

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TELETYPEWRITER TEST SET TS-1060/GG,
 ORGANIZATIONAL MAINTENANCE, SECOND ECHELON

Headquarters, Department of the Army, Washington 25, D.C.
 8 October 1958

WARNING

HIGH VOLTAGE

is used in this equipment.

DEATH ON CONTACT

**may result if safety precautions
 are not observed.**

Be careful not to contact high-voltage connections or any power connections when using or repairing this equipment. Turn off the power before making any connections. Turn off the power and discharge all high-voltage capacitors before doing any work inside the equipment. Be extremely careful when working on or near the power supply.

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This copy is a reprint which includes current pages from Change 3.

TECHNICAL MANUAL
Organizational Maintenance Manual
TELETYPEWRITER TEST SETS TS-1060/GG, TS-1060A/GG, AND TS-1060B/G

TM 11-6625-207-20 }
CHANGES NO. 4 }

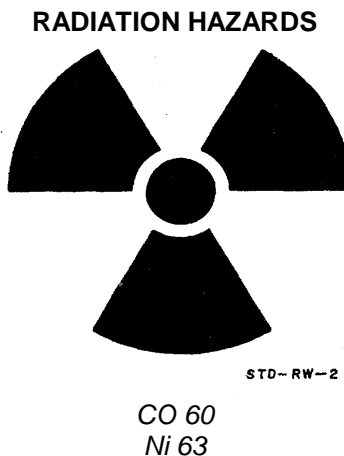
HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 22 July 1963

TM 11-6625-207-20, 8 October 1958, is changed as follows:

Change the title of the manual as shown above.

Note. The parenthetical reference to previous changes (example: "page 1 of C 3") indicates that pertinent material was published in that changes.

Page 1. Warning notice, last line. Below last line, add the following:



Tube types OA2, OA2WA, OB2, and OB2WA used in the TS-1060/GG, TS-1060A/GG, and TS-1060B/GG contain radioactive material. These tubes are potentially hazardous when broken; see qualified medical personnel and the safety director if you are exposed by broken tubes. Use extreme care in replacing these tubes (par. 26, TM 11-6625-207-10) and follow safety precautions in their handling, storage, and disposal.

Never place radioactive tubes in your pocket.

Use extreme care not to break radioactive tubes while handling them.

Never remove radioactive tubes from cartons until ready to use them.

Refer to paragraph 8.1 on handling, storage, and disposal of radioactive materials.

Page 2. Delete paragraph 1 and substitute:

1. Scope

a. This manual contains instructions covering second echelon maintenance of Teletypewriter Test Sets TS-1060/GG, TS-1060A/GG, and TS-1060B/GG. It includes instructions for performing preventive and periodic maintenance services, basic theory, and repair functions to be accomplished by the organizational repairman. Operating instructions are contained in TM 11-6625-207-10.

b. The duties performed by organizational maintenance personnel are limited by the available spare parts, tools, materials, and test equipment. Second echelon maintenance of the equipment consists of the following:

- (1) Monthly preventive maintenance checks and services (par. 4.2).
- (2) Equipment performance (par. 5).
- (3) Repairs (pars. 6 and 7).

c. 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 on Publications), DA Form 2496 (Disposition Form), or letter may be used.

Note. For applicable forms and records, see paragraph 2 of TM 11-6625-207-10.
Add paragraph 1.1 after paragraph 1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310 -4 determine whether there are any new editions, changes, or additional publications pertaining to the equipment. DA Pam 310-4 is an index of current 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.

Delete paragraph 4 and substitute:

4. Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Preventive maintenance is the responsibility of all echelons concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and test indicate would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of Teletypewriter Test Sets TS-1060/GG, TS-1060A/GG, and TS-1060B/GG at the second echelon level are made at monthly intervals unless otherwise directed by the commanding officer.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

Add paragraphs 4.1 and 4.2 after paragraph 4.

4.1. Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (par. 4.2) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours per day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

4.2. Monthly Preventive Maintenance Checks and Services Chart

Warning: This equipment uses selenium rectifiers. When selenium rectifiers fail because of burn-out or arc-over, poisonous fumes and compounds are released. Provide adequate ventilation immediately and do not handle the rectifier until it has cooled.

