

TM 11-6625-302-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

**ORGANIZATIONAL, DS, GS,
AND DEPOT MAINTENANCE MANUAL
INCLUDING
REPAIR PARTS AND SPECIAL TOOL LISTS
TEST SETS TS-190/U AND TS-190A/U**



HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1967

CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC 10 October 1978

**Operator's, Organizational, Direct Support, General Support,
and Depot Maintenance Manual
TEST SETS, TELEPHONE TS-190/U AND TS-190A/U
(NSN 6625-00-553-0932)**

TM 11-6625-302-15, 4 May 1967, is changed as follows:

Page 1. The title is changed as shown above.

Last two lines of table of contents are changed from "Appendix D. Organizational, DS, GS, and Depot Maintenance Repair Parts," to "Appendix D. Deleted."

Page 13. Delete the following references: TB SIG 364, TM 9-213, and TM 38-750.

Substitute the following:

TB 43-0118

Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.

TM 11-6625-302-24P

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Test Sets, Telephone TS-190/U and TS-190A/U (NSN 6625-00-553-0932).

TM 38-750

The Army Maintenance Management System (TAMMS).

Page 17. Appendix C is superseded as follows:

**APPENDIX C
MAINTENANCE ALLOCATION**

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for Test Sets, Telephone TS-190/U and TS 190A/U. 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.

C-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and

comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition; i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system,

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance

with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments components.

C-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of task-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

- C - Operator/Crew
- O - Organizational
- F - Direct Support
- H - General Support
- D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

C-4. Tool and Test Equipment Requirements (Sec III).

a. Tool or Test Equipment Code. 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 or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the name and nomenclature of the tools and equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number for specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

C-5. Remarks (Sec IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

SECTION II MAINTENANCE ALLOCATION CHART
FOR
TEST SET, TELEPHONE TS-190/U, A/U

(1) GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY				TOOLS AND EQPT.	REMARKS
			C	O	D	D		
00	TEST SET TELEPHONE TS-190/U	<ul style="list-style-type: none"> 1. T 2. S 3. T 4. C 					1,2 1,3 1,3,4	I I

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TEST SET, TELEPHONE TS-190/U, A/U

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATC STOCK NUMBER	TOOL NUMBER
1	O,F,H	MULTIMETER AN/URM-105	625-00-581-2036	
2	O	TOOL KIT, ELECTRONIC TK-101/GSQ	180-00-064-5178	
3	F,H	TOOL EQUIPMENT, TELEPHONE, ELECTRONIC TE-49	180-00-408-1863	
4	H	TEST SET, TELEPHONE AN/PTM-6	625-00-229-1048	
		or TEST SET, TELEPHONE TS-7161/U	625-00-965-1433	

SECTION IV. REMA

REFERENCE	REMA
	<p> Fine a o ac p wei su</p> <p> By replace en ot adap er, cap, ap, diaphragm, head nd, and f ooe</p>

Page 20. Appendix D is deleted.

By Order of the Secretary of the Army:

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USAERDAW (1)	11-98	37
Ft Gordon (10)	11-117	39-51
Ft Huachuca (10)	11-127	44-236
Ft Catson (5)	11-147	44-535
Ft Gillem (10)	11-215	44-536
Ft Richardson (CERCOM Ofc) (2)	11-216	44-537
Army Dep (1) except	11-225	57

NG: State AG (3); Units - Same as Active except allowance is one copy per unit

USAR: None

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

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 WASHINGTON, D.C., 11 December 1973

**Operator's, Organizational, Direct Support, General Support and Depot Maintenance Manual
 Including Repair Parts and Special Tools List
 TEST SETS TS-190/U AND TS-190A/U**

TM 11-6625-302-15, 4 May 1967, is changed as follows:

Page 3. Delete paragraph 1-2 and substitute:

1-2. Indexes of Publications

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

Delete paragraph 1-3 and substitute:

1-3. 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).

1-3.1. Reporting of Errors

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 forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C, Fort Monmouth, NJ 07703.

After paragraph 1-4 add:

1-4.1. Items Comprising an Operable Equipment

FSN	QTY	Nomenclature, part No., and mfr code	Usable-on code	Fig. No.
6625-553-0932		Test Sets TS-190/U; TS-190A/U which includes: 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. NOTE Number 1 in the usable on code column refers to TS-190/U with resistor mounted in the prod; number 2 refers to TS-190/U with resistor mounted in an adapter; and number 3 refers to TS-190A/U.		1-1
6625-351-8013	1	Adapter, Test: For mounting resistor; dwg BL154633, 106A, 88440	2	

Page 14. Delete appendix B.

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Chief of Staff

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TSG (1)	LBAD (14)	11-226
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MICOM (2)	MAAG (1)	11-500 (AA-AC)
TECOM (2)	WRAMC (1)	17
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ARADCOM Rgn (2)	Ft Richardson (ECOM	29-17
OS Maj Comd (4)	Ofc) (2)	29-21
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USAADS (2)	11-87	44-236
USAFAS (2)	11-97	44-535
USAARMS (2)	11-98	44-536
USAIS (2)	11-117	44-537
USAES (2)	11-127	57

ARNG: State AG (3).

