TM 11-6625-303-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATION AND ORGANIZATIONAL MAINTENANCE

ELECTRICAL POWER TEST SETS AN/UPM-93 AND AN/UPM-100

This copy is a reprint which includes current pages from Changes 1 through 4

HEADQUARTERS, DEPARTMENT OF THE ARMY

10 JULY 1959

WARNING

Voltages up to 300 volts ac are tested with this equipment. Serious injury or death may result from contact with the teat lead connections.

DON'T TAKE CHANCES!

TM 11-6625-303-12
*** C 4**

CHANGE
No. 4

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 16 *August* 1974

Operator and Organizational
Maintenance Manual

ELECTRICAL POWER TEST SETS AN/UPM-93A, AN/UPM-93B, AN/UPM-93C, AND AN/UPM-100

TM 11-6625-303-12, 10 **July** 1959, is changed as fo]-lows:

Page 9, paragraph la. Change the note after subparagraph ***a*** **to**: "Appendix II is current as of 26 June 1973."

Paragraph 2.1. Delete paragraph 2.1 and substitute:

2.1. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed **in** and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

***c. Discrepancy in Shipment Report (DISREP) (SF* 361).** Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610. 19 (Marine Corps).

After paragraph 2.1, add:

2.2. Reporting of Equipment Publication Improvements.

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C, Fort Monmouth, NJ 07703.

After paragraph 4, add:

4.1. Items Comprising an Operable Equipment.

FSN	*QTY*	Nomenclature, part No., and mfr code	*Useable*	Fig. .Vo.
6625-581-2097		**Test Set, Electrical Power AN/UPM-93A; AN/UPM-93 B**		
6625-971-6210		**Teat Set, Electrical Power AN/UPM-93C**		
6625-542-1290		**Test Set, Electrical Power AN/UPM-100**		
		NOTE **In the usable on code column, number 1 refers to components comprising an operable AN AN/UPN-93A and AN/UPM-93B; number 2 refers to components comprising an operable AN/UPM-93C; number 3refers to component comprising an operable AN/UPM-100.**		
		NOTE **The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.**		
5935-581-3170	**1**	**Adapter, Connector U-175/U**	**1, 2, 3**	**1.1**
5940-655-3727	**2**	**Clip, Electrical: 1410D1; 91802**	**1, 2, 3**	**1.1**
6625-581-2097	**1**	**Test Set, Electrical Power TS-934A/U**	**1**	**1.1**
6625-971-6211	**1**	**Test Set, Electrical Power TS-934B/U**	**2**	**1.1**
6625-542-1289	**1**	**Test Set, Electrical Power TS-914/U**	**3**	**1.1**

*This change supersedes C 2, 16 May 1963.

Page 5, paragraph 10a. In the last line, change "2" to "2.1".

Page ıs, Appendix. Change "Appendix" to: "Appendix I." Appendix II. 1. Delete appendix. II. 1.

Page 20, appendix H. Delete appendix II and sub stitute:

APPENDIX II

BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

1. Scope.

This appendix lists basic issue items required by the crew/operator for operation and maintenance of Electrical Power Test Sets (AN/UPM-93A, AN/UPM-93B, AN/UPM-93C and AN/UPM-100.

2. General.

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sections:

a. Basic Issue Items List-Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or Authorized List-Section II. Not applicable.

3. Explanation of Columns.

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) ***Figure number.*** Indicates the figure number of the illustration in which the item is shown.

(2) Items number. Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCW. The FSCM is a 5-digit **numeric code used** to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. ***Description.*** Indicates the Federal item name and a minimum description required to identify the item.

f. ***Unit of Measure (UIM).*** Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit **of** issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. ***Quantity Furnished with Equipment (Basic Issue Items Only).*** Indicates the quantity of the basic issue item furnished with the equipment.

4. Special Information.

Usable on codes are included in the description column. Uncoded items are applicable to all models. Identification of the usable on codes areas follows:

Code	*Used On*
1	AN/UPM-93A and AN/UPM-93B
2	AN/UPM-93C
3	AN/UPM-100

Section II. BASIC ISSUE ITEMS LIST

(1) ILLUSTRATION (.4) FIG. NO.	(8) ITEM NO.	(2) FEDERAL STOCK NUMBER	PART NUMBER & FSCM	(3) DESCRIPTION	USABLE ON CODE	(4) QTY FURN WITH EQUIP
1		625-672-9296	362-03 66150	COVER, TEST SET CASE	1, 3	1
1.1		6625-077-2398	SM-C-189401 30033	COVER, TEST SET CASE	2	1

By Order of the Secretary **of** the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribtuion:

Active Army:

USASA (2)
CNGB (1)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
USAMB (10)
AMC (1)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Cored (4)
LOGCOMDS (3)
MICOM (2)
TECOM (2)
USACC (4)
MDW (1)
Armies (2)
Corps (2)
USAREUR (10)
HISA (18)
Svc colleges (1)
USASESS (6)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTCS (3)
WRAMC (1)
ATS (1)
Ft *Gordon* (10)
Ft Huachuca (10)
WSMR (1)
Ft Carson (5)
Ft Richardson (ECOM Oft) (2)
Army Dep (1) except
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10)
GENDEP (2)
Sig Sec GENDEP (2)
Sig Dep (2)
SigFLDMS (1)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
USAAVNTBD (2)
USAAESWBD (1)
USAATC (2)
Unite org under fol TOE:
(1 cy each)

1-12$	**29–55**
7	29-57
7-15	29-75
7-16	29-79
7-45	**29–85**
7-46	**29–86**
7-63	**29–87**
7-100	29-105
11-117	28-103
11-302	29-134
11-600 *(AA-AC)*	29-136
17	29-138
17-15	**29–245**
17-16	29-247
17-61	**29–500**
17-66	31-106
17-66	**33–500**
17-96	37
17-86	37-100
17-100	44-235
17-106	44-236
17-108	44-255
29-1	44-256
2%11	44-647
29-15	**45–520**
29-16	55-99
2%17	65-157
28-21	**55–405**
29-25	**55–406**
29-26	**55–407**
29-27	55-457
29–35	**55–458**
29–36	**55–500**
29–37	67
29-41	57-100
29-51	57-4
	77-100

NC: State AC (3)Units-Same as Active Army

USAR: None

For explanation of abbreviations used, see AR 310-50.

TM 11-6625-303-12
C 3

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *19 April 1968*

Operator and organizational Maintenance Manual

ELECTRICAL POWER TEST SETS AN/UPM-93A, AN/UPM-93B, AN/UPM-93C, AND AN/UPM-100

TM 11-6625-303-12, 10 July 1959, is changed as follows:

The title of the manual is changed as shown above.

Note. The parenthetical reference to previous changes (example: "page 2 of C1") indicate that pertinent material was published in that change.

Add "AN/UPM-93A, AN/UPM-93B, and AN/-UPM-93C" after "AN UPM-93" in the following places:

Page 3, paragraph 4, after "380 to 420 cps."

Paragraph 4, after "±5 percent of indicated frequency."

Page 4, paragraph 5, line 2.

Paragraph 6, first line under the "Nomenclature" column of the chart.

Paragraph 8, lines 1 and 3.

Page 2, figure 1. In the upper left-hand section of the illustration, delete "(TS-934/U for AN/UPM-93)."

Delete the caption and substitute: *Electrical Power Test Sets AN/UPM-93A, AN/UPM-93B, and AN/UPM-100.*

Add figure 1.1 after figure 1.