Sequence No.	Item	Procedure	References
1	Cathode-ray tube.....	Inspect screen for burned spots	Fig. 1
2	Case interiors.....	<p>Warning: Cleaning compound is flammable and its fumes are toxic. Do not use near a flame and provide adequate ventilation.</p> <p>a. Inspect case interior for cleanliness. Remove loose dust and dirt with a dry lint-free cloth. Remove other dirt with a cloth dampened with cleaning compound.</p>	<p>TM 11-6625-207-10,</p> <p>a. Figs. 1 and 2, TM 11-6625-207-10.</p>

4.2. Monthly Preventive Maintenance Checks and Services Chart - Continued

Sequence No.	Item	Procedure	References
		b. Inspect interior surfaces of cases for paint chips, rust, or corrosion from metal surfaces with fine sandpaper. Brush two thin coats of proper paint on bare metal surfaces.	b. TM 9-213.
3	Tubes.....	Inspect seating of tubes.....	Figs. 1 and 2, TM 11-6625-207-10
4	Rubber grommet mountings.	Inspect for cracks, excessive wear, or looseness. Tighten or replace as necessary.	Figs 1 and 2, TM 11-6625-207-10.
5	Terminal boards, switches, circuits, components, and wiring.	Inspect terminal boards for cracks or loose mountings. Inspect wafer switches, circuit components, wiring for damage due to overheating or other damage.	
6	Mounting screws, nuts, and washers.	Inspect mountings for tightness. Tighten as necessary.	
7	Spare parts.....	Check all spare parts (operator and organizational) for general condition and method of storage. There should be no evidence of overstock and all shortages must be on valid requisitions.	App. II.
8	Publications.....	Check to see that all publications are complete, DA Pam 310-4. Serviceable, and current.	DA Pam 310-4.
9	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 ROUTINE MWO's must be scheduled.	TM 38-750 and DA Pam 310-4.

Page 3, figure 1. Delete figure 1.

Page 8, after paragraph 8, add paragraph 8.1.

8.1. Handling, Storage, and Disposal of Radioactive Material

Follow the procedures for safe handling, storage, and disposal of radioactive materials as directed by TB SIG 225, AR 40-580, and AR 755-380 (appx I).

Page 9, appendix 1 (par. 1 of C 3). Delete appendix I and substitute:

APPENDIX I

REFERENCES

Following is a list of references available to the organizational maintenance personnel of Teletypewriter Test Sets TS-1060/GG, TS-1060A/GG, and TS-1060B/GG:

AR 40-580	Medical Service, Control of Hazards to Health from Radioactive Materials.
AR 70-10	Research and Development (General): Army Material Testing.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 750-5	Organization, Policies, and Responsibilities for Maintenance Operations.
AR 755-380	Disposal of Supplies and Equipment, Disposal of Unwanted Radioactive Material.
DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides and Phono-Recordings.

AGO 6411A 3

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310-21	Index of Supply Manuals Signal Corps.
TB SIG 225	Identification and Handling of Radioactive Signal Items.
TM 9-213	Painting Instructions for Field Use.
TM 11-655	Fundamentals of Telegraphy (Teletypewriter).
TM 11-664	Theory and Use of Electronic Test Equipment.
TM 11-680	Teletypewriter Circuits and Equipment (Fundamentals).
TM 11-2217	Distortion Test Sets TS-383/GG, TS-383A/GG, and TS-383B/GG.
TM 11-5500	Multimeter TS-297/U.
TM 11-6625-203-12	Operator and Organizational Maintenance: Multimeter AN/URM-105, Including Multimeter ME-77/U.
TM 11-6625-207-10	Operator's Manual, Teletypewriter Test Sets TS-1060/GG, TS-1060A/GG, TS-1060B/GG.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 38-750	The Army Equipment Records System and Procedures.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