USAR: None.

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

TECHINICAL MANUAL }
 No. 11-6625-302-15 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D.C., 4 MAY 1967

Operator, Organizational, DS, GS, and Depot Maintenance Manual
TEST SETS TS-190/U and TS-190A/U

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*This manual supersedes TM 11-6625-302-12P, 7 November 1962, and TM 11-6625-302-35P, 7 November 1962.

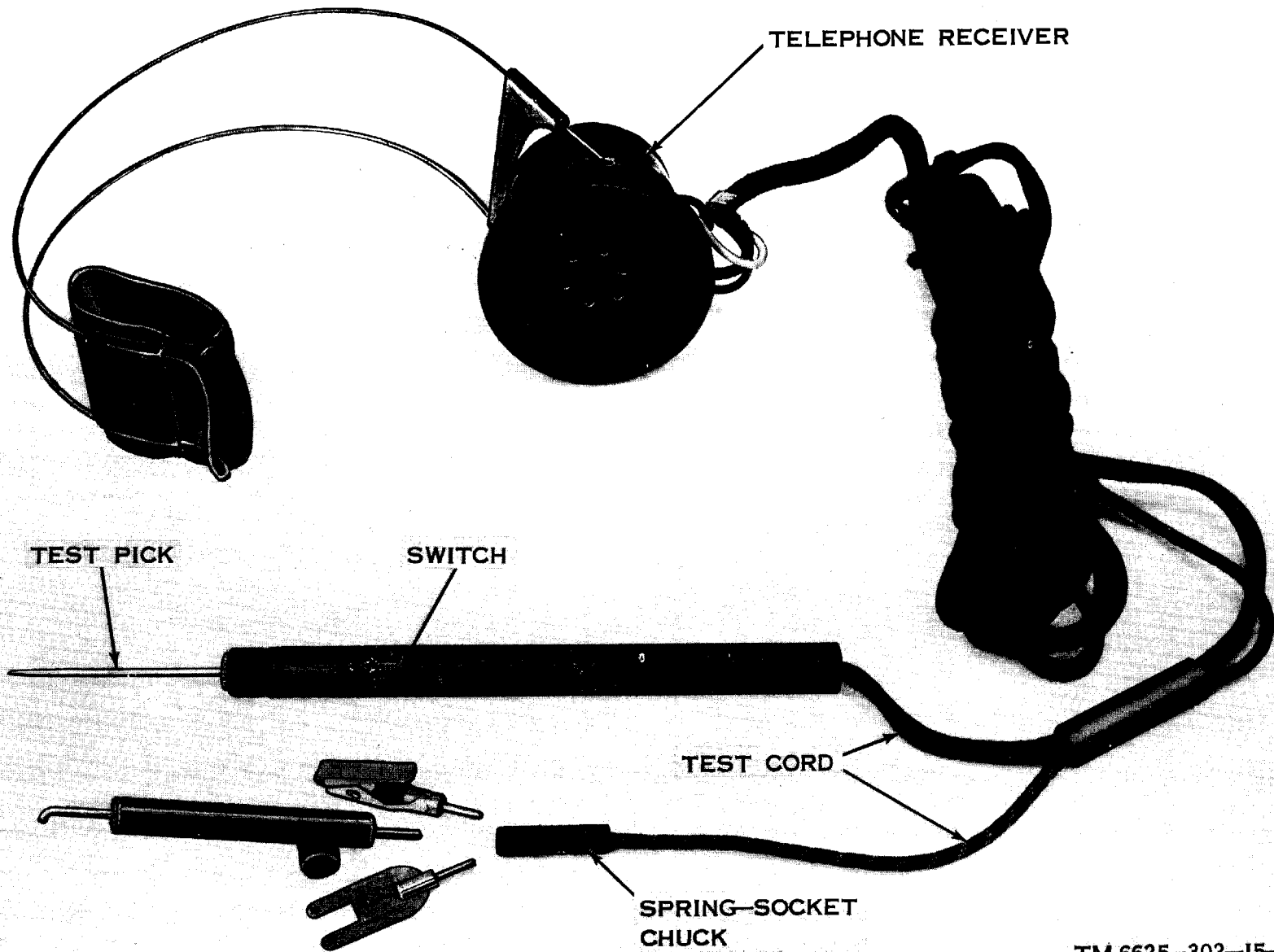


Figure 1-1. Test Set TS-190A/U.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual describes Test Sets TS-190/U and TS-190A/U and covers their installation; and operation, organizational, direct and general support, and depot maintenance. It includes cleaning and inspection of the equipment; replacement parts available to organizational, DS, GS, and depot maintenance personnel; and depot overhaul standards.

1-2. 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. DA Pam 310-4 is an index of current technical manuals, technical bulletins, supply manuals (types 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders 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.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. 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 (Navy), and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. Reporting of errors, omissions, and recommendations for improving this manual 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-MR-NMP-AD, Fort Monmouth, N.J., 07703.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

(fig. 1-1)

Test Sets TS-190/U and TS-190A/U are used in troubleshooting and maintenance of telephone and carrier equipment. These test sets are used in both direct current (dc) and alternating current (ac) circuits. In dc circuits, opens, grounds, and shorts are easily located. In ac (voice frequency) circuits, voice frequencies can be traced through in-

dividual telephone and telegraph carrier channels.

