gate being applied to the grid and a negative marker signal being applied to the cathode of the cathode ray tube.
- (7) The Trigger Channel consists of a pulse generator used to trigger the oscilloscope. Output jacks on the panel make available positive and negative polarity pulses for external use to control the equipment whose output is being studied.
- (8) The Power Supply Channel provides all the necessary voltages required for the operation of the oscilloscope.

*Power Supply:* 115 v  $\pm 10\%$ , ac, 50 to 400 cps, 220 w at 115 v, 60 cps.

*Frequency Range:* 1.5 cps to 8.5 mc.

*Vertical Amplifier:*

*Sine Wave Response:* Flat within -3 db from 2 cy to 6 mc. Flat within -6 db from 1.5 cy to 8.5 mc.

## OSCILLOSCOPE AN/USM-24C

*Transients Response:* 0.07  $\mu$ sec risetime.

*Sensitivity:* 0.014 v with a 0.25 in. deflection.

*Low Frequency Response:* Less than 5% tilt for 200 cps square wave.

*Linear Time Base:*

*Sweep Speed:* Continuously adjustable from 0.5 to 50,000  $\mu$ sec per inch.

*Sweep Circuit:* Variable trigger or periodic and fixed pulse trigger.

*Sweep Time:* 0.125 second to 0.125  $\mu$ sec for 2.5 in. trace.

*Sweep Expansion:* Approximately 10 times for any portion of trace when the sweep time is over 6  $\mu$ sec per inch.

*Calibration Voltage:* 0.1 to 1 v peak-to-peak from an internal 5 kc square wave generator for calibrating the incoming signal amplitude. A potential of 20 v  $\pm$ 20% from this same generator is available at the front panel for external use.

*Timing Markers:* Synchronized with sweep and available at intervals of 0.2, 1, 10, 100, or 500  $\mu$ sec.

*Trigger Pulse Output:* 25 to 50 v, approximately 1.6  $\mu$ sec wide pulse having risetime of 0.1  $\mu$ sec, occurring at 50, 300, 800, 2000, or 5000 per second.

*Trigger Pulse Input:* 0.5 to 450 v peak-to-peak.

*Input Impedance:*

*Vertical:* 300,000 ohms paralleled by 40  $\mu$ mf.

*Horizontal:* 6.2 meg paralleled by 47  $\mu$ mf.

*Beam Modulation:* 56,000 ohms paralleled by 39  $\mu$ mf.

*Output Voltage and Load Impedance:*

*Sweep Output:* 20 v peak-to-peak, 50,000 ohms.

*Test Volts Output:* 20 v peak-to-peak, 250,000 ohms.

*Trigger + or -:* 25 to 50 v peak-to-peak, 500 ohms.

*Temperature Range:* -54° C. (-65° F.) to +65° C. (+150° F.)

*Relative Humidity:* Over 95%.

*Maximum Operational Altitude:* Approximately 10,000 feet (barometric pressures down to 20.6 in.).

*Radio Interference:* Conducted and radiated interference between 14 kc and 1000 mc well below the limits of military specification MILI-16910(SHIPS).

*Effect of Microwave Fields:* Virtually none.

*Display Tube Diameter:* 3 in.

*Tube Display:* Horizontal, 2 1/2 inches. Vertical, 1 1/2 inches undistorted deflection (3/4 inch for unidirectional signals).

*Measuring Scale:* 25 x 15 divisions with controlled illumination.

*Major Units:* OS-51/USM-24C 14 15/22" x 17 5/22" x 12 19/64" 50 1/2 lbs.

## TUBES, CRYSTALS, TRANSISTORS

1 JAN-OA2WA, 2 JAN-1V2, 1 JAN-3JP1, 3 JAN-6AH6, 2 JAN-AN5WA, 5 JAN-12AT7WA,  
7 JAN-12AU7, 1 JAN-5719, 2 JAN-5726, 2 JAN-6135, 4 JAN-6203.

## REFERENCE DATA AND LITERATURE

NAVSHIPS 92465 (Instruction Book).



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
AN/USM-25A, -25B

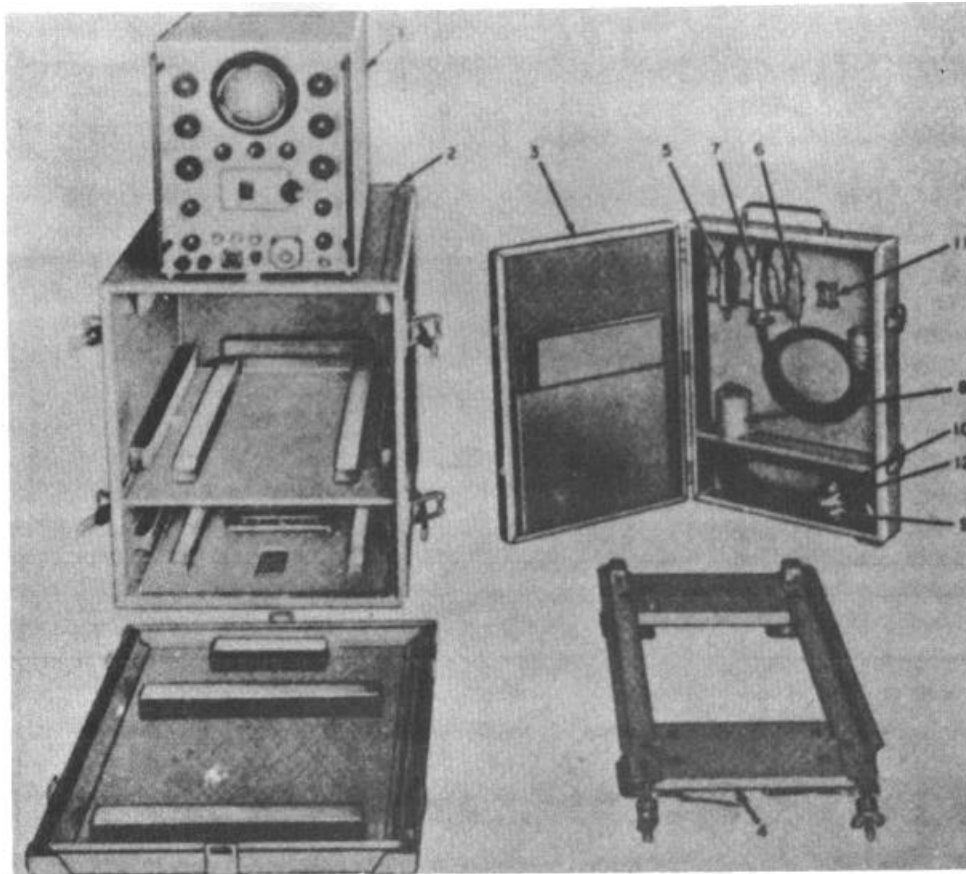
3 May 1955

Cog Serv: USN FSN: 6625-668-2870

USA Line Item No:

Functional Class: 3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Industrial Television Inc.			

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose oscilloscope designed to portray a luminous plot of instantaneous voltage against a time base. The equipment serves as an auxiliary ranging unit, a precision test oscilloscope, and a calibrator. It can be used with radar systems to increase the accuracy in ranging, extend the range scale, and provide accurate crystal controlled markers. It also provides expanded, delayed, or undelayed sweeps.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

The AN/USM-25A is intended for nonflight auxiliary radar ranging and bench testing of electronic devices, and includes Case CY-1094/AP. The AN/USM-25B is intended for flight use and includes Mounting MT-1292/USM-25B. The same oscilloscope, OS-4A/AP, is the major component of both models.



## OSCILLOSCOPE AN/USM-25A, -25B

### TECHNICAL DESCRIPTION:

*Circuit Information:* This equipment contains a cathode ray tube with its associated circuits, a sweep channel, a signal channel, calibration marker and trigger circuits, and a power supply. Horizontal traces are of the start-stop type, produced only by triggering from a suitable synchronizing pulse.

*Power Supply:* 115 v  $\pm$  10%, ac, 50 to 1000 cps, single phase, 180 w.

*Video Amplifier:*

*Sensitivity:*

*Minimum:* 0.5 v peak-to-peak per in.

*With Crystal Probe:* 5.0 v peak-to-peak per in.

*With Test Lead:* 1.0 v peak-to-peak per in.

*Direct to Vertical Deflecting Plates:* 43 to 52 v, peak-to-peak per in.

*Frequency Response:*

*Amplifier:*  $\pm$ 1 db between 50 cps and 5 mc;  $\pm$  3 db between 10 cps and 8 mc.

*With Test Lead:*  $\pm$  1 db between 50 cps and 5 mc;  $\pm$  3 db between 10 cps and 8 mc.

*At Carrier Frequency of 10 to 200 mc:* 10 to 15,000 cps between 6 db points.

*Pulse Response:*

*Rise Time:* Less than 0.1  $\mu$ sec.

*Delay Time:* Less than 0.2  $\mu$ sec.

*200 Cycle Square Wave Droop:* Less than 5M.

*Input Impedance:*

*Amplifier:* 1 meg shunted by 26  $\mu$ f.

*Attenuator Prod:* 1 meg shunted by 10  $\mu$ f.

*Test Lead:* 10 meg shunted by 8  $\mu$ f.

*Crystal Detector:* 47,000 ohms shunted by 8  $\mu$ f.

*Vertical Direct:* 560,000 ohms shunted by 20  $\mu$ f.

*Signal Delay:*

*Delay Time:* 0.60  $\mu$ sec.

*Sweep Ranges:*

*A and S Modes:* 1.2 to 12,000  $\mu$ sec.

*R Mode:* 2.4 to 24  $\mu$ sec. (Inoperative on the fast sweep ranges.)

*Sweep Delay:* 3 to 10,000  $\mu$ sec. (Inoperative on the fast sweep ranges.)

*Synchronizing:*

*Crystal Controlled Markers:* 10  $\mu$ sec or 2,000 yds (12.2  $\mu$ sec); 50  $\mu$ sec or 10,000 (61.0  $\mu$ sec).

*Accuracy:*  $\pm$  0.03%.

*Marker Output:* 12 v peak in 100,000 ohm load shunted by 200  $\mu$ f.

*Internal Impedance:* 56 ohms.

*Sync. Input:* 5 v peak min amplitude.

*Rise Time:* 0.1 to 1.0  $\mu$ sec.

*Repetition Rate:*

*A and R Mode Internal:* 40 to 3,300 pps.

*A and R Mode External:* 6,000 pps, max.

*S Mode:* 20 to 200,000 pps with pulse input; 20 to 1,000,000 cps with sine wave input.

*Sync. Input Impedance:*

*A and R Modes External:* 330,000 ohms, shunted by 15  $\mu$ f, positive; 330,000 ohms shunted by 19  $\mu$ f, negative.

*S Mode:* 1 meg shunted by 17  $\mu$ f.

*Trigger Output:**No Load:* Amplitude, 75 v peak; Rise Time, 0.16  $\mu$ sec.*With Load:* Amplitude, 65 v peak; Rise Time, 0.16  $\mu$ sec.*Ambient Temperature:* -40° C. (-40° F.) to +55° C. (+131° F.).*Transportable Attitude:* 40,000 ft.*Operable Altitude:* 10,000 ft.*Operable Relative Humidity:* 95% max.*Major Units:* OS-4A/AP 11 1/2" x 17 1/2" x 9"

35 lbs.

**TUBES, CRYSTALS, TRANSISTORS,**2 JAN-0A2, 3 JAN-1N69, 1 JAN-1Z2, 5 JAN-12AT7, 1-3WP1 (KRT Display), 1 JAN-5718,  
1 JAN-5725, 1 JAN-5726, 2 JAN-5763, 8 JAN-5814, 2 JAN-AH6.**REFERENCE DATA AND LITERATURE:**

AN 16-30USM25-2 (Service Instructions).

MIL-0-7738.

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
AN/USM-50

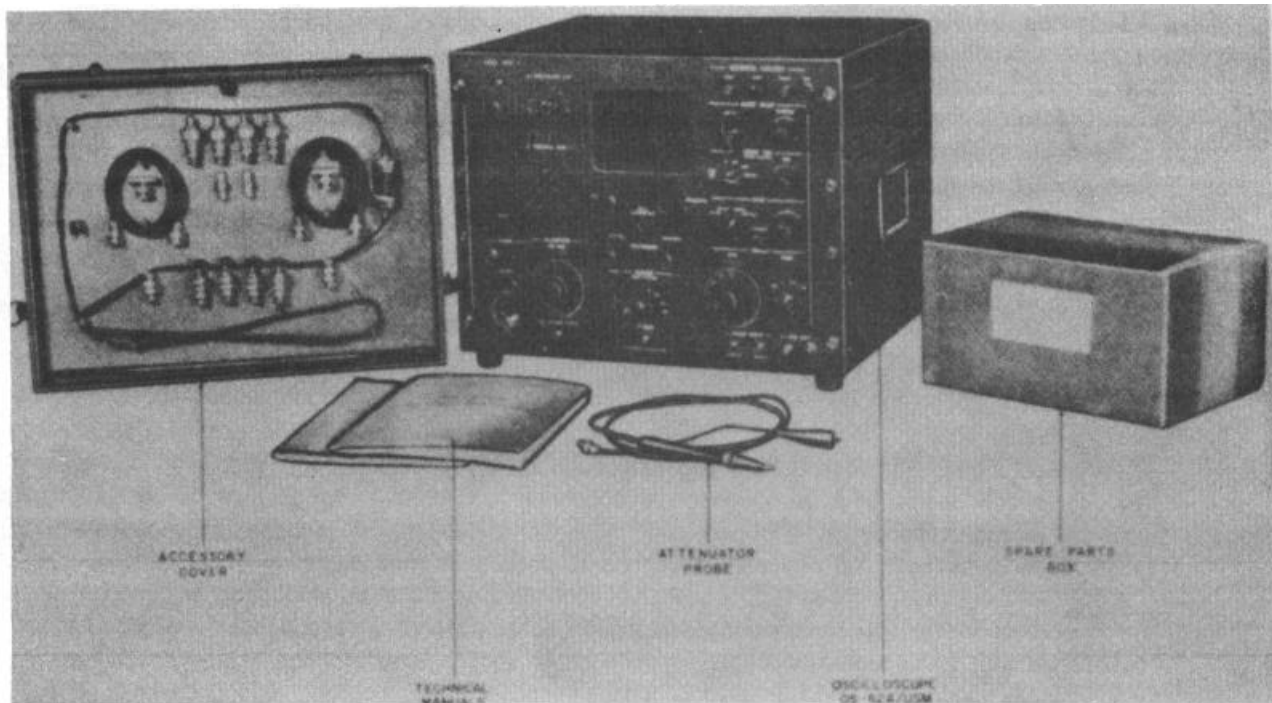
1 March 1964

Cog Serv: USA FSN: 6625-668-4676

USA Line Item No: 628927

Functional Class: 3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	L/Std	-----
Manufacturer:	Lavoie Laboratories			

**FUNCTIONAL DESCRIPTION:**

A portable general purpose test instrument used for circuit phenomena observation and testing radar and communications equipment. Positioning controls permit the trace to be located without distortion anywhere on the face of the 3-inch cathode ray tube. A high impedance probe is included for measuring high impedance circuits. Sine waves which vary from 3 cycles per second to 20 megacycles per second may be observed. May be installed in a standard rack or as a portable bench test set when mounted in its dust cover.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to the Lavoie type No. LA-239C.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Conventional circuitry is used throughout. Highly regulated power supplies maintain accuracy and constant operation under varying line conditions or surges.

*Power Supply:* 110 to 130 v, ac, 50 to 1000 cps, single-phase, 295 w. (Fused at 4 amperes.)

*Input impedance, Vertical and Horizontal:*

*Oscilloscope alone:* 1 meg paralleled by 40  $\mu$ f.

*Oscilloscope with probe:* 10 meg paralleled by 12  $\mu$ f.

## OSCILLOSCOPE

### AN/USM-50

#### *Frequency Characteristics:*

*Sine waves observable:* 10 cps to 20 mc.

*Transients observable:* min rise time of 0.022  $\mu$ sec, max square pulse duration of 30,000  $\mu$ sec, positive or negative polarity.

#### *Input Voltage:*

*Oscilloscope along:* 0.03 to 90 v peak.

*With probe:* 0.3 to 450 v peak.

*Input Sensitivity:* 10 mv per cm rms.

*Sweep Time:* Continuously adjustable from 0.17 to 37,500  $\mu$ sec per inch. Start-stop or recurrent circuit, each sweep started by signal pulses independent of preceding pulse. Any portion of sweep nominally over 10  $\mu$ sec may be delayed and expanded about 10 times.

*Timing Markers:* Synchronized with sweep, 0.2, 1, 5, 20, 100, 500, and 2000  $\mu$ sec. Markers are also available through Z-axis jack as 15 v pulses.

*Calibration Voltage:* Internally generated 1 kc square wave, continuously adjustable from 20 to 200 mv. Constant 40 v output available for external use.

*External Sync:* Without probe,  $\pm 0.05$  v to  $\pm 45$  v; with probe,  $\pm 0.5$  v to  $\pm 450$  v.

*Trigger Pulse Output:*  $\pm 25$  v, 1.5  $\mu$ sec pulses continuously variable from 10 to 10,000 cps, rise time of 0.15  $\mu$ sec.

*Sawtooth Voltage Output:*  $\pm 150$  v, duration varied by adjusting sweep time.

*Accelerating Potential:* 4000 v.

#### *External Connections:*

*To Vertical Plate:* Through 0.1  $\mu$ f, approximately 45 v/in. sensitivity.

*To Horizontal Amplifier:* Through potentiometer, 3 to 200 v/in. Bandwidth 10 to 750,000 cps at max sensitivity.

*To Cathode of Cathode Ray Tube:* Through 0.01  $\mu$ f (Z-axis, max peak 75 v).

*Trace Presentation:* Automatic cutoff of amplitudes exceeding 4 cm, so that there is no visible lag or overshoot to vertical positioning. Standard scale pattern area is 3 by 6 cm, indexed in 2 millimeter and 1 cm increments.

*Major Unit* AN/USM-50                      15 1/4" x 19 1/2" x 16 3/4"                      65 lbs

## TUBES, CRYSTALS, TRANSISTORS

3 JAN-6AL5, 1 JAN-6AS6, 4 JAN-6AU6, 11 JAN-6CB6, 7 JAN-12AT7, 3 JAN-12AU7, 5 JAN-12B4, 1 JAN-12BH7, 4 JAN-12BY7, 2 JAN-5642, 2 JAN-5651, 1 JAN-6080.

## REFERENCE DATA AND LITERATURE:

Manufacturer's Operation and Service Manual.

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
I-245

1 March 1964

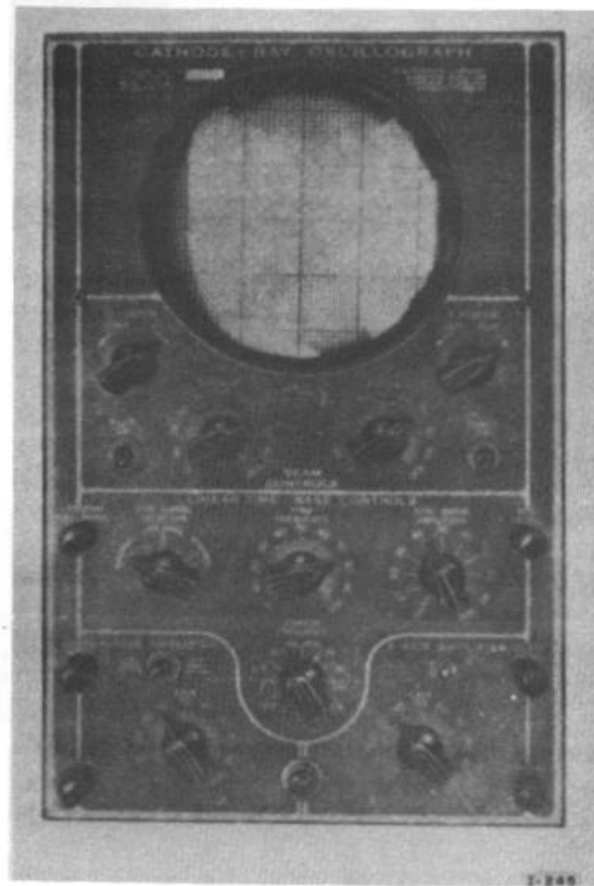
Cog Serv: USA FSN: 6625-237-7372

USA Line Item No: 628950

Functional Class: 3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	L/Std	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Oscilloscope I-245, having a 5-inch cathode-ray tube, permits the viewing of wave forms and checking of frequencies and phase relations at various test points in radio and radar sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 90 w, 115 or 230 v, 1.5 amp, 40 to 60 cy ac

*Amplifier Frequency Response:*

Y Axis:  $\pm 10\%$  of max from 2 to 100,000 sinusoidal cy; 50% response at 325 kc

X Axis:  $\pm 10\%$  of max from 2 to 100,000 sinusoidal cy; 50% response at 250 kc

## OSCILLOSCOPE

### I-245

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#### *Voltage Gain:*

Y Axis: 2,000  $\pm$ 10%

X Axis: 43

#### *Voltage Input:*

Y Axis: 250 v rms (max)

X Axis: 25 v rms (max)

#### *Input Impedance:*

Y Axis: 2 meg, 30  $\mu$ f

X Axis: 5 meg, 25  $\mu$ f

#### *Deflection Factor (Through amplifier):*

Y Axis: .01 v/in. rms

X Axis: .5 v/in. rms

#### *To Deflection Plates:*

Y Axis: 21 v/in. rms

X Axis: 22 v/in. rms

#### *Sweep Circuit:*

*Direction:* Left to right

*Recurrent Frequency:* 2 to 50,000 cy

*Major Units:* I-245

19" x 30 x 14" 4.6 cu ft

125 lbs

## TUBES, CRYSTALS, TRANSISTORS

(1) 5LP1, (1) 6Q5G, (1) 6SJ7GT, (3) 6SN7GT, (5) 6V6, (1) 6X5GT, (2) 80, (1) 991

## REFERENCE DATA AND LITERATURE:

TM 11-2689

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

INDICATOR, PANORAMIC  
IP-173/U

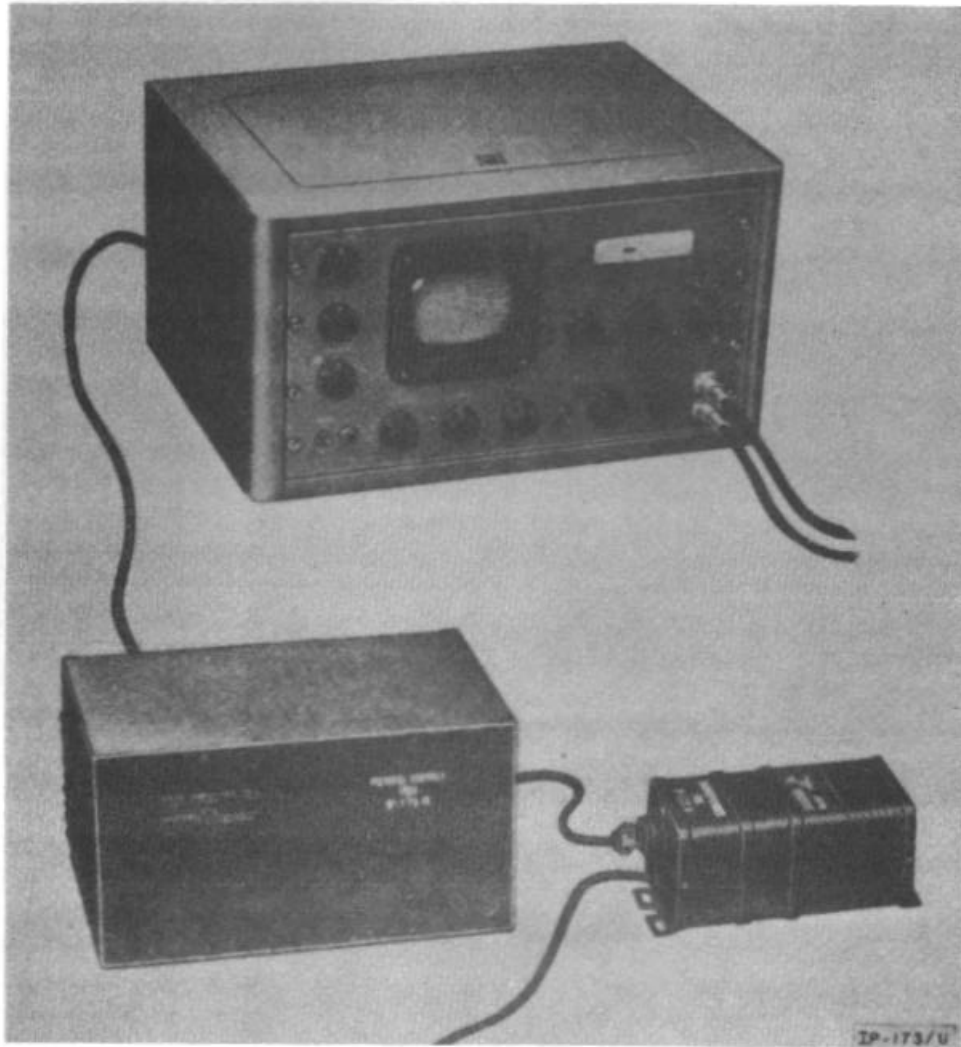
1 March 1964

Cog Serv: USA FSN: 5820-224-5500

USA Line Item No: 621148

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Panoramic Radio Products, Incorporated			

**FUNCTIONAL DESCRIPTION:**

Panoramic Indicator IP-173/U is a portable instrument used in the visual analysis and identification of one or more rf signals at one time.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Panoramic Products Model T-2-1000.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 or 230 v, 50 or 60 cy, 1 phase ac

*Frequency Range:* 0 to 1,000 mc

*Impedance:* 75 ohms (input)

*Major Units:* IP-173/U 20 1/2" x 22 1/2" x 12 1/2"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OC3, (1) 2X2, (1) 5UP7. (1) 6AH6. (1) 6AU6. (2) 6BE6. (2) 6BH6, (2) 6X5, (1) 12AT7 (5) 12AU7

**REFERENCE DATA AND LITERATURE:**



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
OS-8C/U

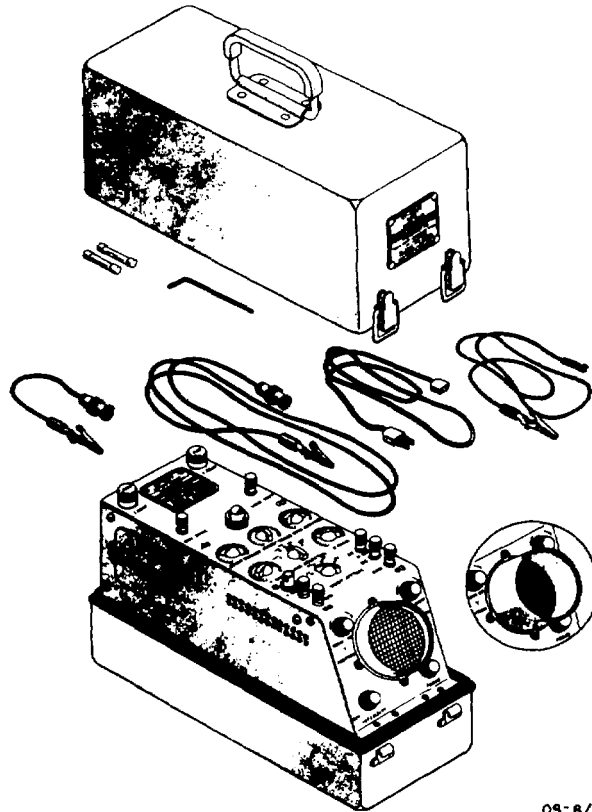
17 June 1955

Cog Serv: USN FSN: 6625-643-1740

USA Line Item No: 628960

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Jetronic Industries, Inc.			

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose test instrument designed to display, meter, and plot the characteristics of a waveform of a varying electrical potential. Indications are viewed on a 3-inch cathode ray tube.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Hycon Model 49 Oscilloscope.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The oscilloscope is made up of seven major assemblies: vertical amplifier, horizontal amplifier, sweep circuit oscillator, sync circuit, power supply, cathode ray tube assembly, and potentiometer assembly (comprised of vertical positioning, horizontal positioning, intensity and focus controls).

*Power Supply:* 115 v  $\pm$  10 v ac, 50 to 1000 cps, single-phase, 60 w at 115 v.

## OSCILLOSCOPE

### OS-8C/U

#### *Frequency Range:*

##### *Vertical Amplifier:*

0 to 2,000,000 cps at full gain control setting.

5 to 2,000,000 cps independent of gain control setting.

##### *Horizontal Amplifier:*

0 to 500,000 cps at full gain control setting.

1 to 500,000 cps independent of gain control setting.

*Sweep Circuit Oscillator:* 3 to 50,000 cps.

#### *Input Impedance:*

##### *Vertical Amplifier:*

AC: 1.5 meg shunted by 25  $\mu$ f

DC: 2.0 meg.

##### *Horizontal Amplifier:*

AC: 1.5 meg shunted by 25  $\mu$ f

DC: 2.0 meg.

*Vertical Direct:* 9 meg shunted by 11  $\mu$ f

*Horizontal Direct:* 9 meg shunted by 11  $\mu$ f

#### *Deflection Sensitivity:*

*Vertical Amplifier:* 0.075 rms v/in

*Horizontal Amplifier:* 0.075 rms v/in

*Vertical Direct Deflection:* 17 rms v/in (approx.)

*Horizontal Direct Deflection:* 25 rms v/in (approx.)

#### *Overall Accuracies:*

##### *Vertical Amplifier:*

$\pm 3$  db from 0 to 2,000,000 cps at full gain control setting.

$\pm 3$  db from 5 to 2,000,000 cps independent of gain control setting.

##### *Horizontal Amplifier:*

$\pm 3$  db from 0 to 500,000 cps at full gain control setting.

$\pm 3$  db from 1 to 500,000 cps independent of gain control setting.

*Temperature Range:* -20° C. (-4° F.) to +55° C. (+131° F.).

*Relative Humidity:* May approach 97% at a mean temp of 40° C. before operation is affected.

*Major Units:* OS-8C/U

14 3/4"x 11 1/8"x 20 1/4"

34 lbs

## **TUBES, CRYSTALS, TRANSISTORS:**

4 JAN-12AT7WA, 2 JAN-6AH6, 2 JAN-6J6, 1 JAN-3RP1, 1 JAN-6X4, (1-CR101, 1-CR102, 1-CR103, selenium rectifiers).

## **REFERENCE DATA AND LITERATURE:**

TO 33A1-13-19-11 (instruction Book)

NAVSHIPS 92251 (Instruction Book)

MIL-0-15525D

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**SPECTRUM ANALYZER  
TS-148/UP**

5 November 1954

Cog Serv: USN FSN: 6625-166-1040

USA Line Item No: 667630

Functional Class: 3.4.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std	-----	-----
<b>Manufacturer:</b>	Hazeltine Electronic Corp. And Westinghouse Electric Corp.			

**FUNCTIONAL DESCRIPTION:**

Spectrum Analyzer TS-148/UP is a portable unit used in testing the overall system performance of radar systems. It checks the frequency of TR and RT boxes, signal generators, local oscillators, and magnetrons, and measures pulse width, rf spectrum width, and the Q of resonant cavities. Application is in depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Equipment AN/MPM-6.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 125 w, 105 to 125 v, 50 to 1,200 cy ac

*Frequency Range:* 8,470 to 9,630 mc $\pm$ 5 mc (input); 8,500 to 9,600 mc (nom)

*Intermediate Frequency:* 22.5 mc (1st); 3 mc (2nd)

*IF Bandwidth:* 50 kc

*Type of Reception:* cw, pulse

*Type of Emission:* cw, fm

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**SPECTRUM ANALYZER**  
**TS-148/UP**

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*Power Range:* + 12 to +70 dbm (input); 1 mw (output)

*Attenuation:* 3 to 7 db

*Major Units:* TS-148/UP

9"X13"X14"

39 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N23B, (1) 2K25, (1) 2X2A, (1) 3BP1, (1) 5R4GY, (1) 6AC7, (1) 6SA7Y, (3) 6SJ7, (3) 6SN7GT,  
(1) 6Y6G, (1) 884, (4) 991

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS148-5, NAVSHIPS 900,754, TM 11-1249

Spec 16A48 (BuAer)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OSCILLOSCOPE  
TS-239/UP

20 August 1954

Cog Serv: USN FSN:

USA Line Item No:

Functional Class: 3.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	Lavoie Laboratories			

**FUNCTIONAL DESCRIPTION:**

Oscilloscope TS-239/UP is a portable measuring instrument used in testing all types of electronic equipment in radar and communication fields. A luminous plot of the time-variation of a voltage pulse or wave, from 10 cycles to 5 megacycles, indicates the duration and instantaneous magnitude of the impulse.

The equipment consists essentially of a calibrating voltage generator, a timing marker generator, and a trigger generator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Both models of this equipment, part of Test Set AN/GPM-1, are identical except that the A model has a negative trigger output of 5,000 pulses per second.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 210 w, 105 to 125 v, 50 to 1,600 cy ac

*Frequency Range:* 1 cy to 3 mc

*Calibrating Voltages, Vertical Y:* 0.1 to 1 v (peak-to-peak)

*Direct Vertical Plate Connection:*

*Input:* 450 v (peak)

## OSCILLOSCOPE

### TS-239/UP

*Input Impedance:* 2.2 meg through 0.1  $\mu$ f  
*Sensitivity:* 110 v/in. deflection  
*Horizontal, X Axis Amplifier:*  
*Input:* 450 v (peak)  
*Input Impedance:* 0.5 meg  
*Response:* 10 to 10,000 cy  
*Sensitivity:* 8 to 200 v/in. deflection  
*Intensity, Z Axis (normally used for internal markers):*  
*Input:*  $\pm 75$  v (max)  
*Input Impedance:* 0.1 meg through .01  $\mu$ f  
*Square Wave Amplitude:* 75 v (peak-to-peak)  
*Sweep (Stop wart) X Axis:*  
*Output Impedance:* 0.1 meg in series w/.05  $\mu$ f  
*Output Trigger Amplifier:* + 150 v  
*Speed:* .05 to 50,000  $\mu$ sec/in.  
*Synchronization:*  
*External with probe:*  $\pm 5$  to  $\pm 450$  v (peak)  
*External without probe:*  $\pm .5$  to  $\pm 150$  v (peak)  
*Input Impedance:*  
     Oscilloscope with probe: 3 meg shunted by 12  $\mu$ f  
     Oscilloscope without probe: 0.3 meg shunted by 30  $\mu$ f  
*Internal:* Trigger generator  
*Timing Markers (synchronized with sweep):* 0.2, 1, 10, 100, or 500  $\mu$ sec  
*Trigger Pules Output:*  
*Amplitude:*  $\pm 25$  v  
*Duration:* 4  $\mu$ sec  
*Repetition Rate:* 300; 800; 2,000; or 5,000 pps  
*Rise Time:* 0.5  $\mu$ sec (10% to 90% to full amplitude)  
*Vertical, Y Axis Ample:*  
*Input Impedance:*  
     Oscilloscope with probe: 3 meg shunted by 12  $\mu$ f  
     Oscilloscope without probe: 0.3 meg shunted by 30  $\mu$ f  
*Polarity:* Pos or neg  
*Sensitivity for Standard Deflection:*  
     Oscilloscope with probe: 1 to 450 v (peak)  
     Oscilloscope without probe: 0.1 to 100 v (peak)  
*Sine War Response:* 10 cy to 5 mc  
*Square Pulse Duration:* 0.2 to 5,000  $\mu$ sec  
*Transients, Observable Rise Time:* .08  $\mu$ sec (max) 10% to 90% of full amplitude  
 Major Units: TS-239/UP                      21 1/2" x 19 1/2" x 17"

66 lbs

## TUBES, CRYSTALS, TRANSISTORS:

(1) 0C3, (1) 3JP1, (1) 5R4GY, (2) 6AG7, (3) 6AK5, (1) 6AL5, (2) 6C4, (2) 6SN7, (2) 6X5GT, (8) 7F8

## REFERENCE DATA AND LITERATURE:

NAVSHIPS 91148  
 Navy Spec CS-750

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**SPECTRUM ANALYZER  
TS-333/UP**

28 October 1954

Cog Serv: USN FSN:

USA Line Item No:

Functional Class: 3.4.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	Std	Std	-----
<b>Manufacturer:</b>	Westinghouse Electric Corp.			

**FUNCTIONAL DESCRIPTION:**

Spectrum Analyzer TS-333/AP, having a 3-inch cathode ray tube, is a portable test set used in checking the operation of signal generators, local oscillators, and magnetrons. It measures frequency and supplies a low power rf signal for measurement of Q factors and standing wave ratios, as well as for determination of TR and RT box characteristics.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:***Power Requirements:* 150 w, 115  $\pm$  10 v, 50 to 1,600 cy, 1 phase ac*Frequency Range:* 23,500 to 24,500 mc  $\pm$  25 mc*Sweep Frequency:* 4.5 to 70 mc*Temperature Range:* -40° C to +55° C

Major Units: TS-333/AP 15" x 13 1/2" x 10"

45 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 0C3, (4) 0D3, (1) 3AP1, (2) 3B24, (1) 5V4G, (1) 6H6GT, (1) 6SK7GT, (1) 6SL7GT, (1) 6SN7GT, (1) 6Y6G,  
(1) 7A6, (5) 7V7, (1) 812A, (1) 884

**REFERENCE DATA AND LITERATURE:**

Navy Spec 16T27(RE)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**MILLIAMMETER RECORDER  
TS-584B/U**

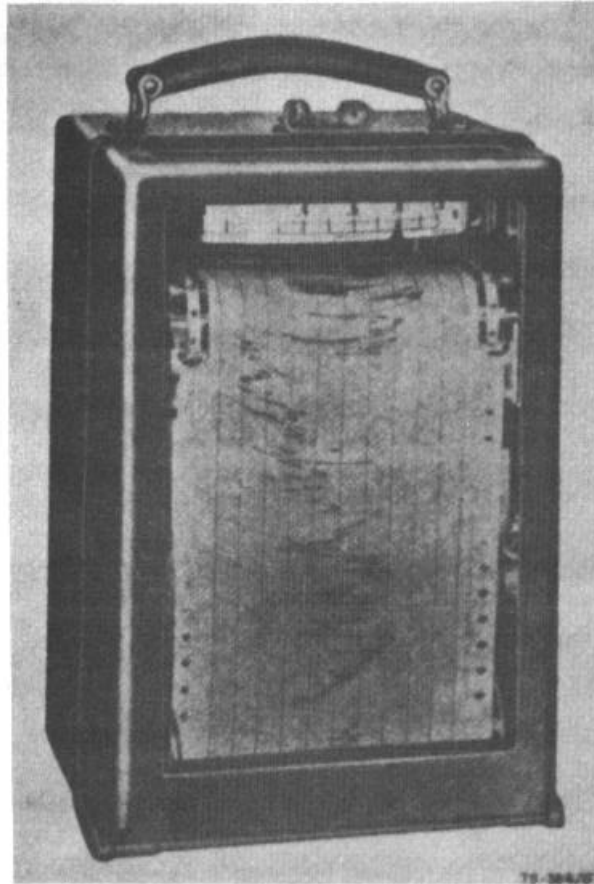
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 3.3.3

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std	-----	-----
<b>Manufacturer:</b>	The Esterline-Angus Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Milliammeter Recorder TS-584B/UT is a portable, variable speed, graphic instrument used in registering current and voltage variations. It records the variations of rf amplitude and functions as an auxiliary to field strength measuring and surveying equipments.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Direct Current Milliammeter Recorder, Easterline-Angus Model AW.



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**MILLIAMMETER RECORDER**  
**TS-584B/U**

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**TECHNICAL DESCRIPTION:***Power Requirements:* 6 w, 115 v, 60 cy, 1 phase ac*Recording Speed:* 3/4 in./min, in./hr; 1 1/2 in./min, in./hr; 3 in./min, in./hr; 6 in./min. in./hr; 12 in./min, in./hr*Voltage Range:* 0 to 15, 30, 150, 300 v dc*Current Range:* 0 to 5 ma*Insulation Test:* 5,000 v ac*Accuracy:*  $\pm 1\%$ *Major Units:* TS-584B/U

14 9/16" x 8 9/16" x 9 9/16"

34 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Instruction Book

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-243-0596

USA Line Item No: 666620

SOUND ANALYZER TS-615/U

Functional Class: 3.4.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer: General Radio Co.				

**FUNCTIONAL DESCRIPTION:**

Sound Analyzer TS-615/U is a portable heterodyne-type vacuum-tube voltmeter used in measuring the amplitude and frequency of steady-state complex electrical wave form components of af communication equipment. It may also be applied in measuring transmission characteristics of electric wave filters and as a null detector for impedance bridges.

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**SOUND ANALYZER TS-615/U**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to wave Analyzer, General Radio Company Type 736-A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 65 w, 115 or 230 v  $\pm 10\%$ , 40 to 60 cy, 1 phase ac

*Frequency Range:* 20 cy to 16 kc  $\pm 2\%$

*Voltage Range:* 300  $\mu$  v to 300 v  $\pm 5\%$

*Input Impedance:* 1 meg

*Major Units:* TS-615/U                      25 1/8" x 19 1/2" x 10 7/8"

86.25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6B8, (1) 6C5, (3) 6C6, (1) 6F5GT, (3) 6J7, (2) 6K6GT, (1) 6X5GT

**REFERENCE DATA AND LITERATURE:**

Instruction Book

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

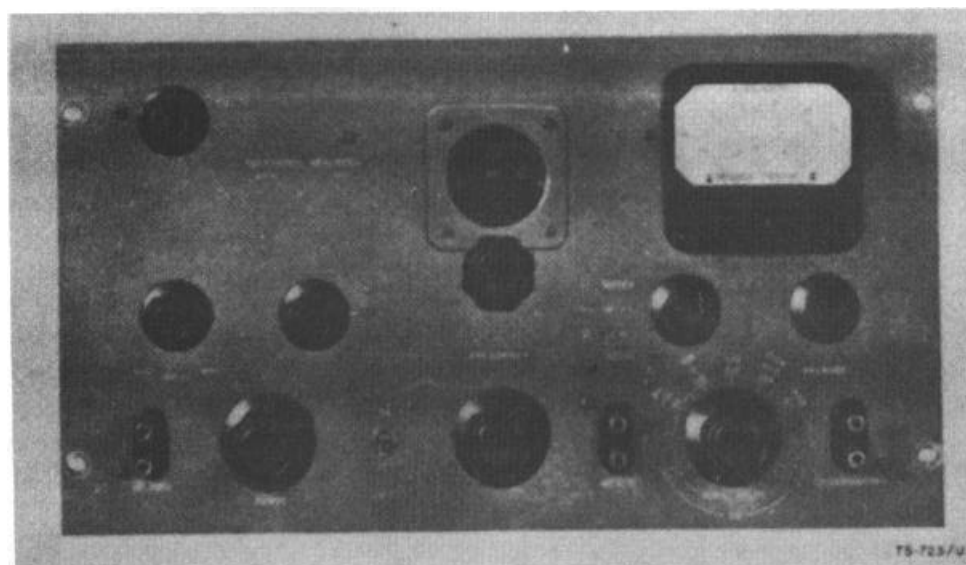
ANALYZER, SPECTRUM

Cog Serv: USA FSN: 6625-668-9418

USA Line Item No: 602640

Functional Class: 3/4/1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Hewlett-Packard Co.				

**FUNCTIONAL DESCRIPTION:**

Spectrum Analyzer TS-723/IT is a portable instrument used in measuring harmonic distortion and noise in af voltages of broadcast transmitters and receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identified with Hewlett-Packard Type 330B.

**TECHNICAL DESCRIPTION:**

*Power Requirement,:* 115 v, 50 to 60 cy, 1 phase ac

*Frequency Range:* 20 to 20,000 cy

*Voltage Range:* .03 to 300 v

*Input Impedance:* 200,000 ohms shunted by 37  $\mu$ f

*Major Unit:* TS-723/U 19" x 13" x 10 1/2"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OD3, (1) 5Y3GT, (3) 6AC7, (1) 6H6 (2) 6J5GT, (4) 6SJ7Y, (1) 6Y6G

**REFERENCE DATA AND LITERATURE:**

TO :33A1-5-64-1

## CATEGORY 4

## SIGNAL GENERATING EQUIPMENT

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C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

22 June 1954

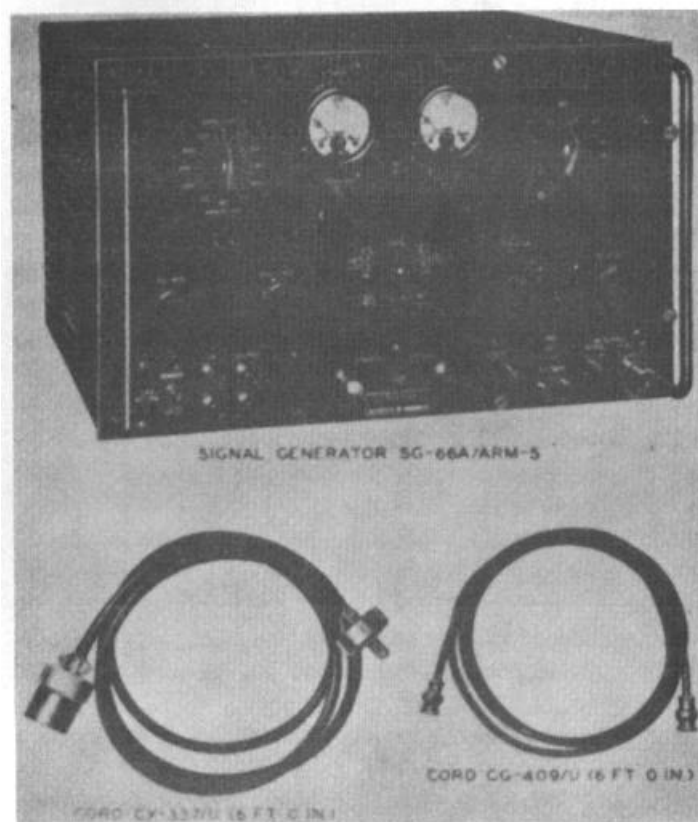
RADIO TEST SET AN/ARM-5

Cog Serv: USN FSN: 6625-669-0272

USA Line Item No: 685700

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----
Manufacturer: Aircraft Radio Corporation				

**FUNCTIONAL DESCRIPTION:**

Radio Test Set AN/ARM-5 provides simulated omnidirectional phase localizer and 90- to 150 cycle amplitude localizer signals for testing aircraft VHF navigational receiving equipment. It is used as a line check item and as an interim item for bench maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is a commercial (Aircraft Radio Corporation Type H-14) signal generator.

*Equipment Required But Not Supplied:* (1) Antenna A-13-B, (1) Cable RG-58/U, (1) Microphone RS-38-A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 160 w, 115 v, 60 cy  $\pm$  .5 cy, 1 phase ac

*Frequency Range:* 108 to 132 mc

*Type of Emission:* AM and FM or AM only as required

*Frequency Control:* Crystal

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**RADIO TEST SET AN/ARM-5**

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*Power Output:* 0 to 20,000  $\mu$ w

*Preset Channels:* 2

*Major Units:* 1 Signal Generator SG-66/ARM-5 17 3/8" x 12 1/4" x 10 1/2"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OA2, (1) 5R4GY, (3) 6AL5, (1) 6AS7G, (1) 6AU6, (1) 6V6GT, (1) 5654, (6) 5670

**REFERENCE DATA AND LITERATURE:**

AN 16-30ARM-5-1

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 March 1956

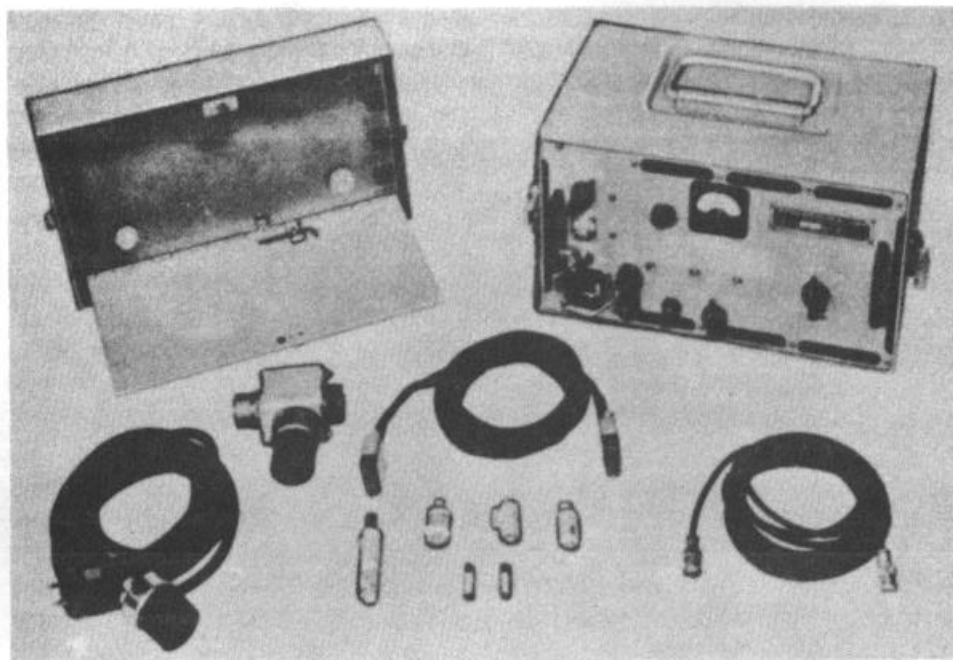
Cog Serv: USAF FSN: 6625-649-2474

USA Line Item No:

SIGNAL GENERATOR AN/GPM-15

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer: Bruno-New York Industries Corporation				

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose set which supplies crystal-controlled rF signals for all Loran channels. It is used to perform the following preflight checks on Loran receivers: accuracy of time delay measurements; receiver alignment and sensitivity; timer performance and crystal oscillator frequency; stability of sweep generating circuits; receiver distortion due to insufficient signal handling capacity on all receiver channels; video distortion; performance of "Gain" and "Amplitude Balance" controls; and performance of "Left-Right" control.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* A small pulse and/or continuous wave generator is connected through proper cabling, adapters, dummy loads, and a 50-ohm coaxial line, to the antenna terminal of the set being tested, and simulates a Loran transmitting station. The various output and frequency selections enable the test set to check the performance of the radar set being tested.

*Power Supply:* 115v  $\pm$  10%, ac, single-phase, 50 to 1000 cps, 38 va, supplied from a receptacle on a Loran receiver, or can be supplied separately.

*Frequency Range:* (1) 100 kc (2) 180 kc (3) 1750 kc (4) 1850 kc (5) 1900 kc (6) 1950 kc.



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**SIGNAL GENERATOR AN/GPM-15**

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*Type of Transmission:* Cw or pm.

*Output Voltage Range:* 15 microvolts, 1 mv, 1 v, calibrated.

*Output Impedance:* 50 ohms, nominal coaxial.

*Output Pulse Repetition Rate:* 303.03 pps.

*Accuracy:* 10% voltage.

0.0065% frequency.

*Temperature Range:* -40° C. (-40° F.) to +55° C. (+131° F.).

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-OB2, 1 JAN-6X4W, 2 JAN-5751, 2 JAN-5814A, 1 JAN-12AT7WA, 1 JAN-5814A

1 JAN-5654/6AK5W, 1 JAN-1N34A.

**REFERENCE DATA AND LITERATURE:**

TO 16-30 GPM 15-2 (Operation and Service Instructions).

TO 16-30 GPM 15-4 (Illustrated Parts Breakdown).

USAF Spec. MIL-G-4477

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

12 October 1954

Cog Serv: USAF FSN: 6625-536-9223

USA Line Item No: 664078

SIGNAL GENERATOR AN/GRM-4

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer: Boonton Radio Corporation				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A depot test instrument used to test glide slope receiving equipment. Radio frequency output is crystal controlled and monitored as to amplitude and modulation percentage. The percent modulation is indicated on a modulation meter located on the front panel. The rf output is calibrated in microvolts.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Circuit Information:* rf frequencies are available in increments of 0.3 megacycles per second selected by a twenty-position switch. This switch dial is calibrated directly in frequency and is used to switch in the desired crystals; 20 crystals are used.

*Power Supply:* 110 v  $\pm 10\%$ , ac, single phase, 60 cps.

*Frequency Range:* 15 to 30 mc, for IF test alignment; 329.3 to 335 mc, 20 channels.

*Voltage Output:* 1.0 to 100,000 microvolts calibrated.

*Output Impedance:* 53 ohms.

*Type of Transmission:* cw, am.

*Modulation Data:* 90, 150, and 1000 cps, internal signals capable of 0 to 100 percent amplitude modulation. 90 and 150 can be applied simultaneously at 40% modulation each to simulate the on course conditions in glide slope equipment. Provision is made for external modulation.

*Accuracy:*  $\pm 1\%$  of Decibel Ratio Control Indication;  $\pm 0.0015\%$  of indicated rf;  $\pm 15\%$  of the 1000 cycle modulation frequency; accuracy of the 90 and 150 cycle signals depends only on the power line frequency;  $\pm 10\%$  of output level indication.

*rf Leakage:* Less than 3 microvolts measured by a standard noise meter with its antenna held one foot from the case and oriented in the most favorable attitude.

*Temperature Range:*  $-40^{\circ}\text{C}$ . to  $+55^{\circ}\text{C}$ .

*Decibel Ratio Control:* 90 to 150 cps signals may, be attenuated by manipulating a calibrated knob on the front panel, in the following steps: 0,  $\pm 0.5$  decibels,  $\pm 1.0$  decibels,  $\pm 2.0$  decibels,  $\pm 3.3$  decibels and  $\pm$  infinity decibels.

*Major Units:* 1 SG-2/GRM-4 19 1/2" x 12" x 12"

63.687 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

4 JAN-6AU6, 5 JAN-12AT7, 1 JAN-5726/6AL5W, 1 JAN-6AS7G, 1 JAN-6AQ5, 1 RETMA-6173,  
2 JAN-6X4-W, 1 JAN-OB2.

**REFERENCE DATA AND LITERATURE:**

TO 16-30GRM4-1 (Operating Instructions).

TO 16-30GRM4-2 (Service Instructions).

TO 16-30GRM4-3 (Overhaul Instructions).

TO 16-30GRM4-4 (Parts Breakdown).

USAF, Spec. MIL-S-4249.

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

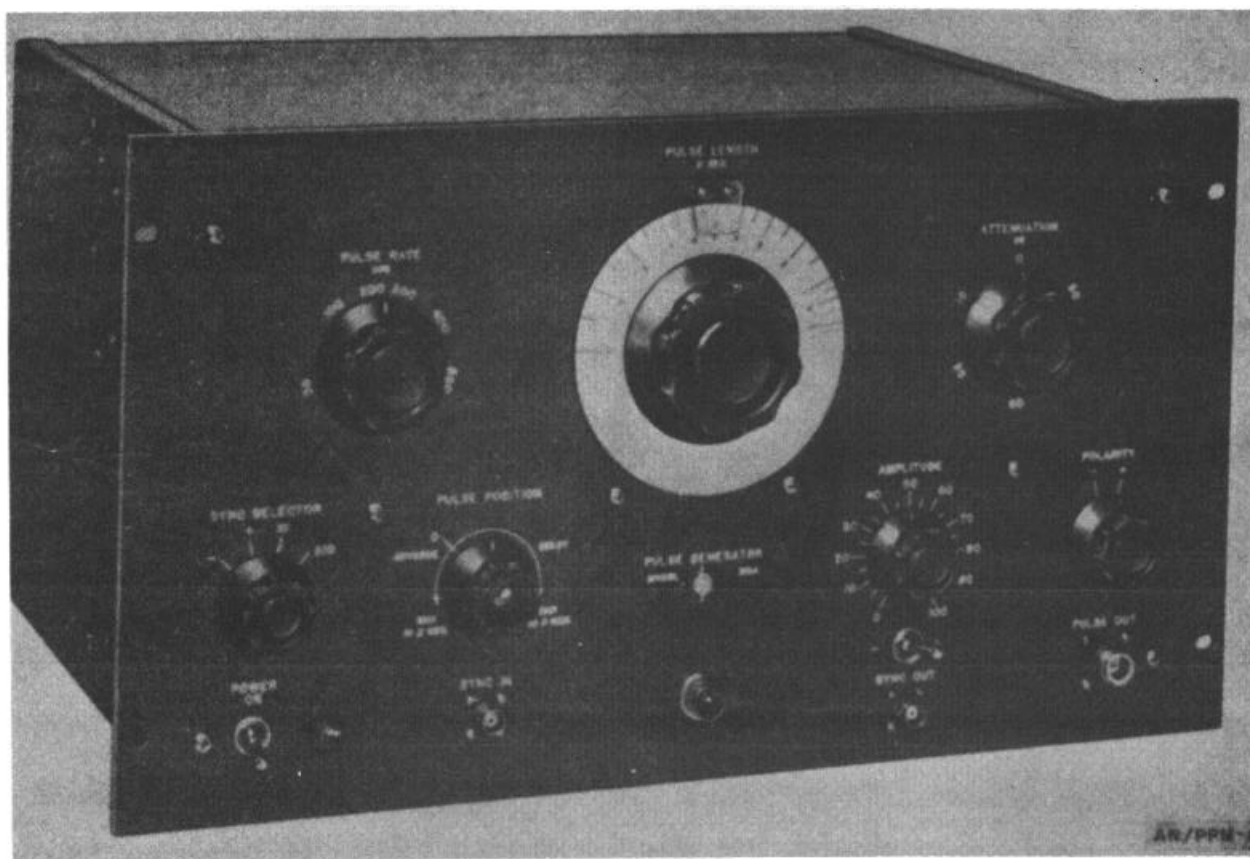
Cog Serv: USA FSN: 6625-503-0661

USA Line Item No: 618082

PULSE GENERATOR AN/PPM-1

Functional Class: 4.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Hewlett-Packard Company			

**FUNCTIONAL DESCRIPTION:**

Pulse Generator AN/PPM-1 is used in determining the response of circuits to rapidly changing signals. It may be used for the pulse modulation of uhf signal generators and is applicable to the testing of radar systems, nuclear counting circuits, television systems, video amplifiers, filters, and band pass circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Hewlett-Packard Model 212A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 325 w, 115 or 230 v, 50 or 60 cy ac

*Pulse Length:* .07 to 10  $\mu$ sec

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**PULSE GENERATOR AN/PPM-1**

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*Pulse Amplitude:* 50 v into 50-ohm load (max, pos or neg)

*Synchronization:* 5 v at rates up to 5,000 pps (ext)

*Major Units:* 1 Pulse Generator SG-69/PPM-1      19" x 14 1/2" x 10 1/2"

45 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) OB2, (1) OD3, (2) 3C45, (1) 5R4, (2) 6AS7, (1) 6AU6, (3) 6J6, (1) 6L6, (1) 6W4, (1) 6X4, (9)  
12AU7, (1) 12AX7

**REFERENCE DATA AND LITERATURE:**

TM 11-2678

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

20 August 1954

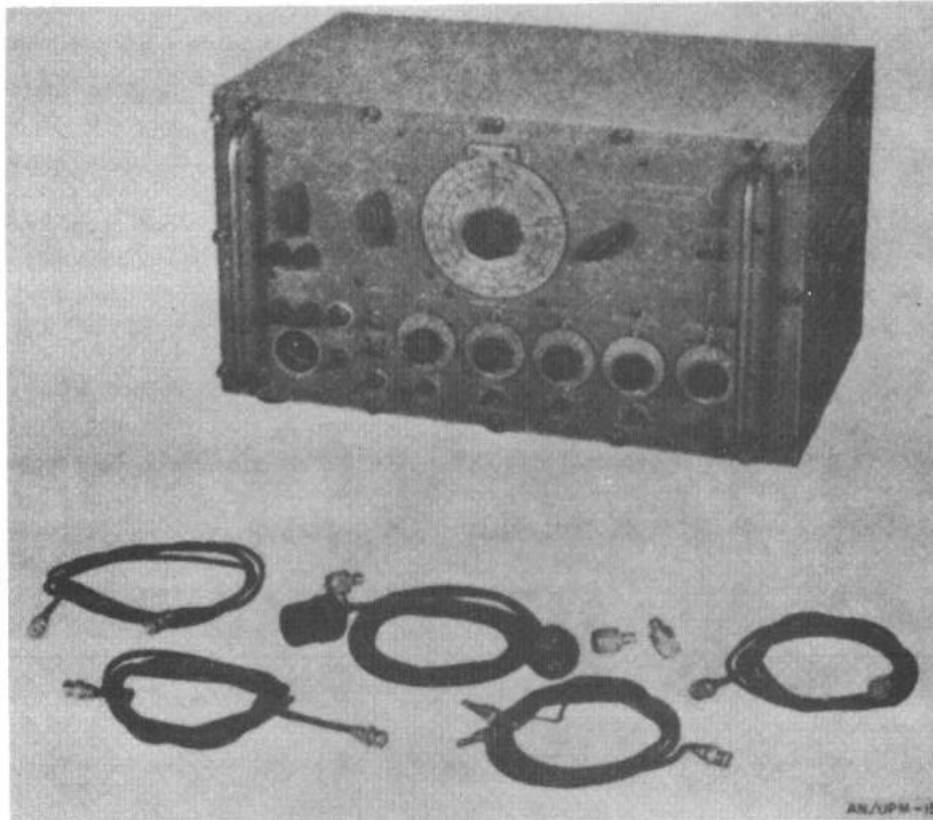
Cog Serv: USAF FSN: 6625-568-4899

USA Line Item No: 633830

PULSE GENERATOR SET AN/UPM-15

Functional Class: 4.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer: Stamford Electronics corporation				

**FUNCTIONAL DESCRIPTION:**

Pulse Generator Set AN/UPM-15 is portable equipment used in field and depot maintenance for testing pulse amplifiers and networks, as well as for modulating oscillators. It generates single or double pulses of variable pulse repetition rate, pulse width, pulse amplitude, and pulse delay. The pulses may also be synchronized with oscillators or other instruments.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is the same as Pulse Generator TS-592/UPM-15 except for the addition of associated components.

**TECHNICAL DESCRIPTION**

*Power Requirements:* 360 w, 115 v  $\pm 10\%$ , 50 to 1,600 cy, 1 phase ac

*Type of Emission:* Pulse

*Output Impedance:* .25 ohm below 20 mv; 2.5 ohms from 20 to 200 mv; 50 ohms from .2 to 2 v; 250 ohms from 2 to 20 v; 2,500 ohms above 20 v

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**PULSE GENERATOR SET AN/UPM-15**

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*Eternal Trigger Pulse:* 0 to 50,000 pps, 2 to 100 v

*Pulse Amplitude:* .002 to 200 v

*Pulse Delay:* 2 to 225  $\mu$ sec after the synchronized pulse

*Pulse Repetition Rate:* 50 to 10,000 pps int (internally or externally synchronized).

*Pulse Rise and Fall Time:* .05 to .25,  $\mu$ sec, .10 to .3  $\mu$ sec respectively, measured from 10 to 90% amplitude

*Pulse Width:* .5 to 100  $\mu$ sec

*Second Pulse:* Identical in shape to first pulse and follows first pulse by an interval of 3 to 30  $\mu$ sec

*Temperature Range:* -40° C to +55° C

*Accuracy:*  $\pm 10\%$  of any indication after 10-min warmup,  $\pm 5\%$  at 21° C

*Major Units:* 1 Pulse Generator TS-592/UPM-15      19" x 12" x 10 1/2"

80 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OA2, (1) OA3, (1) OB2, (1) 5R4WGY, (1) 6AH6, (1) 6AN5, (1) 6AQ5W, (2) 6AS7G, (4) 6AU6,  
(2) 2BA7, (1) 6D4, (1) 6XW4, (5) 12AT7, (1) 829B, (4) 5814

**REFERENCE DATA AND LITERATURE:**

Spec. MIL-P-6324

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

20 August 1954

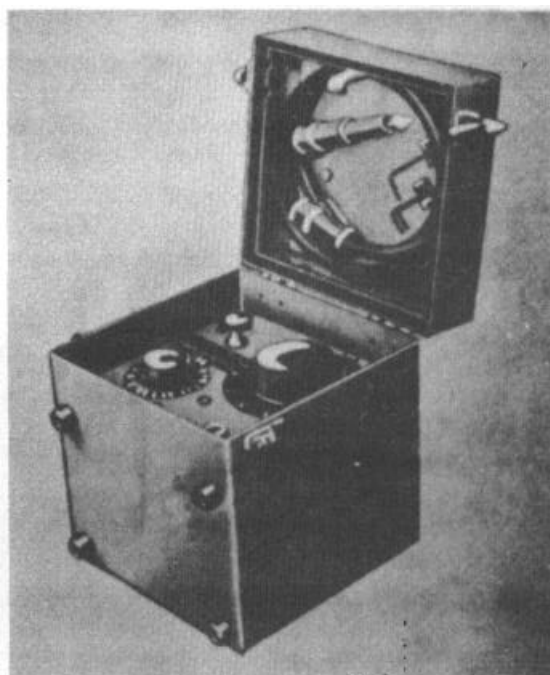
Cog Serv: USN FSN:

USA Line Item No: 682680

TEST OSCILLATOR AN/UPM-46

Functional Class: 4.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer: Seaboard Electric Company				

**FUNCTIONAL DESCRIPTION:**

Test Oscillator AN/UPM-46 is a portable rf signal generator used in checking the frequency calibration and relative sensitivity of radio countermeasures receivers and other receivers operating in its frequency range. Application is in field testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is the same as Test Oscillator TS-508/UP except for the addition of an antenna.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 3 v dc

*Frequency Range:* 3,000 to 11,000 mc  $\pm 2\%$

*Type of Emission:* am; 1,000 to 2,000 pps

*Relative Attenuation:* 0 to 100 db  $\pm 2$  db

*Power Output:* Uncalibrated

*Output Impedance:* 50 ohms

*Major Units:* 1 Test Oscillator TS-508/UP 6 1/2" x 6 1/2" x 6 1/2"

15 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

Spec MIL-T-7144(Aer)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

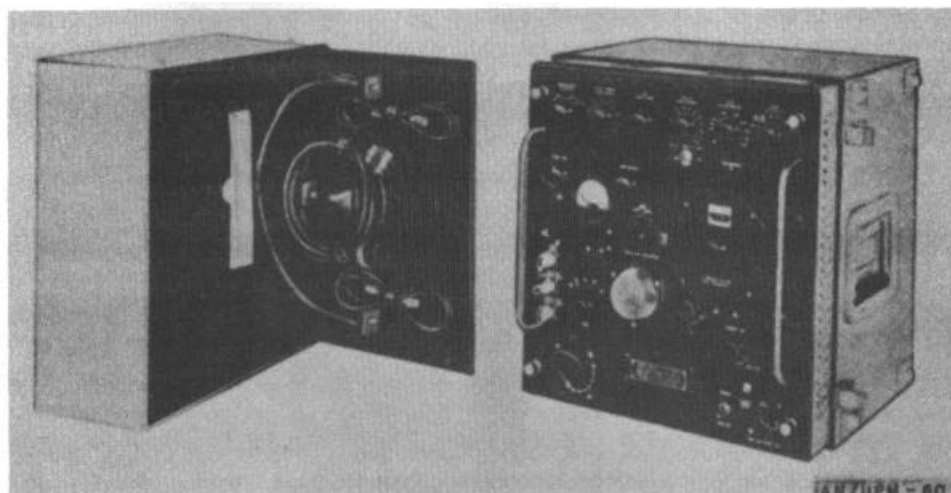
Cog Serv: USA FSN: 6625-569-0266

USA Line Item No: 685691

TEST SET, RADAR AN/UPM-60

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Polarad Electronics Corporation				

**FUNCTIONAL DESCRIPTION:**

Radar Test Set AN/UPM-60 is a portable microwave signal generator and measuring device used in testing the performance of radar transmitters and receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

Equipment Required But Not Supplied: (1) Directional Coupler PRD 405 or equivalent.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 270 w, 105 to 125 v, 50 to 1,000 cy ac

*Frequency:* 16,000 mc  $\pm$ 250 mc

*Types of Emission:* cw, fm, pulse

*Power Range:* +6 to +30 dbm (input); -6 to -91 dbm (output); 1 kw (peak input)

*Modulation Capability:*

*Pulse Rate:* 100 to 10,000 pps

*Pulse Width:* .2 to 2  $\mu$ sec.

*fm Sweep Excursion:* 12.5 mc (min) from center freq

*fm Sweep Repetition Rate:* 100 to 10,000 sweeps/sec

*Major Units:* AN/UPM-60 18 3/16," x 17 5/32" x 16 27/32"

85 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) OB2, (1) 5R4GY, (1) 5Y3GT, (1) 6AH6, (2) 6AR6A, (6) 6AU6, (4) 6C16, (1) 6X4, (7) 12AT7,  
(1) 5651, (2) 6080, (1) 6178

**REFERENCE DATA AND LITERATURE:**

TM 11-5100



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

RF SIGNAL GENERATOR SET AN/URM-25F

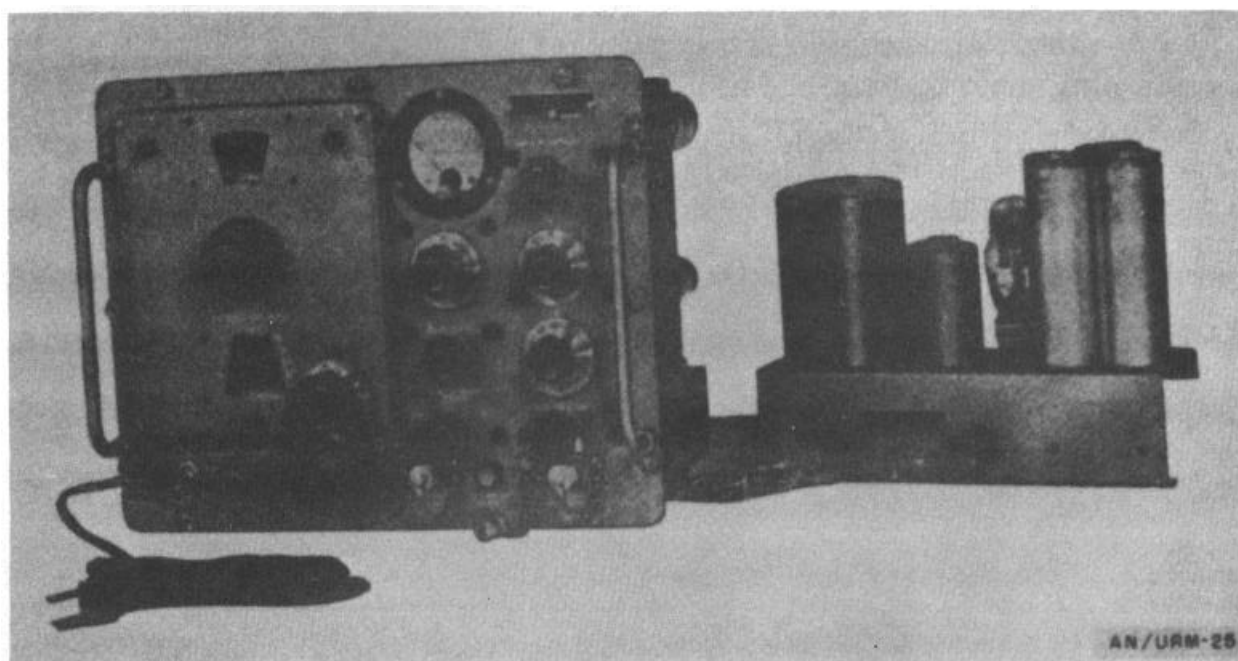
27 June 1956

Cog Serv: USN FSN: 6625-570-5719

USA Line Item No: 665028

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std A	-----
Manufacturer: New London Instrument Company				

**FUNCTIONAL DESCRIPTION:**

This is a portable, general purpose radio frequency signal generator designed for field use in the general maintenance of electronic equipment. It is used to test the sensitivity, selectivity, and audio response of receivers, to align rf and IF stages, and to provide a signal which can be used when measuring receiver gain and output power.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The panel contains a band switch, a twelve-position attenuation selector, a monitor meter, a meter function switch, an rf level control, a microvolts control, a tuning control, and output jacks. The ac power cable is permanently attached to the panel. A pilot lamp indicates when the set is on. The power supply is contained within the set.

*Power Supply:* 115  $\pm$  15 v, ac, 50 to 1000 cps, single-phase.

*Frequency Range:* 10 kc to 50 mc in 9 bands.

*Crystal Frequency:* 1 mc.

*Type of Transmission:* am, cw.

*Modulation Frequency:* 400 and 1000 cps, internal modulation, 0 to 50% modulation; 100 to 15,000 cps, external.

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**RF SIGNAL GENERATOR SET AN/URM-25F**

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*Output Voltage:* 0.1 microvolt to 0.1 v, into a 50-ohm load.

*Output Impedance:* 50 ohms.

*Accuracy:*  $\pm 0.5\%$  (frequency dial).

$\pm 10\%$  (attenuator).

$\pm 2\%$  (monitor meter).

*Major Units:* AN/URM-25F      11 1/4" x 14 3/4" x 11 1/8"

35 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

5 JAN-6AH6, 1 JAN-6AG7Y, 1 JAN-X4W, 1 JAN-OA3, 1 JAN-1N145, 2 JAN-1N69.

**REFERENCE DATA AND LITERATURE:**

New London Instrument Company Bulletin No. 162-3; NRL Memorandum Report 448.

Specification MIL-G-15281A(SHIPS).

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

20 August 1954

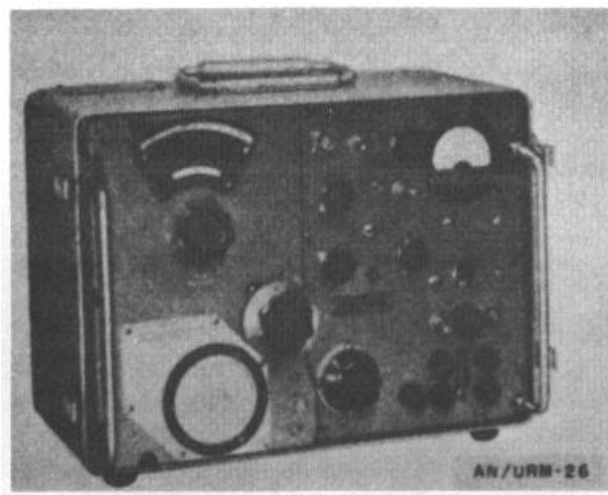
Cog Serv: USN FSN:

USA Line Item No: 661083

RF SIGNAL GENERATOR SET AN/URM-26

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	Std	Std	-----
Manufacturer: Federal Manufacturing and Engineering Corp. & Measurements Corp.				

**FUNCTIONAL DESCRIPTION:**

RF Signal Generator Set AN/URM-26 is an rf signal producing equipment used in aligning and testing the sensitivity of radio receivers, as well as in other test applications where a source of cw or mew signals is required.

It can be modulated internally (am) by a source of sine wave, or externally (pm) by pulsed voltages.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes UHF Signal Generator LX and RF Signal Generator Equipment LAF.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 60 w,  $115 \pm 10\%$ , 50 to 1,600 cy, 1 phase ac

*Frequency Range:* 4 to 408 mc  $\pm 5\%$  in six bands

*Type of Emerson:* am, cw, mcw, pm

*Modulation, Sine Wave:*

*Amplitude:* 0 to 50%

*Internal:* 400 to 1,000 cy

*External:* 100 to 20,000 cy

*Spurious FM:* Less than .035% at 15% modulation, or .08% at 30% modulation

*Modulation Pulse, External:*

*Amplitude:* 40 v (min)

*Pulse Rate:* 50 to 5,000 pps

*Pulse Width:* 2 to 40  $\mu$ sec to 100 mc; 1 to 40  $\mu$ sec from 100 to 408 mc

*RF Output Voltage:* .1 to 100,000  $\mu$ v (-127 to -7 dbm)

*Load Impedance:* 50 ohms

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**PULSE GENERATOR SET AN/URM-26**

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*Accuracy:*  $\pm 10\%$  to 100 mc;  $\pm 20\%$  from 100 to 408 mc (am, attenuation)

*Major Units:* AN/URM-26 10" x 14" x 10"

38 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OD3, (1) 6AQ5, (1) 6F4, (2) 6X4, (1) 12AU7

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91474

Spec MIL-S-15463(Ships), 15 July 1950

C1 MIL-HDBK-172A, VOL I/TM 11-487H-1/1

6 July 1955

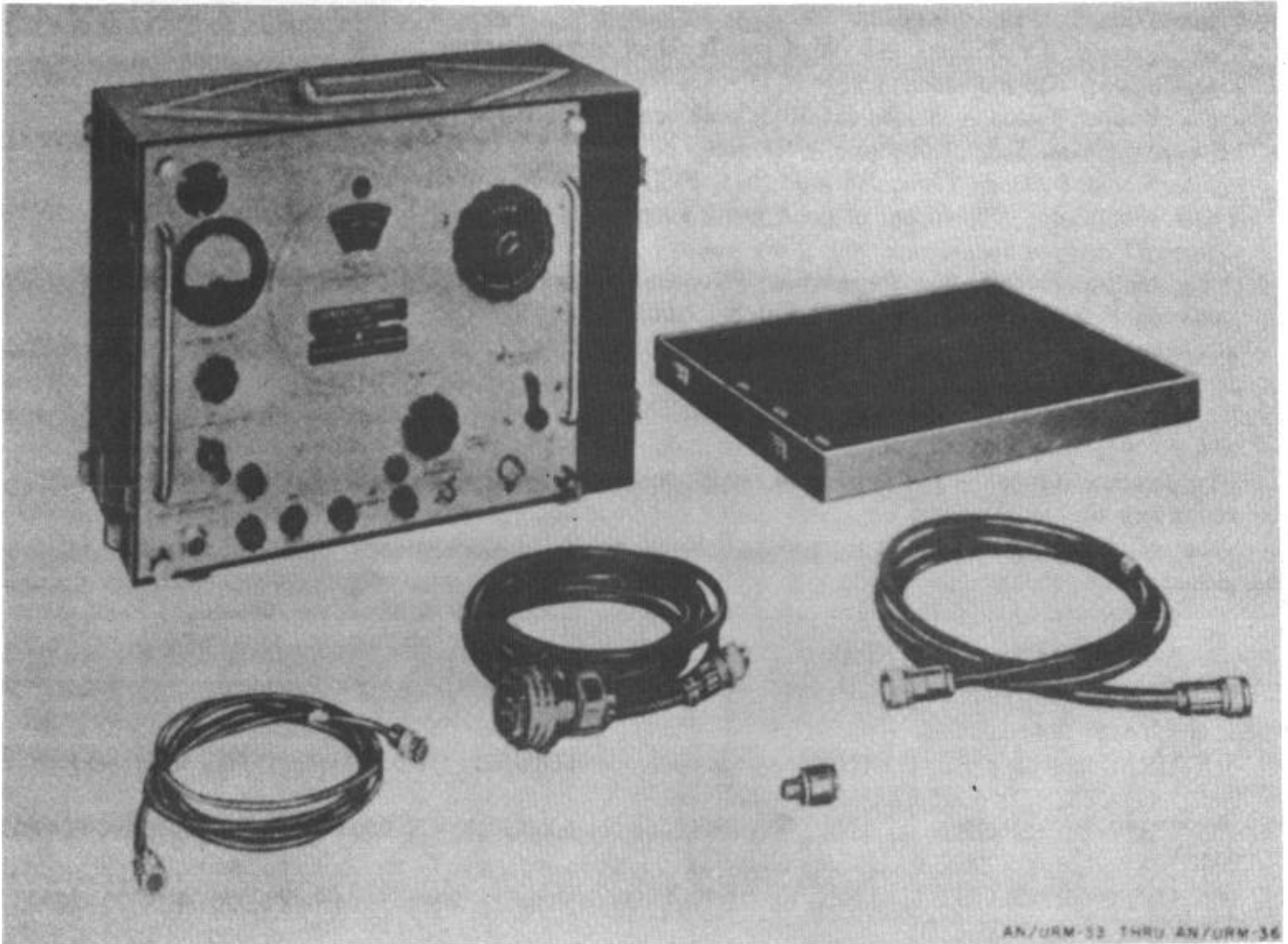
Cog Serv: USAF FSN:

USA Line Item No:

GENERATOR, SIGNAL  
 AN/URM-33 through AN/URM-36  
 Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----

Manufacturer: Polaroid Electronics Corporations

**FUNCTIONAL DESCRIPTION:**

Signal Generators AN/URM-33 through AN/URM-36 are portable rf sets used in the preflight operational check of broad-band radar receivers, antennas, transmission lines, and indicators employed with search and direction-finder equipment. Rf output is available at either a panel jack or a horizontally polarized antenna. Each equipment furnishes a video signal to check various types of pulse equipment. Circuit test point terminals are available for locating the most probable circuit malfunctions.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

These equipments are similar except for frequency range.

**TECHNICAL DESCRIPTION:***Power Requirements:* 270 w (max), 115 v  $\pm 10\%$ , 380 to 1,000 cy, 1 phase ac*Frequency Range:* 1,000 to 2,300 mc (AN/URM-33)

2,150 to 4,600 mc (AN/URM-34)

4,450 to 8,000 mc (AN/URM-35)

7,850 to 10,750 mc (AN/URM-36)

*Type of Transmission:* cw, pm*Power Output:* 0 to -100 dbm*Peak Power of RF Pulses:*  $\pm 1$  db of pwr level of corresponding cw sig*Amplitude of Video Pulses:* 1.25 v  $\pm .5$  v*Pulse Width:* 3  $\mu$ sec  $\pm .5$   $\mu$ sec (at 50% peak amplitude pt)*Pulse Repetition Rate:* 1,000 pps  $\pm 100$  pps*Pulse Rise and Decay Time:* .35  $\mu$ sec (bet, 10% and 90% amplitude pt)*Pulse Variation:* 10% (max) of peak pulse amplitude*Direct RF Output Impedance:* 50 ohms (nom)*Video Output Terminating Impedance:* 50 ohms (resistive)*Antenna Voltage Standing Wave Ratio:* 2:1 (max)*Antenna Beam Width:* 15° (at half-pwr pt)*Frequency Stability:*

cw: .025% incidental fm (max)

*Pulse:* .2% freq shift (max)*Temperature Range:* -40° C to +55° C (operating); -65° C to +85° C (nonoperating)*Humidity Range:* To 90%*Altitude Range:* To 10,000 ft (operating); to 50,000 ft (nonoperating)*Accuracy:**Frequency:*  $\pm .5\%$  (ambient room conditions);  $\pm 1\%$  (all required conditions)*Power Output:* + 3 db (ambient room conditions);  $\pm 5$  db (all required conditions)*Major Units:* AN/URM-33, -34, -35, -36 8 5/8" X 12 3/4" X 11 1/2" 30 lbs**TUBES, CRYSTALS, TRANSISTORS:**

AN/URM-33: (2) OB2, (1) IN69, (1) 5R4GY, (1) 5Y3GTA, (1) 6AU6, (3) 6X4, (4) 12AT7, (3) 5651, (1) 5837, (1) 6005/6AQ5, (1) 6098/CT

AN/URM-34: (2) OB2, (1) IN69, (1) 5R4GY, (1) 5Y3GTA, (1) 6AU6, (3) 6X4, (4) 12AT7, (3) 5651, (1) 5836, (1) 6005/6AQ5, (1) 6098/CT

AN/URM-35: (2) OB2, (1) IN69, (3) 5R4GY, (1) 6AU6, (3) 6X4, (5) 12AT7, (5) 5651, (1) 5721, (1) 6005/6AQ5, (1) 6098/CT

AN/URM-36: (2) OB2, (1) IN69, (3) 5R4GY, (1) 6AU6, (3) 6X4, (5) 12AT7, (5) 5651, (1) 6005/6AQ5, (1) 6098/CT, (1) 6390

**REFERENCE DATA AND LITERATURE:**

TO 16-30URM33-1, TO 16-30URM33-2, TO 16-30URM33-4, TO 16-30URM34-1, TO 16-30URM34-2, TO 16-30URM34-4, TO 16-30URM35-1, TO 16-30URM35-2, TO 16-30URM35-4, TO 16-30URM-36-1, TO 16-30URM36-2, TO 16-30URM36-4.