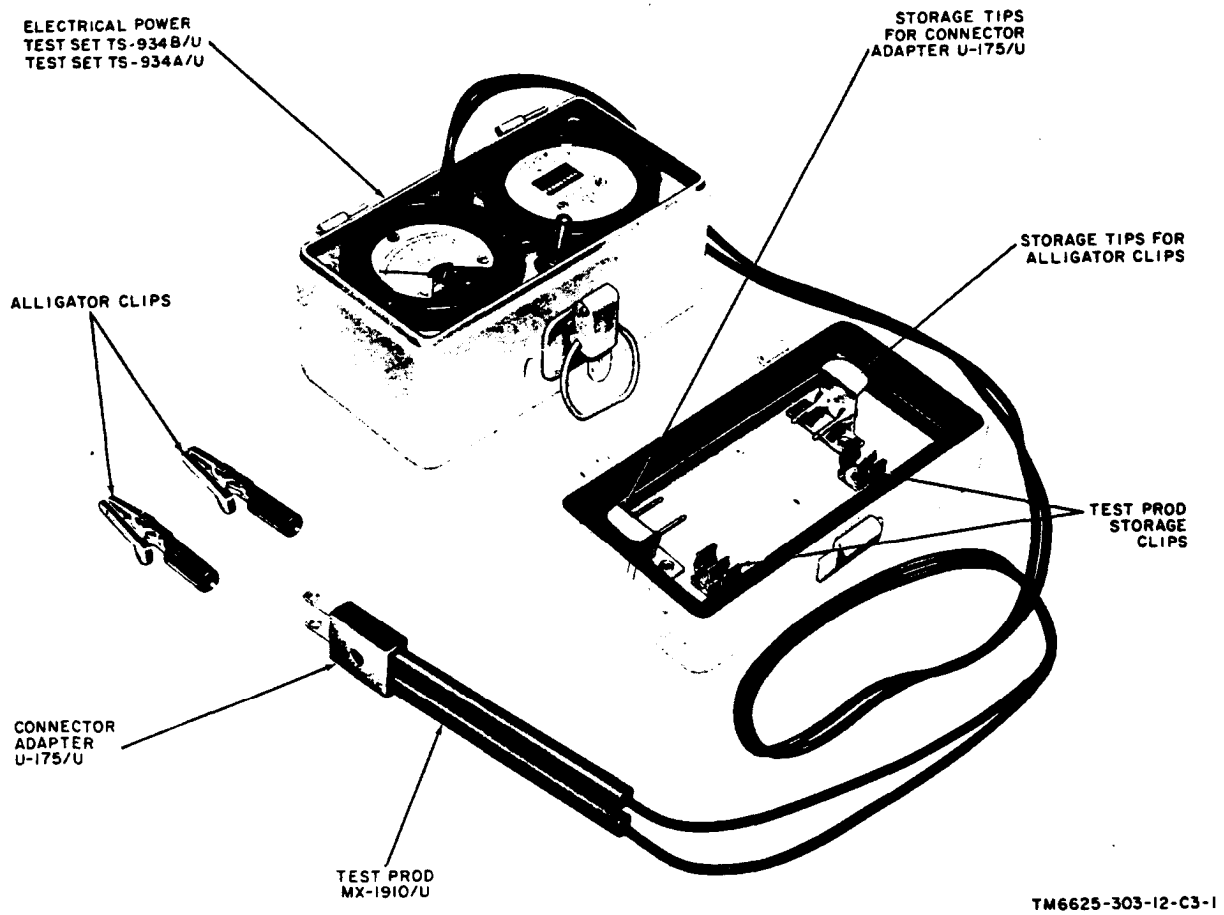

Figure 1.1. Electrical Power Test Set AN/UPM-93C only.

Page 3, chapter 1. Add the following note below the title of chapter 1.

Note. Electrical Power Test Set AN/UPM-93C is similar to Electrical Power Test Sets AN/UPM-93A and AN/UPM-93B. Information in this manual applies to the three models of the AN/UPM-93 test set, unless otherwise specified.

Paragraph 1*a*. Delete lines 1 and 2 and substitute: *a*. This manual describes Electrical Power Test Sets AN/UPM-93A, AN/-UPM-93B, AN/UPM-100 (fig. 1), and AN/-UPM-93C (fig. 1.1) and.

Add the following note after subparagraph *a*.

Note. Appendixes II.1 and III.1 are current as of 31 January 1968.

2. Indexes of Equipment Publications

a. DA Pam 310-4. Refer to DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

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

Paragraph 2.1 (added by C 1, 14 Feb. 63) delete and substitute.

2.1. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and

records in accordance with instructions given in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army), NAVSUP Publication 378 (Navy), AFR 71-4 (Air Force), and MCO P4610-5 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF-361) as prescribed in AR 55-38 (Army), NAVSUP Publication 459 (Navy), AFM 75-34 (Air Force), and MCO P4610.19 (Marine Corps).

d. Report of Equipment Manual Improvements. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J. 07703.

Paragraph 3. Delete lines 1 and 2 and substitute: Electrical Power Test Sets AN/UPM-93A, AN/UPM-93B, and AN/UPM-100 (fig. 1) and AN/UPM-93C (fig. 1.1).

Paragraph 4. Under "Accuracy of frequency calibration," change "±5 percent" to: ±0.5 percent.

Under "Accuracy of voltage calibration," after ±2 percent of full-scale value" add: (AN/UPM-93A, AN/UPM-93B and AN/UPM-100).

Under "Accuracy of voltage calibration," after the last item, add: ±2 percent of full-scale value on 150-volt scale; ±3 percent of full-scale value on 300-volt scale (AN/UPM-93C only).

Page 4, paragraph 5, chart. In the "Item" column, delete "(AN/UPM-93 only)" and substitute: (AN/UPM-93A and AN/UPM-93B only).

After the last item, add:

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Electrical Power Test Set TS-934B/U (AN/UPM-93C only)	3-3/4	3-1/16	6	2.42

Paragraph 6, chart. In the "Nomenclature" column, line 3, second listing, delete "TS-914/U or TS-934/U." and substitute: TS-914/U, TS-934A/U, or TS-934B/U.

After the last item, add:

Nomenclature	Common name
Test Prods MX-1910/U	Test prods

Paragraph 8. Add the following table at the end of the text:

8.1. Summary of Differences in Models

Item	AN/UPM-93A and AN/UPM-93B	AN/UPM-93C	AN/UPM-100
Dimensions	3-1/4" high by 2-5/8" deep by 6-1/2" wide.	3-3/4" high by 3-1/16" deep by 6" wide.	3-1/4" high by 2-5/8" deep by 6-1/8" wide.
Waterproofing construction.	Not included in construction of case and cover.	Included feature, provided by rubber gasket in cover and indented top edge of metal case (fig. 1.1).	Not included in construction of case and cover.

Item	AN/UPM-93A and AN/UPM-93B	AN/UPM-93C	AN/UPM-100
Selector switch (fig. 3)	Rotary type; requires pressing down on the knob and rotating to either the 150- or 300-volt ac position.	Toggle momentary-on type; requires no operator's action for measuring potentials up to 300 volts ac; requires holding in 150-volt position, with spring return to 300-volt position.	Rotary type; requires pressing down on the knob and rotating to either the 150 or 300-volt ac position.
Test prods (figs. 1 and 1.1.)	Provided, but not nomenclatured.	Provided and nomenclatured Test Prod MX-1910/U.	Provided, but not nomenclatured.

Page 5, paragraph 10*a*. Delete "(fig. 1)" and substitute: (figs. 1 or 1.1).

Page 7, paragraph 12. Heading. Delete "(figs. 1 and 3)" and substitute: (figs. 1, 1.1 and 3).

Chart, "Function" column, line 1: After "push button switch," add: (on AN/UPM-93A, AN/UPM-93B, and AN/UPM-100) or spring-return toggle switch (on AN/UPM-93C).

Paragraph 13*b*(1). At the end of the last sentence, add: (on the AN/UPM-93A, AN/UPM-93B, and AN/UPM-100). The selector switch is normally at the 300 position on the AN/UPM-93C. To select the 150 position, depress and hold the spring-loaded toggle switch toward the left, when viewed from the front of the tester.

Paragraph 14. Subparagraph *a*. Add the following note after subparagraph *a*.

Note. The above directions appy to the AN/UPM-93A, AN/UPM-93B, and AN/UPM-100. When the AN/UPM-93C is used, depress and hold the spring-loaded toggle switch in the 150-volt position.

Subparagraph *b*, line 6. Delete "(TS-934/U)" and substitute: (TS-934A/U or TS-934B U).

Page 8, figure 3. Delete the note and substitute:

NOTES:

1. FREQUENCY METER ON TS-934A/U and TS-934B/U CALIBRATED FROM 380 TO 420.
2. SELECTOR SWITCH ON TS-934B/U IS A TWO-POSITION TOGGLE S,WITCH SPRING-LOADED TO THE 300-VOLT POSITTON.

Page 10, paragraph 22, chart (page 2 of C1). Add the following note at the end of the "Item" column.

Note. Item 7*a*. and7*b*(4) above, apply to the AN/UPM-93A, AN/UPM-93B, and AN/UPM-100. When the AN/UPM-93C is used, the selector switch is a two-position toggle switch, spring-loaded to the 300-volt position. To select the 150-volt position, depress and hold the spring-loaded toggle switch toward the left, when viewed from the front of the tester.

Paragraph 22.3, chart (page 3 of C1). Add the following note at the end of the "Item" column.

Note. Item 7*a* and 7*b*(4) above, apply to the AN UPM-93A, AN/UPM-93B, and AN/UPM-100. When the AN/UPM-93C is used, the selector switch is a two-position toggle switch, spring-loaded to the 300-volt position. To select the 150-volt position, depress and hold the spring-loaded switch toward the left, when viewed from the front of the tester.

Page 14, paragraph 24*a*, line 2. Delete "fig. 1" and substitute: (figs. 1 and 1.1).

Paragraph 22.4 (page 4 of C1), line 2. Change TM 9-2851 to: TM 9-213.

Add appendix I after chapter 5.

APPENDIX I

REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U. S. Army Equipment Index of Modification Work Orders.
TM 9-213	Painting Instructions for Field Use.
TM 38-750	Army Equipment Record Procedures.

Page 15 (page 1 of C2). Appendix I is redesignated Appendix III by this change.

Page 15 (page 1 of C 2). Appendix II, the title is changed to read as follows: Appendix II. BASIC ISSUE ITEMS LIST FOR TEST SETS AN UPM-93 and AN/UPM-100.

APPENDIX II.1

BASIC ISSUE ITEMS LIST FOR TEST SETS AN/UPM-93A, AN/UPM-93B, AN/UPM-93C, and AN/UPM-100

Section I. INTRODUCTION

1. Scope

This appendix lists items comprising an operable equipment and those required for installation, operation, or operator's maintenance for Test ets, Electrical Power AN/UPM-93A, AN/UPM-93B, AN/UPM-93C, and AN/UPM-100.