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

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DASA (6)	Army Dep (2) except
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CSigO (7)	USA Elct RD Actv, White Sands (13)
CofT (1)	USA Elct RD Actv, Ft Huachuca (2)
CSptS (1)	USA Trans Tml Comd (1)
USA CD Agcy (1)	Army Tml (1)
USCONARC (5)	POE (1)
USAMC (5)	USAOSA (1)
ARADCOM (2)	AMS (1)
ARADCOM Rgn (2)	WRAMC (1)
OS Maj Comd (3)	AFIP (1)
OS Base Comd (2)	Army Pic Cen (2)
LOGCOMD (2)	USA Mbl Spt Cen (1)
USAECOM (5)	USA Elct Mat Agcy (12)
USAMICOM (4)	Chicago Proc Dist (1)
USASCC (4)	USARCARIB Sig Agcy (1)
MDW (1)	Sig Fld Maint Shop (3)
Armies (2)	Units org under fol TOE (2 cy ea UNOINDC)
Corps (2)	11-7
USA Corps (3)	11 -16
USATC AD (2)	11-57
USATC Engr (2)	11-97
USATC Inf (2)	11-98
USATC Armor (2)	11-117
USASTC (5)	11-155
Instl (2) except	11-157
Ft Monmouth (65)	11-500 (AA-AC) (4)
Svc Colleges (2)	11-557
Br Svc Sch (2) except	11-587
GENDEP (OS) (2)	11-592
Sig Dep (OS) (12)	11-597
Sig Sec. GENDEP (OS) (5)	32-67

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50

* U.S. GOVERNMENT PRINTING OFFICE: 1963-700502

TECHNICAL MANUAL
TELETYPEWRITER TEST SET TS-1060/GG, TS-1060A/GG, AND TS-1060B/GG
ORGANIZATIONAL MAINTENANCE SECOND ECHELON

TM 11-6625-207-20 }
CHANGES NO. 3 }

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., 4 February 1968

TM 11-662 5-207-20, 8 October 1958, is changed as follows:

The title of the manual is changed as shown above.

Page 9. (As changed by C 1, 3 Apr 59). Change appendix to appendix I.

APPENDIX II
MAINTENANCE
(Superseded)

Section I. MAINTENANCE ALLOCATION

1. General

a. This section assigns maintenance functions to be performed on components, assemblies, and subassemblies by the-lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

- (1) *Component*. This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) are listed in disassembly order, or alphabetical order.
- (2) *Maintenance function*. This column indicates the various maintenance functions allocated to the echelons.
 - (a) *Service*. To clean, to preserve, and to replenish lubricants.
 - (b) *Adjust*. To regulate periodically to prevent malfunction.
 - (c) *Inspect*. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.
 - (d) *Test*. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.
 - (e) *Replace*. To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

* These changes supersede C 2, 3 August 1959.

(f) *Repair*. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, welding, grinding, riveting, straightening, and replacement of parts other than the trial-and-error replacement of running spare-type items such as fuses, lamps; or electron tubes.

(g) *Align*. To adjust two or more components of an electrical system so that their functions are properly synchronized.

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

(i) *Overhaul*. To restore an item to *completely serviceable* condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) *Rebuild*. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, 5th echelons*. The symbol X in columns 3 through 7 indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required*. This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks*. Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions*. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon*. The dagger (†) symbol in these columns indicates the echelons normally allocated the facility.

(3) *Tool code*. This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by Signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

Section II. MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
PART OR COMPONENT	MAINTENANCE FUNCTION	1ST ECH	2ND ECH	3RD ECH	4TH ECH	5TH ECH	TOOLS REQUIRED	REMARKS	
TEST SET; TELETYPEWRITER TS-1060/GG; TS-1060A/GG; TS-1060B/GG	service	X							
	adjust		X				7		
	inspect		X						
	test								
	replace	X				X	X	1 thru 7	Item 5 at 5th Echelon only.
	repair					X			
	align					X	X	1, 2, 3, 5, 7	
	calibrate					X	X	1 thru 7	Item 5 at 5th Echelon only.
rebuild						X			

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	1ST ECH	2ND ECH	3RD ECH	4TH ECH	5TH ECH	TOOL CODE	REMARKS
TS-1060/GG; TS-1060A, B/GG (continued) DISTORTION TEST SET TS -3 83/GG				†	†	1	
MULTIMETER TS-352/U				†	†	2	
OSCILLOSCOPE AN/USM- 140A				†	†	3	
TEST SET; ELECTRON TUBE TV-7/U				†		4	
TEST SET; ELECTRON TUBE TV-2/U					†	5	
TOOL KIT; RADAR AND RADIO REPAIRMAN TK-87/U				†	†		
TOOLS AND TEST EQUIPMENT AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION.						7	

TS-1060/GG; TS-1060A, B/GG 3

By Order of the Secretary of the Army:

EARLE G. WHEELER
General, United States Army,
Chief of Staff.