1-5. Description of Test Sets TS-190/U and TS-190A/U

TS-190/U and TS-190A/U consist of a single 1,000-ohm impedance telephone receiver mounted on a headband, with a flexible, 3-conductor test cord approximately 8½ feet long. Two of the conductors terminate in an

insulated test probe equipped with a test pick and a switch in the test probe handle for controlling the external resistance. The other conductor is terminated in a spring-socket chuck to which an alligator clip, a spade lug, or a short test prod may be inserted. A 50,000-ohm resistor is wired in series with one conductor connected to the telephone receiver. This resistor is normally in the circuit, but may be short circuited by depressing the switch. This external resistance protects the operator's ears against excessive clicks when testing for

potentials in dc circuits, and prevents loading a circuit when tracing ac signals.

1-6. Difference Between Models

The main difference between models is the method of mounting the 50,000-ohm external resistor. Some models of the TS-190/U have the resistor in the test probe, others have it mounted in an adapter which fits over the rear of the telephone receiver. The size of alligator clips and spade lugs varies on different order numbers.

CHAPTER 2

INSTALLATION AND OPERATING INSTRUCTIONS

2-1. Installation

Unwrap the flexible test cord and arrange it so that it will not become entangled in the equipment being tested and will not interfere with free movement of the repairman.

2-2. Operating Instructions

Follow the general procedures outlined in a and b below when using the TS-190/U and TS-190A/U for troubleshooting dc and ac circuits:

a. Troubleshooting Dc Circuits.

- (1) Place the headset on your head.
- (2) Install the plug-in probe in the spring-socket chuck (ground lead).
- (3) Place the probes across relay coils, resistors, and capacitors in dc circuits. If a click is heard, dc potential is present.

b. Troubleshooting Ac (Voice-Frequency) Circuits.

- (1) Place the headset on your head.
- (2) Make a chassis (ground) connection by attaching the alligator clip to a bare chassis, or by loosening a nut on the chassis, and inserting the

spade lug between the nut and the chassis. Tighten the nut.

- (3) Plug the spade lug or alligator clip into the spring-socket chuck.
- (4) Using the long probe, start at the output circuit of the signal source and apply the probe at successive points toward the output circuit of the equipment under test.
- (5) A defective circuit is indicated by loss of signal in the earphone.
- (6) Use a voltmeter or ohmmeter to locate the defective circuit component.

Caution: Take care not to pinch the long test cord when closing equipment trays.

2-3. Operation Under Unusual Conditions

Test Sets TS-190/U and TS-190A/U are designed to operate normally under a variety of climatic conditions. The effects of temperature extremes and other atmospheric conditions, such as dust and humidity, are lessened by the protection afforded by indoor operation. When operating in very dusty areas or areas of high humidity, keep the test sets clean and dry by wiping the exposed surfaces periodically with a soft, clean cloth.

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

3-1. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the TS-190/U and TS-190A/U are listed below, with a reference to the paragraphs covering the specific maintenance function.

- a. Operator's daily preventive maintenance checks and services (para 3-4 and 3-5).
- b. Cleaning (para 3-6).

3-2. Items Required for Maintenance

Only the following items are required for maintenance:

- a. Cleaning compound (FSN 7930-395-9542).
- b. Cleaning cloth (FSN 8305-267-3015).

Warning: Prolonged breathing of cleaning compound is dangerous; make sure that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

3-3. Preventive Maintenance

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. *Systematic Care.* The procedures given in paragraphs 3-4, 3-5, and 3-6 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

b. *Preventive Maintenance Checks and Services.* The preventive maintenance checks and

services chart (para 3-5) outlines functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and the normal conditions; the *References* column lists the illustrations, paragraphs, or manuals that contain additional information. If the defect cannot be remedied by the operator, higher category maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

3-4. Preventive Maintenance Checks and Services Periods

Daily checks and services must be performed on the TS-190/U and TS-190A/U.

a. The daily preventive maintenance checks and services chart given in paragraph 3-5 specifies the checks which must be made during the following periods:

- (1) Daily.
- (2) When the equipment is initially installed.
- (3) When the equipment is reinstalled after removal for any reason.

b. If the equipment is being maintained on a standby condition, perform the daily checks and services before the equipment is returned to service.

3-5. Operator's Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item to be inspected	Procedure	References
1	Exterior surface-----	Clean the headband, earphone, cord assembly, test probe, and test clips.	Fig. 1-1.
2	Spring-socket chuck-----	Clean the spring-socket chuck -----	Fig. 1-1.
3	Switch -----	Check the switch action to see that the action is smooth and free of binding.	Fig. 1-1.
4	Operation-----	Check for normal operation -----	Para 2-2.

3-6. Cleaning

Inspect the exteriors of the test sets. The earphone units, headbands, test cords, probes, and test clips should be free of dirt and fungus.

a. Remove loose dirt with a clean, soft cloth.