AN/URM-33: USAF Exhibit WCE-301, 8 May 1952; Spec MIL-E-15090

AN/URM-34: USAF Exhibit WCE-302, 12 May 1952; Spec MIL-E-15090

AN/URM-35: USAF Exhibit WCE-303, 12 May 1952; Spec MILE-15090

AN/URM-36: USAF Exhibit WCE-304, 13 May 1952; Spec MILE-15090



20 August 1954

Cog Serv: USN FSN: 6625-538-9417

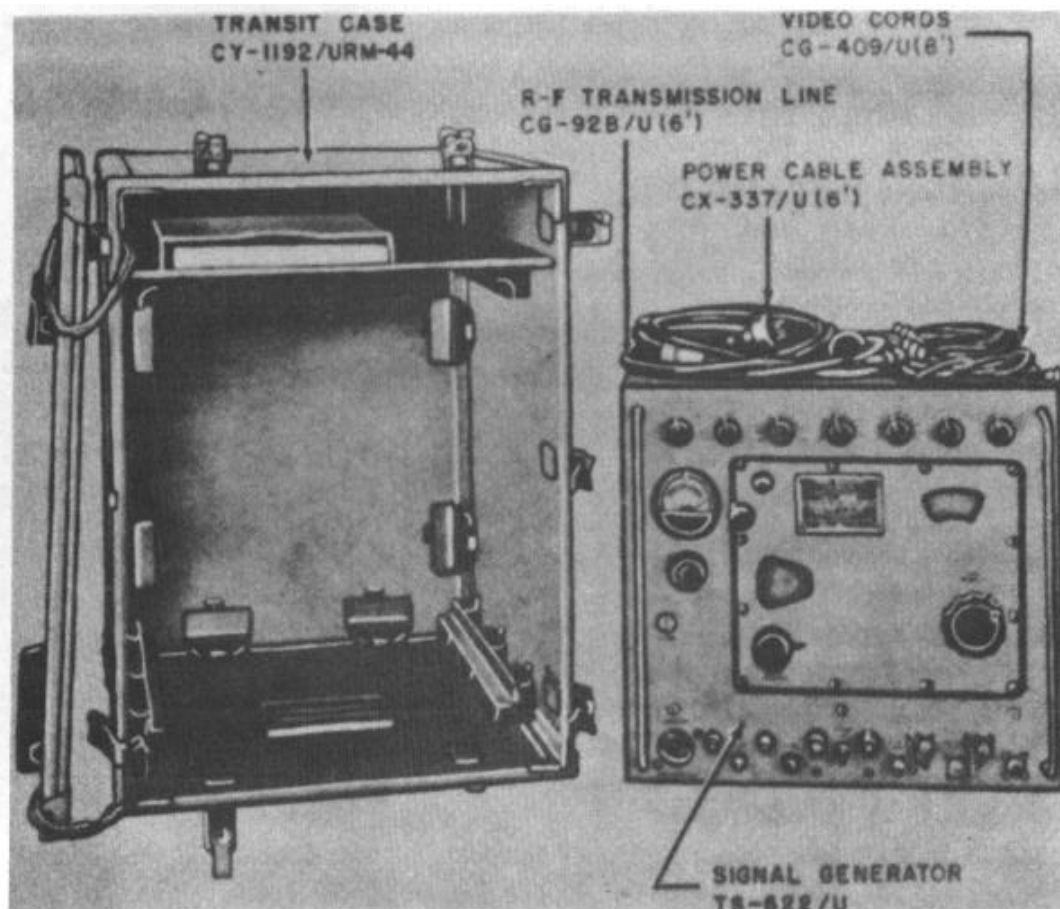
USA Line Item No: 685715

TEST SET, RADIO

AN/URM-44

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Polaroid Electronics Corporations				

**FUNCTIONAL DESCRIPTION:**

Radio Test Set AN/URM-44 is a portable signal generator used in testing and maintaining aircraft radio and radar receivers, as well as other electronic equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, formerly known as Signal Generator TS-622/U, is similar to Microwave Signal Generator, Polarad Model MSG-4.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v  $\pm 10\%$ , 2 amp, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 7,000 to 10,750 mc

*Type of Emission:* cw, fm, pm

*Output Voltage:* .1 to 100,000  $\mu$ v

*Power Output:* .1 mw (max), -10 to -127 dbm  $\pm 2$  lb

*Output Impedance:* 52 ohms

*Internal Pulse Modulation:**Repetition Rate:* 40 to 4,000 pps*Width:* .5 to 10  $\mu$ sec between the points that are 50% of the max amplitude of the initial rise*Final Decay and Initial Rise Time:* Less than .5  $\mu$ sec between 10% and 90% of the max amplitude of the initial rise*Timing:* 3 to 300  $\mu$ sec, but not greater than 75% of the pulse period*External Pulse Modulation:**Polarity:* Pos or neg*Rate:* 40 to 4,000 pps*Amplitude:* 15 to 70 v*Width:* .5 to 2,500  $\mu$ sec*Pulse Separation:* 1 to 2,500  $\mu$ sec*Decay and Rise:* .1 to 1  $\mu$ sec*Internal Frequency Modulation:**Rate:* 40 to 4,000 sawtooths/sec*Deviation:* 0 to  $\pm 3$  mc*Peak Amplitude:* Equal to the cw amplitude  $\pm 1$  db: (variation of no more than 3 db during the deviation)*Output Synchronizing Signal:**Polarity:* Pos*Rate:* 40 to 4,000 pps*Amplitude:* 25 to 100 v*Width:* .5 to 5  $\mu$ sec*Decay and Rise:* Less than 1  $\mu$ sec*Timing:* 1  $\mu$ sec before to 1  $\mu$ sec after the pm rf test signal*Rated Load:* 500 to 100,000 ohms, 500  $\mu$ f*External Synchronization:**Sine Waves:**Frequency Range:* 40 to 4,000 cy*Amplitude:* 5 to 50 v rms*Pulse Signals:**Repetition Rate:* 40 to 4,000 cy*Peak Amplitude:* 5 to 50 v*Width:* .5 to 5  $\mu$ sec*Rise:* .1 to 1  $\mu$ sec*Accuracy:*  $\pm 1\%$  of dial indication in freq*Major Units:* 1 Signal Generator TS-622/U 14 1/16" x 19" x 17" 85 lbs**TUBES, CRYSTALS, TRANSISTORS:**

(2) OB2, (4) 5R4WGYi (3) 6AK6, (1) 6AS7G, (5) 6AU6, (2) 6X4W, (13) 12AT7, (3) 807, (5) 5651, (1) 5721

**REFERENCE DATA AND LITERATURE:**

Spec MIIG-7142A(Aer), 30 July 1952



1 March 1964

Cog Serv: USA FSN: 6625-5457954

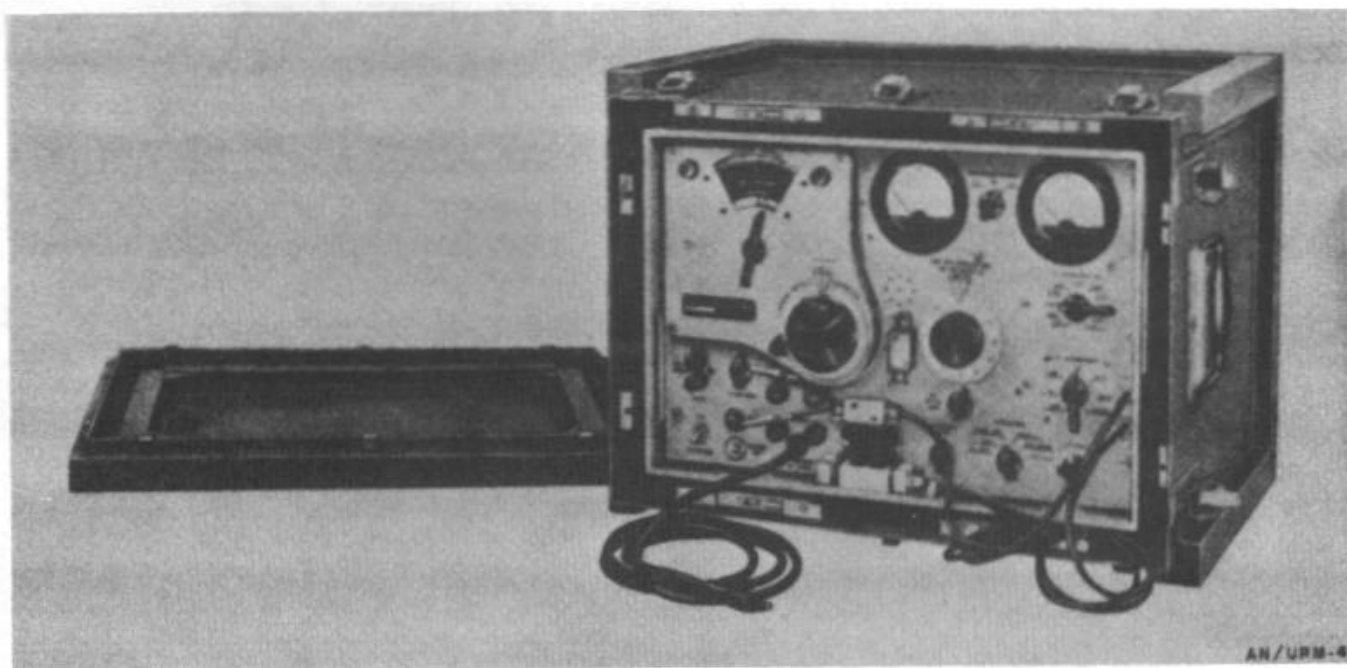
USA Line Item No: 618119

GENERATOR, SIGNAL

AN/URM-48

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	Std	-----
Manufacturer: A.R.F. Products				

**FUNCTIONAL DESCRIPTION:**

Signal Generator AN/URM-48 is a portable, field-type instrument used in servicing fm receivers. It provides calibrated signals for the alignment of rf and IF circuits and for measurements of operating sensitivity, stage gain, and receiver fidelity with external audio oscillator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 75 w, 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Frequency Range:*

rf: 20 to 100 mc in five bands

IF: 9 crystals, 1.4, 2.515, 2.65, 2.88, 4.3, 4.45, 5, 5.35, 15 mc

*Type of Emission:* cw, fm

*RF Modulation:* 100 to 20,000 cy (ext fm); 1,000 cy  $\pm 15\%$  (int fm)

*Deviation Ranges for Internal rf Modulation:* 0 to 25 kc, 0 to 50 kc, 0 to 100 kc

*Type of Calibration:* Every 1 mc in the 20- to 50-mc range, every 2 mc in the 50- to 100-mc range, crystal markers

*External Modulation Input:* 8 v, sine wave (approx)

*Signal Output:* 0.5 to 10,000  $\mu$ v (rf); .5 to 1,000,000  $\mu$ v (IF)

*Input Impedance:* 600 ohms (ext mod)

*Signal Output Impedance:* 10 ohms  $\pm$  10% (rf); 25 ohms (IF)

*Generator Load Impedance:* 80 ohms rf loading (min); 250 ohms IF loading (min)

*Accuracy:*  $\pm$  5% direct reading, rf indication;  $\pm$  0.03%, indirect reading, rf indication;  $\pm$  0.005% IF crystal indication;  $\pm$  1 db,  $\pm$  12.5% rf deviation indication;  $\pm$  2db, output voltage indication

*Major Units:* SG-12/U    12" x 18" x 12"    72 lbs

#### **TUBES, CRYSTALS, TRANSISTORS,**

(1) OA2, (1) 5Y3GT, (6) 6AH6, (1) 6AK6, (3) 6C4, (1) 6J6, (1) 12AU7

#### **REFERENCE DATA AND LITERATURE:**

TM 11-1257

MIL-S-10484 (SigC), 21 September 1950

20 August 1954

Cog Serv: USA FSN: 66256694131

USA Line Item No: 664091

GENERATOR, SIGNAL

AN/URM-49

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer: Lavoie laboratories, Inc and Boonton Radio Corp				

No Illustration Available

**FUNCTIONAL DESCRIPTION**

Signal Generator ANfURM49 is portable test equipment used with radio and radar receivers in measuring standing wave ratios, antenna characteristics, transmission line characteristics, conversion gain, and receiver sensitivity. It consists essentially of an rf oscillator, a power supply and rf power monitor, a modulator section, including a pulse generator, and an output section.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, formerly known as Signal Generator TS-418/U, is part of Test Set AN/MPM-15. Both models of this equipment, which supersedes RF Signal Generator Equipments LAE and LAF, are identical except that the later model is provided with additional rf shielding.

**TECHNICAL DESCRIPTION:**

*Power Requirement* : 130 w, 115 v  $\pm 10\%$ , 50 to 1,600 cy, .9 pf, 1 phase ac

*Frequency Range*: 400 to 1,000 mc  $\pm 1\%$

*Type of Emission*: am, cw, pm

*Power Output*: 1 mw

*Output Impedance*: 50 ohms

*Attenuation*: .2  $\mu$ v (-120 db) to .2 v (0 db)  $\pm 2\%$

*Internal Modulation*:

*Rate*: 40 to 4,000 pps

*Width*: .5 to 10  $\mu$ sec

*Delay*: 3 to 300  $\mu$ sec

*External Modulation*:

*Pulse*: 40 to 6,000 pps, .5 to 20  $\mu$ sec,  $\pm 40$  to  $\pm 70$  v

*Sine Waves*: 100 cy to 100 kc at 3 v for 30% modulation

*Sync Out Pulse*: 65 v peak, no load; 42 v peak into 500 ohm load shunted by 1,500  $\mu$ f; 5  $\mu$ sec (max) width

*Major Units*: TS-418B/U 12 3/8" x 17 5/8" x 13 1/2" 54.5 lbs

**TUBES, CRYSTALS, TRANSISTORS**

(2) OB2, (1) 2C36, (1) 5R4GY, (1) 5Y3GT, (2) 6AG7, (1) 6AK5, (5) 6J6, (2) 12AT7, (1) 12AX7

**REFERENCE DATA AND LITERATURE.**

AN 16-35TS4183

Spec 16G6 (Aer), 1 April 1947

20 August 1954				<b>SIGNAL GENERATOR</b>
Cog Serv: USN FSN: 6625-546663				<b>AN/URM-52</b>
USA Line Item No: 664094				<b>Functional Class: 4.1.2</b>
	<b>USA</b>	<b>USN</b>	<b>USAF</b>	<b>USMC</b>
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	<b>Std</b>	<b>Std</b>	<b>-----</b>
<b>Manufacturer: Hewlett-Packard Company</b>				

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Signal Generator Set ANJURM-52 is a portable unit used in testing and maintaining aircraft radio and radar receivers, as well as other electronic equipment.

#### RELATION TO SIMILAR EQUIPMENT:

This equipment, formerly known as Signal Generator TS621/TJ, is similar to Polytechnic Research and Development Company Type 902 and supersedes Signal Generator TS602/U.

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 115 v  $\pm 10\%$ , 2 amp, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 3,800 to 7,500 me

*Type of Emission:* cw, fm, pulse

*Output Voltage:* 0.1 to 100,000  $\mu$ v

*Power Output:* 0.1 mw (max), -10 to -127 dbm

*Output Impedance:* 52 ohms

*Internal Pulse Modulation:*

*Repetition Rate:* 40 to 4,000 pps

*Width:* 0.5 to 10  $\mu$ sec between the points that are 50% of the max amplitude of the initial rise.

*Final Decay and Initial Rise Time:* Less than 0.5  $\mu$ sec between 10% and 90% of the max amplitude of the initial rise

*Timing:* 3 to 300  $\mu$ sec, but not greater than 75% of the pulse period

*External Pulse Modulation:*

*Polarity:* Pos or neg

*Rate:* 40 to 4,000 pps

*Amplitude:* 15 to 70 v

*Width:* 0.5 to 2,500  $\mu$ sec

*Pulse Separation:* 1 to 2,500  $\mu$ sec

*Decay and Rise:* 0.1 to 1  $\mu$ sec

*Internal Frequency Modulation:*

*Rate:* 40 to 4,000 sawtooths/sec

*Deviation:* 0 to  $\pm 3$  mc

*Peak Amplitude:* Equal to the cw amplitude  $\pm 1$  db; variation of no more than 3 db during the deviation

*Output Synchronizing Signal:*

*Polarity:* Pos

*Rate:* 40 to 4,000 pps

*Amplitude:* 25 to 100 v

*Width:* 0.5 to 5  $\mu$ sec

*Decay and Rise:* Less than 1  $\mu$ sec

*Timing:* 1  $\mu$ sec before to 1  $\mu$ sec after the pulse modulated rf test signal

*Rated load:* 500 to 100,000 ohms, 500 AF

*External Synchronization:*

*Sine Waves:*

*Frequency Range:* 40 to 4,000 cy

*Amplitude:* 5 to 50 v rms

*Pulse Signals:*

*Repetition Rate:* 40 to 4,000 cy

*Peak Amplitude:* 5 to 50 v

*Width:* 5 to 5  $\mu$ sec

*Rise Time:* 0.1 to 1  $\mu$ sec

*Accuracy:*  $\pm$  1% of dial indication in freq,  $\pm$ 2 db from - 10 to - 127

*Major Units:* AN/URM-52 17" X 14X" X 19" 85 lbs

#### **TUBES, CRYSTALS, TRANSISTORS:**

(5) OA2, (1).OA3, (1) 2D21, (1) 5R4GWY, (2) 6AS7, (3) 6AU6, (2) 12AT7, (3) 5726, (1) 5763, (7) 5814, (1) 6236

#### **REFERENCE DATA AND LITERATURE:**

Spec MIL-7141(Aer), 15 February 1951

20 August 1954				<b>SIGNAL GENERATOR</b>
Cog Serv: USN FSN: 6625-229-1095				<b>AN/URM-61</b>
USA Line Item No: 664098				<b>Functional Class: 4.1.2</b>
	<b>USA</b>	<b>USN</b>	<b>USAF</b>	<b>USMC</b>
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	<b>Std</b>	<b>Std</b>	<b>-----</b>
<b>Manufacturer: Federal Mfg and Engineering Co. and Hewlett-Packard Co.</b>				

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Signal Generator AN/URM-61 is portable test equipment used with radio and radar receivers in measuring standing wave ratios, antenna characteristics, transmission line characteristics, conversion gain, and in other applications requiring small amounts of rf power.

#### RELATIONSHIP TO SIMILAR EQUIPMENT-

This equipment, formerly known as Signal Generator TS-403/U, supersedes RF Signal Generator Equipment LAG.

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 150 w (approx), 115 or 230 v  $\pm 10\%$ , 50 to 1,600 cy, 0.9 pf, 1 phase ac

*Frequency Range:* 1,800 to 4,000 mc  $\pm 1\%$

*Type of Emission:* cw, fm, pm

*Pulse Repetition Rate:* 40 to 4,000 pps

*Pulse Width:* 0.5 to 10 .sec

*Frequency Modulation:* Phase variable 180 electrical deg (approx) at pwr supply freq

*Timing:* Undelayed or delayed from 3 to 300  $\mu$ sec (ext or int pulse)

*Modulation Pulse:* Sq wave (ext or int), 40- to 70-v peak, producing 100% modulation

*Power Output:* 1 mw (max), 0 to -127 dbm (continuously variable)

*Voltage Output:* 0.1 to 224,000  $\mu$ v

*Output Impedance:* 50 ohms

*Voltage Standing Wave Ratio:* Less than 5 db, looking into output terminals

*Accuracy:*  $\pm 2$  db (amplitude)

*Major Units:* TS-403A/U 13 1/2" x 14" x 17 1/2" 64 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

(3) OA2, (1) 2K28, (1) 5R4GY, (4) 6C4, (3) 6J6, (1) 6SL7GT, (2) 6Y6G, (2) 6X5GT

#### REFERENCE DATA AND LITERATURE:

AN 16-35TS403-3

MIL-T-18197 (Aer), 15 September 1954

4 August 1954

Cog Serv: USN FSN: 6625-570-5721

USA Line Item No:

**SIGNAL GENERATOR****AN/URM-64****Functional Class: 4.1.2**

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std	Std	-----
<b>Manufacturer: Aircraft Radio Corporation and Technicraft Corporation</b>				

**FUNCTIONAL DESCRIPTION:**

Signal Generator AN/URM-4 is directly calibrated equipment providing an accurate signal source used in testing the operation of radio and radar equipments, in receiver measurements, and in other applications requiring less than 1 milliwatt of cw or pm rf signals. Provisions for external modulation are available.

**RELATION TO SIMILAR EQUIPMENT:-**

This equipment, formerly known as Signal Generator TS-419/U, is similar to Hewlett-Packard Model 614A and Aircraft Radio Corporation Model H-2. It supersedes RF Signal Generator Equipments LAE and LAG.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v  $\pm 10\%$ , 300 va (max), 500 to 1,600 cy, 1 phase ac

*Frequency Range:* 900 to 2,100 mc

*Type of-Emission:* cw, pm

*Power Output:* 0 to -120 dbm; to 0.2  $\mu$ v into 50 ohms

*Output Impedance:* 50 ohms

*Pulse Repetition Rate:* 40 to 4,000 pps (int)

*Delay Time:* 3 to 300  $\mu$ sec (int)

*Voltage Standing Wave Ratio (Looking into output Terminals):* 5 db (max)  
*Major Units:* TS419/U 10 7/8" x 17 3/8" x 14" 41.75 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(5) OA2, (2) 5R4GY, (1) 6BM6, (8) 6V6GTY, (6) 7F8

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS419-3, TO 14549  
Navy Spec CS-322, 16G5 (Aer); Dwg 1060



1 March 1964

Cog Serv: USA FSN: 6625-519-2352

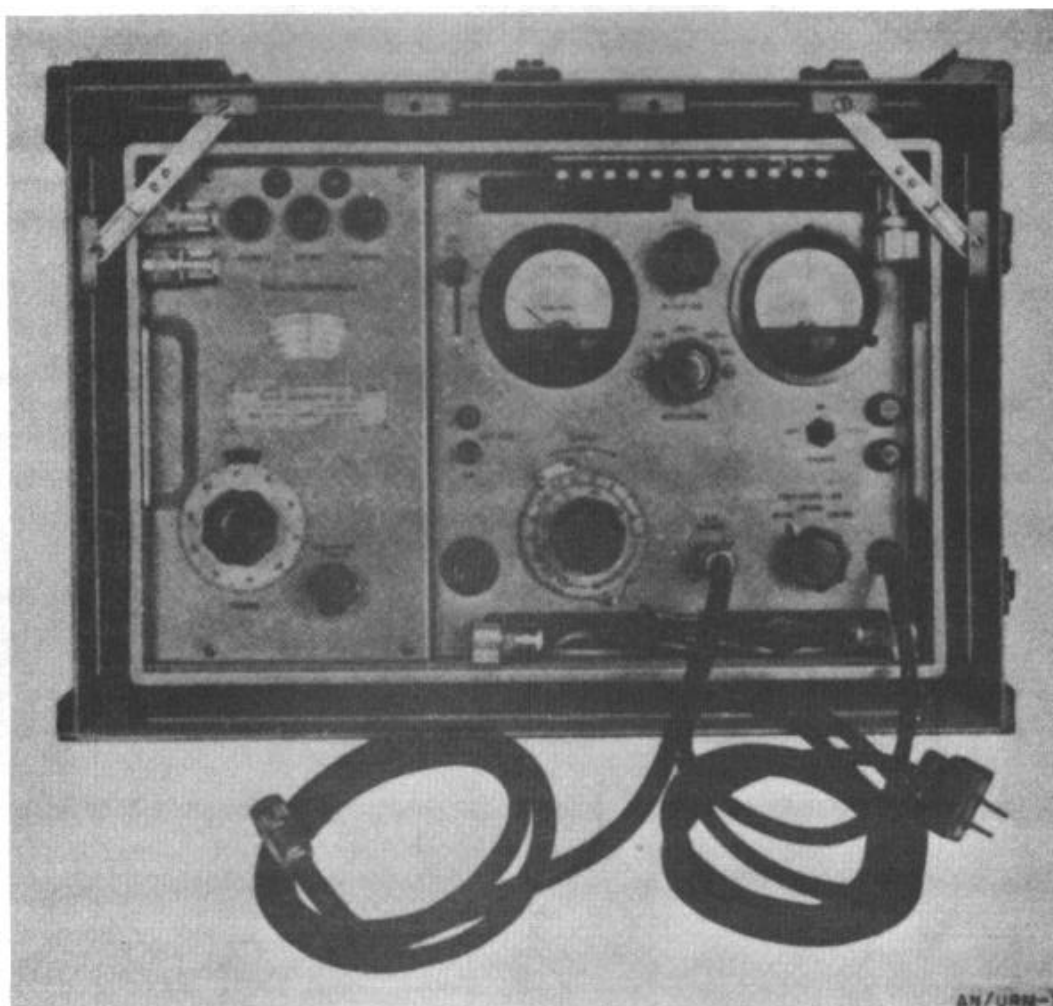
USA Line Item No: 618125

SIGNAL GENERATOR

AN/URM-70

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Measurements Corporation				

**FUNCTIONAL DESCRIPTION.**

Signal Generator ANJURM-70 is a portable instrument providing a test signal used in testing and servicing fm radio receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 50 to 60 cy, 1 phase ac

*Frequency Range:* 50 to 400 me

*Signal Output:* 0.1 to 100,000  $\mu$ v

*Impedance:* 50 ohms

*Modulation Data:* 1,000 to 68,000 cy (int); 250 to 70,000 cy (ext)

*Frequency Deviations:* 75 kc at 50 to 100 mc; 150 kc at 100 to 200 mc; 300 kc at 200 to 400 mc

*Major Units:* AN/URM-70 20 5/8" x 15" x 18"

**TUBES, CRYSTALS, TRANSISTORS:**

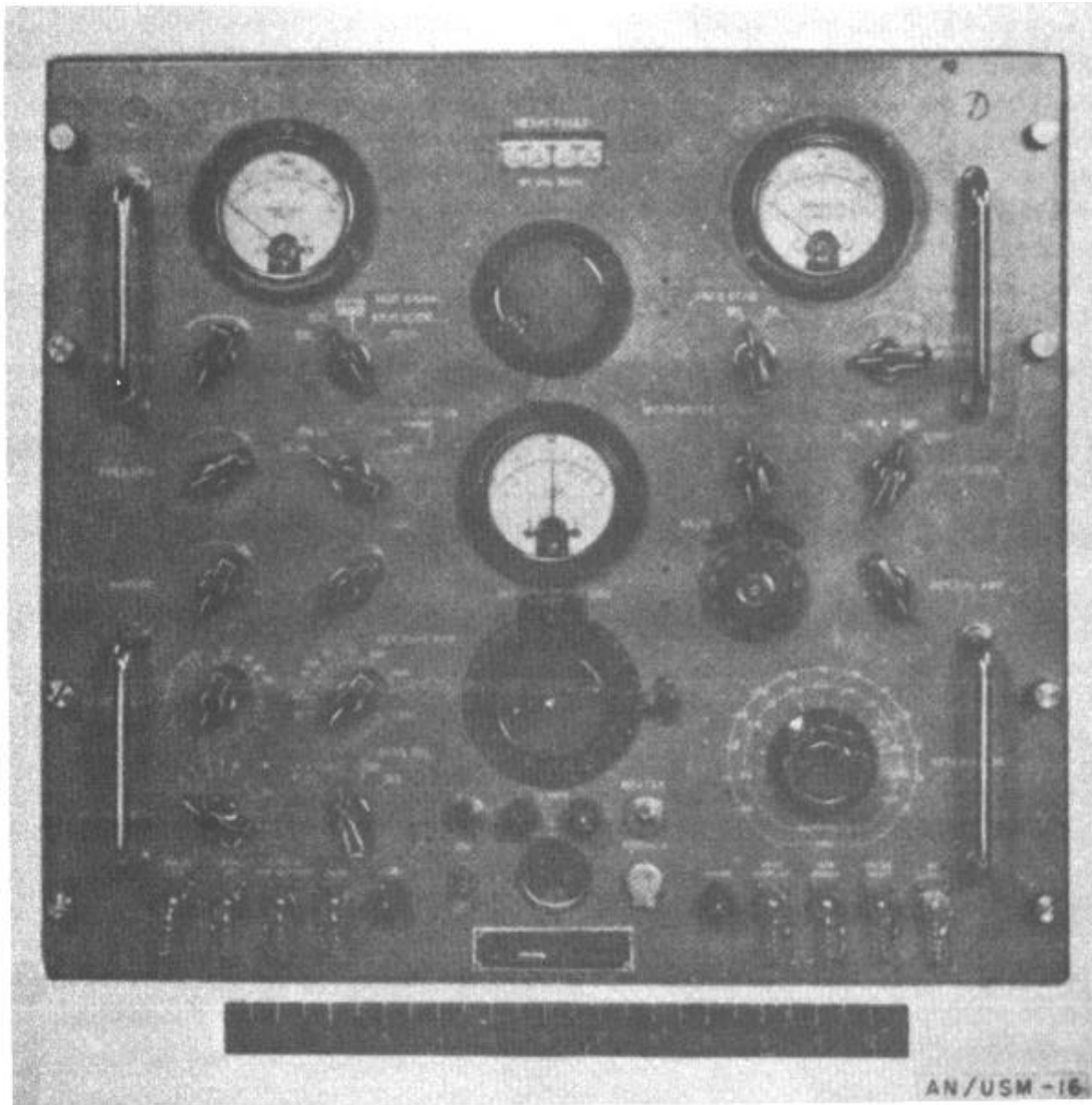
(1) OA2, (1) 5R4, (1) 6AQ5, (12) 5654, (1) 5751, (1) 6080

**REFERENCE DATA AND LITERATURE:**

20 August 1954  
 Cog Serv: USAF FSN:  
 USA Line Item No: 665040

SIGNAL GENERATOR SET  
 AN/USM-16  
 Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:				



#### FUNCTIONAL DESCRIPTION:

Signal Generator Set AN/USM-16 is portable field-type equipment used in determining the characteristics of receivers.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

None

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 110 v, 50 to 450 cy, 1 phase ac  
*Frequency Range:* 10 to 440 mc

*Type of Emission:* am, fm, pm

*Output Voltage:* 0.25 to 100,000  $\mu$ v (calibrated); 1 v (uncalibrated)

*Output Impedance:* 50 ohms

*Power Output:* -6 to -120 dbm (calibrated)

*Modulation Data:*

*Amplitude Modulation:* 400, 1,000 cy (int); 20 cy to 20 kc (ext)

*Frequency Swing:*  $\pm 0.0125$  to  $\pm 7.5$  mc in two ranges

*Pulse Repetition Rate:* 50 to 5,000 pps

*Pulse Width:* 1 to 30  $\mu$ sec

*Pulse Delay:* 1 to 100  $\mu$ sec

*Accuracy:*

*Frequency:*  $\pm 5\%$  of indicated value,  $\pm 0.002\%$  (with int crystal calibrator)

*Power Output:*  $\pm 1$  db

*Frequency Swing:*  $\pm 5\%$

*Pulse Repetition Rate:*  $\pm 10\%$

*Major Units:* SG47/USM-16 17 1/2" x 19" x 18 1/4" 95 lbs

#### **TUBES, CRYSTALS, TRANSISTORS:**

(1) 0A2, (2) 0B2, (12) 1N69, (6) 1N70, (2) 1N72, (4) 1N81, (3) 2C39A, (1) 5HA20, (2) 5R4GY, (1) 6BF7, (19) 6BH6, (5) 6BN6, (3) 6D4, (1) 6WS6DC, (10) 12AT7, (1) 5651, (2) 5675, (1) 5687, (8) 5814, (2) 6080WA, (2) G7B, (1) NE2

#### **REFERENCE DATA AND LITERATURE:**

TO 16-30USM16-1, TO 16-30USM16-2, TO 16-30USM16-3, TO 16-30USM16-4

13 October 1954				<b>SIGNAL GENERATOR</b>
Cog Serv: USN FSN: 66525030659				<b>AN/USM-27A</b>
USA Line Item No:				<b>Functional Class: 4.3</b>
	<b>USA</b>	<b>USN</b>	<b>USAF</b>	<b>USMC</b>
<b>STATUS OR TYPE CLASS.:</b>	<b>Std B</b>	-----	-----	-----
<b>Manufacturer: Harvey-Wells Electronics, Inc.</b>				

**No Illustration Available**

## FUNCTIONAL DESCRIPTION

A portable, general purpose, pulse generator, used for pulsing signal generators, radar equipment, and radiac equipment for test purposes. It can be internally or externally synchronized by an appropriate trigger pulse. Pulse repetition rate and calibrated pulse width are continuously variable over their range. The phase of the output pulse is adjustable and the pulse polarity may be chosen positive or negative. This equipment is used at all maintenance levels.

## RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment is identical to Signal Generator AN/USM-27 except for the case.

## TECHNICAL DESCRIPTION:

*Power Supply:* 105 to 125 v, ac, 60 cps, single phase, 1 amp

*Pulse Repetition Frequency:* 100 to 4000 pps in one band

*Pulse Width:* 0.5 to 11  $\mu$ sec, calibrated

*Internal Trigger Amplitude:* Variable to  $\pm 25$  v, max

*External Trigger:* Positive polarity only

*Phase Shift Range of Output Pulse:* 3 to 20  $\mu$ sec

*Pulse Output:*

$\pm 1$  to  $\pm 40$  volts, peak to peak, at 70 ohms

$\pm 1$  to  $\pm 50$  volts, peak to peak, at 100 ohms

$\pm 1$  to  $\pm 70$  volts, peak to peak, at 100,000 ohms

*Rise and Fall Time Combined:*

*For Positive Pulses:* Not over 10% of pulse width plus 0.27  $\mu$ sec

*For Negative Pulses:* 0.5  $\mu$ sec

*Accuracy:*  $\pm 20\%$  of indicated repetition rate

*Major Unit:* AN/USM-27A 6 3/4" x 11 3/4" x 9 3/4" 19 lbs

## TUBES, CRYSTALS, TRANSISTORS,

2 JAN-12AT7, 2 JAN-12AU7, 1 JAN-6AG7, 1 JAN-5Y3GT, 2 JAN-OA2

## REFERENCE DATA AND LITERATURE

8 July 1955

Cog Serv: USN FSN: 6625-669-4031

USA Line Item No: 618133

SIGNAL GENERATOR

AN/USM-44

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Hewlett-Packard Company				

No Illustration Available

**FUNCTIONAL DESCRIPTION.**

A portable general purpose signal generator designed to furnish signals with very low spurious energy content suitable for alignment of narrow-band amplitude modulated receivers. It is used for testing, calibrating, and troubleshooting vhf radio equipment and circuits and for measuring standing wave ratios, antenna and transmission line characteristics, receiver sensitivity, etc. It is for test bench use and not for permanent installation. It may be amplitude modulated by internally generated sine waves or by externally applied sine waves or pulses.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

AN-USM-44 is the overall nomenclature for Signal Generator TS510/U and accessories. Similar to Hewlett-Packard Models 608C and 608D.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* A Colpitts type rf oscillator generates the rf signal which is fed through a buffer amplifier and power amplifier to the output jack of the signal generator. The buffer isolates the oscillator from the power amplifier and minimizes interaction between the two circuits. The rf power amplifier receives both the rf and modulation signals and amplifies the rf energy for application to the output attenuator. The rf amplifier also receives variable bias from the modulator which permits adjustment of the power level fed to the output attenuator. The output power monitor samples the rf energy fed to the output attenuator. The output power monitor samples the rf energy fed to the output attenuator and indicates the power and voltage level on a front panel meter. The output attenuator obtains monitored rf energy from the power amplifier, applies the selected degree of attenuation, and conducts the energy to the front panel output jack. The beat frequency calibrator generates harmonics of the 5-megacycle signal from the crystal and mixes the harmonics with rf energy coupled to the rf amplifier. The resultant beat frequency signal is amplified and fed to the front panel earphone jack. The internal modulation oscillator generates a fixed sine wave for application to the modulation system. The modulator receives all variable bias to the rf amplifier for control of the rf power level. The modulation measuring circuits receive detected modulation from the rf power monitor, amplify and rectify it, and indicate the modulation percentage directly on a front panel meter.

*Power Supply:* 105 to 125 v, ac, single-phase, 50 to 420 cps 180.

*Frequency Range:* 10 to 420 mc in 5 bands.

*Type of Transmission:* amplitude modulated, pulse modulated, continuous wave.

*Crystal Calibrator:* 5 mc oscillator accurate to  $\pm 0.01\%$  providing check points at each 5 mc over full frequency range. Provides 0.1 mw or better to 600-ohm earphone set.

*Accuracy of Frequency Calibration:* With crystal calibrator,  $\pm 0.015\%$  at check points. Without calibrator  $\pm 0.5\%$  overall.

*Output Voltage:* Continuously adjustable from 0.1 microvolt min to 0.5 v max when operated into rated load of 50 ohms (+7 to -127 dbm).

*Output Level Meter:* Monitors rf power level fed to output attenuator; calibrated 0 to 7 dbm and 0.1 to 0.5 v.

*Output Level Calibration Accuracy:* For all conditions of operation the accuracy of the attenuator dial is within  $\pm 2$  db.

*Rated Load:* Nominally 50 ohms resistive.

*Output Circuit Standing Wave Ratio:* The voltage swr measured at the output connector is less than 1.2 (swr 1.6 db).

*Internal Modulation:* Sine waves at frequencies of 400 and 1000 cps  $\pm 5\%$ . Percent modulation continuously adjustable from 0 to 95% at output levels up to 0 dbm.

*External Sine Wave Modulation:* 100 to above 20,000 cps. Percent modulation continuously adjustable from 1% to 95 % at rf output levels up to 0 dbm with modulating voltages from 4 to 25 volts rms.

*Percent Modulation:* Indicated by direct reading panel meter accurate to  $\pm 10\%$ .

*Envelope Distortion for Sine Wave Modulation:* Less than 5% at 30% modulation for frequencies from 100 to 5000 cps. Less than 10% at 50% modulation.

*Input Impedance for External Sine Modulation:* 20,000 ohms shunted by 50  $\mu\text{f}$ .

*External Pulse Modulation:* rf pulses as short as 1  $\mu\text{sec}$  obtainable at frequencies above 100 mc.

Residual rf between pulses is 25 db below maximum pulse amplitude for rf frequencies below 300 mc (22 db for frequencies above 300 mc).

*Input Impedance for External Pulse Modulation:* 50,000 ohms shunted by 40  $\mu\text{f}$ .

*Major Unit:* AN/USM-44 24" x 20" x 17 5/8" 99 lbs.

#### **TUBES, CRYSTALS, TRANSISTORS,**

2 JAN-6AH6, 1 JAN-6AL5W/5726, 3 JAN-6AU6WA, 1 RETMA-6BC4, 3 RETMA-6CL6, 2 JAN-12AT7WA, 2 JAN-5814/12AU7, 1 JAN-5651, 1 JAN-5670, 1 JAN-5675, 1 JAN-5687, 1 JAN-5676, 1 JAN-5876, 2 JAN-6080, (2 JAN-1N82, 2 JAN-G11A Crystal Diodes).

#### **REFERENCE DATA AND LITERATURE,**

NAVAER 16-30USM44-501 (Operating Instructions).

NAVAER 16-30USM44-502 (Service Instructions).

NAVAER 16-30USM44-503 (Overhaul Instructions).

NAVAER 16-30USM44-504 (Illustrated Parts Breakdown).

Hewlett-Packard Instruction and Operating Manual.

MIL-G-7702A, 15 March 1955.



8 June 1956

Cog Serv: USN FSN:

USA Line Item No: 618120

SIGNAL GENERATOR

AN/USM-47

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Hewlett-Packard Company				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable general purpose self-contained signal generator with direct reading frequency and output level control. It includes provisions for internal or external frequency and pulse modulation and internal square wave modulation. The instrument may be synchronized with external sine waves or positive or negative pulse signals. The equipment is designed for applications requiring accurately controlled amounts of rf power such as measuring standing wave ratios, microwave receiver sensitivity, measurements in determining selectivity or rejection of signal to noise ratio and antenna gain.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Hewlett-Packard Company Model 626A.

**TECHNICAL DESCRIPTION-**

*Circuit Information:* The rf generator is a reflex klystron tube with an external resonant type cavity. The frequency of oscillation is determined by the resonant frequency of the cavity and the repeller voltage. The power output feeds into a power monitoring directional coupler through a rotary vane type power set attenuator. This attenuator is adjusted to obtain a reference level reading on the power monitoring meter which is on the panel. The directional coupler is followed by a rotary precision attenuator. The modulator section generates a positive video pulse of specified characteristics which is applied to the repeller of the reflex klystron so that the klystron will be modulated by the pulse. The video pulse can be modulated with external pulse or sine wave voltages.

*Power Supply:* 115 v  $\pm 10\%$ , ac, 50 to 420 cps, single-phase, approximately 200 w.

*Frequency Range:* 10,000 to 15,500 mc.

*Accuracy of Frequency Dial:* Within 1%. Dial is direct reading in mc.

*Maximum Power Output:* 10 mw.

*Range of Output Attenuator:* +10 to -90 dbm.

*Accuracy of Attenuator Dial:* Better than  $\pm 2\%$  of attenuation in db.

*Output Monitor Accuracy:* Better than 1%.

*Type of Output Power:* Unmodulated or modulated.

*Pulse Modulation:*

*Internal Pulse Modulation:*

*Pulse Repetition Rate:* Adjustable from 40 to 4000 pps.

*Pulse Width:* Adjustable from 0.5 to 10  $\mu$ sec.

*Pulse Rise Time:* Not more than 0.3  $\mu$ sec between points that are 10% and 90% of maximum amplitude of initial rise.

*Delay:* Start of rf pulse delayable over a range from 3 to 300  $\mu$ sec.

*Synchronization:* Internal pulse modulation can be synchronized with external pluses or external sine waves.

*External Synchronizing Pulses:*

*Required Peak Amplitude:* Between 5 and 50 v.



*Polarity:* Pos or neg.

*Required Duration:* From 0.5 to 5.0  $\mu$ sec between points that are 50% of max amplitude of initial rise.

*Required Rise Time:* 0.1 to 1.0  $\mu$ sec between points that are 10% and 90% of max amplitude of initial rise.

*Repetition Rate:* Between 40 and 4000 pps.

*External Sine Wave Synchronization:*

*Required Amplitude:* Between 5 and 50 v peak.

*Frequency:* Between 40 and 4000 cps.

*External Modulation:* Pulse or square wave of either pos or neg polarity.

*Required Peak Amplitude:* Between 20 and 70 v.

*Internal FM Modulation:* At power line frequency; phase and deviation adjustable.

*External FM Modulation:* Max deviation, approximately  $\pm 5$  mc.

*Video Output:* Two different video pulses provided. One is delayable and one is undelayable. Delayable pulse is coincident with start of rf pulse, undelayed pulse is coincident with start of external synchronizing pulse.

*Amplitude of Video Pulses:* At least 25 v into 1000 ohm load.

*Rise Time of Video Pulses:* 0.5  $\mu$ sec or less between 10% and 90% of max amplitude of initial rise.

*Polarity of Video Pulses:* Pos.

*Major Unit:* AN/USM-47 16 3/4" X 13 1/2" X 12" 65 lbs

#### **TUBES, CRYSTALS, TRANSISTORS.**

3 JAN-6080WA, 3 JAN-6AU6WA, 1 JAN-5651, 4 JAN-12AT7, 1 JAN-5687, 2 JAN-5696, 2 JAN-5726/6AL5W, 1 JAN-6X4W, 1 JAN-OA2, 1 Special V39A.

#### **REFERENCE DATA AND LITERATURE:**

17 September 1954

Cog Serv: USAF FSN: 5820-543-1641

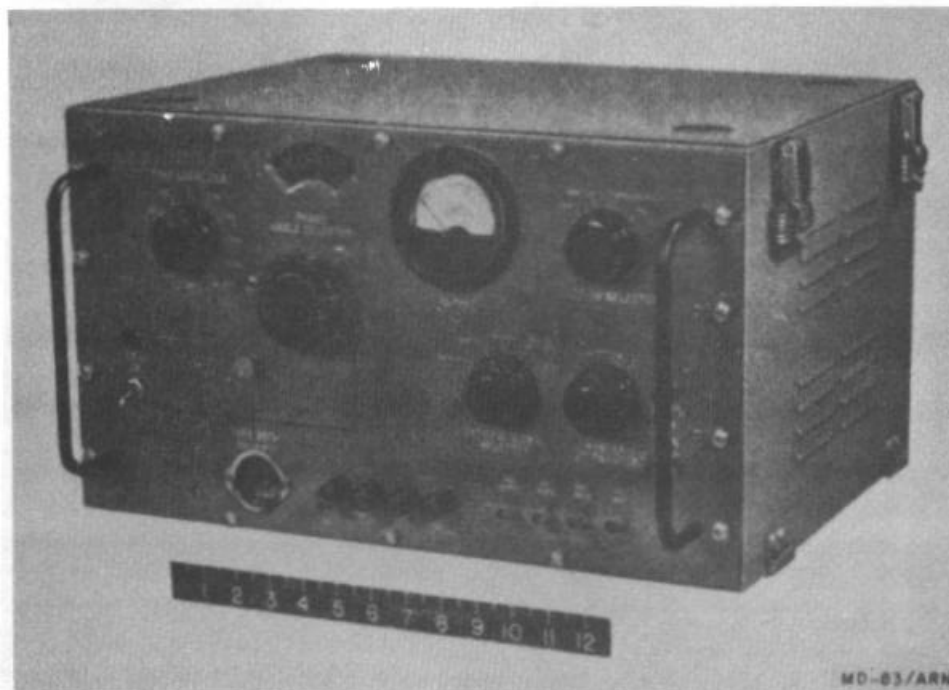
USA Line Item No: 627552

MODULATOR

MD-83A/ARN

Functional Class: 4.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Collins Radio Co				

**FUNCTIONAL DESCRIPTION:**

Modulator MD-83A/ARN is a portable, audio-signal producing unit used in simulating modulation on a visual omnidirectional range and tone localizer. Application is in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 3 amp, 60 cy, 1 phase ac

*Frequency Range:* 30 cy; 90 cy; 150 cy; 1,000 cy; 9,960 cy

*Type of Emission:* cw, fm

*Voltage Output:* 0 to 3 v (modulated across 10,000 ohm load); 0 to 3.5 v (across 400 ohm load at other than modulated output term)

*Frequency Modulation:* 9,960 cy  $\pm$ 480 cy at a rate of 30 cy

*Phase Shift:* Variable, 30 cy thru 3600

*Accuracy:*

*Frequency:* Equal to accuracy of pwr source

*Voltage:*  $\pm$ 5%

*Major Units:* MD-83A/ARN 10 1/2" x 20 1/2" x 14 1/4" 71.3 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

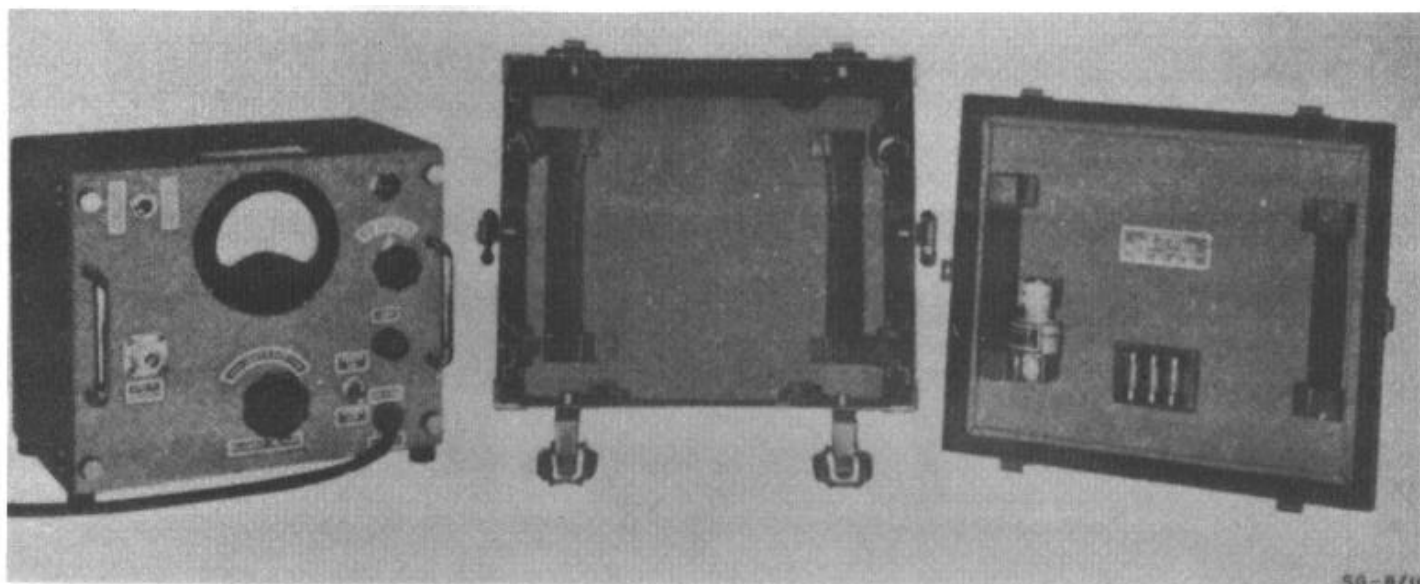
**REFERENCE DATA AND LITERATURE:**

AN 16-35MD83-1, AN 16-35MD83-4'  
Exhibit WCE-196, 25 February 1952

16 September 1954  
 Cog Serv: USAF FSN:  
 USA Line Item No: 628400

**NOISE GENERATOR**  
**SG-8/U**  
 Functional Class: 4.4.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	L/Std	-----
<b>Manufacturer: Electric Impulse Laboratory and Espey Manufacturing Co.</b>				



#### FUNCTIONAL DESCRIPTION:

Noise Generator SG-8/U is a portable test equipment used in determining the noise figure and absolute sensitivity of rf and IF amplifiers.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This equipment supersedes Noise Generator TS-195/GP.

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 115 v to  $\pm 10\%$ , 50 to 1,600 cy, 1 phase ac

*Frequency Range:* 10 to 150 mc

*Noise Figure Range:* 0 to 30 (for 50 ohms output), 0 to 160 (for 270 ohms output)

*Output Impedance:* 50 ohms, 270 ohms

*Power Output:* Max  $1.2 (10^{-13})$  w/mc bw of receiver (with 50 ohms output); max  $6.58 (10^{-13})$  w/mC of receiver (with 270 ohms output)

*Accuracy:*  $\pm 10\%$  of actual noise figure of receiver under test

*Major Unit:* SG-8/U 6 25/32" x 8 1/32" x 6 1/16" 22 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

(1) 6X5GT

#### REFERENCE DATA AND LITERATURE:

TO 16-35SG8-2, TO 16-35SG8-3, TO 16-35SG8-4  
 USAF Spec 7524

C1 MIL-HDBK-172A, VOL I/TM 11-487H-1/1

13 September 1954

Cog Serv: USAF FSN: 6625-508--0071

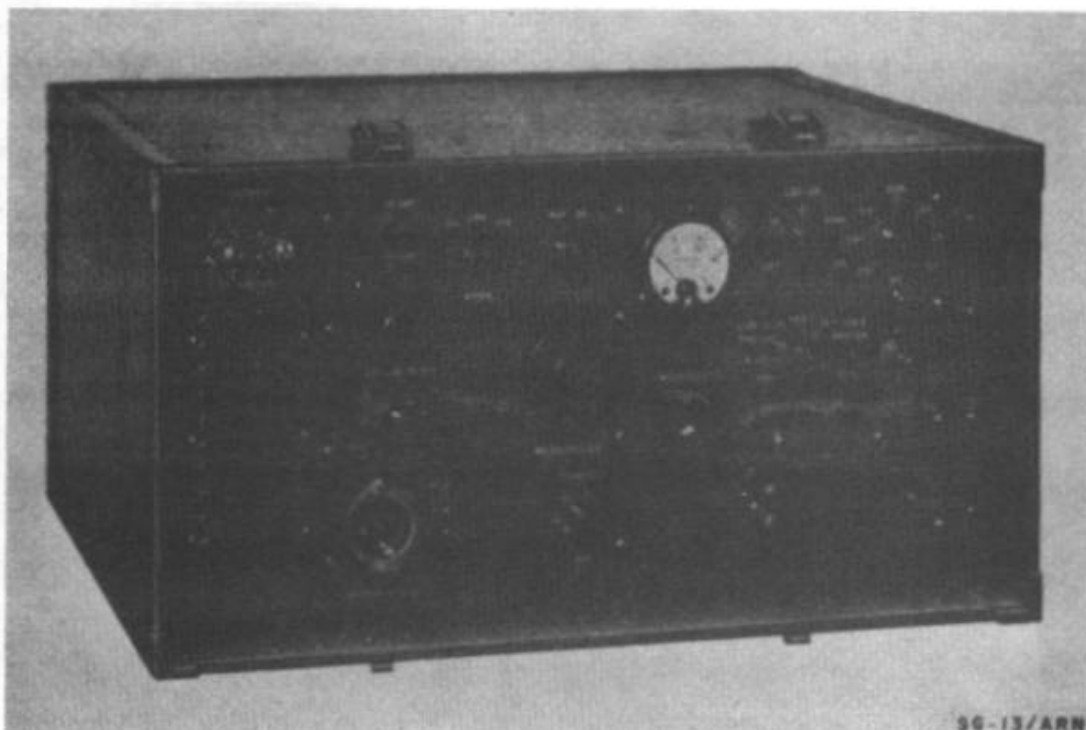
USA Line Item No: 664500

SIGNAL GENERATOR

SG-13/ARN

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer: Bendix Aviation Corp. and Collins Radio Co.				

**FUNCTIONAL DESCRIPTION:**

Signal Generator SG-13/ARN is a portable test instrument used in determining the over-all operation of aircraft navigation and localizer receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 21 to 29 v, 5.4 amp dc

*Frequency Range:* 30 cy; 90 cy; 150 cy; 1,000 cy; 9,960 cy; fm at 30 cy, 108 to 135.9 mc, 329.6 to 335 mc

*Type of Emission:* am, fm

*Voltage Range:* 5 to 200,000  $\mu$ v

*Output Impedance:* 52 ohms

*Field Strength:* 100  $\mu$ v at 100 ft from antenna

*Accuracy:*  $\pm 0.005\%$  (xtal freq),  $\pm 1\%$  (osc freq),  $\pm 2\%$  (audio freq),  $\pm 30\%$  (rf v calibration)

*Major Unit:* SG-13/ARN 35 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(3) OA2, (1) 2C51, (1) 6AG5, (9) 6AK5, (1) 6AL5, (1) 6AQ5, (1) 12AT7, (4) 12AU7, (3) 12AX7

**REFERENCE DATA AND LITERATURE**

AN 16-35SG13-1, AN 16-35SG13-4  
Exhibit MCREE330

1 March 1964

Cog Serv: USA FSN: 6625-229-1087

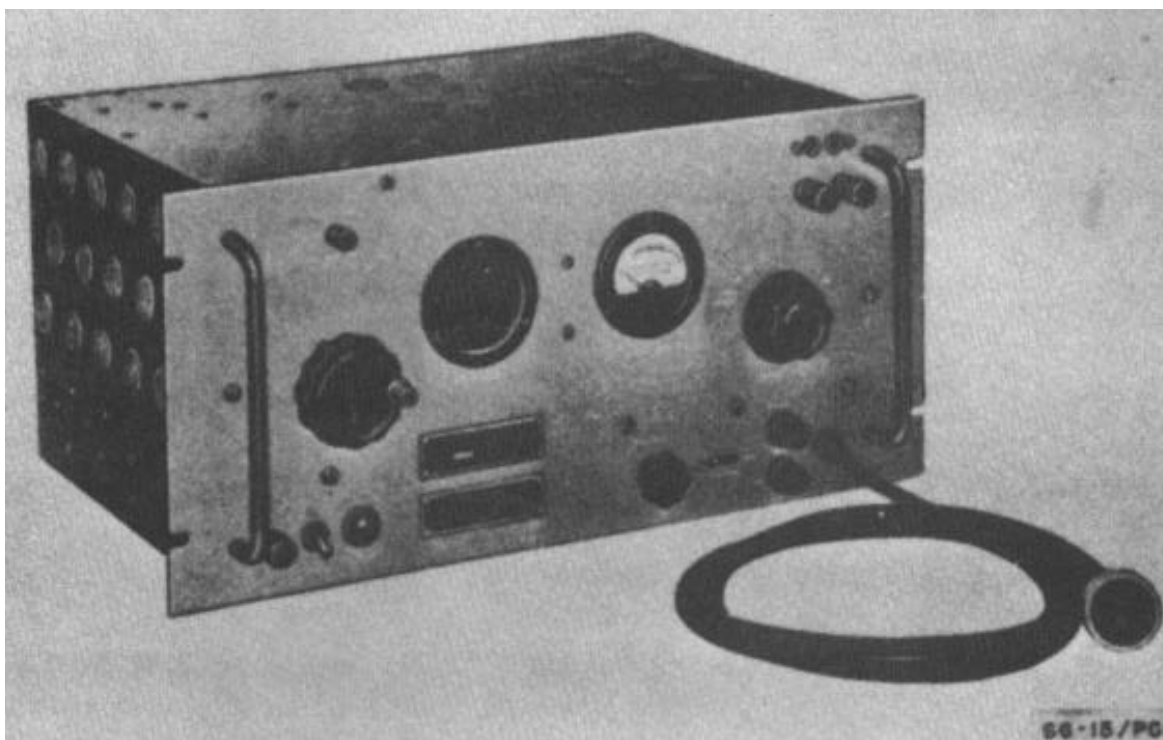
USA Line Item No: 664520

SIGNAL GENERATOR

SG-15/PCM

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std. A	-----	-----	-----
Manufacturer: Great American Industries, Inc, Conn. Telephone & Electric Div.				

**FUNCTIONAL DESCRIPTION:**

Signal Generator SG-15/PCM is a portable general purpose test equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set TS-140/PCM.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 100 w, 115 or 230 v  $\pm 10\%$ , 50 to 70 cy, 1 phase ac

*Frequency Range:* 200 to 35,000 cy  $\pm 10\%$

*Type of Emission:* cw

*Power Range:* -54 to +26-dbm

*Impedance:* 600 ohms balanced to ground

*Major Unit:* SG-15/PCM: 8 3/4" x 19" x 13 1/4" 50 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OC3, (1) 5Y3GT, (3) 6J5, (1) 6L6GAY, (1) 6SA7Y, (2) 6SJ7, (1) 6SL7GT, (1) 6SQ7, (2) 6V6Y

**REFERENCE DATA AND LITERATURE:**

TM 11-2096

Spec MIL-T-12643

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

15 June 1955

Cog Serv: USA FSN: 6625-519-9808

USA Line Item No:

INTERFERENCE GENERATOR

SG-23/U

Functional Class: 4.4.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer: Radio Frequency Laboratories, Inc.

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable general purpose unit used to supply an input signal to electronic amplifying circuits while observing the effect on the output voltage. It can be used (1) to energize audio circuits for signal tracing purposes, (2) to generate a signal in rf and af tuned circuits for signal tracing purposes, (3) as a triggering device for multi-vibrator circuits, (4) with a telephone receiver to "bring" out cables and to check continuity of wiring, (5) with a signal tracer to measure audio gain.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION,**

*Circuit Information:* This is an aperiodic, impulse buzzer type generator housed in a probe case. When the switch is closed by pressing the button at the top of the probe a modified square wave appears across the energizing coil. The harmonic content of this wave extends into the megacycle region. Varying the position of the inner tip with respect to the outer tip varies the coupling capacitance and allows some attenuation. For audio output, the inner and outer probes are placed in contact.

*Power Suppl:* 1.5 supplied by one Battery BA-58 (1.5 v)

*Current:* 0.2 amp

*Frequency Range:* 2000 cps with harmonics extending up to approx 400 mc

*Attenuator Ratio:* Approx 1 to 10

*Major Unit:* SG-23/U 5 3/4" x 3/4"

0.1 lbs

**TUBES, CRYSTALS, TRANSISTORS**

None

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91146 (Instruction Book for AN/USM-3)



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Slav: USA FSN: 6625-192-5089

USA Line Item No: 682720

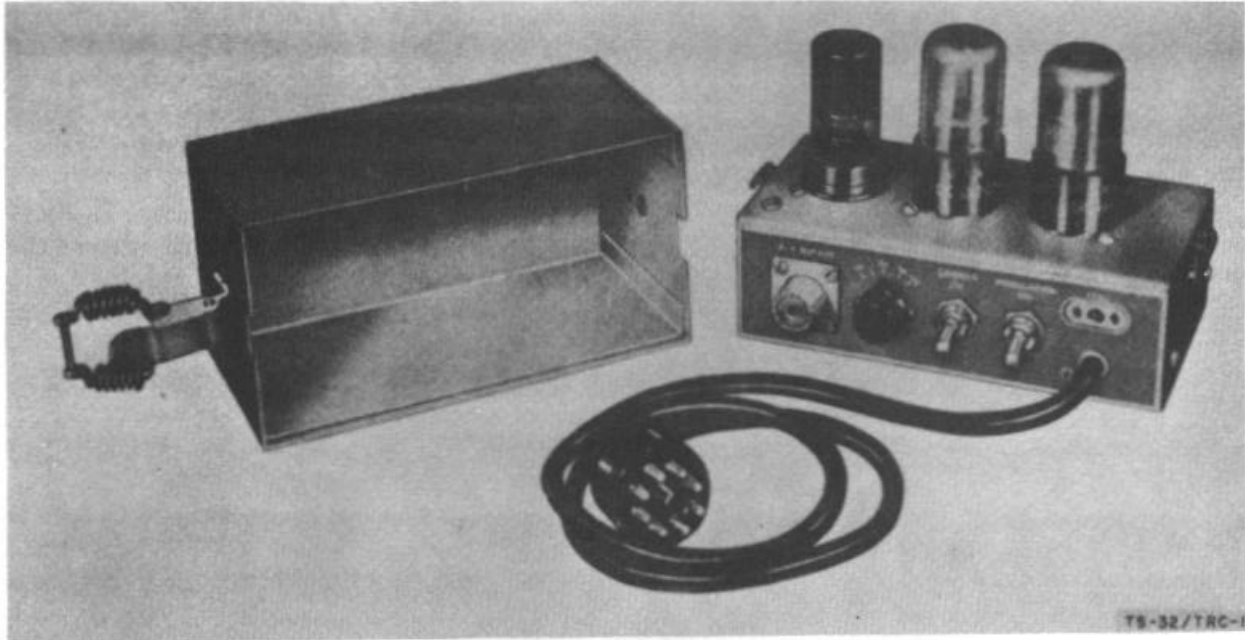
TEST OSCILLATOR

TS-32/TRC-1

Functional Class: 4.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Test Oscillator TS-32/TRC-1 is a frequency-modulated unit used in aligning radio relay receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Set AN/TRC-1, Radio Terminal Set AN/TRC-3, and Radio Relay Set AN/TRC-4.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 60 cy ac

*Frequency Range:* 70 to 100 mc

*Modulation:* 1,000 cy

*Output Power:* 50 mw

*Accuracy:*  $\pm .01\%$  xtal-controlled

*Major Unit:* TS-32/TRC-1      4 3/4" x 4" x 7"

3 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6SH7, (1) 6SL7GT, (1) 6SN7GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2601

MIL-R-10174

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

TEST OSCILLATOR

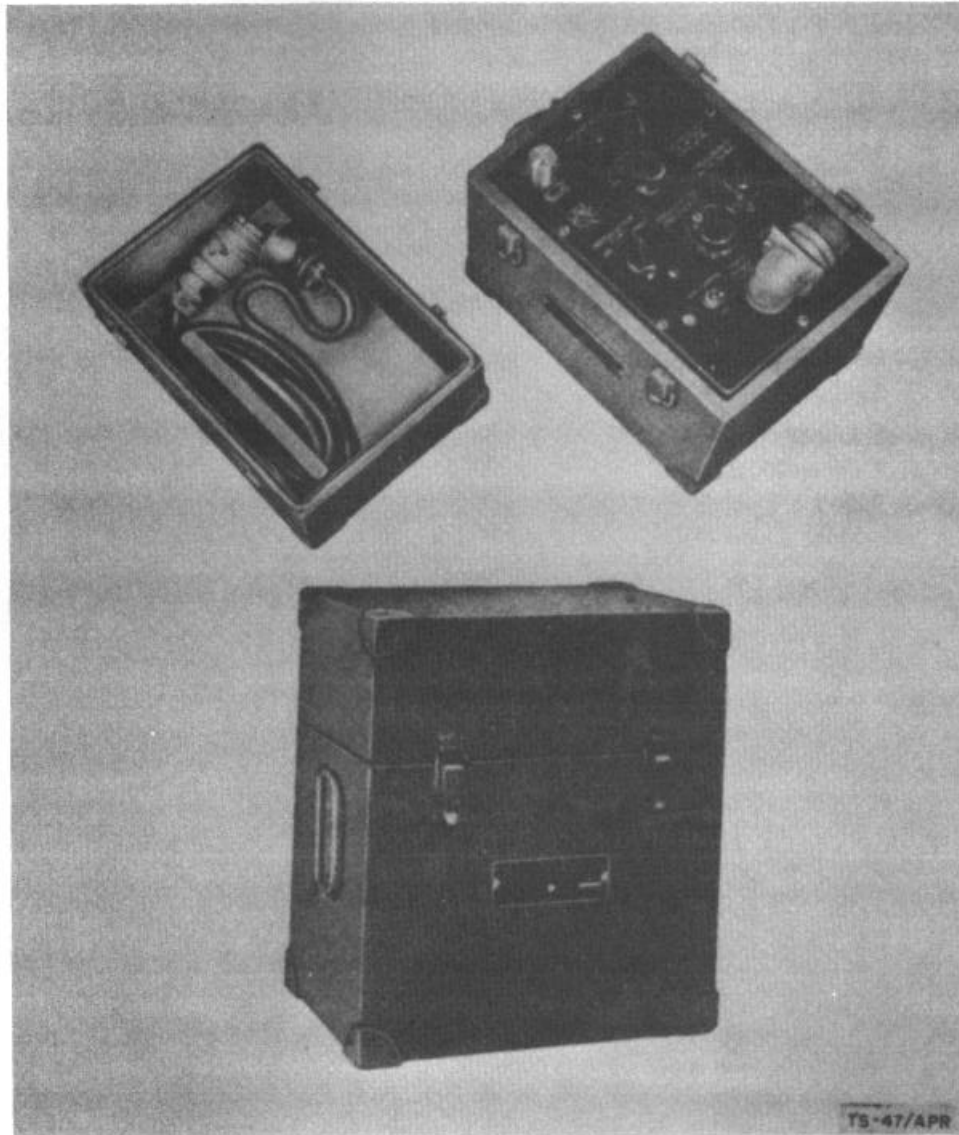
Cog Serv: USA FSN: 6625-405-6345

USA Line Item No: 682760

Functional Class: 4.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	Std	Std	-----

Manufacturer: General Radio Co; Fairchild Camera and Instrument Corporation; Maguire Industries, Inc.; Medco Manufacturing Company

**FUNCTIONAL DESCRIPTION:**

Test Oscillator TS-47/APR is a portable unit providing a calibrated, hf signal source used in checking and aligning radio receivers in the field.

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**TEST OSCILLATOR**  
**TS-47/APR**

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**RELATION TO SIMILAR EQUIPMENT:**

This equipment, identical with Oscillator, General Radio Type P523-A, is similar to Signal Generator TS-109/SPR.

*Equipment Required But Not Supplied:* Batteries: (4) BA-35, (5) BA-36; (1) cord; (1) 1-watt, 2,000-ohm resistor.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 13.5 w, 80 v, 115 v, or 230 v, 50 to 2,600 cy ac; or 8.5 w, 200 v, .02 amp dc; 6.3 v, .55 amp dc;

*Frequency Range:* 40 to 500 mc  $\pm$  1% in two bands (useful harmonics to 3,000 mc)

*Type of Emission:* am, cw, pulse

*Voltage Range:* .387 v

*Power Range:* 3 mw

*Impedance:* 50 ohms

*Modulation Data:*

*Amplitude:* 50% modulation at 1,000 cy

*Pulse:* 70  $\mu$ sec duration at repetition rate of 500 pps

*Temperature Range:* -14° F to + 131 ° F

*Major Unit.* TS-47/APR 11 3/8" x 6 3/4" x 9"

15 lbs

**TUBES, CRYSTALS, TRANSISTORS,**

(1) 6X5GT, (2) 9002

**REFERENCE DATA AND LITERATURE:**

TM 11-1034, TO 16-35TS47-2

Spec MIL-T-11342

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-229-1039

USA Line Item No: 669200

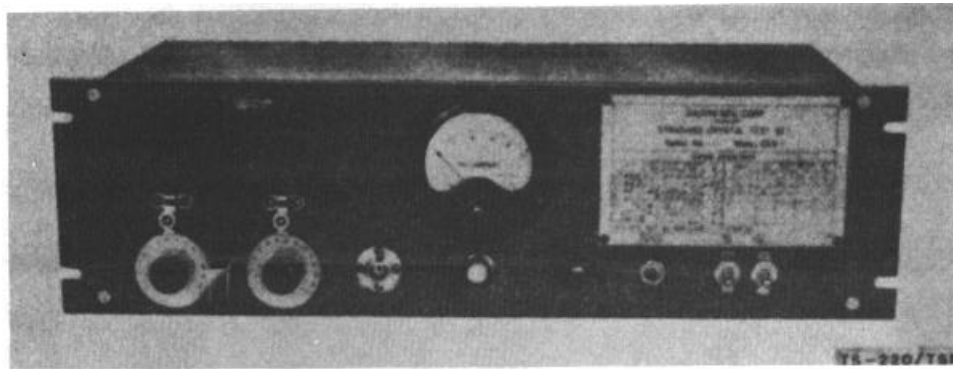
STANDARD OSCILLATOR

TS220/TSM

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Standard Oscillator TS-220/TSM is used in testing the frequency and activity of crystals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Crystal Fabricating Equipment AN/FSM-1.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 v, 50 to 60 cy ac

*Frequency Range:* 1 to 10 mc  $\pm 30$  cy

*Activity Range:* 0 to 1 ma dc  $\pm 0.02$  ma

*Major Unit:* TS-220/TSM 5 1/2" x 17" x 7 3/4"

12.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OB3, (1) 6X6GT, (1) 7C5

**REFERENCE DATA AND LITERATURE:**

TM 11-2675

Sig C Dwg SC-D-14833

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

28 October 1954

Cog Serv: USA FSN: 6625-537-5808

USA Line Item No: 669220

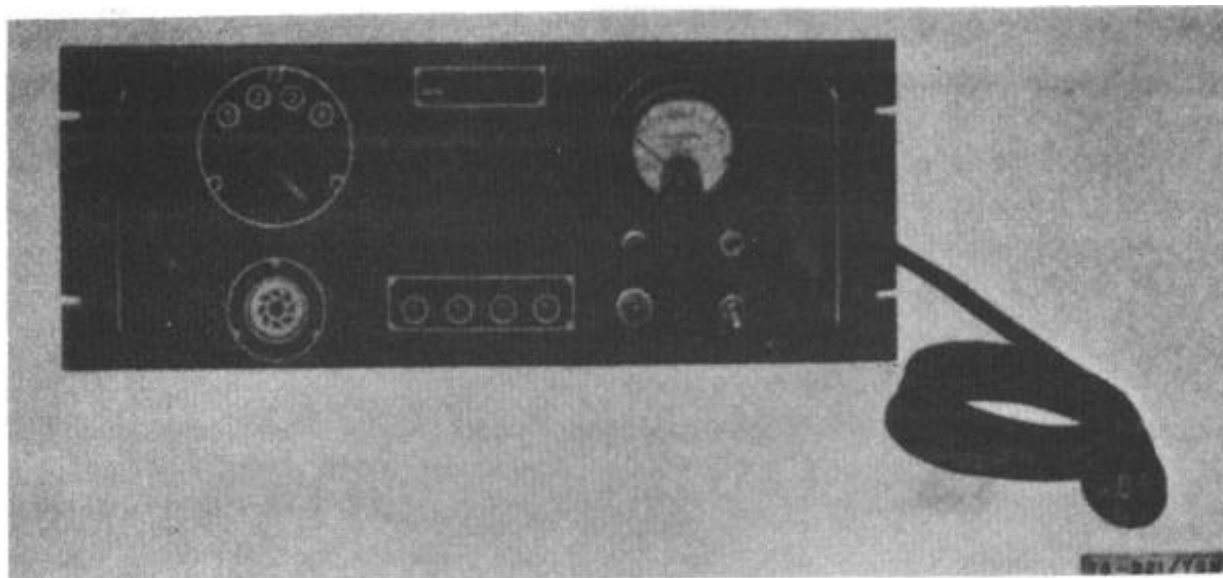
STANDARD OSCILLATOR

TS-221/TSM

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Standard Oscillator TS-221/TSM is used in measuring the activity and frequency of crystals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Standard Crystal Test Set AN/TSM-2.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 52 w, 110 to 120 v, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 200 to 1,200 kc in four bands  $\pm$  2%

*Major Unit:* TS-221/TSM 19" x 8 5/8" x 7"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OC3, (1) OD3, 5U4G, (1) 6H6, (1) 6VGT

**REFERENCE DATA AND LITERATURE:**

TM 11-2672

MIL-T-12622; Sig C Dwgs SC-D-14571, SC-D-25890

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

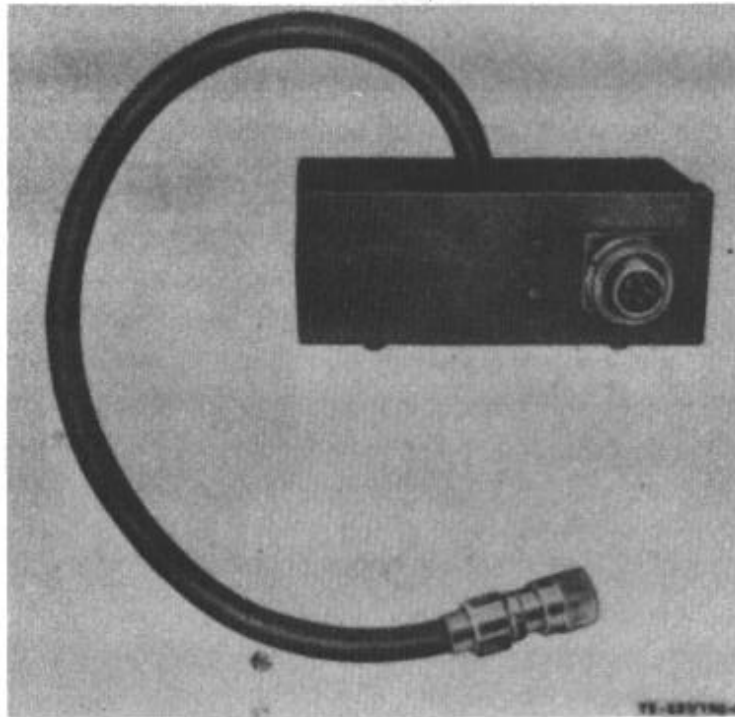
TEST OSCILLATOR

TS-237/TRC-8

Functional Class: 4.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	Std	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Test Oscillator TS-237/TRC-8 is a crystal-controlled unit used in calibrating radio receivers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Set AN/TRC-8, Radio Terminal Set AN/TRC-11, and Radio Relay Set AN/TRC-12.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 30 to 250 mc

*Impedance:* 50 ohms

*Accuracy:*  $\pm 1\%$

*Major Unit:* TS-237/TRC-8 5" x 4" x 3"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6AG5

**REFERENCE DATA AND LITERATURE:**

Spec MIL-R-12887



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

28 October 1954

Cog Serv: USA FSN: 6625-553-0932

USA Line Item No: 685350

TEST SET

TS-251/UP

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----

Manufacturer: Airplane and Marine Instruments, Inc.; Packard Bell Company

**FUNCTIONAL DESCRIPTION:**

Test Set TS-251/UP is a portable signal generator used in preflight and shipboard checking of long range Loran receivers.

**RELATION TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 22 w, 80, 115, or 230 v, 50 to 1,600 cy, 1 phase ac

*Frequency Range:* 1,700 to 2,010 kc

*Type of Emission:* Pulse

*Voltage Output:* 15  $\mu$ v, 1 mv, 1 v

*Impedance:* 50 ohms for 15  $\mu$ v and 1 mv; 150 ohms for 1 v

*Pulse Repetition Rate:* 303.03 pps

---

**TEST SET**  
**TS 251/UP**

---

*Accuracy:*  $\pm 10$  kc

*Major Unit:* TS-251/UP 7 3/4" x 11 3/4" x 10 1/2"

18.1 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 6J5, (1) 6SJ7, (1) 6SK7, (1) 6SL7GT, (1) 6SN7GT, (1) 6X5GT

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS251-2 (NAVSHIPS 900,652), TO 16-35-156 USAF Spec 371-5091



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

SIGNAL GENERATOR

TS-300/CRD-3

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Federal Telephone and Radio Corporation

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Signal Generator TS300/CRD-3 is used as a target transmitter.

**RELATION TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Set AN/CRD-3.

**TECHNICAL DESCRIPTION:***Frequent Range:* 100 to 2,000 kc in four bands*Major Unit:* TS300/CRD-3      10 1/2" x 7 1/2 x 7 1/2"**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1R5, (2) 6G6G

**REFERENCE DATA AND LITERATURE:**

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

4 April 1956

Cog Serv: USA FSN: 6625-192-5094

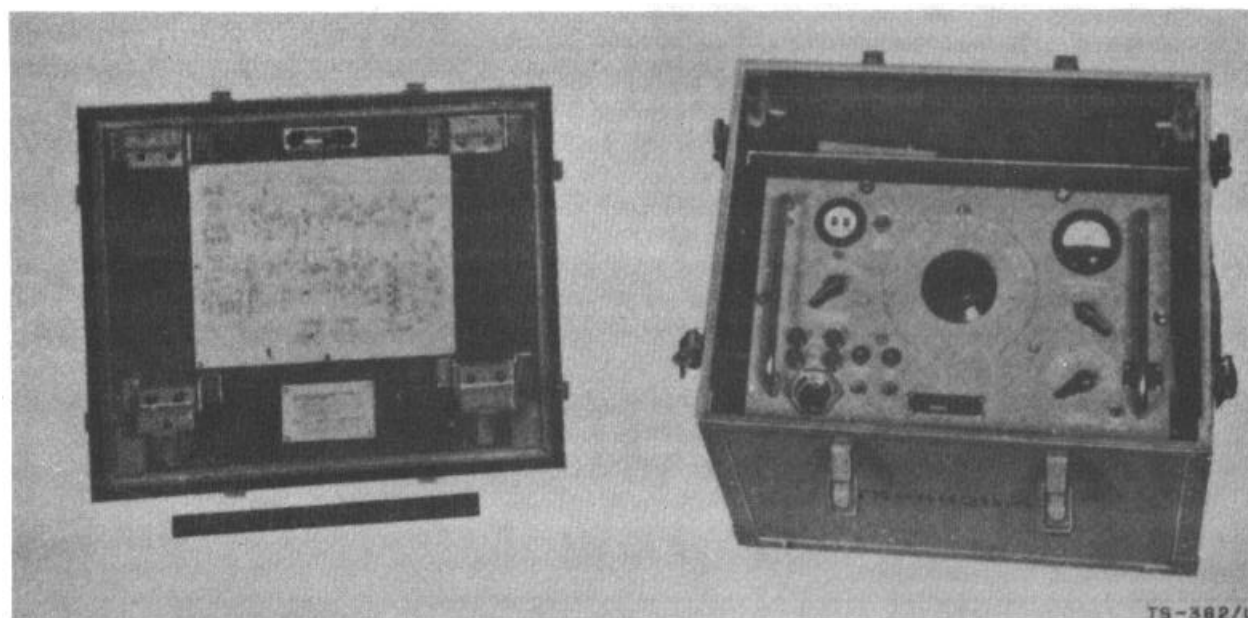
USA Line Item No: 603810

AUDIO OSCILLATOR

TS-382E/U

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer: Carol Electronics Corporation				

**FUNCTIONAL DESCRIPTION:**

This is a portable, general purpose audio oscillator which provides a sine wave output voltage over its frequency range. It is used as a general test oscillator in the field for free point servicing of various radio equipment.

**RELATION TO SIMILAR EQUIPMENT:**

The Audio Oscillator TS-382E/U is functionally, mechanically, and electrically interchangeable with Audio Oscillator TS-382D/U except that the transit case is smaller and the internal electronic components are not interchangeable.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The indicator of a vibrating reed frequency meter is located on the front panel to provide a frequency check at two points. A thermostatically controlled heater is incorporated in the equipment. The thermostat is preset before assembly of the equipment.

The circuit consists of an oscillator section, an amplifier, an output metering circuit, a power supply, a voltage regulating system, and a cathode follower stage.

The oscillator section is a two-stage resistance coupled amplifier. A positive feedback causes the oscillator to oscillate. A resistance-capacity network controls the frequency of oscillation.

The output amplifier section consists of a two-stage resistance coupled amplifier employing negative feedback to minimize distortion and to provide uniform output.

## AUDIO OSCILLATOR

### TS-382E/U

The output metering circuit contains an output level meter, output level control, and a six-section ladder type attenuator. The output meter operates from a full wave rectifier type circuit which uses germanium crystals as rectifying elements.

The power supply provides filament voltage to all the tubes and filtered dc voltage to the plates and screen grids.

The voltage regulating system provides a constant voltage of 230 volts to the plate circuits of the various tubes; to accomplish this action, the regulator employs three electron tubes.

The cathode follower stage isolates the frequency meter from the oscillator section to prevent shifts in frequency when the equipment is in operation.

*Power Supply:* 115  $\pm$  10 v, ac, single-phase, 50 to 1,000 cps

*Frequency Range:* 20 to 200,000 cy in four ranges.

*Type of Transmission:* cw

*Output Voltage:* 0 to 10 v in seven ranges.

*Frequency Meter Check Points:* 60 and 400 cps

*Power Output:* 100 mw

*Output Impedance:* 1,000 ohms.

*Accuracy:* +2% of indicated freq; +2 to -3  $\mu$ v on 1 to 10  $\mu$ v ranges;  $\pm$ 3% on 10  $\mu$ v to 10 v ranges;  $\pm$  0.3% for freq at check points.

*Temperature Range:* -40° C. (-40° F.) to +55° C. (+131° F.), operational.

-40° C. (-40° F.) to +85° C. (+185° F.), storage.

*Altitude Range:* Sea level to 10,000 feet operational.

*Relative Humidity Range:* 0 to 100%.

*Thermostat Setting:* +20° C. (+68° F.).

*Major Unit:* TS-382E/U 10" x 14" 10"

35 lbs

### TUBES, CRYSTALS, TRANSISTORS:

1 JAN-OA-3, 1 JAN-5Y3GT, 1 JAN 6J5, 2 JAN-6SJ7, 1 JAN-6SL7GT, 1 JAN-6Y6G, 1 JAN-6V6GT, 1 JAN-6AG7.

### REFERENCE DATA AND LITERATURE:

TO 33A1-8-83-21 (Operation and Service Instructions).

TO 33A1-8-82-24 (Parts Breakdown).

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-192-5093

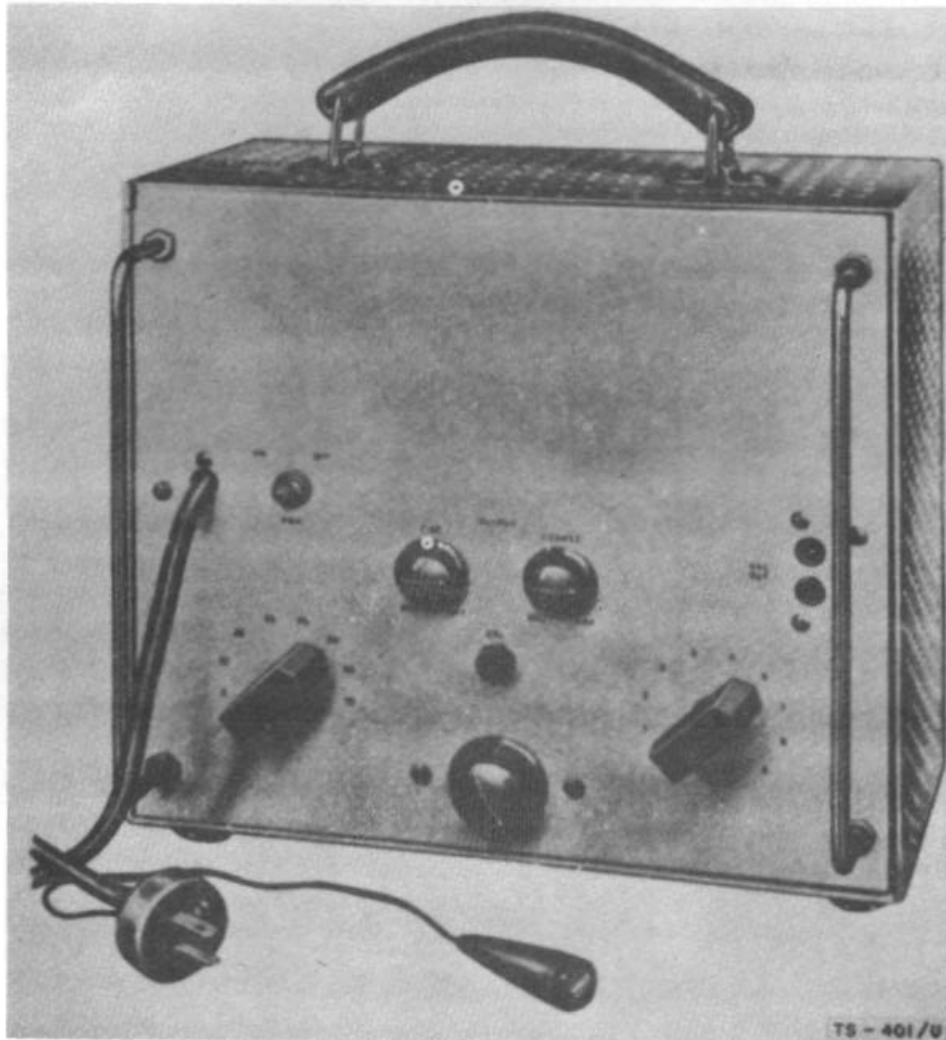
USA Line Item No: 628880

OSCILLATOR

TS-401/U

Functional Class: 4.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer: Western Electric Company				

**FUNCTIONAL DESCRIPTION:**

Oscillator TS-401/U is a portable equipment used as a source of audio testing power over wide ranges of temperature and humidity.

**RELATION TO SIMILAR EQUIPMENT:**

None.

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**OSCILLATOR**  
**TS-401/U**

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**TECHNICAL DESCRIPTION:**

*Power Requirement:* 60 w, 105 to 125 v, 50 to 60 cy ac

*Frequency Range:* 1 to 79 kc

*Power Output Range:* -75 to +16 db

*Impedance:* 135 ohms

*Major Unit:* TS-401/U 11" x 12" x 7 1/2"

30.6 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 5Z4, (1) 6G6G, (1) 6SJ7, (1) 6V6GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2040

28 October 1954

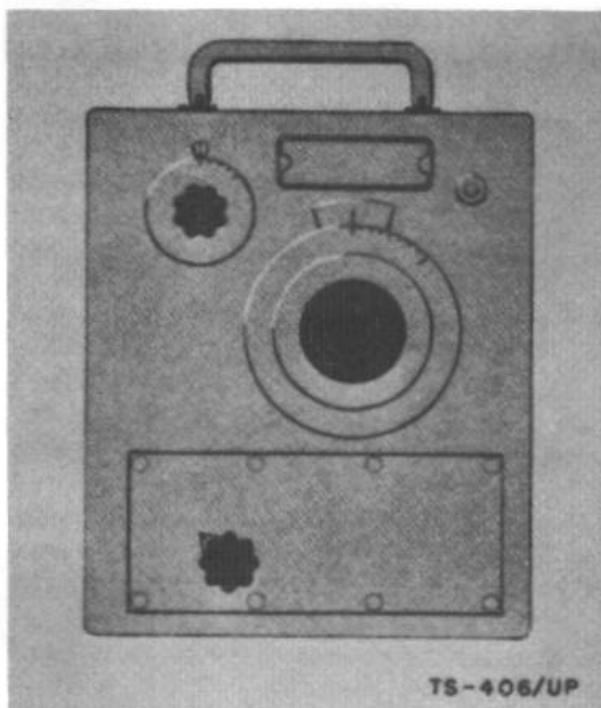
Cog Serv: USN FSN:

USA Line Item No: 682773

TEST OSCILLATOR TS-406/UP

Functional Class: 4.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	Std	-----	-----
Manufacturer:	Presto Recording Corporation			

**FUNCTIONAL DESCRIPTION:**

Test Oscillator TS-406/UP is portable equipment used as a source providing a low power test signal for receivers within its frequency range. The unit consists of an attenuator, buzzer, and cavity.

Application is in field testing.

**RELATION TO SIMILAR EQUIPMENT:**

None.

*Equipment Required But Not Supplied:* Battery: (1) BA-205/U

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 3 v dc

*Frequency Range:* 1,000 to 3,500 me

*Type of Emission:* Damped pulse at 1,500 to 2,000 pps

*Output Impedance:* 50 ohms

*Power Range:* Over 10  $\mu$ v on 50-ohm load

*Temperature Range:* -40° C to +55° C

*Accuracy:*  $\pm 2$  %

*Major Unit:* TS-406/UP 10 1/2" x 8 5/8" x 4 9/16" 14 lbs

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**OSCILLATOR**  
**TS4-06/UP**

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**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS406-3

1 March 1964

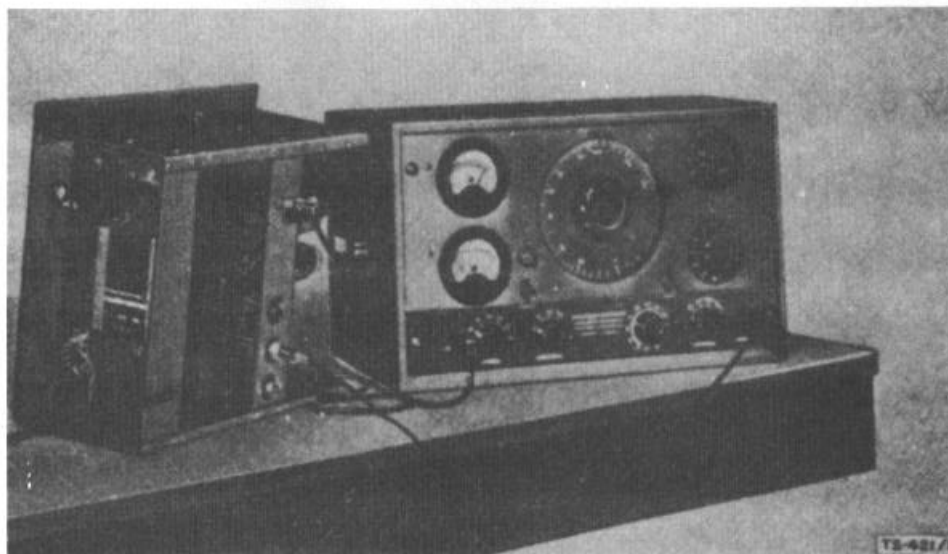
Cog Serv: USA FSN: 6625-669-0228

USA Line Item No: 603820

AUDIO OSCILLATOR TS-421A/U

Functional Class: 4.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Hewlett-Packard Company			

**FUNCTIONAL DESCRIPTION:**

Audio Oscillator TS-421A/U is a portable, low power, resistance-tuned electronic instrument generating of signals used in the testing and repair of audio amplifiers, as well as associated lines and equipment.

**RELATION TO SIMILAR EQUIPMENT:**

This equipment is similar to Hewlett-Packard Models 205-A and 205-AG.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 125 w, 110 to 120 v, 1.5 amp, 50 to 60 cy, 1 phase ac

*Frequency Range:* 20 to 20,000 cy  $\pm 2\%$

*Power Output:* 5 w

*Impedance:* 50 ohms; 200 ohms; 500 ohms; 5,000 ohms (output); 5,000 ohms (input)

*Attenuator:* 0 to 110 db (output); 0 to 40 db (input)

*Input Level:* 0 to 2 v

*Major Units:* TS-421A/U 12 1/4" x 19 3/4" x 17" 75 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 5U4G, (1) 6F6, (2) 6H6, (1) 6J5, (1) 6J7, (2) 6L6G, (1) 6SF5, (1) 6SN7GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2649 (TO 16-35TS421-5)



1 March 1964

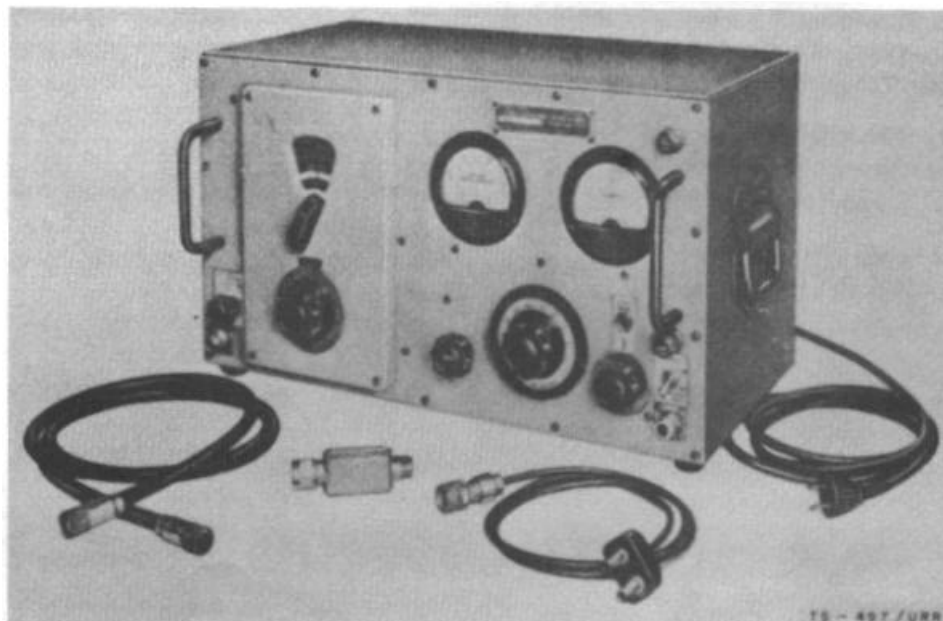
Cog Serv: USA FSN: 6625-669-0258

USA Line Item No: 664870

SIGNAL GENERATOR TS-497B/URR

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	L/Std	-----
Manufacturer:	The Daven Company			

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, signal generator designed primarily for laboratory and field use in making precise measurements in the development and maintenance of radio and video equipment. Internal and external amplitude modulation may be used. An input jack is provided for pulse modulation from an external source. All controls, meters, and assemblies are mounted on the front panel.