2. Explanation of Columns

The following is a list of explanations of columns is section II.

a. Source, Maintenance, and Recoverability Codes (SMR) Column.

(1) *Source code (S).* The selection status and source for the listed item is the first code indicated in this column. The source codes used and their explanations are:

Code	Explanation
P —	Applies to repair parts that are stocked in or supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
A —	Applies to assemblies that are not procured or stocked as such but are made up of two or more units, each of which carries an individual stock number and description and is procured and stocked and can be assembled by units at indicated maintenance categories.

(2) *Maintenance code (M).* The lowest category of maintenance authorized to install the item is indicated by the second code in the column. The maintenance category code and its explanation is:

Code	Explanation
C	Operator/Crew

(3) *Recoverability code (R).* The re-

coverability code is the third code in the column. It indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation is as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	Explanation
R —	Applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

b. Federal Stock Number Column. This column indicates the Federal stock number for the item.

c. Description Column. This column includes the Federal item name and any additional description of the item which may be required. A part number or other reference number is followed by the applicable five-digit Federal supply code for Manufacturers. When required to indicate that the part is used on the models, or serially numbered groups so identified, the numbers 1, 2, 3, 4, etc. are placed under the heading *Usable on Code.* An explanation of the codes precedes the first item in section II of the basic issue items list.

d. Unit of Issue Column. The unit used as a basic of issue (e.g., ea, pr, ft, yd, etc.) is given in this column.

e. Quantity Incorporated in Unit Pack Column. Not used.

f. Quantity Incorporated in Unit Column. The total quantity of the item used in the equipment is given in this column.

g. Quantity Furnished with Equipment Column. This column lists the quantity of the item supplied for initial operation of the equipment and/or the quantities authorized to be kept on hand by the operator for maintenance of the equipment.

h. Quantity Authorized Column.

I. Illustrations Column.

(1) *Figure number (a).* The number of the illustration on which the item is shown is indicated in the column.

(2) *Item No. or reference designation (b). Not* used.

3. Federal Supply Codes

This paragraph lists the Federal supply code with the associated manufacturer's name.

Code	Manufacturer's Name
66150	Winslow Tele-Tronics Inc.
80063	Army Electronics Command
91802	Industrial Devices Inc.

SECTION II. BASIC ISSUE ITEMS

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION Reference Number & Mfr Code	USABLE ON CODE	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY FURN WITH EQUIP	(8) QTY AUTH	(9) ILLUSTRATIONS (a) FIG. NO.	(9) ILLUSTRATIONS (b) ITEM NO. OR REFERENCE DESIGNATION
	6625-581-2097	TEST SET, ELECTRICAL POWER AN/UPM-93A, AN/UPM-93B: (This item is nonexpendable)		ea					1.1	
	6625-971-6210	TEST SET, ELECTRICAL POWER AN/UPM-93C: (This item is nonexpendable)		ea					1.1	
	6625-542-1290	TEST SET, ELECTRICAL POWER AN/UPM-100: (This item is nonexpendable)							1	
		TECHNICAL MANUAL TM 11-6625-303-12 Requisition through pinpoint account number if assigned; otherwise through nearest Adjutant General facility. For technical manuals the quantity indicates the maximum number of copies authorized for packing (or issue) with the equipment. Where a number of these equipments are concentrated in a small area, the quantity on hand may be reduced to the minimum actual requirements as determined by the commanding officer of the unit. NOTE: Usable on code 1 refers to AN/UPM-93A and AN/UPM-93B; 2 refers to AN/UPM-93C; 3 refers to AN/UPM-100.		ea		1	1			
P-C	5935-581-3170	ADAPTER, CONNECTOR U-175/U	1,2,3	ea		1	1		1.1	
P-C	5940-655-3727	CLIP, ELECTRICAL: 1410D1; 91802	1,2,3	ea		2	2		1.1	
P-C	6625-672-9296	COVER, TEST SET CASE: 362-03; 66150	1,3	ea		1	1		1	
P-C	6625-077-2398	COVER, TEST SET CASE: SM-C-189401; 80063	2	ea		1	1		1.1	
A-C-R	6625-581-2097	TEST SET, ELECTRICAL POWER TS-934A/U	1	ea		1	1		1.1	
A-C-R	6625-971-6211	TEST SET, ELECTRICAL POWER TS-934B/U	2	ea		1	1		1.1	
A-C-R	6625-542-1289	TEST SET, ELECTRICAL POWER TS-914/U	3	ea		1	1		1	
		"NO ACCESSORIES, TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT"								
		THE FOLLOWING ITEMS AND THEIR QUANTITIES ARE MOUNTED IN OR ON EQUIPMENT LISTED FOR STORAGE PURPOSES								
		COVER, TEST SET CASE (6625-672-9296) AND COVER, TEST SET CASE (6625-077-2398)								
	5935-581-3170	ADAPTER, CONNECTOR U-175/U: 1								
	5940-655-3727	CLIP, ELECTRICAL: 2								

APPENDIX III.1

MAINTENANCE ALLOCATION CHARTS FOR TEST SETS AN/UPM-93A, AN/UPM-93A, AN/UPM-93B, AN/UPM-93C, and AN/UPM-100

Section I. INTRODUCTION

1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Test Sets, Electrical Power AN UPM-93A, AN/UPM-93B, AN/UPM-93C, and AN/UPM-100. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

2. Explanation of Format for Maintenance Allocation Chart

a. Group number. Not used.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Maintenance Category
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self explanatory.

C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	TEST SETS, ELECTRICAL POWER AN/UPM-93A; AN/UPM-93B; AN/UPM-93C AND AN/UPM-100	O	H	O						H	D		3 7 4 1,2,3,4,5,6	
	TEST SETS, ELECTRICAL POWER TS-934A/U; TS-934B/U AND TS-914/U									H			4	
	COVER, TEST SET CASE									H			4	

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/UPM-93A, AN/UPM-93B; AN/UPM-93C & AN/UPM-100 (continued)		
1	D	FREQUENCY METER AN/TSM-16	6625-542-1666	
2	D	METER, TEST EQUIPMENT TS-682/GSM	6625-669-0747	
3	H,D	MULTIMETER TS-352B/U	6625-553-0142	
4	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-605-0079	
5	D	TRANSFORMER, VARIABLE CN-16/U	5950-235-2086	
6	D	VOLTMETER TS-340/U	6625-643-0624	
7	O	NOTE: Tool and test equipment available to the repairman user bacause of his assigned mission.		

By Order of the Secretary of the Army:

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

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMD (2)
USAMICOM (4)
USASTRATCOM (4)
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Corps (2)
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USAAMS (40)
USAARMS (2)
USAIS (2)
USAES (2)
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USATC Inf (2)
USASTC (2)
WRAMC (1)
Army Pic Cen (2)
USACDCEC (10)
Instl (2) except
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  Fort Huachuca (10)
  Fort Carson (25)
  Fort Knox (12)
  Fort Belvoir (5)
  WSMR (5)
Army Dep (2) except
  LBAD (14)
  SAAD (30)
  TOAD (14)
  LEAD (7)
  SHAD (3)
  NAAD (5)
  SVAD (5)
  CHAD (3)
  ATAD (10)
Gen Deps (2)
Sig Sec Gen Deps (5)
Sig Dep (12)
Sig FLDMS (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
MAAG (2)
USARMIS (2)
USARMA (2)
Units org under fol TOE:
  (2 copies each)

1-128	29-35
1-307	29-36
7	29-37
7-15	29-41
7-45	29-51
7-58	29-55
7-100	29-57
11-57	29-75
11-97	29-79
11-98	29-85
11-117	29-86
11-127	29-87
11-155	29-105
11-157	29-109
11-158	29-134
11-500 (AA-AC, RL, RD, RV)	29-138, 29-205
11-587	29-206
11-592	29-245
11-597	29-247
17	29-500
17-15	31-105
17-16	37
17-51	44-236
17-55	44-547
17-56	55-157
17-95	55-405
17-96	55-406
17-100	55-407
17-105	55-457
29-1	55-458
29-11	55-500
29-15	57
29-16	57-100
29-17	67
29-21	77-100
29-25	

NG: State AG (3); units — same as active Army except allowances of one copy per unit.

USAR: None.

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

TECHNICAL MANUAL

Operation and Organizational Maintenance,

ELECTRICAL POWER TEST SETS AN/UPM-93 AND AN/UPM-100

TM 11-6625-303-12
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *14 February 1963*

TM 11-6625-303-12, 10 July 1959, is changed as follows:

Page 3, paragraph 2.

Delete paragraph 2 and substitute:

2. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment. Department of the Army Pamphlet No. 310-4 is a current index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

Add paragraph 2.1 after paragraph 2.

2.1. Forms and Records

a. Equipment Forms and Records. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publications 378 (Navy), and AFR 71-4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to—Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N. J. (DA Form 1598 (Record of Comments of Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 10. Delete paragraphs 20, 21, and 22. substitute—

Section I. OPERATOR'S MAINTENANCE

(Superseded)

20. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of Electrical Power Test Sets AN/UPM-93 and AN/UPM-100 are listed below, together with a reference to the paragraphs covering the specific maintenance function. The duties assigned do not require tools or test equipment other than those listed in the appendix.

a. Preventive maintenance (par. 21).

b. Daily maintenance service and inspection (par. 22).

c. Cleaning (par. 22.1).