Warning: Prolonged breathing of cleaning compound is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.

b. Remove grease, fungus, and ground-in dirt from the earphones, headbands, test probes, spring-socket chucks, and test clips with a cloth dampened (not wet) with cleaning compound.

c. Remove dust and dirt from the test cords with a brush.

d. Inspect the openings in the earphones. Remove any foreign matter, but do not use a pointed tool.

CHAPTER 4
ORGANIZATIONAL, DS, AND GS MAINTENANCE INSTRUCTIONS

Section I. ORGANIZATIONAL MAINTENANCE

4-1. Scope of Organizational Maintenance

a. This section contains instructions covering organizational maintenance procedures for the TS-190/U and TS-190A/U which are performed in addition to the operator's preventive maintenance (paras 3-1 through 3-6).

b. Organizational maintenance consists of the following:

- (1) Quarterly preventive maintenance (paras 4-3 and 4-4).
- (2) Touchup painting (para 4-5).
- (3) Troubleshooting (para 4-6).
- (4) Replacement of components (para 4-7).

4-2. Tools, Materials, and Test Equipment Required

The tools, materials, and test equipment required for organizational maintenance are as follows :

a. *Tools.* Tool Equipment TE-49.

b. *Materials.*

(1) Cleaning compound (FSN 7930-395-9542).

(2) Cleaning cloth (FSN 8305-267-3015).

c. *Test Equipment.* The only test equipment required is Multimeter TS-352/U.

4-3. Quarterly Preventive Maintenance

Quarterly preventive maintenance checks and services on the TS-190/U and TS-190A/U are required. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38-750. Perform all the checks and services listed in the organizational quarterly preventive maintenance checks and services chart (para 4-4) in the sequence listed.

4-4. Organizational Quarterly Preventive Maintenance Checks and Services Chart

Seq	Item to be ins	Pro	Ref
1	Completeness -----	Check to see that the equipment is complete.	App. B.
2	Cleanliness -----	Check to see if the equipment is clean ---	Para 3-6.
3	Preservation -----	Check all surfaces for evidence of rust, fungus, or corrosion. Spot-paint bare spots.	Paras 3-6 and 4-5, TM 9-213, TB SIG 364, and TB SIG 355-3.
4	Publications -----	Check to see that all publications are complete, serviceable, and current.	DA Pam 310-4.
5	Modifications -----	Check DA Pam 310-4 to determine if new, applicable MWO'S have been published. All URGENT MWO'S must be applied immediately. All NORMAL MWO'S must be scheduled.	DA Pam 3104 and TM 38-750.
6	Cord assemblies -----	Check the cord assemblies for damage to the insulation.	Fig. 1-1.

4-5. Touchup Painting

When the finish on the adapter (when used) and receiver diaphragm has been badly scarred or damaged, lightly sand them with fine sandpaper. Use No. 00 or No. 000 sandpaper (FSN 5350-271-7939) and cleaning compound to clean the surface down to the bare metal. Brush two thin coats of paint on the bare metal. Refer to the applicable cleaning and refinishing practices specified in TM 9-213 and TB SIG 364.

c. Troubleshooting Chart.

Item No.	Symptom	Probable trouble	Corrective measures
1	No sound in earphone when test probes are connected across dc or ac circuits.	<p>a. Open resistor -----</p> <p>b. Open test cord -----</p> <p>c. Defective spring-socket chuck ---</p> <p>d. Open magnet winding -----</p>	<p>a. Check continuity between long test probe and earphone terminals. Report to higher category maintenance personnel.</p> <p>b. Test continuity of wires in test cord. Report to higher category maintenance personnel.</p> <p>c. Check spring-socket chuck connections. Report to higher category maintenance personnel.</p> <p>d. Check continuity of magnet windings. Report to higher category maintenance personnel.</p>
2	Weak sound in earphone when test probes are connected across dc or ac circuits.	<p>a. Weak magnet -----</p> <p>b. Bent diaphragm -----</p>	<p>a. Report to higher category maintenance personnel.</p> <p>b. Report to higher category maintenance personnel.</p>
3	Intermittent sounds when test probes are connected across dc or ac circuits.	Loose test pick -----	Tighten test probe knurled nut.

4-7. Replacement of Spare Parts

No running spares are authorized for replacement of components by organizational

4-6. Troubleshooting

When a test set is reported to be malfunctioning, perform the checks listed below.

a. *Operational Check.* Apply the test probes across a dc source, or across an ac source to check the operation (para 2-2).

b. *Continuity Check.* If trouble is indicated during the operational checks, use Multimeter TS-352/U to check continuity of the cord assemblies, test probes, and earphone magnet windings (fig. 1-1).

maintenance personnel. All replacement of components is performed by DS, GS, and depot maintenance personnel.

Section II. DIRECT AND GENERAL SUPPORT MAINTENANCE

4-8. General

Replacement of components and parts not authorized for the organizational repair personnel are replaced by direct and general support maintenance personnel.

4-9. Replacement of Components

a. *Electrical Cap.* Unscrew the electrical

cap that holds the diaphragm in the earphone and replace it with a new one.

b. *Diaphragm.*

- (1) Remove the electrical cap (a above).
- (2) Slide the diaphragm off the magnet.
- (3) Reassembly by reversing procedures given in (1) and (2) above.

c. Cord Assemblies.