**RELATION TO SIMILAR EQUIPMENT:**

Functionally interchangeable with previous models.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Radio frequency signals are provided by a carrier frequency oscillator. This oscillator output is fed to a carrier output jack through a piston attenuator, and to an output metering system consisting of a barreter bridge and output meter. Proper setting of output meter causes the microvolt calibration of the microvolts dial to be a true indication of the carrier output voltage. An internal audio oscillator provides sine wave signals for amplitude modulation. An internal audio amplifier, called a modulator, amplifies either the internal audio oscillator output or an external audio oscillator output and uses the amplified signal to plate modulate the carrier oscillator.

*Power Supply:* 117 v,  $\pm 10\%$ , ac, single phase, 50 to 60 cps, 65 w approximately.

*Frequency Range:* 2 to 400 mc in six bands.

*Internal Modulation Frequency:* 400 or 1000 cps

*External Modulation Frequency:* 50 to 10,000 cps

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**SIGNAL GENERATOR**  
**TS-497B/URR**

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*External Pulse Modulation:* Pulse generator should provide a minimum of 150 v peak and have an output impedance of 1000 ohms or less.

*Percent Modulation:* 0 to 30 for sine waves.

*Type of Transmission:* Amplitude Modulated Carrier, Pulsed Carrier.

*Output Impedance:* 50 ohms.

*Output Voltage:* 0.1 to 100,000  $\mu$ v continuously variable.

*Attenuator Leakage:* Less than 0.1  $\mu$ v

*Stray Field:* Less than 0.2  $\mu$ v at any point outside the case.

*Accuracy:*  $\pm 0.5\%$  of indicated freq on all ranges.

*Major Units:* TS-497B/URR 11 5/8" x 20 1/8" x 11 1/8" 54.7 lbs

**TUBES, CRYSTALS, TRANSISTORS**

1 JAN-OA3/VR-75, 2 JAN-6AQ5, 1 JAN-5Y3GT, 1 JAN-OC3/VR-105, 1 JAN-6AU6, 1 JAN-12AU7, 1 JAN-955.

**REFERENCE DATA AND LITERATURE:**

To 16-35TS497-7 (TM 11-5030A) (Instruction Book). MIL-Spec. 10262

5 November 1954

Cog Serv: USN FSN: 6625-698-4757

USA Line Item No: 618175

SIGNAL GENERATOR TS-510/UR

Functional Class: 4.1.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	General Electric Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Signal Generator TS-510/IR is a portable instrument producing signals with very low spurious energy content, suitable for alignment of narrow-band uhf communication equipment. Application is in field and depot maintenance.

**RELATION TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 150 w, 105 to 125 v, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 225 to 440 mc in four bands

*Type of Emission:* am, cw, pm

*Voltage Range:* 1 to 100,000  $\mu$ v

*Power Range:* 0 to -110 dbm

*Impedance:* 50 ohms (output) 500 ohms (input)

*Modulation Frequency:* 400 cy; 1,000 cy (int) at 10 to 80%; 100 cy to 20 kc (ext)

*Pulse Amplitude:* 20 to 50 v (peak ext)

*Pulse Repetition Frequency:* 0 to 5,000 pps

*Pulse Width:* 0.3 to 50  $\mu$ sec

*Temperature Range:* -40° C to +55° C

*Major Units:* TS-510/UR 14" x 17" x 13 1/2" 48 lbs

**TUBES, CRYSTALS, TRANSISTORS**

(1) OA2, (2) 6AG5, (1) 6AQ5, (2) 6C4W, (2) 6X4W, (1) 6Y6G, (2) 12AT7, (1) 5751, (2) 5876

**REFERENCE DATA AND LITERATURE**

BuAer Spec XEL-95

1 March 1964

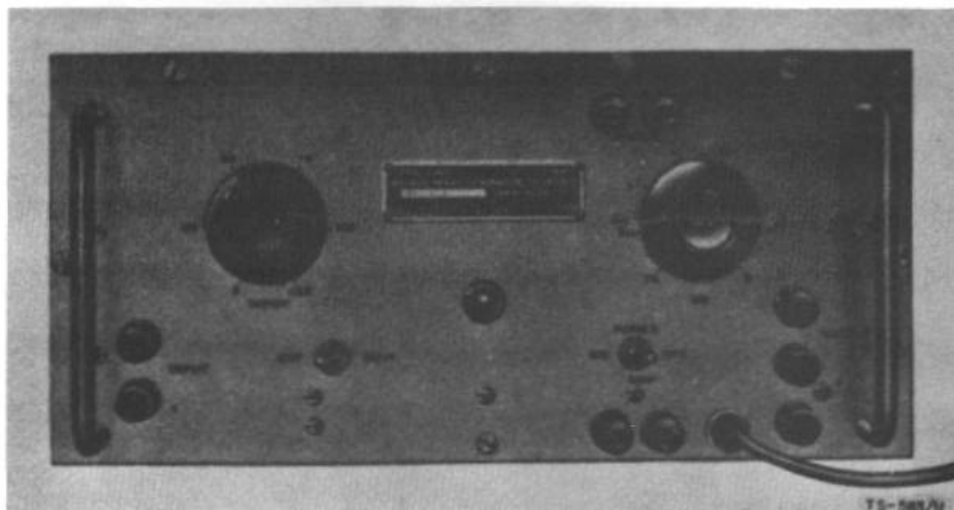
Cog Serv: USA FSN: 6625-669-0254

USA Line Item No: 668690

SQUARE WAVE GENERATOR TS-583/U

Functional Class: 4.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer:	Lavoie Laboratories, Inc.			

**FUNCTIONAL DESCRIPTION:**

Square Wave Generator TS-583B/U is a portable test instrument providing an internally generated square-wave voltage output at the frequency of the line voltage. Synchronized with an external sine wave generator, it is used in testing the frequency and transient response of audio amplifiers or other networks as well as in timing measurements.

**RELATION TO SIMILAR EQUIPMENT:**

This equipment is similar to Square Wave Generator, Hewlett-Packard Model 210A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 85 w, 115 v  $\pm$  10%, 50 to 60 cy, 1 phase ac

*Frequency Range:* 20 cy to 100 kc

*Type of Reception:* Sine wave

*Type of Emission:* Square wave

*Signal Output:* 50 v (max, peak to peak)

*Input Impedance:* 25,000 ohms

*Output Impedance:* 1,000 ohms (balanced); 500 ohms (unbalanced)

*Square-wave Rise and Decay Time:* 0.5  $\mu$ sec

*Major Units:* TS-583B/U 7 1/2" x 11" x 15 1/4" 35 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

(1) OA3, (2) 5Y3GT, (4) 6AQ5, (1) 6J6, (1) 12AX7

**REFERENCE DATA AND LITERATURE:**

TM 11-5024, TO 16-35TS583-3; Spec MIL-G-13214

25 October 1954

Cog Serv: USAF FSN: 6625-537-5724

USA Line Item No: 633818

GENERATOR, PULSE TS-592/UPM-15

Functional Class: 4.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	A/Std	-----
Manufacturer:	Lavoie Laboratories			

No Illustration Available

**FUNCTIONAL DESCRIPTION,**

A general purpose, standard pulse generator used for testing pulse amplifiers, networks, and for modulating oscillators, etc. It generates single or double pulses of variable pulse repetition frequency, pulse width, pulse amplitude, separation, delay, and rise/decay time. Pulses may be positive or negative, and may also be synchronized by an internal oscillator or from external sources.

**RELATION TO SIMILAR EQUIPMENT**

Formerly TS-592(XA)/U, nomenclature and designation amended and TS-592/UPM-15 assigned (26 April 1950). Part of AN/UPM-15 overall nomenclature.

**TECHNICAL DESCRIPTION:**

*Power Supply:* 115 v + 10%, ac, Single phase, 50 to 1600 cps, 330.

*Pulse Repetition Rate:* 50 to 10,000 pps internal, internally or externally synchronized.

*Type of Transmission:* Voltage Pulses.

*Input Impedance:* Greater than 1000 ohms

*Output Impedance:* 0.25 ohms below 20 mv, 2.5 ohms from 20 to 200 mv, 50 ohms from 0.2 to 2 v, 250 ohms from 2 to 20 v, 2500 ohms above 20 v, 75 ohms matched from 0 to 3.5 v.

*Pulse Width:* 0.5 to 100  $\mu$ sec.

*Pulse Amplitude:* 0.002 to 200 v.

*Pulse Delay:* 2 to 225  $\mu$ sec after the synchronized pulse.

*Pulse Rise and Fall Time:* 0.05 to 0.25  $\mu$ sec and 0.1 to 0.3  $\mu$ sec, respectively measured from 10 to 90 percent amplitude.

*Second Pulse:* Identical in shape to first pulse and follows first pulse by an interval of 3 to 30  $\mu$ sec.

*Accuracy:*  $\pm 10\%$  of any indication after 10 minute warm up;  $\pm 5\%$  at 21° C.

*External Trigger Pulse:* 0 to 50,000 pps, 5 to 100 v.

*Temperature Range:* -40° C. to +55° C.

*Major Units:* TS-592/UPM-15 19" x 11" x 12" 80 lbs

**TUBES, CRYSTALS, TRANSISTORS,**

4 JAN-AU6, 5 JAN-5814, 1 JAN6D4, 4 JAN-12AT7, 2 JAN-AS6W, 2 JAN-AH6, 1 JAN-6AN5, 1 JAN-829B, 1 JAN-AQ5W, 1 JAN-5R4WGY, 2 JAN4AS7G, 1 JAN-A2, 1 JAN-X4W, 1 JAN4OB2.

**REFERENCE DATA AND LITERATURE:**

23 November 1954

Cog Serv: USAF FSN:

USA Line Item No: 664990

SIGNAL GENERATOR TS-606/U

Functional Class: 4.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Rollin Company			

**FUNCTIONAL DESCRIPTION:**

Signal Generator TS-606/U is a laboratory instrument that may be used for all conventional measurements normally performed by standard signal generators. It will function as a stable, shielded, low impedance source of cw amplitude modulated or unmodulated rf power and as a calibrated microvolt signal generator.

**RELATION TO SIMILAR EQUIPMENT:**

This equipment is similar to Standard Signal Generator, Rollin Model 20.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v  $\pm$ 10%, 60 cy, 1 phase ac

*Freq Range:* 85 kc to 40 mc in eight bands

*Type of Emission:* am, cw

*Voltage Output Range:* 0.1  $\mu$ v to 10 v (cal); 15 v (max uncal)

*Power Range:* 0 to 10 w

*Impedance:* 10 ohms

*Modulation Frequencies:* 100 cy; 400 cy; 1,000 cy; 3,000 cy at 0 to 80%

*Distortion:* Less than 2%

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**SIGNAL GENERATOR**  
**TS-406/U**

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*Frequency Drift:* Less than  $\pm 0.25\%$

*Accuracy:*  $\pm 0.25\%$  (carrier);  $\pm 2\%$  (modulator);  $\pm 3\%$  (percent modulation)

*Major Units:* TS-606/U 15 1/2" x 25 3/4" x 17" 210 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(3) OD3, (2) 5U4G, (4) 6B4G, (1) 6C4, (2) 6L6, (2) 6SF5, (1) 6SK7, (1) 6SN7, (1) 829B, (3) 9005

**REFERENCE DATA AND LITERATURE:**

Instruction Manual

USAF Exhibit MCREE-482

**CATEGORY 5****FIELD INTENSITY MEASURING EQUIPMENT**

Functional classification	Name of equipment	Type No.	Page No.
5.1 .....	RF Indicator-Probe .....	ID-263/U .....	299
5.1 .....	Pick-up Assembly .....	TS-131/AP .....	301
5.1 .....	Radio Frequency Indicator .....	TS-446/U .....	303
5.1 .....	Field Strength Meter .....	TS-509/UR .....	-305
5.3 .....	Detector-Amplifier Assembly .....	AN/UPA-1B .....	291
5.5 .....	Radio Interference Measuring Set .....	AN/URM-3 .....	293
5.6 .....	Radio Test Set .....	AN/URM-6 .....	295
5.6 .....	Radio Interference Measuring Set .....	AN/URM-7 .....	297
5.6 .....	Ceilorometer Test Set .....	TS-555/GMQ2 .....	307



20 August 1954

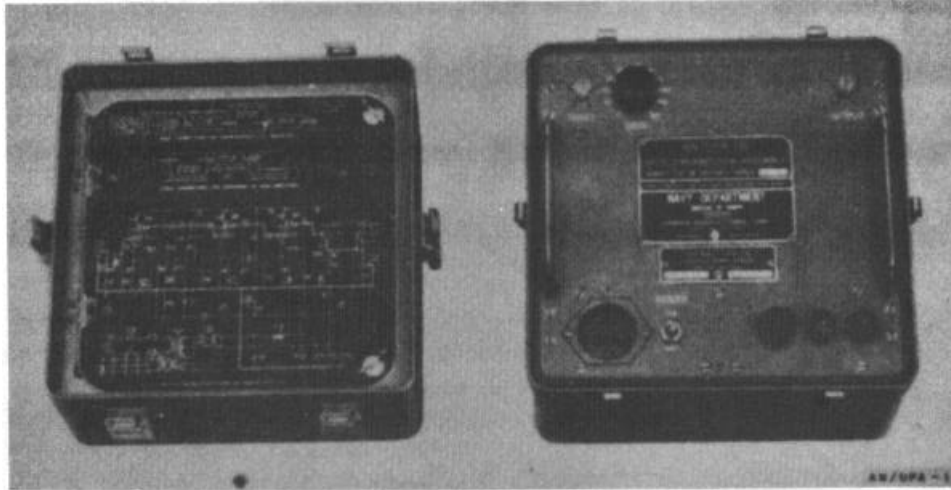
Cog Serv: USN FSN: 5840-404-6046

USA Line Item No: 613130

DETECTOR-AMPLIFIER ASSEMBLY AN/UPA-1B

Functional Class: 5.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----
Manufacturer:	Kardon Manufacturing Company			

**FUNCTIONAL DESCRIPTION:**

Detector-Amplifier Assembly AN/UPA-1B is used with test oscilloscopes and synchroscopes to pick up, detect, and amplify modulated rf signals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are basically similar except that the B model has been reduced in size, weight, and power consumption.

Equipment required but not supplied: One test oscilloscope or synchroscope

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 45 w, 115 v, 50 to 1,000 cy ac

*VIDEO AMPLIFIER AM-647/UPA-1B:*

*Frequency Range-* 175 cy to 6 me

*Gain:* 0 to 40 db

*Input Impedance:* 1,000 ohms shunted by approx 20  $\mu$ f

*Terminating Impedance:* 51 ohms to X

*Output Voltage:* Not less than  $\pm 5$  v with negligible distortion measured across 120-ohm dummy load

*Noise Output:* Not more than 7,000  $\mu$ v at max gain without selection of tubes

*TEST ANTENNA AS-23/AP:*

*Frequency Range:* 1,550 to 5,200 me

*Type:* Two-element directive

*TEST ANTENNA AT-48/UP:*

*Frequency Range:* 5,200 to 11,000 me

*Type:* Pyramidal, horn-type director with vert ant. in its throat

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**DETECTOR-AMPLIFIER ASSEMBLY  
AN/UPA-1B**

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*RF PROBE DT-31/UPA-1A:**Frequency Range:* 15 to 11,000 mc*Input Impedance:* 50 ohms*Design Load Impedance:* 1,000 ohms shunted by not more than 25  $\mu$ f*Maximum Input:* 250 mv across 50 ohms (1.25 mw avg pwr)*Major Units:* 1 AM647/UPA-1B 10 1/2" x 10 1/2" x 10 1/2"

23 lbs

**TUBES, CRYSTALS, TRANSISTORS,***TUBE COMPLEMENT:*

(1) 1N23A, (1) 5Y3GT, (3) 6AK5, (1) 6J6, (1) 5687

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91473

MIL-D-15481

1 March 1964

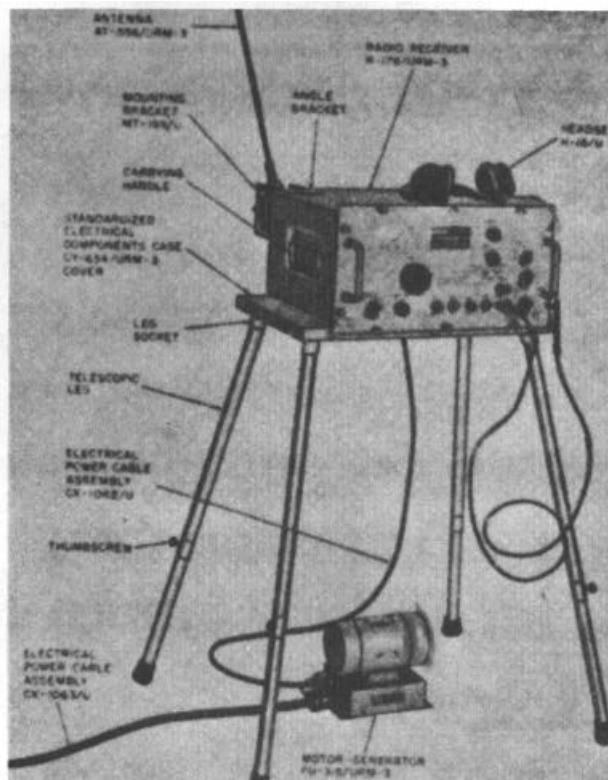
Cog Serv: USA FSN: 6625-519-2415

USA Line Item No: 634885

**RADIO INTERFERENCE MEASURING SET AN/URM-3**

Functional Class: 5.5

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std C	-----	-----	-----

**Manufacturer:****FUNCTIONAL DESCRIPTION:**

Radio Interference Measuring Set AN/URM-3 is a field and depot maintenance equipment used in detecting and measuring the intensity of radiated and conducted radio interference. Probes are provided for conducting exploratory interference tests; matching and coupling networks permit this equipment to be used as a two-terminal rf microvoltmeter.

This equipment consists basically of a superheterodyne receiver and a calibrated impulse noise generator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v  $\pm 10\%$ , 60 cy, 1 phase ac; 12 or 24 v dc

*Frequency Range:* .15 to .4 mc, 1.6 to 40 mc in six bands

*Voltage Range:* 10 to 31,600  $\mu\text{v}/\text{mc}$

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**RADIO INTERFERENCE MEASURING SET**  
**AN/URM-3**

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*Radio Noise Generator:**Pulse Duration:* 0.1  $\mu$ sec (approx)*Pulse Repetition Rate:* 10 to 1,000 pps*Pulse Amplitude:* 0 to 90 db above 1 $\mu$ v/mc or kc bandwidth*Spectrum:* Flat to 40 mc within  $\pm 3$  db*Major Units:* 1 AN/URM-3 24 1/2" x 12" x 14 1/2"

110 lbs

**TUBES, CRYSTALS, TRANSISTORS:***TUBE COMPLEMENT:*(2) OA2, (1) OA3, (2) OB2, (1) OC3, (1) 6AC7W, (1) 6H6, (1) 6J6, (2) 6SA7Y, (1) 6SG7Y, (2) 6SK7W,  
(1) 6SQ7, (1) 6V6GT, (1) 5696**REFERENCE DATA AND LITERATURE:**

TM 11-5084

MIL-T-10645 (SigC)

6 July 1955

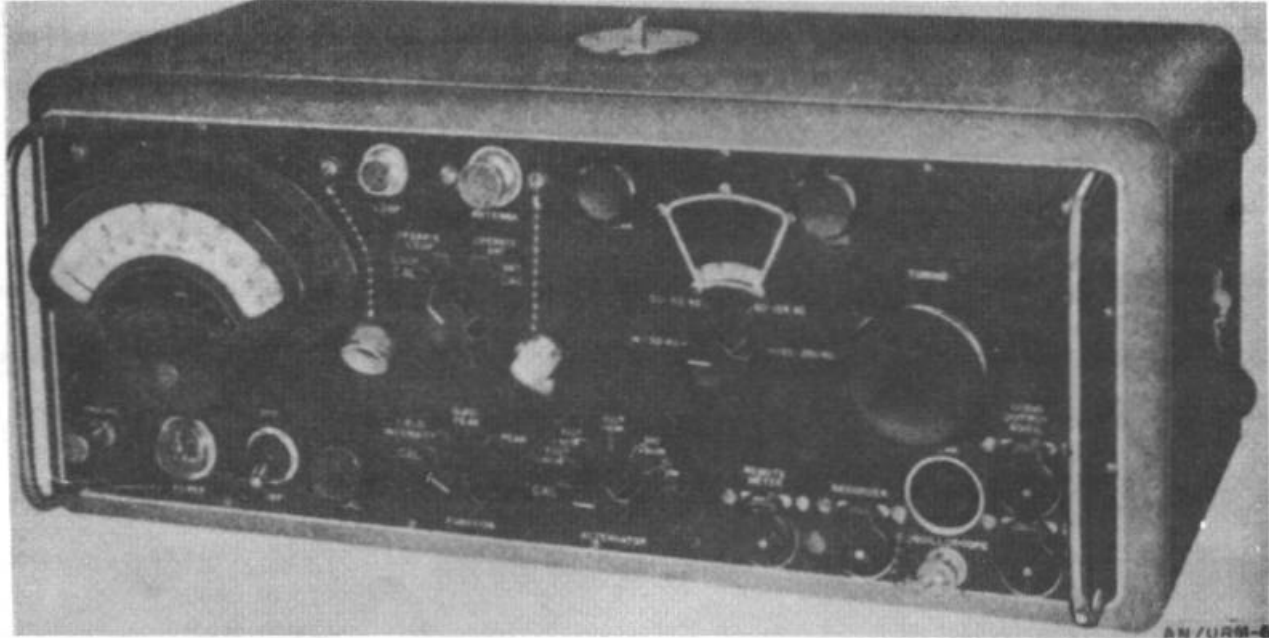
Cog Serv: USN FSN:

USA Line Item No: 657278

RADIO TEST SET AN/URM-6

Functional Class: 5.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	Std	Std	-----
Manufacturer:	Stoddart Aircraft Radio Company			

**FUNCTIONAL DESCRIPTION:**

Radio Test Set AN/URM-6 is a radio interference and field intensity meter used in radio signal or interference surveys, in determining the source of conducted or radiated signals, and in adjusting directive antennas or in the exploration of radiated fields. As a highly sensitive radio receiver, it operates as a selective rf voltmeter over a wide range of field intensity. It may be installed ashore, or aboard vessels, aircraft, or vehicles. Application is in field and depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Stoddart Model NM-10A.

Equipment required but not Supplied: Batteries: (1) BA-2, (6) BA-26, (2) BA-30, (1) NT-6VSBMD-175AH.

**TECHNICAL DESCRIPTION:***Power Requirements:*

AC: 100 w, 105 to 125 v or 210 to 250 v, 50 to 1,600 cy, 1 phase; 100 w, 115 v, 60 cy (milliammeter-recorder)

DC: 3 v (observer compass); 6 v, 4.1 amp (nl); 67.5 v, 8 ma (bias); 225 v, 55 ma (plate)

*Frequency Range:* 14 to 250 kc

*Intermediate Frequency:* 125 kc

*Attenuator Setting:* 0 db, 20 db, 40 db, 60 db, 80 db

*Audio Impedance:* 600 ohms (headset)

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**RADIO TEST SET**  
**AN/URM-6**


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*Field Intensity Range:* 1  $\mu\text{v}$ /meter to more than 1  $\mu\text{v}$ /meter, depending on ant. used

*IF Rejection:* 60 db or better

*Image Rejection:* - 50 db or better from sig level

*Receiver Meter Scale:* 0 to 100  $\mu\text{v}$ ; 0 to 40 db

*Voltage Range:* 1  $\mu\text{v}$  to 1  $\mu\text{v}$

*Selectivity:* 6 db down at 100 cy at lower rf; 6 db down at 600 cy at higher rf; 60 db down for 2,000 cy at any rf

*Sensitivity:* 1  $\mu\text{v}$  (as a vm); 1  $\mu\text{v}$ /meter (as a field intensity meter); 10  $\mu\text{v}$ /meter (w/short rod ant.)

*AF Sensitivity:* 10  $\mu\text{v}$  for 100 mw output

*Accuracy of Intensity Range:*  $\pm 10\%$  (10  $\mu\text{v}$  to 1 v)

*Major Units:*

1 CU-184/URM-6

1 CU-185/URM-6

1 CU-186/URM-6

1 Observer Compass Mark 1, Model 0 4 3/4" x 10 7/8" x 4 7/8"

4.75 lbs

1 Radio Interference Field Intensity Meter IM-36/URM-6 8" x 19 13/16" x 10 3/8"

26 lbs

1 Ammeter ME31/U

1 Milliammeter Recorder RD-59/U 13 1/4" x 8 9/16" x 8 3/4"

**TUBES, CRYSTALS, TRANSISTORS,**

*TUBE COMPLEMENT:*

(2) 0C3, (1) 5Y3GT, (1) 6AL5, (1) 6AT6, (6) 6AU6, (1) 6BE6, (3) 6C4, (1) 6E5, (1) 6J6, (1) 6X4, (1) NE2,  
 (1) NE32

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91196

MIL-T-16202 (Ships)

1 March 1964

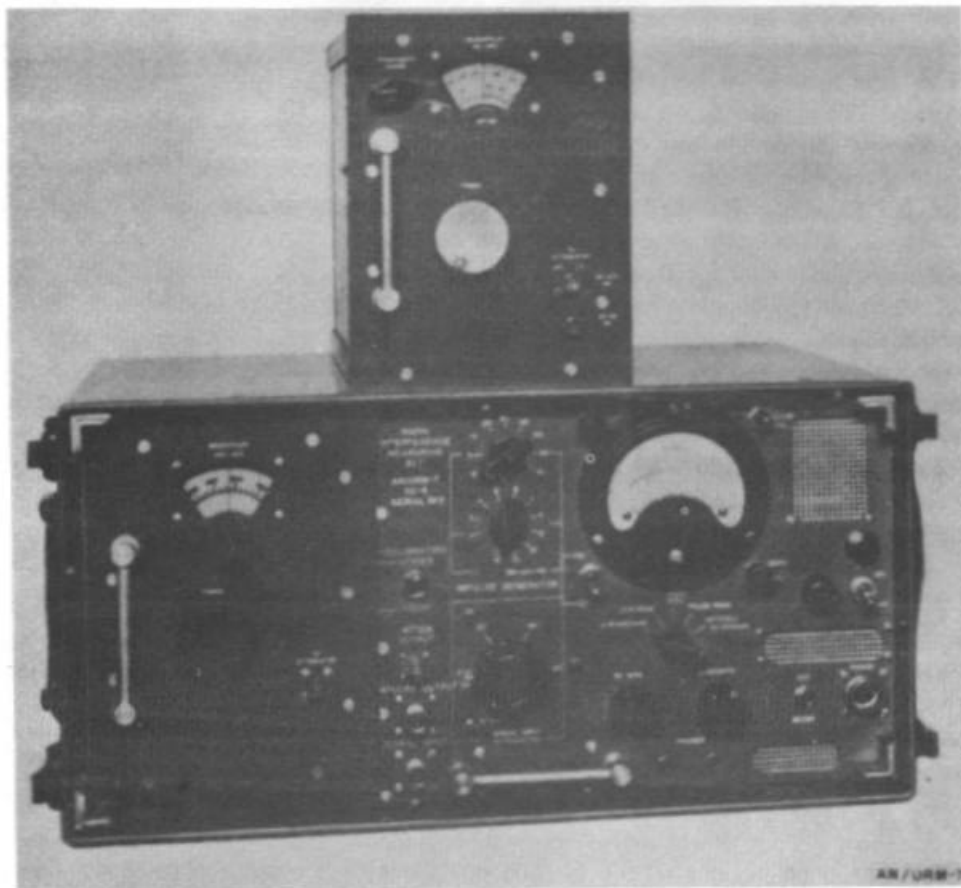
Cog Serv: USA FSN: 6625-774-6299

USA Line Item No: 634890

RADIO INTERFERENCE MEASURING SET AN/URM-7

Functional Class: 5.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer:	Empire devices, Inc.			

**FUNCTIONAL DESCRIPTION:**

A general purpose, field radio interference and field intensity meter designed primarily for the measurement of broadband interference although it incorporates facilities for cw interference and field intensity measurement. Test set incorporates an impulse generator used as a noise reference standard, whose output is calibrated in terms of microvolts per unit bandwidth. The visual output indicator is a peak reading vacuum tube voltmeter with a logarithmic scale calibrated in microvolts and a linear decibel scale calibrated in terms of decibels above one microvolt per megacycle. Probes are provided for conducting exploratory interference tests, and coupling networks are used to permit the test set to be used as a two-terminal noise-microvoltmeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

AN/URM-7 is similar to Empire Devices, Inc. Commercial Model NF-105.

## RADIO INTERFERENCE MEASURING SET AN/URM-7

### TECHNICAL DESCRIPTION:

*Circuit Information:* The impulse generator output is injected into the input circuit of the tuner in such a manner as to permit measurement of open circuited antenna terminal voltage on a permegacycle basis. The tuner utilizes a superheterodyne circuit. The frequency range is covered by means of two plug-in type rf heads. The logarithmic scale characteristic of the output indicator is achieved through tapered pole-pieces in the indicating meter movement, which eliminates the necessity of using automatic gain control. The dipole antenna, use for field intensity measurement applications, can be resonated at each test frequency. The broadband antenna is used in suppression test applications where the antenna must be placed close to the source of interference.

*Power Supply:* 115 v  $\pm$  10%, ac, single phase, 50 to 400 cy, 100-v<sub>a</sub> or 24 v, de; or 12 v, dc.

*Frequency Range:* 20 to 200 mc, 200 to 400 mc.

*Intermediate Frequency Range:* 10.7 me, 30 mc.

*Voltage Range:* 12  $\mu$ v per me, to 1,200,000  $\mu$ v per mc (for 20 to 200 me).

6  $\mu$ v per me to 5,000,000  $\mu$ v per me (for 200 to 400 me).

*Indicating Meter Scale:* 0.5 to 10  $\mu$ v.

-6 to +20 db (10 db scale expansion is provided for scale overlap).

*Calibration Standards:*

(a) Spot frequency sine wave generator.

(b) Broadband impulse noise generator (output externally available).

*Pulse duration:*  $5 \times 10^{-4}$   $\mu$ sec.

*Pulse Repetition Rate:* 2.5 to 2500 pps.

*Pulse Amplitude:* 47 to 97 db above one  $\mu$ v per mc band width.

*Spectrum:* Flat to 100 me within  $\pm 1/2$  db.

*Accuracy:*  $\pm 10\%$  voltage

*Major Units:* 1 AN/URM-7 9 1/2" x 18 3/4" x 14 5/8"

65 lbs

### TUBES, CRYSTALS, TRANSISTORS:

*TUBE COMPLEMENT:*

8 JAN-6BJ6, 4 JAN-12AT7, 3 JAN-12AU7, 5 JAN-6X4, 1 JAN-A2, 5 JAN-6AK5, 1 JAN-6AL5, 1 JAN-6AB4, 1 JAN-6J6, 1 JAN-4F4, 1 JAN-5876, 1 JAN-1N21B (xtal), 1 JAN-IN34 (xtal).

### REFERENCE DATA AND LITERATURE:

Spec. SCL-1170



14 March 1955

RF INDICATOR-PROBE ID-263/U

Cog Serv: USN FSN: 6625-500-4495

USA Line Item No:

Functional Class: 5.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Radio Frequency Laboratories, Inc			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose probe used to indicate the presence of rf fields of relatively large magnitude such as exist around transmitters. An extension rod which slips onto the tip of the probe is provided in order to reach into a deep chassis or into high voltage areas. When the extension rod is used, it normally increases the sensitivity of the unit.

**RELATIONSHIP TO SIMILAR EQUIPMENT:** None.**TECHNICAL DESCRIPTION:**

*Circuit Information:* When the unit is placed in an rf field, dielectric or capacity currents flow through the coupling capacitor. On the positive half cycle the capacity current flows through a germanium diode to the instrument' frame, and then through the operator's hand capacity to the operator, and back into the field. This prevents the coupling capacitors from assuming a dc charge. On the negative half cycle the current flows through a second diode and dc meter which indicates the magnitude of this current.

*Power Supply:* None.

*Frequency Range:* 100 kc to 400 mc.

*Sensitivity:* 25% full scale for one v/meter of rf field applied to tip of probe at 3.5 mc; 5 v/meter for 25% full scale at 30 mc with extension rod in rf field; 200 is full scale for meter.

*RF Signal:* 10 v max across xtal diode.

*Meter Range:* 0 to 100 (arbitrary scale); 10 scale divisions.

*Major Units:* 1 ID-263/U 8" x 3 1/2" x 1 3/4"

0.375 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

2 JAN-IN34 (xtal rectifier).

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91146 (Instruction Book for AN/USM-3).

Navy Spec. CS-838.

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 September 1954

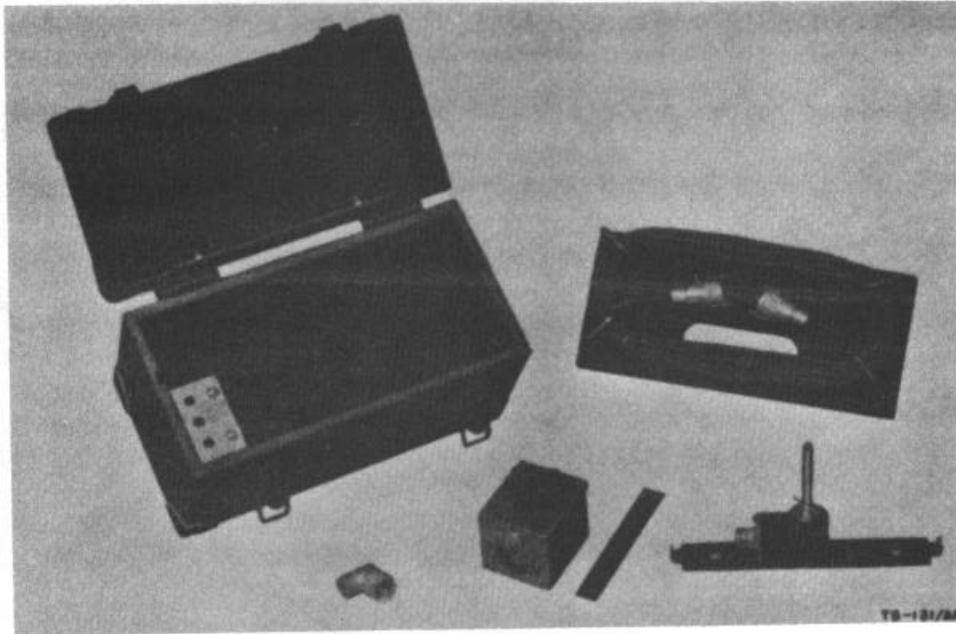
Cog Serv: USAF FSN: 6625-697-1464

USA Line Item No: 630203

PICK-UP ASSEMBLY TS-131/AP

Functional Class: 5.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Cover Dual Company			

**FUNCTIONAL DESCRIPTION:**

Pick-up Assembly TS-131/AP is a test unit used in indicating the relative output of an airborne transmitting antenna.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment required but not supplied:* (2) Test Set I-139-A

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 20 to 1,000 mc

*Major Units:* 1 TS-131/AP 6 1/2" x 1" x 4"

0.3 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

AN 08-35TS131-2

Spec 71-5051 (USAF)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

RADIO FREQUENCY INDICATOR TS-446/U

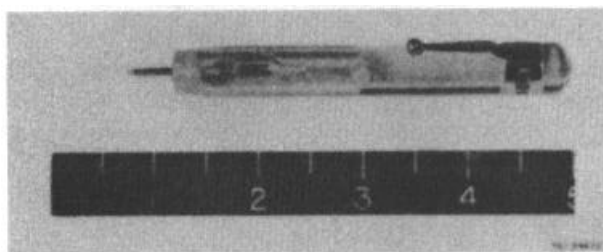
4 August 1954

Cog Serv: USAF FSN: 6625-569-0286

USA Line Item No: 634830

Functional Class: 5.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std A	-----
Manufacturer:	Bell Sound Systems, Inc			

**FUNCTIONAL DESCRIPTION:**

Radio Frequency Indicator TS-446/U is a pocket size, pencil-type test equipment used in determining stray rf fields of radio and radar transmitters and in providing high-voltage checks of power transformers.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set AN/MPM-2.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* .25 w (nom)

*Major Units* 1 TS-446/U 4 5/8" lg x 1/2" dia

1 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

USAF Dwg 45A40680, X45B40679

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

28 October 1954

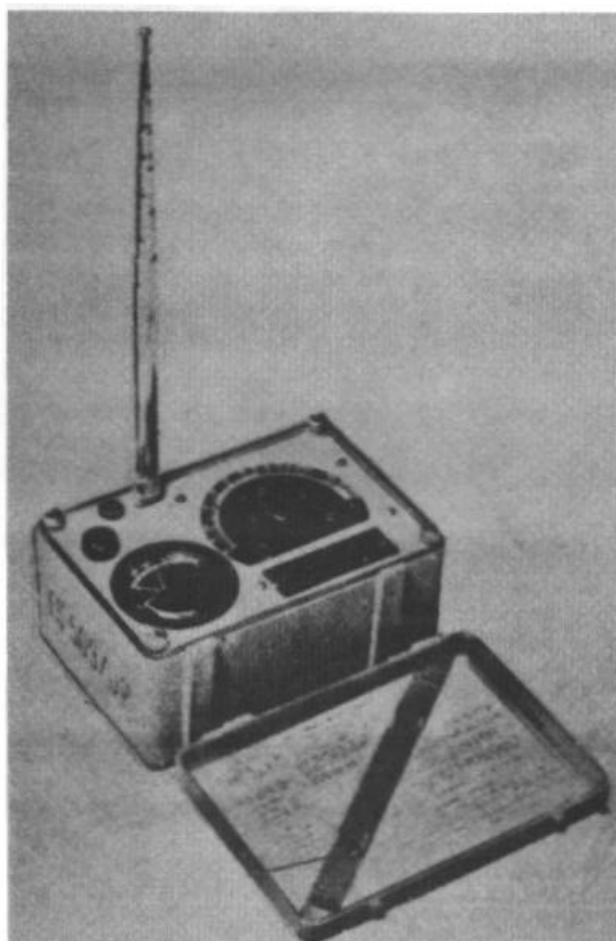
Cog Serv: USN FSN:

USA Line Item No: 615580

FIELD STRENGTH METER TS-509/UR

Functional Class: 5.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	A/Std	-----
Manufacturer:	Hoffman Radio Corp			

**FUNCTIONAL DESCRIPTION:**

Field Strength Meter TS-509/UR is a portable unit used in determining the relative field strength and approximate frequency of rf energy emitted by transmitters.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 100 to 400 mc

*Type of Reception:* CW

*RF Power Range:* 40 w

*Current Range:* 0 to 50  $\mu$ a

---

**FIELD STRENGTH METER TS-509/UR**

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*Distance Range:* 0 to 75 ft

*Accuracy:*  $\pm 5\%$

*Major Units:* 1 TS-509/UR 4 7/8" x 6" x 7 11/16"

8 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:* (1) 1N21B

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS509-3

BuAer Spec 16M21 (Aer); Dwg 91131008

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

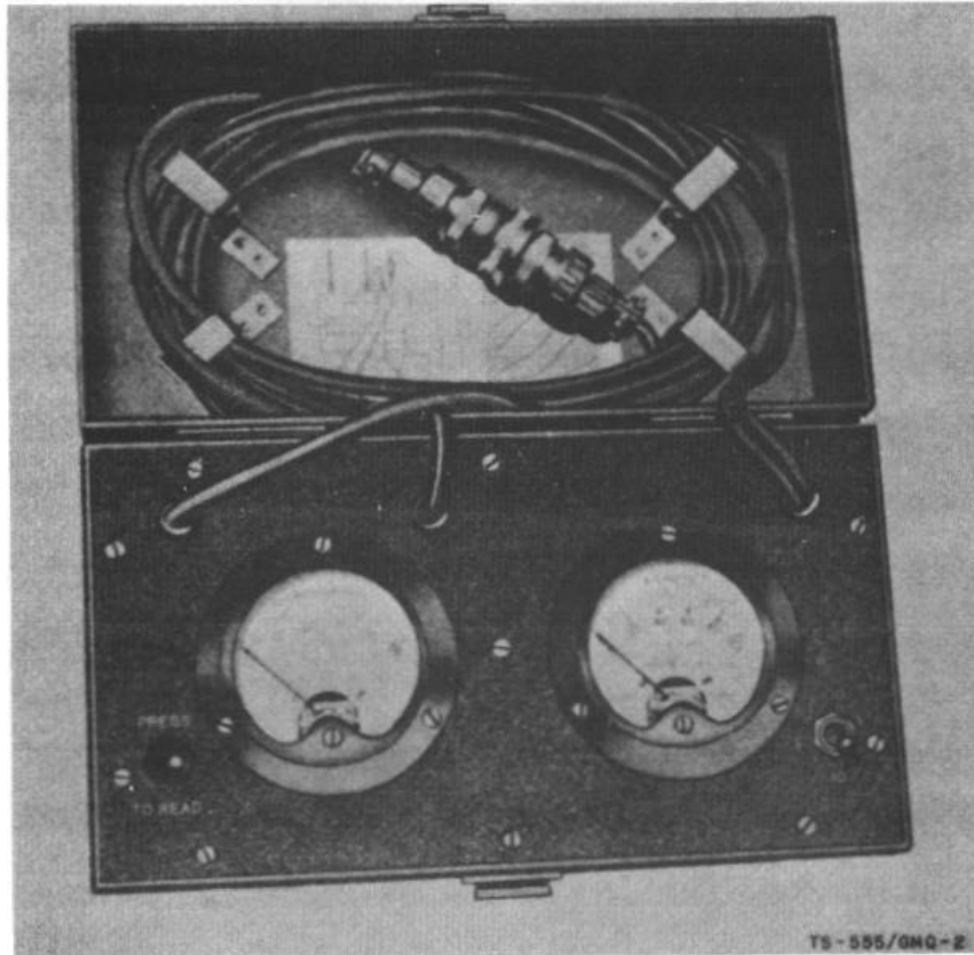
Cog Serv: USA FSN: 6625-498-3691

USA Line Item No: 609533

CEILOMETER TEST SET TS-555/GMQ-2

Functional Class: 5.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	General Electric Company			

**FUNCTIONAL DESCRIPTION:**

Ceilometer Test Set TS-555/GMQ-2 is a portable instrument used in measuring thermal noise originating in the preamplifier input circuit and shot-noise voltage generated by the included phototube. This equipment permits field checking of detector performance without signals from cloud reflections.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Voltage Range:* 0 to 10, 100 v ac

*Current Range:* 0 to 50  $\mu$ a dc

*Sensitivity:* 5,000 ohms/v

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

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**CEILOMETER TEST SET TS-555/GMQ-2**

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*Accuracy:*  $\pm 2.5\%$

*Major Units:* 1 TS-555/GMQ-2 6 5/8" x 11" x 6 3/8"

8 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

TM 11-2419 (TO 16-30GMQ2-5)

## CATEGORY 6

## IMPEDANCE AND STANDARD WAVE RATIO MEASURING EQUIPMENT

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C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

20 August 1954

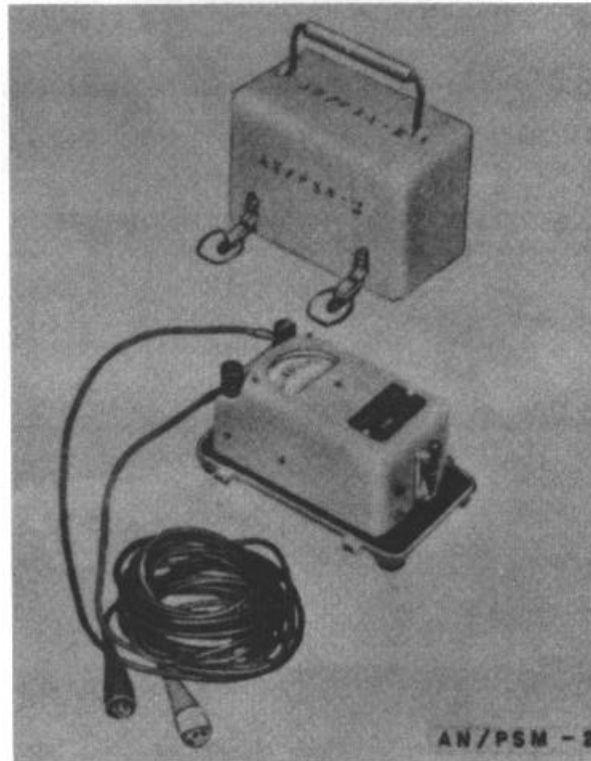
Cog Serv: USN FSN:

USA Line Item No: 621185

INSULATION TEST SET AN/PSM-2

Functional Class: 6.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	Holtzer-Cabot Division, National Pneumatic Co, Inc			

**FUNCTIONAL DESCRIPTION:**

Insulation Test Set AN/PSM-2 is a portable, self-powered high range ohmmeter for measuring insulation resistance. It incorporates a hand-cranked generator, a test voltage indicator, and a meter calibrated in megohms.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Insulation Test Set AN/PSM-1 and to Insulation Resistance Test Equipment OCW except for the resistance range.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* Hand-cranked ac generator

*Resistance Range:* 0 to 1,000 meg

*Testing Voltage:* 500 v dc

*Crank Speed:* 170 rmp (avg)

*Major Unit:* 1 ZM-14/PSM-2      3 21/32" x 7 1/4" x 4 5/8"

3.5 lbs

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**INSULATION TEST SET AN/PSM-2**

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**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(2) 5517

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91430

MIL-M-15023 (Ships)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

17 September 1954

Cog Serv: USAF FSN: 6625-536-9233

USA Line Item No:

TEST SET, RADAR AN/USM-6

Functional Class: 6.1.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Nassau Research and Development Associates, Inc			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, test-set used in measuring wavelength and in determining voltage or power standing wave ratio and impedance of waveguide systems and components of radar and radio sets in its frequency range. This set is used in depot testing. Indication is on a meter calibrated in voltage standing wave ratio, which is part of Standing Wave Indicator TS-12/AP

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This set is used with Standing Wave Indicator TS-12/AP, which is required but not supplied.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The slotted line is inserted between the signal source and the termination to be investigated.

A sample of the rf energy is extracted from the slotted section by the rf probe. This energy is detected by a crystal or bolometer and fed to a standing wave indicator which amplifies the detected signal and presents it on a meter calibrated in voltage standing wave ratio. By moving the probe in its carriage along the slotted line, the voltage standing wave ratio and the positions of maxima and minima may be obtained. With this information; wavelength and impedance of the termination may be calculated.

*Power Supply:* None required.

*Frequency Range:* 5850 to 8200 mc.

*Transmission Line:* 1.50" x 0.750".

*Major Units:* 1 AN/USM-6 9 3/4" x 5 1/2" x 6 1/2"

12 lbs.

1 Bolometer Polytechnic No. 610

**TUBES, CRYSTALS, TRANSISTORS,**

*TUBE COMPLEMENT:*

1 JAN-1N23.

**REFERENCE DATA AND LITERATURE:**

USAF Exhibit ENG-335

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

22 February 1955

Cog Serv: USAF FSN: 6625-534-7431

USA Line Item No:

TEST SET, RADAR

AN/USM-7

Functional Class: 6.1.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Wac Engineering Corporation			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, test set used in measuring wavelength and in determining voltage or power standing wave ratio and impedance of waveguide systems and components of radar and radio sets in its frequency range. This set is used in depot testing. Indication is on a meter calibrated in voltage standing wave ratio, which is part of Standing Wave Indicator TS-12/AP.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This set is used with Standing Wave Indicator TS-12/AP, which is required but not supplied.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The slotted line is inserted between the signal source and the termination to be investigated.

A sample of the rf energy is extracted from the slotted section by the rf probe. This energy is detected by a crystal or bolometer and fed to a standing wave indicator which amplifies the detected signal and presents it on a meter calibrated in voltage standing wave ratio. By moving the probe in its carriage along the slotted line, the voltage standing wave ratio and the positions of maxima and minima may be obtained. With this information, wavelength and impedance of the termination may be calculated.

*Power Supply:* None required.

*Frequency Range:* 7050 to 10,000 mc.

*Transmission Line:* 1.25" x 0.625".

*Major Units:* 1 AN/USM-7 9 1/2" x 5 1/2" x 6 1/2"

11 lbs

1 Bolometer Polytechnic No. 610

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

1 JAN-1N23.

**REFERENCE DATA AND LITERATURE:**

MIL-I-4103A, and USAF Spec 7540

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

17 September 1954

Cog Serv: USAF FSN: 6625-649-4523

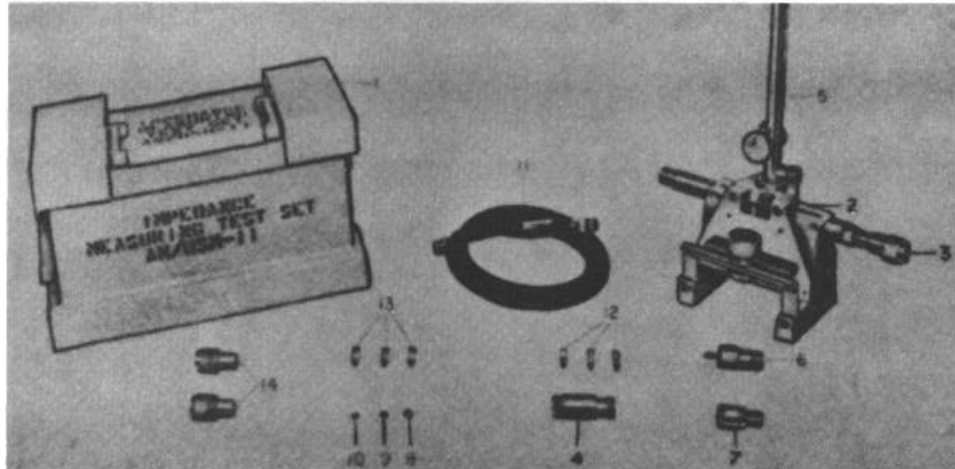
USA Line Item No:

TEST SET, RADAR

AN/USM-11

Functional Class: 6.1.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Polytechnic Research and Development Corporation			

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, test set used in measuring wavelength and in determining voltage or power standing wave ratio and impedance of waveguide systems and components of radar and radio sets in its frequency range. This set is used in depot testing. Indication is on a meter calibrated in voltage standing wave ratio, which is part of Standing Wave Indicator TS-12/AP.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This set is used with Standing Wave Indicator TS-12/AP which is required but not supplied.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The slotted line is inserted between the signal source and the termination to be investigated.

A sample of the rf energy is extracted from the slotted section by the rf probe. This energy is detected by a crystal or bolometer and fed to a standing wave indicator which amplifies the detected signal and presents it on a meter calibrated in voltage standing wave ratio. By moving the probe in its carriage along the slotted line, the voltage standing wave ratio and the positions of maxima and minima may be obtained. With this information, wavelength and impedance of the termination may be calculated.

*Power Supply:* None required.

*Frequency Range:* 3950 to 10,000 mc.

*Impedance:* 49.4 ohms.

*Transmission Line:* 3/8 inch coaxial.

*Vernier Scale:* 4.5 to 11.7 centimeters.

*Accuracy:*  $\pm 0.005$  centimeters.

*Major Units:* 1 AN/USM-11 8 1/2" x 4 1/2" x 5 3/4"

1 Bolometer Polytechnic No. 610

8 lbs

**TEST SET, RADAR  
AN/USM-11**

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**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

1 JAN-1N21B.

**REFERENCE DATA AND LITERATURE:**

USAF Exhibit ENG-336

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

17 September 1954  
 Cog Serv: USAF FSN:  
 USA Line Item No:

TEST SET, RADAR  
 AN/USM-14  
 Functional Class: 6.1.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Polytechnic Research and Development Corporation			

No Illustration Available

## FUNCTIONAL DESCRIPTION

A portable, general purpose, test set used in measuring wavelength and in determining voltage or power standing wave ratio and impedance of waveguide systems and components of radar and radio sets in its frequency range. This set is used in depot testing. Indication is on a meter calibrated in voltage standing wave ratio, which is part of Standing Wave Indicator TS-12/AP.

## RELATIONSHIP TO SIMILAR EQUIPMENT:

This set is used with Standing Wave Indicator TS-12/AP, which is required but not supplied.

## TECHNICAL DESCRIPTION:

*Circuit Information:* The slotted line is inserted between the signal source and the termination to be investigated.

A sample of the rf energy is extracted from the slotted section by the rf probe. This energy is detected by a crystal or bolometer and fed to a standing wave indicator which amplifies the detected signal and presents it on a meter calibrated in voltage standing wave ratio. By moving the probe in its carriage along the slotted line, the voltage standing wave ratio and the positions of maxima and minima may be obtained. With this information, wavelength and impedance of the termination may be calculated.

*Power Supply:* None required.

*frequency Range:* 8200 to 12,400 mc.

*Transmission Line:* 1.00" x 0.500".

*Major Units:* 1 AN/USM-14 9 1/2" x 6 1/2" x 8 1/4"

1 Bolometer Polytechnic No. 610

17 lbs

## TUBES, CRYSTALS, TRANSISTORS

*TUBE COMPLEMENT:*

1 Jan-1N23

## REFERENCE DATA AND LITERATURE,

USAF Exhibit ENG-337

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

12 November 1954

Cog Serv: USAF FSN: 6625-669-2360

USA Line Item No: 628758

OHMMETER

AN/USM-21

Functional Class: 6.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Industrial Instruments, Inc			

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable, precision, general purpose, ohmmeter capable of measuring low resistances directly by means of a meter indication calibrated in ohms. This ohmmeter is used in field and depot maintenance of radio, radar, and other electrical and electronic equipment. It is particularly useful in measuring resistances of relay and switch contacts, antenna connections, and electrical bonding.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

The measurement function of this ohmmeter is similar to that of the lower ranges of the Test Set I-49, except that: (a) the current required through the resistance under test is approximately 5% of that required for proper operation of the Test Set I-49; (b) this ohmmeter is more rugged than Test Set I-49; and (c) this ohmmeter has better accuracy at extremes of temperature, and is more simple to operate than the Test Set I49.

**TECHNICAL DESCRIPTION:**

Circuit Information: The basic principle of the ohmmeter circuit is that of a constant current generator in series with the resistance under test, and a sensitive voltmeter (calibrated in ohms) indicating the voltage drop across the resistance under test. Since the current is a known constant, the resistance under test is directly proportional to the voltage developed across it. Overload protection is provided.

*Power Supply:* 1.5 v, supplied by one battery, BA-30 (1.5 v).

*Resistance Range:* 0 to 0.1, 1.0, 10 ohms. Min readable value is 0.001 ohms.

*Maximum Allowable Current:* 100 ma (0 to 0.1, 1.0 ohm ranges); 50 ma (0 to 10 ohm range).

*Accuracy:*  $\pm 1\%$  of indicated resistance over operational temp range.

*Temperature Range:* -40°C. to +55°C., operational.

*Major Unit:* 1 Ohmmeter ZM-12/USM-21 8 3/8" x 7 1/2" x 5 3/4"

11 lbs

**TUBES, CRYSTALS, TRANSISTORS**

None.

**REFERENCE DATA AND LITERATURE:**

USAF Exhibit MCREE-720



4 April 1956

Cog Serv: USAF FSN: 6625-814-8357

USA Line Item No: 621158

STANDING WAVE INDICATOR

AN/USM-37

Functional Class: 6.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Hewlett-Packard Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable, general purpose equipment used for measuring standing wave ratio and impedance or impedance match of transmission systems, various types of terminations such as antennas and loads, and other high frequency devices such as connectors.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Hewlett-Packard Model 415A Standing Wave Indicator.

**TECHNICAL DESCRIPTION:**

**Circuit Information:** The Standing Wave Indicator IM-97/USM-37 is a high gain, selective amplifier which has an indicating meter as its output. The amplifier is tuned to 1,000 cps so that the signal source with which it is used must be amplitude modulated. with 1,000 cps. The indicating meter, calibrated in swr and db, is an average reading type operating in a fullwave rectifier circuit. The linear voltmeter is calibrated for square law readings because of the square law characteristics of crystals and bolometers. The waveguide probe houses a 1N25 Crystal which is a square law detector element. The probe penetration is adjustable.

**Power Supply:** 115 v, ac, 50 to 60 cps, single-phase.

**Frequency Range:**

**Standing Wave Indicator:** 1,000 cps  $\pm 2\%$ .

**Waveguide Section:** 7050 to 12400 mc.

**Coaxial Section:** 3000 to 12000 mc.

**Selectivity:** Equivalent overall Q of unit is  $20 \pm 5$ ; therefore, at 70% points, bandwidth is of the order of 50 cps wide (1000 cps unit).

**Sensitivity:** 0.3  $\mu$ v min to 0.3 v max gives full scale deflection.

**Equivalent Noise Level (referred to input):** 0.04  $\mu$ v max.

**Calibration:** For use with a square law detector: 0 to 60 db covered in 6 ranges; Accuracy +0.1 db per 10 db step.

**Gain Control:** Adjusts meter to convenient level; range is approx 30 db.

**Input:** Connects to crystal rectifier or bolometer. dc bias of 8 v  $\pm 0.5$  v delivers approx 0.75 ma to a 200-ohm bolometer or 1/100-amp instrument fuse.

**Meter Accuracy:**  $\pm 0.1$  db at "2" db

$\pm 0.2$  db at "4" db

**Standing Wave Ratio Decibel Range Switch Accuracy:**  $\pm 0.1$  db per any single step; +2 db accumulative.

**Probe Carriage:** Probe travel calibrated 10 cm; can be read to 0.1 millimeter.

**Major Unite:** 1 IM-97/USM-37 9" x 12" x 9"

17 lbs

**STANDING WAVE INDIATOR**  
**AN/USM-37**

---

**TUBES, CRYSTALS, TRANSISTORS**

*TUBE COMPLEMENT:*

2 JAN-SN7GT, 1 JAN-36SL7GT, 1 JAN-5Y3GT, 1 JAN-6V6, 1 JAN-6SQ7GT, 1 JAN-OD3/VR150.

**REFERENCE DATA AND LITERATURE**

NAVSHIPS 92036 (Instruction Book).

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN: 6625-240-4611

USA Line Item No: 684070

TEST SET, OHMMETER

1-48-B

Functional Class: 6.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer:	Interstate Manufacturing Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, self-contained and self-powered megger or high-range ohmmeter of special design used for checking insulation resistance of cables between conductors of multiple cables, between windings and windings to ground in transformers or rotating equipment, etc.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Biddle No. 7679.

Similar to I-48 except for resistance range.

Similar to I-48-A except that I-48-A is equipped with a 1 to 10 ratio switch.

**TECHNICAL DESCRIPTION**

*Power Supply:* Operates from built-in hand generator, 500 v constant pressure type.

*Range:* 0 to 1000 meg.

*Major Unit:* I-48-B      6" x 7 3/4" x 7 3/4"

10.7 lbs

**TUBES, CRYSTALS, TRANSISTORS,**

*TUBE COMPLEMENT:*

None.

**REFERENCE DATA AND LITERATURE:**

TO 16-0148-5

Spec. No. 71-3256, Dwg. No. 1058

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN: 6625-151-7800

USA Line Item No: 684090

TEST SET, TELEPHONE

I-49

Functional Class: 6.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Leeds and Northrup Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose Wheatstone Bridge designed for locating faults in communication circuits. Faults which may be identified and located are opens, short circuits, crosses, and grounds; faults which may be identified and measured are resistance unbalance and low insulation resistance. Null is indicated on a self-contained galvanometer. Binding posts are provided for external batteries and an external galvanometer.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Leeds and Northrup 5430A Type U Test Set.

**TECHNICAL DESCRIPTION:****Power Supply:**

*Internal:* 4.5 v, dc, supplied by three 1.5 v Batteries BA-30.

*External:* Up to 200 v, dc. However, when an external voltage exceeding 45 v is used an external resistance of 10 ohms for each volt must be placed in series with the test set and the voltage source.

*Resistance Range:* 0 to 10 meg.

*Rheostat Decades:* 0 to 10, 110 ohms in steps of 1 ohm and a position for infinity setting.

*Ratio Dial Multiplying Values for Resistance Measurements and Varley Loop Tests:* 1/1000, 1/100, 1/10, 1/9, 1/4, 1, 10/1, and 100/1.

*Ratios for Murray Loop Tests:* M1000, M100, M10.

*Current Rating of Rheostat Arm (Determined by Highest Decade in Use):*

1 ohm decade: 0.7 amp.

10 ohm decade: 0.2 amp.

100 ohm decade: 0.07 amp.

1000 ohm decade: 0.02 amp.

*Galvanometer Sensitivity:* 1.0 pea per scale division.

*Galvanometer Coil Resistance:* 250 ohms

*Accuracy of Ratio Resistors:*  $\pm 0.05\%$

*Accuracy of Rheostat Resistors:*  $\pm 0.1\%$

*Major Unit:* 1 I-49      5 3/4" x 8 7/8" x 7 3/8"

8 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

None.

**REFERENCE DATA AND LITERATURE:**

TM 11-2019

Army Spec. 71-110

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN: 6625-356-3027

USA Line Item No: 684458

TEST SET

I-148-A

Functional Class: 6.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Espey Manufacturing Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Test Set I-148-A is a portable test instrument used in measuring the standing wave ratio of the rf voltage along a nonresonant transmission line.

It may also be employed in checking the balance to ground of a parallel, two wire, open, nonresonant transmission line.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Equipment RC-70-A.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 100 to 120 me

*Current Range:* 0 to 250 ma

*Accuracy:*  $\pm 10\%$

*Major Unit:* 1 I-148A 11" x 5" x 3"

3 lbs

**TUBES, CRYSTALS, TRANSISTORS**

*TUBE COMPLEMENT:*

None.

**REFERENCE DATA AND LITERATURE:**

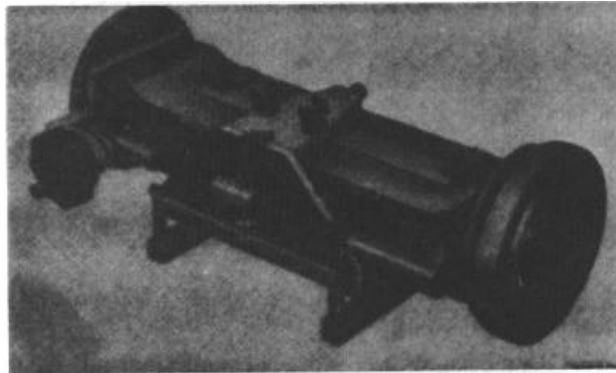
TM 11-1043, TO 16-40RC70-2; Army Dwg ES-D-11133

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 September 1954  
 Cog Serv: USAF FSN:  
 USA Line Item No: 665865

SLOTTED LINE  
 IM-23/U  
 Functional Class: 6.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Nichols Products Company and Polytechnic Research Development Corp			

**FUNCTIONAL DESCRIPTION:**

Slotted Line IM-23/U is portable equipment used in investigating the field distribution along transmission lines and waveguides. Application is in organizational, field, and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment Required but not Supplied:* One indicator

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 2,600 to 3,950 mc

*Major Unit:* 1 IM-23/U 16" x 7 1/2" x 5"

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

None

**REFERENCE DATA AND LITERATURE:**

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

20 August 1954

Cog Serv: USAF FSN:

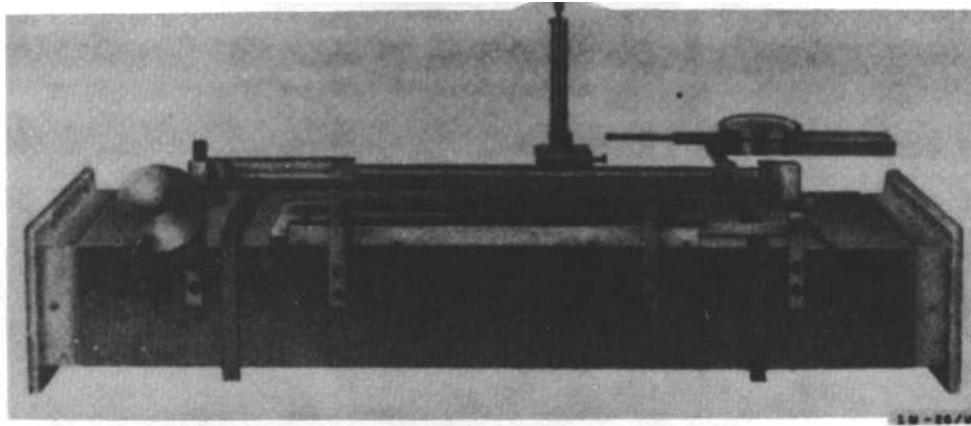
USA Line Item No:

SLOTTED LINE

IM-28/U

Functional Class: 6.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Gorham Company and Nichols Produce Company			

**FUNCTIONAL DESCRIPTION:**

Slotted Line IM-28/U is a portable unit used in investigating the field distribution along transmission lines and waveguides. Application is in organizational, field, and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment Required but not Supplied:* (1) Test Probe MX-831/U; (1) bolometer-type indicator

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 1,120 to 1,700 mc

*Major Unit:* 1 IM-28/U 30" x 9" x 7"

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

None

**REFERENCE DATA AND LITERATURE:**

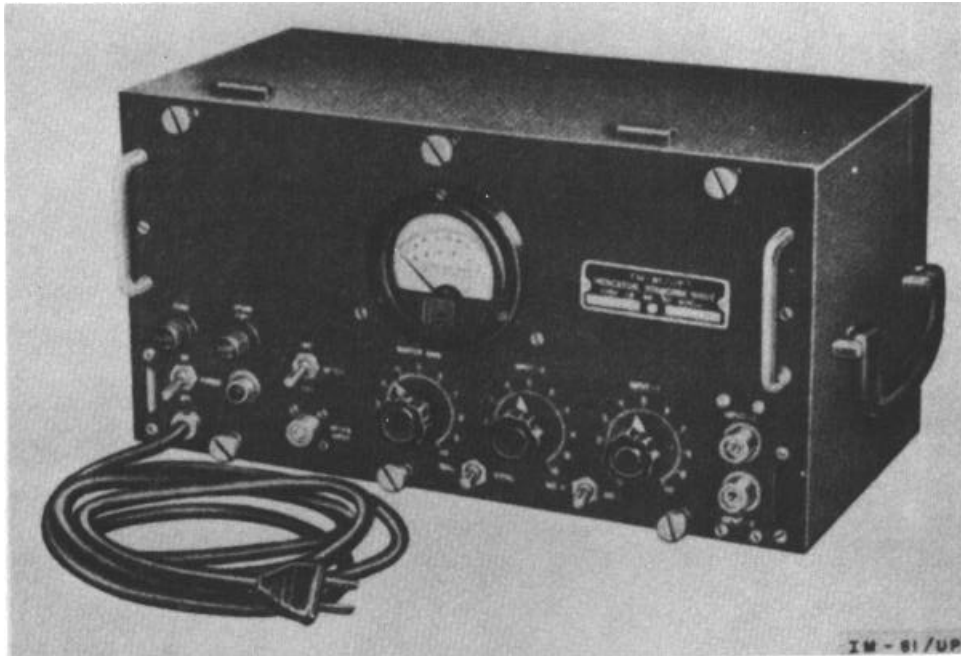
AN 1635IM28-2; AN 1635IM284; USAF Spec 7526; Dwg 48D5545

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 September 1954  
 Cog Serv: USN FSN:  
 USA Line Item No:

STANDING WAVE INDICATOR  
 IM-81/UP  
 Functional Class: 6.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	Trad Television Company			



#### FUNCTIONAL DESCRIPTION:

Standing Wave Indicator TM-81/UP measures the standing wave ratio within a waveguide system used with a source of pulsed rf power.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

None

*Equipment Required* but not Supplied: One signal generator; one slotted line with traveling probe.

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 35 w, 115 v, 50 to 800 cy ac

*Input Impedance:* 250 ohms

*Frequency Response:* 500 to 2,000 cy, linear within 3 db

*Sensitivity:* 15  $\mu$ v full-scale meter reading for freq range of 500 to 2,000 cy; 20  $\mu$ v full scale at 400 and 4,000 cy

*Standing Wave Indication:* 1:1 to 4:1; a linear scale on the meter reading from 0 to 10

*Major Units:* 1 IM-81/UP 8 7/8" x 16 9/16" x 8 11/16"

36 lbs



**STANDING WAVE INDICATOR**  
**IM-81/UP**

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**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(1) 6H6, (2) 6SJ7, (1) 6V6, (1) 6X5GT

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91722

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

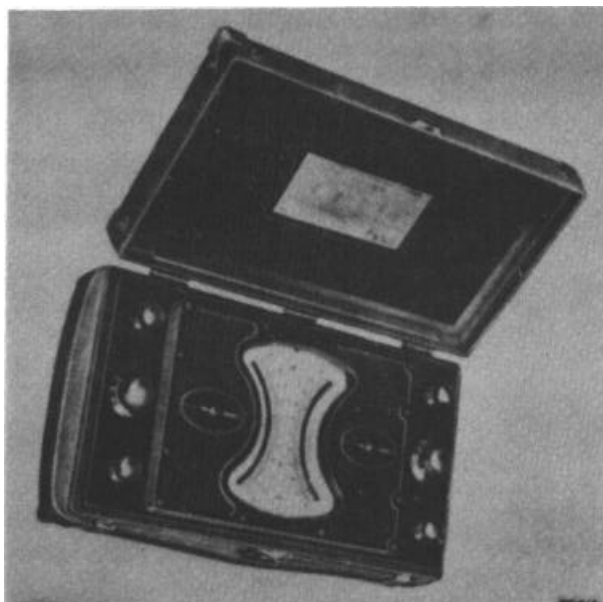
MULTIMETER

ME-8/G

Functional Class: 6.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION,**

Multimeter ME8/G is a portable instrument used in tracing causes of electrolysis in cables.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Weston Model 56.

**TECHNICAL DESCRIPTION:**

*Range:* 0 to 5, 10, 50, 100 mv (0 centered); 0 to 5, 10, 50, 250 v (0 centered)

*Sensitivity:*

*Millivolt:* 300 ohms/v

*Volts:* 1,000 ohms/v

*Accuracy:* 0.5%

*Major Units:* 1 ME8/G      13 1/8" x 7 5/16" x 4 9/16"      10.5 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

*TUBE COMPLEMENT:*

None.

**REFERENCE DATA AND LITERATURE:**

TM 11-2262

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**STANDING WAVE INDICATOR  
TS-12/AP**

23 November 1954

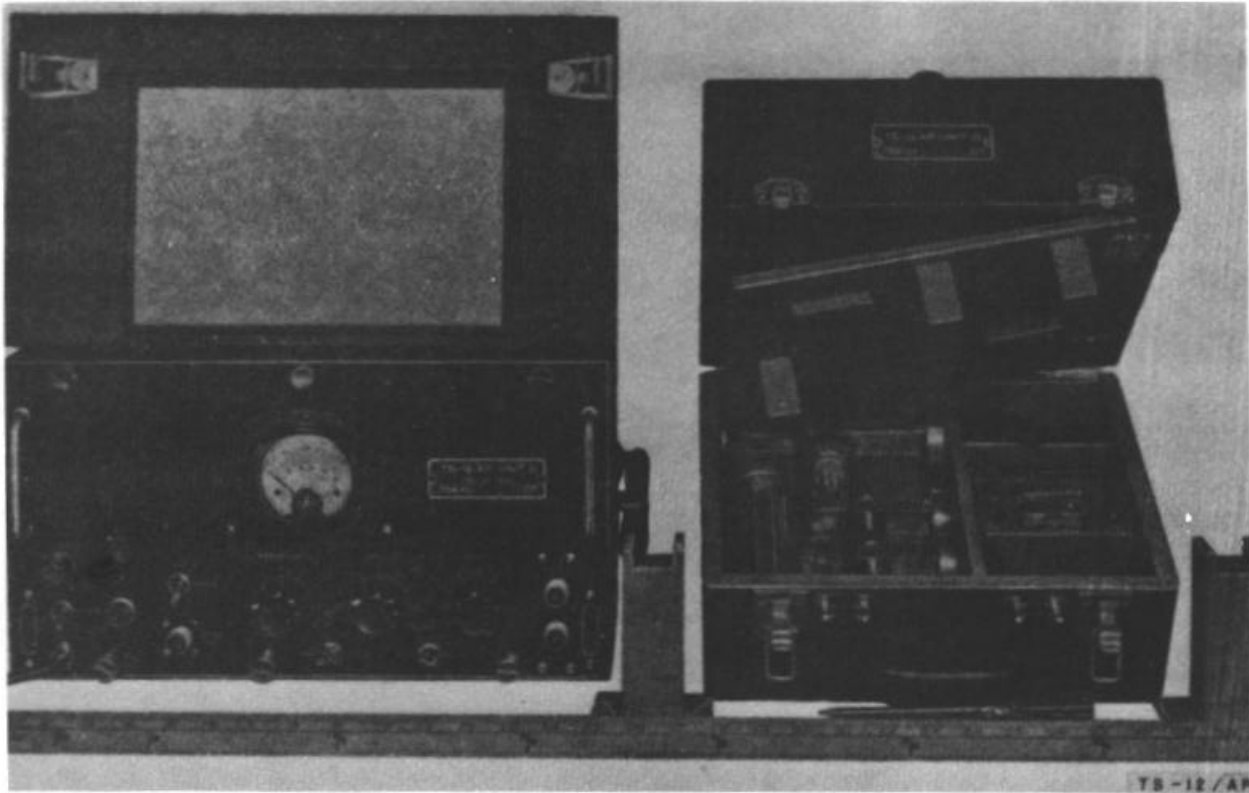
Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 6 2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std(Minor)	Std	-----

Manufacturer: Electro Impulse Laboratory and Presto Recording Corporation

**FUNCTIONAL DESCRIPTION:**

Standing Wave Indicator TS-12/AP is a portable unit used in measuring the standing wave ratio of radar plumbing, TR and RT boxes, crystal mixers, and antennas. In conjunction with a source of pulsed rf power, it may be applied in bench testing of radar sets

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 35 w, 115 v, 60 to 800 cy, 1 phase ac

*Frequency Range:* 9,305 to 9,445 mc

*Pulse Rate Frequency:* 400 to 3,500 cy

*Sensitivity:* 15 Rev (min)

*Temperature Range:* 0° F to + 120° F

*Accuracy:* ±3%

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**STANDING WAVE INDICATOR**  
**TS-12/AP**

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*Major Units:*

1 TS-12/AP	60 lbs
1 CG-87/U	1.3 lbs
1 CG-88/U	.5 lb
1 MX-158/U	.56 lb
1 Amplifier unit 9" x 16 5/8" x 8 5/8"	26 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

(1) 1N21, (1) 6H6, (2) 6SJ7, (1) 6V6GT, (1) 6X5GT

**REFERENCE DATA AND LITERATURE**

1 March 1964

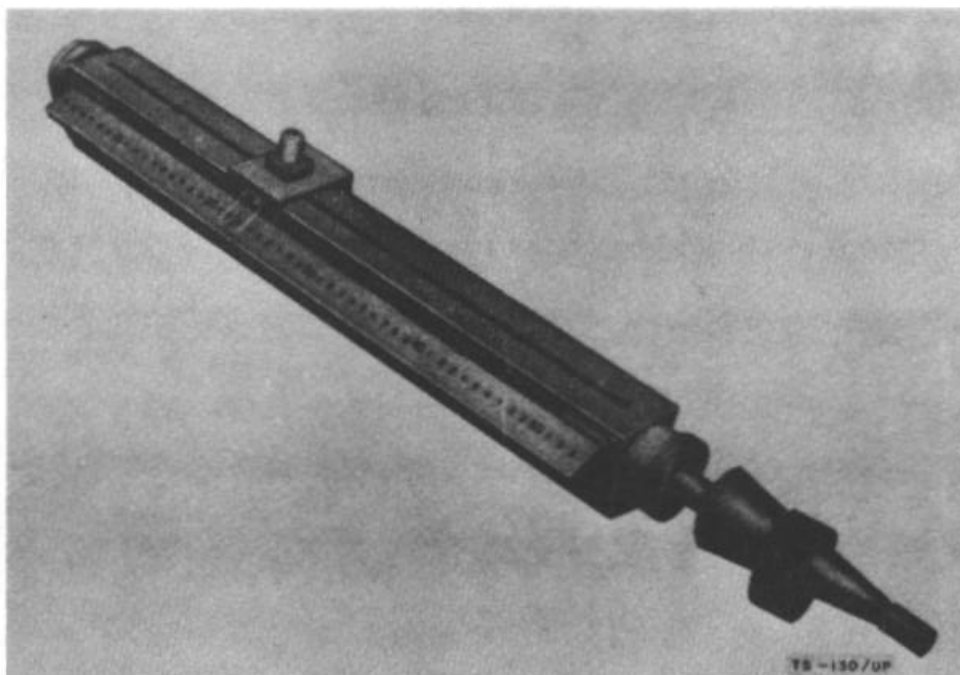
Cog Slav: USA FSN: 6625-532-4181

USA Line Item No:

**STANDING WAVE METER  
TS-1 30A/UP**

Functional Class: 6.2.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Central Research Laboratories, Inc.			

**FUNCTIONAL DESCRIPTION:**

Standing Wave Meter TS-130A/UP is a portable instrument used in measuring the standing wave ratio of radar systems employing 1 5/8-inch coaxial rf lines.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are similar.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 400 to 3,000 mc

*Voltage Standing Wave Ratio:* 1.1

*Impedance:* 53.5 ohms

*Major Units:* 1 TS130A/UP including:

1 IM-34/U

3" x 2 1/2" x 29"

12 lbs

1 MX-1019/U

8" x 2 3/4" x 1 3/8"

.5 lb

1 MX-1020/U

10" x 3" x 1 1/2"

1.5 lbs

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**STANDING WAVE METER**  
**TS-130A/UP**

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**1 UG-539/U****7" x 2 1/2" dia****2.25 lbs****1 Transmission line calculator****TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) IN21B

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS130-12, AN 16-35TS130-14

USAF Exhibit WLENG-219; Spec MIL-S-4169

# IMPEDANCE BRIDGE TS-460C/U

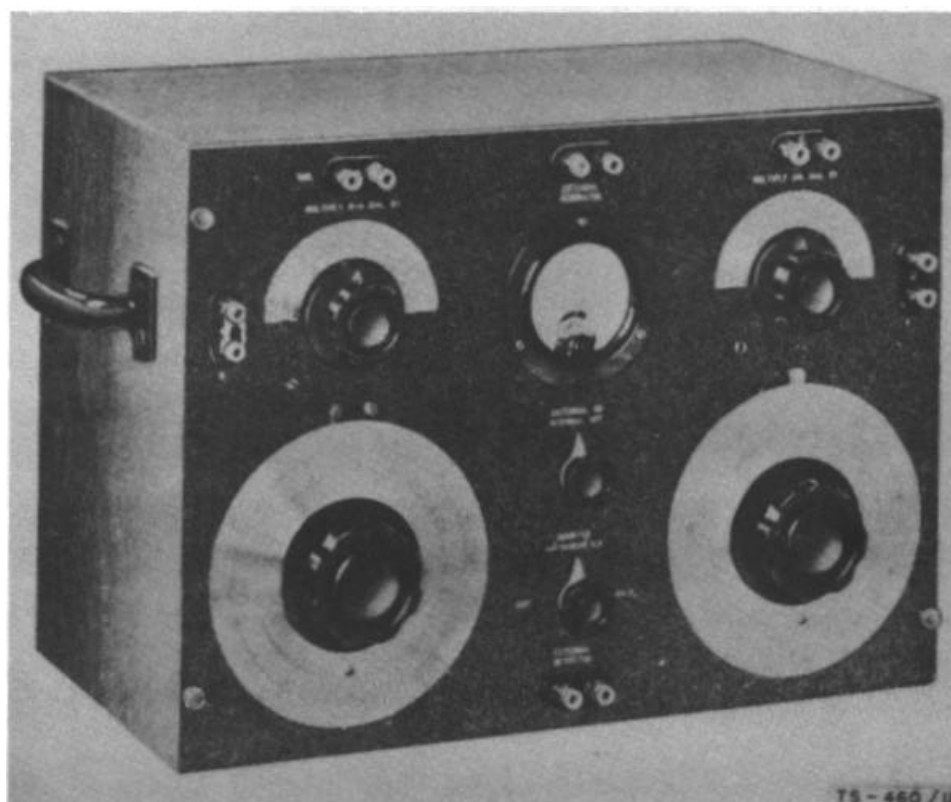
1 March 1964

Cog Serv: USA FSN: 6625-545-7943

USA Line Item No: 621091

Functional Class: 6.1.4.5

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std B	Std	L/Std	-----
<b>Manufacturer:</b>	Brown Electro-Measurements Corporation			



## FUNCTIONAL DESCRIPTION:

Impedance Bridge TS-460C/U is a portable test instrument used in measuring the inductance and storage factor of coils, the capacitance and dissipation factor of capacitors, and the ac and dc resistance of all types of resistors. The unit may be connected to an external signal generator for extending its frequency range.

## RELATION TO SIMILAR EQUIPMENT:

This equipment is similar to Universal Impedance Bridge, Brown Electro-Measurement Corporation Model 250-B.  
Equipment Required But Not Supplied: Battery: (4) BA-30

## TECHNICAL DESCRIPTION:

*Power Requirements:* 6 v dc

*Frequency Range:* To 10 kc

*Internal Signal Source:* 1 kc

*Range:*

Capacitance: 1  $\mu$ f to 1,100  $\mu$ f  $\pm$ 2%

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**IMPEDANCE BRIDGE**  
**TS-460C/U**

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Dissipation Factor: .001 to 1.05  $\pm 7\%$

Inductance: 1  $\mu\text{h}$  to 1,100 h  $\pm 1\%$  to  $\pm 10\%$

Resistance: 1 milliohm to 11 meg  $\pm .35\%$

Storage Factor: .02 to 1,000  $\pm 7\%$

Major Units: 1 TS-460C/U 8 3/4" x 10 1/2" x 10 1/2"

15 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE**

TM 11-2646



1 March 1964

Cog Serv: USA FSN: 6625-257-0298

USA Line Item No: 628290

**MULTIMETER****TS-506A/U****Functional Class: 6.1.4.5**

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std C	Std	-----	-----

**Manufacturer: Solar Manufacturing Corporation****FUNCTIONAL DESCRIPTION:**

Multimeter TS-506A/U is a test instrument used in measuring capacitance, resistance, opens, shorts, intermittents, power factors of capacitors, and insulation resistance.

**RELATION TO SIMILAR EQUIPMENT:**

None

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**MULTIMETER**  
**TS-506A/U**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 v, 50 to 50 cy ac

*Capacitance Range:* 10 serf to 800  $\mu$ f

*Power Factor Range:* 0 to 50%

*Resistance Range:* 50 ohms to 2 meg

*Major Units:* 1 TS506A/U 9 3/4 x 8 1/4" x 6 7/8"

8 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) IV, (1) 6E5, (1) 80

**REFERENCE DATA AND LITERATURE:**

TM 11-2658

**Q METER  
TS-617A/U**

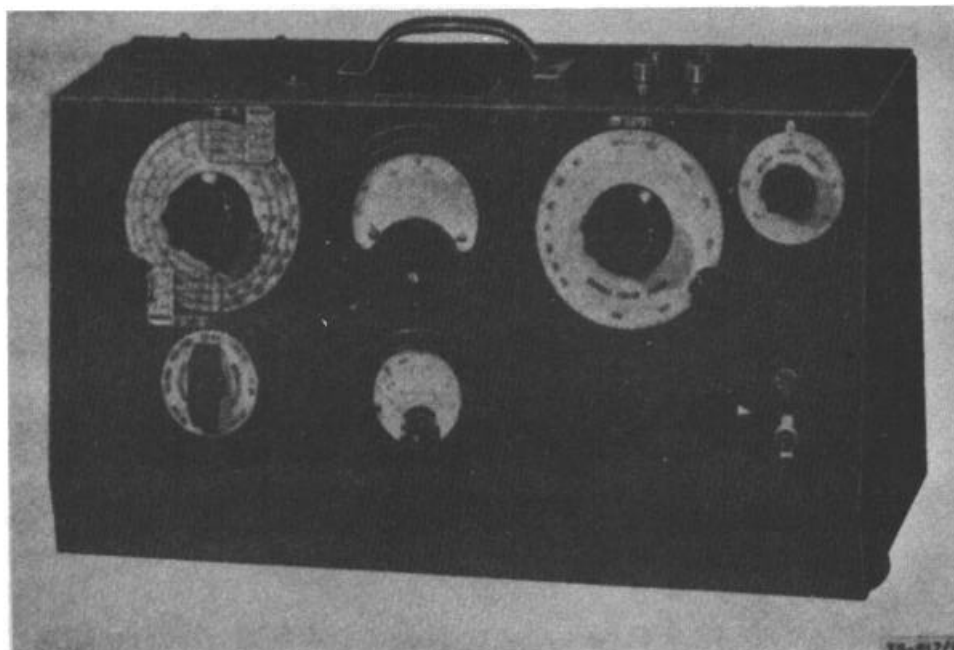
1 March 1964

Cog Slav: USA FSN: 6625-538-9702

USA Line Item No: 6625-538-9702

Functional Class:

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----

**Manufacturer:** Boonton Radio Corporation**FUNCTIONAL DESCRIPTION:**

Q Meter TS-617A/U is a portable instrument used in measuring the ratio of reactance to resistance of coils, capacitors, or other circuit elements having two accessible terminals. The unit consists of an rf oscillator, a vacuum-tube voltmeter, and applicable capacitors.