21. Operator's Preventive Maintenance

Operator's preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. The procedures given in paragraphs 22 and 22.1 cover systematic care essential to proper upkeep and operation of the equipment. The cleaning operations (par. 22.1) should be performed once a day. If the equipment is not used daily, however, the cleaning operations must be performed before operation after any extended shutdown, or once a week while the equipment is kept in *standby* condition. The other items must be checked before the equipment is placed in operation after a shutdown, during operation, or after it is turned off, as specified in the applicable paragraph.

b. The daily maintenance service and inspection chart (par. 22) outlines inspections to be made at

daily intervals. These inspections are made to determine combat serviceability; that is, to determine that the equipment is in good general (physical) condition, in good operating condition, and likely to remain combat serviceable. To assist operators in determining and maintaining combat serviceability, the chart indicates what to inspect, how to inspect, and what the normal conditions are; the *References* column lists the paragraph that contains additional information. If the defect cannot be remedied by the operator, higher echelon maintenance or repair is required. Records and reports of these inspections must be made in accordance with TM 38–750.

22. Daily Maintenance Service and Inspection Chart

Item No.	Procedure: Item	Procedure: Normal condition or result	References
1.	TS–934/U and TS–914/U: Inspect the equipment for:		
	a. Completeness.	*a.* Equipment must be complete.	*a.* Section II, TM 11–6625–303–12P.
	b. Cleanliness.	*b.* Units must be clean and dry inside and out; free of grease, dirt, rust, corrosion, and fungus.	*b.* Par. 22.1.
5.	CONNECTIONS: Check the test leads.	The test leads should be properly connected to the test set and free of cuts or fraying.	Higher echelon maintenance.
6.	VOLTMETER: Check the voltmeter for zero adjust.	The voltmeter pointer should indicate at zero.	Par. 13*b*(2).
7.	OPERATION: Perform the following operations:		
	a. Set the selector switch at 300.	*a.* The selector switch should rotate without binding or scraping.	*a.* Higher echelon maintenance.
	b. Voltage measurements:	*b.* Voltage measurements should read as follows:	*b.* None.
	(1) Insert the test prods into Adapter Connector U–175/U.	(1) None.	(1) None.
	(2) For the TS–914/U, plug the test leads into a 0–300-volt 60-cps power source.	(2) The voltmeter should read between 0 and 300 volts and the reeds should vibrate between 58 and 62 cps.	(2) Higher echelon maintenance.
	(3) For the TS–934/U, plug the test leads into a 0–300-volt 400-cps power source.	(3) The voltmeter should read between 0 and 300 volts and the reeds should vibrate between 380 and 420 cps.	(3) Higher echelon maintenance.
	(4) If the voltage reading (on either test set) is less than 150 volts, set the switch to the 150 position.	(4) The voltmeter concerned, should read between 0 and 150 volts.	(4) Higher echelon maintenance.

22.1. Cleaning

Inspect the exteriors of the test set. The exterior surfaces should be clean, free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

Warning: **Cleaning Compound is flammable and its fumes are toxic. Provide adequate ventilation. *Do not* use near a flame.**

b. Remove grease, fungus, and ground-in dirt from the case; use a cloth dampened (not wet) with cleaning compound.

c. Remove dust or dirt from plugs and jacks with a brush.

Caution: **Do not press on the meter faces (glass) when cleaning; the meter may be damaged.**

d. Clean the front panel, meters, and control knob; use a soft clean cloth. If difficulty in removing dirt occurs, dampen the cloth with water; mild soap may be used to make the cleaning more effective.

Section II. ORGANIZATIONAL MAINTENANCE

22.2. Monthly Maintenance

Monthly maintenance on Electrical Power Test Sets AN/UPM–93 and AN/UPM–100 will be scheduled in accordance with the requirements of TM 38–750. All deficiencies or shortcomings will be recorded, and those not corrected during

the inspection and service will be immediately reported to higher echelon using forms and procedures specified by TM 38-750. Equipment that has a deficiency that cannot be corrected by second echelon should be deadlined in accordance with TM 38-750. Perform all the services listed in the monthly maintenance and inspection chart (par 22.3) in the sequence listed. Whenever a *normal condition or result* is not observed, take corrective action in accordance with the paragraph listed under *references*.

22.3 Monthly Maintenance Service and Inspection Chart

Item No.	Procedure: Item	Procedure: Normal condition or result	References
1.	TS-934/U and TS-914/U: Inspect the equipment for:		
	a. Completeness.	*a.* Equipment must be complete.	*a.* Section II, TM 11-6625-303-12P.
	b. Cleanliness.	*b.* Units must be clean and dry inside and out; free of grease, dirt, rust, corrosion, and fungus.	*b.* Par. 22.1.
	c. Preservation.	*c.* Painted surfaces must be free of bare spots, rust, and corrosion.	*c.* Par. 22.4.
2.	PUBLICATIONS: Check that pertinent publications are available.	*a.* Operator's and organizational manual must be complete and in usable condition without missing pages.	*a.* None.
		b. All Changes pertinent to the equipment are on hand.	*b.* DA Pam 310-4 for requirements.
3.	MODIFICATION WORK ORDERS: Check DA Pam 310-4 to determine if new applicable MWO's have been published.	All URGENT MWO's have been applied to the equipment. All ROUTINE MWO's have been scheduled.	Par. 2.
4.	METER, SELECTOR SWITCH, STORAGE CLIPS and STORAGE TIPS: Inspect for looseness.	The meter, selector switch, storage clips, and storage tips should be properly mounted and securely installed.	Higher echelon maintenance.
5.	CONNECTIONS: Check the test leads.....	The test leads should be properly connected to the test set and free of cuts or fraying.	Higher echelon maintenance.
6.	VOLTMETER: Check the voltmeter for zero adjust.	The voltmeter pointer should indicate at zero.	Par. 13*b*(2).
7.	OPERATION: Perform the following operations:		
	a. Set the selector switch at 300.	*a.* The selector switch should rotate without binding or scraping.	*a.* Higher echelon maintenance.
	b. Voltage measurements:	*b.* Voltage measurements should read as follows:	*b.* None.
	(1) Insert the test prods into Adapter Connector CU-175/U.	(1) None.	(1) None.
	(2) For the TS-914/U, plug the test leads into a 0-300-volt 60-cps power source.	(2) The voltmeter should read between 0 and 300 volts and the reeds should vibrate between 58 and 62 cps.	(2) Higher echelon maintenance.
	(3) For the TS-934/U, plug the test leads into a 0-300-volt 400-cps power source.	(3) The voltmeter should read between 0 and 300 volts and the reeds should vibrate between 380 and 420 cps.	(3) Higher echelon maintenance.
	(4) If the voltage reading is less than 150 volts, set the selector switch to the 150 position.	(4) The voltmeter concerned, should read between 0 and 150 volts.	(4) Higher echelon maintenance.
8.	SPARE PARTS: Check all spare parts (operator and organizational) for general condition and method of storage.	All spare parts must be in good condition and properly stored. There should be no evidence of overstock, and all shortages will be on valid requisitions.	TM 11-6625-303-12P.

22.4. Cleaning and Touchup Painting Instructions

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the

applicable cleaning and refinishing practices specified in TM 9-2851.

Page 12. Delete figure 5.
Page 13. Delete figure 6.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
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11-98	11-592
11-117	11-597
11-155	

NG: State AG (3); units—same as Active Army except allowance is one copy for each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

TECHNICAL MANUAL

No. 11-6625-303-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *10 July* 1959

ELECTRICAL POWER TEST SETS AN/UPM-93 AND AN/UPM-100

*This manual supersedes the operation and organizational maintenance portions of TB SIG 318, 24 March 1958.