- (1) Perform b (1) and (2) above.
- (2) Loosen the screws that hold the cord tips, unhook the hook that holds the cord assembly in place, and remove the cord assembly.
- (3) Replace the cord assembly by reinserting the cord tips, tightening the holding screws, and reversing procedures given in (1) and (2) above.

d. Earphone.

- (1) Perform the steps outlined in *c* (1) and (2) above.
- (2) Remove the headband hooks from the earphone.
- (3) Replace with a new earphone by reversing procedures given in (1) and (2) above.

e. Resistor (in Models Using 106A Adapter).

- (1) Twist the adapter counterclockwise and remove it.

- (2) Loosen the screws holding the resistor and remove it.
- (3) Twist the new resistor leads around the mounting screws and cut off excess wire with diagonal pliers.
- (4) Reassemble by reversing procedures given in (1) and (2) above.

f. Resistor (in Probe-Mounted Models).

- (1) Loosen and remove the knurled nut from the test probe.
- (2) Pull the test cord, resistor, and test pick through the rear of the test probe.
- (3) Unsolder the resistor from the test cord and test pick.
- (4) Replace with a new resistor, and reassemble the test probe by reversing procedures given in (1), (2), and (3) above.

CHAPTER 5

DEPOT OVERHAUL STANDARDS

5-1. Applicability of Depot Overhaul Standards

The tests outlined in this chapter are designed to measure the performance capability of a repaired equipment. Equipment that meets the minimum standards stated in the tests will furnish satisfactory operation, equivalent to that of new equipment.

5-2. Applicable Reference

a. Repair Standards. Applicable procedures of the depot performing these tests and the general standards for repaired electronic equipment given in TB SIG 355-1, TB SIG 355-2, and TB SIG 355-3 form a part of the requirements for testing these equipments.

b. Modification Work Orders. Perform all applicable modification work orders pertaining to this equipment before making the tests specified. DA Pam 310-4 lists all available MWO's.

5-3. Test Facilities Required

Test Set, Telephone AN/PTM-6 is the only test equipment required to provide satisfactory inspection, meeting the requirements of this standard.

5-4. Test Requirements for Test Sets TS-190/U and TS-190A/U

a. Visual and Mechanical Requirements.

- (1) Test Sets TS-190/U and TS-190A/U should be complete with respect to parts peculiar to their design.
- (2) The test set components should be free of grease, dirt, corrosion (rust or salt formations), and other foreign matter. Solder connections should

be clean, and free of flux and oxidation products.

- (3) Component parts should be securely mounted. Mounting screws, nuts, and bolts should be firmly seated, tight, and free from sharp edges, slivers, and burs. Slight burs on screws and nuts are permissible provided they have no sharp edges. Threaded parts should not be stripped or crossed.
- (4) Lockwashers should be present on bolts that secure parts subject to removal.
- (5) Repaired equipment should be reasonably presentable from an appearance standpoint. Parts should not be crushed, cracked, or mutilated. Minor damage, such as slight scratches or dents, is permissible.
- (6) There should be no bare spots, peeling, or flaking of finish. Touching up of finish is acceptable.
- (7) The replacement parts and material used should conform to the requirements in current specifications.
- (8) The adapter (when used) should be in good condition and not distorted. It should lock securely in position.
- (9) Test probe casings should not be cracked.
- (10) Test picks should not be bent.
- (11) The headband should be in good condition and not distorted.
- (12) The test cord should be in good condition and not frayed.
- (13) Applicable moisture proofing and fungiproofing instructions should have been complied with.

b. Test Requirements. The tests should be made at normal room temperature.

5-5. Insulation Resistance Tests

a. Set Telephone Test Set AN/PTM-6 controls for insulation breakdown. Connect L-1 of the AN/PTM-6 to the receiver unit case, and L2 to either terminal of the receiver unit. Operate key 6 to CKT and key 7 to AC. Operate key 5 to BKDN while turning the generator handcrank at approximately 200 revolutions per minute. A meter reading to the left of -6 on the decibel (db) scale indicates satisfactory insulation resistance.

b. Connect the two test leads of the TS-190/U or TS-190A/U to the receiver and common terminals of the AN/PTM-6. Set the AN/PTM-6 controls as shown in the chart below. With the probe switch of the TS-190/U or TS-190A/U in the normal position,

the meter reading should be to the right of -6 db when key 8 is held on receive and button 9 is depressed.

		r			r
		u			

c. Leave the AN/PTM-6 settings the same as in *b* above, except that dial 2 must be placed in position 5. With the TS-190/U or TS-190A/U probe switch depressed, the meter reading should be to the right of -2 db.

Caution: Do not place the breakdown voltage of Telephone Test Set AN/PTM-6 across the receiver coil windings of Test Sets TS-190/U and TS-190A/U.

APPENDIX A

REFERENCES

Following is a list of applicable publications available to the operator and maintenance personnel of Test Sets TS-190/U and TS-190A/U.