**RELATION TO SIMILAR EQUIPMENT:**

Similar to Boonton Radio Corporation Q-Meter type 160-A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 50 w, 115 or 230 v  $\pm$  10%, 50 to 60 cy ac

*Frequency Range:* 50 kc to 75 mc  $\pm$ 3% in eight bands

*Voltmeter Range:* 20 to 250 v

*Capacitance Range:* 30 to 450  $\mu$ f  $\pm$  1 %

*Q Meter Range:* 20 to 625  $\pm$ 5%

*Major Units:* 1 TS-617A/U      20 1/4" x 11" x 8"

25 lbs

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**Q METER**  
**TS617A/U**

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**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) 5W4GT, (1) 1659, (1) BRC-102-A

**REFERENCE DATA AND LITERATURE:**

TM 11-2635

MIL-M-10194

**ANALYZER  
ZM-3/U**

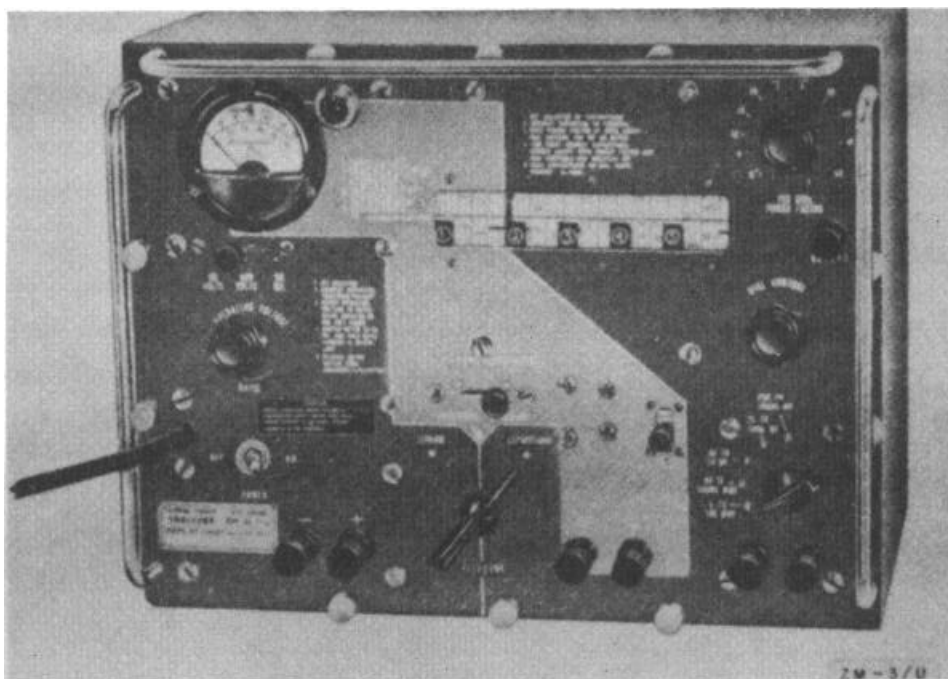
1 March 1964

Cog Serv: USA FSN: 6625-229-1060

USA Line Item No:

Functional Class: 6.1.4.5

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----

**Manufacturer:** Shallcross Manufacturing-Company**FUNCTIONAL DESCRIPTION:**

Analyzer ZM-3/U is a portable test instrument used in measuring leakage current and capacitance of electrolytic capacitors, as well as insulation resistance, capacitance, and power factor of other types of capacitors. The analyzer may also be employed in checking insulation and capacitance of cables.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes Analyzer TS-415B/U.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 105 to 125 v, 210 to 250 v, 1,600 cy ac

*Capacitance Range:* 5 uf to 10,000  $\mu$ f

*Insulation Resistance Range:* 1.1 to 100 meg, 110 to 10,000 meg

*Major Units:* 1 ZM-3/U 10 3/8" x 13 7/8" x 8 5/8"

34.75 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**TUBE COMPLEMENT:**

(1) OA2, (2) OB2, (1) 6BA6, (1) 6C4, (1) 6SL7GT, (1) 6X4, (1) 12AU7, (1) 807

**REFERENCE DATA AND LITERATURE:**

TM 11-5043, TO 16-35ZM3-5

MIL-T-12636

**RESISTANCE BRIDGE  
ZM-4/U**

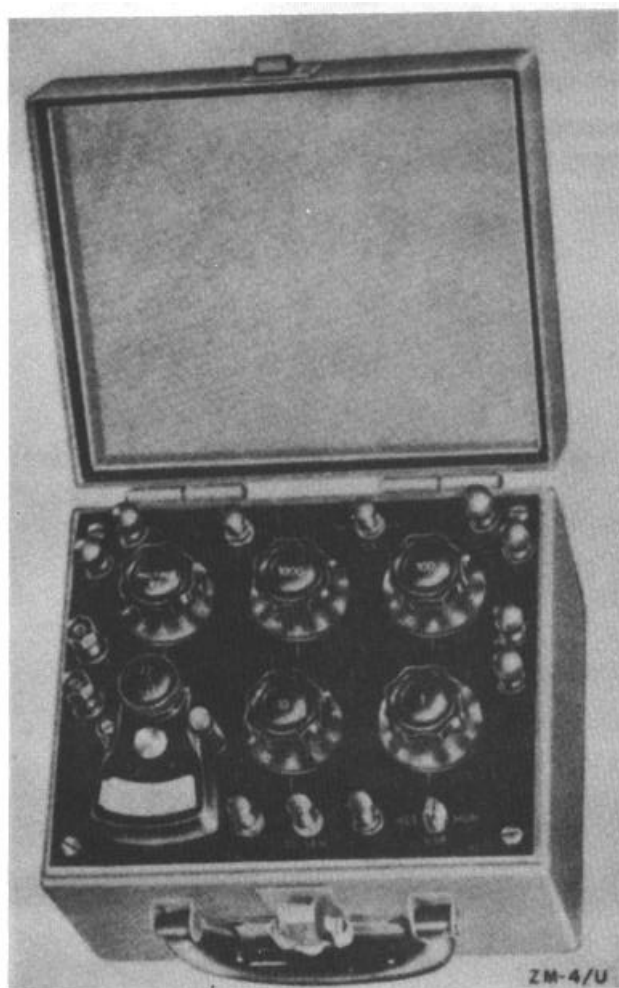
1 March 1964

Cog Serv: USA FSN: 6625-570-5722

USA Line Item No:

Functional Class: 6.1.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std	Std	-----

**Manufacturer:** Leeds and Northrup Company & Shallcross Manufacturing Company**FUNCTIONAL DESCRIPTION:**

Resistance Bridge ZM4/U is a portable resistance measuring equipment used in locating faults in communications systems and power transmission conductors. It can also be used in measuring the resistance of fixed resistors.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Meter Test Equipment AN/GSM-1, is identical with Test Set, Leeds and Northrup Type S.

*Equipment Required But Not Supplied: Battery: (3) BA-30*

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**RESISTANCE BRIDGE**  
**ZM-4/U**

---

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 4.5 v dc

*Resistance Range:* 1 ohm to 10 meg  $\pm$ .15 %

*Rheostat Decades:* 1 ohm: .5 amp; 10 ohm: .16 amp; 100 ohm: .05 amp; 1,000 ohm: .016 amp

*Galvanometer Sensitivity:* 1  $\mu$ a/scale div

*Major Units:* 1 ZM-4/U 5 5/8" x 9" x 7X1/2"

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

None

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91750, 91073 (A), TM 11-2019

MIL-11729

CAPACITANCE-RESISTANCE BRIDGE  
ZM-7A/TSM

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 6.1.4.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Universal Electronic Laboratories, Inc

No Illustration Available

**FUNCTIONAL DESCRIPTION**

Capacitance-Resistance Bridge ZM-7A/TSM is a portable capacitance and resistance measuring device used in locating opens, grounds, and crosses in telephone lines.

**RELATIONSHIP TO SIMILAR EQUIPMENT**

Models of this equipment are identical except for maintenance parts.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 1.5 v, 4.5 v, 90 v de

*Leakage Tests:* 90 v dc (max)

*Resistance Range:* 0 to 50 meg

*Major Units:* 1 ZM-7A/TSM      10 7/8" x 7 3/8" x 6 3/4"  
1 Galvanometer

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(1) 1LN5, (1) 3Q5GT

**REFERENCE DATA AND LITERATURE:**



**OHMMETER  
ZM-21/U**

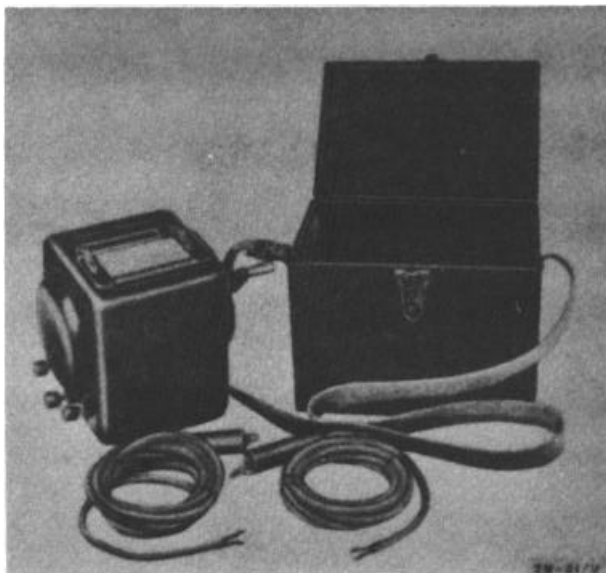
1 March 1964

Cog Serv: USA FSN: 6625-246-5880

USA Line Item No: 628794

Functional Class: 6.1.1

	USA	USN	USAF
<b>STATUS OR TYPE CLASS.:</b>	Std C	Std	-----

**Manufacturer:** Interstate Manufacturing Company**FUNCTIONAL DESCRIPTION:**

Ohmmeter ZM-21/U is a portable, self-powered instrument used in checking insulation resistance of cables between conductors of multiple cables and between windings, including those to ground, in transformers or rotating equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, formerly known as Test Set I-48, is similar to Biddle No. 7679.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 500 v

*Resistance Range:* 0 to 1,000 meg

*Major Units:* 1 ZM-21/U 6" x 7 3/4" x 7 3/4"

10.7 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

None

**REFERENCE DATA AND LITERATURE:**

TM 11-2050

Army Spec 71-3256; Dwg 1058

**CATEGORY 7****AMPLIFYING EQUIPMENT FOR TEST PURPOSES**

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No</i>	<i>Page No.</i>
7.1 .....	Direct current amplifier .....	TS-580/U .....	359

**C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1**  
**DIRECT CURRENT AMPLIFIER**  
**TS-580/U**

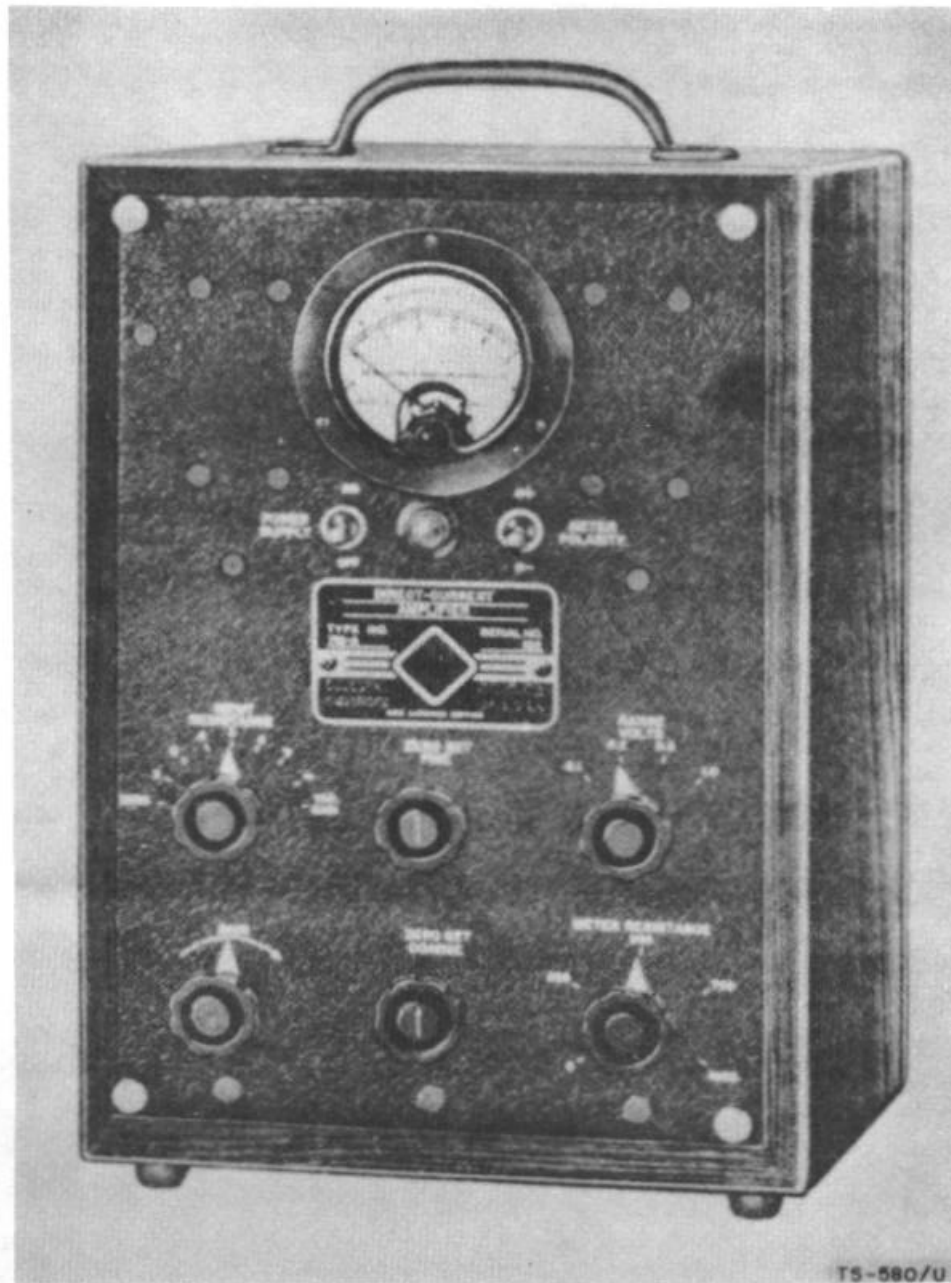
1 March 1964

Cog Serv: USA FSN: 6625-256-8678

USA Line Item No: 613510

Functional Class: 7.1

	USA	USN	USAF
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----
<b>Manufacturer:</b> General Radio Company			



---

**DIRECT CURRENT AMPLIFIER**  
**TS-5 80/U**

---

**FUNCTIONAL DESCRIPTION:**

Direct Current Amplifier TS-580/U is a portable unit used primarily with a milliammeter recorder in the recording of small dc voltages and currents.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to DC Amplifier, General Radio Type 715-AM.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 35 w, 115 or 230 v  $\pm$  10%, 60 cy, 1 phase ac

*Gain:* 50,000 umhos (max)

*Input Resistance:* 100 ohms to 10 meg

*Input Voltage Range:* .1 v, .2 v, .5 v, 1 v

*Output Power:* 25 mw

*Temperature Range:* 65° F to 95° F

*Humidity Range:* 0 to 95%

*Accuracy:*  $\pm$ 1%

*Major Units:* TS-580/U 15 1/4" x 8 1/2" x 9"

22.25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(1) OC3, (1) 4A1, (1) 6F6GT, (2) 6J7GT, (1) 6X5GT

**REFERENCE DATA AND LITERATURE:**

TNT 11-2587

Spec 71-3347 (SigC)

## CATEGORY 8

## TIME BASED MEASURING AND COUNTING EQUIPMENT

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No</i>	<i>Page No.</i>
8.1 .....	Range Calibrator Set .....	AN/UPM-111 .....	363
8.1 .....	Range Calibrator .....	I-223 .....	367
8.1 .....	Test Set .....	TS-10C/APN .....	369
8.1 .....	Range Calibrator .....	TS-102B/AP .....	371
8.1 .....	Calibrator .....	TS-142A/APG .....	373
8.1 .....	Range Calibrator .....	TS-573/UP .....	375
8.4 .....	Stroboscope .....	TS-805/U .....	377
8.4 .....	Electronic Tachometer .....	TS-806/U .....	379
8.6 .....	Frequency Meter .....	FR-67/U .....	365

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

RANGE CALIBRATOR SET

AN/UPM-11

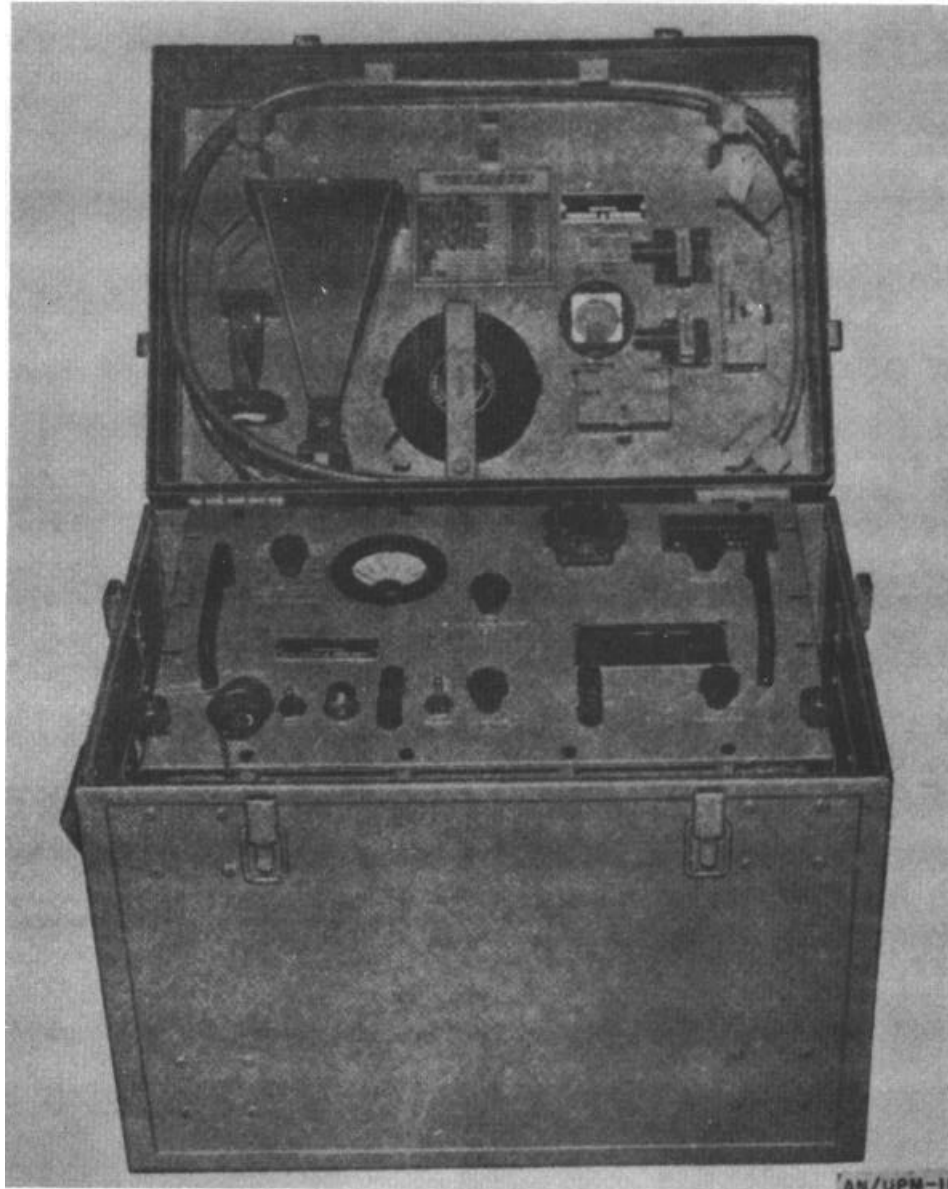
22 June 1954

Cog Slav: USA FSN: 6625-503-0692

USA Line Item No: 658225

Functional Class: 8.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	L/Std	-----
Manufacturer:	Sperry Gyroscope Company			



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**RANGE CALIBRATOR SET  
AN/UPM-11**

---

**FUNCTIONAL DESCRIPTION:**

Range Calibrator Set AN/UPM-11 is a portable test equipment used in collimating the radar antenna and in accurately calibrating the radar range.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 150 w, 115 v, 60 to 1,600 cy, 1 phase ac

*Frequency Range:* 8,600 to 9,500 mc

*Delay:* 300 yd (MX-1302/UPM-11); 400 yd (MX-1300/UPM-11); 1,500 yd (MX-1301/UPM-11)

*Temperature Range:* -40° C to +55° C (operating); -65° C to +85° C (nonoperating)

*Relative Humidity:* 95% (max)

*Accuracy:* ±5 yd

*Major Unit:* 1AN/UPM-11 5 5/64" x 3 5/16" x 8 3/4"

84 lbs

**TUBES, CRYSTALS, TRANSISTORS,****TUBE COMPLEMENT:**

(3) 0A2, (1) 5U4G, (1) 5Y3GT, (4) 6AK5, (1) 6AU6

**REFERENCE DATA AND LITERATURE:**

TO 16-30UPM11-1

WCEG-F-401 (USAF Spec)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

FREQUENCY METER  
FR-67/U

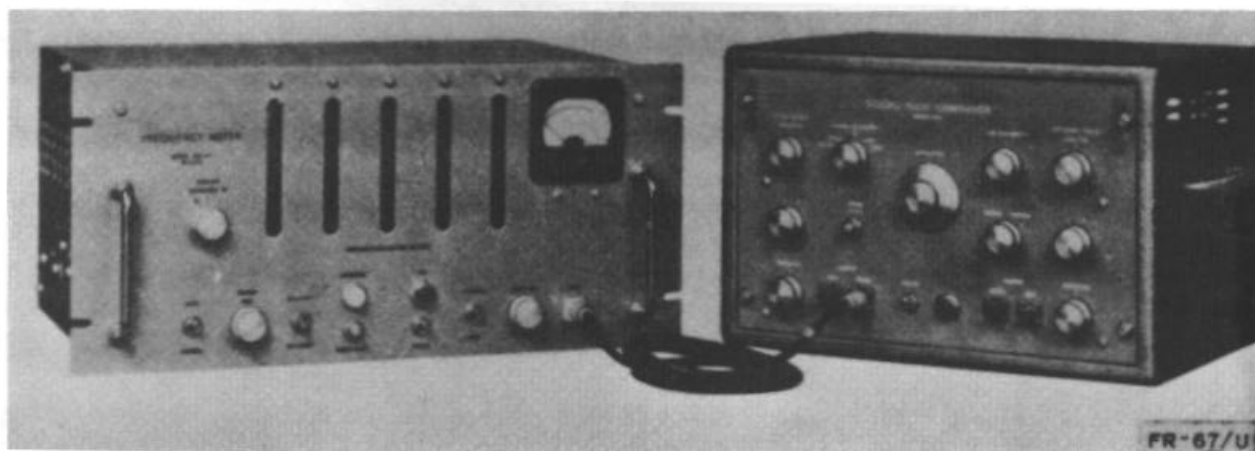
1 March 1964

Cog Serv: USA FSN: 6625-643-4041

USA Line Item No: 616918

Functional Class: 8.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer:	Berkeley Scientific Corporation			

**FUNCTIONAL DESCRIPTION:**

Frequency Meter FR-67/U is a portable, high-speed, electronic instrument that automatically counts and records the number of mechanical, electrical, or optical incidents convertible into charging voltages during, a precise time interval.

It may be used as a precision electronic tachometer, a secondary frequency standard when used with an oscillator, a direct reader of unknown signal frequencies, a calibrator and recorder of fm telemetering systems, or as a multipurpose general laboratory instrument.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Events-Per-Unit-Time Meter, Berkeley Scientific Corporation Model 554-FL.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 175 w, 105 to 130 v, 50 to 60 cy, 1 phase ac

*Counting Rate Range:* 20 to 100,000 events/sec

*Display Time:* 1 to 5 sec (continuously variable)

*Input Requirements:* 0.2 to 20 v rms (amplitude, any wave shape); 50 v ac (max); 600 v dc (max)

*Sensitivity:* 0.2 v rms (max)

*Stability:* Standard xtal better than 5 parts in 100,000; short term, 1 part in 100,000

*Time Base:* 0.1 sec, 1 sec, 10 sec

*Time Base Fundamental Crystal Frequency:* 100 kc

*Accuracy:*  $\pm 1$  event

*Major Unit:* 1 FR-67/U 10 1/2" x 20 3/4" x 15"

68 lbs



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**FREQUENCY METER**  
**FR-67/U**

---

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(1) 0B2, (1) 5U4G, (2) 6AS6, (2) 6AU6, (1) 6Y6G, (1) 12BH7, (37) 5963

**REFERENCE DATA AND LITERATURE:**

TM 11-2698

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**RANGE CALIBRATOR  
I-223**

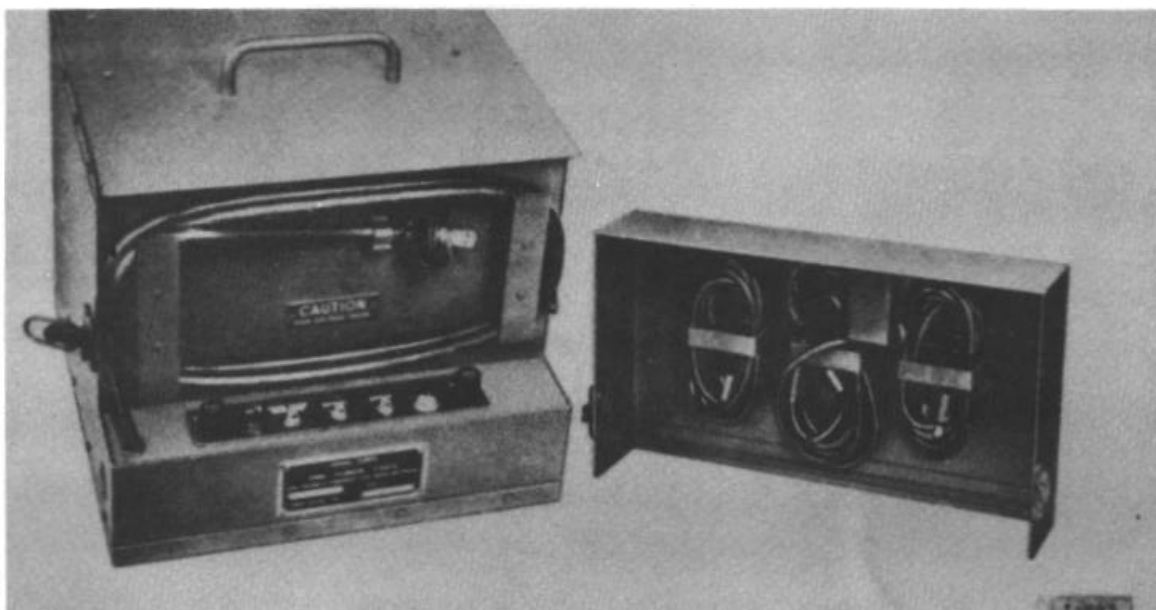
1 March 1964

Cog Serv: USA FSN: 6625-498-3442

USA Line Item No: 658221

Functional Class: 8.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>				

**FUNCTIONAL DESCRIPTION:**

Range Calibrator I-223 is used in calibrating, checking, and adjusting the range measuring circuits of pulse-operated radar apparatus.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Equipments RC-182-A, RC-184, RC-282-A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 40 w, 117.5 v, 60 cy ac

*Signal Outputs:*

*Sine Wave:* 163.94 kc

*Sync Pulse:* 240 pps

*Positive Pulse:* 163,940 pps, 1  $\mu$ sec wide

*Major Units:*

I-223 9 3/4" x 11 3/4" x 12 1/4"

31 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

*TUBE COMPLEMENT:*

(1) 5Y3GT, (2) 6LSG, (1) 6SJ7, (2) 6SN7GT, (2) 6V6GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2528

SCC-9210 (Dwg)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**TEST SET  
TS-10C/APN**

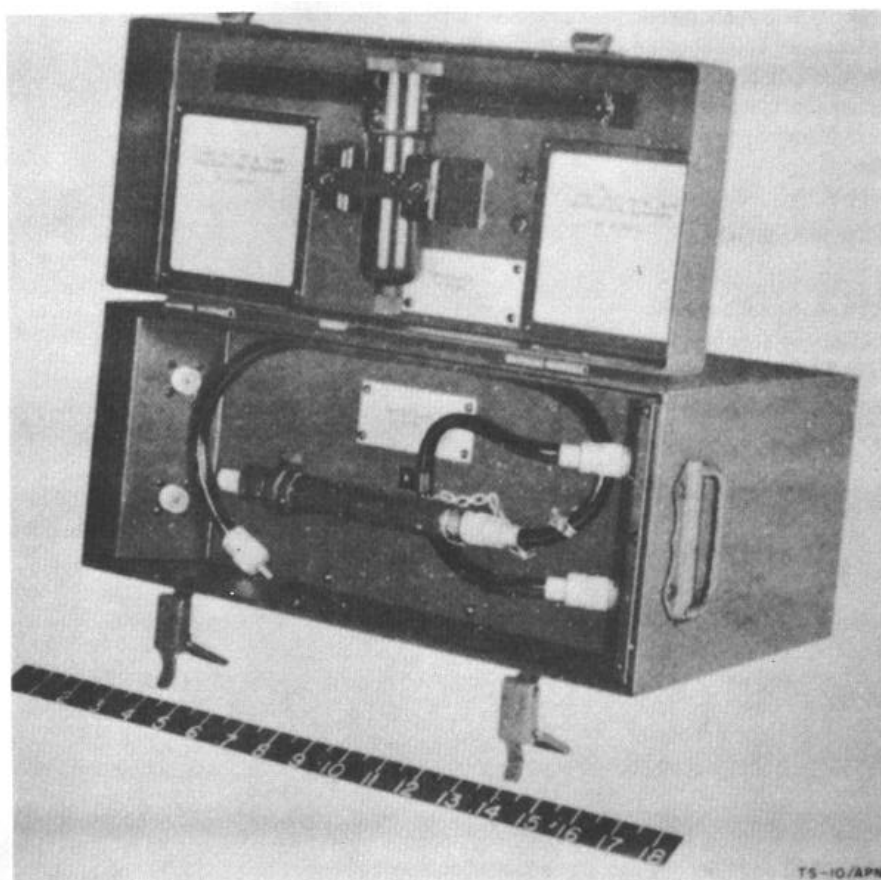
1 November 1954

Cog Serv: USA FSN: 6625-553-0109

USA Line Item No:

Functional Class: 8.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	L/Std	-----
<b>Manufacturer:</b> Atlas Instrument Company				

**FUNCTIONAL DESCRIPTION:**

A portable delay line test set used for testing radio altimeter equipments. It can be used in range calibration tuning and, to a limited extent, in determining the loop sensitivity. Checks for microphonic tubes, transmitter tube performance and regulator tube performance tests can be made. This set cannot be used for detector tuning and balance, or to check the limit lights by varying the attenuator because the tracking of the lights and altitude indicator will not be correct.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

TS-10/APN, TS-10/APN, TS-10B/APN, and TS-10C/APN are functionally the same and in some instances are used in conjunction with TS-16/APN and TS-23/APN.

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**TEST SET**  
**TS-10C/APN**

---

**TECHNICAL DESCRIPTION:**

*Circuit information:* Consists of self-contained, passive electrical circuits that convey a signal from altimeter transmitter to the receiver and introduces a definite time delay, corresponding to the transmission time required for an actual signal to reach the ground surface and be reflected to the aircraft receiver. The test set also includes an adjustable attenuator which introduces a signal loss equivalent to actual signal loss in flight and provides a method of checking loop sensitivity and tuning.

*Power Supply:* None required.

*Frequency Range:* 420 to 460 mc nominal, 440 mc center.

*Delay Period:* 65, 297, and 350 ft.

*Attention:* 31 db, two delay lines in series.

*Impedance:* 50 ohms.

*Major Units:*

1CA-101-A 16" x 6 1/2" x 13 1/2"

**TUBES, CRYSTALS, TRANSISTORS:**

None.

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS10-3 (Maintenance Instructions).

TO 16-55-185 (Spare Parts List).

271-1704-A (Spec. No.).

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**RANGE CALIBRATOR  
TS-102B/AP**

20 June 1955

Cog Serv: USA FSN: 6625-569-0271

USA Line Item No: 658223

Functional Class: 8.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Ltd	-----
<b>Manufacturer:</b> Federal Television Corporation				

**FUNCTIONAL DESCRIPTION:**

A portable precision pulse generator for producing a marker pulse and a synchronizing pulse for test purposes. The synchronizing pulse is used to synchronize the range calibrator with the radar set under test. By viewing the marker pulse on the range indicator of the radar set, the correct value of the indications may be determined. A one-tenth second manually operated stop watch for testing rangerate calibration is mounted on the front panel.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS-102A/AP except for circuitry changes and appearance. Similar to TS-706/UP Range Calibrator except that the TS-102B/AP does not include a stop watch.

## RANGE CALIBRATOR TS-102B/AP

### TECHNICAL DESCRIPTION

*Circuit Information:* The range calibrator consists of four major circuits: a high frequency supply which generates and shapes the basic signal voltage for the marker pulse generator and sync pulse generator; a marker pulse generator which forms the signal voltage from the high frequency supply into marker pulses; a sync pulse generator which converts the signal received from the high frequency generator into pulses suitable for the synchronizing of a radar set; and a power supply which furnishes the high voltage dc plate supply, and low voltage ac supply for the heater and pilot light circuits. The frequency stability of the entire range calibrator is dependent upon a crystal controlled oscillator in the high frequency supply.

*Power Supply:* 115v,  $\pm 10\%$ , ac, 50 to 1000 cps, single-phase, 70 va.

*Marker Pulses:*

*Basic Oscillator Frequency:* 327.820 kc.

*Pulse Repetition Rate:* 327.820 pps (corresponds to a radar pulse-echo distance of 500 yd).

*Pulse Shape:* Triangular.

*Pulse Width at 50% Amplitude:* 0.225 to 0.3  $\mu$ sec, 5000 yd marker; 0.25 to 0.35  $\mu$ sec, 500 yd marker.

*Pulse Rise Time:* 0.1  $\mu$ sec max (20% to 80% amplitude).

*Pulse Amplitude:* 0 to 21 v continuously adjustable for 500 yd marker pulses.

0 to 40 v for every 10th marker pulse or 5000 yd.

*Pulse Polarity:* Pos or neg.

*Output Impedance:* 50 ohms.

*Synchronizing Pulses:*

*Basic Oscillator Frequency:* 327.820 kc.

*Pulse Repetition Rate:* 400, 800, 1600 or 2000, 4000 pps.

*Pulse Shape:* Square.

*Pulse Width at 50% Amplitude:* 0.4 to 0.6  $\mu$ sec.

*Pulse Rise Time:* 0.1  $\mu$ sec max (10% to 90% amplitude).

*Pulse Amplitude:* 42.5 to 52.5 v.

*Pulse Polarity:* Pos or neg.

*Output Impedance:* 75 ohms.

*Accuracy:*  $\pm 10\%$  synchronized pulse spacing,  $\pm 0.1\%$  marker pulse spacing.

*Jitter Between Synchronizing and Marker Pulses:* 0.02  $\mu$ sec or 10 ft max permissible.

*Temperature Range:*  $-40^{\circ}$  C. ( $-40^{\circ}$  F.) to  $+49^{\circ}$  C. ( $+120^{\circ}$  F.).

*Type of Transmission:* Pulses.

*Major Units:* 1 TS-102B/AP 11" x 17 7/8" x 9 7/8"

31 lbs

### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

6 JAN-5814/12AU7, 3 JAN-6AG7, 2 JAN-6X4W.

### REFERENCE DATA AND LITERATURE:

TO 33A1-10-14-1

TO 33A1-10-14-2

TO 33A1-10-14-4

MIL-R-4337 (USAF)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

CALIBRATOR  
TS-142A/APG

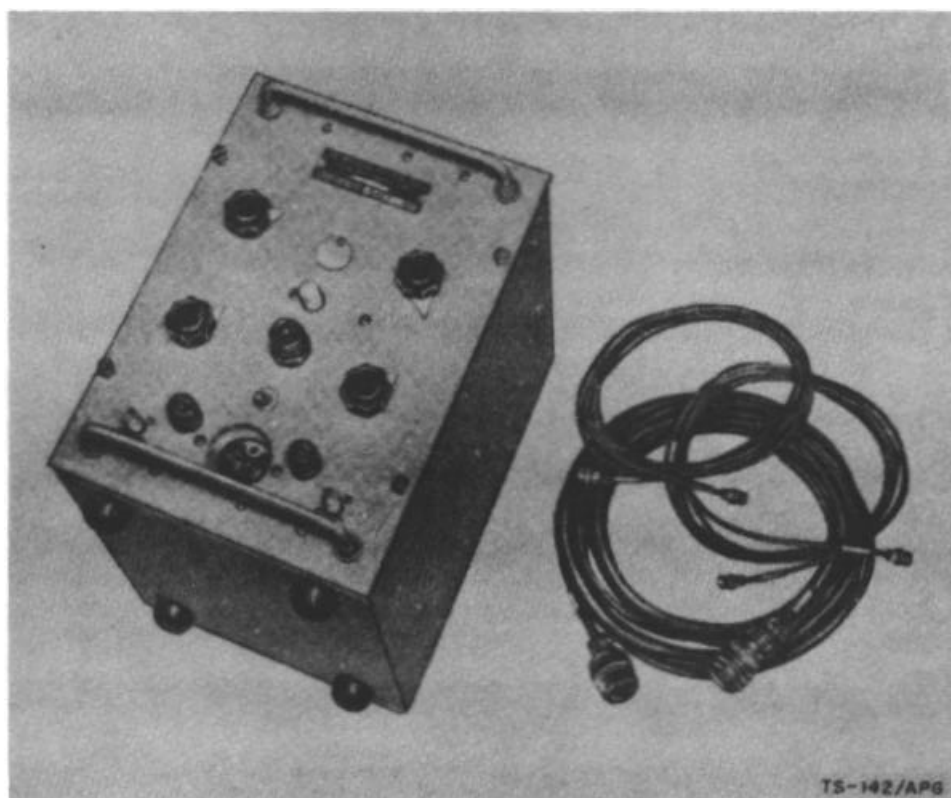
23 November 1954

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 8.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer: Electronics Associates, Inc. & General Electric Company				

**FUNCTIONAL DESCRIPTION:**

Calibrator TS-142A/APG is a portable instrument used in calibrating and adjusting velocity measuring circuits and meters and in testing automatic range-tracking circuits of radar sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are interchangeable; however, the late model has improved stability.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 69 w, 115 v  $\pm 10\%$ , 50 to 1,600 cy, 1 phase ac

*Type of Reception:* Pulse

*Type of Emission:* Pulse

*Input Synchronizing Pulse:*

*Amplitude:* 7 to 50 v

*Impedance:* 100 ohms (max)

*Polarity:* Pos

*Pulse Repetition Rate:* 40 to 6,000 pps

*Pulse Width:* 0.5 to 2.5  $\mu$ sec

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**CALIBRATOR  
TS-142A/APG**

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*Output Pulse:**Amplitude:* 0 to 50 v*Impedance:* Less than 500 ohms*Width:* 0.5 to 0.75  $\mu$ sec*Polarity:* Pos*Relative Velocity:* -500 mph, -100 mph, +100 mph, +500 mph  $\pm$ 10%*Temperature Range:* -55° C to +55° C*Humidity Range:* 100% at 50° C*Altitude Range:* To 10,000 ft (operating); to 50,000 ft (air transportable)*Major Units:* 1 TS-142A/APG      11" x 8" x 10 1/4"

18 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

(1) 0C3, (1) 5U4G, (1) 6AG7, (2) 6SJ7, (4) 6SN7GT, (1) 6V6Y

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS142-2

USAF Spec 71-5062



C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

RANGE CALIBRATOR  
TS-573/UP

20 August 1954

Cog Serv: USA FSN: 6625-503-0697

USA Line Item No: 658222

Functional Class: 8.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std B	Std	L/Std	-----
<b>Manufacturer:</b> Radio Corporation of America, RCA Victor Division				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Range Calibrator TS-573/UP is a portable equipment used in calibrating the range units of pulse type radar systems. It provides a range strobe output and may also be employed in determining the yardage of an external range mark input.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Test Set AN/MPM-23, supersedes Range Calibrators TS-102/AP and TS-358/UP, as well as the range calibrator functions of Oscilloscopes OS-7/U and 60ACZ.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 180 w, 115 v  $\pm 10\%$ , 50 to 1,000 cy, 1 phase ac

*Crystal Oscillator Frequency:* 6.55598 mc, corresponding to 25-yd intervals

*Radar Calibration Capabilities:* Radar sets having prr of 47 to 5,000 pps, pulse lengths from .12 to 6  $\mu$ sec, range sweeps from 1,000 yd to 200 mi, and auto or man. tracking.

*Range Strobe Output:* Variable from 100 yd to 200 mi, either pos or neg

*Accuracy:* Within 10 yd  $\pm 0.01\%$  of actual range

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(24) 6BF7, (4) 5784, (6) 5840, (1) 5902

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91760

MIL-C-15539 (Ships) and AML

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**STROBOSCOPE  
TS-805/U**

1 March 1964

Cog Serv: USA FSN: 6625-223-5150

USA Line Item No: 669920

Functional Class: 8.4

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b> General Radio Corporation				

**FUNCTIONAL DESCRIPTION.**

Stroboscope TS-805/U is a portable instrument used in measuring the speed of rotating, reciprocating, and vibrating mechanisms.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with General Radio Model 631B.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 105 to 125 v, 60 cy, 1 phase ac

*Range:* 600 to 14,400 rpm

*Accuracy:*  $\pm 1\%$

*Major Units:* 1 TS-805/U

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLIMENT:

None

**REFERENCE DATA AND LITERATURE:**

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964		ELECTRONIC TACHOMETER		
Cog Serv: USA FSN: 6680-551-0710		TS-806/U		
USA Line Item No: 674460		Functional Class: 8.4		
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Beckmann Instruments, Berkeley Scientific Division			

No Illustration Available

**FUNCTIONAL DESCRIPTION**

Electronic Tachometer TS-806/U is a portable instrument used in measuring speeds of rotating machinery.

**RELATION TO SIMILAR EQUIPMENT:**

None

Equipment Required But Not Supplied: (1) Frequency Meter FR-67/U

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 6.3 v, 60 cy, 1 phase ac; 180 v dc

*Freon Range:* 100 to 20,000 cy

*Range:* 10 to 10,000 rpm

*Major Units:* 1 TS-806/U 5 1/8" x 5 1/2" x 4 3/4"

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

## CATEGORY 10

## COMBINATION AND GROUP TEST SETS

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No.</i>	<i>Page No.</i>
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10.1.2 .....	Test Oscillator Set .....	AN/PRM-10 .....	393
10.1.2 .....	Test Oscillator .....	BC-376-J .....	413
10.1.2 .....	Test Set .....	TS-16X/APN .....	425
10.1.2 .....	Test Set .....	TS-233/TPN-2 .....	437
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10.1.2 .....	Signal Generator .....	TS-452C/U .....	443
10.1.3 .....	Radar Test Set .....	AN/APM-67 .....	383
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10.1.3 .....	Radar Test Set .....	AN/UPM-44(XN-1) .....	405
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10.1.3 .....	Test Set .....	TS-538B/U .....	447
10.1.3 .....	Test Set .....	TS-541/TPS .....	449
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14 October 1954

Cog Serv: USAF FSN: 6625-692-4566

USA Line Item No:

RADAR TEST SET

AN/APM-67

Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std	-----	T/Std	-----

Manufacturer: Sperry Gyroscope Company

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable, special purpose test set for preflight testing of a radio beacon. The test set is a multitest instrument with a signal generator to aid in checking receiver sensitivity, a radio frequency wattmeter to measure average transmitter power, a cathode ray tube indicator to check transmitter coding, and an absorption type wavemeter to measure receiver-transmitter frequencies. It also has provision for measuring system crystal current and magnetron current.

#### RELATIONSHIP TO SIMILAR EQUIPMENT :

Used to test Radar Beacon AN/APN-69.

#### TECHNICAL DESCRIPTION:

*Power Supply:* 15 v,  $\pm 10\%$ , ac, 380 to 1000 cps, single phase, 150 w max.

*Signal Generator:*

*Frequency Range:* 9326 to 9424 mc.

*Pulse Repetition Rate:* 167, 200, 250, 333, 500, and 1000 pps.

*Pulse Power Output:* - 40 to -52 dbm.

*Pulse Width* 1.5 to 3.5  $\mu$ sec.

*Pulse Rise Time:* 0.1  $\mu$ sec.

*Pulse Decay Time:* 0.3  $\mu$ sec.

*Accuracy:*

*Pulse Repetition Rate:*  $\pm 3\%$ .

*Pulse Power Output.*  $\pm 2$  db.

*Pulse Width:*  $\pm 10\%$  between 2 and 3 nsec;  $\pm 20\%$  below 2  $\mu$ sec and above 3  $\mu$ sec.

*Wavemeter:*

*Frequency Range:* 9308.5 to 9311.5 mc and 9330 to 9420 mc.

*Temperature Range:* -40° C. to +55° C.

*Humidity:* 0 to 100%.

*Power Indication Dip at Resonance:* 45% on cw power, 15% on 0.5  $\mu$ sec duration pulses.

*Accuracy:*  $\pm 0.5$  mc at 25° C. and 60% relative humidity for range 9308.5 to 9311.5 mc.

$\pm 1.25$  mc at 25° C. and 60% relative humidity for range 9330 to 9420 mc.

$\pm 2.5$  mc from 9310 to 9420 mc.

*RF Wattmeter Input:* 1.25 to 10 kw peak pulses.

*Power Measurement Accuracy:*  $\pm 1.5$  db (only signals of a nominal average level 11 db,

+3 db, and -6 db above one mw may be measured).

*Receiver Sensitivity:* Measurement Accuracy:  $\pm 2$  decibels. Signals from -42 dbm  $\pm 6$  decibels are available from a type "N" connector. (This level may be effectively decreased by use of external directional couplers).

*Cathode Ray Tube Display:* 60  $\mu$ sec sweep synchronized with the output pulse.

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**RADAR TEST SET  
AN/APM-67**

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*Major Units:*

AN/APM-67	10 1/2" x 17 1/2" x 13 1/4"	38 lbs
TS-770/APM-67	10 1/2" x 17 1/2" x 10"	27 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

4 JAN-5814, 3 JAN-5687, 1 JAN-6AH6, 1 JAN-12AT7, 1 JAN-2BP1, 2 JAN-0B2, 1 JAN-6AU6, 1 JAN-5R4WGY, 1 JAN-1Z2, 1 JAN-2K25, 1 JAN-1N23B

**REFERENCE DATA AND LITERATURE-**

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 June 1954

Cog Serv: USAF FSN:

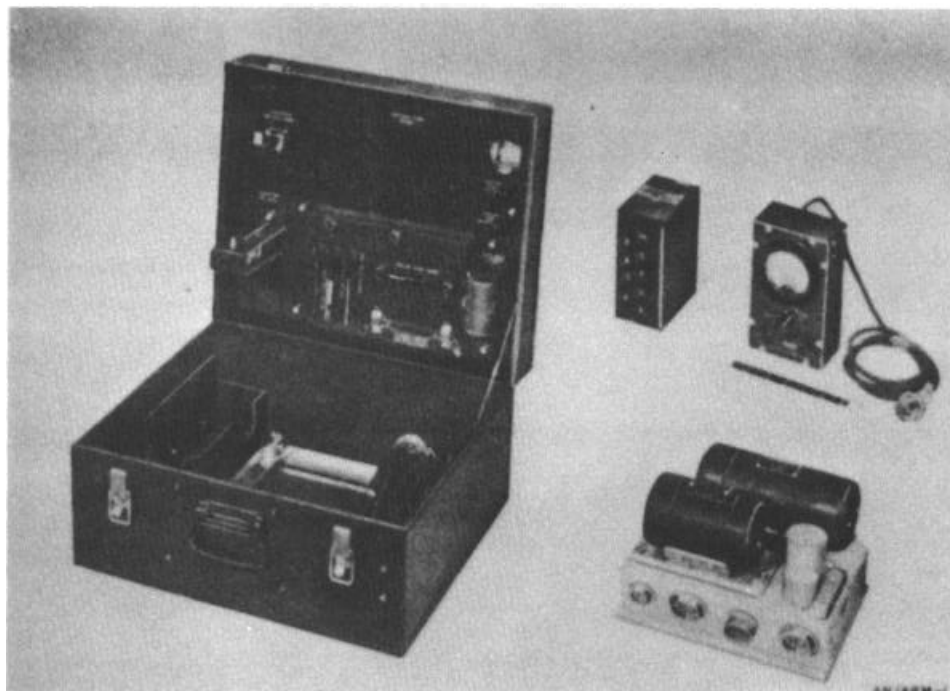
USA Line Item No:

RADIO TEST SET

AN/ARM-1

Functional Class: 10.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Colonial Radio Corporation			

**FUNCTIONAL DESCRIPTION:**

Radio Test Set AN/ARM-1 is special purpose test equipment used in the alignment, testing, and maintenance of radio sets. It is not intended to be operated during flight, but may be transported by air or vehicle.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirement:* 28 v  $\pm$  5v, 5.5 to 12 amp dc

*Frequency Range:* 100 to 156 mc

*Major Units:* AN/ARM-1 17 1/2" x 15 3/4" x 9 7/16"

53 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT

None

**REFERENCE DATA AND LITERATURE:**

AN 16-30ARM1-2

7 June 1956

Cog Serv: USAF FSN: 6625-553-0106

USA Line Item No:

COMPUTER TEST SET

AN/GPM-4

Functional Class: 10.4.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Western Electric Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable special purpose set used to test and calibrate the functioning of Ballistics Computer CP-21A/APA-44 or CP-21B/APA-44 and Auxiliary Offset Unit C-1340/APA-44, components of Ground Position Indicator AN/APA-44A or AN/APA-44B. It is used to check circuitry for continuity, to align "Wind" dials, and to calibrate and check "Time of Fall," "Trial," "Altitude," and "Offset" potentiometers on the ballistics computer.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* A thyatron circuit is provided for checking defective potentiometers. The circuit is arranged so that the thyatron fires and lights a panel lamp if the brush leaves the card for one microsecond or longer.

The POT SHORT indicator lamp lights if one of the brushes becomes shorted to the card.

A dc voltmeter, located on the front panel, measures the release voltage of relays in the component under test.

A potentiometer is used to vary the voltage applied to the relay armature.

CONTINUITY indicator lamps are used to check continuity of switches and circuits in the ballistics computer.

Circuit continuity is checked through the contacts of relays when they are deenergized.

Four standard impedance networks calibrate the "Altitude" potentiometers.

Wind dial magnesyns in the ballistics computer are aligned with a magnesyn transmitter in the computer test set.

Ground range impedance networks in the ballistics computer are checked at three different altitudes by an impedance bridge in the computer test set.

Heaters are provided to maintain the ambient temperature of the component under test at an even value. A thermostatic switch controls the application of heater voltage and a lamp is lighted when the switch is closed.

Power Supply: 115v, ac, 400 cps, single-phase; 115 v, ac, 60 cps, single-phase; and +300, +150, +26, and -150 v, dc; all supplied by Power Supply Group AN/GPM-9.

*Voltmeter Range:* 0 to 30 v.

*Simulated Ground Ranges:* 5,000, 30,000, and 50,000 ft.

*Simulated Wind Rate:* 0 to 200 knots.

*Temperature Limits:* 0° C. (32° F.) to +45° C. (+113° F.), operational; -65° C. (-85° F.) to +85° C. (+185° F.), storage.

*Relative Humidity:* Up to 95%, operational and storage.

*Altitude Range:* Up to 10,000 feet, operational; up to 50,000 feet, storage.

*Major Units:* AN/GPM4 11 7/8" x 17 3/4" x 19 13/16"

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

1 JAN-2D21, 1 JAN-AK5, 1 JAN-12AU7



**REFERENCE DATA AND LITERATURE:**

TO 33D5-5-2-1 (Operation and Maintenance Instructions).

7 June 1956

Cog Serv: USA FSN: 6625-351-5968

USA Line Item No:

TEST SET

AN/MPM-23

Functional Class: 10.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

No Illustration Available

**FUNCTIONAL DESCRIPINON:**

Test Set AN/MPM-23 is radar set test equipment required for third echelon and higher maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used with Test Set AN/GPM-1. Both units are carried in a special van.

**TECHNICAL DESCRIPTION:**

POWER SUPPLY PP-674/TPS-1D: +27v,  $\pm 150$  v, +250 v, +300 v, +450 v dc

Technical characteristics of the following major components are described elsewhere in this publication:

Pulse Generator Set AN/UPM-15, 4.3

Bridge, Summation AN/URM-23, -24, 14.2

Signal Generators

AN/URM-64, 4.1.2

TS-452/U, 10.1.2

TS-497/URR, 4.1.2

Electronic Multimeter ME-6/U, 1.1.1.1

Motor Generator PU-20/C, 12.5

Transformer, Variable, Power TF-171/USM, 11.11

Fluxmeter TS-15/AP, 5.8

Dummy Load TS-234/UP, 11.7

Dummy Antenna TS-235/UP, 11.7

Crystal Rectifier Test Set TS-268/U, 1.2.3

Frequency Meter TS-328/U, 2.5.4

Range Calibrator TS-573/UP, 8.1

Major Units:

1 AN/MPM-23

1 AN[UPM-15

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

Refer to major components.

**REFERENCE DATA AND LITERATURE:**

TM 11-1250

Refer to Signal Corps Procurement Parts List

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

RADAR TEST SET

AN/MPM-24

Functional Class: 10.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Radar Test Set AN/MPM-24 is a special purpose equipment used for repairing and maintaining radar sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

Technical characteristics of the following major components are described elsewhere in this publication:

*Dummy Loads:*

DA-18/U, 11.7

DA-64/UP, 11.7

Fluxmeter TS-15/AP, 5.8

Test Set, Wavemeter TS117/GP, 2.2.3

Power Meter TS-12,5/AP, 14.2

*Signal Generators:*

TS-155/UP, 10.1.4

TS452/UP, 10.1.2

Crystal Rectifier Test Set TS-268/U, 1.2.3

RF Indicator TS-446/U, 5.1

Resistance Bridge ZM-4/U, 6.1.1

Ohmmeter ZM-51JU, 6.6.1

*Major Units:* 1 AN/MPM-24**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

Refer to major components.

**REFERENCE DATA AND LITERATURE:**

Refer to Signal Corps Procurement Parts List

22 June 1954

Cog Serv: USAF FSN:

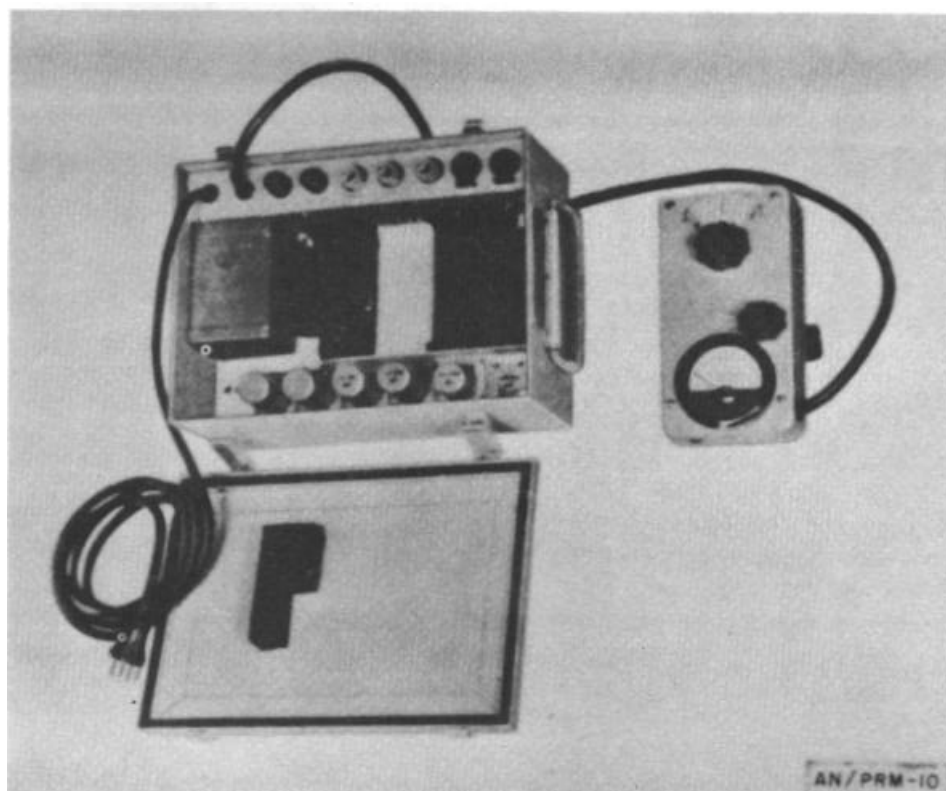
USA Line Item No:

TEST OSCILLATOR SET

AN/PRM-10

Functional Class: 10.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Measurements Corporation			

**FUNCTIONAL DESCRIPTION:**

Test Oscillator Set AN/PRM-10 is a combination equipment used as a signal generator and wavemeter. It measures fundamental and harmonic resonant frequencies of energized or deenergized circuits. This equipment consists of a signal generator, an oscillating wavemeter, and a non-oscillating detector (absorption-type wavemeter).

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is the military version of the "Megacycle Meter" or "Grid Dip Meter."

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v  $\pm 10\%$ , 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 2 to 400 mc

*Type of Emission:* am, cw

*Temperature Range:*  $-54^{\circ}\text{C}$  to  $+71^{\circ}\text{C}$

*Accuracy:*  $\pm 2\%$

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**TEST OSCILLATOR  
AN/PRM-10**

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*Major Units:*

1 AN/PRM-10

11"x 5" x9"

14 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

(1) OA2, (1) 6AQ5, (1) 6AT6, (1) 6 x 4, (1) 955

**REFERENCE DATA AND LITERATURE:**

Instruction Book

MIL-T-4220(USAF), 31 March 1952

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

22 June 1954

Cog Serv: USN FSN:

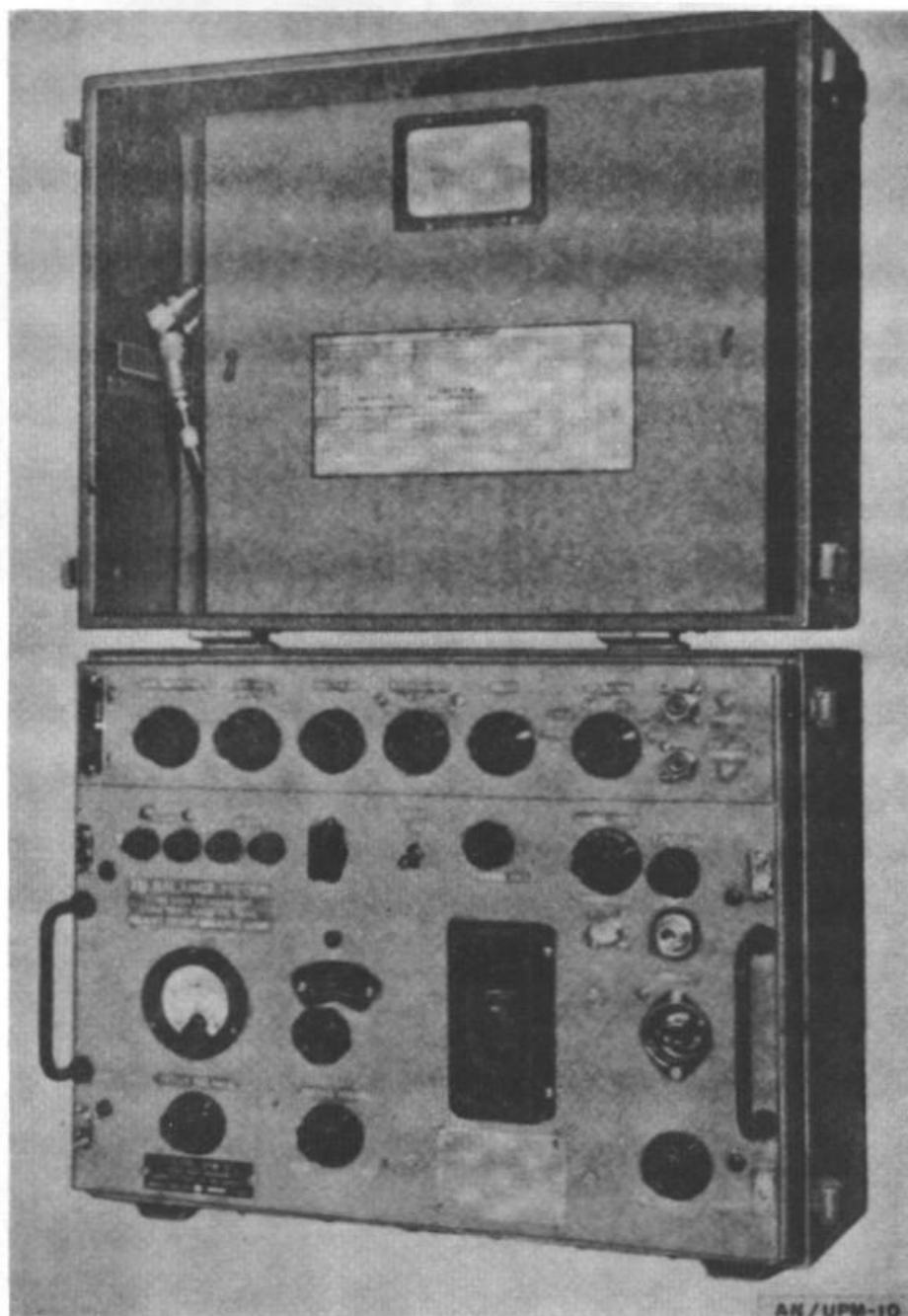
USA Line Item No:

RADAR TEST SET

AN/UPM-10

Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std	-----	Std	-----
Manufacturer:	General Communications Company			



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**RADAR TEST SET  
AN/UPM-10**

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**FUNCTIONAL DESCRIPTION:**

Radar Test Set AN/UPM-10 is a portable, microwave signal generator used in testing and adjusting beacon equipment and radar systems. It measures the power and frequency of external signals and supplies output signals of known power level and frequency. The fm or pulse outputs may be synchronized with an external signal source.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, which replaces Test Set TS-120/UP, is similar to Test Set TS-642/U and General Communication Model P-280. To make frequency response tests, Oscilloscope TS-34/AP is used in conjunction with this equipment.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 210 w, 115 v  $\pm 10\%$ , 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 8,500 to 9,600 mc  $\pm 2.5$  mc

*Type of Emission:* cw, fm, pm, square wave

*Pulse Repetition Rate:* 0 to 3,000 pps

*Pulse Width:* 0.5 to 6  $\mu$ sc

*Pulse Rise Time:* 0.5  $\mu$ sec

*Power Output:* 5 to 500 w (peak)

*Power Range:* 7 to 30 dbm, -7 to -40 dbm, -42 to -83 dbm  $\pm 2$  db

*Major Units:*

1 AN/UPM-10

12 4/5" x 19 1/2" x 14 9/10"

65 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) OC3, (1) 2K25, (1) 5R4GY, (2) 6AH6, (1) 6AN5, (1) 6HS7, (2) 6SL7GT, (1) 6 x 4, (1) 6Y6G, (2) 12AU7, (2) 2021

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91549 Navy Spec SHIPS-R-157, February 1950

9 November 1954		RADAR TEST SET	
Cog Serv: USN FSN: 6625-539-9792		AN/UPM-12	
USA Line Item No:		Functional Class: 10.1.10	
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	Std
Manufacturer:	Sperry Gyroscope Company		

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A general purpose, portable, voltage standing wave ratio instrument. It consists of a signal generator, power supply, dummy load, and a linear amplifier with voltage standing wave ratio indicator.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Similar to Sperry Model 539.

#### TECHNICAL DESCRIPTION:

Circuit Information: The standing wave ratio indicator measures the reflection coefficient by measuring attenuation through the contained rf bridge by means of a built-in calibrator. The attenuator is calibrated by use of the dummy load.

*Power Input:* 115 v  $\pm 10\%$ , ac, single phase, 50 to 800 cps, 76 w

*Type of Transmission:* Pulse

*Indicator:*

*Frequency Range:* 8500 to 9600 mc

*Pulse Recurrence Frequency:* 1300 to 1500 cps

*Signal Strength:* 125  $\mu$ w min

*Meter Scales:* 1.05 to 1.3,  $\pm 5\%$ ; 1.3 to 2.0,  $\pm 10\%$ ; 2.0 to 3.0,  $\pm 10\%$ ; calibrated in voltage swr

*Power Supply:*

*Output:* 300 v, dc, regulated within 1% ripple (less than 5 mv)

*Dummy Load:*

*Power Dissipation:* 125  $\mu$ w

*Frequency Range:* 8500 to 9600 mc

*Major Units:* AN/UPM-12 19 3/6" x 11 3/4" x 10 3/32"

36 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

*Power Supply:* 1 JAN-5Y3, 1 JAN-X4, 1 JAN-6AQ5, 1 JAN-6AU6, 1 JAN-5651, 1 JAN-12AU7, 2 JAN-OB2.

*RF Bridge:* 1 JAN-2K25, 1 JAN-12AT7, 1 JAN-6AV6, 1 JAN-5751, 1 JAN-6AU6

#### REFERENCE DATA AND LITERATURE:

MIL-R-8724



29 June 1955

Cog Serv: USN FSN: 6625-648-8739

USA Line Item No:

RADAR TEST SET

AN/UPM-14

Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Sperry Gyroscope Company, Division of the Sperry Corporation			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose portable unit which contains an fm test set, a spectrum analyzer, and a simplified synchroscope. The equipment is designed to measure rf power output, frequency, and sensitivity, and to visibly display and measure frequencies of radar pulse spectra components. It is used to measure radar receiver local oscillator frequency, bandwidth, sensitivity, and radar recovery time. It is also used to tune radar oscillators; to make performance tests on and tune duplexers, afc systems, and rotating joints; to visually examine the spectra of magnetrons, focal oscillators, and test sets; and to investigate magnetron pulling.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The fm test set consists of a temperature compensated, thermistor bridge wattmeter and a signal generator. The signal generator furnishes continuous wave and frequency modulated test signals at accurately established frequency and power levels. The wattmeter measures externally generated power in decibels and milliwatts. The spectrum analyzer and synchroscope make possible the visible display of power versus frequency spectra of pulsed frequency signal on a three-inch cathode ray tube.

*Power Supply:* 103.5 to 126.5 v, ac, 50 to 1000 cps, single-phase, 300 w.

*Characteristics of FM Test Function:*

*Frequency:* Range: 34,000 to 35,600 mc.

*Absolute Accuracy:*  $\pm 10$  mc at 25° C. (77° F.) and 60% relative humidity.  $\pm 20$  mc at -20° C. (-4° F.) to +40° C. (104° F.) and 0 to 95% relative humidity.

*Accuracy with individual calibration curve:*  $\pm 10$  mc at -40° C. (-40° F.) to +55° C. (131° F.) and 0 to 95% relative humidity.

*Power:*

Input: +9 to +30 dbm at input connector. Accuracy:  $\pm 2$  db.

Output: -50 to -100 dbm at output connection. (Higher uncalibrated levels are available depending upon individual klystron tubes.)

*Frequency Modulation:* Sweep Duration: 6 to 60 mc.

Phase Range: 2 to 50 usec after triggering.

Repetition Rate: 400 to 4000 cps.

Amplitude: 0 to 240 v.

Slope: 0 to 2.0 v/ $\mu$ sec.

*Triggers for Sawtooth Sweep Generator:*

Internal RF Trigger: 50 to 500 w peak, 0.1 to 10 Usec pulses; recurrence rate of 400 to 4000 pps.

*External Video Trigger:* +10 to +50 v peak, 0.1 to 2 usec pulses; recurrence rate of 400 to 4000 pps.

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**RADAR TEST SET  
AN/UPM-14**

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**Characteristics of Spectrum Analyzer Function:**

Tuning Range: 34,000 to 35,600 mc.

Spectrum Sweep Rate: 10 to 30 cps, 0 to 170 v.

RF Sensitivity: -60 dbm for one-inch deflection on Cathode-ray tube.

RF Attenuator: 9 to 50 db.

IF Attenuator Control: 25 db.

IF Bandwidth: 100 kc  $\pm$ 10 kc.Pulse Width Range: 0.1 to 2  $\mu$ sec.

Sweep Synchronization: Equal to and synchronized with sub-multiples of line freq.

**Characteristics of Synchroscope Function:**

Deflection Sensitivity: 30 v per half inch.

Sweep Speeds: 5, 15, and 40  $\mu$ sec.Pulse Duration: 0.25 to 25  $\mu$ sec.

Video Amplifier Bandwidth: 4 mc.

**Triggers Required:**Internal RF Trigger: 50 to 500 w peak, 0.1 to 10  $\mu$ sec pulses; recurrence rate of 400 to 4000 cps.External Video Trigger: +10 to +50 v, peak, 0.1 to 2  $\mu$ sec pulses; recurrence rate of 400 to 4000 cps.

Major Unit: 1 AN/UPM-14

17  $\frac{3}{4}$  x 14  $\frac{3}{4}$  x 14  $\frac{3}{4}$ "

70 lbs

**TUBES, CRYSTALS, TRANSISTORS****TUBE COMPLEMENT:**

1 JAN4)A2, 1 JAN-122, 1 JAN-3KP1, 1 JAN-5R4GY, 1 JAN-5Y3GT, 1 JAN-6AH6, 1 JAN-6AN5, 1 JAN-6AU6, 1 JAN-D4, 1 JAN-6J4, 1 JAN4Y6G, 2 JAN-12AT7, 3 JAN-5651, 1 JAN-5687, 2 JAN-5749, 5 JAN-5751, 4 JAN-5814, 2 JAN-5932, 1 JAN4005, 1 JAN-5RV-38, 3 JAN-6AK5W, 1 JAN-6AL5.

**REFERENCE DATA AND LITERATURE:**

24 May 1956

Cog Serv: USAF FSN: 6625-539-9918

USA Line Item No:

COMPUTER TEST SET

AN/UPM-35

Functional Class: 10.4.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	General Precision Laboratory, Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable test set used in the troubleshooting and routine testing of analog computers which use servomechanisms and resolver drivers. It detects faulty servo amplifiers or mechanical defects by measuring the error signals and servo motor voltages. Booster amplifiers may be checked by measuring the error voltage developed between grid and cathode of the input tube. Performance indications are displayed on a direct reading microammeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The circuit includes a selector switching system, dc and servo metering switches, and auxiliary switching circuits. The selector switches select the input circuit to be tested and the type of metering to be used. A special purpose vacuum tube voltmeter measures the error voltage which occurs across the input of the servo amplifier of the servos. The error voltage is the resultant of that component of the feedback voltage which is 180° out of phase with the input voltage and that component which is in quadrature with it. The error voltage consists of a "real" component which is in phase with the input voltage and a quadrature component. By comparing the values of the error voltage components with the servo motor driving voltage, the performance of the servo system can be determined and troubles can be localized to either the mechanical or electrical section. The voltmeter is capable of measuring separately either component of the error voltage. A conventional dc meter measures the servo motor driving voltage.

*Power Supply:* 115 v  $\pm 10\%$ , ac, single-phase, 50 to 1600 cps, 55 w.

*Meter Calibration:* -100 to +100 divisions.

*Meter Range:* -150 to +150  $\mu$ a.

*Accuracy:* Direct voltage measurements:  $\pm 5\%$ . Voltage Comparison Measurements:  $\pm 0.1\%$ .

*Operating Temperature:* -40° C (- 40° F) to +55° C (+131° F).

*Major Unit:* 1 TS-783/UPM-35                      7 11/18" x 14 1/4" x 9 1/2"

18 1/2 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

3 JAN-6AU6WA, 3 JAN-5814, 1 JAN-6080, 1 JAN-5651, 1 JAN-5R4WGY.

**REFERENCE DATA AND LITERATURE:**

TO 33D5-5-4-1 (Operation Instructions).

TO 33D5-5-4-2 (Service Instructions).

TO 33D5-5-4-4 (Illustrated Parts Breakdown).

21 February 1955		RADAR TEST SET	
Cog Serv: USAF FSN: 6625-649-4658		AN/UPM-41	
USA Line Item No:		Functional Class: 10.4.2	
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	A/Std
Manufacturer:	Airborne Instrument Laboratory, Inc.		

No Illusion Available

#### FUNCTIONAL DESCRIPTIONS:

A portable, general purpose test set which provides means for evaluating the performance of the intermediate frequency and video sections of limiting and linlog types of moving target indicator systems. The test set includes a signal generator and a pulse jitter tester housed in one cabinet with a common, self-contained power supply. The pulse jitter tester measures the time jitter of intermediate frequency and video pulses. The signal generator can be used in measuring subclutter visibility, video cancellation ratio, and coherent oscillator stability. The signal generator also can be used to investigate the shape of the phase detector characteristic.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

AN/UPM-41 is the overall nomenclature for Indicator Test Set TS-677/UP.

#### TECHNICAL DESCRIPTION:

*Power Supply:* 115 v  $\pm 10\%$ , ac, 50 to 1000 cps, single phase, 550 w

*Signal Generator:*

*Frequency Range:* 27 to 33 mc (continuously variable).

*Power Output:* 1 mw.

*Voltage Output:* 22.4  $\mu$ v to 224 mv, calibrated.

*Output Impedance:* 50 ohms.

*Accuracy:*  $\pm 0.1$  mc for freq calibration.

$\pm 10\%$  of indicated int prr.

$\pm 10\%$  of one mw.

$\pm 0.5$  db for output attenuator.

$\pm 10\%$  of indicated pulse delay.

$\pm 5\%$  of indicated target speed.

*Oscillator Stability:* Drifts less than  $\pm 0.01\%$  of indicated freq for one min after 15 min warm-up period.

*Type of transmission:* Pulsed Carrier and Continuous Wave.

*Video Trigger:* The evaluator can be triggered externally or internally.

The internal Trigger pulse triggers the evaluator and at the same time provides a source of trigger pulses to the front panel.

*External Trigger:* Pulse Width: 0.18 to 10  $\mu$ sec

Pulse Repetition Rate: 50 to 6000 pps

Pulse Amplitude: 15 to 50 v

Pulse Polarity: Pos or Neg

*Internal Trigger:* Pulse Width: 1  $\mu$ sec

Pulse Repetition Rate: 50 to 6000 pps

Pulse Amplitude: 15 v

IF Coherent Oscillator Synchronizing Pulse: A synchronizing pulse at IF occurring at the same time as the trigger, and serving to simulate the COHO synchronizing pulse normally provided to an MTI receiver. This pulse establishes a phase reference for the coherent oscillator.

*Pulse Width:* 0.2, 0.5, 1, 2, or 3  $\mu$ sec

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**RADAR TEST SET  
AN/UPM-41**


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*Pulse Rise Time:* Less than 0.2  $\mu$ sec

*Pulse Delay Time:* 6 to 540  $\mu$ sec

*Fixed Target Pulse:* An IF pulse simulates a fixed target. It has a manually variable delay with respect to the synchronizing pulse, but it has a constant phase for any given delay setting relative to the IF within the synchronizing pulse envelope.

*Pulse Width:* 0.6, 1.5, 3, 6, or 8  $\mu$ sec

*Pulse Rise Time:* Less than 0.2  $\mu$ sec

*Pulse Delay Time:* 6 to 540  $\mu$ sec (1.5 to 45 naut mi).

*Moving Target Pulse:* An IF pulse to simulate a moving target. It has a manually variable delay with respect to the synchronizing pulse, and a manually adjustable control to set the rate of change of phase relative to the IF in the synchronizing pulse. This makes it possible to simulate any desired radial component of target velocity. The time delay and phase rate adjustments are independent of each other.

*Rate of Change of Phase (Relative to COHO locking pulse):* 50 to 10,000 cps freq difference, simulate any radial target velocity up to 3000 knots per kilomegacycle.

*Attenuator:* 0 to 80 db.

*CW Source:* A source of continuous wave of fixed phase relative to the IF in the synchronizing pulse for use in observing phase detector characteristics and coherent oscillator stability. It is provided through the same signal jack that supplies the fixed and moving target pulses. By switching, the continuous wave IF signal will be fed through this jack instead of the fixed and moving target pulses.

*Jitter Tester:*

*Oscilloscope* (three-inch): Provides a means for measuring the pulse jitter or instability of the ppr of MTI pulses.

*Spread:* 0.01 Usec corresponds to about 0.012 inches on the oscilloscope.

*Sweep Frequency Range:* 258 kilocycle sine wave.

*Trace:* Intensified for  $\mu$ sec starting 0.1  $\mu$ sec before pulse begins.

*Full Deflection:* Produced by 2 mv or more.

*Peak and Background Brightness:* Manually adjustable.

*Observed Pulse:* Either the system trigger (video signal) or the IF coherent oscillator locking pulse furnished by the system.

*Frequency Range:* 27 to 33 mc.

*Impedance:* 75 ohms.

*Pulse Jitter Accuracy:*  $\pm 10\%$  but not less than  $\pm 0.01 \mu$ sec.

*Major Units:*

AN/UPM-41

33 7/16" x 21 3/8" x 20 5/8"

## **TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

1 JAN-OB2, 4 JAN-5R4WGY, 3 JAN-AS7G, 4 JAN-6AU6, 1 JAN-6X4W, 13 JAN-12AT7, 5 JAN-5750, 3 JAN-5726, 6 JAN-6D4, 2 JAN-5725, 16 JAN-5654, 2 JAN-6AG7, 3 JAN-6005, 1 JAN-6C4, 1 JAN-3JP11.

## **REFERENCE DATA AND LITERATURE:**

AN 16-35TS677-1 (Operating Instructions).

AN 16-35TS677-2 (Service Instructions).

AN 16-35TS677-3 (Overhaul Instructions).

AN 16-35TS677-4 (Illustrated Parts Breakdown).

MCREE-940 (USAF Exhibit)

6 June 1955

Cog Serv: USN FSN:

USA Line Item No:

RADAR TEST SET

AN/UPM-44(XN-1)

Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Sperry Gyroscope Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, combination test equipment which combines in one unit the functions of an fm test set; a spectrum analyzer, and a synchroscope. It is used to test either single-pulse or multi-pulse radar systems. The general applications of the test set include the following: (a) measurement of radar transmitter power and frequency; (b) measurement of radar receiver local oscillator frequency, bandwidth, sensitivity, and radar recovery time; (c) tuning of radar local oscillators; (d) performance testing and/or tuning of duplexers, AFC systems, rotating joints, etc.; (e) visual examination of the spectra of magnetrons, local oscillators and test sets; (f) investigation of magnetron pulling.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* This test set is a combination rf wattmeter, frequency meter, spectrum analyzer, rf signal generator, and synchroscope.

With the function switch in the transmitter testing (TRAN) position, power measurements are made on input signals. The input signals pass thru a microwave section to a temperature-compensated, thermistor wattmeter bridge. A calibrated dbm attenuator in the microwave section is used in conjunction with the wattmeter bridge and indicating meter to obtain direct power-level readings in decibels relative to one milliwatt. In the TRAN position the test set may also be used as a synchroscope. The incoming video signal, passes through the video amplifier to the vertical deflection circuit of the cathode ray tube. The trigger amplifier output controls the synchroscope sweep generator which in turn provides the horizontal deflection voltage for the cathode ray tube.

The function served when the selector switch is in the test set adjustment (MIXER) position is the testing or adjusting of the rf oscillator. The spectrum sweep generator provides horizontal deflection voltage. This voltage is applied to the reflector of the rf oscillator to frequency modulate the klystron in synchronism with the horizontal sweep. The klystron signal then goes to the mixer where it is rectified. The rectified signal is smoothed by a filter and the resulting envelope goes through the mode amplifier to feed the vertical deflection system of the cathode ray tube.

The function of the spectrum analyzer (SPECT) position is spectrum observation. The input signal and the frequency modulated klystron oscillator signal are mixed to produce heterodyne frequencies which are fed to an IF amplifier. The IF amplifier amplitude discriminates and square law detects the signal to obtain an output proportional to frequency rather than voltage. This signal and the differentiated mode amplifier signal are fed through the vertical amplifier and produce a pattern of a frequency vs power spectrum with the frequency meter pip superimposed on the baseline for easy identification of the frequency components. For multi-pulsed systems, a special gating circuit can be switched into operation to select any desired pulse in the radar repetition interval.

The receiver testing (RECV) position causes an fm or cw signal to be developed. Both the frequency and power level of this signal are known. The receiver testing (TEST) position is similar to RECV position except that a high-level output test signal is provided. This is accomplished by switching the step attenuator out of the electrostatic field.

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**RADAR TEST SET  
AN/UPM-44(XN-1)**

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*Power Supply:* 103.5 to 126.5 v, ac, 50 to 1000 cps, single-phase, 210 w.

*FM Test Set:*

*Frequency Range:* 2700 to 3550 mc.

*Absolute Accuracy:*

± 3 mc, 2700 to 3550 mc at 25° C. (77° F.).

±1.5 mc, 2700 to 3000 mc at 25° C. (77° F.).

*Relative Accuracy:* ±1 mc over any 60 mc interval.

*Power Input:*

*Range:* +5 to +30 dbm at input connector.

*Accuracy:* ±1 db with correction chart.

*Power Output:*

*Range (calibrated):* -5 to -55 dbm (TEST).

-50 to -100 dbm (RECV).

*Accuracy:* ±1 db (RECV, with correction chart).

*Frequency Modulation:*

*Frequency deviation of sweep:* 0 to 3 mc min.

*Phase range:* 3 to 50 µsec after triggering.

*Repetition rate range:* 100 to 4000 cps.

*Trigger amplifier gain:* 500.

*Trigger Characteristics for Modulation (Sawtooth) Sweep Generator:*

*RF trigger:* 50 to 500 w peak; 0.2 to 10 µsec duration; repetition rates of 100 to 4000 cps.

*Video trigger:* +10 to +50 v peak; 0.1 to 10 µsec duration; repetition rates of 100 to 4000 cps.

*External Modulation:* 0.2 to 10 µsec pulse width; repetition rates of 100 to 4000 cps, 400 v pos.

*Spectrum Analyzer Characteristics:*

*Tuning Range:* 2700 to 3550 mc.

*Sweep Speeds:* 5 to 30 cps, adjustable.

*RF Attenuator Range:* 50 db.

*RF Sensitivity:* 70 dbm for one-inch deflection on CRT.

*IF Gain Control:* 30 db.

*Pulse Width:* 0.2 to 3 µsec.

*Sweep Synchronization:* At line frequency or subharmonics of line frequency.

*IF Bandwidth:* 55 kc.

*Stability and Jitter:* 1/32 inch at max sensitivity.

*Gating Trigger:*

*Amplitude:* 200 v (neg).

*Timing:* One µsec min before first radar pulse.

*Synchroscope Characteristics:*

*Deflection Sensitivity:* 2 v/in.

*Sweep Speeds:* 5, 40, 150, 1000, and 3000 µsec.

*Trigger Required:* As specified under fm test set characteristics.

*Pulse Observable:* 0.125 µsec duration.

*Video Amplifier Gain:* 30 db.

*Video Amplifier Bandwidth:* 8 mc.

*Meters:* Ammeter: 0 to 2 w; accuracy, ±2% of full scale.

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**RADAR TEST SET  
AN/UPM-44(XN-1)**

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*Major Units:*

AN/UPM-44 (XN-1)

TS-768(XN-1)

16 3/4," x 18 1/4" x 16 1/4"

77 lbs

**TUBES, CRYSTALS, TRANSISTORS,****TUBE COMPLEMENT:**

3 JAN-0A2, 1 JAN-1Z2, 1 JAN-2D21W, 1 JAN-3KP1, 1 JAN-5R4GY, 1 JAN4AG5, 3 JAN-6AH6, 2 JAN-6AN5, 1 JAN-6AS6, 1 JAN-AU6, 1 JAN6D4, 1 JAN6X4W, 2 JAN-12AT7, 1 JAN-726C, 1 JAN-5654, 4 JAN-5654, 1 JAN-5687, 4 JAN-5751, 5 JAN-5814, 1 JAN-6080, 2 JAN-1N23B, 1-CR201.

**REFERENCE DATA AND LITERATURE:**

Handbook of Maintenance Instructions.

MIL-T-18133(Aer)



22 June 1955

Cog Serv: USN FSN: 6625-649-4379

USA Line Item No:

RADAR TEST SET

AN/UPM-56

Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	General Communication Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable precision microwave signal generator, power meter, and frequency meter designed to test and adjust radar, beacon, and associated equipment. The equipment can be used as a continuous wave, frequency modulated, or pulse modulated signal generator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Overall nomenclature for Radar Test Set TS-42/U.

**TECHNICAL DESCRIPTION:**

*Circuit Information-* Pulse modulation is obtained from a pulse generator within the test set. The pulsed rf signals are used for receiver tuning and measurements of receiver sensitivity, radar range, and TR recovery time. Frequency modulation is obtained from a sawtooth sweep generator within the test set. FM output is used with an oscilloscope for receiver frequency and bandwidth measurements. The continuous wave output is used to measure receiver sensitivity and frequency. A square wave output, with a repetition rate of about 1000 pulses per second, is used for impedance, standing wave, and similar measurements with a slotted line.

*Power Supply:* 115 v, +10%, ac, 50 to 1000 cps, single-phase, 350 w.

*Power Meter:*

*Frequency Range:* 8500 to 9600 mc.

*Power Range:* 1 to 30 dbm

*Accuracy:*  $\pm 1.5$  db

*Frequency Meter:*

*Frequency Range:* 8500 to 9600 mc

*Absolute Accuracy:*  $\pm 1$  mc

*Calibration Points:* 8500 mc,  $\pm 1/2$  mc;

9310 mc,  $\pm 1/2$  mc;

9600 mc,  $\pm 1/2$  mc.

*Signal Generator:*

*Frequency Range:* 8500 to 9600 mc

*Power Range:* -1 to -105 dbm (average) in three steps; -1 to -36 dbm, -36 to -71 dbm, -71 to -106 dbm

*Stability:* Less than 1 mc freq drift in a 60-min interval.

*Output Signal Characteristics:*

*Continuous Wave:* Can be continuously tuned throughout the frequency range.

*Pulse Modulation:*

1.0  $\pm 0.1$   $\mu$ sec, fixed duration.

2.35  $\mu$ sec  $\pm 0.1$   $\mu$ sec, fixed duration.

0.2  $\mu$ sec to 10  $\mu$ sec, continuously variable duration.

100 to 50,000 pps, repetition rate.

1000 pps,  $\pm 20\%$ , square wave.

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**RADAR TEST SET**  
**AN/UPM-56**


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0.1  $\mu$ sec, rise time.

0.1  $\mu$ sec, decay time.

Continuously variable pulse delay

*Frequency Modulation:*

8500 to 9600 mc.

0.02 to over 25 mc per  $\mu$ sec, sweep rate.

Less than 1  $\mu$ sec, delay time.

At least 25 mc, freq excursion.

Approximately 100 to 300,000 sweeps per sec, internal synchronization.

*Input Trigger Requirement:*

Video or rf trigger.

Greater than 1  $\mu$ sec duration.

Less than 2  $\mu$ sec rise time.

More than 10 v or 5 w peak.

100 to 50,000 pps

52 ohms rf input impedance, 75 ohms video input impedance.

*Trigger Generator:*

$\pm$  polarity

0.5  $\mu$ sec to 5.,sec, duration.

Less than 0.1  $\mu$ sec, rise time.

Less than 0.5  $\mu$ sec, decay time.

25 to 50 v, peak across 75 ohms.

100 to 50,000 pps repetition rate.

*Major Unit:*

1AN/UPM-56

15 1/8" x 19 11/16" x 22"

124 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**TUBE COMPLEMENT:**

3 JAN-OA2, 8 JAN-12AT7, 1 JAN-2K25, 1 JAN-5687, 1 JAN-5814, 2 JAN-6AH6, 2 JAN-6AN5, 9 JAN-6AQ5,  
3 JAN-6AU6, 2 JAN-6AX4GT, 4 JAN-6X4, 12CK705 (Raytheon), 1 JAN-1N23B.

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 92064 (Instruction Book).

23 May 1956

Cog Serv: USN FSN: 6625-539-8840

USA Line Item No:

RADAR TEST SET

AN/UPM-66

Functional Class: 10.1.10

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Laboratory for Electronics, Incorporated Motorola, Incorporated			

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable, special purpose test set used for preflight and bench checking of Radar Set AN/APS-27. The equipment is designed to check the ability of the radar set to distinguish between fixed and moving targets and, in the case of substandard performance, to determine which component of the radar set is at fault.

**RELATIONSHIP TO SIMILAR EQ4JIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The transmitted pulse from the radar set is coupled into the Test Set TS-898/ UPM-66 from the directional coupler, mixed with a signal from the local oscillator in the balanced mixer, and fed into a 60-megacycle IF amplifier. The output of the IF amplifier is fed through a fused quartz delay line into a second IF amplifier where modulation may be applied to the pulse at a frequency of X the radar set prf (pulse repetition frequency). (The presence and amplitude of modulation is controllable from the front panel.) The pulse is then returned, at a level determined by the setting of the test set IF GAIN and ATTN controls, to the radar set IF where it simulates a moving target return. The video output of the radar set is fed to the input of the test set .synchroscope where it appears as an "A" scan presentation. The ability of the radar set to cancel fixed targets is measured by comparing the video residue from a fixed target with the video output of a moving target. This ability is called Subclutter Visibility and is checked for the radar set, the radar set without the effect of magnetron frequency instability, and for the radar set comparator alone. For the latter check a video pulse is supplied directly to the comparator from the pulse generator in the test set and the rf and IF sections of the test set are not utilized. The built-in synchroscope has three sweep lengths, a variable delay, and an internal voltage calibrator. Dc operating voltages are supplied by a separate Power Supply PP-1295/UPM66, and may be checked by means of a meter mounted on the test set front panel. In addition the meter may be used to check mixer crystal currents and klystron repeller voltage.

*Power Supply:* 115 v  $\pm 10\%$ , ac, 380 to 1,000 cps, single-phase, 350 w

*Frequency Range:* Pulsed RF signals: 9375  $\pm$  40 mc with 2,000 pps repetition rate. IF Pulses: 60 mc delayed 8.6  $\mu$ sec.

*Pulse Generator:* Delayed Pulse: 0.4  $\mu$ sec delayed 6  $\mu$ sec

*Undelayed Pulse:* 5  $\mu$ sec

*Power Supply Output:* -175 v, dc, 50 ma; +300 V, dc, 116 ma; +150 v, dc, 105 ma; +6 v, dc, 440 ma

*Connectors:* Type N

*Input Impedance:* 50 ohms.

*Variable Attenuation for Accepting Signals:* 27 db to 40 db below 55 kw

*System Subclutter Visibility:* 12 to 40 db  $\pm 1$  db

*Receiver Subclutter Visibility:* 12 to 40 db  $\pm 1$  db

*Comparator Subclutter Visibility:* 12 to 40 db  $\pm 1$  db

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**RADAR TEST SET  
AN/UPM-66**

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*Synchroscope:* Sweep Delay: 3 to 13  $\mu$ sec. Sweep Speeds: 3, 12, and 150  $\mu$ sec

*Major Units:*

PP-1295/UPM-66

14 1/2 x 14 3/4" x 15"

48 lbs

TS-898/UPM-66

14" x 18" x 15 1/4"

55 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

PP-1295/UPM-66: 4 JAN-5727/2D21W, 3 JAN6080WA, 3 JAN-6AH6, 1 JAN-OA2, 2 JAN-12AT7WA, 1 JAN-6X4W, 1 JAN-5687, 1 JAN-5651.

TS-898/UPM-6: 10 JAN-12AT7WA, 1 JAN-6AU6WA, 4 JAN4AK5/5654/6096, 2 JAN-6AH6, 2 JAN-5725/6AS6W, 2 JAN-5687, 1 JAN-5727/2D21W, 3 JAN-5726/6AL5W/6097, 2 JAN-5751WA, 3 JAN-5814WA, 1 JAN-1Z2, 1 JAN-3RP1, 1 JAN-2K25, 2 JAN-1N23B, 2 JAN-IN126.