Official:

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

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CofT (1)	USA Pictorial Cen (2)
CofEngrs (1)	USA Mobility Spt Cen (1)
TSG (1)	Yuma Test Station (2)
AMC (5)	USARCARIB Sig Agcy (1)
USCONARC (6)	USA Sig Fld Maint Shops (3)
ARADCOM (2)	USA Corps (3)
ARADCOM Rgn (2)	JBUSMC (2)
OS Maj Comd (3)	Instl (2) except
OS Base Comd (2)	Ft Monmouth (63)
LOGCOMD (2)	USA Elct Mat Agcy (25)
MDW (1)	Chicago Proc Dist (1)
USA CD Agcy (1)	USA Elct R&D Activity,
Armies (2) Corps (2)	Ft Huachuca (2)
USA Tng Cen (2)	USA Elct R&D Activity (WSMR) (13)
USA Elect Comd (6)	Units org under fol TOE: (2 ea UNOINDC)
USA Msl Comd (3)	11-7
USA Strat Comm Comd (4)	11-16
Svc Colleges (2)	11-57
Br Svc Sch (2)	11-97
Army Dep (2) except	11-98
Lexington, Tobyhanna (12)	11-117
Ft Worth (8) Sacramento (17)	11-155
Sig Dep (OS) (12)	11-167
GEN DEP (OS) (2)	11-600 AA-AE (4)
Sig Sec. Gen Dep (OS) (6)	11-657
WRAMC (1)	11-687
USA Trans Tml Comd (1)	11-692
USA Tml (1)	11-697
POE (1)	32-56
	32-67

CHAPTER 1
MAINTENANCE INSTRUCTIONS

Section I. GENERAL MAINTENANCE

1. Scope

a. This manual covers organizational maintenance of Teletypewriter Test Set TS-1060/GG. The operating instructions for this equipment are contained in TM 11-6625-207-10, Teletypewriter Test Set TS-1060/GG, Operator's Manual.

b. Forward comments concerning this manual to the Commanding Officer, United States Army Signal Publications Agency, Fort Monmouth, N. J.

Note. For applicable forms and records, see paragraph 2, TM 11-6625 207- 10.

2. Extent of Organizational Repairman's Maintenance

a. The duties normally performed by the organizational maintenance man are limited by available spare parts, tools, materials, and test equipment.

b. Second echelon maintenance for Teletypewriter Test Set TS-1060/GG consists of the following:

(1) Preventive maintenance (par. 4) . (2) Equipment performance (par. 5) . (3) Repairs (par. 6 and 7).

3. Tools, Materials, and Test Equipment Required

The tools, materials, and test equipment required for second echelon maintenance are listed below.

a. *Tools and Materials.*

- (1) Tool Equipment TE-50-B.
- (2) Tool Equipment TK-21/G.
- (3) Cleaning Compound (Federal stock No. 7930-395-9542) .
- (4) Lint-free cloth.

b. *Test Equipment.*

- (1) Multimeter TS-297/U.
- (2) Electron Tube Test Set TS-7/U, TV-7A/U, or TV-7B/U.

4. Preventive Maintenance

a. *DA Form 11-266.* DA Form 11-266 (Maintenance Checklist for Signal Equipment (Test Equipment)) (fig. 1) is a preventive maintenance checklist to be used at the second echelon. Items not applicable to the equipment are lined out in the figure. Reference to the ITEM block in the figure are to paragraphs that contain additional maintenance information pertinent to the particular item. Additional preventive maintenance information concerning items 1 through 7, and 10 on DA Form 11-266 will be found in the preventive maintenance portion of TM 11-6625-207-10. Instructions for use of the form appear on the form.

b. *Items.* The information shown is supplementary to DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Warning: Disconnect all power before performing the following operations. After the power is disconnected some capacitors still may retain dangerous voltages. Before touching exposed electrical parts, short-circuit the parts to ground (or floating ground). When maintenance is completed, replace the chassis in the cabinet, reconnect the power, and check for satisfactory operation.