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders
TB SIG 355-1	Depot Inspection Standard for Repaired Signal Equipment
TB SIG 355-2	Depot Inspection Standard for Refinishing Repaired Signal Equipment
TB SIG 355-3	Depot Inspection Standard for Moisture and Fungus Resistant Treatment
TB SIG 364	Field Instructions for Painting and Preserving Electronics Command Equipment
TB 11-6625-242-35/1	Calibration Procedure for Telephone Test Set AN/PTM-6 (*) or Test Set I-142(*)
TM 9-213	Painting Instructions for Field Use
TM 11-2062	Test Sets I-142, I-142-B, and Telephone Test Set AN/PTM-6
TM 38-750	Army Equipment Record Procedures

APPENDIX B

BASIC ISSUE ITEMS

Section I. INTRODUCTION

B-1. General

This appendix lists items for Test Sets TS-190/U and TS-190A/U, the component items comprising it, and the items which accompany it, or are required for installation, operation, or operator's maintenance.

B-2. Explanation of Columns

An explanation of the columns in section II is given below.

a. Source, Maintenance, and Recoverability Codes, Column 1.

- (1) *Source code, column 1a.* The selection status and source for the listed item is noted here. The source code used is-

<i>Code</i>	<i>Explanation</i>
-------------	--------------------

P	Applies to repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
---	---

- (2) *Maintenance code, column 1b.* The lowest category of maintenance authorized to install the listed item is noted here. The maintenance code used is as follows:

<i>Code</i>	<i>Explanation</i>
-------------	--------------------

O _ _ _	Organizational maintenance
---------	----------------------------

- (3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage.

Recoverability code and its explanation are as follows:

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

<i>Code</i>	<i>Explanation</i>
-------------	--------------------

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 2.* The Federal stock number for the item is indicated in this column.

c. Description, Column 3. The Federal item name, a five-digit manufacturer's code, part number, and when required, the model designator (*) which indicates different models of the end equipment, are included in this column.

d. Unit of Issue, Column 4. The unit used as a basis of issue (e.g. ea, pr, ft, yd, etc.) is noted in this column.

e. Quantity Incorporated in Unit Pack, Column 5. Not used.

f. Quantity Incorporated in Unit, Column 6. Not used.

g. Quantity Authorized, Column 7. The total quantity of an item required to be on hand and necessary for the operation and maintenance of the equipment is given in this column.

h. Illustration, Column 8.

- (1) *Figure number, column 8a.* The number of the illustration is indicated in this column.

(2) Item or symbol number, column 8b. with the associated manufacturer's name.
Not used.

B-3. Federal Supply Codes

This paragraph lists the Federal supply code

<i>Code</i>	<i>Manufacturer</i>
88440 - - - - -	Western Electric Co., Inc.

SECTION II. BASIC ISSUE ITEMS LIST

SOURCE CD (1)	MAINT. CD (2)	REC. CODE (3)	(2) FEDERAL STOCK NUMBER	(3) MODEL						(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS	
				1	2	3	4	5	6						(a) FIGURE NUMBER	(b) ITEM OR SYMBOL NUMBER
							6625-553-0932									
P	O	R	6625-553-0932	*	*	*				TEST SETS TS-190/U; TS-190A/U						
										TEST SETS TS-190/U; TS-190A/U: For testing opens, shorts, crosses, grounds and continuity in telephone and telegraph circuits, includes headband cord, probe assy, connector assy, and alligator clip; sig dwg SC-DL-183104 (This item is nonexpendable)						
										NOTE: Model column 1 refers to TS-190/U with resistor mounted in the prod; Column 2 refers to TS-190/U with resistor mounted in an adapter; column 3 refers to TS-190A/U.						
P	O	R	6625-553-0932	*	*	*				TEST SETS TS-190/U, TS-190A/U: (Basic component)	ea		1	1-1		
										TECHNICAL MANUAL TM 11-6625-302-15	ea	2	2			
										NOTE: 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 practical levels. Excess publications must be returned to publication supply centers through AG channels.						
										Requisition through Pinpoint account number, if assigned, otherwise through nearest Adjutant General facility.						
P	O	R	6625-351-8013	*						ADAPTER, TEST: For mounting resistor; 88440; 106A dwg BL154633	ea	1	1			
										NO ACCESSORIES, TOOLS OR TEST EQUIPMENT ARE ISSUED WITH THIS EQUIPMENT						
										NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT						

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Test Sets TS-190/U and TS-190A/U. 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.

C-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:

<i>Code</i>	<i>Maintenance category</i>
C _____	Operator/crew
O _____	Organizational maintenance

<i>Code</i>	<i>Maintenance category</i>
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 III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	F	TS-190/U, TS-190A/U (continued) MULTIMETER AN/UFM-105	6625-581-2036	
2	F	MULTIMETER TS-352/U	6625-242-5023	
3	F,0	TOOL EQUIPMENT TE-49	5180-408-1863	

Susp by
 TM11-6625-302-24P

APPENDIX D
 ORGANIZATIONAL, DS, GS AND DEPOT MAINTENANCE REPAIR PARTS

Section I. INTRODUCTION

D-1. General

This appendix contains a list of repair parts required for the performance of organizational maintenance and a list covering the corresponding requirements for direct support, general support, and depot maintenance for Test Sets TS-190/U and TS-190A/U.