**REFERENCE DATA AND LITERATURE:**

MIL-T-945

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

23 May 1956

Cog Serv: USN FSN: 6625-539-8840

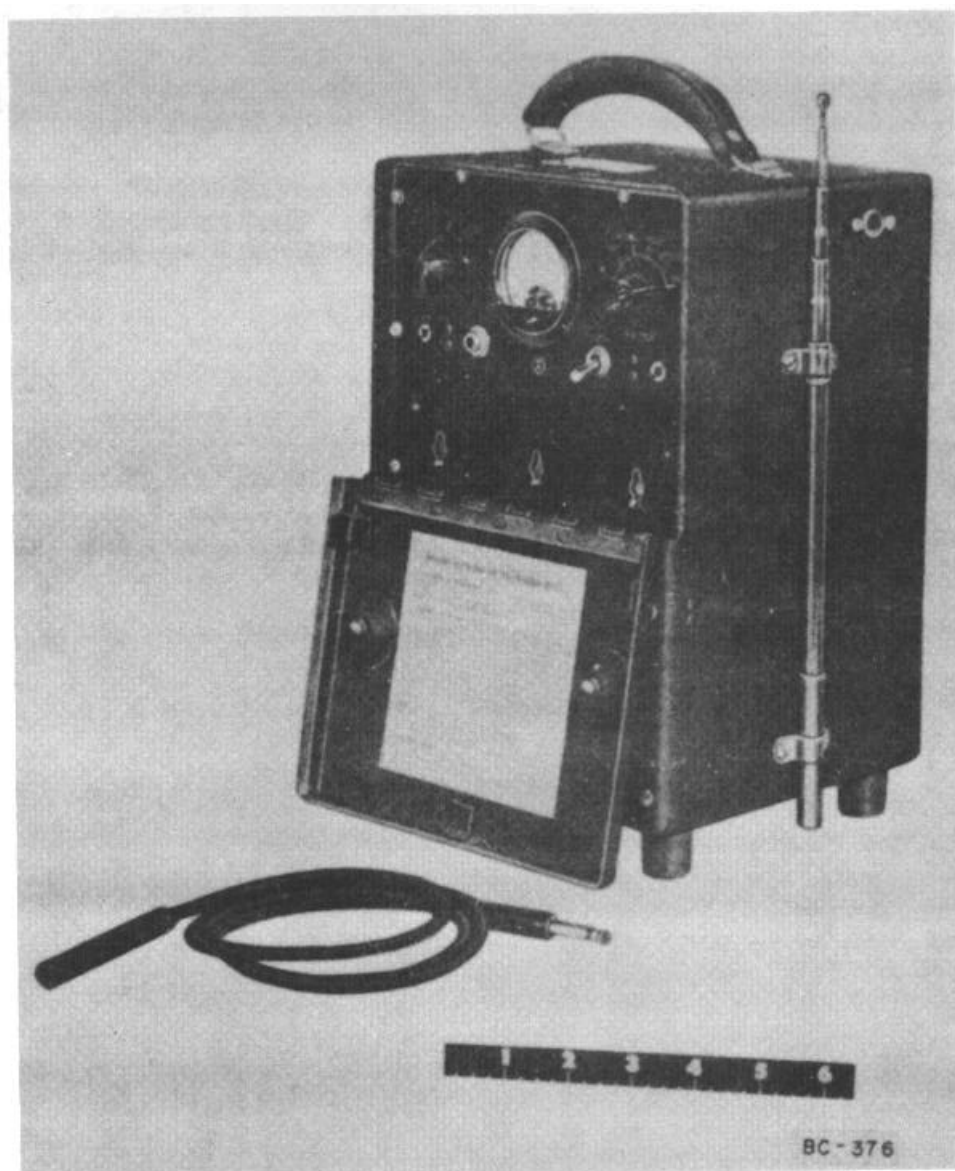
USA Line Item No:

TEST OSCILLATOR

BC-376-J

Functional Class: 10.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Packard Bell Company			

**FUNCTIONAL DESCRIPTION:**

A special purpose, portable unit used as a low power oscillator and heterodyne frequency meter in conjunction with Test Indicator BE-67 for adjustment of marker beacon receivers and transmitters.

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**TEST OSCILLATOR**  
**BC-376-J**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used to test Radio Beacons such as AN/ARN-12.

Various production models differ in dimensions and weight. Models A, B, C, D, and E are similar electrically and mechanically. Models F and G are similar electrically and mechanically and are screen grid modulated while all other models are plate modulated. Model H is the lightest in weight and uses iron core slugs for tuning the modulator stage.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* A crystal oscillator, operating at 12.5 mc is used, to excite a frequency tripler stage which drives a final doubler stage. This provides a 75 mc radio frequency output that may be amplitude modulated, if desired, with audio frequency signals supplied by the modulator stage.

*Antenna:* The antenna is mounted horizontally so as to produce horizontally polarized waves and is electrically connected to the doubler stage output by a flexible transmission line.

*Power Supply:* 1.5 v, supplied by one Battery BA-35 (1.5 v). 90 v, supplied by two Batteries, BA-36 (45 v).

*Frequency Range* 75 mc only.

*Modulation Frequencies:* 400, 1300, or 3000 cps.

*Type of Transmission:* Amplitude Modulated Carrier.

*Type of Reception:* cw.

*Effective Range:* 10 to 20 ft.

*Field Strength:* 900  $\mu$ v per meter at 100 ft from test oscillator with ant. of oscillator and field strength meter parallel and mutually perpendicular to a line between centers of ant.

*Accuracies:* Over the temp range of -26.1° C. to +55° C., the frequency drift with temp is less than 150 cps,  $\pm 2\%$  variation in modulation frequency.

*Major Unit:*

BC-376-J

12 5/16" x 9 3/16" x 7 3/4"

21.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

3 JAN-1A5GT, 1 JAN-1C5GT.

**REFERENCE DATA AND LITERATURE:**

TO 16-40BC376-2 (Maintenance Instructions).

TO 16-55-370 (Spare Parts List).

SB 11-100-69 (Serviceability Standards).

MIL-T-4466 (USAF)

C 1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USN FSN:

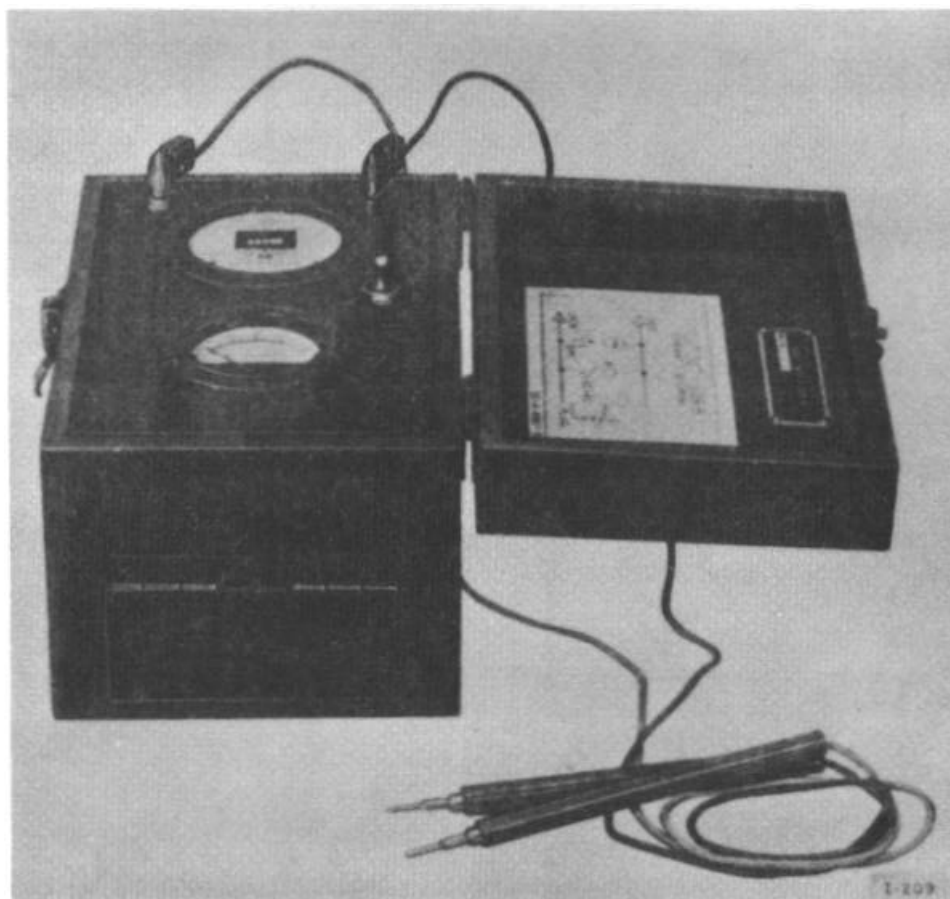
USA Line Item No:

TEST SET

1-209-B

Functional Class: 10.1.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer:	Bird Engineering Company Columbus Electronics Corp.			

**FUNCTIONAL DESCRIPTION:**

Test Set I-209-B is a portable unit used in testing power supply systems of radio direction finders, radio intercept centrals, and any other equipment within its voltage and frequency ranges. It consists of a vibrating reed-type frequency meter and a dynamometer-type voltmeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Direction Finder Central TC-8 and Radio Intercept Central TC-9.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 58 to 62 cy  $\pm 3\%$

*Voltage Range:* 100 to 150 v ac  $\pm 2\%$  (full scale)

*Major Units:* I-209-B

5 3/4" x 6 1/4" x 9"

5.25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TM 11-2501 Army Spec 71-1661-D, Dwg SC-D-6665



28 October 1954

Cog Serv: USAF FSN:

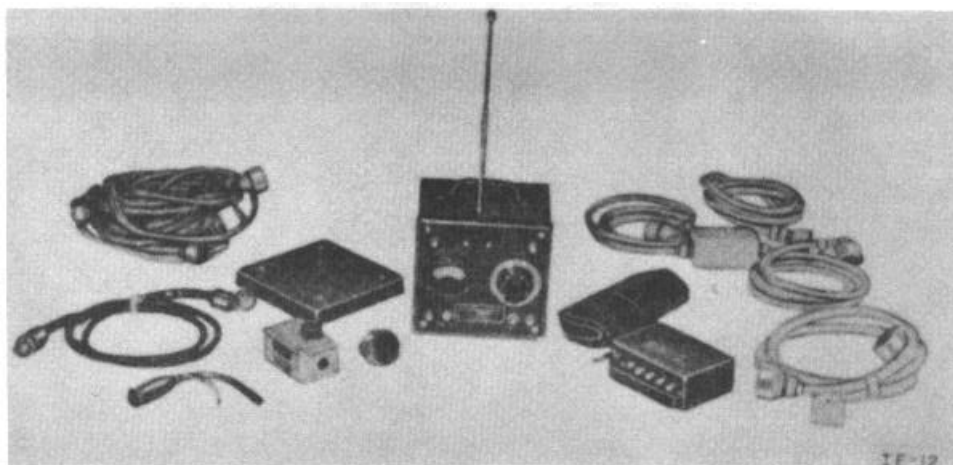
USA Line Item No:

TEST EQUIPMENT

IE-12-A

Functional Class: 10.2.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	L/Std	-----
Manufacturer:	Bendix Aviation Corporation			

**FUNCTIONAL DESCRIPTION:**

Test Equipment IE-12-A is a combination set used in testing airborne vhf communications equipment at a base or depot.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are similar.

**TECHNICAL DESCRIPTION:**

Technical characteristics of the following major components are described elsewhere in this publication:

Field Strength Meter I-95, 5.1

Signal Generator 1-96, 4.2.2

*Major Units:*

IE-12-A including:

1	Field Strength Meter 1-95-A	7 1/4" x 8 1/2" x 7 5/16"	10.7 lbs
1	Signal Generator I-96-A	19" x 26 1/2" x 9 1/2"	82
1	Dynamotor PE-94-CM	12 1/2" x 9" x 6 1/4"	34

**TUBES, CRYSTALS, TRANSISTORS:**

Refer to major components.

**REFERENCE DATA AND LITERATURE:**

AN 16-40IE12-3

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

28 October 1954

Cog Serv: USA FSN:

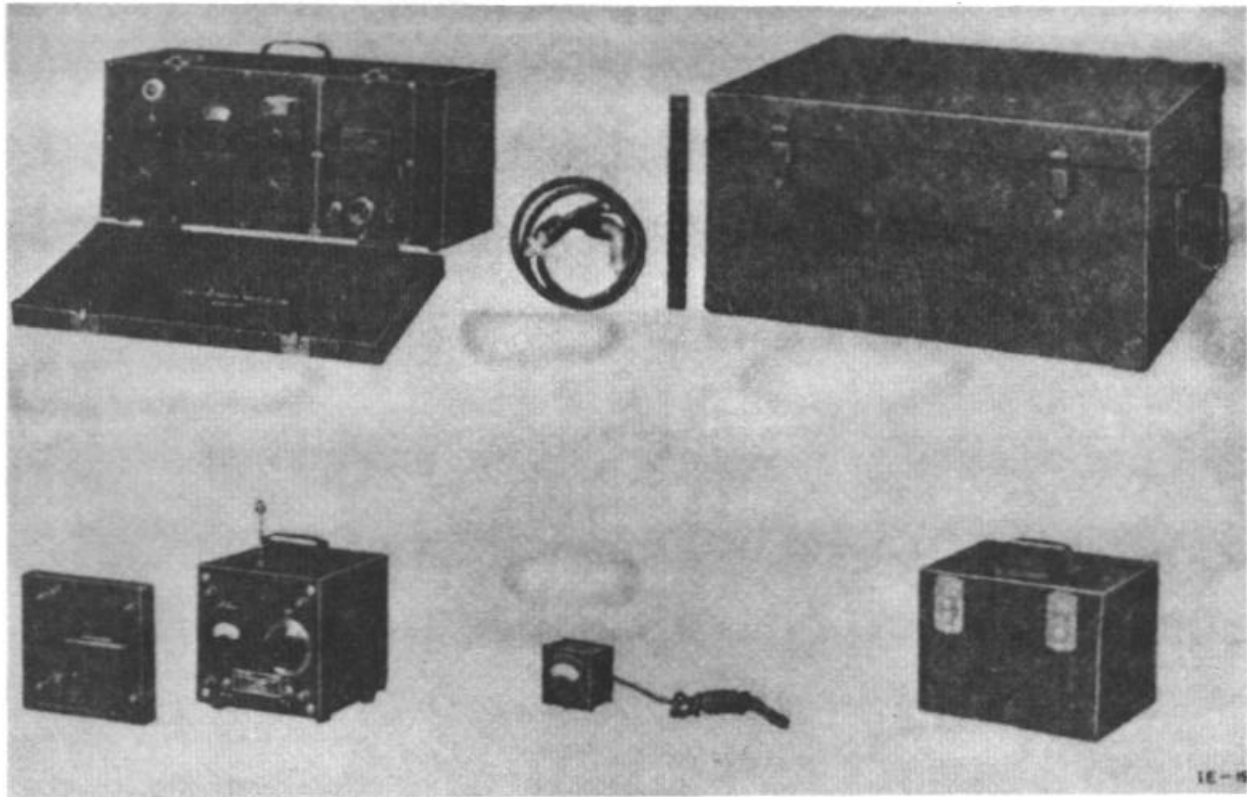
USA Line Item No:

TEST EQUIPMENT

IE-19-A

Functional Class: 10.2.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----
Manufacturer:	Rauland Corporation			

**FUNCTIONAL DESCRIPTION:**

Test Equipment IE-19-A is a combination set used in bench and field testing airborne communication equipment. It provides signals and measuring devices employed in aligning and testing transmitter and receiver units.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

Technical characteristics of the following major components are described elsewhere in this publication:

Field Strength Meter 1-95, 5.1

Signal Generator I-130, 4.2.2

Test Set I-139, 1.2.3

*Major Units:* E1-19-A Including:

1 BX-33-A	9 3/8" x 8 1/2" x 8 11/16"	9.5 lbs	
1 Field Strength Meter I-95-A	8 1/2" x 7 5/16" x 7 1/4"		11
1 Signal Generator I-130-A	19" x 9 3/4" x 7 9/16"		27.2

**TUBES, CRYSTALS, TRANSISTORS:**

Refer to major components.

**REFERENCE DATA AND LITERATURE:**

TO 16-10-111, TO 1640IE-1 Spec Sig C Dwgs C-6298, D-10169

16 September 1954

Cog Serv: USA FSN: 6625-351-5965

USA Line Item No:

TEST EQUIPMENT

IE-36

Functional Class: 10.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	L/Std	-----

Manufacturer: Argus, Inc.  
International Industries, Inc.  
Rauland Corporation

**FUNCTIONAL DESCRIPTION:**

Test Equipment IE-36 is a portable radar maintenance unit used in testing receiver sensitivity, relative modulation, starting and stopping mechanisms, functioning of the channel-selection circuits, receiver-transmitter-remote switching functions, and contractor operation in transmitter sections.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment Required But Not Supplied:* (1) Test Set I-139-A; Microphones: (1) T-17 (carbon), (1) T-44 (magnetic); (1) headset; (1) Bristol No. 6 set screw wrench.

**TECHNICAL DESCRIPTION:***Output:* rf noise generator*Antenna Power Range:* 6 to 10 w*Major Unit:*

I IE-36 11" x 10" x 4 2/5"

5.4 lbs

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

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TEST EQUIPMENT  
IE-36

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**TUBES, CRYSTALS, TRANSISTORS:**

**TUBE COMPLEMENT:**

None

**REFERENCE DATA AND LITERATURE:**

AN 08-40IE36-2, NAVAER 08-5Q-289, TO 16-55-91

20 August 1954			TEST EQUIPMENT
Cog Serv: USA FSN:			IE-56-( )
USA Line Item No:			Functional Class: 10.2
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	L/Std
Manufacturer:	Philco Manufacturing Company		

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Test Equipment IE-56-( ) is used in adjusting homing beacons and interrogator-responsors, and in checking frequency, range calibration, receiver alignment, transmitter output and overall system performance. Application is in field and depot maintenance.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Models A and B of this equipment are identical except for the addition of a frequency meter, signal generator, and receiver in model A.

#### TECHNICAL DESCRIPTION:

*Power Requirements:* 1.5 v, 135 v dc (I-196-B); 1.5 v, 45 v dc (BC-906-D); 1.5 v dc (BC-936-A); 1.5 v, 45 v, 135 v dc (BC-1066-B); power taken from equip. under test for BC-949-A (A); 1.5 v dc (BC-936-A); power taken from equip. under test for BC-949-A (B)

*Frequency Range:* 150 to 235 mc

*Type of Emission:* cw, pm

*Input Impedance:* 50 ohms to high impedance video (B)

*Pulse Duration:* 12  $\mu$ sec, 60  $\mu$ sec, 120  $\mu$ sec (A)

*Distance Range:* 10 mi, 50 mi, 100 mi

*Atmospheric Limits:* Dependent on battery operation (A)

*Accuracy:*  $\pm$ 25% of indicated freq (A)

*Major Units:*

1 IE-56-A		60.3 lbs
1 BC-906-D	9 1/4" x 6 3/4" x 12 3/8"	17.8 lbs
1 BC-936-A	2 3/8" x 3 5/8" x 6 1/2"	2 lbs
1 BC-949-A	8 1/2" x 6 1/2" x 9 1/2"	8 lbs
1 BC-1066-B	13 1/2" x 8" x 8"	17.5 lbs
1 CD-799	48" lg	
1 CD-800/U	48" lg	
1 I-196-B	12 1/2" x 8 1/4" x 8 1/4"	16 lbs
1 IE56-B		10 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

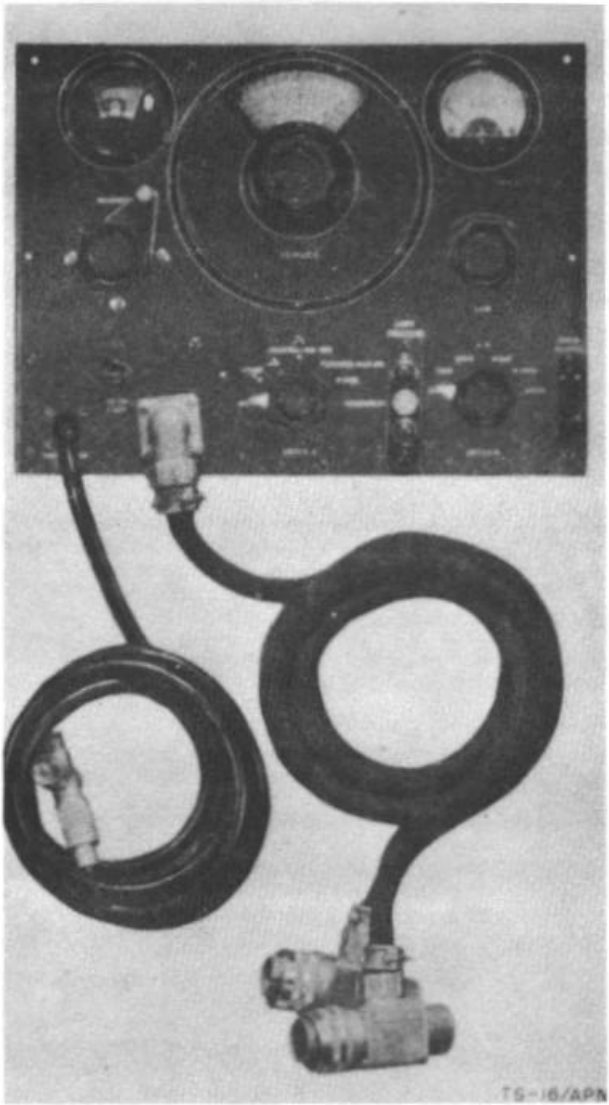
TUBE COMPLEMENT:

(1) 1D8GT, (1) 1S5, (1) 6H6GT, (1) 6SL7GT, (4) 957 (A); (1) 6H6GT, (1) 6SL7GT, (1) 957 (B)

#### REFERENCE DATA AND LITERATURE:

AN 08-40BC-906-2, AN 16-40BC936-2, AN 16-40BC949-2, AN 16-40BC1066-2, AN 16-40I196-2,  
AN 6-40SCR729-2, CO-AN-08-10EB-1  
Army Spec 71-1789

28 October 1954	TEST SET			
Cog Serv: USA FSN:	TS-16X/APN			
USA Line Item No:	Functional Class: 10.1.2			
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Electronics Corporation of America			



**FUNCTIONAL DESCRIPTION:**

Test Set TS-16X/APN is a portable unit used in checking altimeter counter and indicator circuits, modulation sweep frequency, and transmitter frequency swing. Application is in depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are identical except for the power supply.

*Equipment Required But Not Supplied:* (1) Impedance Adapter CU-20/APN, (1) Test Set TS-10/APN, (1) cathode-ray oscilloscope, (1) power supply (10 amp at 13.5 v dc)

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 12 to 14 v dc

*Frequency Range:* 410 to 470 mc  $\pm$ .3 mc

*Input Impedance:* 50 ohms

*Output Impedance:* 500 ohms; 15,000 ohms

*Audio Oscillator Range:* 351 to 6,840 cy (not continuous)

*Temperature Range:* -22° F to + 120° F

*Accuracy:* 2% (audio)

*Major Unit:*

1 TS-16X/APN 10 3/4" x 14 1/8" x 17 1/4"

40 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) 12A6, (2) 12J5GT, (2) 12SJ7, (1) 9002

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS-16-3, TO 16-55-115

USAF Spec 371-1714



28 October 1954

Cog Serv: USA FSN:

USA Line Item No:

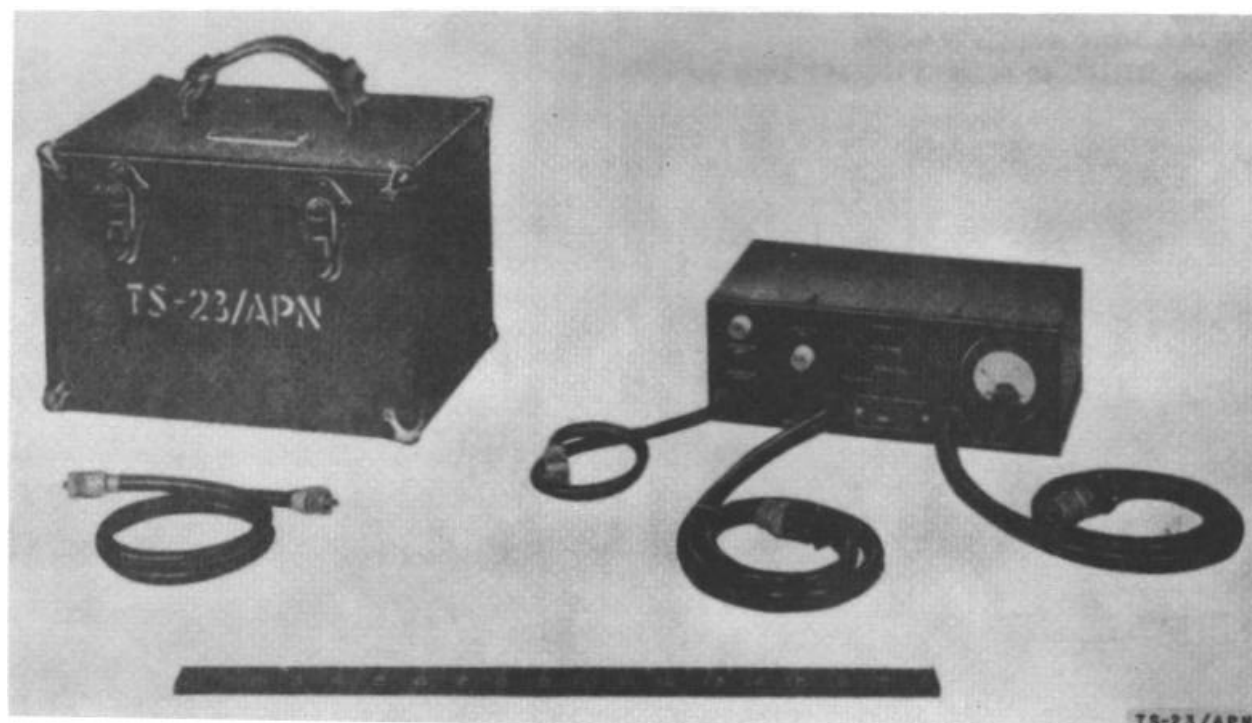
TEST SET

TS-23A/APN

Functional Class: 10.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Test Set TS23A/APN is a portable equipment used in measuring transmitter frequency, in checking transmitter power output, in supplying detected transmitter pulses to the indicator of the set under test, and in measuring the B+ voltage of the set under test. Application is in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are electrically and mechanically interchangeable.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 200 w, 115 v  $\pm 10\%$ , 10 ma, 400 to 1,000 cy, 1 phase ac

*Frequency:*

Input: 440 mc

Output: Video

*Type of Reception:* Pulse

Impedance

Input: 50 ohms

Output: 75 ohms

Temperature Range:  $-40^{\circ}$  C. to  $+55^{\circ}$  C. (operating);  $-65^{\circ}$  C. to  $+85^{\circ}$  C. (nonoperating)

*Humidity Range:* To 90%

*Altitude Range:* Sea level to 5,000 ft (operating); sea level to 50,000 ft (nonoperating)

*Accuracy:*  $\pm 1\%$  (freq),  $\pm 5\%$  pwr,  $\pm 15\%$  (voltage)

*Major Unit:* 1 TS-23A/APN/ 6" x 11" x 4"

7 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

Tube Complement:

(1) 28D7

**REFERENCE DATA AND LITERATURE-**

Spec MIL-T4310(USAF); USAF Dwg 51C13952)

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

23 November 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

WAVE AND POWER METER SET  
 TS-107/TPM-1  
 Functional Class: 10.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer:	Western Electric Company			



#### FUNCTIONAL DESCRIPTION:

Wave and Power Meter Set TS107/TPM-1 is a portable unit used in measuring or checking the frequency of radio transmitters, signal generators, and beat-frequency oscillators. It will also measure the average power of cw, mcw or pulsed radar sets and provide a video output signal for testing oscilloscopes.

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**WAVE AND POWER METER SET**  
**TS-107/TPM-1**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radar Test Set AN/CPM-6, Test Set AN/MPM-14, and Test Set AN/TPM-1.  
Equipment Required But Not Supplied: Battery: (3) BA-30

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 0.25 w, 4.5 v dc  
*Frequency Range:* 500 to 1,500 mc  $\pm 3$  mc  
*Type of Reception-* cw, mcw, pulse  
*Power Range:* 0.5 to 120 mw  
*Current Range:* 0 to 15 ma  
*Impedance:* 50 ohms  
*Temperature Range:* -10° F. to +120° F.  
*Accuracy:*  $\pm .5$  db (rel pwr);  $\pm 1$  db (abs pwr)  
*Major Unit:* 1 TS107/TPM-1    7 3/16" x 9 9/16" x 14 3/4"

18 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENTS:**

(1) 1N21B

**REFERENCE DATA AND LITERATURE:**

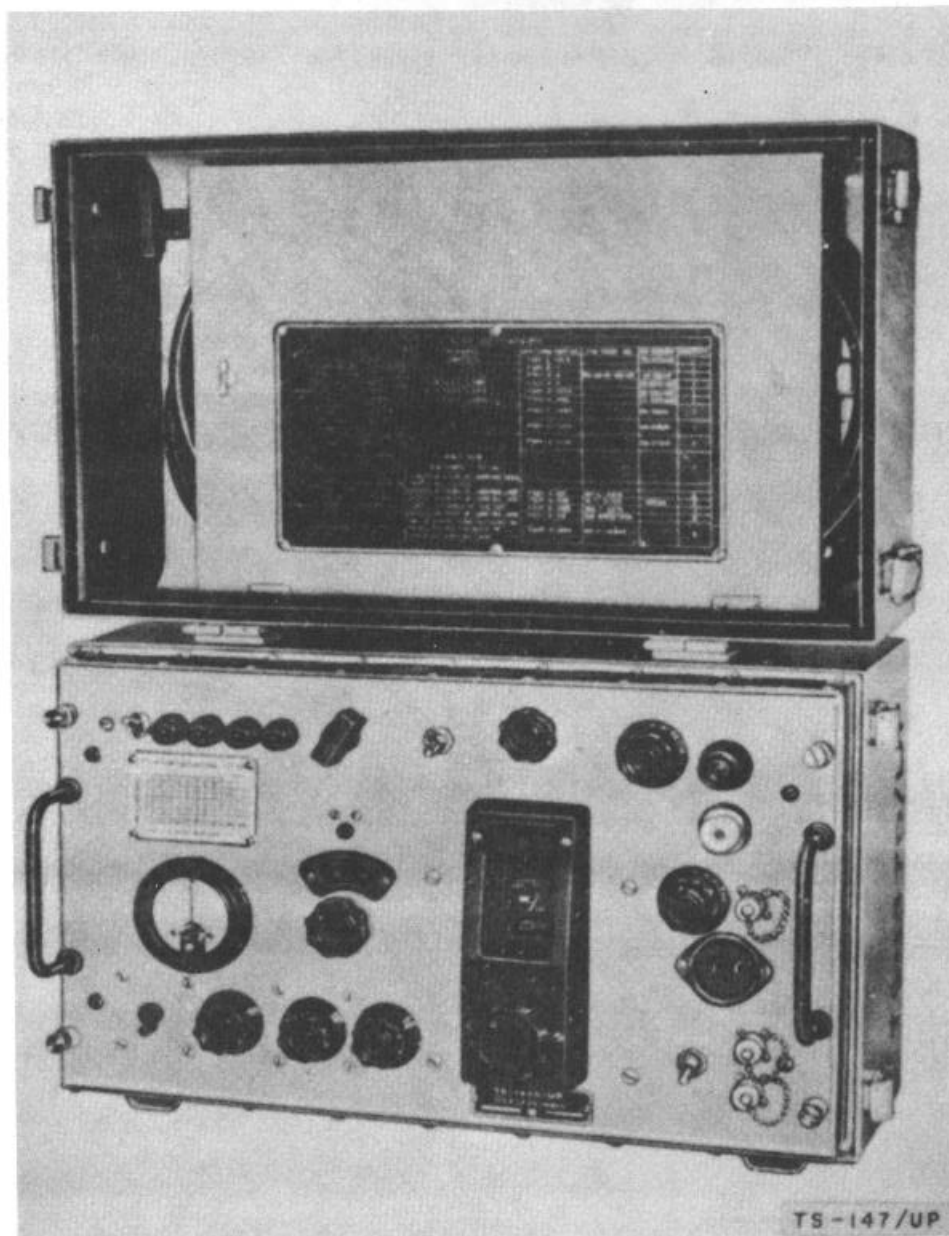
TO 16-35TS107-2-M, TO 16-55-326, NAVSHIPS 900,454A; TM 11-1069; TM 11-1200 Navy Spec OS-3087;  
USAF Spec 371-5080

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

17 September 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

TEST SET  
 TS-147D/UP  
 Functional Class: 10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	L/Std	-----
Manufacturer:	General Communications Company			



**FUNCTIONAL DESCRIPTION:**

Test Set TS-147D/UP is a portable unit used in testing and adjusting beacon equipment and radar systems. It provides fm or cw signals of known power level and frequency for radar receiver testing. The equipment measures frequency, power, spectrum width, frequency fluctuation, TR recovery time, and standing wave ratio of rf signals. The test set permits external modulation to produce a pulsed rf signal.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are basically similar. Differences are in progressively advanced circuit and mechanical design. The TS-147/UP supersedes Signal Generator TS-35/AP and Test Set TS146/UP.

*Equipment Required But Not Supplied:* (1) Directional Coupler CG-176/AP, (1) Oscilloscope TS-34/AP or TS-239/UP

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 125 w, 115 v  $\pm$  10 v, 50 to 1,600 cy, 1 phase ac

*Frequency Dieter:*

*Frequency Range:* 8,470 to 9,630 mc  $\pm$ 2.5 mc

*RF Power Range:* +7 to +30 dbm  $\pm$  1.5 db

*Wattmeter:*

*Power Range:* +7 to +30 dbm (input); -7 to -45 dbm (output)

*Accuracy:*  $\pm$ 1.5 db

*Sawtooth Sweep:*

*Amplitude:* 0 to -100 v

*DC Level:* -60 to -210 v

*Slope:* 0 to +2 v/sec

*Trigger Amplifier Voltage Gain:* 500 (approx)

*Signal Generator:*

*Frequency Range:* 8,500 to 9,600 mc

*Phase Range:* 3 to 50 ;sec

*Power Output:* -7 to -85 dbm  $\pm$ 1.5 db

*Sweep Frequency:* 0 to 40 mc

*Type of Emission:* cw, fm

*Major Unit:* 1 TS-147D/UP      13" x 11 3/4" x 19 1/2"

47 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**TUBE COMPLEMENT:**

(2) OC3, (1) 1N23B, (1) 2K25, (1) 5R4GY, (1) 6SH7, (2) 6SL7GT, (1) 6Y6G

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91716, TM 11-1247, TO 16-35TS147-15

Spec MILT-15254A (Ships)



C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-192-5085; 6625-192-5088(C)

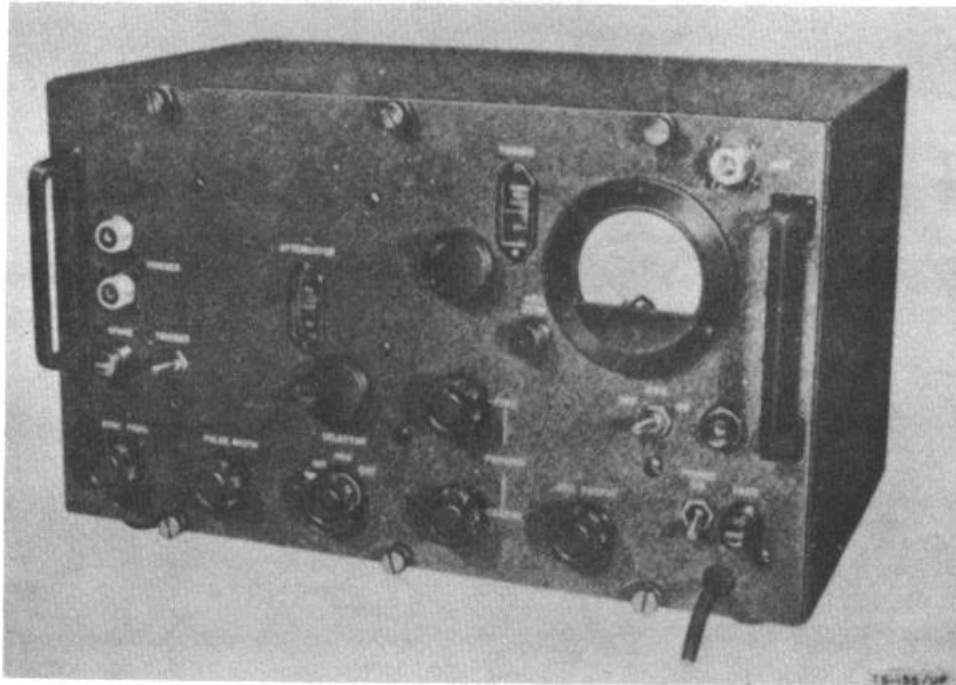
USA Line Item No:

SIGNAL GENERATOR

TS-155( )/UP

Functional Class: 10.1.4

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer:	Boonton Radio Co. Westinghouse Corp.			

**FUNCTIONAL DESCRIPTION:**

Signal Generator TS 155( )/UP is it portable equipment used in field testing and in checking over-all system performance, receiver sensitivity, and power output of transmitters. It also supplies external trigger pulses to radar systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment, part of Test Sets AN/MPM-2., -3, -5, and -7, are similar except for parts and frequency range.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 100 w, 115 v  $\pm 10\%$ , 50 to 800 cv, 1 phase ac (B); 100w, 115 v  $\pm 10\%$ , 50 to 1,600 cv, 1 phase ac (provision also for 230 v operation)) (C)

*Frequency Range:* 2,700 to 2,900 mc (B); 2,700 to :3,400 mc in three bands (C)

*Type of Emission,:* PM(B); pulse (C)

*Power Range:* -20 to -100 dbm

*Output Trigger Repetition Rate:* 120 to 2,000 pps

*Output Trigger Amplitude:* 15 to 100 (B); +50 to +100 v (C)

*Pulse Width:* 0.75 to 6  $\mu$ sec

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

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**SIGNAL GENERATOR**  
**TS-155( )/UP**

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*Pulse Delay:* 5 to 1,800  $\mu$ sec*Major Unit:* 1 TS155( )/UP 17" x 10" x 10"

50 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

TUBE COMPLEMENT:

(1) OC3, (1) OD3, (1) 1N21B, (1) 2C40, (1) 5Y3GT, (1) 6AG7, (4) 6SN7GT (B, C)

**REFERENCE DATA AND LITERATURE:**

Spec MIL-G-10728 TM 11-2657-B(B)

TM 11-2657-C(C)

SIG 8-TS-155B/UP(B)



C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

8 June 1964

Cog Serv: USA FSN:

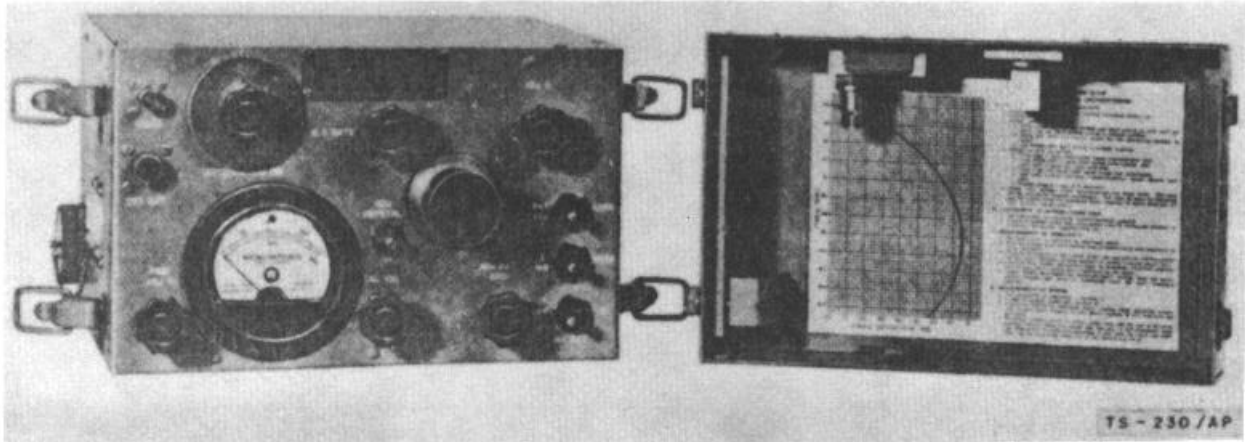
USA Line Item No:

FREQUENCY-POWER METER

TS-230C/AP

Functional Class: 10.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer:	Hycon Manufacturing Company			

**FUNCTIONAL DESCRIPTION:**

Frequency-Power Meter TS-230C/AP is a portable radar test set used in measuring frequency and power of unmodulated and pulsed signals. It permits the detection of small percentages of rf power so that wave forms of pulsed signals can be displayed on an oscilloscope.

**RELATIONSHIP TO SIMILAR EQUIPMENT**

Models of this equipment are basically identical and supersede Frequency Meter TS-33/AP.  
*Equipment Required But Not Supplied:* Battery: (4) BA-30.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 6 v or 24 to 30 v, .19 amp dc

*Frequency Range:* 8,500 to 9,700 mc  $\pm 4$  mc

*Type of Reception:* cw, pulse

*Power Range:* 0.1 to 1,000 mw  $\pm 2.2$  db

*Voltage Standing Wave Ratio:* 1.26 (max)

*Temperature Range:* -40° C to  $\pm 55^\circ$  C

*Major Unit:* 1 TS-230C/AP 6" x 10" x 12 1/2"

10.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) 1N23A

**REFERENCE DATA AND LITERATURE:**

Spec-M-15453A(Ships) 15 January 1951  
 NAVSHIPS 91714, SHIPS 372

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET  
TS-233/TPN-2

1 March 1964

Cog. Serv: USA FSN: 6625-319-3456

USA Line Item No:

Functional Class:10.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer: Fada Radio and Electric Company, Inc.				

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable, special purpose set, used by all maintenance echelons in testing a beacon transmitter-receiver. It consists of a crystal controlled harmonic signal generator, a heterodyne type wavemeter calibrated with a self-contained crystal oscillator, and a built-in high voltage power supply. The test set is used as a wavemeter to check the transmitter frequency, and as a signal generator to check the receiver frequency. Five crystals (1N21B) are used in this set, one crystal for calibrating in each of the five channels in which the beacon operates. All controls and indicators are located on the front panel of the set. The telescoping antenna extends through an opening in the top of the case. A power cord connects to a twist-lock plug at the rear of the case.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This set is used in testing Beacon Transmitter Receiver AN/TPN-2.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The test set consists of a crystal oscillator (Pierce oscillator circuit), a detector-mixer (untuned, nonlinear), a variable frequency oscillator (modified Hartley oscillator, cathode grounded through choke coils instead of returning to the tank coil), two stages of audio-amplification, and a high voltage power supply (full-wave rectifier, regulated to 210 v, dc).

*As a wavemeter:* The variable oscillator signal is heterodyned with the incoming signal from the antenna, which is a series of radio frequency pulses. The beat note at the mixer output consists of pulses at the same recurrence rate as the incoming radio frequency signal. The beat heard at the headphones is at a minimum when the incoming signal is at the same frequency as the variable oscillator, making alignment possible.

*As a signal generator:* The variable oscillator signal is radiated from the antenna and received by the beacon receiver. This radiated signal provides a standard signal in adjusting the receiver tuning.

*Power Supply:* 115 v, ac, 60 cps, single phase, 50 w, derived from the receiver-transmitter component of the beacon or from a separate source.

*Frequency Range:* 200 to 250 mc.

*Testing Frequencies:* 214, 219, 224, 229, 234 mc. Any frequencies between these points may be found by interpolation.

Channel	Fundamental Crystal	
	Frequency (kc/s)	32 Harmonic (mc/s)
A	6,687.5	214
B	6,843.75	219
C	7,000.0	224
D	7,156.25	229
E	7,312.5	234

*Type of Transmission:* cw

*Type of Reception:* Pulsed

*RF Power Output:* 4.5 mw (to beacon receiver)

*Input Impedance:* Telescopic Rod Antenna (15" extended, 5" collapsed)

*Output Impedance:* Telescopic Rod Antenna (rf), also a video output to the test headset

*Distance from Antenna to Beacon:* 20 ft, normal. 50 ft, max

*Accuracy:*  $\pm 0.02\%$  ( $\pm 70$  kc) of indicated frequency at beacon channel freq.  $\pm 0.1\%$  at all other freq.

*Temperature Range:*  $-40^{\circ}\text{C.}$  to  $+65.5^{\circ}\text{C.}$ , operating

*Major Unit:*

TS233/TPN-2      10 5/8" x 6 5/32" x 7 1/2"

25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

2 JAN-OC3/VR-105, 1 JAN-5Y3GT, 1 JAN-AK5, 1 JAN6C4, 1 JAN-6J6, 1 JAN-9002.

**REFERENCE DATA AND LITERATURE:**

TO 16-55-327 (Spare Parts List).

TM 11-1157 (Operating and Maintenance Instructions for AN/TPN-2.

R-7412

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST OSCILLATOR

TS-326B/U

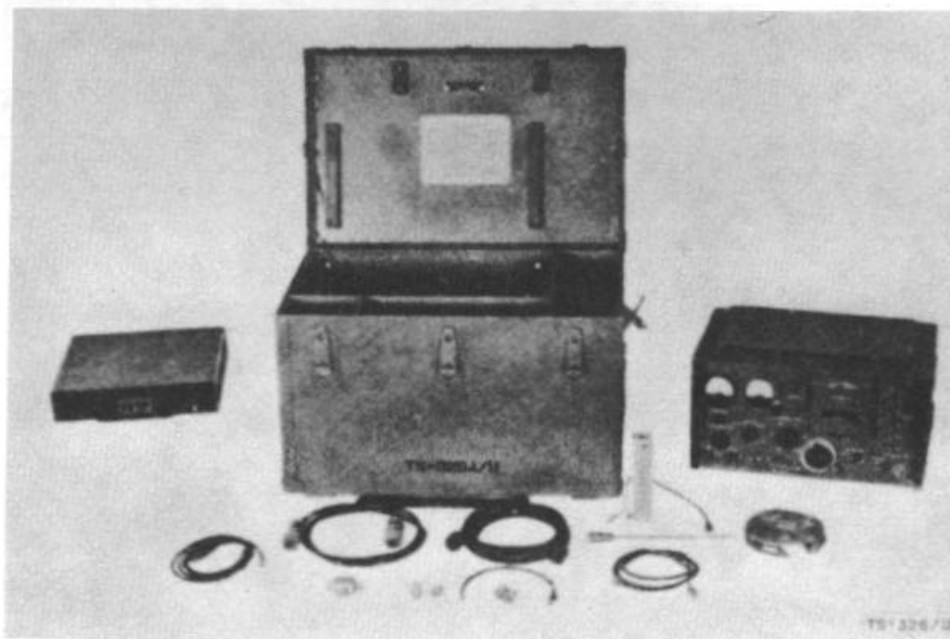
23 November 1954

Cog. Serv: USA FSN: 6625-532-6123

USA Line Item No: 682770

Functional Class:10.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer: Radio Corporation of America, RCA Victor Division				

**FUNCTIONAL DESCRIPTION:**

Test Oscillator TS326B/U is a portable equipment used either as an rf signal generator or a crystal-controlled heterodyne frequency meter. Application is in organizational, field, and depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 105 to 125 v, 1.5 amp, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 50 to 100 mc  $\pm$ .25 mc

*Type of Emission:* am at 300 cy; 475 cy; 650 cy; 755 cy; 955 cy; 1,195 cy; 1,390 cy; 1,900 cy; 3,000 cy; 0 to 90%

*Voltage Output Range:* 1 to 100,000  $\mu$ v; .1 to 1 v

*Impedance:* 50 ohms

*Temperature Range:* -40° C to +55° C (operating); -55° C to +85° C (nonoperating)

*Accuracy:*  $\pm$ 10% (modulation)  $\pm$ 15% (voltage)

*Major Unit:*

TS-326B/U      18X" x 17" x 12 1/2"

60 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(3) 0A2, (1) 5R4GY, (2) 6AK5, (8) 6J6, (1) 5750, (1) 5814

**REFERENCE DATA AND LITERATURE:**

Instruction Book

MIL-T-4406, 25 February 1952

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

ELECTRONIC SWITCH

TS-433B/U

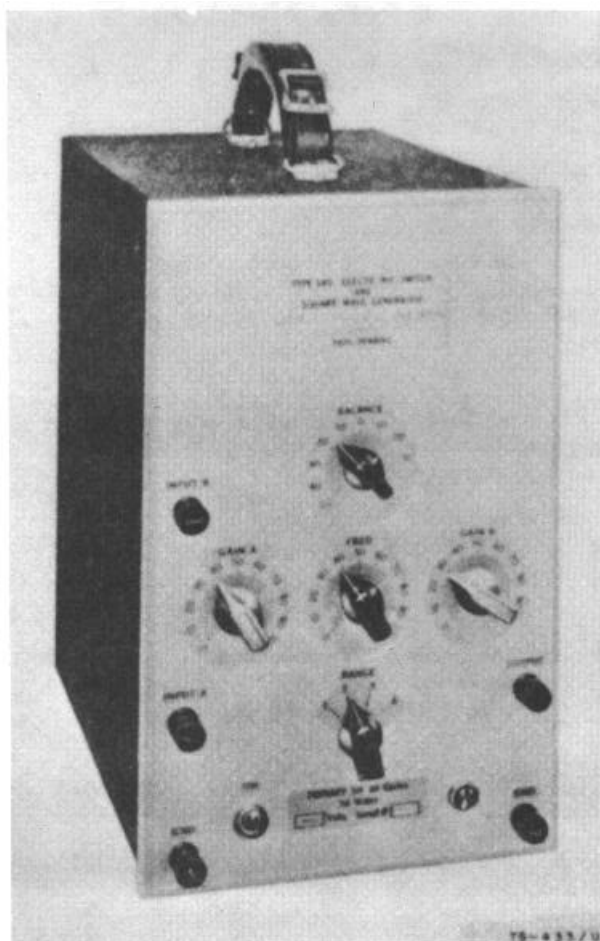
1 March 1964

Cog. Serv: USA FSN: 6625-223-5108

USA Line Item No: 614930

Functional Class:10.1.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Dubrow Development Laboratories				

**FUNCTIONAL DESCRIPTION:**

Electronic Switch TS-433B/U is a portable instrument that permits simultaneous observation of two recurrent patterns on a cathode-ray oscilloscope. A square wave voltage of variable frequency and amplitude is available for use as a test signal in studying the transmission characteristics of vacuum-tube amplifiers and other circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Electronic Switch, Allen B. DuMont Type 185-A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 30 w, 115 or 230 v,  $\pm 10\%$ , 50 to 60 cy, 1 phase ac

*Frequency Range:**Electronic Switch:* 10 to 2,000 cy*Square Wave Generator:* 10 to 500 cy*Voltage Range:**Signal Amplifier:* 1.5 to 150 v (input); 75 v peak-to-peak (output)*Square Wave Generator:* 0 to 30 v, peak-to-peak*Impedance:* 50,000 ohms (output); 100,000 ohms  $\pm 10\%$  (input)*Major Units:*

TS-433B/U 10" x 8 3/4" x 13"

24 lbs

**TUBES, CRYSTALS, TRANSISTORS-**

## TUBE COMPLEMENT:

(1) 5Y3GT, (2) 6SJ7GT, (2) 6SN7GT

**REFERENCE DATA AND LITERATURE:**

TM 11-5049

MIL-E-11702A(SigC)

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

SIGNAL GENERATOR

TS-452C/U

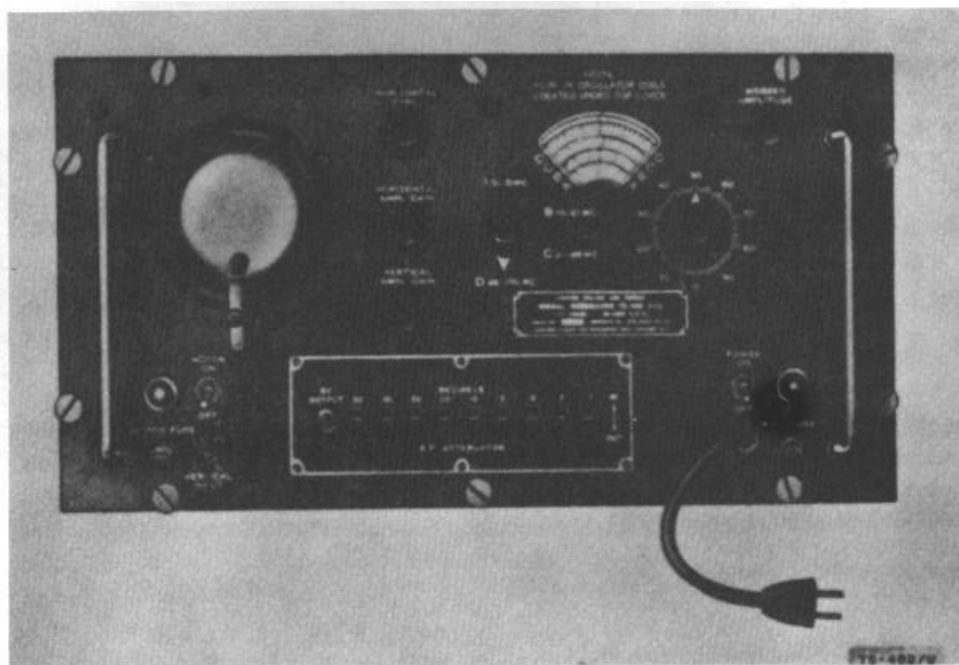
1 April 1955

Cog. Serv: USA FSN: 6625-708-2946

USA Line Item No: 664790

Functional Class:10.1.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Lewyt Manufacturing Corporation				

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, combination signal generator and wavemeter used to check the alignment of intermediate frequency and radio frequency circuits. It is used for the maintenance of equipment, as a laboratory instrument for experimental work, and for production testing. Band-pass characteristic curves are plotted electronically on the screen of a cathode ray tube for a particular network.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Functionally the TS-452/U, TS452A/U, TS45CB/U and TS-452C/U are similar. Location and labeling of controls and indicators in the models differ; however, the same number and means of controls are employed.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The signal generator is a modulator type; the frequency is varied by a motor-driven capacitor over a selected range of 60 to 120 cps. In order to provide a time base corresponding to frequency, a sweep generator is also driven by the same capacitor motor. The wavemeter is an absorption type; a blank section in the oscilloscope track accurately locates frequency points.

*Power Supply:* 115 v  $\pm$  10%, ac, 1 phase, 50 to 1600 cps, 125 w approx



*Frequency Range:**Signal Generator:* 5 to 100 mc in six bands: 5 to 10, 8 to 15, 12 to 24, 19 to 39, 30 to 60, 47 to 100 mc*Wavemeter:* 5 to 100 mc in four bands: 5 to 10, 10 to 20, 20 to 40, and 40 to 100 mc*Vertical Amplifier Flat Frequency Response:* 20 to 30,000 cps*Type of Transmission:* fm*Oscillator RF Output Voltage:* 0.25 v min into matched load, and constant within  $\pm 5\%$  over each freq range*Output Impedance:* 75 ohms  $\pm 2\%$ *Input Impedance of Probe:* 2.5  $\mu$ f shunted by 470 ohms*Attenuator Steps:* 1, 2, 3, 5, 10, 20, 30, 30 (101 db in 1 db steps)*Oscillator RF Output Hum Modulation:*  $\pm 2\%$  max*Accuracy:**Wavemeter:*  $\pm 0.33\%$ . Readable freq accuracy on scope image  $\pm 0.5\%$  of freq*Attenuator:*  $\pm 0.2$  db for attenuator steps 1, 2, 3 db $\pm 0.25$  db for attenuator steps 5 db $\pm 0.5$  db for attenuator step 10 db $\pm 1.0$  db for attenuator step 20 db $\pm 1.5$  db for attenuator step 30 db*Harmonic Content:* No harmonic will have an amplitude greater than 5% that of the fundamental frequency.*Major Units:*

1 TS452C/U 19" x 16" x 9 3/4"

55.0 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

## TUBE COMPLEMENT:

3 JAN-6SN7GT, 1 JAN-6AQ6, 2 JAN-6X5GT, 2 JAN-OD3/VR-150, 1 JAN-3BP1-A, 2

JAN-6SL7GT, 1 JAN-6J6, 1 JAN-1B3GT.

**REFERENCE DATA AND LITERATURE:**

33A1-8-90-2 (Maintenance Instructions)

33A1-8-90-4 (Parts Catalog)

Exhibit ENG-367

MIL4933 (USAF)

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET  
TS-522/CRT-3

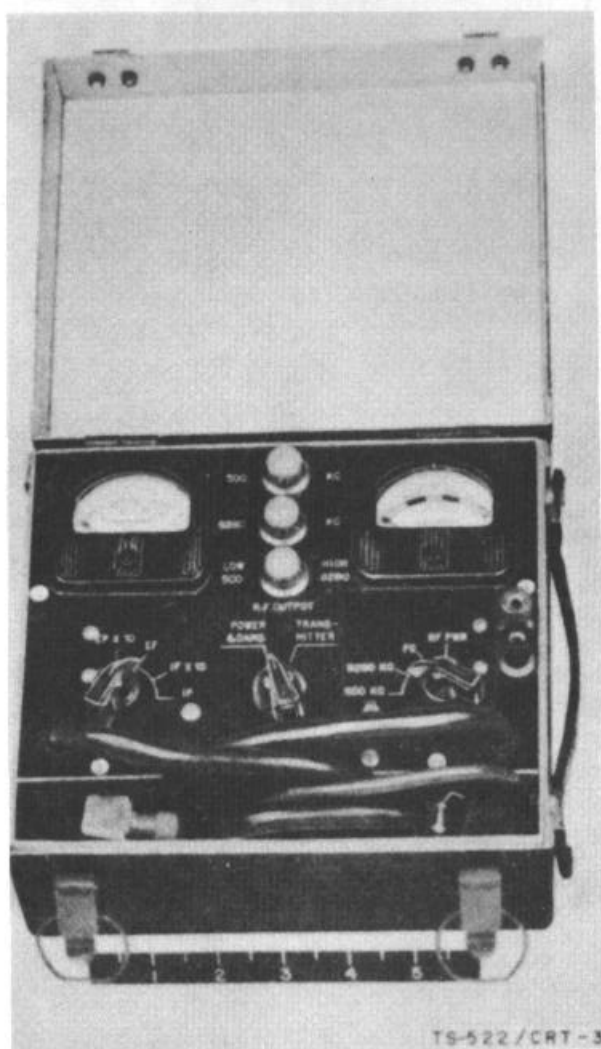
28 October 1954

Cog. Serv: USA FSN:

USA Line Item No:

Functional Class:10.1.11

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Obs	L/Std	-----
Manufacturer: John Meck Industries, Inc. & Nilsson Electrical Laboratory				

**FUNCTIONAL DESCRIPTION:**

Test Set TS-522/CRT-3 is a portable instrument used in measuring transmitter plate and filament voltages and currents, in checking the functioning of the automatic keying and frequency changing cams, in determining modulation and rf power output, and in checking the transmitter power supply.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

*Equipment Required But Not Supplied:* One high impedance headphone set

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 24 v, 0.3-amp dc; 320 v, 0.04 amp dc

*Major Units:*

TS-522/CRT-3      9" x 3 7/8" x 8 3/4"

5.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

AN 16-35TS522-3, TO 16-35TS522-4

71-5056-A (USAF Spec)

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET  
TS-538B/U

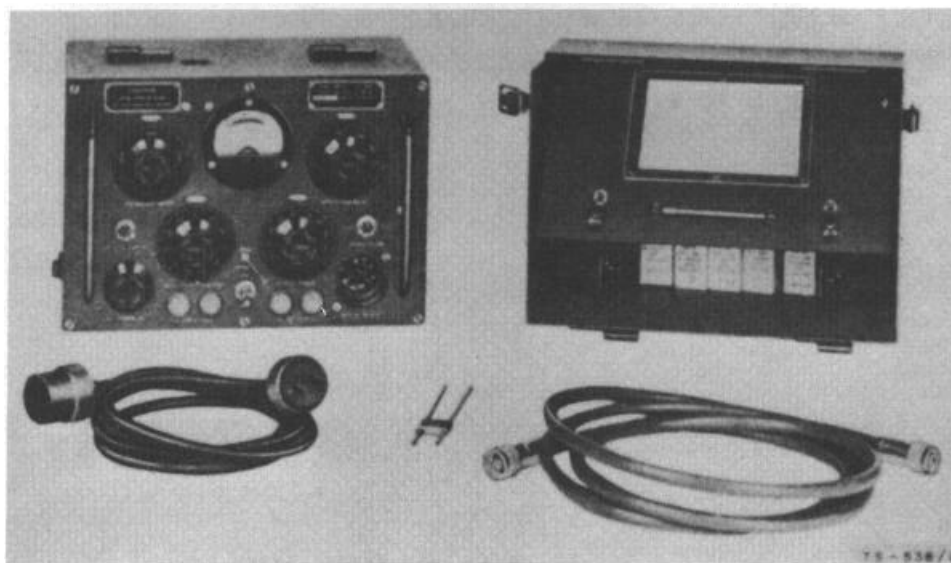
1 March 1964

Cog. Serv: USA FSN:

USA Line Item No:

Functional Class:10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Allen B. Cardwell Company.				

**FUNCTIONAL DESCRIPTION:**

Test Set TS-538B/U is a portable instrument functioning as a signal generator, frequency meter, and power monitor. It is used in testing the operation of radiosonde equipment and in checking the power output of transmitters, as well as the bandwidth, alignment, and sensitivity of receivers. Application is in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 117 v  $\pm$  10%, 60 cy, 1 phase ac

*Frequency Range:* 1,630 to 1,730 mc  $\pm$  2 mc

*Power Monitor Sensitivity:* 150 to 250 mw at 10 in.

*Power Output:* -20 to -107 dbm  $\pm$  3 db

*Impedance:* 50 ohms

*Pulse Repetition Rate:* 5 to 200 pps

*Pulse Width:* 50  $\mu$ sec  $\pm$  10  $\mu$ sec

*Temperature Range:* -40° C to +55° C (operating); -54° C to +65.5° C (nonoperating)

*Humidity Range:* To 100% (operating)

*Altitude Range:* Sea level to 5,000 ft (operating); sea level to 40,000 ft (nonoperating)

*Major Units:*

TS-538B/U      11 1/2" X 8" X 9 1/4"

23.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

(1) OB2, (1) 1N23B, (3) 6J6, (1) 6X4, (1) 5675

**REFERENCE DATA AND LITERATURE:**

TM 11-5014, TO 16-40TS538-5

MILT-10151(SigC), 20 February 1950

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET  
TS-541/TPS

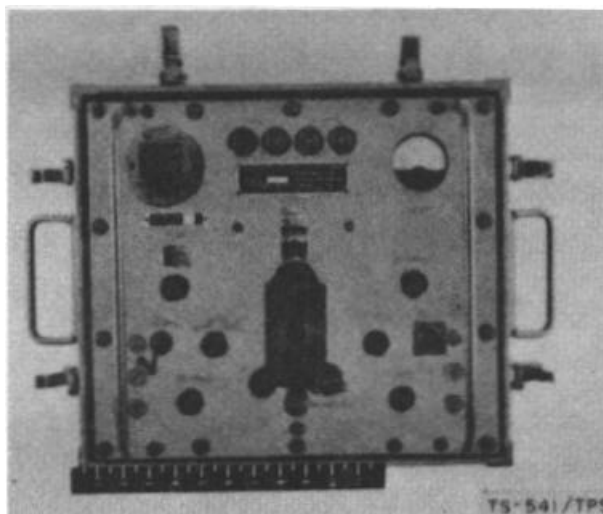
5 November 1954

Cog. Serv: USA FSN:

USA Line Item No:

Functional Class:10.1.3

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer: Espy Mfg. Co, Inc. And Sylvania Electric Products, Inc.				

**FUNCTIONAL DESCRIPTION:**

Test Set TS-541/TPS is a portable unit used in field or laboratory measurements of radar equipment. This unit permits afc circuit checks afc discriminator alignment, and performance checks of radar transmitter frequency, power-output and spectrum, magnetron pulling, and radar receiver sensitivity, frequency, bandwidth, and recovery time.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Test Set TS-147/UP.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 70 to 110w, 110 v  $\pm$  10% 50 to 1,200 cy, 1 phase ac

*Type of Emission:* cw, fm, pulse

*Power Range:* -20 to  $\pm$ 95 dbm (with 25 db directional coupler assy)

*Power Output:* -40 to -90 dbm (avg pwr)

*Major Units:* 1 TS541/TPS 13 1/2" x 15 3/4" x 14 1/2"

55.25 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

TUBE COMPLEMENT:

(3) OD3, (1) 2K25, (1) 5R4GY, (1) 6J5GT, (1) 884

**REFERENCE DATA AND LITERATURE:**

USAF Spec 7483-B, TO 16-35TS541-2, TO 16-35TS541-3, TO 16-35TS541-4

C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

CALIBRATOR, BELLOWS TRAVEL

UG58A-1

8 September 1955

Cog. Serv: Commercial FSN:

USA Line Item No:

Functional Class:10.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Minneapolis-Honeywell Regulator Company				

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable overhaul and maintenance test fixture designed to facilitate the mechanical testing and calibration of the PG 7007B-2 Airspeed Compensator, a component of the MH-11C-1 Autopilot System. It is used to measure the travel of the compensator bellows at the top of the compensator spring assembly.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

The calibrator consists of a bench mounted stand with adjustable mountings for the base of the airspeed compensator and for a standard type depth micrometer. The micrometer is electrically insulated from the calibrator stand and terminals are provided to permit a continuity test to be made between the stand, compensator, and micrometer. This provides a precise means of determining contact or disengagement between the micrometer and the compensator bellows.

*Major Units:***TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Manufacture 's Data Sheet and Drawing.

**C1, MIL-HDBK-172A, VOL I/TM 11-487H-1/1**  
**TESTER, ALTITUDE COMPENSATOR, ELECTRICAL**  
**UG 152A-1**

8 February 1956

Cog. Serv: Commercial FSN:

USA Line Item No:

Functional Class:10.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer: Minneapolis-Honeywell Regulator Company</b>				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A special purpose overhaul tester used to measure the characteristics of the two potentiometers in the PG4A Altitude Compensator. The equipment is designed to indicate input and output voltage and resistance. It also provides facilities for checking continuity between the connector pin and either potentiometer.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None

**TECHNICAL DESCRIPTION:**

*Circuit Information:* ac or dc power is supplied to the tester through a polarized plug. A cable and connector are provided for making electrical connections between the tester and the unit under test. Two potentiometers, switches, pilot lamps, and resistors make up the components of the system.

*Power Supply:* 115 v, dc, or 115 v, ac, 60 cps, single phase, 6 w.

*Potentiometer Calibrations:* Inner Dial: 100 divisions

Outer Dial: 20 divisions

*Major Units:* 1 UG 152A-1 5 3/4" X 7 3/8" x 4 3/4"

2 1/2 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None.

**REFERENCE DATA AND LITERATURE,**

Minneapolis-Honeywell Data Sheet



**APPENDIX B**  
**INDEX BY NOMENCLATURE TYPE NUMBER**  
**CATEGORIES 3-10**

<i>Type No.</i>	<i>Functional Classification</i>	<i>Page No.</i>	<i>Type No.</i>	<i>Functional Classification</i>	<i>Page No.</i>
AN/APM-67	10.1.3	383	I-48-B	6.1.1	325
AN/ARM-1	10.2	385	I-49	6.1.1	327
AN/ARM-5	4.1.2	205	I-148-A	6.2.2	329
AN/GPM-4	10.4.2	387	I-209-B	10.1.5	415
AN/GPM-15	4.1.2	207	I-223	8.1	367
AN/GRM-4	4.1.2	209	I-245	3.1	185
AN/MPM-23	10.2	389	ID-263/U	5.1	299
AN/MPM-24	10.2	391	IE-12-A	10.2.5	417
AN/PPM-1	4.3	211	IE-19-A	10.2.5	419
AN/PRM-10	10.1.2	395	IE-36	10.2	421
AN/PSM-2	6.1.1	311	IE-56-( )	10.2	423
AN/UPA-1B	5.3	293	IM-23/U	6.2.1	331
AN/UPM-10	10.1.3	395	IM-28U	6.2.1	333
AN/UPM-11	8.1	363	IM-81/UP	6.2.1	335
AN/UPM-12	10.1.10	397	IP-173/U	3.4.1	187
AN/UPM-14	10.1.3	399	MD-83A/ARN	4.2.2	247
AN/UPM-15	4.3	213	ME-8/G	6.3	337
AN/UPM-17	3.4.1	171	OS-8C/U	3.1	189
AN/UPM-33	3.4.1	173	SG-8/U	4.4.2	249
AN/UPM-35	10.4.2	401	SG-13/ARN	4.1.2	251
AN/UPM-41	10.1.10	403	SG-15/PC	4.1.1	253
AN/UPM-44(XN-1)	10.1.3	405	SG-23/U	4. 4.3	255
AN/UPM-46	4.2.2	215	TS-10C/APN	8.1	369
AN/UPM-56	10.1.3	409	TS-12/AP	6.2.2	339
AN/UPM-58	3.4.1	175	TS-16X/APN	10.1.2	425
AN/UPM-60	4.1.2	217	TS-23A/APN	10.1.1	427
AN/UPM-66	10.1.10	411	TS-32/TRC-1	4.2.1	257
AN/URM-3	5.5	293	TS-47/APR	4.2.2	259
AN/URM-6	5.6	295	TS-102B/AP	8.1	371
AN/URM-7	5.6	297	TS-107/TPM-1	10.1.1	429
AN/URM-25F	4.1.2	219	TS-130A/UP	6.2.1	341
AN/URM-26	4.1.2	221	TS-131/AP	5.1	301
AN/URM-33 thru 36	4.1.2	223	TS-142A/APG	8.1	373
AN/URM-44	4.1.2	225	TS-147D/UP	10.1.3	431
AN/URM-48	4.1.2	227	TS-148/UP	3.4.1	191
AN/URM-49	4.1.2	229	TS-155( )/UP	10.1.4	433
AN/URM-52	4.1.2	231	TS-220/TSM	4.1.1	261
AN/URM-61	4.1.2	233	TS-221/TSM	4.1.1	263
AN/URM-64	4.1.2	235	TS-230C/A'	10.1.1	435
AN/URM-70	4.1.2	237	TS-233/TPN-2	10.1.2	437
AN/USM-6	6.1.4.1	313	TS-237/TRC-8	4.2.1	265
AN/USM-7	6.1.4.1	315	TS-239/UP	3.2	193
AN/USM-11	6.1.4.1	317	TS-251/UP	4 1.2	267
AN/USM-14	6.1.4.1	319	TS-300/CRD-3	4.1.1	269
AN/USM-16	4.1.2	239	TS-326B/U	10.1.2	431
AN/USM-21	6.1.1	321	TS-333/AP	3.4.1	195
AN/USM-24C	3.2	177	TS-382E/U	4.1.1	271
AN/USNI-25A, -25B	3.1	179	TS-401/U	4.2.1	273
AN/USM-27A	4.3	241	TS-406/UP	4.2.2	275
AN/USM-37	6.2.1	323	TS-421A/U	4.1.1	277
AN/USM-44	4.1.2	243	TS-433B/U	10.1.7	441
AN/USM-47	4.1.2	245	TS-446/U	5.1	303
AN/USM-50	3.2	183	TS-452C/U	10.1.2	443
BC-376-J	10.1.2	413	TS-460C/U	6.1.4.5	343
FR-67/U	8.6	365	TS-497B/URR	4.1.2	279

<i>Type No.</i>	<i>Functional Classification</i>	<i>Page No.</i>
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TS-509/UR	5.1	305
TS-510/UR	4.1.2	281
TS-522/CRT-3	10.1.11	445
TS-538B/U	10.1.3	447
TS-541/TPS	10.1.3	449
TS-555/GM2	5.6	307
TS-573/UP	8.1	375
TS-580/U	7.1	359
TS-583B/U	4.3	283
TS-584B/U	3.3.3	197
TS-592/UPM	4.3	285

<i>Type No.</i>	<i>Functional Classification</i>	<i>Page No.</i>
TS-606/U	4.1.2	287
TS-415/U	3.4.2	199
TS-617A/U	6.1.4.4	347
TS-723/U	3.4.1	201
TS-805/U	8.4	377
TS-806/U	8.4	379
UG-58A-1	10.2	451
UG152A-1	10.2	453
ZM-3/U	6.1.4.5	349
ZM-4/U	6.1.1	351
ZM-7A/TSM	6.1.4.5	353
ZM-21/U	6.1.1	355

**CATEGORY 11**  
**ASSOCIATED DEVICES FOR ELECTRONICS TEST EQUIPMENT**

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No.</i>	<i>Page No.</i>
11.1	Antenna	AN-29	465
11.1	Antenna Assembly	AS-23/AP	473
11.1	Antenna	AT-67/AP	475
11.1	Pick-up Antenna	AT48/UP	477
11.1	Antenna Position Simulator	SM-26/U	569
11.1	Phantom Transmitter Antenna	TS-78/U	571
	Phantom Receiver Antenna	TS-79/U	571
	Test Meter	T80/U	571
11.1	Test Antenna	TS-129/UP	579
11.1.1	Test Antenna	AT-152/U	479
11.1.1	Test Antenna	AT-153/U	481
11.1.1	Test Antenna	AT-154/U	483
11.1.1	Test Antenna	AT-155/U	485
11.1.1	Test Antenna	AT-156/U	487
11.1.1	Test Antenna	AT-157/U	489
11.1.1	Test Antenna	AT-158/U	491
11.1.1	Test Antenna	AT-159/U	493
11.2	Headset Adapter	M385-( )	565
11.2.1	Detector	TS-200/CPM-4	583
11.2.2	Radio Frequency Adapter	UG27C/U	603
11.2.2	Radio Frequency Adapter	UG28A/U	605
11.2.2	Radio Frequency Adapter	UG29B/U	607
11.2.2	Adapter	UG-83( )/U	611
11.2.2	Crystal Adapter	UG-119/UP	615
11.2.2	Adapter	U201/U	617
11.2.2	Adapter	UG25U	619
11.2.2	Adapter	UG273/U	621
11.2.2	Adapter	UG-274A/U	623
11.2.2	Adapter	UG-306/U	625
11.2.2	Adapter	U349( )/U	627
11.2.6	Test Line Assembly	CU-108/UP	537
11.3.1	Cord	CD-307-A	495
11.3.1	Adapter Connector	UG-397/U	629
11.3.1	Coaxial to Waveguide Adapter	UG953( )/U	631
11.3.4	Radar Test Set	AN/UPM-24	469
11.3.4	Cover	UG-51( )/U	609
11.4.1	RF Probe	MX-1019/U	567
11.5	Attenuator	CN-42/UP	535
11.5	Attenuator	TS-402( )/U	599
11.7	Antenna	A-28	459
11.7	Antenna	A-58	461
11.7	Antenna	A-83	463
11.7	Electrical Dummy Load	AN/UPM-50	471
11.7	Dummy Load	DA-18, -19, -20, -21, -23, -24, -25, -53/U	553
11.7	Dummy Load	DA-22/U	555
11.7	Dummy Load	DA-32/	557
11.7	Dummy Load, Electrical	DA-64A/UP	559
11.7	Dummy Load	TS-90A/AP	575
11.7	Radio Frequency Test Load	TS-108/AP	577
11.7	Dummy Load	TS-234( )/UP	585
11.7	Dummy Load	TS-234A/UP	587
11.7	Dummy Antenna	TS-235( )/UP	589
11.7	Dummy Antenna	TS-329( )/U	593
11.7	Dummy Load	TS-366B/TPS-10	597

**CATEGORY 11-Continued**  
**ASSOCIATED DEVICES FOR ELECTRONICS TEST EQUIPMENT-Continued**

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No.</i>	<i>Page No.</i>
11.9	Cord	502 D	497
11.9	Cord	CD-503	499
11.9	Cord	CD-505A	501
11.9	Cord	CD-800	503
11.9	Cord	CD-1099	505
11.9	Cable	CD-1101	507
11.9	Cord	CD-1102	509
11.9	Cord	CD-1106	511
11.9	Cord	CD-1141	513
11.9	Cord	CG-55B/U	515
11.9	Cord	CG-91/U	517
11.9	Cord	CG-92B/U	519
11.9	Cord	CG-107/U	521
11.9	Cord	CG-295A/U	523
11.9	Cord	CG-373/U	525
11.9	Cord	CG-409A/U	527
11.9	Cord	CG-426A/U	529
11.9	RF Cable Assembly	CG-562/U	531
11.9	Cord	CX-247/UP	539
11.9	Cord	CX-251/UP	541
11.9	Cord	CX-255/UP	543
11.9	Cord	CX-262/UP	545
11.9	Cord	CX-263/UP	547
11.9	Cable	CX-337/U	549
11.9	Test Lead Set	CX-1331/U	551
11.11	Transformer	CN-16A/U	533
11.12	Radar Test Set	AN/UPM-18	467
11.12	Voltage Divider	TS9B/AP	573
11.12	Voltage Divider	T265( )/UP	591
11.12	Voltage Divider	T359( )/U	595
11.12	Voltage Divider	T453/U	601
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11.15	Radio Frequency Plug	UG-88( )/U	613
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11.16	Test Set	T190/U	581

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

ANTENNA

A-28

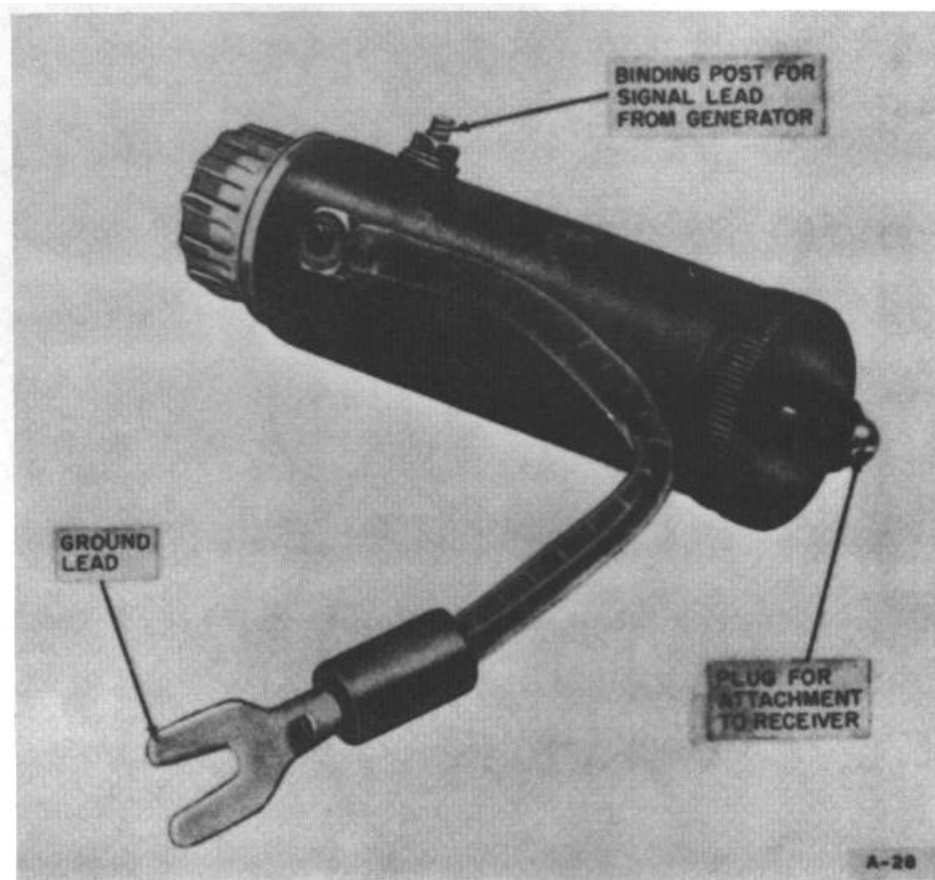
1 March 1964

Cog. Serv: USA FSN:

USA Line Item No:

Functional Class:11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Dayton Acme Co.				

**FUNCTIONAL DESCRIPTION:**

Antenna A-28 is a portable equipment used in testing radio sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Equipment IE9-C.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 40 to 48 mc

*Power Input:* 1.2 w

*Capacitance Range:* 15 to 18  $\mu$ f

*Major Unit:* 1 A-28    3 5/8" x 1 1/8" dia; 0.5 lb

**TUBES, CRYSTALS, TRANSISTORS:**

1 March 1964

Cog. Serv: USA FSN: 5985-194-9740

USA Line Item No:

Functional Class:11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Hoffman Radio Co.

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

Antenna A-58 is a portable equipment used in tuning bench setups of medium-frequency transmitters. Application is in organizational, field, and depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* 0.150 to 12.5 mc in four bands

*Major Unit:* 1 A-58      7" x 6" x 8"; 6.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 16-5172

71-834-1

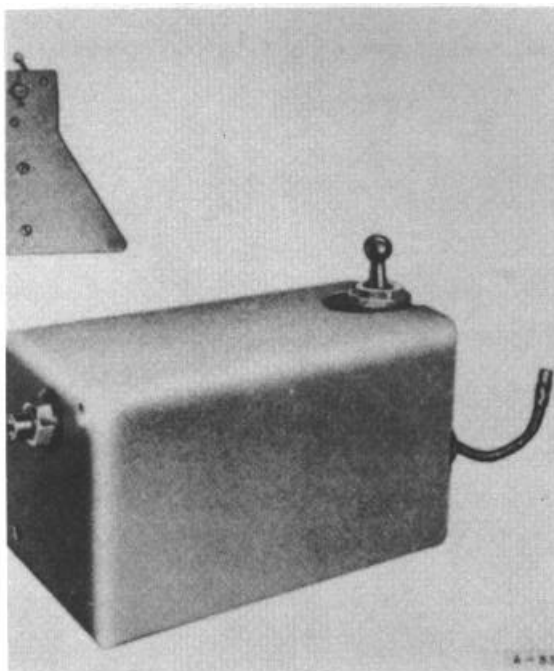
1 March 1964

Cog. Serv: USA FSN: 5985-194-9742

USA Line Item No:

Functional Class:11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: International Detrola Corp.				

**FUNCTIONAL DESCRIPTION:**

Antenna A-83 is a portable equipment that prevents signals from being radiated when adjusting, tuning, or checking the performance of radio sets. The circuit, having an adjustable input impedance, electrically replaces the transmitting antenna for this purpose.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* 27 to 38.9 mc

*Major Unit:* 1A-83      6" x 3 1/2" x 4"; 1 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

71-1642 (SigC)

1 March 1964				ANTENNA
Cog Serv: USA FSN:				AN-29
USA Line Item No:				Functional Class: 11.1
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Galvin Manufacturing Co.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Antenna AN-29 is a collapsible, whip-type transmitting and receiving antenna used in testing receivers and transmitters operated as a portable unit.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Models C and D of this equipment are similar.

#### TECHNICAL DESCRIPTION:

*Frequency Range:* 27 to 38.9 mc

*Impedance:* 700 ohms

*Major Unit:* 1 AN-29 15 1/2" (collapsed)  
or 154" (extended)  
x 1/2" dia; 0.63 lb

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

AN 0840SCR610-2  
SC-D-5686



17 September 1954

Cog Serv: USAF FSN: 6625-649-2814

USA Line Item No:

RADAR TEST SET

AN/UPM-18

Functional Class: 11.12

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Dynamic Electronics - New York, Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose, voltage divider used in conjunction with a synchroscope or cathode ray oscilloscope to measure or view output pulse from modulators of medium-power radar sets. A high voltage input lead is included. Two dividing ratios are available by connection to either of the two permanently attached output leads. The complete equipment is housed in a watertight transit case.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The divider itself consists of a housing for the electronic components, a ceramic bushing capacitor, a molded mica condenser, three ceramic condensers, two surge damping resistors, and two permanently connected output cables.

*Power Supply:* None required

*Frequency Range:* Above 5000 cps, cw

*Input Signal:*

*Pulse Duration:* 0.5 to 10  $\mu$ sec

*Pulse Repetition Rate:* Up to 1000 times per second

*Voltage Input, Maximum:* 35,000 v, peak

*Division Ratios:* 50:1 and 200:1

*Input Capacitance:* 42  $\mu$ f

*Waveform Decay:* Not over 10%, with a 2  $\mu$ sec square wave applied to the voltage divider

*Division Accuracy:*  $\pm 3\%$

*Temperature Range:* -38° C. to +65° C.

*Humidity Range:* Up to 95% relative

*Altitude Range:*

Sea level to 10,000 ft, operating

Sea level to 50,000 ft, nonoperating

*Major Unit:* 1 AN/UPM-18 15" x 12" x 10"; 15.0 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 1630UPM18-1 (Operation and Service Instructions)

MIL-R-4301 (USAF)

ENG-280 (USAF Exhibit)

17 March 1955

Cog Serv: USAF FSN: 6625-539-8256

USA Line Item No:

RADAR TEST SET

AN/UPM-24

Functional Class: 11.3.4

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	A/Std	-----
Manufacturer:	Nichols Products Co. Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose slotted line used to determine standing wave ratios in waveguides. It may also be used to determine the frequency of the rf energy in a waveguide.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

The slotted line is designed for use with the type RG69/U waveguide or another waveguide of equal dimensions. Equipment Required But Not Supplied: An amplifier with indicator and a probe such as MX-831/U or MX-1019/U.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The slotted section of waveguide is approximately one wave length long (for the frequencies for which it is used). A probe, which is mounted on the slot, samples the rf field in the slot. The rf field induces an rf voltage in the probe, which is proportional to the field strength in the slot at the probe position. The induced rf current is then transmitted to a bolometer or crystal rectifier, then to an amplifier, and subsequently to an output meter. By moving the probe, it is possible to find regions of maxima and minima energy in the slotted line. From this information it is possible to determine the VSWR and the frequency of the rf energy in the waveguide.

*Power Supply:* None required

*Frequency Range:* 1120 to 1700 mc

*Smallest Scale Reading:*  $\pm 0.01$  cm

*Voltage Standing Wave Ratio Measurement:* 1.05 min

*Error Due to Slope:* 2% max

*Error Due to Slot Leakage:* 1% max

*Major Units:* 1 AN/UPM-24

1 IM-28/U 30" x 8 3/4" x 10 1/2"; 15 3/4 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

33A1-6-6-1 (Operation and Service Instructions)

33A1-6-6-4 (Parts Breakdown)

MIL-R-4634 & Am. 1 dtd 30 April 1953 (USAF)

17 September 1954  
 Cog Serv: USAF FSN:  
 USA Line Item No:

ELECTRICAL DUMMY LOAD  
 AN/UPM-50  
 Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Phebco, Inc.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable, general purpose instrument which acts as a voltage divider. It will also dissipate all the energy transmitted by the radar set modulator under test so that the modulator can be tested during operation without radiating radio frequency energy.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Overall nomenclature for DA-61/UPM-50.

#### TECHNICAL DESCRIPTION:

*Power Supply:* None required

*Frequency Range:* No-operating; operates with square waves down to 2  $\mu$ sec pulses

*Input Power Rating:* 8000 w, average, max

*Input Voltage Rating:* 12,000 v, peak, max for 2  $\mu$ sec pulses

*Input Impedance:* 12.5 ohms, resistive

*Element Resistance:* 50 ohms  $\pm$ 10%

*Division Ratio:* 240 v to 1 v.

*Major Units:* 1 AN/UPM-50 23" x 25" x 20"; 75 lbs

1 DA-61/UPM-50 23" x 24 1/2" x 19 1/2"

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

None

#### REFERENCE DATA AND LITERATURE:

28 June 1954

Cog Serv: USN FSN: 6625-182-6842

USA Line Item No:

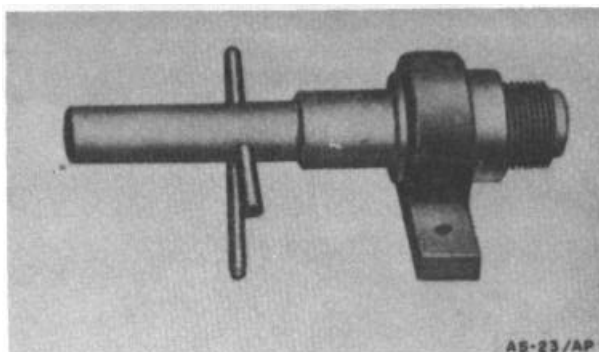
ANTENNA ASSEMBLY

AS-23/AP

Functional Class: 11.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Antenna Assembly AS-23/AP is a portable, half-wave dipole used in tuning and checking the operation of radar equipment. It is installed parallel to, and in front of, the radar antenna.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 2,500 to 3,750 mc

*Resonant Frequency:* 3,000 mc

*Input Impedance:* 50 ohms

*Major Unit:* 1 AS-23/AP 2 1/4" x 4" x 1 1/4"; 0.19 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None.