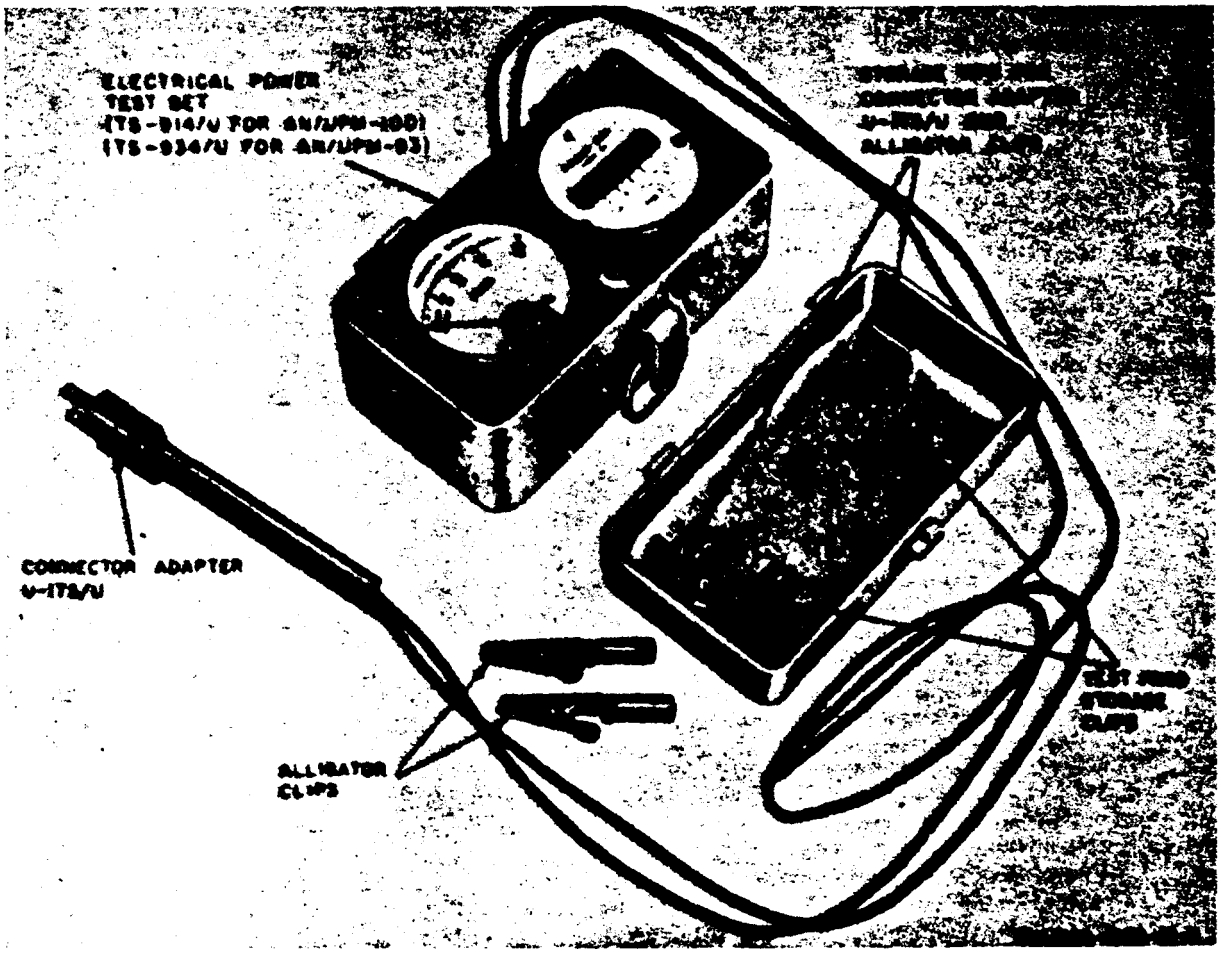


Figure 1. Electrical Power Test Set AN/UPM-93 or AN/UPM-100.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. **This manual describes Electrical Power Test Sets AN/UPM–93 and AN/UPM–100 (fig. 1) and covers installation, operation, and first and second echelon maintenance. It includes instructions for operation under usual and unusual conditions, instructions for cleaning and inspection of the equipment, and replacement of parts available to second echelon maintenance.**

b. **The appendix of this manual contains the maintenance allocation charts.**

2. Forms and Records

a. Unsatisfactory Equipment Reports.

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

(2) **Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-**Patterson Air Form Base, Ohio, as prescribed in AF TO 00-35D-54.

b. Report of Damaged or Improper Shipment. Fill out end forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 18504 (Navy), and AFR 71-4 (Air Force).

c. Preventice Maintenance Form (figs. 5 and 6). Prepare DA Form 11-266 (Maintenance **Check** List for Signal Equipment (Test Equipment)) in accordance with instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7,8, and 9) directly to the Commanding Officer, U.S. Army Signal Equipment Support Agency, Fort Monmouth, N.J., with comments on omissions and discrepancies in the appendix.

e. Comments on Manual Forward all other comments on this publication direct to the Commanding Officer, U.S. Army Signal Publications Agency, Fort Monmouth, N.J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Electical Power Test Sets AN/UPM-93 and AN/UPM-100(fig. 1) are portable test sets used to make voltage and frequency measurements of 400 and 60-cycles per second (cps) power circuits, respectively. The taster is connected to the measurment points by two test prods which may be connected to alligator clips or plugged into Connector Adapter U-175/U.

4. Technical Charactoriatics

Frequency range----------	**380 to 420 cps (AN/UPM-93) .**
	58 to 62 cps (AN/UPM-100).
Voltage ranges----- 0	**to 150 volts.**
	0 to 300 volts.
Power consumption-	**3 watts.**
Accuracy of frequency calibration-	**±5 percent of indicated frequency (AN/UPM-93).**
	±3 percent or indicated frequency (AN/UPM-100).
Accuracy of voltage calibration----------	**±2 percent of full-scale value.**

5. Table of Components
(fig. 1)

The following chart lists the components of Electrical Power Test Sets AN/UPM-93 and AN/UPM-l00.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb.)
1	Electrical Power Ted Set TS-934/U (AN/UPM-93 only).	3¼	2%	6%	2.42
1	Electrical Power Ted Set TS-914/U (AN/UPM-100 only).	3¼	2%	6%	2.42
1	Connector Adapter U-175/U				
2	Alligator clip ---------				

6. Common Names

Common names are assigned to nomenclature items as follows:

Nomenclature	Common names
Electrical Power Test Set AN/UPM-93 or AN/UPM-100.	Teat set.
Electrical Power Test &t TS-914/U or TS-934/U	Tester.
Connector Adapter U-175/U	Adapter.

7. Description of Test Sets
(fig. 1)

a. The tester consists of *a* voltmeter and a frequency meter, mounted in a metal case with a removable hinged cover. A latch on the case secures the cover. A voltage selector switch and permanently attached test leads are between the meters. Spring clips and storage tips are attached to the inside of the cover to secure the alligator clips, the adapter, and the test prods when they are not in use.

b. Connector Adapter U-175/U has two flat, parallel blades on one end and two pin prod jacks on the other end.

c. The alligator clips are covered with an insulating material. Each clip has a pin prod jack at one end for connection to one of the test prods.

8. Differences in Models

Electrical Power Test Sets AN/UPM-93 and AN/UPM-100 are similar in purpose, operation, and appearance. The AN/UPM-93 is used to make voltage and frequency measurments on 400-cps power circuits; the AN/UPM-100 is used to make voltage and frequency measurements on 60-cps power circuits The frequency meter male on the TS-934U is marked from 380 to 420 cps in 5-cycle graduations; the frequency meter scale on the TS-914/U is marked from 56 to 62 cps, in half-cycle graduations (fig. 4).

CHAPTER 2

SERVICE UPON RECEIPT OF EQUIPMENT

9. Unpacking

a. Packing Data. **When packed for ship ment that test set is packed in a corrugated carton 4 by 31/2 by 7 inches. The test set may be shipped individually, or a number of equipments may be packed in a large corrugated carton for shipment. Figure 2 shows typical packaging for an individual test set.**

b. ***Removing Contents.***

(1) Open the large corrugated carton (if used and remove one small corrugated carton.

(2) Open the small corrugated carton and remove the technical manual and the test set. Be careful and to damage the equipment when removing the sealing tape.

10. Checking Unpacked Equipment

a. Inspect the equipment (fig. 1) for damage. If the equipment has been damaged, refer to paragraph 2.

b. Check the equipment received against the packing list. When no packing list accompanies the equipment use the table of components (par. 5) as a general check.