Note. No special tools, test, and support equipment are required.

D-2. Explanation of Sections

This repair parts list is divided into two principal parts—

a. Repair Parts for Organizational Maintenance—Section II. Repair parts authorized for organizational maintenance is included in this section.

b. Repair Parts for Direct Support, General Support, and Depot Maintenance—Section III. This chart lists repair parts authorized for maintenance performance at direct support, general support, and depot categories.

D-3. Explanation of Columns

An explanation of the columns in sections II and III is given below.

a. Source, Maintenance, and Recoverability Codes, Column 1, Sections II and III.

- (1) *Source code, column 1a.* The selection status and source for the listed item is noted here. Source code and its explanation are as follows:

<i>Code</i>	<i>Explanation</i>
P	Applies to repair parts that are stocked in or supplied from the GSA/DSA, or Army supply system, and author-

ized for use at indicated maintenance categories.

- (2) *Maintenance code, column 1b.* The lowest category of maintenance authorized to install the listed item is noted here.

<i>Code</i>	<i>Explanation</i>
O _ _ _ _ _	Organizational maintenance
F _ _ _ _ _	Direct support maintenance

- (3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability code and its explanation are as follows:

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

<i>Code</i>	<i>Explanation</i>
R	Applies to repair parts and assemblies which are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number, Column 2, Sections II and III. The Federal stock number for the item is indicated in this column.

c. Description, Column 3, Sections II and III. The model designator, Federal item name, a five-digit manufacturer's code, and a part number are included in this column. The designator (*) indicates the different models of the

end equipment. The indenture code column is not used.

d. *Unit of Issue, Column 4, Sections II and III.* The unit used as a basis of issue (e.g., ea, pr, ft, yd, etc.) is noted in this column.

e. *Quantity Incorporated in Unit Pack, Column 5, Sections II and III.* Not used.

f. *Quantity Incorporated in Unit, Column 6, Sections II and III.* The quantity of repair parts in an assembly is given in this column.

g. *Maintenance Allowance, Column 7, Sections II and III.*

- (1) The allowance columns are divided into subcolumns. The total quantity of items authorized for the number of equipments supported is indicated in each subcolumn. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.
- (2) Subsequent changes to organizational allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendation should be forwarded to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL-MR-NMP-CM, Fort Monmouth, N.J., 07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USA ECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.
- (3) The quantitative allowances for DS/GS categories of maintenance will represent initial stockage for a 30-day period for the number of equipments supported.

h. *One-Year Allowances Per 100 Equipments/Contingency Planning Purposes, Column 8, Section III.* Opposite the first appearance of each item, the total quantity required for distribution and contingency planning purposes

is indicated. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for 1 year.

i. *Illustration, Column 8, Section II and Column 10, Section III.*

- (1) *Figure number, column 8a and 10a.* The number of the illustration is indicated in this column.
- (2) *Item or symbol number, column 8b and 10b.* Not used.

j. *Depot Maintenance Allowance per 100 Equipments, Column 9, Section III.* This column indicates the total quantity of each item authorized depot maintenance for 100 equipments.

D-4. Location of Repair Parts

a. When the Federal stock number is unknown follow the procedures given in (1) through (3) below.

- (1) Use the table of contents to locate the appropriate appendix of the repair parts list.
- (2) If the figure number is not known check the description column (col. 3) in the repair parts list to locate the part.
- (3) Locate the applicable illustration in this manual and note the figure number. Use the repair parts listing and locate the figure number as noted on the illustration.

b. When the Federal stock number is known, use the repair part listing to find the repair part.

D-5. Federal Supply Codes

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

<i>Code</i>	<i>Manufacturer</i>
80063 -----	Army Electronics Command
81349 -----	Military Specifications
88440 -----	Western Electric Co., Inc.

SECTION II. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE

SOURCE CD (1)	MAINT. CD (2)	REC. CODE (3)	(2) FEDERAL STOCK NUMBER	(3) MODEL						(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW.				(8) ILLUSTRATIONS	
				MODEL										(A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER				
				1	2	3	4	5	6							(A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100
			6625-553-0932						TEST SETS TS-190/U; TS-190A/U NOTE: Model column 1 refers to TS-190/U with resistor mounted in prod; column 2 refers to TS-190/U with resistor mounted in an adaptor; column 3 refers to TS-190A/U.										
P	O	R	6625-351-8013	*					ADAPTOR, TEST: 88440; 106A, dwg BL154633	ea	1	*	*	*	*	1-1			
P	O	R	5965-128-8874	*	*				CAP, ELECTRICAL: 88440; P-Z13314	ea	1	*	*	*	*	1-1			
P	O	R	5940-230-1216	*	*	*			CLIP, ELECTRICAL: 80063; SM-C-183111	ea	1	*	*	*	*	1-1			
P	O	R	5935-127-1656	*	*	*			DIAPHRAGM, EARPHONE: 88440; part no. P-93387	ea	1	*	*	*	*				
P	O	R	5965-128-0453	*	*	*			HEADBAND, HEADSET: 80063; SC-B-25769	ea	1	*	*	*	*	1-1			
P	O	R	5310-678-9703	*		*			NUT, PLAIN, ASSEMBLY: 80063; SM-B-145613	ea	1	*	*	*	*				
P	O	R	6625-542-1373	*		*			TIP, TEST, PROD: 80063; SM-B-183114	ea	1	*	*	*	*	1-1			