**REFERENCE DATA AND LITERATURE:**

SigC Dwg SC-D-12021; TM 11-1212, TM 11-1561, TM11-2538, TM 11-2657

1 March 1964

Cog Serv: USA FSN: 6625-224-4385

USA Line Item No:

ANTENNA

AT-67/AP

Functional Class: 11-1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Cover Dual Signal Systems, Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, parabolic horn-type, broadband, test antenna used for receiving. It is equipped with a type N fitting to connect with rf Plug UG-18/U.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:***Power Supply:* None*Frequency Range:* 2400 to 3335 mc*Gain:* Approximately 8 db*Characteristic Impedance:* 50 ohms*Major Unit:* 1 AT67/AP 4 1/4" x 3 1/2" dia; 0.5 lb**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

TM 11-1217 (Instruction Book for TS125/AP)

20 August 1954

Cog Serv: USN FSN: 6625-405-6410

USA Line Item No:

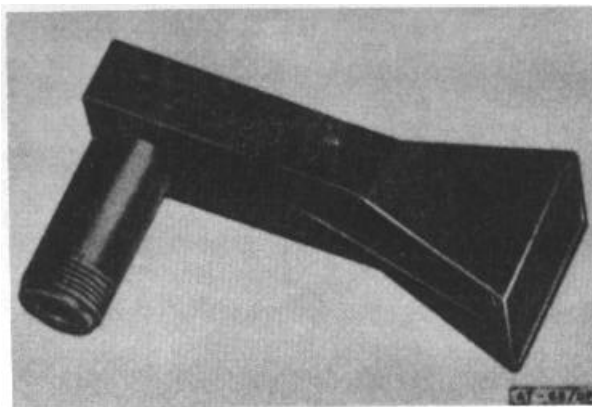
PICK-UP ANTENNA

AT-68/UP

Functional Class: 11.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Pick-up Antenna AT-68/UP is a directional transmitting and receiving antenna assembly used with X-band radar test equipment in checking the performance of radar systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is an operating accessory for Test Sets TS-146/UP and TS-147/UP, as well as for Spectrum Analyzer TS-148/UP.

Equipment Required But Not Supplied: Cord: (1) CG-92/U

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 8,500 to 9,600 mc

*Gain:* 9

*Connector:* Type N for Connector UG-24/U

*Major Unit:* AT-68/UP 2 3/16" x 3 11/22" x 1 15/16"; 0.14 lb

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

TM 11-1249, TO 16-35AT68-5

Spec CS-R660159

30 January 1956			TEST ANTENNA	
Cog Serv: USAF FSN: 5985-538-5174			AT-152/U	
USA Line Item No:			Functional Class: 11.1.1	
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:				

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 383.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with connectors, such as UG-214/U or UG-52/U, and a rectangular horn segment. Supporting structures are included for strength and rigidity. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 2600 to 4000 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 7" x 9 3/8"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-152/U 15 13/16" x 9 3/8" x 7"; 13 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

None

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30-F-1

Sperry data sheet No. 23-1910, April 1950

8 February 1956				TEST ANTENNA
Cog Serv: USAF FSN: 5985-504-7776				AT-153/U
USA Line Item No:				Functional Class: 11.1.1
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Sperry Gyroscope Co., Division of Sperry-Rand Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 327.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-149A/U, and a rectangular horn segment. Supporting structures are included for strength and rigidity. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Freq Range:* 4000 to 6000 mc

*Gain:* 15 db (approx)

*Voltage Standing: Wave Ratio:* 1.2 (max)

*Aperture Size:* 4 19/32" x 6 5/32"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-153/U 10 5/16" x 6 5/32" x 4 19/32"; 4 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

None

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30-F-1

Sperry data sheet No. 23-1910, April 1950



8 February 1956		TEST ANTENNA	
Cog Serv: USAF FSN: 5985-504-7776		AT-153/U	
USA Line Item No:		Functional Class: 11.1.1	
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	Std
Manufacturer:	Sperry Gyroscope Co., Division of the Sperry-Ran Corp.		

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 328.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-344/U, and a rectangular horn segment. Supporting structures are included for strength and rigidity. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 5300 to 8200 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 3 27/64" x 4 35/64"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-154/U 7 41/64" x 4 35/64" x 3 27/64"; 3 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

None

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30F-1

Sperry data sheet No. 23-1910, April 1950

7 February 1956

Cog Serv: USAF FSN: 5985-504-7775

USA Line Item No:

TEST ANTENNA

AT-155/U

Functional Class: 11.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Sperry Gyroscope Co., Division of the Sperry-Rand Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This antenna is similar to Sperry Model 329.

**TECHNICAL DESCRIPTION:**

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-51/U, and a rectangular horn segment. Supporting structures are included for strength and rigidity. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 7000 to 10,000 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 2 51/64" x 3 47/64"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-155/U 6 25/64" x 3 47/64" x 2 51/64"; 1 lb

**TUBES, CRYSTALS, TRANSISTORS:**

TUBE COMPLEMENT:

None

**REFERENCE DATA AND LITERATURE:**

Sperry data sheet No. 23-30-F-1

Sperry data sheet No. 23-1910, April 1950

8 February 1956		TEST ANTENNA	
Cog Serv: USAF FSN: 5985-504-7780		AT-156/U	
USA Line Item No:		Functional Class: 11.1.1	
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	Std
Manufacturer:	Sperry Gyroscope Co., Division of Sperry-Rand Corp.		

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 384.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-39/U, and a rectangular horn segment. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 8100 to 12,400 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 2 1/4" x 3"

*Reflected Power:* Less than 1.0%70

*Major Unit:* 1 AT-156/U 5 7/32" x 3" x 2 1/4"; 1 lb

#### TUBES, CRYSTALS, TRANSISTORS:

TUBE COMPLEMENT:

None

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30-F-1

Sperry data sheet No. 23-1910, April 1950

6 February 1956		TEST ANTENNA		
Cog Serv: USAF FSN: 5985-504-7777		AT-157/U		
USA Line Item No:		Functional Class: 11.1.1		
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Sperry Gyroscope Co., Division of Sperry-Rand Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 385.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-419/U, and a rectangular horn segment. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 12,400 to 18,000 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 1 9/16" x 2 3/32"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-157/U 3 5/8" x 2 3/32" x 1 9/16"; 3/8 lb

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30-F-1.

Sperry data sheet No. 23-1910, April 1950.

6 February 1956

Cog Serv: USAF FSN: 5985-504-7778

USA Line Item No:

TEST ANTENNA

AT-158/U

Functional Class: 11.1.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	Sperry Gyroscope Co., Division of the Sperry-Rand Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This antenna is similar to Sperry Model 386.

**TECHNICAL DESCRIPTION:**

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-425/U, and a rectangular horn segment. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 18,000 to 26,500 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 1 3/32" x 1 7/16"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-158/JU 2 25/64" x 1 7/16" x 1 3/32"; 1/8 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Sperry data sheet No. 23-30-F-1

Sperry data sheet No. 23-1910, April 1950

6 February 1956		TEST ANTENNA	
Cog Serv: USAF FSN: 5985-548-8766		AT-159/U	
USA Line Item No:		Functional Class: 11.1.1	
	USA	USN	USAF
STATUS OR TYPE CLASS.:	-----	-----	Std
Manufacturer:	Sperry Gyroscope Co., Division of the Sperry-Rand Corp.		

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable general purpose electromagnetic horn antenna designed for use as a receiving or transmitting antenna in antenna pattern measurements. It may also be used as a transmitting antenna in microwave communications systems.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

This antenna is similar to Sperry Model 387.

#### TECHNICAL DESCRIPTION:

*Physical Characteristics:* The antenna consists of a cover flange, which mates with Connector UG-381/U, and a rectangular horn section. The horn is fabricated of electro-formed copper with a rhodium covered, silver-plated interior.

*Power Supply:* None

*Frequency Range:* 26,500 to 40,000 mc

*Gain:* 15 db (approx)

*Voltage Standing Wave Ratio:* 1.2 (max)

*Aperture Size:* 3/4" x 63/64"

*Reflected Power:* Less than 1.0%

*Major Unit:* 1 AT-159/U 1 41/64" x 1 1/8"; 1/8 lb

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

Sperry data sheet No. 23-30-F-1.

Sperry data sheet No. 23-1910, April 1950.

12 September 1955  
 Cog Serv: USA FSN:  
 USA Line Item No:

CORD  
 CD-307-A  
 Functional Class: 11.3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Western electric Co.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A general purpose headset extension cord used to connect a headset to a jack box.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

##### Parts:

- 1 Jack JK-26.
- 1 Cordage CO-119-A or -B.
- 1 Plug PL-55.

Length		Stock No.	
Feet	Inches	(USAF)	(USA)
2	0	1600-321030000	3E1307A
3	6	1600-321030775	3E1307A-2
4	0	1600-321031950	3E1307A-3.6
5	0	1600-321032000	3E1307A-4
5	0	1600-321034000	3E1307A-5
5	5	1600-321036000	3E1307A-5.5
5	6	1600-321038000	3E1307A-5.6
6	0	1600-321040000	3E1307A-6
6	6	1600-321040100	3E1307A-6.6
7	0	1600-321041000	3E1307A-7
8	0	1600-321042000	3E1307A-8
9	0	1600-321043000	3E1307A-9
10	0	1600-221044000	3E1307A-10
11	3	1600-321045030	3E1307A-11.3
12	0	1600-321046000	3E1307A-12
15	0	1600-321046090	3E1307A-15
36	0	1600-321046195	3E1307A-36
192	0	1600-321046500	3E1307A-192

Outside Diameter: 0.28"

Major Unit:

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

JAN-J-64 1  
 Dwgs. 71-805  
 71-802-E (SigC)

31 May 1955

Cog Serv: USA FSN: 6625-649-3065 and 6625-649—2959

USA Line Item No:

CORD

CD-502

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, single conductor cable assembly used with Test Equipment RC-68.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

2 Crocodile Clips, Mueller No. 85

2 Rubber Insulators, Mueller No. 87

1 Cable, copper stranded, No. 18 AWG, covered with synthetic red rubber insulator

*Length**Stock No.**(USAF)**(Army)*

2 feet 4 inches

7CAC-170270-1443

3E1502

2 feet 4 inches

-----

3E1502.1

2 feet 4 inches

-----

-----

*Major Units:***TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

SC-D-11915 (SigC)

ESD7676 (Dwg)



31 May 1955

Cog Serv: USA FSN: 6625-649-3406

USA Line Item No: 6625-649-2960

CORD

CD-503

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, single conductor cable assembly used with Test Equipment RC-68.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:***Parts:*

2 Crocodile Clips, Mueller No. 85

2 Rubber Insulators, Mueller No. 87

1 Cable, copper stranded, No. 18 AWG, covered with synthetic black rubber insulator

*Major Unit:* 1 CD-503; 8'6"**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. No. ES-D-7676 (SigC); Spec. No. 714945

1 March 1964

Cog Serv: USA FSN: 6625-187-2814

USA Line Item No:

CORD

CD-505-A

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, electrical power cable assembly used with Test Equipment RC-68.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:***Parts:*

- 1 Plug, Hubbell Part No. 9938
- 1 Connector, Hubbell Part No. 7187
- 1 Cable, rubber insulated, steel stranded, No. 12 AWG.

*Major Unit:* 1 CD-505-A 50'0"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. No. SC-D-11916 (SigC)

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

CORD

CD-800

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose cable assembly used to connect Test Set TS-23/APN to Radio Receiver and Transmitter BC-788-A. It also connects Alignment Test Set I-231 to Radio Transmitter BC-1212 or to Radio Receiver BC-1213.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Superseded by Cord CG-107/U.

**TECHNICAL DESCRIPTION:**

*Parts:*

2 Plugs PI259 or PI259-A.

1 Cable WC-549, RG-31/U, or RG-8/U

*Major Unit:* 1 CD-800

<i>Feet</i>	<i>Inches</i>	<i>Feet</i>	<i>Inches</i>	<i>Feet</i>	<i>Inches</i>	<i>Feet</i>	<i>Inches</i>
1	0	2	6	3	2	10	0
1	8	2	7	5	0	15	6
1	9	3	0	8	0	50	0

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

SC-D-7469

1 March 1964		CORD		
Cog Serv: USA 4 FSN:		CD-1099		
USA Line Item No:		Functional Class: 11.9		
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Belmont Radio Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A special purpose rf cable assembly used for interconnections between Range Calibrator 1-223-A and a test oscilloscope.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

##### *Parts:*

- 1 Plug PL-55
- 2 Spade Lugs, USAF Stock No. 8880-396316529
- 1 Cable RG-59A/U

*Major Unit:* 1 CD-1099      6'0"

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

1 March 1964

Cog Serv: USA FSN: 6625-196-6923

USA Line Item No:

CORD

CD-1101

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Belmont Radio corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A special purpose cable assembly used for interconnections between Range Calibrator I-223-A and radar components under test.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

2 Plugs P155

1 Cable, USAF Stock No. 8860-363000-211

*Major Unit:* 1 CD-11O1 6'0"**TUBES, CRYSTALS, TRANSISTORS,****REFERENCE DATA AND LITERATURE:**

31 May 1955				CORD
Cog Serv: FSN:				CD-1102
USA Line Item No:				Functional Class: 11.9
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Belmont Radio Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A general purpose test cable used with equipment such as Range Calibrator I-223-A.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

*Parts:*

1 Spade Lug

1 Alligator Clip

1 Cable, No. 34 turned copper wire, stranded, with rubber insulated, braided cotton shield

*Major Unit:* 1 CD-1102; 4'0"

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

23 May 1955

Cog Serv: FSN:

USA Line Item No:

CORD

CD-1106

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Belmont Radio Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose cable assembly used to connect test rack to unit under test.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

1 Male Plug, Belmont, C-201-546

1 Female Plug, Belmont C-201-245

1 Cable consisting of 13 conductors No. 16, rubber covered, shielded wires, 4 conductors No. 14 Aeroglas wires, and 4 conductors No. 20 Aeroglas wires

*Major Unit:* 1 CD-1106; 6'0"

**TUBES, CRYSTALS, TRANSISTORS,****REFERENCE DATA AND LITERATURE:**

23 May 1955				CORD
Cog Serv: FSN:				CD-1141
USA Line Item No:				Functional Class: 11.9
	USA	USN	USMC	USAF
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Belmont Radio Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A general purpose cable assembly used in making voltage checks on equipments such as Power Supply RA-105-A.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

##### *Parts:*

- 1 Male Plug, Belmont A-19A-2347
- 1 Special Jack Assembly, Belmont
- 1 Cable, 2 conductor, No. 34 wire, rubber insulated

*Major Unit:* 1 CD-1141; 6'0"

*Outside Diameter:* 0.45"

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:



29 July 1954

Cog Serv: USN FSN:

USA Line Item No:

CORD

CG-55B/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Seaboard Electric Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, coaxial, rf cable assembly for use with equipments such as Test Oscillator TS-508/UP, RF Wattmeter TS87/AP, Switch Assembly SA-153/U, and Direction Finder Set AN/URD-2.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Cord CG55/U and CO55A/U except the B uses rf Plug UG21B/U instead of UG-21/U or UG-21A/U. Used in testing C-1 Mobile Control Tower, AN/ARC3, -27, -33, -34, AN/MRC20.

**TECHNICAL DESCRIPTION:***Parts:*

2 rf Plugs UG-21B/U

1 rf Cable RG-8/U

*Major Unit:* 1 CG-55B/U; 3'0"*Outside Diameter:* 0.405"**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

MIL-T-7144(Aer)

19 January 1955				CORD
Cog Serv: USA FSN:				CG-91/U
USA Line Item No:				Functional Class: 11.9
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Presto recording Corp.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

An rf transmission line for general purpose use.

#### RELATIONSHIP TO EQUIPMENT:

Used in testing AN/CPS1 and AN/MPS5.

#### TECHNICAL DESCRIPTION:

*Parts:*

2 Plugs PL-259-A (Navy type 49195)

1 RF Cable RG-11/U

*Major Unit:* 1 CG-91/U; 6'4"

*Outside Diameter:* 0.405"

#### TUBES, CRYSTALS, TRANSISTORS-

#### REFERENCE DATA AND LITERATURE:

20 January 1955

Cog Serv: USA FSN:

USA Line Item No:

CORD

CG-92B/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Hewlett-Packard Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Transfers rf energy from the output of a Horn-Target Assembly such as AS-405/APG to the input of an Antenna Control such as C497/APG.

**RELATIONSHIP TO SIMILAR EOQWMENT:**

Similar to CG92A/U except the B uses RG-9A/U instead of the RG-9/U. Used in testing AN/CRC30 and AN/GRT-3.

**TECHNICAL DESCRIPTION:***Parts:*

2 RF Plugs UG-21B/U

1 RF Cable RG-9A/U

*Major Unit:* 1 CG-92B/U

<i>Feet</i>	<i>Inches</i>
-------------	---------------

6	0
---	---

10	0
----	---

*Outside Diameter:* 0.420"**TUBES, CRYSTALS, TRANSISTORS,****REFERENCE DATA AND LITERATURE:**

JAN-17

21 January 1955

Cog Serv: USA FSN:

USA Line Item No:

CORD

CG-107/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Boonton radio Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, rf cable assembly for use with equipments such as Radar Set AN/TPX-4.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/APN-76, -76A.

Similar to Cord DC800 except for marking.

**TECHNICAL DESCRIPTION:**

Parts:

2 Plugs PI259A

1 RF Cable RG-8/U

Major Unit: 1 CG-107/U

Feet	Inches	Feet	Inches	Feet	Inches	Feet	Inches
1	0	2	3	5	0	14	6
1	2	2	6	5	5	14	10
1	5	2	9	5	9	15	6
1	6	3	0	6	0	48	0
1	8	3	4	8	0	50	0
1	9	4	0	10	0		
2	1/2	4	0	10	1		

Outside Diameter: 0.405"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE,**

Army Dwg. SC-B-22831

21 January 1955				CORD
Cog Serv: USAF FSN: 6625-504-2450				CG-295A/U
USA Line Item No: 6625-504-2451				Functional Class: 11.9
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

Connects an equipment using Socket SO-239 to an equipment requiring clip lead connections.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Used with Test Sets AN/MPM-10 and AN/MPM-12. Used in testing many equipments.

#### TECHNICAL DESCRIPTION:

##### Parts:

- 1 Plug PI259
- 2 Alligator Clips (Mueller type 85, or equal) with rubber insulators (Mueller type 87, or equal)
- 1 RF Cable RG5B/U

Major Unit: 1 CG295A 2' 3 5/16", 10' 3 5/16"

Outside Diameter: 0.332"

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

JAN-C-17A, Dwg SC-D-14870

29 July 1954

Cog Serv: USA FSN:

USA Line Item No:

CORD

CG-373/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Washington Institute of Technology, Washington, D.C.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, rf cable assembly for use with equipments such as Interference Blanker MX529/U and UHF Signal Generator Equipment Navy Model LX-2.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/AXR-8.

**TECHNICAL DESCRIPTION:**

*Parts:*

2 Plug PL-259-A (Navy type 49195)

1 RF Cable RG-11/U

*Major Unit:* 1 CG-373/U

<i>Feet</i>	<i>Inches</i>
-------------	---------------

2	8
---	---

6	0
---	---

35	0
----	---

*Outside Diameter:* 0.405"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

R-7431 (USAF Spec)

17 June 1954

Cog Serv: USN FSN:

USA Line Item No:

CORD

CG-409A/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----
Manufacturer:	Hewlett-Packard Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

General purpose video cable for interconnecting test equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to (CG-409/U except the A uses RF Cable RG-58A/U instead of the RG-58/U.

**TECHNICAL DESCRIPTION:***Parts.*

2 RF Plug UG-88/U

1 RF Cable RG-58A/U

*Major Unit:* 1 CG-409A/U

<i>Feet</i>	<i>Inches</i>
-------------	---------------

4	10
---	----

5	0
---	---

5	2
---	---

6	0
---	---

*Outside Diameter:* 0.195"**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

14 June 1954

Cog Serv: USAF FSN:

USA Line Item No:

CORD

CG-426A/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	-----	-----

Manufacturer: Airborne Instruments Laboratory, Inc.

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Used as an interconnecting cable assembly for a moving target indicator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/APA-81.

**TECHNICAL DESCRIPTION:**

Parts:

2 RF Plug UG-260/U

1 RF Cable RG-59A/U

Major Unit: 1 CG-426A/U

Feet	Inches	Feet	Inches	Feet	Inches	Feet	Inches
3	9	9	3	12	3	20	3
4	0	10	3	14	3	50	3
6	0	11	3	15	3	100	3
Outside Diameter: 0.242"							

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

ENG-277 (USAF Exhibit)



23 May 1955

Cog Serv: USAF FSN: 6625-171-2992

USA Line Item No:

CORD

CG-562/U

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer:	Local manufacture			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects the IF output of a radio receiver such as R-270/FRR or R-336/GRC-26 to a dual diversity converter such as CV-31 /TRA-7.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

1 RF Cable RG-58C[U (per Spec JAN-C-17A and Exceptions)

1 RF Plug UG-85/U

1 Plug PI259 with Adapter UG-176/U

*Major Unit:* 1 CG-562/U. *Length:* To be specified*Cable Data:*

53.5 ohms impedance

1900-v, rms, max operating voltage

*Conductor Data:* Single conductor, solid, No. 20 AWG, copper wire, plain finish*Dielectric Data:* Polyethylene, 0.111 in. outer dia*Shield Data:* Single, copper, tinned*Rd Cross-section:* 0.195 in. dia, overall, black vinyl resin jacket**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

71-3280 (USAF)

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

TRANSFORMER

CN-16A/U

Functional Class: 11.11

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	General radio corp.			

**FUNCTIONAL DESCRIPTION:**

This is a variable power, general purpose, autotransformer used to adjust an ac voltage from zero to above line voltage. The output voltage is controlled by means of a knob on a calibrated dial. The case is perforated to provide air-cooling.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to CN-16/U except that CN-16/U is similar to the New General Radio Type V-5MT variable transformer with V5-87 adapter plate, instead of General Radio Type 200-CM, which is no longer made.

**TECHNICAL DESCRIPTION:**

*Power Supply:* 115-v, ac, 60-cps single phase

*Output Data:*

0 to 115-v range: 7.5 amp, max; 0.86 kva

0 to 135-v-range: 5 amp, max; 0.67 kva

*Dial Calibration:* 0 to 135-v in 2-volt steps

*Terminal Data:* 7 screw lug terminals inside case

*Major Unit:* 1 CN-16A/U 5" x 4 15/16" dia; 8 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

20 August 1954

Cog Serv: USAF FSN: 5905-151-7472

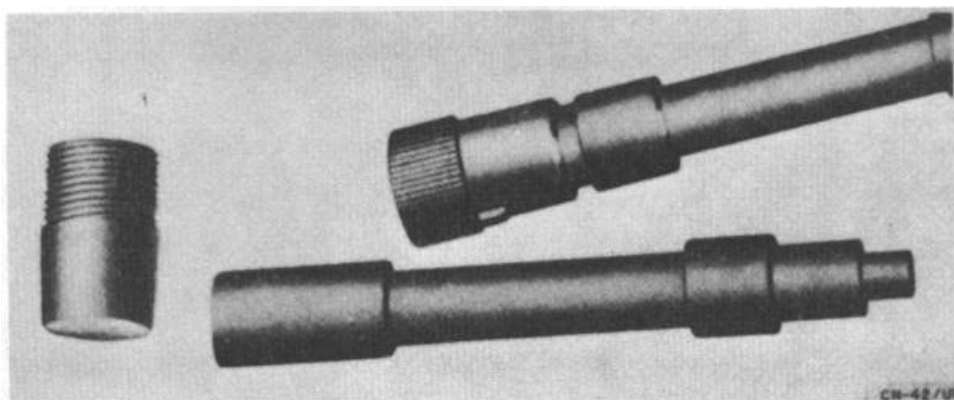
USA Line Item No:

ATTENUATOR

CN-42/UP

Functional Class: 11.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Cover Dual Signal System corp. & DeMornay Budd, Inc. & Electron Radar Products, Inc. & PIB Products, Inc.			

**FUNCTIONAL DESCRIPTION:**

Attenuator CN-42/UP is a fixed attenuator pad used in Decreasing the strength of rf signals fed to power meters and radar sets. Application is in organizational and field maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Power Meter TS-125/AP.

**TECHNICAL DESCRIPTION:**

*Frequency:* 2,400 to 3,700 mc

*Power Rating:* 1 w (avg); 1,000 w (peak)

*Duty Cycle:* 0.001

*Frequency Sensitivity:* 1.4 db

*Voltage Standing Wave Ratio:* 1.25 (max)

*Nominal Impedance:* 49 ohms (characteristic)

*Temperature Range:* -54° C to +71° C

*Humidity Range:* To 100%

*Altitude Range:* Sea level to 10,000 ft (operating); sea level to 35,000 ft (nonoperating)

*Accuracy:* ±1 db (calibration); ±1 db (attenuation)

*Major Unit:* CN-42/UP 5 3/32" x 18" x 34"; 0.5 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

USAF Exhibit WLENG-2106, 31 March 1949

28 February 1956		TEST LINE ASSEMBLY		
Cog Serv: USAF FSN:		CU-108/UP		
USA Line Item No:		Functional Class: 11.2.6		
	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	-----	-----
Manufacturer:	Peter Petroff, Westinghouse Electric & Mfg. Co.			

No Illustration Available

#### FUNCTIONAL DESCRIPTION:

A portable, special purpose, section of radio frequency transmission line terminated in a standard radio frequency plug at one end and a modified radio frequency plug at the other end. A special jack provides a test outlet. This test line serves as a portion of the radio frequency circuit of a radar set, and at the same time provides a suitable radio frequency coupling for test purposes. It permits the removal of a minute portion of the radio frequency energy in the radar plumbing in order to measure power, receiver sensitivity, and frequency. It is used in organizational, field, and depot testing of Close Cooperation Set AN/MPQ-2.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

*Power Supply:* None

*Frequency Range:* Identical to that of the prime equipment

*Nominal Coaxial Impedance:* 50 ohms

*Coupling Loss:* 35.0 db

*Major Unit:* 1 CU-108/UP 12" x 36" x 2 1/2"; 3 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

TO 16-40SCR584-108 (modification of Radio Sets, SCR-584-A, -B to incorporate CU-108/UP).  
Spec 71-2454 (SigC); SC-D-15428 (SigC)

10 June 1954

Cog Serv: USAF FSN: 6625-186-4217

USA Line Item No:

CORD

CX-247/UP

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	General Electric Co.; Westinghouse Electric & Manufacturing Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects between a Test Set such as AN/MPM-2 and a Radio Set such as RC-234 to be tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing: AN/MPQ-2, AN/MSQ-1, AN/MSQ-1A, AN/MSQ-2, SCR-584, SCR-584-A, SCR-584-B.

**TECHNICAL DESCRIPTION:***Parts:*

- 1 Connector AN-3106-16S-5S
- 1 Amphenol Receptacle 97-5103-16S-5P, or equal
- 1 Three Conductor Power Cable Assembly, #18AWG, stranded, rubber insulated conductor, cotton fillers, cotton braid, rubber jacket

*Cord Length:* 8 ft, 1 2 in.

*Outside Diameter:* 0.375 in.

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

G. E. dwgs. K-7888716P2, K-7888701; Wemco dwgs. M-7409516-P6, M-7409460, M-7409485-G1, M-7417451-P3.

SC-D-12049, Group III (SigC)

8 June 1954

Cog Serv: USAF FSN:

USA Line Item No:

CORD

CX-251/UP

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	General cable Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects between a Test Set such as AN/MPM-2 and a Radio Set such as RC-234 to be tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/MPQ-2.

**TECHNICAL DESCRIPTION:***Parts:*

1 Amphenol Plug, type 80M

2 American Hardware Lugs, type 133

1 Two Conductor RF Cable RG-59/U, #20AWG, shielded, black vinyl jacket, 73 ohms impedance

*Cord Length:* 5 ft, 0 in.

*Outside Diameter:* 0.242 in.

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

SC-D-20196 (SigC)

10 June 1954

Cog Serv: USAF FSN: 6625-196-6906

USA Line Item No:

CORD

CX-255/UP

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	-----	-----
Manufacturer:	General Electric Co.; Westinghouse Electric & Manufacturing Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects a Test Oscilloscope to a Video Signal representing a signal from a Radio Set such as RC-234 under test.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing: AN/MPQ-2, AN/MSQ-1, AN/MSQ-1A, AN/MSQ-2, SCR-584, SCR-584-A, SCR-584-B.

**TECHNICAL DESCRIPTION:***Parts:*

- 2 American Hardware #133 spade terminals, or equal
- 1 Mueller #60-S alligator clip, or equal
- 1 Plug Assembly consisting of-
  - 1 Monowatt #3106-14S/1 R.H. housing, or equal
  - 1 Cable Clamp AN-35076
- 1 Single Conductor Power Cable Assembly, #20 AWG, stranded, rubber insulated conductor, rubber jacket shield

*Cord Length:* 5 ft, 2 in.

*Outside Diameter:* 0.242 in.

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

G.E. dwgs. K-7888716-P14, M-7468198; Wemco dwgs. M-7409516-P16, K-7888716-P-14 SC-D-12053 (SigC)

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

10 June 1954

Cog Serv: USAF FSN: 6625-196-6944

USA Line Item No:

CORD

CX-262/UP

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Westinghouse Electric and Manufacturing Co.

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects between a Test Set such as AN/MPM-2 and a Radio Set such as RC-234 to be tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/MPQ2 (two cords required).

**TECHNICAL DESCRIPTION:***Parts:*

1 Amphenol Plug #80M, or equal

1 Amphenol Plug #80F, or equal

1 Single Conductor Cable, Belden Mfg. Co. type #8421, #20 AWG, stranded, synthetic rubber insulated conductor, synthetic rubber jacket, shield around.

*Cord Length:* 8 ft, 0 in.*Outside Diameter:* 0.405 in.**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

SC-D-12075, Group I (SigC)



10 June 1954

Cog Serv: USAF FSN:

USA Line Item No:

CORD

CX-263/UP

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Westinghouse Electric & Manufacturing Co.				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects between a Test Set such as AN/MPM-2 and a Radio Set such as RC-234 to be tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/MPQ-2 (two cords required).

**TECHNICAL DESCRIPTION:***Parts:*

1 Amphenol Plug #80M1, or equal

1 Amphenol Plug #80F1, or equal

1 Single Conductor Cable, Belden Mfg. Co. type #8421, #20 AWG, stranded, synthetic rubber insulated conductor, synthetic rubber jacket, shielded around.

*Cord Length:* 8 ft, 0 in.

*Outside Diameter:* 0.405 in.

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Wemco dwg. M-7417258-1

SC-D-12075, Group II (SigC)

31 May 1954

Cog Serv: USN FSN:

USA Line Item No:

CABLE

CX-337/P

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Hewlett-Packard Co.; Lavoie Labs.; Aircraft Radio Corp.; Hazeltine Electronics Corp.				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

An electrical power cable assembly used as an ac power input in testing radar equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

1 Plug, female, Hubbell No. 7257 or No. 7084

1 Plug, male, Hubbell No. 7057 or equal

1 Cable, 2 conductors, stranded No. 34 wire, No. 18 AWG, underwriter type SJ cable, unshielded; 600 v rms working voltage of individual conductors.

*Outside Diameter:* 1.218 in., min

*Length:*

<i>Feet</i>	<i>Inches</i>
-------------	---------------

6	0
---	---

7	0
---	---

10	0
----	---

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

MIL-G-7141 para 3.24.2

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

24 May 1955

TEST LEAD SET

Cog Serv: USA FSN:

CX-1331/U

USA Line Item No:

Functional Class: 11.9

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Radio City Products Co., Inc.

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Used to connect a multimeter with the circuit or component to be tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

2 Conductors, stranded copper No. 18 AWG, cotton or rayon wrap, synthetic rubber, one black, one red

2 Test prods

2 Alligator clips

*Length:* 4 ft 0 in.**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

SC-C-6878

**DUMMY LOAD**  
**DA-1 8/U THROUGH DA-21 /U**  
**DA-23/U THROUGH DA-25/U**  
**DA-53/U**

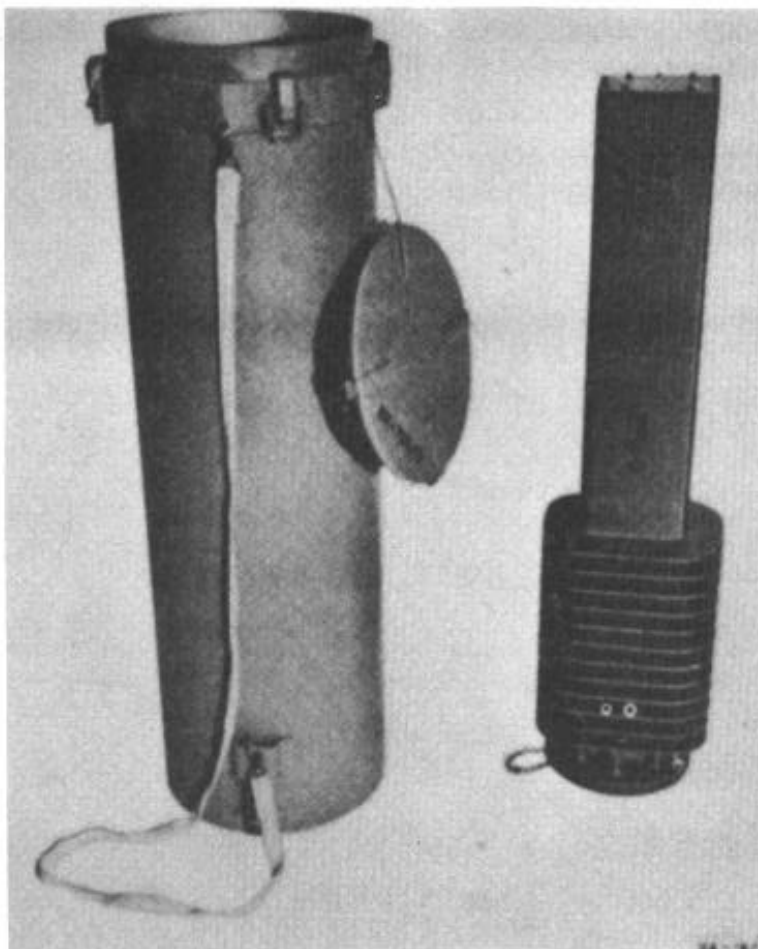
20 August 1954

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	-----	-----	-----
<b>Manufacturer:</b> Airtron, Inc.; Antenna Research Laboratory, Inc.; Electro Impulse Laboratory Sperry Gyroscope Co.; Wac Engineering Co.				



#### FUNCTIONAL DESCRIPTION:

Dummy Loads DA-1S/U through DA-21/U, DA-23/U through DA-25/U, and Electrical Dummy Load DA-53/U are portable, high-power, waveguide-type rf loads used in organizational, field, and depot testing to terminate transmission lines of radio and radar sets. Application of these equipments prevent radiation of energy while permitting testing of certain components of the system.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

These dummy loads are similar except for frequency range and power ratings. Dummy Load DA-18/U is similar to Sperry Model No. 239; DA-19/U, to Sperry Model No. 240.

**DUMMY LOAD****DA-18/U THROUGH DA-21/U****DA-23/U THROUGH DA-25/U****DA-53/U****TECHNICAL DESCRIPTION:**

*Frequency Range:* 1,150 to 1,750 mc (DA-53/U); 2,600 to 3,950 mc (DA-18/U); 3,950 to 5,850 mc (DA-19/U); 5,850 to 8,200 mc (DA-20/U); 7,050 to 10,000 mc (DA-21/U); 12,400 to 18,000 mc (DA-23/U); 18,000 to 26,500 mc (DA-24/U); 26,500 to 39,000 mc (DA-25/U).

*Power Rating:* For 1-μsec pulses

18 w (avg), 50 kw (peak) (DA-25/U); 35 w (avg), 100 kw (peak) (DA-24/U); 100 w (avg), 280 kw (peak) (DA-23/U); 280 w (avg), 800 kw (peak) (DA-21/U); 420 w (avg), 600 kw (peak) (DA-20/U); 600 w (avg), 800 kw (peak) (DA-18/U, DA-19/U); 3,000 w (avg), 10 meg w for .1-μsec pulses (DA-53/U).

*Voltage Standing Wave Ratio:*

1.10 (max) over entire freq range (DA-53/U); 1.12 (max) over entire freq range (DA-20/U);

1.15 (max) over entire freq range (DA-18/U, DA-19/U).

*Duty Cycle Ratio:* .000350 (DA-24/U); .000357 (DA-23/U); .000360 (DA-25/U).

*Temperature Range:* -54° C. to +71° C.

*Humidity Range:* To 100% at temp to +66° C.

*Altitude Range:* Sea Level to 10,000 ft (operating); sea level to 50,000 ft (nonoperating)

*Major Units:*

DA-18/U	26 3/8" x 5" x 6 1/2"	25 lbs
CY-765/U		
DA-19/U	19" x 4 1/2" x 5 1/2"	23 lbs
CY-766/U		
DA-20/U	14" x 3 1/2" x 4"	20 lbs
CY-767/U		
DA-21/U	12" x 3 1/2" x 3 1/2"	15 lbs
CY-768/U		
DA-23/U	9 1/2" x 2 1/4" x 2 1/2"	4 lbs
CY-770/U		
DA-24/U	8 1/2" x 1 3/4" x 1 3/4"	3 lbs
CY-771/U		
DA-25/U	8" x 1 3/4" x 1 3/4"	3 lbs
DA-53/U		

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

An 16-35DA20-1, AN 16-35DA20-2, AN 16-35DA20-3, AN 1635DA20-4 (DA-20/U); TO 16-35DA21-1 (DA-21/U).  
Spec & or DWG: USAF Spec 7535, 3 October 1949; Sperry Dwg 5224-90010 (DA-18/U); USAF Spec 7536; Sperry Dwg 5224-90015 (DA-19/U); Spec MIL-D-4300, 14 March 1949 and Amendment 1; (Exhibit) WLENG-2089 (DA-20/U); USAF Spec 7522, 24 January 1949 (DA-21/U); USAF Spec 7531 (DA-23/U); USAF Spec 7532 (DA-24/U); USAF Spec 7533 (DA-25/U).

5 January 1955

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	Std	-----

**Manufacturer:** Antenna Research Laboratory, Inc.; Sperry Gyroscope Co.; Wac Engineering Co.

**No Illustration Available**

#### FUNCTIONAL DESCRIPTION:

A portable, general purpose, high power, waveguide type, radio frequency dummy load which is used to terminate radio frequency transmission lines of radio and radar sets to prevent radiation of energy and still permit testing of certain components of the system. It is used in organizational, field, and depot testing.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

#### TECHNICAL DESCRIPTION:

*Circuit Information:* This equipment consists of a section of waveguide with a flange on one end and a shorting plate on the other. It contains a section of power dissipating material. Provision is made for attachment to a 1" x 1/2" waveguide.

*Power Supply:* None required

*Frequency Range:* 8200 to 12,400 me

*Power Rating:*

175 w (avg)

500 kw peak, for one-μsec pulses

*Voltage Standing Wave Ratio:* 1.15 max, over the entire freq range

*Temperature Range:* -50° C. to +71° C.

*Humidity Range:* Up to 100% at temperatures up to +660 C.

*Altitude Range:*

Sea level to 10,000 ft, operational

Sea level to 50,000 ft, nonoperational

*Major Units:* 1 DA-22/U 11" x 2 1/2" x 2 1/2"; 7 lbs; 1 CY-769/U

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

TO 16-35DA22-1 (Operation and Service Instructions)

TO 16-35DA22-12 (Service Instructions)

TO 16-35DA22-14 (Illustrated Parts Breakdown)

USAF Spec. No. 7537, 24 January 1949

**DUMMY LOAD**  
**DA-32/U**

20 August 1954

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	Std	Std	-----
<b>Manufacturer:</b> General Electric Co.				

**No Illustration Available**

#### **FUNCTIONAL DESCRIPTION:**

Dummy Load DA-32/U is a portable waveguide-type, rf equipment used at all maintenance echelons to terminate and load high-power, lf rf heads when not connected to antennas. The application of this equipment prevents radiation of rf energy while permitting testing of components of radio and radar sets in operation.

#### **RELATIONSHIP TO SIMILAR EQUIPMENT:**

#### **TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 60 cy 1 phase ac

*Frequency Range:* 90 to 1,000 mc

*Power Dissipation Rating:* 1,500 w (avg)

*Input Impedance:* 50 ohms

*Major Unit:* 1 DA-32/U 5 3/8' x 24 1/8" x 6 7/8"; 50 lbs

#### **TUBES, CRYSTALS, TRANSISTORS:**

#### **REFERENCE DATA AND LITERATURE:**

Navy Spec CS-704 (BuShips)

**ELECTRICAL DUMMY LOAD  
DA-64A/UP**

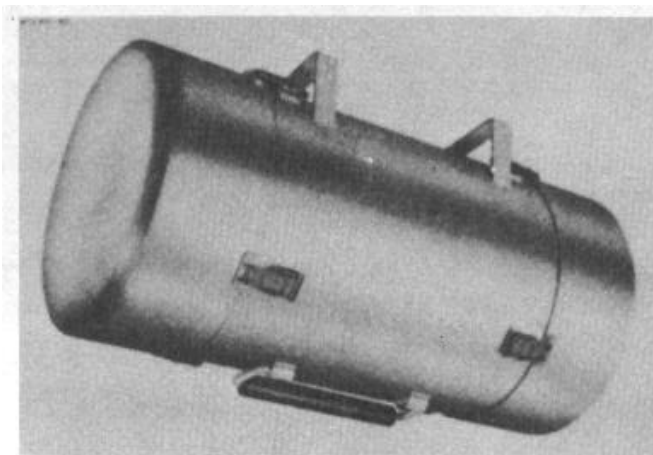
1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	-----	-----	-----
<b>Manufacturer:</b> Raytheon Manufacturing Co.				

**FUNCTIONAL DESCRIPTION:**

Electrical Dummy Load DA-64A/UP is a portable, high-power dissipating equipment used for testing radar modulators during operation without radiating rf energy. Application is in field and depot maintenance.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Power Requirements:* 115v  $\pm$ 10%, 50 to 1,000 cy, 1 phase ac (blower motor only)

*Frequency Range:* To 3 mc

*Peak Voltage Rating:* 10,000 v (max)

*Power Dissipation Rating:* 1,200 w (avg, nom); 1,400 w (avg, max)

*Pulse Length:* 0.5 to 5  $\mu$ sec

*Input Impedance:* 50.5 ohms,  $\pm$ 5% resistive

*Reactance:* 2 ohms (max)

*Phase Shift:* 2 electrical deg (max) at 3 me

*Voltage Dividing Ratio:* 100:1

*Fuse Rating:* 10 amp

*Temperature Range:* -65° F to +150° F

*Altitude Range:* To 10,000 ft (operating); 50,000 ft (nonoperating)

*Major Unit:* 1 DA-64A/UP      14 1/4" x 22 3/4" x 12 1/4"; 33 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

MIL-D-11933 (SigC), 23 April 1952



11 January 1955

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.16

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	-----	<b>L/Std</b>	-----
<b>Manufacturer:</b> Western Electric Co.; Utah Radio Products, Division International Detrola Corp.; Best Manufacturing Co., Inc.; Radio Speakers, Inc.; Shure Brothers				

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A low impedance, flat response, headset of the headband type primarily used with radio and interphone systems in aircraft, but also used as test equipment for various audio checks on radio sets, e.g., preflight setting of the squelch, determining resonance, etc.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Electrically interchangeable with Headset HS-38. Both headsets employ identical receivers.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The conversion of electrical impulses to sound is accomplished by two Receivers (ANB-H-1).

These receivers employ magnetic diaphragm and moving armature units.

*Power Supply:* None

*Voice Frequency Range:* 200 to 4000 cps

*Impedance:* 600 ohms at 1000 cps

*Temperature Range:* -55° C. to +75° C.

*Major Unit:* 1 HS-33; 0.60 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 16-1-29 (Maintenance Instructions)

USAF Spec. No. 71-1183

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

OUTLET BOX  
J-45/MPN-1

10 June 1954

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.15

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b> Gilfillan Brothers				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general purpose unit used as a distribution point for 117 volt, 60 cycle, polarized ac power for radio component testing

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:***Parts:*

1 box, plywood

4 polarized outlets, Hubbell Part No. 9595

1 polarized plug cap, Hubbell Part No. 9938

1 cord, No. 12 AWG, stranded SBRC type Stirex, 15 feet long

*Major Unit:* 1 J45/MPN-1 4" x 4" x 2 3/8" 2 lbs**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 16-55-360 (Spare Parts List)

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

HEADSET ADAPTER  
MC-385( )

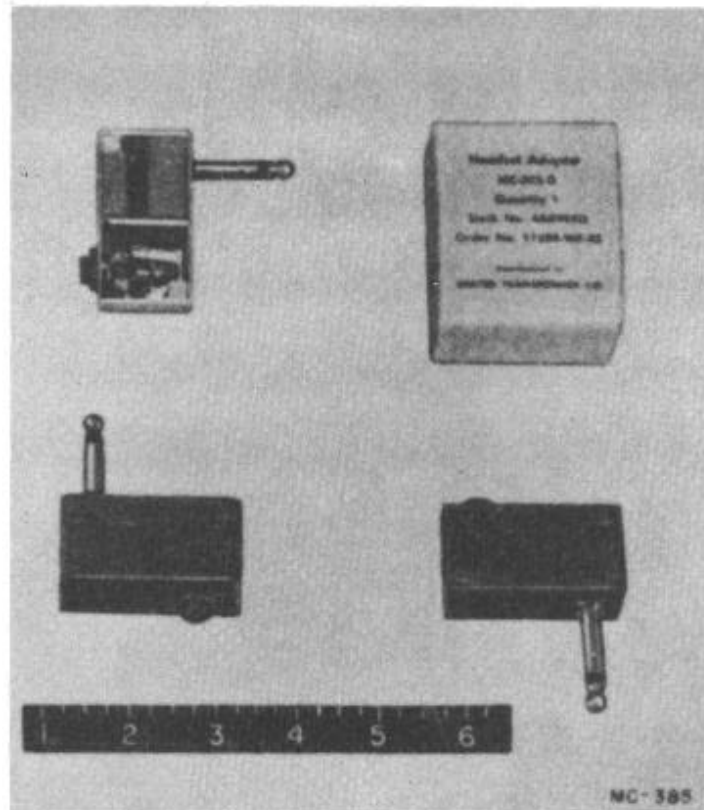
17 September 1954

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer: Quam-Nichols Co. & United Transformer Co.				

**FUNCTIONAL DESCRIPTION:**

Headset Adapter MC-385 is a portable device used in matching the low impedance of headsets to the high-impedance output of standard aircraft radio and interphone equipment. Various audio checks on radio sets may be made by means of this equipment in conjunction with a headset.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Input Impedance:* 3,750 ohms  $\pm$ 5 percent

*Autotransformer Voltage Ratio:* 2.5 to 1

*Major Unit:* 1 MC-385 2" x 1 1/8" x 7/8" .17 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 16-1-29

16 September 1954

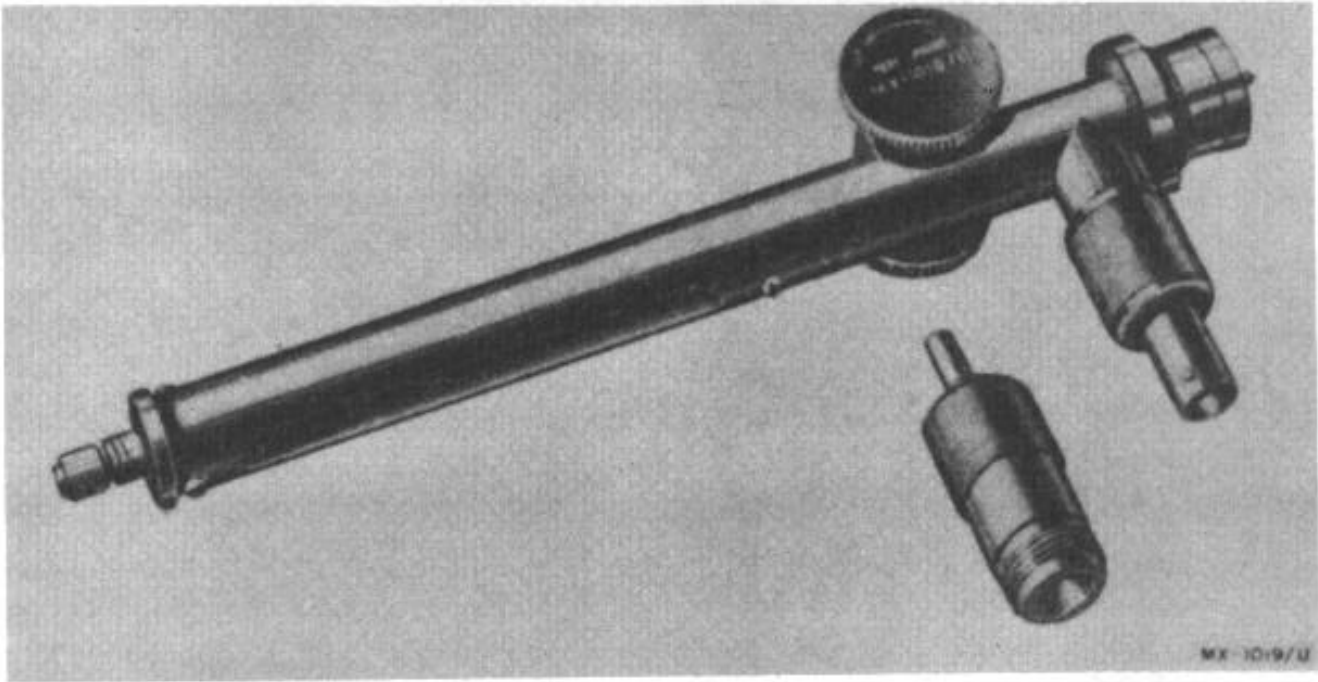
Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.4.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----

Manufacturer: Central Research Laboratories, Inc. & Kings Electronics Co., Inc.

**FUNCTIONAL DESCRIPTION:**

RF Probe MX-1019/U is a portable unit used in investigating rf field distributions along the slotted sections of transmission lines and in determining the voltage standing wave ratio of an electric field within a line. Application is in field and depot testing of radar equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* 900 to 12,400 me

*Impedance:* 50 ohms

*Temperature Range:* -54° C. to +71° C.

*Humidity Range:* To 100% rel to 50° C.

*Altitude Range:* Sea level to 10,000 ft (operating); sea level to 50,000 ft (nonoperating)

*Major Unit:* 1 MX-1019/U      2" x 7 3/4" x 1 3/8"; 0.5 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

AN 16-35MX1019-2, AN 16-35MX1019-4, AN 16-35MX1019-12, AN 16-35MX1019-14;  
MIL-R4105, 24 May 1950; Dwg 51D55030

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

# **ANTENNA POSITION SIMULATOR** **SM-26/ U**

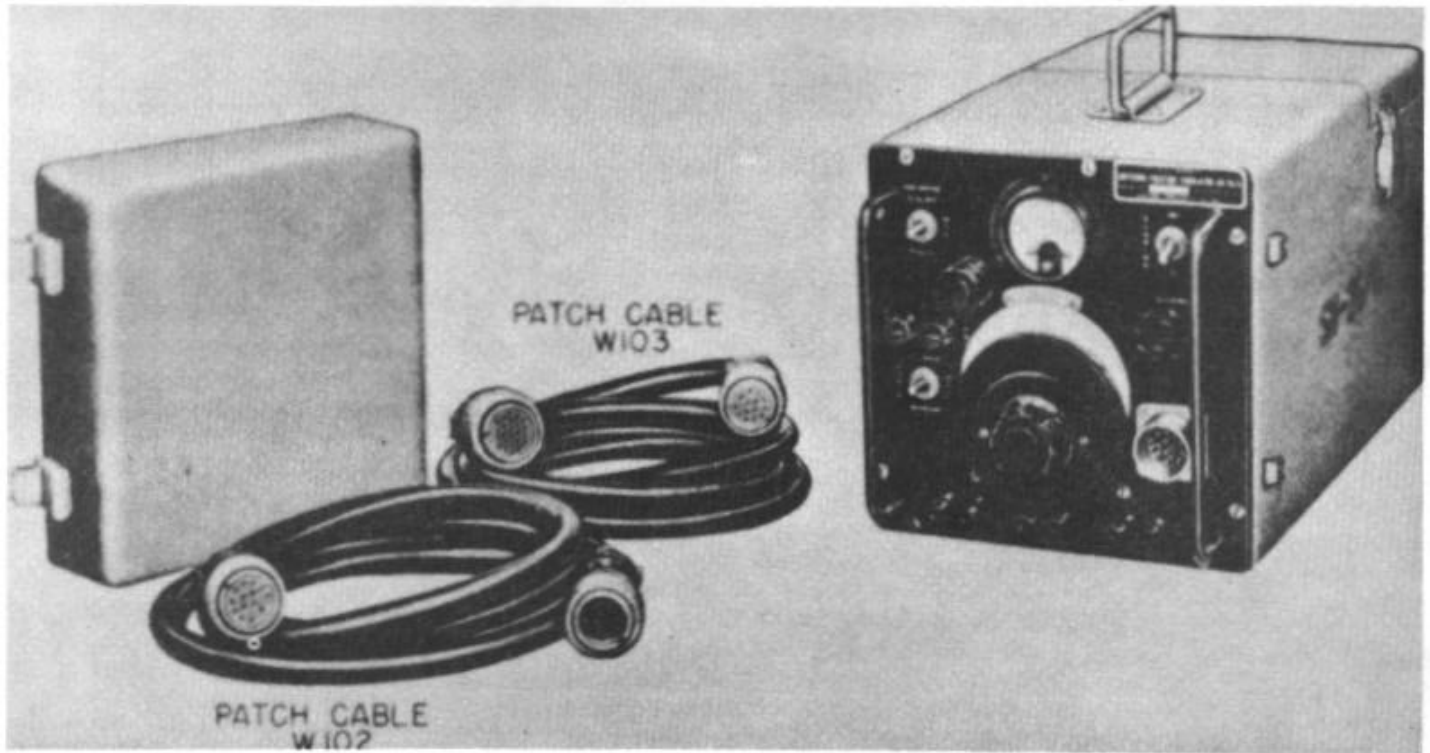
4 January 1955

Cog Serv: USAF FSN: 6625-539-8831

USA Line Item No:

Functional Class: 11.1

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	-----	-----
<b>Manufacturer:</b> Electric Indicator Co.				



## **FUNCTIONAL DESCRIPTION:**

A portable, general purpose, antenna position simulator designed to test the accuracy of direction finder indicating equipment azimuth indicators. It may be substituted for the antenna system output and/or for the radio direction finder and receiver output in the direction finder station for the purpose of calibration and performance tests. Indication is on a voltmeter dial and an azimuth indicator dial (degrees).

## **RELATIONSHIP TO SIMILAR EQUIPMENT:**

## **TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment consists of a single unit containing a synchronous motor, two 30 cycle alternators, an ac voltmeter, an azimuth indicator, a phase reversing switch, a pilot light, fuses, and cables. These components are so arranged as to simulate the operation of a direction finder antenna system, either for comparison with one being tested or a substitute for one in direction finding equipment being tested. In the former case, the azimuth indicator reading is compared with that in the equipment under test after locating a target or beacon. In the latter case, this set is plugged into the output of the equipment and operates as part of it. The variable 30 cycle output is obtained by rotating the stator housing which is directly coupled to the azimuth indicator.

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**ANTENNA POSITION SIMULATOR**  
**SM-26/U**

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*Power Supply:* 110-v 60 cps, single phase

*Frequency Range:* 30 cps (fixed)

*Output:* 0 to 10-v ac, single phase and two phase

*Accuracy of Phase Angles:*  $\pm 0.25^\circ$  over  $360^\circ$

*Major Unit:* 1 SM-26/U 9" x 9" x 19"; 26 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TO 16-35SM26-2 (Service Instructions)

TO 1 6-35SM264 (Parts Breakdown)

USAF Exhibit ENG-217A, Spec. MIL-A-4887

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

PHANTOM TRANSMITTER ANTENNA

TS-78/U

PHANTOM RECEIVER ANTENNA

TS-79/U

TEST METER

TS-80/U

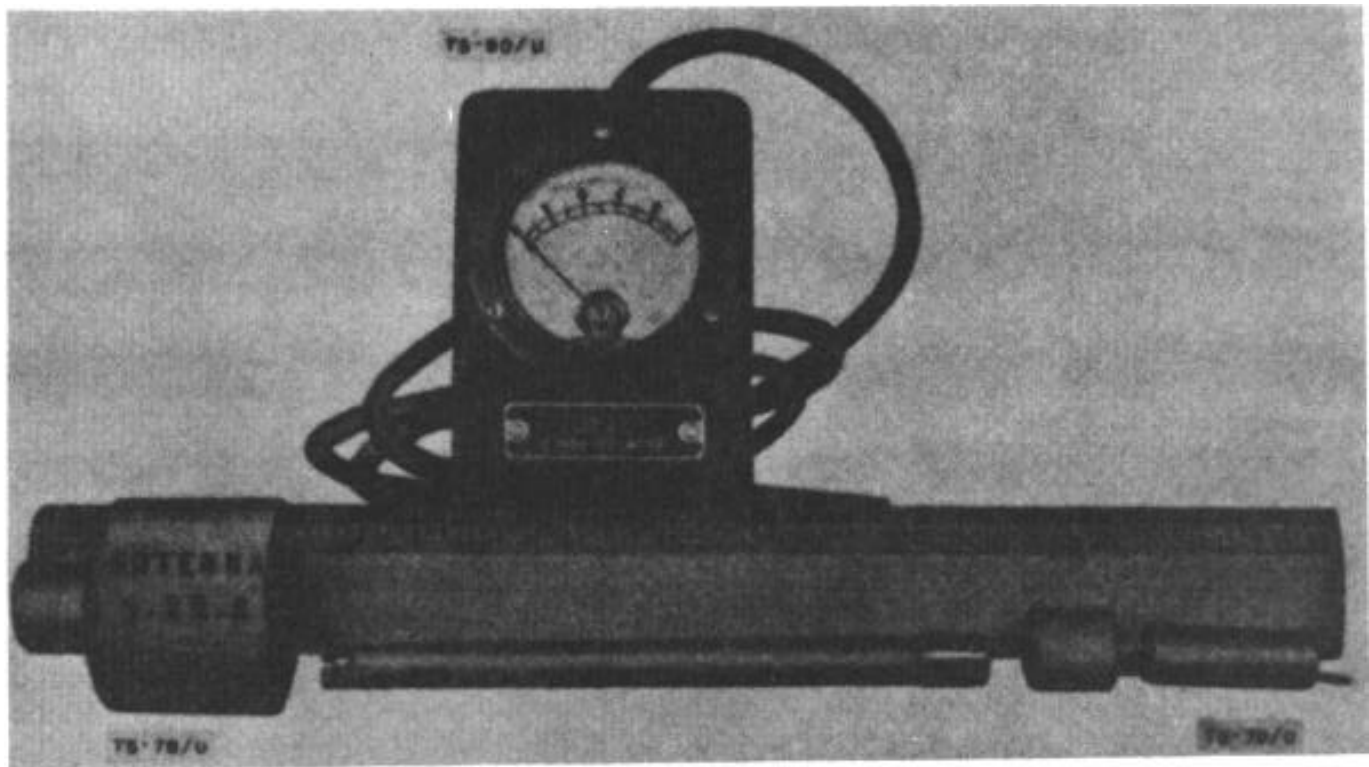
23 November 1954

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	L/Std	-----	-----
Manufacturer: Western Electric Co.				

**FUNCTIONAL DESCRIPTION:**

Phantom Transmitter Antenna TS-78/U, Phantom Receiver Antenna TS-79/U, and Test Meter TS-80/U are combined as a single unit for aircraft vhf radio communication equipments. Application is in field and bench testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Phantom Transmitter Antenna TS-78/U is interchangeable with Dummy Antenna A-85-A, and Phantom Receiver Antenna TS-79/U is identical with Dummy Antenna A-69-A.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 100 to 156 mc (TS-78/U, TS-79/U)

*Load:* 50 ohms, 0.5 w (TS-79/U); 50 ohms, 12 w (TS-78/U)

*Current Range:* 0 to 1 ma dc (TS-80/U)

*Resistance:* 125 ohms (TS-80/U)

*Major Units:* TS-78/U 3" lg x 2" dia; TS-79/U 3" lg x 3/4" dia; TS-80/U

**PHANTOM TRANSMITTER ANTENNA**

**TS-78/U**

**PHANTOM RECEIVER ANTENNA**

**TS-79/U**

**TEST METER**

**TS-80/U**

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**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

Spec RE13A734



C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

**VOLTAGE DIVIDER  
TS-89B/AP**

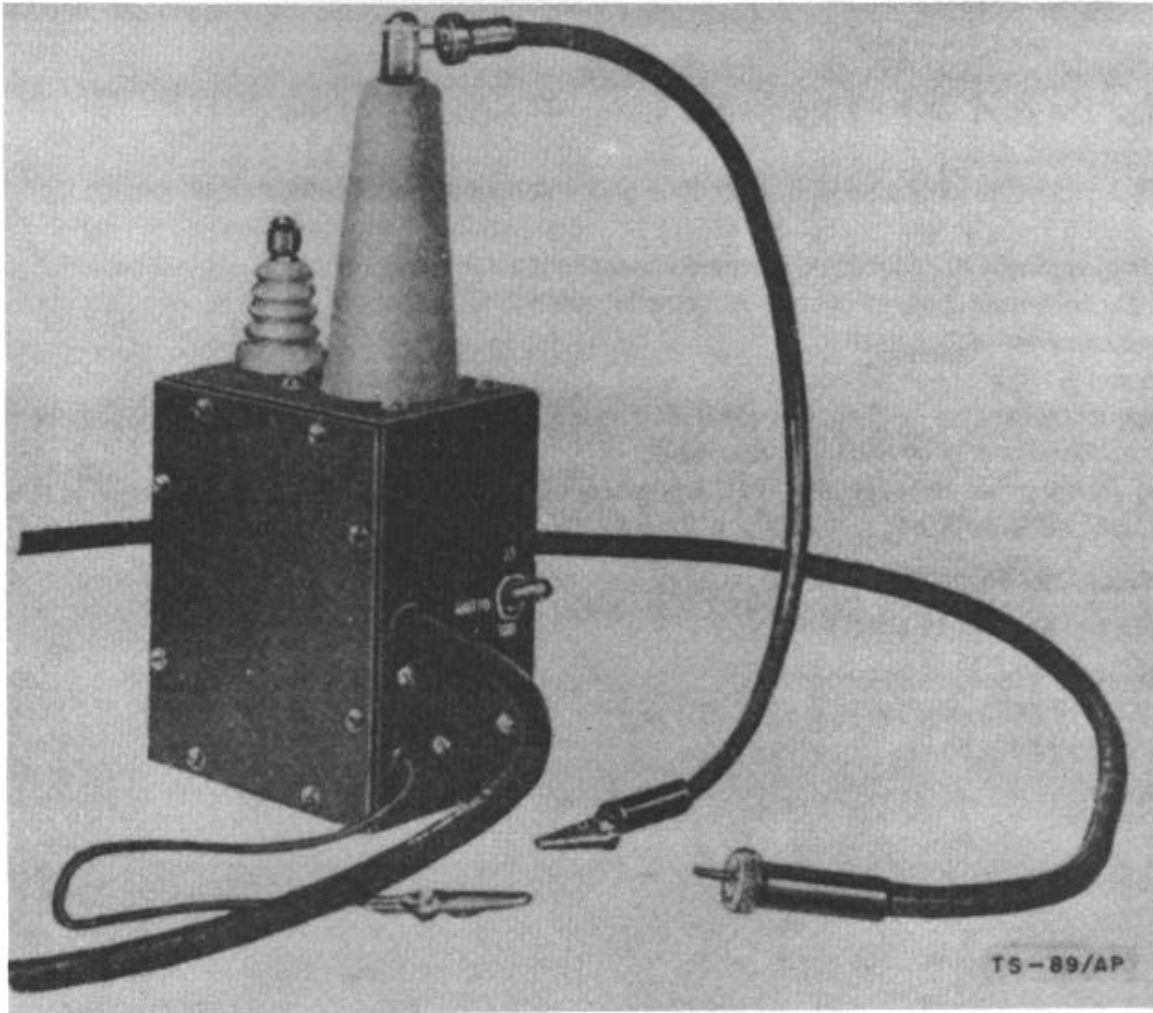
4 April 1955

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 11.12

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	Ltd	-----

**Manufacturer:** Mercury Electronics Corp.**FUNCTIONAL DESCRIPTION:**

A portable, general purpose equipment which is used in conjunction with an oscilloscope to measure video pulse voltages in high impedance circuits. It is provided with a ratio switch and two corresponding input circuits. It is used in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS-89A/AP except that Test lead CX-2490/U is used with TS-89B/AP and Test Lead CX-1903/U is used with TS-89A/AP.

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**VOLTAGE DIVIDER**  
**TS-89B/AP**

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**TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment has two input circuits. The ratio and range of voltage to be measured determines which circuit is to be used. The circuits are resistive-capacitive type unbalanced "Pi" networks, connected as voltage dividers. Resistors in these networks are composition type. Resistors are placed across the output as bleeders to prevent the buildup of high voltages.

*Power Supply:* None

*Frequency Range:* 150 cps to 5 me

*Input Voltage Ranges:* 200 to 2000 v and 2000 to 20,000 v

*Attenuation Ratios:* 10:1 for 200 to 2000v; 100:1 for 2000 to 20,000 v

*Voltage Breakdown:*

100:1 circuit will withstand 30,000  $\pm 15\%$  volts rms for extended periods

10:1 circuit will withstand 3,000  $\pm 15\%$  volts rms for extended periods

*Input Impedance:* Approx 2000 ohms in series with 10  $\mu\text{f}$

*Output Impedance:* Approx 4 meg in parallel with 20  $\mu\text{f}$

*Frequency Response:*  $\pm 1$  db

*Accuracy:*  $\pm 10\%$  of voltage ratio

*Temperature Range:*  $-40^{\circ}\text{C.}$  to  $+55^{\circ}\text{C.}$ , operational;  $-65^{\circ}\text{C.}$  to  $+85^{\circ}\text{C.}$ , nonoperational

*Humidity Range:* Up to 90%, operational

*Altitude Range:* Sea level to 5,000 ft, operational; sea level to 50,000 ft, nonoperational

*Major Unit:* TS-89B/AP 10" x 5 1/2" x 3 1/2"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

33AA22-3-12 (Service Instructions)

33AA22-3-14 (Illustrated Parts Breakdown)

MIL-V-4306(USAF), 18 June 1951

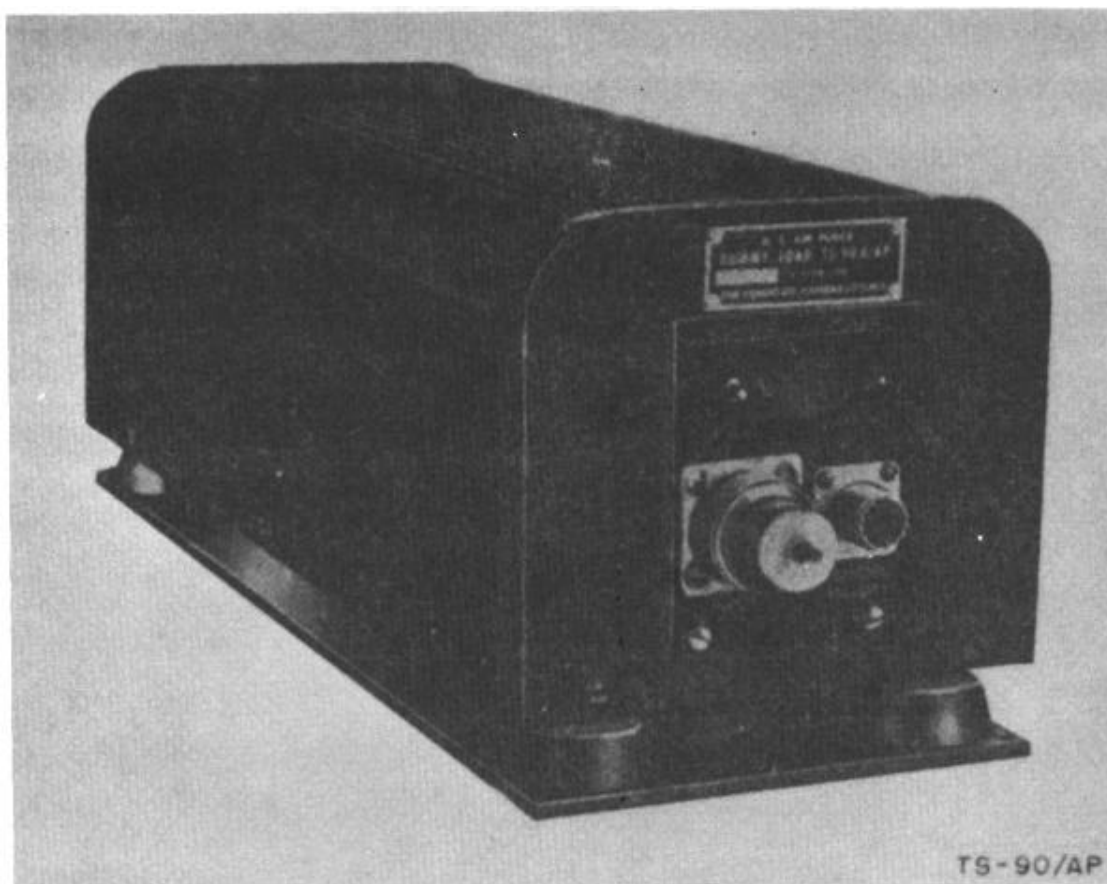
1 March 1964

Cog Serv: USAF FSN: 5985-280-3651

USA Line Item No:

Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer: The- Vendo Co.				

**FUNCTIONAL DESCRIPTION:**

Dummy Load TS-90A/AP is a portable loading device providing a 50-ohm termination used in over-all performance tests of radar modulators. An oscilloscope may be connected for pulse measurement and observation. Application is in organizational, field, and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Dummy Loads TS-90/AP and TS-90A/AP are identical except that the latter is ruggedized.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 0 to 2 mc

*Input Power:* 500 w (max)

*Input Voltage:* 5,000 v (peak)

*Impedance:* 500 ohms

*Major Units:* TS-90A/AP 5 7/8" x 14 1/8" x 6"; 7 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

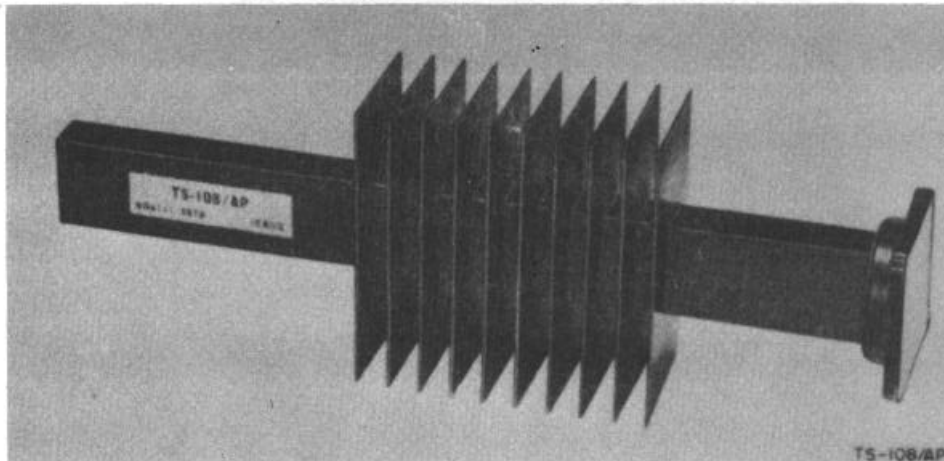
AN 16-35TS90-3, AN 16-35TS90-13

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

16 September 1954  
 Cog Serv: USN FSN:  
 USA Line Item No:

RADIO FREQUENCY TEST LOAD  
 TS-108/AP  
 Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	S/Std	-----	-----
Manufacturer:	Bernard Rice & Sons, Inc.			



#### FUNCTIONAL DESCRIPTION:

Radio Frequency Test Load TS-108/AP is a portable unit providing a matched load that absorbs rf energy without appreciable reflection or radiation in bench testing of X-band radar equipment.

#### RELATIONSHIP TO SIMILAR EQUIPMENT:

Both models of this equipment are similar.

#### TECHNICAL DESCRIPTION:

*Frequency Range:* 9,300 to 9,450 mc  
*Power Range:* 0 to 150 w (avg); 0 to 200 kw (peak)  
*Standing Wave Ratio:* 1.05 (max); 1.10 (with adapters)  
*Major Units:* TS-108/AP 9 3/16" X 3" x 1 5/8"; 1.02 lbs

#### TUBES, CRYSTALS, TRANSISTORS:

#### REFERENCE DATA AND LITERATURE:

NAV-AER 08-5QS-15, TO 16-35TS108-3  
 BuAer Spec 2674, MIT Rad Lab Dwg B-2674

1 March 1964

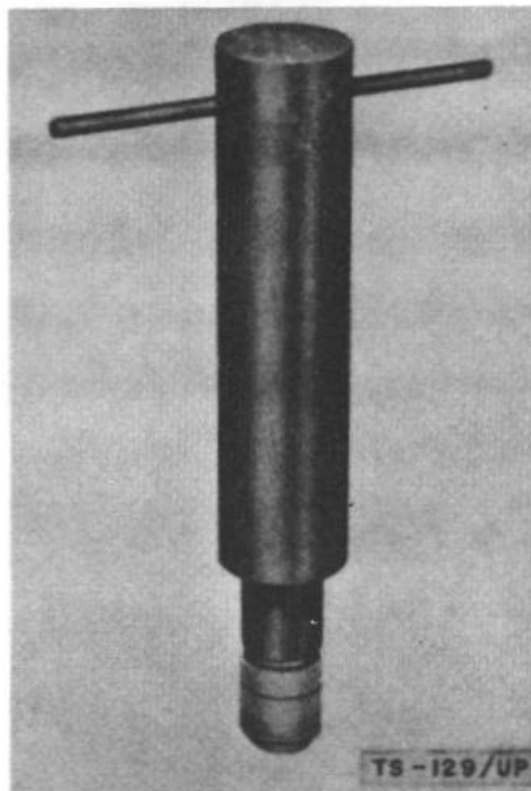
Cog Serv: USN FSN: 5985-248-6338

USA Line Item No:

TEST ANTENNA TS-129/UP

Functional Class: 11.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer:	Western Electric Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Test Antenna TS129/UP is a small dipole-type instrument used in transmitting or receiving signals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Western Electric Model X-66166D.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 950 to 1,350 mc

*Input Impedance:* 50 ohms

*Major Units:* TS-129/UP 5 5/8" x 1" dia; .38 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Navy Spec OS-3087

1 March 1964

Cog Serv: USA FSN: 6625-229-1047

USA Line Item No:

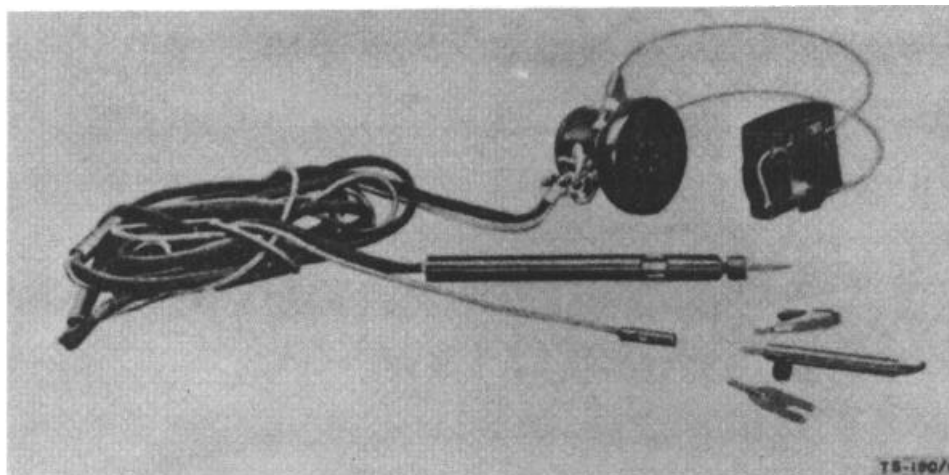
TEST SET

TS-190/U

Functional Class: 11.16

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION-**

Test Set TS-190/U is used in checking spiral-four carrier terminal and repeater stations. It is employed on distributing and apparatus frames in manual and dial central offices.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Residual Resistance:* 1,000 to 50,000 ohms

*Major Units:* TS-190/U 12" x 12" x 5"; 5 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Spec MIL-T-12681



1 March 1964

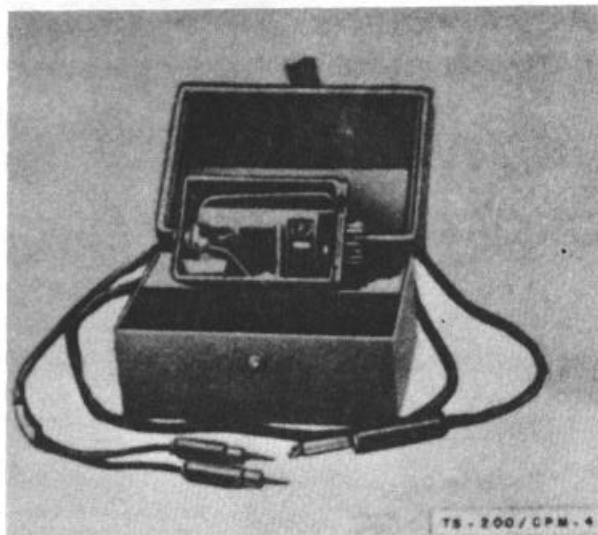
Cog Serv: USAF FSN:

USA Line Item No:

DETECTOR TS-200/CPM-4

Functional Class: 11.2.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std	-----
Manufacturer:	General Electric Co.			

**FUNCTIONAL DESCRIPTION:**

Detector TS-200/CPM-4 is a portable equipment used in testing and aligning the IF stages of radio and radar sets. Application is in organizational, field, and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radar Test Set AN/CPM4.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 2,700 to 3,400 mc

*Temperature Range:* -40° C. to +66° C.

*Major Units:* TS-200/CPM4 1 15/16" x 3 3/4" x 2 5/16"; 1.75 lbs

**TUBE COMPLEMENT:**

(1) 6H6

**REFERENCE DATA AND LITERATURE:**

TO 16-30CPS1-7, TO 16-55-199

MIL-D-4432

1 March 1964

Cog Serv: USAF FSN: 5985-280-3479

USA Line Item No:

DUMMY LOAD TS-234( )/UP

Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----
Manufacturer:	Western Electric Co.			

**FUNCTIONAL DESCRIPTION:**

Dummy Load TS-234/UP is used with oscilloscopes in measuring or checking the wave shapes, magnitude, and power of radar pulsing circuits. It provides a 50-ohm termination in the form of a voltage divider of known ratio for making over-all performance tests in pulse modulators. Application is in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Sets AN/MPM-14 and -23.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* To 2 mc

*Power Dissipation Rating:* 1,800 w (avg, max)

*Voltage Rating:* 5,000 v (peak, max)

*Voltage Division Ratio:* 50:1

*Input Impedance:* 16 ohms, resistive

*Temperature Range:* -40° F. to + 120° F.

*Major Units:* TS-234/UP 9 3/8" x 18 1/2" x 8"; 10 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TM 11-1216, TO 16-55-323

USAF Exhibit WLENG-2070, 31 August 1948



12 July 1955

Cog Serv: USAF FSN: 6625-519-5489

USA Line Item No:

DUMMY LOAD TS-234A/UP

Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	A/Std	-----
Manufacturer:	Network Manufacturing Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general-purpose dummy load used in field and depot to permit the testing of pulse modulators and the viewing of the characteristics of their output during operation without radiation of radio frequency energy. A voltage divider arrangement permits the connection of a portion of the output to an oscilloscope for the visual presentation and for measurement. A single high voltage connector is mounted on one end for connection to modulator output. A connecting cable is included. A BNC connector provides terminals for connecting the oscilloscope.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS-234/UP except the "A" model is a ruggedized version which meets shock and vibration requirements.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Basically the circuit is a resistive impedance which converts the electrical energy into heat. A tap-off provides the necessary voltage division.

*Power Supply:* None.

*Frequency Range:* Up to 2 mc

*Power Dissipation:* 1275 w

*Operating Voltage:* 5000 v (peak)

*Voltage Division Ratio:* 100 to 1

*Input Impedance:* 16 ohms, resistive, hot; 18 ohms, resistive, cold

*Major Units:* TS-234A/UP 9 3/8" x 18 1/2" x 8"; 9 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 33AA7-18-13 (Overhaul Instructions with Parts Breakdown)

Exhibit ENG-275 1 August 1950

1 March 1964

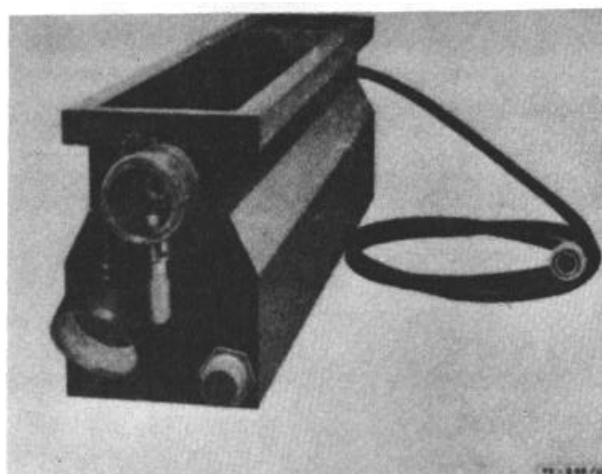
Cog Serv: USN FSN: 5985-244-9511

USA Line Item No:

DUMMY ANTENNA TS-235( )/UP

Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer:	Barlow Engineering Co.; Specialty Spraying & Machine Co.; Western Electric Co.			

**FUNCTIONAL DESCRIPTION:**

Dummy Antenna TS235/UP is a portable equipment providing a power-absorbing termination into which a transmitter can work without radiation into space. A terminated probe for coupling test equipment to the transmission line is included.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Sets AN/MPM-14 and -23, as well as Radio Set AN/TPS-1B it is similar to, but not interchangeable with, Dummy Antenna TS-105/TPM-1.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 15 w, 115 v, 400 cy, 1 phase ac

*Frequency Range:* 500 to 1,600 me

*Power Rating:* 1,000 w; 10 kv (peak)

*Impedance:* 50 ohms (nom)

*Probe Loss:* 50 db at 1,300 me

*Major Units:* TS-235/UP 6 7/8" x 30" x 4 7/8"; 19.5 lbs; 211373 (Motor Assembly)

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

AN 16-35TS235-1, NAVSHIPS 900,457(A)

MIL-D-16211 (Ships)

1 March 1964

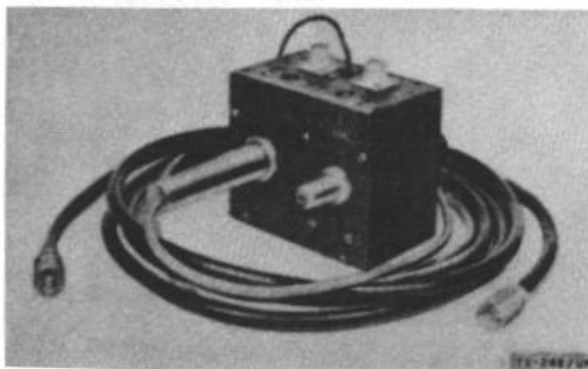
Cog Serv: USA FSN: 6625-242-7544

USA Line Item No:

VOLTAGE DIVIDER TS-265( )/UP

Functional Class: 11.12

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Sperry Gyroscope Co.			

**FUNCTIONAL DESCRIPTION:**

Voltage Divider TS-265/UP is a portable test instrument used in stepping down high video pulse voltages so that they may be observed on a standard oscilloscope or synchroscope.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, similar to Voltage Divider TS-89/AP, is part of Test Sets AN/MPM-6, -7, -11, and -15, and Radar Test AN/TPM-3.

**TECHNICAL DESCRIPTION:**

*Voltage Range:* 0 to 50,000 v

*Impedance:* High

*Major Units:* TS-265/UP 10" x 5" x 3"; 4 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TM 11-1241, TM 11-1552

1 March 1964

Cog Serv: USN FSN:

USA Line Item No:

DUMMY ANTENNA TS-329( )/U

Functional Class: 11.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	-----	-----
Manufacturer:	Western Electric Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Dummy Antenna TS-329/U is a portable unit used in testing the rf output of radio transmitters. Application is in bench testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Antenna A-8-A.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 0 to 160 mc

*Power Dissipation:* 12.5 w

*Impedance:* 50 ohms at 160 mc

*Major Units:* TS-329/U 3" x 5" x 4"; 2 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

NAVAER 08-5S-78; NAVSHIPS 900,155 Vol. II

Navy Spec RE9122(Aer)

1 March 1964

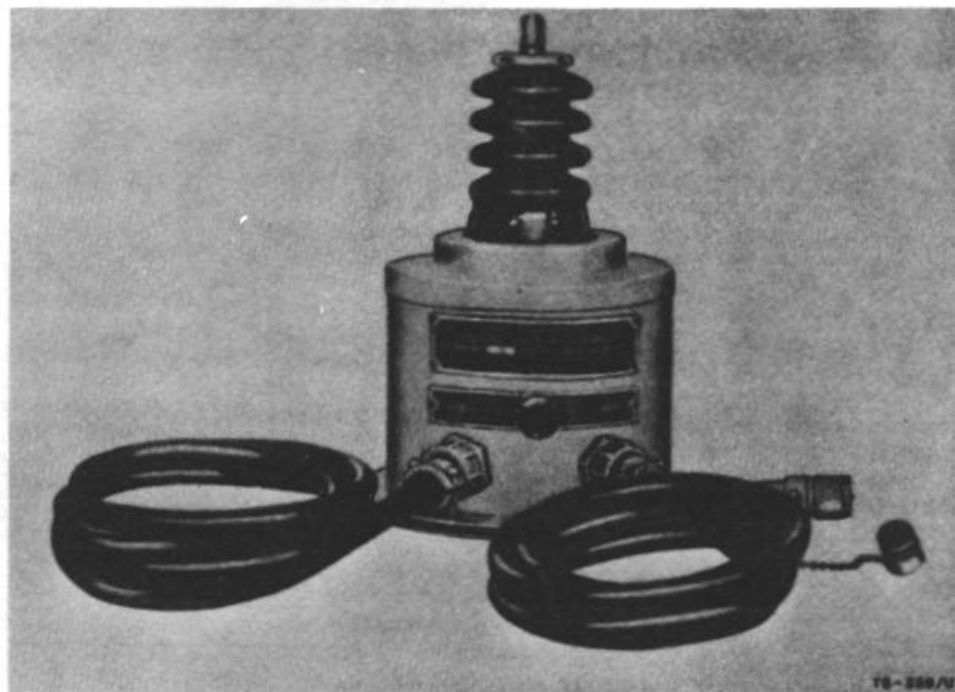
Cog Serv: USAF FSN:

USA Line Item No:

VOLTAGE DIVIDER TS-359( )/U

Functional Class: 11.12

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	L/Std	-----
Manufacturer:	Press Wireless Manufacturing Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Voltage Divider TS-359A/U is a portable unit used with a synchroscope or cathode-ray oscilloscope in measuring or viewing output pulses from modulators of medium-power radar sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* Above 5,000 cy

*Voltage Range:* 35 kv (peak)

*Capacitance:* 20  $\mu\text{f}$

*Temperature Range:* -35° C to +65° C

*Humidity Range:* 0 to 95%

*Major Unit:* TS-359A/U 4 1/2" x 6 1/2" dia; 5.75 lbs

**TUBE COMPLEMENT:****REFERENCE DATA AND LITERATURE:**

TO 1635TS359-2, TO 1635TS359-3, TO 1635TS3594

Exhibit WLENG 2079, 26 October 1948

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

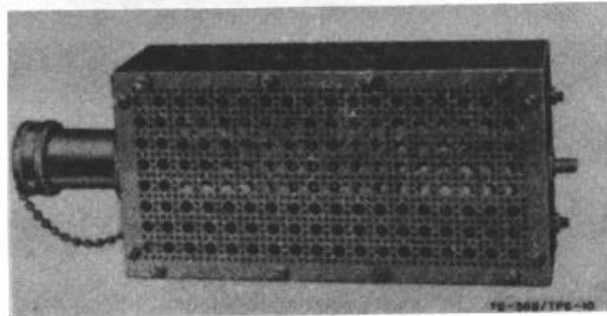
1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

**DUMMY LOAD****TS-366B/TPS-10****Functional Class: 11.7**

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	-----	-----	Std	-----
<b>Manufacturer:</b>	Munston Manufacturing and Services Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Dummy Load TS-366B/TPS-10 is a portable resistor-type unit used in absorbing the rf output of modulators to prevent radiation during testing. Application is in organizational, field, and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Power Range:* 320 w (avg); 1,257 w (peak)

*Impedance:* 50 ohms

*Major Unit:* TS-366B/TPS-10 15 1/4" x 5 5/8" x 3 1/2"; 4.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TO 16-35TS366-2, TO 16-35TS3664

USAF Exhibit WLENG 2077

1 March 1964

Cog Serv: USA FSN:

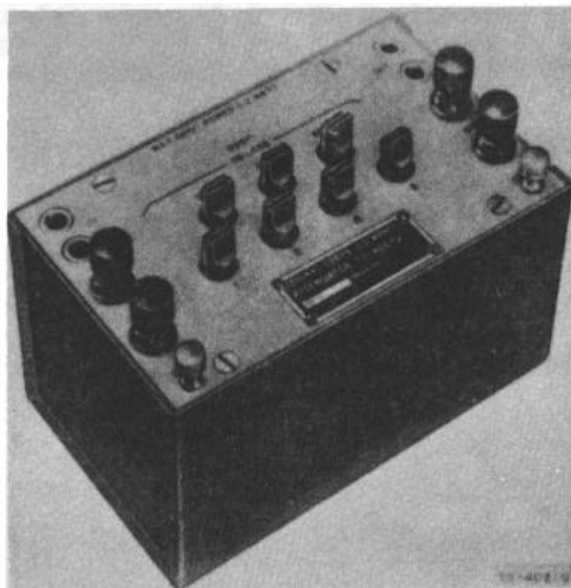
USA Line Item No:

ATTENUATOR

TS-402( )/U

Functional Class: 11.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Western Electric Co.			