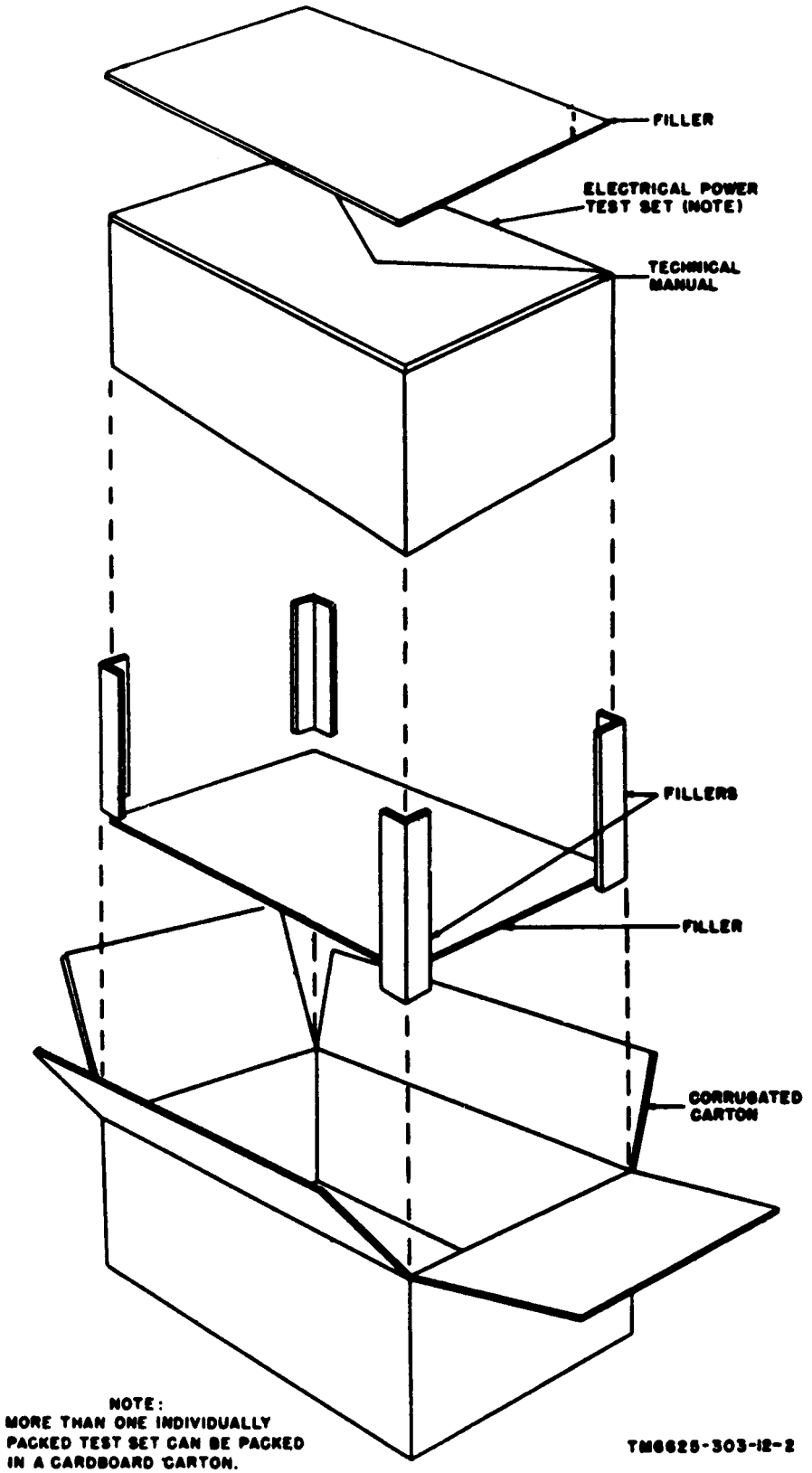


Figure 2. Typical packing.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATION UNDER USUAL CONDITIONS

11. General Instructions

The test set will not be used when the power supply voltage exceeds 300 volts ac. Improper setting of the selector switch (fig. 3) may damage the equipment. Do not operate the tester until the function of the selector switch and the meters (par. 12), and the connection of the equipment (par. 13) are understood.

12. Control, Connectors, and Indicators (figs. 1 and 3)

Control, connector, and indicator	Function
Selector switch	A 2-position push button switch used to select the 0- to 150-volt or 0- to 300-volt voltmeter scale.
Adapter	Connects tester to female convenience outlet.
Alligator clips	Connects tester to power circuit being measured.
Frequency meter	Indicates frequency of power circuit being measured.
Voltmeter	Indicates voltage of power circuit being measured.

13. Connections and Starting Procedure

a. Connections. Connect the tester as follows:

(1) Unsnap the latch and remove the cover from the case.

(2) Remove the test prods from the storage clips (fig. 1).

(3) Insert the test prod tips into the jacks on the adapter or alligator clips (if used).

b. Starting Procedure.

(1) Set the selector switch (fig. 3) at 300. The selector switch is operated by pressing down on the knob and rotating it to the desired position.

(2) Check to see that the voltmeter pointer is at zero. If the pointer is not at zero, perform the procedures indicated below.

(*a*) Place a screwdriver in the slot of the voltmeter adjustment (fig. 3).

(*b*) Slowly turn the voltmeter adjustment until the pointer is directly over 0 on the voltmeter scale.

Note. If the pointer will not adjust to zero, higher echelon repair is required.

(3) Connect the test prods to the power circuit to be measured.

14. Voltage and Frequency Measurements

The test set does not have an on-off switch. Power is applied to the voltmeter and the frequency meter when the test prods are connected to a power circuit.

a. Voltage Measurements. If the voltage indicated on the 0- to 300-volt scale of the voltmeter is less than 150 volts, press down on the selector switch and turn the knob to the 150 position (fig. 3). The reading on the 0- to 150-volt scale is the amount of voltage present in the circuit.

b. Frequency Measurements. When the test prods are applied to a power circuit, one or more reeds, visible on the face of the frequency meter, will vibrate. The vibrating reed or reeds indicate the frequency. A power frequency of 400 cps (TS–934/U) or 60 cps (TS–914/U) is shown in A, figure 4. If the frequency measured has a value midway between two adjacent reeds, both reeds will vibrate. The power supply frequency is then of a value halfway between the two vibrating reeds (B, fig. 4).

15. Stopping Procedure

a. Remove the test prods from the circuit under test.

b. Set the selector switch at 300.

c. Replace the alligator clips and the adapter, if used, on the storage tips (fig. 1) inside the cover.

d. Replace the test prods in the storage clips.

e. Close the cover and secure the latch.

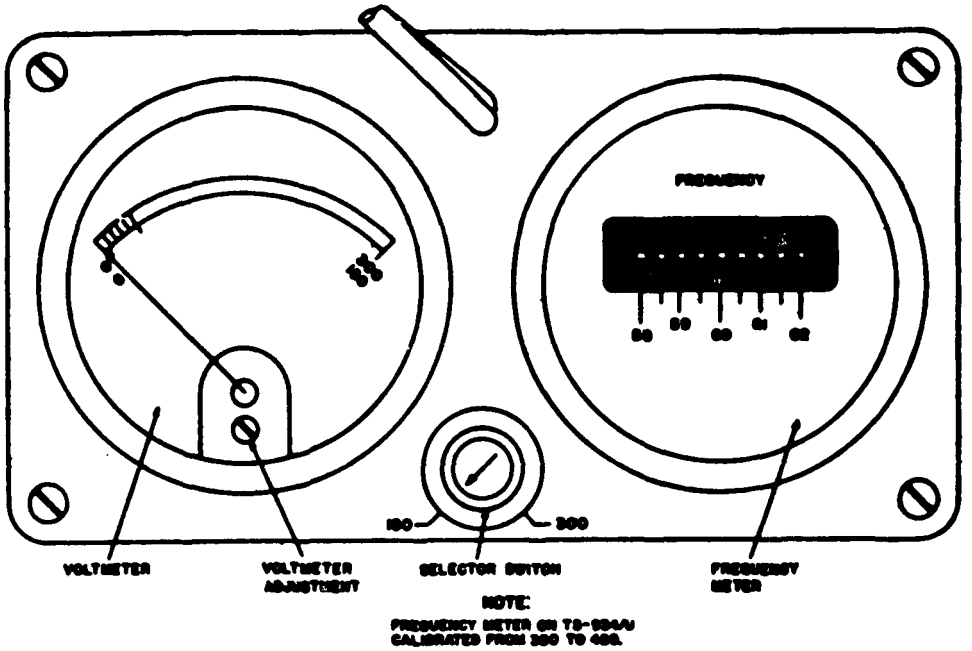


Figure 3. Control and indicators (TS-914/U).

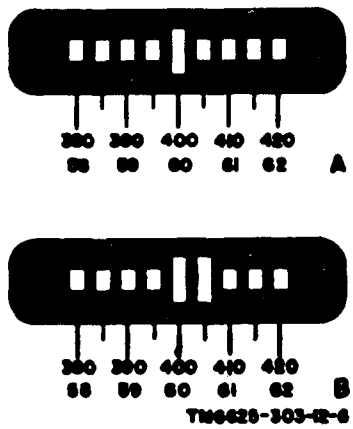


Figure 4. Frequency indications.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

16. General

Operation of the testers may be more difficult in regions where extreme cold, heat, humidity, and moisture conditions prevail. Paragraph 17 through 19 provide operational information that may be used to minimize the effects of regional extremes.

17. Operation at Low Temperatures

Low temperatures and climatic conditions as sociated with cold weather affect the operation of the teat set.

a. Extreme cold makes test leads and other rubber parts stiff and brittle. Handle the equipment carefully to avoid cracking the insulation on the teat leads.

b. If equipment that has been exposed to the cold is brought into a warm room, moisture will gather on it and may cause fogging of the meter glass. Dry the equipment thoroughly.

18. Operation Under Tropical Conditions

Warm damp climates expose the equipment to damage from moisture and fungus. The high rel-

ative humidity cause condension when the temperature of the equipment drops below that of the surrounding air. Adequate ventilation will minimize this condition. Wipe all moisture and fungus from the exterior with a clean lint-free cloth.

19.Operation in Desert Climates

Desert climates expose the set to damage from dirt, dust, and the effects of strong sunlight. Provide means for keeping dust and sand from entering the jacks on the alligator clips and the adaptar, and the moving parts of the tester. Clean end dust the equipment frequently. When not in use, keep the cover closed to keep dust and dirt out of the exposed parts. Protect the equip meant from the direct rays of the sun, if possible.

CHAPTER 4

MAINTENANCE INSTRUCTIONS

20. Gcneral

The procedures outlined in this chapter are to be performed by the operator or the organizational maintenance personnel. Operator's maintenance consists of preventive maintenance (par. 21), and visual inspection (par. 22). Organizational maintenance of the equipment is limited to preventive maintenance (par. 21) and replacement of parts not requiring the use of tools. A screwdriver is used to zero-adjust the voltmeter. No special tools or test equipment are required.