Item	Maintenance procedures
12	Check seating of all tubes and tube shields.
19	Check transformer T1 for broken terminals, shorted terminals, dirt, and corrosion. Check capacitors for discoloration, leaks, or bulges. Check connections of electrolytic capacitors. Check high-voltage rectifiers CR1 and CR2 for discoloration or any other unusual appearance. Warning: If either of the high-voltage rectifiers burn out or arc over, a strong odors evident. Provide adequate ventilation immediately. Avoid inhaling any fumes and do not handle the damaged rectifiers until they have cooled off.
20	Inspect all potentiometers for corrosion and dirt. See that all front panel control knobs are tight and clean. Use a clean cloth to remove dirt and moisture from the chassis. If necessary, dampen the cloth with Cleaning Compound; dry thoroughly. Warning: Cleaning Compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.
24	Inspect the screen of the cathode-ray tube for burns or spots.

Section II. TROUBLESHOOTING

5. Equipment Performance Checklist

a. *General.* The equipment performance checklist provides a procedure for systematically checking equipment performance. The corrective measures that the second echelon maintenance man can perform are given in the corrective measures column. When using the checklist, start at the beginning and follow each step in order. If the corrective measures indicated do not fix the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken.

b. *Procedure.* Place the test set in operation as shown in the checklist below:

Note. For location of controls, refer to figures 2 and 4 in TM 11-6625-207-10

Step	Action	Normal indication	Corrective measures
S T A R T I N G	1 Turn OFF-BASELINE control and BEAM switch to OFF. 2 Connect power cord to ac power source. 3 Move FILTER switch to OUT. 4 Turn OFF-BASELINE control clockwise (allow 10 minutes for warm up).	Power indicator glows	Check continuity of power cord and repair or replace as necessary. Check wiring of primary of transformer T1 (par. 7); change if necessary. Higher echelon repair required
P R E P A R A T O R Y	5 Move BEAM switch to ON. 6 Adjust VERT. POS, HOR. POS, and INTENSITY controls. 7 Adjust FOCUS control	Green dot appears on screen next to letter M. Caution: Keep intensity dot low until signal is applied to prevent burning the screen. Green dot appears clear on screen Caution: Turn BEAM switch to OFF when measurements are not being made.	Tighten tube socket on base of cathode-ray tube V9. Test tubes V9 and V10 (par. 6) and replace if necessary. Higher echelon repair required. Same as step 6 above.

	Step	Action	Normal indication	Corrective measures
P R E P A T O R Y	8	Connect output of TS-383/GG (60 wpm, character Y. 0 per cent distortion, 20 ma) to input of test set.		
E Q U I P M E N T P E R F O R M A N C E	9	Set the following controls to the positions indicated: POS-NEG switch to POS, 60- MA-20MA switch to 20MA, LOOP switch to NEWT, coarse speed control to 60, NOR.-IBM switch to NOR. and BEAM switch to ON. Adjust CLAMP control Readjust INTENSITY and FOCUS controls. Adjust OFF-BASELINE and HOR. POS controls. Adjust fine speed control	Rectangular pattern appears on screen. Pattern becomes steady Pips appear on both base lines Pattern base lines equal to length of scale on screen. Upward pips disappear against left-vertical line of pattern.	Check continuity of patch cord and repair if necessary. Test tubes V1, V3, and VS (par6) and replace as necessary.. Higher echelon repair required. Test tubes V4 and V7 (par. 6) and replace as necessary. Higher echelon repair required. Test tubes V2, V11, and V10 (par. 6) and replace as necessary Higher echelon repair required.. Test tube V8 (par. 6) and replace if necessary. Higher echelon repair required. Test tube V6 (par. 6) and replace if necessary. Higher echelon repair required.
S T O P P I N G	14 15 16	Disconnect patch cord from TS383/GG and from test set. Turn OFF-BASELINE control and BEAM switch to OFF. Disconnect power cord from power source.		