**FUNCTIONAL DESCRIPTION:**

A portable, general-purpose, variable attenuator used in making transmission gain measurements on voice and carrier frequency equipment. It is designed for use in conjunction with a decibel meter which has an input impedance of 600 ohms, and with an oscillator which has an output impedance of 600 ohms. Testing power for transmission measurements is provided by the oscillator which serves as a power source; the testing power is adjusted by the potentiometer of the oscillator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to TS-402/U in external appearance, operation, circuit design, application, and in all other respects except for the type resistors used.

Similar to WEC Co No 5A (SPL).

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The attenuator circuit consists of seven balanced pads of the 0 type and have constant attenuation values. The pads are connected in tandem. Each pad is wired to a two-position rotary switch (locking type) which has two sets of break-make contacts. Each switch is designated on the attenuator control panel by the numerical decibel-loss value of the corresponding pad which it controls.

*Input Power:* 0.2 w during continuous operation: 0.5 w over short period of time

*Frequency Range:* 0 to 100 kc

*Attenuation Range:* 0 through 81 db in steps of 1 db

*Input Impedance:* 600  $\pm$ 10 ohms

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**ATTENUATOR**

**TS-402( )/U**

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*Output Impedance:* 600  $\pm$ 10 ohms

*Accuracy:*  $\pm$ 0.2 decibel at frequencies from 0 to 50 kc  $\pm$ 0.3 db at frequencies from 50 to 100 kc

*Major Unit:* 1 TS-402A/U 5" x 6 3/4" x 4 1/8"; 5 lbs

**TUBES, CRYSTALS, TRANSISTORS:.**

**REFERENCE DATA AND LITERATURE:**

TO 16-35TS402-5(TM 11-2044) (Instruction Book)



C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

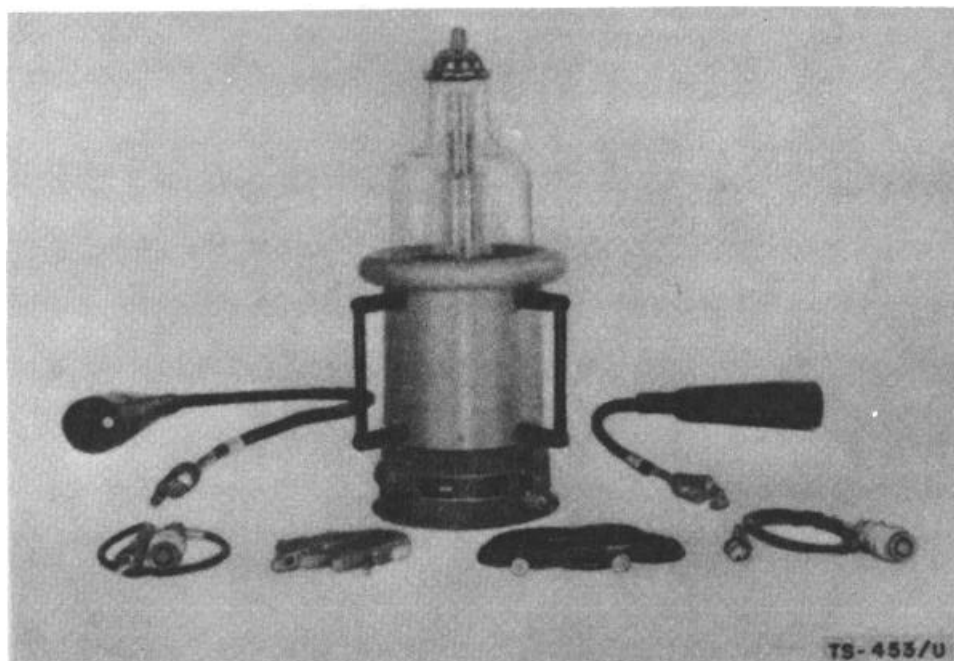
USA Line Item No:

VOLTAGE DIVIDER

TS-453/U

Functional Class: 11.12

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std	Std	-----
Manufacturer:	Press Wireless Manufacturing Co.			

**FUNCTIONAL DESCRIPTION:**

Voltage Divider TS-453/U is a portable equipment used in dividing high-voltage pulses of radar modulators. In conjunction with a synchroscope, it measures and permits viewing of pulses too great in magnitude to be brought directly to a synchroscope. Application is in depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 1 to 1,000 pps; 1  $\mu$ sec width

*Voltage Range:* 200 v to 100 kv

*Input Capacity:* 20  $\mu$ mf, 180  $\mu$ f

*Temperature Range:* -45° C to +65° C

*Accuracy:*  $\pm 2\%$

*Major Unit:* 1 TS-453/U 22" lg x 9 1/2" dia; 11 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Spec and/or Dwg: MIL-V4696 (USAF), 25 May 1953

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

RADIO FREQUENCY ADAPTER

UG-27C/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Industrial Products Co., Polytechnic Institute of Brooklyn			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A type N adapter to couple RF Plug UG-21B/U to RF Jack UG-22B/U. Used with type N straight plugs for making 90° connections to apparatus.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to UG-27B/U except improved electrically.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 2.39 to 9.9 kmc per sec

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Voltage Standing Wave Ratio:* 1.41:1

*Temperature:* High or low (200° C max)

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* 1 male, 1 female, 1 round coaxial contact at each end

*Type:* Right angle

*Dimensions:* 1.4" x 1.3" x 3/4" diameter

*Weight:* 0.125 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Specification MIL-C-71A, Dwg. No. AS-2112 and MS-90156

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: NAVY FSN:

USA Line Item No:

RADIO FREQUENCY ADAPTER

UG-28A/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	Std A	-----	-----
Manufacturer:	American Phenolic Corp., Diamond Mfg. Corp., Industrial Products Co., Kings Electronics, the Workshop Associates			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A type N adapter to couple three type N plugs together.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to UG-28/U except smaller and different insert material; better cable clamping.

**TECHNICAL DESCRIPTION:***Frequency Range:* Up to 3000 mc*Maximum Voltage:* 500 v*Maximum Power:* 1000 w*Impedance:* 50 ohms*Temperature:* High*Weatherproof:* Yes, when used with type N connectors*Pressurized:* No*Shape:* Cylindrical*Material:* Silver-plated brass*Insert:* Teflon*Contacts:* 1 round female coaxial contact (bayonet locking) at each end*Type:* Tee*Dimensions:* 1 3/4" x 1 7/32" x 5/8" dia; 0.156 lb*Major Units:***TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Specification MIL-C-71A. Dwg. No. RE49F465 (Navy)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

RADIO FREQUENCY ADAPTER

UG-29B/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	American Phenol Corp., Diamond Mfg. Corp., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A type N adapter to couple two RF Plugs UG-21B/U, or equal, together.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to UG-29A/U but slightly different in size and suitable for high temperature use.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 10,000 mc

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Temperature:* High (200° C max)

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* 1 round female coaxial contact on each end

Type: *Straight*

*Dimensions:* 1 3/4" x 31/32" dia; 0.125 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Specification MIL-C-71A. Dwg. No. RE49F258 (Navy).

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

COVER

UG-51( )/U

Functional Class: 11.3.4

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Industrial Products Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Mates with Choke Flange UG-52A/U for use with rf Line RG-51/U.

**RELATIONSHIP TO SIMILAR-EQUIPMENT**

Used in testing AN/CPS-4, AN/MPS 10, AN/TPN-2. Similar to Navy Model 49474.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 7050 to 10,000 mc

*Temperature:* Moderate

*Weatherproof:* No

*Pressurized:* No

*Shape:* Rectangular

*Material:* Brass

*Flange Type:* Plain

*Waveguide Size:* 1 1/4" x 5/8"

*Dimensions:* 1 7/8" x 1 7/8" x 7/16"; 0.125 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS****REFERENCE DATA AND LITERATURE,**

Dwg. RE49F203 (Navy); Dwg. AS-2021(ASESA).

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-83( )/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Industrial Products Co., Diamond Manufacturing Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples RF Plug UG-9/U or UG-21/U, or equal, to Army Socket Type SO-239 or Navy Socket Type 49194, or equal. (Adapts "N" to UHF connectors.).

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to UG-83/U except body manufacture redesigned for greater strength.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 200 mc

*Maximum Voltage:* 500v

*Impedance:* Non-constant

*Temperature:* Moderate

*Weatherproof::* No

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Low loss

*Contacts:* 1 round male coaxial contact on one end, 1 round female coaxial contact on other end

*Type:* Straight

*Dimensions:* 1 51/64" x 7/8" dia; 0.07 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS,****REFERENCE DATA AND LITERATURE:**

Dwg. No. RE49F250 (Navy)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

RADIO FREQUENCY PLUG

UG-88( )/U

Functional Class: 11.15

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	King Electronics, Industrial Products Co., Workshop Associates, Diamond Manufacturing Corp., American Phenolic Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A type BNC connector which mates with RF Jack UG-89B/U or UG-291/J. Used with RF Cable RG-5SC/U: Used with its mating fitting in electrical coaxial transmission line circuits to facilitate connection and disconnection of equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/GRA-8.

Interchangeable with previous models, but improved electrically and mechanically.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 3000 mc

*Maximum Voltage:* 500 v

*Maximum Power:* Low

*Impedance:* 50 ohms

*Temperature:* Moderate

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* One male coaxial contact, bayonet locking

*Type:* Straight

*Dimensions:* 1 1/16" x 9/16" dia (Max cable opening is 0.209" dia); 0.03 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. SC-D-72235 (SigC)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

CRYSTAL, ADAPTER

UG-119/UP

Functional Class: 11.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Boonton Radio Corp., Diamond Manufacturing Corp., Industrial Products Co., King Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples an "N" type socket to a video plug; rectifies the rf output of radar sets for use in test equipments requiring video input.

**RELATIONSHIP TO SIMILAR EQUIPMENT.**

Used with 1N21B, AN/MPM-5, TS-207/UP, TS-467/UP.

**TECHNICAL DESCRIPTION,**

*Frequency Range:* Up to 24,000 mc

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Temperature:* Moderate

*Weatherproof:* No

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Cartridge crystal

*Contacts:* 1 type "N" plug on one end and 1 socket SO-239 on other end

*Type:* Straight

*Dimensions:* 2 1/8" x 11/16" dia; 0.5 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. SC-D-12024 (SigC).



1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-201/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Diamond Manufacturing Corp., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples rf Jack UG-20B/U to rf Plug UG-88/U. (Adapts N to BNC connectors.)

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Interchangeable with UG-201/U, but improved electrically and mechanically.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 10,000 mc

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Voltage Standing Wave Ratio:* Less than 1.2:1 for the frequency region 2600 to 7250 mc

*Temperature:* Moderate

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* 1 male end, 1 female end; type N male, type BNC female; both ends locking type

*Type:* Straight

*Dimensions:* 1 5/16" x 13/16" dia; 0.125 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. SC-D-72309 (SigC)

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-255/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Diamond Manufacturing Corp., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples Plug PL-259 (Navy type 49190) or Plug PL-259A (Navy type 49195) to rf Jack UG-89/U, UG-90/U, or Receptacle UG-185/U. (Adapts BNC to UHF connectors.)

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar on one end to SO-239 Navy type 49194 and on other end to UG-88/U.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 500 mc

*Maximum Voltage:* 500 v

*Impedance:* Non-constant

*Temperature:* Moderate

*Weatherproof:* No

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Cross-linked styrene

*Contacts:* 1 type BNC round male, 1 type UHF round female locking type

*Type:* Straight

*Dimensions:* 1 5/16" x 5/8" dia; 0.125 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

JAN-P-77, Dwg No. RE49F378 (Navy)

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-273/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Diamond Manufacturing Corp., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples rf Plug UG-88/U to Socket SO-239 (Navy Type 49194). (Adapts BNC to UHF connectors.)

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 3000 mc

*Maximum Voltage:* 500 v

*Impedance:* Non-constant

*Temperature:* Moderate

*Weatherproof:* No

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Polystyrene

*Contacts:* One end is like Plug PL-259(49190) and the other end is like Jack UG-89/U

*Type:* Straight

*Dimensions:* 1 5/16" x 11/16" dia; 0.085 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. No. RE49F389 (Navy)

1 March 1964

Cog Serv: USAF:

USA Line Item No:

ADAPTER

UG-274/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	American Phenolic Corp., Diamond Manufacturing Corp., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples two rf Plug UG-88H/U to one rf Jack UG-89/U. (Adapts two BNC male to one BNC female connector.)

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 3000 mcs

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Temperature:* Moderate

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Styramic

*Contacts:* Each end of arm terminates in rf Jack UG-89/U and the center leg terminates in rf Plug UG-88/U

*Type:* Tee

*Dimensions:* 1 9/32" x 1 1/32" x 3/8" dia; 0.038 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. SC-D-72348 (SigC)

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-306/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Stewart-Wagner Electric Division of Stewart-Wagner Corp., American Phenolic Corp., H. H. Buggie and Co., Diamond Mfg. Corp., General Electric Co., Industrial Products Co., Kings Electronics			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Couples rf Plug UG-88/U or equivalent to rf Jack UG-89/U or equivalent. (Adapts BNC male to BNC female connectors.)

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 3000 mc

*Maximum Voltage:* 500 v

*Impedance:* 52 ohms

*Temperature:* Moderate

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* 1 round male coaxial on one end, 1 round female coaxial contact, grounded on other end; bayonet locking

*Type:* Right angle (watertight when in mated position)

*Dimensions:* 1" x 31/32" x 9/16" dia; 0.033 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Specification MIL-C-3608, Dwg. No. RE49F429 (Navy)

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

UG-349( )/U

Functional Class: 11.2.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Industrial Products Co., Diamond Manufacturing Corp.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Adapts a type N rf Plug such as UG-21/U to a type BNC rf Jack such as UG-89/U.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/CPS-5C, -5D, AN/FRT-5, -6.

Similar to Adapter UG-335/U except UG-349A/U does not have the mounting plate.

Similar to Adapter UG-349/U except the "A" is improved electrically and mechanically.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* Up to 3000 mc

*Maximum Voltage:* 500 v

*Impedance:* 52 ohms

*Temperature:* Moderate

*Weatherproof:* Yes

*Pressurized:* No

*Shape:* Cylindrical

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* Type ENG male one end, type N female other end

*Type:* Straight

*Dimensions:* 1 1/2" x 17/32" dia; 0.063 lb

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Dwg. SC-D-72331 (SigC)

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

ADAPTER

CONNECTOR UG-397/U

Functional Class: 11.3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Sperry Gyroscope Co., Inc.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, general-purpose, right-angle type, broadband adapter, designed to couple coaxial lines with type N fittings to standard rectangular waveguides. This adapter acts as a fix-tuned transformer which is especially satisfactory for measuring applications. It is used in field and depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This unit is similar to Adapter Connectors UG-398/U, UG-400/U, and UG-446/U, except for frequency range and dimensions.

Similar to Sperry Model 249.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This adapter consists of a short section of standard rectangular waveguide with a section of coaxial line joining the broad face of the guide at right angles. The center conductor of the coaxial fitting extends into the waveguide forming a broadband antenna. A shorting plate, UG-51/U, closes one end of the waveguide and a standard flange coupling is mounted at the other end. A type N jack which will fit rf Plug UG-21B/U terminates the coaxial line. This adapter effectively adapts rf Plug UG-21B/U to a 1.122" x 0.497" inside dimension waveguide.

*Power Supply:* None

*Frequency Range:* 7050 to 10,000 mc

*Impedance (Nominal coaxial):* 50 ohms

*Voltage Standing Wave Ratio:* 1.35 (max)

*Major Units:* 1 UG-397/U 2 1/4" x 1 7/8" x 1 1/2"; 0.5 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Sperry Final Engineering Report

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

COAXIAL TO WAVEGUIDE ADAPTER

UG-953( )/U

Functional Class: 11.3.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Specialty Spraying and Machine Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Connects a Rectangular Waveguide (6.5' x 3.25" x 0.080") such as RG-69/U to a coaxial line.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Used in testing AN/FPS-3, -3A, -8, AN/MPS-7, -11.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 1120 to 1700 mc

*Maximum Voltage:* 500 v

*Impedance:* 50 ohms

*Voltage Standing Wave Ratio:* 1.2:1

*Temperature:* Moderate

*Weatherproof:* No

*Pressurized:* No

*Shape:* Rectangular

*Material:* Silver-plated brass

*Insert:* Teflon

*Contacts:* One Waveguide Flange UG-417A/U on one end, one RF Jack UG-20B/U on other end

*Type:* Right Angle

*Dimensions:* 5 3/4" x 8 3/4" x 8 1/4"; 4 lbs

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**



## CATEGORY 12

## MISCELLANEOUS TEST EQUIPMENT

<i>Functional classification</i>	<i>Name of equipment</i>	<i>Type No.</i>	<i>Page No.</i>
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12.6.....	Teletypewriter Test Set.....	TS-659/UG .....	699
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12.6.....	Test Set, Telephone .....	TS-725/TTQ-3 .....	707
12.6.....	Test Set, Teletypewriter .....	TS-785/GG.....	709
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1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

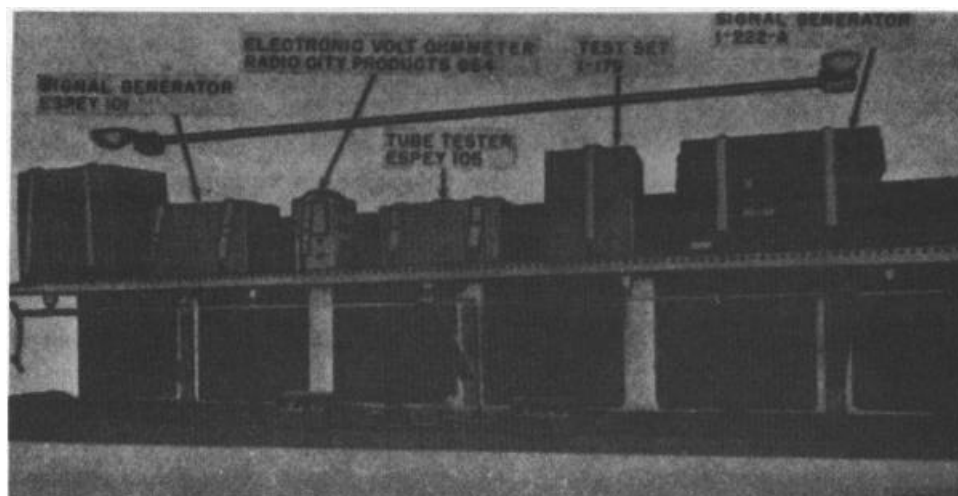
TEST SET

AN/GPM-1

Functional Class: 12.12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Test Set AN/GPM-1 is a transportable assembly of test equipments used for testing and adjusting ground radar equipments at third and higher echelons.

This equipment is used in conjunction with specialized test equipment of the AN/MPM series, the selection of which depends on the frequency range and type of the radar set maintained.

Equipment is installed, operated, and transported in an M-30 Radar Repair Truck.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

Technical characteristics of the following major components are described elsewhere in this publication:

Oscilloscope TS-239/UP, 3.2

Multimeter TS-352/U, 1.1.3.2.1

Audio Oscillator TS-382/U, 4.1.1

Electronic Multimeter TS-505/U, 1.1.3.1.2

Test Set, Electron Tube TV-7/U, 1.2.1

*Major Units:* AN/GPM-1 including: TS-239A/UP, TS-352A/U or 1-176, TS-372/U or I-151, TS-505/U or TS-294C/U, TV-7/U or I-177

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

Refer to major components

**REFERENCE DATA AND LITERATURE:**

TM 11-1080A

Refer to Signal Corps Procurement Parts List

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

Cog Serv: USA FSN:

TEST SET, TELEGRAPH

USA Line Item No:

AN/PGM-1

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Telegraph Test Set AN/PGM-1 is a portable instrument used in preventive maintenance and repair of telegraph terminal equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 50 or 60 cy, 1 phase ac

*Voltage Range:* 0 to 300 v dc

*Output:* 175 to 275 v dc, 100 ma (max)

*Major Units:* AN/PGM-1

**TUBE COMPLEMENT:**

(1) OB2, (1) 5U4, (1) 6SL7, (2) 6Y6

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

5 November 1954

Cog Serv: USA FSN:

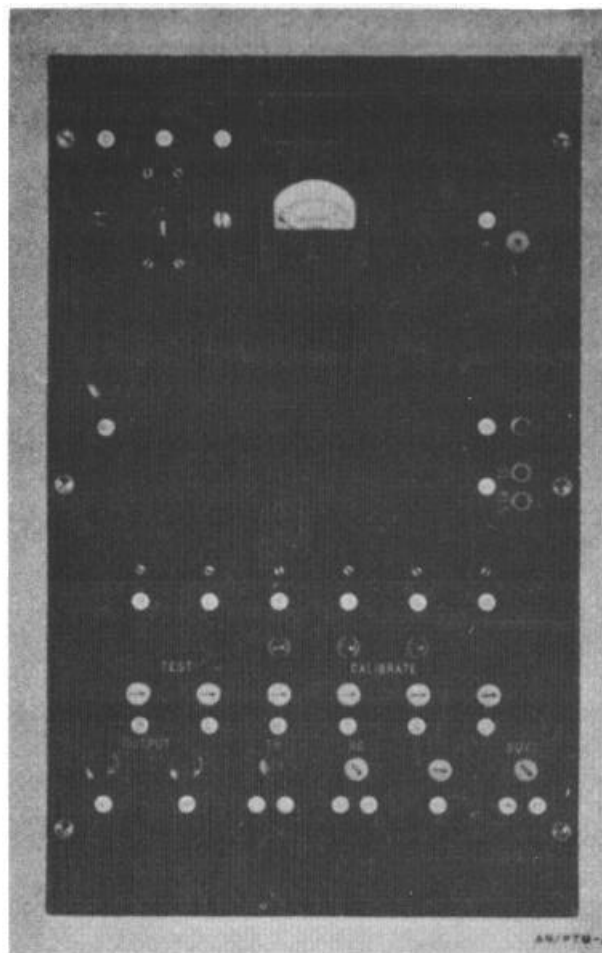
USA Line Item No:

TEST SET, ELECTRICAL CABLE

AN/PTM-2

Functional Class:

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Western Electric Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Electric Cable Test Set AN/PTM-2 is a portable instrument used in testing insulation resistance of telephone lines in dial central offices.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Western Electric Company Test Set H-297421.

*Equipment Required But Not Supplied:* Batteries: (6) BA-2, (2) BA-27, (1) BA-59

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**TEST SET, ELECTRIC CABLE**  
**AN/PTM-2**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 3 v, 46.5 v dc

*Current Range:* 0 to 25 ma

*Major Units:* AN/PTM-2

**TUBE COMPLEMENT:**

(1) 6SJ7, (1) 43RCA

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

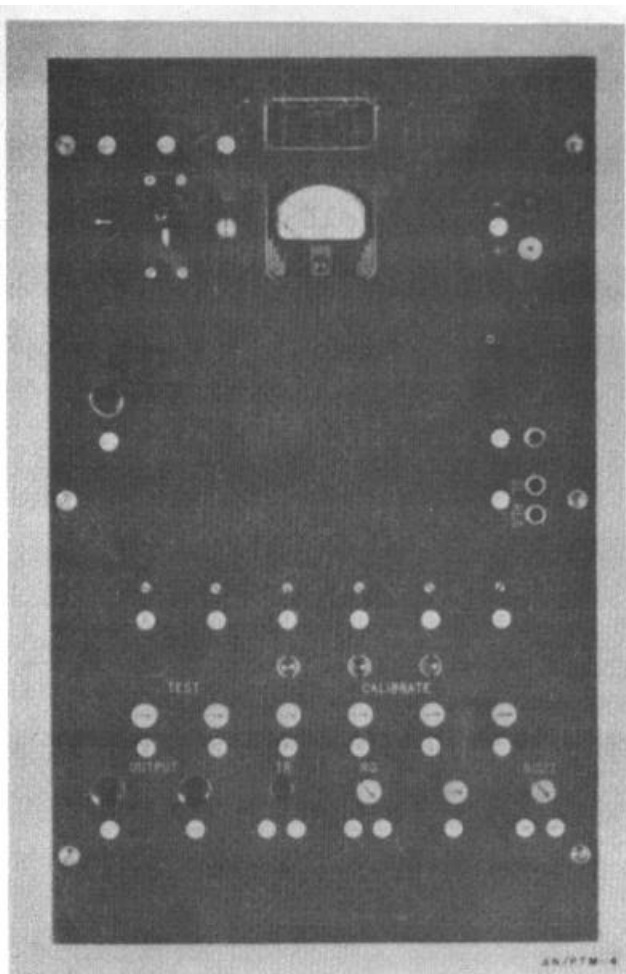
USA Line Item No:

TEST SET, ELECTRICAL CABLE

AN/PTM-4

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Western Electric Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Electrical Cable Test Set AN/PTM-4 is a portable instrument used in testing telephone cables to determine insulation resistance conditions in manual central offices.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Western Electric Company Model 64959.

*Equipment Required But Not Supplied: Batteries: (6) BA-2, (1) BA-8, (1) BA-27*

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**TEST SET, ELECTRICAL CABLE**  
**AN/PTM-4**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 3 v, 46.5 v dc

*Current Range:* 0 to 25 ma

*Major Units:* AN/PTM-4

**TUBE COMPLEMENT:**

(1) 6SJ7, (1) 43RCA

**REFERENCE DATA AND LITERATURE:**

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	-----	<b>Std</b>	-----

**Manufacturer:** Times Telephoto Equipment, Inc.**No Illustration Available****FUNCTIONAL DESCRIPTION:**

An electromechanical-optical facsimile set of the revolving drum type for the transmission and reception of page copy. In service, it is used for transmission of maps, photographs, sketches, and printed or handwritten text over regular voice-communication channels, either wire or radio, between fixed stations. Colored copy may be transmitted but all reproduction is in black, white, and intermediate shades of gray. Received copy is recorded either directly on chemically treated paper or photographically in either negative or positive form.

In transmitting, the subject copy is explored with a beam of light along a set of closely spaced parallel lines (scanning) which translates the blacks and whites of the copy into electrical signals by use of a photo-cell. This electrical signal is translated into amplitude modulation of an audio carrier current. In receiving, the electrical signal is translated into marks on a record sheet which corresponds to those on the original copy. Scanning and recording motions are synchronized by use of a precision tuning fork controlled local oscillator. As test equipment, this set serves to monitor an identical set in service, and its received and reproduced copy serves as a means for analyzing the copy reproduced by the set in service. Many possible malfunctions or misadjustments can be discovered and located using this comparative analysis. Also, by this comparison method, other front panel controls and indicators, as well as the talk-back circuit, can be qualitatively tested.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This set is similar to Facsimile Sets AN/TXC-1 and 1A, but control and circuit changes make it not completely interchangeable.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* Principal components are a facsimile transceiver, which serves either as transmitter or receiver, depending on the setting of a front panel selector switch, and a rectifier power unit which supplies operating power to the transceiver and operates from an ac source.

*Power Supply:* 100 to 130 v ac, 50 to 65 cyc, single phase, 250 w at 115 v

*Frequency Range:* 900 to 2700 cyc (sideband limits)

*Audio Carrier Frequency:* 1800 cyc

*Double Sideband Width:* 1800 cyc

*Type of Transmission Reception:* Amplitude Modulated Audio Carrier

*Signal Levels:*

*Input (for reception):* -45 to 0 dbm

*Output (for transmission):* 0 to +25 dbm

*Maximum Size of Copy:* 12" x 18 11/16"

*Size of Scanning Spot:* 0.01"

*Speed of Drum:* Rotation: 1 rps. Lateral Movement: 12 1/2" in 20 min

*Scanning Line Per Inch:* 96

*Drum Speed Control:* Synchronous motor controlled by 1800 cyc fork oscillator

*Speaker Size:* 4" diam cone



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**FACIMILE SET**  
**AN/TXC-1**

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*Speaker Input:* 150 mw

*Speaker Input Impedance:* 250 ohms

*Major Units:*

AN/TXC-1B including: TT-1B/TXC-1 10 3/4" x 34 5/8" x 17 5/8"; 85 lbs

MT-252A/TXC-1 32" x 37" x 22"; 86 lbs

PP-86A/TXC-1 9" x 12" x 10"; 48 lbs

PH-549/TXC-1; 8.3 lbs

LS-11 4 5/8" x 4 5/8" x 2 5/8"; 4 lbs

Enamel Tray 19" x 4" x 24"; 6.8 lbs

**TUBE COMPLEMENT:**

6 JAN-7C5, 1 JAN-1645, 1 RETMA-R113OB, 5 JAN-7L7, 1 JAN-6S7, 4 JAN-7N7, 1 JAN-5Z3,  
1 JAN-7C7, 2 JAN-5651, 1 JAN-884, 3 JAN-1635

**REFERENCE DATA AND LITERATURE:**

TO 16-30TXC1-8 (TM 11-2258) (Facsimile Sets AN/TXC-1, -1A, -B)  
Army Spec. 71-3107 (Sig C)

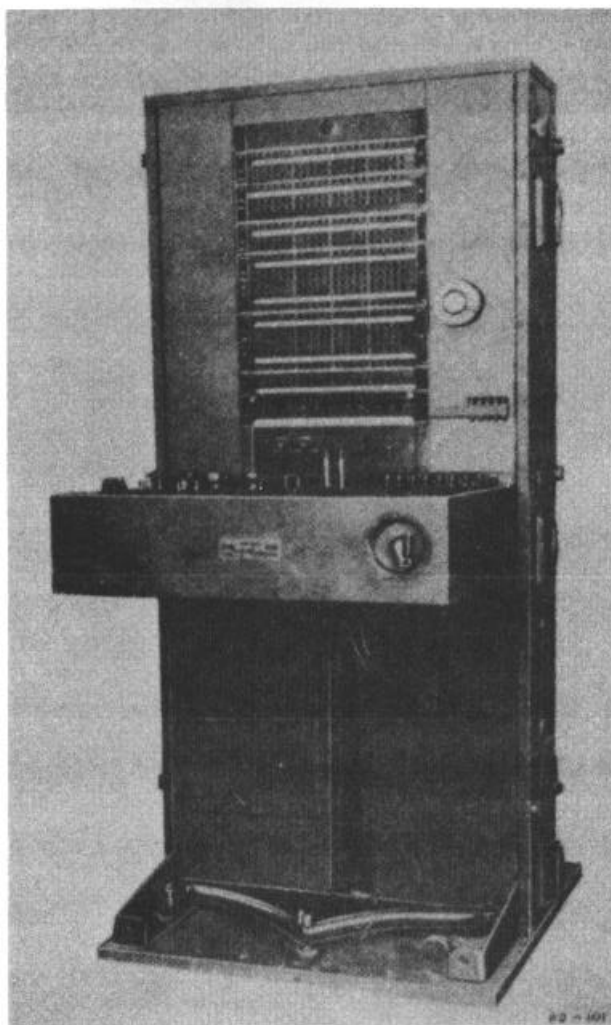
1 March 1964

Cog Serv: USA FSN: 6625-188-3235

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std B	-----	-----	-----
Manufacturer:				

**FUNCTIONAL DESCRIPTION:**

Test Board BD-101 is a terminating equipment used in reassigning and testing wire facilities. It includes circuits for dc voltage, resistance, capacitance, and bridge measurements and provides for talking, ringing, monitoring, dialing, and supervising manually operated systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

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**TEST BOARD**

**BD-101**

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**TECHNICAL DESCRIPTION**

None

*Major Units:* BD-101 57 1/2" x 25 5/8" x 24 5/8"

**TUBE COMPLEMENT:**

(1) 1LN5, (1) 3Q5GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2063

MIL-T-12669

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.15

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b> E. Edelman & Co.				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A general purpose, syringe-type hydrometer used for testing the specific gravity of storage battery electrolytes. It consists of a glass syringe with a soft rubber bulb, an inlet tube, and a glass hydrometer float.. The float is marked with a specific gravity scale.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to Edelman #30 Hydrometer.

**TECHNICAL DESCRIPTION:**

*Specific Gravity Range:* 1.100 to 1.300

*Temperature Range:* -60° F to + 160° F

*Major, Unit:* HY-2 14 1/2" x 1 5/8" x 1 5/8"; 0.25 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Fed Spec GG-H-941

1 March 1964

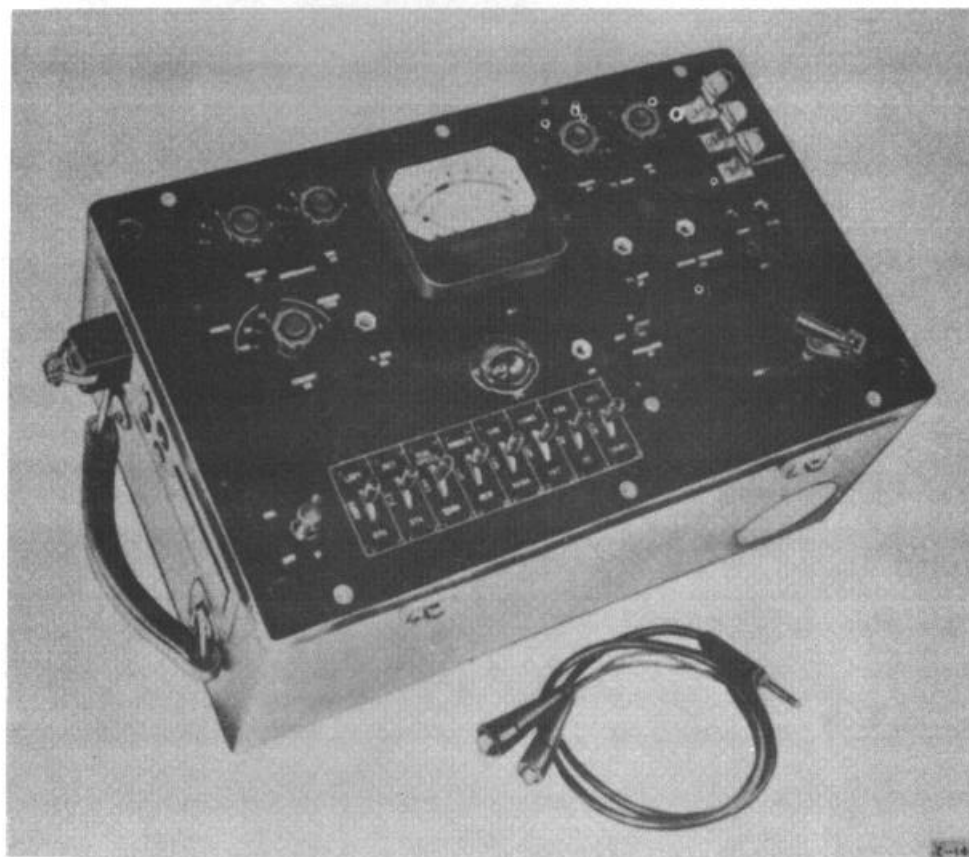
Cog Serv: USA FSN: 6625-229-1048

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	L/Std	-----

Manufacturer: Western Electric Co.

**FUNCTIONAL DESCRIPTION:**

Test Set I-142-B is a portable unit used in measuring the electrical characteristics of field telephones, handsets, head and chest sets, microphones, receivers, generators, ringers, capacitors, and station dials.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are electrically interchangeable.

*Equipment Required But Not Supplied: Batteries: (2) BA-23, (3) BA-26, (4) BA-210/U, (1) BB-223/U*

**TEST SET****I-142-B****TECHNICAL DESCRIPTION:**

*Power Requirements: 3 v, 12 v, 24 v, 135 v dc*

*Capacitor Test Range: .05 to 4  $\mu$ f*

*Insulation Test Circuit: 0 to 1 meg at 200 v into 200,000 ohms*

*Measuring Circuit:*

*Frequency Range: 300 to 5,000 cy*

*Voltage Range: .0002 to 3.8 v*

*Impedance: 10,000 ohms*

*Ringer Test Circuit: 16 2/3 cy*

*Sound Source Circuit:*

*Frequency: 500 to 2,500 cy*

*Acoustic Output: 10 dy/cm<sup>2</sup>*

*Impedance:*

*Sound Powered Telephone: 600 ohms*

*Common Battery Telephones: 24 v, 361 ohms dc resistance and 320 ohms ac*

*Carbon Microphones: 30, 60, 75, 150, 300 ohms, respectively*

*Magnetic microphones and receivers: 128, 256, 512, 1,024, 5,000, 10,000 ohms respectively*

*Major Unit: I-142-B 9" x 19" x 12"; 40 lbs*

**TUBE COMPLEMENT:**

(1) 12SG7Y, (1) 12SN7GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2062, TO 16-401142-5

MIL-T-11003

1 March 1964

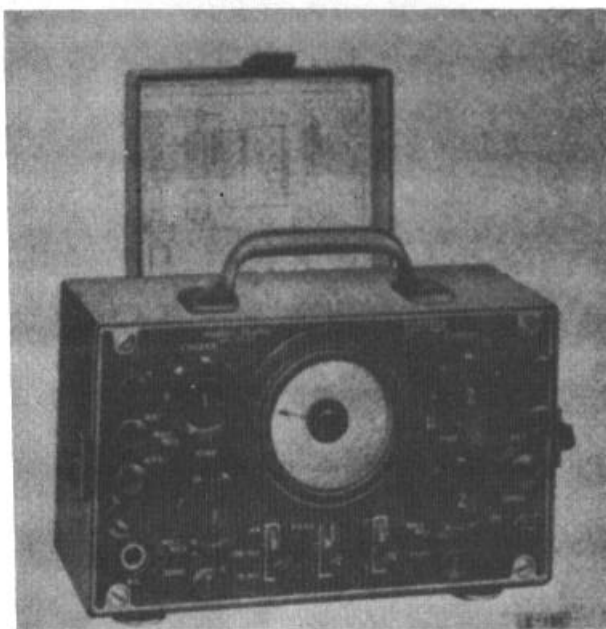
Cog Serv: USA FSN: 6625-229-1042

USA Line Item No:

Functional Class: 12.12.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	L/Std	-----

Manufacturer: Western Electric Co.

**FUNCTIONAL DESCRIPTION:**

Test Set I-181-B is a portable relay adjusting unit used in measuring and controlling current flow through a relay or similar electromagnetic unit. The equipment also functions as a dc milliammeter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Current Range:* 0 to 15, 75, 150 ma

*Temperature Range:* 0° C to +40° C (operating), -650 C to +85° C (nonoperating)

*Humidity Range:* To 95%

*Major Unit:* I-181-B 5 1/8" x 8 3/4" x 5 1/8"; 9 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

TM 11-2036, TO 16-401181-5

MIL-T-3101

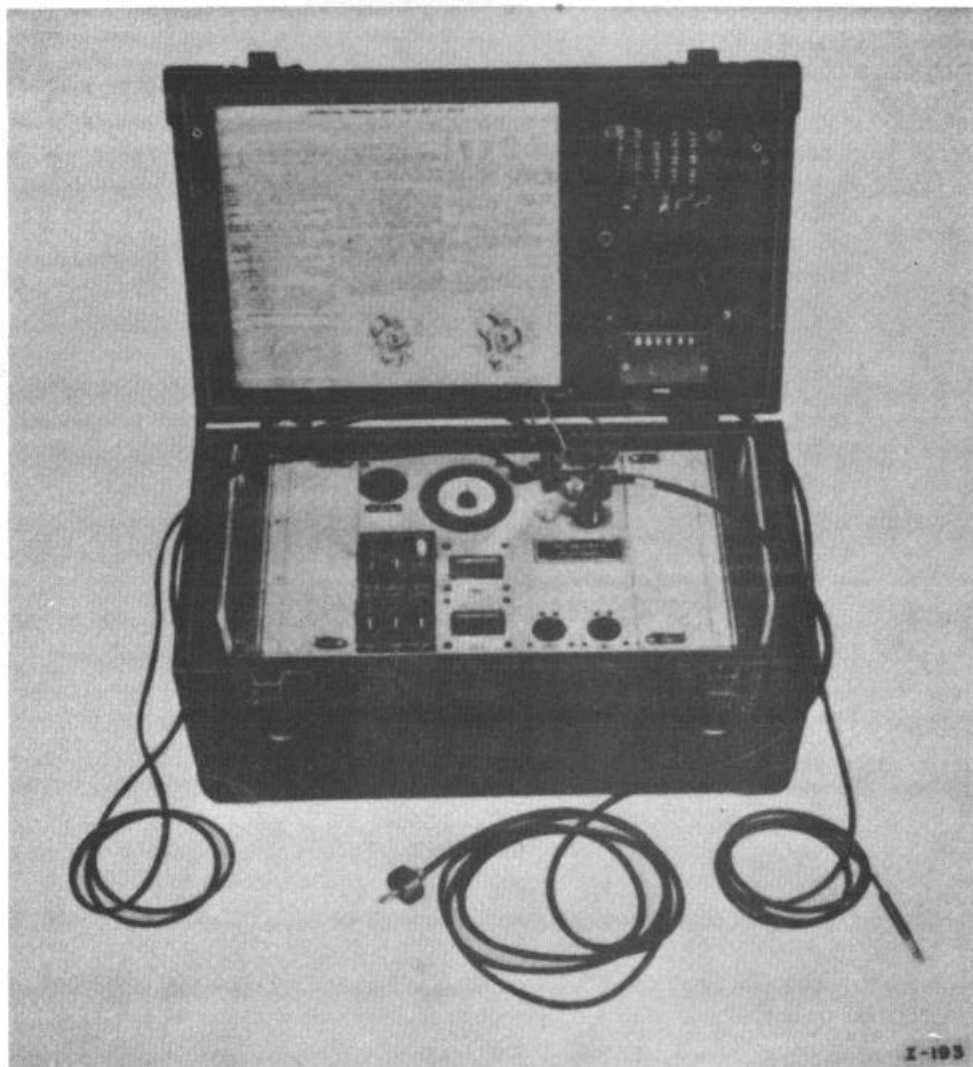
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Utility Electronics Corp.				

**FUNCTIONAL DESCRIPTION-**

Test Set I-193-C is a portable unit used in testing and adjusting polarized relays applied in telegraph equipment. The set may also be used for testing external telegraph circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**



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**TEST SET**  
**I-193-C()**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 10 w, 115 to 130 v dc

*Frequency Output:* 10 to 20 cy

*Current Range:* 0 to 100 ma dc

*Major Unit:* I-193-C 23" x 12 3/4" x 11 3/8"; 63 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TM 11-2513, TO 1640-1193-5

MIL-T-3097

C 2, MIL-HDBK-172A, VOL I/TM 11-487H1/1

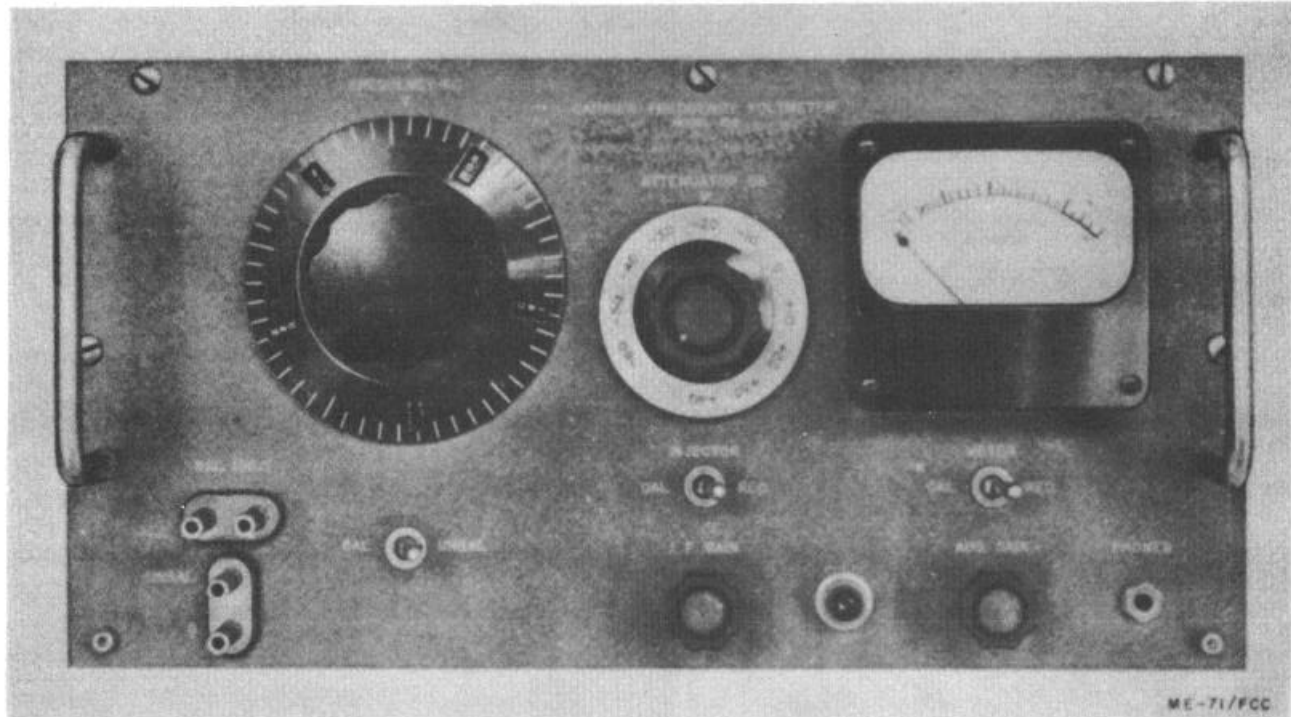
METER, AUDIO LEVEL  
ME-71/FCC

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Western Electric Co., Inc.				

**FUNCTIONAL DESCRIPTION:**

Audio Level Meter ME-71/FCC is a portable tone test detector for use with open wire carrier telephone systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Frequency Range:* 20 to 500 kc

*Attenuation Range:* -25 to +2 db

*Major Unit:* ME-71/FCC 15 1/8" x 10 1/4" x 10"

**TUBE COMPLEMENT:**

(1) OB<sub>2</sub>, (1) 5Y<sub>3</sub>, (3) 6J<sub>5</sub>, (1) 6L<sub>6</sub>, (2) 6SB<sub>7</sub>, (2) 6SJ<sub>7</sub>, (1) 6SK<sub>7</sub>

**REFERENCE DATA AND LITERATURE:**

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.3.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	<b>Std A</b>	-----	-----	-----

**Manufacturer:** Raytheon Manufacturing Co.**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable special purpose delay line which provides a rapid GO-NO-GO altitude range check. This unit is hand held against the face of a receiver-transmitter. Its two antenna horns match those of the receiver-transmitter. It couples a signal, delayed in time by a known fixed value, from the transmitter horn to the receiver horn of the receiver-transmitter. The two antenna horns of the delay line are joined electrically by a length of rf cable sufficient to provide the required delay.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This unit is used with Radar Test Set AN/APM-66 in testing Radar Set AN/APN-22.

**TECHNICAL DESCRIPTION:**

*Power Supply:* None

*Frequency Range:* 4200 to 4400 mg

*Equivalent Unit Time Delay:* 165 ft, fixed

*Accuracy of Time Delay:*  $\pm 8$  ft

*Major Unit:* 1 MX-1381/APM-66      11" x 26" x 6"; 17.6 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

AN 16-30APM66-1 (Operating Instructions)

AN 16-30APM66-2 (Service Instructions)

AN 16-30APM66-3 (Overhaul Instructions)

AN 16-30APM66-4 (Illustrated Parts Breakdown)

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.12.8

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Crystal Research Products				

**FUNCTIONAL DESCRIPTION:**

A portable, special purpose, precision instrument designed to compare the frequency of a crystal in a crystal holder or crystal blank with that of a crystal of known frequency. Minimum required activity readings can also be established. This permits use of this equipment for checking frequency during final hand-lapping or etching process, and for checking groups of crystals of nearly identical frequencies for both frequency and activity. This equipment is used at the depot level.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used in testing Radio Receiving Set AN/FRR-12. Adapter Kit MX-129/FSM-1 is required to adapt crystals with different types of mounting to this instrument.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The equipment consists of two identical tuned-plate, crystal-controlled oscillators, and a combined detector audio-amplifier circuit. A built-in power supply provides the necessary filament and plate voltages. Each oscillator is provided with a band switch to cover the frequency range in five overlapping bands. The components of each oscillator are so selected that the electrical characteristics of each are identical throughout the frequency

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**OSCILLATOR**  
**O-14/FSM-1**

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range. A jack with an associated gain control is provided in the amplifier output for connecting headphones. Indication of crystal activity is obtained by means of a microammeter on the front panel. This meter can be switched from one oscillator to the other by a panel mounted toggle switch.

*Power Supply:* 110v, ac, 60 cys, single phase, 60 w

*Frequency Range:* 0.090 to 18.3 mc in 5 bands: 0.090 to 0.370; 0.350 to 1.2; 1.1 to 3.0; 3.0 to 9.0; 6.1 to 18.3 mc

*Activity Range:* 0. to 925  $\mu$ as

*Meter Range:* 0 to 200  $\mu$ as, 0 to 350  $\mu$ as, 0 to 925  $\mu$ as

*Master Crystal Frequency Deviation:* Not more than 20% of the max allowable deviation on crystal nameplate

*Frequency Deviation for Frequency and Activity Quick Check:* Within 6 kc of the master crystal

*Major Units:*

**TUBES, CRYSTALS, TRANSISTORS:**

2 JAN-6J5, 1 JAN-6SN7GT, 1 JAN-5Y3GT, 1 JAN-OD3/VR-150

**REFERENCE DATA AND LITERATURE:**

TO 16-35014-5 (TM11-2670) (Operating and Maintenance Instructions)

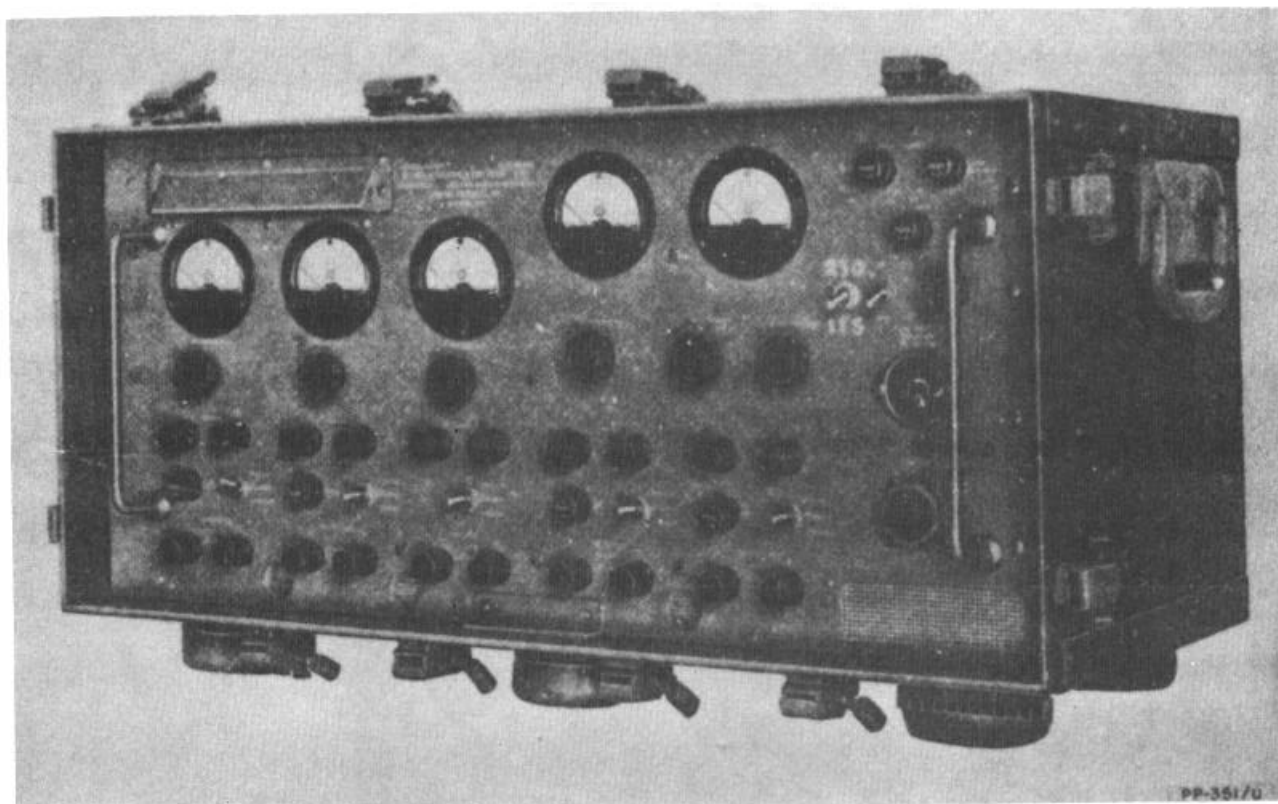
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Anco Products Corp.				

**FUNCTIONAL DESCRIPTIONS**

Power Supply PP-351/U is a portable instrument furnishing power to battery-operated radio sets under test.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 to 120 v, 50 to 1,600 cy ac

*Power Output:*

A1 Supply: 0.9 to 1.8 v, 0 to 1.5 amp dc

A2 Supply: 0.9 to 1.8 v, 2.5 to 8.6 v, 0 to 0.1 amp dc

B1, B2 Supplies: 22.5 to 150 v, 0 to 100 ma dc; 45 to 150 v, 10 to 100 ma dc; 2.5 to 45 v dc

C Supply: 0 to 22.5 v, 0 to 1 ma dc

*Major Unit:* 1 PP-351/U

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:****REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

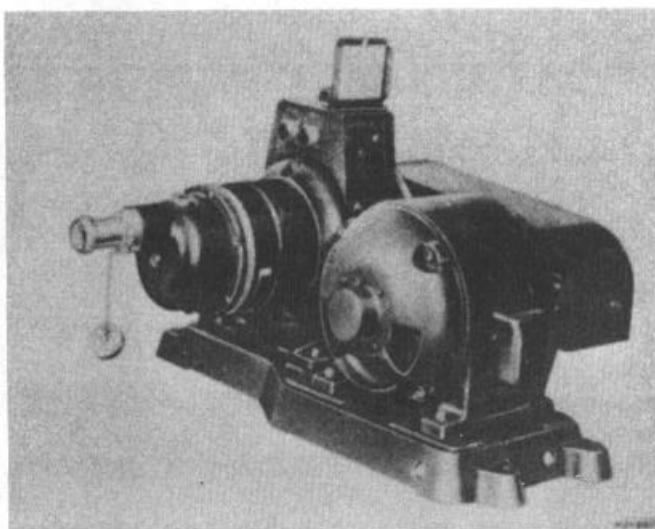
Cog Serv: USA FSN:

USA Line Item No:

**MOTOR GENERATOR  
PU-20/C**

Functional Class: 12.5

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	T/Std	-----
<b>Manufacturer:</b>				

**FUNCTIONAL DESCRIPTION:**

Motor Generator PU-20/C is a power-producing assembly that consists of a motor, generator, and control box. It is used with radio and radar equipment as a power source.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Power Requirements:* 2,500 w, 115 or 230 v, 60 cy, 1 phase ac

*Power Output:* 1,400 w, 120 v, 400 cy ac; 400 w, 26 v, 14.3 amp dc

*Major Unit:* 1 PU-20/C 28" x 33" x 18"; 285 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:****REFERENCE DATA AND LITERATURE:**

TM 11-978

Army Spec 71-2202-A, April 1944



C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

RECTIFIER  
RA-66-B

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer: General Electric Co.				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, special purpose equipment used in testing the receiver system of a ground based radar set. It is used in depot maintenance only. When used in service, the equipment forms an integral part of the radar set, and supplies power to all components of the receiver system except the local oscillator. As test equipment, it supplies power to any or all of these components for bench testing. A red pilot light indicates when power is on. This pilot light, a power ON-OFF switch, and two fuses, are located on the front panel of the unit. The unit has two carrying handles and may be rack-mounted.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used in testing AN/MPQ.2, AN/MSQ-1, -2, SCR-584.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment consists of two separate rectifiers, and primary power circuit. The primary power circuit includes the power switch, fuses, indicator light, and three transformer primaries. An interlock breaks this circuit when the equipment is disconnected from the receiver system of the radar or when the voltage regulator is removed. One rectifier is a two-tube full-wave rectifier with an LC filter network and output bleeder resistor. The output is not regulated. This rectifier provides plate and screen voltages for the video stages of both the range and servo channels, the narrow gate circuit, the voltage regulators, and the seventh IF stage. Through the voltage regulator circuit, it provides the plate and screen voltages for the remaining IF stages and the ACG circuit. The other rectifier is a one-tube full-wave rectifier. Output is filtered in an LC network, and a bleeder resistor is connected across the output. The filtered output is applied through a resistor to a cold-cathode regulator which maintains a constant drop across its terminals. This rectifier provides bias for the AGC circuit, the sixth servo IF stage, and the voltage regulator component.

*Power Supply:* 115 v  $\pm 2\%$ , ac, 58 to 62 cys, single phase

*Unregulated Output:* +300 v, dc

*Regulated Output:* -105 v, dc

*Primary Power Fuse Rating:* 5 amps, max

**TUBES, CRYSTALS, TRANSISTORS:**

3 JAN-5U4G, 1JAN-OC-3/VR105

**REFERENCE DATA AND LITERATURE:**

TO 16-40SCR584-7 (Service Manual, SCR-584-A, -B)



C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

29 November 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

RECTIFIER  
 RA-69-B

Functional Class: 12.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	Std	-----
Manufacturer: General Electric Co.				

No Illustration Available

**FUNCTIONAL DESCRIPTION**

A portable, special purpose equipment used in testing the PPI system of a ground based radar set. It is used in depot maintenance only. When used in service, the equipment forms an integral part of the radar set, and supplies all power to the PPI Unit and the indicator, except for the filaments. As test equipment, it supplies power to these units for bench testing. A red pilot light indicates when power is on. This pilot light, a power ON-OFF switch, and two fuses, are located on the front panel of the unit. The unit has two car handles, and may be reek-mounted.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used in testing AN/MPQ2.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment consists of three separate rectifiers, a primary power circuit, a voltage regulating circuit, and an interlocking system which furnishes all of the operating potentials with the exception of filament volts for the PPI and indicator. The primary power circuit includes the power switch, two fuses, and six transformer primaries. The interlock system removes power from the plate transformers of all three rectifiers to prevent dangerous high voltage conditions during maintenance. The three rectifiers of the power circuit furnish regulated 270 v, unregulated 300 v, and 4500 v for the second anode of the PPI scope. The filament voltages for the PPI unit and the PPI are supplied by a transformer in the PPI unit.

*Power Supply:* 115  $\pm$ 2%, ac, 58 to 62 cps, single phase

*High Voltage Output:* +4500 dc

*Unregulated Output:* +300 dc

*Regulated Output:* +270, dc

*Primary Power Fuse Rating:* 5 amp, max

*High Voltage: Fuse Rating:* 0.5 amp, max

*Major Unit:* 1 RA-69B 8 3/4" x 19" x 13 1/4"; 75 lb

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT**

2 JAN-5U4G, 2 JAN-6B4G, 1 JAN-2X2, 1 JAN-6SN7GT, 1 JAN-OC3/VR105

**REFERENCE DATA AND LITERATURE**

TO 16-40RA69-5 (Maintenance Instructions)

TO 16-40RA69-21 (Replacement of High Voltage Cable)

TO 16-40SCR584-7 (Service Manual, SCR-584-A, -B)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

26 November 1954  
 Cog Serv: USA FSN:  
 USA Line Item No:

RECTIFIER  
 RA-70-B

Functional Class: 12.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer: General Electric Co.				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, special purpose equipment used in testing the drive motors of the antenna positioning system of a ground based radar set. It is used in depot maintenance only. When used in service, the equipment forms an integral part of the radar set, and supplies power to the shunt fields of the antenna drive motors. As test equipment, it supplies power to these fields for bench testing. A red pilot light indicates when power is on. This pilot light, a power ON-OFF switch, and two fuses, are located on the front panel of the unit. The unit has two carrying handles and may be rack-mounted. Amplifier BC-1074-B (Remote Video Amplifier) is mounted with this unit in its case, but has no electrical connection.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used in testing AN/MPQ-2 and SCR-584.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment consists of a primary power circuit and a rectifier circuit. The primary power circuit includes the power switch, fuses, indicator light, and two transformer primaries. The rectifier is a one-tube full-wave rectifier whose output is taken across three bleeder resistors. The inductance of the motor field windings is sufficient to filter this output. One of the transformers supplies the tube plate voltage and the other supplies the tube filament voltage.

*Power Supply:* 115 v,  $\pm 2\%$ , ac, 58 to 62 cps, single phase

*Output Voltage:* +260 v, dc

*Primary Power Fuse Rating:* 5 amp, max

*Major Unit:* RA-70-B 8 3/4" x 19" x 13 1/4"; 75 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

1 JAN-5U4G

**REFERENCE DATA AND LITERATURE:**

TO 16-40RA70-5 (Maintenance Instructions)

TO 16-40SCR584-7 (Service Manual SCR-584-A, -B)

RECTIFIER  
RA-72-C

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.5

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	-----	-----	Std C	-----

Manufacturer: This model manufactured only by Evans Signal Laboratory, Belmar. The "B" model was manufactured by General Electric Co.

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A portable, special purpose equipment used in testing the range unit and range indicator of the range system of a ground based radar set. It is used in depot maintenance only. When used in service, the equipment forms an integral part of the radar set, and supplied power to the vacuum tube circuits in the range unit and the range indicator, to the range scopes and multivibrator bias in the range unit, and to the motor fields and armatures in the range indicator unit. As test equipment, it supplies power to these units for bench testing. Two pilot lights indicate when power is being delivered to the range motors and to the range unit. These pilot lights, a power ON-OFF switch, and four fuses, are located on the front panel of the unit. The unit has two carrying handles and may be rack-mounted.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is used in testing AN/MPQ2, SCR-584. It is interchangeable with previous models except as to parts. Modification Kit MX-1328/MP modifies the A and B models to this model, which has increased filtering, improved regulation, and additional overload protection.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* This equipment consists of a primary power circuit, three rectifiers and a voltage regulator circuit. The primary power circuit includes the power switch, fuses, indicator lights, and four transformer primaries, one of which serves also as an auto-transformer. The low-voltage rectifier consists of a full-wave rectifier, regulators, control regulator, and voltage regulator. Two outputs are taken from this stage, one regulated and the other unregulated, for vacuum tube circuits in the range unit and the range indicator. The high-voltage rectifier consists of a half-wave rectifier with a simple RC filter. It has four outputs taken from points on a bleeder resistor. The field rectifier consists of three gas rectifiers for full-wave rectification. Its output is applied to the fields of the two motors in the range indicator unit through a regulating resistor which controls maximum motor speed by controlling field current. The power supplied for the field and armature current rectifiers is separately fused and does not go through the ON-OFF power switch. A separate indicator light shows when the auto-transformer is energized. This section of the equipment is energized as soon as power is applied to the input.

*Power Supply:* 110 to 120 v, ac, 58 to 62 cy, single phase

*Output:* 6.3 v ac, 8 amps

*Regulated Output:* +250 v, dc, 150 ma

*Unregulated Output:* +400 v, dc, 50 ma

*High-Voltage Output Rectifier:* -1950 v d; -61 v dc; -13.25 v dc

*Field Rectifier Output:* + 80 v, dc, 200 ma

+20 v, dc, 75 ma

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**RECTIFIER**  
**RA-72-C**

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*Primary Power Fuse Ratings:*

*Low and High Voltage Rectifiers:* 5 amps, max

*Field and Armature Current Rectifiers:* 3 amps, max

*Major Unit:* 1 RA-72-C 8 3/4" x 19" x 13 1/4"; 75 lbs

**TUBES, CRYSTALS, TRANSISTORS,**

3 JAN-83, 3 JAN 6B4G, 1 JAN-5U4G, 1 Jan-6SJ7GT, 1 JAN-OC3/VR-105, 1 JAN-2X2/879

**REFERENCE DATA AND LITERATURE:**

TO 16-40SCR584-7 (Service Manual, SCR-584-A, -B)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

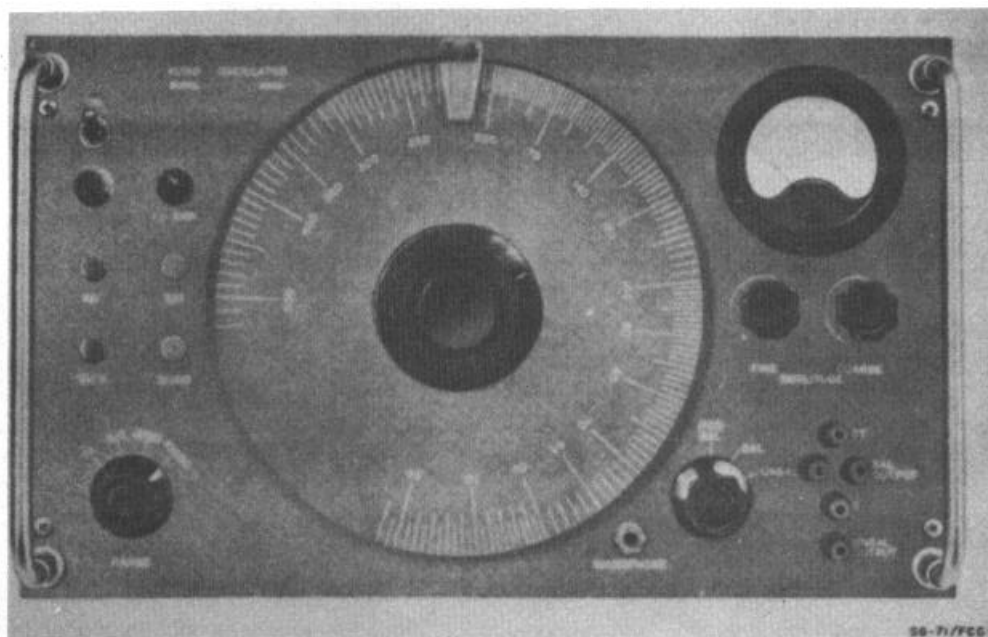
Cog Serv: USA FSN:

USA Line Item No:

GENERATOR, SIGNAL  
SG-71/FCC

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer: Hewlett-Packard Co.				

**FUNCTIONAL DESCRIPTION:**

Signal Generator SG-71/FCC is a portable instrument providing a test tone source for use with open wire carrier telephone systems.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Hewlett-Packard Model 233A.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 50 to 60 cy., 1 phase, ac

*Frequency Range:* 50 to 500,000 cy

*Impedance:* 600 ohms

*Output Signal:* 50 cy to 500 kc

*Major Unit:* SG-71/FCC 14 3/4" x 19" x 10 1/2"; 39 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 0A2, (4) 1N43, (1) 5R4, (1) 6AC7, (2) 6AG7, (1) 6AV6, (1) 6J5, (2) 6L6, (1) 6SA7, (2) 6SJ7, (1) 6Y6

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

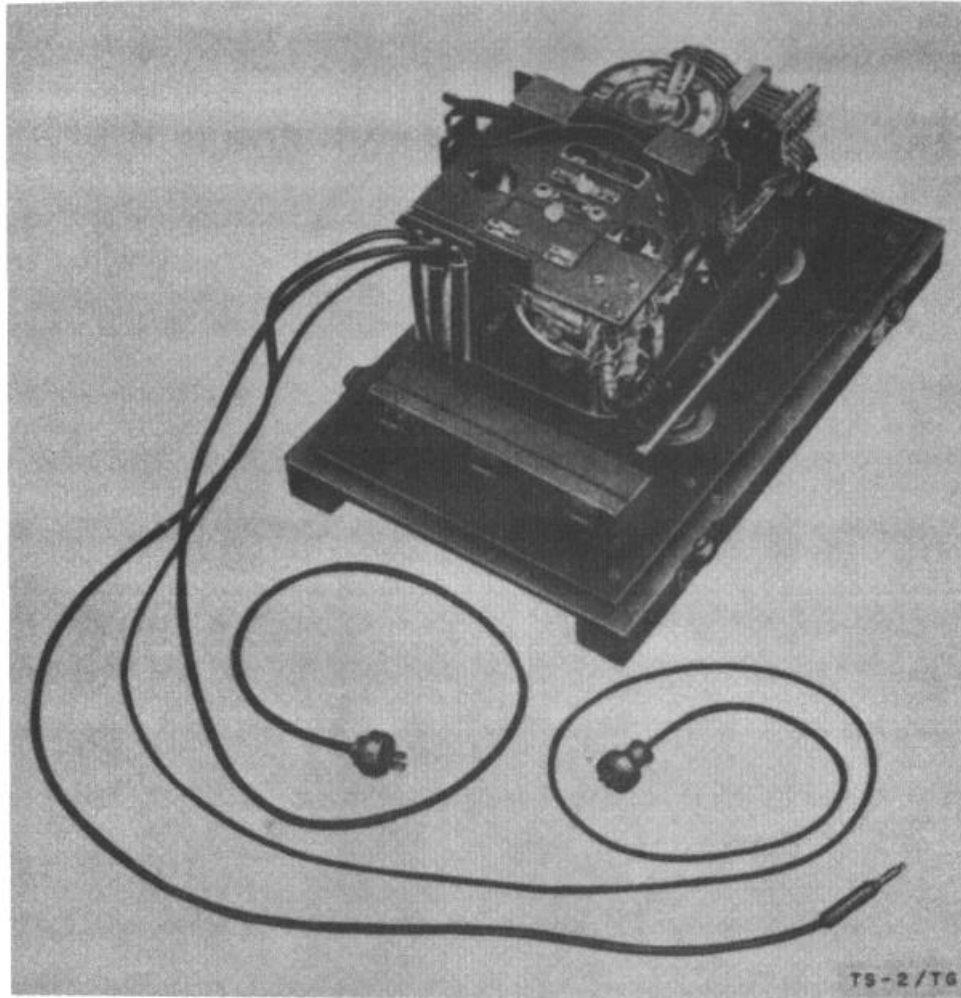
Cog Serv: USA FSN: 6625-243-5173

USA Line Item No:

**TEST SET  
TS-2/TG**

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----
<b>Manufacturer:</b>	Teletype Corp.			

**FUNCTIONAL DESCRIPTION:**

Test Set TS-2/TG is a portable unit arranged to transmit normal or distorted signals used in testing teletypewriter circuits and equipment. It is equipped with a governed motor that can be adjusted for operation with British equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Signal Distortion Test Unit, Teletype Corporation ED57GG.

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**TEST SET**  
**TS-2/TG**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 to 115 v, 50 to 60 cy, 1 phase ac; 115 v dc (local test)

*Type of Emission:*

*Distorted Signals:* 0 to 50%, marking or spacing end distortion

*Undistorted Signals:* Marking or spacing bias; standard test message; R, Y, space; 68 character line

*Motor Speed:* 368.2 to 404 opns/min

*Major Unit:* TS-2/TG      22" x 13X 1/2" x 14X 1/2"; 70 lbs

**TUBES, CRYSTALS, TRANSISTORS,**

**REFERENCE DATA AND LITERATURE**

TM 11-2208

MII-T-3484

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

FLUXMETER  
TS-15C/AP

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Marion Electrical Instrument Co.				





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**FLUXMETER  
TS-15C/AP**

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**FUNCTIONAL DESCRIPTION:**

Fluxmeter TS15C/AP is a portable equipment used in measuring flux densities between pole faces of magnets employed in oscillatory circuits of X-band and S-band transmitters.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment, part of Test Set AN/MPM-2, are similar except for minor modifications facilitating operations and accuracy of measurements.

*Equipment Required But Not Supplied:* Battery: (1) BA-30

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 1.5 v dc

*Flux Density Range:* 1,200 to 2,400 gauss; 2,400 to 4,800 gauss; 4,800 to 9,600 gauss

*Accuracy:*  $\pm 2\%$

*Major Units:* TS-15C/AP      10" x 6" x 4X 1/2"; 6.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

MIL-F-1 1543

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-188-3232

USA Line Item No:

**TEST SET  
TS-27B/TSM**

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----
<b>Manufacturer:</b>	Western Electric Co..			

**FUNCTIONAL DESCRIPTION:**

Test Set TS-27B/TSM is a portable equipment used in measuring conductor and insulation resistance and in locating grounds, crosses, and shorts of wire communication lines. It is also employed in measuring capacitance and in locating opens in wire lines.

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**TEST SET**  
**TS-27B/TSM**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Test Set, Bell Telephone Laboratories Type D-166237

*Equipment Required But Not Supplied:* Batteries: (1) BA-15-A or BA-30, (t) BA-31, (2) BA-59

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 1.5 v, 4.5 v, 90 v dc

*Frequency:* 20 cy  $\pm 3$  cy

*Capacitance Range:* 0 to 3  $\mu f \pm 5$  %

*Resistance Range:* 0 to 50 meg  $\pm 5$  %

*Major Units:* TS-27B/TSM 9" x 13 5/8" x 13 1/4"; 23 lbs

**TUBES, CRYSTALS, TRANSISTORS.**

(1) 1LN5, (1) 3Q5GT

**REFERENCE DATA AND LITERATURE:**

TM 11-2057A, TO 16-35TS27-5

MIJT-2487

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

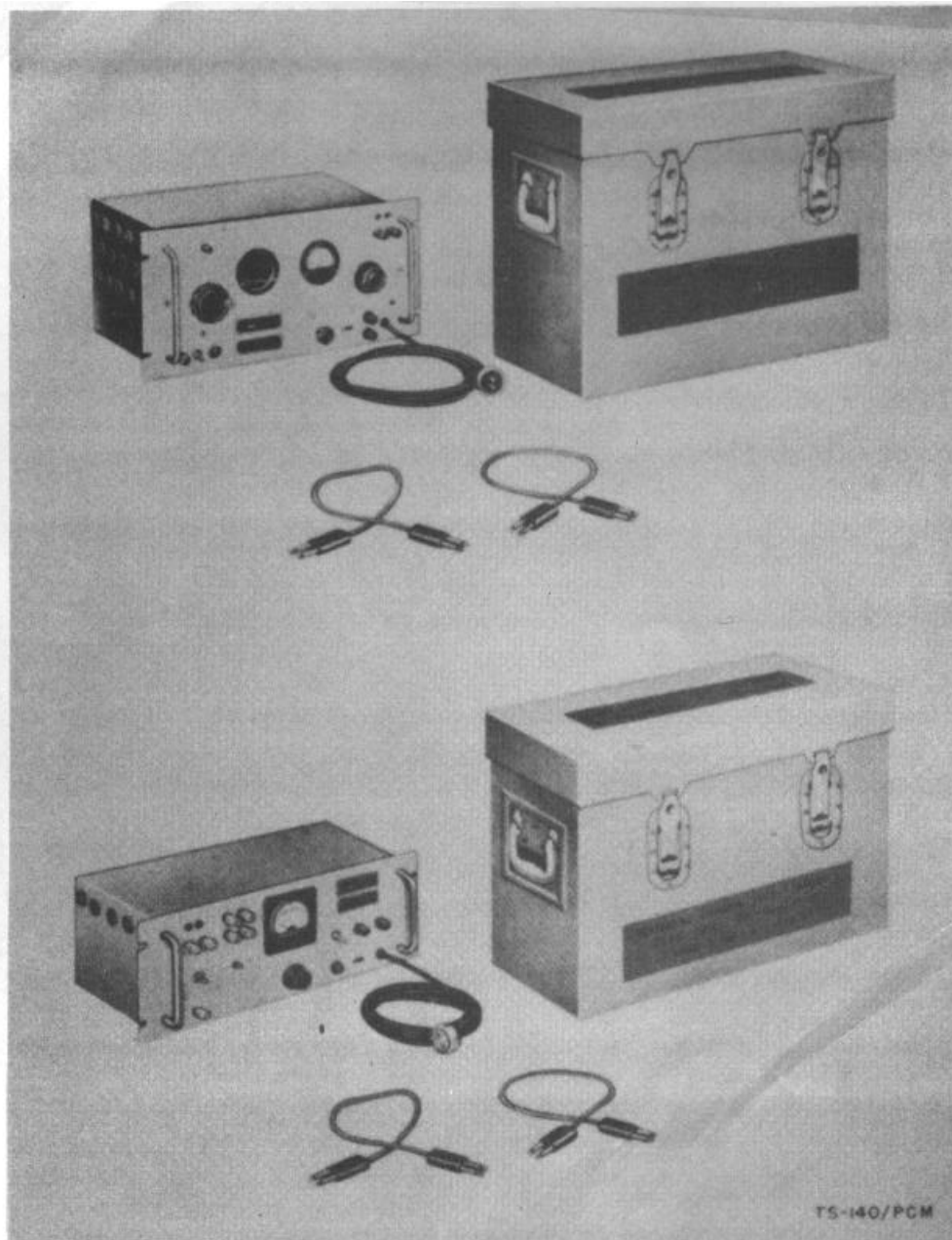
Cog Serv: USA FSN: 6625-243-4888

USA Line Item No:

TEST SET  
TS-140/PCM

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer: Great American Industries, Inc.				



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**TEST SET**  
**TS-140/PCM**

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**FUNCTIONAL DESCRIPTION:**

Test Set TS140/PCM is a portable transmission measuring unit used in matching circuits of a wire or wire-radio communication circuit and in testing carrier and voice-frequency repeater and terminal equipment in depots. The unit consists of a signal generator and a decibel meter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Test Set AN/FCM-1, supersedes AF Signal Generator TS401/U.

**TECHNICAL DESCRIPTION:**

Technical characteristics of the following major components are described elsewhere in this publication:

Decibel Meter ME22/PCM, Functional Class 14.2

Signal Generator SG-15/PCM, Functional Class 4.1.1

*Major Units:*

1 TS-140/PCM including:

1 ME22/PCM        7" x 19" x 10 7/8"; 25 lbs

1 SG-15/PCM       8 3/4" x 19" x 13 1/4x"; 52 lbs

**TUBES, CRYSTALS, TRANSISTORS:****TUBE COMPLEMENT:**

Refer to major components

**REFERENCE DATA AND LITERATURE:**

TM 11-2096

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

TEST PANEL  
TS-286/TRC-5

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer:				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Test Panel TS-286/TRC-5 is a telephone equipment consisting of a ringing oscillator with an internal power supply, a test oscillator, and an audio level meter.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Set AN/TRC-5

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 v, 50 to 60 cy ac

*Ringin Oscillator:* 20 cy

*Test Oscillator:* 1,000 cy

*Major Units:* 1 TS-286/TRC-5 6" x 17" x 14"; 50 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 5Y3GT, (1) 6SL7GT, (2) 6V6GT

**REFERENCE DATA AND LITERATURE:**

Spec and/or Dwg

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-229-1049

USA Line Item No:

TEST SET  
TS-330/TSM

Functional Class: 12.12.8

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	Std	Std	-----
Manufacturer:	Radio Frequency Laboratories			

**FUNCTIONAL DESCRIPTION:**

Crystal Impedance Meter TS-330/TSM is a portable test instrument used in measuring the equivalent electrical parameters of quartz crystals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, part of Standard Crystal Test Set AN/TSM-3, is identical with Crystal Impedance Meter, Radio Frequency Laboratories Model 459, and similar to Crystal Impedance Meter, Lavoie Laboratories Model 51.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 35 w, 115 v, 50 to 1,720 cy ac

*Frequency Range:* 1 to 15 me in seven bands

*Resistance Range:* 0 to 9,900 ohms

*Capacitance Range:* 12 to 110 uuf

*Current Range:* 0 to 100 ma; 0 to 200 ua

*Accuracy:*  $\pm 2\%$

*Major Units:* TS-330/TSM      7" x 19" x 10X 1/2"; 25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) OC3, (1) 5Y3GT, (1) 6V6GT

**REFERENCE DATA AND LITERATURE:**

TM 11-5051, TO 16-35TS330-5, MIL-T-12555

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

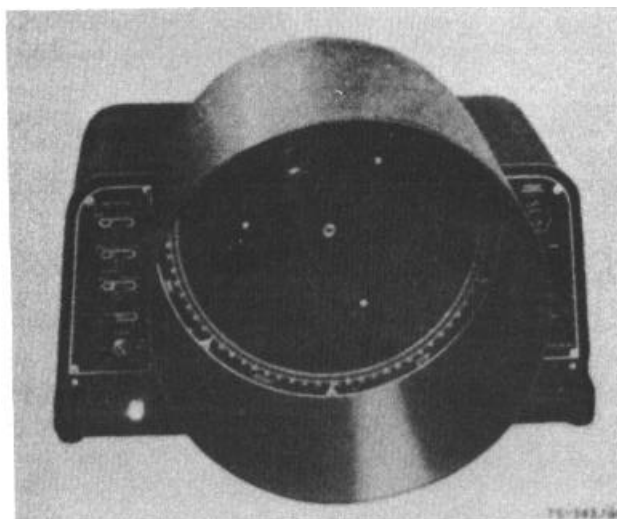
Cog Serv: USA FSN: 6625-222-1714

USA Line Item No:

DISTORTION TEST SET  
TS-383 A/GG

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std	Std	Std	-----
Manufacturer:	Teletype Corp.			

**FUNCTIONAL DESCRIPTION:**

Distortion Test Set TS-383A/GG is a portable, motor-driven unit used in testing teletypewriter start-stop printing telegraph circuits and start-stop selectors. A stroboscope indicates signal length and the amount of distortion.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Distortion Test Set, Teletype Corporation Model DXD4DTS.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 to 115 v, 50 to 60 cy, 1 phase ac

*Type of Emission:* Distorted and undistorted sig

*Undistorted Signals:* Std test, letters, blanks

*Distorted Signals:* Marking or spacing

*Operating Speed:* 368 opns/min

*Major Units:* 1 TS-383A/GG                      13 1/2" x 19" x 14"; 125 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

None

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91161, TM 11-2217, TO 16-35-TS383-5



C 2, MIL-HDBK-172A, VOL I/TM 11487H-1/1

**DECIBEL METER  
TS-400/U**

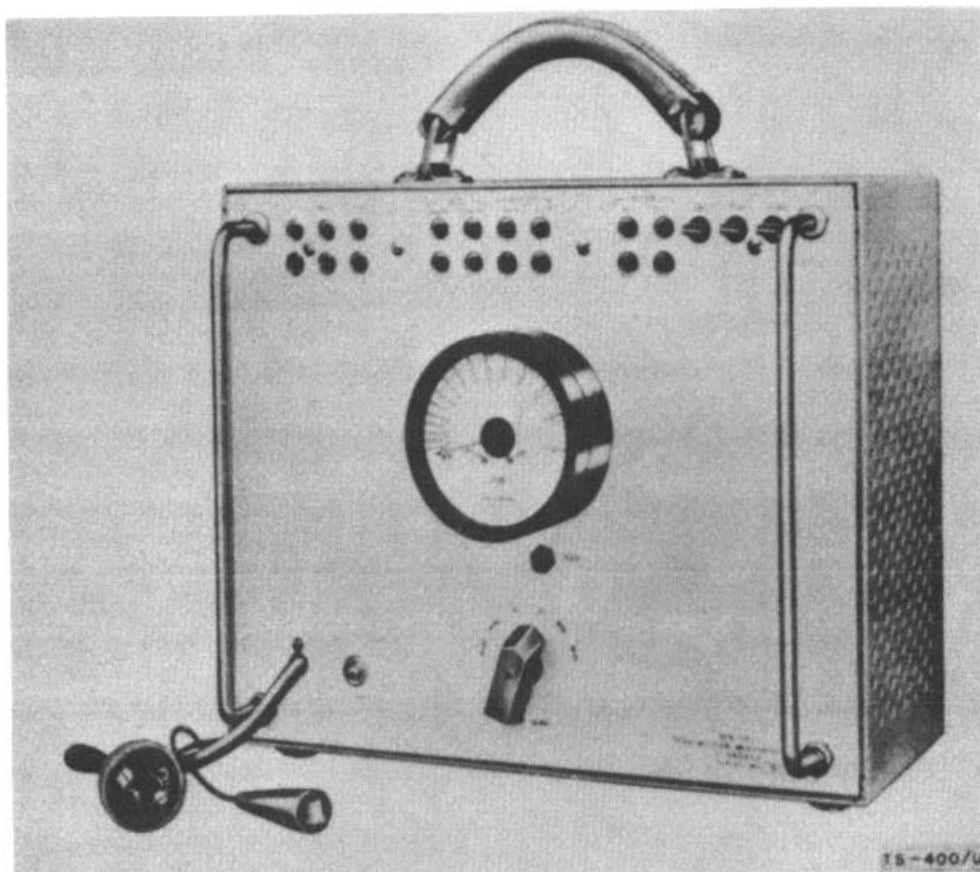
1 March 1964

Cog Serv: USA FSN: 6625-229-1044

USA Line Item No:

Functional Class:12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std C	-----	-----	-----
<b>Manufacturer: Western Electric Co.</b>				

**FUNCTIONAL DESCRIPTION:**

Decibel Meter TS-400/U is a transmission measuring instrument for carrier equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

Power Requirements: 50 w, 105 to 125 v, 50 to 60 cy ac

Frequency Range: 150 cy to 150 kc

Impedance: 600 ohms

Attenuation Range: -35 to +35 dbm

Major Units: 1 TS-400/U 8 1/2" x 11" x 12"; 40 lbs

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**DECIBEL METER**  
**TS-400/U**

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**TUES, CRYSTALS, TRANSISTORS:**

(1) OD3, (1) 5Y3GT, (1) 6G6G, (1) 6H6GT, (2) 6SJ7GT

**REFERENCE DATA AND LITERATURE:**

Instruction Book  
Spec and/or Dwg

# AEROGRAPH CALIBRATION SET TS-407/AMQ-2

1 March 1964

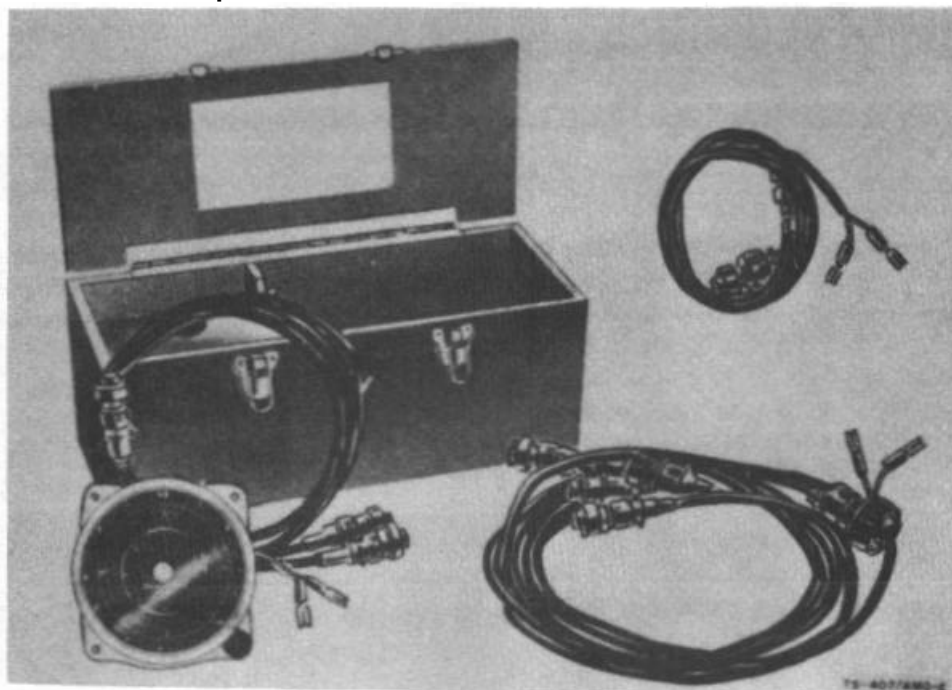
Cog Serv: USA FSN: 6660-096-7490

USA Line Item No:

Functional Class:12.12.7

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----

Manufacturer: Bendix Aviation Corp.



## FUNCTIONAL DESCRIPTION:

Aerograph Calibration Set TS-407/AMQ-2 is used as a standard for calibrating and testing self-synchronous transmitter and receiver units.

## RELATIONSHIP TO SIMILAR EQUIPMENT:

None.

## TECHNICAL DESCRIPTION:

Power Requirements: 26 to 40 v, 400 cy ac

Calibration:

Air Speed: 70 to 300 mph

Angular Displacement: 0° to 360°

Pressure: 200 to 1,060 mb x 100

Temperature: -70°C to +50°C

Humidity 10% to 100% (rel)

Major Units:

1 TS-407/AMQ-2

1 Master self-synchronous unit 5 1/8" x 5 1/8" x 4 3/4"; 1.25 lbs

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**AEROGRAPH CALIBRATION SET**  
**TS-407/AMQ-2**

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**TUBES, CRYSTALS, TRANSISTORS:**

None.