SECTION III. REPAIR PARTS, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(1)			(2)										(3)	(4)	(5)	(6)	(7)						(8)		(9)		(10)			
SOURCE CD	MAINT. CD	REC. CODE	FEDERAL STOCK NUMBER										DESCRIPTION	UNIT OF ISSUE	QTY INC IN UN PK	QTY INC IN UNIT	30 DAY MAINT. ALW.						1 YR. ALW. PER 100 EQUIP. CNTGCTY PL.	DEPOT MAINT. ALW. PER 100 EQUIP.	(A)	(B)				
																	DS			GS										
			1	2	3	4	5	6	IND CD	(A)	(B)	(C)					(A)	(B)	(C)	FIGURE NUMBER	ITEM OR SYMBOL NUMBER									
			6625-553-0932										TEST SETS TS-190/U; TS-190A/U NOTE: Model column 1 refers to TS-190/U with resistor mounted in prod; column 2 refers to TS-190/U with resistor mounted in an adapter; column 3 refers to TS-190A/U																	
			6625-351-8013										ADAPTER, TEST: 88440; 106A	ea	1	*	*	2	*	*	2	8	10							
P	O		5965-128-8874										CAP, ELECTRICAL: 88440; P-213314	ea	1	*	*	2	*	*	2	8	10							
P	F		6625-670-0173										CHUCK, ASSEMBLY: 80063; SM-B-145606	ea	1	*	*	2	*	*	2	12	12							
P	O		5940-230-1216										CLIP, ELECTRICAL: 80063; SM-C-18311	ea	1	*	*	2	*	*	2	8	8							
P	F		5120-222-0802										CONNECTOR, ASSEMBLY: 80063; SM-B-145602	ea	1	*	*	2	*	*	2	10	5							
P	F		6625-679-5002										CONTACT, ELECTRICAL: 80063; SM-B-113557	ea	1	*	*	2	*	*	2	8	8							
P	F		6625-194-8050										CORD ASSEMBLY, ELECTRICAL: 80063; SM-D-166875	ea	1	*	2	2	*	2	2	12	15							
P	F		6625-603-7432										CORD ASSEMBLY, ELECTRICAL	ea	1	*	2	2	*	2	2	12	15							

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.*

Distribution:

Active Army:

USASA (2)	Instl (2) except
CNGB (1)	Ft Hancock (4)
CC-E (7)	Ft Gordon (10)
Dir of Trans (1)	Ft Huachuca (10)
CofEngrs (1)	Ft Carson (25)
TSG (1)	Ft Knox (12)
CofSpts (1)	WSMR (5)
USACDCEA (1)	Gen Dep (2)
USACDCCBRA (1)	Sig Sec, Gen Dep (5)
USACDCCEA (1)	Sig Dep (12)
USACDCOA (1)	Army Dep (2) except
USACDCQMA (1)	LBAD (14)
USACDCTA (1)	SAAD (30)
USACDCADA (1)	TOAD (14)
USACDCARMA (1)	LEAD (7)
USACDCAVNA (1)	SHAD (3)
USACDCARTYA (1)	NAAD (5)
USACDCSWA (1)	SVAD (5)
USACDCCEA (Ft Huachuca) (1)	CHAD (3)
USAARENBD (2)	ATAD (10)
USAMC (5)	UMAD (5)
USCONARC (5)	Sig FLDMS (2)
ARADCOM (5)	AMS (1)
ARADCOM Rgn (2)	USACRREL (2)
OS Maj Comd (4)	Detroit Arsenal (5)
LOGCOMD (2)	USAEPG (5)
USAMICOM (4)	USAG, Arlington Hall (5)
USASTRATCOM (4)	Units org under fol TOE (2 ea):
USAESC (70)	5-600
MDW (1)	6-706
Armies (2) except Seventh (5)	7
Corps (2)	9-57
USAC (3)	10-445
Svc Colleges (2)	10-446
USASESCS (5)	10-536
USAADS (2)	11-7
USAAMS (2)	11-8
USAARMS (2)	11-25
USAIS (2)	11-35
USAES (2)	11-36
USARYIS (10)	11-37
USARHAW (10)	11-38
USATC (2)	11-39
WRAMC (1)	11-46
Army Pic Cen (2)	11-57
USACDCEC (10)	11-58

11-85	17
11-86	29-1
11-87	29-11
11-97	29-15
11-98	29-16
11-117	29-17
11-127	29-21
11-147	29-25
11-155	29-26
11-157	29-27
11-158	29-35
11-215	29-36
11-216	29-37
11-225	29-41
11-226	29-85
11-237	29-86
11-347	37
11-357	39-51
11-377	44-236
11-500 (GL, GR, KA, RC, RT, RU)	44-535
11-587	44-536
11-592	44-537
11-597	47
11-608	57

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.

TM 11-6625-302-15 TEST SETS TS-190/U AND TS-190A/U-1967

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