6. Tube Testing and Replacement

Note. If tube V1, V3, V5, or V6 is replaced, the test set must be recalibrated by higher echelon personnel.

a. General. Many tubes are discarded before their effective life expires. Observe the following precautions to prolong tube life:

- (1) Check the general condition of the test set, all wiring, connections, and components for breaks, leaks, or discolorations before removing any tubes.
- (2) Isolate the trouble, if possible, to a particular stage or component of the test set.
- (3) If tube failure is suspected, use the applicable procedure below to check the tubes. Remove and test one tube at a time. Only the tubes that are defective should be replaced.

b. Removal of Tubes. All tubes in the test set are mounted on the top of the chassis.

- (1) *Small electron tubes.*
 - (a) Remove the tube shields by pressing down on the shield and by rotating it counterclockwise, a short turn, until it is released.
 - (b) Do not rock or rotate the tube when removing it from the socket. Use a tube puller to remove the tube, pulling straight out. If a tube puller is not available, wait until the tube has cooled sufficiently; then grasp the tube and pull straight out.

- (2) *Cathode-ray tube.* When it becomes necessary to test or replace the cathode-ray tube, follow the procedures given in paragraph 25, TM 11-6625-207-10, for removal and replacement of the tube.

c. Use of Tube Tester.

- (1) Test one tube at a time.
- (2) Discard a tube that checks out defective on the tube tester or that is obviously defective.
- (3) Do not discard a tube that tests at or near its minimum test limit on the tube tester.
- (4) Replace the original tube or insert a new one before going on to the next tube.

d. Tube Substitution Method. If a tube tester is not available, trouble shoot the test set by following the tube substitution method.

Note. Do not use the substitution method to test tubes, V1, V3, V5, and V6.

- (1) Replace the suspected tubes, one at a time with new tubes. Note the socket from which the original tubes were removed. If the equipment becomes operative, discard the last tube removed. Do not leave a new tube in a socket if the equipment operates satisfactorily with the original tube.

Note. If a replacement for a bad tube becomes defective, visually check the condition of component parts of the tube circuit. Otherwise, continued tube replacement will effect only temporary repair and more serious troubles may result.

- (2) Reinsert the remaining original tubes one at a time, in the original sockets. If equipment failure occurs during this step, discard the last original tube.
- (3) If tube substitution does not correct the trouble, reinsert the original tubes in the original sockets, and forward the defective equipment to a higher echelon for repair.
- (4) Do not discard tubes merely because the tubes have been used for a specified length of time. Satisfactory operation in the circuit is the final proof of tube quality. The tube in use may work better than the new one.

7. Input Voltage Connections

Check the primary connections of transformer T1. Normally, the test set will be connected for a 115-volt ac power source. However, if only a 230-volt ac power source is available, a change must be made in the primary connections of transformer T1. If the equipment has been connected for a 230-volt input and must be changed for 115-volt input, follow the procedures given in a below. If the equipment has been connected for a 115-volt input and must be changed for a 230-volt input, follow the procedures given in b below.

a. 115-volt Connections (A, fig. 2).

- (1) Disconnect the power cord from the source of power.
- (2) Remove the chassis from the cabinet (TM 11-6625-207-10).
- (3) Remove the jumper wires from between pins 2 and 3.
- (4) Connect a jumper wire between pins 1 and 3.
- (5) Connect a jumper wire between pins 2 and 4.
- (6) Connect the power cord to the power source.
- (7) Turn the BEAM switch to OFF and the OFF-BASELINE control clockwise; the power indicator will glow.
- (8) Turn the OFF-BASELINE control to OFF and disconnect the power cord from the power source.
- (9) Replace the chassis in the cabinet.

b. 280-volt Connections (B, fig. 2).

- (1) Disconnect the power cord from the source of power.
- (2) Remove the chassis from the cabinet (TM 11-6625-207-10).
- (3) Disconnect the jumper wires from between pins 1 and 3 and 2 and 4.
- (4) Connect a jumper wire between pins 3 and 4.
- (5) Follow the procedures given in a(6) through (9) above.