**REFERENCE DATA AND LITERATURE:**

TM 11-2428

# **AEROGRAPH CALIBRATION SET TS-420B/U**

1 March 1964

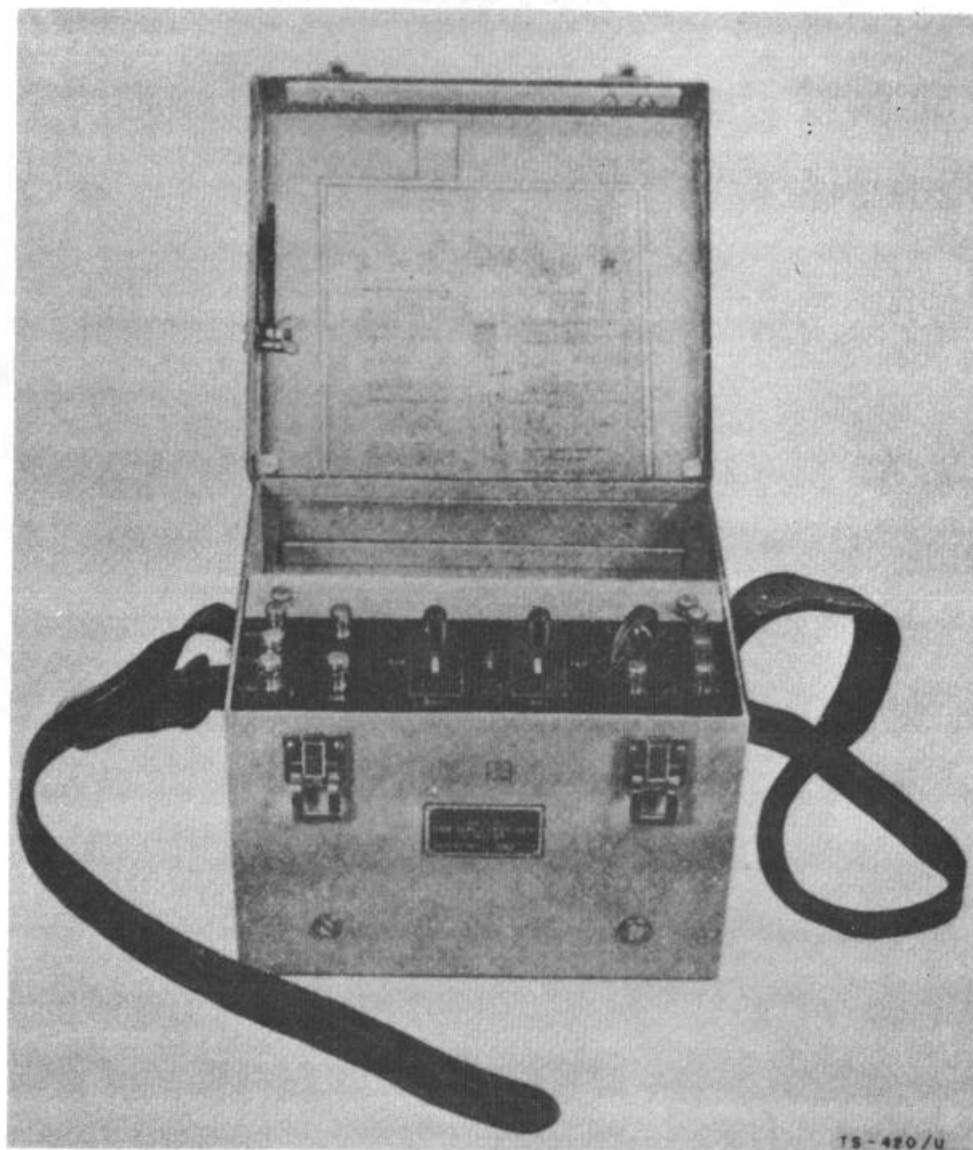
Cog Serv: USA FSN: 6625-229-1053

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std a	-----	-----	-----

Manufacturer: Western Electric Co.



## **FUNCTIONAL DESCRIPTION:**

Test Set TS-420B/U is a portable cable tone testing unit consisting of a battery-operated vacuum-tube oscillator. It is used in exchange and toll cables for conductor identification, exploring coil tests, and other tone testing purposes.

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**TEST SET**  
**TS-420B/U**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This, equipment is part of Cable Splicer's Tool Set TE-56.

Equipment Required But not Supplied: Batteries: (2) BA-2, (2) BA-27.

**TECHNICAL DESCRIPTION:**

Power Requirements: 4.5 v, 45 v dc

Signal Output: 500 cy with 7 cy warble

Major Unit: 1 TS-420B/U 9" x 9" x 7"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 1R5, (1) 3V4

**REFERENCE DATA AND LITERATURE:**

TM 11-2069

TRANSMISSION MEASURING SET  
TS-569/FT

1 March 1964

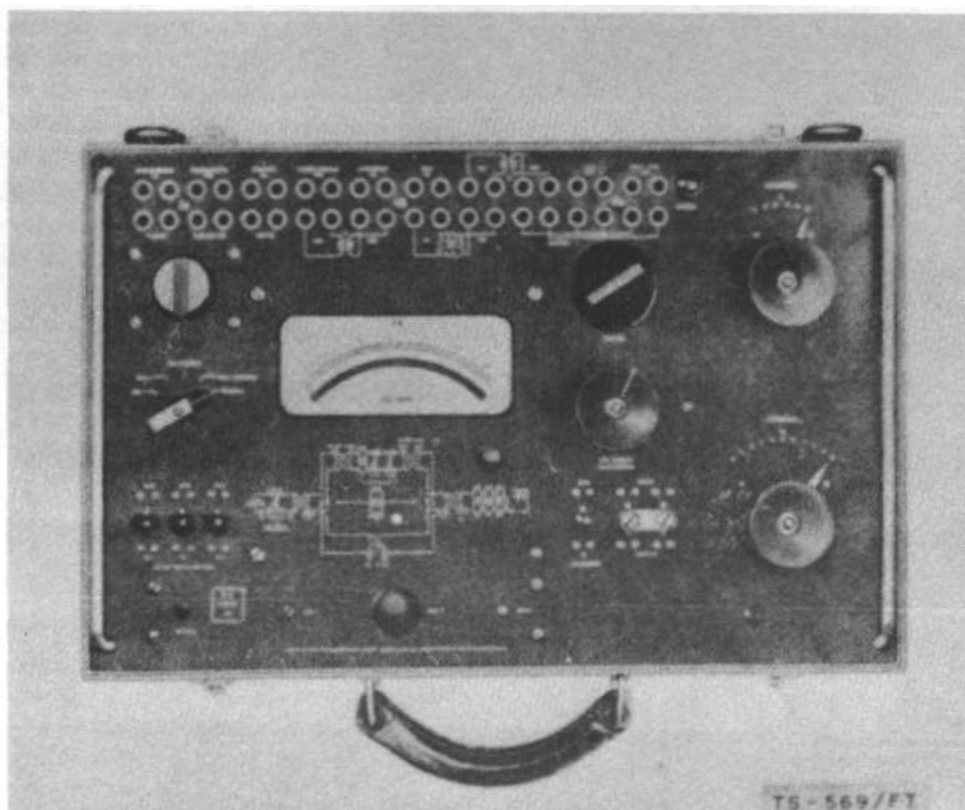
Cog Serv: USA FSN: 6625-188-3234

USA Line Item No:

Functional Class:12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Western Electric Co.

**FUNCTIONAL DESCRIPTION:**

Transmission Measuring Set TS-569/FT is a portable, thermocouple-type instrument used in measuring carrier telephone and carrier telegraph equipment.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Equipment Required But Not Supplied: Battery: (1) BA-30.

**TECHNICAL DESCRIPTION:**

Power Requirements: 1.5 v dc

Frequency Range: 0 to 150 kc

Impedance: 135 ohms

Power Range: -10 to +3.4 db

Gain: 0 to 120 db Attenuation Range: 5 to 7 db

Loss: 0 to 90 db Accuracy:  $\pm 2$  db

Major Unit: TS-569/FT

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**TRANSMISSION MEASURING SET**  
**TS-569/FT**

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**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TM 11-2049



C 2, MIL-HDBK-172A, VOL I/TM 11487H-1/1

TELETYPEWRITER TEST  
TS-611A/FG

1 March 1964

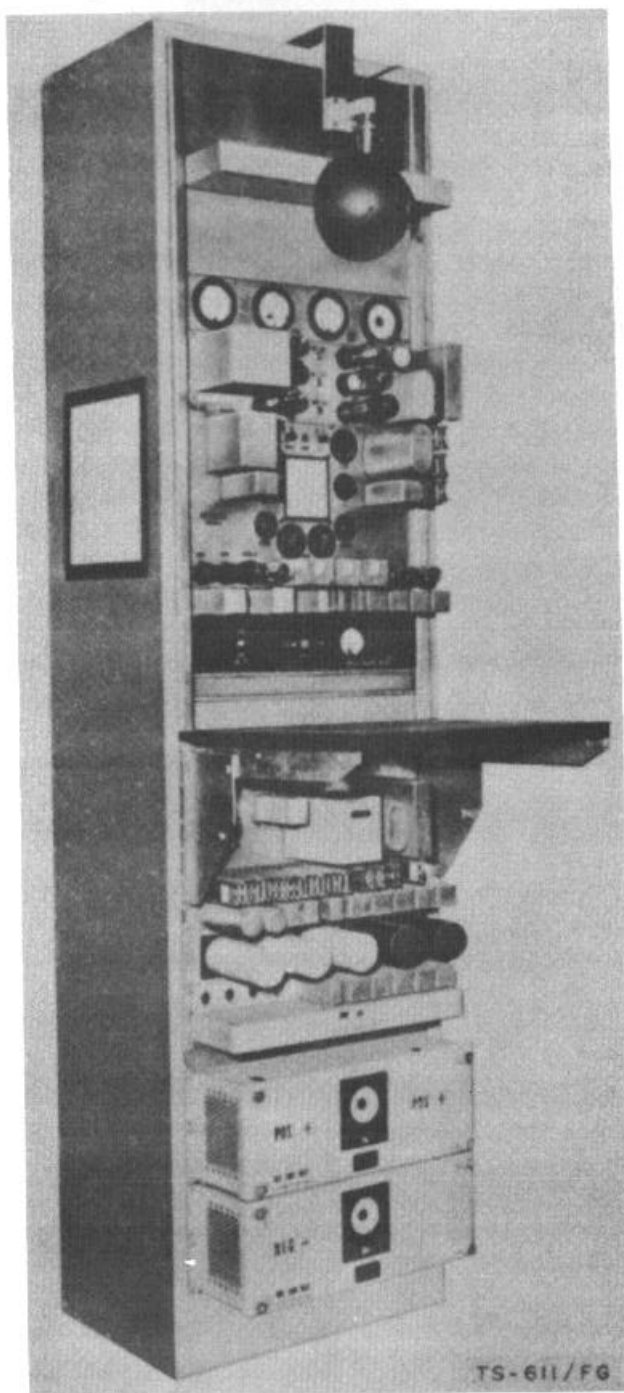
Cog Serv: USA FSN:

USA Line Item No:

Functional Class:12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer: Western Electric Co.



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**TELETYPEWRITER TEST SET  
TS-611A/FG**

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**FUNCTIONAL DESCRIPTION**

Teletypewriter Test Set TS-611A/FG is a fixed-plant instrument used in measuring the quality of teletypewriter signals on a working circuit.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with Western Electric Company Model No. 118C2. Equipment Required But Not Supplied: One extension jack, one meter box.

**TECHNICAL DESCRIPTION:**

Power Requirements: 105 to 125 v, 2 amp, 50 to 60 cyc, 1 phase ac

Range: 5 or 6 digit tty sig of 60, 75, or 100 speed with .02 or .0675 amp neut or .035 amp polar ckt, 48 v inverse neut ckt

Major Units: TS611A/FG 21 1/2" x 17 1/8" x 83 7/8"

**TUBE COMPLEMENT:**

(2) OC3, (1) OD3, (1) 2A5, (1) 5T4, (1) 6F8G, (1) 6H6GT, (2) 6Y6G, (3) 56, (1) 80, (2) 388A, (2) 394A

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91237

**TELETYPEWRITER TEST  
TS-659/UG**

13 December 1954

Cog Serv: USA FSN:

USA Line Item No:

Functional Class:12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	Std	-----	-----
<b>Manufacturer:</b> Teletype Corp.				

**FUNCTIONAL DESCRIPTION:**

Teletypewriter Test Set TS-659/UG is a portable, motor driven unit used in transmitting signals, in testing teletypewriter circuits, and checking the efficiency of start-stop selectors of teletypewriter apparatus.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment, similar to Distortion Test Set TS-658/UG, is identical with Signal Distortion Test Set, Teletype Corporation ED-58-HE.

**TECHNICAL DESCRIPTION:**

Power Requirements: 115 v, 25 to 65 cy, .5 amp ac

Signals: Undistorted; marking bias distortion; spacing bias distortion; marking end distortion; spacing end distortion

Operations: 368/min

Reversals: 23 cy

Motor: Series governed type

Major Unit: TS459/UG 5" x 7" x 8 3/4"; 12 lbs

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**TELETYPEWRITER TEST SET**  
**TS-659/UG**

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**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91162

CRYSTAL IMPEDANCE METER  
TS-683/TSM

1 March 1964

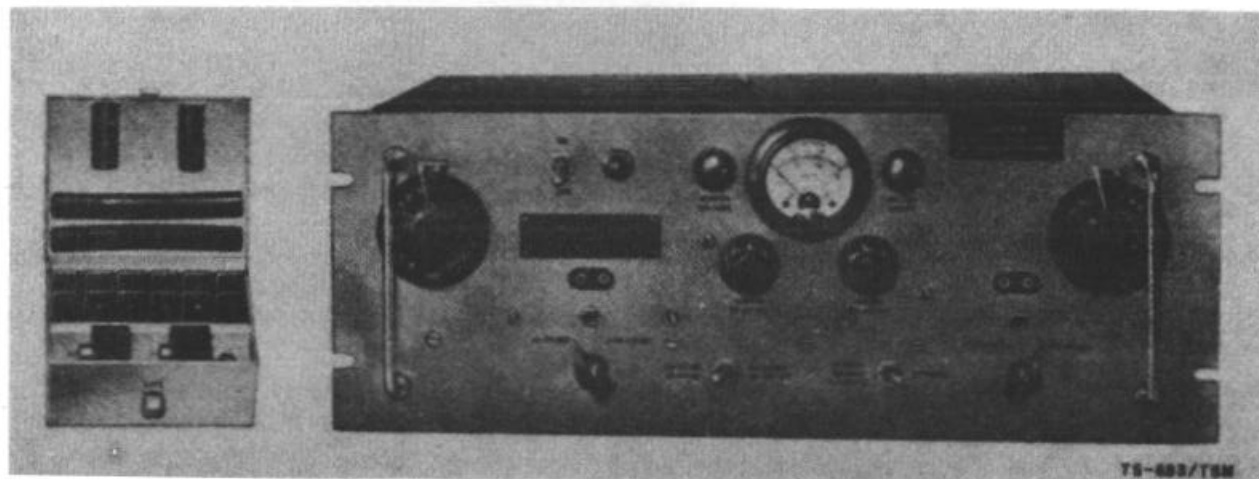
Cog Serv: USA FSN: 6625-247-7374

USA Line Item No:

Functional Class:12.12.8

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	Std	L/Std	-----

Manufacturer: Radio Frequency Laboratories Inc..

**FUNCTIONAL DESCRIPTION:**

Crystal Impedance Meter TS683/TSM is a portable test oscillator used in measuring the equivalent electrical parameter of quartz crystals. Application is in depot testing.

**RELATIONSHIP TO EQUIPMENT:**

This equipment supersedes Radio Frequency Ohmmeter ZM-2/U

**TECHNICAL DESCRIPTION:**

Power Requirements: 30 w, 115 or 230 v, 50 to 1,000 cy, 1 phase ac Frequency Range: 10 to 140 me in four bands

Type of Emission: CW

Equivalent Series Resistance Range: 10 to 150 ohms

Major Unit: 1 TS-683/TSNI 7" x 18 1/2" x 10 1/2" 19 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OA2, (1) 5Y3GT, (2) 5654

**REFERENCE DATA AND LITERATURE:**

TM 11-2652, TO 16-35TS683-5, Spec and/or Dwg: Spec MIL-C-10479 (SigC)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

CRYSTAL IMPEDANCE METER  
TS-710/TSM

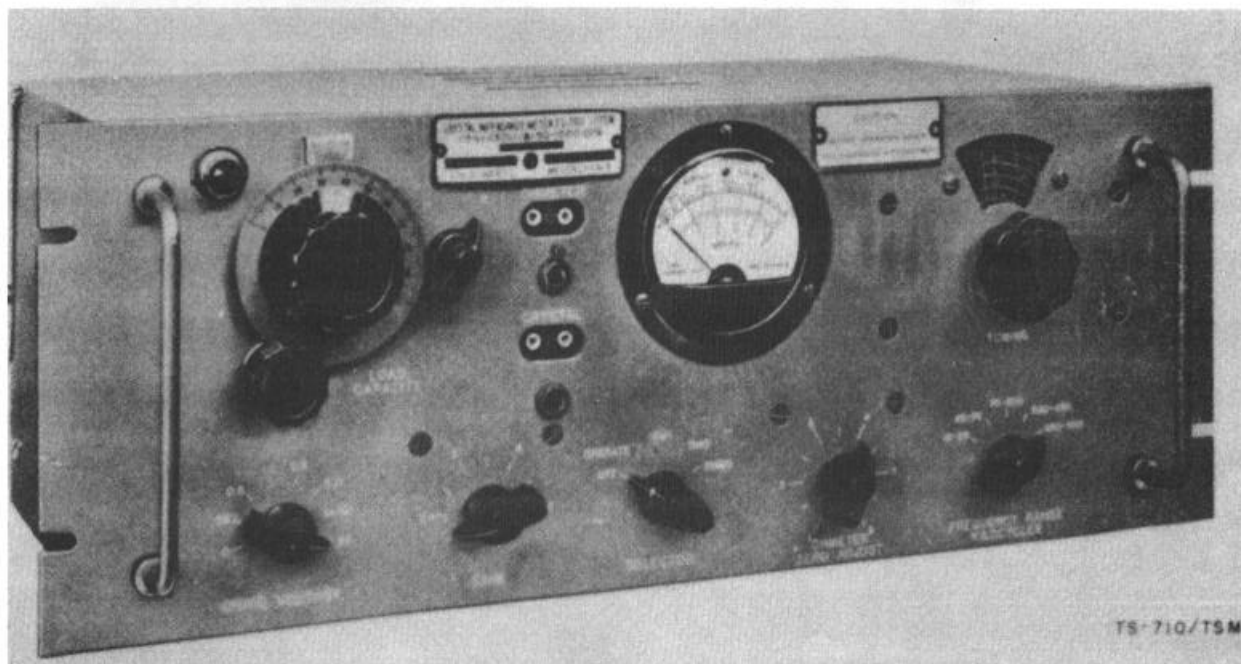
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.12.8

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----
<b>Manufacturer:</b>	Radio Frequency Laboratories, Inc.			

**FUNCTIONAL DESCRIPTION:**

Crystal Impedance Meter TS-710/TSM is a portable test unit used in checking frequency and indicating resistance, as well as the power or the voltage drop of LF and VLF crystals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 115 or 230 v, 50 to 1,000 cy, 1 phase ac

*Frequency Range:* 10 to 1,100 kc in five bands

*Capacitance Range:* 20 to 100  $\mu\text{f}$   $\pm 2 \mu\text{f}$

*Drive Voltage Range:* 0 to .25, .5, 1, 2.5, 5, 10, 25 v  $\pm 10\%$

*Resistance Range:* 0 to 50,000; 500,000; 5,000,000 ohms  $\pm 10\%$

*RF Power Level:* .10 to 10 mw

*Major Units:* 1 TS-710/TSM 7 1/2" x 17" x 8 1/2" 20; lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) OA2, (1) 5Y3GT, (1) 6AQ5, (1) 6BA6, (1) 12AX7

**REFERENCE DATA AND LITERATURE:**

Instruction Book Spec and/or Dwg: Spec MIL-T-12333



C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TELEPHONE TEST SET  
TS-712/TCC-11

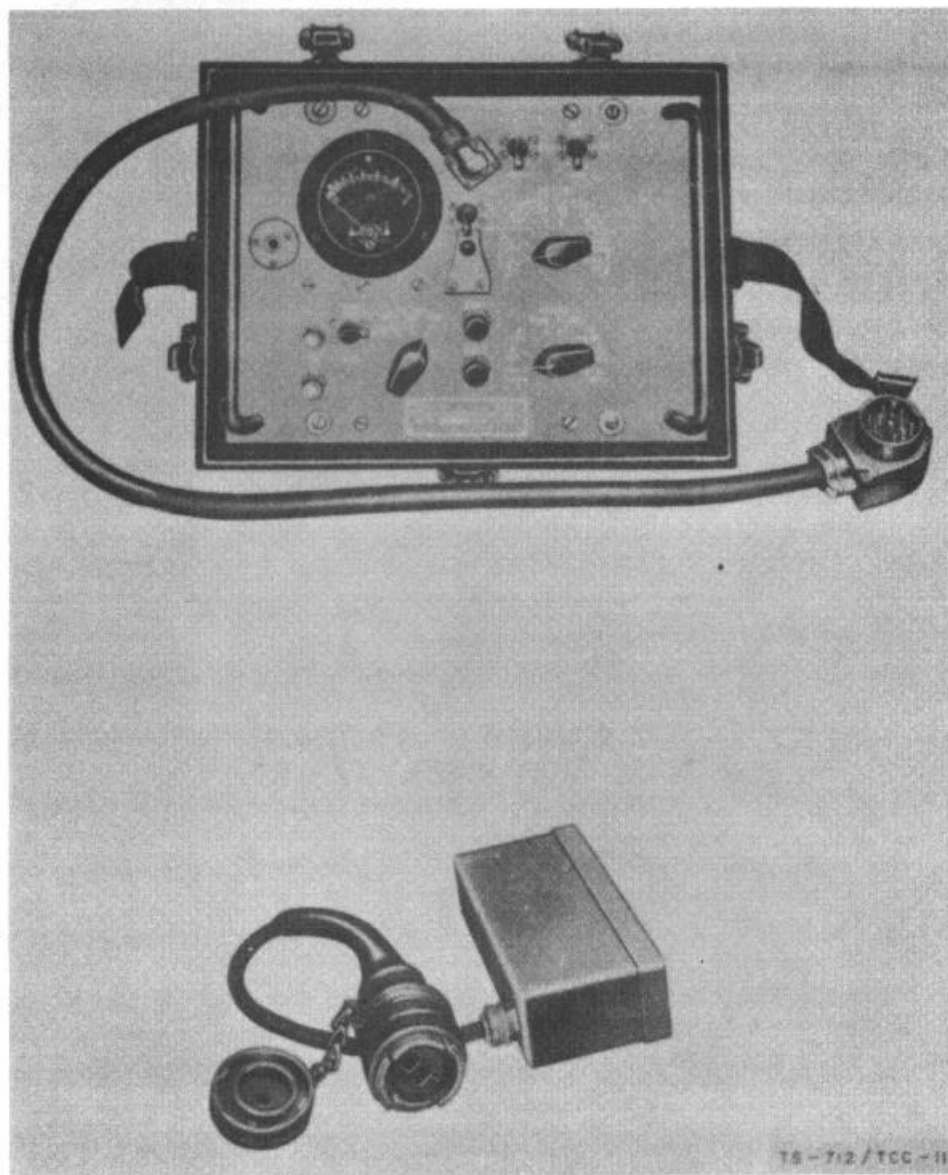
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:				

**FUNCTIONAL DESCRIPTION:**

Telephone Test Set TS-712/TCC-11 is a portable, battery-operated instrument used in testing telephone repeaters and cables.

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**TELEPHONE TEST SET**  
**TS-712/TCC-11**

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**RELATIONSHIP TO SMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 1.5 v, 90 v dc

*Transmission Frequency Range:* 1. to 1.6 kc; 68 kc

*DC Voltage:* 150 v

*Ringng Signal:* 1,600 cy

*Sensitivity:* 100  $\mu$ a (full-scale deflection)

*Temperature Range:* -65° F. to +150° F.

*Major Units:*

1 TS712/TCC-11 13 3/8" x 9 7/8" x 7 1/2"; 19 lbs

1 EE-8 7 2/3" x 3 1/2" x 9 9/16"; 9.75 lbs

1 Artificial cable 7 1/2" x 2" x 3 1/3"; 5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(2) 1U5, (1) 2N21

**REFERENCE DATA AND LITERATURE:**

TM 11-2143



C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TELEPHONE TEST SET  
TS-725/TTQ-3

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std C	-----	-----	-----
<b>Manufacturer:</b>	Emerson Radio & Phonograph Co.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Telephone Test Set TS-725/TTQ-3 is a portable instrument used in continuity and resistance tests on components of radio intercept control sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Radio Intercept Control Set AN/TTQ-3 and Radio Intercept Group OA-596-TTQ-3.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 110 v, 60 cy, 1 phase ac

*Resistance Range:* 0 to 50,000 ohms

*Major Units:* TS-725/TTQ-3

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET, TELETYPEWRITER  
TS-785/GG

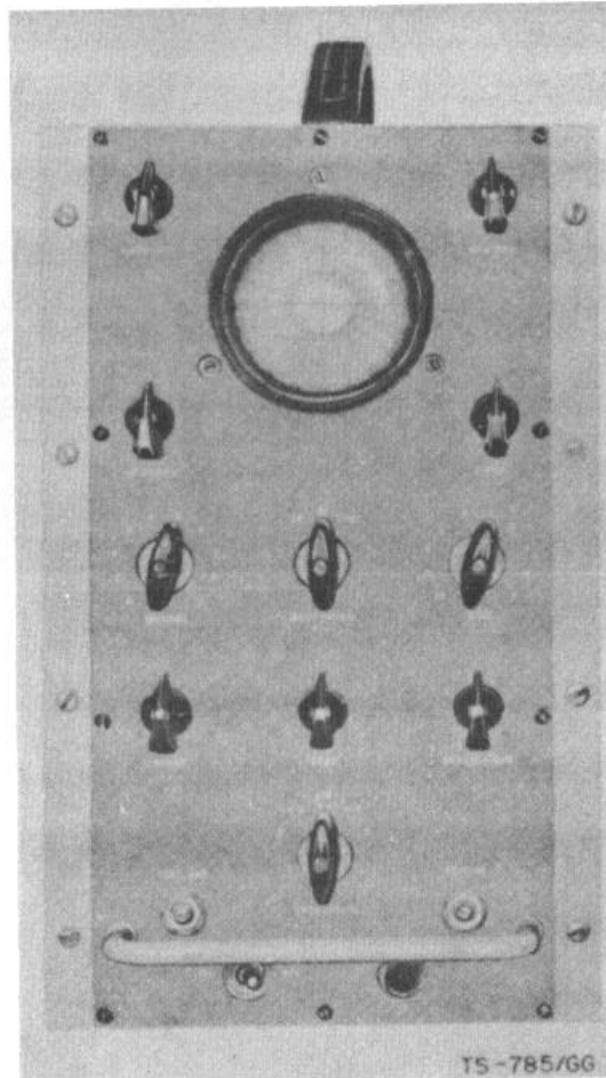
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Western Electric Co., Inc.			

**FUNCTIONAL DESCRIPTION:**

Teletypewriter Test Set TS-785/GG is a portable instrument used in measuring teletypewriter signal distortions of polar or neutral telegraph signals.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

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**TEST SET, TELETYPEWRITER**  
**TS-785/GG**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 100 w, 100 to 125 v, 60 cy, 1 phase ac

*Operating Speed:* 60 wpm, 75 wpm, 100 wpm

*Signal Input:* 20 or 60 ma

*Major Units:* TS-785/GG 14 5/32" x 8 7/8" x 14 3/4"

**TUBES, CRYSTALS, TRANSISTORS:**

(3) OC3, (2) 1V, (1) 3AP1, (1) 6AG7, (1) 6H6, (1) 6N7, (1) 6SN7GT, (1) 83V, (1) 376B

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

TEST SET, TELEPHONE  
TS-816/U

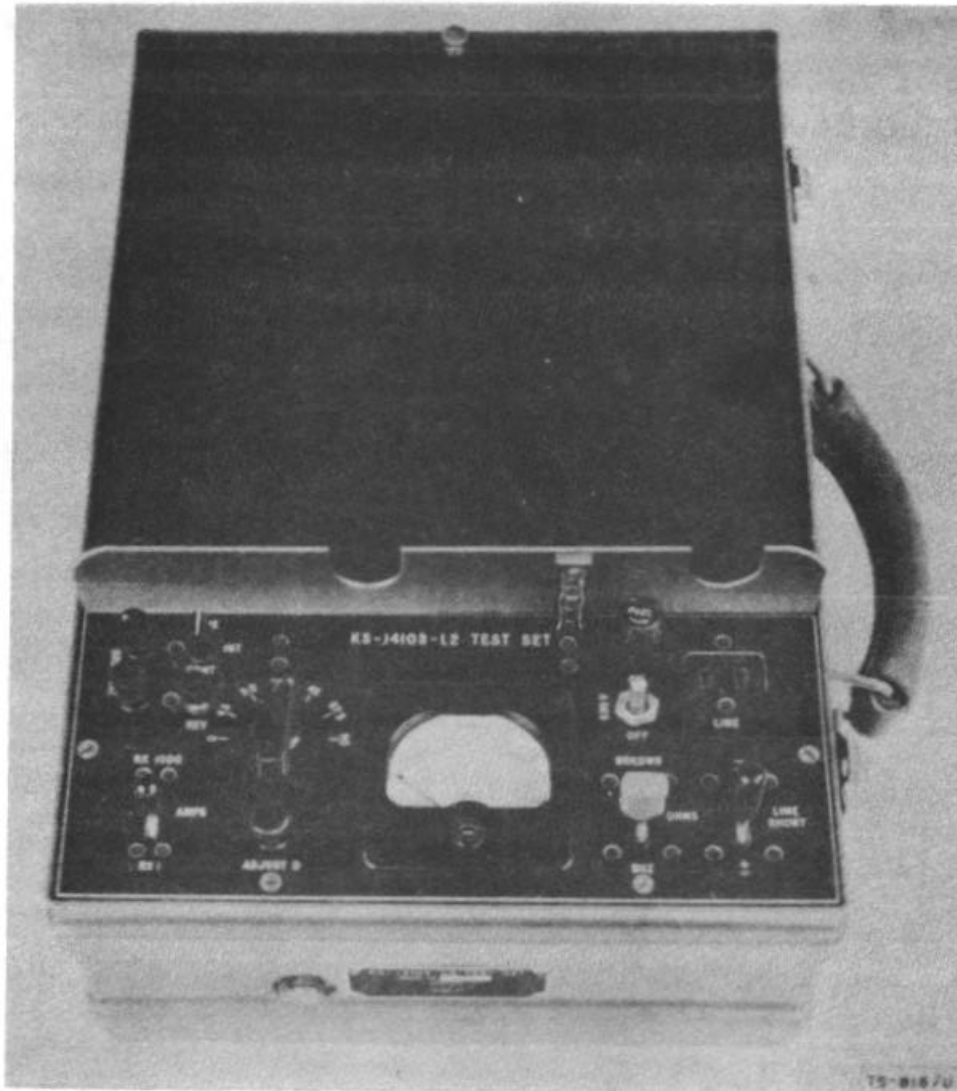
1 March 1964

Cog Serv: USA FSN: 6625-025-3827

USA Line Item No:

Functional Class: 12.6

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Maspeth Telephone & Radio			

**FUNCTIONAL DESCRIPTION:**

Telephone Test Set TS-816/U is a portable instrument used in breaking down low insulation between wires in pulp- and paper-insulated cables. A buzzer tone, by means of an exploring coil, locates faults in cables.

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**TEST SET, TELEPHONE  
TS-816/U**

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**RELATIONSHIP TO SIMILAR EQUIPMENT:**

*Equipment Required But Not Supplied:* Batteries: (1) BA-15-A, (2) BA-27, (15) BA-63.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 630 v dc

*Current Range:* 0 to 5 amp dc

*Resistance Range:* 0 to 2 meg

*Buzzer Tone:* 500 cy

*Major Units:* TS816/U 16 13/16" x 11" x 7<sup>3</sup>/<sub>4</sub>"

**TUBES, CRYSTALS, TRANSISTORS,**

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

ROTOR BALANCING CHUCK

UG-52A-1

UG-52B-1

1 March 1964

Cog Serv: FSN:

USA Line Item No:

Functional Class: 12

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Minneapolis-Honeywell Regulator Co., Aeronautical Division			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

A special purpose tool for holding the JG7044A Cageable Vertical Gyro rotor shaft during the balancing operation.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Physical Description:* The rotor balancing chucks consist of the following: (1) a hollow, split shank which engages the shaft of the rotor under test, (2) a split collar to lock the chuck at any desired position on the shaft, and (3) a round flange which is clamped in a micronamic balancer. The chucks are placed on either end of the rotor shaft, the split collars are locked in place, and the entire assembly may then be mounted for the balancing operation.

*Major Units:* UG-52A-1, UG-52B-1      1½" x 1½" dia; 1/8 lb

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

Manufacturer's Catalog, Form ADT299, ADT300

**CATEGORY 13**  
**CALIBRATING EQUIPMENT FOR ELECTRONICS TEST EQUIPMENT**

<i>Functional classification</i>	<i>Name of Equipment</i>	<i>Type No.</i>	<i>Page No.</i>
13.1 .....	Meter Tester .....	TS-56(XC)/U .....	723
13.2 .....	Calibrator Set, Frequency .....	AN/URM-18 .....	717
13.2 .....	Frequency Standard .....	TS-65C/FMQ-1 .....	719
13.2 .....	Frequency Standard .....	TS-308/U .....	721
13.7 .....	Pulse Rate Indicating Tester .....	UG-183A-1 .....	727
13.8 .....	Crystal Calibrator .....	TS-810/U .....	725

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

CALBRATOR SET, FREQUENCY  
AN/URM-18

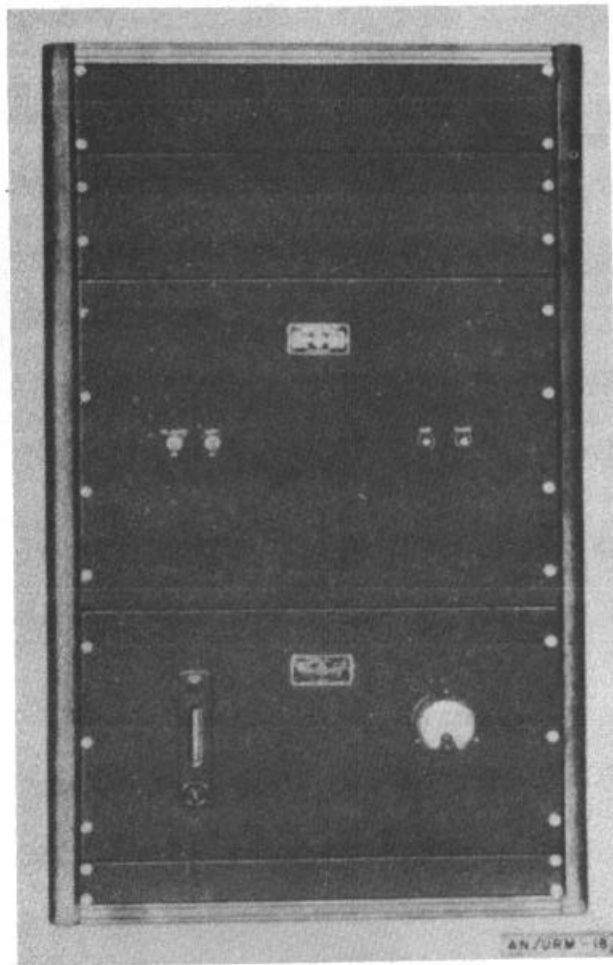
1 March 1964

Cog Serv: USA FSN: 6625-256-8378

USA Line Item No:

Functional Class: 13.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	General Radio Co.			

**FUNCTIONAL DESCRIPTION:**

Frequency Calibrator Set AN/ITRM-18 is used in measuring radio transmitter and receiver frequencies, and in monitoring and calibrating similar measuring equipment. Application is in depot and laboratory testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with the combination of Secondary Frequency Standard, General Radio Type 1100AQ, and Frequency Measuring Equipment, General Radio Type 1105A.



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**CALIBRATOR SET, FREQUENCY  
AN/URM-18**

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**TECHNICAL DESCRIPTION:**

*Power Requirements:* 355w, 105 to 125 V or 210 to 250 v, 50 to 60 cy, 1 phase ac

*Frequency Range:* 100 kc to 100 mc

*Frequency Transfer Units:* 100 to 2,000 kc, 1 to 10 mc, 10 to 100 mc

*Interpolation Oscillator:* 0 to 5,000 cy

*Comparison Oscilloscope Signal Control Network:* 0.1 kc, 1 kc, 10 kc

*Crystal Frequency:* 100 kc

*Multivibrator Frequencies:* 0.1 kc, 1 kc, 10 kc, 100 kc

*Output Voltages:*

At 100 kc: 0.2 v rms across 65 ohms

At 10 kc: 1.2 v rms across 65 ohms; 20 v rms across 10,000 ohms

At 1 kc: 25 v rms across 10,000 ohms

At 0.1 kc: 20 v rms across 10,000 ohms

*Temperature Stability in Temperature Control Unit:* Within 0.01° C.

*Major Units:*

AN/URM-18            76Y" x 22" x 18"; 670 lbs

OA-165/URM-18    43" x 22" x 15¼"; 300 lbs

OA-166/URM-18    76 1/8" x 22" x 20½"; 370 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(3) OD3, (1) 2-LAP-430, (2) 2X2, (1) 3DP1A, (1) 5R4GY, (1) 6AC7, (2) 6H6, (6) 6J5GT, (1) 6K6GT, (7) 6SJ7, (16) 6SN7GT, (3) 6X5GT, (1) 9001, (2) 9002

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

FREQUENCY STANDARD  
TS-65C/FMQ-1

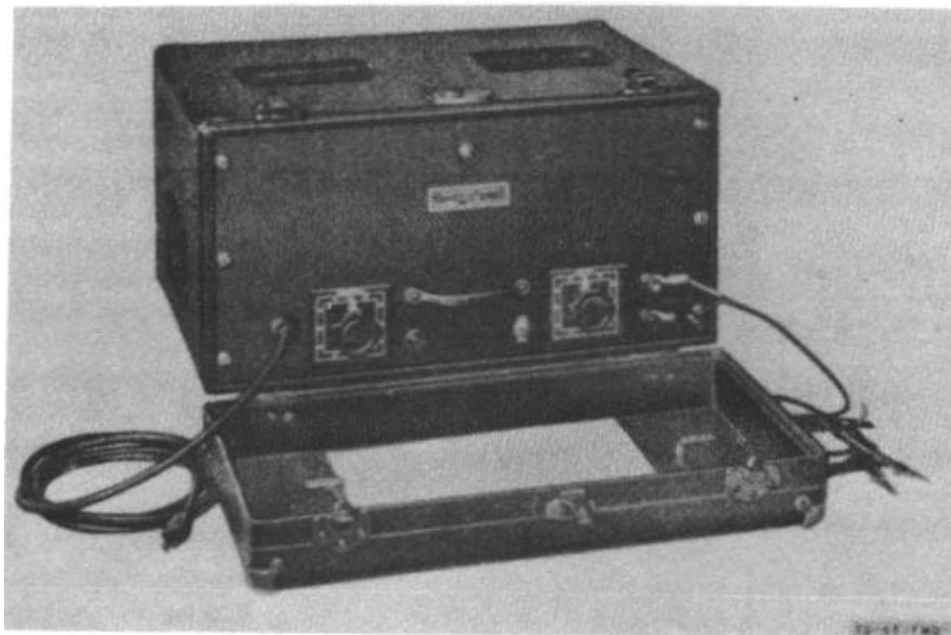
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 13.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----
<b>Manufacturer:</b>	American Time Products, Inc.			

**FUNCTIONAL DESCRIPTION:**

Frequency Standard TS-65C/FMQ-1 is a portable low af generator used in aligning and calibrating frequency meters and radiosonde recorders.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is physically and electrically different from previous models.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 35 w, 110 to 135 v, 50 to 65 cy, 1 phase ac

*Frequency Range:* 10 cy, 20 cy, 40 cy, 60 cy, 80 cy, 100 cy, 120 cy, 140 cy, 160 cy, 180 cy, 190 cy

*Voltage Range:* Variable; 45 v  $\pm$  15 v (max)

*Output Impedance:* 50,000 ohms (max)

*Output Loading:* 250,000 ohms (min)

*Accuracy:*  $\pm$ .05%

*Major Units:* TS-65C/FMQ-1 8¼" x 7¾" x 15½"; 25 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OB2, (1) 2D21, (1) 6AQ5, (1) 6X4, (1) 12AT7, (1) 12AX7

**REFERENCE DATA AND LITERATURE:**

TM 11-2602B, TO 16-35TS65-8

MIL-C-12159

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

FREQUENCY STANDARD  
TS-308/U

1 March 1964

Cog Serv: USA FSN: 6625-223-4849

USA Line Item No:

Functional Class: 13.2

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Ray Jefferson, Inc.			

**FUNCTIONAL DESCRIPTION:**

Frequency Standard TS-308/U is a shielded electronic instrument consisting of an accurate standard frequency crystal oscillator and a dial frequency multivibrator.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set AN/FSM-3.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 95 w, 110 v, 60 cy ac

*Frequency Range:*

Crystal: 100 kc

Fundamental: 10 kc, 50 kc, 100 kc

Harmonics: From 10 kc up, in steps of 10 kc

*Major Unit:* TS-308/U 22" x 10½" x 15"; 63 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OC3, (1) OD3, (1) 5T4, (2) 6J5, (1) 6SJ7, (3) 6SK7

**REFERENCE DATA AND LITERATURE:**

TM 11-2530

SigC Spec 71-3061

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

METER TESTER  
TS-656(XC)/U

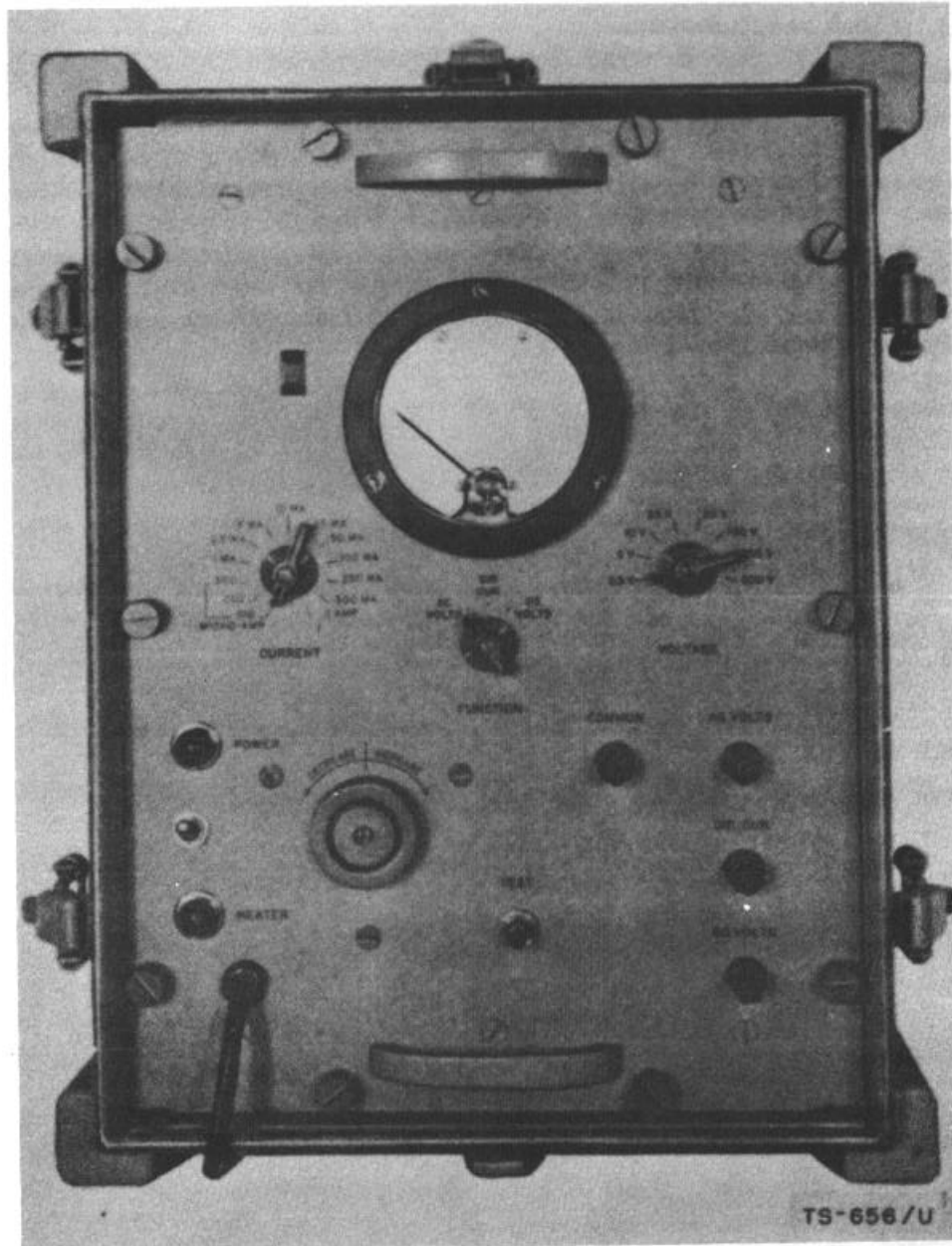
1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

Functional Class: 13.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	ARF Products			



## METER TESTER TS-656(XC)/U

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### FUNCTIONAL DESCRIPTION:

A portable, general purpose, ruggedized, simple "go-no-go" tester used to test the majority of existing voltmeters and ammeters. Selectro switches, a control knob for a variable transformer, and a precision meter for measuring ac and dc voltage and dc current are mounted on the front panel. Provision is made to connect the meter under test to the tester so readings can be compared on all required ranges within the capabilities of the tester. This meter tester is intended for use at all maintenance echelons.

### RELATIONSHIP TO SIMILAR EQUIPMENT:

### TECHNICAL DESCRIPTION:

*Circuit Information:* The ac input is adjusted to the desired value by a variable transformer, whose output feeds the primary of a power transformer. For dc meter supply, part of the secondary voltage is rectified and filtered. The ac meter is merely tapped off the secondary at specified points. The necessary circuitry is included to switch the self-contained meter from voltage to current measurement, when operating on dc. The output of the power circuit is compensated so that when the self-contained meter and the meter under test are supplied with the test voltage or current, both will receive the same quantity regardless of differences in sensitivity or input resistance.

*Power Supply:* 115 or 230 v., ac, 50 to 1600 cy per second, single phase

*Voltage Ranges:* ac and dc, 0 to 2, 4, 10, 20, 40, 100, 200, 400 v

*Current Ranges:* dc, 0 to 100, 200, 400 ua, 0 to 1, 2, 4, 10, 20, 40, 100, 200, 400 ma; 0 to 1 amp

*Accuracy:* ac,  $\pm 5\%$ ; dc,  $\pm 2\%$

*Meter Movement:* D'Arsonval,  $4\frac{1}{2}$ ", round

*Meter Sensitivity:* 1000 ua  $\pm 2\%$

*Meter Resistance:* 300 ohms,  $\pm 10\%$

*Temperature Range:*  $-40^{\circ}$  C to  $+55^{\circ}$  C, operational;  $-54^{\circ}$  C to  $+70^{\circ}$  C, non-operational

*Humidity Range:* Up to 100% at ambient temperatures

*Altitude Range:* Up to 10,000 feet, operational

*Major Units:* TS-656(XC)/U 18 $\frac{1}{2}$ " x 12 $\frac{1}{2}$ " x 13  $\frac{5}{8}$ "; 60 lbs

### TUBES, CRYSTALS, TRANSISTORS,

### REFERENCE DATA AND LITERATURE:

(SigC) SCL-1180, 17 March 1948

21 March 1956

Cog Serv: USA FSN: 6625-649-3285

USA Line Item No:

Functional Class: 13.8

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	Std	-----
<b>Manufacturer:</b>	Allen B. DuMont Laboratories, Inc.			

**No Illustration Available****FUNCTIONAL DESCRIPTION:**

A portable, general purpose instrument used to check equipments employing time bases or incorporating timing functions. It provides a high-frequency sine wave output and sharply-peaked pulse outputs at any one of five frequencies. These are used for sweep calibration of pulse analyzer groups such as AN/APA-74 to assure proper operation before installation in aircraft. It can be used for checking sweep linearity of oscilloscopes, for accurate calibration of sweeps, and for superposition of timing markers on the trace when making permanent photographic recordings. Signal generators and other instruments producing repetitive phenomena can be calibrated by a comparison of their output with the TS810/U output on an oscilloscope. It can also be used as a time calibration source of greater accuracy than the built-in range calibrating circuits of radar sets.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Similar to DuMont type 300 time Calibrator.

**TECHNICAL DESCRIPTION:**

*Circuit Information:* The first stage of the circuit is connected as a modified Pierce-type crystal oscillator which produces an output of 1 megacycle per second. This frequency is applied to a blocking oscillator which operates at one-tenth the input frequency and provides an output signal of 100 kilocycles per second. Three succeeding blocking oscillators operate in a similar manner, each counting down by a factor of 10. A potentiometer is used in the grid circuit of each counter for adjustment of the time constants.

The output of each counter is taken from its cathode to the frequency-period selector switch. The selected frequency is applied to a pulse generator comprising a one-shot multivibrator and a "shock coil" to produce sharp pulses for calibration markers. The sudden change of voltage across the coil, caused by the flip-flop action of the tube, shocks the coil into oscillation. Negative excursions of the signal are clipped by a crystal diode in shunt with the coil. Sharp positive output pulses are applied to a cathode follower, which affords a method of isolating the load from the pulse generator and a method of controlling the output amplitude. In the event pulse stretching of the output pulses is desired, a back-of-panel switch connects a charging capacitor in shunt with the cathode resistor of the cathode follower.

The power supply circuitry includes a full wave rectifier for the B+ supply. B+ for the master oscillator and blocking oscillator counters is regulated by a gas diode. Heater voltage for the same tubes is regulated by a series-connected current regulating tube. Power is applied to the unit through a capacitance-filter type noise suppressor.

*Power Supply:* 115 v  $\pm 10\%$ , ac, 50 to 420 cy per second, single-phase

*Calibration Pulses:* 100 cy to 1 mc, continuously variable

*Synchronization Signals:* 100 cy, 1 kc, 10 kc, and 100 kc

*Sine Wave Output:* 10 me (0.1 usec)

*Pulse Repetition Rate:* 1, 10, 100, 1 K and 10 K usec

*Accuracy:*  $\pm 0.01\%$

---

**CRYSTAL CALIBRATOR**  
**TS-810/U**

---

*Pulse Amplitude:* 3 v peak-to-peak positive; 30 v peak-to-peak negative

*Pulse Width:* Approximately 0.08 usec

*Impedance:* 93 ohms

*Ambient Temperature Range:* 0° C (+32° F) to +55° C (+ 131° F)

*Major Unit:* TS-810/U 7½" x 5½" x 11"; 7.5 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-6AH6, 2 JAN-12AT7, 1 JAN-OA2, 1 JAN-6X4, 3 JAN-12AU7

**REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

PULSE RATE INDICATING TESTER

UG-183A-1

3 March 1955

Cog Serv:

USA Line Item No:

Functional Class: 13.7

	USA	USN	USAF	USMC
<b>STATUS OR TYPE CLASS.:</b>	Std A	-----	-----	-----
<b>Manufacturer:</b>	Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

An overhaul test equipment to electrically check the output pulse characteristics of the RG7064A-1 Servo Amplifier. It is used to indicate the percent time on of the equipment output pulses. These pulses are recorded by means of a counter, from which the pulse rate may be determined. In addition, the average dwell time of the pulses may be determined by dividing the percent time on, as read directly on the meter, by the pulse rate in pulses per second.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* Circuit includes a microammeter, an electrically operated Veeder-Root counter, drive relay, switches, resistors, and associated fuses, jacks, and hardware

*Power Supply:* 115 v, ac, single-phase, 60 cy

*Accuracy:*  $\pm 2\%$  of the indicated percent time on, irrespective of the pulse rate up to 25 pps

*Counter Range:* limitations of the counter limit the effective operating range of the pulse rate function to a maximum of 15 pulses per second

*Major Unit:* UG183A-1 9" x 12" x 8"; 10 lbs

**TUBE , CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**



## CATEGORY 14

## POWER MEASURING EQUIPMENT

<i>Functional classification</i>	<i>Name of Equipment</i>	<i>Type No.</i>	<i>Page No.</i>
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14.1 .....	Wattmeter .....	TS-430/U .....	749
14.2 .....	Bridge, Summation .....	AN/URM-23, -24 .....	731
14.2 .....	Wattmeter .....	AN/URM-43A .....	733
14.2 .....	Volume Indicator .....	ID-220/FRT .....	737
14.2 .....	Audio Level Meter .....	ID-227/F .....	739
14.2 .....	Decibel Meter .....	M22/PCM .....	741
14.2 .....	Wattmeter .....	MF82/U .....	743
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14.2 .....	Power Meter .....	TS-125/AP .....	747
14.2 .....	Output Meter .....	T585B/U .....	751
14.2 .....	Audio Level Test Panel .....	TS-629A/U .....	753

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

BRIDGE, SUMMATION  
AN/URM-23; AN/URM-24

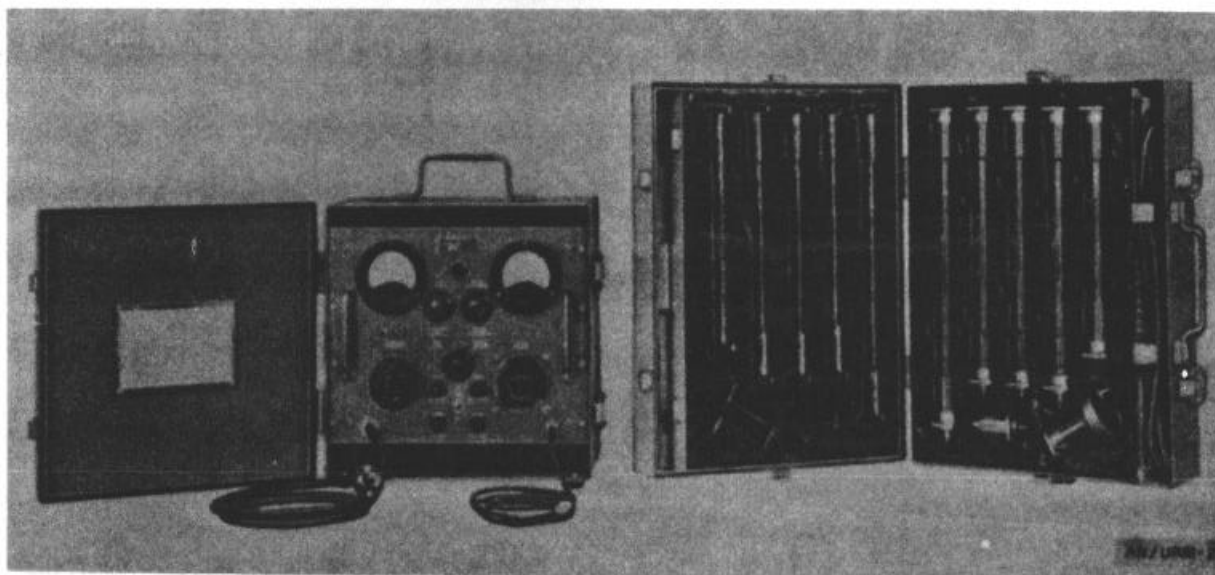
1 March 1964

Cog Serv: USAF FSN:

USA Line Item No:

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C (AN/ URM-23)	-----	L/Std (AN/ URM-23) L/Std (AN/ URM-24)	-----
Manufacturer:	Bruno-New York Industries Corp.			

**FUNCTIONAL DESCRIPTION:**

Summation Bridges AN/URM-23 and AN/URM-24 are portable, field-type, direct-reading watt meters used in measuring rf power output of radio, radar, and navigation equipments.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Summation Bridges AN/URM-19 through -24 are similar except for power requirements and frequency ranges.

**TECHNICAL DECPION**

*Power Requirements:* 115 v  $\pm 10\%$ , 50 to 1,600 cy, 1 phase ac

*Frequency Range :* 1,000 to 4,000 mc (AN/URM-23); 4,000 to 10,000 mc (AN/URM-24)

*Power Input Range:* 5 mw to 5 w

*Input Impedance:* 50 ohms

*Voltage Standing Wave Ratio:* 1:3

*Temperature Range:* -40° C to +55° C

*Accuracy:*  $\pm 15\%$  of pwr being measured

*Major Units:*

1 AN/URM-23      16" x 10" x 13"

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**BRIDGE, SUMMATION**  
**AN/URM-23; AN/URM-24**

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1 AN/URM-24 16" x 10" x 13"

1 TS-730/URM 13 5/8" x 10 5/8" x 13"

**TUBES, CRYSTALS, TRANSISTORS:**

(1) 5Y3GT, (1) 6AU6, (1) 6SA7G, (2) 5651

**REFERENCE DATA AND LITERATURE:**

TO 16-30URM23-1, -2, -3, 4; TO 16-30URM24-1, -2, -3, -4

Spec &/or Dwg: Exhibit WLENG 1081A

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

WATTMETER  
AN/URM-43A

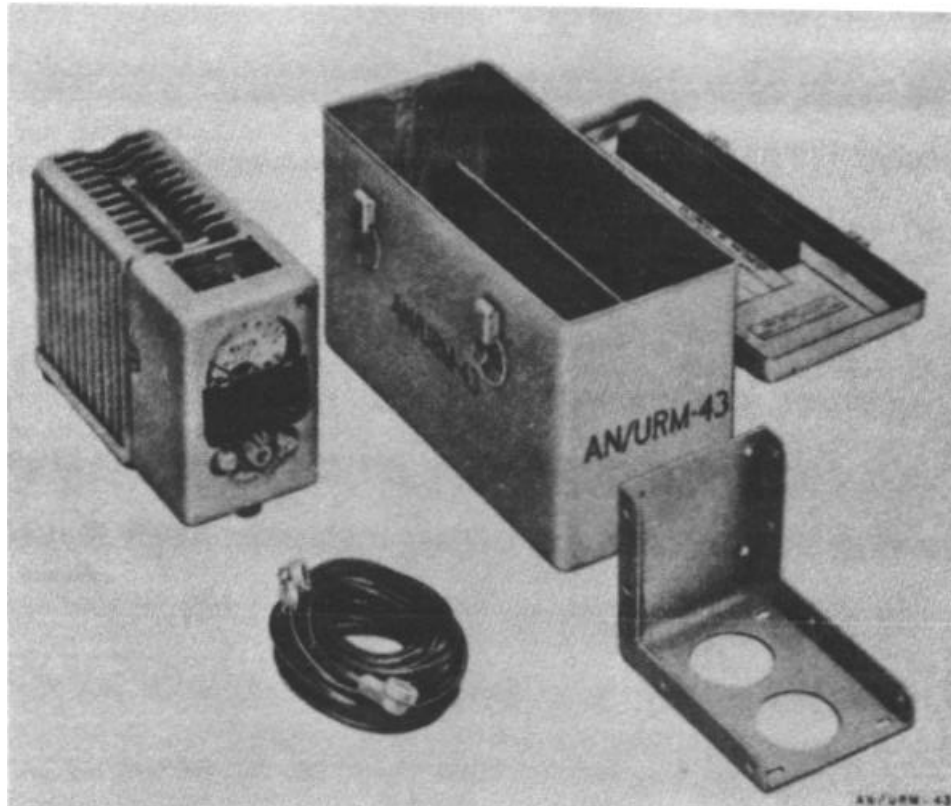
1 March 1964

Cog Serv: USN FSN: 6625-635-9186

USA Line Item No:

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Electro Impulse Laboratory			

**FUNCTIONAL DESCRIPTION:**

A portable general purpose radio frequency absorption type wattmeter used to measure output power and to facilitate tuning of transmitters. It may be used as a dummy load of 51.5 ohms up to 60 watts, as a modulation monitor, as an accurate radio frequency resistance, and for loss measurements on transmission lines. Power indications are read directly on a double scale dc microammeter in rf watts.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The circuit consists of a 50-ohm coaxial load resistor and a dual range crystal rectifier type voltmeter capacitively coupled to the load resistor. The dummy load-voltmeter housing is oil filled and surrounded by a finned radiator structure. A neoprene expansion -diaphragm, which prevents pressure rise with temperature, is mounted on the front of the housing.

*Power Supply:* None

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**WATTMETER**  
**AN/URM-43A**

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*Frequency Range:* Wattmeter, 30 to 600 mc. Dummy load, 0 to above 900 mc.

*Power Range:* 2 to 60 w in two ranges, 0 to 15 and 0 to 60 w

*Type of Reception:* cw, am, fm, or tv type signals

*Voltage Standing Wave Ratio:* Less than 1:1

*Output Impedance:* 51.5 ohms

*Accuracy:*  $\pm 2\%$  of full scale reading

*Temperature Range:*  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) to  $+55^{\circ}\text{C}$  ( $+131^{\circ}\text{F}$ )

*Major Unit:* 1 AN/URM-43A 7" x 5" x 9"; 9 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-1N82 (Crystal Rectifier)

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91842 (Instruction Book)

TO 33A1-7-9-11 (Instruction Book)

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-229-1065

USA Line Item No:

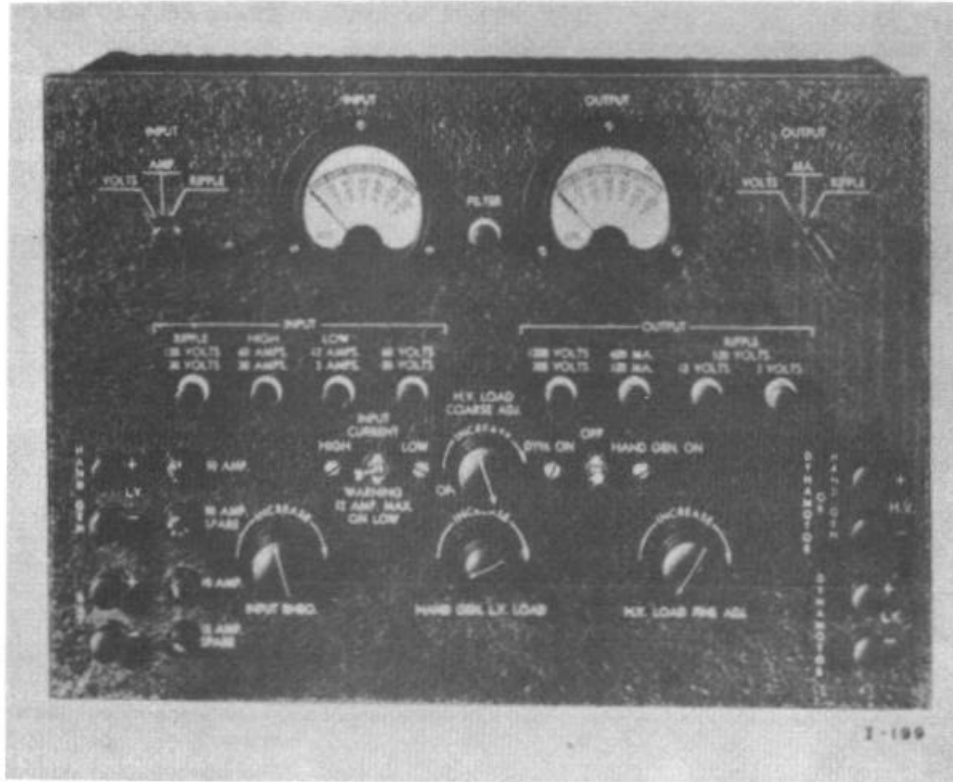
TEST SET

I-199

Functional Class: 14.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----

Manufacturer:

**FUNCTIONAL DESCRIPTION:**

Test Set I-199 is a dynamotor and hand generator test equipment used in measuring input and output voltage, current, and ripple voltage produced by two self-contained meters.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

None.

**TECHNICAL DESCRIPTION:***Voltage Range:*

*Input:* 0 to :30, 120 v ac; 0 to :30, 60 v dc

*Output:* 0 to 3, 12, 130 v ac; 0 to 300, 1,200 v dc

*Current Range:*

*Input:* 0 to :3, 12, 30, 60 amp dc

*Output:* 0 to 120, 600 ma dc

*Major Unit:* 1 I-199 18" x 12" x 10"; 35lbs

**TEST SET**  
**I-199**

---

**TUBES, CRYSTALS, TRANSISTORS**

None.

**REFERENCE DATA AND LITERATURE:**

TM 11-2604      Spec and /or Dwg: Spec MILT-12236





C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

AUDIO LEVEL INDICATOR

ID 227/F

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std C	-----	-----	-----
Manufacturer:	General Radio Company			

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Audio Level Indicator ID-227/F is a portable instrument used in determining signal amplitude in voice transmission circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is identical with General Radio Type 586 DR.

**TECHNICAL DESCRIPTION:**

Attenuation Range: -10 to +36 db

Major Units: ID-227/F 19" 5 1/4" x 5"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE**

1 March 1964

Cog Serv: USA FSN: 6625-498-3469

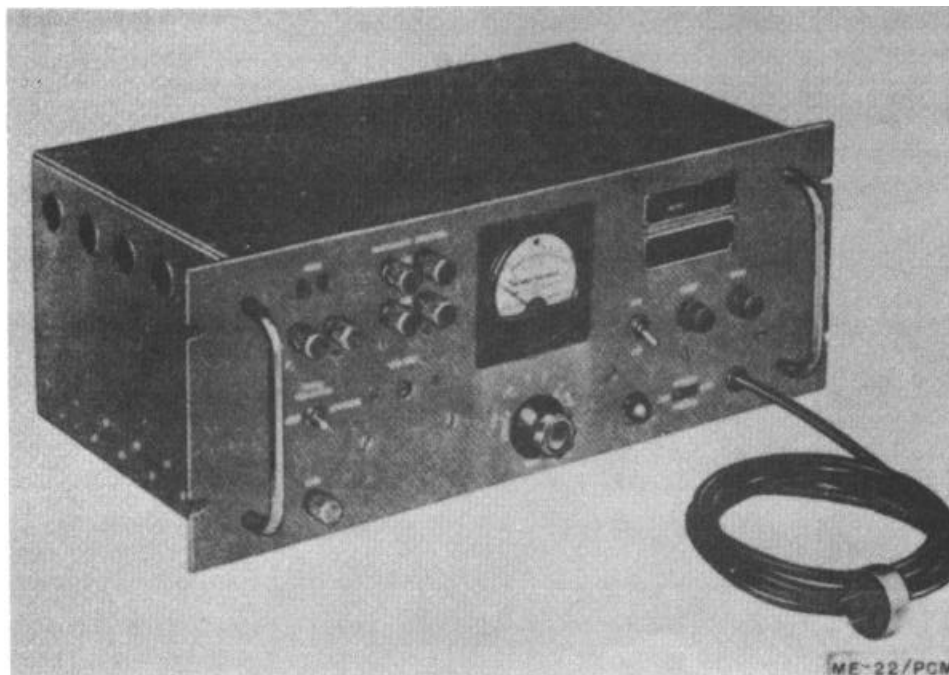
USA Line Item No:

DECIBEL METER

ME-22/PCM

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:	Connecticut Telephone and Electric Company			

**FUNCTIONAL DESCRIPTION:**

Decibel Meter ME-22/PCM is a portable, amplifier-rectifier type output power measuring unit used in testing wire and wire-radio communication circuits.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Telephone Test Set TS-140/PCM.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 50 w, 115 or 230 v  $\pm 10\%$ , 50 to 70 cy, 1 phase ac

*Frequency Range:* 200 to 35,000 cy

*Impedance:* 600 ohms; 8,000 ohms

*Meter Range:* -45 to +25 dbm

*Accuracy:*  $\pm .5$  db

*Major Unit:* ME-22/PMC 7" x 19" x 10 7/8"; 37 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

(1) OC3, (1) 5Y3GT, (1) 6H6, (1) 6L6GAY, (3) 6SJ7, (1) 6SQ7

**REFERENCE DATA AND LITERATURE:**

TM 11-2096

MIL-T-12643

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN:

USA Line Item No:

WATTMETER

ME-82/U

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	-----	-----
Manufacturer:				

No Illustration Available

**FUNCTIONAL DESCRIPTION:**

Wattmeter ME-82/U is portable instrument used in measuring, rf power.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Power Accessories, Kit MI-122/TRC.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 0 to 600 mc

*Impedance:* 52 ohms

*Power Range:* 0 to 120 w

*Major Units:* ME-82/U 13 9/16" x 6" X7 1/8"

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-237-8204

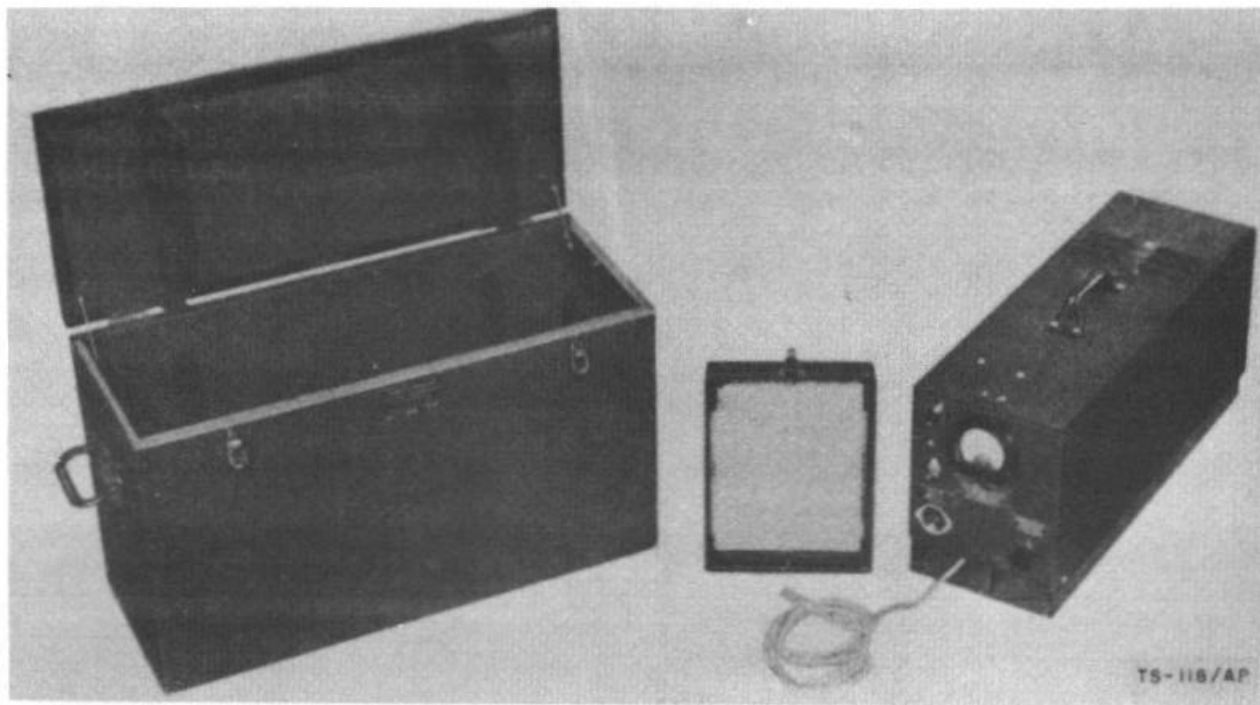
USA Line Item No:

RADIO FREQUENCY WATTMETER

TS-118/AP

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Bird Engineering Co.			

**FUNCTIONAL DESCRIPTION:**

Radio Frequency Wattmeter TS-1 18/AP is a portable test equipment used in measuring the average rf power output of radio transmitters.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment supersedes Radio Frequency Wattmeter TS70/AP.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 100 w, 115 v, 50 to 60 cy, 1 phase ac

*Frequency Range:* 20 to 1,000 mc

*Power Range:* 5 to 500 w (rf)

*Impedance:* 50 ohms

*Accuracy:*  $\pm 10\%$

*Major Units:* TS118/AP 24 1/2" X 11" x 8 1/2", 26 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

AN 16-35TS118-2, TM 11-1036

MIL-R-11817

1 March 1964

Cog Serv: USA FSN: 6625-229-1038

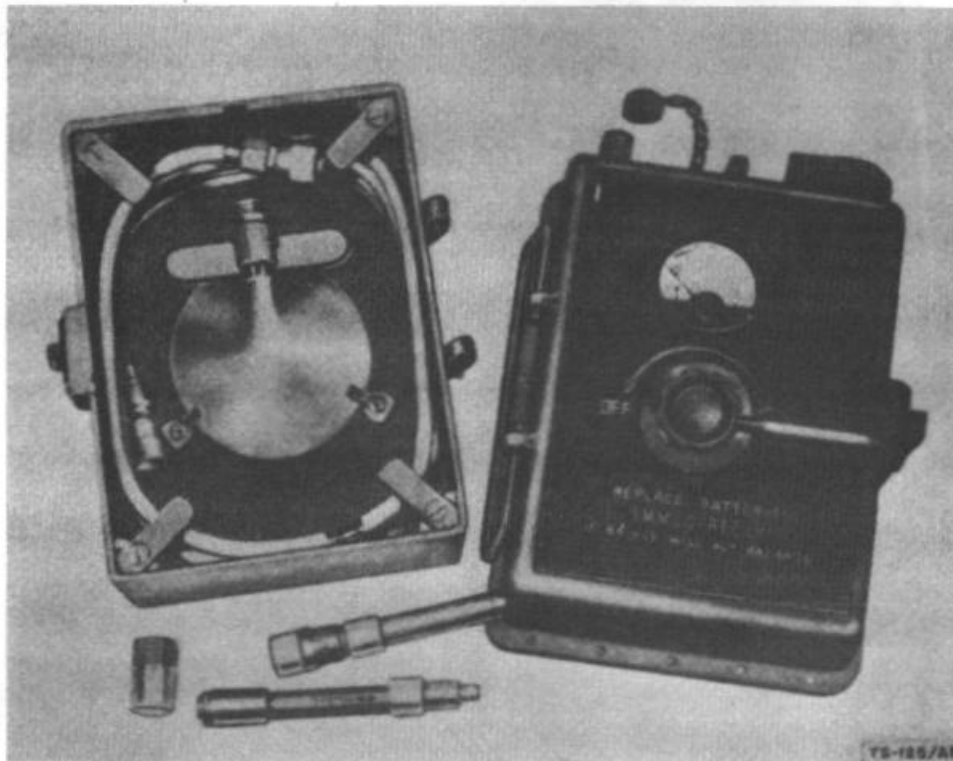
USA Line Item No:

POWER METER

TS1 25/AP

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Cover-Dual Signal Systems, Inc., and Electric Products Co			

**FUNCTIONAL DESCRIPTION:**

Power Meter TS125/AP is a compact, lightweight, battery-operated, UHF wattmeter used in checking the relative power output or radar transmitters. It may also be employed in measuring antenna radiation patterns and standing wave ratios.

This equipment consists of a temperature-compensated thermistor bridge, a milliwattmeter, and a horn-type pickup antenna.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is part of Test Set AN/APM-33, Test Set AN/MPM-2, and Test Kit AN/UPM1-7.

Equipment Required But -Not Supplied: Battery: (3) BA-30.

**TECHNICAL DESCRIPTION:**

*Power Requirements:* 4.5 v dc

*Frequency Range:* 2,400 to 3,335 mc

*Type of Emission:* CW, pulse

*Power Range:* 0 to 2 mw, 0 to 4 w (with attenuators); above 4 w (with pickup ant).

**POWER METER**  
**TS1 25/AP**

---

*Temperature Range:* -20° C to +60° C

*Accuracy:*  $\pm 5$  db

*Major Units:* TS125/AP      10" x 7 7/8" x 5 5/16"; 12 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TM 11-1217

Army Spec 71-5067

1 March 1964

Cog Serv: USAF FSN: 6625-498-3630

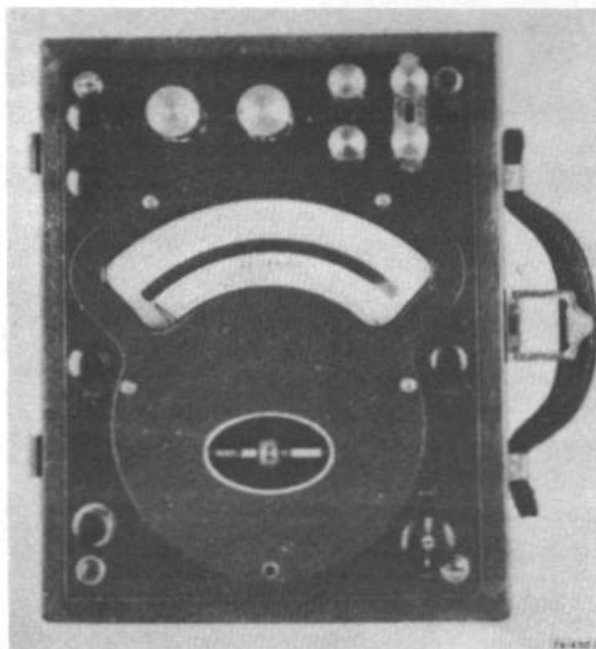
USA Line Item No:

WATTMETER

TS-430/U

Functional Class: 14.1

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Weston Electrical Instrument Corp.			

**FUNCTIONAL DESCRIPTION:**

Wattmeter TS430/U is a portable, dynamotor-type apparatus used in measuring power at dc and at low power frequencies.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

This equipment is similar to Weston Model No. 310, Form 1.

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 25 to 125 cy

*Voltage Range:* 0 to 100, 200, 500 v (nom); 0 to 150, 300, 600 v (max)

*Power Range:* 0 to 3, 6, 15 kw at 30 amp; 0 to 6, 12, 30 kw at 60 amp

*Accuracy:* .25%

*Major Units:* TS-430/U 8" x 10 1/4" x 5 3/4"; 12 lbs

**TUBES, CRYSTALS, TRANSISTORS:****REFERENCE DATA AND LITERATURE:**

C 2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

1 March 1964

Cog Serv: USA FSN: 6625-244-0501

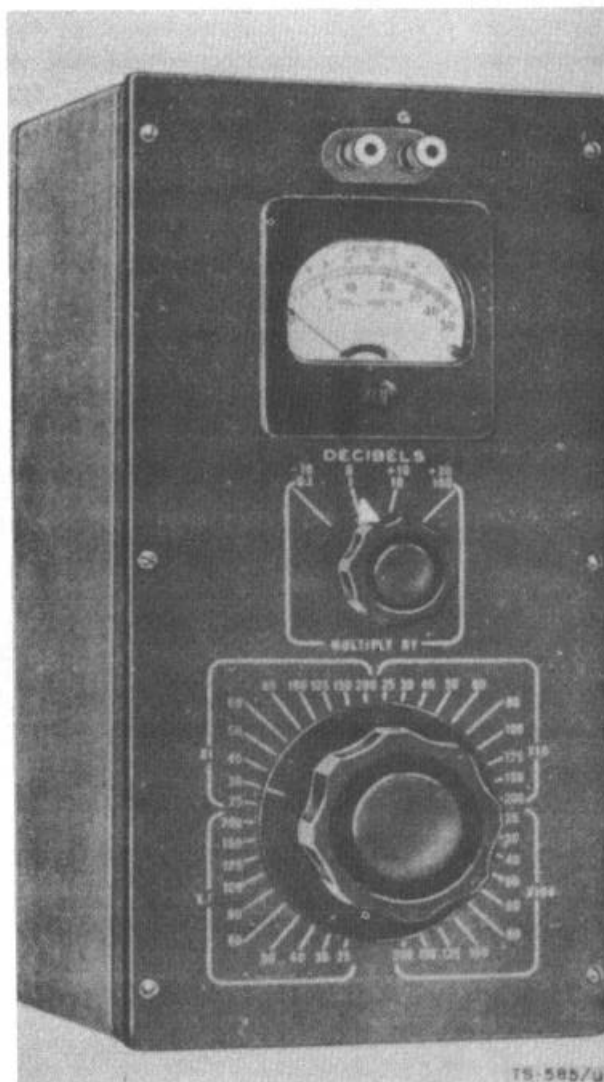
USA Line Item No:

OUTPUT METER

TS-585B/U

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Reiner Electronics Co., Inc.			

**FUNCTIONAL DESCRIPTION'**

Output Meter TS-585B/U is a portable instrument used in measuring af power output of amplifiers filters, oscillators, and similar equipment. Application is in depot testing.

**RELATIONSHIP TO SIMILAR EQUIPMENT:**

Models of this equipment are similar functionally, but not mechanically.



**OUTPUT METER**  
**TS585B/U**

---

**TECHNICAL DESCRIPTION:**

*Frequency Range:* 30 cy to 10 kc

*Power Range:* 0 to 5; 50; 500; 5,000 mw; -10 to +37 db

*Input Impedance:* 2.5 to 20,000 ohms in 40 steps

*Temperature Range:* 0° C to +45° C

*Accuracy:* ± 10% (pwr); ± 5% (impedance)

*Major Unit:* TS-585B/U     11" x 8 1/4" x 5 1/2"; 13 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

**REFERENCE DATA AND LITERATURE:**

TM 11-5017

Army Spec 71-3339

C2, MIL-HDBK-172A, VOL I/TM 11-487H-1/1

12 July 1955

Cog Serv: USAF FSN: 6625-097-5265

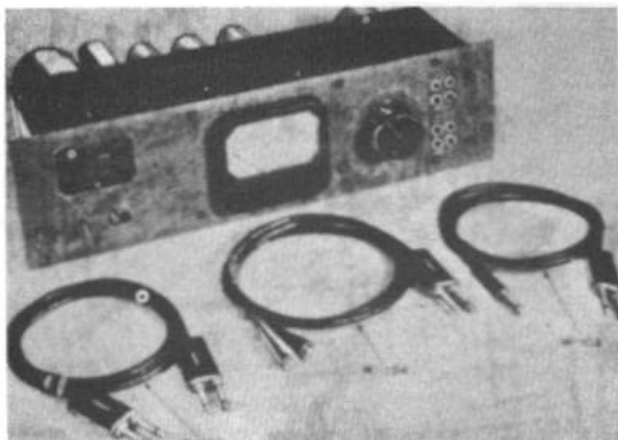
USA Line Item No:

AUDIO LEVEL TEST PANEL

TS-629A/U

Functional Class: 14.2

	USA	USN	USAF	USMC
STATUS OR TYPE CLASS.:	Std A	-----	Std	-----
Manufacturer:	Reiner Electronics Co.			

**FUNCTIONAL DESCRIPTION:**

A portable general purpose test panel designed to accurately measure audio volume levels in broadcasting, sound recording, telephone transmission, and allied fields where precise monitoring over the audio range is required.

**RELATIONSHIP TO SIMILAR EQUIPMENT:****TECHNICAL DESCRIPTION:**

*Circuit Information:* The input circuit consists of a shielded transformer. This is followed by an audio-amplifier, and the indicating meter. A thermal relay shorts out the meter for 20 seconds after power is applied to the built-in regulated supply to avoid damage due to surge voltages.

*Power Supply:* 115 volts  $\pm 10\%$ , ac, 50 to 60 cycles per second, single-phase, 15 watts

*Frequency Range:* 30 to 15,000 cps

*Audio Level Indicating Range:*

*As a bridging type instrument:* -20 to +20 db with a total range including meter scale of -40 to +23 db

*As a terminating type instrument:* -40 to +20 db with a total range including meter scale of -60 to +23 db

*Meter Scale:* -20 to +3 dbm

*Reference Level:* 0 VU (1 mw into 600 ohms)

*Input Impedance:*

Terminating Connection: 600 ohms

Bridging Connection: 12,500 ohms

*Frequency Response:*

$\pm 0.1$  db from 200 to 10,000 cps

$\pm 0.5$  db from 30 to 15,000 cps

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**AUDIO LEVEL TEST PANEL**  
**TS-629A/U**

---

*Accuracy:*

Overall:  $\pm 5\%$

From -15 to +10 db from 200 to 10,000 cps.  $\pm 1\%$

*Temperature Range:* -15° C. (+5° F.) to +55°C. (+131° F.)

*Humidity Range:* Up to 90%

*Major Unit:* TS429A/U 5 1/4" x 19" x 11"; 20 lbs

**TUBES, CRYSTALS, TRANSISTORS:**

1 JAN-6AG7, 1 JAN-6X5GT, 1 JAN-OD3/VR-150

**REFERENCE DATA AND LITERATURE:**

NAVSHIPS 91900 (Instruction Book)

TO 33A1-10-29-1 (Instruction Book)

MIL-A-17045 (Ships) 21 February 1952

## APPENDIX B

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CD-503	11.9	499	SM-26/U	11.1	569	
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CD-800	11.9	503	TS-15C/AP	12.12.6	677	
CD 1099	11.9	505	TS-27B/TSM	12.6	679	
CD-1101	11.9	507	TS-65C/FM1	13.2	719	
CD-1102	11.9	509	TS-78, -79, 80/U	11.1	571	
CD-1106	11.9	511	TS-89B/AP	11.12	573	
CD-1141	11.9	513	TS-90A/AP	11.7	575	
CD-55B/U	11.9	515	TS-108/AP	11.7	577	
CG-91/U	11.9	517	TS-118/AP	14.2	745	
CG-92B/U	11.9	519	TS-125/AP	14.2	747	
CG-107/U	11.9	521	TS-129/UP	11.1	579	
CG-295A/U	11.9	523	TS-140/PCM	12.6	681	
CG-373/U	11.9	525	TS-190/U	11.16	581	
CG-409A/U	11.9	527	TS-200/CPM	11.2.1	583	
CG-426A/U	11.9	529	TS-234( )/UP	11.7	585	
CG-562/U	11.9	531	TS-234A/UP	11.7	587	
CN-16A/U	11.11	533	TS-235( )/UP	11.7	589	
CN-42/UP	1.5	535	TS-265( )/UP	11.12	591	
CU-108/UP	11.2.6	537	TS-286/TRC5	12.6	683	
CX-247/UP	11.9	539	TS-308/U	13.2	721	
CX-251/UP	11.9	541	TS-329( )/U	11.7	593	
CX-255/UP	11.9	543	TS-330/TSM	12.12.8	685	
CX-262/UP	11.9	545	TS-359( )/U	11.12	595	
CX-263/UP	11.9	547	TS-366B/TPS-10	11.7	597	
CX-337/U	11.9	549	TS-383A/GG	12.6	687	
CX-1331/U	11.9	551	TS-400/U	12.6	689	

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TS-407/AMQ2 .....	12.12.7 .....	691
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TS-430/U .....	14.1 .....	749
TS-453/U .....	11.12 .....	601
TS-569/FT .....	12.6 .....	695
TS-585B/U .....	14.2 .....	751
TS-611A/FG .....	1.6 .....	697
TS-656(XC)/U .....	13.1 .....	723
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TS-683/TSM .....	12.12.8 .....	701
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TS-712/TCC-11 .....	12.6 .....	705
TS-725/TTQ3.....	12.6 .....	707
TS-785/GG .....	12.6 .....	709
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UG-274A/U .....	11.2.2 .....	623
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UG-349( )/U .....	11.2.2 .....	627
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**Custodians:**

Army-EL  
Navy-BuShips  
Air Force MAAMA

**Use Activities:**

Army-GL, MO

**Preparing Activity:**

Array-EL  
6625-0072

**MIL-HDBK-172A, VOL I/TM 11-487H-1/1/NAVSHIPS 93003A**

**DEPARTMENTS OF THE ARMY  
AND THE NAVY**

WASHINGTON, D. C., 11 March 1964

TM 11487H-1/1/NAVSHIPS 93003A is issued for the use of all concerned.

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USASA (2)  
USA Elct Mat Agey (100)  
Armies (2) except  
    First USA (4)  
WSMR (2)  
Ft Mason (2)  
Ft McClellan (2)  
Ft Ord (2)  
Ft Bragg (2)  
A Dep (1) except  
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    Sacramento (2)  
    Lexington (2)  
    Tobyhanna (2)  
    Ft Worth (2)

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Sharpe (3)  
Arsenals (Ord) (1) except  
Edgewood (2)  
Frankford (2)  
Redstone  
Detroit (2)  
Army Tml (1) except  
Brooklyn (2)  
Boston (2)  
New Orleans (2)  
PG (2) except  
USAEPG (6)  
USAELRDL (24)  
USA Natick Lab (4)  
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Sig Fld Maint Shops (2)  
MDW (1)  
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(1 copy each)  
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11-15  
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11-65  
11-95  
11-155  
11-556  
11-558  
11587  
11-592  
11-597

*NG*: State AG (3).

*USAR*: None.

For explanation of abbreviations used, see AR 82050.

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# The Metric System and Equivalents

## Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

## Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

## Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

# Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

# Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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**PIN : 010442-000**