21. Prcvcntive Maintenance

a. *DA Form 11-266.* **DA Form 11-266 (figs. 5 and 6) is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items not applicable to the test set are lined out in the figures. References in the ITEM block in figure 6 are to paragaphs that contain additional maintenance information pertient to the particular item. Instructions for the use of the form appear on the form.**

b. ltems. The information shown below supplements DA Form 11-266. The item numbers correspond to ITEM numbeers on the form.

Item	Maintenance procedure
1	Use a clean cloth to remove duct, dirt, moisture, and grease from the case and the front panel.
2	inspect meters, selector witch, storage clips, and storage tips for looseness.
7	Check for bent or missing hinge pins.
11	Impact the voltmeter for a bent or broken pointer.

22. Visual Inspection

u. When the equipment fails to perform properly, check the items listed below.

(1) Wrong setting of selector switch (par. 133(1)).

(2) Teat leads not connected or poorly connetted.

(3) Voltmeter not zeroed (par. 13b (2)).

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (par. 23).

23. Equipment Performance Checklist

a General. The equipment performance checklist provides a procedure for systematically checking equipment performance. Ail corrective measures that the operator or the orgaizational maintenance man can perform are given in the corrective measures column. When using the checklist, start at step 1 and follow each step in order. If the corrective measure indicated does not repair the equipment troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed end the corretive measures taken. Perform the steps indicated in *b* below.

b. Checklist.

Step	Action	Normal indication	Corrective measure
1	Set selector switch at 300.	Switch position without forcing. . . .	Higher echelon repair required.
2	Connect test prods to power circuit	Voltmeter indicates circuit voltage; frequency meter indicates circuit frequency.	Cheek test prods for good connection. If connection is good, remove adapter or alligator clips and reconnect test prods to power circuit. If meters now function properly, replace defective adapter or alligator clips. Higher echelon repair required. Note. If only one meter operates correctly, higher echelon repair is required.
3	If voltage indicated on 0- to 300-volt scale is below 150 voIts, set selector Swltch at 150.	Voltmeter indicates circuit voltage; frequency meter indicates circuit frequency.	Higher echelon repair required.

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-[illegible])

EQUIPMENT NOMENCLATURE: ELECTRICAL POWER TEST SET AN/UPM-100

EQUIPMENT SERIAL NUMBER: 482

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and blocks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual (in TM 11 series) for the equipment. (See DA Pamphlet Number 310-4)
   b. The Supply Bulletin (SB 11-100 series) for the equipment. (See DA Pamphlet Number 310-4)
   c. The Department of the Army Lubrication Order. (See DA Pamphlet Number 310-4)

2. The following action will be taken by either the Communications Officer/Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

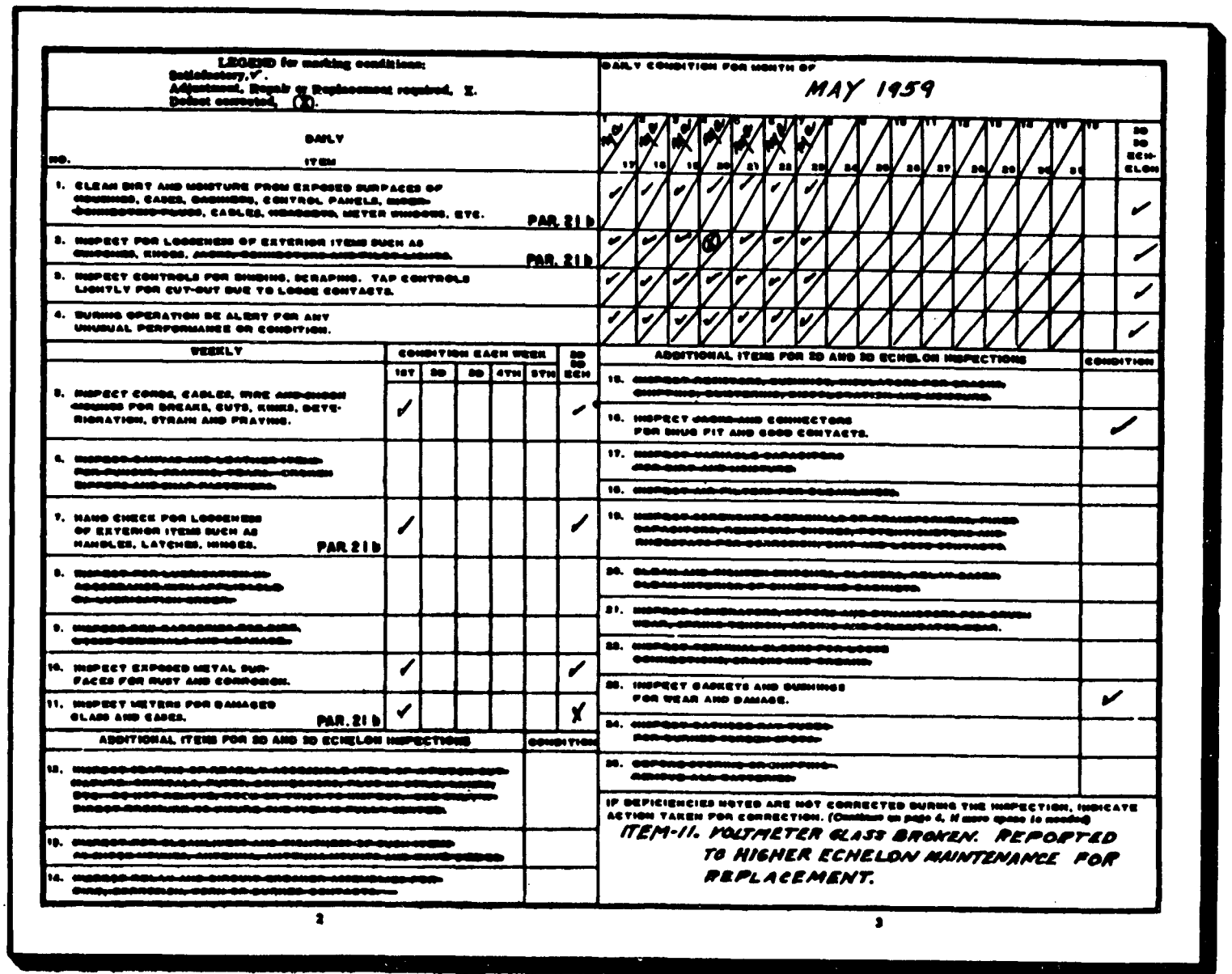
OPERATOR	S/S ECHELON	DATE	SIGNATURE
✓		14 MAY '59	Jack Andrews
	✓	30 MAY '59	Harold Martin

4

DA FORM MAY 51 11-266

TM9825-303-12-4

Figure 5. DA Form 11-266, pages 1 and 4.



LEGEND for making conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, ⊘.

DAILY CONDITION FOR MONTH OF MAY 1959

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF [illegible] PAR. 21 b	✓	✓	✓	✓	✓	✓	✓																									✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS [illegible] PAR. 21 b	✓	✓	✓	⊘	✓	✓	✓																									✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS.	✓	✓	✓	✓	✓	✓	✓																									✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓																									✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D OR 3D ECH
5. INSPECT CORDS, CABLES, WIRE AND [illegible]	✓					✓
6. [illegible]						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES. PAR 21 b	✓					✓
8. [illegible]						
9. [illegible]						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES. PAR. 21 b	✓					X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. [illegible]	
13. [illegible]	
14. [illegible]	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. [illegible]	
16. INSPECT [illegible] AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.	✓
17. [illegible]	
18. [illegible]	
19. [illegible]	
20. [illegible]	
21. [illegible]	
22. [illegible]	
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. [illegible]	
25. [illegible]	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. (Continue on page 4, if more space is needed)

ITEM-11. VOLTMETER GLASS BROKEN. REPORTED TO HIGHER ECHELON MAINTENANCE FOR REPLACEMENT.

2 3

TM9625-303-12-3

Figure 6. DA Form 11-238, pages 2 and 3.

CHAPTER 5

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

24. Disassembly of Equipment

To prepare the test set for shipment or storage, proceed as follows:

a Secure the alligator clips and the adapter on the storage tips (fig. 1).

b. Secure the test prods in the test prod storage clips.

c. Close and fasten the cover of the test set.

25. Repacking for Shipment or limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures out lined below, whenever circumstances permit.

a. Material Repuirements. The following materials a required for packaging and packing the test set. For stock numbers of materials, refer to **SB 38-100.**

Material	Quantity
Corrugated cardboard----------	1 sq ft.
Filler material----------	1/4 lb.
Gummed tape----------	2 ft.
Pressure-sensitive, waterproof tape--------	2ft.

b. Packing. Package the test set as outlined below.

(1) Cushion the test set on all surface with pads of filler material (fig. 2).

(2) Place the cushioned test set inside the corrugated carton.

(8) Secure the corrugated carton with gummed tape.

(4) Place pressure-sensentive waterproof tape over the gummed taps.

(5) If more than one piece of equipment is to be shipped, package each test set ((1) through (4) Above) before placing it in the large corrugated carton. Seal the large corrugated carton (8) and (4) above).

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

26. Authority for Demolition

The destruction procedures (par. 27) will be used to prevent further use of the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

27. Methods of Destruction

Any or all of the methods of destruction given below may be used.

a. Smash. Use sledges, axes, hammers, crowbars, and any other heavy tools available to smash the case, the cover,and the meters..

b. Cut. Use axes, handaxes, machins, or knives to cut the test leads.

c. Burn. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades to burn the technical manuals and teat leads.