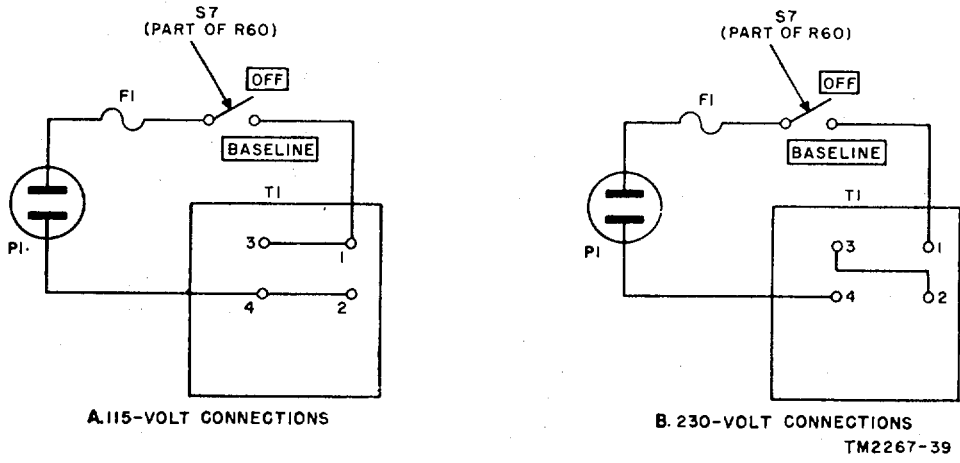


Figure 2. Transformer T1, primary connections.

CHAPTER 2
SHIPMENT AND LIMITED STORAGE

8. Disassembly of Equipment

To disassemble the test set for shipment or limited storage:

- a. Disconnect the patch cord from the test set.
- b. Disconnect the power cord from the source of power; coil the power cord.
- c. Remove dirt and grease from the external surfaces of the equipment.

9. Repackaging

The exact procedures for repackaging depend on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (TM 11-6625-20710) will also be helpful.

a. **Material Requirements.** The following materials are required for repackaging Teletypewriter Test Set TS-1060/GG. For stock numbers of materials, consult SB 38-100, Preservation, Packaging and Packing Materials, Supplies, and Equipment Used by the Army.

Material	Quality
Waterproof paper	12 sq ft
Waterproof tape	8 ft
Corrugated cardboard	20 sq ft
Gummed tape	8 ft
Filler material	8 lb
Wooden packing case	18 in. x 17 in. x 12 in.
Steel strapping	12 ft

b. **Packaging.** Package the components of the TS-1060/GG as follows:

- (1) Cushion the test set on all surfaces with pads of filler material.
- (2) Wrap the cushioned unit with corrugated cardboard.
- (3) Wrap the unit in waterproof paper.
- (4) Cover all seams with waterproof tape.
- (5) Place the unit within another wrap of corrugated cardboard.
- (6) Place the running spares within the wrap containing the test set.
- (7) Cushion each running spare, as necessary, with filler material.
- (8) Wrap the TS-1060/GG within corrugated cardboard.
- (9) Seal the package with gummed tape.
- (10) Package two operator's manuals (TM 11-6625-207-10) with waterproof paper and secure with waterproof tape.

c. **Packing.** Pack the packaged TS-1060/GG in a wooden packing case as follows:

- (1) Line the wooden packing case with waterproof paper.
- (2) Place the package (b (9) above) in the lined wooden packing case.
- (3) Fill all voids with filler material; make certain that the contents fit snugly and cannot move within the case.
- (4) Place the packaged technical manuals (b (10) above) on top of the equipment package.
- (5) Seal the waterproof paper with waterproof tape.
- (6) Nail down the wooden cover.

Note. Strap the box with steel strapping only for intertheater shipments.

APPENDIX
REFERENCES

Following is a list of applicable references available to the organizational maintenance man of Teletypewriter Test Set TS-1060/GG:

TM 11-655	Fundamentals of Telegraphy (Teletypewriter).	TM 11-2217	Distortion Test Sets TS -3 83/ GG and TS-383A/GG.
TM 11-664	Theory and Use of Electronic Test Equipment.	TM 11-5083	Electron Tube Test Sets TV-7/U, TV-7A/U, TV-7B/U.
TM 11-680	Teletypewriter Circuits and Equipment (Fundamentals)	TM 11-6625-207-10.	Teletypewriter Test Set TS 1060/GG, Operator's Manual.

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NG: State AG (6); units-same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 324 60.

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