Warning: Be extremeiy careful with explosive and incendiary devices. Use three items oniy when the need is urgent.

d. Explode. Use grenades, TNT, or firearms, if explosives are necessary.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways.

APPENDIX

MAINTENANCE ALLOCATION CHARTS FOR ELECTRICAL POWER TEST SETS AN/UPM-93 AND AN/UPM-100

Section I. MAINTENANCE ALLOCATION

1. General

a.The maintenance allocation chart assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon. It also specifies the facilities authorized at each echelon to perform the assigned maintenance function.

b. Columns in motions II and IV, maintenance allocation chart, are defined as follows:

(1) *Part or component.* Only the nomenclature or standard item name is annotated in this column. Additional deacriptive data are included only where clarification is necessary to identify the part. Component and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediataly below the assembly listing.

(2) Maintenance function. This column indicates the various maintenance *functions* allocatad to the echelon capable *of* performing the operation. These are defined as follows:

(a) Service. To clean, to preserve and to replenish fuel and lubricant

(b) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(c) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(d) Replace. To substitute serviceble assemblies, subassemblies, and parts for unserviceable components.

(e) Repair. To restore to servicable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting. etc.

(f) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(g) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component. parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies and parts.

(3) *1st, 2d, 3d, 4th, and 5th echelon.* The symbol X indicates that that echelon and higher echelons are responsible for performing the maintenance function indicated. Repair parts may not necessarily be stocked at the echelon indicated; refer to the applicable functional parts lists.

(4) *Tools required.* This column indicates the tools and test equipment required to perform the maintenance" function. These numbers are identified in sections 111 (AN/UPM-93) and V (AN/UPM-100), allocation of tools for maintenance functions.

(5) *Remarks.* This column containg any notations necessary to clarify the data cited in the preceding columns.

c. Columns in sections 111 and V, allocation of tools for maintenance functions are defined as follows :

(1) Tools required for maintenance functions. Column 1 lists tools and test

equipment required to perform the maintenance functions

(2) ***1st, 2d, 3d, 4th, and 5th echelon.*** **A dagger (f) symbol indicates that the tool equipment is allocatad to that echelon.**

(3) ***Tool code.*** **The numbers in column 7 are code numbers that stand for the associated tool equipment and are used in the maintenance allocation charts (AN/** ***UPM-98*** **and AN/UMP-100, respectively), to refer to the indicated item.**

(4) Remarks. Not used.

2. Maintenance by Using Organizatlon

When this equipment is used by signal servive organizatinals organic to theater headquarters or communication zones to provide theater commumications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation charts do not include mounting hardware such as screws, nuts, bolts, washers, brackets, and clamps.

Section II. MAINTENANCE ALLOCATION CHART (AN/UPM-93)

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRICAL POWER AN/UPM-93	service		X				8	
	inspect		X					Visual only
	test				X		3	
	repair				X		4	
	calibrate				X	X	1,2	
	rebuild					X	4	
ADAPTER, CONNECTOR U-178/U: P5	replace		X					
TEST SET, ELECTRICAL POWER TS-934/U	repair				X			
	rebuild					X		
CABLE ASSEMBLY, SPECIAL PURPOSE: W1, W2	repair				X			
PROD, TEST: P1, P2	replace				X			
WIRE, ELECTRICAL: W3	replace				X			
CASE, TEST SET	replace					X		Obtain from salvage if required
	repair				X			
CATCH, LUGGAGE: A8	replace				X			
CLIP, ELECTRICAL (Alligator Type): P3P4	replace		X					
COVER, TEST SET CASE: A2	replace		X					
METER, ELECTRICAL FREQUENCY: M1	replace				X			
	repair				X			
RESISTOR, FIXED, WIRE WOUND: R3, R4	replace				X			
PANEL, MOUNTING: A3	replace				X			
RING, RETAINING (Window): A4, A5	replace				X			
SCREWS, MACHINE (Common Hardware)	replace				X			Available in Maintenance Equipment MD-0 and Hardware Kit MX-61/U
SWITCH, PUSH: S1	replace				X			
VOLTMETER: M2	adjust	X						Adjust pointer to zero only
	replace				X			
	repair				X			
WINDOWS: A6, A7	replace				X			

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS (AN/UPM-93)

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
AN/UPM-93							
FREQUENCY METER AN/USM-26				0	0	1	
METER TEST SET TS-682/GSM-1				0	0	2	
MULTIMETER AN/URM-105				0	0	3	
TOOL EQUIPMENT TK-21/G				0	0	4	
TOOL AND TEST EQUIPMENT AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		0				5	

Section IV. MAINTENANCE ALLOCATION CHART (AN/UPM-100)

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRICAL POWER AN/UPM-100	service		X				8	
	inspect		X					Visual only
	test				X		3	
	repair				X		4	
	calibrate				X	X	1,2	
	rebuild					X	4	
CONNECTOR, ADAPTER U-176/U: P6	replace		X					
TEST SET, ELECTRICAL POWER TS-914/U	repair				X			
	rebuild					X		
CABLE ASSEMBLY, SPECIAL PURPOSE: W1, W2	repair				X			
PROD, TEST: P1, P2	replace				X			
WIRE, ELECTRICAL: W3	replace				X			
CASE, TEST SET: A1	replace					X		Obtain from slavage if required
	repair				X			
CATCH, LUGGAGE: A8	replace				X			
CLIP, ELECTRICAL (alligator type): P3, P4	replace		X					
COVER, TEST SET CASE: A2	replace		X					
METER, ELECTRICAL FREQUENCY: M1	replace				X			
	repair				X			
RESISTOR, FIXED, WIRE WOUND: R3, R4	replace				X			
PANEL, MOUNTING: A3	replace				X			
RING, RETAINING(window): A4, A5	replace				X			
SCREWS, MACHINE (COMMON Hardware)	replace				X			Available in Maintenance Equipment ME-9 and Hardware Kit MK-41/U
SWITCH, PUSH: S1	replace				X			
VOLTMETER: M2	replace				X			
	repair				X			
WINDOW: A6, A7	replace				X			

Section V. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS (AN/UPM-100)

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH.	(3) 2ND ECH.	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
AN/UPM-100							
FREQUENCY METER FL 40/GSM-1				↓	↓	1	
METER TEST SET TS-682/GSM-1				↓	↓	2	
MULTIMETER AN/URM-105				↓	↓	3	
TOOL EQUIPMENT TK-31/G				↓	↓	4	
TOOL AND TEST EQUIPMENT NORMALLY PROVIDED REPAIRMAN UNDER DUE TO HIS ASSIGNED MISSION		↓				5	

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

USASA (2)
CNGB (1)
Tech Stf, DA (1) except
CSigO (30)
Tech Stf Bd (1)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA AD Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA ATB (1)
USCONARC (5)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5) except
First USA (7)
Corps (2)
Div (2)
USATC (2)
Svc Colleges (5)
Br Svc Sch (5) except
USASCS (25)
GENDEP (2) except
Atlanta GENDEP (none)
Sig Sec, GENDEP (12)
Sig Dep (19)
Army Pictorial Cen (2)
Engr Maint Cen (1)
USA Ord Msl Comd (3)
Fld Comd, Def Atomic Spt Agcy (5)
USASSA (15)
USASSAMRO (1)
USA Sig Pub Agcy (8)
USA Ig Engr Agcy (1)
USA Comm Agcy (2)
USA Sig Eqp Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
WRAMC (1)
AFIP (1)
AMS (1)
Ports of Embk (OS) (2)
Trans Terminal Comd (1)
Army Terminals (1)
OS Sup Agcy (1)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Lab (5)
Sig Fld Maint Shops (3)
Mil Dist (1)
USA Corps (Res) (1)
Sector Comd, USA Corps (Res) (1)
JBUSMC (2)
Units organized under following TOE's:
11-7 (2)
11-16 (2)
11-57 (2)
11-97 (2)
11-117 (2)
11-155 (2)
1-500 (AA-AE) (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: State AG (3); units—Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

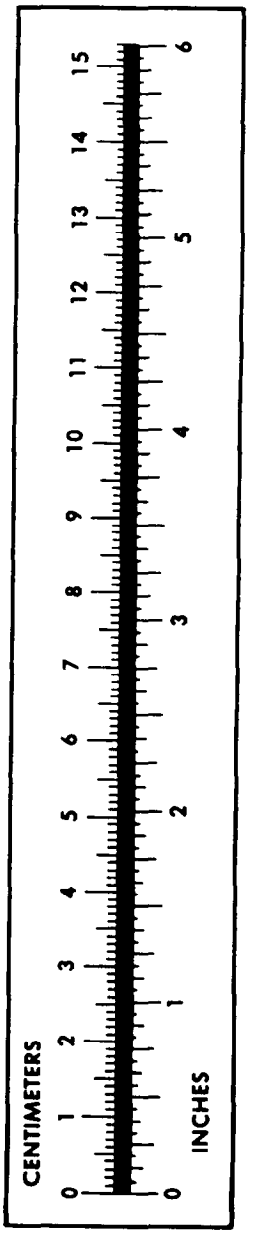
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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